University of Central Lancashire
UCLan

Central Lancashire Online Knowledge (CLoK)

Title	Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS): a mixed-methods study to inform trial design
Type	Article
URL	https://clok.uclan.ac.uk/id/eprint/13706/
DOI	https://doi.org/10.3310/hta19300
Date	2015
Citation	Morgan, Heather, Hoddinott, Pat, Thomson, Gillian, Crossland, Nicola, Farrar, Shelley, Yi, Deokhee, Hislop, Jenni, Moran, Victoria Louise, MacLennan, Graeme et al (2015) Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS): a mixed-methods study to inform trial design. Health Technology Assessment, 19 (30). pp. 1-522. ISSN 1366-5278
Creators	Morgan, Heather, Hoddinott, Pat, Thomson, Gillian, Crossland, Nicola, Farrar, Shelley, Yi, Deokhee, Hislop, Jenni, Moran, Victoria Louise, MacLennan, Graeme, Dombrowski, Stephan U, Rothnie, Kieran, Stewart, Fiona, Bauld, Linda, Ludbrook, Anne, Dykes, Fiona Clare, Sniehotta, Falko F, Tappin, David and Campbell, Marion

It is advisable to refer to the publisher's version if you intend to cite from the work.
https://doi.org/10.3310/hta19300

For information about Research at UCLan please go to http://www.uclan.ac.uk/research/

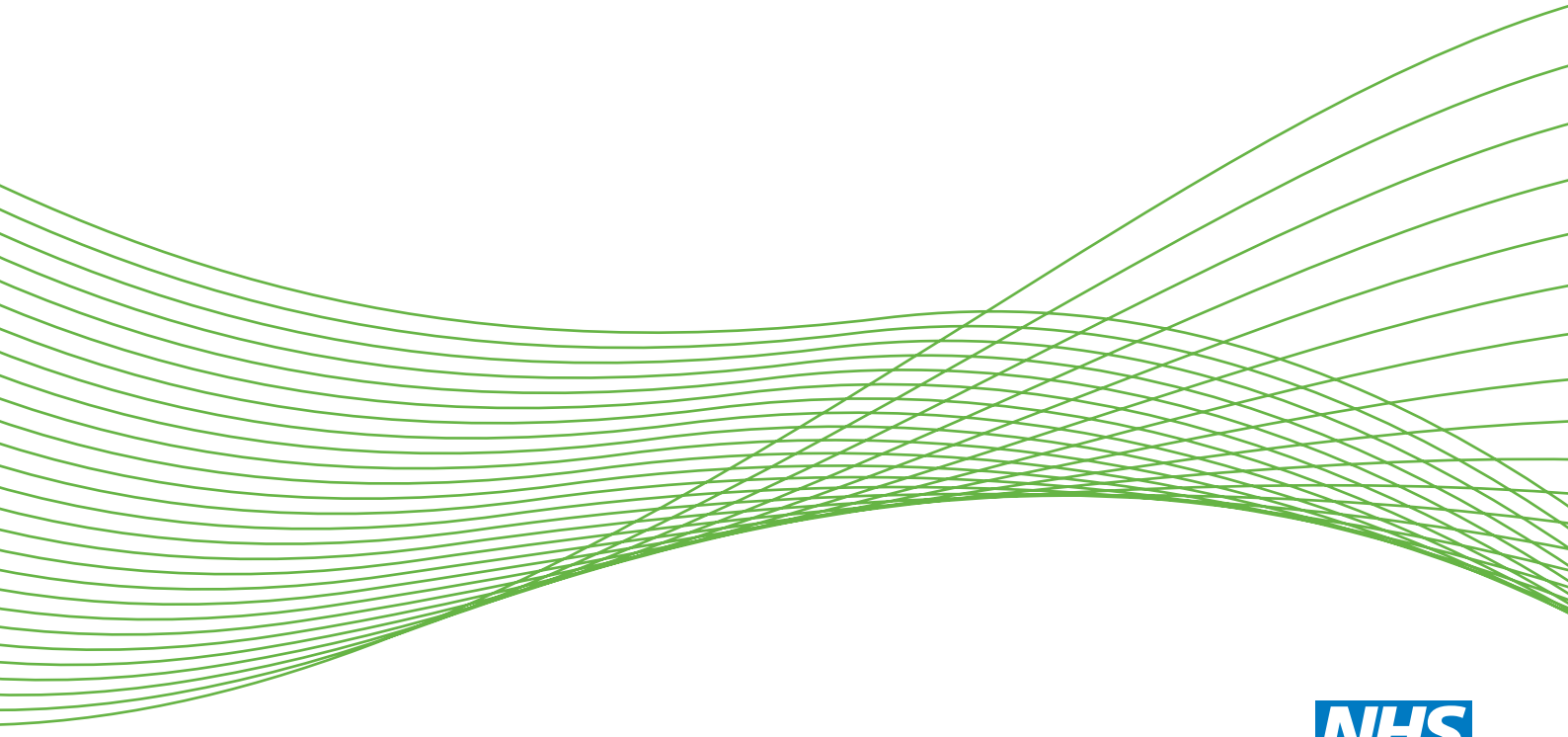
All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the http://clok.uclan.ac.uk/policies/

HEALTH TECHNOLOGY ASSESSMENT

VOLUME 19 ISSUE 30 APRIL 2015
ISSN 1366-5278

Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS): a mixed-methods study to inform trial design

Heather Morgan, Pat Hoddinott, Gill Thomson, Nicola Crossland, Shelley Farrar, Deokhee Yi, Jenni Hislop, Victoria Hall Moran, Graeme MacLennan, Stephan U Dombrowski, Kieran Rothnie, Fiona Stewart, Linda Bauld, Anne Ludbrook, Fiona Dykes, Falko F Sniehotta, David Tappin and Marion Campbell



National Institute for Health Research

DOI 10.3310/hta19300

Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS): a mixed-methods study to inform trial design

Heather Morgan,[1] Pat Hoddinott,[1,2*] Gill Thomson,[3] Nicola Crossland,[3] Shelley Farrar,[4] Deokhee Yi,[4] Jenni Hislop,[1,5] Victoria Hall Moran,[3] Graeme MacLennan,[1] Stephan U Dombrowski,[5,6] Kieran Rothnie,[1,7] Fiona Stewart,[1,8] Linda Bauld,[9] Anne Ludbrook,[4] Fiona Dykes,[3] Falko F Sniehotta,[5] David Tappin[10] and Marion Campbell[1]

[1]Health Services Research Unit, University of Aberdeen, Aberdeen, UK
[2]Nursing, Midwifery and Allied Health Professions Research Unit, University of Stirling, Stirling, UK
[3]Maternal and Infant Nutrition and Nurture Unit, University of Central Lancashire, Preston, UK
[4]Health Economics Research Unit, University of Aberdeen, Aberdeen, UK
[5]Institute of Health and Society, University of Newcastle, Newcastle, UK
[6]Psychology, University of Stirling, Stirling, UK
[7]London School of Hygiene and Tropical Medicine, London, UK
[8]Academic Urology, University of Aberdeen, Aberdeen, UK
[9]The Institute of Social Marketing, University of Stirling, Stirling, UK
[10]Perinatal Epidemiology and Child Health Unit, School of Medicine, University of Glasgow, Glasgow, UK

*Corresponding author

Declared competing interests of authors: Professor Sniehotta is a co-applicant on a National Institute for Health Research (NIHR) Career Development Fellowship for Jean Adams, University of Newcastle (title: Financial incentives for health promoting behaviours). Professor Sniehotta is also a co-applicant on a related grant from the NIHR Health Technology Assessment (HTA) programme [title: Parental incentives and quasi-mandatory schemes for increasing uptake of immunisations in pre-school children (September 2012–July 2014). J Adams, B Bateman, B Gardner Sood, S Michie, J Shucksmith, FF Sniehotta, T Cresswell, L Ternant. Value: £275,419.00]. Professor Linda Bauld is chief investigator on a NIHR HTA grant [title: Facilitators and barriers to smoking cessation in pregnancy (May 2013–April 2015). Bauld L, Graham H, Sinclair L, Flemming K, Naughton F, Tappin D, Gorman D. Value: £250,753.00]. Professor Bauld is also coprincipal investigator on a study funded by the Chief Scientist Office, Scottish Government Health and Social Care Directorates, and the Glasgow Centre for Population Health and NHS Greater Glasgow and Clyde [title: Cessation in Pregnancy Incentives Trial (CPIT) (February 2011–December 2013). Tappin D, Bauld L, Briggs A and colleagues. Value: £850,000.00]. Professor David Tappin is co-applicant on a NIHR HTA grant [title: Facilitators and barriers to smoking cessation in pregnancy (May 2013–April 2015). Bauld L, Graham H, Sinclair L, Flemming K, Naughton F, Tappin D, Gorman D. Value: £250,753.00]. Professor Tappin is also coprincipal investigator on a study funded by the Chief Scientist Office, Scottish Government Health and Social Care Directorates, and the Glasgow Centre for Population Health and NHS Greater Glasgow and Clyde [title: Cessation in Pregnancy Incentives Trial: The CPIT (February 2011–December 2013). Tappin D, Bauld L, Briggs A and colleagues. Value: £850,000.00].

Published April 2015
DOI: 10.3310/hta19300

This report should be referenced as follows:

Morgan H, Hoddinott P, Thomson G, Crossland N, Farrar S, Yi D, *et al*. Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS): a mixed-methods study to inform trial design. *Health Technol Assess* 2015;**19**(30).

Health Technology Assessment is indexed and abstracted in *Index Medicus*/MEDLINE, *Excerpta Medica*/EMBASE, *Science Citation Index Expanded* (SciSearch®) and *Current Contents®*/ Clinical Medicine.

Health Technology Assessment

HTA/HTA TAR

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 5.116

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, The Cochrane Library and the ISI Science Citation Index and is assessed for inclusion in the Database of Abstracts of Reviews of Effects.

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: nihredit@southampton.ac.uk

The full HTA archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hta. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Health Technology Assessment* journal

Reports are published in *Health Technology Assessment* (HTA) if (1) they have resulted from work for the HTA programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

Reviews in *Health Technology Assessment* are termed 'systematic' when the account of the search appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

HTA programme

The HTA programme, part of the National Institute for Health Research (NIHR), was set up in 1993. It produces high-quality research information on the effectiveness, costs and broader impact of health technologies for those who use, manage and provide care in the NHS. 'Health technologies' are broadly defined as all interventions used to promote health, prevent and treat disease, and improve rehabilitation and long-term care.

The journal is indexed in NHS Evidence via its abstracts included in MEDLINE and its Technology Assessment Reports inform National Institute for Health and Care Excellence (NICE) guidance. HTA research is also an important source of evidence for National Screening Committee (NSC) policy decisions.

For more information about the HTA programme please visit the website: http://www.nets.nihr.ac.uk/programmes/hta

This report

The research reported in this issue of the journal was funded by the HTA programme as project number 10/31/02. The contractual start date was in February 2012. The draft report began editorial review in October 2013 and was accepted for publication in April 2014. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).

Editor-in-Chief of *Health Technology Assessment* and NIHR Journals Library

Professor Tom Walley Director, NIHR Evaluation, Trials and Studies and Director of the HTA Programme, UK

NIHR Journals Library Editors

Professor Ken Stein Chair of HTA Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

Professor Andree Le May Chair of NIHR Journals Library Editorial Group (EME, HS&DR, PGfAR, PHR journals)

Dr Martin Ashton-Key Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

Professor Matthias Beck Chair in Public Sector Management and Subject Leader (Management Group), Queen's University Management School, Queen's University Belfast, UK

Professor Aileen Clarke Professor of Public Health and Health Services Research, Warwick Medical School, University of Warwick, UK

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Peter Davidson Director of NETSCC, HTA, UK

Ms Tara Lamont Scientific Advisor, NETSCC, UK

Professor Elaine McColl Director, Newcastle Clinical Trials Unit, Institute of Health and Society, Newcastle University, UK

Professor William McGuire Professor of Child Health, Hull York Medical School, University of York, UK

Professor Geoffrey Meads Professor of Health Sciences Research, Faculty of Education, University of Winchester, UK

Professor John Powell Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK

Professor James Raftery Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

Dr Rob Riemsma Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

Professor Helen Roberts Professor of Child Health Research, UCL Institute of Child Health, UK

Professor Helen Snooks Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Please visit the website for a list of members of the NIHR Journals Library Board:
www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: nihredit@southampton.ac.uk

Abstract

Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS): a mixed-methods study to inform trial design

Heather Morgan,[1] Pat Hoddinott,[1,2*] Gill Thomson,[3] Nicola Crossland,[3] Shelley Farrar,[4] Deokhee Yi,[4] Jenni Hislop,[1,5] Victoria Hall Moran,[3] Graeme MacLennan,[1] Stephan U Dombrowski,[5,6] Kieran Rothnie,[1,7] Fiona Stewart,[1,8] Linda Bauld,[9] Anne Ludbrook,[4] Fiona Dykes,[3] Falko F Sniehotta,[5] David Tappin[10] and Marion Campbell[1]

[1]Health Services Research Unit, University of Aberdeen, Aberdeen, UK
[2]Nursing, Midwifery and Allied Health Professions Research Unit, University of Stirling, Stirling, UK
[3]Maternal and Infant Nutrition and Nurture Unit, University of Central Lancashire, Preston, UK
[4]Health Economics Research Unit, University of Aberdeen, Aberdeen, UK
[5]Institute of Health and Society, University of Newcastle, Newcastle, UK
[6]Psychology, University of Stirling, Stirling, UK
[7]London School of Hygiene and Tropical Medicine, London, UK
[8]Academic Urology, University of Aberdeen, Aberdeen, UK
[9]The Institute of Social Marketing, University of Stirling, Stirling, UK
[10]Perinatal Epidemiology and Child Health Unit, School of Medicine, University of Glasgow, Glasgow, UK

*Corresponding author p.m.hoddinott@stir.ac.uk

Background: Smoking in pregnancy and/or not breastfeeding have considerable negative health outcomes for mother and baby.

Aim: To understand incentive mechanisms of action for smoking cessation in pregnancy and breastfeeding, develop a taxonomy and identify promising, acceptable and feasible interventions to inform trial design.

Design: Evidence syntheses, primary qualitative survey, and discrete choice experiment (DCE) research using multidisciplinary, mixed methods. Two mother-and-baby groups in disadvantaged areas collaborated throughout.

Setting: UK.

Participants: The qualitative study included 88 pregnant women/recent mothers/partners, 53 service providers, 24 experts/decision-makers and 63 conference attendees. The surveys included 1144 members of the general public and 497 health professionals. The DCE study included 320 women with a history of smoking.

Methods: (1) Evidence syntheses: incentive effectiveness (including meta-analysis and effect size estimates), delivery processes, barriers to and facilitators of smoking cessation in pregnancy and/or breastfeeding, scoping review of incentives for lifestyle behaviours; (2) qualitative research: grounded theory to understand

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

incentive mechanisms of action and a framework approach for trial design; (3) survey: multivariable ordered logit models; (4) DCE: conditional logit regression and the log-likelihood ratio test.

Results: Out of 1469 smoking cessation and 5408 breastfeeding multicomponent studies identified, 23 smoking cessation and 19 breastfeeding studies were included in the review. Vouchers contingent on biochemically proven smoking cessation in pregnancy were effective, with a relative risk of 2.58 (95% confidence interval 1.63 to 4.07) compared with non-contingent incentives for participation (four studies, 344 participants). Effects continued until 3 months post partum. Inconclusive effects were found for breastfeeding incentives compared with no/smaller incentives (13 studies) but provider commitment contracts for breastfeeding show promise. Intervention intensity is a possible confounder. The acceptability of seven promising incentives was mixed. Women (for vouchers) and those with a lower level of education (except for breastfeeding incentives) were more likely to disagree. Those aged $\leq$ 44 years and ethnic minority groups were more likely to agree. Agreement was greatest for a free breast pump and least for vouchers for breastfeeding. Universal incentives were preferred to those targeting low-income women. Initial daily text/telephone support, a quitting pal, vouchers for > £20.00 per month and values up to £80.00 increase the likelihood of smoking cessation. Doctors disagreed with provider incentives. A 'ladder' logic model emerged through data synthesis and had face validity with service users. It combined an incentive typology and behaviour change taxonomy. Autonomy and well-being matter. Personal difficulties, emotions, socialising and attitudes of others are challenges to climbing a metaphorical 'ladder' towards smoking cessation and breastfeeding. Incentive interventions provide opportunity 'rungs' to help, including regular skilled flexible support, a pal, setting goals, monitoring and outcome verification. Individually tailored and non-judgemental continuity of care can bolster women's capabilities to succeed. Rigid, prescriptive interventions placing the onus on women to behave 'healthily' risk them feeling pressurised and failing. To avoid 'losing face', women may disengage.

Limitations: Included studies were heterogeneous and of variable quality, limiting the assessment of incentive effectiveness. No cost-effectiveness data were reported. In surveys, selection bias and confounding are possible. The validity and utility of the ladder logic model requires evaluation with more diverse samples of the target population.

Conclusions: Incentives provided with other tailored components show promise but reach is a concern. Formal evaluation is recommended. Collaborative service-user involvement is important.

Study registration: This study is registered as PROSPERO CRD42012001980.

Funding: The National Institute for Health Research Health Technology Assessment programme.

Contents

List of tables xvii

List of figures xxv

List of boxes xxvii

List of abbreviations xxix

Plain English summary xxxi

Scientific summary xxxiii

Chapter 1 Background 1
What are incentives and how do they work? 1
Evidence, complex intervention design and incentives 4
Smoking in pregnancy: epidemiology, health impact and intervention effectiveness 4
Breastfeeding: epidemiology, health impact and intervention effectiveness 5
Smoking and breastfeeding behaviour around childbirth 6
Incentives for smoking cessation and breastfeeding: the policy context 6
Aims of the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study 7
Definitions 12
Report structure 13

Part 1 15

Chapter 2 Service-user engagement 17
Background 17
Methods 17
Engaging service-user groups 17
Negotiating meeting frequency and types of visits 18
Including service-user perspectives 20
Findings 20
Collaborative approaches to incorporating service-user perspectives 20
Relationship with the wider research team 21
Substantive contributions 21
Discussion 24
Conclusions 25

Chapter 3 Review of the benefits of incentives for initiating and continuing smoking cessation in pregnancy or breastfeeding 27
Methods 27
Research questions 27
Objectives 27
Identification of studies 27
Definition of an incentive 28
Inclusion and exclusion criteria 28

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Data extraction strategy 29
Behaviour change techniques 30
Smoking cessation studies 31
Breastfeeding studies 32
Quality assessment strategy 32
Data analysis 32
Results of the smoking cessation review 33
Number of studies identified 33
Included and excluded studies 33
Quality of the included studies 35
Characteristics of the included studies 35
Intervention content and format 43
Incentive/reward-related elements 45
General behaviour change techniques 45
Setting and provider 47
Intervention intensity and the participant journey 47
Intervention fidelity/non-compliance 55
Outcome measurement 55
Actors: who the intervention targeted 57
Baseline population characteristics 57
Effectiveness 61
Smoking cessation outcomes 62
Smoking reduction 62
Alternative definitions of abstinence 62
Changes in biochemically validated indicators of smoking cessation 74
Typology of smoking cessation in pregnancy quitters and non-quitters 74
Attrition 75
'Deception' rates 80
Costs 80
Implementation and sustainability 81
Acceptability outcomes 81
Results of the breastfeeding review 82
Number of studies identified 82
Included and excluded studies 82
Quality of the included studies 84
Characteristics of the included studies 87
Incentive/reward-related elements 88
General behaviour change techniques 88
Setting and provider 97
Intervention intensity and the participant journey 98
Intervention fidelity/non-compliance 100
Outcome measurement 100
Actors: who the intervention targeted 101
Baseline and demographic characteristics 101
Effectiveness 104
Breastfeeding rates 104
Breast pumps 108
Breast pump and vouchers, gifts and raffle for both parents 109
Food packages 109
Gifts 109
Household tasks 110
Financial incentives primarily for engaging in the study 110
Attrition 111

Costs 112
Implementation and sustainability 112
Acceptability outcomes 113
Results of the review of incentives provided to organisations to improve smoking cessation in pregnancy and breastfeeding outcomes 113
Smoking cessation in pregnancy 114
Breastfeeding 114
Discussion 116
Incentives for smoking cessation in pregnancy 116
Incentives for breastfeeding 117
Incentive intervention delivery for smoking cessation and breastfeeding 118
Incentives for providers of services for smoking cessation in pregnancy and breastfeeding 119
Strengths and limitations 119
Conclusions 120
Pointers for the shortlist of promising incentive strategies 121

Chapter 4 Review of reviews of the barriers and facilitators experienced by women for smoking cessation in pregnancy and breastfeeding **123**
Methods 123
Aim 123
Objectives 123
Inclusion criteria 123
Exclusion criteria 123
Search strategy 124
Data extraction strategy 124
Findings 124
Number of studies identified 124
The logic model 124
Findings for smoking cessation in pregnancy 126
Study characteristics 126
The centrality of smoking to identity and the body 126
The pregnancy 128
Risks and benefits 128
Social context 129
Place 129
Health professional services 129
Findings for breastfeeding 130
Study characteristics 130
The centrality of feeding to identity and the body 130
The mother–infant relationship 133
Risks and benefits 133
Breastfeeding: developing a practical skill 133
Social context 134
Place 134
Health professional services 135
Discussion 135
Strengths and limitations 136
Conclusions 136
Key themes for barriers to and facilitators of smoking cessation and breastfeeding 137

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 5 How the evidence on incentives for other lifestyle behaviours contributes to the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study **139**
Methods 139
Research question 139
Objectives 139
Identification of studies 140
Inclusion and exclusion criteria 140
Data extraction strategy 140
Results 141
Number of studies identified 141
Included studies 142
Excluded studies 142
Characteristics of included studies 142
Consumer incentives: findings that support the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study evidence syntheses of incentives to increase smoking cessation in pregnancy and/or breastfeeding (see Chapter 3*)* 142
Consumer incentives: gaps in the evidence and findings that show promise and need further investigation for smoking cessation in pregnancy and breastfeeding (see Chapter 3*)* 149
Incentives delivered to health-care providers 150
Provider incentives: gaps in the evidence and findings that show promise and need further investigation for smoking cessation in pregnancy and breastfeeding 151
Discussion 155
Strengths and limitations 156
Conclusions 156
Pointers for the incentive strategy shortlist 156
Pointers for the acceptability of incentives and any unintended consequences 157
Implications for research 157

Part 2 **159**

Chapter 6 Primary qualitative study investigating perspectives on incentives **161**
Methods 161
Design 161
Key research questions 162
Study settings 162
Sampling and recruitment 162
Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study data collection 163
Data collection for the Cessation in Pregnancy Incentives Trial 163
Data analysis 164
Findings 165
Sample characteristics 165
Overview of the findings 165
An incentive 'ladder' logic model for behaviour change 167
Everyday life: smoking cessation in pregnancy, breastfeeding and incentive intervention programmes 170
Incentive intervention programmes 176
Incentives contingent on verified outcomes 178
Incentives for preparatory behaviours 178
Incentives for more than one behaviour 179

Incentive components: meaning and value 180
Other programme components 188
Delivery of incentive programmes 192
Incentives to providers 197
Who should pay for incentives? 202
Unintended consequences 203
Perspectives on research into incentives 205
Discussion 206
Key findings 206
Strengths and limitations 208
Fit with the literature 208
Conclusions 210

Chapter 7 Surveys to inform the acceptability of incentive interventions around childbirth **211**
Background 211
Acceptability of incentives offered to people to change their behaviour 211
The acceptability of providing incentives to health service providers 212
Methods 213
Research questions 213
Objectives 214
Questionnaire design 214
Study populations 215
Data collection for the general public survey 215
Data collection for the health professional survey 215
Data analysis 216
Results of the Ipsos MORI survey of the acceptability of seven incentive strategies 217
Sample characteristics 217
Shopping vouchers for women who prove that they have stopped smoking during pregnancy 220
Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking 220
Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home 221
Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth 222
A breast pump costing around £40.00 provided for free on the NHS 222
Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy 223
Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding 223
Acceptable values for shopping vouchers (smoking and breastfeeding) 224
The acceptability of targeting incentives to low-income women only (smoking cessation and breastfeeding) 224
Results of the maternity and early years health professional survey of the acceptability of seven incentive strategies 225
Sample characteristics 225
Shopping vouchers for women who prove that they have stopped smoking during pregnancy 228
Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking 228
Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home 228

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth 228
A breast pump costing around £40.00 provided for free on the NHS 228
Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy 229
Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding 229
Acceptable values for shopping vouchers (smoking and breastfeeding) 230
The acceptability of targeting incentives to low-income women only (smoking and breastfeeding) 231
Framing effects 231
Smoking status of respondents 231
Infant feeding status of respondents 234
Discussion 234
Strengths and limitations 236
Implications for the shortlist of incentive strategies 237

Chapter 8 Discrete choice experiment of strategies to support smoking cessation in pregnant women **239**
Background 239
Methods 239
Objectives 239
Developing the discrete choice experiment 239
Developing the attributes and levels 239
Summary of attributes 240
Determining choice sets 242
Screening questions 242
Additional information 243
Pre-pilot 243
Sample, pilot and main data collection 243
Main analysis 244
Probability that an attribute of a smoking cessation service would potentially help a woman to quit smoking in pregnancy 244
Subgroup analysis 244
Results 245
Characteristics of respondents 245
Regression results 245
Likelihood of quitting scores for combinations of service attributes and levels 245
Subgroup analysis 249
Smoking status 250
Age group 250
Perceived ease/difficulty of quitting smoking 250
Educational attainment 250
Summary of the main analysis and the subgroup analysis 251
Discussion 251
Implications for incentive trial design 254

Chapter 9 Discussion **255**
What is the evidence for the effectiveness of incentives and their delivery processes in improving smoking cessation in pregnancy or breastfeeding outcomes? 255
The incentive ladder logic model 256
The development of a shortlist of the most promising incentive strategies 258
The acceptability of a shortlist of the most promising incentive strategies 258

The most promising incentive trial design: incentives for women to stop smoking in pregnancy 259
Breast pumps as a promising incentive strategy 261
Incentives for provider organisations to maintain breastfeeding 264
Incentives to providers to improve smoking cessation in pregnancy 265
Shopping voucher incentives for women to improve breastfeeding outcomes 265
Incentives for a smoke-free home after birth 266
Overall implications for incentive trial design 266
Strengths and limitations 267

Chapter 10 Conclusions **271**
Recommendations for research 273

Acknowledgements **275**

References **279**

Appendix 1 Commissioning brief **301**

Appendix 2 Intervention vignettes **307**

Appendix 3 Aberdeen 'ladders' **311**

Appendix 4 Aberdeen 'rungs' **315**

Appendix 5 Blackpool 'ladders' **329**

Appendix 6 PROSPERO acknowledgement of receipt **333**

Appendix 7 Search strategies **335**

Appendix 8 Studies included in the smoking cessation review **351**

Appendix 9 Studies included in the breastfeeding review **355**

Appendix 10 Grey literature **359**

Appendix 11 Single electronic mixed-methods data extraction form **365**

Appendix 12 Critical Appraisal Skills Programme quality assessment tool for qualitative data included in review studies **373**

Appendix 13 Quality of the studies included in the review of smoking cessation in pregnancy **379**

Appendix 14 Quality of the studies included in the review of breastfeeding **385**

Appendix 15 Illustrative topic guide **391**

Appendix 16 Vignettes for health professionals **393**

Appendix 17 The Cessation in Pregnancy Incentives Trial illustrative topic guide: one-to-one interviews with pregnant women participating in study **395**

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 18 The Cessation in Pregnancy Incentives Trial illustrative topic guide: interviews with professionals with a relevant role (e.g. with pregnant smokers, cessation services and/or the trial) 399

Appendix 19 Final framework used in NVivo10 405

Appendix 20 Interviews: mothers/partners 409

Appendix 21 Focus groups: mothers 413

Appendix 22 Interviews: providers/experts 417

Appendix 23 Focus groups and interactive discussions: providers/experts 419

Appendix 24 Background to Ipsos MORI Computer Assisted Personal Interviewing 421

Appendix 25 Ipsos MORI survey of the general public 423

Appendix 26 Survey of health professionals 429

Appendix 27 Distribution of the health professional survey 453

Appendix 28 Detailed results of the Ipsos MORI survey 455

Appendix 29 Detailed results of the Ipsos MORI survey: health economics 477

Appendix 30 Detailed results of the health professional survey 483

Appendix 31 Detailed results of the health professional survey: health economics 497

Appendix 32 Framing effects in the Ipsos MORI survey 501

Appendix 33 Discrete choice experiment questionnaire 503

Appendix 34 Discrete choice experiment technical appendix 513

Appendix 35 Discrete choice experiment results tables for subgroup analysis 515

List of tables

TABLE 1 Co-applicant mother-and-baby group profiles 19

TABLE 2 Taxonomy of IRBCTs 31

TABLE 3 Detailed quality assessment for qualitative and mixed-methods studies included in the review of incentives for smoking cessation in pregnancy 38

TABLE 4 Classification of studies included in the review of incentives for smoking cessation in pregnancy according to study design 38

TABLE 5 Summary of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women 39

TABLE 6 Details of the incentive/reward dimensions of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women 43

TABLE 7 Detail of incentive setting, provider and intensity in the studies included in the review of incentives for smoking cessation in pregnancy 48

TABLE 8 A participant's journey through the study by antenatal or postnatal month (M) from recruitment until final follow-up contact for studies in which incentives were offered to women for smoking cessation in pregnancy 51

TABLE 9 Baseline characteristics of participants in studies included in the review of incentives for smoking cessation in pregnancy 58

TABLE 10 Smoking cessation outcomes: estimated mid-pregnancy cessation rates (< 7 months' gestation) 63

TABLE 11 Smoking cessation outcomes: end of pregnancy cessation rates (7–9 months' gestation) 65

TABLE 12 Smoking cessation outcomes: early post-partum (0–2 months) cessation rates 67

TABLE 13 Smoking cessation outcomes: 3- to 4-month post-partum cessation rates 69

TABLE 14 Smoking cessation outcomes: 5- to 6-month post-partum cessation rates 70

TABLE 15 Smoking cessation outcomes: additional reported time points for cessation rates 72

TABLE 16 Smoking cessation outcomes: data from the study by Pbert and colleagues 73

TABLE 17 Smoking cessation in pregnancy incentive intervention attrition rates at reported time points before the end of pregnancy 76

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 18 Smoking cessation in pregnancy incentive intervention attrition rates at the end of pregnancy 77

TABLE 19 Smoking cessation in pregnancy incentive intervention attrition rates early post partum 78

TABLE 20 Smoking cessation in pregnancy incentive intervention attrition rates at 6 months post partum 79

TABLE 21 Classification of studies included in the review of incentives provided to childbearing women for breastfeeding according to study design 87

TABLE 22 Classification of studies included in the review of incentives provided to childbearing women for breastfeeding according to incentive content 87

TABLE 23 Summary of studies included in the review of incentives provided to childbearing women for breastfeeding 89

TABLE 24 Details of incentive/reward dimensions of studies included in the review of incentives for breastfeeding 93

TABLE 25 Details of incentive setting, provider and intensity of the intervention in studies included in the review of incentives for breastfeeding 94

TABLE 26 A participant's journey through the study by antenatal or postnatal month from recruitment until final follow-up for studies in which incentives were offered to women for breastfeeding 99

TABLE 27 Baseline and demographic characteristics of participants in studies included in the review of incentives for breastfeeding 102

TABLE 28 Breastfeeding outcomes: initiation – hospital discharge 105

TABLE 29 Breastfeeding outcomes at 2 weeks 106

TABLE 30 Breastfeeding outcomes from 3 weeks to 6 months 107

TABLE 31 Attrition rates at reported time points in studies included in the review of incentives for breastfeeding 111

TABLE 32 Summary of studies included in the review of incentives provided to organisations for smoking cessation in pregnancy and breastfeeding 113

TABLE 33 Characteristics of the studies included in the review of the barriers and facilitators that women experience for smoking cessation in pregnancy 127

TABLE 34 Characteristics of the studies included in the review of the barriers and facilitators that women experience for breastfeeding 131

TABLE 35 Reasons for exclusion of studies 142

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study 143

TABLE 37 Characteristics and findings of systematic reviews of incentives delivered to providers for other lifestyle behaviours that are relevant to the BIBS study 152

TABLE 38 Shortlist of promising incentive strategies 161

TABLE 39 Sampling strategy 162

TABLE 40 Study participants 166

TABLE 41 Summary of characteristics of women and partner participants 167

TABLE 42 An incentive ladder logic model for behaviour change 169

TABLE 43 Typology of incentives 182

TABLE 44 Characteristics of the general public sample ($n = 1144$) 217

TABLE 45 Summary of general public agreement with the seven incentive strategies 224

TABLE 46 Acceptable values for shopping vouchers for women who have proved that they have stopped smoking during pregnancy ($n = 660$) 224

TABLE 47 Acceptable values for shopping vouchers for women who have proved that they are breastfeeding ($n = 697$) 225

TABLE 48 Characteristics of the maternity and early years health professional sample ($n = 497$) 225

TABLE 49 Summary of maternity and early years health professional agreement with the seven incentive strategies 229

TABLE 50 Acceptable values for shopping vouchers for women who prove that they have stopped smoking during pregnancy ($n = 232$) 230

TABLE 51 Acceptable values for shopping vouchers for women who prove that they are breastfeeding ($n = 221$) 230

TABLE 52 Summary of the independent predictors of general public acceptability (+) and non-acceptability (–) for the shortlist of seven incentive strategies 232

TABLE 53 Summary of the independent predictors of health professional acceptability (+) and non-acceptability (–) for the shortlist of seven incentive strategies 233

TABLE 54 Attributes and levels for the DCE 241

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 55 Summary statistics: sociodemographics and smoking-related characteristics ($n = 320$) – categorical variables 246

TABLE 56 Summary statistics: sociodemographics and smoking-related characteristics ($n = 320$) – continuous variables 248

TABLE 57 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking 248

TABLE 58 Scores for the likelihood that varying configurations of attributes will support women to quit smoking in pregnancy 249

TABLE 59 Effects of the attributes and levels on the choice of smoking cessation service 252

TABLE 60 Grey literature on incentives provided to women to improve smoking cessation in pregnancy outcomes 360

TABLE 61 Grey literature on incentives provided to women to improve breastfeeding outcomes 361

TABLE 62 Grey literature on incentives for providers to improve smoking cessation in pregnancy outcomes 363

TABLE 63 Grey literature on incentives for providers to improve breastfeeding outcomes 363

TABLE 64 Survey distribution to primary care staff in Scotland through the SPCRN 453

TABLE 65 Survey distribution to hospital maternity and early years staff through health boards and R&D departments 453

TABLE 66 Survey distribution to stakeholders in Scotland through identified personal contacts who were e-mail list gatekeepers 454

TABLE 67 Survey distribution to maternity and early years health professionals in North West England through Binley's 454

TABLE 68 Survey distribution to UCLan midwifery and health visiting students 454

TABLE 69 Survey distribution to maternity and early years health professionals through R&D departments within the North West trusts 454

TABLE 70 Response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy', by independent variable, from the Ipsos MORI survey 455

TABLE 71 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy' 456

TABLE 72 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking', by independent variable 458

TABLE 73 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking' 459

TABLE 74 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home', by independent variable 461

TABLE 75 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home' 462

TABLE 76 Response to 'Shopping vouchers for women who breastfeed for the first 6 months after the birth of their child', by independent variable 464

TABLE 77 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who breastfeed for the first 6 months after the birth of their child' 465

TABLE 78 Response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding', by independent variable 467

TABLE 79 Simple univariable and multiple ordered logit regression models for response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding' 468

TABLE 80 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy', by independent variable 470

TABLE 81 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy' 471

TABLE 82 Response to 'Local health services should receive additional funding if they reach targets for the number of women who breastfeed', by independent variable 473

TABLE 83 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who breastfeed' 474

TABLE 84 Results from the two-part model to estimate the acceptable values for shopping vouchers among those who agreed with providing vouchers to mothers for smoking cessation 477

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 85 Results from the two-part model to estimate the acceptability of targeting incentives to low-income women only among those who agreed with providing vouchers to mothers for smoking cessation 479

TABLE 86 Results from the two-part model to estimate the acceptable value for shopping vouchers among those who agreed with providing vouchers for breastfeeding 480

TABLE 87 Results from the two-part model to estimate the acceptability of targeting to low-income women only among those who agreed with providing vouchers for breastfeeding 481

TABLE 88 Response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy', by independent variable, from the health professional survey 483

TABLE 89 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy' 484

TABLE 90 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking', by independent variable 485

TABLE 91 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking' 486

TABLE 92 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home', by independent variable 487

TABLE 93 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home' 488

TABLE 94 Response to 'Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth', by independent variable 489

TABLE 95 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth' 490

TABLE 96 Response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding', by independent variable 491

TABLE 97 Simple univariable and multiple ordered logit regression models for response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding' 492

TABLE 98 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy', by independent variable 493

TABLE 99 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy' 494

TABLE 100 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they are breastfeeding', by independent variable 495

TABLE 101 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they are breastfeeding' 496

TABLE 102 Results from the two-part model to estimate the acceptable values for shopping vouchers among those who agreed with providing vouchers to mothers for smoking cessation 497

TABLE 103 Results from the two-part model to estimate the acceptability of targeting incentives to low-income women only among those who agreed with providing vouchers to mothers for smoking cessation 498

TABLE 104 Results from the two-part model to estimate the acceptable value for shopping vouchers among those who agreed with providing vouchers for breastfeeding 499

TABLE 105 Results from the two-part model to estimate the acceptability of targeting to low-income women only among those who agreed with providing vouchers for breastfeeding 500

TABLE 106 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by smoking status subgroup 515

TABLE 107 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by age group 517

TABLE 108 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by perceived ease or difficulty of smoking cessation when pregnant 519

TABLE 109 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by educational attainment 521

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

List of figures

FIGURE 1 Flow diagram of the BIBS study 9

FIGURE 2 Timeline of the multiphased mixed-methods approach 9

FIGURE 3 Comparison of the patient information leaflet before and following service-user input 22

FIGURE 4 Flow chart outlining the screening process for the review of incentives for smoking cessation in pregnancy and within 6 months of giving birth 34

FIGURE 5 Quality assessment results by quality appraisal question for all studies included in the review of incentives for smoking cessation in pregnancy 36

FIGURE 6 Quality assessment results by study for all aspects of quality for the review of incentives for smoking cessation in pregnancy 37

FIGURE 7 General BCTs used in all intervention arms in the studies included in the review of incentives for smoking cessation in pregnancy 46

FIGURE 8 Combinations of contingency targets for incentive/rewards 56

FIGURE 9 Meta-analysis for the effect of incentives contingent on biochemically validated smoking cessation compared with non-contingent incentives towards the end of pregnancy 61

FIGURE 10 Flow chart outlining the screening process for the review of incentives for breastfeeding 83

FIGURE 11 Quality assessment results by quality appraisal question for all studies included in the review of incentives provided to childbearing women for breastfeeding 85

FIGURE 12 Quality assessment results by study for all aspects of quality for all studies included in the review of incentives provided to childbearing women for breastfeeding 86

FIGURE 13 Behaviour change techniques used in studies included in the review of incentives for breastfeeding 97

FIGURE 14 Combinations of contingency targets for incentive/rewards 100

FIGURE 15 Flow chart of the number of potentially relevant reports identified and the number subsequently included and excluded from the review 125

FIGURE 16 Barriers and facilitators logic model 125

FIGURE 17 Flow chart of the number of potentially relevant reports identified and the number subsequently included and excluded from the review 141

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

FIGURE 18 Incentive ladder logic model: two interacting metaphorical 'ladders' with complete, missing or broken rungs are joined by a platform representing sustained behaviour change 168

FIGURE 19 Bar charts showing general public agreement with the shortlist of incentive strategies 219

FIGURE 20 Bar charts showing maternity and early years health professional agreement with the shortlist of incentive strategies 227

FIGURE 21 Example of a choice set of questions presented to participants 242

List of boxes

BOX 1 Study settings 8

BOX 2 Overview of the CPIT 10

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

List of abbreviations

A-level	Advanced level
BCT	behaviour change technique
BFI	Baby Friendly Initiative
BIBS	Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy
CAPIBUS	Computer Aided Personal Interviewing (face-to-face omnibus)
CASP	Critical Appraisal Skills Programme
CDSR	Cochrane Database of Systematic Reviews
CI	confidence interval
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CO	carbon monoxide
COM-B	Capability, Opportunity, Motivation – Behaviour
CPIT	Cessation in Pregnancy Incentives Trial
DCE	discrete choice experiment
GCSE	General Certificate of Secondary Education
GP	general practitioner
HMO	health maintenance organisation
HTA	Health Technology Assessment
IRBCT	incentive/reward behaviour change technique
ISCS	incentive smoking cessation service
ITT	intention to treat
LHA	local health authority
MAP	Motivation development, Action on motivation or Prompted/cued behaviour
MIDIRS	Midwives Information and Resource Service
MORI	Market & Opinion Research International (Ipsos MORI)
MRC	Medical Research Council
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health Research
NRT	nicotine replacement therapy
OR	odds ratio
P4P	pay for performance
PPI	patient and public involvement
QOF	Quality and Outcomes Framework
R&D	research and development
RCT	randomised controlled trial
RD	risk difference
RR	relative risk
SD	standard deviation
SE	standard error
SPCRN	Scottish Primary Care Research Network
SQD	setting a quit date
UCLan	University of Central Lancashire
UNICEF	United Nations Children's Fund
VBRT	voucher-based reinforcement therapy
WHO	World Health Organization
WIC	Women, Infants and Children

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Plain English summary

We reviewed the evidence on incentives to help women stop smoking in pregnancy or to breastfeed. We interviewed 88 women/partners, 53 health professionals, 24 experts/service managers and 63 conference attendees to discuss how incentives might work and features of incentive services. We surveyed 1144 members of the general public, 497 health professionals and 320 women who smoke or who smoked.

Voucher incentives of > £20.00 per month, with regular check-ups to prove that smoking has stopped, increase the likelihood that women will stop smoking in pregnancy. Opinion on the acceptability of incentives was mixed. Agreement was more likely in adults aged ≤ 44 years and ethnic minorities (for breastfeeding). Disagreement was more likely among women and the less educated. Incentives for all, regardless of income, were preferred. Of seven potential incentives, a free breast pump worth £40.00 was most acceptable. People supported giving shopping vouchers for stopping smoking in pregnancy more than giving shopping vouchers for (1) stopping smoking after birth, (2) a smoke-free home or (3) breastfeeding. Additional funding for local health services who meet targets had similar support, but doctors disagreed. Concerns included cheating, stigma and wasting money.

Personal difficulties, emotions, socialising and attitudes of family and friends are all challenges in stopping smoking and breastfeeding. An incentive service might address these challenges by including regular telephone, text or face-to-face support; setting goals; including check-ups; providing a buddy; and providing non-judgemental, continuous care from someone with expertise.

Research is needed into whether incentives work on their own and/or with support and the costs compared with the benefits.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Scientific summary

Background

Smoking in pregnancy and/or not breastfeeding both have considerable negative health outcomes for mother and baby, as well as costs to the NHS; thus, effective and cost-effective interventions to encourage smoking cessation and breastfeeding are required. Current evidence on financial incentives suggests effectiveness for short and simple, rather than long-term, behaviour change.

Study definition of incentives

Financial (positive or negative) and non-financial tangible incentives or rewards, such as free or reduced-cost items or services that have a monetary or an exchange value.

Aim

To conduct evidence syntheses, primary qualitative and survey research and a discrete choice experiment (DCE) to develop an incentive taxonomy and inform the identification of promising (also acceptable and feasible) incentive interventions for improving smoking cessation in pregnancy and/or breastfeeding outcomes.

Objectives

1. To investigate the evidence for the effectiveness of incentive interventions delivered within or outside the NHS to (a) individuals and families or (b) organisations that aim to increase and sustain smoking cessation and breastfeeding.
2. To investigate the evidence for effective incentive delivery processes and how they increase and sustain smoking cessation and breastfeeding, including their acceptability and how they fit with existing barriers, facilitators and intrinsic and extrinsic motivators to behaviour change.
3. To systematically search for and identify incentive interventions in systematic reviews from other areas of health improvement, particularly for women of childbearing age, to (a) assess fit with our evidence synthesis; (b) inform the development of a shortlist of promising incentive strategies; and (c) identify research gaps where effective incentives for other behaviours have not been tested for smoking cessation and breastfeeding.
4. To investigate the acceptability and feasibility of a shortlist of promising incentive strategies and potential adverse consequences from the perspectives of (a) women and partners; (b) health professionals, experts, decision-makers and relevant stakeholders; and (c) the general public.
5. To develop an incentive taxonomy.
6. To inform the design for possible future trials including the target population, active components, mechanisms of action, the control group, the recruitment and delivery strategy, monitoring, outcome measurement and the effect size.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Methods

Three evidence syntheses were integrated with primary qualitative and survey research to investigate diverse perspectives using multidisciplinary, mixed methods. Uniquely, researchers collaborated with two mother-and-baby groups in disadvantaged areas (study co-applicants) who provided dynamic, hard-to-reach patient and public involvement (PPI) throughout.

Evidence syntheses

Systematic evidence syntheses of (1) incentive intervention effectiveness and delivery processes for smoking cessation in pregnancy or breastfeeding; (2) qualitative evidence reviews of the barriers to and facilitators of smoking cessation and breastfeeding; and (3) scoping review of reviews of effectiveness for other lifestyle behaviours followed Cochrane public health guidance:

- Detailed searches were carried out in MEDLINE, MEDLINE-In-Process & Other Non-Indexed Citations, EMBASE, Cumulative Index to Nursing and Allied Health Literature, PsycINFO, Web of Science, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects, Health Technology Assessment (HTA) database, Midwives Information and Resource Service, Applied Social Sciences Index and Abstracts and the Trials Register of Promoting Health Interventions.
- Quality assessment was carried out using the Cochrane risk of bias tool and guidance from the Centre for Reviews and Dissemination and the Critical Appraisal Skills Programme for qualitative studies.
- Outcomes were smoking cessation, prolonged abstinence and exclusive or any breast milk.
- Abstract and full-text screening and data extraction were undertaken by two researchers, including a general taxonomy of behaviour change techniques (BCTs) and a specifically modified taxonomy for incentive/reward behaviour change techniques (IRBCTs).
- Novel patient journey maps through the intervention illustrate the complexity of components, timing and intensity. This was possible only in the intervention arms because of poor reporting in the comparison arms.
- For the narrative synthesis of qualitative reviews of barriers and facilitators (both behaviours), themes were identified according to a logic model to understand the mechanisms of action of incentive interventions and intrinsic and extrinsic influences.
- For the review of systematic reviews of incentive interventions for other lifestyle behaviours, obesity, drug/alcohol addiction, exercise and smoking (all populations) were included.

Primary research

Purposive, theoretical and snowball sampling of sociodemographically diverse participants was undertaken by five interviewers at three sites – one with no incentive schemes, one with a concurrent smoking cessation Phase II incentive trial and one with previous incentive schemes (both behaviours). Grounded theory informed the investigation of the mechanisms of action of incentives, and a framework approach was applied to understand intervention components and delivery to inform trial design. Transcribed interviews were entered into NVivo10 software (QSR International, Warrington, UK). Thematic analysis, topic guide refinement and search for disconfirming data were iteratively undertaken.

A shortlist of promising incentive strategies emerged from the above analyses and acceptability was investigated by a Ipsos Market & Opinion Research International (MORI) Computer Aided Personal Interviewing (face-to-face omnibus) (CAPIBUS) survey of the UK general public, with randomisation of question order. NHS research and development networks and a private company distributed e-mails linked to Survey Monkey (see www.surveymonkey.com) to maternity and early years staff. Survey analysis used multivariable ordered logit models.

A DCE investigated five attributes of a smoking cessation incentive service: initial visit to set a quit date (constant); frequency of face-to-face support from a quitting expert; method of support in first week after quitting; involvement of a quit pal; monthly financial incentives in the form of a voucher. Analysis used a conditional logit regression model and model performance was compared using the log-likelihood ratio test.

Results

Effective interventions

- Out of 1469 smoking cessation and 5408 breastfeeding multicomponent studies identified, 21 smoking cessation studies of incentives for pregnant women and two for providers and 18 breastfeeding studies of incentives for women and one for providers were included in the review.
- Meta-analysis of four studies (332 participants) showed that providing vouchers contingent on biochemically proven smoking cessation was effective in late pregnancy compared with non-contingent incentives for participation [relative risk 2.58, 95% confidence interval (CI) 1.63 to 4.07]. Effects continued until 3 months after birth.
- In 13 studies in which incentives for breastfeeding were compared with no incentive or a smaller incentive, study heterogeneity precluded meta-analysis or the drawing of conclusions about effectiveness.
- The effectiveness of breast pumps remains uncertain (seven studies) because of study heterogeneity, contamination between intervention and control groups and comparisons with formula incentives.
- For smoking cessation, the mean number of BCTs per incentive intervention was 6.62 [standard deviation (SD) 3.1], most commonly information and carbon monoxide monitoring. For breastfeeding, the mean number of BCTs per incentive intervention was 4.34 (SD 2.8), most commonly social support. Attributing effect size to the incentive requires caution.
- Intervention intensity ranged from one to 36 contacts for smoking and from one to eight contacts for breastfeeding. This is a potential confounder.
- Small trials and variable attrition rates raise questions about intervention reach, and insufficient data were reported to assess health inequalities.
- Qualitative data on smoking cessation suggest that incentives work best for 'enthusiastic amateurs' who have more stable lifestyles. Those with more chaotic lives tended to cut down or relapse as smoking is central to their lives. Some 'non-contemplators' increase consumption and some 'do-it-aloners' do not engage.
- The effectiveness of provider incentives for smoking cessation in pregnancy is unknown.
- Provider commitment contract awards for meeting quality criteria or financial penalties for not meeting self-set breastfeeding targets (one study) show promise.

Barriers and facilitators

We identified three qualitative evidence syntheses for smoking cessation in pregnancy and 10 for breastfeeding and applied a logic model to understand how incentives and behaviours interact with the following barrier and facilitator themes:

- the centrality of smoking (e.g. enjoyment, coping with stress, addiction) to women's everyday lives
- for breastfeeding, external support was the dominant theme in terms of learning a new skill; mother–baby well-being was central to feeding decisions
- 'me time' and constructive relationships with partners, family, friends and health professionals
- negotiating the private–public interface for performing both behaviours.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Incentives for other lifestyle behaviours

This evidence synthesis included 17 studies on consumer and/or provider incentives:

- there was short-term (< 12 weeks) effectiveness of contingent financial incentives for substance addictions compared with non-contingent incentives for participation; consistent with our meta-analysis
- effectiveness was inconsistent across behaviours
- incentives can increase engagement in behaviour-change programmes
- the benefits of targeting and incentives beyond the individual are uncertain
- most provider incentive evidence relates to behaviour process measures (e.g. advice documentation and referral)
- provider incentives in the form of commitment contracts to meet quality standards can change behaviour in the short term but effects diminish with time
- provider incentives can do harm through neglect of non-incentivised behaviours and adverse effects on relationships
- the optimal level of the incentive dose–response relationship or ceiling effects are unknown.

Qualitative sample

In total, 16 focus groups, 55 face-to-face interviews and 19 telephone interviews were carried out with 88 pregnant women/recent mothers, 53 service providers, 24 experts/decision-makers, 63 conference attendees and 12 co-applicant group attendees and we obtained 432 out of 497 (86.9%) health professional responses to open survey questions on incentive consequences.

Incentive 'ladder' logic model

A typology of incentives with meanings and the IRBCT taxonomy were developed over the course of the study through synthesis of all data. The typology and IRBCT taxonomy did not fit the data complexity. Data suggest that an incentive in isolation would be unlikely to change or maintain behaviour as the interaction and fit with other life factors/context is likely to affect engagement and effectiveness. Interventions that are rigid, are prescriptive or place the onus on individuals to behave in a 'healthy' way risk women feeling judged and pressurised. To avoid losing face, women may disengage with services and feel demoralised.

We produced an incentive logic model and this was facilitated by the use of a 'ladder' metaphor. Two interacting ladders with complete, missing or broken rungs were joined by a platform representing sustained behaviour change. The rungs in one ladder address the assets, barriers and facilitators for individuals, families, social networks, the environment and other services. The rungs in the other ladder represent incentives/rewards, BCTs and other intervention facets. These would benefit from being individually tailored and delivered by specialist teams to enable women to bolster their individual capabilities. Monitoring to set short-term goals, visual outcome verification (albeit problematic for breastfeeding) and multiple community locations were valued.

Autonomy, motivation and control through providing general shopping vouchers that maximise well-being value in addition to financial value are important for smokers, particularly those with few choice opportunities. Gift deliveries, raffles and breast pumps (to share feeding) that operate as connectors to social support are valued for breastfeeding.

Shortlist of promising incentive strategies

The acceptability of promising incentive strategies was assessed through (1) MORI CAPIBUS general public ($n = 1144$) and maternity and early years health professional ($n = 497$) surveys and (2) qualitative data. Framing effects were observed, with breastfeeding incentives deemed more acceptable when asked about first. Those aged ≤ 44 years were more likely to agree with all seven incentive strategies than those aged ≥ 65 years.

1. *Shopping vouchers for women who prove that they have stopped smoking during pregnancy.* General public net disagreement was 42.3% (484/1144) and net agreement was 40.5% (463/1144). Those less likely to agree were women [odds ratio (OR) 0.71, 95% CI 0.57 to 0.88; $p = 0.002$] and those less educated. Those more likely to agree were current smokers who had tried quitting (OR 1.65, 95% CI 1.18 to 2.12; $p = 0.003$) and ethnic minorities. The attributes of this strategy were assessed with a DCE including 320 women aged ≤ 44 years with a smoking history. The DCE found that > £20.00 per month is required, with higher values up to £80.00 increasing the likelihood of quitting but at a decreasing rate. Initial daily text/telephone support and a quitting pal increase the likelihood of smoking cessation but the effect of the incentive seems greater.
2. *Shopping vouchers for women after the birth of their baby for proven smoking quit.* General public net disagreement was 46.4% (531/1144) and net agreement was 36.5% (417/1144). Those less likely to agree were women (OR 0.68, 95% CI 0.55 to 0.85; $p = 0.001$) and the less educated.
3. *Shopping vouchers for women after birth for a smoke-free home.* General public net disagreement was 46.0% (526/1144) and net agreement was 34.4% (394/1144). Those less likely to agree were women (OR 0.72, 95% CI 0.58 to 0.90; $p = 0.003$) and the less educated. Those more likely to agree were current smokers who had tried quitting and ethnic minorities.
4. *Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth.* General public net disagreement was 39.1% (447/1144) and net agreement was 34.2% (391/1144). Those less likely to agree were women (OR 0.77, 95% CI 0.62 to 0.95; $p = 0.003$). Those who had a breastfed child (OR 1.67, 95% CI 1.24 to 2.25; $p = 0.001$) or ethnic minorities were more likely to agree.
5. *A breast pump costing around £40.00 provided for free on the NHS*. General public net disagreement was 27.3% (312/1144) and net agreement was 45.8% (524/1144). Those more likely to agree had a breastfed child (OR 1.84, 95% CI 1.36 to 2.49; $p < 0.001$). Those less likely to agree were less educated. This was the most agreeable incentive strategy for health professionals: net disagreement 21.9% (109/497) and net agreement 67.8% (337/497). The cost was considered prohibitive by younger, more disadvantaged women. Breast pumps address women's barriers to and facilitators of breastfeeding, from intrinsic physiological/emotional to extrinsic factors, particularly at the private–public interface. They provide more ladder 'rungs' than shopping vouchers. Health professionals expressed concern about endorsement as a breastfeeding prerequisite and uncertainty about effects on feeding outcomes.
6. *Additional funding for local health services if they reach smoking cessation targets.* General public net disagreement was 37.2% (426/1144) and net agreement was 39.4% (451/1144). Midwives/health visitors/maternity care staff were more likely to agree than doctors (OR 2.35, 95% CI 1.51 to 3.64; $p < 0.001$).
7. *Additional funding for local health services if they reach breastfeeding targets.* General public net disagreement was 38.5% (441/1144) and net agreement was 36.4% (416/1144). Ethnic minorities were more likely to agree. Women professionals (OR 1.81, 95% CI 1.09 to 3.00; $p = 0.023$) and midwives/health visitors/maternity care staff (OR 2.54, 95% CI 1.65 to 3.91; $p < 0.001$) were more likely to agree than doctors.

Vouchers for up to £40.00 per month were acceptable (general public > 85% agreement). Universal provision rather than targeting low-income women was preferred (general public 55% agreement; health professionals 67% agreement). Unintended consequences concern health inequalities, gaming, opportunity costs and positive health and emotional implications.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

In the DCE, initial daily text/telephone support, a quitting pal, vouchers for >£20.00 per month and values up to £80.00 increased the likehood of smoking cessation in pregnancy.

Conclusions

1. Public opinion is mixed with regard to incentives for smoking cessation in pregnancy and breastfeeding.
2. Shopping vouchers for pregnant women contingent on smoking cessation are effective, but intervention intensity and other BCT components are likely confounders.
3. Participant journeys for the intervention and control arms should be identical and reported to enable the incentive effect size to be determined in a definitive trial.
4. Frequent initial daily text/telephone support and a quitting pal increase the likelihood of smoking cessation. Other valued components include continuity of non-judgemental care, visual carbon monoxide monitoring, short-term goal-setting, feedback, tailoring of support and specialised skilled services.
5. There was most agreement with a free breast pump worth £40.00. This addresses multiple barriers to breastfeeding. A feasibility study is required.
6. Women, those less educated and those living in more disadvantaged areas were independent predictors of disagreeing with voucher incentives. Narratives reveal feelings of blame, pressure and stigma.
7. Commitment contracts for providers and incentives beyond the individual, for example smoke-free homes, show some promise and feasibility studies are required.
8. An incentive 'ladder' logic model, which we developed from the study data, has face validity with target population service users for the design of trial 'rungs' that fit with everyday life 'rungs', as incentives alone were considered unlikely to succeed.

Study registration

This study is registered as PROSPERO CRD42012001980.

Funding

Funding for this study was provided by the HTA programme of the National Institute for Health Research.

Chapter 1 Background

This monograph reports the findings of the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy (BIBS) study. The BIBS study was funded to conduct evidence syntheses and primary qualitative and survey research, together with a discrete choice experiment (DCE), to develop an incentive taxonomy and to inform the design of an acceptable and feasible incentive intervention(s) with promise for improving smoking cessation in pregnancy and/or breastfeeding outcomes.

In this chapter we briefly describe what incentives are and how they are proposed to work to change behaviour. They are presented in the context of designing complex intervention trials to improve health outcomes. The health implications of smoking in pregnancy and breastfeeding are then considered with a brief history of incentives for these behaviours and the current policy context. The chapter concludes with the aims of the BIBS study and an overview of the chapters included in this report.

What are incentives and how do they work?

The *Oxford English Dictionary*[1] defines an incentive as 'a thing that motivates or encourages one to do something'. It is derived from the Latin word *incentivum,* 'something that sets the tune or incites', from *incantare,* 'to chant or charm'. Incentives may be direct, as in a reward for attaining a goal, or indirect, for example reduced-price products or services. A financial incentive may also be a penalty imposed for not achieving a goal. Kane and colleagues[2] argue that definitions of incentives often fail to distinguish their function and seldom consider the incentive within the larger environmental context. They propose that an incentive can function as a goal; as an external reinforcement of behaviour with the aim of increasing an individual's internal motivation until it is sufficient; as reinforcement until learning is accomplished and a habit has formed; or as a way of focusing a person's attention to a neglected area. For these reasons, we consider a broad definition of incentives delivered to and by a range of individuals and organisations in this study, as described later in this chapter.

Little is known about how incentives work in health care, how they might facilitate rather than erode informed choice and, crucially, how time and context modify effects.[3,4] In addition, new knowledge about behaviour, provided by neuroscience, is increasing rapidly and is beginning to inform theory. Incentive, motivation and behaviour theories are multitudinous, often overlap and are derived from a wide spectrum of disciplines besides health, including economics, psychology, sociology, education, law, business organisation and social policy. A review of these theories and of the neuroscience of incentives and rewards is beyond the scope of this study. Indeed, it has been asserted that there are too many theories of behaviour, with inherent problems around classification, labelling and the science underpinning the choice of theory.[5] In addition, Wise[6] suggests that 'Most writers have not come to grips with the problem of differentiating motivation from everything else' (p. 161) with respect to human behaviour. This parallels the conclusion of Johnston and Dixon[5] that there are gaps in the science of behaviour as applied to health. It is uncertain to what extent evidence and theories of incentives derived from non-health contexts are generalisable as this is a relatively new field of human behaviour research. Theories informing incentive interventions range from those targeting the individual only, which often stem from psychology and economics, to those that embrace the social network or apply a more ecological or systems approach to behaviour change. Economic theories focus on the values, costs and benefits of incentive interventions and can span all of these approaches. As many incentive interventions are multicomponent and complex,[7] more than one theory of behaviour change from more than one discipline may explicitly or implicitly apply in an incentive programme.

The following paragraphs provide a brief overview of theories selected by the research team because they were considered particularly relevant to the BIBS study of incentives for health behaviour change in relation to smoking cessation in pregnancy and breastfeeding. By definition, incentives serve as motivators.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

One motivational theory,[6,8] discussed in the context of neuroscience research and substance misuse, describes three main variables for motivation: drive, incentive and reinforcement. This builds on the work of Skinner,[9] who described the reinforcement of behaviours through rewards. A similar distinction between incentive and reinforcement is made by Michie and colleagues[10] in a recent taxonomy of behaviour change techniques (BCTs). Drive and incentive precede behaviour and energise it; reinforcement follows the first enactment of behaviour to establish memory and other processes that strengthen and sustain it, for example pleasure. Intrinsic drive exerts a push effect on action and extrinsic factors such as incentives exert a pull effect on action. Consistent incentives, and their reinforcement, result in conditioned learned responses, which establish behaviour.

In early incentive studies, for example that by Higgins and colleagues,[11] individual learning theory and operant conditioning theory are applied whereby the behaviour is influenced or controlled by the consequences. Learning theories assume that incentives will increase the target behaviour and that withdrawing the incentives should result in the behaviour stopping. They are rooted in social cognitive theories, such as social learning theory[12] and the theory of planned behaviour,[13] and hypothesise that people deliberately consider the balance of anticipated positive and negative consequences of their behaviour. From this perspective, incentives might tip the balance towards a desirable behaviour. In addition, incentives can also be explained by expectancy-value models, in which an individual forms beliefs about the consequences of a behaviour, attributes a value to these beliefs and incentives can change the value and the likelihood of the behaviour occurring. Social cognition models, like the theory of planned behaviour, are developments of expectancy-value models.[13]

It is important to understand the fit of incentives and rewards with more general theories of behaviour, such as dual process models, which have proposed that behaviour is underpinned by two separate, but interacting, systems: the cognitive, rational and reflective system as well as an impulsive, emotional, automatic system.[14,15] Although the relative importance of these two systems is often contested, incentives may exert their effects through either of these two behavioural systems. More specifically, Dixon and Johnston[16] have recently proposed a cognitive route MAP (i.e. *M*otivation development, *A*ction on motivation or *P*rompted/cued behaviour) to behaviour change. Whereas the motivation and action routes can be allocated to the reflective system of dual process models, the prompted route is akin to the automatic system. MAP has been used to inform interventions by organising 89 BCTs as affecting behaviour through either of these three proposed MAP routes.[16] Rewards delivered contingent on the behaviour are thereby considered to act via the prompted route, which bypasses the reflective system. Incentives, on the other hand, in which the actor is aware that a reward will be delivered contingent on a target behaviour or goal, were not considered in MAP, yet incentives have the potential to develop and to influence behaviour via the motivational route. The most recent taxonomy of BCTs[17] lists 93 hierarchically clustered techniques agreed through expert consensus methods and includes both incentives (i.e. informing someone that future rewards or removal of future punishment will be contingent on performance of the behaviour) and rewards (i.e. arranging the delivery of a reward if there has been effort and/or progress towards performing the behaviour).

In a recent review of behaviour change intervention development frameworks, Michie and colleagues[10] have systematically integrated psychological theory (in line with aspects of dual processing models and MAP) together with intervention functions (including BCTs) and policy categories. At the heart of the wheel is the COM-B system, which refers to three proposed essential conditions of a *B*ehaviour system: *C*apability, *O*pportunity and *M*otivation. The outer layer of the wheel contains nine intervention functions, one of which is incentives. The intervention functions address deficits in the COM-B system and an outer ring of seven policy categories is outlined as a way to draw in specific intervention functions. Applying the behaviour change wheel to incentives highlights the complexity of incentive intervention development, both in terms of the mechanisms of action as well as from a policy perspective. Thus, to develop a successful incentive-based intervention, it is paramount to take into account which sources of behaviour (or route to behaviour within the MAP framework) are being targeted as well as how the intervention can be stimulated from a policy perspective to integrate evidence-based behaviour change practice into routine care.

It can be argued that wider systems and ecological theory are relevant to understanding incentive interventions as occurring within a complex sociocultural milieu. Such approaches view incentives as having multiple interactions at different levels: between personal attributes, situations and the local and distal features of place, including their structural attributes, cultures and meanings.[18,19] Individual and national economic milieu, media influences and local incentive cultures within schools, workplaces and shops are all likely to impact on incentive outcomes. For example, in a study by Allen and colleagues,[20] it was found that a central reason for disengagement in a smoking cessation incentive programme was the change in the contractual relationship between the pharmacist and the client. Some participants associated attending the pharmacy with attending for methadone distribution, which pharmacists supervise, and were concerned about the potential stigma involved, which enhanced feelings of failure, guilt and shame.

In addition to the proposed mechanisms of action for the incentives described above, there are effect moderators operating through incentive delivery processes. These usually include a variety of associated activities and relationships, for example to establish behavioural targets, agree to a commitment contract, monitor performance or provide additional BCTs.[21] Incentives are unlikely to be similarly effective across all types of behaviour or in all contexts. Within health, differences would certainly be anticipated when comparing incentives for habitual behaviour change, in particular when overcoming a physiological addiction (such as smoking), and incentives for the establishment of a new skilled, performing behaviour (such as breastfeeding). Tversky and Kahneman[22] propose that changes in behaviour may be more likely to be triggered to avoid losses than to realise rewards, and Deci and Ryan[23] consider intrinsic motivation to be as important a factor in explaining human behaviour as extrinsic motivators such as economic incentives. Indeed, there are some surprising findings from studies that demonstrate changes of behaviour despite only a small proportion of the incentives offered actually being redeemed.[2] This suggests that mechanisms other than the actual incentive are responsible, for example triggering a socially desirable response, yet this has been relatively underexplored. Deci and colleagues[24] argue that incentives can actually inhibit intrinsic motivation, with associated perceptions of 'paternalism' interfering with effectiveness. This complexity is compounded by the fact that these behaviours are socially, culturally and environmentally situated and have different meanings, which can change rapidly for the actors involved.

From the perspective of economic theory, financial incentives are used to change the behaviour of health-care consumers and providers to induce an optimal level of supply. The use of incentives increases the benefits associated with activities that require greater levels of effort, and so changes the costs and benefit balance associated with choices. By increasing benefits through the introduction of explicit incentives, policy-makers can increase the likelihood that behaviour changes in the desired direction, providing the benefits are perceived as exceeding the costs of the new behaviour. Behavioural economic theory acknowledges that people's preferences may depend on timing, with more immediate desirable and certain outcomes (e.g. pleasure) valued more highly than distant and uncertain outcomes (e.g. potential health consequences). Such future uncertain benefits are valued less highly than those enjoyed immediately and with certainty, a process known as discounting. The costs of health-promoting behaviour (whether it is associated with additional financial costs or greater personal effort), on the other hand, are felt immediately. A measure of delayed discounting, which Yoon and colleagues[25] equate to impulsivity, has shown that the greater discounting (impulsivity) of rewards predicts post partum smoking and substance misuse relapse. However, as Marteau and colleagues[4] point out, many people do not act in the way that they retrospectively would have preferred to act, and much of our behaviour is triggered automatically by situations and environments.[26] Changes to the 'choice architecture' within an organisation or system can facilitate behaviour change and immediately associating incentives with a desired behaviour might therefore tip the balance.[27] There is strong evidence that financial penalty incentives, for example increased taxes, change behaviour.[28,29] Incentives as a means to redistribute resources to address health inequalities have recently gained popularity in low- and middle-income countries.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Evidence, complex intervention design and incentives

The BIBS study, reported in this monograph, provides an incentive evidence platform that takes theory, service-user, health professional and general public perspectives into account to inform the design of incentive intervention trials. It represents Phase I of the framework for the design of complex interventions as recommended by the Medical Research Council (MRC)[30] and draws on the less linear development published in 2008.[31] A generic linear causal model for applying behaviour change theory to intervention design is described by Hardeman and colleagues[32] and specifies techniques and measures for each step in a causal pathway. Another approach that we apply in this study is to develop a logic model, to understand the theory, intervention components, activities, processes and outcomes involved in a programme, as recommended by Armstrong and colleagues.[33]

An important consideration was to define the target population for receipt of incentive interventions. In this study, the effectiveness of incentives delivered to consumers and to health-care providers is considered in *Chapters 3* and *5*. The focus is to change health behaviour outcomes. However, an alternative outcome of redistribution is apparent in some incentives literature, in which incentives are targeted to low-income populations. Health inequalities are increasing in the UK, with one in four children born into poverty.[34]

Universalism, proportionate universalism[35] or specific targeting is an important consideration for intervention design. Targeting can cause stigma and is unpopular with some, yet unhealthy lifestyle behaviours are socially patterned and health inequalities could be increased by universal incentive provision. Targeting has been used mostly in developing countries, for example conditional cash transfer or coresponsibility payments for pregnant women and families who attend antenatal, vaccination and child-care appointments have improved child health outcomes.[36] Such projects have been implemented in > 40 countries worldwide and aim to address poverty by providing cash to help families deal with their most urgent needs and use incentives to promote behaviours that aim to improve the well-being of children. However, their success and sustainability is questioned because of supply-side concerns in countries with weak health and education service infrastructure and shortages of service providers.[37,38]

An example of targeting in the UK demonstrates the risks of incentivising a proxy outcome rather than the actual behaviour. The UK government's Educational Maintenance Allowance programme was rolled out nationally in 2004 and was subsequently discontinued. This was a means-tested cash payment scheme conditional on attendance at post-compulsory education rather than achievements and had mixed outcomes.[39] The risk of implementing incentive schemes ahead of the evidence can be demonstrated by the example of the 'smoke-free class' competition for young people. This was widely implemented across some parts of Europe; however, a Cochrane review found no evidence that it had prevented young people from starting to smoke in the medium to long term.[40]

Smoking in pregnancy: epidemiology, health impact and intervention effectiveness

Maternal smoking in pregnancy causes substantial harm, increasing the risk of miscarriage, stillbirth, prematurity, low birth weight, perinatal morbidity and mortality, neonatal or sudden infant death, asthma, attention deficit disorder, learning difficulties, obesity and diabetes.[41–50] Annual costs to the NHS of adverse events related to smoking in pregnancy have been estimated at between £8M and £64M for maternal outcomes and between £12M and £24M for infant outcomes.[51] Pregnancy is an opportunity to help women stop smoking before their own health is permanently compromised, which can significantly reduce rates of spontaneous preterm birth, small for gestational age babies and complicated pregnancies compared with those of non-smokers.[52]

The 2010 UK Infant Feeding Survey found that at least 12% of mothers continued to smoke throughout their pregnancy, down from 17% in 2005.[53] Of survey respondents, 28% reported that they lived with at least one other person who smoked during their pregnancy and, in these situations, 30% continued to smoke compared with only 5% of mothers who did not live with any other smokers.[53] Of mothers who smoked in the year before or during their pregnancy, 54% gave up at some point before the birth.

The most recent Cochrane review of smoking cessation interventions for pregnant women found that those used in early pregnancy can reduce smoking in later pregnancy by around 6%. Cognitive–behavioural approaches were found to be effective and financial incentives were the single most effective intervention, but this latter finding was based on just four trials from the USA.[54] Nicotine replacement therapy (NRT) is licensed for use in pregnancy; however, adding a nicotine patch (15 mg per 16 hours) to behavioural support did not significantly increase the rate of abstinence from smoking until delivery or decrease the risk of adverse pregnancy or birth outcomes in one large UK trial.[55] National Institute for Health and Care Excellence (NICE) guidelines in the UK state that all pregnant women who smoke should be offered support to quit.[56] Self-help interventions have also been shown to be effective; however, the UK evidence for this is limited and may not be directly applicable.[57] In the UK, NHS stop smoking services are available for pregnant women, employing cognitive–behavioural approaches to cessation delivered by a trained adviser and including the offer of NRT when appropriate.[58] This follows the 2010 NICE guidance on smoking cessation interventions in pregnancy and following childbirth.[41] However, one challenge is that very few pregnant smokers access NHS support. In Scotland in 2006, for example, < 10% of pregnant smokers set a quit date with NHS services, suggesting that there is a need for new approaches that will encourage women to access support, potentially including the use of financial incentives.[59]

Breastfeeding: epidemiology, health impact and intervention effectiveness

The World Health Organization (WHO) recommends exclusive breastfeeding (with no other liquids or solids) until the age of 6 months.[60] This policy is supported by the UK government; however, < 1% of UK women currently breastfeed until 6 months.[53] In 2010, only 46% of UK women exclusively provided breast milk to their infant at 1 week and 23% did so at 6 weeks.[53] In the UK, data from a 5-yearly Infant Feeding Survey show a steady increase in breastfeeding initiation, from 62% in 1990 to 76% in 2005 and 81% in 2010; however, increases in the duration of breastfeeding have been disappointing. For women who initiate breastfeeding, 19% stop breastfeeding before 2 weeks and 85% of these women report that they would have liked to have breastfed for longer, and 32% stop before 6 weeks.[53] When women were asked, one in five responded that more guidance and support from hospital staff, midwives and family would have helped them to continue breastfeeding for longer. Mothers express dissatisfaction with breastfeeding care[61,62] and 30% report feeding problems in the early weeks.[53]

There is good-quality evidence on the short- and long-term health benefits of breastfeeding for both mothers and infants.[63] Babies who are breastfed are at a lower risk of respiratory and gastrointestinal infections and hospitalisations for these conditions, allergies and leukaemia. Premature infants who are breastfed are at decreased risk of necrotising enterocolitis and suboptimal neurological development, with lower longer-term risks in adolescence of raised blood pressure and cholesterol levels.[63] Mothers who breastfeed are at reduced risk of breast cancer, ovarian cancer and type 2 diabetes. A recent health economic analysis estimated that, if 45% of women exclusively breastfed at 4 months and 75% of infants in neonatal units were breastfed while in hospital, over £17M of treatment costs could be saved in terms of gastrointestinal infections, lower respiratory infections, otitis media and necrotising enterocolitis, as well as there being gains in maternal breast cancer-related quality-adjusted life-years.[64]

Systematic review evidence on interventions to increase the initiation and duration of breastfeeding suggests that increased professional and lay support are effective, particularly if this spans pregnancy and postnatal care, with multifaceted interventions reported as more likely to be effective.[65] However, the

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

generalisability of these findings is uncertain as nine UK trials providing additional support since 2000 have not reported significant improvements in breastfeeding outcomes.[66] Qualitative studies suggest that current UK NHS support is not meeting women's needs, particularly in the early weeks following birth,[62] and qualitative evidence synthesis recommends a woman-centred approach.[67]

Smoking and breastfeeding behaviour around childbirth

Smoking cessation and breastfeeding have a long history of being researched independently; however, recent studies suggest correlations and possibly causal relationships between the two.[68–70] Women who quit smoking in pregnancy and who breastfeed are more likely to abstain from smoking post partum for up to 12 months,[69,70] and data from incentive intervention studies suggest a causal relationship between stopping smoking and increased breastfeeding duration.[68] UK data (2009/10) report that 41.5% of non-smoking mothers exclusively breastfed their babies at 10–14 days compared with 13.6% of mothers who smoked, with a similar pattern observed for partial breastfeeding rates and across maternal age groups and deprivation categories.[53] Considerable health inequalities are evidenced for both smoking in pregnancy and breastfeeding behaviours. Pregnant mothers aged ≤ 20 years are more than five times less likely to be breastfeeding at 4 months,[71] are three times more likely to smoke before or during pregnancy and are less likely to quit smoking than mothers aged ≥ 35 years.[53] The breastfeeding initiation rate was 90% for mothers in managerial and professional occupations compared with 74% for mothers in routine and manual occupations, with a fourfold difference in smoking before or during pregnancy (14% and 40% respectively).[53] Mothers in routine and manual occupations are also less likely to attend parentcraft education classes or engage in health services that support behavioural change.

Incentives for smoking cessation and breastfeeding: the policy context

Given the health burden and considerable health inequalities observed for smoking in pregnancy and not breastfeeding, together with the limited reach and effectiveness of interventions to date, new innovative approaches to change these behaviours, such as incentives, seem attractive. UK governments are adopting a broader approach than the previous focus on individual behaviour change interventions, with reducing health inequalities as a priority.[35,72] In 2010, the UK government set up the Cabinet Office Behavioural Insight Unit, or 'Nudge' Unit, to consider how to encourage people to act in their own longer-term interests, as well as those of society, informed by behavioural economics theory.[27] Strategies that act at a population level, with a wider systems approach, and which can complement individually tailored brief interventions are suggested. Patient-centred care and self-care, which encourage individuals to take responsibility for their health, is a strong policy theme.[7,73]

The 2010 public health White Paper in England[73] compares providing incentives to local communities to forge partnerships to deliver better health outcomes and reduce health inequalities with incentivising individuals or health service providers, and considers the former more feasible. Local community development incentive schemes can have benefits beyond individual behaviour change, by increasing social capital in disadvantaged communities, fitting the current UK government's vision of a 'Big Society'.[74]

Until recently, disincentives through increasing taxes on tobacco products or restricting where people can smoke (through smoke-free legislation) have been the dominant policy approach in the UK. However, such initiatives have commanded media attention. Some of these have included local financial incentive schemes for smoking cessation in pregnancy and grey literature on some of these schemes is included in our review. In addition, at least one incentive programme for the general adult population has been conducted in the UK. This is the Quit4U programme in Scotland that offers supermarket vouchers of £12.50 (2013 prices) per week to people living in disadvantaged areas of Tayside.[75] The Quit4U evaluation showed that the incentives helped to engage smokers and increased short-term quit rates; however, success rates at

12 months were only slightly higher than for other, existing smoking cessation services[76] and some adverse impacts on client–professional relationships were reported, which impacted on engagement with services.[20] Concern has been expressed by others about the change in professional–patient relationships when financial incentives to either party are involved, particularly around mutual trust.[77]

Incentives for feeding babies have a long history in the UK, dating back to when Winston Churchill introduced free national dried milk in 1942 to improve the health of children, famously saying 'There is no finer investment for any community than putting milk into babies'.[78] The Welfare Food Scheme operated from 1942 until 2006 and removed a financial barrier to formula milk purchase. Indeed, it can be argued that this acted as a disincentive to breastfeed. On the other hand, breastfeeding has been perceived as cost free, but other costs for nursing bras, pumps and pads, and crucially the mother's time, are incurred but rarely calculated in public policy. Until 2006, lower-income mothers were entitled to 900 g of formula milk a week for every child aged < 1 year and this was distributed through health centres. This scheme was replaced in 2006 by the current Healthy Start scheme,[79] which provides vouchers to low-income families that include a pregnant woman or children aged < 4 years that can be exchanged for infant formula, liquid cow's milk and fresh or frozen fruit and vegetables. The scheme does not offer any extra incentive to breastfeed. The NHS endorses the WHO *International Code of Marketing of Breast Milk Substitutes*;[80] however, commercial formula milk samples, discount vouchers of < £90.00, cuddly toys and children's clothes are available in the UK through mother-and-baby magazines, supermarket loyalty incentive schemes and websites.

Aims of the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study

The overarching aims of the BIBS study were to conduct evidence syntheses and primary qualitative and survey research, together with a DCE, to develop an incentive taxonomy and to inform the design of an acceptable and feasible incentive intervention(s) with promise for improving smoking cessation in pregnancy and/or breastfeeding outcomes. Aberdeenshire, Glasgow and Lancashire were purposively selected as the settings for primary data collection because of their diverse sociodemographic characteristics and their different incentive cultures for smoking cessation in pregnancy and breastfeeding (*Box 1*). A multiphase mixed-methods design[87] with sequential stages was considered the most appropriate design to address the commissioning brief (see *Appendix 1*). The quantitative and qualitative methods converged (*Figures 1* and *2*) and integration of the findings occurred iteratively throughout the study to address both the a priori and emergent research questions. The Cessation in Pregnancy Incentives Trial (CPIT)[88] was running concurrently with the BIBS study and the CPIT qualitative process evaluation data were incorporated into the BIBS analysis towards the end of the BIBS study. An overview of the CPIT is provided in *Box 2*.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

BOX 1 Study settings

Aberdeenshire

Aberdeenshire has a mixed urban/town/rural population, with partners absent for long spells working offshore or in the fishing industry and oil industries, and there are pockets of affluence and deprivation. In Grampian in 2012, 14.5% of women were reported as current smokers at antenatal booking and 13.5% were reported as smoking at 10–14 days after birth.[81] In 2011/2, 58.4% of babies were being given some breast milk at 10–14 days, with 45.4% still receiving some breast milk at 6–8 weeks after birth.[81]

Incentive culture: Aberdeenshire has the highest proportion in Scotland (71%) of smoking cessation services for pregnant women delivered through community pharmacists, who receive payments per person registering for smoking cessation support and for data collection.[53] In discussions between PH and providers in primary care and maternity services, many managers and practitioners are resistant to providing financial incentives to patients following adverse media publicity about a smoking cessation incentive scheme in neighbouring Tayside, which our collaborator Susan MacAskill evaluated. Our co-applicant mother-and-baby group is an example of a partnership community development project that has raised money from local businesses to provide non-financial incentives (a crèche and subsidised café).

Glasgow

Glasgow has an urban multicultural population with a wide sociodemographic range from affluence to large areas of extreme disadvantage. A total of 50% of households are in areas of the highest material deprivation compared with 20% for Scotland as a whole. In 2012, 18.3% of women living in Greater Glasgow and Clyde were reported as current smokers at antenatal booking, with 15.3% smoking at 10–14 days after birth.[82] In 2011/2, 43.4% of babies were being given some breast milk at 10–14 days, with 33.9% still receiving some breast milk at 6–8 weeks after birth.[83]

Incentive culture: The CPIT started in June 2011 and includes a qualitative element examining how incentives are perceived by recipients and providers. This Phase II randomised controlled trial is summarised in *Box 2*.

Lancashire

Lancashire has a mixed urban, small town and rural population with a wide sociodemographic range. For 2007 Indices of Deprivation,[84] six local districts (including Blackpool) are ranked within the top 50 in England and in some towns up to 35% of births are to women of South Asian origin. Blackpool has one of the highest rates of teenage pregnancy, one of the lowest breastfeeding initiation rates (56% compared with 74% for England) and one of the lowest rates for babies still breastfed at 6–8 weeks (24% compared with 47% for England).[85] Although smoking rates vary across the region, Blackpool has the highest overall rate with 30% of women smoking at the time of delivery in 2011/12, which is over twice the national average for England (13%).[86]

Incentive culture: Lancashire is an innovative area for breastfeeding incentive schemes. The Be a Star campaign started in Lancashire in 2008 and promotes breastfeeding among 16- to 25-year-old mothers (see www.beastar.org.uk/archives/tag/be-a-star-adverts-lancashire). It originated as a partnership between one of the primary care trusts, the Little Angels breastfeeding peer support organisation and The Hub social marketing agency. Be a Star transforms local breastfeeding mums to look like models, celebrities, singers and actresses, making breastfeeding glamorous, sexy and appealing, and provides breastfeeding support. Be a Star has been rolled out across 15 primary care trusts in England with encouraging results. The strategic health authority provided funds to three areas in the North West (one of which is NHS Blackpool Primary Care Trust) to run incentive schemes with the aim of increasing breastfeeding duration at 6–8 weeks in 2011 by 5%. The community Star Buddies Breastfeeding Peer Supporters who are delivering the incentive scheme in Blackpool operate out of St Cuthbert's and Palatine Children's Centre (our co-applicant base).

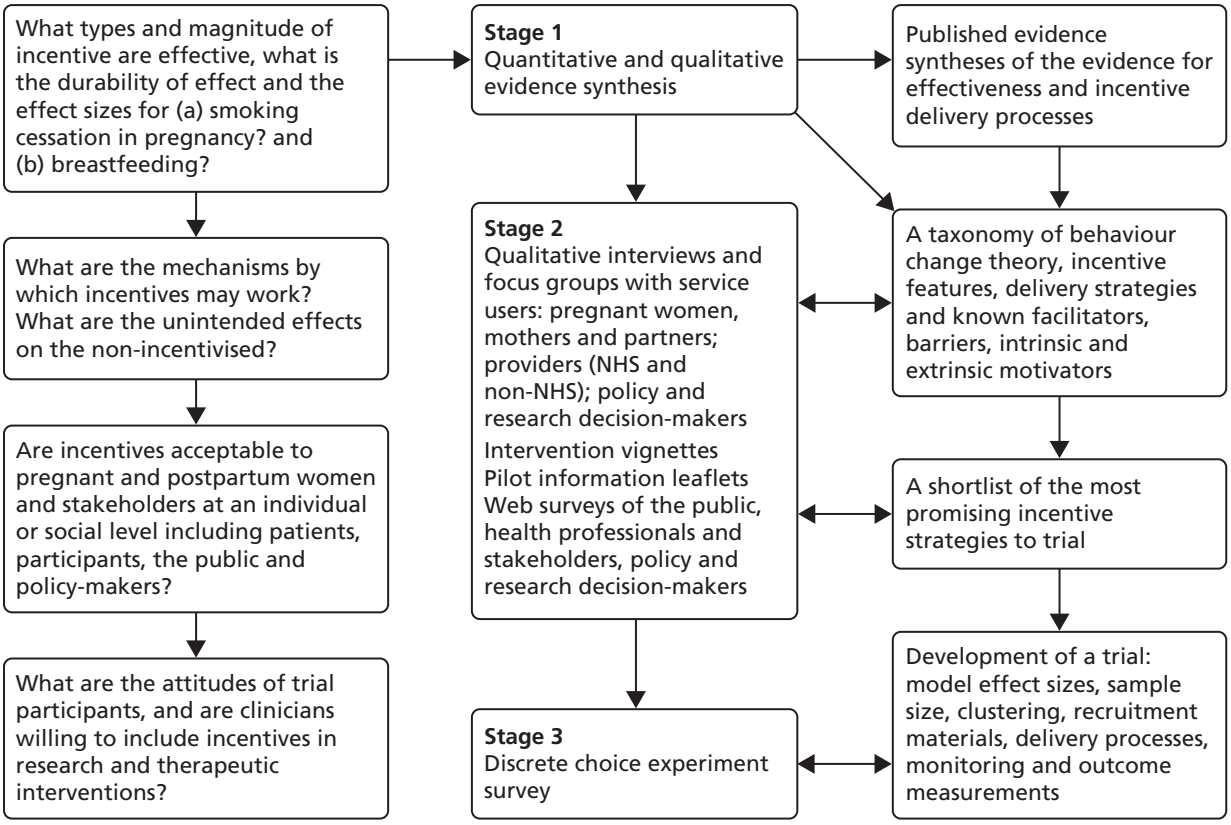


FIGURE 1 Flow diagram of the BIBS study.

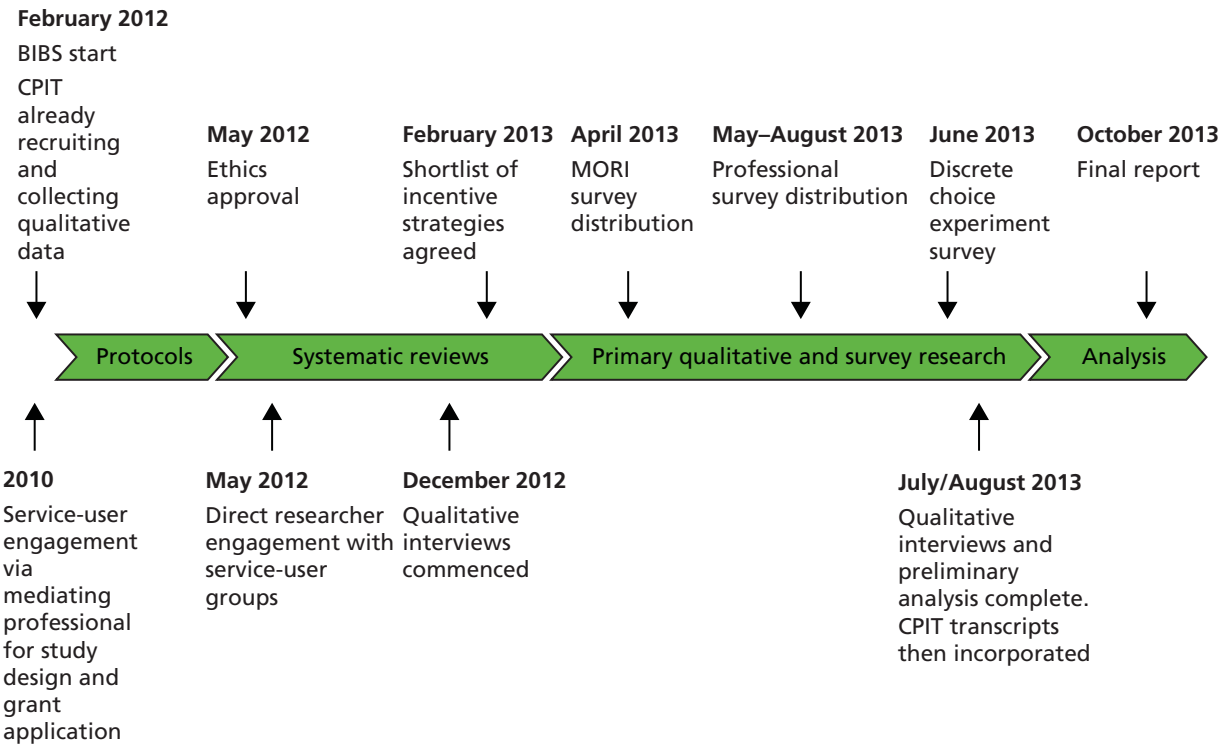


FIGURE 2 Timeline of the multiphased mixed-methods approach. MORI, Market & Opinion Research International (Ipsos MORI).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

BOX 2 Overview of the CPIT

Objectives

Pregnancy is an opportunity for most young women to stop smoking before their own health is irreparably compromised. Quitting will protect their infants from miscarriage, stillbirth, low birth weight, sudden infant death syndrome, asthma, attention deficit disorder and adult cardiovascular disease. The NICE guideline *Quitting Smoking in Pregnancy and Following Childbirth*[41] highlights the lack of evidence and recommends a research question: 'Within a UK context, are incentives an acceptable, effective and cost-effective way to help pregnant women who smoke to quit?'. A Phase II exploratory trial was therefore run from June 2011 to December 2013 aimed at establishing a workable trial design based on individual randomisation; a generalisable regimen of intervention delivery; a primary biochemically verified outcome measure; methods to document cost-effectiveness; and a process evaluation to explore women's' and professionals' views.

Setting

Maternity services, Glasgow, UK.

Population

Pregnant women who self-reported as smokers at maternity booking, who had an expired carbon monoxide level of ≥ 7 parts per million (p.p.m.), who were at least 16 years of age, who could speak English and who were < 24 weeks' gestation at maternity booking.

Recruitment

All women in Glasgow are asked routinely at the maternity booking appointment if they are current smokers and all have a carbon monoxide breath test. Self-reported smokers and all who have a carbon monoxide level of ≥ 5 p.p.m. are automatically referred to the Stop Smoking Service, which attempts to contact all to discuss smoking and possible cessation.

The trial was discussed with women who satisfied the eligibility criteria outlined above when contact was successful, either by telephone or at the booking clinic (walk-ins). If interested, women were given an information sheet and asked for permission for their contact details to be passed to the research team. They were then contacted by the research team for formal telephone consent. Concealed randomisation followed.

Intervention

The control group received standard Stop Smoking Service care for pregnant women. This included the offer of a face-to-face appointment to discuss cessation and setting a quit date with telephone follow-up at 4 weeks after the quit date and the offer of telephone support for up to 12 weeks post quit date. Those who set a quit date were offered free NRT provided by pharmacy services for up to 16 weeks following their quit date.

BOX 2 Overview of the CPIT (*continued*)

Women in the intervention group were offered the routine service plus a £50.00 voucher if they attended their face-to-face appointment and set a quit date and a further £50.00 voucher if they had quit at the 4-week follow-up, which required a home visit to corroborate self-reported quitting by means of a carbon monoxide breath test (< 10 p.p.m.). Those who had quit at 4 weeks were contacted at 12 weeks and if they were still quit and this was corroborated by another carbon monoxide breath test carried out during a home visit they received a further £100.00 voucher. At a random time between 34 and 38 weeks' gestation all participants were contacted to ascertain their current smoking status. Those who self-reported as having quit smoking were visited at home for corroboration of quit status using a carbon monoxide breath test and urine/saliva cotinine assays. Intervention participants who were confirmed to have quit by carbon monoxide breath test were sent a final voucher for £200.00. In total, £400.00 of voucher incentives were offered.

Outcomes

The primary outcome was self-reported quit at 34–38 weeks' gestation, corroborated by either saliva (< 14.2 ng/ml) or urine (< 44.7 ng/ml) cotinine assay. A £25.00 voucher was given to all participants who provided primary outcome information.

Secondary outcomes were the proportion who set a quit date, birthweight and costs and benefits of the incentives intervention.

Results

In total, 612 women were enrolled over 15 months from December 2011 to March 2013, with two participants opting out of the control group. By May 2013, 480/610 (79%) participants had reached the primary outcome stage; 39 (16.2%) were lost to follow-up in the control group compared with 38 (15.9%) in the intervention group. In total, 49/241(20.3%) were cotinine-validated quit in the incentives group compared with 19/239 (7.9%) in the control group. Sensitivity analysis showed a significant improvement in the cotinine-validated quit rate whether those lost to follow-up were treated as all smokers or all non-smokers. This control group quit rate is similar to that seen in the Smoking, Nicotine and Pregnancy (SNAP) trial in Nottingham (7.6%),[89] giving credibility to the intervention being generalisable to other geographical areas of the UK. The process evaluation found that the intervention was acceptable to pregnant women and professionals and that the trial was feasible to deliver, informing a future Phase III study.

Conclusions

This Phase II trial has established a workable pragmatic trial design, for example the optimal sample size, which will reduce the risks associated with a future definitive Phase III multicentre randomised controlled trial. Stakeholder views about incentive payments for smoking cessation in pregnancy have been examined. A cost-effectiveness approach has been developed to inform data collection for a future definitive trial.

Trial registration

Current Controlled Trials ISRCTN87508788.

Reference

Tappin DM, Bauld L, Tannahill C, de Caestecker L, Radley A, McConnachie A, *et al.* The Cessation in Pregnancy Incentives Trial (CPIT): study protocol for a randomized controlled trial. *Trials* 2012;**13**:113.

Tappin D, Bauld L, Sinclair L, Boyd K, McKell J, Macaskill S, *et al.* Financial incentives for smoking cessation in pregnancy: randomised controlled trial. *BMJ* 2015;350. doi: http://dx.doi.org/10.1136/bmj.h134

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Specific objectives were to:

1. Investigate the evidence for the effectiveness of incentive interventions delivered within or outside the NHS to (a) individuals and families or (b) organisations that aim to increase and sustain smoking cessation and breastfeeding.
2. Investigate the evidence for effective incentive delivery processes and how they work to increase and sustain smoking cessation and breastfeeding, including their acceptability and how they fit with existing barriers, facilitators and intrinsic and extrinsic motivators to behaviour change.
3. Systematically search for and identify incentive interventions in systematic reviews from other areas of health improvement, particularly for women of childbearing age to (a) assess fit with our evidence synthesis, (b) inform the primary research questions to investigate a shortlist of incentive strategies, and (c) identify research gaps where effective incentives for other behaviours have not been tested for smoking cessation and breastfeeding.
4. Investigate the acceptability and feasibility of a shortlist of promising incentive strategies and potential harms or adverse consequences from the perspectives of (a) women and partners; (b) health professionals, managers, policy-makers, research funders, ethics committee members, academics and other relevant stakeholders; and (c) the general public.
5. Develop an incentive taxonomy from the four objectives listed above.
6. Design a feasible trial: identify the target population, the active components and mechanisms of action of the intervention, the control group, the recruitment and delivery strategy, monitoring and outcome measurement and the effect size.

Definitions

The research team became aware early on that disciplines in applied health sciences use different terminologies that have multiple meanings and functions, which, as our service-user co-applicants pointed out, also have common usage or lay definitions. For terms that we identified as problematic in this respect, we referred to the *Oxford English Dictionary*[1] for a common working definition; these are listed below:

- *Incentives* include financial (positive or negative) and non-financial tangible incentives or rewards. By tangible, we mean free or reduced-cost items that have a monetary value or an exchange value, such as refreshments, baby products or services such as childcare or ironing (any setting). Our definition excludes intangible incentives such as supportive, motivational or persuasive relationships with professionals or peers. Incentives may be delivered directly or indirectly at a local, regional or national level by NHS or non-NHS organisations.
- *Incentive taxonomy* – a classification of incentive characteristics in relation to behavioural change techniques.
- *Incentive typology* – a classification of incentive types related to their meanings.
- *Incentive intervention logic model* – a hypothetical description of a complex intervention and process whereby an incentive is delivered to a target population with the aim of sustaining or changing behaviour.
- *Incentive recipients* may be women, families (collectively referred to in the report as consumers or service users) and/or NHS or non-NHS providers at the local, regional or national level. Incentive packages may benefit more than one group, for example local communities and parents.
- *Providers* is an umbrella term referring to people, individually, in groups or in organisations, working in the NHS, government, voluntary sector or other organisations, who help women to stop smoking and/or to breastfeed. Providers also deliver incentive interventions and/or they may receive them.

When referring to human behaviour:

- *Intrinsic* is a broad adjective referring to anything internal (states such as motivation, anxiety, pleasure; personal characteristics, for example age; thought processes such as planning; the senses; personal history) that is wholly within an individual, some of which can change over time. This definition of *intrinsic* is equivalent to the word *internal* and the two terms could be used interchangeably. The *Oxford English Dictionary* also describes another meaning in which *intrinsic* is the innate nature, or constitutional. Our interpretation is that this secondary definition implies a meaning of *intrinsic* as fixed rather than dynamic, which we do not wish to imply.
- *Extrinsic* is used as an adjective in its broadest sense to refer to anything external to the individual (objects; other people; environments local to distal; cultures), some of which can change over time. This definition of *extrinsic* is equivalent to the word *external* and the two terms could be used interchangeably.
- *Influence* is the capacity to have an effect on the character, development or behaviour of someone or something. We are using this term as an umbrella term rather than in a strict statistical sense and instead of using the more precise *mediator* or *moderator* terms that are sometimes used in relation to intervention design.

Our rationale for including incentives to providers is that a whole-systems approach is likely to be required. Changing recipients' behaviour is likely to be less effective if there are barriers to the provision of support and thus changing provider behaviour may be more effective than individual incentives and the context in which incentives are delivered is likely to be important. The effect of incentivising both recipients and providers may be less than, the same as or greater than the sum of the two.

Report structure

This report is in two parts. Part 1 presents the evidence syntheses (stage 1 in *Figure 1*) and part 2 presents the primary qualitative, survey and DCE research (stages 2 and 3 in *Figure 1*). At the end of each part the findings are discussed together with the strengths and limitations. Each chapter concludes with the implications for the relevant outcomes described in *Figure 1*.

In part 1:

- *Chapter 2* describes how our co-applicant mother-and-baby groups contributed service-user perspectives throughout the study.
- *Chapter 3* presents a quantitative and qualitative evidence synthesis of the effectiveness and delivery processes of incentives to promote smoking cessation and breastfeeding in pregnancy. The review assesses incentive strategies at an individual recipient level as well as at provider and organisation levels. It develops an incentive taxonomy and the beginnings of an incentive typology, which are further developed and incorporated into an incentive logic model in *Chapter 6*. It concludes by considering the implications for a shortlist of incentive strategies, which is then refined by the findings presented in each of the subsequent chapters.
- *Chapter 4* presents a systematic narrative review of qualitative syntheses and a logic model to describe women's perspectives on smoking in pregnancy and breastfeeding. This assists in understanding the barriers and facilitators, together with the overall balance of existing intrinsic and extrinsic motivators or demotivators for pregnant women and new mothers, for either initiating or sustaining smoking cessation or breastfeeding. The chapter concludes by considering how the findings inform the incentive taxonomy and the shortlist of incentive strategies.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

- *Chapter 5* presents a scoping review of systematic reviews that have assessed the effectiveness of incentives for complex lifestyle behaviours relevant to women of childbearing age. The review identifies evidence of effective incentive strategies that support the findings presented in *Chapter 2*, as well as identifying knowledge gaps and incentive strategies that have not yet been evaluated for smoking cessation in pregnancy or breastfeeding. This review therefore triangulates findings from the earlier chapters and informs the shortlist of incentive strategies to take forward for further investigation in the primary qualitative and survey research.

In part 2:

- *Chapter 6* presents the findings of the qualitative research, in which interviews and focus groups were undertaken with pregnant and post partum women, partners, health professionals, experts, decision-makers and other key informants. The chapter begins with an incentive intervention logic model, which was developed during the course of the study according to our study data and applies the metaphor of a 'ladder' to understand how key components of incentive programmes (rungs) are perceived in relation to the life course and context facilitators of (rungs) and barriers to (missing or damaged rungs) smoking cessation in pregnancy and breastfeeding. A typology of incentive types and meanings expands the incentive taxonomy developed in *Chapter 3* and is integrated into the logic model. Findings relevant to incentive intervention components and delivery processes for the shortlist of promising incentive strategies are described. Finally, we present participants' views on potential unintended consequences of incentive interventions and issues relating to research studies.
- *Chapter 7* presents the findings of a survey to assess the acceptability of the shortlist of incentive strategies. We report findings from a Market & Opinion Research International (MORI) survey of the general public and a survey of health professionals who work with pregnant women, infants or new parents across Scotland and North West England.
- *Chapter 8* reports the findings from a DCE to inform the design of the most promising incentive strategy from the shortlist, which addresses incentives to improve smoking cessation outcomes in pregnancy.
- *Chapter 9* discusses the overall findings from the study. The most promising incentive trial design to emerge, together with other promising incentive strategies that require further development and research, are presented. The acceptability and feasibility of incentive interventions are considered, and the potential utility of the incentive logic model is discussed.
- *Chapter 10* summarises the main conclusions and implications for research.

Part 1

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 2 Service-user engagement

For this project, a novel approach was adopted and we recruited two mother-and-baby groups, located in disadvantaged areas, as co-applicants. This chapter describes how we engaged service users through their groups, how they informed the research process and some reflections on collaborative approaches.

Background

Although there is a need to include patient and public involvement (PPI) in health research, which is a statutory requirement by virtue of the Health and Social Care Act 2001,[90] and there is guidance and a growing pool of resources available on how this might be achieved,[91] there is no 'gold standard' in terms of what constitutes best practice in PPI. The ways in which research teams approach PPI vary.[92] However, new strategies are being developed to actively and effectively involve the public to make PPI more meaningful.[93]

The benefits of PPI include enhanced depth, credibility and applicability of findings, improved clarity of final reports and recommendations and an immediate link between practice-based evidence and evidence-based methodology.[94–96] Although it is recognised that PPI in research should begin at the earliest stage possible, in practice it is not easily achievable. Constraints on time, funding, ethics approvals and the availability of appropriate representatives often mean that PPI is not included until research is fairly well advanced. This is particularly so in studies such as BIBS, where the grant application was submitted in response to a commissioned National Institute for Health Research (NIHR) Health Technology Assessment (HTA) programme funding call. Involving patients or the public at a later stage, however, jeopardises and compromises one aim of PPI: to ensure that research is being carried out 'with' or 'by' members of the public rather than 'to', 'about' or 'for' them. It can marginalise them during the crucial project scoping and design phases, although the NIHR/HTA programme boards have PPI representation when deciding whether to commission research. Innovatively, we actively engaged in our project, from its inception, groups of service users who had not previously been involved in research, and who were untrained, by working with them as co-applicants.

Our aim was to foster a partnership approach[97–99] to understand service-user perspectives on engaging in research, rather than imposing an unequal 'researcher-dominant' agenda. In the following sections we use a traditional structure to describe the process of service-user engagement, that is, using the headings of *Methods* and *Findings*, although it could be argued that this is inappropriate for such a categorisation, as the collaborative approach was dynamic and flexible, rather than fixed a priori. Service-user engagement was therefore conceived as an iterative, loosely structured process that was emergent and sensitive to the views and preferences of the service users involved. PH had the original idea based on her experience as a member of maternity service liaison committees; she had used action research methods successfully in a previous study[100] and had conducted a longitudinal qualitative study with families recruited from disadvantaged areas to inform the design of interventions to improve breastfeeding outcomes.[62] NC, PH, HM and GT have extensive experience in conducting qualitative interviews with service users, including those living in disadvantaged areas.

Methods

Engaging service-user groups

At the grant application stage, service-user engagement was initiated by approaching maternity services, primary care and children's centre managers to select two thriving, but diverse, groups operating in areas of high deprivation in Aberdeen and Lancashire. Managers identified group representatives to negotiate involvement with the study: a health visitor – Wendy Ratcliffe (Aberdeen) – and a community centre

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

worker – Helen Cook (Blackpool) – both named in the grant application. Areas of high deprivation were considered most likely to be able to provide insights from service users who had experience of the target behaviours for change: smoking in pregnancy and formula feeding.[53] Moreover, the selected groups were considered to be particularly well suited to collaboration on the BIBS project: the Aberdeen group is user led, is successful in generating some funding and provides a café and crèche as incentives to attend; the Blackpool group is located in a local authority-run children's centre. The settings for these groups were summarised in *Chapter 1* (see *Box 1*) and the group profiles are summarised in *Table 1*.

The group representatives were sent drafts of the grant proposal to discuss with the groups and they provided feedback during the planning stages. They negotiated reimbursement for their group's refreshments and crèche costs as part of the grant application. Although the service-user collaborators were independent or local government representatives, rather than NHS groups, we considered it preferable to gain ethics committee approval before active engagement, particularly because the groups had not been involved in research before. When the study started (February 2012), service users assisted in developing the protocol and study information materials through feedback to the group representatives (HC and WR). Once ethics approval had been obtained (May 2012), the group representatives made the introductions between the service users and the fieldwork researchers. Researchers HM and GT attended 15 meetings between May 2012 and September 2013 to engage the service users by discussing study progress, gaining feedback and thus informing the research strategy. Reflecting on researcher perspectives is important and so reflexive diaries were kept and researcher observations were shared with the research team throughout.

Negotiating meeting frequency and types of visits

In Aberdeen, initial contact was made through the health visitor (WR); however, the researcher was able to exchange contact details with group members at her second visit and so the gatekeeper role shifted to the group's treasurer, who shared it with one of the grandmothers who was responsible for organising meetings and events. This allowed for much less formal communication, good rapport building and thus intermittently 'dropping in' for informal lunch visits, as well as the more directed research sessions. The group met at a facility within walking distance of the university (approximately 10 minutes); this made visits easy to schedule and undertake. These circumstances were also fortunate in that, a few months into the project (September 2012), WR was relocated by her NHS employer and her replacement assumed a less prominent role within the group. In fact, after some further months (February/March 2013), health visitor support for the group was withdrawn altogether. However, this did not adversely affect engaging these service users and possibly strengthened a direct partnership between the researcher (HM) and the group. By contrast, in Blackpool, contact was initiated and continued through the community centre worker and therefore only formal research meetings were undertaken. The distance of travel for the researcher (18 miles by car) was a barrier to informal contacts. For both groups, long school holidays coincided with crucial research stages and were thus inopportune for our research schedule. For example, the final qualitative data analysis overlapped with the school summer holidays, although we were able to conduct an exercise involving our key qualitative findings with both groups (September 2013).

The Aberdeen group used Facebook (see www.facebook.com) as its primary communication mode; however, despite gaining ethical approval, the research team decided against engaging with the group using this social medium. Several concerns were discussed around maintaining appropriate boundaries, the best use of researcher time and a lack of published guidance. Using e-mail/telephone/text only did not appear to prevent or diminish engagement. Informal contacts and balancing communication traffic presented a challenge to the researcher (HM), who was confronted with some pressure for full group membership, such as being proactively invited to additional/extra activities: to assist at fundraising events and fêtes, to wear fancy dress to group seasonal parties and to attend mothers' social evenings.
The requirements of a researcher to remain objective and maintain a distance compared with a more anthropological approach to fieldwork were discussed with the research team. Of the six informal social events that took place during the course of this research, HM attended three to show goodwill. Researcher participation can therefore be considered as 'active'[101] as HM was able to gain insight into the cultural codes and rules for behaviour of the group.

TABLE 1 Co-applicant mother-and-baby group profiles

Group	Location	Distance for researcher to travel	Setting	Average attendance	Meetings	Purpose and structure	Funder
Mastrick Café Crèche, Aberdeen	One of the most disadvantaged areas of Aberdeen	Approximately 10-minute walk	One room within a larger family centre including a separate crèche room. Sofas, play area adjacent, toys, kitchen area, dining area, unobtrusive site manager in room nearby	Approximately seven mothers (two mothers left the group and two new mothers joined) and their babies, two (grandmothers fairly regular group membership)	Weekly, Wednesdays 1200–1400 (except during school holidays), plus some additional social/fundraising events	Set format: the café is facilitated by mothers who make and sell a cheap, healthy lunch costing £2.00 (subsidised through fundraising) to mothers and babies during the first hour, when, until early 2013, a health visitor was present to provide support. During the second hour the babies go into the crèche and the mothers enjoy a coffee and a catch-up or participate in training activities/listen to external speakers	Established through a partnership project between Aberdeen City Council, Homestart (see www.home-start.org.uk/) and NHS Grampian. The café crèche is now independent and self-funding
St Cuthbert's and Palatine Children's Centre, Blackpool	Covers a disadvantaged area of Blackpool	18-mile drive	One room within a larger community centre with toys, books and soft-play facilities and seating for parents. A café is also located in this room for parents to purchase drinks and food	16–20 families (discontinuous participation)	Weekly	Unstructured format. Mother-and-baby/toddler group in an informal setting where parents can drop in and out to interact with and receive support from children's centre staff members and engage with peers. Children's centre staff member in attendance throughout the session	Local government

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Including service-user perspectives

Participatory approaches were employed and initially consisted of building good rapports with both groups by attending their meetings, informally socialising and observing in an unobtrusive manner to acknowledge the researchers' roles as visitors to an established group.[101] This began with standing passively on the periphery, waiting to be invited in, eventually sitting comfortably on the sofas and even on the floor, and led to more active engagement, such as being asked to console crying babies. Once rapports were established, the researchers initiated requests for more directed sessions to gather feedback and data on important stages in the study.

Directed data-gathering sessions with the service users occurred after information was provided in advance and on an agreed date. HM and GT sought informed consent to audio record discussions. Researchers involved the groups in the design, editing and presentation of intervention vignettes derived from a diverse sample of promising studies identified in the systematic reviews (see *Appendix 2*). The study vignettes were then used in interviews and focus groups to gain participants' perspectives of incentive interventions and to assist with shortlisting promising incentive strategies. Pilot focus groups were undertaken to contribute to interview topic guide refinement. We were able to generate data that contributed to the qualitative analysis from five of those sessions [two individual interviews and three focus groups (see *Chapter 6*)]. In addition, group members piloted the DCE as the majority had a smoking history, constructed their own intervention 'ladders' using the logic model that we developed (see *Chapter 6*), commented on the lay summary and advised on future dissemination of study findings. Our co-applicant groups also assisted us in identifying and actively engaging 'hard-to-reach' women, who seldom access health services and participate in PPI initiatives even less often. Although they contributed to the development work leading to the shortlist of incentive strategies asked about in the MORI survey of the general public (see *Chapter 7*), a separate sample of independent general public participants was sought to pilot this to minimise the 'group think' that may occur through repeated discussion of a topic.[102]

Findings

Collaborative approaches to incorporating service-user perspectives

The Aberdeen group environment, cohesiveness and set structure suited a directed format, that is, focused activities, to address research issues. Women in this group were used to undertaking training (e.g. food preparation, child first aid) and had regularly welcomed external speakers in the second hour of their weekly 2-hour meetings. During this time, women sat on comfortable sofas around a large coffee table or leaned in over the kitchen counter if they were making the tea/coffee. Meanwhile, their children were occupied in the crèche, which meant that the researcher (HM) could interact with women informally as well as undertaking researcher-led whole-group data collection sessions, with minimal issues around audio recording and using interactive materials, such as the intervention vignettes. Although computing/projector facilities were not available, whiteboard and printed copies were used and worked fairly well. The vignettes helped the group to become focused and positively engaged with the study in a more concrete and tangible way. On one occasion, however, internal politics caused tension because the session was led by the organiser, who was upset that day and prevented any research activities taking place because she was 'telling off' members of the group about rota duties and fulfilling their responsibilities (e.g. washing up and cleaning the carpets).

In Blackpool, the group's drop-in format presented the researcher (GT) with the practical challenge of having to move between members to involve them in 'chance encounters'. Although the service users were keen to participate and engage in discussions, group membership was discontinuous and so GT was unable to engage with the same parents at each visit. Despite these limitations, a number of women were involved in various activities on more than one occasion, and an advantage was that a wider number of service users were engaged in total ($n = 12$) compared with the Aberdeen group ($n = 8$). Further challenges were faced when trying to engage parents and carers in meaningful conversations when their infants/children were in attendance. However, during piloting of the DCE, additional support was provided by

children's centre staff to 'supervise' the children to enable close reading and discussion of the online format of this tool. Furthermore, although the noise levels (children playing, shouting, etc.) compromised the digital recordings of the discussions, GT also kept handwritten notes and transcribed the session recordings herself as soon as possible to facilitate accurate and comprehensive data documentation.

Relationship with the wider research team

Engaging the mother-and-baby groups with the wider research team was problematic. Inviting and encouraging group members to attend regular weekly or formal research team meetings at the university (e.g. grant holders' meetings) proved impossible at both sites. The health visitor group facilitator from Aberdeen (WR) attended one meeting (September 2012) and suggested that the women would have been very nervous had any of them attended because of the formality. Her successor was invited to a subsequent meeting and expressed an interest in the associated paperwork, which was e-mailed to her; however, she did not attend. It was not possible for Blackpool group members to attend because of the distance to travel and they did not accept an invitation to attend by telephone.

Other members of the research team were invited to join HM and GT for visits to the mother-and-baby groups. Highly sceptical comments such as 'You'll be lucky!' were made by academic colleagues and administrative staff when considering the potential take-up of such an invitation. PH accepted on two occasions and attended an Aberdeen mother-and-baby group Christmas 'drop-in' (December 2012) and observed and took notes while HM facilitated a 'ladders' session (September 2013) (see *Substantive contributions*, *Ladders*). NC similarly observed and took notes while GT facilitated a 'ladders' session in Blackpool (September 2013).

The importance for the groups of researchers going into their territory to gain PPI input was evident. They took pride in hosting researcher visits, for example enthusiastically offering refreshments and home baking (Aberdeen) or computer facilities for directed sessions (Blackpool). In addition, researchers witnessed conversations that are seldom encountered in formal health or research settings. For example, some group members were adversarial towards health professionals, one group described complex and disruptive domestic relationships and highly charged personal opinions were expressed about health behaviours (smoking during pregnancy) and on one occasion someone left the room. In the presence of health service staff, such accounts would have been unlikely.

Substantive contributions

Designing participant materials

Through the group representatives as mediators, service users helped us to rephrase several sections of the information sheet for both readability and acceptability before gaining ethics approval and undertaking the primary qualitative research (*Figure 3*).

We revised the document to take account of the target participants' style preferences, language and social and cultural contexts. In particular, they drew our attention to their unfamiliarity with the term 'cessation' and the predominance of formula feeding, either from their own personal experience or in their immediate family and social networks. Thus, they suggested that 'help women to stop smoking' and 'try breastfeeding' were more appropriate phrases, and they also pointed out that 'encourage' is persuasive, 'smoking cessation' is too technical and the word 'breastfeeding' alone implies a certainty. The last of these was a very important change as we noted that a mother in one of the groups disclosed that she was providing exclusive breast milk to her infant (on her information form) but pretended that she was formula feeding to other group members, using bottles of expressed breast milk that she allowed them to assume was formula by talking about preparing it. Breastfeeding was not a social norm and this woman anticipated that it could possibly be considered unacceptable by some.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.



Research team draft **Revised and final version following service user input**

FIGURE 3 Comparison of the patient information leaflet before and following service-user input.

Systematic review feedback and study vignettes

The mother-and-baby groups contributed to interpreting systematic review findings by providing feedback on a number of vignettes of studies included in the evidence syntheses, which were initially drafted by the researchers. Six vignettes were developed from studies that were selected either because they had statistically significant effects or because they involved an unusual or innovative approach.[103–108] Different vignette structures were tried out, for example presenting and discussing sections of the vignette sequentially compared with presenting the whole vignette. Presenting the vignette as a whole was the most popular format and this differed from the advice that we had received from our steering committee. Discussions around the vignettes assisted in talking interviewees through the interventions step by step and provided valuable insights into which incentives and programmes might be acceptable. This was particularly useful as very little detail around acceptability and processes is reported in the included studies (see *Chapter 3*), even when they are classified as using qualitative or mixed methods.[109–113]

Piloting topic guides

We piloted draft interview topic guides in three focus groups with service-user mother-and-baby groups before recruiting participants. In Aberdeen, this involved trying a structured topic guide and the integration of study vignettes within the schedule and revisions. The final preferred version was unstructured with prompts for use if and when appropriate, for example opening with questions around what incentives were meant for women and using women's conceptions of incentives to guide the interview.

The discrete choice experiment

The DCE was piloted with four mothers with a history of smoking from one group (Blackpool). When reading and answering each of the questions (using SurveyMonkey's online format – see www.surveymonkey.com), the mothers were asked to use the 'think aloud' cognitive interviewing technique[114] whereby they expressed their feelings and discussed any issues around the questions/process. This session was facilitated by GT, who audio recorded and transcribed the key points for team discussion.

All participants in this session took the questionnaire seriously and engaged with the choices. Descriptions and explanations in the DCE were revised for better understanding and readability based on their comments.

'Ladders'

In the final stages of the project, the 'ladder' logic model emerged through mixed-methods analysis of the BIBS study data and feedback from our mother-and-baby group co-applicants (see *Chapter 6*). This was taken to the groups in an interactive format so that women could engage and feed back on it before finalising it as a research output, but could also attempt to put together their own 'ideal' tailored interventions, using the components that either they or we identified. As researchers, we wanted to garner a sense of how the ladder might be communicated in lay terms and also to assess whether it could be used with potential trial participants as a tool to contribute to identifying important components and processes to optimise intervention codesign. This exercise proved popular and was successfully completed by participants in Aberdeen ($n = 4$; $n = 3$ reproduced with consent in *Appendix 3*) using a blank ladder and three envelopes labelled 'life', 'incentive' and 'other' rungs. Each envelope contained individual paper 'rung' cards with labels corresponding to barriers and facilitators, identified from study data, and some blank rungs for women's own contributions (see *Appendix 4*). They then constructed their own smoking cessation or breastfeeding behaviour change programmes, applying star stickers to highlight those 'rungs' that they considered crucial. In retrospect, clarity could have been improved with separate ladders for barriers (damaged or missing rungs) and facilitators (rungs). However, women liked the simplicity of the ladder metaphor. They considered that it enabled them to set a clear goal and a direct means of reaching it while taking their personal circumstances and contexts into consideration and valuing their individual needs and preferences. Participants in this exercise commented that this model for intervention design would improve engagement as it felt personalised and suggested that it could work for other or multiple health behaviours. For example, some spontaneously talked about the implications of incentive rungs for other health behaviours, in particular healthy eating, which was considered too expensive to do. One woman commented that if she was 'overhauling' her health she might attempt to improve several aspects of her lifestyle, especially if she was being provided with incentives or rewards to help her do this. This suggests the relevance of incentives for addressing multiple health behaviours at this life stage. However, others expressed entrenched resistance to change; for example, when completing a ladder for stopping smoking, one woman responded to breastfeeding saying 'no, no, no, no, no!'

In Blackpool, because of children being present in the room, a different format was adopted. For this exercise GT and NC constructed separate A4 sheets, which had a ladder diagram picture in the background, for the different 'rungs' ('life', 'incentive' and 'other'). Mothers ($n = 4$) were requested to put a tick and/or a star by the rungs considered most important or relevant and a cross by those considered unimportant for behaviour change programmes. This method worked well, with the mothers agreeing with the ladder concept and engaging with the process. Three ladders, reproduced with consent, can be found in *Appendix 5*.

Lay summary

Mothers at the Aberdeen group read the first draft of the lay summary and commented. Two sentences were reworded according to their feedback and 'promising' was replaced with 'potential' as it was felt that the meaning of the former could not be easily understood without explanation and examples.

Dissemination

We took a poster presentation[115] to discuss with one mother-and-baby group (Aberdeen) to show them how we are reporting and presenting results publicly. They reported that they liked the format, which was something none of the members had seen before, and were delighted that their group's name had been included, expressing a sense of immense pride regarding being involved. At the final group meeting, mothers offered numerous suggestions, such as face-to-face briefings, making information available online

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

on key web pages that parents may access, leaflets within community/health facilities and inclusion within school newsletters and local newspaper articles with a group and researcher photograph. We will also share the final report summary with the groups, several members having requested personal copies, and will explore involving the group members in our use of local press and social media (e.g. Facebook, see www.facebook.com; Mumsnet, see www.mumsnet.com/) to disseminate research findings.

We hope to retain connections with both groups so that potential future research collaborations can be realised.

Discussion

In summary, our flexible approach to service-user engagement was essential and positive interest from co-applicants was achieved. Participatory, qualitative and observational research methods were acceptable and facilitated substantive contributions to decision-making. It was important to start with social rapport building and move, at the pace of the groups, to more directive researcher-initiated agendas for gathering feedback and data at key research stages. Challenges experienced were the careful negotiation of boundaries; the use of social networking communication, which may allow consistency with group members but has potential drawbacks in terms of confidentiality and objectivity for researchers; having uninterrupted space for inclusion (e.g. difficult while supervising children) as this affects participation; and the presence of health professional/community staff, which may be inhibitive and thus accessing more private settings is important. However, it was possible to avoid the potential bias of relying on individual expert service users by involving two groups, both of which, to greater and lesser extents, had a turnover of attendees and a dynamic membership of women from more disadvantaged areas with experience of smoking in pregnancy and either short-term breastfeeding or formula feeding. We would have missed out on rich data from some of the harder-to-reach, more disadvantaged perspectives without the mother-and-baby groups' involvement.

An important consideration is the grey area between a co-applicant PPI role and being a research participant in qualitative research. Aside from the impact that our approach had on research development through substantive contributions, and thus decision-making, the difference is subtle, especially when groups or individuals had had a dual role in that they were also involved in data generation (e.g. the interviews and focus groups included in *Chapter 6*). Qualitative research to inform trial design is recommended in the MRC framework for complex interventions.[30] This was undertaken in the BIBS study (see *Chapter 6*) and applies a more rigorous approach to sampling, data collection and analysis to ensure that a wide range of perspectives is incorporated. The single service-user perspective can be prone to selection bias. In addition, contrary to the norm[116] with PPI involvement, we did not offer the mother-and-baby group participants any training in PPI. Our approach therefore falls somewhere in between conventional PPI and qualitative research.

We consider our engagement of harder-to-reach participants through collaborating with mother-and-baby groups to be a strength of our approach to PPI. Our ability to operate outside of the health service and develop trusting continuing relationships with independent groups facilitated substantive contributions, which had a direct impact on the development of our research. Another strength of our approach was the sense of pride experienced by the group members that their group was involved in the research and that they could host researcher visits, which challenged traditional power relations. Our observations were that some group members changed behaviours during the process, including stopping smoking and enrolling in college for further education. The extent to which the collaboration might have primed individual motivation to behave differently is uncertain, however, as others remained highly resistant to change in relation to either smoking and/or breastfeeding.

The limitations of this approach were that engagement with the wider research team was usually dependent on single researcher observations. Equally, the need to identify a legitimate manager or leader with a good rapport with the group to gain and maintain access until ethics approval is in place and the researcher has established a trusting relationship means that power differentials and representation are complex. This is not least manifested in naming co-applicants who are professionals and thus the service users themselves were involved only from the project's inception and not its conception. Such issues of mediation include the translation of technical research language into lay terms, which is essential. The preparation of vignettes to substitute for publications relating to complex interventions and piloting long surveys such as the DCE mean that considerable work is needed to prepare and facilitate directed sessions. Best use of researcher time is therefore a consideration.

The implications of this approach are that the incorporation of service-users' views throughout the research process has focused on women within the target population in the context of their real lives, with them informing the scientific elements of the study. We consider this to have been a novel, and crucial, approach to the development of an acceptable and feasible trial(s). It allowed for a deeper level of engagement, and developing ongoing ethically approved relationships with such groups needs further consideration as leaving the field is an issue once a partnership has been established but the funding stops. Gaps between funding and the need for input are not concepts familiar to service users. The use of social media to engage with groups is also an issue and comprehensive guidance is required.

Conclusions

There are advantages and disadvantages to engaging mother-and-baby groups in PPI as research co-applicants. Extensive involvement of the co-applicant groups as team members across a diverse range of research activities, from study onset to dissemination, resulted in novel contributions to the BIBS project's development and decision-making. Regularly taking the research to the groups enabled harder-to-reach, less 'professionalised' and more confident PPI involvement than members of the research team have experienced when group representatives have been invited to the university setting.

However, there are methodological challenges. It is possible to overcome the issue of the 'professional patient' and to involve harder-to-reach communities, and multiple individuals, but not in conventional ways. Therefore, modified and flexible research methods, and off-site engagement, are required, but are not necessarily matched by participation in more traditional formal aspects of the research, such as university-based meetings. The question of PPI being an active partnership between researchers and the public remains an important one when power relations are still omnipresent.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 3 Review of the benefits of incentives for initiating and continuing smoking cessation in pregnancy or breastfeeding

This chapter describes evidence syntheses for the effectiveness of incentive interventions and their delivery processes for smoking cessation in pregnancy or breastfeeding. The section describing the methods for the review includes both smoking cessation and breastfeeding studies. The results are presented in three sections: results for incentives delivered to women for smoking cessation in pregnancy, results for incentives delivered to women for breastfeeding and finally results for incentives delivered to providers of care to improve smoking cessation in pregnancy or breastfeeding outcomes. The discussion and conclusions sections consider the review findings overall.

Methods

Research questions

1. What is the evidence for the effectiveness of incentive interventions delivered within or outside the NHS to (a) individuals and/or their families or (b) organisations that seek to increase and sustain (i) smoking cessation during pregnancy and/or within the first 6 months following birth and (ii) breastfeeding in the first 6 months following birth?
2. What is the evidence for effective incentive delivery processes (including acceptability, mechanisms of action, barriers/facilitators and intrinsic or extrinsic motivators to behavioural change) for recipients and/or providers to increase and sustain (i) smoking cessation during pregnancy and/or within the first 6 months following birth and (ii) breastfeeding in the first 6 months following birth?

Objectives

1. To systematically review incentive strategies for (i) smoking cessation in pregnancy and/or within the first 6 months following birth and (ii) breastfeeding within the first 6 months following birth to gather evidence to inform the design of an incentive intervention trial and to address the overall study objectives detailed in *Chapter 1*.
2. To integrate the quantitative and qualitative evidence on incentives for (i) smoking cessation in pregnancy and up to 6 months after birth and (ii) breastfeeding up to 6 months after birth.

For each of the two behaviours of interest – smoking cessation and breastfeeding – an integrated mixed-methods systematic review of effectiveness and delivery processes was undertaken. The effectiveness review was informed by the principles of Cochrane guidance on the conduct of systematic reviews,[117] with particular reference to public health intervention guidance.[118] The process review was guided by the nature of the studies identified and the overall study research questions. The process review includes any data that meet the study inclusion criteria but are not included in the effectiveness review. The protocols were registered with PROSPERO (reference no. CRD42012001980) (see *Appendix 6*).

Identification of studies

Extensive electronic searches were conducted to identify reports of published, unpublished and ongoing studies that report data on the benefits of incentives for smoking cessation during pregnancy and/or within the first 6 months after birth and initiating and/or sustaining breastfeeding within the first 6 months after birth. The search strategy was designed to be highly sensitive and include appropriate subject headings and text-word terms. Full details of the search strategies used are reported in *Appendix 7*.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

The databases searched were MEDLINE (1946 to February 2012), EMBASE (1974 to February 2012), Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1981 to February 2012), Science Citation Index (1981 to February 2012), Social Science Citation Index (1981 to February 2012), Applied Social Sciences Index and Abstracts (1987 to February 2012), PsycINFO (1967 to February 2012) and Trials Register of Promoting Health Interventions (February 2012). In addition, the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, Issue 2, 2012) was searched for additional reports of randomised controlled trials (RCTs) and the Health Management Information Consortium database (1979 to February 2012) and the NHS Economic Evaluation Database (February 2012) were searched for economic literature. The Cochrane Database of Systematic Reviews (CDSR) (The Cochrane Library, Issue 2, 2012), Database of Abstracts of Reviews of Effects (DARE) (February 2012) and the HTA database (February 2012) were searched for relevant systematic reviews and reports. Relevant websites, including the WHO website (see www.who.int) and those of the United Nations Children's Fund (UNICEF) (see www.unicef.org), the King's Fund (see www.kingsfund.org.uk/), the Health Foundation (see www.health.org.uk), the Joanna Briggs Institute (see www.joannabriggs.edu.au), the Picker Institute (see www.pickereurope.org) and the Midwives Information and Resource Service (MIDIRS) (see www.midirs.org) were also searched. Co-applicants also used their networks to identify relevant studies.

Definition of an incentive

Incentives included financial (positive or negative) and non-financial but tangible incentives or rewards. Tangible incentives were defined as either free or reduced-cost items that have a monetary value (e.g. refreshments or baby products) or services with a monetary value (e.g. childcare or ironing). These incentives could be delivered directly or indirectly at local, regional or national level by health-care or other community and/or commercial providers. This excluded supportive, persuasive or motivational relationships with service providers or peers or educational materials such as information leaflets or non-commercial DVDs that reinforce verbal persuasive advice to stop smoking or to breastfeed.

Inclusion and exclusion criteria

The reviews included English-language studies of any study design (RCT, quasi-RCT, non-randomised interventions, mixed-method designs and qualitative studies) that met the definition of incentives and which were from a developed country as defined by the United Nations.[119] Grey literature was identified according to the Luxembourg definition of multiple document types produced by all levels of government, academia, business and organisations in electronic and print formats not controlled by commercial publishing, that is, in which publishing is not the primary activity of the producing body.[120]

The purpose of the incentive could be (1) a behaviour change outcome or (2) participation in either an intervention or monitoring of the behaviour. We were interested in how incentives/rewards as BCTs were being used by researchers in intervention studies either alone or in combination with other BCTs.

The population of interest was women who were pregnant or those who had given birth within 6 months at the time of the intervention (either including or not including other family members) and/or health-care (e.g. NHS or other health-care companies), community (e.g. local authority or voluntary sector) or commercial (e.g. pharmacy) providers and/or stakeholders at local, regional or national level. Interventions could benefit one or more than one of these groups. The review concentrated on interventions specifically targeted at the population of interest and did not include studies analysing the population of interest as a subgroup within a wider population at whom the intervention was aimed.

Comparators under consideration included any alternative treatment arms to those of the interventions that represented either practices similar to those currently being provided in countries meeting the inclusion criteria for the review or possible alternative interventions that are realistic options that may be relevant to health-care and/or community providers in these countries, particularly (from a UK perspective) stakeholders within the NHS. Single-group before-and-after studies were also included.

Our primary outcomes were smoking cessation rates and relapse rates and any breast milk and exclusive breast milk feeding rates. All studies for the effectiveness review were required to provide data for at least one of these outcomes. In addition, when possible, we collected secondary outcomes related to the delivery of the intervention or outcomes related to the characteristics of the incentive mechanism. We were particularly interested in:

- the context of the intervention:
  - the behaviour change theories informing the intervention
  - the setting within which the intervention was delivered
  - who the intervention was delivered by
  - how the intervention was delivered, for example in person, remote delivery, number of person contacts involved in delivery
- for outcomes related to the characteristics of the incentive mechanism:
  - who is being incentivised (e.g. individuals, their families and/or provider organisations)
  - other incentive characteristics (e.g. size, duration, timing, delivery, 'currency', that is, financial or tangible non-financial)
  - the fidelity (compliance with the protocol) of the intervention and/or the incentive/reward mechanism
  - details of whether the incentive is contingent on something and if so what it is contingent on (e.g. abstinence from smoking, initiation or duration of breastfeeding, attendance at clinic, monitoring to validate primary outcomes either biochemically for smoking cessation or self-report, achieving other programme components)
  - differential effects, for example health inequalities evident.

The gold standard for biochemical validation of smoking outcomes is considered to be the level of cotinine in blood or saliva. Cotinine measurements are more reliable than exhaled carbon monoxide (CO) levels as levels of the latter can be undetectable within < 24 hours.[121] The half-life of cotinine in pregnant women between 16 and 40 weeks' gestation is 8.8 hours compared with 16 hours for non-pregnant women and clearance to non-detectability takes place in about 44 hours.[122] Cotinine-level cut-offs vary, largely dependent on the levels of sensitivity and specificity chosen. The plasma level cut-off used is often 13.7 ng/ml but more recent studies in the pregnant population suggest that because of increased clearance of nicotine and cotinine during pregnancy a lower cut-off of 11.5 ng/ml may provide greater accuracy.[123] Saliva levels are thought to mirror plasma levels, with a cut-off of 13 ng/ml quoted for pregnant smokers in a recent study.[124] Urine cotinine levels are in theory more problematic in that the cotinine level should be corrected for dilution by measuring creatinine in the urine. In practice, the dilution effect may not be important and laboratories differ, with a cut-off of around 44.7 ng/ml.[125] Bedside assays for cotinine using urine and saliva are being developed.[126]

Studies that reported secondary outcomes without also reporting at least one of the primary outcomes were excluded, with the exception of incentive studies that were not linked to a specific intervention but focused on experiences/perceptions of incentives for smoking around childbirth or breastfeeding (see *Data extraction strategy*). When interventions included both an incentive/reward behaviour change technique (IRBCT) component and general BCT components (e.g. support/motivational counselling), these studies were included regardless of the relative size of each component. The studies included in this evidence synthesis chapter are listed in *Appendices 8* (smoking cessation) and *9* (breastfeeding).

Data extraction strategy

Abstracts identified by the search strategy were screened by two reviewers (JH and HM for smoking cessation and KR and HM or KR and PH for breastfeeding). Full-text papers of potentially relevant reports were obtained and independently assessed by two reviewers for inclusion in the effectiveness and process

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

reviews (JH and KR for smoking cessation and KR and one of GT, NC or DT for breastfeeding). Qualitative and mixed-methods papers that met inclusion criteria only for the process review were independently assessed by two reviewers (HM and PH). Differences of opinion were resolved through review team discussion. Authors of individual papers were contacted for additional information when it was required to answer the research questions. The grey literature was assessed by two reviewers – for smoking cessation studies and KR and HM for breastfeeding studies – for inclusion in either the effectiveness or the process reviews; however, following team discussion it was considered more appropriate to use these data to inform triangulation of the findings for the entire study and to inform qualitative data collection. The grey literature is summarised in *Appendix 10* and is referred to throughout the report.

As no purely qualitative studies were identified, the original analysis protocol was modified to maximise the information available on incentive delivery processes reported in the included studies. Studies for process data extraction were grouped into two categories:

1. Qualitative and mixed-method studies linked to identified RCTs and intervention studies, including any descriptive data reported as part of papers reporting quantitative outcomes. This is recommended in critical interpretive synthesis[127] and in a review of smoking cessation interventions in pregnancy to ensure that findings are relevant for service users and practitioners.[128]
2. Qualitative or descriptive studies not linked to any specific intervention. This included studies drawing on the experiences and perceptions of incentives for smoking cessation and breastfeeding around childbirth.

A single electronic mixed-methods data extraction form (see *Appendix 11*) for use in Microsoft Word (Microsoft Office Professional Plus 2010, Microsoft Corporation, Redmond, WA, USA) was developed and agreed through review team discussion, informed by the Cochrane public health guidance.[118] A single data extraction form was considered to be possible for the dual purposes of conducting a hypothesis-testing (effectiveness) review and a hypothesis-generating (process) review.

One reviewer extracted quantitative data from the included full-text papers first (JH for smoking cessation and KR, VHM or SJ for breastfeeding) and a second reviewer (KR for smoking cessation and KR, VHM, SJ, LJ or NC for breastfeeding) – depending on who originally extracted data from each study – checked the data extraction. The data extraction form was then passed to the process review team where one reviewer (HM) extracted hypothesis-generating data relating to the delivery of and perceptions about incentive interventions and a second reviewer (GT or PH) checked the data extraction. For the studies reporting qualitative data, identified themes were integrated with the mixed-methods review.

Behaviour change techniques

Intervention content was characterised by extracting BCTs for studies in which an intervention was delivered. Studies providing incentives to providers of care were excluded from BCT extraction. BCTs were extracted in two ways: (1) general BCTs (not involving incentives/rewards) were extracted to characterise the range of general BCTs employed and (2) IRBCTs were extracted for an in-depth examination of these components. General BCTs were extracted using behaviour-specific taxonomies[17,129] to utilise the most appropriate frameworks to characterise intervention content. IRBCTs were excluded from the general BCT extraction as these were covered in the in-depth examination. In-depth examinations of IRBCTs were based on extractions using the recent BCT-v1,[17] which provides the most comprehensive cover of incentive/reward-related techniques (i.e. taxonomy section 'reward and punishment' 10.1–10.11). The IRBCTs were coded in a modified taxonomy created for this study derived from the literature review (*Table 2*). This is based on the four dimensions inherent in the 'reward and punishment' BCTs from BCT-v1,[17] namely contingency target (i.e. health behaviour such as self-reported smoking abstinence, preparatory behaviour such as intervention participation and engagement, or outcomes such as CO measurement), actor (i.e. participant, health-care professional, social other), content (i.e. material, social, self, non-specific) and type/awareness (i.e. aware of reward in advance and therefore acting as an incentive; not aware of reward; unclear). Social rewards were maintained for completeness, although they

TABLE 2 Taxonomy of IRBCTs

Category	Item	Description	Example
Type/ awareness	Reward	Delivery of a reward	Participants receive money for confirmed SC or BF
	Incentive	Informing someone of the delivery of a reward *Also code as reward as we can assume that the incentive element will be delivered as promised*	Participants are told that they will receive money for being confirmed as a non-smoker
Content	Material	Money, vouchers or other objects with a value	Participants receive money for verified SC or BF
	Social	Accompanying verbal or non-verbal reward from the intervention facilitator or other social contacts	Intervention facilitator congratulates person for verified SC or BF
	Self-selected	Self-rewards selected by the target person for health behaviour change	The participant is asked to choose self-rewards for SC or BF
	Non-specific	Non-specific rewards or experiences that the individual values	Providing exercise classes to individuals for SC or BF
Contingency target	Health behaviour	Performance of the health behaviour that constitutes the main target for change	Participants receive money for reporting SC or BF
	Preparatory behaviour	Performance of any behaviours that might facilitate the performance of the target health behaviour *Includes intervention attendance, intervention engagement, assessment attendance, agreeing to quit*	Participants receive money for attending intervention sessions
	Outcome	Achieving a verified outcome (i.e. physiological, biochemical or health outcome) related to the target behaviour	Participants receive money for verified SC on CO monitoring
	Other	Other contingency targets not performed by the target person for change	Health professional receives money for counselling participants
Actor	Participant/ patient	The target person for health behaviour change	People recruited to a SC or BF incentive intervention
	Health-care professional	The health-care professional caring for people who intend to change their health behaviour	Health professional receives money for delivering SC or BF intervention
	Social other	A person with meaningful social relations with the target person for health behaviour change	Social support 'buddies' rewarded in a SC or BF intervention

BF, breastfeeding; SC, smoking cessation.

did not meet our inclusion criteria for the review. All BCTs were coded using a conservative approach, which required explicit written evidence for the use of a technique to avoid subjective inferences. Data were not extracted for the control arms because of poor-quality reporting, particularly of usual care.

Smoking cessation studies

Behaviour change techniques were extracted using a smoking cessation-specific taxonomy[129] that includes 41 smoking-relevant BCTs (the BCTs 'provide rewards contingent on successfully stopping smoking' and 'provide rewards contingent on effort or progress' were not rated as these were examined in the in-depth section based on the BCT-v1 taxonomy). BCTs were rated for the target behaviour of stopping smoking in the target population of pregnant women and/or those who had given birth within the last 6 months. The definition of the BCT 'measure CO' was extended to also include objective verification of smoking

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

status through saliva samples. Two reviewers (HM and SUD) initially extracted BCTs for three studies that had been excluded from the review but which were very similar to included studies to pilot the extraction procedures and documents to obtain good inter-rater reliability. A consistent extraction and coding strategy was agreed following comparison and discussion. The reviewers then independently extracted BCTs from the included papers. Discrepancies in BCT codings were compared and resolved by a third senior reviewer (FFS).

Breastfeeding studies

A similar approach was used for the breastfeeding papers; however, in the absence of a behaviour-specific taxonomy for breastfeeding, the generic BCT-v1 taxonomy[17] was applied. BCTs were rated for the target behaviour of breastfeeding in the target population of woman who were pregnant or who had recently given birth. The definition of the BCT 'adding objects to environment' was refined to explicitly exclude information-based materials such as leaflets and booklets as these were judged to be qualitatively different from the provision of objects such as breast pumps.

Quality assessment strategy

Two reviewers [JH and KR for smoking cessation and KR or VHM and SJ (acknowledgement) for breastfeeding] independently appraised the quality of studies included in the effectiveness review using the Cochrane Collaboration's risk of bias tool[130] for RCTs and/or (depending on the design of identified studies) an 18-question checklist for non-randomised studies and case series that was adapted from several sources including the Centre for Reviews and Dissemination's guidance for those carrying out or commissioning reviews,[131] Verhagen and colleagues,[132] Downs and Black[133] and the Graphic Appraisal Tool for Epidemiology (GATE).[134] This tool assesses bias and generalisability, sample definition and selection, description of the intervention, outcome assessment, adequacy of follow-up and performance of the analysis. The checklist was developed through the NICE Review Body for Interventional Procedures (ReBIP), a joint venture between the Health Services Research Unit at the University of Aberdeen and Health Services Research at the University of Sheffield for the NICE Interventional Procedures Programme. Any differences of opinion between independent reviewers were resolved through discussion with a third member of the team.

The quality of papers reporting qualitative data was independently assessed by two qualitative researchers HM or GT or NC; for one study authored by members of the research team, SM and VS (see *Acknowledgements*) assessed quality using a modified version of the Critical Appraisal Skills Programme (CASP)[135] (see *Appendix 12*). Multimethod studies included in the effectiveness review were also assessed for risk of bias as described above. When consensus could not be reached, wider discussion with the research team took place to reach agreement. We also applied the Mixed Methods Assessment Tool (MMAT)[136] to studies reporting quantitative and qualitative data, including survey studies; however, this was abandoned as it did not contribute additional useful information and it was insufficiently sensitive to detect quality issues with the surveys.

Data analysis

For the quantitative results we report means or changes in means or proportions between groups. For data that were reported only as figures (i.e. without information in the text of the article), data have been digitised using Engauge software (Digitizer version 4.1, see http://sourceforge.net/projects/digitizer/files/Engauge%20Digitizer/) to maximise the available information and report data as precisely as possible. For relevant outcomes, meta-analysis was carried out when appropriate to estimate a summary measure of effect, using Stata 13 (StataCorp LP, College Station, TX, USA), by calculating relative risk (RR) and risk difference (RD) statistics, using random-effects methods to account for heterogeneity. Inter-rater agreement was assessed using Cohen's kappa[137] if BCTs were identified in five or more instances. For studies not considered suitable for meta-analysis but in which primary outcomes were reported for intervention and control groups, RRs were calculated from the outcome data reported.

A narrative synthesis was conducted for the incentive process review. Process review analysis involved the qualitative research team (NC, PH, HM, GT) familiarising themselves with the studies and discussing the data extracted, developing initial descriptive themes and finally developing higher-order analytical and

interpretive themes and concepts. Service-users' perspectives were incorporated into this process through discussion with our co-applicant mother-and-baby groups (see *Chapter 2*). This cyclical and iterative process was used to identify the promising 'ingredients', processes and temporal aspects of incentive interventions most likely to contribute to effectiveness for smoking cessation in pregnancy and breastfeeding, including situation, context and environment themes.

We now present the results of the smoking cessation review. This is followed by the results of the breastfeeding review and the results of studies that incentivised providers.

Results of the smoking cessation review

Number of studies identified

We identified 1469 records from the primary searches for this review. After title and abstract screening, 1161 studies were considered not to be relevant and were excluded, leaving 215 studies for full-text assessment and a further 93 studies that were requested for background information only. An additional seven studies were identified by searching reference lists and from research team knowledge. In total, the full texts of 222 studies were therefore screened. In total, 23 studies (34 reports[25,68,104,105,108–111,113,138–162]) met our inclusion criteria. A flow diagram of the screening process is provided in *Figure 4*.

Included and excluded studies

Of the 23 studies included, 20 provided incentives to childbearing women.[104,105,108–111,113,138–150] One study was included in the process review only as it was a survey of acceptability and feasibility and did not provide incentives to women.[151] One study[152] provided reimbursement to organisations providing care and one study included a question in a survey about reimbursement.[153] The surveys were included to inform the primary survey research to investigate the acceptability of incentives reported in *Chapter 7*. Studies providing incentives to organisations for either smoking cessation or breastfeeding are reported separately later in this chapter. The reasons for exclusion of assessed full-text papers are given in *Figure 4*.

There were reports in which it was unclear whether a study met our definition of an incentive. Decisions to include as an incentive study were made for the following:

1. A study by Ussher and colleagues[150] in which free expert-led exercise sessions with free gym equipment and an exercise DVD were provided. As free expert tuition, a DVD and use of gym equipment has a cost, this met our criteria for an incentive intervention.
2. Multifaceted programmes providing incentives to women as part of usual care, for example the Women, Infants and Children (WIC) programme (see www.fns.usda.gov/wic/). The WIC programme provides federal grants to states for supplemental foods, health-care referrals and nutrition education for low-income pregnant, breastfeeding and non-breastfeeding post partum women and infants and children aged up to 5 years who are found to be at nutritional risk. It was decided to include only studies in which the aim was to investigate an incentive intervention according to our study definition rather than to include all WIC studies.

Decisions to exclude as an incentive study were made for the following:

1. Studies in which it was unclear whether an item provided was intended as an incentive or as a treatment or therapy that was being subsidised as part of the research were excluded. For example, NRT is provided free to NHS patients within the UK; however, in other countries this may not be the case. In such countries a pregnant smoker could be incentivised to stop smoking if they had free access to NRT.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

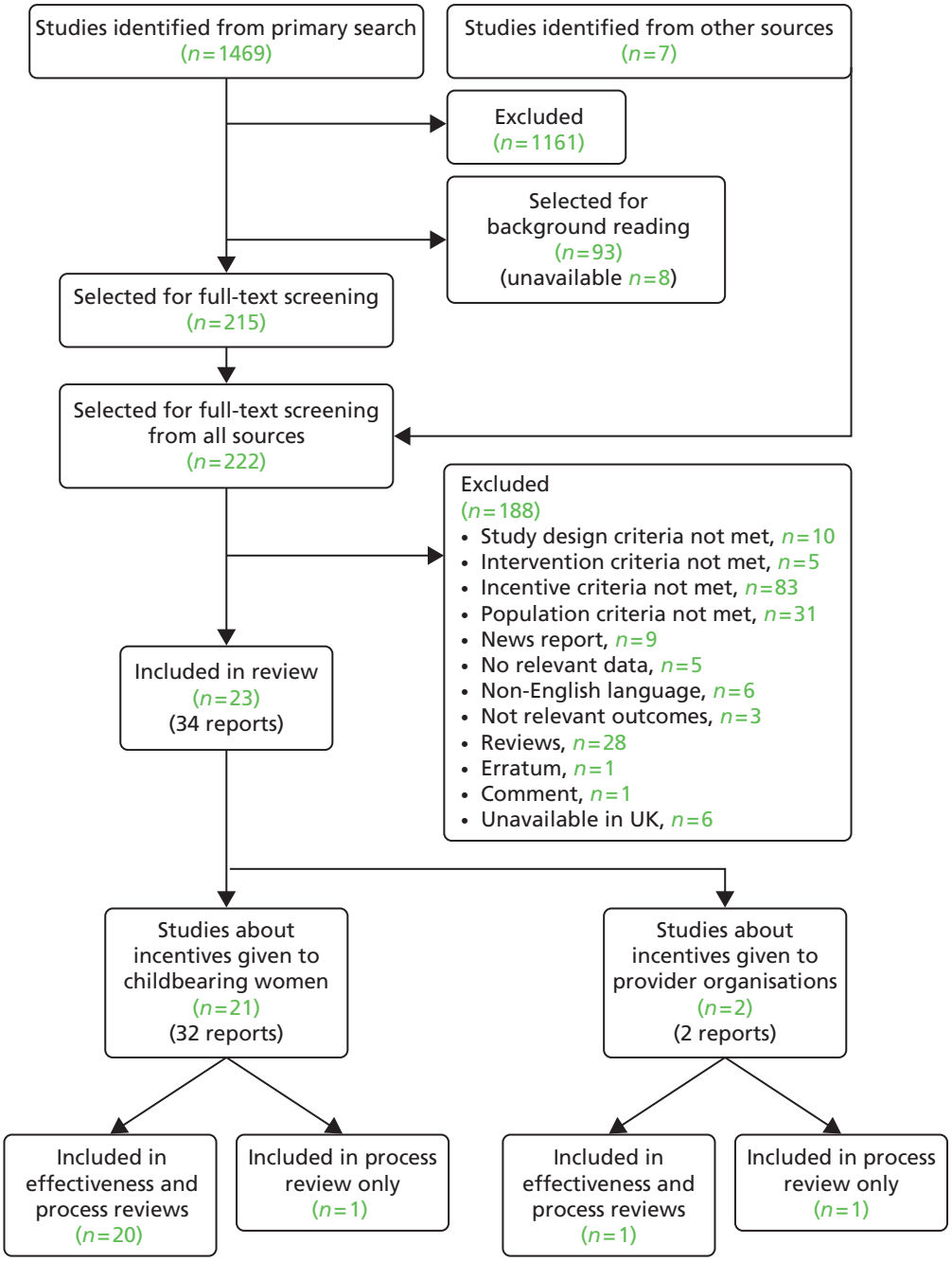


FIGURE 4 Flow chart outlining the screening process for the review of incentives for smoking cessation in pregnancy and within 6 months of giving birth.

Quality of the included studies

Details of the questions used to establish the quality of all included studies presenting quantitative outcome data are available in *Appendix 13*, where the individual assessment results for each question by study are reported.

Information is provided about each individual aspect of quality across all studies (*Figure 5*) and across all aspects of quality for each individual study (*Figure 6*). For both figures, answers of 'yes' represented the maximum possible level of quality. Therefore, in considering *Figure 5*, it can be seen that most studies (> 70%) had clearly described their inclusion and exclusion criteria, had undertaken data collection prospectively, had clearly defined their interventions and comparators, had followed up participants for long enough to detect important effects on outcomes and had considered and reported all of the important outcomes.

For some studies, details regarding the study population were absent and so it was less clear that participants were from a representative sample of a relevant patient population or that groups were comparable on demographic characteristics, although in some studies there was no comparator group and so it was not possible to answer this question or those regarding whether length of follow-up was similar between groups and whether groups were treated identically other than for the named intervention. For most studies (i.e. > 50% of studies) objective (valid and reliable) outcome measures had been used (e.g. biochemical validation of cessation).

More problematic aspects of study quality were the lack of clarity regarding the selection of patients and allocation concealment for studies reporting to be randomised. The effect of loss to follow-up on smoking cessation results was also unclear. Consistent with the Russell standard for outcome criteria in smoking cessation trials,[163] we assumed for the purposes of our analysis that loss to follow-up would result in smoking relapse.

With regard to *Figure 6*, studies with the lowest proportion of 'yes' answers were those with an atypical study design. For example, the studies by Edwards and colleagues[142] and Morgan and colleagues[148] considered the effect of the interventions at a population level and the studies by Mantzari and colleagues,[109] Nichter and colleagues[110] and Ripley-Moffitt and colleagues[111] were predominantly qualitative with additional quantitative results mentioned. In addition, several studies, including those by Cluss and colleagues[140] and Ussher and colleagues,[150] did not have comparator groups and therefore some of the questions considering the appropriateness of how groups were selected and treated did not apply.

The overall quality of the qualitative content of the four included qualitative and mixed-methods studies,[109–111,113] assessed using CASP,[135] was high and the detail is presented in *Table 3*.

Characteristics of the included studies

Studies were classified from A to E according to incentive and study design. This classification is presented in *Table 4*.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

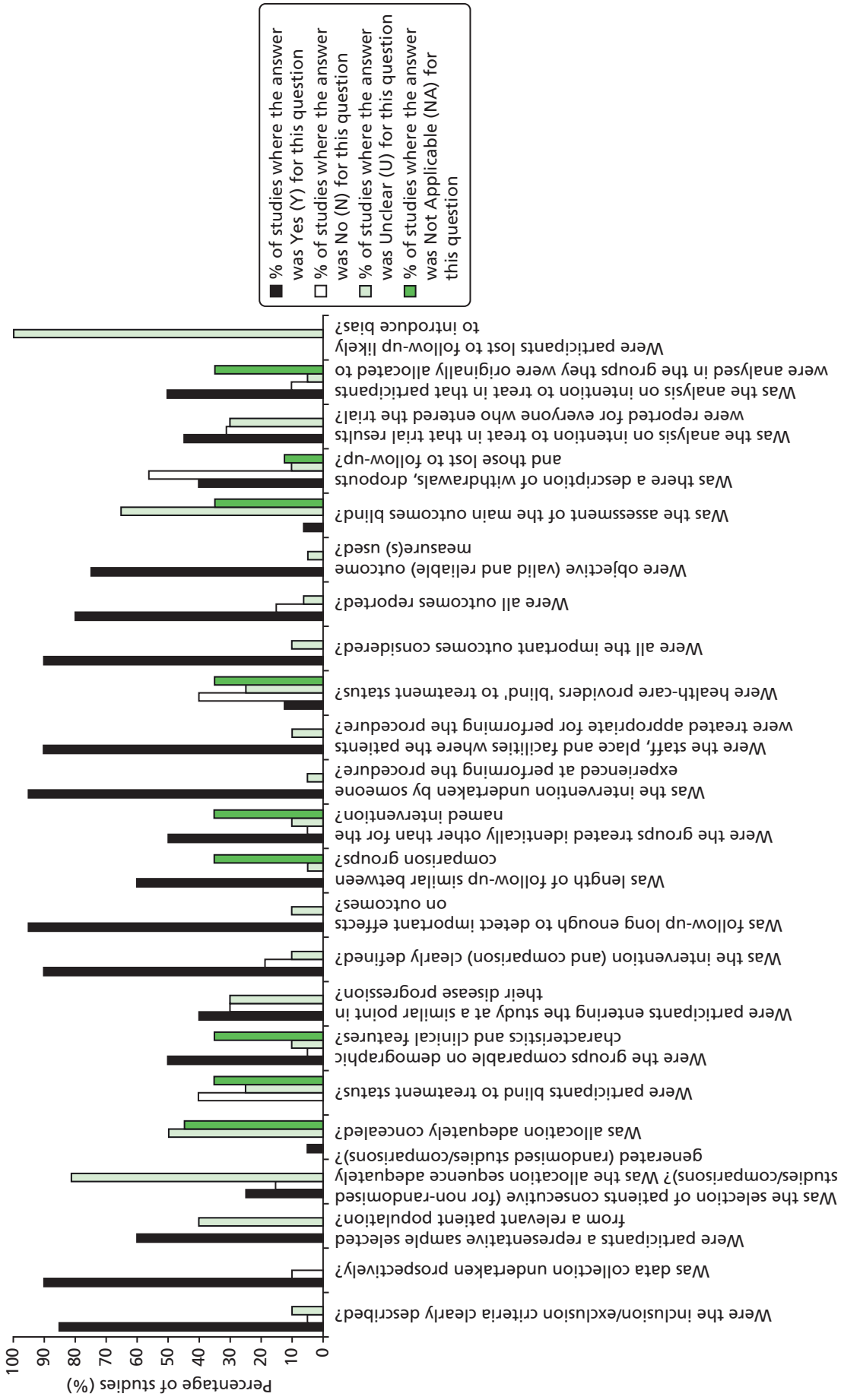


FIGURE 5 Quality assessment results by quality appraisal question for all studies included in the review of incentives for smoking cessation in pregnancy.

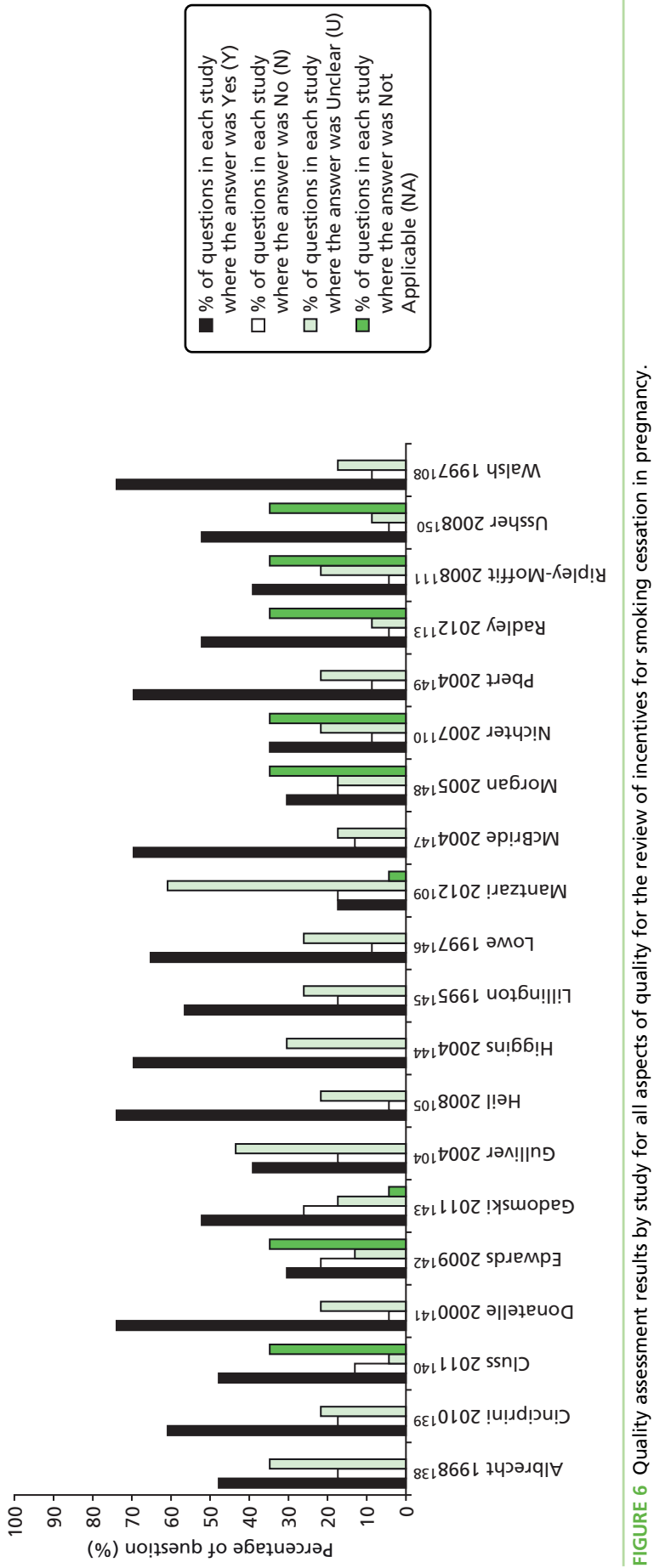


FIGURE 6 Quality assessment results by study for all aspects of quality for the review of incentives for smoking cessation in pregnancy.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 3 Detailed quality assessment for qualitative and mixed-methods studies included in the review of incentives for smoking cessation in pregnancy

Study	CASP score	Main weaknesses
Mantzari 2012[109]	9/10	CASP: 0 points given for reflexivity
Nichter 2007[110]	9/10	CASP: 0.5 points given each for reflexivity and value of the research
Radley 2013[113]	7.5/10	CASP: 0.5 points given each for data collection, data analysis and findings; 0 points given for reflexivity
Ripley-Moffitt 2008[111]	9/10	CASP: 0 points given for reflexivity

TABLE 4 Classification of studies included in the review of incentives for smoking cessation in pregnancy according to study design

Category	Studies
Category A studies ($n = 4$) compare incentives contingent on validated smoking cessation outcomes with non-contingent incentives for participation	A: Donatelle 2000,[141] Heil 2008,[105] Higgins 2004,[144] Mantzari 2012[109]
Category B studies compare incentives contingent on validated smoking cessation outcomes (B1, $n = 2$ studies) or non-contingent incentives (B2, $n = 5$ studies) with no incentive	B1: Gadomski 2011,[143] Walsh 1997[108] B2: Albrecht 1998,[138] Edwards 2009,[142] Lillington 1995,[145] Lowe 1997,[146] McBride 2004[147]
Category C studies evaluate incentives contingent on validated smoking cessation outcomes (C1, $n = 2$ studies) or non-contingent incentives (C2, $n = 5$ studies), but do not have a control group	C1: Morgan 2005,[148] Radley 2013[113] C2: Cluss 2011,[140] Gulliver 2004,[104] Nichter 2007,[110] Ripley-Moffitt 2008,[111] Ussher 2008[150]
Category D studies are those in which both the intervention group and the control group receive the same contingent (D1, $n = 0$ studies) or non-contingent (D2, $n = 2$ studies) incentives and these studies are therefore comparing another intervention component	D2: Cinciripini 2010,[139] Pbert 2004[149]
Category E studies are those in which no incentive intervention is provided ($n = 1$)	E: Lynagh 2011[151]

The main characteristics of the 20 included studies that report incentives for smoking cessation in childbearing women are described in *Table 5*. Detailed characteristics of the incentive/reward are described in *Table 6*; the setting, provider and intensity of incentive delivery are summarised in *Table 7* and the chronological patient journey through the intervention showing the timing of intervention components and BCTs offered to study participants is shown in *Table 8*.

Most studies originated from the USA and they fell into two main categories: (1) contingent incentives for smoking cessation or (2) non-contingent incentives for participation in a smoking cessation programme and providing outcome data. This latter category included incentives for participation in another intervention component in the study or research to understand participants' smoking behaviour. Within these two broad categories, a range of comparisons was present. Three studies were considered to have two incentive intervention arms.[138,139,147] The studies by Albrecht and colleagues[138] and McBride and colleagues[147] are B2 studies; both intervention arms involved incentives and these are compared with a comparator arm (usual care). The study by Cinciripini and colleagues[139] is a category D study; both study arms received incentives and differed only in terms of another non-incentive component.

TABLE 5 Summary of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women

Study and category	Country	Study design as described	Total *n* participants	Incentive	Value of incentive	Contingency	Cessation biochemically validated	Smoking outcome	Main outcome reported towards the end of pregnancy (see Smoking outcome time point in bold)
Donatelle 2000[141] A1	USA	RCT	220	Vouchers	Varied by arm	Varied by incentive	Yes	Cessation at **end of pregnancy**, 2 months post partum	I: 34/105 (32.4%) C: 9/80 (11.3%) RR (95% CI): 2.88 (1.47 to 5.65) *p*-value: < 0.001
Heil 2008[105] A1	USA	RCT	82	Vouchers	High	Varied by arm	Yes	Cessation at **end of pregnancy**, 3 and 6 months post partum	I: 16/37 (43.2%) C: 4/25 (16.0%) RR (95% CI): 2.70 (1.02 to 7.14) *p*-value: 0.024
Higgins 2004[144] A1	USA	RCT	58	Vouchers	High	Varied by arm	Yes	Cessation at **end of pregnancy**, 3 and 6 months post partum	I: 11/30 (36.7%) C: 2/21 (9.5%) RR (95% CI): 3.85 (0.95 to 15.61) *p*-value: 0.029
Mantzari 2012[109] A1	UK	Non-randomised, comparative	36	Vouchers + £20.00 per interview	High	Yes	Yes	Cessation at **unclear time point (7–9 months)**	I: 8/19 (42.1%) C: 4/15 (26.7%) RR (95% CI): 1.58 (0.59 to 4.25) *p*-value: 0.35
Gadomski 2011[143] B1	USA	Non-randomised, comparative	858	Vouchers	Moderate	Yes	Yes	Cessation at 3 and 6 months post partum	Not reported

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 5 Summary of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women (*continued*)

Study and category	Country	Study design as described	Total *n* participants	Incentive	Value of incentive	Contingency	Cessation biochemically validated	Smoking outcome	Main outcome reported towards the end of pregnancy (see Smoking outcome time point in bold)
Walsh 1997[108] B1	Australia	RCT[a]	293	Lottery + gifts	Varied by incentive	Varied by incentive	Yes	Cessation at 4 weeks from baseline, **end of pregnancy**, early post partum (< 2 months)	I: 17/127 (13.4%) C: 7/125 (5.6%) RR (95% CI): 2.39 (1.03 to 5.56) *p*-value: 0.035
Albrecht 1998[138] B2	USA	RCT[b]	84	Gift items	Low	No	Yes	Cessation at 4–6 weeks from baseline	Not reported
Edwards 2009[142] B2	USA	Non-randomised, comparative	8445	Gift items	Low	No	No	Cessation at unclear time point	Not reported
Lillington 1995[145] B2	USA	Cluster RCT[b]	768	Weekly lottery	Varied by incentive	No	No	Cessation at **end of pregnancy** and early (< 2 months) post partum	I: 106/208 (51.0%) C: 263/560 (47.0%) RR (95% CI): 1.09 (0.92 to 1.27) *p*-value: 0.32
Lowe 1997[146] B2	USA	RCT[a]	97	Gift items	Low	No	Yes	Cessation at **end of pregnancy**	I: 32/45 (71.0%) C: 29/52 (56.0%) RR (95% CI): 1.28 (0.94 to 1.73) *p*-value: 0.12
McBride 2004[147] B2	USA	RCT[a]	625	Gift items	Low	No	No	Cessation at **end of pregnancy**, early post partum (< 2 months) and 6 months post partum	I1: 118/193 (61.0%) I2: 113/192 (59.0%) C: 119/198 (60.0%) RR for I1 (95% CI): 1.02 (0.87 to 1.19) RR for I2 (95% CI): 0.98 (0.83 to 1.15) I1 *p*-value: 0.83 I2 *p*-value: 0.80

TABLE 5 Summary of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women (*continued*)

Study and category	Country	Study design as described	Total *n* participants	Incentive	Value of incentive	Contingency	Cessation biochemically validated	Smoking outcome	Main outcome reported towards the end of pregnancy (see Smoking outcome time point in bold)
Morgan 2005[148] C1	UK	Non-randomised, cohort	86	Gift items/rewards	Moderate	Yes	Yes	Cessation at 4 weeks from baseline	Not reported
Radley 2013[113] C1	UK	Non-randomised, cohort	383	Weekly incentive voucher	High	Yes	Yes	Cessation at 4 weeks, 12 weeks and 3 months post partum	Not reported
Cluss 2011[140] C2	USA	Non-randomised, cohort	856	Gift items	Low	No	Yes	Cessation at **end of pregnancy**	I: 119/856 (13.9%) C: not applicable RR (95% CI): not applicable *p*-value: not applicable
Gulliver 2004[104] C2	USA	RCT[b]	20	Gift items	High	Varied by incentive	Yes	Cessation at 4 weeks from baseline	not reported
Nichter 2007[110] C2	USA	Non-randomised, cohort	53	Small gift + US$20.00 per interview	Moderate	No	Yes	Cessation at **end of pregnancy**	I: 16/53 (30.2%) C: not applicable RR (95% CI): not applicable *p*-value: not applicable
Ripley-Moffitt 2008[111] C2	USA	Non-randomised, cohort	94	Small cash incentive + gift card	Unclear	No	Yes	Cessation at 4 months post partum	Not reported

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 5 Summary of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women (*continued*)

Study and category	Country	Study design as described	Total *n* participants	Incentive	Value of incentive	Contingency	Cessation biochemically validated	Smoking outcome	Main outcome reported towards the end of pregnancy (see Smoking outcome time point in bold)	
Ussher 2008[150] C2	USA	Non-randomised, cohort	Study 1: 10; study 2: 22	Not stated as incentives	Study 1: low/ moderate; study 2: unclear	No	Yes	Study 1: cessation at 4 weeks from baseline and at **end of pregnancy**; Study 2: cessation at 1 week and 6 weeks post baseline, and at **end of pregnancy**	I1: 5/10 (50.0%) C: not applicable RR (95% CI): not applicable *p*-value: not applicable	I2: 3/22 (13.6%) C: not applicable RR (95% CI): not applicable *p*-value: not applicable
Cinciripini 2010[139] D2	USA	RCT[b]	266	US$ or gift card	Moderate	No	Yes	Cessation at 10, **12** and 26 **weeks from baseline** and 3 and 6 months post partum	I1: 40/129 (31.0%) C: not applicable RR (95% CI): not applicable *p*-value: not applicable	I2: 47/128 (36.7%)
Pbert 2004[149] D2	USA	RCT[b]	609	Gift items	Unclear	No	Yes	Cessation at **end of pregnancy**, early post partum (< 2 months), 3 months post partum and 6 months post partum	I1: 82/278 (29.6%) C: not applicable RR (95% CI): not applicable *p*-value: not applicable	I2: 95/272 (35.0%)

C, control group; CI, confidence interval; I, intervention group.
a Randomised on the basis of the incentive + other components (i.e. confounded).
b Not randomised on the basis of the incentive.

Intervention content and format

Studies providing multicomponent incentive interventions to aid smoking cessation among pregnant women are summarised in *Table 6*. All incentive interventions involved interactions with incentive providers or other professionals, either directly or indirectly supporting smoking cessation, and we refer to these as the general BCT components of the intervention. However, communication at the time of delivering the incentive is under-reported and no study mentions observations or recordings of interactions during intervention delivery. The proportion of the intervention that can be attributed to the incentive and to the BCT component varied between studies and was sometimes difficult to assess. In category A studies[105,109,141,144] the incentive was the dominant component. In some studies the primary study aim was to investigate separate BCT components, with the incentive of secondary importance, for example to improve recruitment, intervention uptake or reduce attrition. For category B–D studies, women were invited to participate in a range of activities to obtain the incentives, some of which were reported as usual care plus additional components[110,111,138] or an enhanced programme of care[108,145–149] or involved the implementation of a new protocol.[104,113,139,140,142,143,150] These programme components involved either one or a combination of advice, counselling, group sessions, written materials and motivational strategies and, in one study, a programme of supervised exercise.[150]

TABLE 6 Details of the incentive/reward dimensions of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women

Study and category	Incentive/reward type	Awareness	Content	Contingency target	Actor
Donatelle 2000[141]	Vouchers (US$50.00)	Unclear	Material	Outcome	Participant
A1	Voucher (US$5.00)	Unclear	Material	Preparatory behaviour	Participant
	Vouchers (between US$25.00 and US$50.00)	Yes	Material	Outcome[a]	Social other
Heil 2008[105]	Vouchers (between US$6.25 and US$45.00)	Yes	Material	Outcome	Participant
A1	Vouchers (between US$15.00 and US$25.00)	Yes	Material	Preparatory behaviour	Participant
Higgins 2004[144]	Vouchers (between US$6.25 and US$45.00)	Yes	Material	Outcome	Participant
A1	Vouchers (between US$11.50 and US$20.00)	Yes	Material	Preparatory behaviour	Participant
Mantzari 2012[109]	Vouchers	Yes	Material	Health behaviour	Participant
A1	Money (£20.00)	Yes	Material	Preparatory behaviour	Participant
	Vouchers (£10.00–40.00)	Yes	Material	Outcome	Participant
Gadomski 2011[143]	Vouchers (US$40.00)	Yes	Material	Outcome	Participant
B1					
Walsh 1997[108]	Lottery (prize of A$75.00)	Yes	Material	Outcome	Participant
B1					
Albrecht 1998[138]	'Gifts and refreshments'	No	Material	Preparatory behaviour	Participant
B2					
Edwards 2009[142]	Gifts (e.g. bottles, baby bibs, sipper cups)	Unclear	Material	Preparatory behaviour	Participant

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 6 Details of the incentive/reward dimensions of studies included in the review of incentives for smoking cessation in pregnancy delivered to childbearing women (*continued*)

Study and category	Incentive/reward type	Awareness	Content	Contingency target	Actor
B2	'Incentives'	Unclear	Non-specific	Preparatory behaviour	Health professional
	Vouchers (US$20.00)	Yes	Material	Outcome	Participant
	Raffle ticket (to win a car seat)	Yes	Material	Preparatory behaviour	Participant
Lillington 1995[145]	Raffle prizes (e.g. baby items + US$100.00 grand prize)	Yes	Material	Preparatory behaviour	Participant
B2	Cloth baby bib	No	Material	Preparatory behaviour	Participant
Lowe 1997[146]	Gifts (e.g. toothbrushes, chewing gum, nappy coupons)	No	Material	Preparatory behaviour	Participant
B2	Praise	No	Social	Health behaviour	Participant
McBride 2004[147]	'Gift items'	No	Material	Preparatory behaviour	Participant
B2					
Morgan 2005[148]	Rewards (e.g. aromatherapy massage, flowers, bubble bath)	No	Material	Health behaviour	Participant
C1	Congratulatory postcard, certificate	No	Social	Health behaviour	Participant
Radley 2013[113]	Vouchers (£12.50)	Yes	Material	Outcome	Participant
C1					
Cluss 2011[140]	Small baby gifts (< US$5.00 each)	Unclear	Material	Preparatory behaviour	Participant
C2					
Gulliver 2004[104]	Raffle ticket (to win a car seat)	Yes	Material	Preparatory behaviour	Participant
C2	Coupon for items on a list (brand new)	Yes	Material	Outcome	Participant
Nichter 2007[110]	Money (US$20.00) + gift (infant health kit)	Yes	Material	Preparatory behaviour	Participant
C2					
Ripley-Moffitt 2008[111]	'Cash incentive' + 'gift card'	Unclear	Material	Preparatory behaviour	Participant
C2					
Ussher 2008[150]	'Supervised exercise sessions'	Unclear	Non-specific	Preparatory behaviour	Participant
C2					
Cinciripini 2010[139]	Money (US$40.00)	Unclear	Material	Preparatory behaviour	Participant
D2	Voucher (US$15.00)	Unclear	Material	Preparatory behaviour	Participant
Pbert 2004[149]	Vouchers (for grocery store)	Yes	Material	Preparatory behaviour	Participant
D2					

a Contingent on pregnant smoker confirmed as abstinent (not the social other).

Incentive/reward-related elements

When extracting the IRBCT data, incentive and reward elements were identified reliably (kappa = 0.87). Out of the 20 studies, eight[104,109–111,139,142,145,148] used multiple incentives (see *Table 6*) within their interventions, which varied in the four assessed incentive elements: material, social, self-selected and non-specific (see *Table 2*).

All studies included material incentives/rewards as this was a criterion for study inclusion. Two interventions specifically mentioned including social incentive/reward components such as congratulatory cards for being abstinent[148] and health-care professional praise[146] as well as the material incentive. In addition, one intervention offered supervised exercise classes.[150]

Incentive categories emerged through analysis of the description of the incentives and the context in which they were delivered:

- Earned rewards, for example vouchers contingent on biochemical validation of quit status as in the studies by Heil and colleagues,[105] Higgins and colleagues[144] and Donatelle and colleagues.[141]
- Prizes or awards – these could be either contingent on programme participation as in the study by Pbert and colleagues[149] or contingent on stopping smoking. They were either predictable or unpredictable as in the raffles provided in the study by Gulliver and colleagues.[104]
- Gifts that were not contingent on either programme participation or quitting, with the aim of encouragement or increasing goodwill towards the programme deliverers or research team, as in the study by Edwards and colleagues.[142]
- Compensatory, for example voucher-based reinforcement therapy (VBRT). This was for participating in BCT programmes that might be demanding in time and commitment, as in the study by Cinciripini and colleagues.[139]

Further analysis of the meanings of these emerging incentive categories is provided in *Chapter 6*, where qualitative data contribute to an incentive typology.

General behaviour change techniques

One study[152] was excluded from BCT data extraction as the intervention was rolled out at the health system level rather than at the individual level and was thus not in line with the target behaviour.

When extracting the general BCT data, inter-rater agreement was acceptable, with a kappa of 0.78, ranging from 0.66 ('offer/direct towards appropriate written materials') to 0.94 ('facilitate goal-setting'). Explicit reporting of BCTs underpinning interventions varied and this was often unclear or implicit. Altogether, 32 study arms were rated for the inclusion of 41 BCTs, including nine control/usual care arms and 23 intervention arms. Intervention arms were identified to use an average of 6.62 [standard deviation (SD) 3.1] BCTs, ranging from one[109] to 12,[145] emphasising that incentive interventions are complex and consist of various potentially active ingredients. Control/usual care arms used an average of 1.11 (SD 0.9) BCTs, ranging from zero[109,143] to three.[138]

Out of 41 BCTs rated, study arms were identified to have used 30 (*Figure 7*), with the BCTs used most often being 'providing information on the consequences of smoking cessation' ($n = 24$), 'measuring CO' ($n = 18$), which mostly took the form of objectively validating smoking status within intervention encounters, and 'facilitating goal-setting' ($n = 15$), which in most studies took the form of setting a formal quit date.

In addition to the BCTs, six studies were also rated as being engaged in the WIC programme[105,141–143,145,149] and one study was rated as being partially engaged in the WIC programme.[110] BCTs used in the WIC programme were recorded separately without inferring the presence of specific BCTs given the variation in WIC programme implementation.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

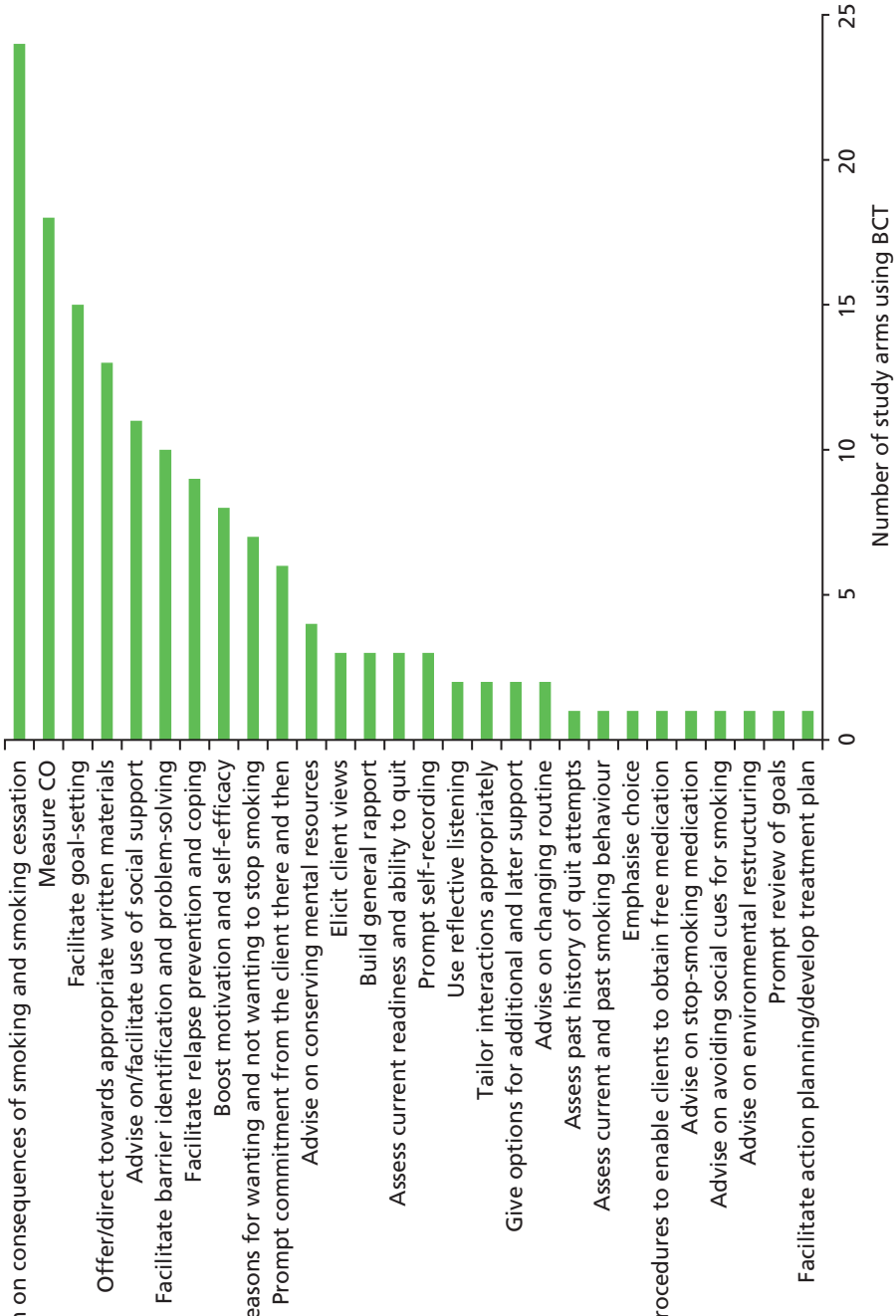


FIGURE 7 General BCTs used in all intervention arms in the studies included in the review of incentives for smoking cessation in pregnancy.

The majority of individuals targeted to receive the incentives/rewards were judged to have been aware of these components ($n = 12$); of the remaining rewards, some were judged as not being known to participants ($n = 5$) and it was unclear whether participants were aware of the others ($n = 5$).

Setting and provider

Included studies were mostly from the USA, with three[109,113,148] set in the UK (see *Table 5*). The studies varied in terms of their funding sources. One was funded by a research council[108] and several were funded by private trusts.[104,109–111,142,151] One study was jointly funded by a private trust and a national health provider[142] and the remainder were funded by national health or government institutes,[113,138–140,143,144,146–150] with two receiving extra financial support from the WIC programme.[105,145] In addition, two explicitly relied on donations from local businesses to provide the incentives,[104,108] which was framed as helping to reinforce the message of community support for smoking cessation through drawing women's attention to it, as well as being cost-saving and making the programme and its continuation more attractive and sustainable to principal funders. The authors' disciplinary backgrounds were also assorted and often involved multidisciplinary collaborations among research teams. A number of studies had a behavioural/psychological background[108,109,139,147,149] and many involved public health/health researchers,[113,141,142,146,150] with one overlapping both areas.[151] A number of studies were led by psychiatric specialists[105,140,144] and two had other origins: education (paired with midwifery)[148] and nursing.[138] Several had a cancer-specific derivation[145–147] and two were approached by substance abuse/addiction experts.[104,111] One study was led by anthropologists who used ethnographic methods to understand participant perspectives.[110]

The intervention settings and providers varied across the included studies (*Table 7*). A number of the studies were WIC based and were delivered in WIC clinics by WIC staff as an enhancement of usual care/smoking in pregnancy interventions.[105,141–143,145,149] One study recruited women through the WIC programme but women were interviewed in their own homes.[110] Similarly, other studies also involved improved or more intensive programmes designed for smoking cessation in pregnancy delivered alongside or through health services (e.g. the NHS) where contact with pregnant women was already taking place.[109,148] The others were mostly delivered in health-care settings but involved attending a non-standard clinic.[104,111,113,138–140,146,150] One intervention was delivered through an army hospital[147] and others specifically recruited pregnant women to their studies and delivered the interventions in other settings, such as a university-based clinic,[111,144] a teaching hospital[108] and in schools.[138] Although most of the programmes were delivered in clinics by health professionals or research staff, some also involved trained workers carrying out home visits/offering telephone support,[110,113,148] a helpline[109,143] or telephone calls.[141,149] Details were often provided about the setting and staff providing the counselling-based components of the intervention, but little information was given regarding the process of providing incentives to participants. Some differentiation was made between the staff delivering the intervention, although in most cases this was carried out by usual-care health professionals: WIC staff,[142,143] doctors and midwives,[108] clinical psychologists,[104] nurses[138,146] and pharmacists.[113] The details reported were variable, but some noted when staff were specifically trained to deliver the intervention.[113,140,141,148] Study staff were also involved in delivering the intervention in many of the studies.[104,105,109–111,138,139,141,143–145,147,149] A number of the studies involved a community element whereby the smoking cessation message was explicitly reinforced either at routine clinic appointments in addition to intervention components[108,140,146] or through community-based messages.[104]

Intervention intensity and the participant journey

Studies provided multicomponent interventions to aid smoking cessation among pregnant women, with interventions (or even individual components within the intervention) provided at varying frequencies and time points. This is summarised in *Tables 7* and *8*. Intervention intensity refers to the number of contacts involved for patients from the start of the intervention until the final outcome data are collected; the study duration; and the length of individual encounters. The participant journey refers to a participant's experience of the intervention components (time points and frequency) during the course of the intervention.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 7 Detail of incentive setting, provider and intensity in the studies included in the review of incentives for smoking cessation in pregnancy

Study and category	Setting	Who delivered the intervention	Mode of delivery	Recruitment (week of pregnancy)	Number of contacts when incentive provided	Number of contacts when no incentive was provided	Total number of contacts	Number of contacts with CO/saliva/urine monitoring	Intervention finish (week/month before or after birth)	Final follow-up contact (week/month before or after birth)	Total study contact period
Donatelle 2000[141] A1	WIC clinic	WIC programme or Singificant Other Supporter programme research staff	Face-to-face, telephone and social support	< 28 weeks	< 13	Only if specimen positive	13	13	2 months post partum	2 months post partum	Maximum 10 months
Heil 2008[105] A1	WIC clinic	Study staff at university-based research clinic	Face to face	≤ 20 weeks	36	None	36	36	12 weeks post partum	24 weeks post partum	> 43 weeks
Higgins 2004[144] A1	Three large group obstetric practices or one single-practitioner obstetric practice	Study staff at university-based research clinic	Face to face or telephone	≥ 32 weeks	36	None	36	36	12 weeks post partum	24 week post partum	< 31 weeks
Mantzari 2012[109] A1	Primary care trust/NHS Stop Smoking Services	Call centre staff, research staff	Telephone and face to face	Any – unclear	9	1	10	8	2 months post partum	2 months post partum	Unclear
Gadomski 2011[143] B1	WIC clinic	WIC programme and research staff	Face to face and telephone	Unclear	12 post-partum	≤ 4 in pregnancy	16	16	12 months post partum	< 12 months post partum	Unclear (> 12 months)
Walsh 1997[108] B1	Urban teaching hospital	Doctors, midwives	Face to face or by mail	Any – unclear	2	1	3	3	34–36 weeks	6–12 weeks post partum	Unclear
Albrecht 1998[138] B2	Prenatal clinics and local public schools	Project investigators, project nurse, clinic and school nurses	Face to face, group or face to face, group and a buddy	From 4 weeks to < 28 weeks	8	(Buddy arm – can have additional contact with buddy)	> 8	2 (baseline and at study finish)	4–6 weeks after study entry	4–6 weeks after study entry	4–6 weeks
Edwards 2009[142] B2	WIC clinic	Trained providers and various WIC staff	Face to face and telephone	Any – unclear	> 3 (unclear whether all incentives provided at baseline)	Unclear	> 3	None	Post partum – unclear	Post partum – unclear	Unclear

TABLE 7 Detail of incentive setting, provider and intensity in the studies included in the review of incentives for smoking cessation in pregnancy (*continued*)

Study and category	Setting	Who delivered the intervention	Mode of delivery	Recruitment (week of pregnancy)	Number of contacts when incentive provided	Number of contacts when no incentive was provided	Total number of contacts	Number of contacts with CO/saliva/urine monitoring	Intervention finish (week/month before or after birth)	Final follow-up contact (week/month before or after birth)	Total study contact period
Lillington 1995[145] B2	WIC clinic	Study staff (bachelor's degree/bilingual health educators)	Face to face or telephone and by mail	Any	2	1	3	2	1 month after study entry	6 weeks post partum	Unclear
Lowe 1997[146] B2	Public health maternity clinics	Nurses, health educators, prenatal nurses	Face to face and buddy	Any – unclear	1	Clinic appointments (n = unclear) plus one process evaluation interview	> 1	1	Unclear	Unclear	Unclear
McBride 2004[147] B2	Womack Army Medical Centre (WAMC)	Study staff, health advisors	Letter, face to face, telephone and partner coaching	≤ 20 weeks	1	Five study interviews, six counselling calls	12	Not applicable	4 months post partum	12 months post partum	16 months
Morgan 2005[148] C1	SureStart UK	SureStart midwife, other trained personnel	Face to face and telephone	Any	Unclear	Unclear	Minimum 6–8	Each visit (minimum 6–8)	As long as women needed support	As long as women needed support	As long as women needed support
Radley 2013[113] C1	Clinics and at home	Give it up for Baby development worker	Face to face	Any – unclear	Weekly during pregnancy	Weekly		Weekly	During pregnancy (although support available post partum)	Unclear – variable	Pregnancy and post partum – unclear
Cluss 2011[140] C2	Delivered in community health clinics. Referrals from a wide variety of sources including hospital obstetric providers, community clinics, drug and alcohol rehabilitation centres, school-based programmes for pregnant teens and self-referrals	Delivered by STOP counsellors. Close collaboration of programme staff with all referral sources including information and feedback	Face to face or telephone	Any	> 4	None	> 4	> 4	Final session post partum (unclear)	Final session post partum (unclear)	Unclear as varied

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 7 Detail of incentive setting, provider and intensity in the studies included in the review of incentives for smoking cessation in pregnancy (*continued*)

Study and category	Setting	Who delivered the intervention	Mode of delivery	Recruitment (week of pregnancy)	Number of contacts when incentive provided	Number of contacts when no incentive was provided	Total number of contacts	Number of contacts with CO/saliva/urine monitoring	Intervention finish (week/month before or after birth)	Final follow-up contact (week/month before or after birth)	Total study contact period
Gulliver 2004[104] C2	Private obstetric practices, self-referral through community flyers and newspaper ads	Research assistant, clinical psychologist	Telephone and face to face (individuals and couples) and groups	Any	Regular check-ins (unclear)	Only if positive specimen	Unclear	At every check-in	< 3 months post partum	< 3 months post partum	Unclear (pregnancy and < 3 months post partum)
Nichter 2007[110] C2	WIC clinics and other local community sites	Advanced graduate anthropology students (female)	Face to face	< 28 weeks	4	4	4	3	Child's birth	Child's birth	From 28 weeks to birth
Ripley-Moffitt 2008[111] C2	University and community clinics and local health departments	Clinic directors, prenatal co-ordinators, social workers, research staff	Face to face and telephone plus social support	< 30 weeks	2	2	4	4	4 months post partum	4 months post partum	> 6 months
Ussher 2008[150] C2	Antenatal care at one London hospital	Antenatal clinic staff, scan clinic staff, hospital and community midwives	Telephone, letter, face to face	From 12 to < 20 weeks	Study 1: 6; study 2: 15	Not applicable	Study 1: 6; study 2: 15	Study 1: 6; study 2: 15	< 8 months	< 8 months	Study 1: 5/6 weeks; study 2: 8/9 weeks
Cinciripini 2010[139] D2	In clinic	Five doctoral-level clinical psychologists and two master's-level counsellors	Telephone and face to face	≤ 32 weeks	16	2	18	17	6 months post partum	6 months post partum	From 8 to < 14 months
Pbert 2004[149] D2	WIC clinic	Research assistants	Face to face or telephone	Any	5	Only if positive specimen	5	5	6 months post partum	6 months post partum	> 6 months

TABLE 8 A participant's journey through the study by antenatal or postnatal month (M) from recruitment until final follow-up contact for studies in which incentives were offered to women for smoking cessation in pregnancy

Study and category	M2	M3	M4	M5	M6	M7	M8	Birth	M1	M2	M3	M4	M5	M6	(M12)[a]
Donatelle 2000[141]	WB£IG	TWB£S	TWB£S	TWB£S	TWB£S	TWB£S	WB£	TWB£S	TWB£S	WB£					
	TWB£S						TWB£S			TWB£S					
A1															
Heil 2008[105]				WB£	B£B£	B£	B£	WB£	WB£WB£	WB£	WB£			WB£	
				Q	B£B£B£B£B£B£	B£	B£	B£	B£	B£	B£				
A1				B£B£B£B£B£		B£		B£	B£	B£	B£				
				B£B£		B£			B£						
				B£B£					B£						
				B£B£											
Higgins 2004[144]				WB£	B£B£	B£	B£	WB£	WB£WB£	WB£	WB£			WB£	
				Q	B£B£B£B£B£B£	B£	B£	B£	B£	B£	B£				
A1				B£B£B£B£B£		B£		B£	B£	B£	B£				
				B£B£		B£			B£						
				B£B£					B£						
				B£B£											
Mantzari 2012[109]		T	B£		B£		B£			B£					
		G£	B£				G£								
A1		B£													
		B£													

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 8 A participant's journey through the study by antenatal or postnatal month (M) from recruitment until final follow-up contact for studies in which incentives were offered to women for smoking cessation in pregnancy (*continued*)

Study and category	M2	M3	M4	M5	M6	M7	M8	Birth	M1	M2	M3	M4	M5	M6	(M12)[a]
Gadomski 2011[143]					Q	GB	GB	GB	B£G(I)	B£G(I)	B£G(I)	B£G(I)	B£G(I)	B£G	B£G(I)
B1					GB										B£G (I)
															B£G(I)
															B£G(I)
															B£G(I)
															B£G(I)
Walsh 1997[108]					GI£WSBR	WB£	WB			WB					
B1															
Albrecht 1998[138]	GS£	GS£	GS£	GS£	GS£	GS£									
		GS		GS£											
B2	GSB£	GSB£	GSB£	GSB£	GSB£	GSB£									
		GSB		GSB£											
Edwards 2009[142]			IGQ£W				G£W			G£W					
B2															
Lillington 1995[145]			WGIQS	W£R	W£	W£	W£	W£	W£	W					
				W£	W£	W£	W£	W£	W£						
B2															
Lowe 1997[146]		GSIR£	R	R	R	R	R	R							
B2															
McBride 2004[147]		WI£	T		T	W		T	T	WT	T			W	W
		WI£				W								W	W

TABLE 8 A participant's journey through the study by antenatal or postnatal month (M) from recruitment until final follow-up contact for studies in which incentives were offered to women for smoking cessation in pregnancy (*continued*)

Study and category	M2	M3	M4	M5	M6	M7	M8	Birth	M1	M2	M3	M4	M5	M6	(M12)[a]
B2			T		T			T	T	WT	T				
			TF		TF			TF	TF	TF	TF				
Morgan 2005[148]		GWBI£	GBT£	T	T	T	T	T							
C1		GWBQ	GBT£												
		GBT£	(GB£)T												
		GBT£	(GB£)T												
Radley 2013[113]		GB£(T)	GB£(T)	GB£(T)	GB£(T)	GB£(T)	GB£(T)	GB£(T)	(GT)	(GT)	(GT)	(GT)	(GT)	(GT)	(GT)
C1															
Cluss 2004[140]		WB GB£QI	GB£QI	GB£QI	GB£QI	GB£QI	GB£QI	WB	GB£QI						
C2								GB£QI							
Gulliver 2004[104]		FGWIQB£	GB£F	GB£F	GB£F	GB£F	GB£F	GB£F	GB£F	GB£F	GB£F				
C2															
Nichter 2007[110]					£BG	£BG	£BG	£							
C2															
Ripley-Moffitt 2008[111]		BW£							TB		TB	GB£			
C2															

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 8 A participant's journey through the study by antenatal or postnatal month (M) from recruitment until final follow-up contact for studies in which incentives were offered to women for smoking cessation in pregnancy (*continued*)

Study and category	M2	M3	M4	M5	M6	M7	M8	Birth	M1	M2	M3	M4	M5	M6	(M12)[a]
Ussher 2008[150] C2		GI Study 1: £QB£B£B£B Study 2: £B£BQ£B£B£B£B£B£B	Study 1: £B£BG Study 2: £B£B£B£B £B £B	Study 2: £BG			W							
Cinciripini 2010[139] D2					GWB£ GWB£ Q	GWB£ GWB£ GWB£ GWB£	GWB£ GWB£ GWB£ GWB£	WB£	WB£ WB£		WB£			WB£	
Pbert 2004[149] D2					WGB£R	R	R	WGB£R	WGB£R	R	WGB£R	R	R		WGB£R

£, incentive (see *Table 6* for detail); B, biochemical verification of smoking status; F, father involved; G, general BCTs; I, written information/materials provided; M, month; Q, quit commitment; R, reminders/reinforcement (e.g. chart or stickers, booster postcards, usual-care clinic reinforcement); S, social supporter/buddy involved; T, telephone call/support helpline; W, worksheet/written survey/self-assessment/self-report of smoking status (interview or questionnaire).

a Some studies continued until 12 months (M12) after birth. However the inclusion criterion for studies in the review was follow-up to < 6 months after birth.

Shaded boxes indicate the period over which each study took place across pregnancy and post partum. Brackets indicate when an intervention component is optional.

The time points at which women were recruited to the studies, when they first attended and when they received the first incentive varied and were often unclear. In particular, differentiation between contacts that were integrated with usual care and contacts that were separate from usual care was often unclear. In several studies it appears that recruitment could occur at any point during pregnancy.[104,109,113,140,142,144–146,148] When specific details were given, the earliest point at which women were reported to be recruited was at 4 weeks' gestation[138] and the latest was at 32 weeks' gestation.[139] The incentive, or first incentive if more than one was given, was not necessarily provided at the point of recruitment; however, an incentive was given at initial intervention sessions in all studies with the exception of one.[143] In this study, the incentives (vouchers for nappy purchase) were not provided until the post partum period. In all of the other studies, incentives included items that were delivered during pregnancy. The overall number of contacts ranged from one to 36. In four of the studies, in addition to receiving the intervention, participants were also given usual care,[108,138,144,147] whereas in three of the studies usual care was the control condition.[105,143,149] It might be assumed, however, that usual care was delivered in addition to the intervention in the remainder of the studies when this was not made clear, as well as for those in which it was the control condition. This, and the number of contacts that usual care might involve, was poorly reported throughout.

Some of the studies reported intensity in more detail with weekly attendance for the duration of the treatment and two involved daily monitoring for a period of 5 days.[105,144] Duration of treatment varied, with some studies delivering the programme components regularly over a short period of time, for example several, often consecutive, weeks,[104,108,110,113,138–140,143,145,147–150] and some involving assessment at more spaced time points, for example at baseline, before delivery and postnatally.[111,141,142,146] Others were more varied, for example weekly to begin with and then after 3 months and 5 months.[109] End of treatment appears to have occurred before birth in some of the studies,[138,140,150] although it is sometimes unclear. Six studies involved follow-up by way of an interview or assessment at a specified time point up to 6 months post partum.[105,139,143,144,147,149] In two studies contacts continued up to 1 year after birth,[143,147] with one study providing monthly visits.[143] In another study an optional telephone helpline was available up to 1 year after birth.[113]

Cinciripini and colleagues[139] reported the mean duration of therapy sessions as 58 minutes (SD 10.1 minutes), with no significant differences in length of session between treatment groups, although in this study both treatment groups were incentivised to participate.

Ussher and colleagues[150] reported the mean minutes of supervised exercise recorded for one of the studies they conducted that used exercise as the main component of the intervention, with supervised exercise increasing from 8.4 minutes (SD 3.5 minutes, $n = 22$) at the first visit to 19.9 minutes (SD 8.6 minutes, $n = 16$) on the first day of cessation, 23.3 minutes (SD 6.1 minutes, $n = 6$) 5 weeks after the first day of cessation and 18.5 minutes (SD 14.5 minutes, $n = 6$) 6 weeks after the first day of cessation.

Intervention fidelity/non-compliance

The fidelity of the intervention, in terms of whether the intervention was actually delivered or implemented in the way described in the protocol, was seldom reported. The intervention provided in the study by Gulliver and colleagues[104] required participants to select a quit day; however, six of the 10 participants did not quit on their selected quit day.

Outcome measurement

In terms of incentive targets, 15 studies targeted preparatory behaviours (*Figure 8*). Preparatory behaviours targeted through incentives were intervention attendance and participation behaviours ($n = 11$), stating an intention to quit ($n = 1$), engaging in exercise ($n = 1$), counselling pregnant smokers ($n = 1$) or not specified ($n = 3$). Nine studies were identified as targeting only preparatory behaviours.[110,111,138–140,145,147,149,150] Six studies targeted preparatory behaviour in addition to outcomes ($n = 4$),[105,141,142,144] health behaviour ($n = 1$)[146] or outcomes and health behaviours simultaneously ($n = 1$)[109] within the same intervention. Other studies targeted outcomes[108,113,143] or health behaviours only.[148]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

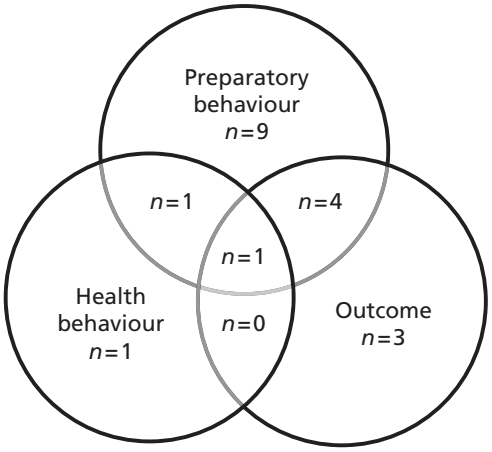


FIGURE 8 Combinations of contingency targets for incentive/rewards.

Outcome assessment varied depending on the study methodology used. Abstinence was point prevalence alone in 11 studies.[104,109,113,138,140–142,144,146,148,149] Seven studies attempted to quantify both point-prevalent and continuous abstinence.[105,108,139,143,145,147,150]

Of the studies that had considered point-prevalent abstinence only, ten out of 11 (81.8%)[104,109,113,138,140,141,144,146,148,149] had biochemically validated this. Seven studies[104,109,113,138,140,144,148] had done so using CO levels, with the cut-offs ranging from ≤ 6 p.p.m.[144] to ≤ 10 p.p.m..[104] The cut-off was unspecified in the studies by Morgan and colleagues[148] and Radley and colleagues.[113] Two studies[141,146] used thiocyanate to biochemically validate abstinence although only the study by Donatelle and colleagues[141] specified the cut-off for this as 100 μg/ml. The studies by Donatelle and colleagues,[141] Higgins and colleagues[144] and Pbert and colleagues[149] also used cotinine validation, with cut-offs ranging from 20 ng/ml to 80 ng/ml. The remaining study relied on self-reporting of smoking status.[142]

Of the studies that used both point-prevalent and continuous abstinence, five out of seven (71.4%) had biochemically validated this.[105,108,139,143,150] Four studies[105,139,143,150] had done so using CO levels, with the cut-offs ranging from < 4 p.p.m.[139] to < 8 p.p.m.,[150] The studies by Cinciripini and colleagues[139] and Heil and colleagues[105] also used cotinine validation, with cut offs of < 15 ng/ml and ≤ 80 ng/ml respectively. The study by Walsh and colleagues[108] used urinary cotinine validation, with a cut off of < 500 nmol/l. The remaining two studies did not use biochemical validation.[145,147]

Of note, two studies had used biochemical validation methods for a different outcome, namely to quantify the deception rate, as it is possible to temporarily stop smoking to achieve a low CO level; however, this would be revealed by a raised cotinine level.[143,145] Gadomski and colleagues[143] used salivary cotinine for this purpose (cut-off not specified) and Lillington and colleagues[145] used a saliva cotinine cut-off of 20 ng/ml.

For the purposes of comparing data it was not always possible to utilise comparator data even if there had been a control group in the original study. For example, Gadomski and colleagues[143] analysed data for an intervention with both gestational and post partum components. The provision of incentives applied to the post partum aspect of the intervention (vouchers for nappies); however, the authors did not have comparator data for this part of the intervention even though comparator data were available for the gestational part of the intervention (Anne Gadomski, Bassett Healthcare Research Institute, New York, May 2012, personal communication with JH).

In other cases it was not possible to derive outcome data for separate treatment groups. For example, the study by Albrecht and colleagues[138] had three treatment arms comparing an intervention (Teen FreshStart), enhancement of the intervention with peer support (Teen FreshStart Plus Buddy) and a control group.

However, results are reported comparing the enhanced intervention with combined data from the other two treatment arms; separate data for each of these arms are not available.

In two studies collecting population-level data had been attempted to consider the effectiveness of the interventions.[142,148] In the study by Edwards and colleagues[142] data were gathered from forms that indicated whether or not a pregnant woman received a smoking cessation guide, which was provided only to women who expressed a desire to stop smoking (who were then offered counselling and access to a Smoking Quitline and provided with incentives). The study by Morgan and colleagues[148] estimated the effect of a SureStart smoking cessation intervention by estimating the number of women who were reached through the incentive as a proportion of the estimated number of pregnant women smokers living within the SureStart area.

Actors: who the intervention targeted

The majority of studies targeted pregnant women who were smoking (*Table 9*). Engagement of social support in the intervention occurred in seven studies, although the format of this varied, with five involving 'social supporters' or 'buddies'[108,138,141,145,146] and two specifying that the father should perform this role.[104,147] In these studies a social supporter[108,138,141,144,146] or partner[104,147] was also registered to the programme and in one study[141] also received incentives. Peer support was considered an essential element in two of the studies.[104,138] The involvement of the wider community was also a key factor in three of the studies[104,108,140] and Cluss and colleagues[140] concluded that community-reinforced interventions deliver results that are comparable to those of RCTs. In terms of equity pointers, most of the studies targeted low-income or disadvantaged women (or WIC programme participants); however, in some studies this was unclear.[110,111]

Baseline population characteristics

Baseline characteristics data are summarised in *Table 9*. Several studies reported no baseline details of their study populations,[108,142,146,148] although the studies by Lowe and colleagues[146] and Walsh and colleagues[108] indicated that there were no significant differences at baseline between the control and the experimental groups, without reporting further details.

Of those studies that reported baseline characteristics, with the exception of the study by Ussher and colleagues,[150] the mean age of participants was ≤ 30 years. In terms of the ethnicity of participants, over half of the participants in each study population were white, apart from in the studies by Albrecht and colleagues,[138] Cinciripini and colleagues[139] and Lillington and colleagues,[145] which was a study specifically designed to evaluate the effectiveness of a smoking cessation intervention among ethnic minority pregnant smokers.

Twelve studies reported the domestic status of participants,[104,105,110,111,138–141,144,147,149,150] with more than half of study participants reported as single (or not married or living with a partner) in eight of the studies.[105,110,138–140,144,149,150] Gestational age was frequently prespecified in the inclusion criteria and therefore the maximum range for this characteristic can be derived from this information even when baseline characteristic data have not been reported, as was the case in the study by Walsh and colleagues,[108] although range data were also provided separately too.[138,150] With the exception of the study by Heil and colleagues,[105] in which the mean gestational age was 9.2 weeks, the mean gestational age for all studies reporting this information was between 10 and 20 weeks.

For smoking behaviour, the average number of cigarettes smoked per day before discovering they were pregnant exceeded 10 for all studies reporting this information.[105,111,139,143,144,149,150,152] Conversely, the reported average cigarette intake per day since discovering pregnancy was < 10 for all studies[104,105,138,139,144,147,150] except for that by Higgins and colleagues,[144] although it is worth noting that this study population had the highest mean pre-pregnancy cigarette intake of all those reporting this characteristic.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 9 Baseline characteristics of participants in studies included in the review of incentives for smoking cessation in pregnancy

Study and category	Age (years)			Ethnicity				Relationship status				Weeks pregnant			Smoking behaviour				Education								
				White		Other		Married and/or living with a partner		Other					Average no. of cigarettes smoked per day pre pregnancy		Average no. of cigarettes smoked per day since pregnancy		Education < high school		Education – high school/GED		Education – vocational school, some college or more		Mean years of educational attainment		
	Mean	SD	Range	*n*	%	*n*	%	*n*	%	*n*	%	Mean	SD	Range	Mean	SD	Mean	SD	*n*	%	*n*	%	*n*	%	Mean	SD	Range
Donatelle 2000[141]	23.7	5.7		199	91.2	19	8.8	122	55.5	98	45.5	16.5	7.0	≤28											11.7	1.9	
A1																											
Heil 2008[105]	24.3	5.2		72	93.7	5	6.3	14	18.0	63	82.0	9.2	3.2	≤20	18.5	7.7	8.7	5.8							11.9	2.3	
A1																											
Higgins 2004[144]	22.7	4.9		50	94.3	3	5.7	12	22.6	41	77.4	14.0	7.2		23.0	11.3	10.3	8.7							11.7	2.0	
A1																											
Mantzari 2012[109]	28.0	NR	17–43	34	94.4	2	5.6																				
A1																											
Gadomski 2011[143]	23.4	NR		702	90.9	71	9.1								14.1	NR									12.0	NR	
B1																											
Walsh 1997[108]														≤26													
B1																											
Albrecht 1998[138]				31	37.0	53	63.0	0	0.0	84	100.0			4–28			6.4	6.2									
B2																											

TABLE 9 Baseline characteristics of participants in studies included in the review of incentives for smoking cessation in pregnancy (*continued*)

Study and category	Age (years)			Ethnicity				Relationship status				Weeks pregnant			Smoking behaviour				Education								
				White		Other		Married and/or living with a partner		Other					Average no. of cigarettes smoked per day pre pregnancy		Average no. of cigarettes smoked per day since pregnancy		Education < high school		Education – high school/GED		Education – vocational school, some college or more		Mean years of educational attainment		
	Mean	SD	Range	*n*	%	*n*	%	*n*	%	*n*	%	Mean	SD	Range	Mean	SD	Mean	SD	*n*	%	*n*	%	*n*	%	Mean	SD	Range
Edwards 2009[142]																											
B2																											
Lillington 1995[145]	26.8	5.3	18–43	20	3.6	536	96.4																				
B2																											
Lowe 1997[146]																											
B2																											
McBride 2004[147]	24.0	4.7		449	77.0	134	23.0	583	100.0	0	0.0	11.0	3.8	≤20			6.0	5.0					303	52.0			
B2																											
Morgan 2005[148]																											
C1																											
Radley 2012[113]	27.7	6.2																									
C1																											
Cluss 2011[140]	24.6	6.3	13–46	505	59.0	351	41.0			633	74.0	19.9	7.2														
C2																											
Gulliver 2004[104]	26.7	4.3	19–35	15	75.0	5	25.0	12	62.0	8	38.0						9.7	5.6							12.9	1.5	10–16
C2																											

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 9 Baseline characteristics of participants in studies included in the review of incentives for smoking cessation in pregnancy (*continued*)

Study and category	Age (years)			Ethnicity				Relationship status				Weeks pregnant			Smoking behaviour				Education								
				White		Other		Married and/or living with a partner		Other					Average no. of cigarettes smoked per day pre pregnancy		Average no. of cigarettes smoked per day since pregnancy		Education < high school		Education – high school/GED		Education – vocational school, some college or more		Mean years of educational attainment		
	Mean	SD	Range	*n*	%	*n*	%	*n*	%	*n*	%	Mean	SD	Range	Mean	SD	Mean	SD	*n*	%	*n*	%	*n*	%	Mean	SD	Range
Nichter 2007[110]	25.0		18–43	33	62.0	20	38.0	17	32.0	36	68.0	19.3							19	36.0	20	38.0	14	26.0			
C2																											
Ripley-Moffit 2008[111]	25.0	NR		55	58.5	39	41.5	54	57.4						10.5	NR									12.9	NR	
C2																											
Ussher 2008[150]	30.2	5.7		23	71.8	9	28.2	23	71.9	9	28.1	16.3	4.3	12–20	18.4	7.9	9.0	5.5							14.2	3.2	
C2																											
Cinciripini 2010[139]	25.0	5.9		86	33.5	171	66.5	107	41.7	150	58.3	19.5	8.5	≤32	16.3	9.0	9.8	6.9	82	31.9	90	35.0	85	33.1			
D2																											
Pbert 2004[149]	25.7	6.3		290	52.7	260	47.3	194	35.3	356	64.7	16.1	7.7		16.7	11.6			300	54.5	250	45.5					
D2																											

GED, General Educational Development; NR, not reported.

Note

Cells shaded green indicate that these data were calculated from available information as totals were not reported directly.

Apart from these characteristics there was less consistency in reported baseline data across studies; other characteristics reported included income, education, employment and mean Fagerström Test for Nicotine Dependence (FTND) scores.[164] Most studies targeted either disadvantaged areas or disadvantaged women. One study specifically aimed to recruit African American/Hispanic women[145] and one was designed for pregnant adolescents who were still at school.[138]

Effectiveness

The four category A studies, which compared incentives contingent on validated smoking cessation outcomes with non-contingent incentives for participation in a smoking cessation programme and providing outcome data, were considered sufficiently homogeneous for smoking cessation rates to be combined in a random-effects meta-analysis.[105,109,141,144] *Figure 9* summarises the meta-analysis for biochemically validated cessation towards the end of pregnancy (from 7 months' gestation onwards). The estimated RD was 0.23 [95% confidence interval (CI) 0.14 to 0.31], favouring the provision of contingent incentives. The RR of cessation was 2.58 (95% CI 1.63 to 4.07). All control groups in the studies included in this meta-analysis received some form of non-contingent incentive for participation in a smoking cessation programme and providing outcome data although the value provided varied.

The study by Donatelle and colleagues[141] also reported the proportion of those maintaining abstinence at 2 months post partum, with 21% (22/103) of participants receiving partner incentivisation as well as incentives for themselves maintaining abstinence at 2 months compared with 6% (6/102) of participants receiving incentives for themselves alone (RR 3.63, 95% CI 1.54 to 8.85; $p = 0.001$). At 3 months post partum, Heil and colleagues[105] reported that 24% (9/37) of those receiving contingent vouchers were abstinent compared with 3% (1/40) of those receiving non-contingent vouchers (RR 9.72, 95% CI 1.29 to 73.12; $p = 0.004$). At the same time point, Higgins and colleagues[144] reported that 33% (10/30) of participants receiving contingent vouchers were abstinent compared with no participants receiving non-contingent vouchers ($p = 0.002$).

At 6 months post partum, Heil and colleagues[105] reported that 8% (3/37) of those receiving contingent vouchers were abstinent compared with 3% (1/40) of those receiving non-contingent vouchers (RR 3.32, 95% CI 0.36 to 30.58; $p = 0.26$). Higgins and colleagues[144] reported that 27% (8/30) of participants receiving contingent vouchers were abstinent for the same period compared with no participants receiving non-contingent vouchers ($p = 0.007$).

All category B–D studies reported cessation rates at various time points and are summarised narratively. None of the category B studies comparing incentive interventions (intervention) with no incentive (control)

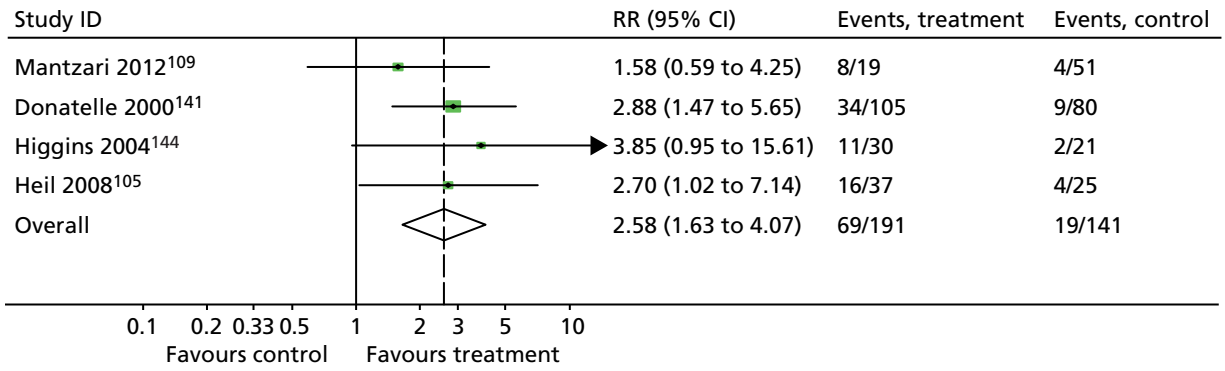


FIGURE 9 Meta-analysis for the effect of incentives contingent on biochemically validated smoking cessation compared with non-contingent incentives towards the end of pregnancy.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

were considered suitable by the research team to be included in the meta-analysis. For example, if other components of the intervention (e.g. counselling) had been provided multiple times it was not suitable to combine these data with data from studies in which the same component had been provided once as the effect of providing the incentive could be confounded with the effect of providing more intensive counselling. Category C studies had no control groups and in category D studies the incentive had been provided to all participants and these studies were therefore unsuitable for meta-analysis.

Smoking cessation outcomes

The effect of incentives on smoking cessation was our main outcome of interest. Apart from the meta-analysed data (see previous section), the reported numbers and percentages of those who quit smoking are provided. This outcome was reported for all studies as this was a prerequisite to meet the inclusion criteria for the effectiveness review. Details of smoking cessation rates at various time points during and beyond pregnancy are provided in *Tables 10–15*. Outcomes were sometimes reported at time points after the incentive programme had ceased (see *Table 8*). Intention-to-treat (ITT) and attrition data were often unclear, as detailed in *Figure 9*. RRs have been calculated from the reported smoking cessation rates and care was taken to use the most conservative estimate of the sample size (e.g. number randomised, number at the start of the study) to prevent any unintentional overinflation of the effectiveness of interventions. However, this was not possible in all cases because of the quality of reporting.

In addition, Lowe and colleagues reported data for a historical control group for their study, published previously,[165] which suggested a relapse rate of 35%. Lillington and colleagues[145] provided an adjusted relapse rate to account for deception rates among participants, based on a method cited elsewhere.[145,166]

McBride and colleagues[147] provided data on abstinence among partners. Those whose pregnant partners had received care without partner involvement in the intervention and those who were involved in their partner's intervention were incentivised groups. Of the 84 men in the partner-assisted group, 15 (17.9%) were abstinent when their partner was at 28 weeks' gestation and 17 (20.2%) and 20 (23.8%) were abstinent when their partner had reached 2 months and 6 months post partum respectively.

Smoking reduction

Albrecht and colleagues[138] reported that those randomised to one intervention group (intervention including social support) smoked on average four fewer cigarettes per day than those in the other intervention group (without social support) and the control group combined. Using digitised data reported in a figure, results indicate that the intervention group smoked an average of 2.8 cigarettes per day post intervention compared with an average of 5.8 in the other groups (i.e. three fewer cigarettes per day on average). Gulliver and colleagues[104] reported that respondents who did not quit smoked three to eight cigarettes per day. Pbert and colleagues[149] graphically showed the number of cigarettes smoked by those who did not quit. Digitised data for the reduction in cigarette intake are reported in *Table 16*.

Cluss and colleagues[140] reported the number of participants who reduced their cigarette intake even though they did not quit (217/797, 27.3%) but did not provide data on the average number of cigarettes smoked per day for these participants.

Alternative definitions of abstinence

Point-prevalent abstinence was the most commonly used method to define abstinence, likely because of the ability of biochemical measures to validate abstinence only across short time periods. However, several studies defined abstinence in alternative ways to account for consecutive periods of point-prevalent abstinence among participants.

The study by Cinciripini and colleagues[139] distinguished between continuous abstinence, defined as no smoking on any day, and prolonged abstinence, defined as not having a relapse of either 7 consecutive days of smoking or smoking at least one cigarette over 2 consecutive weeks within the period of interest.

TABLE 10 Smoking cessation outcomes: estimated mid-pregnancy cessation rates (< 7 months' gestation)

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/*N*	%	*n*/*N*	%	
Donatelle 2000[141]	A1	NR							
Heil 2008[105]	A1	NR							
Higgins 2004[144]	A1	NR							
Mantzari 2012[109]	A1	NR							
Gadomski 2011[143]	B1	NR							
Walsh 1997[108]	B1	4 weeks post baseline: approximately < 30 weeks' gestation	252	✓ (cotinine)	20/127	15.7	2/125	1.6	9.84 (2.35 to 41.23), < 0.001
Walsh 1997[108]	B1	4 weeks post baseline: approximately < 30 weeks' gestation	252	✗	25/127	19.7	9/125	7.2	2.73 (1.33 to 5.62), 0.004
Albrecht 1998[138]	B2	4–6 weeks post baseline: approximately 8–34 weeks' gestation	33	✓	5/33	15.2	NA		
Albrecht 1998[138]	B2	4–6 weeks post baseline: approximately 8–34 weeks' gestation	13	✓	3/13	23.1	NA		
Edwards 2009[142]	B2	Unclear	11,210	✗	2044/8445	24.2	578/2765	20.9	1.16 (1.07 to 1.26), < 0.001
Lillington 1995[145]	B2	NR							
Lowe 1997[146]	B2	NR							
McBride 2004[147]	B2	NR							
Morgan 2005[148]	C1	NR							
Radley 2013[113]	C1	NR							
Cluss 2011[140]	C2	NR							
Gulliver 2004[104]	C2	NR							
Nichter 2007[110]	C2	NR							

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 10 Smoking cessation outcomes: estimated mid-pregnancy cessation rates (< 7 months' gestation) (*continued*)

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/*N*	%	*n*/*N*	%	
Ussher 2008,[150] study 2	C2	1 week post baseline: approximately 15 weeks' gestation	22	✓	4/22	18.2	NA		
Ussher 2008,[150] study 1	C2	4 weeks post baseline: approximately 18.4 weeks' gestation	10	✓	7/10	70.0	NA		
Ussher 2008,[150] study 2	C2	6 weeks post baseline: approximately 20 weeks' gestation	22	✓	4/22	18.2	NA		
Cinciripini 2010[139]	D2	NR							
Pbert 2004[149]	D2	NR							

NA, not applicable; NR, not reported.

TABLE 11 Smoking cessation outcomes: end of pregnancy cessation rates (7–9 months' gestation)

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/N	%	*n/N*	%	
Donatelle 2000[141]	A1	8 months' gestation	185	✓	34/105	32.4	9/80	11.3	2.88 (1.47 to 5.65), < 0.001
Heil 2008[105]	A1	'End of pregnancy'	62	✓	16/37	43.2	4/25	16	2.70 (1.02 to 7.14), 0.024
Higgins 2004[144]	A1	'End of pregnancy'	51	✓	11/30	36.7	2/21	9.5	3.85 (0.95 to 15.61), 0.029
Mantzari 2012[109]	A1	Approximately 32 weeks' gestation (calculated from personal correspondence with author)	34	Unclear	8/19	42.1	4/15	26.7	1.58 (0.59 to 4.25), 0.35
Gadomski 2011[143]	B1	NR							
Walsh 1997[108]	B1	Reported as '34th week of gestation'	252	✓ (cotinine)	17/127	13.4	7/125	5.6	2.39 (1.03 to 5.56), 0.035
Walsh 1997[108]	B1	Reported as '34th week of gestation'	252	✗	24/127	18.9	10/125	8.0	2.36 (1.18 to 4.73), 0.011
Albrecht 1998[138]	B2	NR							
Edwards 2009[142]	B2	NR							
Lillington 1995[145]	B2	9 months' gestation	768	✗	106/208	51.0	263/560	47.0	1.09 (0.92 to 1.27), 0.32
Lowe 1997[146]	B2	9 months' gestation, stated as 'at end of pregnancy'	97	✓ (cotinine)	32/45	71.0	29/52	56.0	1.28 (0.94 to 1.73), 0.12
McBride 2004[147]	B2	28 weeks' gestation	391	✗	118/193	61.0	119/198	60.0	1.02 (0.87 to 1.19), 0.83
McBride 2004[147]	B2	28 weeks' gestation	390	✗	113/192	59.0	119/198	60.0	0.98 (0.83 to 1.15), 0.80
Morgan 2005[148]	C1	NR							
Radley 2013[113]	C1	NR							
Cluss 2011[140]	C2	'Last session before delivery' [calculated as being within the 7- to 9-month time frame as the mean (SD) length of time between this and delivery was reported in the paper as 44 (55) days, with a median of 22 days]	856	✓	119/856	13.9	NA		

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 11 Smoking cessation outcomes: end of pregnancy cessation rates (7–9 months' gestation) (*continued*)

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/N	%	*n/N*	%	
Gulliver 2004[104]	C2	NR							
Nichter 2007[110]	C2	'End of term', i.e. at the end of pregnancy	53	✓ (cotinine)	16/53	30.2	NA		
Ripley-Moffitt 2008[111]	C2	NR							
Ussher 2008,[150] study 2	C2	8 months' gestation	10	✓	5/10	50.0	NA		
Ussher 2008,[150] study 1	C2	8 months' gestation	22	✓	3/22	13.6	NA		
Cinciripini 2010[139]	D2	10 weeks post baseline: approximately 29.6 weeks' gestation	129	✓ (cotinine)	51/129	39.5	NA		
Cinciripini 2010[139]	D2	10 weeks post baseline: approximately 29.5 weeks' gestation	128	✓ (cotinine)	58/128	45.3	NA		
Cinciripini 2010[139]	D2	12 weeks post baseline: approximately 31.6 weeks' gestation	129	✓ (cotinine)	40/129	31.0	NA		
Cinciripini 2010[139]	D2	12 weeks post baseline: approximately 31.5 weeks' gestation	128	✓ (cotinine)	47/128	36.7	NA		
Pbert 2004[149]	D2	9 months' gestation	278	✓ (cotinine)	82/278	29.5	NA		
Pbert 2004[149]	D2	9 months' gestation	272	✓ (cotinine)	95/272	35.0	NA		

NA, not applicable; NR, not reported.

TABLE 12 Smoking cessation outcomes: early post-partum (0–2 months) cessation rates

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/*N*	%	*n*/*N*	%	
Donatelle 2000[141]	A1	2 months post partum	205	✓	22/103	21	6/102	6	3.63 (1.54 to 8.85), 0.001
Heil 2008[105]	A1	NR							
Higgins 2004[144]	A1	NR							
Mantzari 2012[109]	A1	NR							
Gadomski 2011[143]	B1	NR							
Walsh 1997[108]	B1	Approximately 9 weeks post partum (reported as range '6 to 12 weeks post partum')	252	✓ (cotinine)	13/127	10.2	1/125	0.8	12.8 (1.7 to 96.3), 0.001
Walsh 1997[108]	B1	Approximately 9 weeks post partum (reported as range '6 to 12 weeks post partum')	252	✗	17/127	13.4	8/125	6.4	2.1 (0.9 to 4.7), 0.064
Albrecht 1998[138]	B2	NR							
Edwards 2009[142]	B2	NR							
Lillington 1995[145]	B2	6 weeks post partum	768	✗	80/208	38.5	174/560	31.1	1.24 (1.00 to 1.53), 0.053
Lowe 1997[146]	B2	NR							
McBride 2004[147]	B2	2 months post partum	391	✗	81/193	42.0	75/198	38.0	1.1 (0.9 to 1.4), 0.41
McBride 2004[147]	B2	2 months post partum	192	✗	71/192	37.0	NA		
Morgan 2005[148]	C1	NR							
Radley 2013[113]	C1	NR							
Cluss 2011[140]	C2	NR							
Gulliver 2004[104]	C2	NR							
Nichter 2007[110]	C2	NR							

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 12 Smoking cessation outcomes: early post-partum (0–2 months) cessation rates (*continued*)

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/*N*	%	*n*/*N*	%	
Ripley-Moffitt 2008[111]	C2	NR							
Ussher 2008,[150] study 2	C2	NR							
Ussher 2008,[150] study 1	C2	NR							
Cinciripini 2010[139]	D2	NR							
Cinciripini 2010[139]	D2	26 weeks post baseline: approximately 45.6 weeks' gestation	129	✓ (cotinine)	21/129	16.3	NA		
Cinciripini 2010[139]	D2	26 weeks' gestation post baseline: approximately 45.5 weeks' gestation	128	✓ (cotinine)	23/128	18.0	NA		
Pbert 2004[149]	D2	1 month post partum	269	✓ (cotinine)	57/269	21.3	NA		
Pbert 2004[149]	D2	1 month post partum	233	✓ (cotinine)	63/233	27.2	NA		

NA, not applicable; NR, not reported.

TABLE 13 Smoking cessation outcomes: 3- to 4-month post-partum cessation rates

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/N	%	*n/N*	%	
Donatelle 2000[141]	A1	NR							
Heil 2008[105]	A1	12 weeks post partum	77	✓	9/37	24	1/40	3	9.72 (1.29 to 73.12), 0.004
Higgins 2004[144]	A1	12 weeks post partum	51	✓	10/30	33	0/21	0	$p = 0.002$
Mantzari 2012[109]	A1	NR							
Gadomski 2011[143]	B1	3 months post partum	264	✓	137/264	52.0	NA		
Gadomski 2011[143]	B1	3 months post partum	112	✓	86/112	77.0	NA		
Gadomski 2011[143]	B1	3 months post partum	17	✓	6/17	37.5	NA		
Walsh 1997[108]	B1	NR							
Albrecht 1998[138]	B2	NR							
Edwards 2009[142]	B2	NR							
Lillington 1995[145]	B2	NR							
Lowe 1997[146]	B2	NR							
McBride 2004[147]	B2	NR							
Morgan 2005[148]	C1	NR							
Radley 2013[113]	C1	3 months post partum	393	✓	65/393	16.5	NA		
Cluss 2011[140]	C2	NR							
Gulliver 2004[104]	C2	NR							
Nichter 2007[110]	C2	NR							
Ripley-Moffitt 2008[111]	C2	4 months post partum	94	✓ (cotinine)	43/94	45.7	NA		
Ussher 2008,[150] study 2	C2	NR							
Ussher 2008,[150] study 1	C2	NR							
Cinciripini 2010[139]	D2	3 months post partum	129	✓ (cotinine)	23/129	17.8	NA		
Cinciripini 2010[139]	D2	3 months post partum	128	✓ (cotinine)	24/128	18.8	NA		
Pbert 2004[149]	D2	3 months post partum	269	✓ (cotinine)	27/269	10.0	NA		
Pbert 2004[149]	D2	3 months post partum	233	✓ (cotinine)	18/233	7.7	NA		

NA, not applicable; NR, not reported.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 14 Smoking cessation outcomes: 5- to 6-month post-partum cessation rates

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/N	%	*n/N*	%	
Donatelle 2000[141]	A1	NR							
Heil 2008[105]	A1	24 weeks post partum	77	✓	3/37	8	1/40	3	3.32 (0.36 to 0.58), 0.26
Higgins 2004[144]	A1	24 weeks post partum	51	✓	8/30	27	0/21	0	$p = 0.007$
Mantzari 2012[109]	A1	NR							
Gadomski 2011[143]	B1	6 months post partum	264	✓	84/264	32.0	NA		
Gadomski 2011[143]	B1	6 months post partum	112	✓	72/112	64.0	NA		
Gadomski 2011[143]	B1	6 months post partum	17	✓	4/17	25.0	NA		
Walsh 1997[108]	B1	NR							
Albrecht 1998[138]	B2	NR							
Edwards 2009[142]	B2	NR							
Lillington 1995[145]	B2	NR							
Lowe 1997[146]	B2	NR							
McBride 2004[147]	B2	6 months post partum	391	✗	71/193	37.0	65/198	33.0	1.12 (0.85 to 1.47), 0.41
McBride 2004[147]	B2	6 months post partum	390	✗	69/192	36.0	65/198	33.0	1.09 (0.83 to 1.44), 0.52
Morgan 2005[148]	C1	NR							
Radley 2013[113]	C1	NR							
Cluss 2011[140]	C2	NR							
Gulliver 2004[104]	C2	NR							

TABLE 14 Smoking cessation outcomes: 5- to 6-month post-partum cessation rates (*continued*)

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/N	%	*n/N*	%	
Nichter 2007[110]	C2	NR							
Ripley-Moffitt 2008[111]	C2	NR							
Ussher 2008,[150] study 2	C2	NR							
Ussher 2008,[150] study 1	C2	NR							
Cinciripini 2010[139]	D2	6 months post partum	129	✓ (cotinine)	12/129	9.3	NA		
Cinciripini 2010[139]	D2	6 months post partum	128	✓ (cotinine)	9/128	7.0	NA		
Pbert 2004[149]	D2	6 months post partum	269	✓ (cotinine)	24/269	8.9	NA		
Pbert 2004[149]	D2	6 months post partum	233	✓ (cotinine)	19/233	8.2	NA		

NA, not applicable; NR, not reported.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 15 Smoking cessation outcomes: additional reported time points for cessation rates

Study	Category	Measured at	Sample size	Biochemically validated	Intervention		Control		RR (95% CI), *p*-value
					n/N	%	*n/N*	%	
Donatelle 2000[141]	A1	NR							
Heil 2008[105]	A1	NR							
Higgins 2004[144]	A1	NR							
Mantzari 2012[109]	A1	NR							
Gadomski 2011[143]	B1	NR							
Walsh 1997[108]	B1	NR							
Albrecht 1998[138]	B2	NR							
Edwards 2009[142]	B2	Unclear	11,210	✗	2044/8445	24.2	578/2765	20.9	1.16 (1.07 to 1.26), $p < 0.001$
Lillington 1995[145]	B2	NR							
Lowe 1997[146]	B2	NR							
McBride 2004[147]	B2	NR							
Morgan 2005[148]	C1	4 weeks post baseline: baseline gestation information not available	86	✗	28/86	32.6	NA		
Radley 2013[113]	C1	4 weeks post baseline: baseline gestation information not available	393	✓	211/393	53.7	NA		
Radley 2013[113]	C1	12 weeks post baseline: baseline gestation information not available	393	✓	125/393	31.8	NA		
Cluss 2011[140]	C2	NR							
Gulliver 2004[104]	C2	4 weeks post baseline: baseline gestation information not available	20	✓	11/20	54.0	NA		
Nichter 2007[110]	C2	NR							
Ussher 2008,[150] study 2	C2	NR							
Ussher 2008,[150] study 1	C2	NR							
Cinciripini 2010[139]	D2	NR							
Pbert 2004[149]	D2	NR							

NA, not applicable; NR, not reported.

TABLE 16 Smoking cessation outcomes: data from the study by Pbert and colleagues[149]

Measurement point	Average no. of cigarettes smoked per day (intervention group)	Average no. of cigarettes smoked per day (usual care group)	Between-group difference
Pre pregnancy	18.1	21.1	3.0
Baseline	8.3	9.6	1.3
9 months' gestation	8.0	10.4	2.3
1 month post partum	7.2	9.2	2.0
3 months post partum	10.3	12.8	2.4
6 months post partum	10.2	12.1	1.9

In this study both treatment groups received incentives (as it compared different methods of providing behavioural support).

Continuous abstinence rates ranged from 21.0% (27/129) to 23.4% (30/128) at 3 months following treatment, which was on average 9.5 weeks (SD 4.6 weeks) post partum, from 10.9% (14/129) to 11.7% (15/128) at 3 months post partum, from 8.5% (11/129) to 11.1% (14/128) at 6 months post treatment, which was on average 17.5 weeks (SD 7.3 weeks) post partum and from 1.2% (3/129) to 3.1% (4/128) at 6 months post partum.

Prolonged abstinence rates ranged from 27.1% (35/129) to 31.3% (40/128) at 3 months following treatment (see above for definition), from 16.4% (21/128) to 18.6% (24/129) at 3 months post partum, from 14.1% (18/128) to 14.7% (19/129) at 6 months following treatment (see above for definition) and from 6.2% (8/129) to 7.8% (10/128) at 6 months post partum.

The study by Heil and colleagues[105] reported that 24% of women receiving vouchers contingent on smoking abstinence sustained abstinence throughout the third trimester compared with 3% of those receiving non-contingent incentives. However, the time point at which this was established (and therefore the total numbers of women involved) is unclear.

McBride and colleagues[147] reported sustained abstinence ('not smoking at all four follow-ups') among women but this was measured at 12 months' follow-up and is therefore outwith the scope of this study. However, the authors also reported the proportion of women who were abstinent at 28 weeks' gestation who remained abstinent at 2 and 6 months post partum. In total, 55% and 47% of women in the control group sustained abstinence at these time points, respectively, compared with 54% and 52% of women receiving the intervention without partner support and 60% and 52% of women who received both the intervention and social support. However, the total numbers of women in each group at each time point is unclear.

Pbert and colleagues[149] reported subgroup data for those women who had spontaneously quit at baseline (i.e. who had been recent smokers until they discovered their pregnancy) who remained non-smokers at 9 months' gestation and 1, 3 and 6 months post partum. In this study the control group received no intervention whereas the intervention group received vouchers as an incentive for completing interviews regarding their smoking status. Using ITT analysis based on the number of spontaneous quitters at baseline, in the intervention and control groups, respectively, 70.3% (57/81) and 78.2% (60/77) of women remained non-smokers at 9 months' gestation compared with 40.1% (32/81) and 49.7% (38/77) at 1 month post partum, 12.8% (10/81) and 27.7% (21/77) at 3 months post partum and 11.7% (9/81) and 24.9% (19/77) at 6 months post partum.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Walsh and colleagues[108] reported both self-reported and biochemically validated (urine cotinine of ≤ 500 nmol/l) continuous abstinence rates (abstinent on two or three consecutive follow-up visits). In this study the intervention group received incentives whereas the control group did not. Self-reported consecutive abstinence was 13% (17/127; 95% CI 8% to 21%) for participants in the experimental group compared with 3% (4/125; 95% CI 1% to 8%), for participants in the control group from first follow-up to the end of pregnancy, and 8% (10/127; 95% CI 4% to 14%) compared with 1% (1/125; 95% CI 0% to 4%) for the experimental and control groups, respectively, from first follow-up to the post partum follow-up. However, when biochemical validation was used, no control group participants were found to be abstinent on consecutive occasions. For the experimental group, consecutive abstinence from first follow-up to the end of pregnancy was 9% (12/127; 95% CI 5% to 16%) and from first follow-up to the post partum follow-up was 6% (8/127; 95% CI 3% to 12%).

The study by Gadomski and colleagues[143] graphically reported time to first failed post partum test for those receiving incentives. Insufficient information was available to estimate data from this graph using digitising software. The study by Heil and colleagues[105] reported that, for participants receiving contingent voucher incentives, the mean number of weeks of continuous abstinence as measured at the end of pregnancy was 9.7 weeks (SD 1.9 weeks) whereas, for those receiving non-contingent vouchers, the mean number of weeks of abstinence was 2.0 weeks (SD 0.8 weeks).

Changes in biochemically validated indicators of smoking cessation

Two studies reported changes in biochemical validation readings over the study time frame. The study by Albrecht and colleagues[138] reported an average reduction in the CO level of 1.7 p.p.m. among those receiving the intervention (including incentives) plus social support at between 4 and 6 weeks post baseline compared with an increase of 0.9 p.p.m. among those receiving either the intervention (including incentives but without social support) or the control treatment (no incentive or intervention). Mean exhaled CO levels for the groups were also reported graphically and these data confirm the reported rates. The study by Heil and colleagues[105] reported the mean decrease in urine cotinine levels from baseline for those receiving contingent voucher incentives (39 ng/ml) and those receiving non-contingent vouchers (33 ng/ml) as measured at the end of pregnancy.

Typology of smoking cessation in pregnancy quitters and non-quitters

Qualitative data from four studies[109,110,111,113] illuminate how pregnant smokers are a heterogeneous group who attach different values to incentives and other BCT components. A typology of women engaging in an incentive intervention in Scotland describes six user groups.[113] The least successful at quitting were characterised as 'breadline survivors'[113] who felt pressured to quit[109] and who were typically the most socially and financially disadvantaged,[109,111] with an unsupportive or no partner.[110,111] They were 'shifters' whose changes in smoking behaviour included erratic reductions and increases.[110] Those who were most successful were 'mothers to be',[113] 'quitters',[110] with 'a moral identity'[110,111] for whom the child's health was at the forefront of their decision-making, and they were women who had more stable lifestyles with more control over their environment.[110,113] Some women in a number of studies also reported concern for their baby, concern for self and concern for existing children as reasons for wanting to quit.[109,111] Also successful in the Scottish study were 'enthusiastic amateurs',[113] who had a history of quit attempts and who benefited most from the support of those delivering the programme and the CO monitoring.[109] These women tended to have more stable lifestyles and to conceptualise the incentive as part of a wider rewards and social support structure,[109] particularly valuing relationships established with their local community pharmacists. Women who cut down, 'harm reducers',[110] or those who relapsed were more likely to have stressful, chaotic lives and perceive smoking as an essential strategy for coping.[110,111]

Other groups identified by Radley and colleagues[113] were 'novice quitters', 'opportunists' and 'impulse shoppers'. 'Novice quitters' were typically younger, first-time mothers still living within the family home.

They had limited motivation, were looking for a quick solution and were least likely to benefit from the incentive scheme. 'Opportunists' saw the scheme as a financial opportunity, had minimal engagement with other intervention components, were often light smokers and were relatively confident of their ability to give up. 'Impulse shoppers' were women with limited commitment and those who did not expect to succeed. They had tried to quit smoking numerous times but thought that they should try again as they were pregnant. They were not necessarily looking to participate in a scheme but were speculatively looking for advice.[113]

Women seemed not to be aware of the effect of incentives on their motivation, except in one study[109] in which some women reported a connection, for example 'And then the vouchers give me incentive to, like, stop smoking' (participant 14, incentivised group).

In most studies reporting qualitative data the incentives were described as an 'added bonus' in addition to the general BCTs received.[109] Where incentives seemed to play their greatest role, however, was in engaging more women in the study or programme and in achieving higher quit rates.[113] In one study, women in the intervention group who received incentives engaged more with stop smoking services and were more positive about their experiences than those in the control group.[109]

Attrition

Attrition rates were reported (or calculable) for 14 studies. Details for different time points ranging from early follow-up in pregnancy through to around 6 months post partum are reported in *Tables 17–20*.

Higgins and colleagues[144] reported compliance as the proportion of monitoring sessions attended and found that 531 of 833 scheduled sessions (63.7%) were attended by women receiving vouchers contingent on cessation and 426 of 673 scheduled sessions (63.3%) were attended by women receiving non-contingent vouchers.

The study by Cinciripini and colleagues[139] reported the proportions of respondents completing various numbers of therapy sessions as specified by the intervention, with 78% (208/266) completing seven sessions, 74% (197/266) completing eight sessions and 70% (186/266) completing nine sessions. The authors also reported that there were no between-group differences in treatment session attendance. In any case, in this study both groups received incentives.

In the study by Lillington and colleagues[145] incentives were provided for the completion of behaviour change sheets. In total, 88% (136/155) of women completed one or more behaviour change sheet, 32% (50/155) completed between two and seven sheets, 19% (30/155) completed more than seven sheets and 8% (12/155) completed all 12 sheets.

Heil and colleagues[105] reported compliance to be relatively high (83–95%) and not significantly different between the two treatment conditions at any assessment point, although no further details were provided.

Lowe and colleagues[146] reported details of the proportions of participants who received individual components of the intervention. Of 45 participants, 93.9% ($n = 42$) received counselling, 97.9% ($n = 44$) received the calendar, 93.8% ($n = 42$) received a letter to give to their social supporter/'buddy', all received a non-smoking contact, 66.7% ($n = 30$) received a physician's letter to their home, 68.4% ($n = 31$) received reinforcement from a doctor, 71.1% ($n = 32$) received reinforcement from a registered nurse, 86.2% ($n = 39$) received 'quit tips' and 78.8% ($n = 35$) received deep-breathing instructions.

The study by Lowe and colleagues[146] also reported the proportions of participants receiving various kinds of social support from their nominated social supporter/'buddy'. For the intervention group (who received incentives), 72.7% ($n = 33$) received support from a friend and the same proportion reported that they received help and praise from others and that their significant other understood stress. A total of 78.8% ($n = 35$) said that they received support from their significant other and 57.6% ($n = 26$) felt that they had

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 17 Smoking cessation in pregnancy incentive intervention attrition rates at reported time points before the end of pregnancy

			Intervention		Control		
Study	Category	Time of follow-up	*n/N*	%	*n/N*	%	RR (95% CI), *p*-value
Donatelle 2000[141]	A1	NR					
Heil 2008[105]	A1	NR					
Higgins 2004[144]	A1	NR					
Mantzari 2012[109]	A1	NR					
Gadomski 2011[143]	B1	NR					
Walsh 1997[108]	B1	4 weeks after first visit	11/127	9.0	13/125	10.0	0.83 (0.39 to 1.79), 0.64
Albrecht 1998[138]	B2	4–6 weeks post baseline	13/29	44.8	12/29	41.4	1.08 (0.60 to 1.96), 0.79
Albrecht 1998[138]	B2	4–6 weeks post baseline	13/26	50.0	12/29	41.4	1.21 (0.68 to 2.16), 0.52
Edwards 2009[142]	B2	NR					
Lillington 1995[145]	B2	NR					
Lowe 1997[146]	B2	NR					
McBride 2004[147]	B2	NR					
Morgan 2005[148]	C1	NR					
Radley 2013[113]	C1	NR					
Cluss 2011[140]	C2	NR					
Gulliver 2004[104]	C2	1 month	2/10	20.0	NA		
Nichter 2007[110]	C2	NR					
Ripley-Moffitt 2008[111]	C2	NR					
Ussher 2008,[150] study 2	C2	1 week post baseline	6/22	27	NA		
Ussher 2008,[150] study 1	C2	1 week post baseline	2/10	20	NA		
Ussher 2008,[150] study 2	C2	6 weeks post baseline	14/22	64	NA		
Cinciripini 2010[139]	D2	NR					
Pbert 2004[149]	D2	NR					

NA, not applicable; NR, not reported.

TABLE 18 Smoking cessation in pregnancy incentive intervention attrition rates at the end of pregnancy

			Intervention		Control		
Study	Category	Time of follow-up	n/N	%	n/N	%	RR (95% CI), *p*-value
Donatelle 2000[141]	A1	8 months' gestation	36/112	32.1	56/108	51.9	0.62 (0.45 to 0.86), 0.003
Heil 2008[105]	A1	NR					
Higgins 2004[144]	A1	End of pregnancy	3/30	10.0	0/23	0.0	$p = 0.12$
Mantzari 2012[109]	A1	NR					
Gadomski 2011[143]	B1	NR					
Walsh 1997[108]	B1	End of pregnancy	13/127	10.0	11/125	9.0	1.16 (0.54 to 2.50), 0.70
Albrecht 1998[138]	B2	NR					
Edwards 2009[142]	B2	NR					
Lillington 1995[145]	B2	End of pregnancy	52/208	25.0	157/560	28.0	0.89 (0.68 to 1.17), 0.40
Lowe 1997[146]	B2	End of pregnancy	5/45	11.1	14/52	26.9	0.41 (0.16 to 1.06), 0.050
McBride 2004[147]	B2	28 weeks' gestation	40/193	20.7	42/198	21.2	0.98 (0.66 to 1.44), 0.91
McBride 2004[147]	B2	28 weeks' gestation	28/192	14.6	42/198	21.2	0.69 (0.44 to 1.06), 0.088
Morgan 2005[148]	C1	NR					
Radley 2013[113]	C1	NR					
Cluss 2011[140]	C2	NR					
Gulliver 2004[104]	C2	NR					
Nichter 2007[110]	C2	NR					
Ripley-Moffitt 2008[111]	C2	NR					
Ussher 2008,[150] study 2	C2	8 months' gestation	18/22	81.8	NA		
Ussher 2008,[150] study 1	C2	8 months' gestation	5/10	50.0	NA		
Cinciripini 2010[139]	D2	NR					
Pbert 2004[149]	D2	End of pregnancy	58/309	18.8	24/300	8.0	2.35 (1.50 to 3.67), < 0.001

NA, not applicable; NR, not reported.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 19 Smoking cessation in pregnancy incentive intervention attrition rates early post partum

			Intervention		Control		
Study	Category	Time of follow-up	*n/N*	%	*n/N*	%	RR (95% CI), *p*-value
Donatelle 2000[141]	A1	2 months post partum	58/112	52.0	56/108	52.0	1.00 (0.77 to 1.29), 0.99
Heil 2008[105]	A1	NR					
Higgins 2004[144]	A1	3 months post partum	4/30	13.0	2/23	9.0	1.53 (0.31 to 7.66), 0.60
Mantzari 2012[109]	A1	NR					
Gadomski 2011[143]	B1	NR					
Walsh 1997[108]	B1	4–6 weeks post partum	28/127	22.0	34/125	27.0	0.81 (0.52 to 1.25), 0.34
Albrecht 1998[138]	B2	NR					
Edwards 2009[142]	B2	NR					
Lillington 1995[145]	B2	NR					
Lowe 1997[146]	B2	NR					
McBride 2004[147]	B2	2 months post partum	50/193	25.9	44/198	22.2	1.17 (0.82 to 1.66), 0.39
McBride 2004[147]	B2	2 months post partum	42/192	21.9	44/198	22.2	0.98 (0.68 to 1.43), 0.93
Morgan 2005[148]	C1	NR					
Radley 2013[113]	C1	NR					
Cluss 2011[140]	C2	NR					
Gulliver 2004[104]	C2	NR					
Nichter 2007[110]	C2	NR					
Ripley-Moffitt 2008[111]	C2	NR					
Ussher 2008,[150] study 2	C2	NR					
Ussher 2008,[150] study 1	C2	NR					
Cinciripini 2010[139]	D2	3 months post partum	22/128	17.2	NA		
Cinciripini 2010[139]	D2	3 months post partum	9/129	7.0	NA		
Pbert 2004[149]	D2	1 month post partum	59/309	19.1	NA		
Pbert 2004[149]	D2	1 month post partum	39/300	13.0	NA		
Pbert 2004[149]	D2	3 months post partum	116/309	37.5	NA		
Pbert 2004[149]	D2	3 months post partum	111/300	37.0	NA		

NA, not applicable; NR, not reported.

TABLE 20 Smoking cessation in pregnancy incentive intervention attrition rates at 6 months post partum

			Intervention		Control		
Study	Category	Time of follow up	*n/N*	%	*n/N*	%	RR (95% CI), *p*-value
Donatelle 2000[141]	A1	NR					
Heil 2008[105]	A1	NR					
Higgins 2004[144]	A1	6 months post partum	4/30	13.0	3/23	13.0	1.02 (0.25 to 4.12), 0.98
Mantzari 2012[109]	A1	NR					
Gadomski 2011[143]	B1	NR[a]					
Walsh 1997[108]	B1	NR					
Albrecht 1998[138]	B2	NR					
Edwards 2009[142]	B2	NR					
Lowe 1997[146]	B2	NR					
Lillington 1995[145]	B2	NR					
McBride 2004[147]	B2	6 months post partum	48/193	24.9	41/198	20.7	1.20 (0.83 to 1.73), 0.33
McBride 2004[147]	B2	6 months post partum	35/192	18.2	41/198	20.7	0.88 (0.59 to 1.32), 0.54
Morgan 2005[148]	C1	NR					
Radley 2013[113]	C1	NR					
Gulliver 2004[104]	C2	NR					
Nichter 2007[110]	C2	NR					
Ripley-Moffitt 2008[111]	C2	NR					
Ussher 2008,[150] study 2	C2	NR					
Ussher 2008,[150] study 1	C2	NR					
Cinciripini 2010[139]	D2	6 months post partum	54/128	42.2	NA		
Cinciripini 2010[139]	D2	6 months post partum	42/129	32.6	NA		
Pbert 2004[149]	D2	6 months post partum	113/221	51.1	NA		
Pbert 2004[149]	D2	6 months post partum	108/221	48.9	NA		

NA, not applicable; NR, not reported.
a Gadomski and colleagues[143] also reported follow-up data but it was not possible to calculate the denominators from which percentages had been drawn.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

the ability to deal with staying quit. Among the control (non-incentivised) group, 62.2% ($n = 32$) said that they received support from a friend, 72.4% ($n = 38$) received help and praise from others and 69.0% ($n = 36$) received support from their significant other. A total of 58.6% ($n = 30$) felt that their significant other understood their stress and 44.8% ($n = 23$) felt that they had the ability to deal with staying quit.

'Deception' rates

Some studies have tried to examine the issue of whether women 'cheated' (stated that they were abstinent when in fact they had smoked) to receive an incentive. 'Deception' was commonly measured by either comparing the difference between self-reported abstinence and biochemically validated abstinence or comparing different types of biochemical validation.

For example, the study by Gadomski and colleagues[143] verified negative CO tests by comparing 10% of these samples with a saliva cotinine test to derive a deception rate (the number of positive saliva cotinine tests divided by the number of negative CO tests). For intervention groups there were large differences between samples (from 6% to 61%) but the time point at which these samples were verified was not reported, which is problematic as incentives (vouchers for nappies) were provided to intervention participants only post partum and not during pregnancy.

Walsh and colleagues[108] reported inconsistencies between self-reported abstinence and biochemical validation (defined as a urine cotinine level of ≤ 500 nmol/l). Deception rates in self-reported abstinence were 12% for the experimental group (receiving the intervention) and 52% for the control group (not receiving the intervention), although there was some disparity in the proportion of respondents whose self-reported abstinence could be verified (86% in the experimental group and 78% in the control group). Pbert and colleagues[149] reported the proportions of participants for whom saliva cotinine values were available, which was 58% at 9 months' gestation, 49% at 1 month post partum, 43% at 3 months post partum and 46% at 6 months post partum, although it is not clear whether these percentages include those lost to follow-up at each time point. Problems with storage and transfer of samples were reported as the reason for this. Agreement between the self-reported and the cotinine-validated (with ≤ 20 ng/ml classified as abstinence) abstinence rates for the intervention and control groups, respectively, was high except at the final testing point: 89% and 92% at baseline, 84% and 94% at 9 months' gestation, 81% and 88% at 1 month post partum, 71% and 90% at 3 months post partum and 40% and 80% at 6 months post partum. Both groups in this study received non-contingent incentives.

Lillington and colleagues[145] also reported agreement between self-reported abstinence and saliva cotinine-verified abstinence (defined as < 20 ng/ml) at 6 months post partum. However, of the 111 saliva samples available for this time point, 23% (*n* calculated as 26 participants) exceeded the cut-off (of which 26% were from the intervention group and 21% were from the control group, although the denominators for both groups are unclear). The intervention group received incentives in this study although these were contingent on completing behaviour change worksheets and not on abstinence success.

This study also reported the reasons for not obtaining cotinine samples for validation, of which participant refusal was the reason in 48/143 (33.6%) cases. The study also reported that the intervention group (receiving incentives contingent on completing behaviour change sheets) had a lower refusal rate (23%) than the group not receiving incentives (33%), although the number of participants involved is not clear (numerators and denominators were not reported).[145]

Costs

No studies reporting the cost-effectiveness of incentive interventions were identified; however, several other potentially relevant outcomes were reported by individual studies. Cost data were reported by five studies.[104,105,108,140,144] For the studies by Cluss and colleagues[140] and Walsh and colleagues[108] these data were estimates of the cost of providing the intervention.

For Cluss and colleagues,[140] the cost per participant enrolled in the intervention was US$616.91 and the cost per abstainer was US$4433.87. The total cost of the intervention over the course of its 8-year implementation was US$527,631.00. A 2011 price year is assumed. This study had no control group.

For Walsh and colleagues,[108] costs were reported as A$13.95 per participant for the intervention group (who received incentives) and A$1.83 for the control group, with the total cost per biochemically validated abstainer as measured at the end of pregnancy of A$121.41 for intervention participants and A$37.88 for control group participants (1997 price year assumed).

Two other studies[105,144] reporting information on costs provided data on mean voucher earnings for those receiving vouchers contingent on cessation and for those receiving non-contingent vouchers. For the study by Heil and colleagues,[105] voucher earnings as measured at the end of the intervention (12 weeks) in the contingent group ranged from US$0.00 to US$1180.00, with mean earnings of US$461.00 (SD US$456.00), and in the non-contingent group ranged from US$75.00 to US$670.00, with mean earnings of US$413.00 (SD US$163.00). A 2008 price year is assumed. For Higgins and colleagues,[144] voucher earnings in the contingent group ranged from US$0.00 to US$1135.00, with mean earnings of US$397.00 (SD US$414.00), whereas voucher earnings in the non-contingent group ranged from US$35.00 to US$517.00, with mean earnings of US$313.00 (SD US$142.00). (A 2004 price year is assumed.)

The study by Gulliver and colleagues[104] reported that funding did not exceed US$4000.00 (2004 price year) but noted that this figure did not include donated advertising costs and the costs of the incentives.

Implementation and sustainability

There were no data relevant to the sustainability of the incentive interventions in terms of the long-term benefits outweighing the costs, or to unintended effects once the research has finished. In two studies, incentives donated by local businesses were specifically sought to save costs and to make the programme more sustainable to principal funders.[104,108] Several authors commented that implementation in practice would require provider service changes;[142] additional contacts over and above usual care to allow for monitoring/contingency;[105,144] the enhancement or intensification of usual care contacts;[104,108,143,146] a joined-up approach or case management;[111] one-to-one specialist care in pregnancy;[148] and additional care post partum to help to prevent relapse.[149] All of these suggestions are likely to have considerable resource implications. However, there was some disagreement in that the authors of two studies concluded that delivery could be effective even in brief (existing) usual care consultations in pregnancy.[145,149]

Acceptability outcomes

For some studies, authors had conducted a pilot study to determine feasibility, for example the study by Higgins and colleagues[144] was a pilot for the study by Heil and colleagues.[105] Other studies used a process evaluation, which included participants' feedback,[142,145,146,148] or planned to conduct an evaluation.[141] Four studies reported information on the acceptability of the interventions. Walsh and colleagues[108] reported that, for midwives, the duration of the intervention was acceptable. This staff group spent significantly more time (*t*-test value of $p < 0.0001$ reported) discussing smoking with experimental (incentivised) patients (on average 7 minutes and 12 seconds) than with control (non-incentivised) patients (on average 1 minute 46 seconds).

The study by Cluss and colleagues[140] reported that 90% of participants responding to a question about the quality of the service they received were 'very satisfied' and 98.5% said that the intervention had helped them deal more effectively with quitting smoking or cutting down their smoking intake. In addition, 95.5% said that they would refer a friend. In terms of the components that respondents found to be the single most helpful treatment, 40.8% cited the interventionist support, 30.5% indicated that CO monitoring helped, 14.8% stated that it was education about the effects of smoking, 5.1% said that it was the improvement to their health, 3.5% cited incentives, 2.1% said that it was problem-solving assistance and 3.3% said that it was another reason.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Ussher and colleagues[150] reported that 30 out of 32 recruited participants (94%) had indicated that they would like to join a study involving randomisation to a physical activity (the main component of the intervention in this study) or the control condition.

Lynagh and colleagues[151] surveyed acceptability and feasibility of incentives among outpatients at an antenatal clinic of a public hospital in Australia. The self-administered survey was distributed to women between 16 and 42 weeks' gestation by clinic staff. There were quality limitations with the findings as numerators and denominators were not well reported. It was found that only 25% of 213 participants would endorse the idea of paying women to quit smoking (agreed or strongly agreed). In total, 60% disagreed or strongly disagreed that it was a good idea and 15% were undecided. In terms of feasibility, however, support for the idea that such a programme would be successful was greater and just over half thought that it might work (30%) or were undecided (22%). Among respondents, those who were smokers themselves were significantly more likely to think that incentives were both a good idea ($p < 0.0001$) and that they would be likely to work ($p < 0.003$).

Results of the breastfeeding review

We now consider the results of the evidence synthesis for studies that report incentives delivered to women to improve breastfeeding outcomes.

Number of studies identified

We identified 5408 records from the primary searches for this review. After title and abstract screening, 5092 studies were considered not to be relevant and were excluded, leaving 316 studies for full-text assessment; in addition, 10 studies were identified from other sources. In total, therefore, the full texts of 326 studies were screened, of which 19 studies (20 reports[103,106,107,112,167–182]) were included in the review. Two of the studies included in the effectiveness and process reviews were conference abstracts.[180,181] A flow chart of the screening process is provided in *Figure 10*.

Included and excluded studies

Nineteen studies evaluating incentives for breastfeeding met our inclusion criteria because an incentive had been provided, even though evaluating the effect of incentivisation was not always the primary purpose of the study. Seventeen full study reports[103,106,107,112,167–179] and two conference abstracts[180,181] were included in the effectiveness and process review. One additional study was included in the process review only as it did not provide the required breastfeeding outcome data for inclusion.[182] Seventeen studies[103,106,107,112,167,169–181] provided incentives to childbearing women and one study[168] levied financial penalties against organisations for not meeting their own breastfeeding targets. The study providing incentives to organisations for breastfeeding[168] is considered separately later in this chapter.

There were reports in which it was unclear whether the study met our definition of an incentive. Decisions to include as an incentive study were made for the following:

1. Organisational awards/quality standard achievements (e.g. 'kite marks') that have a tangible value such as a plaque, certificate or award ceremony, and usually require financial investment to attain, were included and can be considered commitment contracts. An example is the UNICEF Baby Friendly Initiative (BFI),[183] which awards hospitals and communities with a plaque and can be considered as a commitment contract. The literature search identified 22 reports describing the BFI, which is a multifaceted and multilevel intervention. Hospitals and primary care organisations pay money to UNICEF UK to complete an accreditation process, commit to training staff and receive an esteemed award on achieving the quality standards. The reports identified by our search strategy represent a small proportion of a substantial body of literature that has recently been systematically reviewed by a team including co-applicant FD.[184] A full review of the BFI literature to identify data relating to the incentive

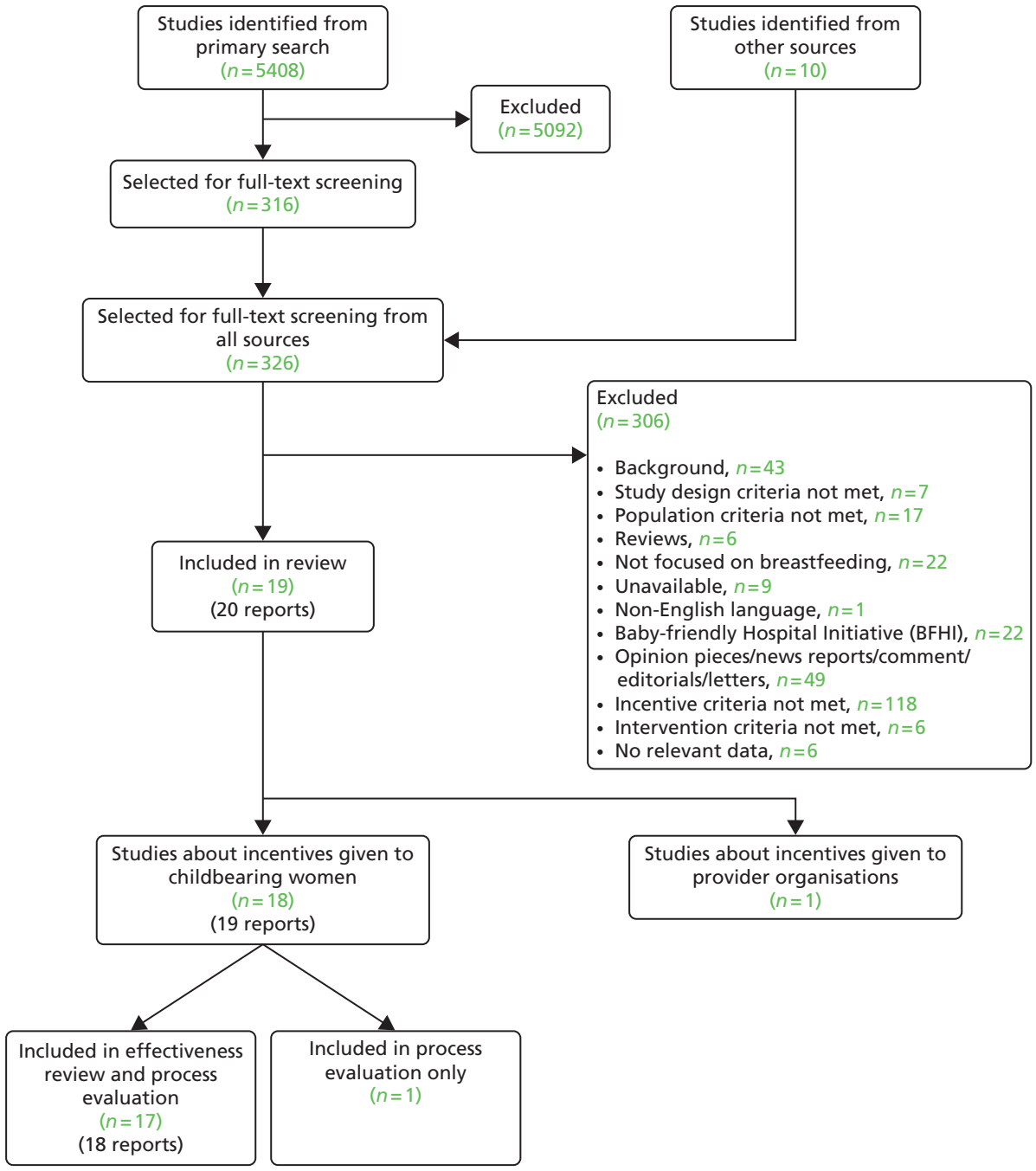


FIGURE 10 Flow chart outlining the screening process for the review of incentives for breastfeeding.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

component of interest is beyond the scope of our study because of the large number of publications. The Beake and colleagues[184] review is summarised later in this chapter (see *Results of incentives provided to organisations to improve smoking cessation in pregnancy and breastfeeding outcomes*).
2. As with the review of studies providing incentives for smoking cessation in pregnancy, US WIC programme studies were included if they provided incentives over and above those routinely provided as part of the programme or reported qualitative findings about incentives.
3. Studies providing medical devices to assist the target behaviours that are not routinely provided by the UK health service, which women can keep and which potentially have a monetary exchange value. Studies providing breast pumps were therefore included.

Decisions to exclude as an incentive study were made for the following:

1. Studies providing medical devices to assist the target behaviours that are routinely provided free of charge by the UK health service as a treatment and which women can keep. Nipple shields were therefore excluded.

The reasons for exclusion of assessed full-text papers are given in *Figure 10*.

Quality of the included studies

Details of the questions used to establish the quality of 16 of the 18 included studies presenting quantitative outcome data are available in *Appendix 14*.[103,106,107,112,167–176,178,179] The quality of two conference abstracts[180,181] was not assessed because of the limited data presented. The study by Wright and colleagues[182] was not quality assessed as no appropriate tool was identified to assess the quality of case studies and it provided few data.

Information about quality across studies for each individual aspect of quality and across all aspects of quality for each individual study are provided in *Figures 11* and *12* respectively. For both figures, answers of 'yes' represented the maximum possible level of quality. Therefore, in considering *Figure 11*, it can be seen that most studies recruited women at the same point in their pregnancies (88%[103,106,107,167–172,174–179]), had a follow-up period that was similar between groups (94%[103,106,107,112,167,168,170–179]) and long enough to detect important effects on outcomes of interest (100%[103,106,107,112,167–179]), used experienced staff (94%[103,106,107,112,167,169–172,174–179]), had appropriate facilities to perform the intervention (100%[103,106,107,112,167–179]) and reported all important outcomes (100%[103,106,107,112,167–179]).

More problematic aspects of study quality within this group of studies were the lack of description of those lost to follow-up (31% of studies reported this adequately[112,167,170,178,179]) and an imbalance in demographic characteristics between groups (38% of studies reported this[106,107,112,172,174,178]); in addition, only two studies conducted analysis based on ITT.[173,174] Only five studies (25%) used a valid and reliable outcome measure.[112,167–169,174] For the purposes of this review, studies were considered to have a valid and reliable outcome measure if they reported a recognised description of how they defined breastfeeding. When studies were assessed for adequacy of reporting on randomisation and recruitment, that is, whether randomisation sequences had been adequately generated for RCTs or whether patients were recruited consecutively for non-randomised studies, only one study was considered adequate.[103] Because of the nature of the interventions, none of the participants was blind to treatment status and in only one study were caregivers blinded.[174]

Two independent researchers (VS and SM) appraised the qualitative part of a mixed-methods study in one paper because it had been written by members of the research team involved in quality assessment.[112] The CASP score for this paper was high at 8 out of 10, with half a point given for ethical issues because of a lack of clarity around the consent procedure and only verbal information being provided and half a point given because of weak integration of mixed-methods analysis. No points were given for reflexivity.

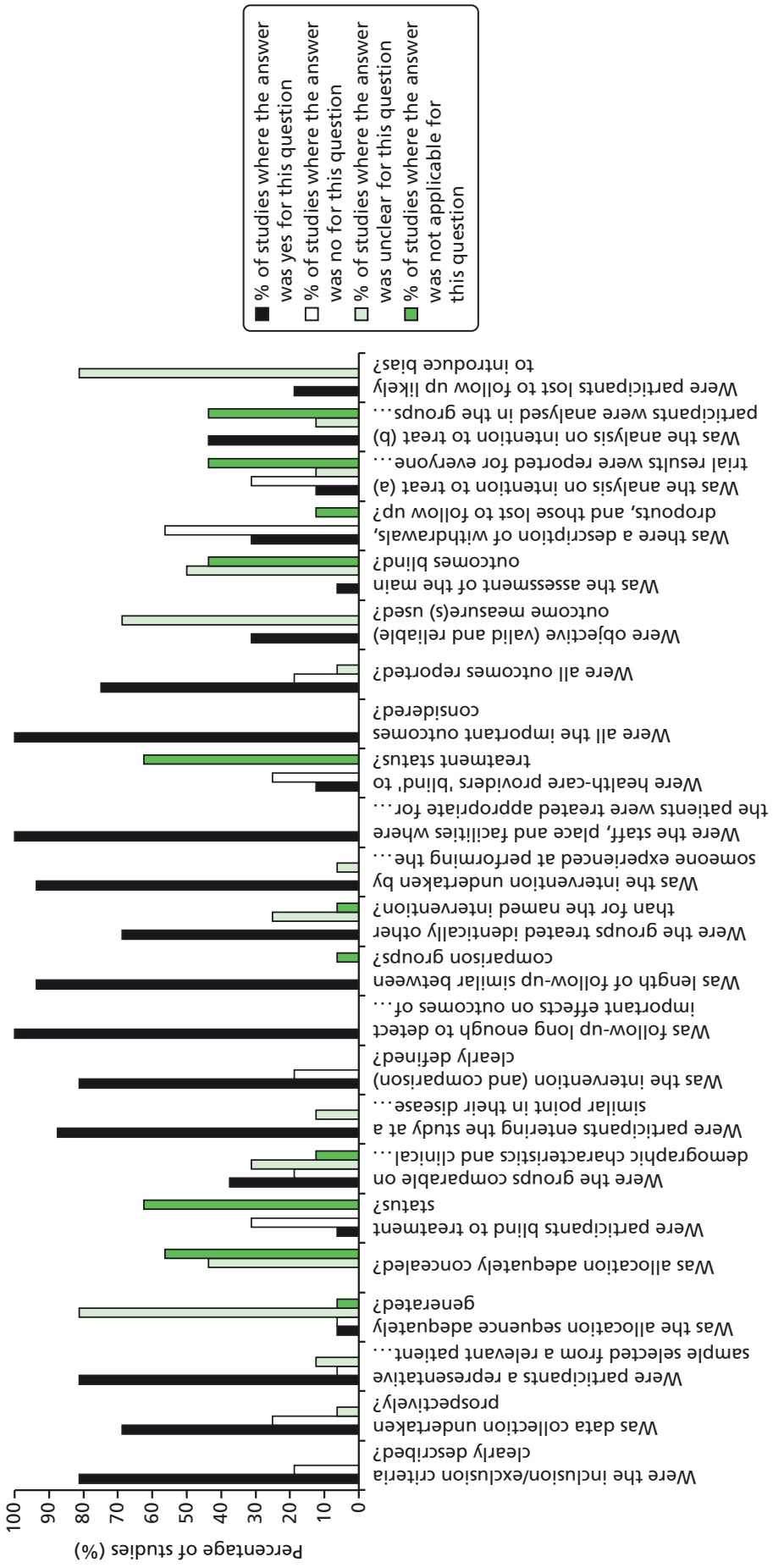


FIGURE 11 Quality assessment results by quality appraisal question for all studies included in the review of incentives provided to childbearing women for breastfeeding.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

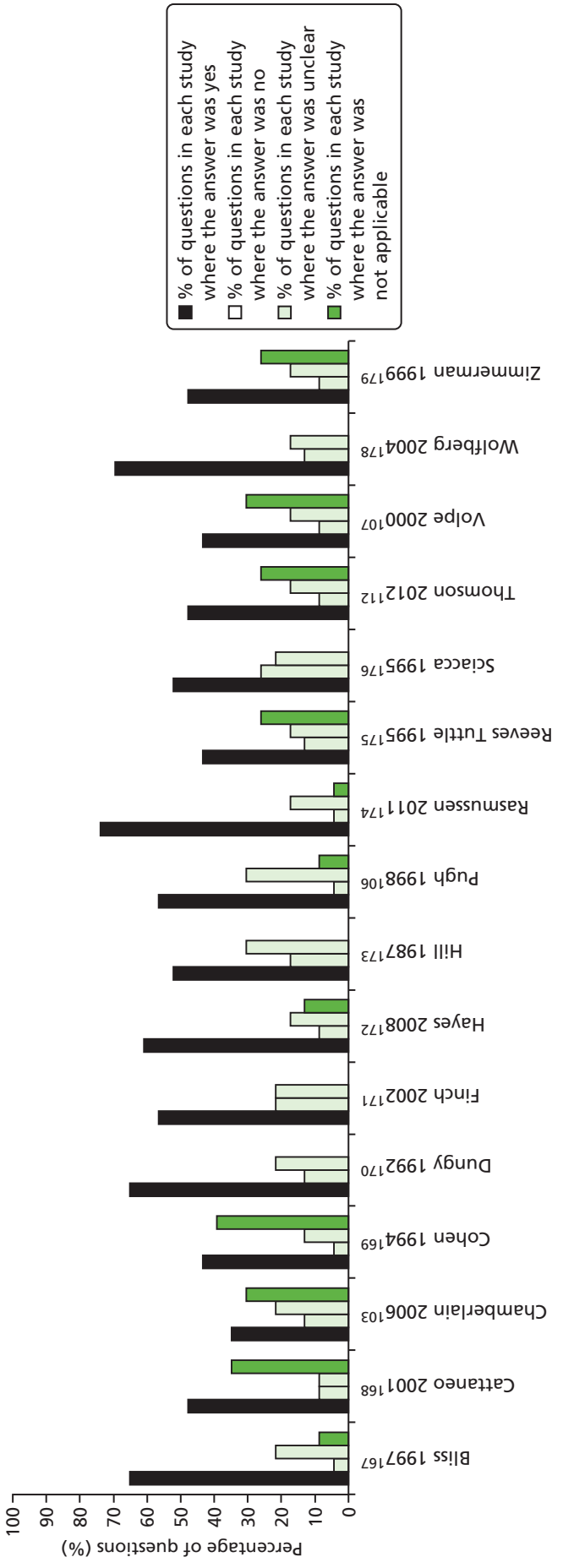


FIGURE 12 Quality assessment results by study for all aspects of quality for all studies included in the review of incentives provided to childbearing women for breastfeeding.

Characteristics of the included studies

Initially, studies included in the review of incentives provided to childbearing women for breastfeeding were classified according to study design, as described in the smoking cessation review. This classification is presented in *Table 21*.

Unlike the incentives in the smoking cessation review, there were no category A studies or other categories of study suitable for meta-analysis. Thus, to maximise the potential of the narrative evidence synthesis, studies were categorised according to the type of incentive, with the order within each category determined, first, by study design, with randomised studies placed before other intervention designs, and, second, by sample size (*Table 22*). This order is maintained for all tables in this chapter.

TABLE 21 Classification of studies included in the review of incentives provided to childbearing women for breastfeeding according to study design

Category	Studies
Category A studies ($n = 0$) compare contingent incentives for validated breastfeeding outcomes with non-contingent incentives	No studies
Category B studies ($n = 13$) compare incentives with no incentive, a very small incentive or a disincentive (gift packs including infant formula)	Bai 2010,[180] Bliss 1997,[167] Chamberlain 2006,[103] Chiasson 2011,[181] Dungy 1992,[170] Finch 2002,[171] Pugh 1998,[106] Rasmussen 2011,[174] Reeves Tuttle 1995,[175] Sciacca 1995[176] (control group given very small incentive by comparison), Thomson 2012,[112] Volpe 2000,[107] Zimmerman 1999[179]
Category C studies ($n = 3$) evaluate incentives but do not have a control group	Cohen 1994,[169] Hayes 2008,[172] Wright 2012[182]
Category D studies ($n = 2$) are those in which both the intervention group and the control group received the same incentives and these studies are therefore comparing another intervention component	Hill 1987,[173] Wolfberg 2004[178]
Category E studies ($n = 0$) are those in which no incentive intervention was provided	No studies

TABLE 22 Classification of studies included in the review of incentives provided to childbearing women for breastfeeding according to incentive content

Incentive	Studies
Includes a breast pump (and possibly other secondary incentive items, e.g. feeding-related items)	RCTs ($n = 4$): Bliss 1997,[167] Dungy 1992,[170] Hayes 2008,[172] Rasmussen 2011[174]
	Historically controlled study ($n = 1$): Chamberlain 2006[103]
	Non-RCT ($n = 1$): Bai 2010[180]
	Case series ($n = 1$): Cohen 1994[169]
Breast pump, vouchers, gifts and raffle for both parents	RCT ($n = 1$): Sciacca 1995[176]
Includes food packages	RCT ($n = 1$): Finch 2002[171]
	Historically controlled study ($n = 1$): Chiasson 2011[181]
Gifts and vouchers	Historically controlled studies ($n = 4$): Reeves Tuttle 1995,[175] Thomson 2012,[112] Volpe 2000,[107] Zimmerman 1999[179]
	Case study ($n = 1$): Wright 2012[182]
Household tasks	RCT ($n = 1$): Pugh 1998[106]
Cash for participation in both study arms	RCT ($n = 2$): Hill 1987,[173] Wolfberg 2004[178]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

The main characteristics of the studies, most of which originated in the USA (17/18), are described in *Table 23*.

Incentive/reward-related elements

The detail of the incentive interventions provided are summarised in *Table 24*. Studies provided multicomponent interventions to encourage new mothers to breastfeed, with interventions (or even individual components within the intervention) being provided with varying frequency, intensity and duration (*Table 25*). Three studies were considered to have more than one incentive intervention arm for the outcome of interest (i.e. breastfeeding). The four-arm RCT by Bliss and colleagues[167] compared discharge packs containing manual breast pumps alone, manual breast pumps with infant formula or formula alone with a control group receiving neither formula nor a pump. The RCT by Rasmussen and colleagues[174] compared two incentive intervention arms, a manual breast pump or the loan of an electric breast pump for 14 days, with a control group receiving no pump. The non-RCT by Bai and colleagues[180] compared discharge packs containing a manual breast pump and breastfeeding information, discharge packs with information only and 'commercial' discharge packs that contained infant formula. The incentive components varied across the studies and ranged from a breast pump[103,172,174,180] to a combination of a breast pump and feeding-related items,[167,169,170] a breast pump, vouchers, gifts and a raffle for both parents,[176] enhanced food packages in the context of the WIC programme,[171,181] gift items or vouchers[107,112,175,179,182] or cash.[173,178] Only one study provided non-material incentives as a help with non-nursing tasks.[106] In all studies incentives were provided at consistent and predictable time points. In addition, in the study by Sciacca and colleagues,[176] a raffle was provided at 3 months post partum with a wide range of gifts and experiences on offer.

All incentive interventions involved interactions with incentive providers or other professionals either explicitly or implicitly supporting breastfeeding and we refer to this as the general BCT component of the intervention. These were extracted for each study when reported. However, general BCT components are frequently under-reported and no study mentions observations or recordings of interactions during intervention delivery to assess fidelity or content. We could not extract data for the control arms because of poor-quality reporting, particularly of usual care.

The proportions of the intervention that can be attributed to the incentive and to the general BCT component varied between studies and were sometimes difficult to assess. Across studies, women were invited to participate in a range of activities to obtain the incentives, some of which were reported as usual care plus additional components,[103,170,171,179,181] an enhanced programme of care[106,112,175,176,178,182] or involved the implementation of a new protocol.[107,167,169,172–174,180]

General behaviour change techniques

One study was excluded from BCT extraction as the intervention was rolled out to providers at the health system level rather than at the individual level[168] and was thus not in line with the target behaviour. Two studies were excluded from BCT extraction as they were reported only in abstract form, which prevents accurate judging of intervention content.[180,181] Moreover, one study[178] targeted partners of pregnant women and BCTs were rated only in relation to increasing breastfeeding in women (i.e. support-related BCTs) rather than rating the BCTs used to target partners' support behaviours (e.g. information provision and instruction techniques).

Applying the 93-point BCT taxonomy described by Michie and colleagues[17] to the included studies resulted in an acceptable inter-rater agreement, with a kappa of 0.77, ranging from 0.69 ('instruction on how to perform the behaviour') to 0.88 ('adding objects to the environment'). Explicit reporting of BCTs underpinning interventions varied and reporting was often unclear or implicit. Altogether, 27 study arms were rated for inclusion of 82 BCTs, including seven control/usual care arms and 20 intervention arms. Intervention arms used an average of 4.34 (SD 2.8) BCTs, ranging from one[170,173] to 12,[175] whereas control/usual care arms used an average of 1.7 (SD 2.5) BCTs, ranging from zero[106,107,175] to five.[176]

TABLE 23 Summary of studies included in the review of incentives provided to childbearing women for breastfeeding

Study	Country	Study design	No. randomised/ recruited	Incentive	Contingency	Primary outcome	Follow-up	Main outcomes reported
Bliss 1997[167]	USA	RCT	1625	Manual breast pump and formula discharge packs (three intervention arms)	Initiation	Breastfeeding duration	6 weeks and 4 and 6 months	Mean duration (weeks) of any breastfeeding: intervention (pump only) 16.0; intervention (pump + formula) 15.7; control 15.7
Dungy 1992[170]	USA	RCT	146	Manual breast pump + gift items	Initiation	Breastfeeding continuation rates	2, 4, 6 and 8 weeks	Prevalence of exclusive breastfeeding (weeks): intervention: 2 weeks 72.7% (32/44), 4 weeks 54.5% (24/44), 6 weeks 45.5% (20/44), 8 weeks 36.4% (16/44); control: 2 weeks 53.5% (23/43), 4 weeks 34.9% (15/43), 6 weeks 30.2% (13/43), 8 weeks 23.3% (10/43)
Hayes 2008[172]	USA	RCT	280	Electric or manual breast pump	Participation	Breastfeeding duration	6 and 12 months	Breastfeeding for ≥ 6 months: electric pump 72.3% (94/130); manual pump: 76.8% (76/99) Median duration (months) of any breastfeeding: electric pump 12 (95% CI 8 to 12); manual pump 11 (95% CI 9 to 14)
Rasmussen 2011[174]	USA	RCT	34	Electric or manual breast pump (two intervention arms)	Participation	Breastfeeding continuation rates	7, 30 and 90 days	Median duration (weeks) of exclusive breastfeeding (IQR): electric pump 0.7 (0.1–2.7); manual pump 2.3 (0.4–4.4); control 4.4 (1.1–9.4) Median duration (weeks) of any breastfeeding (IQR): electric pump 4.0 (2.4–8.4); manual pump 13.4 (2.1–36.0); control 26.6 (9.4–44.6)
Chamberlain 2006[103]	USA	Historically controlled study	Unclear	Breast pump (type unspecified)	Participation	Breastfeeding initiation rates	Initiation	Breastfeeding initiation: intervention: general 74%, NICU 64%; control: general 16%, NICU 34.5%

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 23 Summary of studies included in the review of incentives provided to childbearing women for breastfeeding (*continued*)

Study	Country	Study design	No. randomised/ recruited	Incentive	Contingency	Primary outcome	Follow-up	Main outcomes reported
Bai 2010[180]	USA	Quasi-experimental	450	Manual breast pump	Participation	Exclusive breastfeeding continuation	2, 4 and 12 weeks	Mean (±SD) exclusive breastfeeding rate (weeks): intervention 8.1 (±5.0); control 6.0 (±4.8) Exclusive breastfeeding at 12 weeks: intervention 60.4%; control 37.8%
Cohen 1994[169]	USA	Case series	187	Electric breast pump + gift items	Initiation	Breastfeeding duration and behaviour	Unclear	Average duration (months) of any breastfeeding: 8.1. Since programme inception (4-year period), 74% ($n = 139$) of mothers who returned to work breastfeeding continued to breastfeed for a least 6 months compared with a national average of 10%
Sciacca 1995[176,177]	USA	RCT	68	Breast pump, vouchers, gifts and raffle for both parents	Participation and continuation of breastfeeding	Exclusive and any breastfeeding rates at hospital discharge and continuation rates	2 and 6 weeks and 3 months	Exclusive breastfeeding: at discharge: intervention 23/26 (88.5%), control 16/29 (55.2%); at 2 weeks: intervention 21/26 (80.8%), control 10/29 (34.5%); at 6 weeks: intervention 13/26 (50.0%), control 7/29 (24.1%); at 3 months: intervention 11/26 (42.3%), control 5/29 (17.2%) Any breastfeeding: at discharge: intervention 3/26 (11.5%), control 7/29 (24.1%); at 2 weeks: intervention 4/26 (15.4%), control 6/29 (20.7%); at 6 weeks: intervention 8/26 (30.8%), control 2/29 (6.9%); at 3 months: intervention 5/26 (19.2%), control 2/29 (6.9%)

TABLE 23 Summary of studies included in the review of incentives provided to childbearing women for breastfeeding (*continued*)

Study	Country	Study design	No. randomised/ recruited	Incentive	Contingency	Primary outcome	Follow-up	Main outcomes reported
Finch 2002[171]	USA	RCT	60	Food packages + voucher	Initiation, continuation, exclusivity	Exclusive and partial breastfeeding initiation and continuation rates	Initiation and 8 weeks	Breastfeeding initiation: no significant difference between the two groups Median duration (weeks) of exclusive breastfeeding (min./max.): intervention 12 (7/12+) ($n = 9/19$); control 12 (5/12+) ($n = 5/29$) Median duration (weeks) of partial breastfeeding (min./max.): intervention 5 (1/12+) ($n = 6/19$); control 12 (1/12+) ($n = 15/29$)
Chiasson 2011[181]	USA	Historically controlled study	Unclear	Food packages	Initiation and continuation	Breastfeeding initiation rates	Unclear	Breastfeeding initiation rates increased from 72.2% (pre implementation) to 75.5% (post implementation)
Reeves Tuttle 1995[175]	USA	Historically controlled study	412	Vouchers + gift items	Participation, initiation and continuation	Breastfeeding initiation rates and continuation rates	By day 3 and at 3–6 weeks	Breastfeeding at initiation: intervention 24/63 (38.1%), control NR; at 3–6 weeks: intervention 11/63 (17.5%), control 19/349 (5.4%)
Thomson 2012[112]	UK	Qualitative and historically controlled study	266 in historically controlled arm	Vouchers + gift items	Initiation and continuation	Breastfeeding at 6–8 weeks in historically controlled arm	6–8 weeks	Any breastfeeding at 6–8 weeks: intervention 57/94 (60.6%); control 119/172 (69.2%)
Volpe 2000[107]	USA	Historically controlled study	91	Gift items	Participation	Breastfeeding initiation rates defined as at least once a day for at least 3 days	Initiation	Breastfeeding at initiation: intervention 28/43 (65.1%); control 7/48 (14.6%)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 23 Summary of studies included in the review of incentives provided to childbearing women for breastfeeding (*continued*)

Study	Country	Study design	No. randomised/ recruited	Incentive	Contingency	Primary outcome	Follow-up	Main outcomes reported
Zimmerman 1999[179]	USA	Historically controlled study	737	Gift items	Participation	Exclusive and partial breastfeeding rates	Hospital discharge and 2 weeks	Exclusive breastfeeding at discharge: baseline 67 (36%), year 1 74 (51%), year 2 222 (55%); at 2 weeks: baseline 37 (20%), year 1 44 (24%), year 2 115 (30%) Partial breastfeeding at discharge: baseline 26 (14%), year 1 14 (10%), year 2 47(12%); at 2 weeks: baseline 28 (15%), year 1 35 (24%), year 2 105 (27%)
Wright 2012[182]	USA	Case study	Approximatley 100	Gift items	Participation	NR	NA	NA
Pugh 1998[106]	USA	RCT	60	Non-nursing tasks	Initiation and continuation	Breastfeeding duration and breastfeeding continuation rate	Initiation and 6 months	Mean breastfeeding duration (days): intervention 136.3; control 88.3 Breastfeeding at 6 months: intervention 50%; control 27%
Hill 1987[173]	USA	RCT	64	Cash	Participation	Breastfeeding continuation rates	≥ 6 weeks	Breastfeeding at ≥ 6 weeks: intervention 12/31 (39%); control 10/33 (30%)
Wolfberg 2004[178]	USA	RCT	59 couples	Cash	Participation	Breastfeeding initiation rates and continuation rates	Initiation and 4, 6 and 8 weeks	Breastfeeding at initiation: intervention 20/27 (74%), control 13/32 (41%); at week 4: intervention 10/26 (38%), control 11/31 (35%); at weeks 6 and 8: intervention 9/26 (35%), control 6/31 (19%)

IQR, interquartile range; max., maximum; min., minimum; NA, not applicable; NICU, neonatal intensive care unit; NR, not reported.

TABLE 24 Details of incentive/reward dimensions of studies included in the review of incentives for breastfeeding

Study	Incentive/reward type	Awareness	Content	Contingency target	Actor
Bliss 1997[167]	Manual breast pump	Unclear	Material	Preparatory behaviour	Participant
Hayes 2008[172]	Electric breast pump (loan)	Unclear	Material	Preparatory behaviour	Participant
	Manual breast pump (loan)	Unclear	Material	Preparatory behaviour	Participant
Dungy 1992[170]	Manual breast pump + gifts (e.g. breast pads, breast cream). Total value US$15.00	Unclear	Material	Preparatory behaviour	Participant
Rasmussen 2011[174]	Manual breast pump	Unclear	Material	Preparatory behaviour	Participant
	Electric breast pump (loan for 10–14 days)	Unclear	Material	Preparatory behaviour	Participant
Chamberlain 2006[103]	Breast pump (type unspecified)	Unclear	Material	Preparatory behaviour	Participant
Cohen 1994[169]	Electric breast pump + gifts (expressing kit)	Unclear	Material	Preparatory behaviour	Participant
Bai 2010[180]	Manual breast pump	Unclear	Material	Preparatory behaviour	Participant
Sciacca 1995[176]	Breast pump (type unspecified) + gifts (e.g. baby powder, nappies)	Yes	Material	Preparatory behaviour	Participant
	Gifts (e.g. coupon for haircut, lunch or breakfast for two, clothing voucher, infant carrier)	Yes	Material	Preparatory behaviour	Participant + social other
	Gifts (e.g. 'pair of tickets to a Northern Arizona football game')	Yes	Material	Preparatory behaviour	Social other
	Gifts (e.g. bag of nappies, baby wipes) + raffle (e.g. trip to Grand Canyon, US$100.00 grocery voucher, tool kit)	Yes	Material	Health behaviour	Participant
Finch 2002[171]	Food package (US$50.00) + gift certificate (US$25.00)	Unclear	Material	Health behaviour	Participant
Chiasson 2011[181]	Food package	Unclear	Material	Health behaviour	Participant
Zimmerman 1999[179]	Gifts (nursing pads, t-shirt, fridge magnet, safety plug guard). Total value US$8.00	Unclear	Material	Preparatory behaviour	Participant
Reeves Tuttle 1995[175]	Vouchers + gifts (baby-care products, certificate with infant photograph)	Yes	Material	Preparatory behaviour	Participant
Volpe 2000[107]	Gifts (chocolate, safety plug guard, perfume)	Yes	Material	Preparatory behaviour	Participant
Thomson 2012[112]	Gifts (picture frame, healthy treats, swimming vouchers, magazine, cakes/hot drinks). Total value £71.99	Yes	Material	Preparatory behaviour	Participant
Wright 2012[182]	Gifts (water bottle, e.g. baby blanket, reminder bracelet)	Unclear	Material	Preparatory behaviour	Participant
Pugh 1998[106]	Non-nursing tasks including housework or childcare	Yes	Social	Preparatory behaviour	Participant
Wolfberg 2004[178]	Money (US$25.00)	Unclear	Material	Preparatory behaviour	Social other
	Money (US$25.00)	Unclear	Material	Preparatory behaviour	Participant
Hill 1987[173]	Money (US$5.00)	Unclear	Material	Preparatory behaviour	Participant

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 25 Details of incentive setting, provider and intensity of the intervention in studies included in the review of incentives for breastfeeding

Study	Setting	Who delivered the intervention	Mode of delivery	Recruitment timing	No. of contacts when incentive provided	No. of contacts when no incentive provided	Total no. of contacts	Intervention finish (week/month before or after birth)	Final follow-up contact (week/month before or after birth)	Total study contact period
Bliss 1997[167]	Regional tertiary hospital with a Certificate of Intent to become a WHO/UNICEF BFI hospital	Staff nurses	Face to face	Postnatal before discharge	1	3	4	Unclear	6 months post partum	6 months
Hayes 2008[172]	WIC clinic	Unclear	Face to face	Last prenatal or first post-partum appointment	1	2	3	Unclear	12 months post partum	12 months
Dungy 1992[170]	Private hospital	Trained female interviewee	Face to face	< 48 hours after delivery	1	5	6	Unclear	8 weeks post partum	8 weeks
Rasmussen 2011[174]	Rural hospital	Research assistants	Face to face	Prenatal	1	11	12	2 weeks post partum	90 days post partum	90 days
Chamberlain 2006[103]	Inner city hospital/ disadvantaged area – general ward and a neonatal intensive care unit	Hospital staff	Unclear	Birth	1	NA	1	Unclear	None (routine data)	NA
Cohen 1994[169]	At work (aeronautics company, water and power utilities company)	Lactation professional	Face to face (individual and family)	Prenatal	1	Unclear	Unclear	Unclear	Unclear	Unclear
Bai 2010[180]	Two hospitals	Unclear	Face to face	Post partum	1	3	4	Unclear	12 weeks post partum	12 weeks
Sciacca 1995[176]	Two WIC clinics	Unclear	Groups, couples + peer counselling	Prenatal	> 10	Additional peer counselling	> 10	3 months post partum	3 months post partum	4–11 months

TABLE 25 Details of incentive setting, provider and intensity of the intervention in studies included in the review of incentives for breastfeeding (*continued*)

Study	Setting	Who delivered the intervention	Mode of delivery	Recruitment timing	No. of contacts when incentive provided	No. of contacts when no incentive provided	Total no. of contacts	Intervention finish (week/month before or after birth)	Final follow-up contact (week/month before or after birth)	Total study contact period
Finch 2002[171]	WIC clinic	Trained counsellor	Group	Prenatal	Unclear – regular packages	1 – education plus counselling	Unclear	2 months post partum	Unclear	Unclear
Chiasson 2011[181]	WIC clinic	WIC staff	Unclear	Unclear	Unclear – regular packages	Unclear	Unclear	Unclear	Unclear	Unclear
Zimmerman 1999[179]	Inner-city clinic (university affiliated)	Clinic nutritionist	Group + peer support	Prenatal (third trimester)	1	Monthly breastfeeding support group	Unclear	1 week post partum	2 weeks post partum	Unclear
Reeves Tuttle 1995[175]	WIC clinic	Research staff, Hmong peer counsellors	Group and individual face to face	Prenatal (third trimester)	4	Additional telephone calls to hospital/mother from 38 weeks to check whether infant born	Unclear	3–6 weeks post partum	3–6 weeks post partum	4–5 months
Volpe 2000[107]	High school	Nurse clinician/lactation consultant	Group	3 weekly classes	> 3	Weekly visits for those who continued breastfeeding	Unclear	Unclear	Unclear	Unclear

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 25 Details of incentive setting, provider and intensity of the intervention in studies included in the review of incentives for breastfeeding (*continued*)

Study	Setting	Who delivered the intervention	Mode of delivery	Recruitment timing	No. of contacts when incentive provided	No. of contacts when no incentive provided	Total no. of contacts	Intervention finish (week/month before or after birth)	Final follow-up contact (week/month before or after birth)	Total study contact period
Thomson 2012[112]	Participants recruited on the postnatal ward of a hospital in North West England disadvantaged area. Intervention delivered in participants' homes, community settings or children's centres	Peer supporters	Face to face peer support	Postnatal	> 8	Unclear	> 8	8 weeks post partum	8 weeks post partum	8 weeks
Wright 2012[182]	WIC clinic (room remodelled to include art, television and DVD player)	Project staff	Groups and telephone calls	NA	1	Unclear	Unclear	Unclear	Unclear	Unclear
Pugh 1998[106]	Participants recruited at community hospital. Intervention delivered in participants' homes	Community health nurse	Home help	< 24 hours of delivery	3	5	8	6 weeks post partum	6 months post partum	6 months
Wolfberg 2004[178]	Local hospital	Peer educator (black, also a father)	Groups for fathers, telephone calls for mothers	Prenatal (third trimester)	1 (father) + 0 (mother)	1 (father) + 4 (mother)	2 (father) + 4 (mother)	Unclear (third trimester)	8 weeks post partum	8 weeks
Hill 1987[173]	Midwestern tertiary university hospital	Antenatal hospital staff	Groups	Prenatal	1	1	2	6 weeks post partum	6 weeks post partum	Unclear

NA, not applicable.

Out of 82 BCTs rated, study arms were identified to have used 22 (*Figure 13*), with the BCTs used most often used being 'Adding objects to the environment' ($n = 14$), which, in most studies, took the form of providing breast pumps, 'Social support (unspecified)' ($n = 12$), 'Instruction on how to perform the behaviour' ($n = 11$) and 'Information about health consequences' ($n = 10$). As in the smoking cessation review, WIC studies were recorded separately without inferring the presence of specific BCTs given the variation in WIC programme implementation. Six studies were rated as being engaged in the WIC programme[171,172,175,176,181,182] in addition to the identified BCTs.

Incentive and reward elements were identified reliably (kappa = 0.73). Out of the 18 studies, two[176,178] used multiple incentives within an intervention, which varied across the four assessed incentive elements: contingency target, actor, type and content (see *Table 24*). Two studies used different rewards/incentives for different experimental groups within the same study.[172,174] The majority of studies were rated as unclear in relation to whether participants were aware of the incentives/rewards ($n = 13$), with the remaining rewards/incentives rated as being known to participants ($n = 5$).

General BCT components included peer support or counselling in five studies, although the formality of this varied from its being a key component, that is, having a nominated peer supporter,[107,112,176] to the intervention involving membership of a peer support group[107,179] or a trained Hmong peer counsellor.[175] Professional support was offered in one study[182] and professional counselling was offered in a number of studies.[106,107,169,175] Proactive telephone calls were made in five studies, with the purpose being predominantly to collect outcome data[167,170,173,180] although in one study new breastfeeding mothers were offered reactive breastfeeding support by telephone.[182]

Setting and provider

The studies included in the review were typically conducted in the USA (17/18), with only one carried out in the UK[112] (see *Table 23*). Several studies were funded by private sources[106,107,167,170,172,178,179,182] whereas others were funded by private and university funds[180] or national health or government institutes,[175,176,185]

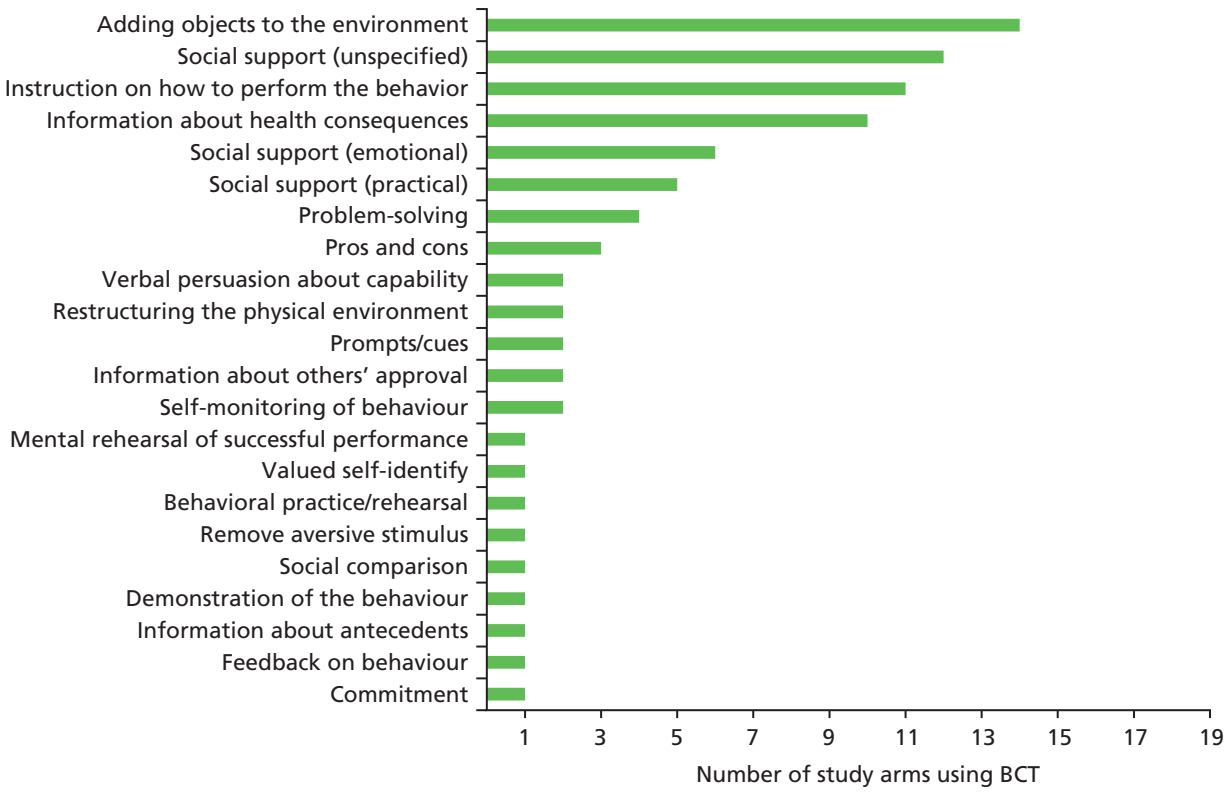


FIGURE 13 Behaviour change techniques used in studies included in the review of incentives for breastfeeding.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

one of which explicitly reported the receipt of extra financial support from the WIC programme.[175] One study was jointly funded by a charity, breast pump distributors and local insurance companies, relying on donations from local businesses to provide the incentives.[103] Authors in one study declared research consultancy for a breast pump manufacturer[169] and another involved the breast pump manufacturer for distribution.[174] In four studies the funding source was unclear.[169,171,173,181] For the study conducted in the UK, funding was received from the NHS and a breastfeeding charity.[112]

The lead authors' disciplinary backgrounds were also assorted, including lactation specialists,[107,179] nutritionists,[175] paediatricians/maternal health clinicians,[169,170,172,178] public health/health research researchers[112,182] and psychologists,[170] and those with a health education background.[106,171] Five study teams involved members from across these disciplines.[103,167,174,176,180] Details were not reported for two studies.[172,181]

The intervention settings and providers delivering the interventions varied across the included studies (see *Table 25*). Six of the studies recruited women in WIC clinics and provided the intervention as a supplement to usual care.[171,172,175,176,181,182] Similarly, other studies recruited in centres where concurrent contact with pregnant women was already taking place.[103,106,112,167,170,173,179,180] One study was conducted with employees in a work setting[169] and one was conducted at a school with adolescent school pupils who were pregnant.[107]

Little information was given regarding the process of providing incentives to participants (see *Table 25*). Some differentiation was made between the staff delivering the incentive and the staff delivering the general BCT components of the intervention, although in most cases this was carried out by usual care health professionals: WIC staff,[172,176,181] doctors and midwives,[103,106,173] lactation consultants or nutritionists,[107,169,179] hospital staff,[167,180] trained interviewers or counsellors,[112,170,171,178] peer supporters[112] and research staff.[174,182] The details reported were often unclear but some noted when staff were specifically trained to deliver the intervention.[170,175]

Intervention intensity and the participant journey

Intensity refers to the number of contacts involved for patients from the start of the intervention until the final outcome data are collected. Studies provided multicomponent interventions to encourage women to breastfeed, with interventions (or even individual components within the interventions) being provided at varying frequencies and time points, and this is summarised in *Tables 25* and *26*.

The time points at which women were recruited to the studies, first received any intervention components or received the first incentive varied and were often unclear, in particular how the intervention integrated with usual care. For most studies, recruitment occurred in late pregnancy at some point during the third trimester.[107,169,172–176,178,179,182] In six studies, recruitment occurred around or just after delivery[103,106,167,170,180] or early post partum.[112] In two studies it was unclear when recruitment occurred and our interpretation is that recruitment was post partum.[171,181]

Incentives were given between the third trimester of pregnancy and 3 months post partum. The incentive, or first incentive if more than one was given, was not necessarily provided at the point of recruitment. In four studies, participants were provided with general BCT interventions prior to birth but did not receive an incentive until early post partum.[106,169,171,173]

The overall number of formal contacts ranged from one[103,182] to 12,[112] with one study explicitly reporting that additional support was available in person (peer/professional counselling) or by telephone but that this was not scheduled.[169] Sometimes the availability of extra contact was implied but was not sufficiently reported to determine how often or how much a participant might encounter additional BCT components. Contacts at which the delivery of incentives took place were more clearly reported and these ranged from once[103,169,170,173,182] to eight times,[112] with one study[176] reporting raffles of additional incentives. For the studies providing breast pumps[103,167,169,170,172,174,180] the incentive was provided once but was taken home and could be used continuously. Although the point of recruitment was mostly unclear or flexible (i.e. not

TABLE 26 A participant's journey through the study by antenatal or postnatal month from recruitment until final follow-up for studies in which incentives were offered to women for breastfeeding

Study	M6	M7	M8	Delivery	M1	M2	M3	M4	M5	M6	(M12)
Bliss 1997[167]				G£		T		T		T	
Hayes 2008[172]			I	£						W	W
Dungy 1992[170]				G	T	T					
				£	T	T					
Rasmussen 2011[174]			W	£G	G		T				
			T		TTTTTTT						
					T						
Chamberlain 2006[103]				£							
Cohen 1994[169]		G(F)	(G or T)	£I	G	G	(G or T)	(G or T)	(G or T)	(G or T)	(G or T)
Bai 2010[180]				£	T		T				
					T						
Sciacca 1995[176]	G£££	GGG (GG)		S£		G£	G£				
		£									
Finch 2002[171]											
Chiasson 2011[181]											
Zimmerman 1999[179]		(S)	G£(S)	(S)	S£(S)	(S)	(S)	(S)	(S)	(S)	(S)
Reeves Tuttle 1995[175]		GI£	G£	(T)	G£	G£					
Volpe 2000[107]			G£G£	(ST)	(ST)	(ST)	(ST)	(ST)	(ST)	(ST)	
			G£								
Thomson 2012[112]					S£S£	S£S£S£S£					
					S£S£						
Wright 2012[182]			G£?								
			(ST)								
Pugh 1998[106]				G	GT£T	£T	(T)	(T)	(T)	G/T	
					G£						
Wolfberg 2004[178]			G£F[a]		TT	T£					
Hill 1987[173]		GW			T£						

£, incentive (see *Table 24* for detail); F, father involved; G, general BCTs; I, written information/materials provided; M, month; S, social supporter/buddy involved; T, telephone call/support helpline; W, worksheet/written survey/self-assessment/self-report of breastfeeding status (interview or questionnaire).

a Delivered to expectant father.

Note

Intervention components in parentheses are optional.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

a named week in pregnancy), it seems that the longest period of contact could have been approximately 12 months.[172] It was not always possible to define when the intervention ended as support appeared to be available for those who sought it up to a later stage in many of the studies,[106,107,169,179] for example through the availability of additional support if required.[169] When a breast pump was provided, data on reported frequency of use were not given. The mean duration of sessions for the delivery of the intervention was not reported clearly enough to draw any meaningful conclusions.

Intervention fidelity/non-compliance

There was minimal reporting of issues around intervention fidelity or compliance with the intervention, except in the study by Rasmussen and colleagues[174] in which it was noted that most participants violated the protocol by pumping (control group) or using a different pump from that given (intervention group).

Outcome measurement

Feeding outcomes were self-reported and not validated as, unlike in smoking cessation, no biochemical test is available to confirm outcome status. In terms of incentive targets, all except three studies[171,176,181] targeted preparatory behaviours (*Figure 14*). Targeted preparatory behaviours were pumping of breast milk ($n = 7$[103,167,169,170,172,174,176]), intervention attendance and participation ($n = 8$[107,112,173,175,176,178,179,182]) or others that were not specified ($n = 3$[106,171,176]). One study[176] targeted preparatory behaviours as well as health behaviour and two studies[171,181] targeted health behaviours only.

Studies varied in their selection and definition of feeding outcomes and there was poor consistency in outcome reporting, as noted by Hector.[186] Some studies differentiated between exclusive breastfeeding (no other liquid supplementation), any or partial breastfeeding (some breast milk and some supplementation) and formula only,[112,170,171,174,176,179] but in others the extent of breastfeeding was not specified or it was unclear.[106,172,173,175,178,181] Bliss and colleagues[167] categorised 'full breastfeeding' as daily breastfeeding with no regular formula feeding. In two studies exclusive and partial breastfeeding were defined but there was no differentiation between the two in the results.[169,182] Breastfeeding initiation was also defined differently among studies, ranging from any breastfeeding one or more times daily for at least 3 days post partum[107] to still breastfeeding on day 4 following delivery[174] and breastfeeding at discharge from hospital.[179] Two studies reported only exclusive breastfeeding rates but did not provide a definition.[103,180] None of the studies reported recall time (e.g. reporting breastfeeding within the last 24 hours) as recommended by Hector.[186] Frequency of breast pumping, volume of milk expression and feeding ratio (at breast or using expressed breast milk) were also not reported. One study did ask women in the intervention group to pump after five nursing sessions of their choice every day for 10 minutes on each breast until their milk came in or until their infants were 5 days old.[174]

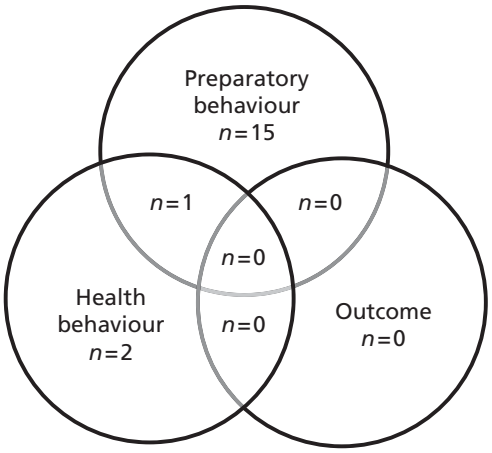


FIGURE 14 Combinations of contingency targets for incentive/rewards.

Studies varied in their data collection points and follow-up times, making comparisons between studies difficult. Rates of breastfeeding were assessed at initiation,[103,106,107,171,178,181] 1 week,[174] 2 weeks,[170,176,179,180] 4 weeks,[170,174,178,180] 6 weeks,[167,170,173,176,178] 8 weeks,[112,171,178] 12 weeks,[174,176,180] 4 months,[167] 6 months[106,167,172] or 12 months[172] or at hospital discharge.[175,176,179] Reeves Tuttle and Dewey[175] assessed breastfeeding continuation rates at 3–6 months. In three studies breastfeeding initiation only was measured and no follow-up data were collected[103,107,181] and in another study it was unclear when follow-up contacts were made.[169]

All studies except that by Wright and colleagues[182] utilised a comparator group to compare breastfeeding outcomes, although these varied and were not always control groups who received no treatment or a standard treatment. Six studies used a historical control group within the setting in which the subsequent intervention took place. These ranged from control data collected in the 6–12 months before the start of the intervention[107,112,175,179,181] to data collected up to 4 years before the intervention in one pre-post BFI implementation study.[103] Cohen and colleagues[169] compared 6-month breastfeeding rates over a 5-year work-based lactation programme with population-level breastfeeding data.

Actors: who the intervention targeted

The majority of studies appeared to opportunistically target all women without complications receiving maternity-related care from the provider settting.[103,106,112,167,170,173,179,180] One targeted the partners of women seeking prenatal care[178] and another encouraged fathers to participate.[176] The remaining studies targeted specific groups, for example the study by Cohen and colleagues[169] recruited employees of two companies who were returning to work for at least 16 hours per week following maternity leave and the study by Volpe and colleagues[107] targeted pregnant adolescents. One study targeted Hmong women in California[175] and another was conducted in an area with a predominantly non-white population, with predominantly black Caribbean and African American women participating.[179] Although one study did not specify targeting black women, only data relating to black women (both US born and non-US born) were presented.[103] One study targeted only obese women.[174]

In terms of equity pointers, nine studies targeted low-income or disadvantaged women (or WIC programme participants)[103,112,171,172,175,176,179,181,182] whereas other studies involved predominantly higher socioeconomic status populations[170,180] or were concerned with factors such as employment,[169] age[107] or weight.[174] The remaining studies did not target any specific socioeconomic group and their samples appeared to contain those of reasonably diverse socioeconomic status.[106,167,173,178]

Baseline and demographic characteristics

Demographic characteristics data are summarised in *Table 27*. Most studies provided some demographic data to describe their participants, but this varied in quantity and in its categorisation making comparisons across studies difficult. Two studies did not provide any demographic information other than stating that the interventions targeted WIC attendees.[181,182] Thomson and colleagues[112] provided information about the age of the study participants only and Reeves Tuttle and Dewey[175] provided demographic data on the intervention group only.

Only two studies provided data on baseline infant feeding method. In a historically controlled study, Zimmerman and colleagues[179] compared the proportions of women exclusively and partially breastfeeding and formula feeding prior to the intervention with the proportions of women exclusively and partially breastfeeding and formula feeding in years 1 and 2 of the intervention period. An evaluation of the effect of discharge packs on continued breastfeeding rates by Dungy and colleagues[170] excluded women who did not breastfeed and at baseline the study sample consisted of 140 women (96%) who exclusively breastfed and six women (4%) who mixed fed while in hospital.

When reported, the mean age of participants across studies varied between 16.2 years in a study that specifically focused on adolescents[107] to 31.6 years.[180] Some studies did not provide an overall description of participants' ages but rather presented findings according to specific age groups, for example < 21 years, 21–30 years, > 30 years.[167,171,176] Two studies gave the age of intervention participants only.[175,179]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 27 Baseline and demographic characteristics of participants in studies included in the review of incentives for breastfeeding

			Ethnicity						Relationship status				Type of pregnancy/mode of birth								Type of feeding method at baseline						Education level					
	Age (years)		White		Black		Other		Married and/or living with partner		Other		Primiparous		Multiparous		Vaginal		Caesarean section		Breast milk		Formula		Both		Completed high school		Less than high school		College or higher		Socioeconomic status: income (monthly or yearly)	
Study	Mean	(SD)	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	Mean	%
Bliss 1997[167]			1227	77	101	6	270	17																								
Hayes 2008[172]							106	100	95	39	149	61	126	51	116	47															96	39		
Dungy 1992[170]	29		135	91.8	2	1.4	9	6	139	94.6	8	5.4									140	95.9			6	4.1	46	31.3	5	3.4	96	65.8	US$30,000.00/year[a]	
Rasmussen 2011[174]	29.1								24	71	10	29	15	44.1	19	55.9	24	70.6	10	29.4											24	70.6		
Chamberlain 2006[103]						100																										
Cohen 1994[169]	31.4		94	50.3	31	16.6	62		33.2																							
Bai 2010[180]	31.6		223	82.6					238	88																					191	71		
Sciacca 1995[176]			36	65.5										68	100																	
Finch 2002[171]			2	4.2	32	66.7	14		29.1																							
Chiasson 2011[181]																																
Zimmerman 1999[179]			28	15	88	47	72		38					65	35				146		78				67	36	95	51	26	14				
Reeves Tuttle 1995[175]	25.9	(6.8)					412		100																							
Volpe 2000[107]	16.2		57	62.6	24	26.4	10		11.0																							
Thomson 2012[112]	29.1																															

TABLE 27 Baseline and demographic characteristics of participants in studies included in the review of incentives for breastfeeding (*continued*)

			Ethnicity						Relationship status				Type of pregnancy/mode of birth						Type of feeding method at baseline						Education level							
	Age (years)		White		Black		Other		Married and/or living with partner		Other		Primiparous		Multiparous		Vaginal		Caesarean section		Breast milk		Formula		Both		Completed high school		Less than high school		College or higher		Socioeconomic status: income (monthly or yearly)	
Study	Mean	(SD)	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	Mean	%
Wright 2012[182]																																
Pugh 1998[106]	24.4		55	93						47	78	13	22	60	100				60		100								58	97		
Wolfberg 2004[178]					50	84.7				35	59.3																				16	27.1
Hill 1987[173]			61	95						44	69			27	42	37		58														0

a Median.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

The ethnicity of participants was described in all but four studies.[112,174,181,182] Most studies that described ethnicity had a reasonably diverse sample of Caucasian, black and other ethnicities. Exceptions to this were the studies by Hayes and colleagues,[172] who classified the ethnicity of their sample as Hawaiian and non-Hawaiian, Reeves Tuttle and Dewey,[175] whose sample consisted of Hmong immigrants to the USA, and Chamberlain and colleagues,[103] who provided demographic and outcome data for black women only. In some studies the majority of the sample were white Caucasian women (95%,[173] 93%,[106] 92%,[170] 83%,[180] 66%[176] and 63%[107]) whereas in others the majority were black (85%[178] and 67%[171]).

Relationship status was reported in seven studies, six of which reported that the majority of their participants were married or living with their partner (95%,[170] 88%,[180] 78%,[106] 71%,[174] 69%[173] and 59%[178]). In the study by Hayes and colleagues[172] it was reported that the majority (61%) of the sample were not married but it was not clear whether this included women living with their partner.

Few studies clarified whether women were primiparous or multiparous when entering the study. Two studies consisted of entirely primiparous women,[106,176] but only Sciacca and colleagues[176] stated that primiparity was an eligibility criterion as an attempt to control for the influence of previous feeding experiences on current infant feeding decisions. Four other studies included both primiparous and multiparous women.[172–174,179]

Only three studies described their participants' mode of birth, including women who had caesarean and vaginal births.[174,179] Pugh and Milligan[106] described their participants as having vaginal births only but were not explicit whether this was a criterion for inclusion to the study.

Level of education was described in eight studies[106,170,172–176,178] but this was often categorised differently, making comparisons across studies difficult. Socioeconomic status was also described differently across studies, being assessed either in relation to whether participants received Medicaid (a US health programme for families and individuals with low income and resources) or WIC services[167,171,174–176,178] and/or by salary.[106,169,170,173,175]

Some studies indicated that there were no significant differences in demographic characteristics between control and experimental groups without reporting further details[106,112,173–175,178] whereas other studies did not compare control and intervention group demographics.[107,167,169,170] Hayes and colleagues,[172] Bai and colleagues,[180] Sciacca and colleagues[176] and Finch and Daniel[171] reported no significant differences between treatment groups at a significance level of $p > 0.05$. In a historically controlled study, Zimmerman and colleagues[179] found a significant difference between year 2 data and baseline data with regard to ethnicity ($p < 0.005$).

Effectiveness

Breastfeeding rates

The effect of incentives on the proportion of women exclusively or partially breastfeeding was the main outcome of interest. Breastfeeding rates at various time points are provided in *Tables 28–30* and they are summarised narratively because none of the studies was considered suitable to be included in a meta-analysis. There was too much variation among intervention components and, for example, if other components of the intervention (e.g. counselling) had been provided multiple times it was not suitable to combine these data with studies in which the same component had been provided once. The effect of providing the incentive could be confounded with the effect of providing more intensive counselling. Likewise, studies with no control group and studies in which the incentive had been provided to all participants were equally unsuitable for meta-analysis.

Effect sizes were calculated when data were available (see *Tables 28–30*). We found a significant effect of breast pumps when they were given with vouchers, gifts and a raffle for both parents on both exclusive breastfeeding at discharge, 2 weeks post partum and 6 weeks post partum and any breastfeeding at

TABLE 28 Breastfeeding outcomes: initiation – hospital discharge

Study	Category	Type of breastfeeding	Time point	Intervention		Control		RR (95% CI), *p*-value
				n/N	%	*n/N*	%	
Rasmussen 2011[174]	Breast pump – electric	Unclear	4 days postpartum	12/13	92.3	12/12	100.0	0.92 (0.79 to 1.08), 0.33
Rasmussen 2011[174]	Breast pump – manual	Unclear	4 days postpartum	7/9	77.8	12/12	100.0	0.78 (0.55 to 1.10), 0.086
Chamberlain 2006,[103] US-born black participants	Breast pumps and implementing BFI	Unclear	Initiation	NR	74	NR	16	
Chamberlain 2006,[103] non-US-born black participants	Breast pumps and implementing BFI	Unclear	Initiation	NR	96	NR	43	
Sciacca 1995[176]	Breast pumps, gifts, vouchers, football tickets and raffle gifts	Exclusive	Discharge	23/26	88.5	16/29	55.2	1.60 (1.12 to 2.29), 0.007
Sciacca 1995[176]	Breast pumps, gifts, vouchers, football tickets and raffle gifts	Any	Discharge	26/26	100.0	23/29	79.3	1.26 (1.05 to 1.52), 0.014
Chiasson 2011[181]	Food packages	Unclear	Initiation	NR	75.5	NR	72.2	
Zimmerman 1999,[179] year 1	Gifts and vouchers	Exclusive	Discharge	74/144	51.4	67/188	35.6	1.44 (1.12 to 1.85), 0.004
Zimmerman 1999,[179] year 1	Gifts and vouchers	Any	Discharge	88/144	61.1	93/188	49.5	1.24 (1.02 to 1.50), 0.035
Zimmerman 1999,[179] year 2	Gifts and vouchers	Exclusive	Discharge	222/405	54.8	67/188	35.6	1.54 (1.24 to 1.90), < 0.001
Zimmerman 1999,[179] year 2	Gifts and vouchers	Any	Discharge	269/405	66.4	93/188	49.5	1.34 (1.14 to 1.58), < 0.001
Reeves Tuttle 1995[175]	Gifts and vouchers	Unclear	Initiation	24/63	38.1	NR	NR	
Volpe 2000[107]	Gifts and vouchers	Unclear	Initiation	28/43	65.1	7/48	14.6	4.47 (2.18 to 9.16), < 0.001

NR, not reported.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 29 Breastfeeding outcomes at 2 weeks

Study	Category	Type of breastfeeding	Time point	Intervention		Control		RR (95% CI), *p*-value
				n/*N*	%	*n*/*N*	%	
Dungy 1992[170]	Breast pumps	Unclear	2 weeks	32/44	72.7	23/43	53.5	1.36 (0.98 to 1.90), 0.063
Sciacca 1995[176]	Breast pumps, gifts, vouchers, football tickets and raffle gifts	Exclusive	2 weeks	21/26	80.8	10/29	34.5	2.34 (1.37 to 4.00), < 0.001
Sciacca 1995[176]	Breast pumps, gifts, vouchers, football tickets and raffle gifts	Any	2 weeks	25/26	96.2	23/29	79.3	1.21 (0.99 to 1.48), 0.061
Zimmerman 1999,[179] year 1	Gift items and vouchers	Exclusive	2 weeks	44/154	28.6	37/186	19.9	1.44 (0.98 to 2.10), 0.061
Zimmerman 1999,[179] year 1	Gift items and vouchers	Any	2 weeks	79/154	51.3	65/186	34.9	1.47 (1.14 to 1.88), 0.002
Zimmerman 1999,[179] year 2	Gift items and vouchers	Exclusive	2 weeks	115/389	29.6	37/186	19.9	1.49 (1.07 to 2.06), 0.014
Zimmerman 1999,[179] year 2	Gift items and vouchers	Any	2 weeks	220/389	56.6	65/186	34.9	1.62 (1.31 to 2.01), < 0.001

TABLE 30 Breastfeeding outcomes from 3 weeks to 6 months

Study	Category	Type of breastfeeding	Time point	Intervention		Control		RR (95% CI), *p*-value
				n/N	%	*n/N*	%	
Bliss 1997[167]	Breast pumps	Exclusive	6 weeks	240/419	57.3	196/360	54.4	1.05 (0.93 to 1.19), 0.43
Bliss 1997[167]	Breast pumps	Partial	6 weeks	87/419	20.8	88/360	24.4	0.85 (0.65 to 1.10), 0.22
Bliss 1997[167]	Breast pumps	Exclusive	4 months	141/403	35.0	123/346	35.5	0.98 (0.81 to 1.20), 0.87
Bliss 1997[167]	Breast pumps	Partial	4 months	79/403	19.6	53/346	15.3	1.28 (0.93 to 1.76), 0.12
Bliss 1997[167]	Breast pumps	Exclusive	6 months	90/388	23.2	79/331	23.9	0.97 (0.75 to 1.27), 0.83
Bliss 1997[167]	Breast pumps	Partial	6 months	59/388	15.2	42/331	12.7	1.20 (0.83 to 1.73), 0.33
Dungy 1992[170]	Breast pumps	Unclear	4 weeks	24/44	54.5	15/43	34.9	1.56 (0.96 to 2.55), 0.065
Dungy 1992[170]	Breast pumps	Unclear	6 weeks	20/44	45.5	13/43	30.2	1.50 (0.86 to 2.63), 0.14
Dungy 1992[170]	Breast pumps	Unclear	8 weeks	16/44	36.4	10/43	23.3	1.56 (0.80 to 3.05), 0.18
Rasmussen 2011[174]	Breast pumps – electric	Exclusive	30 days	2/13	15	5/12	42	0.37 (0.09 to 1.56), 0.14
Rasmussen 2011[174]	Breast pumps – manual	Exclusive	30 days	3/9	33	5/12	42	0.80 (0.26 to 2.50), 0.70
Rasmussen 2011[174]	Breast pumps – electric	Partial	30 days	3/13	23	8/12	67	0.35 (0.12 to 1.01), 0.028
Sciacca 1995[176]	Breast pumps, gifts, vouchers, football tickets and raffle gifts	Exclusive	6 weeks	13/26	50.0	7/29	24.1	2.07 (0.98 to 4.39), 0.047
Sciacca 1995[176]	Breast pumps, gifts, vouchers, football tickets and raffle gifts	Any	6 weeks	21/26	80.8	9/29	31.0	2.60 (1.47 to 4.62), <0.001
Reeves Tuttle 1995[175]	Gift items and vouchers	Unclear	3–6 weeks	11/63	17.5	19/349	5.4	3.21 (1.60 to 6.41), <0.001
Thomson 2012[112]	Gift items and vouchers	Any	6–8 weeks	57/94	60.6	119/172	69.2	0.88 (0.72 to 1.06), 0.16
Pugh 1998[106]	Household tasks	Unclear	6 months	15/30	50.0	8/30	26.7	1.88 (0.94 to 3.75), 0.063

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

discharge and 6 weeks post partum.[176] A significant effect of gifts and vouchers was found on initiation of breastfeeding,[107] breastfeeding at 3–6 weeks post partum[175] and exclusive and any breastfeeding at discharge and 2 weeks post partum.[179] A small effect size was observed for the provision of electric breast pumps for partial breastfeeding at 30 days post partum.[174]

Reporting of ITT and attrition data was poor, as detailed in *Figure 11*. In addition, some studies referred to between-group comparisons at a certain time point and other studies referred to within-group comparisons from baseline to different time points. We would have preferred to use ITT analysis because it provides a more conservative estimate of effect. When the total number in the sample for reported percentages was not obvious, care was taken to use the most conservative estimate of the sample size (e.g. number randomised, number at the start of the study) to prevent any unintentional overinflation of the effectiveness of interventions. However, this was not possible in all cases because of the quality of reporting.

Breast pumps

Seven US studies evaluated the effect of breast pump provision on breastfeeding outcomes.[103,167,169,170,172,174,180] The four RCTs[167,170,172,174] appeared to show conflicting results for breastfeeding continuation and few patterns could be observed because of the heterogeneity of the included studies.

A large RCT by Bliss and colleagues[167] of 1625 women provided the women with one of four free discharge packs that were identical in every respect except that one contained powdered infant formula, one a manual breast pump, one both formula and a pump and one neither. The contents of the discharge packs had a limited overall effect on feeding method and breastfeeding duration. Subgroup analyses suggested that there may have been a significant positive effect of breast pump provision (or a negative effect of giving mothers infant formula) on exclusive breastfeeding rates among women who intended to breastfeed for at least 6 months (mothers receiving formula were less likely to exclusively breastfeed at 6 weeks than women receiving breast pumps; $p = 0.003$) or in women who had not returned to work by 6 weeks post partum (mothers receiving formula were more likely to breastfeed partially at 6 weeks than women receiving breast pumps; $p = 0.002$).

A smaller RCT by Dungy and colleagues[170] of 146 women, which also compared hospital discharge packs containing either a manual breast pump or infant formula, reported a higher prevalence of exclusive breastfeeding among women who received breast pump discharge packs than among those who received formula discharge packs up to 8 weeks post partum. Breast pump provision was associated with longer exclusive breastfeeding than infant formula (mean 4.18 and 2.78 weeks respectively; $p < 0.05$). It is not clear from either study, however, whether the observed effect was due to the provision of breast pumps (higher breastfeeding rates) or the inclusion of infant formula in discharge packs (lower breastfeeding rates).

A RCT by Hayes and colleagues[172] comparing the provision of manual or electric breast pumps to 280 WIC women returning to work or school in Hawaii found no significant difference between the two groups in the proportion of women breastfeeding for at least 6 months. Both groups continued to breastfeed on average for at least 11 months, suggesting that manual pumps have a similar effect on breastfeeding rates as electric pumps. As the study did not include a control group (no breast pump), no conclusions can be made about the effectiveness of the availability of breast pumps on breastfeeding duration.

A small RCT by Rasmussen and colleagues[174] of 34 obese women who received a manual pump up until 14 days post partum, an electric pump up until 14 days post partum or no pump found no significant differences in adjusted analyses among treatment groups in the proportion of women still breastfeeding up to 90 days post partum. During data collection it was discovered that most participants violated the protocol either by pumping (all control participants) or by using a different pump from the one assigned and this, together with the limited sample size, may have contributed to the lack of difference detected between these groups of obese women.

A non-randomised controlled intervention study by Bai and colleagues,[180] which consecutively enrolled 270 mothers with newborn infants to a control group (received commercial discharge pack including infant formula) and an intervention group (received discharge pack with either breastfeeding information or information plus a manual breast pump) found that the duration of exclusive breastfeeding was significantly longer in women who received a pump (8.1 ± 5.0 weeks) than in women who received infant formula (6.0 ± 4.8 weeks) ($p = 0.015$) (see *Table 23*).

Two observational studies evaluated the effect of breast pump provision on breastfeeding outcomes. A case series study by Cohen and colleagues,[169] which provided women returning to work at two corporations with breast pumps and facilities to express and store milk, reported that, since programme inception (a 4-year period), a larger proportion of women continued to breastfeed for at least 6 months than in national average data[187] (74.3% vs. 10%) (see *Table 23*). The average duration of breastfeeding was 8.1 months. Chamberlain and colleagues[103] provided free electric breast pumps at the time of implementing the BFI standards and compared breastfeeding rates before and after BFI accreditation. In the general hospital setting, breastfeeding rates increased overall by 288% (see *Table 23*).

Breast pump and vouchers, gifts and raffle for both parents

Sciacca and colleagues[176] randomised 68 women to receive either an intervention consisting of a variety of incentives for women and their partners (see *Table 24*) to participate in a breastfeeding class for expectant couples and an educational series on childbirth, or usual breastfeeding education with infant shirt and free nappies if breastfeeding at 3 months (control group). Incentives included a breast pump, baby gifts (baby products, nappies, infant carrier, stuffed animals), vouchers (e.g. for clothing, breakfast/lunch), football tickets for the partners and a raffle of more expensive items (e.g. US$100.00 of groceries, trip to the Grand Canyon, tool kit). Intervention group mothers received nappies if they were still breastfeeding at 3 months post partum and if women were breastfeeding for at least 50% of the time at hospital discharge, 6 weeks and 3 months post partum they were also eligible for entry into a prize raffle. A significantly higher percentage of women in the intervention group reported exclusively breastfeeding at each measurement point (hospital discharge and 2 weeks, 6 weeks and 3 months post partum) ($p < 0.05$) (see *Table 23*).

Food packages

A RCT by Finch and Daniel[171] was undertaken in 60 women who were randomised prenatally to receive either a breastfeeding education intervention or usual prenatal education. Enhanced WIC food packages worth US$50.00 per month were offered to mothers who exclusively breastfed for at least 2 months and they also received a US$25.00 shopping mall certificate. Although it was stated that access to breast pumps was also included as an incentive in this study, the details of this provision were unclear. No significant difference in the number of women initiating breastfeeding between the two groups was observed, and subgroup analyses were based on too few participants to be meaningful (i.e. five vs. nine participants) (see *Table 23*).

Chiasson and colleagues[181] conducted a historically controlled study of WIC participants, which evaluated a change in WIC policy whereby women who reported breastfeeding received enhanced food packages. Comparing two 6-month periods, 75.5% of women initiated breastfeeding following the policy change compared with 72.2% before implementation of the policy change.

Gifts

Zimmerman and colleagues[179] conducted a historically controlled study that compared breastfeeding outcomes pre and post intervention, which consisted of prenatal breastfeeding education, postnatal gift packs worth approximately US$8.00 and breastfeeding support groups. The rate of exclusive breastfeeding at discharge increased significantly from 36% ($n = 67$) at baseline to 51% ($n = 74$) in year 1 ($p < 0.05$) and 55% ($n = 222$) in year 2 ($p < 0.05$). At 2 weeks the proportion of women breastfeeding increased from 35% ($n = 65$) at baseline to 48% ($n = 79$) in year 1 ($p < 0.05$) and 57% ($n = 220$) in year 2 ($p < 0.05$).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Reeves Tuttle and Dewey[175] conducted a historically controlled study that compared an intervention group of women ($n = 63$) who received pre- and postnatal breastfeeding support with a control group of women ($n = 349$) who had delivered infants within the previous 8 months. The intervention group received incentives at each phase of the intervention, which included childbirth and baby-care magazines, baby-care and post partum product samples and coupons, night lights and, for those who were still breastfeeding at 3–6 weeks post partum, a certificate of accomplishment with their infant's picture. At 3–6 weeks, a significantly higher proportion of women in the intervention group (17.5%, 11/63) than in the control group (5.4%, 19/349) continued to breastfeed ($p = 0.002$).

The study by Volpe and Bear[107] was a historically controlled study that compared pregnant teenagers who were still at school who were provided with an education programme and education-linked gifts (chocolate cigars, vials of perfume and electric socket covers) with the previous year's cohort of pregnant teenagers who received no specific breastfeeding intervention. In the intervention group, 65.1% (28/43) initiated breastfeeding whereas in the control group 14.6% (7/48) initiated breastfeeding ($p < 0.001$).

A mixed-methods study by Thomson and colleagues[112] investigated the impact of an incentive intervention delivered within an existing 8-week breastfeeding support programme. The incentive consisted of weekly home visits by peer supporters for 8 weeks to deliver eight different incentives (a picture frame, healthy treats, a swimming voucher, a pamper gift set, a glossy magazine, a pamper session, a family ready meal and a hot drink/cake voucher) with a monetary value of £71.99 per woman. For those who completed the full 8-week peer support programme, 40 women (75.5%) in the intervention group exclusively breastfed compared with 74 women (68.5%) who took part before the incentive intervention was introduced, which was not statistically significant (see *Table 23*).

Household tasks

Pugh and Milligan[106] randomised 60 women to either an intervention ($n = 30$) that involved structured teaching and support, including home visits from a nurse and telephone calls from a lactation consultant, or usual care ($n = 30$). The home visits included help with domestic tasks of the woman's choice. Women in the intervention group breastfed for longer than women in the control group (136.3 days and 88.3 days respectively) and, at 6 months, 50% of the women in the intervention group were still breastfeeding compared with 27% of women in the control group (*n* not given). However, because of the skewness of the data no statistically significant differences were detected. Fatigue scores were significantly higher in the control group than in the intervention group at 14 days post partum [9.5 ± 7.6 vs. 6.9 ± 5.7 (maximum score 30, indicating a high level of fatigue); $p < 0.05$].

Financial incentives primarily for engaging in the study

Wolfberg and colleagues[178] randomised 59 fathers to either a 2-hour intervention class on infant care and breastfeeding promotion or a class on infant care only (control group). Both intervention and control group participants received US$25.00 for attendance. The pregnant women received US$25.00 if they completed a series of interviews about the intervention/control programmes. Women whose partners attended the breastfeeding class were more likely to initiate breastfeeding (74%, 20/27) than those whose partners attended the control class (41%, 13/32) ($p = 0.02$). There was no significant difference between groups for breastfeeding duration.

Hill[173] randomised 64 women to either a prenatal breastfeeding education programme or a control group with no prenatal breastfeeding education programme. Each individual received US$5.00 remuneration for participation in the study. In the intervention group 61% (19/31) of women initiated breastfeeding whereas in the control group 45% (15/33) of women initiated breastfeeding. At 6 weeks 39% (12/31) of women in the intervention group breastfed for ≥ 6 weeks compared with 23% (7/31) in the control group. Although breastfeeding knowledge was significantly greater in women in the intervention group than in women in the control group ($p < 0.001$), the differences in breastfeeding outcomes were not statistically significant.

Attrition

Attrition rates were reported (or calculable) for eight of 18 studies included in the effectiveness review.[112,170,171,174,176,178–180] Details for different time points are reported in *Table 31*. In two studies[171,176] the attrition rate was higher in the intervention arm than in the control arm (by 9.4%[176] and 33.4%[171]). Reasons provided for dropouts in the study by Finch and Daniel were miscarriage or infant death, relocation and participants missing appointments.[171] Sciacca and colleagues[176] did not provide reasons for attrition. In one study[112] an attrition rate of around 60% was reported in both the intervention arm and the control arm, although reasons for dropping out were not provided. In the study by Rasmussen and colleagues[174] there was no attrition among the 13 women receiving the electric breast pump but three of 12 women receiving a manual pump (25%) and two of 14 women in the control group (14.3%) did not complete the study. Reasons provided were because of a change of care, infant birth injury or going into foster care, and deciding not to breastfeed. Bai and colleagues[180] reported attrition rates at 12 weeks post partum in the three groups studied: provision of a breast pump (35%), provision of breastfeeding information (45%) or no provision of a pump/information (40%); however, no reasons for dropping out were given. Two further studies reported attrition rates: Zimmerman and colleagues[179] reported attrition rates of 0.5% at 2 weeks post partum, 0% in year 1 of the intervention and 3.7% in year 2 of the

TABLE 31 Attrition rates at reported time points in studies included in the review of incentives for breastfeeding

		Intervention		Control	
Study	Time of follow-up	*n*/*N*	%	*n*/*N*	%
Bliss 1997[167]	NR				
Hayes 2008[172]	NR				
Dungy 1992[170]	Attrition rate at 8 weeks post partum for both treatment groups combined was 60% (87/146)				
Rasmussen 2011[174]	Before or immediately after delivery	3/12[a]	25.0	2/14	14.3
		0/13[b]	0.0		
Chamberlain 2006[103]	NA				
Cohen 1994[169]	NR				
Bai 2010[180]	12 weeks post partum	53/150	35	60/150	40
Sciacca 1995[176]	2 weeks post partum	8/32	25.0	5/32	15.6
Finch 2002[171]	2 months post partum	11/30	36.7	1/30	3.3
Chiasson 2011[181]	NA				
Zimmerman 1999[179]	2 weeks post partum	0/144[c]	0.0	1/188	0.5
		15/405[d]	3.7		
Reeves Tuttle 1995[175]	NR				
Volpe 2000[107]	NR				
Thomson 2012[112]	8 weeks	83/136	61.0	164/272	60.3
Wright 2012[182]	NR				
Pugh 1998[106]	NR				
Wolfberg 2004[178]	8 weeks post partum	1/27	3.7	1/32	3.1
Hill 1987[173]	NR				

NA, not applicable; NR, not reported.
a Manual pump.
b Electric pump.
c Year 1.
d Year 2.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

intervention; Wolfberg and colleagues[178] reported attrition rates at 8 weeks of 3.7% and 3.1% in the intervention and control groups respectively. Neither study provided reasons for dropping out. None of the studies described above attempted to compare the demographic characteristics of those who completed the study and those who did not.

Dungy and colleagues[170] reported a combined attrition rate for both treatment groups of 60% (87/146). No reasons were provided for dropping out. They calculated that the sociodemographic and breastfeeding attitude measures obtained during interviews conducted in hospital were not significantly different between the women from whom follow-up data were obtained and those who could not be contacted for postdischarge interviews.

Costs

No studies reporting the cost-effectiveness of incentive interventions were identified. Data related to the costs of implementing the incentive were reported by eight studies.[103,112,169–171,173,178,179] The ways in which costs were reported varied and so it is difficult to draw direct comparisons between them. However, in the eight studies the cost per participant can be approximated. The values range from a cost of approximately US$5.00 per participant[173] to US$500.00 per employee,[169] which did not include the overall outlay for the employers concerned to furnish on-site breastfeeding accommodation.

Between these two extremes of incentive costs was a range of other incentive values. In one study a cost of between US$175.00 and US$320.00 per woman was given for the provision of a breast pump.[103] Other studies that provided breast pumps as incentives for breastfeeding, either as gifts or on loan, did not report the costs associated with this provision.[167,172,174,180]

In another study a cost of £71.99 per woman was cited to finance a series of eight gift items,[112] whereas in a further two studies costs of US$25.00 for fathers and US$25.00 for mothers (total per couple US$50.00)[178] and US$15.00 per discharge packet (US$11.75 of which was for a manual breast pump)[170] were quoted.

In two studies cost data were reported but it was difficult to determine a precise cost per participant. For example, in one study, approximately US$1000.00 per annum was budgeted for the provision of refreshments at breastfeeding education sessions; therefore, the cost per participant cannot be easily determined.[179] In the other study, although the cost of the WIC food package provided as an incentive to breastfeed was reported as having a value of > US$50.00 per month and the additional cost of a one-off US$25.00 gift card was fixed, the cost per woman was difficult to estimate given that individuals were eligible for the incentives for different time periods.[171]

In the remaining studies, a range of incentives was provided and these appeared to differ in value quite considerably, but data were not available to calculate or estimate total costs. Sciacca and colleagues[176] provided a range of incentives, combining small gift items with a low value, for example baby wipes, haircuts and breakfast vouchers, with raffle gifts that had a much higher value, for example sports tickets, a holiday voucher and US$100.00 for groceries. This study raffled some of the incentives and so the total provision is difficult to ascertain.

Implementation and sustainability

There were no data relevant to the sustainability of the incentive interventions in terms of the long-term benefits outweighing the costs or to unintended effects once the research had finished. It is clear that provider changes would need to be implemented to improve the success of any incentives programme but it was concluded among several studies that programmes could be most effectively implemented and delivered through enhancing or intensifying usual care contacts and engaging staff through raising awareness or increased training.[175,179,182] In some studies, one-to-one specialist care[169] and extended care post partum to help sustain breastfeeding[106,112] were also considered necessary. However, two studies concluded that delivery could be effective even in brief or short-term incentive interventions.[103,175]

Acceptability outcomes

One study reported information on the acceptability of the intervention. Thomson and colleagues[112] reported that almost all of the women perceived that ongoing support from the programme had enabled them to breastfeed for longer. The weekly receipt of gifts reinforced and recognised their breastfeeding achievements in the context of breastfeeding being perceived as arduous and difficult.

In addition, Dungy and colleagues[170] reported that provision of a breast pump helped to change attitudes around the ease of breastfeeding and Finch and Daniel[171] reported that 89% (16/18) of women valued incentives. Chamberlain and colleagues[103] reported that insurance companies favoured including breast pumps on their list of items that can be claimed because it allowed them to gain more clients as breast pump provision is popular.

Results of the review of incentives provided to organisations to improve smoking cessation in pregnancy and breastfeeding outcomes

This section reports the results of the evidence synthesis for incentives provided to organisations to improve smoking cessation in pregnancy and breastfeeding outcomes. Three studies have been included in this section of the review. Two provided incentives to organisations – one reimbursed an organisation for the provision of smoking cessation counselling[152] and one provided a financial incentive for breastfeeding promotion[168] – and one collected survey data, which included attitudes towards reimbursement of health-care providers in relation to providing a smoking cessation intervention.[153] The studies that gave incentives to care-providing organisations are summarised in *Table 32*.

TABLE 32 Summary of studies included in the review of incentives provided to organisations for smoking cessation in pregnancy and breastfeeding

Study	Country	Study design as described	Total *n* participants	Incentive	Primary outcome
Smoking cessation					
Latts 2002[152]	USA	Pilot project to implement a new smoking in pregnancy counselling system in a health maintenance organisation	18 physician practices representing 27 office sites and 80 physicians. Training was provided to 66 staff members	US$150.00 for each pregnant smoker counselled	Reimbursement received for providing counselling to four of 21 smokers identified
Hartmann 2007[153]	USA	Survey of prenatal care providers about smoking cessation interventions. One of 18 questions asked about the influence of reimbursement on providers' willingness to provide a smoking cessation intervention	844 health professionals consisting of obstetricians (50%), midwives (18%), family medicine physicians (15%), nurse practitioners (13%) and physician assistants (4%)	No incentive provided	Over half of providers reported that reimbursement was at least 'somewhat' influential in relation to their willingness to provide smoking cessation services, with no difference between provider types
Breastfeeding					
Cattaneo 2001[168]	Italy	Breastfeeding promotion programme	Six local health authorities, 18 public hospitals	Financial penalty for not reaching a self-set breastfeeding prevalence target	Breastfeeding

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Smoking cessation in pregnancy

The smoking cessation review identified one study that had considered the effect of incentivising a care-providing organisation.[152] The intervention involved training 66 staff in smoking cessation counselling in obstetric practices delivering health maintenance organisation (HMO) care. The HMO was billed US$150.00 per woman, in increments of US$25.00 per 10 minutes, for providing counselling to women. Only 18 of the 33 obstetric practices agreed to participate. Before and following the intervention, reviews of medical charts of patients were undertaken to collect data on the identification of smoking status and the provision of advice to stop smoking. Smoking status was identified in 96% (175/182) of patients post intervention compared with 90% (198/220) of patients before the intervention. Smoking status identification was carried out at the first obstetric visit for 99% (196/198) at baseline and in 100% of cases (171/171) after the intervention. For the 12% (21/170) of women currently smoking in pregnancy at the time of the survey, documentation of advice to stop smoking actually worsened, from a baseline of eight out of 13 (62%) to four out of 17 (24%) after the intervention. The HMO received claims for reimbursement for only four out of 21 (19.1%) identified smokers who received counselling over the study period.

Patients were asked to recall components of the care provided to them in a follow-up survey, which had a response rate of 59% (505/849) at baseline and 33% (250/753) after the intervention. For the respondents who reported being current or former smokers, 96.8% (120/124) recalled being asked whether they were a smoker after the intervention compared with 90.2% (74/82) at baseline. However, only 64.5% (20/31) recalled being advised to quit by their obstetric provider after the intervention compared with 85.9% (61/71) before the intervention. After the intervention 3.2% (1/31) recalled receiving smoking cessation counselling compared with 11.3% (8/71) before the intervention. At both time points no participant could recall being referred to a smoking cessation programme.

Staff acceptability for eligible staff still in employment was reported for 56.9% (29/51) who responded to a post-intervention survey. Of the 29 respondents, 23 indicated that they had used their training to provide smoking cessation counselling, three reported that they did not see any smokers to counsel, five did not see any smokers from the participating HMO, one reported having no interest in counselling smokers and one felt unqualified to counsel smokers despite training. The authors identified several barriers to participation and engagement in the intervention, including the presence of office managers who themselves smoked. They suggest that only the more enthusiastic physicians participated, yet despite this the intervention resulted in a decrease in the provision of counselling.

Prenatal care provider organisation attitudes were captured in a survey about best practice in providing a smoking cessation intervention.[153] Within a mailed survey of 18 items, one question asked about 'the influence of reimbursement on providers' willingness to provide smoking cessation intervention', with respondents rating their willingness on a Likert scale from 'none' to 'very substantial'. Numerators and denominators were infrequently reported in this study. More than half of the 844 respondents, who comprised obstetricians (50%), midwives (18%), family medicine physicians (15%), nurse practitioners (13%) and physician assistants (4%) from an area in the USA, reported that reimbursement was 'somewhat' influential on their willingness to provide smoking cessation counselling, with no difference between provider types. Of those who thought that reimbursement would be influential, 40% were less likely to provide best practice. The most commonly reported barriers to providing smoking cessation services were time and a perceived lack of patient interest. Appropriate reimbursement was recommended for further investigation.

Breastfeeding

The breastfeeding review identified one study that considered the effect of incentivising a care-providing organisation.[168] In addition, there were 22 studies[188–209] relating to the WHO/UNICEF BFI.[183] The BFI is an accreditation award that is achieved by meeting evidence-based and quality standards and can be considered a commitment contract. The BFI is a significant health-care intervention with multiple components that aim to increase breastfeeding rates. Only a small proportion of BFI studies were identified

by our search strategy and we did not identify any studies specifically investigating the incentive component of BFI among the 22 studies identified and hence only a brief overview is provided below.

Beake and colleagues[184] conducted a systematic review to assess whether a structured programme such as the WHO/UNICEF BFI implemented in maternity acute care settings is more likely to be associated with higher rates of initiation and duration of exclusive breastfeeding than no structured programme. The 'structured programme' included a multifaceted approach to support breastfeeding that targeted change at organisational, service delivery and individual behaviour levels. Studies that considered only community-based interventions were excluded. An extensive search of literature published in 1992–2010 was undertaken and methodological quality was assessed using checklists developed by the Joanna Briggs Institute. Twenty-six studies were included: one cluster RCT, two controlled trials, one cross-sectional study, two descriptive studies, 15 cohort studies and five systematic reviews.

Because of clinical and methodological heterogeneity of study designs it was not possible to combine studies or individual outcomes in meta-analyses. Most studies found a statistically significant improvement in breastfeeding initiation following introduction of a structured breastfeeding programme, although effect sizes varied. An impact on the duration of exclusive breastfeeding and duration of any breastfeeding to 6 months was also evident, although not all studies found statistically significant differences. Few studies controlled for any potential confounding factors, and the impact of bias has to be considered. It was concluded that structured programmes compared with standard care positively influence the initiation and duration of exclusive breastfeeding and any breastfeeding. In health-care settings with low breastfeeding initiation and duration rates, structured programmes may have a greater benefit. The generalisability of this evidence to the UK context is still debated as, to date, increased breastfeeding duration beyond the first week after birth is uncertain.[210] This is perhaps not surprising given that the effects of the more recently implemented BFI in the community, which aims to sustain breastfeeding after hospital discharge, have not been reported.

Cattaneo and colleagues[168] conducted an observational study in Italy of a breastfeeding promotion programme that attributed financial incentives to local health authorities (LHAs) for complying with work plans and achieving targets set by the LHAs themselves. Financial penalties were levied against LHAs that did not comply with or did not achieve the targets. None of the hospitals in the LHAs had been designated 'baby friendly'. The breastfeeding work plans and targets varied across the LHAs and included process or activity objectives, such as policy development, training of health professionals, education of mothers and improving co-ordination and integration of teams and activities, and outcomes measures, such as increasing breastfeeding rates. The penalty for not achieving their own work plans and targets or not participating in the collection of data was a fixed percentage (0.5 per thousand of the amount paid by the region to the LHA every year) (Adriano Cattaneo, Istituto per l'Infanzia, Trieste, Italy, May 2013, personal communication).

Ten hospitals across six LHAs set up a breastfeeding reporting system in 1998 and defined breastfeeding promotion activities for 1999. High variability in breastfeeding outcomes at hospital discharge was recorded among LHAs. Overall, between 1998 and 1999, there was a statistically significant trend towards an increased exclusive breastfeeding rate at discharge (from 37% to 49%; $p < 0.001$), although two LHAs showed either no difference or a reduction in the exclusive breastfeeding rate. The overall rate of predominant breastfeeding at discharge decreased (from 46% to 39%; $p < 0.001$) but full breastfeeding rates did not change in four of the six LHAs. The rate of complementary breastfeeding at discharge also declined from 15% in 1998 to 10% in 1999 ($p < 0.001$).

The variability in breastfeeding outcomes among LHAs was much smaller at 16–19 weeks than at hospital discharge. Overall, there was a small but significant increase in exclusive breastfeeding rates between 1998 and 1999 (from 26% to 30%; $p < 0.001$) with an associated increase in the rate of full breastfeeding (from 38% to 41%; $p < 0.001$) and a decrease in the rate of complementary breastfeeding (from 25% to 23%; $p < 0.05$).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Published data are not available for subsequent years but as all six LHAs achieved their targets for every year that the programme was active (1998–2004) no penalties were applied (Adriano Cattaneo, personal communication). The data suggest an association of a financial incentive mechanism with improved breastfeeding rates. As the financial mechanism contributed to the establishment of a reporting system for breastfeeding and to the development of work plans and targets, the effect may result from the introduction of a surveillance system with regular feedback or the modified practices carried out in each LHA to achieve the objectives, many of which are known to be effective in improving breastfeeding outcomes. Although this intervention shows promise, there was a sharp fall in breastfeeding rates at hospital discharge compared with around 4 months (16–19 weeks), suggesting that changing hospital practices is not sufficient to prolong breastfeeding, even when initiation is high.

Discussion

Incentives for smoking cessation in pregnancy

In relation to smoking cessation, there is good evidence that pregnant women provided with contingent voucher incentives with biochemical validation of outcomes are more likely to stop smoking by the end of pregnancy than those who receive non-contingent incentives (for participation in a smoking cessation programme and providing outcome data) alone. This is shown by the four studies meta-analysed for end-of-pregnancy data in our results.[105,109,141,144] From the post-partum data available from three of the four studies meta-analysed the difference in abstinence rates between the groups is carried into the early months of the postpartum period (≤ 3 months) and is statistically significant. However, by 6 months post partum, data available from two studies indicate that the difference is no longer statistically significant.

The meta-analysis provides some information on the effect of varying the level and type of incentives. However, the evidence on incentives more generally is varied. At the end of pregnancy, cessation rates ranged from 13.4% to 71.0% for incentivised groups compared with 6.0–60.0% for control groups provided with smaller non-contingent incentives for participation. Intervention groups achieved abstinence rates of 10.2–42.0% for the early post-partum period (from 0 to 2 months) whereas control groups achieved abstinence rates of 0.8–38.0% for the same period. At 6 months post partum, intervention groups and control groups achieved cessation rates of 36.0–37.0% and 0–33.0% respectively. The findings of our meta-analysis are consistent with the findings of others.[54,211] A study by Sexton and Hebel[212] was included in an earlier meta-analysis of incentives for smoking cessation in pregnancy[54] but was excluded from our review. The abstract was not picked up through our search and the full-text paper reporting the trial outcomes does not mention incentives or rewards at all. It does highlight that intervention strategies were reviewed throughout the study, and new ideas and approaches were incorporated. The paper was similarly excluded from a recent NICE review of the incentives evidence.[41] Reviews by Higgins and colleagues[211] and Sigmon and Patrick[213] did not include any new eligible published studies.

Aside from meta-analysed data described above, reported rates of abstinence included maximum values for incentivised groups that exceeded the maximum values for control groups, but there is overlap in the ranges and it is very difficult to draw any firm conclusions about the effectiveness of incentives from these data, particularly as the other components of the interventions being provided also varied widely.

It was also difficult to consider the effectiveness of interventions when studies did not have a comparator (non-incentivised) group. Cessation rates for these studies ranged from 13.6% to 50% at the end of pregnancy, from 21.3% to 37.0% during the early post partum period, from 7.9% to 77.0% at 3 months post partum and from 7.0% to 64.0% at 6 months post partum.

An added complication in comparing cessation between studies is how smoking status was measured. Studies used widely varying primary outcomes, including point prevalence, prolonged and continuous abstinence, measured at a number of different points during pregnancy and post partum. This reflects the

lack of consistency in the field as to how smoking cessation in pregnancy should be measured. Although for general population smoking studies the Russell standard[163] is often used, providing some consistency, a similar standard is not currently available for studies involving pregnant women.

Biochemical verification of smoking cessation was common, although the methods for determining abstinence and the cut-offs used varied and were problematic. It could be argued that standards for biochemically validating smoking cessation may not be adequate when incentive payments to individuals are made. CO and cotinine levels are both likely to be lower among pregnant smokers than among non-pregnant smokers because of more rapid clearing of these metabolites of smoking.[121] Before the results of the studies described above are accepted as true, there needs to be further study of pregnant smokers' ability to 'game' the system to receive incentive payments while still smoking. One way to look at CO biochemical verification would be to make it clear that incentives are paid on self-report corroborated by CO level, but to take a cotinine level at the same time to assess gaming. A second method would be to use blood samples that are taken routinely at an appropriate time in pregnancy for other reasons (i.e. at 36 weeks' gestation). These routine blood samples could be used to assess the extent of gaming at the later pregnancy assessment for smoking cessation (corroborated by cotinine or CO level). It would be prudent to accept the findings with reservations until it is clear that gaming is minimal among pregnant smokers who are offered financial incentives for smoking cessation.

Some studies reported outcomes other than smoking cessation. Although some reported reductions in cigarette consumption,[104,138,140,149] study design makes it difficult to determine whether or not the incentive component of the interventions prompted the reductions.

Incentives for breastfeeding

With regard to breastfeeding, there is currently insufficient evidence to formulate conclusions on the effectiveness of incentives to improve breastfeeding outcomes. The lack of good-quality RCTs prohibited meta-analysis and the heterogeneity of the studies limits comparisons. The studies included in this review were different in a number of aspects, such as the type and complexity of the intervention, the comparison groups, study design, sample size, outcome definitions, follow-up times and the population studied.

In total, 13 category B studies (see *Table 21*) compared an incentive of any type with no incentive or a much smaller incentive. Breastfeeding rates at initiation or at hospital discharge ranged from 38.1% to 88.5% in incentivised groups and from 14.6% to 72.2% in non-incentivised groups.[103,107,175,176,179,181] The average duration of exclusive breastfeeding ranged from 0.7 to 12 weeks for incentivised groups and from 2.78 to 12 weeks for non-incentivised groups.[170,171,174,180] The average duration of any breastfeeding ranged from 4.0 to 136.3 weeks for incentivised groups and from 15.7 to 88.3 weeks for non-incentivised groups.[106,167,171,174] Reported breastfeeding initiation and duration rates in intervention and control groups therefore showed considerable overlap, limiting the ability to formulate conclusions about the effectiveness of incentives from these data.

The most commonly used incentive involved providing access to a breast pump. Seven studies evaluated the effect of provision of only a breast pump on breastfeeding outcomes and one evaluated the effect of the provision of a breast pump plus other gifts and vouchers. Of the studies that investigated breast pumps only, four RCTs,[167,170,172,180] ranging in size from 34 to 1625 women, provided little consensus. As statistically significant findings were identified only when women given breast pumps were compared with those given infant formula,[167,170] it is not possible to ascertain whether it was the incentive of a breast pump to breastfeed or the incentive of infant formula to formula feed that produced the observed effect. When breast pumps were provided with a number of other incentives such as gift items, vouchers and raffle prizes in a small RCT of 55 women,[176] the proportion of women who exclusively breastfed was significantly higher in the intervention group than in the control group (who received usual care and small incentives). The remaining studies evaluating breast pumps included a conference abstract[180] and two observational studies[103,169] and so the results should be treated with caution. In summary, studies investigating the effectiveness of breast pumps as incentives to breastfeed are limited by sample size,

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

restrictions on breast pump availability, contamination of intervention and control groups, short follow-up times and lack of adequate control groups. A Cochrane review[214] (currently withdrawn) investigated the influence of the provision of commercial discharge packs that include infant formula samples and/or infant formula promotional materials on the duration and exclusivity of breastfeeding. Commercial discharge packs reduced the number of women exclusively breastfeeding at all times from 0 to 6 months but had no significant effect on non-exclusive breastfeeding. There are also ethical issues concerning the provision of infant formula incentives, which would contravene the WHO *International Code of Marketing of Breast Milk Substitutes*.[80] Given the reported problems with intervention fidelity,[174] there is a need for an adequately powered cluster RCT that compares breast pump provision with usual care to clarify the impact of breast pumps on breastfeeding rates.

Overall, it is difficult to draw any conclusions about the effectiveness of incentives from these data, particularly as the incentives differed and most interventions consisted of a number of BCT components. For example, most studies incorporated an education and/or a support element in their intervention, with the incentive provided either to encourage continuation in the programme or as a reward for continuing to breastfeed.[106,107,171,173,175,176,178,179]

It was also difficult to consider the effectiveness of interventions when studies did not have a adequate comparator (non-incentivised) group. A number of studies either did not include a non-incentivised control group[169,172,182] or used historical control subject, which may be subject to strong selection bias.[103,107,112,175,179,181]

Incentive intervention delivery for smoking cessation and breastfeeding

The frequency and intensity of the general BCTs provided to women in the studies is a potential confounder. In lifestyle behaviour change interventions for diet and exercise, frequent contacts have been shown to be associated with effectiveness, together with self-regulatory BCTs such as goal-setting.[215] Greaves and colleagues[215] also undertook causal analysis which showed that including social support in interventions increased effectiveness. However, in both the smoking cessation and breastfeeding incentive reviews it was often difficult to determine the frequency and duration of contacts and how these related to contacts taking place as part of usual care in either the intervention or the control arms. Therefore, the data that we report are based on our interpretations of the authors' accounts. The nature of communication at the time of delivering the incentives is under-reported but could be crucial in terms of empowering, motivating or encouraging women; conversely, providers could also be seen as functional, brusque and disempowering. No studies mention observations or recordings of interactions to investigate their nature, and such process evaluation would be important in future trials.

Data on the acceptability of incentive interventions to participants or providers are an important aspect of the BIBS study; however, they were very limited and methods were not comparable between studies. The acceptability of interventions to research participants was high except in the one study that sampled a group of pregnant women not currently engaged with any incentive scheme, in which it was more mixed.[151] In terms of satisfaction among those receiving support, feedback was generally positive. However, it was not always the incentives themselves that could be directly linked to satisfaction levels. It is worth noting that the participants in the study by Cluss and colleagues[140] reported that they were satisfied with the quality of service that they received and that the intervention had helped them but that a low proportion cited incentives as being the single most important component of the intervention. This may be an effect of participants comparing the incentive components with the other intervention components, or a bias whereby participants did not want to admit that they were most motivated by the incentives (depending on the data collection method used to elicit satisfaction).

Dropout or loss to follow-up in studies was an issue for both smoking cessation and breastfeeding studies. A wide range of attrition rates was reported and again the results are likely to be confounded by both the study population being investigated and the interventions being provided by the different studies. For smoking cessation studies that reported multiple attrition rates over time, these increased, although only six studies reported multiple end points for attrition data. Attrition rates in uncontrolled studies ranged

from 20% to 64% within 2 months of baseline, from 4.9% to 50% at the end of pregnancy, from 7.0% to 37.5% in the early post-partum period and from 32.6% to 51.1% at 6 months post partum. For controlled studies, in the immediate post-baseline period attrition rates ranged from 9.0% to 50.0% for intervention participants and from 10.0% to 41.4% for control participants. These ranges were 10.0–32.0% and 0–51.5% at the end of pregnancy, 13.0–52.0% and 9.0–52.0% for the early postpartum period and 13.0–24.9% and 13.0–20.7% at 6 months post partum respectively. Eight of 18 breastfeeding studies reported information regarding attrition rates. Attrition rates ranged from 0% to 25% (intervention) and from 0.5% to 15.6% (control) in the period before delivery to 2 weeks post partum and from 3.7% to 61% (intervention) and from 3.1% to 60.3% (control) at 8 weeks post partum and were 35% (intervention) and 40% (control) at 12 weeks post partum. These findings are consistent with a recent Cochrane review which found that incentives have a small effect on attrition in research studies.[216]

Costs varied in terms of what was reported (e.g. cost per participant or cost of implementing the entire intervention), what was provided (e.g. the value of incentives provided to participants), the currencies used (depending on the origin of each study reporting costs) and the price year (depending on when each study reporting costs was published), and it is therefore difficult to compare the results.

Incentives for providers of services for smoking cessation in pregnancy and breastfeeding

One intervention study of incentives for providers of services for smoking cessation in pregnancy was identified, which appeared to show some adverse effects on outcomes.[152] However, the methods used to establish effectiveness of the intervention in this study were not robust.

Only one study was identified that investigated breastfeeding incentives for providers.[168] Although associations between financial incentives and improved breastfeeding outcomes were made, the study is limited by its observational design and its findings should be treated with caution. Both the study by Cattaneo and colleagues[168] and the BFI[183] data suggest that commitment contracts show promise, but the role of incentives in these multicomponent interventions is uncertain. In 2012 the US Joint Commission introduced targets for exclusive breastfeeding at the time of hospital discharge as one of several mandatory requirements for maternity unit accreditation.[217]

It is likely that pilot schemes and other interventions may not be widely published and therefore were not identified by our literature search, even though they may have been implemented in practice. Very limited acceptability data on incentives for providers were reported from one question in a survey[153] and conclusions cannot be drawn.

Strengths and limitations

This review was comprehensive and the search strategy was particularly sensitive, covering a wide range of materials and types of study. However, it is possible that some multicomponent interventions that included incentive components may have been missed because of how they were reported. Nevertheless, no new studies were included in a systematic review of incentives for smoking cessation in pregnancy identified after our literature search had been completed, and the conclusions drawn are similar.[211] The inclusion criteria were broad enough to capture all possible kinds of incentives being provided and all types of study design. The breadth of the inclusion criteria and the multidisciplinary, mixed-methods evidence synthesis approach are important aspects of the BIBS study design. This approach assists in understanding the mechanisms of action for incentives for complex behaviours, informs the primary qualitative research (see *Chapter 6*) and informs the design and delivery of incentive intervention trials. This resulted in novel systematic review approaches, for example detailing the variation in incentive intervention journeys. The poor reporting of intervention details in studies included in the systematic reviews and the difficulties that this causes for replication and implementation has been highlighted.[218] BCT taxonomies can be helpful, as we have demonstrated; however, they capture only what is reported rather than what actually happened. Our approach develops the graphical methods that have been suggested for individual trial reporting by Perera and colleagues,[219] which aim to capture content, delivery and chronology. Our

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

approach demonstrates how this can be applied in a systematic review. It provides important detail about variation in content and intensity over time, which has the potential to confound an intervention and has implications for the costs of implementation and sustainability.

This study was hampered by the quality of data available and the multicomponent nature of the interventions, whereby the provision of incentives was not usually all that was being compared between groups. It was not always possible to identify the active component(s) of the intervention or whether synergy or opposition was occurring. In some cases, studies met our inclusion criteria by virtue of having provided token participation incentives to both groups and were therefore comparing another facet of the intervention than the incentive. As a result, both the intervention and 'control' groups in studies had to be treated as multiple intervention groups, as both received incentives. This also affected the analysis and quality assessment as studies that reported to be randomised had to be treated as containing non-randomised data, as this was the case for the data that we were interested in. Particularly important is the absence of a biochemical or other suitable method for validating breastfeeding outcomes. Self-report is relied on with the inherent and under-reported risks of gaming.

There is likely to be a great deal of confounding in studies reporting the effectiveness of incentives as, with all complex intervention studies, there was much variation in the other intervention components being provided. The under-reporting of intervention delivery processes, the absence of reported observations or recordings of interactions and the sparse qualitative data on patient experiences are potentially important. For example, relationships and communication with incentive intervention providers could be crucial in terms of empowering, motivating and encouraging women or, conversely, providers could be perceived as functional, brusque or disempowering. Most of the evidence is from US studies and the generalisability of the findings is unknown, particularly as many US women of childbearing age are not insured for health care and this is a barrier to health-care treatment. They may therefore behave differently from their UK counterparts.

Conclusions

The results indicate that providing high-value voucher incentives contingent on biochemically validated smoking cessation or providing voucher incentives to women and their social supporters, compared with providing non-contingent incentives for participation in a smoking cessation programme and providing outcome data, shows effectiveness observed up to 3 months post partum.

However, for both smoking cessation in pregnancy and breastfeeding the overall effect of providing incentives compared with no incentives is less clear, and the minimum size and the optimal frequency of incentives is uncertain. Furthermore, it is not clear to what extent other BCT components are synergistic or oppose the incentive effects or how incentive interventions interact with other aspects of usual care. Biochemical validation is important to detect deception.

For both smoking cessation and breastfeeding, further evidence on incentives is required to understand the possible effects and variation in effects of providing different types of incentives. We are aware of two UK incentive intervention studies on smoking cessation in pregnancy in progress, the CPIT[88] and a single-arm intervention study.[220] In addition, a feasibility study for a financial incentive trial for breastfeeding is under way.[221] At present, most evidence is of varied quality and the incentivisation components of interventions are not sufficiently detailed to be certain of their effect compared with the effects of the other BCT components. In addition, the frequency and duration of contacts is a likely confounder. This is of crucial importance to multicentre trial design as usual care is variable and it is unrealistic to expect usual care to change substantially to accommodate an incentive intervention.

There is a paucity of qualitative research to understand the perspectives of those receiving and delivering incentive interventions. Further research is also required to establish the effectiveness of incentivising organisations to provide smoking cessation and breastfeeding interventions.

Pointers for the shortlist of promising incentive strategies

The incentive strategy with the most promising evidence of effectiveness is vouchers contingent on biochemically validated smoking cessation, provided either just to women or to women and their social supporters, compared with non-contingent incentives (which may be small payments for taking part and providing outcome data) extending from early pregnancy to late pregnancy.

The following incentive strategies show some promise but caution is required because of the quality of the data:

- Vouchers contingent on biochemically validated smoking cessation, provided either just to women or to women and their social supporters, compared with non-contingent incentives (which may range from small payments for taking part to potentially larger payments for providing regular outcome data) extending from pregnancy until 3 months after birth.
- Commitment contracts with either financial penalties for not meeting point prevalence breastfeeding targets or esteemed non-financial accreditation awards for investment in and meeting quality criteria.
- Vouchers and gifts, which may include a breast pump, contingent on self-reported breastfeeding compared with no incentive or a much smaller incentive.
- Incentives to reduce attrition in research studies.

There is insufficient evidence for the following incentive strategies:

- Breast pump provision as an incentive to either increase the exclusivity of breast milk provision or prolong the duration of breastfeeding.
- Multicomponent interventions in which one or several BCTs are combined with an incentive(s). It is unknown whether combinations of different components have synergistic or opposition effects for outcomes. This includes incentives for preparatory behaviours in addition to incentives for verified outcomes.
- Incentives to providers of smoking cessation services.

The following are pointers for the acceptability of incentives and any unintended consequences:

- Very few data are available and the data quality is variable.
- Incentive interventions appear to be acceptable to those who receive them although differentiation between the incentive and other BCT components is difficult.
- The acceptability of incentives to those who are not eligible to receive them is uncertain.
- The acceptability of incentives delivered to providers of care to pregnant women is uncertain, particularly for smoking cessation. No data are available for breastfeeding.
- Data on unintended consequences were generally not reported. Protocol violation was reported in one breast pump trial, which suggests that individual randomisation may be inappropriate.

The following are pointers for the development of an incentive taxonomy:

- The IRBCT taxonomy was developed from existing BCT taxonomies and informed qualitative data collection (see *Chapter 6*).
- A wide variety of incentives was delivered in the included studies and a typology began to emerge through discussion with service users. This typology is developed further in the primary qualitative research (see *Chapter 6*).

The wide variety of BCTs delivered alongside the incentives, and the variation in delivery mode, duration and intensity, need to be taken into account.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 4 Review of reviews of the barriers and facilitators experienced by women for smoking cessation in pregnancy and breastfeeding

In this chapter, reviews of qualitative research on women's perspectives on smoking cessation in pregnancy and breastfeeding are thematically compared and contrasted to identify the barriers and facilitators for these behaviours. The review methods are described followed by a logic model for presenting the barrier and facilitator themes identified from the smoking cessation in pregnancy and the breastfeeding reviews. The chapter concludes by summarising the common themes for both behaviours and the behaviour-specific themes and considers how these inform the development of an incentive taxonomy for the design of incentive trials.

Methods

Aim

To understand how women's experiences of the barriers to and facilitators of smoking cessation in pregnancy and breastfeeding fit with the evidence synthesis reviews on the effectiveness and delivery of incentive interventions.

Objectives

- To identify systematic and narrative reviews of service-user perspectives on smoking cessation in pregnancy and breastfeeding.
- To undertake a narrative evidence synthesis of qualitative reviews and thematically describe the barriers to, facilitators of and intrinsic and extrinsic motivators and demotivators of smoking cessation in pregnancy and breastfeeding.
- To understand how the evidence on the barriers to and facilitators of smoking cessation in pregnancy and breastfeeding fits with the evidence synthesis for incentive interventions. In turn, this will inform the primary qualitative and survey data collection and contribute to both the shortlist of promising incentive strategies and the development of an incentive taxonomy.

Inclusion criteria

Types of studies

English-language reviews reporting qualitative evidence syntheses from developed countries only were included.

Population

The population of interest is pregnant or post-partum women up to 6 months after birth. The reviews may, in addition, include the perspectives of family members or professionals.

Subject/topic

Qualitative data describing women's experiences of smoking in pregnancy or infant feeding and the barriers to and facilitators of sustained behaviour change were included.

Exclusion criteria

Surveys and predominantly quantitative reviews in which only one or two qualitative studies were included and studies reporting the perspectives of health professionals only were excluded. Reviews in which health professionals' and women's perspectives were given equivalent weight and the findings could be

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

distinguished, for example the study by Baxter and colleagues[222] on smoking cessation, were included. Similarly, in a review that included quantitative and qualitative studies relating to the perspectives of adolescents on breastfeeding, only the findings from the qualitative studies were included.[223]

Search strategy

The literature was searched to identify reviews or syntheses of qualitative studies describing women's perspectives on breastfeeding and on smoking in pregnancy. The databases searched were MEDLINE (1946 to August 2012), MEDLINE-In-Process & Other Non-Indexed Citations (7 August 2012), EMBASE (1974 to August 2012), CINAHL (1981 to August 2012) and PsycINFO (1806 to August 2012). Searches were limited to English-language publications but no date restrictions were imposed. Our existing files of studies relevant to breastfeeding, compiled for other research projects, were cross-checked as a supplement to the literature searches.

Data extraction strategy

Two qualitative researchers (HM and PH) screened the abstracts, independently screened the full-text papers and reached agreement on those to be included. All of the papers were read initially by HM and PH to identify text relating to the a priori broad themes of the barriers to and facilitators of smoking cessation in pregnancy and breastfeeding. The intention was to identify themes that could be applied across both behaviours to facilitate the constant comparative method of data analysis.[224] The identification of themes was undertaken within the broader context of understanding the mechanisms of action of how incentive interventions might help to change behaviour, as a platform to design future trials. Data were extracted by two researchers (HM and PH) and summarised into Microsoft Excel tables (Microsoft Office Professional Plus 2010, Microsoft Corporation, Redmond, WA, USA). With wider team involvement (SUD, GT, NC and FD), themes were compared and contrasted, first across the studies within each behaviour (smoking cessation in pregnancy and breastfeeding) and then across the reviews for both behaviours, to produce an integrated thematic anaysis. A logic model emerged (see *Figure 16*) through considering the fit between barrier and facilitator themes for smoking cessation and breastfeeding and more general theories of motivation and behaviour.

We drew in particular on the theories that are summarised in *Chapter 1*.[6,10,16] Interventions and BCTs are at the bottom of the model as they are extrinsic influences. This allows the model to incorporate how the evidence synthesis and the shortlist of incentive strategies described in *Chapter 3* fit. To present the barrier and facilitator themes we apply a socioecological theory of behaviour,[19] which considers the micro, meso and macro levels of context in which behaviours are situated.

Findings

Number of studies identified

In total, 386 studies were identified, 384 from the primary literature searches and two from additional sources. Of these, 36 were selected for full-text screening and 13 were subsequently included in the analysis. The screening process is detailed in *Figure 15*.

The logic model

The logic model that emerged from our analysis (*Figure 16*) reflects the complexity of dynamic social lives, relationships and situations.

Rather than a neat dichotomy of categories for barriers or facilitators, the presented themes should be considered as a dynamic continuum of influences that are either intrinsic (wholly internal to the woman) or extrinsic (wholly external to the woman) or a combination at any one point in time. A woman has control over some intrinsic and some extrinsic influences and little or no control over others. Similarly, these intrinsic and extrinsic influences interact with the variety of motivation and other components of incentive and behaviour change theories that were highlighted in *Chapter 1*. Although an objective was to review

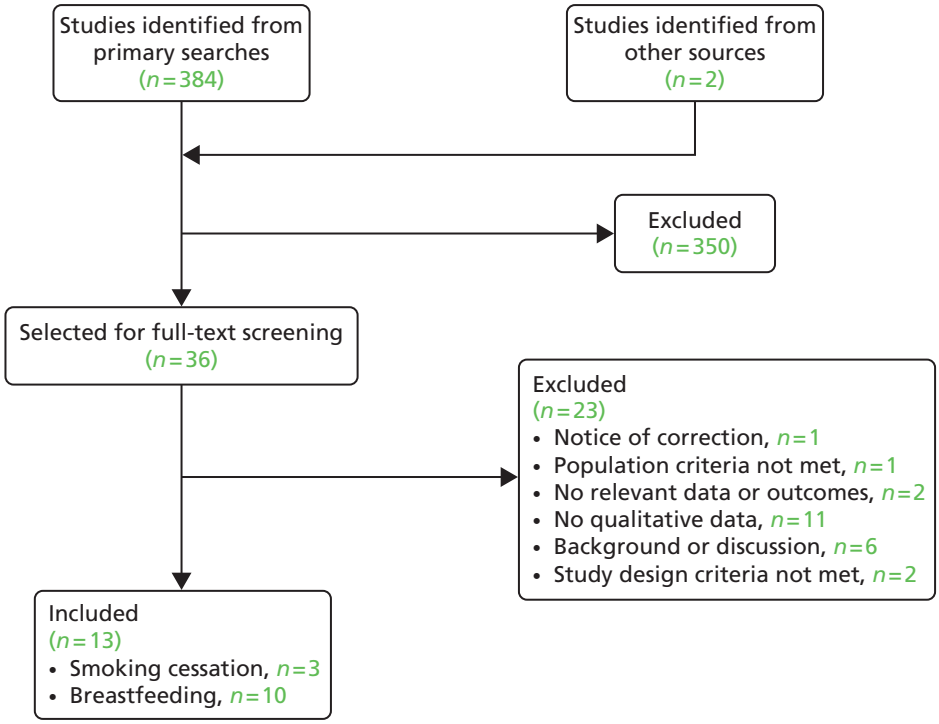


FIGURE 15 Flow chart of the number of potentially relevant reports identified and the number subsequently included and excluded from the review.

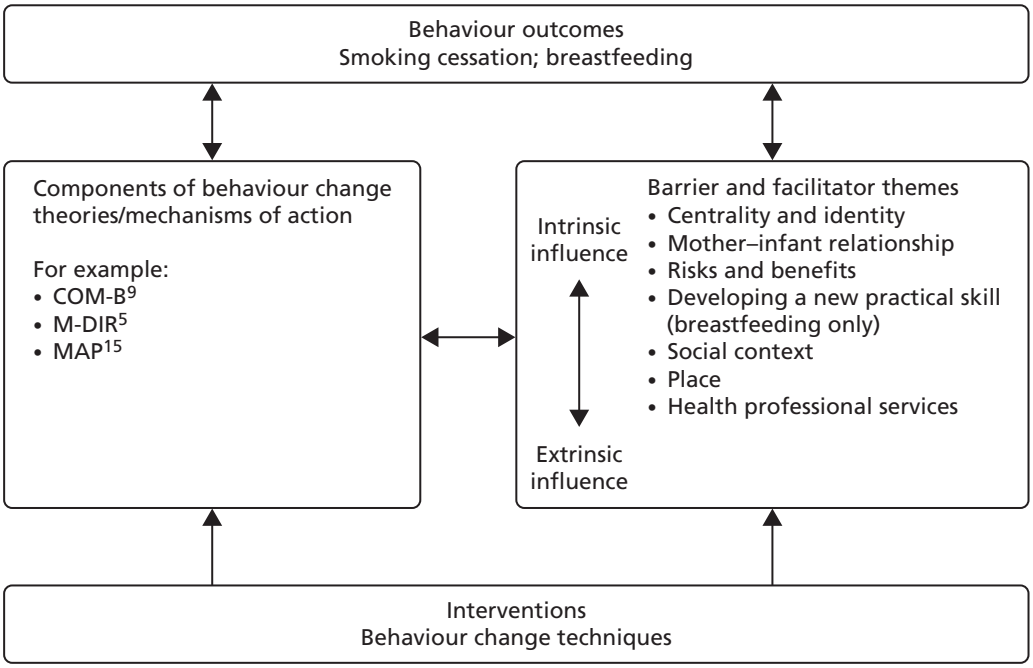


FIGURE 16 Barriers and facilitators logic model. M-DIR, motivation-drive: incentive and reinforcement.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

the intrinsic and extrinsic motivators for behaviour change, this conceptualisation was found to be too narrow to apply to the data extracted from the reviews. The themes for the barriers and facilitators are ordered from predominantly intrinsic influences to those in which extrinsic influences are more dominant, with health professional involvement considered as the most extrinsic influence as health professionals are often the least integral to women's social lives in which the behaviours are situated and performed. Increasing specialisation in maternal and infant care is evident in the data, particularly for smoking cessation services in pregnancy and formal peer support for breastfeeding. However, for smoking cessation and breastfeeding, it is optional for women to access health professionals for additional support and for health professionals to engage in changing or sustaining the target behaviours.

Findings for smoking cessation in pregnancy

Study characteristics

Three reviews,[222,225,226] which included women's accounts of the barriers to and facilitators of smoking behaviour change in pregnancy or engagement with smoking cessation services, were identified (*Table 33*). Graham and colleagues[225] conducted a systematic review of qualitative studies to address the importance of everyday life to smoking status during pregnancy, a context that is often overlooked by research on public health issues but which is crucial for understanding how barriers and facilitators work and is therefore central to intervention design. Baxter and colleagues[222] conducted a systematic review to investigate factors enabling or discouraging the uptake of smoking cessation services by pregnant smokers and they suggest 10 aspects of service delivery that may have an influence on the uptake of interventions. They identified that variation in practice can lead to conflicting advice being given to women and recommended that greater training and use of protocols is needed in this area. Ingall and Cropley[226] reviewed qualitative studies that investigated the psychological and social factors around women attempting to quit smoking during pregnancy.

The centrality of smoking to identity and the body

The dominant theme was the centrality of smoking in the everyday life of some pregnant women, her identity, her strategies to cope with stress and adversity and the experience of withdrawal symptoms relating to addiction. Graham and colleagues[225] identified that one of the key barriers to pregnant women's smoking cessation includes the centrality of smoking to their lives, a finding supported by Ingall and Cropley.[226] For many women who smoke during their pregnancy, smoking is already enmeshed in the everyday, in terms of their own identities as smokers, both before conception and as the pregnancy develops. The meaning that smoking has for them is fundamentally important. In what are often constraining circumstances of financial pressure, in which coping mechanisms are developed to balance stress, smoking appears to bring about psychosocial benefits that help women to alleviate stress, as well as boredom, and can bring pleasure, comfort and reward. Women believe that their reliance on smoking for these reasons is less problematic and less dangerous than the use of other substances.[225]

Addiction is similarly fundamental to the centrality of smoking in women's lives, with a sense of smoking controlling them and quitting being something beyond their control.[225] This relates to the physiological addiction to or dependence on nicotine. Smoking is therefore necessary to avoid withdrawal effects. Smoking is also a habit that produces perceived desirable effects and consequences. Dependence is based on physical continuity, coupled with a lack of willpower and self-doubt, as well as a lack of confidence around women's ability to maintain abstinence.[225,226] These daily struggles occur in the context of everyday life circumstances that are often already difficult, as smoking in pregnancy is more prevalent among women who are more economically and socially disadvantaged.[53] Reconciling daily struggles with smoking cessation and other life adversities could determine whether or not a woman can successfully change her behaviour, even when she would like to. It may be that cutting down might be more possible and sustainable in some cases and that promotion of this approach might facilitate a positive behaviour change in the direction desired to improve health, and this is often condoned by health professionals.[225] Ingall and Cropley[226] highlight, however, that this is a barrier to complete smoking cessation and it might lead to compensatory smoking whereby women inhale more deeply or smoke more of each cigarette.

TABLE 33 Characteristics of the studies included in the review of the barriers and facilitators that women experience for smoking cessation in pregnancy

Study	Country/countries	Papers included	Aim	Population	Type	Key results
Baxter 2010[222]	UK, Sweden, France, USA, Australia, New Zealand, South Africa and one international study	23	To investigate the uptake of smoking cessation interventions (delivery of services to women who smoke)	Pregnant or recently pregnant	Systematic review and qualitative synthesis	10 aspects of service delivery may have an influence on the uptake of interventions: if smoking broached by health professional, content of advice and information provided, manner of communication, having service protocols, follow-up discussion, staff confidence in skills, time and resource constraints, staff perceptions of ineffectiveness, differences between professionals, obstacles to accessing interventions
Graham 2012[225]	High-income countries, UK	27 (24 studies)	To enrich the evidence base informing policies and interventions to reduce smoking in pregnancy by including evidence from qualitative studies	Pregnant smokers	Systematic review of qualitative studies/ meta-ethnography	Four dimensions with implications for design and delivery of interventions: role of partners, motivation to quit for pregnancy rather than for good, prominence of cutting down as method of quitting and alternative to quitting, different concepts of risk that underpin scientific evidence and professional advice on the one hand and guide everyday life on the other
Ingall 2010[226]	UK, USA, Sweden, Canada, Australia	7	To examine and evaluate qualitative studies that have investigated the psychological and social factors around women attempting to quit smoking during pregnancy	Pregnant smokers and when changes made to smoking behaviour in pregnancy discussed post partum	Systematic review of qualitative studies	Women are aware of health risks to foetus; however, knowledge of potential health risks not sufficient to motivate them to quit. Several barriers identified including willpower, role, meaning of smoking, issues with cessation provision, changes in relationship interactions, understanding of facts, changes in smell and taste and the influence of family and friends

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

The pregnancy

Associations of smoking with stress relief, pleasure, comfort and reward are deeply embedded within smokers' everyday lives and, for women, this does not automatically alter as a result of becoming or being pregnant. These associations therefore constitute a significant barrier to behaviour change, even when compounded with feelings of shame and guilt about smoking continuation.[226] Graham and colleagues[225] discuss how smoker identity is particularly problematic for pregnant women, especially as their pregnancies develop and are increasingly visible, with societal attitudes and overt or perceived social disapproval encouraging feelings of guilt. The pregnant smoker identity is not one that many women are comfortable with and so this consideration may serve as a facilitator to behaviour change during the course of pregnancy. Ingall and colleagues[226] and Graham and colleagues[225] found that this often consists of cutting down or multiple attempts to stop smoking, with relapse after varying periods of being abstinent. Most women will not have planned to give up smoking before the pregnancy. Moreover, the additional willpower that women consider necessary to quit completely may not be considered achievable.[226] As such, women are not ready to sacrifice the imperative smoker identity in favour of the pregnant woman one, especially when they see pregnancy as a short-term condition and the expectation of smoking cessation as temporary, with many returning to their previous levels of smoking post partum.[225,226] Furthermore, it seems that, for many women, life is even more complex in the context of their pregnancy and so, because smoking often serves as a crutch in times of stress, smoking may continue or even increase despite the pregnancy.[225]

Risks and benefits

In addition to well-established issues of identity and everyday life that serve as barriers to smoking cessation in pregnancy, all three reviews[222,225,226] found that many women also have deep-seated beliefs that the risks of smoking in pregnancy are exaggerated. Graham and colleagues[225] found that women give more weight to the experiences of friends and family than to scientific evidence or health professional advice. Baxter and colleagues[222] identified that women perceive a lack of 'proof' that smoking is harmful to the baby. Ingall and Cropley[226] found that health professionals' advice is followed less than personal experience or the experiences of family and friends, particularly when accounts of smoking during pregnancy appear to result in a healthy baby. This knowledge intensifies scepticism about public health messages around the dangers of smoking in pregnancy and promotes ideas about it not being dangerous enough to warrant giving up. Moreover, the stress of receiving such public health messages, which try to instil a notion of harm, can increase smoking, again because women turn to it as a source of stress relief. Even when there is an awareness or acknowledgement of the harmful effects of smoking, Ingall and Cropley[226] distinguish between knowledge and action, and conclude that understanding risk does not necessarily lead to quitting.

Graham and colleagues[225] found that for some women, however, an increased awareness of the risks of smoking for their unborn child, especially low birth weight but also miscarriage and damage to the baby, serves as a facilitator for smoking cessation, particularly when a woman's primary motivation is the protection of her unborn child. They found that knowing about the risks can operate as a temporary quitting motivator and that receiving personalised feedback following maternity care procedures, such as ultrasound and heart beat measures, and imagining the baby in the womb can facilitate change. However, as Graham and colleagues[225] note, even when the health risks extend into childhood and the teenage years, many women still believe that the risks are not hazardous enough to warrant quitting. Compounding this issue is an additional concern about the weight gain that might occur with stopping smoking, in addition to the weight gained from being pregnant. The desire to lose weight after birth is also a consideration around relapse or continued smoking. However, countering this, the physical condition of being pregnant may trigger change,[225] in particular changes in maternal body shape as the pregnancy progresses, which make smoking when pregnant more difficult to conceal.[225] Changes in smell and taste[226] or morning sickness[225] causing aversion to smoking are also intrinsic motivators, but they are not straightforward because the influence of family and friends remains unaccounted for. Women do not necessarily reconcile beliefs and knowledge about the dangers of smoking during pregnancy with public

health messages because many share and enjoy smoking with friends and family members[225] and quitting can adversely affect their relationships with these people.[226]

Social context

Graham and colleagues[225] and Ingall and colleagues[226] both found that a major barrier to smoking cessation for pregnant women is that they are often around others who smoke. What is more, smoking might function as an axis for a significant relationship, particularly with a partner, and their smoking status can play a central role. Graham and colleagues[225] note that many partners who smoke do not quit during a woman's pregnancy. The contrast between a relationship in which a partner smokes, which may be perceived as taunting or controlling to some degree, and a relationship in which ongoing encouragement and support are provided illustrates how a close, interpersonal relationship can serve as a barrier to or a facilitator of behaviour change. The latter might involve verbal encouragement, actually quitting together with a partner or 'buddy',[225] a more peaceful home environment where a partner is a non-smoker[226] or the presence of older children/other members of the close network who find smoking unacceptable.[225] The former might be more influential when a partner smokes at home and the woman perceives increased pressure to police the home[225,226] or when women themselves feel that their smoking behaviour is being policed,[225] both creating conflict, which can increase stress levels and thus perpetuate one of the triggers for continued smoking.

Place

Ingall and Cropley[226] note that the immediate environment can be influential on women's success in quitting smoking and that, when giving up or cutting down, a smoke-free home is important. Graham and colleagues[225] concluded that pregnancy gives women the moral authority to insist on establishing smoke-free areas at home and to change the behaviour of others. However, as noted in the previous section, the 'policing' that is necessary if a partner smokes can become a drain on women. Therefore, women are often marginalised and exposed to stigma and pressure at home.[226] Women can perceive that there is no refuge, nowhere to escape from the daily stress of smoking. Women also experience the same pressures outside of the home when they are pregnant and smoking, as it is considered socially unacceptable and is often met with overt disapproval. As Graham and colleagues[225] note, women might then be tempted to conceal their pregnancy or conceal their smoking to avoid stigma as they continue to smoke while pregnant. As the pregnancy becomes more visible women can be encouraged to quit smoking, to do the 'right thing' and to avoid places associated with smoking so that they avoid temptation.[225] Ingall and Cropley[226] suggest that quitting can reduce conflict and therefore the desire for a peaceful environment acts as a motivating factor. However, smoking is a physiological addiction and these situations and environments as motivators conflict with the sense of the cigarettes being in control and the centrality of smoking to women's lived experiences.

Health professional services

There are many obstacles to accessing services and women perceive issues such as long sessions, lack of time and mobility restrictions as barriers.[222] Therefore, women's commitment to smoking cessation services is often compromised. This can lead to their disengagement with services and/or personnel. When the public health message recommends smoking cessation in pregnancy, barriers for pregnant women also include negative perceptions of care-provider counselling and unsatisfactory or inconsistent information.

Using smoking cessation advisors to deliver specialised services can increase the quality and consistency of the services. However, Baxter and colleagues[222] note that women reported fearing that they would disappoint a smoking advisor and so do not attend appointments. In addition, they feared failure in general and feeling disappointed in themselves. Cutting down might be promoted by health professionals in certain instances[225] and there is certainly a perception among women that some health professionals condone this in pregnancy because a lower level of smoking is assumed to be less hazardous. However, what Graham and colleagues[225] found across studies was that this is just another example of conflicting advice given to women. Ingall and Cropley[226] indicate that the relationship with a midwife in particular is crucial; however, Baxter and colleagues[222] note the potential conflict perceived by midwives who do not

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

wish to discuss smoking in pregnancy because it can increase a woman's sense of guilt and compromise their relationship with women. Moreover, Baxter and colleagues[222] found that women's smoking status is not always recorded and, even when it is, it is not always questioned and therefore women are not actively engaged in discussions about issues pertaining to smoking or their readiness to change. However, some women reported such discussions as positive and important.[222] When women are confronted, they note that this quite often consists of being given information and advice as opposed to being persuaded to quit. They report feeling insulted and leaving consultations feeling resentful about the health professional's manner of communication and as though they have been judged.[222] This is a barrier, especially because Baxter and colleagues[222] also note that health professionals acknowledge that their approach is inadequate. Lack of protocol and follow-up, low staff confidence level in their skills and the impact of time and resource constraints make it difficult for health professionals to facilitate smoking cessation effectively. Furthermore, women seem to feel that there is a lack of enthusiasm or empathy from health-care professionals and that any support they do receive is short term. These considerations all serve as barriers to smoking cessation in what is already a complex context. What Graham and colleagues[225] considered as factors that might minimise these barriers, and perhaps serve as facilitators to smoking cessation, were ongoing encouragement and personalised support solutions, which Ingall and Cropley[226] call a 'tailored approach' and conclude is necessary within a smoking cessation programme. Ingall and Cropley[226] suggest better multidisciplinary teamwork between doctors, midwives and health visitors. In addition, it is recommended that smoking cessation programmes include the provision of NRT in the form of patches, which women generally view favourably and regard as important.

Findings for breastfeeding

Study characteristics

The included reviews report women's accounts of breastfeeding behaviour and patterns and consider breastfeeding support,[67,223,227] women's experiences of breastfeeding,[228–230] formula milk feeding,[231] breastfeeding among adolescent mothers,[223] decision-making about feeding[232,233] and current research in the subfields of anthropology and related disciplines[234] (*Table 34*). Throughout the included evidence reviews, themes that emerged can be applied to understand the barriers to and facilitators of initiating and sustaining breastfeeding. Nelson[230] notes that, in industrialised societies, breastfeeding is a 'voluntary decision to act' and not a necessity for infant survival and therefore the reality is that breastfeeding is a choice that is influenced by many factors. Intrinsic influences were less dominant in the breastfeeding literature than they were in the smoking literature. However, attachment to the infant as both a barrier and a facilitator was more apparent than in the smoking literature where, apart from ultrasound images and heartbeat recordings, the infant was a more theoretical and less tangible influence. For breastfeeding, the extrinsic relational concept of 'support' was dominant throughout the reviews, with some considering who provides the support and others focusing on the nature of the support. So, once again, clear divisions between support from social networks and support from health professionals are to some extent artificial.

The centrality of feeding to identity and the body

There are intrinsic facilitators for breastfeeding, which are discussed in the context of the pleasure and intimacy that women can experience through breastfeeding,[228,234] as well as feelings of connection and confidence.[228] Breastfeeding is tied in with the concept of being a good mother, which provides a sense of pride and self-worth.[228,233] Belief that breastfeeding influences bonding and attachment with their infants is closely linked with what Burns and colleagues[228] put forward as another facilitator: faith in the body. However, women have also described barriers that are related to increased negative awareness of their bodies, such as pain and discomfort. Nelson's 2006 meta-synthesis[230] found that many women perceived breastfeeding as messy and felt disgusted or that their breasts were repulsive, whereas the same author's 2012 meta-synthesis[233] discusses a sense of personal comfort with the physical act of breastfeeding and perceptions of control. Both of Nelson's reviews[230,233] found that discomfort encouraged feeling out of control. In addition, van Esterik[234] talks about a loss of self and agency. Breastfeeding is also portrayed as emotionally and physically demanding and time-consuming and a lack of confidence can increase anxiety,

TABLE 34 Characteristics of the studies included in the review of the barriers and facilitators that women experience for breastfeeding

Study	Country/countries	Papers included	Aim	Population	Type	Key results
Atchan 2011[232]	Unclear (although mainly Australian context)	86	To review the literature to explore the factors that influence women's decisions about breastfeeding and their reasons for not initiating breastfeeding	Women, although unclear	Narrative review	Relatively few studies explore experiences of women who decide not to initiate breastfeeding
Burns 2010[228]	Canada, UK, Australia, USA, New Zealand	17	To better understand the social phenomenon of breastfeeding by making the hidden obvious	Varied – women with experience of breastfeeding	Meta-ethnography	Two overarching themes emerged: breastfeeding was described in terms of expectation and reality, whereas the emotional aspects of breastfeeding were expressed in connected or disconnected terms
Hall Moran 2007[223]	USA, UK, Australia	7	To review the evidence on the nature of support for breastfeeding adolescent mothers	Adolescent breastfeeding mothers	Systematic review – narrative and thematic	Five types of support identified: emotional, esteem, instrumental, informational and network. Emotional, esteem and network most helpful
Lakshman 2009[231]	UK, USA, New Zealand, Australia	6 qualitative and 17 quantitative studies	To understand how formula feeding decisions are made	Parents of either sex	Systematic review	Mothers who bottle fed experienced negative emotions. Mothers reported receiving little information on bottle-feeding and did not feel empowered to make decisions. Mistakes in preparation of bottle-feeds were common
Larsen 2008[229]	UK, Ireland, Sweden, Australia	7	To examine what has affected a mother's confidence in breastfeeding when she gives up breastfeeding	Mothers, midwives, fathers, child health nurses, people in network	Meta-synthesis	Confidence in breastfeeding is shaped by shattered expectations and is affected on an immediate level by mothers' expectations, the network and the breastfeeding experts and on a discourse level by the discourses: breastfeeding as nature, the female body as a machine and the note of caution
McInnes 2008[227]	UK, USA, Australia, New Zealand, Sweden, Canada	47	To synthesise mothers' and health-care professionals' experiences and perceptions of breastfeeding support	Women, fathers and health-care professionals	Narrative synthesis and secondary thematic analysis	Five themes emerged in health service support of breastfeeding: the mother–health professional relationship, skilled help, pressures of time, medicalisation of breastfeeding and the ward as a public place

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 34 Characteristics of the studies included in the review of the barriers and facilitators that women experience for breastfeeding (*continued*)

Study	Country/countries	Papers included	Aim	Population	Type	Key results
Nelson 2006[230]	USA, Australia, Canada, UK	15	To synthesise qualitative breastfeeding studies related to maternal breastfeeding experience	Women with breastfeeding experience	Meta-ethnographic, comparative	Breastfeeding is an engrossed journey that is very physical and requires maternal commitment, adaptation and support from multiple sources. Breastfeeding is also shown to have a significant personal impact on mothers and to require time for resolution on discontinuing
Nelson 2012[233]	USA, UK, Australia	14	To synthesise the findings of qualitative research studies related to infant feeding decision-making	Pregnant or post-partum women, primiparas, adolescents, fathers	Meta-ethnographic, comparative	Two processes emerged as central: making a personal choice and defending the choice. Six themes are indicative of issues that affected these processes: knowing breast is best, disapproval of public breastfeeding, sense of personal comfort, level of confidence/commitment, need for support, perceived lifestyle compatibility
Schmied 2011[67]	UK, USA, Australia, Canada, New Zealand, Tanzania	31	To examine women's perceptions and experiences of breastfeeding support, either professional or peer	Primiparas and multiparas who initiated breastfeeding	Meta-ethnography	Support for breastfeeding occurred along a continuum from authentic presence at one end, perceived as effective support, to disconnected encounters at the other, perceived as ineffective or even discouraging or counterproductive. Facilitative vs. reductionist approaches as contrasting styles
van Esterik 2002[234]	Unclear	NA	To examine current research in the subfields of anthropology and related disciplines on the biocultural process of breastfeeding and broader questions of infant and young child feeding	NA	Narrative review	The narrow speciality of infant feeding has broad implications for the discipline. Themes: sexuality, reproduction, embodiment, subjective experience, problems breastfeeders face in bottle-feeding culture

NA, not applicable.

thus creating a barrier to continuing. In cultures that sexualise women's breasts, difficulties around the body and image, sexual identity and relations can inhibit breastfeeding,[223,232,234] especially if the body is seen as a 'machine'.[229] Breastfeeding is the sole responsibility of the mother[223,229] and this can act as a barrier, especially if women are less likely to try new things.[232] Overall body image and sensations were influential, as they were in the reviews of smoking when pregnant. The public–private interface, with concern around the judgements of others, was also a common theme.

The mother–infant relationship

The extent to which mothers consider their baby separate or attached, both physically and emotionally, while breastfeeding can cause conflicts. Nelson[230] reported that some women feel as though their breasts now belong to their infant, which creates an emotional burden and results in cravings for separation. Conversely, some women interpret the physical bond as promoting closeness and a better understanding of their infant's needs. The physical bond can affect women's perceptions of autonomy and control, especially as the infant must also 'know' or learn what to do.[228] Mothers' observations of happy and contented infants are key facilitators for breastfeeding continuation,[228] with discontented babies cited as a justification for feeding behaviour change. Nevertheless, there are beliefs about not producing enough milk, or milk of sufficient quality, that lead women to formula feed because they feel that they are unable to satisfy their infants.[228] There are also issues around what constitutes effective mothering and many women believe that the pain and discomfort that they feel when breastfeeding inhibits their ability to be effective mothers. Women may therefore give up breastfeeding because of a perception of having problems feeding and then feel guilty.

Risks and benefits

The dominant Western sociocultural and health professional discourse, 'breast is best', is the primary reason why many women choose to breastfeed.[228,230] However, 'breast is best' can contribute to a sense of disillusionment, guilt and failure, which some breastfeeding women describe as a result of receiving what they consider to be technical (and often unrealistic) advice from health professionals. In particular, there is confusion caused by the idea that some health professionals view bottle-feeding as 'safer', an idea that many women feel has been communicated to them. Lakshman and colleagues[231] note that this is a barrier to breastfeeding for women, especially when they can be more reassured that their baby is getting enough milk when they bottle-feed. When there is any breast pain or discomfort, or indeed the mother is anxious, this might impact negatively on the mother–infant relationship and, because of scientific advances, formula milk might be an acceptable alternative. 'Breast is best' may therefore be contested when formula is seen as not harmful[233] or when breastfeeding can be perceived as 'risky'.[234]

Breastfeeding: developing a practical skill

Support for breastfeeding was the dominant theme – both as a barrier and a facilitator for breastfeeding, particularly the availability, characteristics, amount and quality of the support and the emotional impact on maternal well-being. Breastfeeding can be perceived as being natural and therefore easy or automatic,[229] but, in contrast to smoking, it is a learned skill that requires practice and perseverance to develop. Nelson[230] calls it an engrossing, personal journey, which takes account of the maternal self-sacrifice, time and life adaptations that breastfeeding requires. However, the dominant theme is that this personal journey requires support from others, with other intrinsic and extrinsic influences less evident in the reviews.

In the review by Hall Moran and colleagues,[223] which looked at breastfeeding support in the context of adolescent mothers, a useful framework of support types was applied, derived from Sarafino.[235] Network support, emotional support, esteem support, informational support and instrumental support are each relevant to feeding choices from initiation through to sustaining breastfeeding. In addition to the everyday life context, and social network, in which women are situated, Hall Moran and colleagues[223] found that having a nominated supporter, whether that person was new, that is, a health professional or peer counsellor, or familiar, that is, a partner or family member, was effective as a facilitator for breastfeeding. This was also found by Schmied and colleagues[67] whose categories of support, such as 'authentic presence', 'being there', 'empathy' and 'sharing the experience', can refer to any supporter (professional or peer). Whatever the

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

source, one-to-one care, and its continuity, can make women feel emotionally supported, which is a priority for women. Schmied and colleagues[67] described the ideal supporter as someone who is responsive, who shares the experience and who provides affirmation. For Nelson,[230] support is not reducible to individuals, however, but rather 'it takes a village' (p. e17). This includes partners, mothers, friends, groups, counsellors and professionals all providing support.

Emotional and esteem support are described by McInnes and Chambers[227] as being about praise and building self-confidence. However, women have described feelings of being watched and judged as opposed to the more facilitative perception of support, regardless of whether or not they are successful. Therefore, support from others is important for women not only in underlying emotional terms but also because it can help to improve women's feelings of well-being when breastfeeding. Schmied and colleagues[67] describe the ideal as a facilitative approach, in which there is encouragement for breastfeeding and encouraging dialogue as opposed to 'disconnected encounters', which appear to involve undermining, blaming, pressuring and communicating a lack of time and which therefore serve as barriers.

Schmied and colleagues[67] also suggest that the ideal facilitative approach should involve realistic, accurate and sufficiently detailed information. This is in contrast to the reductionist approach, which creates barriers through the delivery of conflicting information and advice, or standardised rather than individually tailored information. Hall Moran and colleagues[223] suggest that the facilitative-type approach is particularly important for adolescent mothers who can be made to feel important through breastfeeding, as well as being better accepted as mothers, rather than problematised as 'teenage mothers'. The encouragement that they are given acts as a facilitator compared with a lack of encouragement, which can lead to rapid disillusionment and early cessation.

Social context

The social context in which the woman is situated is crucial to her ability to deal with the barriers and facilitators that initiating and sustaining breastfeeding present. Having a mother who breastfed or who actively supports breastfeeding, as well as a supportive partner who is encouraging and shifts his perception of the breast from sexual to functional,[232] have been identified as key facilitators in reviews.[223,227,228,230,232,233] Conflict can occur if these people encourage supplementing or weaning.[230] Conversely, if bottle-feeding with formula is a cultural norm in the immediate family then this will act as a barrier to breastfeeding.[223] Nelson[230,233] also noted that 'perceived lifestyle compatibility' can act as a barrier when work or school commitments for the mother or other children may be construed as barriers. In contrast, membership in groups with shared interests or activities and peer support encourages breastfeeding when women can talk about their situation.[223] This can involve the generation of new friendships, especially when, as Burns and colleagues[228] and Hall Moran and colleagues[223] highlight, connections with other mothers experiencing the same emotions and challenges are forged. This can be formalised and facilitated through health or social care agencies connecting a woman with a dedicated peer supporter, which can be considered as more similar to professional support.

Place

The issue of public breastfeeding is cited as a key barrier within a number of reviews.[223,227,230,232–234] McInnes and Chambers[227] suggest that hospital set-ups do not necessarily facilitate good relationships between mother and infant, when women might feel isolated and distressed. This is further complicated by the adverse effects of birth and inadequate pain relief, or when the mother and infant might be separated or accommodated within semi-public postnatal wards. Breastfeeding in public, whether in hospital, at home or outside the home, is potentially embarrassing and a tricky public performance, even in the presence of family or friends.[233,234] As Larsen and colleagues[229] also reported, there is considerable pressure on many women to return to work after giving birth and therefore breastfeeding might be considered an unsuitable choice. Other family or social commitments contribute to lifestyle compatibility, besides the return to work,[233,234] and to a wider need to manage feeding in everyday life and especially in unsupportive environments.[230,232,234] Negative attitudes towards breastfeeding affect women's ability,

willingness or commitment to breastfeed at home and elsewhere, and many women refer to breastfeeding as an 'inconvenience' or embarrassment.[228]

Health professional services

Burns and colleagues[228] suggest that opportunities for women to explore and articulate their experiences of breastfeeding are important and, more crucially, can influence the ways in which health professionals might represent breastfeeding during pregnancy and into the postnatal period. There were varied perceptions of postnatal support and individual experiences were wide-ranging, from encouragement through to discouragement. Overall, the reviews presented professional support as essential and the perceived insufficiencies recounted by women as major barriers to breastfeeding. Hall Moran and colleagues[223] suggest that direct, tangible assistance, including practical help, is important, but it can be perceived as a barrier if it is given in a rushed or uncaring, or indeed fragmented, way. This is supported by Schmied and colleagues,[67] who suggest that an authentic presence, characterised by being there, empathy, taking time and touching base, can facilitate breastfeeding. In addition, women can be reluctant to seek professional support that might facilitate breastfeeding.[223,233]

McInnes and Chambers[227] discuss how lack of knowledge can act as a barrier to receiving and accepting support for breastfeeding and likewise this is the case for women who feel that they have been denied information about bottle-feeding/formula.[232] McInnes and Chambers[227] note that lack of resources can often mean that staff do not engage in the relevant training and this can result in inaccurate or inconsistent advice being given. Lack of emotional support is a strong theme, for example encouragement and reassurance,[67,223,229,230] which also impacts on and compounds women's self-esteem. Mixed messages, such as those surrounding the risks and benefits of breast or formula milk, or conflicting information on the practicalities of and instrumental support for breastfeeding, are described.[67,227–229] Women have described feeling pressured to breastfeed[67,227,229] as well as to formula feed.[233] Health professionals are perceived by some mothers to be taking over, delivering standardised care, attributing problems to the mother's or the infant's personality and even projecting a lack of belief in the mother's ability.[227] Lack of health professional time and fragmented support for women is emphasised across many of the reviews.[223,227,228,230,233] Instrumental support with positioning and attachment is required, but unhelpful and inappropriate practices such as insensitive and physically intrusive touching (doing not showing) cause distress or embarrassment.[227,229,233] This is especially important when, as Burns and colleagues[228] state, there is confusion around exposing breasts and being a 'good' woman. McInnes and Chambers[227] suggest that technical advice or 'medicalisation' can be a barrier for women and that advice should be based on real experiences and delivered in lay language, both of which could bridge the gap between theory and practice. In the review by Burns and colleagues,[228] biomedical descriptions of female bodily experiences are hypothesised to suppress women's own embodied descriptions of breastfeeding and have the potential to impact on the mother–infant relationship.

Discussion

For smoking cessation in pregnancy, intrinsic barriers were the dominant theme around the centrality of smoking to the everyday life of a pregnant woman, her identity, her strategies to cope with stress and adversity and the experience of withdrawal symptoms relating to addiction. In contrast, for breastfeeding, the extrinsic facilitator and barrier 'support' was the dominant theme, particularly the availability, characteristics, amount and quality of the support and the emotional impact on maternal well-being. Intrinsic influences for breastfeeding around identity as a 'good mother', confidence and attachment were described. For both behaviours, the well-being and health of the baby is an important intrinsic and, once born, extrinsic motivator, with accompanying feelings of guilt if smoking is continued or formula milk given. However, for both behaviours there is some disbelief about the associated adverse health outcomes, reinforced by witnessed personal, family or network experiences. The social context and the places where smoking and breastfeeding are situated were relevant to both behaviours, with partners, relatives, friends and network relationships acting as either barriers or facilitators, or demotivators or motivators, to both the

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

initiation of the desired behaviour and sustaining the behaviour. Particularly for breastfeeding, professional support was reported as a facilitator when it was confidence boosting, skilled, accessible, consistent and timely; alternatively, it could be seen as a barrier if it was perceived as judgemental, pressurising, rushed or conflicting. Communication and support that are sensitive to each woman's unique situation and the intrinsic and extrinsic influences that she is experiencing would appear to impact on both smoking and breastfeeding outcomes.

Strengths and limitations

As far as we are aware, this is the first qualitative synthesis to compare and contrast the barriers to and facilitators of smoking cessation in pregnancy and breastfeeding from the perspectives of women and it provides valuable insights into the data collected and reported by the respective academic researchers. Qualitative researchers and academics have considered the behaviours separately, with limited cross-reference or collaborations to share understanding. Indeed the socioeconomic patterning of the behaviours received little attention, particularly in the breastfeeding reviews. This could reflect the data collected from women in the original studies, the focus of the analysis or the second- and third-order interpretations by the review researchers. Health inequalities and social patterning of the two behaviours are more evident in surveys. Lifestyle behaviours that are undesirable from a health perspective, such as smoking and formula milk feeding, are known to be clustered in younger mothers from more disadvantaged backgrounds, particularly in the northern regions of the UK.[53] By not including observational studies in this review, some barrier and facilitator themes might be under-represented. For example, in the 2010 UK Infant Feeding Survey the most common reasons for stopping breastfeeding are the baby not sucking or rejecting the breast (33%), painful breasts or nipples (22%) and the mother feeling that she had insufficient milk (17%).[53] This review did not include important qualitative studies on the perspectives of partners on women smoking in pregnancy or post partum smoking as they were excluded from the included studies.

There are considerable limitations in applying an a priori framework of barriers and facilitators to papers whose aims were different. The amount of data relevant to our analysis that was omitted from the published accounts, perhaps because of strict word limits, is unknown. The review does not assess the quality of the reviews or the included papers, and this was inconsistently reported in the included studies. Groupthink[102] is a consideration as the included papers in these reviews cite each other, with considerable overlap, and therefore can over- or underemphasise some themes. Additional reasons given by women for stopping breastfeeding after the first few weeks include the baby feeding too often/being constantly hungry (10%) or breastfeeding taking too long/being too tiring (8%).[53] This would suggest that intrinsic influences and the relationship with the infant may be more important than the dominant theme of support emerging from the reviews. Applying the constant comparative approach to the raw data in the transcripts in the original papers in each review would be a methodologically more rigorous approach, albeit very resource intensive and beyond the scope of this review.

Conclusions

This synthesis illustrates the similarities in and differences between the barriers to and facilitators of stopping smoking in pregnancy, and not relapsing, and initiating and sustaining breastfeeding. It provided an important evidence platform for informing the qualitative interview data collection and analysis and the development of a taxonomy of incentive strategies (see *Chapter 6*).

Key themes for barriers to and facilitators of smoking cessation and breastfeeding

In conclusion, the common dynamic themes for barriers to and facilitators of both smoking cessation and breastfeeding are:

- centrality to the concept of self
- the resistance to adopting a new identity and not trying a new behaviour, for example being a non-smoker for good or being a breastfeeding mother
- time: maternal 'me time' and family/social time conflicting with the future optimal health of the baby
- stress, anxiety, adversity and pressure
- feelings of failure and guilt around being a 'good mother'
- beliefs and disbeliefs about health messages
- body image and the private–public interface
- social and cultural norms, particularly around lifestyles and the places where smoking and breastfeeding are situated, both within and outside the home
- pleasure and control crossover, for example the pleasure that cigarettes and breastfeeding can both provide and the sense of control over situations that vary in their adversity
- relationships with family and friends
- experiences of information and support provided by health professionals, their timeliness and how they are tailored in relation to a woman's needs.

Behaviour-specific themes for barriers to and facilitators of smoking cessation and breastfeeding are:

- for smoking cessation: the addiction to nicotine and strategies that aim to address this such as NRT
- for breastfeeding: learning and developing a new practical and performing skill and the additional skilled support that is required to do this.

The following are pointers for the development of an incentive taxonomy:

- Applying dichotomies: barriers/facilitators and intrinsic/extrinsic motivators and demotivators for smoking cessation in pregnancy and breastfeeding do not capture the complexity and dynamic interactions evident in the reviews.
- A logic model emerged that appears to fit the data. This incorporates influences on a continuum between intrinsic (wholly within self) and extrinsic (wholly outside of self) and which are in a dynamic relationship with the components identified in behaviour change theories, their mechanisms of action and the themes relating to the barriers to and facilitators of achieving the behaviour outcomes.
- The level of perceived control that individuals have over intrinsic or extrinsic influences is an important consideration.
- An incentive taxonomy will need to incorporate the common and behaviour-specific themes identified.

The following are pointers for the shortlist of promising incentive strategies:

- Any incentive strategy will need to address the complexity of women's real-life situations, particularly as those who continue to smoke during pregnancy and who choose to formula feed or to stop breastfeeding early are more likely to experience disadvantage in other aspects of their lives.
- Relationships with health professionals during routinely provided care can be influential in both positive and negative directions. What happens during routine maternity care is likely to interact with any incentive intervention.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 5 How the evidence on incentives for other lifestyle behaviours contributes to the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study

This chapter presents a scoping review of evidence syntheses of incentives for other complex lifestyle behaviours, particularly for populations relevant to women of childbearing age. Following a description of the methods, we present the findings, first, for incentives offered to consumers and, second, for incentives offered to providers. The chapter concludes with a summary and the implications for the shortlist of incentive strategies and future research.

Methods

This scoping review of evidence syntheses of incentives for other complex lifestyle behaviours was undertaken once the smoking cessation and breastfeeding incentive evidence syntheses (see *Chapter 3*) were complete. The methodological rationale for doing this was threefold. First, incentive interventions that aim to change complex lifestyle behaviours from an increasingly popular research field and the evidence base is changing rapidly. Second, as incentive interventions are a relatively recent development, publications are dominated by a few groups of authors, mostly in North America, as illustrated by the meta-analysis for smoking cessation in pregnancy (see *Figure 9*). There is a risk of pursuing potentially less effective incentives and generating citation bias whereas new or potentially more effective strategies, which are less publicised, may be overlooked. Third, there is a danger that interventions leap ahead of behaviour change theory about how incentives work, and this may be evident from the wider literature. As our evidence syntheses for breastfeeding and smoking cessation in pregnancy identified few intervention studies delivering incentives for health-care providers or organisations, this was a particular area of relevance.

The definitions in *Chapter 1* apply. 'Consumers' and 'providers' are used as umbrella terms, as not all people in receipt of incentives were patients. Similarly, providers included a wide range of people and professionals in differing health service systems who deliver services for people with the target behaviour.

Research question

How do evidence syntheses of incentive interventions from other areas of health improvement, particularly for women of childbearing age, (1) fit with our evidence syntheses for smoking cessation in pregnancy and breastfeeding, (2) inform the primary research questions relating to the development of a shortlist of incentive strategies and (3) help to identify research gaps where effective incentives for other behaviours have not been tested for smoking cessation in pregnancy and breastfeeding?

Objectives

- To systematically search for and identify evidence syntheses of incentive interventions for other complex lifestyle behaviours that are relevant to women of childbearing age and health-care providers.
- To assess the fit of the scoping review findings with our evidence syntheses of incentives for smoking cessation and breastfeeding and triangulate the findings.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

- To identify knowledge gaps where incentives for other behaviours show promise but (1) have not been tested for smoking cessation in pregnancy or breastfeeding and (2) have received little research interest to date for any complex lifestyle behaviour.
- To provide any new information relevant to the development of a shortlist of incentive strategies for smoking cessation in pregnancy and breastfeeding and to inform primary qualitative and survey data collection in the BIBS study.

Identification of studies

Literature searching was carried out in two stages. First, to inform the grant application for the project, a scoping search was undertaken to identify studies of incentives for any lifestyle behaviour in any population. Second, a search was undertaken to inform the review of incentive reviews, which was specifically designed to identify systematic reviews of incentives for lifestyle behaviours, other than smoking and breastfeeding, in women of childbearing age. A decision was made to limit the number of databases searched to adequately address the research question but to allow the searches to remain feasible for the project team and resources. No language or date restrictions were imposed on the searches. Databases searched were MEDLINE (1946 to November Week 3 2012), MEDLINE-In-Process & Other Non-Indexed Citations (19 November 2012), EMBASE (1974 to 2012 Week 47), CINAHL (1981 to December 2012), CDSR (Issue 12, 2012) and The Cochrane Library Technology Assessments (Issue 4, 2012). Other websites consulted were the King's Fund (see www.kingsfund.org.uk/), EPPI-Centre (see http://eppi.ioe.ac.uk/cms/) and the Health Foundation (see www.health.org.uk/).

Inclusion and exclusion criteria

The reviews included English-language studies reporting evidence syntheses that met the definition of an incentive (see *Chapter 1*) and included studies conducted in a developed country and reported between 2003 and October 2012. These dates were based on the findings from our scoping review for the grant application, in which no new primary studies or findings were reported in systematic reviews published before 2003.

The population of interest was adult women of childbearing age, with or without family members and health-care providers. For health-care providers, the evidence synthesis was included only if it reported on studies relevant to a UK NHS context.

Primary outcomes relating to the following complex lifestyle behaviours were included, in which the incentives are delivered either to the women or to health-care providers: weight management, drug and alcohol addiction, exercise and smoking (not in the context of pregnancy). Evidence syntheses reporting outcomes for only simple behaviour change, defined as a one-off behaviour (e.g. a clinic or screening appointment attendance, an immunisation), were excluded, although some of the reviews examined these alongside incentives for complex lifestyle behaviours.[236] Simple behaviour change interventions (e.g. turning up for a mammogram) are (usually) performed less frequently than healthy eating. They were excluded as it is widely recognised that breaking or forming a behaviour habit such as smoking or breastfeeding is unlikely to be achieved by a once-only intervention.[3]

Data were extracted from the most recently published reviews first, before working chronologically backwards. For lifestyle behaviours under consideration, a date was reached when a review included only studies that were included in later or more comprehensive reviews. When this occurred, earlier studies addressing similar research questions were excluded. For reviews of incentives provided to health service organisations, no new studies or findings were identified in systematic reviews published before 2009 and this was the cut-off date for inclusion in this review.

Data extraction strategy

Abstracts identified by the search strategy were screened by two of three reviewers (PH, HM and FS) and agreement was reached on which to exclude at this stage. Full-text papers of potentially relevant reviews were obtained and assessed by two reviewers for inclusion (PH and either DT, GT, FD, LB, NC or SF).

Differences of opinion were resolved through review team discussion. Data were extracted by one reviewer (PH) and cross-checked by a second (DT, GT, FD, LB, NC or SF). The following data were extracted:

- authors
- title of the review
- the behaviour targeted for change
- the population receiving the incentive intervention
- summary of effectiveness findings reported by the authors that are of relevance to the BIBS study
- summary of incentive delivery process findings reported by the authors that are of relevance to the BIBS study
- any findings that refute the BIBS study review findings for smoking cessation in pregnancy or breastfeeding
- any findings for incentive strategies that were not identified in the BIBS study evidence syntheses for smoking cessation in pregnancy or breastfeeding
- any hypotheses arising from the review that inform primary data collection for the BIBS study.

An electronic form was used to record data. The quality of the reviews was not assessed as the aim of this scoping review was not formally to synthesise the evidence presented but to inform the subsequent stages of the BIBS study. A narrative thematic analysis of the data was undertaken, with themes discussed by the research team and assessed for their relevance and contribution to the BIBS study in an iterative process.

Results

Number of studies identified

We identified 255 records from the primary searches for this review. An additional three studies were identified from other sources. After title and abstract screening, 223 studies were considered not to be relevant and were excluded, leaving 35 studies for full-text assessment, of which 17 studies met our inclusion criteria.[2,3,236–250] A flow diagram of the screening process is provided in *Figure 17*.

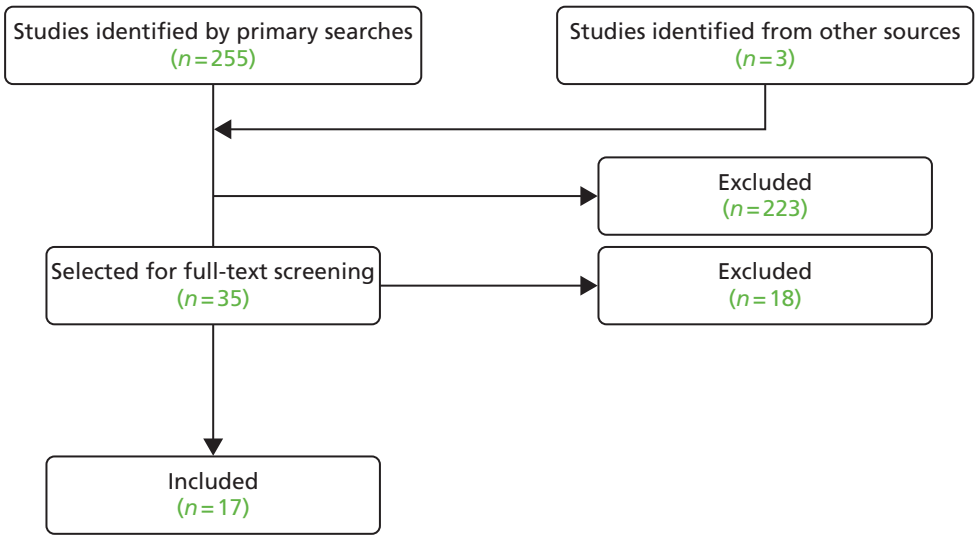


FIGURE 17 Flow chart of the number of potentially relevant reports identified and the number subsequently included and excluded from the review.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Included studies

Of the 17 evidence syntheses included, 10 provided incentives to consumers and were relevant to women of childbearing age,[3,237–245] one focused on young people aged 11–19 years,[236] one provided incentives to both consumers and health service providers[2] and five delivered incentives to health service providers relevant to the UK NHS and included some studies in which the incentive targeted a complex lifestyle behaviour.[246–250]

Excluded studies

The reasons for exclusion of assessed full-text reviews are given in *Table 35*.

Characteristics of included studies

All included reviews reported outcomes for some complex lifestyle behaviours, with eight reviews including studies reporting outcomes for adult smoking cessation, either alone[237,238] or combined with other lifestyle behaviours.[3,236,239] Six reviews included studies reporting outcomes for weight management or diet alone[241,244] or in addition to other lifestyle behaviours.[2,3,236,239,240,242] Six reviews included addiction to drugs, including cocaine, alcohol or opiates alone[243] or in combination with tobacco[240,242] or other lifestyle behaviours.[3,236,245] One review included incentives for physical activity in addition to other lifestyle behaviours.[239] The study by Kavanagh and colleagues[239] was a scoping review of study titles and abstracts only; all other studies reviewed full-text publications and reports of intervention studies. In the following sections we present key points relevant to the aims and objectives of the BIBS study; *Table 36* summarises the data on consumer incentives.

Consumer incentives: findings that support the Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study evidence syntheses of incentives to increase smoking cessation in pregnancy and/or breastfeeding (see Chapter 3)

Effectiveness of incentives for lifestyle behaviour change

- Effectiveness is short term and dissipates when the incentives are withdrawn.[2,3,238,241,242,245] Short-term programmes may have more effect than long-term programmes.[242]
- Uncertain whether there is a dose–response curve.[2,237,240] Even small incentives can influence health-related behaviours.[2,245]
- Consistent periodic incentives (compared with one-off incentives)[3] delivered as rewards immediately after (vs. delayed) and contingent on a validated test to confirm change are effective.[3,236,240,242,243]
- Abrupt withdrawal of cigarettes rather than reducing the level of smoking consistently predicted successful smoking cessation.[237]
- Larger effect sizes are seen with higher researcher involvement.[242]

TABLE 35 Reasons for exclusion of studies

Reason for exclusion	No. of studies excluded
Not a systematic evidence synthesis[6,251–254]	5
Outcomes do not include complex lifestyle behaviours[255–257]	3
Incentive criteria not met[258]	1
More up-to-date review available[259–266]	8
Setting not relevant to UK health services[267]	1
Total	18

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Findings that were not identified in the BIBS smoking in pregnancy and/or breastfeeding reviews
Cahill 2008[237] Quit and win contests for smoking cessation	Smoking cessation	Adult smokers within the targeted community	Quit rates were significantly higher (8–20%) for quit and win competitions than in the control groups at the 12-month assessment. None of the included studies was a true RCT as the control populations were different and more generic than the intervention populations. The population impact was small, ranging from one in 1400 to one in 160 smokers quitting. Two factors were consistent predictors of success: the assistance of supportive others (partner, cohabiting non-smokers, family and friends, workmates) and abrupt cold turkey withdrawal rather than reducing smoking. The average cessation rates stayed relatively stable and did not appear to be diluted by increased participation; therefore, enhancing participation is important to increase absolute numbers of quitters. Reported quit rates are higher in developed countries. Cost-effectiveness could not be determined. No dose–response effect was observed	Predominantly female, younger, better-educated, heavier smokers with previous quit attempts who are in the contemplation or preparation stage for change register with quit and win contests. In one of the five included studies, women and low-income groups were as likely to quit as men and high-income groups and show particular promise. Quit and win contests might be attractive to women. Deception rates, when they could be measured, were high and may compromise the validity of the intervention. Recruitment was through self-selection via mass media advertising campaigns, which included television, schools and workplaces. Raffle prizes included a holiday to Disneyworld. Volunteers delivered the intervention and prizes were donated. Biochemical outcome validation was usually for prize winners only and nearly always this included CO testing only, which can be falsified by not smoking for a few hours	Settings were relatively large geographical areas with no targeting of specific smoking populations. Population impact calculation = (quit rate × % of smokers who participated in the intervention) facilitates comparison between intervention settings and calculation of number needed to participate for long-term abstinence. Relationship between community involvement in competitions, financial motivation and the value of the prize

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Findings that were not identified in the BIBS smoking in pregnancy and/or breastfeeding reviews
Cahill 2011[238] Competitions and incentives for smoking cessation	Smoking cessation	Adult smokers of either sex in any setting. Excludes pregnant smokers	Of 19 heterogeneous studies, only one demonstrated a significantly higher quit rate for the incentives group beyond 6 months. No evidence that participants who committed their own money did better than those who did not (four studies) or that contingent rewards enhanced success rates over fixed payment schedules (four studies). Recruitment rates can be improved by rewarding participation but this does not lead to higher quit rates	Incentives of < US$750.00 together with referral to independently funded local smoking cessation services were components of interventions reporting prolonged abstinence. Early success dissipates when the rewards disappear. Most studies were set in the workplace and were based in the USA. Most studies were multicomponent. Little evidence that levels of deception differed between intervention and control groups and rates were low. People responding indirectly (not face to face) to a question about their smoking and not expecting to have their answer checked biochemically showed a higher level of discrepancy	Cost-effectiveness could not be assessed as the efficacy of most interventions was not demonstrated. Two studies provided lottery tickets for a prize draw for smoking buddies. Generalisability of the findings to populations with diverse regional, socioeconomic and ethnic mixes. Random biochemical testing and cross-checking with family and friends. Merits of cash vs. payments in kind (e.g. grocery vouchers) are unknown
Jochelson 2007[3] Paying the patient. Improving health using financial incentives	Any	Patients	Financial incentives are effective for simple, time-limited behaviours but not for complex behaviours. They encourage participation and reduce attrition in lifestyle programmes, but healthier behaviour is not maintained once the reward is withdrawn. They may be useful as one part of a multifaceted programme. There is limited evidence on behaviour deposit contracts with payments made (or forfeited) from the deposit if goals met (not met)	Higher-value incentives increased participation. Better outcomes were reported for incentives delivered immediately (vs. delayed) after testing a specimen and interventions that provided feedback and increased self-efficacy. Consistent and periodic rewards may support behaviour change compared with one-off rewards. A controlling or humiliating communication style can undermine behaviour change compared with praise and encouragement	Penalising poor performance may reinforce the sense of personal failure and attrition rates may be higher. Group weight loss contracts may be more effective than individual, with group participants less likely to regain weight

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Findings that were not identified in the BIBS smoking in pregnancy and/or breastfeeding reviews
Kane 2004[2] Economic incentives for preventive care	Health promotion and preventative care pre-diagnosis of a disease	Providers and consumers	Little evidence available to support explicit provider financial incentives. Consumer economic incentives are effective for simple preventative care and distinct short-term behavioural goals that are well defined. There were no long-term benefits. There is minimal evidence for a dose–response effect for provider incentives. For consumer incentives the threshold dose appears low. Facilitative incentives to increase engagement in a new behaviour and programme participation are effective. Studies using disincentives showed significant effects. Coupons were preferred to gifts. The cost-effectiveness and effectiveness of provider incentives for complex behaviours are relatively unexplored	Low reporting of process data, e.g. timing, time lag between behaviour and incentive, frequency, performance feedback (private or public) or who received the payment (individual or organisation) for provider incentives. 'Improvements in chart documentation procedures may account for the positive effects'. For consumers, coupons that are more convenient and flexible may be preferred to gifts. Some were never redeemed. The effects of gift incentives were sometimes confounded by lottery and competition processes	Process factors: how the readiness stage of a provider to change behaviour may affect the salience of the incentive programme; barriers such as attitudes regarding the perceived accuracy of the data; provider work-flow decisions when only a portion of the patient base may be affected by an incentive programme; the providers' level of knowledge of guidelines; the effects of peer pressure and performance norms; continuity of care; fear of retribution; and professional pride. The potential synergy between individual-level and system-level incentives is untested
Kavanagh 2006[236] A systematic review of the evidence for incentive schemes to encourage positive health and other social behaviours in young people	Any health promotion, education or social behaviour	Young people aged 11–19 years	'Useful' in some settings for some groups, particularly for simple or single-event preventative health behaviours. School-based competitions reduced smoking behaviours in a small number of studies. No evidence for sustained behaviour change. Unintended consequences can occur if a proxy outcome such as attendance is rewarded rather than the behaviour outcome as in the UK government's Educational Maintenance Allowance (EMA) programme. The EMA targets means-tested household income and provides cash incentives for post-compulsory education attendance. Some	Attributes of the study setting, resources and interactions had an impact on intervention outcomes. Incentives are perceived favourably by young people. If targets are not met, self-esteem can be reduced; incentives perceived negatively can cause some harm, such as undesirable peer pressure. Incentives targeted at some groups and not others are perceived as unethical and inequitable by some. Consistent monitoring and rewards are important. Robust systems with skilled staff to provide intensive support are required. Commitment, organisation of services and characteristics of the	Experiential incentives including holidays and social outings; edible treats – ice cream, pizza; achievement recognition by peers/others – public presentation of certificates, applause. The EMA can be considered as a redistribution programme and was not perceived as unethical or inequitable – unlike some other targeted incentive interventions. How staff interpret reasons for non-compliance varies. Tracking and reminder systems for providers are important. Personal

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Findings that were not identified in the BIBS smoking in pregnancy and/or breastfeeding reviews
			incentive programmes do not achieve their intended demographic reach, with more advantaged groups benefiting from the programmes. The cost-effectiveness and the size and type of incentive that is sufficient to motivate young people are unknown	populations served possibly contributed to differential effects. A team-orientated atmosphere can reinforce compliance. Cash to reward staff collectively to fund lunches and 'treats' was valued. Competitions may be more suitable for younger teenagers before commencing smoking. Views of young people were not taken into account in the intervention designs	provider experience of the behaviour, praise and positive feedback from clients and from staff influenced compliance
Kavanagh 2009[239] Incentives to improve smoking, physical activity dietary and weight management behaviours: a scoping review of the research evidence	Smoking, diet, physical activity, healthy weight maintenance	Any consumer	Scoping review of study abstracts that recommends full in-depth systematic reviews for smoking cessation and weight loss in overweight or obese people	Uncertainty about the effects of incentives for low socioeconomic status groups	
Lussier 2006[240] A meta-analysis of VBRT for substance use disorders	Illicit drug, alcohol or tobacco dependence	Any	Meta-analysis of 30 studies showed that VBRT increased short-term abstinence with an average effect size of r = 0.32 (95% CI 0.26 to 0.38) compared with the control. More immediate voucher delivery at the clinic visit resulted in almost twice the effect size of delayed vouchers. Incentives with an average daily voucher earning of US$5.00 were associated with smaller effect sizes than those with an average daily voucher earning of between US$5.00 and < US$16.00, with a dose–response relationship observed. VBRT increased clinic attendance with an average effect size of 0.15 (95% CI 0.02 to 0.28)	Duration of the intervention was not a moderator of effect size unlike in the review by Prendergast *et al.*,[242] which included these studies and a wider range of contingency management interventions. Abstinence was for around 12 weeks in most studies. There were larger effect sizes for targeting a single drug than for targeting multiple drugs. Unlike in the study by Prendergast *et al.*,[242] there were also reported effects of VBRT for tobacco use	Delays between monitoring, feedback and receipt of the voucher might weaken the reinforcement effect. Monetary value of incentive may moderate the effect – dose–response curve observed. Effects beyond the intervention period – mixed results

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Findings that were not identified in the BIBS smoking in pregnancy and/or breastfeeding reviews
Paul-Ebhohimhen 2008[241] Systematic review of the use of financial incentives in treatments for obesity and overweight	Weight loss as a proxy measure of diet or physical activity	Obese and overweight mostly female patients	No significant effect of financial incentives on weight loss or maintenance at 12 and 18 months. Weak trends were observed for (1) more positive effects for incentives valued at ≥ 1.2% of personal disposable income and (2) reversal of effects for studies with 30-month follow-up data	Additional motivators such as providing food or a personal exercise trainer at groups. The contracting processes could be time-consuming. Attrition rates were high in some studies. Weak trends were observed (1) in favour of rewarding behaviour change rather than weight change; (2) for rewards for group rather than individual performance; (3) for incentives delivered by non-psychologists rather than psychologists. There were few data on lower socioeconomic and ethnic groups	Financial deposits with refunds made for either weight loss, compliance with behaviour change or attendance at sessions. Behaviour change rewards (self-report and not validated) compared with primary outcome (validated weight) rewards
Prendergast 2006[242] Contingency management for treatment of substance use disorders: a meta-analysis	Illicit drug, alcohol or tobacco dependence	Juveniles or adults	Meta-analysis showed that contingency management increased abstinence with a median effect size of $d = 0.42$ (95% CI 0.35 to 0.50). The magnitude of the effect size declined over time and was greater for a single illicit drug than for tobacco or multiple drug use. Larger effect sizes were associated with studies conducted in the 1970s and 1980s, higher researcher involvement and shorter (< 25 weeks) treatment duration, with higher effect sizes reported at < 11 weeks	VBRT (the voucher value escalates with each successive negative urine sample and is reset to a lower value for a positive sample). Support offered in addition to the incentive was often unclear	Shorter interventions may be more effective than longer interventions – possibly related to the chronic relapsing nature of substance misuse. 'Fishbowl' variable reinforcement interventions using either prize draws for financial incentives or documented praise. The aim of the fishbowl approach was to reduce costs
Roozen 2004[243] A systematic review of the effectiveness of the community reinforcement approach in alcohol, cocaine and opioid addiction	Alcohol, cocaine and opioid addiction	Adults aged 18–65 years with substance dependence excluding those for whom substance dependence was not the main diagnosis (i.e. adults with mental health	Evidence that the community reinforcement approach (CRA) with incentives is effective for cocaine addiction compared with usual care (two studies) but limited evidence for opioid addiction (one study). Evidence that CRA with abstinence-contingent incentives is more effective than CRA with non-contingent incentives for	All four cocaine CRA with incentives studies were conducted by teams including the same author (Higgins). It is unknown which components of CRA are most effective and which are necessary or superfluous. Authors suggest that 'The favourable results appear attributable to the inclusion of a significant other in the therapy and the	CRA is a multifaceted biopsychosocial approach that acknowledges the role of the environment and influences on habits and develops alternative rewarding social activities that are incompatible with substance misuse. CRA integrates cognitive–behavioural

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 36 Characteristics and findings of systematic reviews of incentives provided to consumers for other lifestyle behaviours that are relevant to the BIBS study (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Findings that were not identified in the BIBS smoking in pregnancy and/or breastfeeding reviews
		problems who also had a substance dependency)	cocaine abstinence (two studies). CRAFT (Community Reinforcement Approach including Family Training) to achieve a lifestyle that is more rewarding than substance misuse. Included trials have high internal validity but new trials should focus on high external validity. Little follow-up data beyond 6 months	use of reinforcement contingent incentives'. The social, vocational and recreational activities are a crucial component of CRA: peer group social reinforcement could improve outcomes. Feasibility of implementation in practice is questioned as this approach is labour intensive and has a high cost. CRA can be provided in five sessions over 4–6 weeks (< 50 hours per person) and can be tailored to individual goals	interventions including a treatment manual with incentive and pharmaceutical interventions to bring about change in environmental contingencies such as work, recreation and family involvement
Sutherland 2008[245] Paying the patient: does it work?	Any	Patients and employees/ community members	Even relatively small incentives can influence individuals' health-related behaviours, but effects diminish over time. Worksite incentive schemes have high adherence and seem promising for diet and exercise interventions. Few studies report long-term follow-up	Some but not all incentives studies increased attendance at pre- and postnatal care appointments. Selection effects occur when only the most motivated engage in the programme. Limited data on sample characteristics to know whether tailoring the incentive to certain populations would increase effectiveness. Information on overall programme costs was very limited	
Wall 2006[244] Effectiveness of monetary incentives in modifying dietary behaviour: a review of randomized, controlled trials	Dietary behaviour	Community-based populations	All four included trials found a positive effect of incentives on healthy eating or weight loss compared with the control group. Growing observational evidence for price reduction strategies increasing the purchase of healthy food and the increased sensitivity to price of those on lower incomes	Uncertainty about sustained positive effects. The small number of studies and small sample sizes precluded the drawing of any conclusions about the form or level or incentive. No studies assessed effects according to socioeconomic or ethnic group. No studies assessed cost-effectiveness	

Other components of incentive interventions

- Multicomponent interventions with support and feedback that increased self-efficacy had better outcomes.[3,236,243]
- Support from others (partner, cohabiting non-smokers, family, friends, work colleagues) consistently predicted successful smoking cessation.[237,243]

Incentive intervention design and delivery

- Incentives can increase recruitment and participation rates and this may increase the absolute numbers of quitters.[3,236–238]
- Predominantly female, younger, better-educated, heavier smokers with previous quit attempts who are in the contemplation or preparation stage for change register with quit and win contests.[237]
- Attrition rates can be high[241] and selection effects occur when only the most motivated engage in the programme; therefore, comparison between participants and non-participants is recommended.[245]
- Studies of incentive-based interventions should take into account the views of participants in designing and delivering the interventions.[236]

Consumer incentives: gaps in the evidence and findings that show promise and need further investigation for smoking cessation in pregnancy and breastfeeding (see Chapter 3*)*

Effectiveness of incentives for lifestyle behaviour change

- Voucher-based reinforcement therapy (the voucher value escalates with each successive negative urine sample and is reset to a lower value for a positive sample) has comparable efficacy to variable 'fishbowl' reinforcement using either prize draws (lower cost) for financial incentives or documented praise.[242]
- There are limited data on the costs of schemes or cost-effectiveness.[237,243–245] The contracting process can be time-consuming[241] and robust systems with committed, skilled staff to provide intensive support are required. Sustainability is a concern.[236,243]
- Quit and win competitions with easy to enter raffles, enticing prizes such as holidays or social activities, refreshed each year.[237]
- Coupons that are convenient and flexible may be preferred to gifts.[2]
- Workplace incentives have high adherence and show promise.[237,245]

Other components of incentive interventions

- Achievement rewarded through recognition by peers/others, for example public presentation of certificates, applause for young people.[236]
- Community reinforcement through social or recreational activities[243] and donation of prizes, together with health professional support and social marketing approaches.[237]
- The interagency communication and human resources necessary to sustain complex interventions and sustain behaviour change are unknown.[236]
- Incentives delivered to a group of participants, including social support networks, peers and families, with the aim of setting new peer norms.[3,241]

Incentive intervention design and delivery

- Unintended consequences can occur if a proxy outcome such as attendance is rewarded rather than the behaviour outcome. If targets are not met, self-esteem can be reduced, and incentives perceived negatively can cause harm, such as undesirable peer pressure.[236]
- The effect of media publicity to assist in recruitment is uncertain.[237]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

- There is uncertainty about incentives delivered by non-professionals or volunteers,[237,241] including those with personal experience of the behaviour,[236] compared with those delivered by health professionals.
- Tracking and reminder systems for providers, with a team-orientated atmosphere, can reinforce compliance. Cash to reward staff collectively to fund lunches and 'treats' was valued.[236]
- A controlling or humiliating communication style can undermine behaviour change whereas praise, positive feedback and encouragement help.[3,236]
- There are limited data reported on effectiveness for lower socioeconomic and ethnic groups and therefore it is not known whether tailoring the incentive to certain populations would increase effectiveness.[239,241,244,245]
- Some incentive programmes do not achieve their intended demographic reach, with more advantaged groups benefiting from the programmes.[236]
- Incentives targeted at some groups and not others are perceived as unethical and inequitable by some. When eligibility for incentives is means tested for household income, such redistribution incentives are more acceptable.[236]
- Levels of deception determined through random checks and cross-checks with family and friends varied but were higher in high-risk populations (e.g. drug addicts) and when checks were random and unexpected.[237,238]

Incentives delivered to health-care providers

The studies included in the reviews of incentive interventions delivered to health-care providers addressed only one of our identified complex lifestyle behaviours: smoking cessation. In addition, a wide range of simple behaviours related to primary and secondary disease prevention and quality of care or treatment were addressed. In the majority of reviews, process indicators for documenting smoking status, providing advice or referral to specialist services rather than quit outcomes were incentivised. The eligibility criteria for each review varied from narrow to broad, which resulted in considerable variation in the number of studies included, the number of different outcomes or process indicators reported and the range of study designs. There was considerable overlap both in the included studies and in the reported findings. It could therefore be difficult to attribute the reported findings to the smoking cessation studies. However, all studies reported on changes in provider behaviour as a result of an incentive intervention. The providers incentivised were predominantly doctors, either individually or as groups.

The reviews highlight that the popularity of incentives to change provider behaviour is partly because educational strategies involving protocols and guidelines alone have had limited success at improving the quality of care, are expensive and are difficult to sustain.[268] The underpinning theory is that financial incentives will change health professionals' behaviour to improve the quality and/or quantity of care or reach targets, with the assumption that this will translate into improved patient outcomes, resulting in reduced costs and improved access to care. However, health professionals often have high levels of intrinsic motivation to improve patients' health and well-being and extrinsic incentives can crowd this out with potentially detrimental consequences for health care.[269] A small extrinsic incentive may be effective for a behaviour that the provider values highly. Conversely, a large incentive may be required to change a behaviour that is not considered important to the provider. The individual behavioural response to financial incentives may be more complex than generally considered by most empirical economic analyses, as health professionals are motivated by more than financial incentives[269] and gaming the system is a concern.[2]

Kane and colleagues[2] identify several forms that incentives for providers can take: pay per service provided (often called fee-for-service); pay per service with a bonus or penalty paid based on assessed performance [often called fee-for-service with withhold or pay for performance (P4P)]; on the basis of the costs of providing a service (often called cost-based or retrospective payment); a fixed payment (often called capitation or prospective payment); or a mixture of payment types. P4P became part of the UK general practitioner (GP) primary care contract in 2004. This is known as the Quality and Outcomes Framework (QOF) and financially rewards general practices for recording smoking behaviour and offering smoking cessation services, particularly for long-term conditions such as diabetes and heart and lung disease.[270] This is supported by prompts from electronic medical records available during the consultation. It does not incentivise smoking quit

outcomes and the recording of these is inconsistent. A maximum of 1000 points per annum can be earned by GPs for meeting quality process and outcome targets and 79 of these are for smoking indicators. Practices are paid on average £130.50 per point (2011/12 prices).[270] Currently, QOF does not include any complex lifestyle behaviours relating to pregnancy, unless the woman has one of the target diseases.

Overall, there is little evidence to date that would support provider incentives to improve complex lifestyle behaviour change outcomes for consumers and this area is relatively unexplored. However, undoubtedly incentives do change doctors' behaviour in supporting and documenting behaviour change. In the following sections key bullet points relevant to the aims and objectives are presented; *Table 37* summarises the data on provider incentives.

Provider incentives: gaps in the evidence and findings that show promise and need further investigation for smoking cessation in pregnancy and breastfeeding

Effectiveness of incentives for lifestyle behaviour change

- The effectiveness of provider incentives for complex lifestyle behaviour change is relatively unexplored and both studies and indicators are diverse.[246–250] Recording of smoking behaviour, provision of smoking cessation advice and referral rates to stop smoking services increase.[248,250]
- Improvements occur at the fastest rate in the first year of a programme and subsequently return to the pre-intervention rates of improvement.[247]
- Achievements for non-incentivised conditions worsen.[247]
- Provider incentives can narrow health inequalities between the most and the least deprived populations.[247,249]
- P4P seems effective to support uniform minimum standards. Ceiling effects are observed.[249]
- Guaranteed incentives seem more effective than competitions in which there are winners and losers.[249]
- Incentives result in greater consistency and improved organisation of care. Some doctors report improved teamwork and some nurses report enhanced specialist skills.[247]
- Protocol-driven care increases whereas person centeredness, patient satisfaction and continuity of care can decline.[247]
- Little is known about cost-effectiveness, price elasticity, the optimum size of incentives or opportunity costs. Costs can be considerable and depend on the other intervention components delivered.[246–250]

Other components of incentive interventions

- Incentives as one component in multicomponent interventions are more effective than incentives alone, for example incentives combined with education and subsidised medication for smoking cessation.[250]

Incentive intervention design and delivery

- A stronger theoretical basis for incentive schemes and more rigorous study design, with attention to tensions between scientific–bureaucratic and professional models of health care, are needed.[248]
- Most of the evidence relates to doctors or general practices rather than nurses or other maternity care providers. The differences in effect between incentivising individuals and incentivising groups are uncertain.[247,250]
- Little is known about the prevalence of gaming or unintended consequences as they are seldom evaluated.[246,247,249]
- Little is known about the impact of provider incentives on provider–patient relationships, provider–provider relationships, teamwork or morale.[247,248]
- Recommendations: select and define targets on the basis of room for improvement, involve stakeholders and communicate information thoroughly and directly and focus on both quality improvement and achievement.[249]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

NIHR Journals Library www.journalslibrary.nihr.ac.uk

TABLE 37 Characteristics and findings of systematic reviews of incentives delivered to providers for other lifestyle behaviours that are relevant to the BIBS study[a]

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Relevant evidence gaps that apply to smoking in pregnancy and/or breastfeeding	Incentive strategies/ themes to explore in primary research
Flodgren 2011[246] An overview of reviews evaluating the effectiveness of financial incentives in changing health-care professional behaviours and patient outcomes	Aspects of the quality, quantity or targeting of care	Health professionals	Incentives were categorised by the unit of reimbursement rather than considering the unit of effect. Studies looked at the impact of paying per unit of time; paying per unit of service; paying for providing to specific types of patients; and paying for providing a prespecified level of care or providing a change in activity or quality of care. Payment was generally effective for providing (1) a service, episode or visit, (2) care for a patient or specific population and (3) a prespecified level of care or change of activity or quality of care. Financial incentives improved processes of care, referral and admissions and prescribing cost outcomes. There was no evidence for an effect of financial incentives on patient outcomes. There was mixed effectiveness of incentives for consultations or visits and incentives were ineffective for improving compliance with guidelines or for working for a specified time	No studies evaluated adverse or unexpected effects. No studies investigated variable 'doses' of incentive. The studies had methodological weaknesses and the generalisability of the findings is uncertain. Doses of incentives were poorly described	Adverse or unexpected effects; dose–response effects for incentives; how incentives interact with intrinsic motivation	The relationship between the dose of the incentive and the value or intrinsic motivation of the behaviour that it seeks to change; the effectiveness of different payment strategies, i.e. meeting a target level, targeting specific groups (good way of avoiding patient selection), paying per service provided

TABLE 37 Characteristics and findings of systematic reviews of incentives delivered to providers for other lifestyle behaviours that are relevant to the BIBS study[a] (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Relevant evidence gaps that apply to smoking in pregnancy and/or breastfeeding	Incentive strategies/ themes to explore in primary research
Gillam 2012[247] Pay-for-performance in the United Kingdom: impact of the Quality and Outcomes Framework: a systematic review	Process and intermediate outcome measures in a wide range of domains	General practices	Quality of care for incentivised conditions during the first year improved at a faster rate than the pre-intervention trend and subsequently returned to previous rates of improvement. Achievement for non-incentivised conditions worsened in relative terms. The impact remains uncertain. Conflicting findings because of the diverse indicators and study heterogeneity	Inequalities in the process of care narrowed between the most and the least deprived population quintiles. Ethnic and age-related variation were both reduced. Greater consistency and improved organisation of care. Some doctors reported improved recording and teamwork and some nurses reported enhanced specialist skills. Protocol-driven care increased, with person centeredness and continuity perceived as being negatively affected and patients' satisfaction with continuity of care decreasing. Care should be taken over the weight given to 'perceived' changes although some of these were supported by studies of patient experience	Few studies evaluated cost-effectiveness and this varied according to the indicator. The costs of the scheme are substantial and the opportunity costs are unknown. The effects of incentives and the availability of comparative outcome data on teamwork, hierarchies, morale and the primary care provider–patient relationship are also unknown. There was little evidence of gaming. Linking the size of the financial reward to the public health impact of individual indicators was recommended	Impact on non-incentivised care, teamwork, staff–staff and staff–patient relationships, organisational hierarchies and workload; ethical issues; the extent to which incentives should be linked to protocols; scientific–bureaucratic medicine as a threat to professionalism; comparison of data between colleagues and teams
Hamilton 2013[250] Effectiveness of providing financial incentives to healthcare professionals for smoking cessation activities: systematic review	Smoking cessation	Individual or groups of health-care providers (doctors, nurses or other members of health-care teams)	Financial incentives appear to improve recording of smoking behaviour, the provision of smoking cessation advice and referral to stop smoking services. Three studies reported smoking quit rates and the results were mixed. Multicomponent interventions are more effective than single-component interventions. Cost-effectiveness was examined in one study only and depended on the training and medication components of the intervention	Four studies examined effects on individual doctors, with the remainder examining incentives provided to groups of health-care providers. Financial incentives may have more effect when combined with other interventions, e.g. education, subsidised smoking cessation prescriptions. There is evidence of GPs' perceived lack of expertise in changing smoking behaviours and overcoming this could increase the effectiveness of incentives	Interactions between health-care provider training and incentive provision. Effectiveness of incentives for nurses and non-doctor staff is unknown. Price elasticity and the optimum incentive level are unknown. Evidence on the response to incentives appears to be clearest for two types of interventions: measuring smoking status and prescribing, which are both relatively easy to implement	Individual or group provider incentives; the other components that might increase the effectiveness of financial incentives delivered to providers

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 37 Characteristics and findings of systematic reviews of incentives delivered to providers for other lifestyle behaviours that are relevant to the BIBS study[a] (*continued*)

Study and title	Behaviour	Population	Summary of effectiveness findings	Summary of incentive delivery process findings	Relevant evidence gaps that apply to smoking in pregnancy and/or breastfeeding	Incentive strategies/ themes to explore in primary research
Scott 2011[248] The effect of financial incentives on the quality of health care provided by primary care physicians	Patient well-being, which included smoking cessation	Primary care physicians or teams	The effects of financial incentives on the quality of primary care were 'modest and variable'. For the three included smoking cessation trials, there were statistically significant effects on referral rates and recording of smoking status, but not on measures of smoking cessation	Studies used a variety of payment mechanisms including single-threshold target payments, a fixed fee per patient achieving an outcome (smoking quit) and payments based on the relative ranking of medical groups' performance (tournament-based pay). The size of the incentives as a percentage of total revenue is unknown	A stronger theoretical basis for incentive schemes and more rigorous study design; degree of attachment between patients and physicians; how the incentive payments were distributed and used within teams	Different payment mechanisms; how the level of attachment between provider and patient might interact with incentives to providers
Van Herck 2010[249] Systematic review: effects, design choices, and context of pay-for-performance in health care	Any medical condition including prevention	Primary care or acute hospital care providers	Effects were variable from absent to strongly beneficial, relating to the design choices and context. In general, there was about a 5% improvement because of P4P. It seems effective to support uniform minimum standards. Positive results were reported for smoking cessation. Ceiling effects occur. Financial rewards seemed to generate more positive results than competitive approaches in which there were winners and losers. Equity is improving in the UK. Unintended effects on non-incentivised interventions or conditions were identified. Positive and negative spillover effects were reported. There is limited evidence that gaming occurs with P4P	Recommended P4P programme best practice hypotheses and recommendations: targets should be selected and defined on the basis of room for improvement; use process and intermediary outcome measures as targets; implement a uniform design; involve stakeholders and communicate information thoroughly and directly; focus on both quality improvement and achievement; distribute incentives to the individual and/or the team rather than at the organisation level. The dose–response relationship is not known. Incentives worked better when they were introduced to a uniform health-care system as opposed to a fragmented payment-based system	There is little evidence on the co-ordination and continuity of care or patient centeredness. Few studies measured gaming or unintended consequences; however, these seem minimal	Importance of communication and awareness of provider incentive programmes; organisational aspects; incentivising individuals or teams

a The study by Kane and colleagues[2] reviewed incentives for both consumers and providers and is summarised in *Table 36*. The findings are included in the later reviews in this table.

Discussion

The evidence supporting incentives delivered to consumers to change lifestyle behaviours is strongest for contingency management programmes with varying levels of additional support addressing illicit drug, alcohol and tobacco use. Meta-analysis of included studies was possible for these behaviours and showed short-term effectiveness of around 12 weeks.[240,242] Other studies in reviews of incentive strategies for smoking cessation, including competitions,[237,238] were so heterogeneous that it was not considered appropriate to calculate an overall combined effect. The methodological quality was variable, particularly for verification of smoking outcomes using CO monitoring. Presently, evidence does not support incentive interventions for weight loss through diet or exercise.[236,241] There is an absence of sustained longer-term behaviour change. Unknowns include the most effective dose including ceiling effects; the nature of the dose–response relationship; and the optimal proportions of incentive to psychosocial support for effectiveness, as well as the characteristics of the support. The reach of incentive interventions is poorly reported; many studies have small sample sizes and the question of selection bias arises. Indeed, typologies of the impact of incentives on five groups of individuals – the 'lucky ones', the 'yes I can' group, the 'I'll do it tomorrow' group, the 'unlucky ones' and the 'leave me alone' group – have implications for whether incentives should be universal, targeted or abandoned.[271] Unintended consequences are reported in some studies, with gaming to receive the incentive seeming more likely if the incentive rewards attendance rather than the actual desired behaviour. Incentive studies for complex lifestyle behaviours are therefore predominantly hypothesis generating and have largely targeted individuals and further research into targeting other populations is indicated, for example families, communities and workplaces.

The evidence supporting incentives to change provider behaviour is predominantly for provider process outcomes not relevant to the complex lifestyle behaviours of interest. In the included studies, only interim process indicators for smoking cessation were relevant to our review. These included relatively simple health professional behaviours to change, such as documenting smoking status, the provision of advice or referral to stop smoking services. There was no reported evidence relating to incentives delivered to providers to change consumer complex lifestyle behaviours. A recent analysis of incentives for smoking counselling implemented as part of the UK QOF payments questions their utility.[272] Coleman[272] argues that incentives may not be having the desired effect and that they could adversely affect patient-centred care and that indicators of meeting targets require rigorous evaluation.

Research has focused on incentives delivered to doctors rather than to nurses, midwives or maternity staff, thus limiting their generalisability to smoking in pregnancy and breastfeeding. The UK evidence is dominated by the QOF financial incentives provided to general practices, whereas US incentives have largely been paid to individual doctors. There is an absence of evidence on how the financial incentives are distributed within practices. UK GPs have independent contractor status and employ practice nurses and other staff. It is unclear to what extent each team member perceives the QOF as a financial incentive or as a managerial tool, as electronic reminder systems are commonly used that can trigger intrinsic motivation to provide quality care. Findings suggest that, for complex behaviours, multifaceted programmes might be more promising than single-component interventions. Components might include electronic prompts, education of health-care providers or subsidised smoking cessation medication, as well as a financial payment for meeting a target level. However, the evidence is dominated by a few well-researched programmes, in particular the QOF.

Commitment contracts for lifestyle behaviours have been considered for consumers to bring the risk of loss into the present, reduce temptation and increase motivation,[273] but these have received less attention for providers. In an overview of P4P for health service providers by the King's Fund, which did not meet our inclusion criteria, Appleby and colleagues[255] conclude that giving priority to the prevention of illness will require a radical rethink of the incentives needed. A recently published checklist helps decision-makers to assess when incentives might do more good than harm, to help prevent premature or inappropriate implementation.[274] Importantly, the checklist highlights the need for systems and structures to be in place to facilitate a provider incentive intervention.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Strengths and limitations

This was a scoping review of evidence syntheses of incentives for lifestyle behaviour change and we cannot guarantee that every relevant review was identified by our search strategy. The aims of the review were very specific to the BIBS study and the data extracted are therefore selective and purposive. A recently published review found no convincing evidence that effects were different between incentives for different groups of behaviours: long-term (> 6 months) smoking cessation, attendance for vaccination or screening, or all behaviours.[275] This study reports some evidence that effect size increased with increasing incentive value in smoking cessation studies with follow-up beyond 6 months. One further narrative review of contingent incentives for smoking cessation was identified after completion of this review. The study by Sigmon and Patrick[213] confirms findings on the effectiveness of incentives and discusses some new aspects of programme delivery. For example, technological innovations such as internet technology and smart phones to increase uptake of incentive interventions, with video recordings using a webcam to verify CO monitoring, are being developed and show promise.[276] We made every attempt to identify reviews between our cut-off dates by searching reference lists of the reviews that we included. We did not include general reviews for the included complex behaviours, some of which include incentive studies, for example a review of smoking cessation in pregnancy.[54] Incentives for increasing exercise are therefore likely to have been missed as no stand-alone review was identified. As exercise involves the establishment of a new behaviour, this could have relevance for breastfeeding, for example one recent study investigated a loyalty card scheme to increase the uptake of exercise in the workplace.[277]

Conclusions

In the following section we consider how the evidence presented in this chapter supports, refutes or does not contribute to the development, acceptability and any unintended consequences of the shortlist of incentive strategies for smoking cessation and breastfeeding commenced in *Chapter 3*.

The following pointers were incorporated into discussions with service users (see *Chapter 2*) and the qualitative interviews (see *Chapter 6*), and the shortlist was finalised at a grant holders' meeting in February 2013. The final shortlist taken forward for further qualitative investigations and the survey research is presented in *Chapter 6*.

Pointers for the incentive strategy shortlist

- Supports *contingent shopping vouchers* for proven smoking cessation in pregnancy and for breastfeeding, with regular monitoring, feedback and support provided by someone with expertise. The effects appear to be short term; however, as the maximum benefit period is the 9 months of pregnancy plus 6 months for breastfeeding,[60] this may be less important than for other lifestyle behaviours such as obesity.
- Supports *incentives beyond the individual* as involvement of others in an incentive intervention (partner/cohabitant, family, friends, work colleagues) consistently predicted successful smoking cessation. However, there is a gap in the evidence with regard to incentives delivered to groups rather than individuals, for example social support networks, peers and families.
- Supports the strategy of *financial incentives delivered to providers* for improving outcomes relevant to the quality of care and for changing service provider and professional behaviour. However, their impact on actual lifestyle behaviour outcomes is unknown. Given the low number of studies identified that tested provider incentives for smoking cessation in pregnancy and breastfeeding (see *Chapter 3*), these warrant further investigation. The findings strengthen the case for more research to evaluate provider incentives and commitment contracts for breastfeeding, particularly as support was identified as the dominant barrier/facilitator in *Chapter 4* and there is some evidence of improved breastfeeding outcomes from multicomponent accreditation interventions that include an award (see *Chapter 3*).
- This review does not contribute any relevant evidence on the effect of the provision of free or subsidised *breast pumps.* However, returning to work is a trigger for breastfeeding behaviour change and workplace interventions show some promise.

Pointers for the acceptability of incentives and any unintended consequences

- There is uncertainty and about the acceptability and effectiveness of targeting incentives to some populations and the impact of incentives on health inequalities.
- Gaming is an unintended consequence, particularly if attendance or a preparatory behaviour is incentivised rather than the target behaviour.
- Neglect of non-incentivised areas of care can occur when incentivising providers.

Implications for research

Many hypotheses are generated by the reviews and warrant further research; in particular, multicomponent interventions, the involvement of social support networks, different settings for incentive programmes such as the workplace, the use of raffles and community engagement all show promise and warrant more robust evaluation. The review of incentive reviews has identified both gaps in the evidence and emergent themes, which have informed the qualitative study and survey data collection described in *Chapters 6* and *7* respectively.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Part 2

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 6 Primary qualitative study investigating perspectives on incentives

In this chapter we present qualitative research that explores the mechanisms of action and interactions of incentives, a shortlist of incentive strategies and the unintended consequences of incentives. An incentive 'ladder' logic model for behaviour change is used. This was developed during the course of the study from the analysis and synthesis of the mixed-methods data and in collaboration with our service-user co-applicants (see *Chapter 2*). We consider the ladder model to be a useful metaphorical aid to explore how the components and delivery of incentive programmes fit with the behaviours, which are enmeshed in women's life courses and contexts.

Methods

Design

This primary qualitative research was part of a mixed-methods approach that included the three evidence syntheses (see *Chapters 3–5*), general public and health professional surveys (see *Chapter 7*) and a DCE (see *Chapter 8*). In addition, co-applicant service users contributed to the design and the data (see *Chapter 2*), and independently collected qualitative interview and focus group data from the CPIT[88] (see *Box 2*) were included in the final analysis. A timeline for the study is given in *Figure 2*. The mixed-methods approach was informed by different theoretical approaches and used both deductive and inductive reasoning.

The shortlist of promising incentive strategies (*Table 38*) was agreed by consensus at a research team meeting in February 2013 by considering the evidence syntheses (see *Chapters 3–5*), service-user input (see *Chapter 2*) and early qualitative interview data. It was unclear from the evidence syntheses in *Chapter 3* what other components, for example BCTs, might be needed as well as the incentive as no trial tested an incentive alone compared with no incentive. A framework approach[278] was therefore applied early in the data collection and analysis to inform incentive trial design for the shortlist of incentive strategies. Trial design has fixed components and processes that tie in with Consolidated Standards of Reporting Trials (CONSORT) guidelines for reporting trials.[279] The shortlist of incentive strategies in turn informed the design of a survey (see *Chapter 7*) to measure acceptability and the results then fed back into the qualitative data collection and analysis. In particular, open questions were included in the survey about the consequences of incentive programmes (see *Chapter 7*).

TABLE 38 Shortlist of promising incentive strategies

No.	Details
1	Incentives for women who prove that they have stopped smoking during pregnancy
2	Incentives for women for 2 months after the birth of their baby if they prove that they are still not smoking
3	Incentives beyond the individual, for example incentives for a partner or a buddy or for a smoke-free home
4	Incentives for women who prove that they are breastfeeding
5	A breast pump provided for free on the NHS
6	Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy, or penalties if targets are not met
7	Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding, or penalties if targets are not met

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

A grounded theory approach[280] was applied concurrently to develop an incentive taxonomy and to understand the mechanisms of action of incentives. This is appropriate as it is a relatively unexplored area. We used an iterative approach to collecting data, analysis, refining our research questions, theoretical sampling, revising the topic guides and refining the analysis. A range of qualitative methods was also integrated, including unstructured interviews, structured interviews with vignettes, focus groups, interactive discussions, observations with mother-and-baby groups and open questions on surveys.

Key research questions

Our research questions were:

- How do incentives alter the balance of existing intrinsic and extrinsic motivators/demotivators?
- How do incentives interact with the environmental, organisational, social and cultural facilitators of and barriers to behaviour change?
- Is the shortlist of incentive strategies acceptable and feasible?
- What are likely to be the unintended consequences for the incentivised and the non-incentivised?

Study settings

The settings for conducting this research included primary and secondary health services and local authority community and voluntary sector services (e.g. antenatal clinics, children and family centres, mother-and-baby groups). Aberdeenshire, Lancashire and Glasgow (the CPIT[88]) were purposively selected for their diverse sociodemographic characteristics and their different incentive cultures for smoking cessation in pregnancy and breastfeeding (see *Box 1*).

Sampling and recruitment

The purposive, theoretical and snowball sampling strategy is summarised in *Table 39*.[281] This was flexibly implemented over time, with snowball sampling included to identify harder-to-reach, more disadvantaged participants and to search for disconfirming perspectives. For example, through a midwifery contact we were able to gain access to a Barnardo's group for teenage mothers.

TABLE 39 Sampling strategy

Sample	Recruitment strategy
Pregnant women and mothers/partners/significant others from the first trimester until 6 months after birth	• Pregnancy and mother-and-baby/toddler groups across Aberdeenshire and Lancashire • Antenatal clinics, GP surgeries, hospitals and community settings across Aberdeenshire and Lancashire • GPs and health visitors, midwives and voluntary workers across Aberdeenshire and Lancashire • Partners/significant others through women already participating • Anonymised qualitative interview data collected through the Glasgow CPIT[88]
Providers of care/stakeholders: midwives, health visitors, obstetricians, paediatricians, GPs, public health specialists, pharmacists, voluntary sector, children and family centre staff	• Purposive or theoretical sampling: individuals identified by NHS managers, primary care networks, antenatal clinics and baby clinics. Web survey question inviting volunteers to a 15-minute telephone interview/ 30-minute face-to-face interview • Providers involved in the Glasgow CPIT[88]
UK experts/decision-makers: UK government policy-makers for maternal and child health and public health, research ethics and research governance personnel, expert advisers, voluntary sector	• Purposive or theoretical sampling: individuals identified through key informants and our advisory panel. Web survey question inviting volunteers to a 15-minute telephone/30-minute face-to-face interview • Conference delegates at the Maternal and Infant Nutrition and Nurture conference, the UK National Smoking Cessation conference and the Public Health in Scotland conference

Benefits of Incentives for Breastfeeding and Smoking cessation in pregnancy study data collection

Qualitative data collection started in June 2012 and finished in early August 2013. Three postdoctoral researchers (NC, HM and GT) conducted qualitative interviews and focus groups in Aberdeenshire and Lancashire with the participants and conference attendees detailed in *Table 40*. They worked closely with the two mother-and-baby group co-applicants, informed by participatory research methods, which are described in detail in *Chapter 2*. Qualitative sampling strategies, topic guide refinement, data collection and analysis were iterative to address specific research questions as they arose and were refined throughout the study. Once interview participants' personal or professional trajectory vis-à-vis smoking in pregnancy and feeding intention/experience had been established, members of the research team explored interviewees' understandings of 'incentives', specifically as defined within the project: as financial or non-financial tangible incentives or rewards. Participants were asked how they conceptualised incentives, what various types of incentive might mean and whether or not they were acceptable. Early interviews explored the processes through which existing barriers to and facilitators of smoking cessation and breastfeeding could potentially interact with both incentives and other intervention components, including the BCTs identified in the evidence synthesis findings (see *Chapter 3*). Interviews were open-ended, audio recorded and transcribed verbatim. The lengths of the interviews ranged from approximately 15 minutes to 100 minutes. Topic guides changed over time as the analysis progressed, to ensure that key issues were covered (see *Appendix 15*). Although initial topic guides were informed by and explored issues relating to *Chapters 3–5* and the shortlist of promising incentive strategies, as the analysis progressed the sampling strategy and topic guides were modified to develop theory about incentive interventions and explore the acceptability and feasibility of the shortlist of incentives and the unintended consequences of incentives.

Intervention vignettes, used by PH in previous qualitative research to inform the design of an intervention,[62] were employed to facilitate more directed discussions when appropriate/feasible (see *Appendices 2* and *16*). Vignettes were developed from studies that either were effective or involved an unusual/notable approach. Three studies for each of the target behaviours were selected.[103–108] As reported in *Chapter 2*, the mother-and-baby groups contributed to interpreting systematic review findings by providing feedback on a number of vignettes of studies included in the evidence syntheses. Initially, vignettes were referred to assist participants who struggled to conceptualise incentives. Therefore, they were not used in all interviews because some participants spoke more confidently than others. Later, more focused discussions around the vignettes helped the research team to gain valuable participant insights into aspects of content and delivery as well as to generate data around what might be acceptable incentives for the target population. Vignettes were also used in interviews with health professionals and the studies represented were based on the shortlist.[82,103,105,168] These vignette data therefore enabled us to refine the shortlist.

Free-text responses by health professionals about the consequences of incentive schemes in response to open questions in the survey investigating the acceptability of the shortlist of incentive strategies (see *Chapter 7*) were entered onto a Microsoft Excel spreadsheet. The questions were:

1. We would like you to imagine that your local health service is going to run a scheme that provides incentives for stopping smoking in pregnancy. What do you think the consequence might be for participants and/or staff? (1) Positive consequences? (free text); (2) negative consequences? (free text).
2. We would like you to imagine that your local health service is going to run a scheme that provides incentives for breastfeeding. What do you think the consequence might be for participants and/or staff? (1) Positive consequences? (free text); (2) negative consequences? (free text).

Data collection for the Cessation in Pregnancy Incentives Trial

Data collection for the qualitative research element of the CPIT Phase II RCT began in April 2012 and ended in October 2012. Two experienced qualitative researchers (SM, JM) conducted semi-structured qualitative interviews with women participating in the trial and professional stakeholders. Interviews explored various topics to address the following research question: 'Can incentives be introduced in a way that is feasible and acceptable to women and service providers and are there any unintended consequences?'

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

One-to-one interviews with trial participants were conducted on a face-to-face basis in participants' homes located within the boundaries of the CPIT study site: NHS Greater Glasgow and Clyde. Qualitative interview participants were recruited as part of the process of recruitment for the wider trial. In total, 100 trial participants were approached to achieve a target qualitative sample of 20 women, which incorporated an equal balance across intervention and control groups and age groups (< 25 years and 25+ years). Sampling also involved an approximate 70/30 split with regard to participant location in the Glasgow or Clyde area, reflecting the population ratio within the health board area. Additionally, interviews were planned to incorporate different stages post setting a quit date (SQD), that is, SQD + 4 weeks, SQD + 12 weeks and SQD + 20 weeks.

Interviews began with discussion of individuals' experiences of smoking cessation services and their recent smoking cessation attempt and progressed to cover views on the use of incentives to encourage smoking cessation in pregnancy; their experience of, or opinions on, trial processes, including monitoring at key stages; and the likelihood of becoming involved in gaming. The initial topic guide used within interviews (see *Appendix 17*) evolved during the period of data collection to take account of interview experiences, specific requests from the trial team and participants' different stages post SQD. Every woman who took part in a qualitative interview for the trial was given £20.00 in cash as a thank you for participation.

Professional views were gathered in 10 one-to-one interviews and two focus groups involving 23 individuals overall. Interviews with professionals were mainly conducted face to face in the workplace although three interviews were conducted by telephone. Professionals were invited to participate in a study interview based on their role within the delivery of the trial or their professional interest in routine service delivery among pregnant women within NHS Greater Glasgow and Clyde. The content of the interview varied depending on the occupation of the participant but it followed a topic guide that covered personal experiences of trial implementation, including the impact on routine service delivery, and elicited views on key aspects of the intervention and trial, as in interviews with trial participants (see *Appendix 18*). Interviews lasted for between 25 and 80 minutes and all were audio recorded and transcribed verbatim.

Ethical approval for incorporating the qualitative transcripts from the CPIT into the BIBS study was granted by the West of Scotland REC2 on 25 May 2011.

Data analysis

All qualitative data were entered into NVivo10 software (QSR International, Warrington, UK) to facilitate data organisation, coding and retrieval. In addition, free-text responses to open questions in the health professional survey on the perceived consequences of incentive programmes were entered onto a Microsoft Excel spreadsheet and content analysis was used to triangulate the analysis of the interview data. Analysis was informed by the framework method,[278] which is well established as a transparent, systematic and rigorous data management tool in applied policy research. One of the strengths of the framework method is its potential to summarise data into thematic matrices, to look for patterns or explanations. Initially, three researchers (NC, HM and GT) identified key themes and categories independently by reading transcripts of and listening to the first four participant and four provider interviews. Through wider research team transcript reading and discussion, a single tree structure coding index (see *Appendix 19*) was agreed and applied in NVivo10 to the data sets from the separate sites, with merges of data sets every 2–4 weeks. The researchers undertook a detailed analysis of the data with regular discussion several times a week between sites to ensure consistency and to search for disconfirming perspectives. Drafts of the findings and analysis were circulated before weekly meetings with ongoing feedback provided by the project lead (PH). The emerging mixed-methods analysis, drawing on data from other stages of the BIBS study, and the framework matrices, informed and helped to develop an incentive logic model. CPIT transcripts were then added into NVivo10 software in July 2013 and incorporated into the analysis. This was to minimise bias of interpretation, as those participating in an incentive trial for smoking cessation in pregnancy are likely to bring very different perspectives to the data. The research team did not share the analysis of the data with the CPIT researchers until a final draft of this chapter was available, when they were asked to check it for accuracy.

When presenting the findings we refer to an intervention that aims to change smoking or breastfeeding behaviour as 'a programme', regardless of whether the reference point in the data is a research study (data collected using intervention vignettes), an actual intervention experienced, for example as part of usual maternity care or delivered in the community by the voluntary sector, or a potential future service delivered by health-care or other agencies. The collective term 'participant' is used within the text to indicate that all participant groups (women/partners, providers and experts) provided similar comments. When the points raised specifically refer to certain groups, this has been made explicit within the text. We refer to 'providers' as those who deliver a behaviour-related programme, with specific reference made to professional groups only when appropriate. The findings are supported by quotations from participants followed by a reference, for example 'FG5, I, mother'. The first code is the participant identification number, which can be cross-referenced to the detailed participant characteristics provided in *Appendices 20–23*, preceded by letters that relate to whether the participant took part in a focus group (FG), an interactive discussion (IA) or a telephone interview (T). If there is no preceding letter the participant took part in a face-to-face interview. The second code (the presence of an 'I') relates to whether the participant was/had been involved in an incentive programme. If there is no 'I' then the participant has no direct experience of an incentive programme. The last code provides a narrative description of who the participant is. To protect confidentiality, study sites and all quotations have been anonymised.

Findings

Sample characteristics

There were three main sample populations: (1) pregnant women and new mothers and their partners or significant others until 6 months after birth, (2) providers, who could either deliver or receive incentives to support women to initiate or maintain smoking cessation or breastfeeding and (3) experts and decision-makers in a management/co-ordinator position potentially responsible for implementing incentive programmes, for example a policy-maker at local, regional or national level or a member of a research ethics committee (*Table 40*). Some from each sample had had experience of incentive programmes for either smoking cessation in pregnancy or breastfeeding. Overall, a total of 177 participants took part in 16 focus groups, 55 face-to-face interviews and 19 telephone interviews. In addition, approximately 63 conference attendees at three conferences took part in audio-recorded interactive discussion sessions. Detailed characteristics of the sample are provided in *Appendices 20–23* and are summarised in *Table 41*. There were 432/497 (86.9%) responses to the open survey questions (see *Chapter 7* for the survey questions).

Initially, problems were encountered in the Aberdeenshire area in relation to recruitment. There appeared to be some resistance to the study by gatekeepers and thus recruiting both service users and health professionals proved difficult. Higher-level managers were supportive and this was cascaded down, for instance by facilitating meetings with middle management; however; it was largely unsuccessful. For example, on one occasion, a focus group was organised for local health visitors, during work time, on site at their office base. Despite being told to expect between six and eight participants, nobody attended. Nevertheless, by engaging a wider network of champions and through chance encounters (especially two made through the mother-and-baby group co-applicant in Aberdeen), both women and health professional participants in the Aberdeenshire area were able to be recruited to quota. In Lancashire, where there has been an incentive culture, no problems were encountered.

Overview of the findings

First we present a logic model that emerged from the data analysis and which addresses the first two research questions concerning the mechanisms of action of incentives and how they interact with the environmental, organisational, social and cultural facilitators of and barriers to behaviour change. Data are then presented to support the logic model. How incentive programmes might fit with everyday lives is therefore considered first, as this was of paramount importance to women. Although the interview topic guides focused on incentives, women's accounts constantly returned to smoking and breastfeeding within

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 40 Study participants

Participants	No. interviewed	Totals and format
Mother-and-baby groups: co-applicants:		Participants $n = 12$, focus groups[a] $n = 3$, face-to-face interviews $n = 2$
Aberdeenshire	$n = 6$	
Blackpool	$n = 6$	
Pregnant women and recent parents:[b]		Participants $n = 88$, focus groups[a] $n = 8$, face-to-face interviews $n = 39$, telephone interviews $n = 6$
Pregnant women	$n = 38$[c]	
Postnatal women	$n = 45$	
Partners	$n = 5$	
Providers:[d]		Participants $n = 53$
Midwives	$n = 11$	Focus groups[a] $n = 10$
Nurse	$n = 1$	Face-to-face interviews $n = 13$
Health visitors	$n = 12$	Telephone interviews $n = 6$
Doctors: paediatricians, obstetricians, GPs	$n = 5$	
Public health staff	$n = 3$	
Smoking cessation specialists/staff	$n = 11$	
Voluntary sector/ children's centre staff	$n = 2$	
Pharmacists	$n = 7$	
Incentive scheme administrator	$n = 1$	
Experts and decision-makers	$n = 24$	Participants $n = 24$, focus groups[a] $n = 4$, face-to-face interviews $n = 3$, telephone interviews $n = 7$
Public health, maternal and infant health conferences	Range of participants per session involving policy-makers, decision-makers, experts and some practitioners	Participants $n = \approx 63$, interactive recorded group discussions at conferences $n = 3$

a In total, 16 focus groups were conducted. At three focus groups with women/recent parents a provider was present and three focus groups were a mixture of providers and experts. Two women attended two different focus groups, as did two experts (they are counted once only).
b Thirty women/parents had experience of an incentive intervention [22 in the CPIT – incentive intervention for smoking cessation; four in a North West England breastfeeding incentive scheme; and four involved in Barnardo's Early Years Early Action Fund – see www.barnardos.org.uk/media_centre/press_releases.htm?ref = 81644 (accessed 30 September 2014)].
c Two pregnant women were involved in a follow-up postnatal interview (one of whom had an older child at the time of the first interview).
d Twenty-three CPIT providers/experts participated; one expert was involved in the breastfeeding incentive intervention and two experts had been involved in a voucher incentive programme for smoking cessation.

TABLE 41 Summary of characteristics of women and partner participants

Characteristic	Women/partners	Not recorded
Ethnicity	78 (88.6%) white, 9 (10.2%) black and minority ethnic	1 (1.1%)
Marital status	68 (77.3%) married, 18 (20.5%) divorced/single	2 (2.3%)
Currently employed	43 (48.9%) employed, 40 (45.5%) unemployed	5 (5.7%)
Smoking status	26 (29.5%) never smoked, 24 (27.3%) currently smoking, 37 (42.0%) previously quit	1 (1.1%)
Previous infant feeding behaviours ($n = 58$)[a]	51 (87.9%) previous experience of breastfeeding, 4 (6.9%) used formula only	3 (5.2%)
Current infant feeding intentions ($n = 18$)[a]	11 (61.1%) planned to breastfeed, 4 (22.2%) planned to mixed feed, 3 (16.7%) planned to formula feed	–

a Data collected for Lancashire/Aberdeenshire women only.

their everyday lives, with the interviewer needing to bring the topic back to incentives. Views about incentive programmes are then presented. Incentive strategies relating to the shortlist (see *Table 38*) are then considered in depth. Data on incentives contingent on verified outcomes, incentivising preparatory behaviours and for multiple health behaviours are presented. A typology of potential incentive components and their meanings to women is then detailed as well as the psychosocial and BCT intervention components that women felt should accompany incentive components. Other programme components in relation to goal-setting, monitoring and proof, help and support, and information and education are presented. This is followed by the context and delivery processes that are important for informing incentive programmes and trial design, for example the setting, who provides the programme and whether incentives should be targeted or universal. Providing incentives beyond the individual to partners, buddies, communities and providers of care is discussed, following which the mode, timing and intensity of delivery are presented. The final sections consider who pays for incentives, the unintended consequences and views on the conduct of research into incentives.

An incentive 'ladder' logic model for behaviour change

The research team considered the interactions and fit between women's lives, behaviour change, incentives and other intervention components in a programme and how to represent the complex interactions that emerged through data analysis. After careful consideration of other symbolic challenges, such as mountains to climb and pathways to navigate, and through informal conversations with our mother-and-baby group co-applicant collaborators, the team identified resonance between a 'ladder' as a metaphorical concept and the 'rungs' as what an individual woman might need to achieve the behaviour outcome(s). Ladders are universally comprehensible and accessible, whereas climbing a mountain, for example, would be unfamiliar to city residents without resources for transport. The ladder concept is represented diagrammatically in an incentive logic model (*Figure 18*) and summarised in *Table 42*. The logic model incorporates and builds on the four categories detailed in the taxonomy of IRBCTs (see *Table 2*): type/awareness, content, contingency target and actor. The taxonomy of IRBCTs is derived from a general taxonomy of BCTs,[17] which are included as other intervention components.

The configuration of rungs in each woman's ladder can differ considerably. The rungs represent intrinsic and/or extrinsic influences as well as programme components in the ladder to achieve the behaviour outcome(s). However, the ways in which these motivators/facilitators/components fit together might be flawed from the woman's perspective, or some rungs might compensate for others or need to be replaced or (re)introduced. Broken or missing rungs represent something/someone/a situation that impedes, reverses or destabilises, or is a barrier to taking another step towards behaviour change.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

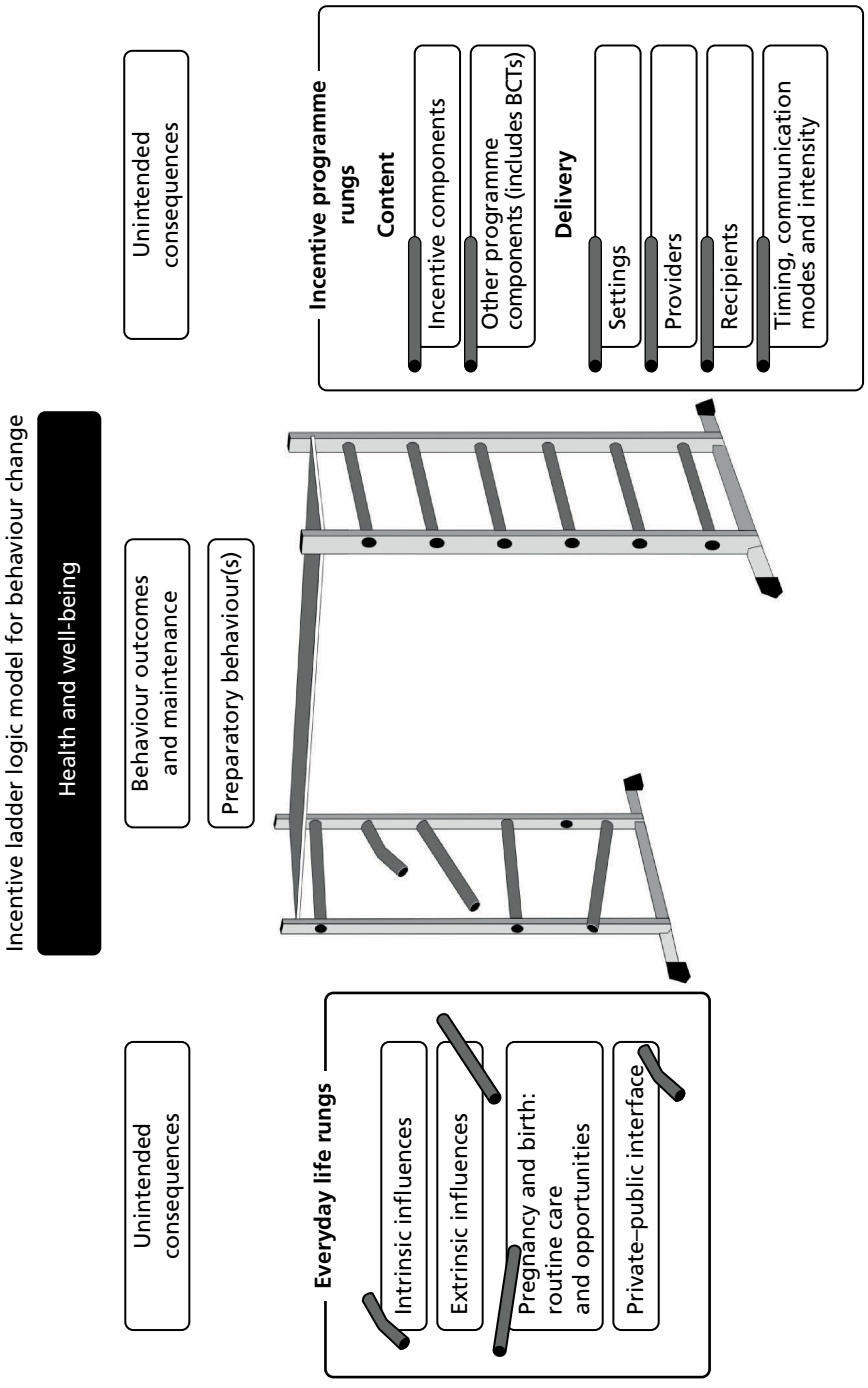


FIGURE 18 Incentive ladder logic model: two interacting metaphorical 'ladders' with complete, missing or broken rungs are joined by a platform representing sustained behaviour change.

TABLE 42 An incentive ladder logic model for behaviour change

Metaphor	Represents	Examples
Ladder	A behaviour change process, which includes life course and context rungs and incentive programme rungs	Even though a woman may be engaging in a behaviour change incentive programme, smoking and infant feeding are socially located and influenced
Life course and context rungs	Something/someone/a situation in the woman's life that helps/facilitates or motivates her to climb the ladder and supports her at each step	Rungs may be a woman's desire and willpower to change, positive health decisions influenced by pregnancy/birth events, routine maternity service care, social network/partner/family friends, the environment/place/community/ media or a combination of these
Damaged rungs	Intrinsic or extrinsic barriers or demotivators that a woman may encounter	A rung might break when a woman and her partner both quit smoking but the partner relapses, thus weakening social support
Missing rungs	Lack of contemplation of the behaviour, independence from or rejection of rungs	A rung might be missing, for example when no one in the immediate social network has breastfed or a woman does not believe the health evidence
Incentive/reward programme rungs	Incentive/reward component(s), contingency and verification of the behaviour, other intervention components, programme processes and modes of delivery	An intervention that includes an incentive and other components, for example CO monitoring, BCTs such as goal-setting, support, feedback

An incentive might be one or more rung(s) among several on a ladder. These rungs might appear in conjunction with other rungs, such as an additional psychosocial intervention or BCT components to bolster the rungs. Although an incentive programme may offer a standard package of rungs, each woman's ladder will vary in how complete, broken or damaged it is, and the condition of the ladder can change very quickly and unpredictably, particularly for those with more chaotic or disadvantaged lives.

The length of the ladder will vary for each programme and for the behaviour change process that each woman will go through. From the literature reviews, a woman's journey through an intervention programme (see *Chapter 3*) may involve relatively short ladders with few rungs (intervention components or processes) provided over a short time period, for example the trials by Chamberlain and colleagues[103] or Hayes and colleagues,[172] or longer ladders with many closely spaced rungs to start with and then longer spaces between rungs, for example the trials by Heil and colleagues[105] or Higgins and colleagues.[144] Similarly, ladder length can be determined by when the final outcome or goal is set. Goals may be relatively short term or longer term, requiring more effort, for example maintaining smoking cessation until the end of pregnancy or until 4 months after birth or breastfeeding for 6 months compared with 6 weeks. In contrast to a drug trial, in which the drug is all that is needed for the change in outcome, our data suggest that an incentive in isolation will seldom be sufficient to maintain behaviour change, a finding supported by the lifestyle behaviour change literature reviewed in *Chapter 5*. Instead, a combination of rungs is required to support a woman's journey. Some women require very few or no intervention component rungs to change their behaviour as they have sufficient rungs within their own intrinsic (e.g. motivation, confidence, resilience) or extrinsic (e.g. support from partner, family and friends) resources. For example, one woman in a co-applicant mother-and-baby group meeting to discuss 'ladders' reported that she stopped smoking immediately when she developed chest pains and no additional help was required, whereas another woman said that 'the ladder keeps getting longer and longer'. Pregnancy is a sufficient trigger and motivator for maintaining behaviour change for some, who as a result may never need to engage in an intervention programme. Others require many and frequent intervention programme rungs to succeed. Some women choose to restart smoking or stop breastfeeding and leave the ladder; however, some programmes allow for behaviour relapse by resetting the value of the incentive to a lower level and by setting a new quit date (e.g. studies by Heil and colleagues[105] and Higgins and colleagues[144]) and women may therefore be afforded a 'second chance' or repaired rung(s).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

In interviews, perspectives on which outcomes should be incentivised were considered and are represented at the top of the ladder model (see *Figure 18*). When discussing the shortlist of incentive strategies, the outcomes chosen were smoking cessation for the duration of pregnancy and breastfeeding for 6 months after birth, which are used in the surveys (see *Chapter 7*). Preparatory behaviours were included in the systematic reviews (see *Chapter 3*). Preparatory behaviours discussed included attending educational or support sessions or groups; cutting down on the number of cigarettes smoked; and changing the performance of the behaviour such as ensuring a smoke-free home and using a breast pump.

In the logic model, maintenance is when a level of ideal, desired or suboptimal behaviour occurs and is sustained. Suboptimal behaviour change is important to some women, for example only social intermittent smoking or non-exclusive breastfeeding to allow expression of pre-pregnancy social identity. This allows a woman to engage in behaviour change on terms that seem appropriate to her but which may fall short of achieving the ideal behaviour (no smoking and exclusive breastfeeding) and ultimately optimal health and well-being.

The data to support the incentive ladder logic model are now presented, starting with the everyday life rungs on the left side of the ladder. The following themes were identified: intrinsic and extrinsic influences within everyday life; pregnancy and birth: routine care and opportunities; and the private–public interface. These fit closely with the themes described in the literature review of the barriers to and facilitators of smoking cessation in pregnancy and breastfeeding (see *Chapter 4*).

Everyday life: smoking cessation in pregnancy, breastfeeding and incentive intervention programmes

Intrinsic influences

A broad typology emerged for the intrinsic influences on engagement with an incentive programme: 'give it a try', 'non-contemplators' and 'do-it-aloners'. For some women who smoke, no intervention programme is considered necessary. These women can be typified as 'non-contemplators' or 'do-it-alone quitters'. Pregnancy could act as a strong influence – 'I just stopped straight away, willpower' – and the do-it-alone quitters did not express the need for any extrinsic influence to make the effort and persevere. However, many of these women acknowledged that they were likely to relapse and that an incentive programme might help them to maintain their quit smoking status.

'Non-contemplators' have no intention of giving up smoking during their pregnancy because they are not intrinsically motivated to quit and smoking is central to their identity, often in spite of feeling embarrassed or conscious of the potential risks:

> *But I didn't quit smoking through mine, because I just didn't feel that my baby . . . because everything was perfect in all the scans and that, all the antenatals and stuff like that. I just didn't feel that it was having an effect on him. If they'd have told me that he was too small or something, then that would have gave me more reason to quit, but nothing ever came up like that, so that just didn't give me a reason to quit. Obviously having a baby is a good enough reason to quit but I don't know.*
>
> *FG3, mothers*

Women could find it difficult to articulate the reason for not considering stopping smoking, as illustrated by the 'I don't know' at the end of the previous quote. Our interpretation is that the centrality of smoking to some women's everyday lives was a significant barrier to either their thinking about engaging in a programme or the perceived potential for a successful outcome.

Smoking might be couched in different ways: some women described their smoking passively, as a habit or addiction, whereas others looked at it as enjoyable or as a treat that they actively earned:

> *I roll my own fags and all the rest of it so by the time pay day comes on a Tuesday, well it used to come on a Tuesday, my reward instead of going out and buying an item of clothing, I'd go and buy my fags. I've paid all my bills, everything is done, cleaning and I'm buying a packet of fags.*
>
> *FG8, I, mothers*

For these women, engaging in a programme is not on their agenda and thus, regardless of content, it would not be helpful, particularly if it is likely to increase feelings of fear and anxiety. There were accounts of how smoking provides relief and how drawing too much attention to it might exacerbate the behaviour. Being made aware of the health risks of smoking in some cases actually resulted in an increase in women's smoking, as discussed in *Information and education*.

Being confronted with personal experience of the effects of smoking on the baby could influence a woman's reflections on her behaviour and result in her deciding to 'give it a try'. For one, at the worst extreme, a personal experience of losing a baby motivated contemplation of change:

> *'Cos I had a wee baby, so I did, and he was born asleep and I was smoking through that pregnancy, so I just didn't want to take any risks in this pregnancy. So I just wanted to stop.*
>
> *30, I, pregnant woman*

As with smoking, women's deep-seated feelings about and experiences of breastfeeding affect their infant feeding intention and actual behaviour and, for some, a programme was not considered desirable or necessary. Often the infant feeding choice had already been made during pregnancy: 'you decide when you are pregnant if you want to do that kind of thing or not'. Non-contemplation could be because of lifestyle implications – 'I sat there and I thought, why would I want to breastfeed when I can't go out?' – or because the idea of breastfeeding is abhorrent or has other connotations:

> *I think it is a personal choice, some people don't feel comfortable with that sort of closeness, it is a sexual area in some people's views and they don't want their child on it.*
>
> *FG8, I, mothers and liaison worker for young mums*

However, as with quitting smoking, some women have a 'do-it-alone' attitude and they already want to try because they are intrinsically motivated towards breastfeeding and they assume that they will do it. Even though some women talked about breastfeeding coming 'naturally', this was not always their expectation and many were aware of potential difficulties: 'you never know until you start' and 'you think "boob", but it's not always the case'. They questioned how they could be supported by an incentive programme should they go on to encounter difficulties when they actually start breastfeeding because they believe that what is important is their own intrinsic motivation and resilience and that, ultimately, it is down to them: 'If it goes wrong, well you're on your own. You are'.

Many acknowledged, however, that their own intrinsic motivation might be affected by their infant's behaviour and how that is interpreted, particularly the effort/learning required on both sides and the extent to which infant feeding decisions appear reversible or irreversible.

Personal history of infant feeding experiences was very important for those with children. There is less opportunity for women to even consider breastfeeding when they have previously experienced adverse events that may be too strong a barrier for any programme to overcome, such as intense pain or perceived failure because of insufficient milk or latching problems.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Extrinsic influences

Many women expressed concern that other influences in their lives, beyond their own internal smoking and breastfeeding identities, would affect their ability to give up smoking or try breastfeeding. When they did not fit the 'non-contemplator' or 'do-it-aloner' categories above, and sometimes when they did, many women talked about the magnitude of extrinsic influences. In particular, concerns were expressed around interpersonal partner and family relationships, home life situations and wider norms and support available within their immediate network. When considered as rungs on the metaphorical ladder, women's accounts of these extrinsic influences could be interpreted as fixed, damaged or missing for either positive or negative influences.

For smoking, these might include a partner 'hating' smoking, thus encouraging women to consider quitting when they did not necessarily have intrinsic motivation. However, this rung might be damaged or missing if a partner is unsupportive or is unwilling to consider the harmful effects of smoking in pregnancy:

> *My partner smokes as well so with him being round about me and even just the smell, it was really annoying.*
>
> *37, I, pregnant mother*

> *Their dad, once the oldest was born, he wouldn't smoke in the house any more, he had that much intelligence, but he didn't see any harm to the child smoking when I was pregnant and caused quite a few problems in the house.*
>
> *16, mother*

The rung could be damaged or missing because the relationship is pivoted on smoking as a couple and enjoying time together sharing the experience. Therefore, 'partner-dependent' women may have to negotiate their relationships with both smoking *and* their partner, with consequences for home life and their environment. For example, on introducing house rules:

> *When the baby gets here there will have to be changes put in place 'cos there will be no smoking in the house at all, so they can be going out in the snow and smoking.*
>
> *31, I, pregnant mother*

Further complications exist when, as many women pointed out, they are surrounded by 'no harm narratives'. Family and friends who have shared histories of smoking around pregnancy tell anecdotes of smoking having little or no effect on pregnancy, child health or development. Women's mothers might have smoked and thus there is a norm within their upbringing, with their own reference being that smoking is not a problem as they themselves are healthy and well; therefore, the rung is missing. Even if a woman came across as intrinsically motivated, extrinsic influences, such as experience and prevalence of smoking in her family and social network, could be interpreted as potential barriers: damaged or missing rungs. Such women did not have support readily available and remained located in a culture of smoking, which is problematic even when they are amenable to the idea of giving up or joining an incentive programme:

> *Because although my partner, he doesn't smoke, like being round his mum and stuff they all smoke so it's really hard being round them a lot.*
>
> *24, pregnant mother*

Therefore, our interpretation of the data is that many women would need additional facilitative rungs to support them in individual or collective behaviour change and to enable barriers in family and social environments to be addressed and overcome. New incentive strategies would need to facilitate change regarding women's situations at home and with partners/family and friends. These are considered later in *Incentivising beyond the individual within social networks and communities*. Strategies suggested outside

of a formal programme included joint quitting, which could be motivated by the social norm of 'being a good parent' and 'a good extended family' in relation to smoking:

> *It's as important for them to stop as it is you, you are setting an example at the end of the day, one of you smoking isn't . . . you know, isn't going to look very good at all either, so it is best that everybody stops.*
>
> *T4, I, mother*

Another strategy was associating smoking with a non-health-related outcome (such as smell) or even adding prompts to the environment in an attempt to minimise the negative implications of smoking:

> *All it took to stop was my other half went I don't like you doing that. Do you mind stopping, it makes you smell and . . . I stopped, much to mum's surprise because she went through hell trying to give up when I was a baby so when I said oh I have stopped smoking, she was like 'how did you did it', I was like . . . I just stopped, you know.*
>
> *5, pregnant woman*

> *My partner smokes, so he took to smoking in the garden and we have got some alcohol rub at the back door and things like that so . . . there is steps that we have took as we heard that it stays on your clothing and things like that, we heard that off television and campaigns and things, so I suppose in that sense, that kind of shaped us a bit.*
>
> *T9, I, mother*

Beyond the immediate family, women also considered that changing their social networks to minimise temptation and break social behaviour habits was perhaps necessary – 'You need to find a social group that doesn't smoke' – or they responded to media campaigns either individually or as a group strategy:

> *My lodger, who is also sort of, a good friend – he smokes. I've always had a rule of no smoking in the house – always. So, wherever I've lived it's always been a rule. So he always smokes outside anyway and my partner he smoked up until he done the Stoptober so he's not smoked since the 1 October. So I'm quite pleased about that.*
>
> *44, I, pregnant woman*

Equally, for breastfeeding, personal and vicarious histories of the behaviour within women's family and social networks were reported to be a strong influence. For some, it is a given, a norm, because they were breastfed themselves or peers do. If women want to try breastfeeding after birth then a need to be supported by others was expressed, particularly when equal parenting and the father's role was an issue:

> *It's the mother that's going through the difficult time but then is the father going through a difficult time because they quite often feel cut out and women will say, 'Well, I want him to have a more active role as a parent' and that would be their reason for stopping breastfeeding.*
>
> *T51, I, lead health trainer – smoking cessation*

Therefore, women expressed a need for flexibility around feeding, reported feeling pressurised and assumed that formula feeding would provide an ideal solution. This was not always the case, however, and, as with smoking, many women weighed up the health risks and benefits of feeding options and reported being influenced particularly by the tangible and comparative experiences of others:

> *All my friends and family and people that have had breastfed babies and people who have formula fed, you know, they seem to be a pattern of formula fed babies are ill and pick up more bugs and they have got more colds and things more than breastfed babies. My child is never ever ill . . . I think it gives them a big advantage.*
>
> *T4, I, mother*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Nevertheless, for women to continue to provide breast milk for the recommended 6 months, many felt that they needed more flexible strategies, which any incentive programme would need to fit with. Some who disliked the idea of feeding from the breast suggested that they might consider providing breast milk using a pump: 'I didn't want that bond and it was just that I didn't want that connection with him'. Conversely, for many women, feeding from the breast was highly valued and some described a 'lovely' bond developing and 'enjoying it really', especially 'when nobody else bothered us'. Expressing breast milk was often important for women who wanted the infant's father or other family members to have an active feeding role.

Pregnancy and birth: routine care and opportunities

Many women already knew the risks of smoking in pregnancy and the benefits of breastfeeding from their routine pregnancy care, and this triggered reflections on these behaviours. Some women felt that the health service was 'pushing it' and, although opportunities for helping women to quit smoking and try breastfeeding were described, many women resisted additional pressure, particularly if the pregnancy was unplanned. Likewise, many health professionals reported being reluctant to compromise their relationships with women, especially those they perceived as vulnerable. Nevertheless, there were accounts of non-pressurising encounters from women. In fact, some women welcomed the confrontation or felt that more should have been said. Some women were actively looking for a trigger or a switch (a rung) to change their behaviour but felt that this would come from within and not through any other influences that they could articulate:

> *So I thought well it [referral to a smoking cessation advisor] can't do any harm, you never know she might say something to me that might make me you know that wee switch in your head that needs to go, because as far as I am concerned it doesn't matter how much help you are given it's like an alcoholic, you've got to hit rock bottom before you can lift yourself up. You've got to get to that point where you make that decision. No amount of scary pictures of black lungs or tubs of what looks like Marmite are going to put you off because people witness the side effects of smoking every day, they hear about it, somebody's got cancer because of it, somebody has got bronchitis because of it . . . It's got to be if and when that little switch in your own head says it's time now. Nothing else is going to affect that.*
>
> *28, I, pregnant mother*

However, some had negative experiences of the type of help and support that is available, particularly if it was not tailored to pregnant women:

> *I'm biased with these stop smoking while you're pregnant things 'cos I've tried it and I went to the cessation classes and it just, it did n'a work and I really wanted to, but the classes . . . unless they were designed specifically for pregnant people, 'cos mine's was a case of you got put in amongst everybody else ken like for whatever reasons they wanted to stop and they were all getting champix and all sorts of things and I got chewing gum.*
>
> *FG4, mothers*

For breastfeeding, there were examples of too little help or intervention, particularly in the early days:

> *The neonatal doctors stand up and say, 'No, you can't put them home, they're breastfeeding', which is what happened with me, but the girl who was in the room next to me she was trying to breastfeed but because she hadn't had it established the ward pushed her out and the doctors hadn't been able to back her up sufficiently to prevent it happening . . . She was devastated, she was so upset because it was the one thing she really wanted to be able to do and she couldn't do it in the end because they said, 'No, you're going home'.*
>
> *FG6, mothers*

In the early stages breastfeeding is a skill that is not considered 'easy' to acquire and so health professional help and support was considered to be more important than an incentive programme. Participants highlighted that the balance must be right. Communication of this help and support was considered crucial either within or outside a formal programme, especially when women feel that they are being 'forced' or being judged for 'not doing right by your baby' if they do not breastfeed, for example if health professionals use unhelpful comparisons:

> *One of them said feeding your baby a bottle of milk is as bad as giving your baby a McDonalds – it's not as bad as, it's not as good as breast milk but it's not as bad as giving a McDonalds.*
>
> *FG2, mothers*

Private–public interface

What happens outside the home, immediate environment and social circle also influenced women's behaviours in pregnancy and after birth. In pregnancy, women reported feeling ashamed of smoking because their bump is visible and how smoking attracts adverse attention and causes embarrassment. These feelings, which they did not like, could help them to stay quit. Some women retrospectively considered it in these terms: 'it looks horrible, more than I am thinking for health reasons, but yeah, I wouldn't do it again'. In contrast, such perceived judgements sometimes caused women to feel more stressed and to resort to smoking (see *Unintended consequences*) or to otherwise justify their behaviour:

> *Because I've got a bit of a bump do you know what I mean a lot of people give me really dirty looks as if, then I think to myself I could be doing a lot worse, I could be taking drugs, I could be drinking, I could be doing so much more than just having a fag.*
>
> *43, I, pregnant woman*

The physicality of the pregnancy is a reminder to women that they should not be smoking or that they should try to quit. Once the baby is born, however, prioritising staying smoke free presented new challenges: 'when I am socialising, baby is not there, its different, your inhibitions are down'. Women associated smoking with socialising or working routines and any change of smoking behaviour during pregnancy could be jeopardised. Therefore, any incentive programme would need to take account of the interface between women's private and their public lives.

Women often struggled with breastfeeding in public or in front of people as they built motherhood into their daily lives. In particular, embarrassment was described as a significant barrier and thus it is something that any programme would need to address. Examples suggested were showing women how and where they can comfortably feed so that they can plan and devise strategies that fit their lifestyles:

> *I never ever felt totally secure when we were out and about because all it took was him to throw a hand or something like that, the towel has fallen and I'm exposed. It wasn't until you said that it'd changed and I actually saw you breastfeeding in public that I thought, 'Nobody ever showed me that I could just do it that way' and it's so discreet, just lift your top a little and you can sit no problem.*
>
> *FG6, mothers*

> *Well yeah, it's just knowing where you can go and breastfeed without people staring and throwing comments and whatever, because you know how people can be.*
>
> *T10, pregnant mother*

Nevertheless, for these women, the realities of feeding in front of family/friends or in public, for example at a family wedding, mean that they must confront and negotiate daily practical challenges.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Incentive intervention programmes

In the following sections we consider the rungs of the ladder on the right-hand side of the incentive ladder logic model (see *Figure 18*). General views about incentive intervention programmes are summarised first. The incentive and associated intervention components are considered in depth, followed by rungs relating to the delivery relevant to the shortlist of incentive strategies described earlier (see *Table 38*).

Attitudes towards incentives were varied and ambivalent. Women seemed less worried about or resistant to incentives than providers, but were also less convinced about their potential fit with real life as they had very limited experiences of success in relation to achieving the target behaviours. Conversely, providers were more cautious about the appropriateness of incentives. They were equally concerned about effectiveness and financial value, but if incentives could be proven to be more effective and cost-effective than other strategies would be open to using them. Financial incentives for smoking cessation in pregnancy seemed more acceptable than those for breastfeeding, except in the case of the provision of a breast pump. Very few participants voiced any concerns around providing breast pumps as an incentive for breastfeeding or expressing breast milk:

> *Once you have got past those initial weeks you are saving money by not smoking and you start to feel a bit better and feel quite self-righteous and the health benefits but carrying on breastfeeding in a way has the opposite effect because it's time consuming, it limits what you can do, where you can go, who can manage the baby so it's a funny mix match in a way that makes it quite difficult to think to incentivise because its two quite opposite things in terms of feeling good about adhering to the change, so smoking yes, people would feel good about it, but breastfeeding, for a lot of these mothers they will be tired, they actually feel worse by continuing because of the amount of effort that you have to put in, so it's a bit of a strange thing.*
>
> *62, ethics committee member*

Women's views about incentive programmes

Some women considered incentives to be the wrong way to go about improving health outcomes and thought that the health benefits should be enough to encourage change:

> *I think they should be doing it for the right reasons, for their health and if they want to stop smoking because you want to be healthy and things, that's fine. Don't just do it because you're going to get money and things out of it. I don't agree with that.*
>
> *24, pregnant mother*

In particular, some felt that knowing that a behaviour was 'wrong' was an incentive in itself: 'as adults we should know the rights from wrongs, so themselves should be an incentive'.

Financial incentives were met with mixed opinions, from 'no one should get paid for stopping smoking' to 'that's a good idea':

> *'Well done, there is a £10.00 voucher for Boots', I think it's a bit, a bit patronising as well, a bit childlike, like at school, so I think that is probably more for kids.*
>
> *12, pregnant mother*

Many women relayed how 'appropriate' incentives could enhance and encourage motivation. Incentives enabled the process of change to be a 'nicer experience'; they provided something to 'look forward to', 'recognition' and 'acknowledgement' of their success:

> *I suppose it's not about necessarily having £50.00 or the £100.00 or whatever, it's about the recognition that you've done something, that you've achieved something, it's not, it could have been anything I suppose.*
>
> *27, I, pregnant woman*

However, even when women seemed to favour the idea of incentives, or were not averse to them, they did tend to express concern about how they might work and were often quite convinced that they would not. For some, money didn't matter:

> *You should quit yourself without the incentive because that's what you should do.*
>
> *2, I, mother*

> *Because at the end of the day if you are going to succeed you'll succeed whether somebody hands you a Love to Shop voucher or not, if you are going to fail then you're going to have a cigarette whether or not somebody's going to give you a voucher or not.*
>
> *28, I, pregnant mother*

Nevertheless, the issue of altruism for improving health and social culture seemed to be a strong one for the use of incentives:

> *I know people go 'oh the tax payers money' and all that, I wouldn't mind my money being used towards incentives for, you know smoking and things like that because I can imagine the positive effects from other things, such as the health service, and just socially as well, you know the health benefits because I find it quite an antisocial habit.*
>
> *5, pregnant woman*

Providers' views about incentive programmes

Improving health and social culture was a much stronger theme among providers and experts. Even when there was ambivalence, respondents felt that, if incentives could help, then they should be used, as it would be unethical not to explore all approaches to improving smoking cessation in pregnancy and breastfeeding outcomes. If incentives were shown to be financially more effective than existing strategies or if respondents were greatly concerned about health effects then they were willing to 'try anything':

> *My gut instinct is incentives are wrong, but as you say we've got such an issue and we have to do something and whatever we end up doing . . . But if you try a reward scheme, and even if it seems quite unpalatable and it works, then the justification is right there.*
>
> *FG9, I, experts*

> P1: *But I think, moralistically, I would be opposed but arithmetically I would support it because it appears to make . . .*

> P2: *From the smoking point of view obviously my biggest issue is obviously the babies because those babies – so I would agree to it with the smoking side of things because those babies – and even with the breastfeeding as well – but those babies are being put in a vulnerable situation, aren't they? If we don't do anything to stop those women smoking and they're going to suffer long term with ill health, etc. and going to end up on the neonatal unit probably and have long-term health problems. So I do think we need to do something and that's where probably why I agree – it's difficult to say.*
>
> *FG12, providers and expert*

Some providers were opposed to incentives altogether as they considered them to be unethical or inappropriate as an approach: 'not just wrong, I'd say morally wrong':

> *I think we're going right down the wrong route; I think that, you know, when we're enticing people with money and gifts just to do what's right for their health, you know. What else will we expect?*
>
> *53, midwife*

Others, by contrast, were concerned that incentives might 'crowd out' self-motivation, which they perceived as having an opposite effect, demotivating and demoralising people. At one extreme, one

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

participant commented that: 'it's almost like prostituting yourself in some way for incentives'. Providers also recognised the importance of the challenges faced by some of the more disadvantaged women, as described earlier, which present barriers to behaviour change:

> *Efforts could possibly be better addressed – best spent – by addressing their circumstance rather than rewarding them for doing something they should be doing anyway.*
>
> *FG12, providers and expert*

Incentives contingent on verified outcomes

Although a few participants felt that unpredictable gifts, for example the raffle within the study by Gulliver and colleagues,[104] were acceptable as 'everyone has a chance', the majority opinion was that guaranteed incentive provision was needed for ongoing commitment and motivation. However, raffles (alongside the provision of guaranteed incentives) were considered to have a wider reach beyond the individual, by turning them into events with publicity:

> *It [raffle] could be on top of. I mean that would be a nice piece of publicity. If you have a smaller thing and entry into, and the person who wins is then a publicity machine aren't they?*
>
> *FG9, I, experts*

However, several participants considered that incentives should be given as rewards only after the target behaviour had been achieved and verified (see *Monitoring, proof and feedback*). It appeared important to not reward deviant behaviour because of how it would be internalised by those who had succeeded, as well as by those who had not:

> *Yeah, if I was going to go to something and thought, 'It's nice to go but I'm not going to do anything about it', it'd probably make me feel worse . . . Because then I'd think I should be giving up.*
>
> *1, pregnant mother*

Incentives for preparatory behaviours

Although women's and providers' views supported incentives for complete and verified smoking cessation in pregnancy and/or exclusive breastfeeding, some preferred less idealistic goals. If stopping smoking altogether did not seem possible, some women preferred to be encouraged to cut down and thought that they would feel better for it. Cutting down was favoured as a strategy for engaging women in a programme as a first stage in quitting. Nevertheless, many were sceptical about incentives for cutting down smoking and thought that they would not succeed unless it came from within, as an intrinsic influence rung on the ladder:

> *Then to get pregnant and cut down and then knowing you've got a limit to smoke a day. Sometimes I can go over it; sometimes I cannot want a fag do you know what I mean. Sometimes I can light up a cigarette and then put it out and go no I don't want this it is making me feel sick. But I wish that had happened at the start, I wish that when I lit up a cigarette I would be sick or something so I wouldn't need to smoke.*
>
> *43, I, pregnant woman*

Similarly for breastfeeding, mixed feeding or breastfeeding for a shorter duration than the recommended 6 months was a preferred option for some women. These options were discussed by women in relation to the father's role and expressing milk using a breast pump.

Incentives contingent on participation in services were believed to be important to encourage attendance for information and support, provided by health professionals, peers or community organisations, and to prevent women 'dropping off the system'. Such incentives were generally perceived to be acceptable, with reference made to successful programmes where lunch was provided or opportunities to purchase cost price breastfeeding bras at antenatal workshops. Incentives for programme participation were considered

important by many as they can 'hook people in', particularly those who are 'undecided', and enable 'meaningful discussions' and 'a proper conversation' to take place that could help to change women's opinions about smoking cessation or breastfeeding:

> *I think, for me, it was about getting me into that first appointment. If you can get people into that first appointment and have someone like [smoking cessation adviser] talking you through it, for me that was where the real success was, because I came out of there like that, I need to do this.*
>
> *33, I, pregnant woman*

Other participants, in line with the Gulliver and colleagues'[104] vignette (see *Appendix 2*), believed that the ongoing incentives for those who 'turned up' for support, irrespective of their smoking status, were justified as it was indicative of them 'trying' and their 'willpower' to change. Many believed, however, that the value of the incentive for those who had not succeeded should be 'less' than the value of the incentive for those who had, with 'unpredictable' (e.g. entry into a raffle) incentives identified as more palatable on these occasions:

> *I think if they are still attending the meetings, they are still trying, they are still wanting to stop, but haven't achieved it yet, so they are still trying, so yes I think they should get the chance of the raffle.*
>
> *16, mother*

Incentives for more than one behaviour

In some women's accounts, spontaneous comparisons were made between more than one lifestyle behaviour, particularly in relation to behaviour changes at different stages of pregnancy and childbirth:

> *Because I am still breastfeeding so I am not drinking again, but I have often thought, I wonder if I will smoke again when I do drink.*
>
> *T9, I, mother*

Participants were asked their views on the feasibility and acceptability of incentivising more than one behaviour, for example smoking cessation and breastfeeding, concurrently. Some women queried how many health behaviours might be incentivised at once and anticipated 'lots of do's and don'ts'. The contrast between the two behaviours was noted:

> *I think there is quite a difference between breastfeeding and smoking cessation, and I don't know whether they can actually be aligned . . . I think the comparison between breastfeeding and smoking, one's an addiction, very negative. Breastfeeding is not an addiction and it's a very positive aspect.*
>
> *FG9, I, experts*

At co-applicant mother-and-baby group meetings arranged to discuss the incentive ladder model, healthy eating was seen as related to overall health and health behaviour change/healthy choices: women described not being able to afford fruit and vegetables for larger families, saying that biscuits are so cheap and filling by comparison. These women suggested that an incentive related to healthy eating would inspire them to 'overhaul' more than one behaviour and help allay fears about gaining weight when stopping smoking.

Some service providers pointed out that habit change is demanding and suggested that expecting the adoption of more than one new behaviour at once could be 'quite a lot to take on':

> *You know, you've got to look at your woman; what can she cope with? Sometimes you've just got to tackle, you know, a little bit. And as long as she's doing that little thing. You know, not too much. I mean, we all know when you've got too much going on you're just going to fail, aren't you?*
>
> *53, hospital midwife*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Conversely, some service providers stated that they were 'already attempting to address multiple habits' anyway and felt that these attempts 'probably would be more successful with incentives'. It was also suggested that change in one behaviour may motivate women to attempt to change another or to engage in an incentive programme for another:

> *If the incentive is going to work, then yes, I think it is, they are not going to think, 'Well I'll do it for that one and not for that one', I think they are more likely to do it, you know if they are going to do it, they would do it across the board.*
>
> *52, specialist midwife*

Some service providers noted the relationship between smoking cessation and breastfeeding: 'But then if you address the smoking then they're more liable to go into breastfeeding':

> *If you were concentrating on smoking and you had an incentive you could bring that through postnatally, and you know, sort of change it to the breastfeeding as well.*
>
> *T59, midwife*

However, some service providers felt that incentivising smoking cessation and breastfeeding concurrently would be seen as equating smoking and bottle-feeding, which risked alienating some women:

> *I just think they'll find it – and we are comparing, maybe, not breastfeeding to smoking because perhaps they are as harmful, but I think they'll find that really emotive, almost offensive. I don't think that's our problem, but I think that's how it'll be perceived by the public.*
>
> *FG10, provider and experts*

Incentive components: meaning and value

The following sections consider the right-hand side of the incentive ladder logic model and the components (rungs) that can be provided as part of an incentive programme. Exploring the meaning, values and types of incentives is important for understanding how they might work. Participants used various terms in addition to 'incentive', such as 'reward', 'gift', 'bribe', 'payment' or 'prescription', with different meanings associated with each. The type of incentive appeared to influence the language used; thus, some women equated shopping vouchers to 'bribery with money', in contrast to baby-related or personal well-being-related items, which were more likely to be described as 'gifts' or 'more practical, it's like wee treats and titbits not bribery with money'. When an incentive was seen as a 'payment' to engage in behaviour change – 'you are getting paid to stop smoking'– this was often viewed negatively, with reservations about 'giving money to the people to look after their own health'. Some providers queried whether something could be considered an 'incentive' if it had not been shown to change behaviour:

> *I think I'm still troubled by the word 'incentive' because it's bandied around and it's not an incentive; it's only a reward or a gesture or a something until you know it works. And because we don't know if any of these things work until you've tried them.*
>
> *FG9, I, experts*

Women were more concerned with talking about what they thought would help them the most as an incentive and often conceptualised incentives outside of our definition, for example behaviour-related items such as nicotine replacements:

> *I think if people genuinely want to give up smoking then they want to have the things to help them not £20.00 for a shop. If somebody gave me £20.00 I'd go out and buy a pack of cigarettes. There would be no incentive there for me to stop smoking. If somebody gave me an inhalator and some patches and some Nicorettes then it would be an incentive because it's there in front of me. I think I'd have to be getting support first and then an incentive to carry it on maybe on my own rather than with somebody. So if I had an inhalator and then was doing it on my own with an inhalator.*
>
> *1, pregnant mother*

This quotation suggests a medical model of incentive provision, but also the inhalator as aiding self-management of the behaviour. Offering an incentive on 'prescription' as a component of a structured course of treatment was suggested as a strategy that would allow an individually tailored approach and which may be publically acceptable:

> *If you have incentive prescription it's possibly more socially acceptable. If that's the line of thinking that actually this is part of my treatment is to have this, this is not a reward, to the rest of the population it's not a reward but obviously the individual is going to see it as such.*
>
> *FG12, providers and expert*

Some service providers were concerned that being too 'narrow' in the types of incentives offered would be akin to:

> *Disempowering [service users] because there is almost an insistent judgement in whatever it is that we are giving them.*
>
> *T58, smoking awareness co-ordinator*

This was felt to be particularly disadvantageous for 'people who don't necessarily have a lot of choices or options in their lives'. In related observations, providers warned against making assumptions about what types of incentives would be effective, arguing that health professionals and decision-makers did not necessarily have enough insight into the life circumstances of many women to determine what would constitute a motivating incentive:

> *So whether it's money or whether it's a token but it should be for something that they want, not something we think they should have as kind of middle-class professionals.*
>
> *T63, GP*

A typology of incentive categories ordered according to their meanings (*Table 43*) is discussed in detail below. The categories and their meanings derive from the purpose and function of the incentives and the degree of restriction associated with their use. They range from highly restrictive health-related or behaviour-associated incentives to hedonic incentives such as shopping vouchers or cash where recipients have a high degree of free choice and trust is implied as these have a high resale or exchange value. The issue of who is in control of the incentive – the woman or the provider – is important to consider from the perspective of motivation and empowerment. The categories of incentives were derived through analysis of data from two main sources: the literature on incentive interventions (see *Chapters 3* and *5*) and spontaneously generated ideas from mother-and-baby group co-applicants and research participants.

Views were mixed on the optimum financial value of an incentive and how this might influence its effectiveness and the likelihood of gaming (see *Unintended consequences*). For some, the financial value was less important than the values relating to the meanings, the 'thoughtfulness' of a gift and the other helping components of incentive programmes, which are described later in this chapter. Some women who had taken part in the CPIT, in which the value of shopping vouchers given totalled £400.00, viewed this greater value to be more motivating:

> *I think if I was getting that much I'd be like, 'I'll stop smoking and I'll not go back on it'.*
>
> *30, I, pregnant woman*

But the optimal financial value of an incentive was often related to the recipient's financial situation, with some family members considering 'people on low incomes' more likely to be motivated by lesser amounts 'because £35.00 is a lot to them'. Others felt that even very large sums of money would be an insufficient incentive if their own motivation was lacking:

> Q: *Ok would it have helped if it was a bit more money?*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 43 Typology of incentives

Type	Examples	References
Vouchers and cash	Restricted, e.g. local shops	Sciacca and colleagues[176]
	Health restriction, e.g. no cigarettes or alcohol	Radley and colleagues (Give it up for Baby)[113]
	Minimal restriction, e.g. widely redeemable vouchers	Tappin and colleagues (CPIT)[88]
	No restriction, e.g. cash	Hill;[173] Wolfberg and colleagues[178]
Maternal well-being	Beauty treatments or products	Sciacca and colleagues;[176] Morgan and colleagues;[148] Thomson and colleagues[112]
Baby and pregnancy related	Infant car seat	Gulliver and colleagues;[104] Edwards and colleagues[142]
	Nappies	Sciacca and colleagues[176]
Behaviour related	Breast pumps	Dungy and colleagues;[170] Cohen and Mrtek;[169] Sciacca and colleagues;[176] Chamberlain and colleagues;[103] Bliss and colleagues;[167] Hayes and colleagues;[172] Bai and colleagues;[180] Rasmussen and colleagues[174]
	Nursing bras	Grey literature (see *Appendix 10*); emergent from interviews
	Bedside cots	Emergent from interviews
	E-cigarettes and NRT inhalators	Emergent from interviews
Health related	Healthy foods	Finch and Daniel;[171] Chiasson and colleagues;[181] Thomson and colleagues[112]
	Sports and leisure centre vouchers	Thomson and colleagues[112]
Household services	Home help	Pugh and Milligan[106]
	Ironing service	Hoddinott and colleagues[62]
	Childcare	Pugh and Milligan[106]
General utility	Providing refreshments	Albrecht and colleagues;[138] Hoddinott and colleagues;[62] emergent from interviews
	Travel vouchers	Bristol incentives scheme (grey literature, see *Appendix 10*)
Awards and certificates	Congratulations cards	Morgan and colleagues[148]
	Certificates	Emergent from interviews
Experiences and incentives beyond the individual	Family day out	Sciacca and colleagues;[176] emergent from interviews
	Holiday	Emergent from interviews
	Infant photograph	Reeves Tuttle and colleagues[175]
	Partner incentives	Sciacca and colleagues;[176] Wolfberg and colleagues[178]
	Buddy incentives	Donatelle and colleagues[141]

A: *No I don't think so. . . . I think if they'd said to me you'll get £2000.00 you know what I mean if you stop smoking then it maybe would have pushed me to it but I think in myself, you'd need to want to for yourself to stop smoking, not for money.*

38, I, pregnant woman

Vouchers and cash

Although some participants explicitly contrasted shopping vouchers with cash, they were more often seen as equivalent, perhaps because the types of shopping vouchers discussed were so widely redeemable in many retail outlets, as they were in the CPIT and in the effectiveness studies described in *Chapter 3*. The research team did not introduce the concept of cash in the interview schedules. Our interpretation is that this lack of distinction between shopping vouchers and cash by many underlines the perception that the woman is in control over how the incentive is used and the implicit trust that providers are giving to the woman to use them appropriately. Such unrestricted incentives offer autonomy, particularly to more disadvantaged women who have few opportunities for choice in their lives. They therefore have a value over and above their monetary value, in terms of valuing the woman and the effort that she is applying to positive behaviour change and her sense of well-being and pleasure gained through achievement. Tailor-made incentive programmes that are individualised to women's needs or their individual motivation were popular with women, in recognition of the fact that 'the same thing is not going to be useful for everybody'. Incentives such as shopping vouchers could allow women to individually tailor the incentive to maximise their own motivation, with the option to 'save up' for an expensive item – 'Yeah I was thinking: pram. That's a pram' – which involves goal-setting, planning and delaying gratification.

Choice was seen to be key to the motivating nature of vouchers, as 'the money is theirs to spend how they like' or to 'treat yourself'. They were seen as a 'reward' that enhanced feelings of well-being and were a 'boost' to continue:

I was over the moon with it. I was. I was really happy with it and just receiving my wee £100.00 one there, I was really quite chuffed.

33, I, pregnant woman

Women described a variety of items that they had chosen or would choose to buy with incentive vouchers, such as baby items, household goods, clothing and jewellery. However, most women and providers considered an entirely free choice (cash) to be undesirable, as people may 'squander' it or buy inappropriate items such as cigarettes or alcohol: 'if it was cash or anything they'd just end up smoking it'. For this reason, vouchers tended to be preferred to 'hard cash'.

Although most discussions centred around shopping vouchers that were widely redeemable at national chains, one service provider described an incentive programme that offered women vouchers from local businesses. In this incentive scheme for breastfeeding, local shopping vouchers were thought to be inappropriate as it was felt that women's circumstances were not considered:

They were all just really expensive companies that you wouldn't ordinarily use; like top-class hair salons and . . . you just thought: well most people, therefore those incentives aren't worth anything to them because they can't use them. It's only worthwhile to those that are very wealthy.

FG9, I, experts

The 'immediate and fun' nature of shopping vouchers was considered important to compensate for the perceived loss of enjoyment arising from behaviour change – what people would be 'prepared to get in return for not smoking'. However, in addition to views of shopping vouchers as a 'bonus', some women saw shopping vouchers as potentially 'helpful' for people who are 'struggling' financially.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

In comparing vouchers with gifts or services, it was suggested that 'people respond better to cash' because it is assumed to be more financially valuable, and thus more motivating, 'in this climate', referring to the current economic downturn since the 2008 credit crisis.

Although shopping vouchers as incentives for smoking cessation were largely considered acceptable, although with some reservations, vouchers for breastfeeding were not considered as acceptable and were contrasted unfavourably with some of the other categories such as behaviour-related or personal well-being-related incentives.

Maternal well-being incentives

This category of incentives comprised non-utilitarian gifts or services for the women's own personal benefit, such as beauty products, beauty treatments, massage or magazines. Women noted that 'everyone talks to you about a baby. It's baby this, baby that' and that 'quite often the mother's forgotten about'. Women expressed a wish for an incentive that focused attention on the woman herself: something aimed at 'pampering them and making a fuss'.

These types of incentives were seen as having an effect through enhancing a woman's emotional well-being – 'I think it has to be to make you feel good' – which in turn was thought to increase her capacity to cope with the challenges of new behaviours, acting in effect as a 'morale booster'. Mothers recounted experiences of stress in the postnatal period and reflected that gifts aimed at promoting personal well-being, such as 'some nice bath salts or something', could prompt women to 'stop and think, "actually, I haven't really been doing relaxing for a while" ', and thus encourage them to 'just take care of yourself for half an hour'. The enjoyment gained from personal gifts was considered motivating: 'oh I look forward to getting that'. In some cases, small personal gifts were seen by some as more 'manageable' than vouchers because they did not require recall, planning or access to retail outlets to be used and enjoyed.

Women felt that the effort that they put into behaviour change deserved recognition and validation: 'Yeah, I think it has to be for you because you're the one that's doing it, no one else is'. In this context, personal gifts were contrasted favourably with some of the other categories of incentives such as baby gifts or household support.

Baby- and pregnancy-related incentives

These incentives specifically relate to pregnancy or the baby and include items such as maternity clothes, bibs, nappies and more expensive baby items such as car seats. Such incentives can be considered utilitarian and the smaller everyday items such as nappies have a low exchange value. Some women felt that incentives should be necessities:

> *Like a pack of nappies or something that is used basically every day but doesn't cost the earth because, obviously, if there's budgets and stuff.*
>
> *T10, pregnant mother*

However, some women and providers felt that better incentives would be 'niceties, the luxuries people generally can't afford', which suggests that the incentive should add value to the woman's sense of well-being as well as target the desired behaviour.

In discussions of more expensive baby items such as car seats, prompted by the Gulliver and colleagues'[104] study vignette (see *Appendix 2*), many women stated that 'people prefer to shop around and buy [a car seat] themselves', and therefore receiving one as an incentive would be superfluous: 'it is just going to get flogged on eBay, it is quite an expensive bit of equipment that'.

Behaviour-related incentives

These were incentives considered to have a direct functional role in achieving or modifying the target behaviour and were largely discussed in relation to breastfeeding: breast pumps, breastfeeding bras, other

breastfeeding clothing and baby carriers. For smoking cessation, some women viewed free NRT devices as a behaviour-related incentive and our mother-and-baby co-applicants suggested e-cigarettes as a behaviour-related incentive. Some women considered free-choice incentives such as shopping vouchers to be inappropriate and thought that incentives should be restricted to items with some utility:

> *I would agree with that rather than them getting handed money for breastfeeding, giving them something that's going to be helpful to them rather than say like, 'Here's £50.00 to breastfeed your kid'.*
>
> *24, pregnant mother*

Some providers considered that the relative lack of choice was problematic, as a behaviour-related incentive ' says you have to buy a breastfeeding bra . . . then I think we are controlling that woman', indicating a regard for women's autonomy and a desire to avoid being seen to pressurise women. Others reflected on the undesirable consequences of endorsing the idea that a behaviour-related incentive such as a breast pump is a necessity to breastfeed, which could create barriers for some women 'because they'll say they can't afford them but then they don't really need them anyway'.

Women who had expressed or who intended to express their milk tended to be enthusiastic about the prospect of receiving a free or reduced-cost breast pump, prompted by discussions of the Chamberlain and colleagues'[103] vignette (see *Appendix 2*), which they viewed as a 'brilliant' incentive. A breast pump could help 'share the load' of breastfeeding with significant others, who could feed the baby expressed breast milk. The importance of family involvement as a rung to support breastfeeding is discussed earlier (see *Extrinsic influences*), and breast pumps are an example of how incentives can connect the two ladders in *Figure 18*. Pumps were seen by some women as preferable to hand expression of breast milk, which was viewed as 'hard work after the first few days'. Some women believed that having had access to a pump might have prolonged their breastfeeding experience or better enabled them to provide breast milk:

> *If I'd've had a breast pump, I'd've carried on breastfeeding, but I didn't have a breast pump, and it was just too expensive.*
>
> *FG3, mothers*

> *I was fine if I was going to express into a bottle, which I did, but then the expense of actually buying a breast pump alone was extortionate and I was like, 'I am not paying that money'.*
>
> *FG8, I, mothers*

For some women, expressing milk appeared to be a middle ground between breastfeeding and formula feeding: 'if you've got one, you'd be more likely to use it than to think, oh I'll put him on bottles', and some providers considered that a breast pump would be encouraging for those women who 'don't want to put babe to breast', as discussed in *Everyday life: smoking cessation in pregnancy, breastfeeding and incentive intervention programmes*.

However, some women were concerned that breast pumps may not be useful for all breastfeeding mothers, as 'there is nothing simple about expressing' and many women find them difficult to use. Similarly, it was noted that 'maybe not everybody wants to use a breast pump'. Therefore, breast pumps given as a universal incentive (rather than just to women who specifically want to use one) were considered potentially wasteful if they ended up being 'something that gets shoved in the cupboard' or 'expensive breast pumps that just end up on eBay or something within a week'. Participants, particularly providers, expressed concerns about the timing of breast pump provision and how that might influence behaviour outcomes, and this is considered further in *Timing, communication modes and intensity*.

For many women, a major appeal of behaviour-related incentives for breastfeeding was that their direct utility – 'something that is going to be helpful' – made them more justifiable and warranted, 'rather than the incentives just being a treat': they were 'not like proper freebies'.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Other behaviour-related incentives were considered to help by removing the barriers to breastfeeding. For example, specialised bedside cots were suggested by some providers as a 'beneficial' item that could incentivise through facilitating night-time breastfeeding. Likewise, as many women feel discomfort or embarrassment with breastfeeding outside the home, breastfeeding clothing or baby carriers were suggested by women and providers as possible incentives:

> *everybody is different but if you have got clothing you are comfortable in, and can cover your entire baby if you want to, it might make people get over that, oh people are looking at me, because they do though.*
>
> *FG1, mothers*

Health-related incentives

Incentives that could be seen to have some benefit to health, such as vouchers for fruit and vegetables or access to sport and leisure facilities, were considered acceptable by some women and providers, but other women were more sceptical about their motivating effects:

> *Then again a lot of people might go, 'What? I am not quitting cigarettes for a punnet of strawberries and a banana'.*
>
> *5, pregnant woman*

There were concerns that the incentive should be 'something that is useful' but not something 'that can be abused', and also that any incentives provided by the NHS for health behaviours should themselves be health promoting:

> *If it's something positive and it's going to be related to improving the whole, you know, family health, you know. I think it should be health-related benefits because we are, you know, it's the health service rather than just here's some money.*
>
> *53, hospital midwife*

Household services

These included help with household tasks, prompted by the Pugh and Milligan[106] vignette (see *Appendix 2*), and crèche facilities or childcare. Some women suggested that household services provided as incentives may compensate for the 'me time' lost if new habits are adopted, with some considering that household services would be encouraging 'when your house is a mess and you're feeling tired'. Household help was thought be particularly helpful to encourage breastfeeding, which was viewed as being time-consuming, with babies potentially 'feeding three times an hour'. Time to oneself was frequently mentioned by women as a motivating factor in continuing to smoke, and breastfeeding was often described as time-consuming relative to bottle-feeding. Some providers felt that help with housework might help prevent some women from feeling overwhelmed and discontinuing breastfeeding:

> *I think life gets a bit busy, I think sometimes they give up because breastfeeding is all on them whereas if they decided to switch to bottle-feed somebody else could do it and they could get on with other things that are going on with life as opposed to just breastfeeding.*
>
> *T60, infant feeding co-ordinator*

However, negative reactions to this type of incentive were far more commonly expressed. Several women stated that they would be 'offended' by the offer of help with household chores, which they felt would imply that their own housekeeping was inadequate:

> *I know my house isn't perfect but I tend to find if someone says I'll do your housework for you, I'm like are you saying I've got a dirty house?*
>
> *32, I, pregnant woman*

Perhaps for this reason or other social pressures, women expressed an obligation to take care of household chores themselves and to maintain control over their home environment: 'even if family offered you think, "ooh you best do that yourself" '. Women were concerned that accepting outside services could be construed as them 'not coping':

> *I think you want to come across like you can cope . . . I think if you have got a big backlog of ironing or washing then you can feel that maybe people will think you are not coping, do you know what I mean.*
>
> *T9, I, mother*

Some women found this type of incentive 'intrusive', particularly during the postnatal period: 'to have someone else come in again I just personally don't like it'. There were also concerns that the help offered would not be 'done to my standards', with women describing themselves as 'far too picky' or 'fussy'.

Women also thought that help with household tasks did not generate the enjoyment or pleasure associated with shopping vouchers or personal well-being incentives: 'I think it has to be to make you feel good. Having your ironing done isn't going to make me feel good'.

The offer of crèche facilities as an incentive also produced mixed views, with some feeling that a break would be welcome – 'it would be good to get just an hour to yourself' – and others expressing anxiety about leaving their young baby with others – 'you're just clock-watching all the time'. Service providers gave mixed reports of the effectiveness of offering crèche facilities to encourage attendance for health interventions:

> *We actually put a letter in to say that in this particular area we had free nursery care for the group [a smoking cessation group] and not one person took that up.*
>
> *T57, stop smoking service manager*

General utility

A few participants mentioned incentives that did not fit any of the above categories. For example, some providers mentioned food and drink, particularly in the context of incentivising women to attend group interventions: 'we had a much, much higher turnout when we offered lunch than we did when we didn't'. Refreshments as an incentive to increase attendance and engagement in group activities was confirmed through observations of interactions at our co-applicant mother-and-baby groups, where our interpretation is that commitment and esteem value was added when participants brought 'home bakes'. Similarly, petrol vouchers were cited as incentives to encourage attendance at groups. For example, an incentive was added to reimbursement of travel costs by providing petrol vouchers with a value 'well over and above what it costs them to drive there' for young mothers to attend breastfeeding peer supporter training.

Awards and certificates

Certificates to honour breastfeeding milestones were spontaneously raised by our mother-and-baby group co-applicants and discussed by some providers who viewed them as a means 'to instil a sense of pride'. Some reflected on experiences where 'these certificates were coveted and appreciated by the women'. Conversely, some providers considered certificates to be 'patronising' and believed that these 'wouldn't be helpful' within affluent or more educated population groups, inferring that for less educated women they could be. However, others argued that, even if some service users perceived certificates negatively, the effects would be minimal.

Experiences

Some examples of experiences are included in the previous categories, in that shopping vouchers entail the experience of spending them; having baby photographs taken is an event that involves rituals preparing for it and then showing the photograph to social networks; and groups that provide outings such as picnics or baby massage provide experiences. However, there were examples spontaneously generated

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

which suggest that providing an experience that extends beyond the individual was highly valued by some of our most disadvantaged participants and that these warrant a category of their own. Suggestions included activities such as holidays – 'Maybe holidays might be reasonable incentive' – or family days out, suggested by a partner:

> *Like an activity event or a day with your kids or something like that.*
>
> *20, father*

Other programme components

Many women had caveats around what else would need to be delivered along with incentives and what would help them most to engage in a new behaviour, change behaviour and maintain the behaviour. In the ladder (see *Figure 18*) these are referred to as general programme components or rungs and they can be compared with the general BCTs described in *Chapter 3*. There was a strongly held view that incentives alone were not enough, even individually tailored ones as discussed earlier. For many, flexibility of approach at different stages of the behaviour journey and life in relation to pregnancy and birth (the left-hand side of *Figure 18*), with the option for individual tailoring of the rungs in the programme journey, was considered important.

Goal-setting, resetting and ongoing motivation

The agreement of a quit date for smoking cessation with an associated incentive and ongoing structured provision of incentives served as 'milestones' to work towards on the achievement journey. Such goal-setting discussions were considered to motivate the continuation of smoking cessation and breastfeeding and encourage ongoing engagement with services.

Women within the CPIT identified how setting their own quit date without being pressurised to do so was an important first step; being ready to stop and the timing of such was crucial:

> *When you go, they give you, you can choose your own date to stop smoking so it could be a week, a month, it's totally up to you. And I think I had kind of just jumped into it too quick because I think I chose mine for the next day and it's more when I am working as well that I do smoke more rather than when I am in the house.*
>
> *38, I, pregnant woman*

It was acknowledged that the long-term health benefits of smoking cessation and exclusive breastfeeding were not easily recognised or experienced. Incentive provision therefore offered shorter-term 'in-between' goals and self-gratification to motivate work towards longer-term goals. Some of the women reflected on how incentives could offer goals towards 'doing the right thing':

> *It's a wee goal. It's a good wee thing. To keep people off smoking it is a good thing, because smoking is pure bad when you are pregnant.*
>
> *30, I, pregnant woman*

Incentives could provide or had provided tangible goals in contrast to a cognitive or behaviour goal, by anticipating future personal rewards – 'I've got that coming and I can maybe go and treat myself' – or enabling an incentive to reach beyond the individual to achieve a family-related goal (see *Table 43*):

> *Because you're achieving something and your family would be achieving something because you've got a healthier dad or something like that. That's what I'd do anyway. I wouldn't give them something, I'd say, 'Right, there's something for your family'.*
>
> *20, father*

The consistent, regular structure of incentive programmes was closely intertwined with incentive provision in women's narratives. For some CPIT women, the structured ongoing provision of incentives was indicative of what incentive experts refer to as a 'commitment contract', which influenced their continued engagement: 'you've signed up for something and you have to see it through'. Our interpretation is that there appeared to be a synergistic interaction between incentive intervention components rather than it being just the sum of the individual parts. For example, signing up to an incentive programme could be perceived as a 'commitment contract' rather than it being a programme that the woman could choose to drop out of.

Monitoring, proof and feedback

Monitoring and proof of behaviours in exchange for financial rewards/incentives was considered another important component of the programme structure. This subject generated a lot of debate because of the fallible nature of the testing methods for smoking and problems associated with 'proof' of breastfeeding.

In some areas CO monitoring as part of routine antenatal appointments with the midwife could instil fear (in women as well as partners), which was intrinsically motivating:

> *I didn't mind, I don't mind the shock factor or the scare factor or, it didn't offend me or. It did make me feel under pressure but in a good way, I didn't feel bad that they were forcing the pressure; it was enough to make me put pressure on myself.*
>
> *34, I, pregnant mother*

However, these objective methods of monitoring and providing feedback were not identified as effective for all:

> *Aye, I done a carbon monoxide thing and it came up at three and she said that she would refer me. I got referred and I got another one done and it came up at seven. I don't know. I just couldn't stop smoking cigs.*
>
> *30, I, pregnant woman*

Carbon monoxide monitoring was often considered an imperfect form of testing because levels decrease rapidly. The relatively high CO cut-off levels assigned within the CPIT (see *Box 2*) and the fact that incentives are issued without cotinine levels being confirmed meant that some women could potentially still be smoking. A few women were unaware of the potential for 'cheating' the tests, and some CPIT providers referred to how they would not necessarily be explicit about CO levels: 'so I kind of keep that wee snippet of information to myself'. However, the majority of participants did cite ways in which smoking status could be hidden, for example not smoking for 24/48 hours before testing. Accounts of women's explanations for what they considered to be false high CO readings were also given, such as 'faulty boilers' and women who 'asked about getting their central heating checked', implying that extrinsic environmental factors were responsible. Non-attendance at monitoring appointments was also raised by some as a strategy to avoid loss of face: 'the last thing anyone wants is to go along and be told you have failed'.

Withholding information concerning decreasing CO levels, together with appropriate, regular or even 'random' testing, were considered essential by some participants to 'prevent the study coming into disrepute'. However, not all shared this view:

> *And they can cheat, but it doesn't matter because the people that smoke are the poorest in our society and so I am giving them a bit of extra money to help with their lives and I don't think I mind about that.*
>
> *T48, I, public health consultant*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Regular monitoring as part of an incentive/smoking cessation programme was considered important for a number of reasons: to keep women 'in check' and prevent against relapse – 'they never once offered to do a CO test on me so that's probably why I went back to smoking'; to provide justification for expenditure; to provide recognition that the incentive was 'deserved'; and to provide a sense of achievement through the visibility of proof when the monitor colour changes:

A: *I used to like having it.*

Q: *Why?*

A: *Because I knew then.*

Q: *You could see the difference?*

A: *Yeah. From my first time blowing on red and then the next time going in and I'm in the green already. That quick.*

2, I, mother

There were several references to tangible objects being added to the environment such as CO monitors and props used in education and to support women, as well as the incentives themselves being tangible. Our interpretation is that tangible, non-verbal cues often seemed more powerful as motivators and prompts for behaviour change than words for some women.

One of the key issues for breastfeeding was how to monitor or provide 'proof'. Monitoring suggestions introduced through the topic guide included observations, verification by 'others' (e.g. providers) and photographic/video evidence. Some providers felt uncomfortable countersigning 'if I didn't know that it was happening all the time'. Furthermore, although home visits to ascertain smoking status (house odours/ashtrays) and breastfeeding (evidence of formula feeding paraphernalia) could be undertaken, there were reservations about 'the resources required' and the potential for misinterpretation (e.g. mother mixed feeding or partner smoking in the home):

If somebody's taking the gift or whatever it is, usually if somebody is formula feeding, they've got stuff everywhere that tells you their form of feeding. There's the tins, there's the steriliser, there's a part used bottle, there's often a lot of things . . . But they could be mixed feeding.

FG9, I, experts

Maternal blood or urine tests for smoking were 'not a problem' for some participants or from an ethics viewpoint if clearly explained, as pregnancy was associated with numerous physiological tests. However, others considered that the more invasive forms of testing, such as breastfeeding observations/photographs/video or urine tests, were 'too intrusive', a 'bit personal', which may 'put people off'. Continuity of care and positive provider–mother relationships were considered important to ascertain 'proof', and incentive provision contingent on attending a breastfeeding group was considered a possibility 'because you're not going to go if you're not really [breastfeeding]'. There were further concerns about the fallibility of 'proof' as well as women's awareness of how to 'cheat' the tests; 'anyone can stick a pump on their boob and stick a bit of milk in it'.

Help and support

Most participants were concerned that incentives alone would not be enough to motivate women to initiate or maintain either smoking cessation or breastfeeding and felt that other programme elements, such as help and support, were the top priority:

Obviously, because my partner works full time and I'm on maternity leave at the moment and with the benefits and everything and the government the way it is at the moment, a lot of people are losing a

> *lot of stuff so gifts like that people would appreciate kind of thing and would find helpful. But, it's like, it's more the support side of it, I reckon people would probably use and need more than the gift side of it kind of thing. The gift side of it is kind of like a bonus.*
>
> *T10, pregnant mother*

> *If you are going to use incentives what else goes with it because you can't compromise on the other services because the incentive alone, well, I think it is kind of accepted that it won't work on its own.*
>
> *T61, smoking cessation advisor*

In fact, a strong message in relation to breastfeeding was that help and support were what would help most, as many women did not have life course or context rungs in place:

> *Yes, because if you are struggling and if you want to feed, and you are desperate to feed your baby then help from somebody who has got a lot of experience is what you need, you don't need a bath bomb, you need that person to come around and help you feed your baby.*
>
> *T4, I, mother*

In fact, many women, health professionals and stakeholders felt that 'money's best spent probably in services so that they can support more people' rather than on incentives, a theme that is developed in *Incentives to providers*:

> *So if there was more of a service that allowed – especially when you're in neonatal unless you've actually managed to get the baby on the breast the ward is pushing daily to get you out and unless the neonatal doctors stand up and say, 'No, you can't put them home, they're breastfeeding', which is what happened with me, but the girl who was in the room next to me she was trying to breastfeed but because she hadn't had it established the ward pushed her out and the doctors hadn't been able to back her up sufficiently to prevent it happening. So she ended up not breastfeeding because she was forced out and she lived too far away to be able to commute in to do three hour feeds. She was devastated, she was so upset because it was the one thing she really wanted to be able to do and she couldn't do it in the end because they said, 'No, you're going home'.*
>
> *FG6, mothers*

Information and education

Providing information and education about the adverse effects of smoking was considered important by some, but not particularly effective, and was seldom enough on its own, although it did prompt some women to think about the risks and benefits of quitting at an early stage in pregnancy. However, for others, it seemed that the future health consequences were 'scary' but insufficient to maintain motivation to quit and could result in relegation of the pregnancy to the background of their lives:

> *Well, I tried at the start but then it got harder. I just felt like I was smoking a wee bit more because – I don't know if it's just being bored with nothing to do. But I did try hard at the start. But I kinda just, after a while I just forgot about the fact that I was pregnant – not that I'd forgot I was pregnant but you don't really think about what it is actually causing – what it's doing to your baby.*
>
> *42, I, pregnant woman*

Others believed that 'scaring pregnant women' was 'not fair' and would not work. Women became stressed when they acknowledged the health benefits and tried to quit – 'and when you can't do it that really gets you. That really did my head in'. The pressure of a programme and fear could therefore result in negative unintended consequences as some women rely and are dependent on smoking:

> *I think if anything . . . I probably would have stopped or cut down but I think I've actually started smoking more.*
>
> *24, pregnant mother*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Any education component/rung would need to be carefully balanced to support women without pushing them too hard. Likewise, for breastfeeding, how education is designed and delivered affects its potential to make a positive difference. In particular, some women felt that it could be more balanced and should prepare them for the realities that they might experience and possible failure:

> *I could tell you everything about breastfeeding through my classes which, as I say, is fine and dandy but when you can't do it, it really hacks you off so maybe put a few of the bad points in there, maybe education of what happens if it doesn't work because there's nothing on what happens if it doesn't work. There is nothing.*
>
> *2, I, mother*

> *That first meeting where you are getting told [about smoking], not only what you are putting in your body, but what you are putting into the baby. They have this little model and it's got the baby. It was relevant to me because I was at 15 weeks and the baby was of similar size.*
>
> *33, I, pregnant woman*

Prompts and models were raised in several contexts, particularly for learning to breastfeed, and seemed to be preferred to words by some:

> *No they could do with more things like prompts to do it properly, coz like I said they are not allowed to show you by touching them themselves, and not allowed to touch us either.*
>
> *14, I, pregnant mother*

Delivery of incentive programmes

In the following section we consider aspects of the delivery of incentives and other programme components that aim to change behaviour. These include perspectives on the setting and the providers who deliver the incentives or other psychosocial or BCT components; whether incentives should be targeted to certain populations or should be universal; whether the onus should be entirely on the woman or engage a wider support network including incentives for organisations and/or service providers; and the timing and intensity of incentives and other components.

Setting

Divergent views were expressed concerning where incentive interventions are delivered, which is related to views on the professional background of the providers discussed later. Overall, home and/or community locations were preferred, with some participants wanting multiple locations to be offered to suit women's lifestyles and needs: 'Anywhere really, hospital, or go to your house, school, even do them at our doctors'.

Health-care environments for incentive programme delivery were viewed positively by some participants who valued accessing support from a 'trusted' professional where 'people know what they are getting when they access a health service'. Multipurpose locations were considered beneficial if appointments were synchronised with routine scheduled services, for example vaccinations, groups/venues where mothers would already be in attendance or even 'integrated into the antenatal setting'. However, other participants felt that health promotion needed to be taken out of the 'ivory towers'; that health premises may be 'threatening' for some 'mothers who won't go out to a building that's official' or disconcerting because of sitting in a waiting room 'full of ill people'.

Community locations (e.g. children's centres, pharmacies) were considered to be able to offer a more individualised service, with consumers being 'equal partners in care', which in turn 'increases the achievement' of the programme, and this is considered again in *Incentivising beyond the individual within social networks and communities*. Access and engagement were considered to be promoted through the convenient, familiar and accessible nature of venues, which could reduce 'stigma' and 'embarrassment'.

Home-based delivery of incentives was considered unfeasible or unrealistic among some providers and experts. However, from a woman's perspective, particularly in the postnatal period, it was often the most favourable for both target behaviours. Home visits could enable mothers to receive a more individually tailored duration of support, 'whereas in the clinic, if something runs late, you are in and out like a shot'. They also offered convenience for new mothers – 'it is overwhelming leaving the house when you have just had a baby'; they could prevent disruption to routines – 'you could be feeding at the same time and discussing things with them'; they could provide contextually situated support – 'if you are sat with someone [at home] they can say try this or that position'; and they could enable a mother to 'feel a bit more comfortable talking about things' and facilitate family-based support:

> *They could say to somebody else in the household who is not entirely being supportive [. . .] it is really important and can emphasise to them first-hand the benefits of giving up smoking.*
>
> *T6, I, mother*

However, several CPIT women were more negative about or ambivalent towards home visits: it would depend on having 'the house work done' before the visit and some disliked the attitude of the professional attending. Some of the providers involved in the CPIT spoke of the need to be mindful about 'child protection' issues when undertaking home visits.

Incentives delivered in the workplace were favoured by some providers and experts and are discussed in *Incentivising beyond the individual within social networks and communities.*

Providers of incentives

There were three overarching themes relating to who delivers and provides the intervention components: specialists or generalists, continuity of care and personal experience of the behaviour.

Views differed about the extent to which incentive programmes should be integrated into general universal care, with smoking cessation and breastfeeding needing to be 'everyone's business', or separated for specialist services to deliver. Many women and health professionals believed that incentive programmes were best placed within a dedicated expert service (e.g. smoking cessation advisors, peer support) that they could refer women to for 'whole-systems joined-up thinking'. A few participants felt that providers within a specialist team should have a health professional background (e.g. midwifery); however, for others this was less important. Many believed that a dedicated service would encompass 'specialist' knowledge, 'passion', 'emotional attachment', 'devotion' and 'drive' – to provide 'that extra above and beyond that gets them that one step further', with time and 'dedicated time slots' to help women. This was contrasted with trying to include smoking cessation and breastfeeding support along with all of the other demands when providing routine care.

The specialist psychologist-led support depicted in the Gulliver and colleagues'[104] vignette (see *Appendix 2*) received mixed reactions: for some it was felt able to 'reach out to people'; others felt that this level of specialism was unnecessary – 'it's all playing with your mind' or 'too in-depth', when 'it's quite simple why people do it'. GPs and pharmacists (particularly evident in CPIT women and provider interviews) were perceived as being legitimate to deliver an incentive programme, whereas health visitors and midwives, who have universal contact with almost all women, were considered more appropriate among participants not involved in incentive interventions:

> *With midwives who see women right the way through the pregnancy, we get to know the women. Perhaps it would, they'd be more interested and we know the women who would require it. We'd perhaps be able to offer services to a bigger, a larger amount of women, especially those in need, really.*
>
> *53, midwife*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Participants did, however, highlight concerns that more generalised health professionals may not have the knowledge or skills to help women stop smoking or breastfeed – how their 'agendas are different'; their 'personal motives' may interfere with incentive delivery or support considered inappropriate, 'putting the fear of God into me by telling me all the stuff that could happen'. This was directly experienced among some of the CPIT providers through non-referrals to specialist services by maternity professionals:

> *I think it's just their personal feeling that the girl's got enough on her plate just now and smoking is a coping mechanism for her you know whatever her situation might be so I think it's the midwife, the midwife might be a smoker.*
>
> *FG15, I, smoking cessation advisors*

Some participants expressed concerns regarding health professionals' 'capacity' to deliver these services and felt it important not to 'lump it [incentive delivery] into' statutory care provision. Furthermore, expert and provider participants reported that GPs' engagement would be dependent on targets and associated reimbursement as they 'don't do anything unless you pay them'.

Continuity of care and having a strong woman–provider relationship was believed by many, including CPIT participants, to be important to enhance women's motivation and commitment to succeed.

In the ladder meeting with co-applicant mother-and-baby groups (see *Chapter 2*), 'seeing the same person' was one of the few intervention components selected by women to accompany an incentive intervention. Positive women–provider relationships could also help prevent unnecessary repetition of information and enable targeted, needs-led support:

> *It should be the [. . .] same person because that is where she can like relate to, because the person will know all her background and all other things.*
>
> *8, pregnant woman*

Personal qualities of the staff were valued – 'She was really, really good – really supportive' – with difficulties experienced when no continuing or satisfactory relationship was present: 'it was never the same person so that kind of, wasn't really too good'. Effective relationships were also considered necessary to ascertain 'proof' of behaviour change (see *Monitoring, proof and feedback*).

Contrasting opinions were provided about whether those who deliver incentives should have had personal, first-hand experience of smoking or breastfeeding or just expert knowledge: a 'professional or they have been trained and knows what they're talking about'.

The CPIT women provided some positive comments about receiving support from an advisor who demonstrated in-depth knowledge and understanding and associated this with an unprejudiced approach: 'she didn't judge you'. Other participants felt that ex-breastfeeders and ex-smokers would have credibility and would comprehend and have empathy with their situation:

> *People who have done it, they are the best people because obviously these health workers, they are probably so against it, they have never smoked in their lives, so they are giving advice but they have never actually been through that, so it is all well and good, them saying not to smoke and this is what happens, blah blah blah, black and white, there is a leaflet, and never actually experienced it, so they shouldn't really be giving, you know, advice on something they have never experienced.*
>
> *12, pregnant mother*

Targeted or universal incentives

Divergent views were expressed and caveats identified when discussing whether incentives should be universally provided or targeted to groups of women who would be expected to benefit the most, in particular those living in disadvantaged areas or with individual characteristics associated with

disadvantage. Overall, universal provision appeared to be more acceptable, with concerns about creating a 'postcode lottery' of care, with participants emphasising a need for 'equity in health care'. Some felt that if targeting was to occur, this should be by area or town as it 'would be better than offering it to only a certain section of the population everywhere' or based on other sociodemographics, for example income, rather than behaviours (e.g. smoking or not smoking), such as within the Healthy Start voucher scheme.[79]

Although the potential for wasting resources by providing incentives to those already motivated was highlighted, discussed later in *Unintended consequences*, others felt that, irrespective of income, 'they [women] still need something to make them stop [smoking]'. For breastfeeding, it was felt that only 'first time mums need this level of support', with incentives not required when breastfeeding had previously been achieved.

However, concerns were raised that marginalised families with complex issues, because of their lack of engagement with statutory service provision, may not benefit even if universal provision was provided, which suggests that incentive programmes might increase health inequalities:

> *You can be pretty sure that everyone earning between £25,000.00 and £70,000.00 a year will be taking advantage of that incentive scheme whereas those who are on £8000.00 a year won't even know about the incentive scheme.*
>
> *FG12, providers and expert*

Providers recognised how care is already focused on those considered 'more problematic', suggesting the potential for stigma, although this strategy is not necessarily condoned for equity reasons: 'unfortunately the ones who are doing everything right don't get as much attention'.

It was considered that as smoking and formula feeding are more prevalent within low-income, less-educated, younger populations, incentive programmes would naturally target these groups. However, others emphasised that incentives should be specifically targeted towards younger women 'because they're our future generation of parents', with vouchers, gifts or behaviour-related incentives felt to be more acceptable within 'more receptive' teenage and/or low-income population groups.

Incentivising beyond the individual within social networks and communities

This section relates to studies in the systematic review (see *Chapters 3* and *4*) in which partners or a quitting 'pal' are included in the incentive intervention, and this is explored further in the DCE (see *Chapter 8*). This ties in with the importance of partners, families and social networks as life rungs in *Figure 18* and in the review of barriers to and facilitators of smoking cessation and breastfeeding (see *Chapter 4*). A smoke-free home was raised by participants and was included in the shortlist of promising incentive strategies (see *Table 38*). In addition, vignettes were created for studies that included community-provided incentives, for example the Gulliver and colleagues'[104] vignette (see *Appendix 2*) encompassing a wider ecological or systems approach to behaviour change. Incentives to providers of care (also included in the shortlist) were discussed in relation to these wider systems approaches and are considered separately in the next section. Not all interviews included either the shortlist of incentives or the vignettes in the topic guide and the theme of incentivising beyond the individual was raised spontaneously by some participants.

Some women considered that, if incentives were going to be issued, they should be 'for everybody' and should 'support each other as a unit rather than like an individual against everybody else'. For example, they should be delivered to organisations, providers, women, their partners and significant others to encourage engagement and provide motivation for all involved. This might prevent against 'discrimination', in which all of the responsibility for a behaviour is perceived as being placed on the women alone:

> *I think there should definitely be some sort of target at a high level and then that should be fed down to people who are interacting with the people who you want to affect, and then if the people that have actually got to do the change, they have got to have a bit of help.*
>
> *7, pregnant woman*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Family and friends incentives were generally introduced through direct questioning or through discussion of the Gulliver and colleagues'[104] vignette (see *Appendix 2*). They were considered important to create a family identity – 'we don't smoke in this household' – either through engagement of partners or from a 'matriarch' perspective.

Involvement of partners, that 'supportive person in the home with you', or even on a household basis, for smoking cessation programmes was considered important to enable a collective effort to achieve behaviour change. This was considered beneficial in terms of 'making it easier' by providing 'encouragement' and being there 'to prop each other up' and facilitate healthy 'competition':

> *I wonder if it would be more beneficial to work on an incentive to stop a household smoking rather than just the pregnant woman, because I think so many of them go back to it afterwards because somebody in the house is smoking.*
>
> *FG10, provider and experts*

Participants identified the difficulties in maintaining behaviour change if 'someone has got a partner that is smoking', as well as how this would 'erase' the benefits to the baby if it is still a smoking household. However, although one of the women whose partner (non-smoking) received vouchers as part of an incentive programme was positive about the rewards he received, ultimately she felt that his incentives had not been necessary to engage his support and encouragement. Others not involved in incentive interventions considered how incentives could encourage partners to quit, 'to smoke outside' the home and to be 'even more supportive' by providing a reward for coping with women's 'mood swings and cravings'. It was generally considered that the reward issued to partners should be 'smaller' but 'one worth having'. Involving partners or wider family members if they were not 'interested' or not 'motivated to quit' was highlighted as a concern and it was acknowledged that 'it's a lot harder for a man to stop as a woman has a reason to', implying a differential motivating effect of pregnancy.

Some providers recognised the benefits of partner involvement at CO monitoring appointments as this provided an opportunity to talk about the dangers of smoking and recognition that they are 'in it together' rather than 'as if one is feeling responsible if the baby is compromised':

> *I think it is putting too much pressure on the mum to do it on her own, so I do think it has got to be something that you do need to be rolling out across the household.*
>
> *52, midwife*

Unlike smoking cessation, there appeared to be a polarisation of views among some of the participants in terms of whether partners should be incentivised for breastfeeding. Although a family incentive approach was considered acceptable as 'there's better outcomes for everything, not just breastfeeding', mothers and providers were concerned that incentivising others could have adverse consequences, as discussed in *Unintended consequences*:

> *You have enough pressure being a mum anyway at the start let alone someone then trying to throw this at you and this at you and this at you.*
>
> *2, I, mother*

It was considered by some that the partner's role was to generally help and provide support: 'involved in getting the outcome that the mother and they want', regardless of her feeding choices. It was not considered 'an incentive issue', implying that breastfeeding is a central issue for the mother alone.

At a wider level, incentives as part of a workplace culture were considered desirable by some:

> *I think it would be an area to look at as a model to look at . . . employer wellness programmes, it has to do with the employee to do certain behaviours that are appropriate and you are rewarded for doing them by your employer who is paying for your insurance, but some of them are very successful [in the US].*
>
> *IA1, providers and experts*

Some providers and experts also considered how engagement of employers to support partners' involvement in incentive schemes could have financial and productivity benefits because of reduced absence rates:

> *The other thing is, if you sell it to employers that they allow even the male part of the workforce out to come to these sessions, the long-term effects for the workforce are that their sickness rates will decrease because the child's healthier, so they're less likely to need time off work to go to appointments with the child or with the mum with the child. That's the way to go because then you're not actually giving a person a reward, you're giving the company for helping them [breastfeed].*
>
> *FG10, provider and experts*

Incentive delivery within close-knit communities was also considered to have potential snowball benefits of 'advocating it to people that they know', as described in *Setting*, thereby encouraging social networks to engage with incentive programmes. Furthermore, numerous participants made reference to how such schemes and associated behaviour change held wider benefits of decreasing (smoking) or increasing (breastfeeding) the visibility of these behaviours, which in turn would encourage and normalise positive behaviours, 'as fewer and fewer people who do it, the more socially unacceptable it [smoking] is'.

Incentives to providers

Participants were asked their views on incentives for both individual health professionals and health service organisations. A vignette derived from the study by Cattaneo and colleagues[168] (see *Appendix 16*) was used in some interviews and focus groups to prompt discussion. Some women favoured a programme in which health professionals, 'those that are doing the work and putting in the hours' to support smoking cessation or breastfeeding, were incentivised rather than incentives being given at an organisational level, whereas others believed that both organisations and individual professionals should be incentivised:

> *There should definitely be some sort of target at a high level and then that should be fed down to people who are interacting with the people who you want to affect.*
>
> *5, pregnant woman*

However, both women and providers commonly felt that individual health professionals should not need anything extra for providing support for smoking cessation or breastfeeding because:

> *That should be part of your job, that's part of your, what you are supposed, you know, that's kind of thing you are supposed to do as a role of a midwife.*
>
> *12, pregnant mother*

Some believed that 'doing a good job is the incentive' and questioned the extent to which financial rewards to health professionals would be effective, suggesting that intrinsic motivation is high, 'because nobody sets out to do a bad job in the morning'.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

With regard to breastfeeding, women were concerned that incentivising health professionals, either individually or through organisational incentives, would lead to a more 'forceful' approach to breastfeeding promotion, where 'everyone would harp on about it', thus increasing the 'pressure' on women to breastfeed (see also *Unintended consequences*):

> *I definitely wouldn't say [incentives for] professionals in breastfeeding. Because they hammer it on you enough, they don't need any incentive. They really lay it on, they spread it thick.*
>
> *2, I, mother*

Discussion of incentives for health service organisations also yielded mixed views. Some providers saw a direct relationship between such incentives and financial support for services:

> *The amount of resources you put in to try and change people's behaviour depends upon the amount of the incentive.*
>
> *T55, consultant obstetrician*

However, many providers were eager to point out that outcomes for both smoking cessation and breastfeeding were dependent on other life factors in addition to service provision and that high-quality support might nevertheless be insufficient to change behaviour 'if that mum makes her choice that she doesn't want to continue'. Providers also noted that outcomes depended partly on whether or not women engaged with services in the first place; this was felt to be outside their control and something on which they should not be evaluated:

> *Because my target, my achievement rate, is based on those that engage with the service. You get those that say to the midwife – because they daren't say anything else and they're only young mums – 'Yeah, I'll go and see them' and then they make appointments and they don't turn up. How can you be judged on that? Because you've never had a chance. I don't agree with that at all.*
>
> *T51, I, lead health trainer – smoking cessation*

In particular, providers were very concerned that, as sociocultural factors are highly influential for both smoking and breastfeeding rates, organisational incentives would penalise those who 'worked in a deprived area'. This type of postcode variation was seen as especially problematic if incentives (or penalties) were linked to absolute rather than relative targets:

> *If they told us around here that we needed 20% smoking rate and we don't get that we're penalised. We'll just go, 'Oh, we're penalised now', because there isn't any point in throwing the money into that because 10% is so far away.*
>
> *FG9, I, experts*

A suggested approach to avoid this perceived unfairness was to 'incentivise the work, not the result, because the result is out of our control'. Another suggestion was to incentivise referrals to specialist services, on the grounds that otherwise referrals would not be forthcoming. Other suggestions were to incentivise staff 'to turn up to training' or to give incentives to staff who could demonstrate specialist knowledge.

Some providers felt that the distinction between incentives for reaching targets and penalties for failing to reach targets was simply a 'linguistic difference', whereas others felt strongly that penalties would be 'counterproductive'. Some were concerned about the implications of lost income for the service – 'how would the money withholding help to fix the situation? – whereas others presumed that there would be

knock-on effects on other services whereby a 'health board loses money so they cut a service somewhere else'. Some providers believed that organisational penalties would lead to 'low morale amongst the staff':

> P4: *If you worked in an area that did not breastfeed at all, and you just couldn't do it, and you got penalised, it would be so disheartening after all that work.*
>
> P1: *You wouldn't engage would you?*
>
> *FG9, I, experts*

Some providers felt that organisational incentives for breastfeeding rates would contribute to a 'shared aim' across different services within the organisation, to getting 'everybody on board in some shape or part'. Some reflected that breastfeeding support was considered an undervalued area within organisations. However, other providers were concerned that incentives to meet organisational targets for breastfeeding would detract from good care, leading to a 'box ticking' approach in which health professionals would 'forget about the support and the woman' and 'lose the point of it all':

> *They won't be looking at that woman, they'll be looking at those numbers, 'well I've only got how many'.*
>
> *FG10, provider and experts*

Timing, communication modes and intensity

A strong theme among women and provider participants was for flexibility and individual tailoring of the timing, modes of delivery, length of sessions and intensity when delivering incentive programmes and any additional support sessions. Participants provided varying views about when programmes should begin and end and the optimal overall duration of interventions.

The majority considered that smoking cessation interventions should be provided 'as early as possible' in pregnancy as this was 'a prime time' to 'get the messages across' about the health risks involved. However, as pregnant mothers can feel 'bombarded with everything', opportunities for later engagement and/or partner involvement to help retain and re-enforce the information were considered beneficial.

Participants emphasised the importance of continuing the intervention throughout pregnancy and/or for a prolonged period of time (e.g. 12 weeks), as well as into the postnatal period (e.g. at least 2 months, 52-week quit or up to 12 months postnatally), when the potential for relapse was high:

> *At least then they've given up smoking through the pregnancy and at least until the baby is 3 months old, so they've gone a year without smoking so it decreases the chance of them smoking again, if you know what I mean? They'll be so used to not smoking.*
>
> *T10, pregnant mother*

Post-partum incentives were provided in some effectiveness studies in the systematic review (see *Chapter 3*), as relapse after birth is evidently a problem (see *Chapters 3–5*). In addition, the continuation of financial incentives postpartum was supported by some participants and they were included in the shortlist of promising incentive strategies. However, some women did not feel that incentives would work in the post partum period, especially when there was a desire to return to a pre-pregnancy social life/identity:

> *I stopped smoking through pregnancy and I was just saying when I am out, if I have a few glasses of wine I want a cigarette. I don't know, I don't think an incentive would stop me from doing that because that's when I am socialising, baby is not there its different, your inhibitions are down. Your judgements are different anyway.*
>
> *FG7, mothers and health visitors*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

When discussing the Volpe and colleagues[107] study vignette (see *Appendix 2*), antenatal recruitment onto breastfeeding education programmes was considered appropriate by some but not others, particularly if this caused 'a blow' and a sense of failure for those who were then unable to establish breastfeeding (see *Information and education*). Opinions as to when to end breastfeeding support programmes varied. For some, 6–8 weeks was suitable to help women to resolve early breastfeeding difficulties, as this was when women were likely to access other avenues for support, such as postnatal groups. Although concerns were expressed about the costs of prolonged service delivery, some considered that programmes should be offered for 3–4 months or for 6–12 months, in line with WHO guidance, or to ensure support provision at 'pinch points', for example on return to work or at times of growth spurts when the potential for discontinuation is high.

Several participants considered that regular weekly or fortnightly contacts should be provided or, as detailed in the study by Heil and colleagues[105] (see *Appendix 2*), initial daily contacts that then reduce in frequency. Others viewed the weekly and varying schedule of contacts detailed in the study by Heil and colleagues[105] as 'too confusing', requiring 'too much effort' and being unlikely to fit in with women's individual lifestyles. A few participants judged the Gulliver and colleagues'[104] vignette (see *Appendix 2*), with prolonged support periods (e.g. 60 minutes), to be acceptable for smoking cessation; however, some considered that it was 'too long'. In the Walsh and colleagues'[108] vignette (see *Appendix 2*), the specification of 'minutes' of support was considered suitable for those with a 'short attention span'; for others it was felt to be 'too strict' and restrictive, with a preference for the intensity of support to be tailored to individual need. For example, CPIT providers referred to how they would offer more than four weekly contacts if requested by the women, as well as work earlier or later (out of hours) to ensure that contacts would fit with the women's lifestyles:

> *If that's what they've requested us to do and then if that's what's going to keep them on track then we will do it.*
>
> *FG15, I, smoking cessation advisors*

Although some women involved in the CPIT considered the four 30-minute contacts per week to be acceptable, others felt it was 'too much' and others wanted additional contacts in the middle of the programme (rather than just at the beginning and the end) to receive 'positive feedback':

> *I want to come in and see you and blow on your silly wee machine, I'll show you. So actually she made me another appointment and I went in just literally to do a CO for the fun of it basically. She was flexible with me that way, you know, she had space to do that which was more productive than sitting on the phone for 45 minutes. I went in and I saw her.*
>
> *28, I, pregnant mother*

With regard to the timing of incentive provision, participants considered that incentives should be offered at each or every other contact with the service or distributed throughout the incentive programme (e.g. start, middle and end or every month/3 months) to provide more dispersed 'milestones' (see section on goal-setting) and/or timed to enable rewards at key points, for example 'just before the baby is born'. The weekly issue of gifts within the breastfeeding incentive scheme was considered important to motivate women through the early 'difficult' periods:

> *Whereas you know if you had the X [peer supporter] popping round every week seeing how you were doing, and bringing, you know, some sort of goody you are thinking if you can get through the next couple of days and I will have achieved another week.*
>
> *T6, I, mother*

Several participants expressed other perspectives, reflecting on how support sessions and incentive provision should be more frequent at the start of the programme, 'sectioning things up rather than doing something at the end' (e.g. weekly), followed by increasing periods between incentives as behaviours become established and maintained. Alternatively, there could be a combination of 'predictable' ongoing incentives together with unpredictable incentives (e.g. raffles) at key points (e.g. every 3 months, programme end), which could subsequently be utilised to promote the service.

Across the narratives, the timing of breast pump provision provoked differing views, with uncertainty about the existing evidence and conflicting advice. Providers expressed concerns that giving breast pumps may encourage women to express milk 'too early', that is, before breastfeeding is established, and that there may be deleterious effects as a result:

> *So to give them a breast pump you're going to interfere with the actual lactation of breastfeeding process and you're going to create problems for them I think in the early days doing that.*
>
> *FG12, providers and expert*

A few women, in discussions around the Chamberlain and colleagues'[103] vignette (see *Appendix 2*), felt that it was most appropriate to receive a breast pump as an incentive immediately after birth but some women queried the power of a breast pump to motivate if provider advice is that it should not be used immediately:

> *They mentioned . . . try and wait till 4–6 weeks before you can do that [express milk], I mean that's 4–6 weeks where you might not necessarily get to 4–6 weeks and make use of it.*
>
> *5, pregnant woman*

When considering modes of delivery, contrasting views were expressed about the utility of telephone support. This communication mode for breastfeeding support (e.g. in addition to a breast pump – Chamberlain and colleagues'[103] vignette, see *Appendix 2*) was felt to be useful by some and a potential 'distraction' and 'intrusion' by others. Numerous women in the CPIT expressed positive views about being able to determine when helpline support was received, but, although some valued the additional encouragement that the telephone support provided, keeping 'you on your toes a wee bit', others provided more negative comments and 'didn't find it any help at all'. CPIT providers would inform/remind women about receiving a call, request women to key the telephone number into their telephones to aid recognition and issue text messages if calls were not answered. However, several issues were expressed by CPIT women, such as telephones breaking, missing calls and being unclear as to the purpose of calls or what to do next:

> *I had a missed call from an 0800 number but I don't what it could have been, it could have been them.*
>
> *40, I, pregnant woman*

The CPIT women also valued the speed with which vouchers were received by post and the secure nature of this method of receiving vouchers – 'because that way you know that you are getting it safely'; for providers it avoids the operational issues of supply and accountability involved with immediate reward at the time of verification.

Face-to-face support was considered to be important to develop positive relationships and to provide practical support, particularly for positioning with breastfeeding. However, participants had different perspectives about whether individual or group support should be provided, with several participants emphasising the need for women to be 'in control' of how support was received. Group support

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

incorporated benefits of enhanced well-being and social support as well as normalising and validating women's experiences – 'to know I am not the only way that is facing the same problem'– with positive 'peer pressure' believed to aid maintaining behaviour change:

> *That was quite successful for me as well. I found the support and the information was really good. You heard everybody's experiences and a lot of people were there for all different reasons. You could phone up the woman any time you wanted and get support.*
>
> *37, I, pregnant mother*

Conversely, others expressed concerns about not 'fitting in', how group members could inhibit discussions and be internalised as 'patronising' as well as create unnecessary 'pressure'. Several women stressed the importance of shared characteristics among smoking cessation group members, for example only pregnant mothers and not the general population or, for teenage mothers, 'not sex groups but age groups'.

Who should pay for incentives?

Participants were asked who they thought should pay for incentive programmes. Most participants assumed that incentives would be paid for by the NHS, the government or 'taxpayers' money'. For some service providers, this was felt to be appropriate because 'it's really a public health issue' and because prevention was felt to be an important focus for the health service:

> *I don't draw a huge distinction between lifestyle-type interventions and medical-type interventions, because you know I see one is just getting in earlier than the other.*
>
> *T47, research manager, voluntary sector*

However, discussion of public funding frequently provoked discussions about fairness and the potential for resentment for those not incentivised, as well as concerns about health service priorities and the possibility of lost or reduced funding from other areas. In contrast to these reservations, some participants perceived there to be wider societal benefits if incentives were effective in increasing smoking cessation or breastfeeding rates (see *Unintended consequences*).

The idea of local or national business funding incentive programmes was prompted by the local business involvement in the Gulliver and colleagues'[104] vignette (see *Appendix 2*). Some participants suggested that 'big companies' may be interested in funding or subsidising incentive schemes 'because it will all be advertising for them'. For some service providers, this raised ethical concerns because of the potential for business interests to conflict with health priorities:

> *I think you have to be very careful because the businesses that are gonna have the most money to put in are those going to be sharpest about thinking about how they can make best of the situation. You'd have to be very clear that it wasn't undermining help in another way.*
>
> *FG9, I, experts*

Views were mixed with regard to local business involvement. Some service providers believed that local business involvement in incentive schemes could be beneficial for communities:

> *I think involving local – especially quite local businesses – would be good as well to make it seem like it was more of a community thing. I think particularly in rural areas that might work particularly well.*
>
> *T56, tobacco trainer – tobacco control team*

However, others felt that local business involvement would be intrusive in what they considered 'personal' issues and could end up being quite 'Big Brotherish'. Local businesses were seen to have more of a role in supporting their employees to quit smoking and providing a facilitating environment.

A perceived drawback of involving local businesses in incentive programmes was that programmes would be less transferable between areas. Some service providers believed that finding businesses willing to support incentive programmes would be more difficult in areas of deprivation – where shops 'all sell cigarettes, where's the incentive for them?'

Unintended consequences

Participants presented disparate views on the unintended consequences of incentive programmes. Although CPIT providers were generally unaware of any negative 'backlash' to the incentive intervention, other participants expressed concerns about 'negative publicity', with incentive provision described as 'controversial', 'unpalatable' or a 'hot potato'. Overall, there were a number of negative as well as positive consequences identified by the participants in relation to the fairness of incentives in terms of whether recipients were considered to be deserving or undeserving. Negative consequence themes were increased health inequalities through diminished personal responsibility and motivation; gaming and cheating leading to negative consequences for health as well as the reputation of the intervention; adverse effects on relationships at home and with health professionals; how the resale value of the incentive held risks of domestic abuse; how endorsement of behaviour-related incentives can create an illusory correlation of needing the item to succeed; and perceptions of wasting NHS funds and the workload involved in administering incentive programmes with consequent opportunity costs for other services that would benefit from the resources. Positive consequence themes were health and emotional outcomes consequent on success; engagement in health-promoting services; maternal well-being; and helping to provide resources to those most in need, thus addressing poverty.

In relation to the 'fairness' of incentives, they were considered by some to be 'unfair' and 'penalising' to those who do not smoke or breastfeed:

> *I think if you are going to provide free ironing only for those who give up smoking in pregnancy, it's discouraging or unfair on those who gave up smoking before, or who never started smoking.*
>
> *T64, paediatrician*

Numerous participants made reference to the unfairness of penalising those who 'are doing the right thing', with some referring to how this was counter to practices advocated within parenting and education in terms of 'positive reinforcements' for good rather than negative behaviour:

> *If you are a pregnant mum and not smoking, you should be incentivised because you are being the role so that might give the other mums who smoke motivation to stop, knowing what they could get, so you are rewarding the good behaviour.*
>
> *FG2, mothers*

From a different viewpoint, others felt that incentives could create 'polarisation' between different groups of women (e.g. those who breastfeed and those who formula feed) and even instil 'resentment', particularly if the incentive was targeted towards a particular, 'undeserving' population: 'well that's my money, going to my next door neighbour, they don't have a job'.

Financial incentives were considered to have the capacity to increase health inequalities because of marginalised families and those with very chaotic lifestyles being less likely to be aware of, and engage with, health provision. Incentive provision was also felt to diminish personal motivation by discouraging women to quit so that they could participate in the programme, thereby reducing 'health choices to a financial transaction', or even to incentivise 'people to get pregnant'. Although some women considered this unlikely – 'why damage your body if you don't actually already do it' – incentives of higher value were generally believed to be associated with a greater likelihood of 'gaming and cheating' in order to receive the incentive – 'but £750.00, like I say I would I start smoking for that' – with small personal gifts felt to be less open to abuse than vouchers because 'there's no resale value of some bubble bath'.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Concerns were expressed about the fallibility of 'proof', as well as women's awareness of how to 'cheat' the tests, as described in *Monitoring, proof and feedback*. However, these concerns were not necessarily evident within the CPIT:

> *So far the people that I have engaged with that have signed up to the service to me, bar one, I feel have been one hundred percent genuine.*
>
> *T72, I, smoking cessation advisor*

Providers considered how behaviour-related (e.g. breast pumps, breastfeeding clothing) incentives were less likely to elicit cheating than shopping vouchers because of their more limited appeal: 'you're not going to pretend to carry on breastfeeding are you, just to get the incentive'. However, there were concerns that endorsing such incentives could create a situation in which women considered these items to be a necessity to be able to breastfeed, as discussed in *Behaviour-related incentives*.

Incentive provision was believed to lead to adverse effects on women–provider relationships because of women feeling 'coerced' or 'forced' into persevering, with implications for future engagement with health service provision: 'women may not attend antenatal for fear of being pushed to stop smoking'. It was also believed that the increased pressure associated with intervention programmes could exacerbate unhealthy behaviours, for example women smoking more or being less inclined to breastfeed. Although smoking was considered a 'choice', breastfeeding was believed to be shrouded within 'uncontrollable circumstances' relating to the relative difficulty of performing breastfeeding compared with smoking. Withdrawal or non-eligibility of incentives for women who were unable to breastfeed or quit smoking was therefore considered to create 'pressure' and 'blame', leading to feelings of being 'judged', 'reduced self-esteem', 'guilt' and 'failure', a situation that created unease and discomfort, particularly among the providers. Other concerns related to how organisational incentives could result in individuals (providers and women) being 'inappropriately handled' in order to meet targets.

Risks of abuse were also identified in terms of how vouchers could be resold or used to purchase undesirable items, as well as the potential for 'domestic abuse' – 'people taking those vouchers off those women as they walk out the door' – or manipulation by others:

> *There was a thing in the newspaper about it and her husband phoned up, phoned the service asking about the money and then, well we ended up making her an appointment and she came along to see me because her husband wanted her to get this money. She came along to the face to face and then I never heard from her after that.*
>
> *FG15, I, smoking cessation advisors*

Concerns were expressed over how incentives could be perceived as being a 'waste' of taxpayers' money and NHS resources. Preventing waste through targeting those who are 'actually really serious about their health' rather than those whose 'main motivation was financial gain' was suggested. Issues regarding relapse after the incentive had been withdrawn, because of 'people stopping for the wrong reasons', and limiting re-access among those who relapse – 'get the voucher, spend it, then start again' – were highlighted by many participants. Because of the current adverse economic climate, participants considered incentives to be the 'wrong use of money' when the NHS was faced with 'overstretched services' and hospitals 'trying to clear debts'. Participants expressed concerns over the perceived implications of funding incentive programmes for existing dedicated services, for example smoking cessation, as well as the opportunity costs for other services:

> *It's bad enough giving them NRT free, sometimes you get the feedback about that, you get nipped a wee bit but if they thought they were actually getting money, just because there is so many cutbacks you know, they may be seeing it that they've got an elderly relative with Alzheimer's or something like that or nursing home fees.*
>
> *66, I, health improvement senior officer*

Providers and experts had reservations about the associated costs of appointing committed and skilled staff to deliver these interventions and the potential implications of training, paperwork, organisation and 'policing' of incentive delivery for 'overstretched staff'.

Numerous participants made requests for the intended incentive costs to be redirected towards increased and/or more effective services to support behaviour change (for smoking cessation and breastfeeding):

> *I think the money needs to be invested in helping people who do want to breastfeed, breastfeed properly.*
>
> *FG1, mothers*

Participants referred to the 'paternalistic', 'nanny state' ethos that exists in the UK and expressed concerns about how paying for health could have long-term ramifications in terms of the other health-related behaviours that individuals might expect rewards for, creating new social or health-care norms that could potentially diminish individual responsibility for making healthy choices:

> *This is the NHS. We're health, you know. It's your own health, take some responsibility. I think we're going right down the wrong route; I think that, you know, when we're enticing people with money and gifts just to do what's right for their health, you know. What else will we expect?*
>
> *53, midwife*

With regard to positive consequences of incentive provision, participants referred to how incentives were 'preventative measures' that had the potential to lead to a 'greater uptake of services' with subsequent long-term cost benefits to the NHS through improved health. Incentive programmes were believed to provide wider benefits of enhanced 'social awareness' of these behaviours, 'social connectivity' and 'social exposure' to positive behaviour change. They could enhance self-esteem and encourage positive behaviour to 'cascade through the family' and to other members of the women's social networks or wider community members, as well as providers. For providers, improvements in patient and public health behaviours could provide 'job satisfaction', 'encouragement' and a 'boost' for staff morale. Some participants considered the cost of incentives to be 'far outweighed by the benefits' of not being 'surrounded by people puffing away on fags' and the associated health and well-being implications for women and families. Some participants also believed that employer-led 'wellness' schemes such as enabling employees (e.g. women and their partners) to attend incentive programmes would lead to financial and productivity benefits through reduced absenteeism for ill health.

Perspectives on research into incentives

Divergent attitudes were expressed towards research into incentive interventions. Participants who had been involved in incentive interventions referred to how inclusion in a research study could enable women to feel that they were 'part of something' and lead to them 'feeling valued', irrespective of whether they were allocated to the intervention arm or not. CPIT women also expressed feeling more 'confident' and 'privileged' in terms of how their inclusion could 'help somebody else stop smoking, that gives me great pleasure'. Although some in the control arm expressed ambivalence towards not receiving an incentive – 'I wasn't really too bothered' – other participants considered how allocation to a control arm of a trial could lead to 'disappointment', 'jealousy' or even apathy:

> *She said, well do you know, if I had been selected for the vouchers I think I probably would have given up. That is so ironic isn't it? Because they're given a voucher they'll stop because you know, it's something they are getting.*
>
> *68, I, midwife*

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Ethical issues in terms of how incentive provision could lead to coercive practices were highlighted. For example, organisational/provider incentives could result in 'people being inappropriately handled because they haven't adhered', or the wording used within the protocol or participant sheets could read 'almost like bait':

> *I think if you go to an ethics committee and tell them it's an incentive, they'll throw you out. If you go to an ethics committee and say it's in recognition of the time that they've given for the study, they'll have it.*
>
> *T65, paediatrician*

The fact that incentive provision for recruitment purposes may influence someone's decision whether or not to take part, rather than intrinsic motivation for behaviour change, was considered to be 'slightly unethical', with additional concerns related to the implications of incentive withdrawal for non-compliance for personal well-being:

> *In terms of ethics those that don't achieve, shouldn't be made to feel bad about themselves for taking part in a research project so it's a difficult thing, from an ethical perspective.*
>
> *62, ethics committee member*

It was also believed that incentives provided only to the intervention arm could jeopardise the trial in terms of attrition as the 'control might end up with a very low number'. Concerns were expressed about the capacity of smoking cessation trials to recruit representative samples as it's an addictive habit and 'a lot just wouldn't take part because of that'.

The need for careful planning of the trial design was acknowledged, as other intervention components that include BCTs are important and it is difficult to 'unpick what was caused by your incentive and what was caused by your intervention'.

Discussion

Key findings

The primary qualitative findings are presented as a logic model to illuminate the meanings, mechanisms of action and interactions of incentives to inform our shortlist of promising strategies and to uncover the unintended consequences associated with incentives.

Our data illustrate how the fit between the real lives of women and incentive intervention programmes is crucial. Using a ladder conceptual model, we illustrate this fit, showing how rungs supporting behaviour change can be missing (e.g. lack of family support, stressful lives, unsatisfactory relationships with health professionals) and how supportive rungs can break (e.g. if a partner resumes smoking, the need for a breastfeeding woman to return to work), thus identifying where incentive intervention programme 'rungs' might help.

Although attitudes towards incentive programmes were varied, women appeared more amenable to the idea than providers. Providers expressed greater caution about the unintended consequences of incentives, the appropriate use of health service resources and the ethics of incentives. In relation to incentive components (rungs), guaranteed incentives were preferred for proven behaviour change whereas unpredictable incentives (e.g. raffles) were thought to encourage participation, irrespective of outcomes. Incentives were generally more acceptable if provision was dependent on proof of a successful outcome; however, methods for gaining proof of smoking cessation were considered fallible and lack of biochemical proof for breastfeeding is problematic, with preference for trust rather than statements of verification or video/photographic evidence.

A typology of incentives emerged, which ranged from highly restrictive incentives (e.g. health or behaviour related), to free-choice 'hedonic' incentives (e.g. shopping vouchers or cash), with the degree of free choice often critical to how they were perceived. The necessity to individually tailor incentives was a recurring theme, as was the potential for incentives to enhance well-being or to accompany the provision of additional support as an intervention component. Although the financial value of the incentive influenced the significance of the incentive for some women, the relationship was not necessarily commensurate. Breast pumps, although considered to be problematic among health professionals because of conflicting advice and guidance concerning their use, were particularly attractive to women on a low income and when sharing the experience or the onus of feeding, particularly with partners, was a priority.

In terms of other programme components, it was considered important that incentives should be combined with short-term goal-setting, monitoring, personal feedback, verification of achievement and other BCTs. Help and support were felt to be important programme components, and education and information were also mentioned, albeit these were considered less valuable. Sensitive communication was required to avoid perceptions of pressure, fear, failure and judgement. Feeling supported was considered most important for both behaviours, particularly for breastfeeding when women and babies were learning a new and often challenging practical skill. Incentives are tangible non-verbal cues and, similarly, education and support that included objects added to the environment, technology or visual prompts, such as seeing the monitor turn green, and sensations such as smell seemed more powerful as motivators than words for some women.

Flexible settings for incentive programme delivery were suggested, with home or community locations favoured over health premises. Dedicated specialist services with continuity of non-judgemental care were preferred, whereas personal experience of the behaviour was less important. Although midwives and health visitors were considered best placed to deliver incentives by some, there were concerns about their lack of skills, different agendas and capacity and the potential impact on health professional–women relationships. Early engagement of pregnant women into incentive programmes was thought to be advantageous, as was continuation of programmes throughout pregnancy and following birth. Face-to-face support was considered important for building relationships and to individually tailor an approach in terms of timing, frequency, intensity and mode of delivery (face to face, telephone, text message, group), as no single package suited all.

Although many felt that these target behaviours warranted public health funding, others considered that spending taxpayers' money on incentives was not appropriate. Involvement of local businesses was popular with some women, but health professionals felt that this could present conflicts of interest. Universal and equitable rather than targeted incentives were considered more acceptable to reduce stigma, although there were concerns about increasing health inequalities as more marginalised women were thought less likely to access them. Provider incentives at a higher organisational level rather than for individual health professionals were considered important when they involved setting targets or funding specialist services that women valued. Finding a way to incentivise everyone – women, families, communities and providers – was suggested. However, incentives beyond the individual (e.g. partners or wider social networks) were more acceptable for smoking cessation than breastfeeding, and concerns were raised around creating family pressure.

Positive consequences of incentive programmes were identified with regard to health and emotional outcomes and providing resources to those most in need. However, key negative consequences of incentives included fairness, potential deleterious effects on personal responsibility and motivation, the risk of gaming and cheating, possible adverse effects on family and provider–mother relationships, perceptions of wasting NHS resources and the opportunity costs in terms of the negative impact on other services that would benefit more from the resources. Wider personal and social benefits of involvement in research trials were identified. However, negative attitudes and behaviours associated with trial arm assignment were highlighted, as well as difficulties in distinguishing between the effect of the incentive and that of other programme components.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Strengths and limitations

The strengths of this study are primarily methodological and include the multidisciplinary, mixed-methods, three-site approach, which enabled us to contrast the views and experiences of those with and without direct experience of incentive interventions. This provided contextualised and experiential as well as theoretical perspectives on a wide range of different incentive strategies to inform both the mechanisms of action of incentives for behaviours around pregnancy and childbirth and our incentive strategy shortlist. Stratified sampling techniques enabled us to obtain a broad range of views from participants with a diverse range of socioeconomic and behavioural characteristics, including participants who seldom engage in health services research. However, the views that were collected revealed some common 'norms' across that sample, for example only a small number of the women had not tried to breastfeed or planned to formula feed, perhaps reflecting that 80% of UK women initiate breastfeeding.[53] In addition, limited views from wider family members were collected. Data collection was undertaken by five researchers with diverse participants over a prolonged period of time, with different research questions addressed at different times within the BIBS study and the process evaluation of the CPIT providing a different objective and context. This resulted in variations in terms of how the interview and focus group questions were framed. The in-depth richness of the data suggests that this was a strength rather than a limitation. The significance of framing effects is discussed in *Chapter 7* and is highly relevant to controversial topics in which there is ambivalence. Using a smaller team of researchers, with a structured, fixed interview topic guide, could have resulted in systematic bias in the data collected. The use of vignettes frame the incentives; however, they enabled participants to highlight issues from a more individualised, reflective perspective than would have been achieved using question–answer techniques. They helped to investigate aspects of the patient journey through an incentive intervention (see *Chapter 3*) in a more tangible, less abstract format, as delivery processes were not well reported in the studies included in our systematic review (see *Chapter 3*). CPIT data were included at a late stage and were analysed using the existing thematic framework to minimise bias but allow triangulation of these independently collected data. Every effort has been made to be transparent about the source of data and the context in which we interpret it, as this was a complex topic and the study focus changed over time.

Fit with the literature

The typologies of women reported by Nichter and colleagues[110] and Radley and colleagues[113] for smoking cessation incentive programmes in pregnancy, and the typology for a wider range of wellness incentives described by Schmidt,[271] resonate with our data and influence engagement and behaviour outcomes. These typologies have important implications for policy decisions about whether incentives are universal, the preferred option in our study, or targeted to those who have the capacity to benefit and/or who are most likely to succeed. The differential uptake across social classes and the potential for health inequalities to increase is a concern, as noted for all lifestyle behaviour change interventions.[282] However, typologies have their limitations in terms of stigma, their static nature and the grey areas between categories.

Individually tailoring the incentive and support components of an intervention, as well as the delivery processes, was an important study finding as one size did not suit all. Important themes included autonomy and freedom to choose, as illustrated by preferences for unrestricted hedonic shopping vouchers over health-related or utilitarian incentives; the wide range of material and non-material influences that enable women to take advantage of the opportunities available to them to achieve change and well-being; and the value of trusting continuing relationships. The question of 'who controls the incentive' has implications for the meanings of the incentive for women, and potential implications for women's motivation, as described in self-determination theory.[23] The sense of women wanting to self-direct and be in control of their lives and behaviours around childbirth, with intrusion by others unwelcome, is illustrated by the dislike of household services as an incentive, confirming data from a recent qualitative study.[62] These themes resonate with the capabilities theory of Amartya Sen[283] and assets-based approaches to health improvement[284,285] in relation to reducing health inequalities and improving well-being and quality of life as outcomes. Incentives, combined with a facilitative supportive package, can therefore acknowledge women's capabilities, rather than highlighting their deficits, which fits with the MAP theory of behaviour change.[16] Our data were congruent with self-directed learning style theory to establish and

sustain lifestyle behaviours,[12] as incentives alone were not considered sufficient, and the need for sensitive, authentic person-centred communication,[67] as women dislike feeling judged or pressurised to behave in a way deemed appropriate by others.[225]

Importantly, our data support and develop earlier qualitative research about the value of incentives as connectors.[112] They can motivate some women to succeed at the behaviour and to engage with preparatory behaviours. For example, peer support initiatives[112] or the use of breast pumps as technology connectors could help to overcome emotional barriers to feeding at the breast. They also facilitate parents' valued social lives and family roles in child care. Food and drink[286,287] or an ironing service[287] can increase participation in education or support group programmes and incentives can increase recruitment and participation in research trials.[216] Gifts focusing on maternal well-being were valued for their communication of achievement and recognition of the effort required to 'be a good mother', when the odds might be stacked against this. Gifts can also be considered a cultural norm in the context of pregnancy and parenting magazines, websites, proactive e-mails and texts to shared mailing lists and NHS 'bounty bags', where small gifts and discounts are widely provided to advertise products and services. Preference for incentives that increase feelings of well-being is consistent with findings that maternal and family well-being are important drivers in behaviour decisions.[288,289]

Life course events and their relation to disadvantage and the accompanying vulnerability or resilience in the face of adversity were important in our data, as noted by others.[290] Situations, for example domestic stress or an unsatisfactory health-care encounter, can occur suddenly, be emotionally intense, preclude rational decision-making[14] and be pivotal for behaviour change.[17,26,289] Incentive programmes therefore need to be flexible and tailored to fit with 'everyday life rungs', which was consistent with the qualitative evidence syntheses for the barriers to and facilitators of smoking cessation and breastfeeding (see *Chapter 4*). Early engagement in programmes at 'teachable moments of increased receptivity', with assessment of motivation and tailoring of the timing and modes of delivery, supports the conclusions of Racine and colleagues;[291] however, this creates challenges for the design of complex intervention trials. For behaviour maintenance, there is a need to tailor support to tie into 'pivotal points' (the times when support is most needed), such as the early days after birth, stressful situations, social events and return to work.[288] It could be argued that this supports the findings that smoking and breastfeeding are not independent behaviours and/or outcomes[68–70] but rather are bound up in the complexity of women's everyday lives. Rather than applying an individually targeted incentive programme there may be merit in applying ecological and systems approaches to behaviour change,[19,292] thus pointing to the potential for complex interventions to address multiple behaviours. Weight management is an issue particularly with smoking cessation, but there is currently a gap in the evidence with regard to incentivising both. However, offering health-related incentives to promote exercise and reduce smoking, as in the study by Ussher and colleagues,[150] and offering free vouchers for use at local leisure facilities for breastfeeding[112] were largely unattractive. Consistent with wider ecological and systems approaches, some considered that there was a need to incentivise beyond the individual, to include organisations, providers, families and communities to achieve a cultural shift and collective efforts. Work-based incentives (see *Chapter 3*) were considered desirable; the pressure on women to return to work can have an adverse influence on breastfeeding and return to work can lead to smoking relapse in the presence of work culture norms and smoking rituals. The engagement of partners/wider social networks in incentive provision shows some promise[104,141,176,178] but was more acceptable for smoking cessation than for breastfeeding, where women's personal choice was paramount and additional partner pressure was considered undesirable.

The finding that women value support both over and above incentives for breastfeeding or education also fits with earlier qualitative findings[112] and with the evidence that any additional support, professional or lay, improves breastfeeding outcomes.[65] To date, there is little evidence that education is effective.[54,293] Although there are recommendations for the expression of breast milk and the use of breast pumps for sick and/or premature infants,[294] there appears to be uncertainty and conflicting health professional advice around this practice for healthy, full-term babies.[295] Because of the potential capacity, knowledge and skill deficits within health providers, and some reservations expressed by midwives and health visitors about

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

behaviour change roles, the delivery of incentive programmes within dedicated services was preferred. The utility of structured support to provide shorter-term, small achievable goals, with resetting and feedback, has been previously recommended as an effective behaviour change strategy[215,296] and can counter the discounting that occurs for non-tangible, theoretical longer-term adverse health outcomes. Monitoring appointments and verification of behaviour outcomes were important for motivation and acceptability, but also a source of concern for many, with no standard for breastfeeding and imperfect standards for smoking cessation.[163]

Ethical issues and concerns about how incentive provision could encourage unhealthy behaviours, game playing and coercive practices also support those identified by the wider incentives literature (see *Chapter 5*) and a Citizen's Council meeting held by NICE.[297] Although small personal gifts were felt to be less open to abuse than those of a larger financial value, these findings may well reflect an internal bias to overestimate risk,[15] particularly when 'cheating' was not evident within the CPIT data.

Conclusions

Implications for the incentive taxonomy

- A typology of incentive types, incorporated with the IRBCTs developed in *Chapter 3*, was incorporated into an incentive ladder logic model, as a taxonomy just for incentives alone did not fit with the complexity of the data.
- We hypothesise that an incentive intervention would be unlikely to change or maintain behaviour in isolation and, as the ladder model demonstrates, the interaction and fit with other life course and context rungs will be likely to affect engagement and effectiveness.
- Incentives and other intervention components in programmes would benefit from being tailored, communicated, interpreted and delivered to enable women to bolster their individual capabilities and their existing intrinsic and extrinsic influences on smoking and breastfeeding.

Implications for the shortlist of incentive strategies

- Shopping voucher incentives for smoking cessation in pregnancy and continued after birth were preferred to shopping vouchers for breastfeeding.
- Incentives beyond the individual, which include support from partners, families, friends and service providers, show promise, with smoking at home highlighted as a barrier to sustained behaviour change.
- Breast pumps and breastfeeding behaviour-related incentives were popular, particular with younger mothers and those with material disadvantage. They addressed barriers relating to negative emotions about the role of breasts for feeding and those relating to the desire to share the onus of breastfeeding with others, particularly for resuming a public social life.

Incentives for providers provoked mixed views, with concerns about the impact on other services. However, the importance of everyone working in the same direction to support women was recognised as a positive consequence of incentives to organisations.

Chapter 7 Surveys to inform the acceptability of incentive interventions around childbirth

Background

In this chapter we report two surveys to investigate the acceptability of providing incentives from the perspectives of (1) the general public and (2) health professionals and other stakeholders working in maternity and early years services.

Acceptability of incentives offered to people to change their behaviour

Assessment of the acceptability of incentives to the wider public is potentially important in the current economic climate, where the use of taxpayers' money in public services is already widely scrutinised. Incentive initiatives such as Give it up for Baby,[113] which provides £12.50 per week of grocery vouchers, has generated media controversy and resistance from some organisations, such as the TaxPayers' Alliance.[298]

The National Institute for Health and Care Excellence held a Citizen's Council in May 2010 to discuss when and whether incentives to change individual behaviour might be acceptable to improve health.[297] Of 32 attendees, 12 voted against and 20 voted for incentives, but with conditions such as the need for evidence that incentives work; the need for evidence on why incentives sometimes fail; and cash incentives should be a last resort. Other concerns were unfairness to those who make healthy choices; that incentives appear to reward unhealthy behaviours; the potential for abuse; the cost; the need to monitor and safeguard, particularly if private companies are involved; and the danger of becoming a 'nanny state'. The benefits of incentives included their potential to demonstrate to people that they are worthy of being helped; to facilitate contacts between recipients and care providers; and to provide benefits for child health.

There are also some survey data available on public attitudes to incentives in the UK. For example, the British Social Attitudes survey[299] asks, 'Regardless of what happens now, what, in your view, is the best way for the government to help people to lead healthy lifestyles?' 'Pay people' was the least popular option (2.4%), with more popular options being tax unhealthy things (e.g. alcohol and cigarettes) (21.9%), leave people to make their own choices (17.8%) or provide information (48.0%). A decision guide survey for purchasers asked the question, 'Are consumers in our community ready for financial incentives?'[254] The answer, the authors argue, depends on how the information is presented, keeping the message simple and designing financial incentives that better align the goals of consumers with those of the programme sponsor, yet the authors point out that this has received little direct research attention. The importance of how a question is worded is confirmed by a 2012 survey of Scottish adults by Ipsos MORI ($n = 1003$).[300] In total, 49% supported *paying* women to stop smoking in pregnancy and 44% supported paying women to breastfeed. However, the nature of the incentive and how the incentive scheme was described affected responses. When the same question was asked about *rewards*, which might or might not be financial, rather than payment, there was an increase in support. Of those who originally opposed, 26% said that they would be more likely to support such schemes and a further 27% said that they would be more likely to support rewards for some behaviours. Of the 506 Scottish adults who were asked about rewards, > 50% supported rewards for breastfeeding and 70% supported rewards for giving up smoking when pregnant. Incentives for smoking in pregnancy received the strongest support of all behaviours, followed by coming off (non-prescription/illegal) drugs, smoking in general, attending parenting classes, taking more exercise and, finally, losing weight. There was less opposition when there is a direct benefit to children.[300] In contrast, in a DCE study, in which participants were presented with alternative treatment packages, respondents were asked, 'Which treatment should be funded?' incentives (being *paid* £50.00 per month) for weight loss were more acceptable than those for smoking cessation (60% vs. 40%).[301]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

In the USA, a four-arm RCT of an experimental survey completed by 1010 American adults waiting at public transport depots found that the overall acceptability of a $25.00 increase in annual health insurance to pay for a smoking cessation treatment package was 41.6%.[302] The financial incentive arm of the trial received the lowest support (39.3%), but this was not statistically different from that in the unspecified treatment arm (45.6%) or the medication arm (41.7%). In this RCT, the incentive arm question was (p. S42):

> *According to research, paying people to stop smoking helps some of them to quit smoking. Each person who stops smoking is given $750.00. Would you support a $25.00 increase in your annual health insurance premium to pay for this treatment?*

The question in the fourth arm (financial incentives with statement on societal costs) was identical to that in the financial incentives arm except that it included a preceding sentence on societal costs: 'On average, each person who smokes costs society over $2000.00 per year due to health problems' (p. S42).[302] The a priori hypothesis being tested was that support for a financial incentive programme would increase when evidence on the societal cost of smoking was included in the questionnaire; however, this was not demonstrated. Park and colleagues[302] found no differences in the acceptability of financial incentives for smoking cessation according to income, gender, ethnicity or educational level.

Questions derived from a Multidimensional Locus of Control Scale were rated by Park and colleagues[302] and the strongest agreement was with statements for an internal locus of control, with personal responsibility for smoking behaviour, followed by those for an external locus of control, with help from other people playing a big role, and lastly the role of chance or luck in determining smoking habits.

Public attitudes are shaped by collective and individual experiences and the level of awareness of the adverse effects of a behaviour on health. When Park and colleagues[302] compared responses to a question asking whether there should be financial incentives for smoking cessation, according to participant smoking status, current smokers (53%) were more likely to support financial incentives than either previous smokers (37%) or lifetime non-smokers (37%), with a similar pattern observed for a question asking whether unspecified treatment and medication should be provided for smoking cessation. Apart from the Ipsos MORI survey,[300] there are no comparable data on the public acceptability of incentives for breastfeeding. However, it is known that personal experience, for example having been breastfed as a baby or having breastfed a previous child, are predictors of feeding outcome.[53]

The acceptability and fairness of financial rewards and penalties compared with medical interventions for smoking cessation together with several other health outcomes were considered in separate online surveys in the UK ($n = 88$) and USA ($n = 100$).[303] The authors hypothesised that penalties would be favoured over rewards when recipients were deemed responsible for their condition and vice versa. There was strong agreement that smokers were responsible for smoking. Acceptability ratings for financial incentives were lower than for medical interventions and preference for rewards or penalties varied with context. In a DCE study with three samples, two from an online panel ($n = 81$ and $n = 101$) and one from a general offline population ($n = 450$), the acceptability of payments of £50.00 per month for smoking cession or weight loss was very sensitive to effect size, even to small changes in effectiveness.[301] For example, an increase from 10% to 11% in the effect size of an incentive for smoking cessation resulted in an increase from 46% to 55% in the proportion favouring incentives.

The acceptability of providing incentives to health service providers

In the review of the literature (see *Chapter 3*), no studies were identified that looked at the acceptability of providing incentives to care providers or organisations from the point of view of the general public for either smoking cessation in pregnancy or breastfeeding. The review of the wider incentives literature relevant to lifestyle behaviour change suggested that this warrants further investigation (see *Chapter 5*).

Methods

In *Chapter 6* we presented the shortlist of promising incentive strategies emerging from the literature review and early qualitative data collection and this formed the basis for the survey design. The shortlisted incentive strategies for initiating and sustaining smoking cessation in pregnancy and breastfeeding are:

1. shopping vouchers for women who prove that they have stopped smoking during pregnancy
2. shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking
3. shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home
4. shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth
5. a breast pump costing around £40.00 provided for free on the NHS
6. additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy
7. additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding.

Research questions

The main research question addressed by the general public and health professional surveys was:

1. Are the seven shortlisted incentive strategies for initiating and sustaining smoking cessation in pregnancy and breastfeeding acceptable to (1) the general public and (2) health professionals involved in providing maternity services and other stakeholders?

In addition, the following analysis questions were posed:

2. Is the acceptability to the general public of the seven shortlisted incentive strategies influenced by age (categories: 18–24 years, 25–34 years, 35–44 years, 45–54 years, 55–59 years, 60–64 years, ≥ 65 years), sex, social grade (A, B, C1, C2, D, E), region (North, North West, Yorkshire and Humberside, East Midlands, West Midlands, East Anglia, South East, South West, London, Wales, Scotland), ethnicity (white British, other ethnicity), education (degree level, A level or equivalent, GCSE or equivalent, no formal qualifications, still studying or other qualifications or don't know), having children (yes, no), personal experience of smoking (never smoked, ex-smoker, current smoker – failed to quit or no quit attempts) or whether a child was ever breastfed (even if only for a day or two)? What are the independent predictors of acceptability of the shortlist of incentive strategies?
3. Is the acceptability to health professionals of the seven shortlisted incentive strategies influenced by health professional group [doctor (GP, obstetrician, paediatrician) or nurse (midwife, health visitor, other maternity care staff) or other health professional], age (18–34 years, 34–44 years, 45–54 years, ≥ 55 years, missing), gender, ethnicity (white British, other ethnicity), having children (yes, no), personal experience of smoking (never smoked, previous smoker or current smoker or declined to answer), whether a child was ever breastfed? What are the independent predictors of acceptability of the shortlist of incentive strategies?
4. What value of incentive is most acceptable and what are the independent predictors of the preferred incentive value for (1) smoking cessation in pregnancy and (2) breastfeeding women?
5. Are universal incentives for (1) smoking cessation in pregnancy and (2) breastfeeding preferred to incentives targeted at low-income women and what are the independent predictors for preference?

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Objectives

The objectives were to:

- contribute questions to the Ipsos MORI Computer Aided Personal Interviewing (face-to-face omnibus) (CAPIBUS) survey to assess the acceptability of the shortlist of promising incentive strategies to the general public
- conduct a web survey linked to an e-mail to assess the acceptability of the shortlist of promising incentive strategies to a range of health service professionals involved in pregnancy and early years care.

Questionnaire design

The research team selected the sociodemographic variables most relevant to the research question from the range used by Ipsos MORI. An additional sociodemographic variable for personal smoking status was selected from a recent relevant study[301] to provide comparable data. The research team searched existing large surveys to find equivalent questions for personal experience of breastfeeding that had been validated for use with the general public. None was identified – the national Infant Feeding Survey questions (Q68, Q69),[53] which are asked of women after childbirth, were not considered to have face validity for older male respondents. A single question following a filter question so that only people with children would be asked the question was designed: 'Have any of your children ever been breastfed or received breast milk, even if only for a day or two?' For the health professional survey, occupation was asked rather than social grade. Question design relating to specific aspects of our shortlist of promising incentive strategies (see *Chapter 6*) was decided iteratively by the research team through discussion and was guided both by experts at Ipsos MORI and by academic colleagues. Careful consideration was given to potential framing effects in how the survey was introduced. Promberger and colleagues[301] reported that even a 1% increase in effectiveness can dramatically increase acceptability. This provided the logic for the opening statement at the beginning of the telephone and web surveys. As effectiveness for contingent shopping vouchers for smoking cessation in pregnancy was a finding from the meta-analysis of four incentive trials (see *Chapter 3*) and interim analysis of the CPIT II trial, which the research team had access to, an effectiveness statement was included. However, as the effectiveness of incentives for breastfeeding is more uncertain (see *Chapter 3*), this was omitted from the introductory statement. A decision was made to provide minimal introductory text about specific health benefits to minimise bias from framing effects. Our introductory statements were therefore as follows:

> *Stopping smoking in pregnancy benefits the health of the baby and the mother. Research shows that providing shopping vouchers to women who prove that they have stopped smoking in pregnancy increases the numbers who stop. While some people feel that providing vouchers is appropriate, others feel that it is wrong or unfair.*
>
> *Breastfeeding benefits the health of the baby and the mother. While some people feel that providing shopping vouchers to encourage breastfeeding is appropriate, others feel that it is wrong or unfair.*

Careful consideration was given to the terminology used to describe an incentive, as an earlier MORI survey found greater acceptability for incentives by calling them *rewards* rather than *payments*.[300]

The following phrase was standardised across questions: 'monthly shopping vouchers to reward women who prove that they have stopped smoking during pregnancy/are breastfeeding'. Monthly was selected as this was the frequency used in several studies including the CPIT[88,113,141] (see *Box 2*). Questions about variable intensity as in the effective incentives for smoking cessation trials[105,144] were considered too complex for a general public survey. A filter question for those agreeing or neither agreeing nor disagreeing with vouchers asked about the highest acceptable value, starting from a value close to zero (£2.00 per month) up to a value of £80.00 a month, which is higher than the upper value in any of the studies that we identified.

Gaming and cheating, by either taking up smoking deliberately to receive the reward or smoking in-between monitoring checks, is a concern raised by the qualitative data in this study and others.[297] As strongly held views about this could confound all responses, the word 'proof' was included in all questions about rewards being given to women.

The questionnaire was piloted by HM and GT with members of the general public (three women and four men; age range 17–57 years) and 24 health professionals from midwifery, health-visiting, children's centre and voluntary backgrounds. Individual interviews were conducted using cognitive interviewing (think aloud) techniques.[114]

Study populations

- General public survey: a nationally and regionally representative sample of UK adults aged ≥ 18 years.
- Health professional survey: maternity unit staff, health-visiting staff, obstetricians, paediatricians, public health specialists, GPs, practice nurses and policy-makers whose work involves caring for pregnant and postnatal women and/or infants and who work in Scotland or North West England.

Data collection for the general public survey

Potential respondents were identified by Ipsos MORI interviewers, who are asked to interview five people from every 250 addresses. They may knock on between five and 100 doors to achieve this. All interviews were conducted face to face at home between 22 March 2013 and 15 April 2013 using CAPI (Computer Assisted Personal Interviewing) (see *Appendix 24*). Quotas are set for age, gender and region and the data weighted to the known profile of Great Britain using age, gender, government office region, social grade, taken a foreign holiday in the last 3 years, tenure, number of cars in the household and working status. Targets for quotas and weights are taken from the National Readership Survey (see www.nrs.co.uk/). For this survey, questions relating to incentives (CS1–10 in *Appendix 25*) were asked after questions on standard demographics that are routinely asked by MORI. Parent, smoking and breastfeeding status were asked at the end of the survey. Randomisation of the order of questions on smoking and breastfeeding incentives was generated independently and automated using CAPI software, to investigate question framing effects.

Data collection for the health professional survey

We aimed to recruit health professionals and stakeholders involved in providing maternity services and early years care by sending an e-mailed web link to the Ipsos MORI survey, which we reproduced on SurveyMonkey (see www.surveymonkey.com) (see *Appendix 26*). Gaining access to e-mail lists for the population to survey was discussed with the Scottish Primary Care Research Network (SPCRN), the North of Scotland Research Ethics Committee (NOSRES), NHS Grampian Research and Development (R&D), the Scottish Multiprofessional Maternity Development Programme (SMMDP), the North West Strategic Health Authority, the Cumbria and Lancashire Research Network, the relevant Royal Colleges, Ipsos MORI and academic colleagues who had attempted similar surveys. Key publications were identified through colleagues, for example the study by Braithwaite and colleagues,[304] who used a web survey of health professionals. However, these failed to identify any robust strategy for larger UK regional or national surveys of maternity and early years health professionals. The logistical difficulties of identifying and gaining the approval of the gatekeepers to e-mail lists of these specific groups of professionals and, where possible, knowing the denominator, became apparent in both Scotland and North West England.

In Scotland, R&D approvals were gained for every health board and the survey was then administered through:

- the SPCRN to all general practice managers for distribution to GPs and staff involved in maternity and early years care
- individual R&D departments for hospital, maternity and early years staff
- a mailing list of public health doctors

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

- a mailing list of paediatricians in training
- two contacts at the Scottish government for distribution to relevant maternity and early years stakeholders.

This strategy could result in eligible participants receiving the e-mail through more than one source. It was not possible to calculate accurate denominators for most individual collectors.

However, the SPCRN provided a breakdown of general practice managers to whom the survey was sent for distribution to GPs ($n = 4800$ at July 2013[305]) and other relevant practice staff ($n = 2140$ at 30 January 2009[306]). Using Information Services Division (ISD) workforce data[307] we know that, at 31 March 2013 (published 28 May 2013), there were 12,455 medical staff (hospital, community and public health services) and 66,068 nursing and midwifery staff who should have received a link to the survey through e-mails cascaded down in individual health boards.

The number of individuals receiving our web survey is not known as its distribution was entirely dependent on the e-mail gatekeepers listed above. Separate SurveyMonkey collectors were set up to monitor response rates and these are summarised in *Appendix 27*.

In North West England the timing of the survey was unfortunate as it coincided with the implementation of the Health and Social Care Act 2012[308] on 1 April 2013, which resulted in considerable NHS reorganisation and upheaval. Through discussions with the Cumbria and Lancashire Research Network and colleagues at UCLan (University of Central Lancashire), it was recommended to commission Binley's (see www.binleys.com/; accessed 6 November 2014), a commercial organisation, to distribute the survey. The survey was sent by e-mail in May 2013 to 4821 relevant professionals on their mailing list (see *Appendix 27*). The survey was also issued to health-visiting and midwifery students at UCLan ($n = 139$), with seven responses received (response rate 5.0%). In July 2013, because of the low response rate from Binley's, all R&D departments within the North West trusts were also asked to distribute the survey to relevant professionals ($n = 13$ respondents, denominator unknown).

Data analysis

An a priori target sample size of 1000 was set for both surveys to allow us to estimate proportions to within 3% with 95% confidence. Data were described using the appropriate summary statistics where relevant. Responses to the Likert-style outcome items were summarised as number and percentage and graphed using bar charts. Responses to these outcome items were broken down by the independent predictor variables specified earlier. Net agreement (agree and strongly agree) and net disagreement (disagree and strongly disagree) were also reported as number and percentage. Simple and multiple ordered logit regression models were used to determine the independent predictors of acceptability for the shortlist. The relationship between predictor and outcome variables was summarised using odds ratios (ORs) and 95% CIs. For the value of incentives and targeting of incentives to low-income women only (research questions 4 and 5), two-part models were used. For research question 4, the value of incentives, a probit model was used to estimate a 'positive' response (i.e. strongly agree, agree or neither agree nor disagree) and then linear regression was used to model the value of shopping voucher acceptable to those with a positive response. For research question 5, targeting low-income women only, a similar model was used but as the conditional response here was dichotomous a probit model was used instead of linear regression. In all models the most affluent status was used as the reference category when this was possible (i.e. child breastfed, male, degree-level qualification, London region, never smoked, white ethnicity, social grade A or B, no children). Age was entered as 5-year categories. All analyses were carried out in Stata 13.

Results of the Ipsos MORI survey of the acceptability of seven incentive strategies

Sample characteristics

The characteristics of the 1144 respondents are summarised in *Table 44*. There is a broad sociodemographic spread of characteristics. Current smoking status among respondents is similar to that reported in other UK surveys (just over one in five adults), although 4.6% of respondents chose not to answer this question. Having a child who was ever breastfed, even for a few days, is low compared with the current reported breastfeeding initiation rate of around 80% in the UK;[53] however, breastfeeding initiation has increased over recent decades since the first survey in 1975.

Figure 19 provides bar charts summarising the acceptability of all seven promising incentive strategies.

TABLE 44 Characteristics of the general public sample ($n = 1144$)

Variable	Classes	*n* (%)
Sex	Male	540 (47.2)
	Female	604 (52.8)
Age (years)	18–24	170 (14.9)
	25–34	175 (15.3)
	35–44	181 (15.8)
	45–54	159 (13.9)
	55–59	72 (6.3)
	60–64	94 (8.2)
	≥ 65	293 (25.6)
Ethnicity	White	985 (86.1)
	Black and minority ethnic	151 (13.2)
	Refused to answer	8 (0.7)
	White British	914 (79.9)
	White Irish	11 (1.0)
	White gypsy/traveller	–
	White other	60 (5.2)
	Mixed white/black Caribbean	3 (0.3)
	Mixed white/black African	1 (< 0.1)
	Mixed white/Asian	3 (0.3)
	Mixed other	2 (0.2)
	Asian Indian	19 (1.7)
	Asian Pakistani	47 (4.1)
	Asian Bangladeshi	12 (1.0)
	Asian Chinese	7 (0.6)
	Asian other	13 (1.1)
	Black African	26 (2.3)
	Black Caribbean	7 (0.6)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 44 Characteristics of the general public sample ($n = 1144$) (*continued*)

Variable	Classes	*n* (%)
	Black other	2 (0.2)
	Arab	4 (0.3)
	Other	5 (0.3)
	Refused	8 (0.7)
Smoking status	Never smoked	573 (50.1)
	Current smoker, tried to stop smoking	175 (15.3)
	Current smoker, not tried to stop smoking	63 (5.5)
	Ex-smoker	281 (24.6)
	Declined to answer	52 (4.5)
Any children	Yes	742 (64.9)
	No	402 (35.1)
Breastfeeding	Any children breastfed	512 (44.8)
	No children breastfed	632 (55.2)
Education	Degree/Masters/PhD	295 (25.8)
	A-level or equivalent	193 (16.9)
	GCSE/O-level/CSE/NVQ	342 (29.9)
	No formal qualifications	197 (17.2)
	Other/don't know/still studying	117 (10.2)
Social grade	A	36 (3.1)
	B	203 (17.7)
	C1	370 (32.3)
	C2	236 (20.6)
	D	162 (14.2)
	E	137 (12.0)
Survey region	North	77 (6.7)
	North West	142 (12.4)
	Yorks and Humberside	104 (9.1)
	West Midlands	109 (9.5)
	East Midlands	66 (5.8)
	East Anglia	41 (3.6)
	South West	81 (7.1)
	South East	200 (17.5)
	Greater London	149 (13.0)
	Wales	66 (5.8)
	Scotland	109 (9.5)

A-level, Advanced level; CSE, Certificate of Secondary Education; GCSE, General Certificate of Secondary Education; NVQ, National Vocational Qualification; O-level, Ordinary level; PhD, doctor of philosophy.

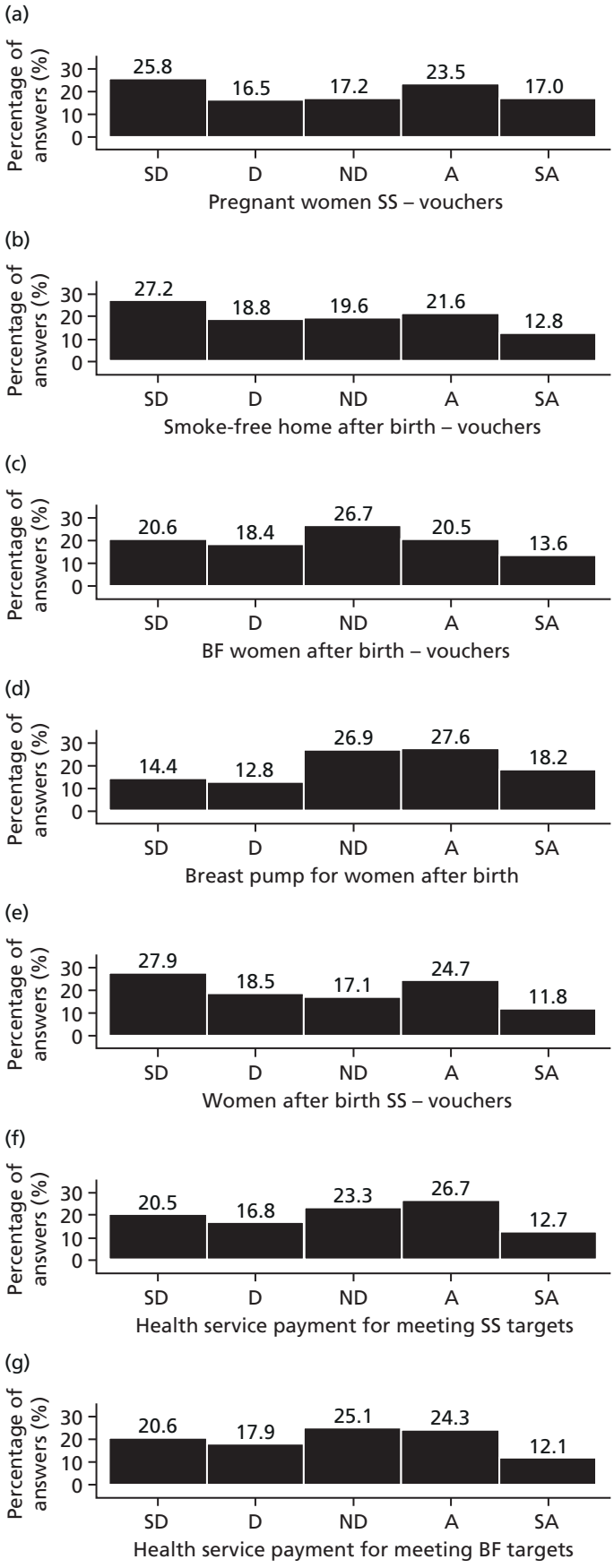


FIGURE 19 Bar charts showing general public agreement with the shortlist of incentive strategies. A, agree; BF, breastfeeding; D, disagree; ND, neither agree nor disagree; SA, strongly agree; SD, strongly disagree; SS, stop smoking.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Shopping vouchers for women who prove that they have stopped smoking during pregnancy

There was a net disagreement of 42.3% (484/1144) with the incentive strategy of shopping vouchers for smoking cessation during pregnancy. Net agreement was 40.5% (463/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 70*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years, 25–34 years and 35–44 years) were significantly more likely to agree with this incentive strategy than the reference group aged ≥ 65 years. The age group 35–44 years had the biggest OR (1.88, 95% CI 1.30 to 2.72; $p = 0.001$).
- *Sex*: women were less likely to agree with this incentive strategy than men (OR 0.71, 95% CI 0.57 to 0.88; $p = 0.002$).
- *Ethnicity*: respondents who classified themselves in a category other than white British were more likely to agree with this incentive strategy than white British respondents (OR 1.42, 95% CI 1.01 to 1.99; $p = 0.047$).
- *Education*: respondents with lower levels of education were less likely to agree with this incentive strategy than the reference group with a degree-level education [General Certificate of Secondary Education (GCSE): OR 0.59, 95% CI 0.43 to 0.81, $p = 0.001$; Advanced (A) level or equivalent: OR 0.63, 95% CI 0.44 to 0.90, $p = 0.010$; no formal qualifications: OR 0.63, 95% CI 0.42 to 0.95, $p = 0.029$].
- *Social grade*: those in social grade E were more likely to agree with this incentive strategy than the reference group (social grades A and B) (OR 1.74, 95% CI 1.12 to 2.70; $p = 0.014$). Other social grades did not differ from group AB.
- *Smoking status*: current smokers who had tried quitting previously were more likely to agree with this incentive strategy than those who had never smoked (OR 1.63, 95% CI 1.18 to 2.26; $p = 0.003$), but other smoking status groups were broadly similar to the reference group who had never smoked.
- *Geographical area*: the North, Yorkshire and Humberside, East Midlands, West Midlands, Wales and Scotland all had ORs of < 0.8, indicating that respondents from these areas were less likely to agree with this incentive strategy than respondents from the reference group, those living in London. However, only the OR for Wales ruled out unity (OR 0.55, 95% CI 0.31 to 0.97; $p = 0.04$).

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 71*).

Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking

There was a net disagreement of 46.4% (531/1144) with the incentive strategy of shopping vouchers for smoking cessation for 2 months after pregnancy. Net agreement was 36.5% (417/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 72*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: there was an inconsistent pattern across the age categories, with those aged 35–44 years (OR 1.65, 95% CI 1.14 to 2.39; $p = 0.007$) and 60–64 years (OR 1.65, 95% CI 1.05 to 2.57; $p = 0.028$) significantly more likely to agree with this incentive strategy than the reference group aged ≥ 65 years. The remaining age groups were not significantly more likely to agree with this incentive strategy.
- *Sex*: women were less likely to agree with this incentive strategy than men (OR 0.68, 95% CI 0.55 to 0.85; $p = 0.001$).
- *Ethnicity*: respondents who classified themselves in a category other than white British were more likely to agree with this incentive strategy than white British respondents in the univariable model (OR 2.12, 95% CI 1.59 to 2.83; $p < 0.001$) but this relationship was attenuated when other variables were adjusted for in the multiple regression model (OR 1.39, 95% CI 0.98 to 1.95; $p = 0.062$).

- *Education*: respondents with lower levels of education were less likely to agree with this incentive strategy then the reference group with a degree-level education (GCSE: OR 0.62, 95% CI 0.45 to 0.85, $p = 0.003$; A-level or equivalent: OR 0.68, 95% CI 0.48 to 0.96, $p = 0.028$; no formal qualification: OR 0.64, 95% CI 0.42 to 0.96, $p = 0.032$).
- *Social grade*: those in social grade C2 were more likely to agree with this incentive strategy than those in the AB reference group (OR 1.64, 95% CI 1.18 to 2.27; $p = 0.003$). Other grades did not differ from the AB group.
- *Smoking status*: there was no evidence of a difference across smoking status groups in response to this option.
- *Geographical area*: the North, Yorkshire and Humberside, East Midlands, West Midlands, the South West, Wales and Scotland all had ORs of < 0.8, indicating that respondents from these areas were less likely to agree with this incentive strategy than respondents from the reference group, those living in London. All of these areas were significantly different from London apart from the North and the South West.

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 73*).

Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home

There was a net disagreement of 46.0% (526/1144) with the incentive strategy of providing shopping vouchers for no smoking in the home for 2 months after pregnancy. Net agreement was 34.4% (394/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 74*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years and 35–44 years) were significantly more likely to agree with this incentive strategy, with both groups having ORs > 1.5 compared with the reference group aged ≥ 65 years.
- *Sex*: women were less likely to agree with this incentive strategy than men (OR 0.72, 95% CI 0.58 to 0.90; $p = 0.003$).
- *Ethnicity*: respondents who classified themselves in a category other than white British were more likely to agree with this incentive strategy than white British respondents (OR 1.49, 95% CI 1.06 to 2.08; $p = 0.021$).
- *Education*: respondents with lower levels of education were less likely to agree with this incentive strategy than the reference group with a degree-level education (GCSE: OR 0.60, 95% CI 0.44 to 0.83, $p = 0.002$; A-level or equivalent: OR 0.56, 95% CI 0.39 to 0.79, $p = 0.001$; no formal qualification: OR 0.66, 95% CI 0.44 to 1.00, $p = 0.048$).
- *Social grade*: there was no evidence of a difference across social grade.
- *Smoking status*: current smokers who had tried quitting previously were more likely to agree with this incentive strategy than those who had never smoked (OR 1.48, 95% CI 1.08 to 2.04; $p = 0.016$), but other smoking status groups were broadly similar to the reference group of those who had never smoked.
- *Geographical area*: the North, Yorkshire and Humberside, East Midlands, West Midlands, the South West, Wales and Scotland all had ORs of < 0.8, indicating that respondents from these areas were less likely to agree with this incentive strategy than respondents from the reference group, those living in London. All of these areas were significantly different from London apart from the North, the South West and Wales.

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 75*).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth

There was a net disagreement of 39.1% (447/1144) with the incentive strategy of shopping vouchers for breastfeeding for the first 6 months. Net agreement was 34.2% (391/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 76*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years, 25–34 years and 35–44 years) were significantly more likely to agree with this incentive strategy than the reference group aged ≥ 65 years. The 25–34 years age group had the biggest OR (1.91, 95% CI 1.31 to 2.89; $p = 0.001$).
- *Breastfeeding status*: respondents with children who were breastfed were more likely to agree with this incentive strategy (OR 1.67, 95% CI 1.24 to 2.25; $p = 0.001$).
- *Sex*: women were less likely to agree with this incentive strategy than men (OR 0.77, 95% CI 0.62 to 0.95; $p = 0.016$).
- *Ethnicity*: respondents who classified themselves in a category other than white British were more likely to agree with this incentive strategy than white British respondents (OR 2.03, 95% CI 1.43 to 2.88; $p < 0.001$).
- *Education*: there was no evidence of a difference across education groups.
- *Social grade*: there was no evidence of a difference across social grade.
- *Smoking status*: there was no evidence of a difference across smoking status groups.
- *Geographical area*: the North, Yorkshire and Humberside, East Midlands, West Midlands, the South West and Wales all had ORs of < 0.8, indicating that respondents from these areas were less likely to agree with this incentive strategy than respondents from the reference group, those living in London. All of these areas were significantly different from London apart from the North.

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 77*).

A breast pump costing around £40.00 provided for free on the NHS

There was a net disagreement of 27.3% (312/1144) with the incentive strategy of breast pumps being freely available on the NHS. Net agreement was 45.8% (524/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 78*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years, 25–34 years and 35–44 years) were significantly more likely to agree with this incentive strategy than the reference group aged ≥ 65 years. The 18–24 years age group had the biggest OR (1.74, 95% CI 1.14 to 2.63).
- *Breastfeeding status*: respondents with children in the family who were breastfed were more likely to agree with this incentive strategy (OR 1.84, 95% CI 1.36 to 2.49; $p < 0.001$).
- *Sex*: there was no evidence of a difference between women and men.
- *Ethnicity*: there was no evidence of a difference across ethnic groups.
- *Education*: respondents with lower levels of education were less likely to agree with this incentive strategy then the reference group with a degree-level education (GCSE: OR 0.70, 95% CI 0.51 to 0.96, $p = 0.026$; no formal qualifications: OR 0.62, 95% CI 0.41 to 0.93, $p = 0.02$).
- *Social grade*: there was no evidence of a difference across social grade, although comparing social grade E with social grade AB the OR was 1.57 (95% CI 1.00 to 2.46; $p = 0.05$).
- *Smoking status*: there was no evidence of a difference across smoking status group.
- *Geographical area*: respondents from the East Midlands and Wales were significantly less likely to agree with this incentive strategy than those living in London.

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 79*).

Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy

There was a net disagreement of 37.2% (426/1144) with the incentive strategy of additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy. Net agreement was 39.4% (451/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 80*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years, 25–34 years and 35–44 years) were significantly more likely to agree with this incentive strategy than the reference group aged ≥ 65 years and the 45–54 years age group. The 18–24 years age group had the biggest OR (2.28, 95% CI 1.50 to 3.49; $p < 0.001$).
- *Sex*: there was no evidence of a difference between women and men.
- *Ethnicity*: there was no evidence of a difference across ethnic groups.
- *Education*: those with lower levels of education were less likely to agree with this incentive strategy than the degree-level reference group (GCSE: OR 0.71, 95% CI 0.51 to 0.97, $p = 0.033$; A-level or equivalent: OR 0.68, 95% CI 0.48 to 0.97, $p = 0.032$).
- *Social grade*: those in social grade C1 were less likely to agree with this incentive strategy than those in the AB group (OR 0.68, 95% CI 0.50 to 0.94; $p = 0.019$).
- *Smoking status*: there was no evidence of a difference across smoking status group.
- *Geographical area*: respondents from the North, Yorkshire and Humberside, East Midlands, West Midlands, the South West and Scotland were significantly less likely to agree with this incentive strategy than respondents from the reference group, those living in London.

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 81*).

Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding

There was a net disagreement of 38.5% (441/1144) with the incentive strategy of additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding. Net agreement was 36.4% (416/1144). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 28* (see *Table 82*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years, 25–34 years and 35–44 years) were significantly more likely to agree with this incentive strategy than the reference group aged ≥ 65 years. The 35–44 years age group had the biggest OR (1.91, 95% CI 1.32 to 2.76; $p = 0.001$).
- *Sex*: there was no evidence of a difference between men and women.
- *Ethnicity*: respondents who classified themselves in a category other than white British were more likely to agree with this incentive strategy than white British respondents (OR 2.31, 95% CI 1.63 to 3.29; $p < 0.001$).
- *Education*: there was no evidence of a difference across education groups.
- *Social grade*: there was no evidence of a difference across social grade.
- *Smoking status*: there was no evidence of a difference across smoking status group.
- *Geographical area*: respondents from the East Midlands, the South West and Scotland were less likely to agree with this incentive strategy than respondents from the reference group, those living in London. All of these areas were significantly different from London apart from the North.

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 28* (see *Table 83*). A summary of general public agreement with the seven incentive strategies is provided in *Table 45*.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 45 Summary of general public agreement with the seven incentive strategies

Incentive strategy	% disagree	% neither agree nor disagree	% agree	Mean agreement score
Shopping vouchers for women who prove that they have stopped smoking during pregnancy	42.3	17.2	40.5	2.9
Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking	46.4	17.3	36.5	2.7
Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home	46.0	19.6	34.4	2.7
Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth	39.1	26.8	34.2	2.9
A breast pump costing around £40.00 provided for free on the NHS	27.3	27	45.8	3.2
Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy	37.2	23.3	39.4	2.9
Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding	38.5	25.1	36.4	2.9

Acceptable values for shopping vouchers (smoking and breastfeeding)

The acceptable value of shopping vouchers was asked only of those responding to the question of whether shopping vouchers for either smoking cessation or breastfeeding are acceptable with strongly agree, agree or neither agree nor disagree. For both smoking cessation and breastfeeding, > 85% stated that a value of ≤ £40.00 was acceptable (*Tables 46* and *47* respectively). Full details of the two-part models to estimate the acceptable values for shopping vouchers are provided in *Tables 84* and *86* in *Appendix 29*. In brief, living in the South East, South West or East Midlands (compared with London) was correlated with lower values for shopping vouchers for smoking cessation, whereas being a current smoker who has tried quitting (compared with never having been a smoker) or having a child who was previously breastfed (compared with no children) was correlated with increased values for shopping vouchers. For breastfeeding, living in the East Midlands, South East, Wales or Scotland (compared with London) was correlated with lower values for shopping vouchers, whereas having a child who was previously breastfed (compared with no children breastfed) was correlated with increased values for shopping vouchers.

The acceptability of targeting incentives to low-income women only (smoking cessation and breastfeeding)

Of the 660 respondents who did not disagree with vouchers for smoking cessation in pregnancy, 296 (44.9%) thought that vouchers should be targeted at low-income women only and 364 (55.1%) thought that all women should receive vouchers, regardless of income. For vouchers for breastfeeding, the

TABLE 46 Acceptable values for shopping vouchers for women who have proved that they have stopped smoking during pregnancy ($n = 660$)

Value (£)	*n*	%
2	116	17.6
10	146	22.1
20	193	29.2
40	115	17.4
60	36	5.5
80	54	8.2

TABLE 47 Acceptable values for shopping vouchers for women who have proved that they are breastfeeding ($n = 697$)

Value (£)	*n*	%
2	146	20.9
10	150	21.5
20	199	28.6
40	110	15.8
60	36	5.2
80	56	8.0

numbers and percentages were similar: 330 (47.4%) thought that vouchers should be provided to low-income women only and 367 (52.3%) thought that vouches should be provided to all women. The only predictors of the acceptability of targeting vouchers to low-income women were living in the South West or Scotland (positive correlation) or being female (negative correlation). Full details are provided in *Tables 85* and *87* in *Appendix 29*.

Results of the maternity and early years health professional survey of the acceptability of seven incentive strategies

Sample characteristics

There were 519 responses to the survey of health professionals; of these, 22 (4.2%) respondents did not answer any of the survey questions concerning the acceptability of incentive strategies and these data were excluded from all analyses. These 22 responses had extensive missing data on other survey questions and it was not possible to assess the similarity or otherwise between the excluded respondents and the included respondents. The characteristics of the 497 included respondents are shown in *Table 48*. Midwives and GPs were the largest professional groups to respond and 83% of respondents were female and 88% worked in Scotland. This is a highly self-selected sample that is unlikely to be representative of UK health professional opinion.

Figure 20 provides bar charts summarising the acceptability of all seven of the promising incentive strategies.

TABLE 48 Characteristics of the maternity and early years health professional sample ($n = 497$)

Variable	Classes	*n* (%)
Sex	Male	64 (12.9)
	Female	411 (82.7)
	Missing	22 (4.4)
Age (years)	18–34	91 (18.3)
	35–44	114 (22.9)
	45–54	182 (36.6)
	≥ 55	85 (17.1)
	Missing	25 (5.0)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 48 Characteristics of the maternity and early years health professional sample ($n = 497$) (*continued*)

Variable	Classes	*n* (%)
Ethnicity	White	444 (89.3)
	Black and minority ethnic/prefer not to say	53 (10.7)
	White British	339 (68.2)
	White Irish	7 (1.4)
	White other	1 (0.2)
	Mixed white/black Caribbean	1 (0.2)
	Mixed other	1 (0.2)
	Asian Indian	10 (2.0)
	Asian Pakistani	2 (0.4)
	Asian Chinese	1 (0.2)
	Black African	2 (0.4)
	Refused	35 (7.0)
Smoking status	Never smoked	370 (74.4)
	Current smoker, tried to stop smoking	17 (3.4)
	Current smoker, not tried to stop smoking	1 (0.2)
	Ex-smoker	101 (20.3)
	Declined to answer	8 (1.6)
Any children	Yes	401 (80.7)
	No	96 (19.3)
Breastfeeding	Any children breastfed	387 (77.9)
	No children breastfed	110 (22.1)
Profession	GP	132 (26.6)
	Health visitor	47 (9.5)
	Manager	20 (4.0)
	Midwife	121 (24.3)
	Obstetrician	12 (2.4)
	Maternity staff	29 (5.8)
	Paediatrician	12 (2.4)
	Other nurse	41 (8.2)
	Public health staff	32 (6.4)
	Allied health professional	18 (3.6)
	Support role	8 (1.6)
	Researcher	4 (0.8)
	Missing	21 (4.2)
Survey region	England	60 (12.1)
	Scotland	437 (87.9)

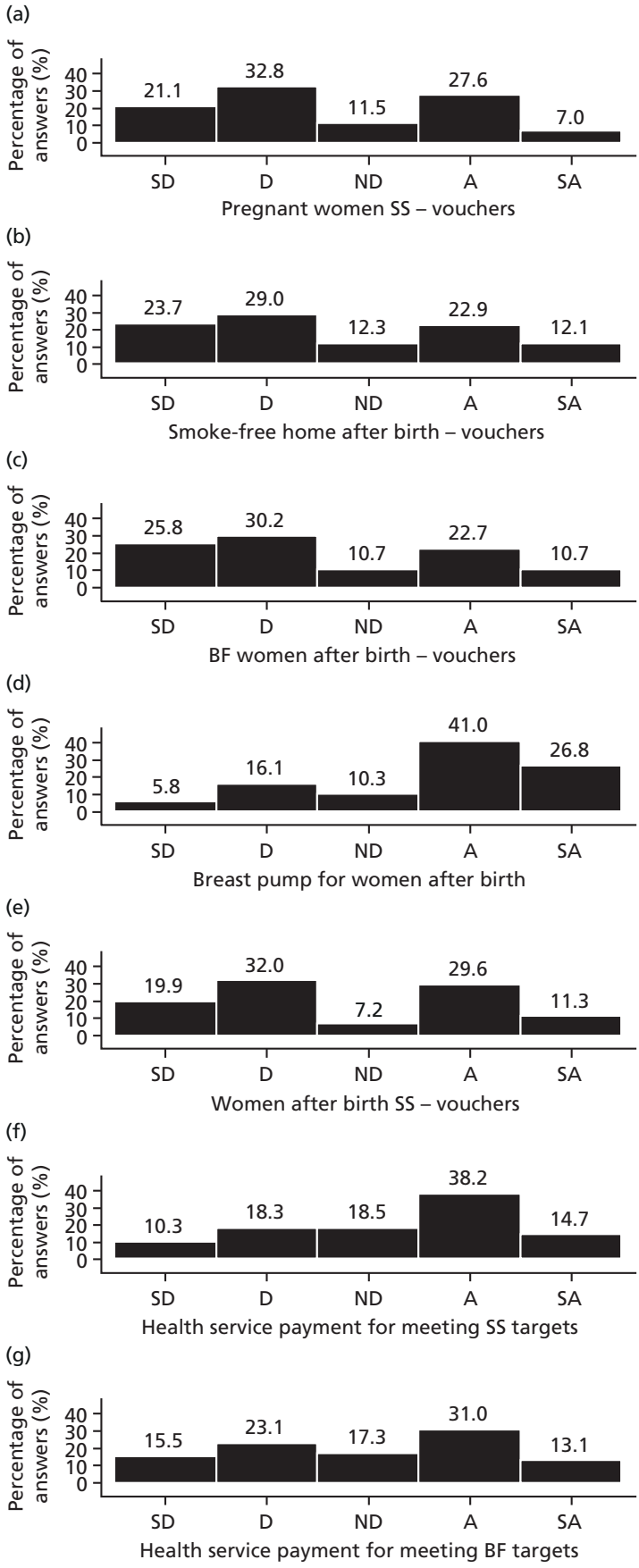


FIGURE 20 Bar charts showing maternity and early years health professional agreement with the shortlist of incentive strategies. A, agree; BF, breastfeeding; D, disagree; ND, neither agree nor disagree; SA, strongly agree; SD, strongly disagree; SS, stop smoking.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Shopping vouchers for women who prove that they have stopped smoking during pregnancy

There was a net disagreement of 53.9% (268/497) with the incentive strategy of shopping vouchers for smoking cessation during pregnancy. Net agreement was 34.6% (172/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 88*). From a multiple ordered logistic regression model there were no predictors of agreement. Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 89*).

Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking

There was a net disagreement of 51.9% (258/497) with the incentive strategy of shopping vouchers for smoking cessation for 2 months after pregnancy. Net agreement was 40.8% (203/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 90*). From a multiple ordered logistic regression model there were no predictors of agreement. Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 91*).

Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home

There was a net disagreement of 52.7% (262/497) with the incentive strategy of shopping vouchers for no smoking in the home for 2 months after pregnancy. Net agreement was 35.0% (174/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 92*). From a multiple ordered logistic regression model there were no predictors of agreement. Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 93*).

Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth

There was a net disagreement of 55.9% (278/497) with the incentive strategy of shopping vouchers for breastfeeding for the first 6 months. Net agreement was 33.4% (166/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 94*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Age*: younger age groups (18–24 years) were significantly more likely to disagree with this incentive strategy than the reference group aged ≥ 65 years (OR 0.41, 95% CI 0.23 to 0.72; $p = 0.002$).
- *Profession*: respondents in the midwives/health visitors/other maternity care staff group were more likely than doctors to agree with this incentive strategy (OR 1.84, 95% CI 1.21 to 2.79; $p = 0.005$).

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 95*).

A breast pump costing around £40.00 provided for free on the NHS

There was a net disagreement of 21.9% (109/497) with the incentive strategy of a free breast pump. Net agreement was 67.8% (337/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 96*). From a multiple ordered logistic regression model there were no predictors of agreement. Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 97*).

Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy

There was a net disagreement of 28.6% (142/497) with the incentive strategy of additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy. Net agreement was 52.9% (263/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 98*). From a multiple ordered logistic regression model, respondents in the midwives/health visitors/maternity care staff group were more likely than doctors to agree with this incentive strategy (OR 2.35, 95% CI 1.51 to 3.64; $p < 0.001$), as were other staff (OR 2.18, 95% CI 1.38 to 3.44; $p < 0.001$) Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 99*).

Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding

There was a net disagreement of 38.6% (192/497) with the incentive strategy of additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding. Net agreement was 44.1% (219/497). A summary of the results for each predictor variable against response to this incentive strategy is reported in *Appendix 30* (see *Table 100*). From a multiple ordered logistic regression model the predictors of agreement were:

- *Profession*: respondents in the midwives/health visitors/maternity care staff group were more likely than doctors to agree with this incentive strategy (OR 2.54, 95% CI 1.65 to 3.91; $p < 0.001$), as were other staff (OR 1.94, 95% CI 1.23 to 3.05; $p = 0.004$).
- *Sex*: female respondents were more likely to agree with this incentive strategy than male respondents (OR 1.79, 95% CI 1.06 to 3.91; $p = 0.029$).
- *Geographical region*: respondents from England were more likely to agree than the reference group Scotland (OR 1.81, 95% CI 1.09 to 3.00; $p = 0.023$).

Full details of the univariable and multivariable ordered logistic regressions are provided in *Appendix 30* (see *Table 101*). A summary of maternity and early years health professional agreement with the seven incentive strategies is provided in *Table 49*.

TABLE 49 Summary of maternity and early years health professional agreement with the seven incentive strategies

Incentive strategy	% disagree	% neither agree nor disagree	% agree	Mean agreement score
Shopping vouchers for women who prove that they have stopped smoking during pregnancy	53.9	11.5	34.6	2.7
Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking	51.9	7.2	40.8	2.8
Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home	52.7	12.3	35.0	2.7
Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth	55.9	10.7	33.4	2.6
A breast pump costing around £40.00 provided for free on the NHS	21.9	10.3	67.8	3.7
Additional funding for local health services if they reach targets for the number of women who prove that they have stopped smoking during pregnancy	28.6	18.5	52.9	3.3
Additional funding for local health services if they reach targets for the number of women who prove that they are breastfeeding	38.6	17.3	44.1	3.0

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Acceptable values for shopping vouchers (smoking and breastfeeding)

The acceptable value of shopping vouchers was asked only of those responding to the question of whether shopping vouchers for either smoking cessation or breastfeeding are acceptable with strongly agree, agree or neither agree nor disagree. For both smoking cessation and breastfeeding, > 90% stated that a value of ≤ £40.00 or less was acceptable (*Tables 50* and *51* respectively). Full details of the two-part models to estimate the acceptable values for shopping vouchers are provided in *Tables 102* and *104* in *Appendix 31*. In brief, age 16–24 years and the experience of children being breastfed were negatively correlated with the value of shopping vouchers for smoking cessation. There were no significant predictors of the value of shopping vouchers for breastfeeding.

TABLE 50 Acceptable values for shopping vouchers for women who prove that they have stopped smoking during pregnancy (*n* = 232)

Value (£)	*n*	%
2	9	3.9
10	89	38.4
20	80	34.5
40	33	14.2
60	6	2.6
80	15	6.5

TABLE 51 Acceptable values for shopping vouchers for women who prove that they are breastfeeding (*n* = 221)

Value (£)	*n*	%
2	10	4.5
10	70	31.7
20	81	36.7
40	39	17.6
60	8	3.6
80	13	5.9

The acceptability of targeting incentives to low-income women only (smoking and breastfeeding)

Of the 232 respondents who did not disagree with vouchers for smoking cessation, 77 (33.2%) thought that vouchers should be targeted at low-income women only and 155 (66.8%) thought that all women should receive vouchers, regardless of income. For breastfeeding, out of 221 respondents, the numbers and percentages were similar, with 69 (31.2%) responding that vouchers should be provided to low-income women only and 151 (68.3%) responding that vouchers should be provided to all women. There were no predictors of the acceptability of targeting vouchers to low-income women for smoking cessation in pregnancy and the only predictor of the acceptability of targeting vouchers to low-income women for breastfeeding was being resident in England (compared with Scotland). Full details of the two-part models are provided in *Tables 103* and *105* in *Appendix 31*.

Results comparing the general public survey with the health professional survey

Tables 52 and *53* provide summaries of the independent predictors of general public acceptability and non-acceptability and health professional acceptability and non-acceptability, respectively, of the shortlist of seven incentive strategies.

Framing effects

In the general public survey framing effects were observed, with a significantly higher acceptability of vouchers for breastfeeding when breastfeeding questions were randomly selected to be asked first than when breastfeeding questions were asked after the smoking questions (OR 2.00, 95% CI 1.61 to 2.46; $p < 0.001$). Differences in the acceptability of vouchers for smoking cessation during pregnancy depending on whether smoking questions were asked first or were asked after the breastfeeding questions were non-significant. There was a significantly higher acceptability of free breast pumps when breastfeeding questions were asked first than when they were asked after the smoking questions (OR 1.32, 95% CI 1.08 to 1.62; $p < 0.008$).

As with all of the other breastfeeding-related incentive questions, significant framing effects were observed for the acceptability of provider incentives for breastfeeding targets. Agreement was significantly higher when breastfeeding questions were randomised to be asked first than when they were asked after the smoking questions (OR 1.44, 95% CI 1.17 to 1.77; $p < 0.001$). No significant framing effects were observed for the acceptability of provider incentives for smoking cessation targets.

Full details of the framing effects are provided in *Appendix 32*.

Smoking status of respondents

General public respondents were less likely to answer 'yes' to the statement 'I currently smoke every day' if they were aged ≥ 65 years, belonged to social grades A, B or C1, lived in the South West, had a degree-level qualification or had no children. Those with children were less likely to answer 'yes' to the statement 'I currently smoke, but not every day'. Those who answered 'yes' to the statement 'I used to smoke, but have quit' were less likely to be in the 18–24 years and 25–34 years age groups, have no children, live in the North or London, be of Asian Pakistani ethnicity or have had a male interviewer. Respondents who said that they had never smoked were more likely to be female, to be aged < 65 years, to not have any children, to live outside of the South East, to have some formal qualification(s) and to be from social grades A, B, C1 or C2. Those who said that they had ever smoked were more likely to have tried to stop smoking at some point if they were female or had children. Those who were female, who lived in the Midlands, who were of white British ethnicity or who had a female interviewer preferred not to answer the smoking status question. For the health professional survey, few responded that they were current or past smokers, as might be expected.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 52 Summary of the independent predictors of general public acceptability (+) and non-acceptability (–) for the shortlist of seven incentive strategies

Incentive strategy	Age < 44 years	Female	Non-white ethnic group	Lower educational level	Social grade C or below	Parent	Current smoker (quit attempts)	Children breastfed	Resident outside London
Shopping vouchers should be provided to women who prove that they have stopped smoking during pregnancy	++	–	+	–	++ (E)		++		– (Wales)
It is acceptable to provide shopping vouchers to a woman for 2 months after the birth of her baby if she proves that she is still not smoking	++	–		–	++ (C2)				– – (Scotland, West Midlands) – (Wales, East Midlands, Yorkshire and Humberside)
It is acceptable to provide shopping vouchers to a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home	++	–	+	–			+		– – (West Midlands) – (East Midlands, Yorkshire and Humberside, Scotland)
Shopping vouchers should be provided to women who breastfeed for the first 6 months after the birth of their child	++	–	+++					++	– – (West Midlands, East Midlands) – (South West, Yorkshire and Humberside, Wales)
A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding	++			–	++ (E)			++	– – (Wales, East Midlands)
Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy	+++			–	– (C1)				– – (East Midlands) – (South West, Yorkshire and Humberside, North, West Midlands, Scotland)
Local health services should receive additional funding if they reach targets for the number of women who breastfeed	++		+++						– (South West, East Midlands, Scotland)

Note
ORs for acceptability: + = OR 1.0 to ≤ 1.49; ++ = OR ≥ 1.50 to ≤ 1.99; +++ = OR ≥ 2.0. ORs for non-acceptability: – = OR ≥ 0.5 to ≤ 1; – – = OR ≤ 0.49.

TABLE 53 Summary of the independent predictors of health professional acceptability (+) and non-acceptability (–) for the shortlist of seven incentive strategies

Incentive strategy	Age < 54 (years)	Female	Non-white ethnic group	Profession: midwives, health visitors and maternity staff	Parent	Current smoker (quit attempts)	Children breastfed	Resident in England
Shopping vouchers should be provided to women who prove that they have stopped smoking during pregnancy								
It is acceptable to provide shopping vouchers to a woman for 2 months after the birth of her baby if she proves that she is still not smoking								
It is acceptable to provide shopping vouchers to a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home								
Shopping vouchers should be provided to women who breastfeed for the first 6 months after the birth of their child	– – (age 18–34 years)			++				
A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding								
Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy				+++ (+++ for other staff group)				
Local health services should receive additional funding if they reach targets for the number of women who breastfeed		++		+++ (+++ for other staff group)				++

Note
ORs for acceptability: + = OR 1.0 to ≤ 1.49; ++ = OR ≥ 1.50 to ≤ 1.99; +++ = OR ≥ 2.0. ORs for non-acceptability: – = OR ≥ 0.5 to ≤ 1; – – = OR ≤ 0.49.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Infant feeding status of respondents

Those who reported having children were more likely to be female, be aged > 45 years, live in the Midlands or have white British ethnicity. Those with children who were breastfed, even if only for a day or two, were less likely to be male, be from social grade C2, live in Scotland, have qualifications at A-level equivalent or above or have white British ethnicity. Those with children who were not breastfed were less likely to be in the 55–64 years age group, live in the Midlands or have a degree-level qualification. Those who did not know were more likely to be male. For the health professional survey, most with children responded that they had given at least one child breast milk, even if only for a few days.

Discussion

Overall, opinion was mixed about the provision of incentives to either women or local health services in both the general public and the health professional samples. For both the general public and health professionals, the most agreeable incentive strategy would be to provide a free breast pump costing around £40.00 to help women to continue breastfeeding, with 45.8% and 67.8% net agreement in the general public and health professional samples respectively. Net disagreement with providing a free breast pump was 27.2% for the general public and 21.9% for health professional respondents. The general public and health professional respondents differed in their views about the least acceptable incentive strategies. For the general public, shopping vouchers for women who continue to stop smoking after birth (net agreement 36.5% and net disagreement 46.4%) or for women who maintain a smoke-free home (net agreement 34.4% and net disagreement 46.0%) were the least acceptable, although over one-third of respondents agreed with the provision of these incentives. For the health professional respondents the least acceptable incentive strategy was shopping vouchers for women who prove that they are breastfeeding for 6 months, with net agreement of 33.4% and net disagreement of 55.9%. The general public expressed collective uncertainty for providing funding to local health service providers to meet smoking cessation or breastfeeding targets, with just over one-third of respondents agreeing and one-third disagreeing, whereas health professionals were slightly more in agreement with these strategies.

Being of childbearing age (< 44 years) was the only independent predictor of general public agreement with all seven incentive strategies, with agreement tending to decrease with increasing age. Health professional respondents in the age group 18–24 years were more likely to disagree with vouchers for breastfeeding, with an opposite trend noted for breast pumps, but with uncertainty around this estimate.

It is important to note that this survey was conducted in the midst of a sustained economic downturn since 2008, in the month of a substantial reform of the NHS in England and in a culture in which pay or bonuses are related to performance and an incentive/reward culture in schools is common. Older respondents may be less likely to have had direct experience of this culture in their day-to-day lives and generational attitudes towards state intervention to promote healthy lifestyle behaviours have changed in recent years, for example towards legislation on smoking in public places.

Women in the general public sample who are (or who would have been when younger) the intended recipients of the vouchers were less likely than men to agree with any shopping vouchers for smoking cessation during pregnancy, smoking cessation after birth, a smoke-free home or breastfeeding. This is a very important finding as women are the target group for behaviour change. There are several possible explanations. Women across the generations can feel under pressure to behave in the 'right way' and to be a 'good mother',[288,309] both from within themselves and from others, including health professionals, and this can conflict with complex social circumstances and their own identities, as described in *Chapters 4* and *6*. In this context it was interesting to observe that more women refused to answer smoking status questions asked by women interviewers, suggesting gender differences in perceived acceptability.

Another hypothesis is that, for women, taking all the onus to stop smoking and to breastfeed is less acceptable than the onus being on the health service to support them. In contrast, there was no difference between men and women in terms of the acceptability of a free breast pump. Some fathers are keen to actively feed their babies and women are keen to express milk to enable them to do this, to free up social time for either the woman or the couple or to avoid breastfeeding in public (see *Chapter 6*). A partner could potentially perceive a personal benefit from a free breast pump that would not necessarily occur if feeding directly from the breast was the target behaviour.

The implications of our findings for health inequalities are important. General public respondents with a lower educational level were more likely to disagree with any voucher incentives for women for smoking cessation or with providing a free breast pump than those with degree-level qualifications. Similarly, respondents from more disadvantaged northern regions of Britain were more likely to disagree with incentives, with the South East and East Anglia showing similar patterns to the London reference group. East Midlands residents disagreed with six of the seven incentive strategies, whereas residents in the West Midlands, Yorkshire and Humberside, Wales and Scotland disagreed with four of the seven incentive strategies. It is interesting to observe that the North West (selected as a BIBS study site because of its history of incentive schemes for smoking cessation and breastfeeding) had different agreement patterns from neighbouring northern regions. The associations with social grade were less clear, with social grade E predicting agreement with shopping vouchers for smoking cessation in pregnancy and breast pumps and social grade C predicting agreement with shopping vouchers for smoking cessation that continues for 2 months after birth. Additional funding for local health services to meet smoking cessation targets was less agreeable to respondents with a lower educational level and to those in social grade C1 than to more educated respondents and those in social grades A and B respectively. Education is considered the strongest indicator of disadvantaged socioeconomic status.[310] Less-educated women and those living outside the South East are the most likely to smoke in pregnancy and not to initiate or sustain breastfeeding.[53] To address health inequalities these are the populations that governments would most like to target with effective behaviour change initiatives.[73] This has implications for a commonly held assumption: that incentives might be more effective in disadvantaged populations, as illustrated by examples of redistribution interventions (see *Chapter 5*). People may have varied views on what they would accept and what is acceptable for others, for example, and this requires further investigation. Of importance, universal incentives were preferred by the general public and health professionals, consistent with the findings from the qualitative data that women and babies should be treated equally (see *Chapter 6*).

Besides the geographical differences, other cultural differences were apparent. Being from a minority ethnic group was a strong predictor of agreeing with incentives to improve breastfeeding outcomes, but less so for agreeing with incentives to quit smoking, and there was no difference in the acceptability of providing a free breast pump between minority ethnic groups and white British respondents. This could reflect different cultural values given to feeding directly at the breast and expressing milk using a pump. In the UK, minority ethnic groups have a higher incidence and prevalence of breastfeeding than white British mothers, although this declines in subsequent generations who remain resident.[53,311] The cultural norm for many minority ethnic groups is to breastfeed, often for beyond 6 months, and so an incentive would be rewarding what many of these women do already. The potential stigma that is implicit in providing incentives for women, who in the health services eyes are not behaving how they should and which women can interpret as 'being a bad mother' (see *Chapters 4* and *6*), would be likely to be less evident in this group.

Those with personal experiences of achieving the desired behaviour, even if only short-term breastfeeding or a failed quit attempt, were more likely agree with the provision of incentives to women, consistent with the findings on smoking cessation in the study by Park and colleagues.[302] Being a parent was not a predictor of agreement. Those with direct experience of the ease or difficulty of achieving the behaviour, the amount of effort required and the personal consequences encountered are likely to place a different value on the behaviour than those who have no direct experience (see *Chapter 6*).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

We do not think that it is appropriate to compare the predictors of agreement for health professionals with those for the general public, because of the self-selected and potentially unrepresentative sample. However, it is noteworthy that midwives, health visitors and maternity care staff were more likely to agree with vouchers for breastfeeding and with funding for local health services to meet targets than doctors or the other staff group. Midwives, health visitors and maternity care staff are the professional group that such incentive strategies would be most likely to impact on as they provide breastfeeding support and refer women to specialist smoking cessation services. The proportion of the sample in the health professional survey with a child who had been breastfed was 78% and the sample consisted of 83% women, which reflects the maternity care workforce. Health professional women approved of additional funding for local health services who meet breastfeeding targets and this was the only incentive for which a difference in response was observed between men and women. In addition, health professionals' personal experience of a breastfed child was a predictor only for incentives to local health services for meeting breastfeeding targets. This fits with the qualitative data in *Chapter 6*, which showed that staff were keen on increased resources to support women with establishing and maintaining breastfeeding. The doctor respondents were predominantly GPs (27% of the sample), who are contractually obliged to receive funding for meeting targets and so have direct experience of such incentives through the QOF (see *Chapter 5*), unlike most midwives, health visitors and maternity care staff. However, we do not know at what level respondents interpreted 'local health services'. This could be at the GP practice, the local hospital or a geographical catchment level.

The different predictors of general public agreement for incentives to women and incentives to health services are interesting. In contrast to incentivising women, neither sex nor personal experiences of the behaviour were predictors of agreement with incentives to local health services for meeting targets. A hypothesis generated is that there are differences in perceived need for additional motivation (in the form of incentives), with no perceived need for an additional incentive for women for the behaviour and mixed views about health services receiving an incentive to help women to succeed. This ties in with the qualitative data reported in *Chapters 4* and *6*. Some women can feel pressurised to stop smoking or to breastfeed and they value their freedom to choose. Health professional support is appreciated if it is non-judgemental, and often staff are strongly motivated to promote these healthy behaviours already (see *Chapter 6*). We do not know how the respondents interpreted what the local health services would be doing to reach the targets. Would incentivising health professionals to do more of the same be effective or are new approaches needed? Certainly, there is evidence that any additional support for women who want to breastfeed is effective at improving both the duration and the exclusivity of breastfeeding;[65] however, this seems to be context dependent and not necessarily generalisable to the UK.[66] However, for smoking cessation in pregnancy, counselling and support interventions have less effect than incentives delivered to women, and the evidence for the effectiveness of NRT in pregnancy remains unclear.[54,55] Further research is needed on whether incentivising health professionals to support smoking cessation in women will be as promising as incentivising women themselves.

Strengths and limitations

As far as we are aware, to date, this is the largest, most representative survey of the general public and health professionals about the acceptability of incentives for healthy lifestyle behaviours. The Ipsos MORI survey sampling and data collection methods provide findings that can be considered to represent those of the British general public. The randomisation of the order of the smoking cessation and breastfeeding questions was important, as evidenced by the significant framing effects observed. By combining both behaviours in one survey, an evaluation of the comparative acceptability of incentives for each behaviour is likely to be more robust than if using independent surveys for each behaviour. A higher number of the general public respondents than health professional respondents neither agreed nor disagreed with the incentive strategies, perhaps suggesting that more opinionated staff responded. This, together with the differences in recruitment and data collection methods, would suggest that comparisons between health professional and general public findings are unlikely to be valid. In addition, some general public respondents were likely to have been health professionals.

Access to e-mail addresses of the relevant health professionals who we wanted to invite to participate was problematic through NHS contacts. In England, it was recommended that we pay a commercial company to gain access; however, the response rate was very disappointing. The commercial company had its own branding of the e-mail, unlike the e-mail sent to staff in Scotland, which was distributed through NHS gatekeepers. Response rates via the North West R&D units were equally poor. It is therefore possible that the difficulties that we encountered with survey completion may well reflect the transitional changes that staff were experiencing because of reorganisation of NHS trusts. However, despite these limitations, some comparisons between the health professional survey findings and the general public survey findings have been highlighted as relevant for further research in this area and they triangulate with the qualitative data findings in *Chapter 6*.

A challenge was to introduce and describe the incentive scenarios with sufficient clarity and detail to minimise differing interpretations but allow meaningful comparison between them. Given the framing effects identified in this survey and by others in relation to how the incentive is described[300] and the stated effect size,[301] the generalisability of these findings to other types of vouchers or incentives is uncertain and is likely to change over time as more evidence relating to effectiveness becomes available. For example, Promberger and colleagues[301] found that healthy groceries were considered to be around 20% more acceptable than cash or vouchers for luxury items. In our survey, the introduction statement about the effectiveness of incentives for smoking cessation is stronger than the statement about the effectiveness of incentives for breastfeeding, which reflects the strength of evidence described in *Chapter 3*. This difference is likely to have influenced responses, as even a 1% increase in effectiveness can dramatically increase acceptability.[301] It is therefore uncertain whether the framing effects observed for the order of the breastfeeding incentive questions represent a true difference in the comparative acceptability of incentives for the two behaviours or reflect the stronger wording associated with smoking cessation. There may be other framing effects that are not apparent, for example if we had randomised the order of questions asking about incentives for providers and for women or if we had asked about incentives for breastfeeding for a shorter duration, for example 8 weeks rather than the WHO-recommended length of 6 months and beyond.[60] Given these framing effects, as well as the cultural and socioeconomic predictors of acceptability, comparison with other surveys is difficult, for example the study by Lynagh and colleagues[151] (see *Chapter 3*) in which only 25% of patients in an Australian antenatal clinic endorsed the idea of paying women to quit smoking.

Implications for the shortlist of incentive strategies

Overall, the general public has mixed views about the acceptability of the proposed incentive strategies. This can be interpreted in different ways. From a research perspective, this collective uncertainty about acceptability is potentially ideal for the conduct of RCTs to ensure a rigorous evidence base. However, the mixed opinions among health professionals about the acceptability of voucher incentives for women could be problematic if a trial was reliant on NHS staff for recruitment or for delivering the intervention.

From the perspectives of those who are against incentivising women because of the implicit stigma and blame, these findings would suggest that a trial would be unacceptable to some in the target group, which could be problematic for recruitment and engagement. It is a concern that incentive strategies are less agreeable to those with lower educational attainment living in more disadvantaged regions of the UK and therefore it would be important in any future trial to investigate the impact on health inequalities.

Over 85% of general public respondents who did not disagree with the provision of incentives to women for either smoking cessation or breastfeeding stated that a value of $\leq$ £40.00 per month for vouchers was acceptable. This is of a similar order of magnitude to that in the studies included in the meta-analysis reporting the effectiveness of financial incentives for smoking cessation in pregnancy (see *Chapter 3*). This is less than the £400.00 total that can be provided for women who remain quit in the CPIT (see *Box 2*), for example.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Although the format of the survey did not facilitate formal assessment of which incentive was most acceptable, we can make some crude assumptions by comparing the arithmetic mean rating of the acceptability of each incentive strategy. In particular, a free breast pump up to a value of £40.00 was more popular than the more hedonistic shopping vouchers, for which a woman has autonomy and little restriction on how she chooses to use the incentive. Searching the Amazon UK website in September 2013 identified 406 hits for 'breast pump'; however, this did include related equipment. The cheapest manual pump costs £3.27 and the most expensive double-breast electric pump costs £701.31. A voucher value of £40.00 would buy a middle-of-the-range manual breast pump or a lower-range electric pump or, alternatively, could be used to hire a top-of-the-range electric pump and provide the sterile pack required. The acceptability of the different types of pump, the timing of pump provision and the education and support required to use one to benefit breastfeeding require more investigation. In addition, it cannot be assumed that a breast pump would increase either breastfeeding duration or exclusivity and this therefore requires testing. The systematic review of the evidence on effectiveness presented in *Chapter 3* found most evidence to support shopping vouchers for smoking cessation in pregnancy; however, recruitment, attrition and qualitative data from published studies suggest that only a relatively small proportion of pregnant smokers engage with such interventions.

Younger age groups were more in favour of incentives for local health services to meet behaviour targets; however, there were few other general public predictors for the acceptability of these incentives. Importantly, midwives, health visitors and maternity staff were more in favour than doctors of incentives for local health services to meet behaviour targets, and further evaluation of these incentives would therefore be indicated.

The shortlist of incentive strategies is considered again in *Chapter 9*, when all of the findings are pulled together and discussed.

Chapter 8 Discrete choice experiment of strategies to support smoking cessation in pregnant women

Background

The views of potential service users are one of the important elements when designing effective services to help pregnant mothers quit smoking. This chapter describes a DCE to investigate the views of current and former female smokers of childbearing age on whether different service characteristics would help pregnant women to quit smoking. A web-based online survey was used.

Methods

Objectives

The objectives of the DCE were to:

- explore the characteristics of a smoking cessation service and their relative importance in helping pregnant women quit smoking
- examine the effect of financial incentives to help pregnant women quit smoking and to use this to inform the design of any future trials
- assess the variation in response by individual characteristics, such as age, smoking status, perceived ease/difficulty of smoking cessation and educational attainment, and how this impacts on service design.

Developing the discrete choice experiment

Discrete choice experiments are a stated preference technique that is increasingly used in health care to elicit preferences for attributes of health-care services. They are based on the premise that goods or services can be described by their characteristics (attributes) and that an individual values, in terms of utility or benefits, goods or services depending on the levels of these attributes.[312–314] Participants responding to a DCE questionnaire are asked to make a number of choices between services, each of which is described by a series of attributes at different levels. By changing the levels of the attributes and asking participants to make their choices again, it is possible to assess the relative importance that individuals place on these attributes and the extent to which they are willing to trade between the different characteristics of the services. Generally, the results are used to derive overall benefit or utility scores for different configurations of services. In this relatively novel application, women were asked to choose between services on the basis of their likelihood of quitting smoking and the results are interpreted in terms of the potential effectiveness of different scenarios.

Developing the attributes and levels

Defining the attributes and associated levels is the first step in a DCE. Two phases of research informed the choice of attributes and levels: a systematic review (see *Chapter 3*) and qualitative analysis (see *Chapter 6*). A shortlist of seven promising incentive intervention strategies was identified from the systematic reviews (see *Chapters 3* and *5*). The meta-analysis of contingent compared with non-contingent incentives for smoking cessation in pregnancy (see *Chapter 3*) provided supporting evidence for the effectiveness of contingent incentives. However, the systematic review evidence revealed uncertainty about the optimal dose of incentive, frequency of incentive and non-incentive intervention components, for example support, CO monitoring or other BCTs. In addition, there was uncertainty about whether including a significant other as a recipient of the incentive intervention or as an additional support component for the pregnant woman contributes to intervention effectiveness.[141]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Furthermore, the CPIT Phase II trial[88] (co-applicants LB and DT) (see *Chapter 6*) was in progress concurrently with this study and interim recruitment and outcome data were available at the design phase for this DCE in March 2013 and showed promise of effectiveness. Qualitative data from 20 pregnant women recipients and 23 service providers in the CPIT were collected independently of the BIBS study qualitative researchers. CPIT transcripts were included in the analysis of qualitative data in *Chapter 6* in July 2013 after the completion of this DCE to minimise bias. Potential attributes were developed based on the characteristics of the studies included in the meta-analysis, the CPIT interim analysis and also preliminary qualitative data collected from mother-and-baby group co-applicants and participants who provided data before April 2013 (see *Chapter 2*). The potential attributes were discussed within the research team to reduce them to a manageable number for the DCE and levels were identified to cover the range of possibilities. Details of each attribute are given in the following sections.

Summary of attributes

Attribute 1

A first meeting with an expert adviser to get help to stop smoking and agree a quitting date forms part of routine care for pregnant women and was therefore retained as an attribute for all choices. After the first meeting, the potential configurations of the service offered to individuals vary.

The next two attributes relate to the method of providing support to women as part of the intervention. They are included as the review found limited evidence about the interaction between incentive and non-incentive behaviour change components and their modes of delivery. In particular, there is recent evidence suggesting that text messaging support is effective at helping people to stop smoking.[315] In a review of the evidence for lifestyle behaviour change for patients at risk of diabetes, contact frequency was associated with increased effectiveness.[215] *Chapter 3* identified many different BCTs that were delivered in addition to the incentive component in smoking cessation interventions for pregnant women and it was not possible within the confines of a single DCE to examine all of the potential interactions. We chose a simple advice-based interaction from a smoking cessation expert adviser, as this would be compatible with a short text message, and varied the method of delivery and timing of the delivery contacts.

Attribute 2

Attribute 2 varies the frequency of regular face-to-face meetings with an expert adviser to get help throughout pregnancy and until the baby is 2 months old. Participants have regular meetings to get face-to-face help from a quitting expert adviser, to have their smoking status checked and to receive a voucher for staying quit. Participants can meet with the quitting expert adviser either once a week or once every 2 weeks.

Attribute 3

Attribute 3 varies the method of providing more intensive support during the first week after deciding to quit. In two trials,[105,144] daily face-to-face contact occurred initially. This is supported by research into decision-making, which suggests that interventions to develop new behaviours need to address present bias.[316] For nicotine addiction, the immediate benefits of relapse are likely to be particularly powerful in the early stages of quitting and outweigh the longer-term benefits. In addition, when considering new habit formation, the frequency of motivating contacts, however brief the intervention, is important.[317] Participants can visit the clinic daily to meet with their quitting expert adviser, receive a daily telephone call from a quitting expert adviser or receive a daily text message from a quitting expert adviser.

Attribute 4

Attribute 4 provides a financial incentive in the form of a voucher. In *Chapter 3*, a meta-analysis of data from four trials[105,109,141,144] showed that contingent financial incentives are effective in helping women stop smoking in pregnancy compared with non-contingent incentives (which may be small payments for taking part and providing outcome data). These all used a similar level of total reward, although the payment schedules varied. There had been no direct comparison of different incentive levels to test for dose–response and this is addressed by attribute 4.

In the DCE, respondents were offered a choice of no voucher or vouchers of £20.00, £40.00 or £80.00 per month, contingent on providing a saliva test to show that participants have not smoked. The range of total values for the vouchers that women could receive over the duration of the service encompasses the total level of reward found in the literature and offers values above and below.

Attribute 5

Attribute 5 includes a quitting pal: someone close (a friend or a relative) who helps the woman to quit. One of the largest trials in the meta-analysis had given incentives to a non-smoking 'pal' as well as to the woman quitting,[141] and other trials also involved partners or significant others without incentives.[104,108,138,145–147] We were interested in the relative importance of the different ways in which the 'pal' is involved in the process with regard to women's quitting behaviour and addressed this in the final attribute.

In the DCE, participants were given the option of choosing whether or not to have a 'quitting pal' who is a friend or relative. There are three levels of 'quitting pal' support: pal receiving information on how to help the woman quit only when she first sees her quitting expert adviser; pal receiving help and information when the woman first sees her quitting expert adviser and a text message after each saliva test with the woman's result; and pal receiving information on how to help the woman quit when she first sees her quitting expert adviser, a text message after each saliva test with the woman's result *and* a £20.00 voucher every month that she stays quit.

The final attributes and levels for the DCE are shown in *Table 54*. The descriptions of the levels are as they appeared in the DCE questionnaire. The last column presents the current service, which was included as option C in the DCE questionnaire.

TABLE 54 Attributes and levels for the DCE

Attributes in the DCE	Levels in the DCE	Current service (or option C)
1. First meeting with expert adviser to get support to stop smoking and agree quitting date (*First meeting*)	Yes	Yes
2. Frequency of regular face-to-face meetings with expert adviser to get support (*Frequency of meeting*)	Once a week; once every 2 weeks (base-level category)	None
3. Method of support during the first week after deciding to quit (*Method of support*)	A visit to the clinic every day to meet with your quitting expert adviser (base-level category); a telephone call every day from your quitting expert; a text message every day from your quitting expert	None
4. Monthly financial incentive in the form of a voucher (*Incentive*)	No vouchers (base-level category); £20.00; £40.00; £80.00	None
5. Quitting pal: someone close (friend or relative) who supports to quit (*Quitting pal*)	No 'quitting pal' (base-level category); your 'quitting pal' will receive information on how to support you when you first see your quitting expert adviser; your 'quitting pal' will receive support and information when you first see your quitting expert adviser and a text message after each test to let him or her know your result; your 'quitting pal' will receive information on how to support you when you first see your quitting expert adviser, a text after each test to let him or her know your result and a £20.00 voucher every month that you stay quit	None

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Determining choice sets

The combination of attributes and levels resulted in 96 possible profiles (1 × 2 × 3 × 4 × 4). This was reduced to a more manageable 48 profiles (i.e. 24 choice sets) using experimental design techniques. SAS version 9.1.2 software (SAS Institute Inc., Cary, NC, USA) was employed to generate a main-effects D-efficient design, ensuring that uncertainty around parameter estimates was minimised (by minimising the determinant of the covariance matrix).[318] An example of a choice set is shown in *Figure 21*. Along with two options offering different configurations for the new service (option A and option B), a third option (option C) was included in each of the 24 choice sets. This third option allows respondents to choose the currently provided smoking cessation services, which do not have the properties defined by attributes 2–5. The 24 choice sets were randomly divided into three blocks to reduce the length of the questionnaire each respondent had to complete. The questionnaire is provided in *Appendix 33*.

To make sure that respondents were engaged in making choices, two choice questions, so-called warm-up tests, were presented before the real choices. Thus, an individual respondent was presented with eight choices and two warm-up tests. However, it was not possible for the respondents to know which were real choices and which were warm-up tests.

Screening questions

At the beginning of the survey, screening questions were asked to ensure that information was obtained from women with smoking experience, who currently smoked (i.e. smokers) or who previously smoked (i.e. ex-smokers), who were aged 16–40 years (i.e. of childbearing age) and who were from the UK. These women were considered best placed to assess the impact of the choices on the likelihood of quitting smoking. Finally, respondents were asked to pick the best statement about themselves out of the following seven: I am a smoker; I am a smoker and would like to quit; I have recently quit smoking by using nicotine patches and/or gum; I have recently quit smoking by other means; I was a regular smoker but gave up a long time ago; I was an irregular smoker but do not smoke now; I have never smoked. Those who had never smoked were screened out.

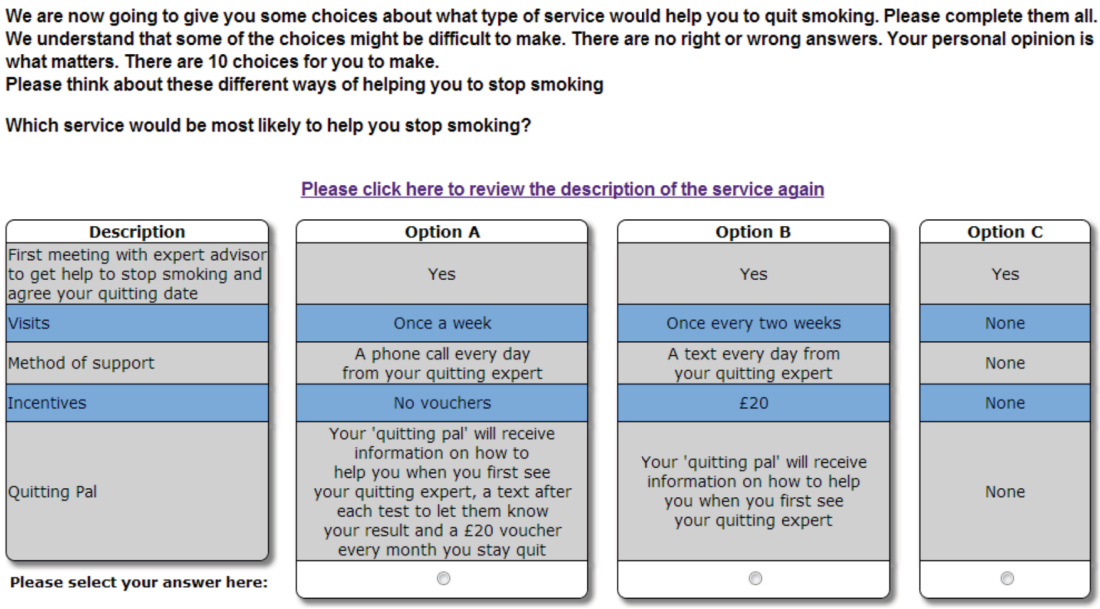


FIGURE 21 Example of a choice set of questions presented to participants. Note: In each of the choice set of questions, participants were presented with a highlighted icon that read, 'Please click here to review the description of the service again'. This linked to a new window with a description of the suggested smoking cessation service that had been presented beforehand.

Additional information

We also asked respondents for their views on the services most likely to help women to stop smoking during pregnancy and during the first couple of months after birth. We provided information on the harm caused by smoking to the health of mothers and babies: an increase in the risk of premature birth, stillbirth and caesarean section and increases in their baby's risk of chest infections, ear infections, chronic bronchitis, asthma and sudden infant death or cot death. We then posed a question about their intention to quit smoking or cut down by putting them in an imaginary situation in which they found out that they were pregnant while smoking 10 cigarettes a day. After the first meeting to discuss different ways to stop smoking and to be given information about the importance of stopping for their health and their baby's health, they might choose one of the following behaviours: stop smoking completely; limit smoking to a couple of cigarettes a week; limit smoking to a couple of cigarettes a day; or keep smoking the same amount as before becoming pregnant. This provided a baseline against which to interpret their views of the likelihood that the service choices offered would help them to quit.

We asked respondents how difficult they thought it would be to quit smoking, scaled as very difficult, quite difficult, quite easy and very easy, and the most likely result after trying to stop smoking while pregnant. The possible results were stop smoking completely; limit smoking to a couple of cigarettes a week; limit smoking to a couple of cigarettes a day; or keep smoking the same amount as before they were pregnant.

After completing the choice questions, respondents were asked whether they had children, about their smoking experience during pregnancy for those children and about their quit efforts during pregnancy for those children. Finally, we asked about respondents' educational attainment, employment status and annual household income before tax.

Pre-pilot

The pre-pilot version of the questionnaire was made available to the research team using an online format facilitated by Survey Monkey. Members of the research team and their colleagues, including DCE experts, were invited to complete the questionnaire and make comments. The questionnaire was amended based on 12 responses in the initial draft and 18 responses in the second draft.

We also conducted a pre-pilot with four mothers at the Blackpool mother-and-baby group (3 May 2013). They had smoked previously (none currently) and were each currently pregnant. All of the women were shown the online survey and, while reading the questions on screen, they were asked to express their feelings and discuss any issues as they presented. This session was accompanied by one of the research team members, who audio recorded it and transcribed the key points for team discussion. All participants in this session took the questionnaire seriously and were found to be engaged with the choices. Descriptions and explanations were revised for better understanding and readability based on their comments.

Sample, pilot and main data collection

Based on experience from a study that had poor response rates for unsolicited general population surveys[319] and on a literature review,[320] a market research company, Research Now (see www.researchnow.co.uk/), with a guaranteed respondent base, was employed to collect the data set using a web-based online survey method. Individuals who were registered with this company were invited by e-mail to complete the questionnaire. Each individual who successfully completed the questionnaire was given £2.00 as a reward, credited to the individual's account. A forced choice was imposed in all questions, thus participants were prevented from moving forward without answering.

Achieving quotas by country and by smoking status was discussed and determined before the pilot was launched. We collected 20% and 80% of responses from Scotland and the rest of UK, respectively, and equal numbers of ex-smokers and current smokers. In addition, we assigned an equal quota to each block of questionnaires generated from the experimental design. Initially, we received responses from

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

169 individuals and provisional analysis was conducted. Estimation using choice questions was conducted and no problems were found. Data collection was continued with no changes, with a target sample size of 300 individuals, providing a sufficient sample size to carry out subgroup analysis. The final sample achieved was 320.

Main analysis

Responses to the choice questions were analysed using a conditional logit regression model within Stata 12.1 (clogit command). The relationship estimated is described in *Equation 1*, where the dependent variable *V* is interpreted as the individual's perceived likelihood of quitting as a function of the attribute levels of the alternative service chosen.

$$\begin{aligned} V &= F(\text{First meeting, Frequency of meeting, Method of support, Incentive, Quit pal}) \\ &= \beta_0 + \beta_1 \text{Once a week} + \beta_2 \text{Telephone call} + \beta_3 \text{Text} + \beta_4 \text{Incentive} + \beta_5 \text{Quit pal_info} \\ &\quad + \beta_6 \text{Quit pal_help} + \beta_7 \text{Quit pal_voucher} + \varepsilon \end{aligned} \quad (1)$$

The constant term β_0 captures whether any new service is seen to be more or less likely to help women to quit smoking compared with currently available smoking cessation services. A positive (negative) constant would indicate that the new smoking cessation service being offered is more (less) likely to help women quit, with everything else being equal. ε is the error term for unobservable factors.

Attribute 1 (First meeting) was not included in the experimental design because there is no difference between the alternatives and thus no variation was explained by this in the estimation.

For discrete attributes, effects coding rather than dummy coding was used. Effects coding allows for coefficient values and standard errors (SEs) to be provided for every level of the attributes (see *Appendix 34*), whereas with dummy coding values are expressed relative to the baseline category and the baseline effect is absorbed into the constant term. Dummy coding is not appropriate in this study as the baseline categories for the attributes do not correspond to the current service provision but need to be estimated separately. Effects coding was used for attribute 2 (Frequency of meeting), attribute 3 (Method of support), attribute 4 (Incentive) and attribute 5 (Quit pal).

Although attribute 4 (Incentive) was designed as a categorical variable, we first estimated the model treating this attribute as if it was a continuous variable to estimate the magnitude of the effect of a £1.00 change in the financial incentive. This was then compared with the model estimating the financial incentive as a categorical variable. The performance of the models was compared using the log-likelihood ratio test.

Probability that an attribute of a smoking cessation service would potentially help a woman to quit smoking in pregnancy

Any new incentive smoking cessation service (ISCS) will need to be accepted by potential users, pregnant women, if it is going to be effective in reducing harm for mothers and babies in the population. The relative importance of the characteristics of ISCSs in helping pregnant women to quit was explored using the *V* scores from *Equation 1* for the newly designed smoking cessation service with varying configurations of attributes. We also calculated the *V* scores for varying levels of incentive attributes to assess the role of the financial incentives in helping pregnant women quit smoking.

Subgroup analysis

We estimated the same model on several subgroups defined by demographic and socioeconomic characteristics: age group, smoking status, perceived ease/difficulty of quitting smoking when pregnant and educational attainment. We tested whether the perceived likelihood of quitting differed across values within each subgroup (e.g. smokers vs. non-smokers) using a log-likelihood ratio test. *V* scores were then calculated for each subgroup.

Results

Characteristics of respondents

The summary statistics for the sample are shown in *Table 55* (categorical variables) and *Table 56* (continuous variables). The women who responded were more likely to be older, well educated and in employment. A high proportion had experience of trying to quit smoking during pregnancy and 85% would plan to quit in a hypothetical future pregnancy.

Regression results

In total, 7680 observations, covering eight choices with three scenarios from 320 respondents, were analysed and the results are presented in *Table 57*. The constant term was positive and statistically significant in both variants of the model, implying that respondents were more likely to choose the new service (ISCS). Note that the coefficient on the constant is larger when the financial incentive is categorical, whereas the coefficients on other attributes are similar between the two models.

A positive and significant value of the coefficient (β in *Table 57*) means that the attribute level contributes to increasing the perceived likelihood of quitting for the service whereas a negative and significant value reduces this.

Frequency of face-to-face meeting with the quitting expert advisers was not significant. For the *Method of support in the first week*, all three levels were statistically significant and respondents perceived that services where help was provided by a telephone call or text message every day from the quitting expert adviser were more likely to help women quit. Visiting the clinic to get daily help in the first week was viewed negatively.

Financial incentive was significant: no incentive or an incentive of £20.00 per month had negative effects on the likelihood of quitting whereas an incentive of £40.00 or £80.00 per month had a positive effect. Looking at the direction (i.e. positive or negative) and magnitude of the coefficients on levels within the incentive attribute, there was a dose–response relationship between the value of the monthly financial incentive and the impact on the likelihood of quitting, that is, when an incentive above £20.00 was provided, women were more likely to perceive the service as likely to help them quit. The effect was not linear, however, with some indication that the increase in effect begins to slow down between £40.00 and £80.00. When the incentive attribute was treated as a continuous variable, the coefficient was significant and positive, with the *V* score, indicating the likelihood of quitting, increasing by 0.412 as £1.00 more incentive is provided (columns 6–9, *Table 57*).

Among the four levels for *Quitting pal*, 'no pal' and 'pal with support and text' were statistically significant. The service with 'pal with support and text' was perceived by women as increasing the likelihood of quitting whereas the service with 'no pal' would not be likely to help women to quit smoking.

Likelihood of quitting scores for combinations of service attributes and levels

The regression coefficients on the attribute levels can be combined to compare the perceptions of respondents about which service was more likely to help them quit smoking. Therefore, the scores resulting from different combinations of service attributes and levels are an indicator of their *perceived* likelihood of helping women to stop smoking in pregnancy. *Table 58* gives the *V* scores, in rank order, for different combinations of these service attributes and levels for which the coefficients were significantly different from zero and positive. It should be noted that these scores should be interpreted only ordinally, that is, a higher score indicates that the service described is perceived by the respondents to be more likely to help but the differences in scores do not show how much more or less likely a particular configuration is to actually help.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 55 Summary statistics: sociodemographics and smoking-related characteristics ($n = 320$) – categorical variables

Categorical variable	*n*	%
Age category (years)		
16–20	18	5.6
21–25	35	10.9
26–30	64	20.0
31–35	101	31.6
36–40	102	31.9
UK region		
Scotland	70	21.9
Rest of the UK	250	78.1
Highest level of education completed		
No formal qualifications	10	3.1
GCSE, O-Level, CSE, O Grade, Standard Grade[a]	54	16.9
Vocational qualifications[b]	29	9.1
A-Level, Higher, Advanced Higher or equivalent[c]	93	29.1
Bachelor's degree or equivalent	109	34.1
Master's degree/PhD or equivalent	23	7.2
Current employment status		
Working full-time (≥ 30 hours per week)	119	37.2
Working part-time (< 30 hours per week)	76	23.8
At home and not looking for paid work	56	17.5
Unable to work because of illness or disability	11	3.4
Student	25	7.8
Unemployed and looking for work	24	7.5
Estimate of annual household income		
Up to £9999.00	37	11.6
Between £10,000.00 and £19,999.00	70	21.9
Between £20,000.00 and £29,999.00	74	23.1
Between £30,000.00 and £39,999.00	46	14.4
Between £40,000.00 and £49,999.00	39	12.2
≥ £50,000.00	28	8.8
Would rather not say	26	8.1
Smoking status		
Smoker	160	50.0
Ex-smoker	160	50.0

TABLE 55 Summary statistics: sociodemographics and smoking-related characteristics ($n = 320$) – categorical variables (*continued*)

Categorical variable	*n*	%
Quit attempt (among smokers)		
Never tried	18	5.6
Once to twice	99	30.9
Three times or more	43	13.4
When pregnant, would you		
Stop completely?	272	85.0
Limit smoking to two cigarettes/week?	19	5.9
Limit smoking to two cigarettes/day?	24	7.5
Keep smoking the same as before?	1	0.3
How difficult it would be to quit?		
Very difficult	59	18.4
Quite difficult	91	28.4
Quite easy	76	23.8
Very easy	73	22.8
Do not know	21	6.6
Do you have children?		
Yes	184	57.5
No	136	42.5
Tried to stop smoking during the most recent pregnancy?		
No, not smoking then	61	19.1
Yes and stayed smoking then	22	6.9
Yes and started again before baby was born	27	8.4
Yes and started again after baby was born	59	18.4
Number of children aged < 16 years in the household		
0	137	42.8
1	73	22.8
2	78	24.4
3	24	7.5
≥ 4	8	2.5

CSE, Certificate of Secondary Education; O Grade, Ordinary Grade; O-Level, Ordinary Level; PhD, doctor of philosophy.
a e.g. National Vocational Qualification (NVQ)1 or NVQ2, Scottish Vocational Qualification (SVQ)1 or SVQ2, SCOTVEC module.
b NVQ3, SVQ3, Ordinary National Certificate, Ordinary National Diploma, SCOTVEC Diploma.
c Higher National Certificate, Higher National Diploma, SVQ4 or SVQ5, NVQ4.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 56 Summary statistics: sociodemographics and smoking-related characteristics ($n = 320$) – continuous variables

Continuous variable	*n*	Mean	SD	Min.	Max.
No. of cigarettes a day (smoking or used to smoke)					
Smoker	160	12.65	7.49	1	40
Ex-smoker	160	12.32	8.31	1	40
Age of the youngest child in the household under 16 years	184	5.47	4.51	1	23
Time to complete questionnaire (in minutes)[a]	311	10.28	7.14	2.73	59.10

Max., maximum; min., minimum.
a Observations were excluded when the time taken to complete the questionnaire exceeded an hour.

TABLE 57 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking

	Financial incentive (categorical)			Financial incentive (continuous)		
	β	SE	95% CI	*β*	SE	95% CI
Constant (= 1 if option A or B)	1.308	0.063	1.184 to 1.431	0.282	0.092	0.101 to 0.463
Frequency of meeting						
Once a week	0.032	0.023	–0.013 to 0.077	0.031	0.023	–0.014 to 0.076
Once every 2 weeks	–0.032	0.023	–0.076 to 0.014	–0.031	0.023	–0.076 to 0.014
Method of support in the first week						
Daily visit to the clinic	–0.361	0.037	–0.433 to –0.289	–0.360	0.037	–0.432 to –0.289
Daily telephone call	0.193	0.037	0.121 to 0.265	0.188	0.036	0.117 to 0.260
Daily text message	0.168	0.037	0.096 to 0.240	0.172	0.037	0.100 to 0.244
Monthly financial incentive						
Continuous				0.412	0.026	0.362 to 0.463
£0.00	–0.677	0.046	–0.768 to –0.586			
£20.00	–0.131	0.046	–0.221 to –0.041			
£40.00	0.217	0.046	0.128 to 0.307			
£80.00	0.591	0.048	0.497 to 0.685			
Quitting pal						
No pal	–0.316	0.047	–0.409 to –0.224	–0.321	0.047	–0.413 to –0.228
Pal with information[a]	0.048	0.049	–0.047 to 0.144	0.054	0.048	–0.041 to 0.149
Pal with support and text[b]	0.197	0.047	0.105 to 0.289	0.195	0.047	0.103 to 0.288
Pal with voucher[c]	0.071	0.046	–0.020 to 0.162	0.071	0.046	–0.020 to 0.162
Log likelihood	–2255.0916			–2255.7794		
Pseudo R^2	0.1985			0.1979		
N (observations)	7680			7680		
N (respondents)	320			320		

a Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser.
b Quitting pal will receive support and information at the first meeting with a quitting expert adviser and a text after each test about the result.
c Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser, a text after each test about the result and a £20.00 voucher every month that a woman stays quit.

TABLE 58 Scores for the likelihood that varying configurations of attributes will support women to quit smoking in pregnancy

Method of support	Voucher value	Quitting pal	Total score with categorical incentive
Call	£80.00	Yes	2.2886
Text	£80.00	Yes	2.2637
Call	£80.00	No	1.7750
Text	£80.00	No	1.7500
Clinic	£80.00	Yes	1.7347
Clinic	£80.00	No	1.2211
Call	£40.00	Yes	1.9153
Text	£40.00	Yes	1.8903
Call	£40.00	No	1.4017
Text	£40.00	No	1.3767
Clinic	£40.00	Yes	1.3614
Clinic	£40.00	No	0.8478
Call	£20.00	Yes	1.5667
Text	£20.00	Yes	1.5417
Call	£20.00	No	1.0531
Text	£20.00	No	1.0281
Clinic	£20.00	Yes	1.0128
Clinic	£20.00	No	0.4992
Call	£0.00	Yes	1.0210
Text	£0.00	Yes	0.9960
Call	£0.00	No	0.5074
Text	£0.00	No	0.4824
Clinic	£0.00	Yes	0.4671
Clinic	£0.00	No	–0.0465

The only case in which a new service configuration is not scored above the current provision (our option C) is when all of the least preferred attribute levels are combined, that is, face-to-face support requires a clinic visit, there is no voucher provided and there is no 'quitting pal' support. The ranking of the service options increases with the financial value of the incentive. For any given level of financial incentive, the service is ranked as more effective if a quitting pal with support and text messaging is included. Follow-up in the first week by daily telephone call is preferred to text messaging but the difference is small.

Subgroup analysis

We conducted subgroup analysis by smoking status, age group, perceived ease/difficulty of quitting smoking when pregnant and educational attainment to see whether preference for the services differed by respondent characteristics. The full tables of results are presented in *Appendix 35* with the main findings summarised in the following sections.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Smoking status

Appendix 35 (see *Table 106*) shows the results from the conditional logit analysis by smoking status. These show that smokers differed from ex-smokers in their perception of the relative effects of the attributes of the ISCS on helping women to quit. Both groups perceived the new service as being more likely to help women to quit smoking; this view was stronger among smokers than among ex-smokers. The *frequency of meeting* with the quitting expert adviser was significant for ex-smokers for meeting weekly whereas smokers were indifferent to this attribute when choosing between services. Smokers and ex-smokers had similar ratings for the *method of support* in the first week (daily face-to-face meetings, telephone calls or text messages); the size of the coefficients varied slightly but the differences were not significant. The magnitude of the coefficient for the monthly *financial incentive* was greater in smokers than in ex-smokers and the difference was significant for the extreme values (£0.00 and £80.00), meaning that current smokers thought that the incentive was more important for helping women to quit smoking. The pattern of results for the *quitting pal* were similar for the two groups; although ex-smokers had a larger, negative coefficient on the 'no quitting pal' and a larger positive coefficient on the 'quitting pal with support and text', the CIs overlapped.

Age group

Overall, preference did not differ by age group. All age groups perceived the new service as being more likely to help women quit. The results for the youngest age group (age 16–20 years) could have been driven by the small number of observations; none of the attributes except a monthly *financial incentive* of £80.00 was statistically significant. The results are presented in *Appendix 35* (see *Table 107*).

Perceived ease/difficulty of quitting smoking

The results differed by the perceived ease/difficulty of quitting smoking adviser (see *Appendix 35*, *Table 108*). The *frequency of meeting* with the quitting expert was statistically significant only for those who felt that it would be quite easy to quit, who preferred more frequent (weekly) meetings. Visiting the clinic daily to get help in the first week was statistically significant and negative for all groups, whereas one or both of the daily telephone call or text message alternatives had a positive and significant coefficient for each group. For those who thought that quitting would be very difficult, the coefficient on *financial incentive* was positive and significant only for the highest value (£80.00) and the magnitude of the coefficient was significantly larger than for the group who thought that quitting would be very easy. Similarly, those who thought that quitting would be very difficult had a significantly more negative view of having no voucher than those who thought that quitting would be very easy. All groups had a negative view of not having a quitting pal. Groups who thought that quitting would be very or quite difficult and quite easy had a significant preference for a 'quitting pal with support and text'; those who thought that quitting would be quite easy also had a significant preference for the quitting pal receiving a financial incentive (voucher).

Educational attainment

There was a rather skewed distribution in the levels of educational attainment. Because of the small number of observations in groups with the lowest levels of education, only three groups of respondents (GCSE, A-level and university) were used for this subgroup analysis (see *Appendix 35*, *Table 109*).

The GCSE group was small compared with the other two groups. Overall, the results differed by educational attainment. Those with a higher educational attainment level (A-level or university level) had a stronger view than those with a lower educational attainment level (GCSE level) that new services would be more likely to help women quit smoking. The *frequency of meeting* was significant only for those with a university-level education, who preferred more frequent (weekly) meetings. Daily visits to the clinic for support in the first week had a significant negative coefficient for all groups; services with daily telephone calls or text messages were seen to have a significant positive effect by those with a higher educational attainment level (A-level or university level). All groups had significant negative coefficients for no financial incentive and significant positive coefficients for the largest incentive (£80.00). Those with a higher education level also had significant coefficients for the other voucher values: negative for £20.00 and positive for £40.00. The lack of significance for those with a lower educational attainment level (GCSE level) may be related to the smaller sample size, also shown in the lack of significance for any of the levels

for *quitting pal*. Those with higher levels of education had significant negative coefficients for 'no quitting pal' and significant positive coefficients for 'quitting pal with text and help'. Providing a financial incentive to the quitting pal was seen to have a significant positive impact on helping women to quit only by those with the highest education level.

Summary of the main analysis and the subgroup analysis

The results of the conditional logit estimation from the main analysis and the subgroup analysis are summarised in *Table 59*, in which '+' and '–' note the positive and negative significant coefficients respectively. For the *monthly financial incentive* attribute analysed as a continuous variable, the coefficient itself is reported for comparison purposes.

Discussion

The use of DCEs to inform the design of health services is a well-established approach. The research reported here has taken this a step further with a relatively novel attempt to estimate the effect of different attributes of a smoking cessation service on the expected likelihood that pregnant smokers would be helped to quit. The attributes of the service, including the incentives, were selected on the basis that the systematic reviews showed these to be promising. In the particular case of incentives, the clearest evidence of effectiveness came from comparisons between contingent and non-contingent incentives, with limited evidence relating to contingent incentives compared with no incentive (see *Chapter 3*). There were no within-study comparisons of level of incentive or frequency of either incentive or general behaviour change components and the studies differed in the types of BCTs used.

Overall, the findings support the potential use of financial incentives and suggest that daily text or telephone support at the start of the quit attempt and the use of a quitting pal will also increase the likelihood that the service will help pregnant women to quit smoking. Incentives are not the only feature of smoking cessation services that are expected to increase the likelihood of quitting but the relative effect of incentives seems to be greater than for other attributes. Importantly, those who consider that stopping smoking would be very difficult perceive that higher-value incentives, daily telephone support and a quitting pal would increase the likelihood of quitting. Results from the categorical analysis of incentives suggest that a voucher value of > £20.00 per month is required to increase the likelihood of quitting. Higher values increase the likelihood of quitting but at a decreasing rate, that is, the magnitude of the effect of a voucher of £80.00 is estimated to be greater than that of a voucher of £40.00, but the effect is less than double.

There has been only limited use of DCEs to investigate behavioural intentions and these have been mainly in smoking cessation. Hammar and Carlsson[321] were the first to use DCEs to determine the relative importance or effectiveness of different policies on quitting smoking among smokers. The focus was on high-level policies such as tobacco taxation and regulation and on financial subsidies for smoking cessation. A financial subsidy cannot be considered as a comparable incentive as it would not be contingent on outcome. Respondents were presented with single scenarios and asked whether they would be very likely to quit or to continue to smoke. The authors interpret their responses as smokers' expectations of their behaviour if smoking policies change and report their results in terms of the share of smokers who would quit smoking under different policies. This is compared with a baseline estimate of 31% of smokers wanting to quit. We believe that the interpretation of our results should be more cautious, partly because an extremely high number of our sample (85%) indicated that if they were smoking at the start of a future pregnancy they would intend to quit.

Goto and colleagues[322] conducted a similar DCE with current smokers but asked respondents if they would quit or continue smoking. They repeated the DCE 4 years later.[323] Both studies found that the response to different policies varied with degree of smoking dependence. They did not include the use of incentives in their analyses.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 59 Effects of the attributes and levels on the choice of smoking cessation service

			Smoking status		Age group (years)					Perceived ease/difficulty of quitting smoking					Educational attainment		
Attribute	Level	All	Smoker	Ex-smoker	16–20	21–25	26–30	31–35	36–40	Very difficult	Quite difficult	Quite easy	Very easy	Do not know	GCSE	A-level	University
Constant		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Frequency of meeting																	
	Once a week	NS	NS	+	NS	NS	NS	NS	NS	NS	NS	+	NS	NS	NS	NS	+
	Once every 2 weeks	NS	NS	–	NS	NS	NS	NS	NS	NS	NS	–	NS	NS	NS	NS	–
Method of support in the first week																	
	Daily visit to the clinic	–	–	–	NS	–	NS	–	–	–	–	–	–	–	–	–	–
	Daily telephone call	+	+	+	NS	+	+	+	+	+	+	NS	+	NS	NS	+	+
	Daily text message	+	+	+	NS	+	+	+	NS	NS	+	+	+	+	NS	+	+
Monthly incentive																	
Categorical	£0.00	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	£20.00	–	NS	–	NS	NS	NS	NS	–	NS	–	NS	NS	NS	NS	–	–
	£40.00	+	+	+	NS	NS	+	NS	+	NS	+	+	+	NS	NS	+	+
	£80.00	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

TABLE 59 Effects of the attributes and levels on the choice of smoking cessation service (*continued*)

			Smoking status		Age group (years)					Perceived ease/difficulty of quitting smoking					Educational attainment		
Attribute	Level	All	Smoker	Ex-smoker	16–20	21–25	26–30	31–35	36–40	Very difficult	Quite difficult	Quite easy	Very easy	Do not know	GCSE	A-level	University
Continuous		0.412	0.536	0.298	0.324	0.447	0.571	0.329	0.418	0.580	0.421	0.351	0.342	0.462	0.319	0.446	0.423
Quitting pal																	
	No pal	–	–	–	–	NS	–	–	–	–	–	–	–	NS	NS	–	–
	Pal with information[a]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Pal with support and text[b]	+	+	+	NS	NS	NS	+	+	+	+	+	NS	NS	NS	+	+
	Pal with voucher[c]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	+	NS	NS	NS	NS	+

NS, not significant.
a Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser.
b Quitting pal will receive support and information at the first meeting with a quitting expert adviser and a text after each test about the result.
c Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser, a text after each test about the result and a £20.00 voucher every month that a woman stays quit.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

We were unable to include all potential attributes in the DCE given the constraints required to produce a manageable number of choice alternatives. Therefore, other relevant issues, such as frequency and duration of incentives and CO monitoring, could not be explored. The interpretation of the results has to take into account that the responses are based on respondents' expectations of how they would behave; for this reason, we place more weight on the relative effects of different attributes and levels than on the absolute values. In other words, respondents can judge reliably that they are *more* likely to quit under one service configuration than under another but this does not readily translate into *how* they will actually behave in reality.

It should also be noted that the respondents to the survey were volunteers who answer online surveys for a reward and this is a potential source of bias in respect of their attitude to incentives. However, they had been asked to rate the importance of features of a smoking cessation service before undertaking the choice questions and their responses to these questions do not suggest that bias in favour of incentives would be a major problem. In total, 52% of respondents rated receiving rewards for stopping smoking as not very important or not at all important; 47% gave the same response in respect of the level of reward. Comparing ratings for support from a friend or relative, with or without a reward for the supporter, suggested that the reward increased the proportion rating this as important or very important by six percentage points, from 21% to 27%.

Implications for incentive trial design

The results from the DCE can be used to inform the design of future trials of incentives. The results indicate that the size of the effect will increase with the value of the incentive, at least up to £80.00 per month. Studies that are primarily concerned with whether or not incentives work can show an effect with smaller numbers of participants by offering a larger incentive. Studies that focus on the effect of different levels of incentive should have a starting level of incentive that is > £20.00 per month.

The most promising incentive strategy identified in the evidence synthesis, shopping vouchers contingent on verified smoking cessation in pregnancy, and the design of the CPIT (see *Chapter 6*) are supported by these findings.

The results suggest that providing additional initial support in the form of daily text messages or telephone calls from a quitting expert adviser or including a quitting pal is also likely to contribute to effectiveness for some women. Qualitative data (see *Chapter 6*) triangulate the DCE findings and suggest that women vary in what they perceive would help them to quit in terms of the method, frequency and the inclusion of others in quit attempts. What would help a woman changes over time and with circumstances and is inextricably entwined with her personal experiences, current real-life issues and other contextual influences, and flexibility of service provision was suggested. This raises the following question: 'Would individual tailoring of the additional components that accompany incentive provision, either as part of usual care or as part of an intervention, be more effective than a "one size fits all" service?'

Chapter 9 Discussion

In this chapter we briefly summarise the findings from our mixed-methods study in relation to the research objectives and the outcomes described in *Figure 1* and conclude with some overall strengths and limitations. Readers should refer to individual chapters for more detailed summaries of the findings, discussions of how the findings fit with the literature, methodological strengths and limitations and the implications of each study stage.

The outcomes reported are:

1. the evidence for the effectiveness of incentives and their delivery processes for improving smoking cessation in pregnancy or breastfeeding outcomes
2. the incentive ladder logic model, a taxonomy of incentive/reward BCTs, an incentive typology, mechanisms of action, delivery strategies and their relation to known facilitators of, barriers to and intrinsic and extrinsic motivators of behaviour change and any unintended consequences
3. the acceptability of a shortlist of the most promising incentive strategies
4. the implications for trial design and development: feasibility, clustering, recruitment, delivery processes, monitoring, outcome measurements and effect size.

This mixed-method multiphase study consisted of three main stages that overlapped. The findings of each stage were integrated to inform the conduct and analysis of other stages. Stage 1 consisted of three evidence syntheses using focused research questions to inform the design of a trial: the effectiveness and delivery processes of financial and non-financial incentives delivered to women, families and NHS or non-NHS providers with regard to smoking cessation in pregnancy or breastfeeding; a qualitative evidence synthesis of the barriers to and facilitators of both behaviours; and a scoping review of incentives for consumers or providers for other relevant lifestyle behaviours. Stage 2 consisted of primary qualitative and survey research to investigate recipient, public and health professional acceptability of incentives and their mechanisms of action, with specific attention paid to any unintended consequences. This resulted in a shortlist of promising incentive strategies. Stage 3 consisted of mixed-methods data analysis and a DCE to refine the design of the most promising incentive trial. This included the incentive characteristics, timing, quantity, delivery processes, recipient monitoring and outcome collection and organisational and contextual factors that are likely to increase effectiveness.

Interventions for these behaviours around childbirth have predominantly applied an individual theory of behaviour change, placing the primary onus on the woman to change her behaviour, with little consideration of wider community, systems and ecological approaches to intervening for behaviour change,[18,19] as recommended in the 2010 public health White Paper in England.[73] In addition, very little qualitative research to understand incentives from the perspectives of either the recipient or the person delivering the incentive was identified in our literature searches. Therefore, a broad definition of tangible incentives with a monetary or exchange value was applied (see *Chapter 1*) as it was considered important not to make assumptions about the meaning of 'an incentive' by excluding studies.

What is the evidence for the effectiveness of incentives and their delivery processes in improving smoking cessation in pregnancy or breastfeeding outcomes?

The evidence for the effectiveness of incentives in improving smoking cessation in pregnancy rates (see *Chapter 3*) found that financial incentives provided as vouchers for biochemically validated smoking cessation towards the end of pregnancy (four studies[105,109,141,144] including 332 participants) had an estimated RD of 0.23 (95% CI 0.14 to 0.31) compared with the provision of non-contingent smaller-value incentives for participation or outcome data collection. The RR of cessation was 2.58 (95% CI 1.63 to 4.07).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

This supports the findings of other systematic reviews of smoking cessation in pregnancy[41,54] and recent systematic reviews of incentives for smoking cessation in all age groups conducted since our literature search.[211,213]

In four trials[107,175,176,179] of 1308 participants, significant effects on breastfeeding up to 6 weeks after discharge were observed for the provision of various combinations of gifts, vouchers, raffles and breast pumps contingent on self-reported breastfeeding compared with no incentive or a much smaller incentive. However, there was too much variation among both the intervention and the BCT components for meta-analysis and caution is required in interpreting these findings.

Data extracted on the general BCTs that were included with incentives in the intervention differed between smoking cessation and breastfeeding. For smoking cessation, provision of information and CO monitoring were most commonly included in the intervention, with a mean of 6.62 (SD 3.1) BCTs per intervention. For breastfeeding, adding objects to the environment (breast pumps) and social support were most commonly included, with a mean of 4.34 (SD 2.8) BCTs per intervention. This highlights that incentive interventions consist of various potentially active ingredients[21] and 'the signal' or effect size needs to be balanced against 'the noise' of the low methodological quality and heterogeneity of the interventions.[324] In particular, any added lay or professional support is known to increase the duration and exclusivity of breastfeeding and is therefore a confounder.[65]

Few process evaluations were identified and the delivery strategies were not well described in the main. We therefore created a novel method of mapping the patient journey to illustrate the complexity of the intervention components, timing, modes of delivery and intensity (see *Chapter 3*). Our approach builds on the graphical methods suggested by Perera and colleagues[219] for trial reporting and addresses the poor reporting of intervention detail in systematic reviews and the difficulties that this causes for replication and implementation and which results in waste of resources.[218,325] The number of contacts between recruitment and final outcome collection (intensity) in incentive interventions varied from one to 36 for smoking cessation and from one to eight for breastfeeding. This is important for behaviour change interventions, for which intensity and the quality of additional provider–recipient interactions is recognised as a potential confounder,[215] particularly for breastfeeding.[65]

Trials were small, the proportion who were eligible who were actually recruited and who subsequently turned up and engaged in the intervention were seldom reported, and attrition rates were variable and often high, particularly for sustained smoking cessation after birth. Qualitative data suggest that incentives are likely to work best for certain types of women, classified by Radley and colleagues[113] as 'enthusiastic amateurs'. These women tend to have more stable lifestyles and thus conceptualise the incentive as part of a wider rewards and social support structure. In contrast, those with more chaotic, stressful lives tend to cut down or relapse, for example, as smoking is central to their lives and an essential strategy for coping.[110,111,113] In addition, we identified two other types of women who do not consider engaging with incentive interventions. The 'do it aloners' are represented by the 27% of women reported in an American study who stopped smoking as soon as they found out they were pregnant.[326] This group tends to be well supported and motivated by the health risks and benefits. The 'non-contemplators', by contrast, are those who are resistant to change because of the centrality of smoking in their lives. The reach of incentive interventions is a concern and research is in progress to investigate how best to engage pregnant smokers in either self-directed behaviour change or smoking services, for example using text messaging.[327]

The incentive ladder logic model

Our original objective was to develop an incentive taxonomy of incentive strategies and to understand the mechanisms of action of incentives and their interactions with the existing barriers and facilitators, and intrinsic and extrinsic motivators of behaviour. However, it quickly became apparent, through service-user consultation and qualitative interviews with women about incentives, that the key issue was the centrality

of smoking or breastfeeding to women's everyday life experiences, as interview narratives kept returning to this.

A narrative systematic review of qualitative evidence syntheses of women's experiences of the barriers to and facilitators of smoking cessation and breastfeeding identified only three studies for smoking cessation compared with 10 for breastfeeding. A logic model was applied to describe how theories of behaviour change might interact with barrier and facilitator themes ranging from intrinsic to extrinsic influences. The seven key themes for comparison within and between behaviours were centrality and identity; the mother–infant relationship; risks and benefits; developing a new practical skill (breastfeeding only); social context; place; and health professional services. We noted that the smoking and breastfeeding studies had quite different findings:

1. the centrality of smoking to women's everyday lives was a dominant theme for smoking cessation, with new strategies required to cope with stress, addiction and 'me time' when women stop
2. for breastfeeding, external support to facilitate learning a new skill was the dominant theme; however, the mother–baby relationship was central to feeding decisions
3. constructive relationships with partners, family and social networks and health professional relationships and support are necessary
4. negotiating the private–public interface for performing both behaviours is crucial.

An incentive ladder logic model (see *Figure 18*) emerged from the mixed-methods data analysis of the following phases of the study:

1. Service-user discussion and qualitative data from interviews and focus groups allowed us to access harder-to-reach women experiencing social and material disadvantage, and a few of their partners, all with a wide range of smoking and infant feeding experiences (see *Appendices 20* and *21*). Some of our sample had experience of being in a voucher incentive intervention for smoking cessation in pregnancy, for example the CPIT, and some had experience of being in a gift incentive scheme for breastfeeding; a few teenage mothers had experience of a scheme incentivising multiple behaviours organised by a charity.
2. The review of qualitative evidence syntheses of women's experiences of the barriers to and facilitators of smoking cessation and breastfeeding.
3. The systematic review (see *Chapter 3*), in which the incentives provided were multiple both within and across studies. An initial typology was refined through qualitative data collection and analysis. The incentives ranged from unrestricted, hedonistic shopping vouchers to behaviour-related, utilitarian, more restricted health-related and experiential incentives with benefits beyond the individual. The incentive meaning could imply moral judgements and values around autonomy, choice and trust. Incentives that increased maternal well-being seemed to be the most motivating.
4. In an attempt to understand any interactions between the incentive component and the other BCT components in intervention studies included in the systematic review, an IRBCT taxonomy (see *Table 2*) was developed from existing behaviour change taxonomies.[17] This was designed to fit and extract data from the studies included in the systematic review (see *Chapter 3*) and had four categories: incentive/reward content and type, contingency target and actor. In particular, it was considered important to distinguish between an incentive, which is something that motivates an individual to act and may include awareness that achieving the behaviour outcome will result in a guaranteed reward, and when a person either does not have prior awareness of or is uncertain about the receipt of a reward. In the latter case, the motivation to act may be less. This distinction is seldom addressed or well reported in the literature; however, our data suggest that the timeline from awareness to receipt could be important.
5. The patient journey (see *Tables 8* and *26*), which captures how the timing, frequency and intensity of the incentive and BCT components and their modes of delivery varied over time. This was an important step in our understanding of the potential mechanisms of action of incentives.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

A logic model based on a 'ladder' as a metaphorical concept and the 'rungs' as what an individual woman might need to achieve the behaviour outcome(s) emerged from the mixed-methods data analysis of all stages of the study. The ladder refers to life course and context rungs, which are something/someone/a situation in the woman's life that helps/facilitates or motivates a woman to climb the ladder and supports her at each step. Damaged rungs occur when existing support for behaviour change ceases, for example when a partner starts smoking again or when support from helpful hospital staff for breastfeeding stops when a woman goes home. Missing rungs are evident when the personal and/or vicarious experiences of the behaviours are strong social norms for continued smoking or formula feeding. Such social norms are known to influence both smoking in pregnancy and infant feeding decisions.[12] The ladder also has intervention rungs, specifically incentive/reward component(s), contingency and verification of the behaviour, other BCT and psychosocial intervention components, delivery processes and modes of delivery. These need to be structured and replicable for trial design, but also need to fit with the everyday lives of women and with routine maternity and early years care for the intervention to work in practice and be feasible.

The development of a shortlist of the most promising incentive strategies

The initial shortlist of incentive strategies was compiled from the evidence synthesis of the effectiveness of incentive interventions for smoking cessation in pregnancy and breastfeeding presented in *Chapter 3*. Intervention vignettes were created for a diverse range of effective or promising studies (*Appendices 2* and *16*) to allow us to revise the shortlist through discussion with co-applicant mother-and-baby groups and qualitative interviews with women and providers. This resulted in changes to the incentive strategies when there was weak evidence from the review. For example, breast pumps were particularly popular with younger, more materially disadvantaged women who considered the cost prohibitive, who disliked the feelings of embarrassment when the function of breasts changed from sexual to nursing and when sharing feeding with either a partner or another family member was a priority, for example to re-establish a social or working life after birth. However, health professionals expressed concern that a free breast pump would endorse it as a prerequisite for breastfeeding and voiced uncertainties around the effects that the introduction of a breast pump might have on feeding outcomes.

A scoping review of systematic reviews of other relevant lifestyle behaviours (see *Chapter 5*), for example drug and alcohol addiction, smoking in all age groups and obesity, supported the meta-analysis findings for the effectiveness of contingent financial incentives compared with smaller non-contingent incentives for participation or outcome data collection. In addition, it found that incentives provided to health service providers can change short-term behaviour, particularly for GPs who have a commitment contract to deliver the QOF, which includes documenting smoking status and referral to cessation services. The shortlist is discussed in the following sections, bringing together the mixed-methods analysis for all stages of the study, including the implications for trial design.

The acceptability of a shortlist of the most promising incentive strategies

Overall, opinions were divided in both the general public and the health professional survey samples about the provision of incentives to either women or local health services. For both the general public and health professionals, the most agreeable incentive strategy would be to provide a free breast pump costing around £40.00 to help women to continue breastfeeding. Being of childbearing age (< 44 years) was the only independent predictor of general public agreement with all seven incentive strategies, with agreement decreasing with increasing age. However, women were significantly more likely than men to disagree with any of the voucher incentive strategies delivered to women. Those with a lower educational level, which is the best indicator of disadvantage,[310] were also more likely to disagree than those with a degree-level

qualification. These findings are a concern as addressing health inequalities is a government priority and the target populations in which smoking in pregnancy and not breastfeeding are highest are less-educated, younger women living outside London and the South East.[53] However, those with direct parental experience of even short-term breastfeeding of a child, or current smokers with a failed quit attempt, were more likely to agree with incentives for women for the respective behaviour. Overall, universal incentives were preferred to incentives targeted at low-income women, with concerns about stigma and value judgements raised (see *Chapter 6*). Geographical areas and cultural groups known to have higher rates of breastfeeding, for example those living in London and minority ethnic groups,[53] were more likely to agree with breastfeeding incentive strategies. Ethnic minority women are less likely to smoke during pregnancy than white British women and this was a predictor of agreement with incentives for women for smoking cessation.

Views on the acceptability of the individual incentive strategies are discussed in the following sections.

The most promising incentive trial design: incentives for women to stop smoking in pregnancy

Providing shopping vouchers for biochemically proven smoking cessation in pregnancy was supported by the systematic review evidence of effectiveness in pregnancy (see *Chapter 3*) and by the review of incentives for smoking in all age groups (see *Chapter 5*), the qualitative data (see *Chapter 6*) and the DCE (see *Chapter 8*).

General public and health professional acceptability

Considering survey and qualitative data, shopping voucher incentives for smoking cessation in pregnancy were more acceptable than incentives for preventing smoking relapse after birth or for breastfeeding. In the survey of the general public there was a net disagreement of 42.3% and a net agreement of 40.5% with this incentive strategy, whereas in the survey of health professionals there was a net disagreement of 53.9% and a net agreement of 34.6%. This could be considered as representing collective uncertainty and therefore the ideal conditions for a definitive RCT. DCE research suggests that acceptability is very sensitive, even to small changes in effectiveness for smoking cessation (general population),[301] which strengthens the case for a definitive trial. Over 85% of general public respondents who did not disagree with the provision of incentives to women, for either smoking cessation or breastfeeding, stated that a value of $\leq$ £40.00 per month was acceptable. This is of a similar order of magnitude to that in the studies in the meta-analysis reporting the effectiveness of financial incentives for smoking cessation in pregnancy (see *Chapter 3*), which suggests that vouchers for smoking cessation are effective; however, this is less than the £400.00 total that can be provided to women who remain quit until the end of pregnancy in the CPIT (see *Box 2*). The DCE (see *Chapter 8*) found that studies should have a starting level of incentive that is > £20.00 per month and that the size of the effect will increase with the value of the incentive, at least up to £80.00 per month. The incentive value provided in the CPIT is therefore appropriate for a definitive trial as the larger incentive will reduce the sample size requirement.

Fit with the Cessation in Pregnancy Incentives Trial

The CPIT[88] is summarised in *Chapter 1* (see *Box 2*) and qualitative transcripts were included in the analysis in *Chapter 6*. This was led by co-applicants LB and DT and commenced before the BIBS study started. The CPIT was modelled on the effectiveness study by Donatelle and colleagues[141] and the Give it up for Baby study by Radley and colleagues,[113] except that it did not include a quitting buddy. The encouraging interim analysis of the CPIT data was reported to the BIBS research team in February 2013, after completion of the smoking cessation incentive systematic review (see *Chapter 3*) and at the time of agreeing the shortlist. In December 2014 when this report was finalised the only publication available was a conference abstract.[328] The full CPIT findings were published in January 2015.[329] Qualitative interview transcripts from CPIT participants and providers were incorporated into the data analysis at the end of July 2013 at a late stage

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

to minimise bias when interpreting the data (see *Chapter 6*). Overall, the design of the CPIT Phase II trial was supported by the findings of the BIBS study.

Proposed design for a future trial of incentives for smoking cessation

The proposed design for a future trial of incentives for smoking cessation is a RCT of the effectiveness and cost-effectiveness of shopping vouchers contingent on verified smoking cessation compared with non-contingent smaller incentives for participation, setting a quit date and final outcome measurement.

Target population and setting

The target population is any woman who is confirmed pregnant and smoking by salivary or plasma cotinine level, with the intervention ideally delivered in a variety of settings, including in the community.

Intervention

The intervention includes shopping vouchers, with a value of at least £20.00 and up to £80.00 per month, for biochemically proven smoking cessation in pregnancy and continuing after birth for up to 3 months. The active components are shopping vouchers; setting a quit date; short-term goal-setting and feedback through regular CO monitoring appointments and seeing the colour of the monitor change to green; salivary or serum cotinine verification of outcomes; and additional support tailored to the woman's life circumstances, which may include the woman's partner or a buddy participating in the intervention. In the DCE (see *Chapter 8*), the relative effect of incentives seems to be greater than that of the other attributes: face-to-face meetings with a quitting expert adviser; telephone or text support with varying frequency, including daily during the first week; and including a quitting pal. Those who consider stopping smoking to be very difficult perceive that higher-value incentives, daily telephone or text support and a quitting pal will increase their likelihood of quitting. Frequent support in the early stages of breaking an addictive habit could work through helping to overcome present bias[316] and fits with the evidence of effectiveness.[315] The DCE confirms that daily text or telephone support at the start of the quit attempt and the use of a quitting pal will increase the likelihood that the service will help pregnant women to quit smoking. This provision of additional support should be considered in incentive interventions.

Control

An identical patient journey to the intervention arm in terms of the number of contacts with service providers, the number of BCTs, the support offered and the mode of delivery (telephone, text, face to face) is required. A small incentive for setting a quit date to increase participation and a small incentive at the final outcome measurement is supported by the evidence. However, the CPIT provided only a £25.00 voucher for providing the primary outcome data and this was both acceptable and feasible to recruit and retain participants. Identical patient journeys will provide a definitive test of the incentive component.

Mechanism of action

The mechanism of action crucially depends on non-restrictive shopping vouchers, which increase autonomy, motivation and control to maximise the well-being value of the incentive in addition to the financial value. In the health promotion literature, there has been criticism that incentives to change behaviour can undermine personal moral autonomy by nudging people to make decisions and behave against their free will.[27,330] However, although there was evidence that some women feel judged or blamed for smoking while pregnant, others saw incentive schemes as an opportunity that tipped the balance of latent intrinsic motivation towards action. Importantly, for the materially disadvantaged, unrestricted shopping vouchers can be seen as autonomy enhancing and providing rare choices and treats to enhance well-being. As such, they were seen as a just reward for the effort involved. The nature of the relationship between the individual woman and the specialist smoking cessation advisor once the woman has enrolled is also crucial. Flexible, tailored, non-judgemental support provided through a continuing relationship with a dedicated smoking advisor was highly valued and motivating. This is consistent with social learning theory,[12] developing self-efficacy and the intrinsic motivation necessary to put the rungs of the ladder in place to sustain the new behaviour. The BIBS study data generate the hypothesis that the incentive, the

BCT and the relationship components are synergistic and greater than the sum of the parts, which fits with Deci and Ryan's self-determination theory.[23]

To address the potential missing or damaged rungs in a woman's life, some individual tailoring of the intervention is likely to moderate the effects, for example the frequency of support, the mode of delivery (text, telephone or face to face). This is consistent with the evidence that individually tailored materials in self-help interventions for smoking cessation are important.[331] A strongly held view was that shopping vouchers should be provided contingent on attending appointments for monitoring and proof of behaviour change, and women, particularly those with experience of the CPIT or other incentive interventions, valued this.

The intervention is consistent with the theory of reinforcement through reward, which results in conditioned learned responses to establish the new behaviour.[9,17] However, in the CPIT there is a slight delay in receiving the reward in contrast to the immediate reinforcement that is usually provided,[105,141,144] as the vouchers were securely posted to women. In the CPIT, posting the incentive was considered more logistically feasible and appropriate within the UK NHS, where exchange of money is not the norm.

Recruitment and delivery strategy

Recruitment can be by self-referral or by referral by the midwife or other health professional to the smoking cessation service. The current dedicated smoking cessation service in the CPIT was acceptable to those who engaged. Consideration needs to be given to alternative strategies to increase reach, including recruitment through home visits or convenient community settings for those for whom attending institutional settings is a barrier.

Monitoring and outcome measurement

The primary outcome should be at the end of pregnancy as this is the time of maximum health gain for the baby. Trials with > 3 months' follow-up after birth are required to assess whether the outcome attained at the end of pregnancy is sustained. The contact(s) for outcome measurement should be considered part of the process for both the intervention group and the control group. The structured CO monitoring visits, at which achievement was verified and visible, acted as short-term goals and this was often more acceptable than urine testing. Using samples that are collected routinely in maternity care was acceptable and is likely to minimise the effects of the interaction between health professionals and women.

Effect size

Only early incomplete data from the CPIT Phase II trial, and a published abstract were available when this report was finalised in December 2014.[328] The CPIT findings were published in January 2015[329] and provide a UK context to help a sample size calculation to be carried out for a definitive Phase III multicentre trial.

Breast pumps as a promising incentive strategy

The evidence of effectiveness for providing a breast pump as an incentive to prolong the duration or exclusivity of breast milk feeding is inconclusive and the overall quality of the studies providing this evidence was low (see *Chapter 3*). The interventions (type of pump, target population, timing) and the comparison groups (no pump, a different type of pump, infant formula gift packs) all varied and the amount of additional information given and support provided for expressing breast milk was poorly reported. All included trials used individual randomisation, but contamination occurred.[174] However, some positive breastfeeding outcomes were observed and further feasibility studies followed by a pilot trial are indicated based on the qualitative (see *Chapter 6*) and survey (see *Chapter 7*) findings that this was the most acceptable incentive strategy, as discussed in the following section. Importantly, younger, more disadvantaged women, who are the least likely to breastfeed,[53] were enthusiastic about this incentive strategy as the cost of an electric pump was considered prohibitive.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

The epidemiology of expressing breast milk and pump use in the UK and how this relates to breastfeeding duration and exclusivity are unknown. These data would be required before carrying out any feasibility or pilot trial. Data from the USA[185] and Australia[332] suggest that breast pump use is increasing, with around 85% of breastfeeding mothers of young infants in the USA expressing breast milk, mainly using electric pumps,[333] which produce greater volumes of milk at 6 days after birth than hand expressing.[295] Routinely collected infant feeding data from Scotland show an increase in mixed feeding at 6–8 weeks.[81] Exclusive breastfeeding benefits infant and maternal health most; however, any breastfeeding is better than none at all.[63,64] There are concerns about the commercialisation and commodification of breastfeeding through marketing breast pumps, which could potentially disrupt the mother–infant relationship by adding technology.[334] Vested interests and shareholder profits could undermine breastfeeding.

General public and health professional acceptability

For both the general public and health professionals, provision of a breast pump was the most agreeable of the seven incentive strategies, with 48.0% and 67.8% net agreement by the general public and health professional respondents respectively. Net disagreement with providing a free breast pump was 27.8% for general public and 21.9% for health professional respondents. Qualitative data showed that behaviour-related incentives such as breast pumps (or NRT devices for smoking cessation) were more acceptable with some than hedonistic and unrestricted incentives such as shopping vouchers, as the latter could be perceived as rewarding women who had behaved badly.

Potential design for a future trial of a breast pump as an incentive for the continuation of breastfeeding

A cluster RCT would be required to avoid contamination between the intervention arm and the control arm, as reported by Rasmussen and colleagues,[174] and to ensure intervention fidelity.

Target population and setting

The target population is mothers who initiate breastfeeding as qualitative data suggest that receiving a free breast pump is unlikely to act as a motivator for women who do not want to try breastfeeding. However, providing antenatal information about breast pump services and expressing milk is important, as accounts suggest that this is a neglected area because of health professional concerns about it disrupting breastfeeding. The most acceptable setting will be related to the optimum timing of providing information and pump provision and this is currently unknown.

Intervention

The optimal type and value of pump are unknown and may differ for different women according to personal preference and breast characteristics. For expensive electric pumps, a free hire service with the provision of personal sterile tubing, bottles and freezer bag packs could be an option. Hire services are provided by charities such as the National Childbirth Trust, with fees of between £38.50 and £45.00 for the first 15 days in some areas.[335] Additional information and support are likely to be required as pumping milk is a practical skill that women report is challenging to acquire. The timing and content of the information and support required for skill acquisition are currently unknown and concerns were expressed that providing information and the provision of a breast pump too soon might jeopardise the establishment of breastfeeding. In guidelines for premature infants, mothers are encouraged to express breast milk (hand or pump) immediately after birth to maximise the health benefits for the infant,[183] yet for term infants there is no clear guidance, with accounts of inconsistent advice to wait a variable length of time until breastfeeding is established. The optimal training for those providing support for expressing breast milk is also unknown. Anecdotally, breast pump service provision within the NHS is variable. Health professionals have reservations about a breast pump being perceived as a necessity to breastfeed and it being a 'slippery slope' towards introducing bottles. They often state the need to establish breastfeeding before trying to express. The current uncertainty about best practice is problematic for women and health professionals and is resulting in conflicting advice. This needs to be resolved before a trial can be undertaken.

Control
The control arm would not receive a breast pump incentive but would receive identical antenatal education and support provided to all women who choose to buy or hire a pump themselves. This would need to take account of any variation in pump provision between areas.

Mechanism of action
Expressing milk is a preparatory behaviour for the primary outcome of sustained duration of either mixed or exclusive breastfeeding (although the relationship is unknown). From a BCT perspective, a breast pump is classified as adding an object to the environment to facilitate the behaviour.[17] However, a recurrent theme in the data is of incentives as connectors,[112] and breast pumps serve as technological connectors or bricolage. They help the mother (the bricoleur) to manage the work or problems experienced with breastfeeding and to establish a breastfeeding habit and culture that works for her, her baby and her family. Breast pumps facilitate how breastfeeding fits her social network norms and potentially enhance family well-being. Providing a breast pump as an incentive is unusual in that it addresses the barriers and facilitators at all levels, from intrinsic physiological and emotional factors to extrinsic factors, particularly at the private–public interface and among family and social networks (see *Chapter 4*). They therefore act at more levels than a shopping voucher or other well-being or utilitarian or health incentives. Breast pumps can facilitate milk production, particularly for premature or sick infants in whom sucking is poorly developed or impaired. They allow the mother to have some control over infant demand for food. They can provide flexibility to create 'me time', which, for some mothers, is a coping strategy for countering stress and maintaining personal and family well-being. Family well-being, rather than the longer-term non-tangible health benefits, is the main outcome that influences infant feeding decisions.[288] Breast pumps can be a rung for re-establishing social life after birth or caring responsibilities (e.g. other children) or allowing a return to work. They can act as a rung to overcome the embarrassment of the change of role of breasts from sexual to feeding, particularly for younger mothers in whom this is a key barrier (see *Chapter 6*). Breast pumps increase flexibility by allowing the provision of breast milk in front of other people and outside the home, which 43% of UK mothers find uncomfortable.[53] Some partners/couples/grandparents want to share parenting by actively feeding the baby and perceive feeding as a unique way to establish a bond.[289,336]

Recruitment and delivery strategy
The recruitment and delivery strategy would need to be ascertained through a feasibility study, in particular the timing and type of pump provision and the education, training and support required to optimise the incentive component. A breast pump service is likely to be needed in hospitals and in community locations with easy access, particularly for women who are unable to drive for 6 weeks after a caesarean section.

Monitoring and outcome measurement
Routinely collected data at 6–8 weeks post partum on any and exclusive breastfeeding would be the most feasible primary outcome for a cluster RCT in the UK. Exclusive breastfeeding at 6 months would be the most appropriate secondary outcome as this is the WHO recommendation,[60] which is endorsed by UK governments. However, exclusive breastfeeding at 6 months is not routinely collected in the UK at present. Longer-term follow-up would be desirable, particularly to understand the relationship between breastfeeding, breast pumps and a return to work. There is currently no biochemical test to verify breastfeeding outcomes. A contingent incentive for attending a breastfeeding session to collect outcome data would be supported by the evidence from the review (see *Chapter 3*) and would be more acceptable than available alternatives, such as photography or professional verification (see *Chapter 6*). Incentives for participation are known to reduce attrition in trials,[216] and participants considered gaming less likely for a free breast pump than shopping vouchers (see *Chapter 6*).

Effect size
The effect size is currently unknown and would be informed by further feasibility work.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Incentives for provider organisations to maintain breastfeeding

The evidence synthesis in *Chapter 3* suggests some promise for provider incentives in the form of an award (or a penalty) for meeting (or not meeting) quality targets for improving breastfeeding rates, if embedded within a structured programme (a commitment contract).[168,184] However, further experimental research is needed to test different doses of incentive/penalty components for providers, preferably a RCT, as recommended by Flodgren and colleagues.[246] No RCT of the QOF commitment contract was conducted prior to implementation as UK policy for all general practices. Although there have been short-term health benefits and there is evidence of behaviour change, there are unintended consequences for other services (see *Chapter 5*).

Public and health professional acceptability

In the survey of the general public, there was a net disagreement of 38.6% and a net agreement of 36.4% with the strategy of provider incentives. There was a similar net disagreement among health professionals, but a higher net agreement of 44.1%. The qualitative data identified mixed views: some felt that incentives for local health services might encourage investment in skilled staff and peer support programmes, especially in the community. However, targets were viewed by many with caution as they were seen as potentially undermining motivation in more disadvantaged areas that were already struggling with workload. As there is evidence that any additional lay or professional support for breastfeeding can increase breastfeeding duration and exclusivity,[65] even though the generalisability of this to the UK is uncertain,[66] it was decided to include provider incentives as our third promising incentive strategy.

Potential design of a future trial of provider incentives

With routinely collected breastfeeding data at 6–8 weeks being available in the UK, with > 90% completion rates in some areas of Scotland,[81] a cluster trial or a step wedge intervention design could be feasible.

Intervention

The intervention would be financial commitment incentives or penalties conditional on a significant reduction in breastfeeding cessation rates for women who are breastfeeding at hospital discharge and who are still providing some breast milk at 6–8 weeks. The publicity for the scheme, with award ceremonies for the best achievements and dissemination of good practice, could provide an additional incentive, as it does with the UNICEF BFI (see *Chapter 3*). However, caution would be needed around public naming, blaming and shaming as it can result in stigma that is demotivating.[337]

Control

Depending on the design, the control could be usual care or a waiting list to join the incentive scheme.

Mechanism of action

Behavioural economic theory suggests that potential losses are more influential triggers to motivate change than gains.[23] Audit of and feedback to health service providers can result in small to moderate improvements in professional practice;[338] however, the benefits of adding an incentive/penalty system are unknown. A commitment contract with an incentive will focus an organisation's attention on breastfeeding as a priority and counteract providers' accounts of services being squeezed and women's complaints of insufficient health service support. By providing incentives (or penalties) for a significant change in breastfeeding rates, regression towards the mean and ceiling effects could result in areas with the lowest breastfeeding rates and most deprived communities being more likely to benefit. However, a counter argument is that the most disadvantaged areas, where unhealthy behaviours are most prevalent, require additional funding regardless of meeting targets, as it not an even playing field. Incentives provided to organisations have the potential to combine health, community, women's and family efforts in the same direction to generate additional resources for providing breastfeeding support.

Monitoring and outcome measurement

The primary outcome would be any breastfeeding at 6–8 weeks determined from routinely collected data. Outcome verification and accuracy of reporting would need to be considered. A process evaluation to assess patient, staff and manager experiences, to understand outcomes and to capture any unintended consequences, in particular any opportunity costs sustained as a consequence of the intervention, would be important.

Incentives to providers to improve smoking cessation in pregnancy

No intervention studies of incentives for providers to improve smoking cessation in pregnancy were identified in the systematic review (see *Chapter 3*). There was some evidence of short-term effectiveness of the use of incentives to change provider behaviour in terms of documenting smoking status and referring women to smoking cessation services from the UK general practice QOF system (see *Chapter 5*). The QOF system is another example of a commitment contract and there is evidence to suggest that care for chronic conditions has reduced health inequalities. However, there are criticisms that it undermines the intrinsic motivation of GPs and leads to neglect of un-incentivised aspects of care. General public views of incentives for providers to improve smoking cessation in pregnancy were mixed, with a net disagreement of 37.2% and a net agreement of 39.4% (see *Chapter 7*). Health professionals were more likely to agree with this strategy and, importantly, midwives, health visitors and other maternity staff were significantly more likely to agree than doctors. This is in the context of most UK midwives and health visitors referring pregnant women to specialist smoking cessation services in the UK. Specialist services were viewed favourably by participants in the qualitative interviews, although some felt that this should be a role for all providers (see *Chapter 6*). Further research to assess the feasibility of this strategy is indicated.

Shopping voucher incentives for women to improve breastfeeding outcomes

There is some evidence to support the provision of a variety of gifts for improving breastfeeding outcomes (see *Chapter 3*); however, the interventions in identified studies were multicomponent, with support being the most common additional intervention component, which is a confounder.[65] This incentive strategy was the least acceptable of the 'vouchers for women' incentive strategies, with general public net agreement of 33.4% and net disagreement of 55.9% (see *Chapter 7*).

Qualitative data similarly showed that there was opposition to this strategy, with a preference for more behaviour-related incentives such as breast pumps or nursing bras. For smoking cessation, additional motivation to even try to overcome substance addiction is required; this is in contrast to breastfeeding for which many have the intrinsic motivation to 'give it a go'.[339] However, both women and health professionals noted the requirement for additional help and support to succeed with breastfeeding, which accounts suggest is a current unmet need for many. Given the considerable barriers at intrinsic and extrinsic levels (see *Chapters 4* and *6*), many women choose to stop breastfeeding in the early weeks, but eight out of 10 would have liked to continue for longer.[53] Indeed, health professionals, except doctors, suggested that incentivising organisations to provide additional breastfeeding support was warranted, rather than incentivising women, in the face of squeezed services in the current economic climate. The findings of a proposed breastfeeding incentive intervention study,[221] which is in progress, will provide important additional data for assessing the acceptability and feasibility of financial incentives for breastfeeding and therefore no further consideration was given to trial design for this strategy.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Incentives for a smoke-free home after birth

This strategy of providing incentives to women for a smoke-free home was considered important by some women and professionals; however, this was the least acceptable of the seven incentive strategies in the general public survey (net agreement 34.4% and net disagreement 46.0%). Continuing the incentives for up to 3 months after birth had similar acceptability. We are not aware of any incentive interventions for a smoke-free home, or a smoke-free car (as suggested by one of our co-applicant service users), and further Phase I studies to investigate the optimum trial design in terms of the feasibility of monitoring and verification of outcomes at home, the incentive delivery processes, any additional BCT components required and the costs of providing such an incentive strategy are indicated. This is important as in a Cochrane review only 11 out of 36 trials reported a significant effect on environmental tobacco exposure in children aged up to 12 years of interventions aimed at parents, families, carers and teachers, and counselling had only a limited effect.[340]

Overall implications for incentive trial design

We suggest that an incentive intervention alone would be unlikely to change or maintain behaviour in isolation and, as the ladder model demonstrates, the interaction and fit with other life course and context rungs will be likely to influence engagement and effectiveness.

The cost-effectiveness of incentive interventions is unknown. A monthly incentive value of at least £20.00 is required. Delivering and engaging in an incentive programme, which, in some effective studies, entailed up to 36 contacts with service providers,[105,144] itself incurs transportation and opportunity costs. These costs will have differential effects across different employment categories, income levels and caring responsibilities and need to be accounted for.

Women can feel valued, encouraged and supported by the provision of appropriate incentives combined with other BCT and psychosocial components. The attributes of interventions valued by women are:

- interim short-term goal-setting through regular visible monitoring and feedback
- additional specialised and skilled support from dedicated services, particularly by telephone or text
- individual and flexible tailoring of interventions to fit women's complex and/or chaotic everyday life situations
- continuity of non-judgemental, flexible and confidence-building care
- services provided in multiple settings to increase access, particularly in the community
- including a partner or buddy in the intervention.

These valued intervention components and modes of delivery are likely to interact with the incentive component and we hypothesise that there are likely to be synergistic effects. Conversely, there are likely to be detracting interactions, for example unskilled, insensitive, 'one size fits all' delivery, which participants perceive as pressurising, moralistic and judgemental and which undermines confidence, autonomy and intrinsic motivation.

If the intensity of the interactions occurring within a research intervention is a confounder, then an ideal trial to test the incentive component is to have identical patient journeys for the intervention and control arms apart from the incentive component. As recommended by Sutherland and colleagues,[29] multisite comparisons of an intervention are crucial to understand the interactions of incentive interventions with context, particularly different health systems and cultures. A strong case can be made for reporting patient journeys in incentive trials and for conducting process evaluations so that systematic reviews can compare journeys for both trial arms to determine the effects of the incentive.

The use of logic models is recommended when reporting public health research[33] and their utility beyond theory was evidenced in the BIBS study. When tested with service users, the ladder model showed considerable potential to assist in the codesign of incentive trials for smoking cessation in pregnancy and breastfeeding. Codesign and partnership working are recognised as crucial to ensure that research is relevant to and optimised for the target populations.[91] The ladder model might have wider relevance for the design of complex interventions that aim to change behaviour: to identify the intervention component rungs, their delivery and how a trial would fit with the life and context rungs. Further fieldwork testing of the model with a wider range of stakeholders and for a wider range of behaviours is indicated, particularly as our participants identified non-financial or non-tangible incentives as important motivators for change.

Strengths and limitations

These are considered in detail for each individual chapter and are therefore not repeated here. Overall, we consider the strengths of the BIBS study to be the multidisciplinary, multiphase, mixed-methods design, which considers a broad definition of incentives from multiple perspectives. Most research adopts a narrow definition of financial incentives. If we had done this the understanding gained from the rich, in-depth data would not have been achieved. A broad definition of tangible incentives was chosen to assist in understanding their mechanisms of action by exploring the meaning and value of incentives to the target populations. Similarly, more limited study inclusion criteria in the systematic review (see *Chapter 3*) would have excluded important studies that were used for understanding the mechanisms of action of incentive interventions. The qualitative purposive, theoretical and snowball sampling strategy[281] provided a diverse sample for sociodemographic characteristics and variety of perspectives. The approach was reflective and iteratively refined the research questions and constantly searched for disconfirming data. This is a methodological strength. The survey, delivered through Ipsos MORI, provided a sample that was representative of the general public and is the largest of its kind to date. Our study is original in several respects:

- Service-user mother-and-baby groups from disadvantaged areas as co-applicants contributed substantially throughout the study. Members of the research team engaged with these service users on their premises, fitting with their agendas and therefore challenging conventional power relations. This enabled us to obtain a range of perspectives from harder-to-reach informants in the target population with experience of the behaviours that the study seeks to change. This can be contrasted with the single trained and hence professionalised service-user perspective, which is sometimes reported.
- Patient journeys through interventions for the systematic review were mapped to reveal the complexity of these interventions. Intervention vignettes were then created to incorporate service-user and professional perspectives.
- The current BCT taxonomy[17] was modified to create an incentive/reward BCT to fit the diversity of studies included.
- An incentive ladder logic model from the mixed-methods analysis of the whole study was created to inform the design of complex incentive interventions to change lifestyle behaviours. A strength is that this had face validity in discussions with co-applicant mother-and-baby groups, many of whom smoked during pregnancy and/or did not breastfeed and lived in disadvantaged communities and thus represented the target population. Women found the 'ladder' idea easy to understand, to relate to and to use. More importantly, they found it acceptable as a model to consider how incentive behaviour change theory could be translated into their everyday lives. We anticipate that the codesign of behaviour change intervention trials using the ladder model might be valuable.

The main limitations of the study are the difficulty of assessing the effectiveness or cost-effectiveness of incentives because of their multicomponent nature, the heterogeneity in study design, the poor quality of reporting of intervention delivery and the control arms, the focus on short-term outcomes and the paucity of process evaluations. This limited our ability to report results for incentives according to the income, education, ethnicity or other sociodemographic characteristics of participants. Most of the evidence is from

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

US trials and the generalisability of these findings is unknown, particularly as many US women of childbearing age are not insured for health care and this is a barrier to health-care treatment. They therefore may behave differently from their UK counterparts.

Researcher reflexivity is an important quality indicator in qualitative research and indeed any study. Our multidisciplinary, multi-institutional team and the selection of areas where health service attitudes to and experience of incentives were known to differ were a priori decisions to minimise bias of interpretation. Our research team included previous smokers, researchers with and without children and experiences of breast and formula milk feeding and male and female researchers. Researchers held different perspectives on incentive interventions for behaviour change, with four involved in incentive interventions (LB, DT, GT and PH). Differences and potential biases were discussed in regular team meetings and noted in reflective diaries kept by the qualitative research team. Every attempt was made to minimise the conflict of interest from the CPIT co-applicants in the data by including qualitative transcripts once the initial qualitative analysis had been carried out, by not involving the CPIT co-applicants in the data extraction or analysis in *Chapters 3* and *6–8* and through transparency throughout in research team meetings. This was important as CPIT participants and others who had participated in incentive schemes were generally more positive about incentives and their delivery processes than those with no experience of incentive interventions. This is encouraging as incentives can reduce attrition in intervention trials[216] and, once engaged, voucher incentive interventions for smoking cessation in pregnancy are both effective and acceptable to participants.

For qualitative data collection, every attempt to minimise framing effects was taken by using four interviewers from different disciplines, three locations and flexible topic guides that were revised as the research questions were refined, consistent with a grounded theory approach. The interactions between the researchers and the participants for qualitative data collection needed to be flexible because of literacy problems or preferences for where data collection took place (e.g. clinic areas). The environment (group, clinic, home) and context (private, public, telephone, face to face) may have influenced the data collected. Researchers did not always introduce intervention vignettes according to circumstances or sometimes they were read by the researcher rather than letting the participants read them at their own pace. Some participants appeared to expect the researchers to be pro incentives, without researchers conveying any information or evidence to this effect. This was not considered to impact obviously on the participant views expressed, but rather on how opinions were presented as either apologetic or confrontational.

Limitations of the ladder metaphor include the many different types, purposes and interpretations of ladders, not all of which may be constructive. However, ladders offer a broad range of possible uses and allow for individuals' own interpretations to be relevant to their own context, goals or challenges. They can therefore be considered an asset. Nevertheless, we would like to distinguish our model from hierarchical and linear ladders, such as those used in health for pain management.[341] Although the step-by-step ascent of a ladder can be considered to fit progression through an incentive intervention trial, it might not necessarily fit the complexity of barriers and facilitators in women's everyday lives. Further evaluation of the validity of the ladder logic model is needed with a diverse sample of the target population who are not familiar with this research, unlike our service-user groups. In particular, this should address any concerns that 'ladders' might exacerbate stigma.

Limitations of the Ipsos MORI and health professional surveys and the DCE include possible selection bias and unknown confounding. Through randomising the order of questions in the survey, framing effects were evident when comparing the acceptability of different incentives for the different behaviours. This is important as most research on lifestyle behaviour change is conducted on behaviours considered in isolation from one another, and there appears to be little cross-collaboration, as illustrated in *Chapter 4*. If we had conducted separate surveys at separate times for individual behaviour incentives, the outcomes might have been different.

The health professional survey was sent to a small self-selected sample of health professionals who were mostly based in Scotland. With the exception of the help received from the SPCRN, we experienced difficulties in identifying e-mail list gatekeepers for health professionals working only in maternity and early years services. The timing of the survey, which coincided with the reorganisation of the NHS in England, was unfortunate. However, private companies do not appear to be the solution to accessing health professional perspectives as the response in North West England was low.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 10 Conclusions

1. Overall, general public views about the acceptability of incentives for smoking cessation in pregnancy, to prevent relapse after birth and for breastfeeding were not clear-cut.
2. Women, the less educated and those living in more disadvantaged UK regions significantly disagreed with providing vouchers to women for either smoking cessation in pregnancy or breastfeeding.
3. More participants agreed with universal incentives than incentives targeted at low-income women. The importance of equity, with all unborn children seen as being of equal importance, and concerns about the stigma of targeting are important considerations.
4. Younger age groups, in particular those aged < 44 years, which includes the target population, were more likely to agree with incentives than those aged ≥ 65 years.
5. Qualitative data suggested that incentive interventions that are rigid, prescriptive and place the onus primarily on the woman to behave in a 'healthy' way risk women feeling judged, pressurised and blamed. To avoid losing face, women describe disengaging with services and feeling demoralised. This is a potential explanation for why some women, particularly those with stressful life situations, disagree with incentives.
6. There was evidence that, compared with non-contingent incentives (which may be small payments for taking part and providing outcome data), providing vouchers contingent on biochemically validated smoking cessation, either solely to women or to their social supporters as well, combined with intensive support, is effective for smoking cessation in late pregnancy and until 3 months after birth.
7. Effective smoking cessation incentive interventions included up to 36 contacts for additional support and BCTs such as goal-setting, monitoring and feedback. Intensity and BCTs are therefore likely confounders.
8. Incentives contingent on verification of behaviour outcomes were considered important by participants. CO monitoring to set short-term goals with visual outcome verification was valued; however, the absence of a biochemical or other acceptable method of verification for breastfeeding is a concern. The use of routinely collected blood samples in pregnancy for analysis of cotinine levels should be considered in pragmatic evaluations of incentives.
9. The cost-effectiveness of incentive interventions for smoking cessation in pregnancy or for breastfeeding is unclear and only short-term outcomes are reported.
10. The DCE found that incentives of > £20.00 per month are required for smoking cessation, with higher values up to £80.00 increasing the likelihood of quitting but at a decreasing rate. Initial daily text/telephone support and a quitting pal increase the likelihood of smoking cessation; however, the relative effect of incentives seemed to be greater than that of other attributes. Those who consider stopping smoking to be very difficult perceive that higher-value incentives, daily initial telephone or text support and a quitting pal will increase their likelihood of quitting.
11. In the Ipsos MORI survey of the general public and the survey of health professionals, the majority agreed with the provision of incentive up to a value of £40.00 per month.
12. More of the general public and health professional survey respondents agreed with providing a free breast pump to women with a value of £40.00. However, the systematic review indicated that there is uncertainty about the effectiveness of breast pumps to increase breastfeeding duration or exclusivity, because of study heterogeneity, contamination and comparison with formula incentives. The cost of a breast pump is considered prohibitive by more disadvantaged and younger women. Breast pumps address multiple barriers experienced by women, from intrinsic embarrassment to extrinsic relationships with partners, social networks and environments, such as feeding in public places or returning to work. Women receive conflicting advice about using breast pumps. The current availability of breast pumps through UK health services, the provision of education and support in how to use them and best practice are unclear. The commercialisation and commodification of breast pumps is a concern.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

13. There was some evidence that combinations of gifts, vouchers and a breast pump with additional support are effective at increasing breastfeeding duration up to 6 weeks, but caution is required because of the quality of the evidence base. The public and health professional survey evidence showed that providing shopping vouchers to women for proven breastfeeding was the least popular incentive strategy. The qualitative data showed that women and health professionals thought that providing vouchers for breastfeeding would be unlikely to make a difference, whereas additional support would. Many women are prepared to try breastfeeding but they experience challenges with developing the skills required and integrating it into their daily lives.
14. There was some evidence to support provider commitment contracts, which require investment to meet quality standards and for which publicised achievement awards are given. In addition, financial penalties for self-set breastfeeding targets showed promise. Provider incentives for achieving breastfeeding targets was the only one of the seven incentive strategies that women did not significantly disagree with, which is consistent with the qualitative data on the need for more support.
15. There was no evidence on provider incentives to reach targets for proven smoking cessation in pregnancy. However, evidence from the primary care QOF contractual system demonstrates that incentives change general practice behaviour for the proxy outcomes of documenting smoking advice and referral. Public and professional views were divided, with midwives, health visitors and maternity care staff significantly more likely to agree with this strategy than doctors (mostly GPs).
16. More evidence is required on incentivising partners or a buddy as some studies reported significant effects of this strategy on smoking cessation in pregnancy and the DCE suggested that it would increase the likelihood of quitting smoking.
17. We did not identify any studies investigating incentives for a smoke-free home. Partners and household smokers were a barrier to quitting and contributed to relapse after birth. However, concerns were expressed about the impact of this strategy on relationships.
18. Multiple lifestyle behaviours with adverse health consequences were raised spontaneously in women's narratives. There was evidence of an association between not smoking and breastfeeding; however, no intervention studies had evaluated effects on both behaviours together.
19. Unintended consequences of incentives include health inequalities, gaming and opportunity costs; however, there are other unintended positive health and emotional implications.

Mechanisms of action of incentives:

1. Our investigation of the mechanisms of action of incentives suggests that incentives alone are unlikely to result in sustained smoking cessation or breastfeeding, given the complexity of the interactions between the incentive and the real-life barriers to and facilitators of behaviour change and maintenance.
2. An incentive ladder logic model for the mechanisms of action of incentive intervention programmes is proposed. It incorporates a typology of incentives with their meanings and an IRBCT taxonomy, developed from a published general BCT taxonomy, which we used for data extraction in the systematic reviews. The interaction and fit between incentive intervention ladder 'rungs' and other life course/context 'rungs' is hypothesised to interact with programme engagement and effectiveness.
3. Data suggest that incentives and other intervention components (rungs) in programmes would benefit from being individually tailored and delivered by specialist teams to enable women to bolster their individual capabilities.
4. Qualitative data analysis found that the autonomy, motivation and control provided by non-restricted shopping vouchers, which maximise maternal well-being in addition to having a financial value, are important for smokers, particularly those with few choice opportunities. This counters arguments that incentives reduce autonomy through coercion or bribery. Gift deliveries, raffles, experience incentives and breast pumps (to share feeding and allow the woman to spend time away from her baby), which operate as connectors to other sources of support, are valued for breastfeeders.
5. Evidence from a wider range of lifestyle behaviour studies suggested that incentives can increase engagement in research. Qualitative data identified some concerns around feeling pressurised or blamed. However, for others, incentive schemes represented an opportunity for latent intrinsic

motivation to be transformed into action. Participants who engaged in incentive schemes for both smoking cessation and breastfeeding were positive about the experience.

6. The reach of incentive interventions is a concern as recruitment rates are seldom reported and attrition rates vary. This is particularly the case for smoking cessation incentive studies, in which participant numbers are small. Qualitative data support and build on existing typologies of pregnant women smokers. Findings suggest that incentives work best for 'enthusiastic amateurs' (those who are willing to try but who have not yet attempted behaviour change) who have more stable lifestyles. Those with more chaotic, stressful lives tend to cut down or quit–relapse as smoking is central to their lives. Some 'non-contemplators' increase consumption and some 'do-it-aloners' do not engage. Flexible services with multiple community locations for delivery are valued.
7. To address the sole onus being placed on women, incentives beyond the individual were suggested, in which partners, family, social networks, providers and a community focus on facilitating behaviour change through collective effort. However, it was found to be important to ensure that such an approach would not introduce new pressures for women and their relationships with family, friends and health professionals.
8. Visual cues as motivators were evident in the data, particularly for women visualising positive change on CO monitors. The possibility that a breast pump might act as a visual cue requires further exploration.

Recommendations for research

1. A definitive trial of unrestricted shopping voucher incentives for smoking cessation in pregnancy is indicated, in which the patient journey, in terms of the intensity of contacts and other BCT components provided, is identical between the intervention arm and the control arm to test the effect of the incentive component.
2. The development of a biochemical test to verify breastfeeding in RCTs of incentive interventions is recommended, as self-report is perceived to facilitate gaming.
3. There is potential confounding from the intensity of contacts in incentive intervention trial designs and the nature of additional support provided. However, because of the quality of reporting, this could not be investigated. Further assessment of this is required.
4. The quality of reporting of the BCT components included in incentive intervention and control arms and their delivery processes is currently poor and this has implications for interpreting the evidence base and for study replication.
5. A novel approach to mapping the patient journey in the systematic review shows promise for understanding possible interactions and moderating effects between incentive and BCT intervention components, their timing, their intensity and their mode of delivery. The patient journey map could contribute to systematic review methods for other complex interventions and to trial reporting. It has particular value as a tool when few process evaluations or qualitative research studies are identified, as was the case in this project. Further research into its potential role is indicated.
6. Where there is uncertain evidence of effectiveness or optimal delivery of an intervention, patient journeys through interventions can be further explored through creating intervention vignettes. Guided by service-user contributions, a diverse selection of promising studies written as vignettes in lay language can be used in qualitative research to inform intervention design before or during feasibility studies.
7. An incentive ladder logic model shows promise for engaging socially and materially disadvantaged women with experience of smoking and formula feeding in the codesign and tailoring of behaviour change interventions to fit with everyday lives. This is important in transforming the approach from a deficit model, in which providers control what incentives are provided based on their perceptions of need, to a capabilities- and assets-based approach. Women can contribute to the codesign of more realistic interventions that fit their own circumstances and real-life contexts, informing the 'rungs' that they think or believe will motivate and sustain their own behaviour change while taking into account their fit within their social networks and everyday lives. Further evaluation of the validity of the ladder logic model with a diverse sample of the target population who have not been involved with this

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

research is indicated. In particular, this should address the hypothesis that 'ladders' might exacerbate stigma. If validity is confirmed, research to test the practical utility of the ladder logic model for complex intervention design is recommended to inform how individual tailoring can be incorporated.

8. Incorporating non-professionalised service-user perspectives from a dynamic range of the target population through community groups, where engagement is on their terms, rather than those of the experts, is recommended, particularly for research into socially patterned lifestyle behaviours. This approach can help to achieve research that is carried out 'with' or 'by' members of the public rather than 'to', 'about' or 'for' them. This challenges conventional power relationships.
9. Applying a newly developed IRBCT taxonomy to studies included in the systematic review suggests that distinguishing between an incentive and a reward may be important. In the latter case, the motivation for action may be less, and distinguishing between content, contingency target and actor is also imperative. However, reporting of this is often unclear. Further fieldwork into its use in practice is recommended.
10. Further evidence of the effectiveness of, and the most feasible and acceptable delivery processes for, addressing more than one behaviour simultaneously in pregnancy and after birth is required.
11. Further evidence of cost-effectiveness with economic modelling for longer-term outcomes is required. In addition, the full costs of incentive interventions should be captured wherever they might arise, for health care, social services and families.

Acknowledgements

We would like to thank our co-applicants for their collaboration (detailed in *Chapter 2*): Mastrick Café Crèche, Aberdeen, and Wendy Ratcliffe, who facilitated access, and St Cuthbert's and Palatine Children's Centre, Blackpool, and Helen Cook. We would also like to thank all of the women, families and staff from health service, local government, voluntary sector and other organisations who generously provided their time for interviews and completed the survey; study authors and professional organisations that we contacted who provided additional details of their studies; Fiona Stewart and Cynthia Fraser for providing guidance with literature searching and reference management; Lara Kemp for providing secretarial support; Jennifer McKell and Susan MacAskill who collected the qualitative data for the CPIT and Lesley Sinclair, the CPIT manager, who facilitated access; Kate Sewell from Ipsos *MORI* Scotland who contributed to the survey design, oversaw data collection and commented on *Chapter 7*; Shalmini Jayakody, Sharon McCann and Virginia Schmied who assisted with quality assessment of the included studies; Linju Joseph who assisted with full-text screening to select review papers for *Chapter 2*; Amanda Cardy, SPCRN North East Co-ordinator, acknowledging the financial support of NHS Research Scotland (NRS) through the SPCRN; NHS R&D managers in Scotland and North West England and Binley's (see www.binleys.com/) who assisted with distribution of the health professional survey; Gladys McPherson who independently conducted the survey prize draw; Diane Skåtun who advised on collection of the survey data; Alison Avenell who commented on *Chapter 3*; and Gordon Stables, Medical Illustration, University of Aberdeen, who created the graphic for the incentive ladder logic model in *Chapter 6*.

This report was commissioned by the NIHR Health Technology Assessment programme as project number 10/31/02. The Nursing, Midwifery and Allied Health Professions Research Unit, University of Stirling, and the Health Services Research Unit and Health Economics Research Unit, Institute of Applied Health Sciences, University of Aberdeen, are all core funded by the Chief Scientist Office of the Scottish Government Health and Social Care Directorates. The views and opinions expressed are those of the authors and do not necessarily reflect those of the funders.

Ethics committee approvals

Full ethical approval for this study, including service-user involvement, was obtained from the North of Scotland Research Ethics Committee (NOSRES; reference no. 12/NS/0041, 12 April 2012) and subsequent permissions were granted locally by NHS Grampian R&D (24 April 2012) and the BUSH (Built & Natural Environment, Sport and Health) Ethics Committee, University of Central Lancashire (BUSH064, 8 May 2012). Four amendments were submitted to NOSRES: AM01 to cover the amendments required by BUSH (approved 10 May 2012); AM02 to allow us to use a flyer for recruiting health professionals at conferences and an information leaflet designed for partners/family/friends (approved 6 December 2012); AM03 to gain ethical approval for the contents of the general public and health professionals survey (approved 17 April 2013); and AM04 for the final version of the discrete choice experiment (approved 10 May 2013).

Contributions of authors

All authors contributed to the work involved in this study and to writing this monograph. The substantial contributions are detailed below.

Heather Morgan (Research Fellow, Social Science) co-ordinated the ethics and R&D approvals for the project, co-ordinated contributions from the co-applicant Aberdeen mother-and-baby group and wrote the first draft for *Chapter 2*. She reviewed the qualitative and intervention delivery process evidence and wrote the first draft of these sections of *Chapter 3*; reviewed the behaviour change techniques evidence for

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Chapter 3 in conjunction with Stephan Dombrowski; reviewed the qualitative evidence and wrote the first draft for *Chapter 4*; assisted with abstract screening for *Chapter 5*; collected and analysed the primary qualitative data and wrote the first draft of the methods, the incentive ladder logic model and the life course and context findings for *Chapter 6*; contributed to the survey design and piloting, jointly co-ordinated the distribution of the survey with Gill Thomson, contributed to analysis decisions and wrote the first draft of the results for *Chapter 7*; and contributed to the design of the DCE for *Chapter 8*. She had significant involvement in co-ordinating the writing of this monograph and wrote the first draft of the scientific summary.

Pat Hoddinott (Chair in Primary Care, General Practice) was Chief Investigator and led the design of the study, oversaw and co-ordinated all aspects of the study and contributed to the writing of all chapters. She contributed to the evidence reviews for *Chapters 3* and *4*, reviewed the evidence and wrote the first draft of *Chapter 5*, contributed to the interpretation of the qualitative data for *Chapter 6*, wrote the first draft of the background, methods, survey questions and discussion for *Chapter 7* and contributed to design decisions for the DCE in *Chapter 8*. She also wrote the first drafts for *Chapters 1*, *9* and *10*, the abstract and the plain English summary.

Gill Thomson (Senior Research Fellow, Social Science) co-ordinated the ethics and R&D approvals in North West England; co-ordinated contributions from the co-applicant Blackpool children's centre and assisted in writing *Chapter 2*; assisted in reviewing the evidence for *Chapters 3–5* and the quality assessment of qualitative studies; collected and analysed the primary qualitative data and wrote the first draft of the other components and incentive delivery sections for *Chapter 6*; contributed to the survey design and piloting and jointly co-ordinated the distribution of the survey with Heather Morgan; and assisted in piloting the DCE.

Nicola Crossland (Research Assistant, Maternal and Infant Health) assisted in reviewing the evidence for *Chapters 3–5*, collected and analysed the primary qualitative data and wrote the first draft of the incentive typology section and incentives to providers/delivery sections for *Chapter 6* and contributed to the survey design for *Chapter 7*.

Shelley Farrar (Research Fellow, Health Economics) provided health economic expertise for the clinical effectiveness reviews in *Chapter 3*, assisted in reviewing the evidence on incentives to providers in *Chapter 5*, contributed to the survey design in *Chapter 7* and led the design of the DCE and contributed to the first draft of the methods for the DCE in *Chapter 8*.

Deokhee Yi (Research Fellow, Health Economics) analysed the incentive value and targeting questions in the survey (see *Chapter 7*), analysed the data for the DCE and wrote the first draft of the results for *Chapter 8*.

Jenni Hislop (Research Associate Systematic Reviewer) reviewed the evidence for clinical effectiveness and wrote the first draft of the smoking cessation section in *Chapter 3*.

Victoria Hall Moran (Reader, Maternal and Child Nutrition) reviewed the evidence on clinical effectiveness and, in conjunction with Heather Morgan, wrote the first draft of the breastfeeding review section in *Chapter 3*.

Graeme MacLennan (Senior Research Fellow, Statistics) provided statistical advice for the systematic review (see *Chapter 3*), led the statistical analysis of the survey data and contributed to writing the results section for *Chapter 7*.

Stephan U Dombrowski (Senior Lecturer in Psychology) reviewed the evidence for behaviour change techniques in conjunction with Heather Morgan and wrote the first draft of these sections for *Chapter 3*. He contributed behaviour change theory for the interpretation of data for *Chapters 4* and *6* and the corresponding logic models.

Kieran Rothnie (Research Assistant, Systematic Reviewer) contributed to abstract and full-text screening, data extraction, the review of the evidence for clinical effectiveness and the drafting of tables for *Chapter 3* for both smoking cessation and breastfeeding.

Fiona Stewart (Information Specialist) developed and ran the search strategies for all systematic reviews and was responsible for obtaining full-text papers, providing the flow charts of the searches and reference management.

Linda Bauld (Professor, Health Policy) contributed smoking cessation in pregnancy research expertise and helped to draft the smoking cessation background section for *Chapter 1* and the discussion section for *Chapter 3*, assisted in reviewing the evidence for *Chapter 5* and contributed to the survey design for *Chapter 7*. As coprincipal investigator with David Tappin for the CPIT, she provided CPIT information, oversaw CPIT qualitative data collection and arranged the transfer of qualitative transcripts for incorporation into the data analysis for *Chapter 6*.

Anne Ludbrook (Professor, Health Economics) contributed health economics expertise to all aspects of the study, contributed to survey data analysis for *Chapter 7* and contributed to the drafting of the DCE results and discussion sections in *Chapter 8*.

Fiona Dykes (Professor, Maternal and Infant Health) contributed breastfeeding expertise to the study design and conduct. She assisted in drafting background sections for the breastfeeding review in *Chapter 3* and reviewing the evidence for *Chapters 4* and *5* and oversaw the researchers working on primary qualitative data collection and analysis in North West England.

Falko F Sniehotta (Professor, Behavioural Medicine and Health Psychology) contributed psychology expertise in behaviour change for the study design and conduct and for *Chapters 1*, *3* and *4*.

David Tappin (Professor, Paediatrics and Trials in Children) contributed smoking cessation in pregnancy expertise for the study design and conduct. He helped to draft the smoking cessation background sections in *Chapter 1* and the discussion section in *Chapter 3* and to screen the abstracts and full texts in *Chapter 3* and assisted in reviewing the evidence for *Chapter 5*. As coprincipal investigator with Linda Bauld for the CPIT, he arranged for ethics committee approval for CPIT qualitative transcripts to be included in *Chapter 6*, provided CPIT information, oversaw CPIT qualitative data collection and facilitated their incorporation into the data analysis for *Chapter 6*.

Marion Campbell (Professor and Director of the Health Services Research Unit, Statistics and Health Services Research) provided methods advice for the overall study design, the systematic reviews (see *Chapters 3–5*), the survey (see *Chapter 7*), the DCE (see *Chapter 8*) and aspects of the study relating to trial design.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

References

1. Simpson J, Weiner E, editors. *Oxford English Dictionary*, 2nd edn. Oxford: Clarendon Press; 1989.
2. Kane RL, Johnson PE, Town RJ, Butler M. *Economic Incentives for Preventive Care: Summary*. Rockville, MD: Agency for Healthcare Research and Quality; 2004.
3. Jochelson K. *Paying the Patient: Improved Health using Financial Incentives*. London: The King's Fund; 2007. URL: www.kingsfund.org.uk/sites/files/kf/field/field_document/paying-the-patient-kicking-bad-habits-supporting-paper-karen-jochelson.pdf (accessed February 2013).
4. Marteau TM, Ashcroft RE, Oliver A. Using financial incentives to achieve healthy behaviour. *BMJ* 2009;**338**:b1415. http://dx.doi.org/10.1136/bmj.b1415
5. Johnston M, Dixon D. What happened to behaviour in the decade of behaviour? *Psychol Health* 2008;**23**:509–13. http://dx.doi.org/10.1080/08870440701816728
6. Wise RA. Drive, incentive, and reinforcement: the antecedents and consequences of motivation. *Nebr Symp Motiv* 2004;**50**:159–95.
7. Boyce T, Robertson R, Dixon A. *Commissioning and Behaviour Change: Kicking Bad Habits Final Report*. London: The King's Fund; 2008. URL: www.kingsfund.org.uk/publications/commissioning-and-behaviour-change (accessed October 2013).
8. Wise RA. Dopamine, learning and motivation. *Nat Rev Neurosci* 2004;**5**:483–94. http://dx.doi.org/10.1038/nrn1406
9. Skinner BF. *Science and Human Behaviour*. New York, NY: The Free Press; 1953.
10. Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;**6**:42. http://dx.doi.org/10.1186/1748-5908-6-42
11. Higgins ST, Alessi SM, Dantona RL. Voucher-based incentives: a substance abuse treatment innovation. *Addict Behav* 2002;**27**:887–910. http://dx.doi.org/10.1016/S0306-4603(02)00297-6
12. Bandura A. *Social Learning Theory*. London: Prentice-Hall; 1977.
13. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process* 1991;**50**:179–211. http://dx.doi.org/10.1016/0749-5978(91)90020-T
14. Strack F, Deutsch R. Reflective and impulsive determinants of social behavior. *Pers Soc Psychol Rev* 2004;**8**:220–47. http://dx.doi.org/10.1207/s15327957pspr0803_1
15. Kahneman D. *Thinking Fast and Slow*. London: Allen Lane; 2011.
16. Dixon D, Johnston M. *Health Behaviour Change Competency Framework: Competences to Deliver Interventions to Change Lifestyle Behaviours that Affect Health*. Edinburgh: NHS Health Scotland; 2010. URL: www.healthscotland.com/uploads/documents/4877-Health_behaviour_change_competency_framework.pdf (accessed August 2013).
17. Michie S, Richardson M, Johnston M, Abraham C, Francis J, Hardeman W, *et al.* The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. *Ann Behav Med* 2013;**46**:81–95. http://dx.doi.org/10.1007/s12160-013-9486-6
18. Maibach EW, Abroms LC, Marosits M. Communication and marketing as tools to cultivate the public's health: a proposed 'people and places' framework. *BMC Public Health* 2007;**7**:88. http://dx.doi.org/10.1186/1471-2458-7-88

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

19. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q* 1988;**15**:351–77. http://dx.doi.org/10.1177/109019818801500401

20. Allen C, Radley A, Williams B. Paying the price for an incentive: an exploratory study of smokers' reasons for failing to complete an incentive based smoking cessation scheme. *J Health Serv Res Policy* 2012;**17**:212–18. http://dx.doi.org/10.1258/jhsrp.2012.011084

21. Johnston M, Sniehotta F. Financial incentives to change patient behaviour. *J Health Serv Res Policy* 2010;**15**:131–2. http://dx.doi.org/10.1258/jhsrp.2010.010048

22. Tversky A, Kahneman D. Loss aversion in riskless choice: a reference-dependent model. *Q J Econ* 1991;**106**:1039–61. http://dx.doi.org/10.2307/2937956

23. Deci EL, Ryan RM. *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum; 1985. http://dx.doi.org/10.1007/978-1-4899-2271-7

24. Deci EL, Koestner R, Ryan RM. A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychol Bull* 1999;**125**:627–68. http://dx.doi.org/10.1037/0033-2909.125.6.627

25. Yoon JH, Higgins ST, Heil SH, Sugarbaker RJ, Thomas CS, Badger GJ. Delay discounting predicts postpartum relapse to cigarette smoking among pregnant women. *Exp Clin Psychopharmacol* 2007;**15**:176–86. http://dx.doi.org/10.1037/1064-1297.15.2.186

26. Ross L, Nesbitt RE. *The Person and the Situation: Perspectives of Social Psychology*. London: Pinter & Martin; 2011.

27. Thaler RH, Sunstein CR. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven, CT: Yale University Press; 2008.

28. US Department of Health and Human Services. *Preventing Tobacco Use among Youth and Young Adults: a Report of the Surgeon General*. Rockville, MD: US Department of Health and Human Services; 2012. URL: www.cdc.gov/tobacco/data_statistics/sgr/2012/ (accessed October 2013).

29. Sutherland K, Christianson JB, Leatherman S. Impact of targeted financial incentives on personal health behavior: a review of the literature. *Med Care Res Rev* 2008;**65**:36–78S. http://dx.doi.org/10.1177/1077558708324235

30. Medical Research Council Health Services and Public Health Research Board. *A Framework for Development and Evaluation of RCTs for Complex Interventions to Improve Health*. London: MRC; 2000. URL: www.mrc.ac.uk/consumption/idcplg?IdcService = GET_FILE&dID = 9025&dDocName = MRC003372&allowInterrupt = 1 (accessed October 2013).

31. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. *Developing and Evaluating Complex Interventions: New Guidance*. London: MRC; 2008. URL: www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d = MRC004871 (accessed October 2013).

32. Hardeman W, Sutton S, Griffin S, Johnston M, White A, Wareham NJ, *et al.* A causal modelling approach to the development of theory-based behaviour change programmes for trial evaluation. *Health Educ Res* 2005;**20**:676–87. http://dx.doi.org/10.1093/her/cyh022

33. Armstrong R, Waters E, Moore L, Riggs E, Cuervo LG, Lumbiganon P, *et al.* Improving the reporting of public health intervention research: advancing TREND and CONSORT. *J Public Health (Oxf)* 2008;**30**:103–9. http://dx.doi.org/10.1093/pubmed/fdm082

34. British Medical Association Board of Science. *Growing up in the UK – Ensuring a Healthy Future for our Children*. London: British Medical Association; 2013. URL: http://bma.org.uk/working-for-change/improving-and-protecting-health/child-health/growing-up-in-the-uk (accessed October 2013).

35. Marmot M, Allen J, Goldblatt P, Boyce T, McNeish D, Grady M, *et al. Fair Society Healthy Lives: the Marmot Review*. London: UCL Institute of Health Equity; 2010. URL: www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review (accessed October 2013).

36. Lagarde M, Haines A, Palmer N. The impact of conditional cash transfers on health outcomes and use of health services in low and middle income countries. *Cochrane Database Syst Rev* 2009;**4**:CD008137.

37. Forde I, Bell R, Marmot MG. Using conditionality as a solution to the problem of low uptake of essential services among disadvantaged communities: a social determinants view. *Am J Public Health* 2011;**101**:1365–9. http://dx.doi.org/10.2105/AJPH.2011.300140

38. Tan M, Yamey G. Paying the poor. *BMJ* 2012;**345**:e4929. http://dx.doi.org/10.1136/bmj.e4929

39. Middleton S, Perren K, Maguire S, Rennison J, Battistin E, Emmerson C, *et al. Evaluation of Education Maintenance Allowance Pilots: Young People Aged 16 to 19 Years. Final report of the Quantitative Evaluation*. London: Department for Education and Skills; 2005. URL: http://webarchive.nationalarchives.gov.uk/20130401151715/https://www.education.gov.uk/publications/standard/publicationDetail/Page1/RR678 (accessed October 2013).

40. Johnston V, Liberato S, Thomas D. Incentives for preventing smoking in children and adolescents. *Cochrane Database Syst Rev* 2012;**12**:CD008645.

41. National Institute for Health and Care Excellence. *Quitting Smoking in Pregnancy and Following Childbirth*. NICE guidelines PH26. London: NICE; 2010. URL: http://guidance.nice.org.uk/PH26/Guidance/pdf/English (accessed October 2013).

42. Royal College of Physicians. *Passive Smoking and Children: a Report by the Tobacco Advisory Group of the Royal College of Physicians*. London: Royal College of Phyicians; 2010. URL: www.rcplondon.ac.uk/publications/passive-smoking-and-children (accessed October 2013).

43. Batstra L, Hadders-Algra M, Neeleman J. Effect of antenatal exposure to maternal smoking on behavioural problems and academic achievement in childhood: prospective evidence from a Dutch birth cohort. *Early Hum Dev* 2003;**75**:21–33. http://dx.doi.org/10.1016/j.earlhumdev.2003.09.001

44. Castles A, Adams EK, Melvin CL, Kelsch C, Boulton ML. Effects of smoking during pregnancy. Five meta-analyses. *Am J Prev Med* 1999;**16**:208–15. http://dx.doi.org/10.1016/S0749-3797(98)00089-0

45. Dietz PM, England LJ, Shapiro-Mendoza CK, Tong VT, Farr SL, Callaghan WM. Infant morbidity and mortality attributable to prenatal smoking in the US. *Am J Prev Med* 2010;**39**:45–52. http://dx.doi.org/10.1016/j.amepre.2010.03.009

46. Jaakkola JJ, Gissler M. Maternal smoking in pregnancy, fetal development, and childhood asthma. *Am J Public Health* 2004;**94**:136–40. http://dx.doi.org/10.2105/AJPH.94.1.136

47. Jaddoe VW, Troe EJ, Hofman A, Mackenbach JP, Moll HA, Steegers EA, *et al.* Active and passive maternal smoking during pregnancy and the risks of low birthweight and preterm birth: the Generation R study. *Paediatr Perinat Epidemiol* 2008;**22**:162–71. http://dx.doi.org/10.1111/j.1365-3016.2007.00916.x

48. Montgomery SM, Ekbom A. Smoking during pregnancy and diabetes mellitus in a British longitudinal birth cohort. *BMJ* 2002;**324**:26–7. http://dx.doi.org/10.1136/bmj.324.7328.26

49. Rogers JM. Tobacco and pregnancy: overview of exposures and effects. *Birth Defect Res* 2008;**84**:1–15. http://dx.doi.org/10.1002/bdrc.20119

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

50. Salihu HM, Wilson RE. Epidemiology of prenatal smoking and perinatal outcomes. *Early Hum Dev* 2007;**83**:713–20. http://dx.doi.org/10.1016/j.earlhumdev.2007.08.002

51. Godfrey C, Pickett KE, Parrot S, Mdege M, Eapen D. *Estimating the Costs to the NHS of Smoking in Pregnancy for Pregnant Women and Infants: Project Final Report*. University of York: Public Health Research Consortium; 2010. URL: http://phrc.lshtm.ac.uk/project_2005–2011_a306.html (accessed October 2013).

52. McCowan LM, Dekker GA, Chan E, Stewart A, Chappell LC, Hunter M, *et al.* Spontaneous preterm birth and small for gestational age infants in women who stop smoking early in pregnancy: prospective cohort study. *BMJ* 2009;**338**:b1081. http://dx.doi.org/10.1136/bmj.b1081

53. McAndrew F, Thompson J, Fellows L, Large A, Speed M, Renfrew MJ. *Infant Feeding Survey 2010: Summary*. Leeds: Health and Social Care Information Centre; 2012. URL: www.hscic.gov.uk/catalogue/PUB08694/ifs-uk-2010-sum.pdf (accessed August 2013).

54. Lumley J, Chamberlain C, Dowswell T, Oliver S, Oakley L, Watson L. Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev* 2009;**3**:CD001055.

55. Coleman T, Cooper S, Thornton JG, Grainge MJ, Watts K, Britton J, *et al.* A randomized trial of nicotine-replacement therapy patches in pregnancy. *N Engl J Med* 2012;**366**:808–18. http://dx.doi.org/10.1056/NEJMoa1109582

56. Bauld L, Coleman T. *The Effectiveness of Smoking Cessation Interventions during Pregnancy: a Briefing Paper*. London: NICE; 2009. URL: www.nice.org.uk/guidance/index.jsp?action=download&o=45552 (accessed October 2013).

57. Naughton F, Prevost AT, Sutton S. Self-help smoking cessation interventions in pregnancy: a systematic review and meta-analysis. *Addiction* 2008;**103**:566–79. http://dx.doi.org/10.1111/j.1360-0443.2008.02140.x

58. Bauld L, Bell K, McCullough L, Richardson L, Greaves L. The effectiveness of NHS smoking cessation services: a systematic review. *J Public Health (Oxf)* 2010;**32**:71–82. http://dx.doi.org/10.1093/pubmed/fdp074

59. MacAskill S, Bauld L, Tappin D, Eadie D. *Smoking Cessation Support in Pregnancy in Scotland*. Edinburgh: NHS Health Scotland; 2008. URL: www.healthscotland.com/documents/2665.aspx (accessed October 2013).

60. World Health Organization. *Global Strategy for Infant and Young Child Feeding*. Geneva: WHO; 2003. URL: www.who.int/nutrition/publications/infantfeeding/9241562218/en/index.html (accessed October 2013).

61. Bhavnani V, Newburn M. *Left to Your Own Devices: the Postnatal Experiences of 1260 First-Time Mothers*. London: National Childbirth Trust; 2010. URL: www.nct.org.uk/sites/default/files/related_documents/PostnatalCareSurveyReport5.pdf (accessed October 2013).

62. Hoddinott P, Craig L, Britten J, McInnes R. *A Prospective Study Exploring the Early Infant Feeding Experiences of Parents and their Significant Others during the First 6 Months of Life: What Would Make a Difference?* Edinburgh: NHS Health Scotland; 2010.

63. Eidelman AI, Schanler RJ. Breastfeeding and the use of human milk. *Pediatrics* 2012;**129**:e827–41. http://dx.doi.org/10.1542/peds.2011-3552

64. Renfrew MJ, Pokhrel S, Quigley M, McCormack F, Fox-Rushby J, Dodds R, *et al. Preventing Disease and Saving Resources: the Potential Contribution of Increasing Breastfeeding Rates in the UK*. London: UNICEF UK; 2012. URL: www.unicef.org.uk/BabyFriendly/Resources/General-resources/Preventing-disease-and-saving-resources/ (accessed October 2013).

65. Renfrew MJ, McCormick FM, Wade A, Quinn B, Dowswell T. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev* 2012;**5**:CD001141.

66. Hoddinott P, Seyara R, Marais D. Global evidence synthesis and UK idiosyncrasy: why have recent UK trials had no significant effects on breastfeeding rates? *Matern Child Nutr* 2011;**7**:221–7. http://dx.doi.org/10.1111/j.1740-8709.2011.00336.x

67. Schmied V, Beake S, Sheehan A, McCourt C, Dykes F. Women's perceptions and experiences of breastfeeding support: a metasynthesis. *Birth* 2011;**38**:49–60. http://dx.doi.org/10.1111/j.1523-536X.2010.00446.x

68. Higgins TM, Higgins ST, Heil SH, Badger GJ, Skelly JM, Bernstein IM, *et al.* Effects of cigarette smoking cessation on breastfeeding duration. *Nicotine Tobacco Res* 2010;**12**:483–8. http://dx.doi.org/10.1093/ntr/ntq031

69. Kendzor DE, Businelle MS, Costello TJ, Castro Y, Reitzel LR, Vidrine JI, *et al.* Breast feeding is associated with postpartum smoking abstinence among women who quit smoking due to pregnancy. *Nicotine Tob Res* 2010;**12**:983–8. http://dx.doi.org/10.1093/ntr/ntq132

70. Lauria L, Lamberti A, Grandolfo M. Smoking behaviour before, during, and after pregnancy: the effect of breastfeeding [published online ahead of print 12 March 2012]. *Sci World J* 2012. http://dx.doi.org/10.1100/2012/154910.

71. Bolling K, Grant C, Hamlyn B, Thornton A. *Infant Feeding Survey 2005*. London: NHS Information Centre; 2007. URL: www.ic.nhs.uk/cmsincludes/_process_document.asp?sPublicationID = 1177936850140&sDocID = 3603 (accessed January 2012).

72. Asthana S, Halliday J. Developing an evidence base for policies and interventions to address health inequalities: the analysis of 'public health regimes'. *Milbank Q* 2006;**84**:577–603. http://dx.doi.org/10.1111/j.1468-0009.2006.00459.x

73. HM Government. *White Paper: Healthy Lives, Healthy People: Our Strategy for Public Health in England*. London: Department of Health; 2010. URL: www.gov.uk/government/publications/healthy-lives-healthy-people-our-strategy-for-public-health-in-england (accessed October 2013).

74. HM Government. *Building the Big Society*. London: Cabinet Office; 2010. URL: www.gov.uk/government/publications/building-the-big-society (accessed October 2013).

75. Tayside Smokeline. *Free Yourself – Smoking, It's Not Worth It! (Tayside Quit4U Scheme)*. Smokeline; 2013. URL: www.canstopsmoking.com/local-help/free-yourself-smoking,-it's-not-worth-it!-(tayside-quit4u-scheme) (accessed October 2013).

76. Ormston R, McConville S, van der Pol M, Ludbrook A, Amos A. *Evaluation of Quit4U: Main Report*. Edinburgh: NHS Health Scotland; 2012. URL: www.healthscotland.com/uploads/documents/18652-EvaluationofquitquitMainReport.pdf (accessed October 2013).

77. Heyman J, Ariely D. Effort for payment. A tale of two markets. *Psychol Sci* 2004;**15**:787–93. http://dx.doi.org/10.1111/j.0956-7976.2004.00757.x

78. Winston Churchill, Prime Minister of Great Britain. *Post-War Councils on World Problems. A Four Year Plan for England*. Broadcast from London over the BBC, 21 March 1943. URL: www.ibiblio.org/pha/policy/1943/1943-03-21a.html (accessed 16 December 2014).

79. Department of Health. *Delivering a Healthy Start for Pregnant Women, New Mums, Babies and Young Children: a Guide for Health Professionals*. London: Department of Health; 2010. URL: www.healthystart.nhs.uk/for-health-professionals/healthy-start-resources/ (accessed October 2013).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

80. World Health Organization. *International Code of Marketing of Breast Milk Substitutes*. Geneva: WHO; 1981. URL: www.who.int/nutrition/publications/infantfeeding/9241541601/en/ (accessed October 2013).

81. NHS National Services Scotland. *Breastfeeding Statistics Financial Year 2011/12*. Edinburgh: Information Statistics Division, NHS National Services Scotland; 2012. URL: www.isdscotland.org/Health-Topics/Child-Health/Infant-Feeding/ (accessed October 2013).

82. NHS National Services Scotland. *Data Tables: Births in Scottish Hospitals – Year Ending 31st March 2012*. Edinburgh: Information Statistics Division, NHS National Services Scotland; 2013. URL: www.isdscotland.org/Health-Topics/Maternity-and-Births/Publications/data-tables.asp (accessed October 2013).

83. NHS National Services Scotland. *Breastfeeding by NHS Board of Review: Financial Years 2001/02–2011/12*. Edinburgh: Information Statistics Division, NHS National Services Scotland; 2012. URL: www.isdscotland.org/Health-Topics/Child-Health/Publications/data-tables.asp (accessed October 2013).

84. Lancashire County Council. *Indices of Deprivation 2007 District Analysis*. URL: www.lancashire.gov.uk/corporate/web/?siteid=6121&pageid=40301&e=e (accessed 5 January 2015).

85. Child and Maternal Health Intelligence Network. *Breastfeeding Profiles*. London: Public Health England; 2013. URL: http://atlas.chimat.org.uk/IAS/dataviews/report?reportId = 351&viewId = 355&geoReportId = 3198&geoId = 4&geoSubsetId = (accessed October 2013).

86. Public Health England. *Local Tobacco Control Profiles for England*. London: Public Health England; 2013. URL: www.tobaccoprofiles.info/tobacco-control#gid/1000110/par/E12000002/ati/102/page/0 (accessed October 2013).

87. Cresswell JW, Klassen AC, Plano Clark VL, Smith KC, Office of Behavioral and Social Sciences Research. *Best Practices for Mixed Methods Research in the Health Sciences*. Bethesda, MD: National Institutes of Health; 2011. URL: http://obssr.od.nih.gov/mixed_methods_research/ (accessed October 2013).

88. Tappin DM, Bauld L, Tannahill C, de Caestecker, Radley A, McConnachie A, *et al.* The cessation in pregnancy incentives trial (CPIT): study protocol for a randomized controlled trial. *Trials* 2012;**13**:113. http://dx.doi.org/10.1186/1745-6215-13-113

89. Cooper S, Lewis S, Thornton JG, Marlow N, Watts K, Britton J, *et al.* The SNAP trial: a randomised placebo-controlled trial of nicotine replacement therapy in pregnancy – clinical effectiveness and safety until 2 years after delivery, with economic evaluation. *Health Technol Assess* 2014;**18**(54). http://dx.doi.org/10.3310/hta18540

90. Great Britain. *Health and Social Care Act 2001*. London: The Stationery Office; 2001.

91. National Institute for Health Research. *INVOLVE*. Eastleigh: NIHR; 2013. URL: www.invo.org.uk/ (accessed October 2013).

92. Oliver SR, Rees RW, Clarke-Jones L, Milne R, Oakley AR, Gabbay J, *et al.* A multidimensional conceptual framework for analysing public involvement in health services research. *Health Expect* 2008;**11**:72–84. http://dx.doi.org/10.1111/j.1369-7625.2007.00476.x

93. Cook T. Where participatory approaches meet pragmatism in funded (health) research: the challenge of finding meaningful spaces. *Forum Qual Soc Res* 2012;**13**:1.

94. Boote J, Baird W, Sutton A. Public involvement in the systematic review process in health and social care: a narrative review of case examples. *Health Policy* 2011;**102**:105–16. http://dx.doi.org/10.1016/j.healthpol.2011.05.002

95. Braye S, Preston-Shoot M. Emerging from out of the shadows? Service user and carer involvement in systematic reviews. *Evid Policy* 2005;**1**:173–94. http://dx.doi.org/10.1332/1744264053730743

96. Smith E, Donovan S, Beresford P, Manthorpe J, Brearley S, Sitzia J, *et al.* Getting ready for user involvement in a systematic review. *Health Expect* 2009;**12**:197–208.

97. Cashman SB, Adeky S, Allen AJ, Corburn J, Israel BA, Montano J, *et al.* The power and the promise: working with communities to analyze data, interpret findings, and get to outcomes. *Am J Public Health* 2008;**98**:1407–17. http://dx.doi.org/10.2105/AJPH.2007.113571

98. Reed J, Weiner R, Cook G. Partnership research with older people – moving towards making the rhetoric a reality. *J Clin Nurs* 2004;**13**:3–10. http://dx.doi.org/10.1111/j.1365-2702.2004.00920.x

99. Truman C, Raine P. Involving users in evaluation: the social relations of user participation in health research. *Crit Public Health* 2001;**11**:215–29. http://dx.doi.org/10.1080/09581590110066667

100. Hoddinott P, Lee AJ, Pill R. Effectiveness of a breastfeeding peer coaching intervention in rural Scotland. *Birth* 2006;**33**:27–36. http://dx.doi.org/10.1111/j.0730-7659.2006.00071.x

101. Spradley JP. *Participant Observation*. New York, NY: Holt, Rinehart and Winston; 1980.

102. Janis IL. Groupthink. *Psychol Today* 1971;**5**:43–6.

103. Chamberlain LB, McMahon M, Philipp BL, Merewood A. Breast pump access in the inner city: a hospital-based initiative to provide breast pumps for low-income women. *J Hum Lact* 2006;**22**:94–8. http://dx.doi.org/10.1177/0890334405284226

104. Gulliver SB, Colby SM, Hayes K, Raffa SD. Tobacco cessation treatment for pregnant smokers: incorporating partners and incentives. *Med Health R I* 2004;**87**:9–12.

105. Heil SH, Higgins ST, Bernstein IM, Solomon LJ, Rogers RE, Thomas CS, *et al.* Effects of voucher-based incentives on abstinence from cigarette smoking and fetal growth among pregnant women. *Addiction* 2008;**103**:1009–18. http://dx.doi.org/10.1111/j.1360-0443.2008.02237.x

106. Pugh LC, Milligan RA. Nursing intervention to increase the duration of breastfeeding. *Appl Nurs Res* 1998;**11**:190–4. http://dx.doi.org/10.1016/S0897-1897(98)80318-2

107. Volpe EM, Bear M. Enhancing breastfeeding initiation in adolescent mothers through the Breastfeeding Educated and Supported Teen (BEST) Club. *J Hum Lact* 2000;**16**:196–200. http://dx.doi.org/10.1177/089033440001600303

108. Walsh RA, Redman S, Brinsmead MW, Byrne JM, Melmeth A. A smoking cessation program at a public antenatal clinic. *Am J Public Health* 1997;**87**:1201–4. http://dx.doi.org/10.2105/AJPH.87.7.1201

109. Mantzari E, Vogt F, Marteau TM. The effectiveness of financial incentives for smoking cessation during pregnancy: is it from being paid or from the extra aid? *BMC Pregnancy Childbirth* 2012;**12**:24. http://dx.doi.org/10.1186/1471-2393-12-24

110. Nichter M, Nichter M, Muramoto M, Adrian S, Goldade K, Tesler L, *et al.* Smoking among low-income pregnant women: an ethnographic analysis. *Health Educ Behav* 2007;**34**:748–64. http://dx.doi.org/10.1177/1090198106290397

111. Ripley-Moffitt CE, Goldstein AO, Fang WL, Butzen AY, Walker S, Lohr JA. Safe babies: a qualitative analysis of the determinants of postpartum smoke-free and relapse states. *Nicotine Tob Res* 2008;**10**:1355–64. http://dx.doi.org/10.1080/14622200802238936

112. Thomson G, Dykes F, Hurley MA, Hoddinott P. Incentives as connectors: insights into a breastfeeding incentive intervention in a disadvantaged area of North-West England. *BMC Pregnancy Childbirth* 2012;**12**:22. http://dx.doi.org/10.1186/1471-2393-12-22

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

113. Radley A, Ballard P, Eadie D, MacAskill S, Donnelly L, Tappin D. Give it up for Baby: outcomes and factors influencing uptake of a pilot smoking cessation incentive scheme for pregnant women. *BMC Public Health* 2013;**13**:1. http://dx.doi.org/10.1186/1471-2458-13-343

114. Willis G. *Cognitive Interviewing: A 'How To' Guide. Reducing Survey Error through Research on the Cognitive and Decision Processes in Surveys*. Short course presented at the 1999 Meeting of the American Statistical Association, Research Triangle Institute, 1999. URL: www.hkr.se/PageFiles/35002/GordonWillis.pdf (accessed October 2013).

115. Hoddinott P, Hislop J, Morgan H, Stewart F, Farrar S, Rothnie K, *et al.* Incentive interventions for smoking cessation in pregnancy: a mixed methods evidence synthesis. *Lancet* 2013;**380**(Suppl. 3): S48. http://dx.doi.org/10.1016/S0140-6736(13)60404-3

116. National Institute for Health Research. *What Do We Mean by 'Training' and 'Support'?*. Eastleigh: NIHR; 2013. URL: www.invo.org.uk/posttyperesource/whatdowemeanbytrainingandsupport/ (accessed October 2013).

117. Higgins JPT, Green S. *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [Updated March 2011]*. The Cochrane Collaboration; 2011. URL: www.cochrane-handbook.org/ (accessed October 2013).

118. Armstrong R, Waters E, Jackson N, Oliver S, Popay J, Shepherd J, *et al. Guidelines for Systematic Reviews of Health Promotion and Public Health Interventions. Version 2*. Australia: Melbourne University; 2007. URL: http://ph.cochrane.org/sites/ph.cochrane.org/files/uploads/Guidelines%20HP_PH%20reviews.pdf (accessed October 2013).

119. United Nations Statistics Division. *Composition of Macro Geographical (Continental) Regions, Geographical Sub-Regions, and Selected Economic and other Groupings*. New York: United Nations; 2013. URL: http://unstats.un.org/unsd/methods/m49/m49regin.htm#developed (accessed October 2013).

120. *GreyNet: Grey Literature Network Service*. Amsterdam: GreyNet International; 2013. URL: www.greynet.org/greynethome.html (accessed october 2013).

121. Higgins ST, Heil SH, Badger GJ, Mongeon JA, Solomon LJ, McHale L, *et al.* Biochemical verification of smoking status in pregnant and recently postpartum women. *Exp Clin Psychopharmacol* 2007;**15**:58–66. http://dx.doi.org/10.1037/1064-1297.15.1.58

122. Dempsey D, Jacob P, Benowitz NL. Accelerated metabolism of nicotine and cotinine in pregnant smokers. *J Pharmacol Exp Ther* 2002;**301**:594–8. http://dx.doi.org/10.1124/jpet.301.2.594

123. Sasaki S, Braimoh TS, Yila TA, Yoshioka E, Kishi R. Self-reported tobacco smoke exposure and plasma cotinine levels during pregnancy – a validation study in Northern Japan. *Sci Total Environ* 2011;**412–13**:114–18. http://dx.doi.org/10.1016/j.scitotenv.2011.10.019

124. Hegaard HK, Kjaergaard H, Moller LF, Wachmann H, Ottesen B. Determination of a saliva cotinine cut-off to distinguish pregnant smokers from pregnant non-smokers. *Acta Obstet Gynecol Scand* 2007;**86**:401–6. http://dx.doi.org/10.1080/00016340601147517

125. Advanced Bioanalytical Service Laboratories Ltd. *Specialist Assays: Nicotine and Cotinine Assays*. Welwyn Garden City: Advanced Bioanalytical Service Laboratories Ltd; 2003. URL: www.abslabs.com/sub_page.cfm/title/Nicotine%20Laboratory/section/specialistassays/editID/15 (accessed October 2013).

126. Marrone GF, Shakleya DM, Scheidweiler KB, Singleton EG, Huestis MA, Heishman SJ. Relative performance of common biochemical indicators in detecting cigarette smoking. *Addiction* 2011;**106**:1325–34. http://dx.doi.org/10.1111/j.1360-0443.2011.03441.x

127. Dixon-Woods M, Sutton A, Shaw R, Miller T, Smith J, Young B, *et al.* Appraising qualitative research for inclusion in systematic reviews: a quantitative and qualitative comparison of three methods. *J Health Serv Res Policy* 2007;**12**:42–7. http://dx.doi.org/10.1258/135581907779497486

128. Oliver S, Oakley L, Lumley J, Waters E. Smoking cessation programmes in pregnancy: systematically addressing development, implementation, women's concerns and effectiveness. *Health Educ J* 2001;**60**:362–70. http://dx.doi.org/10.1177/001789690106000408

129. Michie S, Hyder N, Walia A, West R. Development of a taxonomy of behaviour change techniques used in individual behavioural support for smoking cessation. *Addict Behav* 2011;**36**:315–19. http://dx.doi.org/10.1016/j.addbeh.2010.11.016

130. Higgins JPT, Altman DG, Sterne JAC, Cochrane Statistical Methods Group, Cochrane Bias Methods Group. *Chapter 8: Assessing Risk of Bias in Included Studies*. The Cochrane Collaboration; 2011. URL: www.cochrane-handbook.org/ (accessed October 2013).

131. Centre for Reviews and Dissemination. *Systematic Reviews: CRD's Guidance for Undertaking Reviews in Health Care*. York: University of York, Centre for Reviews and Dissemination; 2009. URL: www.york.ac.uk/inst/crd/pdf/Systematic_Reviews.pdf (accessed March 2013).

132. Verhagen AP, De Vet HCW, De Bie RA, Kessels AGH, Boers M, Bouter LM, *et al.* The Delphi list: a criteria list for quality assessment of randomized clinical trials for conducting systematic reviews developed by Delphi consensus. *J Clin Epidemiol* 1998;**51**:1235–41. http://dx.doi.org/10.1016/S0895-4356(98)00131-0

133. Downs SH, Black N. The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. *J Epidemiol Community Health* 1998;**52**:377–84. http://dx.doi.org/10.1136/jech.52.6.377

134. Jackson R, Ameratunga S, Broad J, Connor J, Lethaby A, Robb G, *et al.* The GATE frame: critical appraisal with pictures. *Evid Based Med* 2006;**11**:35–8. http://dx.doi.org/10.1136/ebm.11.2.35

135. Critical Appraisal Skills Programme. *Critical Appraisal Skills Programme: Making Sense of Evidence about Clinical Effectiveness: 11 Questions to Help you Make Sense of a Trial*. Oxford: Critical Appraisal Skills Programme; 2013. URL: www.casp-uk.net/find-appraise-act/appraising-the-evidence/ (accessed October 2013).

136. Pluye P, Robert E, Cargo M, Bartlett G, O'Cathain A, Griffiths F, *et al. Proposal: a Mixed Methods Appraisal Tool for Systematic Mixed Studies Reviews*. Montreal, QC: McGill University; 2011. URL: http://mixedmethodsappraisaltoolpublic.pbworks.com (accessed October 2013).

137. Cohen J. A coefficient of agreement for nominal scales. *Educ Psychol Meas* 1960;**20**:37–46. http://dx.doi.org/10.1177/001316446002000104

138. Albrecht S, Payne L, Stone CA, Reynolds MD. A preliminary study of the use of peer support in smoking cessation programs for pregnant adolescents. *J Am Acad Nurse Pract* 1998;**10**:119–25. http://dx.doi.org/10.1111/j.1745-7599.1998.tb01205.x

139. Cinciripini PM, Blalock JA, Minnix JA, Robinson JD, Brown VL, Lam C, *et al.* Effects of an intensive depression-focused intervention for smoking cessation in pregnancy. *J Consult Clin Psychol* 2010;**78**:44–54. http://dx.doi.org/10.1037/a0018168

140. Cluss PA, Levine MD, Landsittel D. The Pittsburgh STOP program: disseminating an evidence-informed intervention for low-income pregnant smokers. *Am J Health Promot* 2011;**25**:S75–81. http://dx.doi.org/10.4278/ajhp.100616-QUAN-197

141. Donatelle RJ, Prows SL, Champeau D, Hudson D. Randomised controlled trial using social support and financial incentives for high risk pregnant smokers: significant other supporter (SOS) program. *Tob Control* 2000;**9**(Suppl. 3):III67–9. http://dx.doi.org/10.1136/tc.9.suppl_3.iii67

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

142. Edwards MJ, Geiser T, Chafin C, Weatherby NL, Smith CM. S.M.A.R.T. mothers are resisting tobacco: prenatal smoking cessation in WIC mothers. *J Allied Health* 2009;**38**:170–6.

143. Gadomski A, Adams L, Tallman N, Krupa N, Jenkins P. Effectiveness of a combined prenatal and postpartum smoking cessation program. *Matern Child Health J* 2011;**15**:188–97. http://dx.doi.org/10.1007/s10995-010-0568-9

144. Higgins ST, Heil SH, Solomon LJ. A pilot study on voucher-based incentives to promote abstinence from cigarette smoking during pregnancy and postpartum. *Nicotine Tob Res* 2004;**6**:1015–20. http://dx.doi.org/10.1080/14622200412331324910

145. Lillington L, Royce J, Novak D, Ruvalcaba M, Chlebowski R. Evaluation of a smoking cessation program for pregnant minority women. *Cancer Pract* 1995;**3**:157–63.

146. Lowe JB, Windsor R, Balanda KP, Woodby L. Smoking relapse prevention methods for pregnant women: a formative evaluation. *Am J Health Promot* 1997;**11**:244–6. http://dx.doi.org/10.4278/0890-1171-11.4.244

147. McBride CM, Baucom DH, Peterson BL, Pollak KI, Palmer C, Westman E, *et al.* Prenatal and postpartum smoking abstinence – a partner-assisted approach. *Am J Prev Med* 2004;**27**:232–8.

148. Morgan A, Bennett K, Hannon P, Weinberger J. Evaluation of a Smoke Stop service in a Sure Start programme. *MIDIRS Midwifery Digest* 2005;**15**:496–500.

149. Pbert L, Ockene JK, Zapka J, Ma Y, Goins KV, Oncken C, *et al.* A community health center smoking-cessation intervention for pregnant and postpartum women. *Am J Prev Med* 2004;**26**:377–85. http://dx.doi.org/10.1016/j.amepre.2004.02.010

150. Ussher M, Aveyard P, Coleman T, Straus L, West R, Marcus B, *et al.* Physical activity as an aid to smoking cessation during pregnancy: two feasibility studies. *BMC Public Health* 2008;**8**:8. http://dx.doi.org/10.1186/1471-2458-8-328

151. Lynagh M, Bonevski B, Symonds I, Sanson-Fisher RW. Paying women to quit smoking during pregnancy? Acceptability among pregnant women. *Nicotine Tob Res* 2011;**13**:1029–36. http://dx.doi.org/10.1093/ntr/ntr108

152. Latts LM, Prochazka AV, Salas NM, Young DA. Smoking cessation in pregnancy: failure of an HMO pilot project to improve guideline implementation. *Nicotine Tob Res* 2002;**4**(Suppl. 1):25–30. http://dx.doi.org/10.1080/14622200210128054

153. Hartmann KE, Wechter ME, Payne P, Salisbury K, Jackson RD, Melvin CL. Best practice smoking cessation intervention and resource needs of prenatal care providers. *Obstet Gynecol* 2007;**110**:765–70. http://dx.doi.org/10.1097/01.AOG.0000280572.18234.96

154. Heil SH, Higgins ST, Mongeon JA, Badger GJ, Bernstein IM. Characterizing nicotine withdrawal in pregnant cigarette smokers. *Exp Clin Psychopharmacol* 2006;**14**:165–70. http://dx.doi.org/10.1037/1064-1297.14.2.165

155. Heil SH, Higgins ST, Solomon LJ, Lynch ME, McHale L, Dumeer A, *et al. Voucher-Based Incentives for Abstinence from Cigarette Smoking in Pregnant and Postpartum Women*. Society for Research on Nicotine and Tobacco, 13th Annual Meeting, Austin, TX , USA, 2007. Abstract PA6-1.

156. Reynolds S. Vouchers boost smoking abstinence during pregnancy. *Nida Notes* 2010;**23**:10.

157. Walsh RA, Redman S, Byrne JM, Melmeth A, Brinsmead MW. Process measures in an antenatal smoking cessation trial: another part of the picture. *Health Educ Res* 2000;**15**:469–83. http://dx.doi.org/10.1093/her/15.4.469

158. Donatelle RJ, Prows SL, Champeau D, Hudson D. *Using Social Support, Biochemical Feedback, and Incentives to Motivate Smoking Cessation During Pregnancy: Comparison of Three Intervention Trials*. American Public Health Association Meeting, Boston, MA, USA, 2000. Abstract 8260.

159. Donatelle RJ, Hudson D. *Using 5 A's and Incentives to Promote Prenatal Smoking Cessation*. National Conference on Tobacco or Health, San Francisco, CA, USA, 19–21 November 2002.

160. Higgins ST, Heil SH, Dumeer AM, Thomas CS, Solomon LJ, Bernstein IM. Smoking status in the initial weeks of quitting as a predictor of smoking-cessation outcomes in pregnant women. *Drug Alcohol Depend* 2006;**85**:138–41. http://dx.doi.org/10.1016/j.drugalcdep.2006.04.005

161. Higgins ST, Bernstein IM, Washio Y, Heil SH, Badger GJ, Skelly JM, *et al.* Effects of smoking cessation with voucher-based contingency management on birth outcomes. *Addiction* 2010;**105**:2023–30. http://dx.doi.org/10.1111/j.1360-0443.2010.03073.x

162. Higgins ST, Heil SH, Badger GJ, Skelly JM, Solomon LJ, Bernstein IM. Educational disadvantage and cigarette smoking during pregnancy. *Drug Alcohol Depend* 2009;**104**:S100–5. http://dx.doi.org/10.1016/j.drugalcdep.2009.03.013

163. West R, Hajek P, Stead L, Stapleton J. Outcome criteria in smoking cessation trials: proposal for a common standard. *Addiction* 2005;**100**:299–303. http://dx.doi.org/10.1111/j.1360-0443.2004.00995.x

164. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. *Br J Addict* 1991;**86**:1119–27. http://dx.doi.org/10.1111/j.1360-0443.1991.tb01879.x

165. Windsor RA, Lowe JB, Perkins LL, Smith-Yoder D, Artz L, Crawford M, *et al.* Health education for pregnant smokers: its behavioral impact and cost benefit. *Am J Publ Health* 1993;**83**:201–6. http://dx.doi.org/10.2105/AJPH.83.2.201

166. Velicer WF, Prochaska JO, Rossi JS, Snow MG. Assessing outcome in smoking cessation studies. *Psychol Bull* 1992;**111**:23–41. http://dx.doi.org/10.1037/0033-2909.111.1.23

167. Bliss MC, Wilkie J, Acredolo C, Berman S, Tebb KP. The effect of discharge pack formula and breast pumps on breastfeeding duration and choice of infant feeding method. *Birth* 1997;**24**:90–7. http://dx.doi.org/10.1111/j.1523-536X.1997.tb00347.x

168. Cattaneo A, Borgnolo G, Simon G. Breastfeeding by objectives. *Eur J Publ Health* 2001;**11**:397–401. http://dx.doi.org/10.1093/eurpub/11.4.397

169. Cohen R, Mrtek MB. The impact of two corporate lactation programs on the incidence and duration of breast-feeding by employed mothers. *Am J Health Promot* 1994;**8**:436–41. http://dx.doi.org/10.4278/0890-1171-8.6.436

170. Dungy CI, Christensen-Szalanski J, Losch M, Russell D. Effect of discharge samples on duration of breast-feeding. *Pediatrics* 1992;**90**:233–7.

171. Finch C, Daniel EL. Breastfeeding education program with incentives increases exclusive breastfeeding among urban WIC participants. *J Am Diet Assoc* 2002;**102**:981–4. http://dx.doi.org/10.1016/S0002-8223(02)90224-5

172. Hayes DK, Prince CB, Espinueva V, Fuddy LJ, Li R, Grummer-Strawn LM. Comparison of manual and electric breast pumps among WIC women returning to work or school in Hawaii. *Breastfeed Med* 2008;**3**:3–10. http://dx.doi.org/10.1089/bfm.2007.0022

173. Hill PD. Effects of education on breastfeeding success. *Matern Child Nurs J* 1987;**16**:145–56.

174. Rasmussen KM, Dieterich CM, Zelek ST, Altabet JD, Kjolhede CL. Interventions to increase the duration of breastfeeding in obese mothers: the Bassett Improving Breastfeeding Study. *Breastfeed Med* 2011;**6**:69–75. http://dx.doi.org/10.1089/bfm.2010.0014

175. Reeves Tuttle C, Dewey KG. Impact of a breast-feeding promotion program for Hmong women at selected WIC sites in northern California. *J Nutr Educ* 1995;**27**:69–74. http://dx.doi.org/10.1016/S0022-3182(12)80343-8

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

176. Sciacca JP, Phipps BL, Dube DA, Ratliff MI. Influences on breast-feeding by lower-income women – an incentive-based, partner-supported educational program. *J Am Diet Assoc* 1995;**95**:323–8. http://dx.doi.org/10.1016/S0002-8223(95)00083-6

177. Sciacca JP, Dube DA, Phipps BL, Ratliff MI. A breast-feeding education and promotion program – effects on knowledge, attitudes, and support for breast-feeding. *J Community Health* 1995;**20**:473–90. http://dx.doi.org/10.1007/BF02277064

178. Wolfberg AJ, Michels KB, Shields W, O'Campo P, Bronner Y, Bienstock J. Dads as breastfeeding advocates: results from a randomized controlled trial of an educational intervention. *Am J Obstet Gynecol* 2004;**191**:708–12. http://dx.doi.org/10.1016/j.ajog.2004.05.019

179. Zimmerman DR. You can make a difference: increasing breastfeeding rates in an inner-city clinic. *J Hum Lact* 1999;**15**:217–20. http://dx.doi.org/10.1177/089033449901500311

180. Bai Y, Wunderlich SM, Kashdan R. Inclusion of manual breast pump in hospital discharge bags promotes breastfeeding exclusivity. *J Am Diet Assoc* 2010;**110**(Suppl. 2):A112. http://dx.doi.org/10.1016/j.jada.2010.06.423

181. Chiasson MA, Findley S, Sekhobo J, Scheinmann R, Edmunds LS, Faly A, *et al.* Changing WIC changes what children eat. *Obesity* 2011;**19**:S48.

182. Wright SS, Lea CS, Holloman R, Cornett A, Harrison LM, Randolph GD. Using quality improvement to promote breast-feeding in a local health department. *J Public Health Manag Pract* 2012;**18**:36–42. http://dx.doi.org/10.1097/PHH.0b013e31822d2e3a

183. United Nations Children's Fund UK. *The Baby Friendly Initiative*. London: UNICEF UK; 2010. URL: www.unicef.org.uk/BabyFriendly/ (accessed October 2013).

184. Beake S, Pellowe C, Dykes F, Schmied V, Bick D. A systematic review of structured compared with non-structured breastfeeding programmes to support the initiation and duration of exclusive and any breastfeeding in acute and primary health care settings. *Matern Child Nutr* 2012;**8**:141–61. http://dx.doi.org/10.1111/j.1740-8709.2011.00381.x

185. Rasmussen KM, Geraghty SR. The quiet revolution: breastfeeding transformed with the use of breast pumps. *Am J Publ Health* 2011;**101**:1356–9. http://dx.doi.org/10.2105/AJPH.2011.300136

186. Hector DJ. Complexities and subtleties in the measurement and reporting of breastfeeding practices. *Int Breastfeed J* 2011;**6**:5. http://dx.doi.org/10.1186/1746-4358-6-5

187. Ryan A, Martinez G. Breast-feeding and the working mother: a profile. *Pediatrics* 1989;**83**:524–31

188. Abrahams SW, Labbok MH. Exploring the impact of the Baby-Friendly Hospital Initiative on trends in exclusive breastfeeding. *Int Breastfeed J* 2009;**4**:11. http://dx.doi.org/10.1186/1746-4358-4-11

189. Biro MA, Sutherland GA, Yelland JS, Hardy P, Brown SJ. In-hospital formula supplementation of breastfed babies: a population-based survey. *Birth* 2011;**38**:302–10. http://dx.doi.org/10.1111/j.1523-536X.2011.00485.x

190. Broadfoot M, Britten J, Tappin DM, MacKenzie JM. The Baby Friendly Hospital Initiative and breast feeding rates in Scotland. *Arch Dis Childhood Fetal Neonat Edn* 2005;**90**:F114–16.

191. Daniels L, Jackson D. Knowledge, attitudes and practices of nursing staff regarding the Baby-Friendly Hospital Initiative in non-accredited obstetric units in Cape Town. *S Afr J Clin Nutr* 2011;**24**:32–8.

192. Feldman-Winter L, Schanler RJ, Eidelman A, Landers S, Noble L, Szucs K, *et al.* In reply. *Pediatrics* 2011;**128**:e1314–16. http://dx.doi.org/10.1542/peds.2011-2698C

193. Flaherman VJ, Newman TB. In reply. *Pediatrics* 2011;**128**:e1317–19. http://dx.doi.org/10.1542/peds.2011-2698E

194. Garcia-de-Leon-Gonzalez R, Oliver-Roig A, Hernandez-Martinez M, Mercader-Rodriguez B, Munoz-Soler V, Maestre-Martinez MI, *et al.* Becoming baby-friendly in Spain: a quality-improvement process. *Acta Paediatr* 2011;**100**:445–50. http://dx.doi.org/10.1111/j.1651-2227.2010.02061.x

195. Gokcay G. Ten steps for successful breast feeding: assessment of hospital performance, its determinants and planning for improvement. *Child Care Health Dev* 1997;**23**:187–200. http://dx.doi.org/10.1111/j.1365-2214.1997.tb00892.x

196. Haiek LN. Measuring compliance with the Baby-Friendly Hospital. *Public Health Nutr* 2012;**15**:894–905. http://dx.doi.org/10.1017/S1368980011002394

197. Hill ME. Is baby-friendly certification nurse friendly? *Can Nurse* 2011;**107**:11.

198. Levitt C, Hanvey L, Kaczorowski J, Chalmers B, Heaman M, Bartholomew S. Breastfeeding policies and practices in Canadian hospitals: comparing 1993 with 2007. *Birth* 2011;**38**:228–37. http://dx.doi.org/10.1111/j.1523-536X.2011.00479.x

199. Long L. Achieving 'baby friendly' standards in pre-registration education. *Br J Midwifery* 2011;**19**:33–6. http://dx.doi.org/10.12968/bjom.2011.19.1.33

200. Merewood A, Mehta SD, Chamberlain LB, Philipp BL, Bauchner H. Breastfeeding rates in US Baby-Friendly Hospitals: results of a national survey. *Pediatrics* 2005;**116**:628–34. http://dx.doi.org/10.1542/peds.2004-1636

201. Merten S, Dratva J, Ackermann-Liebrich U. Do Baby-Friendly Hospitals influence breastfeeding duration on a national level? *Pediatrics* 2005;**116**:e702–8. http://dx.doi.org/10.1542/peds.2005-0537

202. Sampaio PF, Moraes CL, Reichenheim ME, Dias de Oliveira AS, Lobato G. Birth in Baby-Friendly Hospitals in Rio de Janeiro, Brazil: a protective factor for breastfeeding? *Cad Saude Publica* 2011;**27**:1349–61. http://dx.doi.org/10.1590/S0102-311X2011000700010

203. Schmied V, Gribble K, Sheehan A, Taylor C, Dykes FC. Ten steps or climbing a mountain: a study of Australian health professionals' perceptions of implementing the Baby Friendly Health Initiative to protect, promote and support breastfeeding. *BMC Health Serv Res* 2011;**11**:208. http://dx.doi.org/10.1186/1472-6963-11-208

204. Souza MFL, Ortiz PN, Soares PL, Vieira TO, Vieira GO, Silva LR. Evaluation of breastfeeding promotion in Baby-Friendly Hospitals. *Rev Paul Pediatr* 2011;**29**:502–8. http://dx.doi.org/10.1590/S0103-05822011000400006

205. Taylor C, Gribble K, Sheehan A, Schmied V, Dykes F. Staff perceptions and experiences of implementing the Baby Friendly Initiative in neonatal intensive care units in Australia. *J Obst Gynecol Neonat Nurs* 2011;**40**:25–34. http://dx.doi.org/10.1111/j.1552-6909.2010.01204.x

206. Taylor SN, Barreira J, Murphy P, Haase B, Browning D, Mauldin J, *et al.* Multidisciplinary improvements of hospital lactation support process: impact on mothers' milk delivery to infants. *Breastfeed Med* 2011;**6**:S20.

207. Thomson G, Dykes F. Women's sense of coherence related to their infant feeding experiences. *Matern Child Nutr* 2011;**7**:160–74. http://dx.doi.org/10.1111/j.1740-8709.2010.00251.x

208. Vasquez MJ, Berg OR. The baby-friendly journey in a US public hospital. *J Perinat Neonatal Nurs* 2012;**26**:37–46. http://dx.doi.org/10.1097/JPN.0b013e3182107179

209. Walsh AD, Pincombe J, Henderson A. An examination of maternity staff attitudes towards implementing Baby Friendly Health Initiative (BFHI) accreditation in Australia. *Matern Child Health J* 2011;**15**:597–609. http://dx.doi.org/10.1007/s10995-010-0628-1

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

210. Bartington S, Griffiths LJ, Tate AR, Dezateux C, Millennium C. Are breastfeeding rates higher among mothers delivering in Baby Friendly accredited maternity units in the UK? *Int J Epidemiol* 2006;**35**:1178–86. http://dx.doi.org/10.1093/ije/dyl155

211. Higgins ST, Washio Y, Heil SH, Solomon LJ, Gaalema DE, Higgins TM, *et al.* Financial incentives for smoking cessation among pregnant and newly postpartum women. *Prev Med* 2012;**55**:S33–40. http://dx.doi.org/10.1016/j.ypmed.2011.12.016

212. Sexton M, Hebel JR. A clinical trial of change in maternal smoking and its effect on birth weight. *JAMA* 1984;**251**:911–15. http://dx.doi.org/10.1001/jama.1984.03340310025013

213. Sigmon SC, Patrick ME. The use of financial incentives in promoting smoking cessation. *Prev Med* 2012;**55**:S24–32. http://dx.doi.org/10.1016/j.ypmed.2012.04.007

214. Donnelly A, Snowden HM, Renfrew MJ, Woolridge MW. Commercial hospital discharge packs for breastfeeding women. *Cochrane Database Syst Rev* 2000;**2**:CD002075.

215. Greaves CJ, Sheppard KE, Abraham C, Hardeman W, Roden M, Evans PH, *et al.* Systematic review of reviews of intervention components associated with increased effectiveness in dietary and physical activity interventions. *BMC Public Health* 2011;**11**:119. http://dx.doi.org/10.1186/1471-2458-11-119

216. Brueton V, Rait G, Tierney J, Meredith S, Darbyshire J, Harding S, *et al.* Strategies to reduce attrition in randomised trials. *Cochrane Database Syst Rev* 2011;**2**:MR000032.

217. Joint Commission. *Specifications Manual for Joint Commission National Quality Measures (v2013A1): Perinatal Care*. Oakbrook Terrace, IL: Joint Commission; 2012. URL: https://manual.jointcommission.org/releases/TJC2013A/PerinatalCare.html (accessed October 2013).

218. Glasziou P, Meats E, Heneghan C, Shepperd S. What is missing from descriptions of treatment in trials and reviews? *BMJ* 2008;**336**:1472–4. http://dx.doi.org/10.1136/bmj.39590.732037.47

219. Perera R, Heneghan C, Yudkin P. Graphical method for depicting randomised trials of complex interventions. *BMJ* 2007;**334**:127–9. http://dx.doi.org/10.1136/bmj.39045.396817.68

220. Marteau TM, Thorne J, Aveyard P, Hirst J, Sokal R. Financial incentives for smoking cessation in pregnancy: protocol for a single arm intervention study. *BMC Pregnancy Childbirth* 2013;**13**:66. http://dx.doi.org/10.1186/1471-2393-13-66

221. Research Councils UK. *A Randomised Controlled Trial of the 'Health in Early Feeding Scheme' to Improve Breastfeeding in Neighbourhoods with Low 6 Week Breastfeeding Rates*. Sheffield: University of Sheffield, Research Councils UK; 2012. URL: http://gtr.rcuk.ac.uk/project/BBF2A150-C72A-4009-A88E-665A49CB8F7D (accessed October 2013).

222. Baxter S, Everson-Hock E, Messina J, Guillaume L, Burrows J, Goyder E. Factors relating to the uptake of interventions for smoking cessation among pregnant women: a systematic review and qualitative synthesis. *Nicotine Tob Res* 2010;**12**:685–94. http://dx.doi.org/10.1093/ntr/ntq072

223. Hall Moran V, Edwards J, Dykes F, Downe S. A systematic review of the nature of support for breast-feeding adolescent mothers. *Midwifery* 2007;**23**:151–71. http://dx.doi.org/10.1016/j.midw.2006.06.005

224. Glaser BG, Strauss AL. *The Discovery of Grounded Theory. Strategies for Qualitative Research*. London: Weidenfeld & Nicolson; 1968.

225. Graham H, Sowden A, Flemming K, Heirs M, Fox D. *Using Qualitative Research to Inform Interventions to Reduce Smoking in Pregnancy in England: a Systematic Review of Qualitative Studies*. York: Public Health Research Consortium; 2012.

226. Ingall G, Cropley M. Exploring the barriers of quitting smoking during pregnancy: a systematic review of qualitative studies. *Women Birth* 2010;**23**:45–52. http://dx.doi.org/10.1016/j.wombi.2009.09.004

227. McInnes RJ, Chambers JA. Supporting breastfeeding mothers: qualitative synthesis. *J Adv Nurs* 2008;**62**:407–27. http://dx.doi.org/10.1111/j.1365-2648.2008.04618.x

228. Burns E, Schmied V, Sheehan A, Fenwick J. A meta-ethnographic synthesis of women's experience of breastfeeding. *Matern Child Nutr* 2010;**6**:201–19.

229. Larsen JS, Hall EOC, Aagaard H. Shattered expectations: when mothers' confidence in breastfeeding is undermined: a metasynthesis. *Scand J Caring Sci* 2008;**22**:653–61. http://dx.doi.org/10.1111/j.1471-6712.2007.00572.x

230. Nelson AM. A metasynthesis of qualitative breastfeeding studies. *J Midwifery Womens Health* 2006;**51**:e13–20. http://dx.doi.org/10.1016/j.jmwh.2005.09.011

231. Lakshman R, Ogilvie D, Ong KK. Mothers' experiences of bottle-feeding: a systematic review of qualitative and quantitative studies. *Arch Dis Child* 2009;**94**:596–601. http://dx.doi.org/10.1136/adc.2008.151910

232. Atchan M, Foureur M, Davis D. The decision not to initiate breastfeeding – women's reasons, attitudes and influencing factors – a review of the literature. *Breastfeed Rev* 2011;**19**:9–17.

233. Nelson AM. A meta-synthesis related to infant feeding decision making. *MCN Am J Matern Child Nurs* 2012;**37**:247–52.

234. van Esterik P. Contemporary trends in infant feeding research. *Annu Rev Anthropol* 2002;**31**:257–78. http://dx.doi.org/10.1146/annurev.anthro.31.040402.085428

235. Sarafino EP. *Health Psychology: Biopsychosocial Interactions*, 2nd edn. New York: Wiley; 1994.

236. Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre). Kavanagh J, Trouton A, Oakley A, Powell C. *A Systematic Review of the Evidence for Incentive Schemes to Encourage Positive Health and Other Social Behaviours in Young People*. London: University of London, EPPI-Centre; 2006. URL: http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=Soskzt1sFZs%3d&tabid=671&mid=1562 (accessed February 2013).

237. Cahill K, Perera R. Quit and win contests for smoking cessation. *Cochrane Database Syst Rev* 2008;**4**:CD004986.

238. Cahill K, Perera R. Competitions and incentives for smoking cessation. *Cochrane Database Syst Rev* 2011;**4**:CD004307.

239. Kavanagh J, Stansfield C, Thomas J. *Incentives to Improve Smoking, Physical Activity, Dietary and Weight Management Behaviours: a Scoping Review of the Research Evidence*. London: University of London, EPPI-Centre; 2009. URL: http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=UR9rFlMPeF0%3d&tabid=2468&mid=4592 (accessed February 2013).

240. Lussier JP, Heil SH, Mongeon JA, Badger GJ, Higgins ST. A meta-analysis of voucher-based reinforcement therapy for substance use disorders. *Addiction* 2006;**101**:192–203. http://dx.doi.org/10.1111/j.1360-0443.2006.01311.x

241. Paul-Ebhohimhen V, Avenell A. Systematic review of the use of financial incentives in treatments for obesity and overweight. *Obes Rev* 2008;**9**:355–67. http://dx.doi.org/10.1111/j.1467-789X.2007.00409.x

242. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: a meta-analysis. *Addiction* 2006;**101**:1546–60. http://dx.doi.org/10.1111/j.1360-0443.2006.01581.x

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

243. Roozen HG, Boulogne JJ, Van T, van den Brink W, De Jong CA, Kerkhof AJFM. A systematic review of the effectiveness of the community reinforcement approach in alcohol, cocaine and opioid addiction. *Drug Alcohol Depend* 2004;**74**:1–13. http://dx.doi.org/10.1016/j.drugalcdep.2003.12.006

244. Wall J, Mhurchu CN, Blakely T, Rodgers A, Wilton J. Effectiveness of monetary incentives in modifying dietary behavior: a review of randomized, controlled trials. *Nutr Rev* 2006;**64**:518–31. http://dx.doi.org/10.1111/j.1753-4887.2006.tb00185.x

245. Sutherland K, Leatherman S, Christianson J. *Paying the Patient: Does it Work?*. London: Quest for Quality and Improved Performance, Health Foundation; 2008. URL: www.health.org.uk/publications/paying-the-patient-does-it-work/#./replace (accessed February 2013).

246. Flodgren G, Eccles MP, Shepperd S, Scott A, Parmelli E, Beyer FR. An overview of reviews evaluating the effectiveness of financial incentives in changing healthcare professional behaviours and patient outcomes. *Cochrane Database Syst Rev* 2011;**7**:CD009255.

247. Gillam SJ, Siriwardena AN, Steel N. Pay-for-performance in the United Kingdom: impact of the Quality and Outcomes Framework: a systematic review. *Ann Fam Med* 2012;**10**:461–8. http://dx.doi.org/10.1370/afm.1377

248. Scott A, Sivey P, Ait OD, Willenberg L, Naccarella L, Furler J, *et al.* The effect of financial incentives on the quality of health care provided by primary care physicians. *Cochrane Database Syst Rev* 2011;**9**:CD008451.

249. Van Herck P, De Smedt D, Annemans L. Systematic review: effects, design choices, and context of pay-for-performance in health care. *BMC Health Serv Res* 2010;**10**:247. http://dx.doi.org/10.1186/1472-6963-10-247

250. Hamilton FL, Greaves F, Majeed A, Millett C. Effectiveness of providing financial incentives to healthcare professionals for smoking cessation activities: systematic review. *Tob Control* 2013;**22**:3–8. http://dx.doi.org/10.1136/tobaccocontrol-2011-050048

251. Kaplan RM. Should medicare reimburse providers for weight loss interventions? *Am Psychol* 2007;**62**:217–19. http://dx.doi.org/10.1037/0003-066X.62.3.217

252. Kellogg SH, Kreek MJ. Gradualism, identity, reinforcements, and change. *Int J Drug Policy* 2005;**16**:369–75. http://dx.doi.org/10.1016/j.drugpo.2005.08.001

253. Ries NM. Financial incentives for weight loss and healthy behaviours. *Healthc Policy* 2012;**7**:23–8.

254. Adams Dudley R, Tseng C-W, Bozic K, Smith WA, Luft HS. *Consumer Financial Incentives: a Decision Guide for Purchasers*. Rockville, MD: Agency for Healthcare Reseach and Quality; 2007. URL: www.ahrq.gov/professionals/quality-patient-safety/quality-resources/value/incentives/index.html (accessed October 2013).

255. Appleby J, Harrison T, Hawkins L, Dixon A. *Payment by Results: How Can Payment Systems Help to Deliver Better Care?* London: The King's Fund; 2012. URL: www.kingsfund.org.uk/publications/payment-results-0 (accessed October 2013).

256. Davies C, Anand P, Artigas L, Holloway J, McConway K, Newman J, *et al. Links between Governance, Incentives and Outcomes: a Review of the Literature. Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R&D (NCCSDO)*. Milton Keynes: NIHR; 2005. URL: www.nets.nihr.ac.uk/projects/hsdr/081318066 (accessed October 2013).

257. Giuffrida A, Gosden T, Forland F, Kristiansen IS, Sergison M, Leese B, *et al.* Target payments in primary care: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2000;**3**:CD000531.

258. Smith JE, Meyers RJ, Austin JL. Working with family members to engage treatment-refusing drinkers: the CRAFT program. *Alcohol Treat Q* 2008;**26**:169–93. http://dx.doi.org/10.1300/J020v26n01_09

259. Cahill K, Perera R. Competitions and incentives for smoking cessation. *Cochrane Database Syst Rev* 2008;**3**:CD004307.

260. Custers T, Hurley J, Klazinga NS, Brown AD. Selecting effective incentive structures in health care: a decision framework to support health care purchasers in finding the right incentives to drive performance. *BMC Health Serv Res* 2008;**8**:66. http://dx.doi.org/10.1186/1472-6963-8-66

261. Gosden T, Forland F, Kristiansen IS, Sutton M, Leese B, Giuffrida A, *et al.* Capitation, salary, fee-for-service and mixed systems of payment: effects on the behaviour of primary care physicians. *Cochrane Database Syst Rev* 2000;**3**:CD002215.

262. Hey K, Perera R. Competitions and incentives for smoking cessation. *Cochrane Database Syst Rev* 2005;**2**:CD004307.

263. Higgins ST, Heil SH, Lussier JP. Clinical implications of reinforcement as a determinant of substance use disorders. *Annu Rev Psychol* 2004;**55**:461. http://dx.doi.org/10.1146/annurev.psych.55.090902.142033

264. Lavack A, Watson L, Markwart J. Quit and win contests: a social marketing success story. *Soc Mar Q* 2007;**13**:31–52. http://dx.doi.org/10.1080/15245000601163499

265. Meyers RJ, Villanueva M, Smith JE. The community reinforcement approach: history and new directions. *J Cogn Psychother* 2005;**19**:247–60. http://dx.doi.org/10.1891/jcop.2005.19.3.247

266. Petersen LA, Woodard LD, Urech T, Daw C, Sookanan S. Does pay-for-performance improve the quality of health care? *Ann Int Med* 2006;**145**:265–72. http://dx.doi.org/10.7326/0003-4819-145-4-200608150-00006

267. Christianson J, Leatherman S, Sutherland K. *Financial Incentives, Healthcare Providers and Quality Improvements*. London: Health Foundation; 2009. URL: www.health.org.uk/publications/financial-incentives-healthcare-providers-and-quality-improvements/ (accessed October 2013).

268. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health Promot Int* 2000;**15**:259–67. http://dx.doi.org/10.1093/heapro/15.3.259

269. Frey B. *Not Just for the Money: an Economic Theory of Personal Motivation*. Brookfield, VT: Edward Elgar Publishing; 1997.

270. Health and Social Care Information Centre. *Quality and Outcomes Framework*. 2013. URL: www.qof.ic.nhs.uk/ (accessed October 2013).

271. Schmidt H. Wellness incentives, equity, and the 5 groups problem. *Am J Publ Health* 2012;**102**:49–54. http://dx.doi.org/10.2105/AJPH.2011.300348

272. Coleman T. Do financial incentives for delivering health promotion counselling work? Analysis of smoking cessation activities stimulated by the Quality and Outcomes Framework. *BMC Public Health* 2010;**10**:167. http://dx.doi.org/10.1186/1471-2458-10-167

273. Halpern SD, Asch DA, Volpp KG. Commitment contracts as a way to health. *BMJ* 2012;**344**:e522. http://dx.doi.org/10.1136/bmj.e522

274. Glasziou PP, Buchan H, Del M, Doust J, Harris M, Knight R, *et al.* When financial incentives do more good than harm: a checklist. *BMJ* 2012;**345**:e5047. http://dx.doi.org/10.1136/bmj.e5047

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

275. Giles EL, Robalino S, McColl E, Sniehotta F, Adams J. The effectiveness of financial incentives for health behaviour change: systematic review and meta-analysis. *PLOS ONE* 2014;**9**:e90347. http://dx.doi.org/10.1371/journal.pone.0090347

276. Dallery J, Raiff BR. Contingency management in the 21st century: technological innovations to promote smoking cessation. *Subst Use Misuse* 2011;**46**:10–22. http://dx.doi.org/10.3109/10826084.2011.521067

277. Hunter RF, Tully MA, Davis M, Stevenson M, Kee F. Physical activity loyalty cards for behavior change: a quasi-experimental study. *Am J Prev Med* 2013;**45**:56–63. http://dx.doi.org/10.1016/j.amepre.2013.02.022

278. Ritchie J, Spencer L. Qualitative Data Analysis For Applied Policy Research. In Bryman A, Burgess RG, editors. *Analyzing Qualitative Data*. London: Routledge; 1994. pp. 173–94. http://dx.doi.org/10.4324/9780203413081_chapter_9

279. Schulz KF, Altman DG, Moher D, CONSORT group. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMJ* 2010;**340**:c332. http://dx.doi.org/10.1136/bmj.c332

280. Strauss A, Corbin J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Newbury Park, CA: Sage; 1990.

281. Patton MQ. *Qualitative Evaluation and Research Methods*. London: Sage; 1990.

282. Jepson RG, Harris FM, Platt S, Tannahill C. The effectiveness of interventions to change six health behaviours: a review of reviews. *BMC Public Health* 2010;**10**:538. http://dx.doi.org/10.1186/1471-2458-10-538

283. Sen A. Capability and Well-being. In Nussbaum M, Sen A, editors. *The Quality of Life*. Oxford: Clarendon Press; 1993. pp. 30–53. http://dx.doi.org/10.1093/0198287976.003.0003

284. Glasgow Centre for Population Health. *Asset Based Approaches for Health Improvement: Redressing the Balance*. Glasgow: Glasgow Centre for Population Health; 2011. URL: www.gcph.co.uk/publications/279_concepts_series_9-asset_based_approaches_for_health_improvement (accessed October 2013).

285. Foot J. *What Makes us Healthy? The Asset Approach in Practice: Evidence, Action, Evaluation*. Chester le Street: Asset Based Publishing; 2012. URL: www.assetbasedconsulting.co.uk/ (accessed October 2013).

286. Baby Café. *Baby Café: Your First Choice for Breastfeeding Support*. London: Baby Café; 2013. URL: www.thebabycafe.org/ (accessed October 2013).

287. Hoddinott P, Britten J, Pill R. Why do interventions work in some places and not others: a breastfeeding support group trial. *Soc Sci Med* 2010;**70**:769–78. http://dx.doi.org/10.1016/j.socscimed.2009.10.067

288. Hoddinott P, Craig L, Britten J, McInnes R. A serial qualitative study of infant feeding experiences: idealism meets realism. *BMJ Open* 2012;**2**:e000504. http://dx.doi.org/10.1136/bmjopen-2011-000504

289. McInnes RJ, Hoddinott P, Britten J, Darwent K, Craig LC. Significant others, situations and infant feeding behaviour change processes: a serial qualitative interview study. *BMC Pregnancy Childbirth* 2013;**13**:114. http://dx.doi.org/10.1186/1471-2393-13-114

290. Davey Smith G. *Health Inequalities: Lifecourse Approaches*. Bristol: Policy Press; 2003.

291. Racine EF, Frick KD, Strobino D, Carpenter LM, Milligan R, Pugh LC. How motivation influences breastfeeding duration among low-income women. *J Hum Lact* 2009;**25**:173–81. http://dx.doi.org/10.1177/0890334408328129

292. Stokols D. Establishing and maintaining health environments: toward a social ecology of health promotion. *Am Psychol* 1992;**47**:6–22. http://dx.doi.org/10.1037/0003-066X.47.1.6

293. Gagnon AJ, Sandall J. Individual or group antenatal education for childbirth or parenthood, or both. *Cochrane Database Syst Rev* 2007;**3**:CD002869.

294. Jones L. *Principles to Promote the Initiation and Establishment of Lactation in the Mother of a Preterm or Sick Infant*. London: UNICEF UK; 2008. URL: www.unicef.org.uk/Documents/Baby_Friendly/Research/Liz_Jones_article_full.pdf?epslanguage = en (accessed October 2013).

295. Becker GE, Cooney F, Smith HA. Methods of milk expression for lactating women. *Cochrane Database Syst Rev* 2011;**12**:CD006170.

296. National Institute for Health and Care Excellence. *Behaviour Change: the Principles for Effective Interventions*. NICE guidelines PH6. London: NICE; 2007. URL: http://guidance.nice.org.uk/PH6/Guidance/pdf/English (accessed October 2013).

297. National Institute for Health and Care Excellence. *The Use of Incentives to Improve Health*. NICE Citizens' Council Meeting, London, 20–22 May 2011. URL: www.nice.org.uk/media/9AF/56/CCReportIncentives.pdf (accessed October 2013).

298. Clear the Air News Tobacco Blog. *Mothers Offered £650 to Stub out Tobacco*. 12 May 2010. URL: http://tobacco.cleartheair.org.hk/?p = 2731 (accessed October 2013).

299. Park A, Clery E, Curtice J, Phillips M, Utting D. *British Social Attitudes 29*. London: NatCen Social Research; 2012. URL: www.bsa-29.natcen.ac.uk/ (accessed October 2013).

300. Eunson J, Murray L. *The Acceptability of Carrots*. Edinburgh: Ipsos MORI Scotland; 2012. URL: www.ipsos-mori.com/newsevents/ca/1233/The-acceptability-of-carrots.aspx (accessed October 2013).

301. Promberger M, Dolan P, Marteau TM. 'Pay them if it works': discrete choice experiments on the acceptability of financial incentives to change health related behaviour. *Soc Sci Med* 2012;**75**:2509–14. http://dx.doi.org/10.1016/j.socscimed.2012.09.033

302. Park JD, Mitra N, Asch DA. Public opinion about financial incentives for smoking cessation. *Prev Med* 2012;**55**:S41–5. http://dx.doi.org/10.1016/j.ypmed.2012.06.013

303. Promberger M, Brown RC, Ashcroft RE, Marteau TM. Acceptability of financial incentives to improve health outcomes in UK and US samples. *J Med Ethics* 2011;**37**:682–7. http://dx.doi.org/10.1136/jme.2010.039347

304. Braithwaite D, Emery J, De Lusignan S, Sutton S. Using the internet to conduct surveys of health professionals: a valid alternative? *Fam Pract* 2003;**20**:545–51. http://dx.doi.org/10.1093/fampra/cmg509

305. Information Statistics Division Scotland. *GPs in Practice Details*. Edinburgh: Information Statistics Division, NHS National Services Scotland; 2013. URL: www.isdscotland.org/Health-Topics/General-Practice/GPs-and-Other-Practice-Workforce/#gp-work (accessed July 2013).

306. Information Statistics Division Scotland. *National Primary Care Workforce Planning Survey 2009: Results for Scotland*. Edinburgh: Information Statistics Division, NHS National Services Scotland; 2009. URL: www.isdscotland.org/Health-Topics/General-Practice/GPs-and-Other-Practice-Workforce/national-primary-care-workforce-survey-2009.asp (accessed July 2013).

307. Information Statistics Division Scotland. *Primary Care Workforce Survey 2013: a Survey of Scottish General Practices and GP Out Of Hours Services*. Edinburgh: Information Statistics Division, NHS National Services Scotland; 2013. URL: www.isdscotland.org/Health-Topics/General-Practice/GPs-and-Other-Practice-Workforce/primary-care-workforce-survey-2013.asp (accessed October 2013).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

308. Great Britain. *Health and Social Care Act 2001*. London: The Stationery Office; 2012.

309. Lee E. Living with risk in the age of 'intensive motherhood': maternal identity and infant feeding. *Health Risk Soc* 2008;**10**:467–77. http://dx.doi.org/10.1080/13698570802383432

310. Marmot M. *Status Syndrome*. London: Bloomsbury; 2004.

311. Kelly YJ, Watt RG, Nazroo JY. Racial/ethnic differences in breastfeeding initiation and continuation in the United Kingdom and comparison with findings in the United States. *Pediatrics* 2006;**118**:e1428–35. http://dx.doi.org/10.1542/peds.2006-0714

312. Lancaster KJ. A new approach to consumer theory. *J Polit Econ* 1966;**74**:132–57. http://dx.doi.org/10.1086/259131

313. Louviere JJ, Hensher DA, Swait J. *Stated Choice Methods*. New York: Cambridge University Press; 2000. http://dx.doi.org/10.1017/CBO9780511753831

314. Ryan M, Gerard K, Amaya-Amaya M. *Using Discrete Choice Experiments to Value Health and Health Care*. Dordecht: Springer; 2008. http://dx.doi.org/10.1007/978-1-4020-5753-3

315. Free C, Knight R, Robertson S, Whittaker R, Edwards P, Zhou W, *et al.* Smoking cessation support delivered via mobile phone text messaging (txt2stop): a single-blind, randomised trial. *Lancet* 2011;**378**:49–55. http://dx.doi.org/10.1016/S0140-6736(11)60701-0

316. Rabin M, O'Donoghue R. Doing it now or later. *Am Econ Rev* 1999;**89**:103–24. http://dx.doi.org/10.1257/aer.89.1.103

317. Wood W, Neal DT. A new look at habits and the habit–goal interface. *Psychol Rev* 2007;**114**:843–63. http://dx.doi.org/10.1037/0033-295X.114.4.843

318. Kuhfeld WF. *Experimental Design: Efficiency, Coding, and Choice Designs*. Cary, NC: SAS Institute; 2010. URL: http://support.sas.com/techsup/technote/mr2010c.pdf (accessed October 2013).

319. Yi D, Ryan M, Campbell S, Elliott A, Torrance N, Chambers A, *et al.* Using discrete choice experiments to inform randomised controlled trials: an application to chronic low back pain management in primary care [published online ahead of print 12 November 2010]. *Eur J Pain* 2011. http://dx.doi.org/10.1016/j.ejpain.2010.10.008

320. de Bekker-Grob EW, Ryan M, Gerard K. Discrete choice experiments in health economics: a review of the literature. *Health Econ* 2012;**21**:145–72. http://dx.doi.org/10.1002/hec.1697

321. Hammar H, Carlsson F. Smokers' expectations to quit smoking. *Health Econ* 2005;**14**:257–67. http://dx.doi.org/10.1002/hec.923

322. Goto R, Nishimura S, Ida T. Discrete choice experiment of smoking cessation behaviour in Japan. *Tob Control* 2007;**16**:336–43. http://dx.doi.org/10.1136/tc.2006.019281

323. Goto R, Takahashi Y, Ida T. Changes in smokers' attitudes toward intended cessation attempts in Japan. *Value Health* 2011;**14**:785–91. http://dx.doi.org/10.1016/j.jval.2010.12.010

324. Edwards A, Elwyn G, Hood K, Rollnick S. Judging the 'weight of evidence' in systematic reviews: introducing rigour into the qualitative overview stage by assessing signal and noise. *J Eval Clin Pract* 2000;**6**:177–84. http://dx.doi.org/10.1046/j.1365-2753.2000.00212.x

325. Glasziou P, Chalmers I, Altman DG, Bastian H, Boutron I, Brice A, *et al.* Taking healthcare interventions from trial to practice. *BMJ* 2010;**341**:c3852. http://dx.doi.org/10.1136/bmj.c3852

326. Fingerhut LA, Kleinman JC, Kendrick JS. Smoking before, during, and after pregnancy. *Am J Publ Health* 1990;**80**:541–4. http://dx.doi.org/10.2105/AJPH.80.5.541

327. UK Centre for Tobacco Control Studies. *Improving the Effectiveness and Reach of NHS Support for Smoking Cessation in Pregnancy*. Nottingham: University of Nottingham, UK Centre for Tobacco Control Studies; 2013. URL: www.ukctcs.org/ukctcs/research/featuredprojects/nihrpregnancy.aspx (accessed October 2013).

328. Tappin D, Bauld L, Purves D, Boyd K, Sinclair L, MacAskill S, *et al.* Financial incentives for smoking cessation during pregnancy: a randomised controlled trial. *Lancet* 2014;**384**:S4. http://dx.doi.org/10.1016/S0140-6736(14)62130-9

329. Tappin D, Bauld L, Purves D, Boyd K, Sinclair L, MacAskill S, *et al.* Financial incentives for smoking cessation in pregnancy: randomised controlled trial. *BMJ* 2015;**350**:134. http://dx.doi.org/10.1136/bmj.h134

330. Ashcroft RE. Personal financial incentives in health promotion: where do they fit in an ethic of autonomy? *Health Expect* 2011;**14**:191–200. http://dx.doi.org/10.1111/j.1369-7625.2011.00664.x

331. Lancaster T, Stead LF. Self-help interventions for smoking cessation. *Cochrane Database Syst Rev* 2005;**3**:CD001118.

332. Clemons SN, Amir LH. Breastfeeding women's experience of expressing: a descriptive study. *J Hum Lact* 2010;**26**:258–65. http://dx.doi.org/10.1177/0890334410371209

333. Labiner-Wolfe J, Fein SB, Shealy KR, Wang C. Prevalence of breast milk expression and associated factors. *Pediatrics* 2008;**122**(Suppl. 2):S63–8. http://dx.doi.org/10.1542/peds.2008-1315h

334. Ryan K, Team V, Alexander J. Expressionists of the twenty-first century: the commodification and commercialization of expressed breast milk. *Med Anthropol* 2013;**32**:467–86. http://dx.doi.org/10.1080/01459740.2013.768620

335. National Childbirth Trust. *Breast Pump Hire*. London: National Childbirth Trust; 2012. URL: www.nct.org.uk/branches/glossop-district/breastfeeding-support/breast-pump-hire (accessed October 2013).

336. Hoddinott P, Britten J, Craig L, McInnes R, Darwent K. *Significant Others, Situations and their Influence on Infant Feeding*. NHS Health Scotland; 2013. URL: www.healthscotland.com/documents/21865.aspx

337. Bevan G, Hood C. What's measured is what matters: targets and gaming in the English public health care system. *Public Admin* 2006;**84**:517–38. http://dx.doi.org/10.1111/j.1467-9299.2006.00600.x

338. Ivers N, Jamtvedt G, Flottorp S, Young JM, Odgaard-Jensen J, French SD, *et al.* Audit and feedback: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2012;**6**:CD000259.

339. Bailey C, Pain RH, Aarvold JE. A 'give it a go' breast-feeding culture and early cessation among low-income mothers. *Midwifery* 2004;**20**:240–50. http://dx.doi.org/10.1016/j.midw.2003.12.003

340. Priest N, Roseby R, Waters E, Polnay A, Campbell R, Spencer N, *et al.* Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke. *Cochrane Database Syst Rev* 2008;**4**:CD001746.

341. World Health Organization. *WHO Analgesic Ladder*. Cardiff: Cardiff University, Pain Community Centre; 1986. URL: www.paincommunitycentre.org/article/who-analgesic-ladder-0 (accessed March 2013).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

342. Robl J, Ashford KB, Centers I, McCubbin A, Shepherd RA. *GIFTS (Giving Infants and Families Tobacco-Free Starts): a Bundled Approach to Help Pregnant Mothers Quit Smoking*. American Public Health Association 138th annual meeting, Denver, CO, 6–10 November, 2010. URL: https://apha.confex.com/apha/138am/webprogram/Paper226318.html (accessed 11 November 2011).

343. University of Sheffield. *Financial Incentives*. Sheffield: University of Sheffield, School of Health and Related Research; 2013. URL: www.shef.ac.uk/scharr/sections/ph/research/breastmilk/fi (accessed October 2013).

344. Tobacco Free Futures. *Reducing Exposure to Secondhand Smoke: Smokefree Pregnancy*. Manchester: Tobacco Free Futures; 2013. URL: http://tobaccofreefutures.org/how-we-can-help-you/reducing-exposure-to-second-hand-smoke/smokefree-pregnancy/ (accessed October 2013).

345. Scottish Government Health and Social Care Directorates. *Forum: Best Fed Babies*. Edinburgh: Scottish Executive Health Department; 2004. URL: www.sehd.scot.nhs.uk/publications/fm35/fm35.pdf (accessed October 2013).

346. University of the West of England. *Encouraging Teenage Mothers to Breastfeed*. Bristol: University of the West of England; 2012. URL: www1.uwe.ac.uk/bl/research/bsmc/researchprojects/healthandexercise/encouragingbreastfeeding.aspx (accessed October 2013).

347. Saurel-Cubizolles MJ, Romito P, Garcia J. Description of maternity rights for working women in France, Italy and in the United Kingdom. *Eur J Publ Health* 1993;**3**:48–53. http://dx.doi.org/10.1093/eurpub/3.1.48

348. University of Sheffield. *Breast Milk Policy*. Sheffield: University of Sheffield, School of Health and Related Research; 2013. URL: www.shef.ac.uk/scharr/sections/ph/research/breastmilk (accessed October 2013).

349. JFL. Quebec to pay mothers to breastfeed. *Pediatrics* 1995;**95**:A37.

350. Action on Smoking & Health (Scotland). *Support Fund External Evaluation: Partnership Action on Tobacco & Health (PATH)*. Edinburgh: Action on Smoking & Health (Scotland) (ASH Scotland); 2013. URL: www.ashscotland.org.uk/what-we-do/projects/path-funded-projects/support-fund-external-evaluation.aspx (accessed October 2013).

351. La Valle I, Gibb J, Bryska B, Durbin B, Sharp C, Ashton H, *et al. Feasibility Study for the Trials of Payment by Results for Children's Centres*. Slough: National Foundation for Educational Reseach; 2011. URL: www.nfer.ac.uk/nfer/publications/91048/91048_home.cfm?publicationID = 670&title = Feasibility%20study%20for%20the%20trials%20of%20Payment%20by%20Results%20for%20children's%20centres (accessed October 2013).

Appendix 1 Commissioning brief

NIHR Health Technology Assessment Programme *HTA no 10/31*

Effectiveness of financial or other incentives

Introduction

The aim of the HTA programme is to ensure that high quality research information on the effectiveness, costs and broader impact of health technologies is produced in the most efficient way for those who use, manage, provide care in or develop policy for the NHS. Topics for research are identified and prioritised to meet the needs of the NHS. Health technology assessment forms a substantial portfolio of work within the National Institute for Health Research and each year about fifty new studies are commissioned to help answer questions of direct importance to the NHS. The studies include both primary research and evidence synthesis.

Question

Are financial or other incentives acceptable as an intervention to change health behaviours to optimise outcomes in pregnancy?

1 **Technology:** Financial or other incentives to promote smoking cessation during pregnancy and promote breastfeeding.
2 **Target group:** Pregnant women and women in the postpartum period and stakeholders.
3 **Setting:** Any.
4 **Control or comparator treatment:** Behaviour change without financial or other incentives.
5 **Design:** Mixed methods research to look at the acceptability of financial or other incentives on an individual and social level (including as a minimum participants or patients, the public and policy makers) to explore the mechanisms by which these may work and to investigate the possible effect size of incentives in sustaining behaviour change. Researchers should explore both the type and magnitude of incentives, durability of effect, attitudes of trial participants and willingness of clinicians to include incentives in research and therapeutic interventions.
6 **Outcome:** Acceptability, mechanisms of action and type/magnitude of incentive. Unintended effects on the non-incentivised.
7 **Commissioned to inform:** This study is a preliminary stage to planning future HTA research in this area.

Background to commissioning brief:

Offering financial or other incentives to encourage behaviour change is becoming increasingly popular as a method to promote sustained lifestyle modification. It is unclear, however, whether such incentives are effective in encouraging and maintaining such behaviour change. There is a need for mixed methods research to evaluate the effects of incentives. Little is known about the mechanisms of action of incentives or their effects at social or individual level. This research aims to help us to understand these factors better.

The median duration of breastfeeding in the UK is around one month. Continuation rates are lowest among lower socio-economic groups, contributing to inequalities in health. There is a lack of evidence on the acceptability and effectiveness of incentives to increase breastfeeding rates, but these are being used to target interventions on specific socio-economic, ethnic, low-income or vulnerable groups.

32% of mothers in England smoke immediately before or during their pregnancy, with 17% across the UK still smoking after the baby was born. Smoking cessation in pregnancy has a significant part to play in improving outcomes for babies and mothers and again, use of incentives to increase quit rates is poorly understood, but increasingly being considered as an option to improve results.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Notes to Applicants

The NIHR Health Technology Assessment programme is funded by the NIHR, with contributions from the CSO in Scotland and WORD in Wales. Researchers from Northern Ireland should contact NETSCC to discuss their eligibility to apply.

For many of the questions posed by the HTA programme, a randomised controlled trial is likely to be the most appropriate method of providing an answer. However, there may be practical or ethical reasons why this might not be possible. Applicants proposing other research methods are invited to justify these choices.

Applicants are asked to:

1. Follow the Medical Research Council's Good Clinical Practice guidelines (http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC002416) when planning how studies, particularly RCTs, will be supervised. Further advice specific to each topic will be given by the HTA programme at full proposal and contract stages.

2. Note that trials involving medicinal products must comply with "The Medicines for Human Use (Clinical Trials) Regulations 2004". In the case of such trials, the DH expects the employing institution of the chief investigator to be nominated as the sponsor. Other institutions may wish to take on this responsibility or agree co-sponsorship with the employing institution. The DH is prepared to accept the nomination of multiple sponsors. Applicants who are asked to submit a full proposal will need to obtain confirmation of a sponsor(s) to complete their application. The DH reserve the right to withdraw from funding the project if they are not satisfied with the arrangements put in place to conduct the trial.

The MHRA (info@mhra.gsi.gov.uk, http://www.mhra.gov.uk) can provide guidance as to whether your trial would be covered by the regulations. The DH/MRC website (http://www.ct-toolkit.ac.uk/) also contains the latest information about Clinical Trials regulations and a helpful FAQ page.

Research networks

The HTA programme expects, where appropriate, that applicants will work with the relevant research network.

Making an application

If you wish to submit an outline proposal on this topic, complete the on-line application form at http://www.hta.ac.uk/funding/standardcalls/index.shtml and submit it on line by 30/06/10. Applications will be considered by the HTA Commissioning Board at its meeting in late-September. For outline applications, if shortlisted, investigators will be given a minimum of eight weeks to submit a full proposal.

Applications received electronically after 1300 hours on the due date will not be considered.

Please see GUIDANCE ON APPLICATIONS overleaf.

Guidance on applications

Required expertise

HTA is a multidisciplinary enterprise. It needs to draw on the expertise and knowledge of clinicians and of those trained in health service research methodologies such as health economics, medical statistics, study design and qualitative approaches. The HTA programme expects teams proposing randomised controlled trials to include input from an accredited clinical trials unit, or one with equivalent experience. Applicants are also expected to engage a qualified Trial Manager for appropriate projects. A commitment to team working must be shown and applicants may wish to consider a collaborative approach between several institutions.

Public involvement in research

The HTA programme recognises the benefit of increasing active involvement of members of the public in research and would like to support research projects appropriately. The HTA programme encourages applicants to consider *how* the scientific quality, feasibility or practicality of their proposal *could* be improved by involving members of the public. Examples of how this has been done for health technology assessment projects can be found at http://www.hta.ac.uk/PPIguidance/. Research teams wishing to involve members of the public should include in their application: the aims of active involvement in this project; a description of the members of the public (to be) involved; a description of the methods of involvement; and an appropriate budget. Applications that involve members of the public will not, for that reason alone, be favoured over proposals that do not but it is hoped that the involvement of members of the public will improve the quality of the application.

Outcomes

Wherever possible, the results of HTA should provide information about the effectiveness and cost-effectiveness of care provided in its usual clinical setting and for the diverse subjects who would be eligible for the interventions under study. The endpoints of interest will in most cases include disease specific measures, health related quality of life and costs (directly and indirectly related to patient management). Wherever possible, these measurements should be made by individuals who are unaware of the treatment allocation of the subjects they are assessing. We encourage applicants to involve users of health care in the preparation of their proposal, for instance in selecting patient-oriented outcomes. A period of follow up should be undertaken which is sufficient to ensure that a wider range of effects are identified other than those which are evident immediately after treatment. These factors should guide applicants in their choice of subjects, settings and measurements made.

Sample size

A formal estimate should be made of the number of subjects required to show important differences in the chosen primary outcome measure. Justification of this estimate will be expected in the application.

Communication

Communication of the results of research to decision makers in the NHS is central to the HTA Programme. Successful applicants will be required to submit a single final report for publication by the HTA programme. They are also required to seek peer-reviewed publication of their results elsewhere and may also be asked to support NETSCC, HTA in further efforts to ensure that results are readily available to all relevant parties in the NHS. Where findings demonstrate continuing uncertainty, these should be highlighted as areas for further research.

Timescale

There are no fixed limits on the duration of projects or funding and proposals should be tailored to fully address the problem (including long-term follow-up if necessary). Applicants should consider however that there is a pressing need within the NHS for this research, and so the duration of the research needs to be timely.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Feasibility and Pilot studies

We expect that when pilot or feasibility studies are proposed by applicants, or specified in commissioning briefs, a clear route to the substantive study will be described. This applies whether the brief or proposal describes just the preliminary study or both together. Whether preliminary and main studies are funded together or separately may be decided on practical grounds.

Feasibility Studies are pieces of research done before a main study. They are used to estimate important parameters that are needed to design the main study. Feasibility studies for randomised controlled trials may not themselves be randomised. Crucially, feasibility studies do not evaluate the outcome of interest; that is left to the main study. If a feasibility study is a small randomised controlled trial, it need not have a primary outcome and the usual sort of power calculation is not normally undertaken. Instead the sample size should be adequate to estimate the critical parameters (e.g. recruitment rate) to the necessary degree of precision.

Pilot studies are a version of the main study that is run in miniature to test whether the components of the main study can all work together. It is focused on the processes of the main study, for example to ensure recruitment, randomisation, treatment, and follow-up assessments all run smoothly. It will therefore resemble the main study in many respects. In some cases this will be the first phase of the substantive study and data from the pilot phase may contribute to the final analysis; this can be referred to as an internal pilot. Or at the end of the pilot study the data may be analysed and set aside, a so-called external pilot.

For a full definition of the terms 'feasibility study' and 'pilot study' visit the NETSCC website glossary page http://www.netscc.ac.uk/glossary/

2.3 Stage 3

In **Stage 3** (again, to be undertaken over September 2012-July 2013), we want to use a ***discrete choice experiment (DCE) questionnaire*** where those who complete it (some mothers and their partners/significant others where it will be administered through the research team and some women of childbearing age through a commercially administered Research Now TM version) will be asked to choose between incentive schemes and to vote for the most acceptable and reasonable options that can be tested in a further research study.

The overall aim of this project is to identify feasible and acceptable incentives to use within a randomised controlled trial for smoking cessation and breastfeeding continuation.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 2 Intervention vignettes

Intervention vignettes

Smoking cessation

Gulliver and colleagues[104]

- You and your partner/relative are invited to attend a 60-minute group with other expecting couples, which is led by a psychologist at a local hospital, to discuss pregnancy and smoking.
- In the group, the psychologist wants to find out whether you are ready to give up smoking and if your partner/relative can help you. The group is told that giving up smoking is possible and how it would improve their own and their baby's health.
- You and your partner/relative are also invited to couple counselling appointments to discuss your own experiences of smoking and previous attempts to stop. You are told that the counselling appointments will include working with a self-help manual (*Freedom from Smoking for You and Your Baby*; see www.in.gov/isdh/files/Cessation_Manual.pdf, accessed 5 January 2015) and thinking about the triggers for smoking. You will be asked to sign a contract for your chosen stop smoking plan.
- You are then invited to attend monthly appointments until your baby is 3 months old. At these appointments you are asked about your smoking and have a breath test to show whether you are still smoking or not.
- At each visit there is a raffle that you can enter to win gifts, regardless of whether you are still smoking or not. A car seat is raffled every 3 months.
- Also, if you stay quit, and the breath test proves it, you will be given additional gifts donated by local businesses as they want to support your efforts to stay smoke free.
- All your travel to and from appointments will be paid for.

Heil and colleagues 2008[105]

- At 18 weeks of pregnancy you are invited to attend a stop smoking appointment. There, you are asked to agree a quit date, give a breath test and provide a urine sample and you are also given a smoking cessation leaflet, which you discuss with staff members.
- If you agree to continue the service, you will have tests to assess whether you are still smoking:
    - every day for the next 5 days
    - then twice weekly for another 7 weeks
    - once a week for the next 4 weeks
    - then fortnightly up until the baby is born.
- After your baby is born, you will also have to provide samples:
    - every week for 4 weeks
    - then fortnightly for the next 8 weeks (12 weeks in total)
    - at a final assessment made at 24 weeks after the baby is born.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

- You will receive vouchers for as long as you stay quit and these increase in value each time the test confirms that you have stopped smoking (starting from £10.00 at first testing and then increasing by £2.00 for each negative test, up to a maximum of £70.00).
- Any positive/missing results will reset the value of the vouchers (to £10.00); however, if you then have a further two negative results, the value of the vouchers will be restored.
- During each visit you will discuss your smoking status and the benefits of not smoking during pregnancy/after the birth and at the end you will receive a pamphlet highlighting the reasons to remain non-smoking.

Walsh and colleagues 1997[108]

- You and your partner have been invited to attend a three-session smoking cession programme. The programme consists of the following:

First session

- You are given 2–3 minutes of risk information advice from a doctor and shown a 14-minute video that contains risk information, barriers to quitting and how to overcome them and stop smoking tips.
- Following the video, a 10-minute counselling session is provided by a midwife and a quit date is agreed.
- You receive a self-help manual as well as guidance on how to use it (this manual includes sections on risks, barriers, and smoking cessation).
- You and your partner are offered four packets of confectionary gum.
- Your partner is provided with a tip sheet, a contract and a letter that stresses the importance of smoking cessation support.
- A sticker is placed on your medical records so that other professionals know that you are involved in the programme.

Second and third sessions (held at approximately 34–36 weeks of pregnancy)

- On the second and third visits a midwife will provide approximately 5 minutes of counselling support and a doctor will provide approximately 2 minutes of risk advice.
- Urine samples will be collected during these visits to test whether you are smoking.

Follow-up

- You will provide a further urine sample between 6 and 12 weeks after your baby has been born.
- If your urine sample (provided at your second visit) is negative, your name is entered into a draw to win four donated prizes (approximately £120.00 each).

Breastfeeding

Chamberlain and colleagues[103]

- You are offered a personal-use double electric breast pump (worth £120.00–225.00, your brand of choice), which can be delivered to the hospital or to your home following the birth of your baby.
- You will have access to a breastfeeding specialist in the hospital and you will be given a number for a breastfeeding telephone support line that you can call from home.

Pugh and Milligan[106]

- Within 24 hours of having your baby you are asked whether you would like to take part in a parenting/breastfeeding programme. Once you have agreed, you are asked to complete some questionnaires and are provided with breastfeeding support. You are told that:
  - at 3–4 days following the birth a nurse will visit you to discuss parenting issues/provide breastfeeding support
  - at 5 days following the birth a breastfeeding specialist will telephone you to discuss breastfeeding
  - at 12 days after the birth the nurse will visit you and offer flexible 'non-nursing' support based on what support you need, for example washing dishes, doing the laundry, providing childcare.
- You are also told that further questionnaires will be sent to you for completion at 14 days and 6 weeks after the birth of your baby.

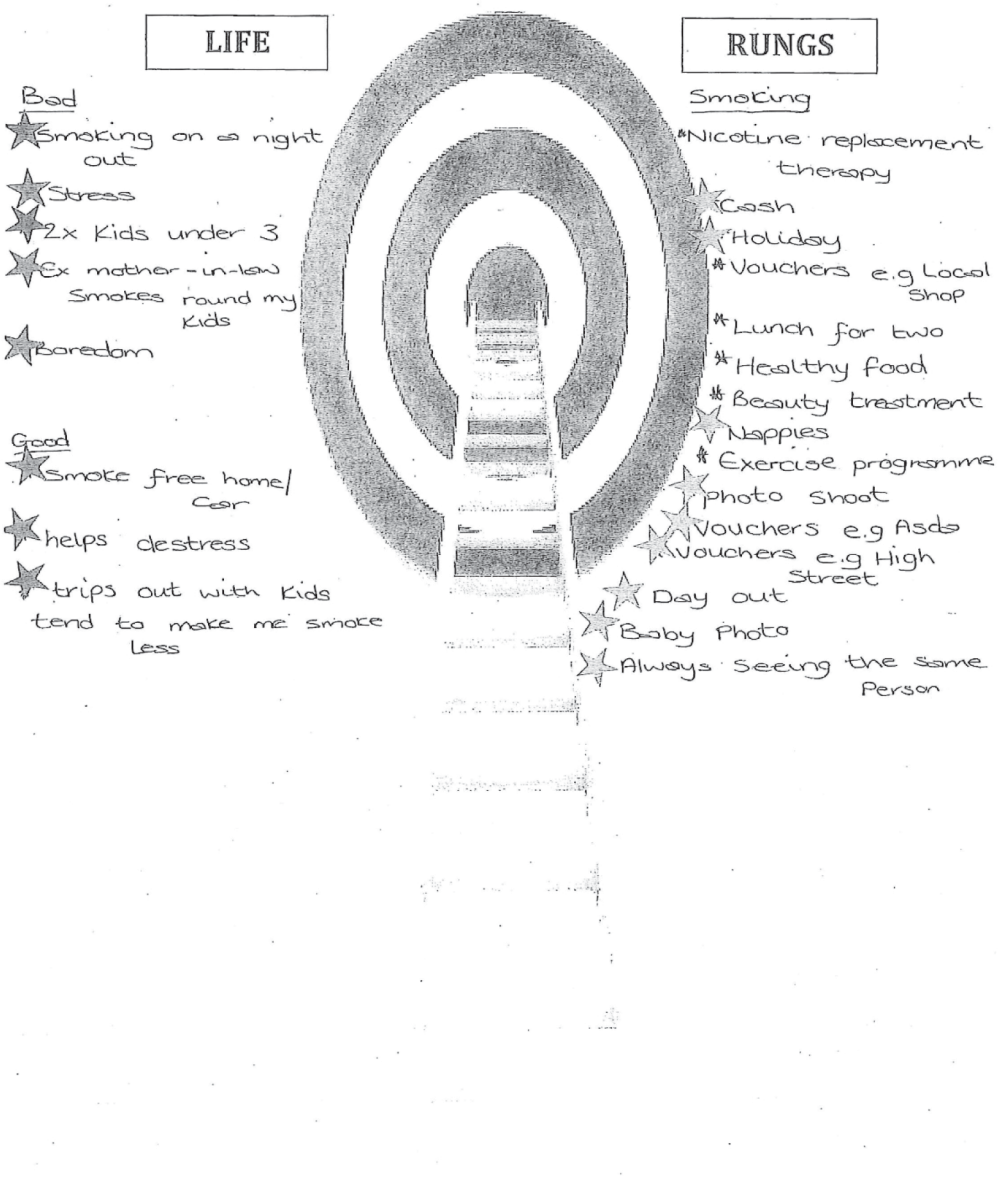
Volpe and Bear[107]

- During your pregnancy you are invited to attend three 1-hour weekly group sessions that provide education, information and support for parenting issues and breastfeeding.
- Each week will focus on a different topic and you will be provided with a gift at the end of each session. The focus of the sessions and the gift provided will be:
  - week 1: healthy eating – chocolate cigar
  - week 2: safety – electrical outlet covers
  - week 3: mothering the mother – perfume.
- The sessions are run by a nurse/breastfeeding specialist and a breastfeeding supporter will also be present to provide support and encouragement. The breastfeeding supporter will continue to visit you after your baby has been born if you continue to breastfeed.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

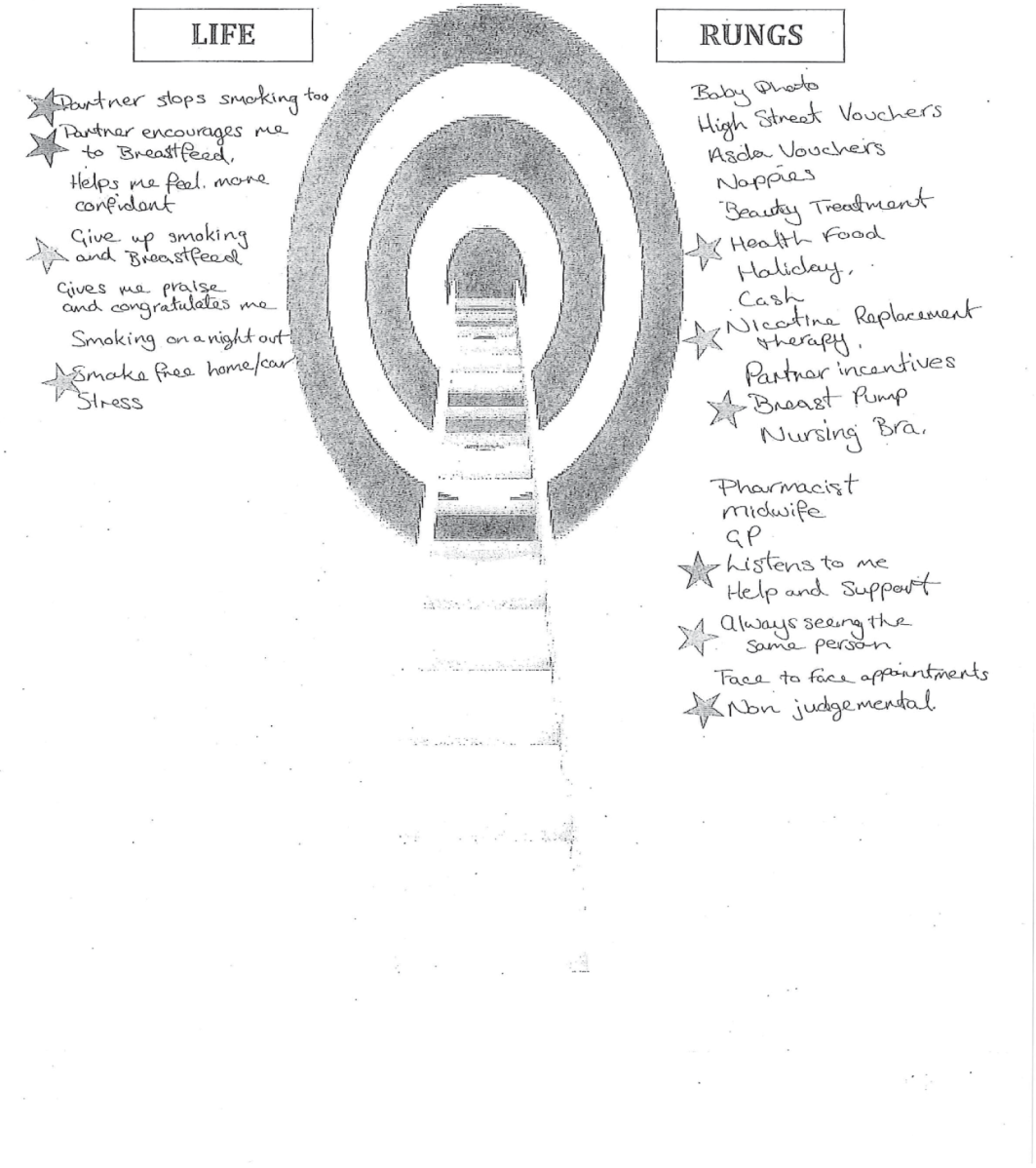
Appendix 3 Aberdeen 'ladders'

Ladder A

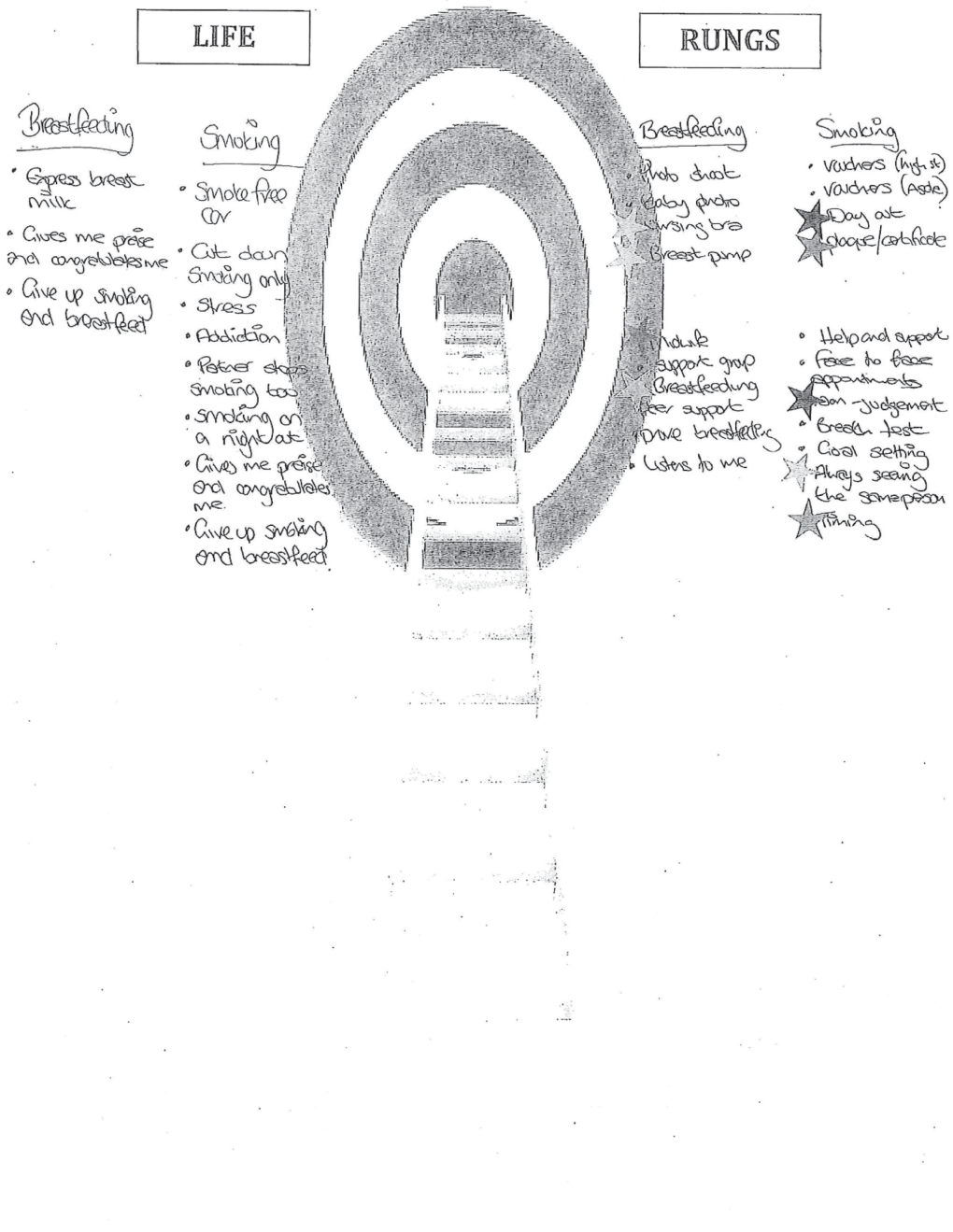


© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Ladder B


LIFE
RUNGS
Partner stops smoking too
Partner encourages me to Breastfeed,
Helps me feel. more confident
Give up smoking and Breastfeed
Gives me praise and congratulates me
Smoking on a night out
Smoke free home/car
Stress
Baby Photo
High Street Vouchers
Asda Vouchers
Nappies
Beauty Treatment
Health Food
Holiday.
Cash
Nicotine Replacement therapy.
Partner incentives
Breast Pump
Nursing Bra.
Pharmacist
midwife
GP
Listens to me
Help and Support
Always seeing the same person
Face to face appointments
Non judgemental.

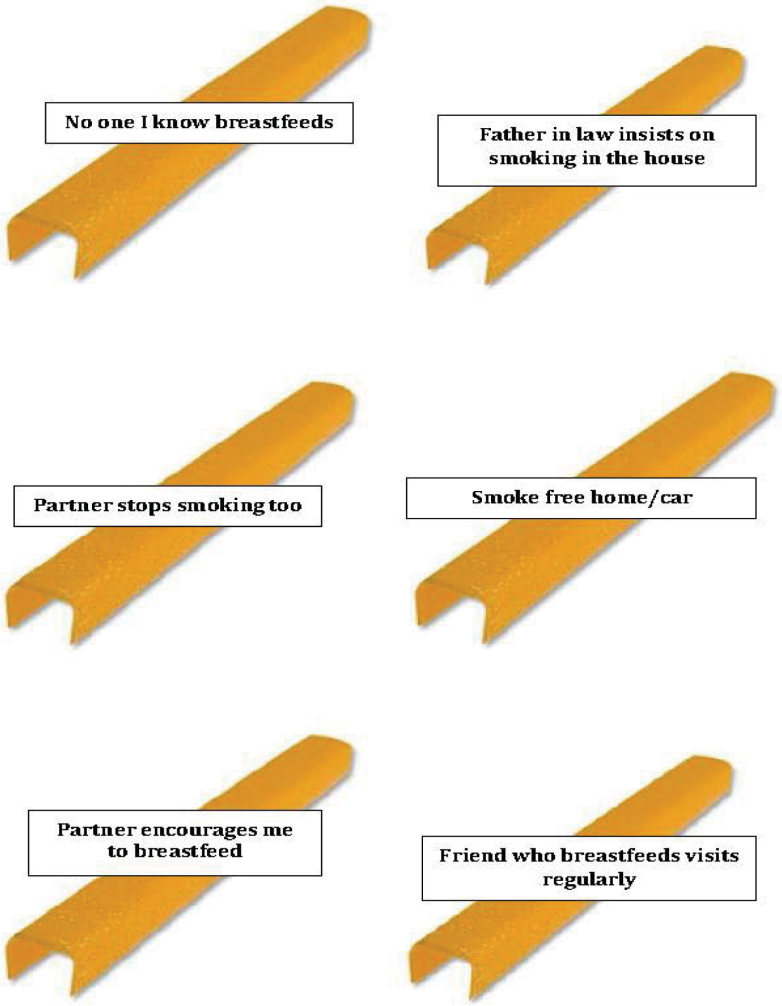
Ladder C



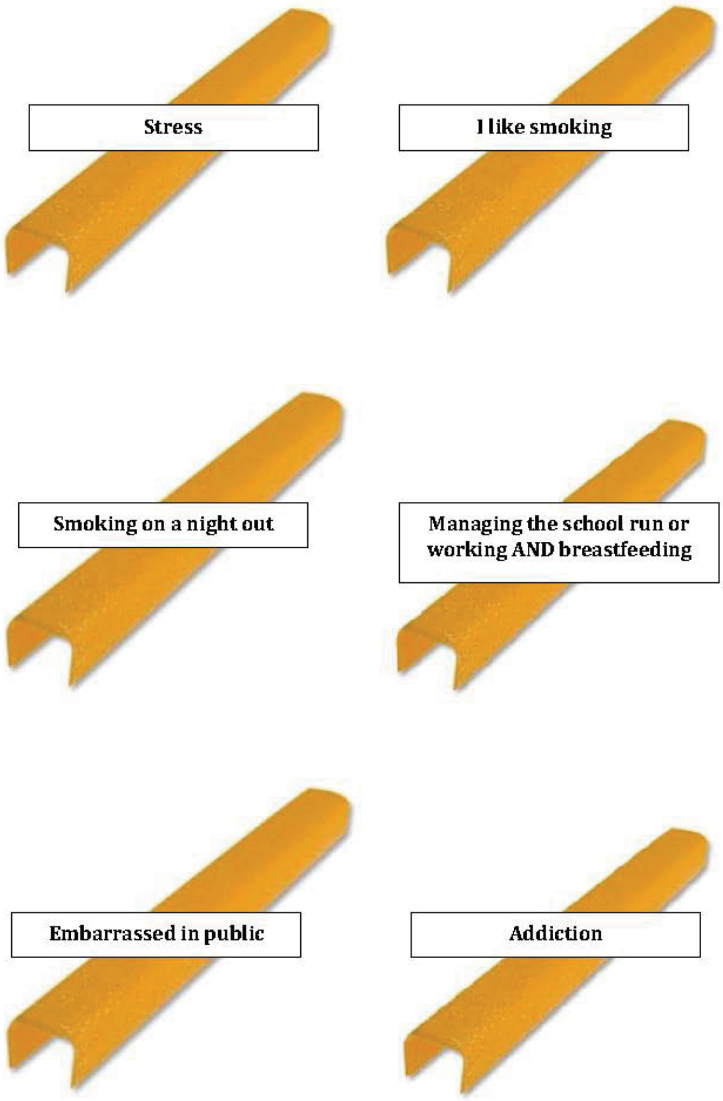
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

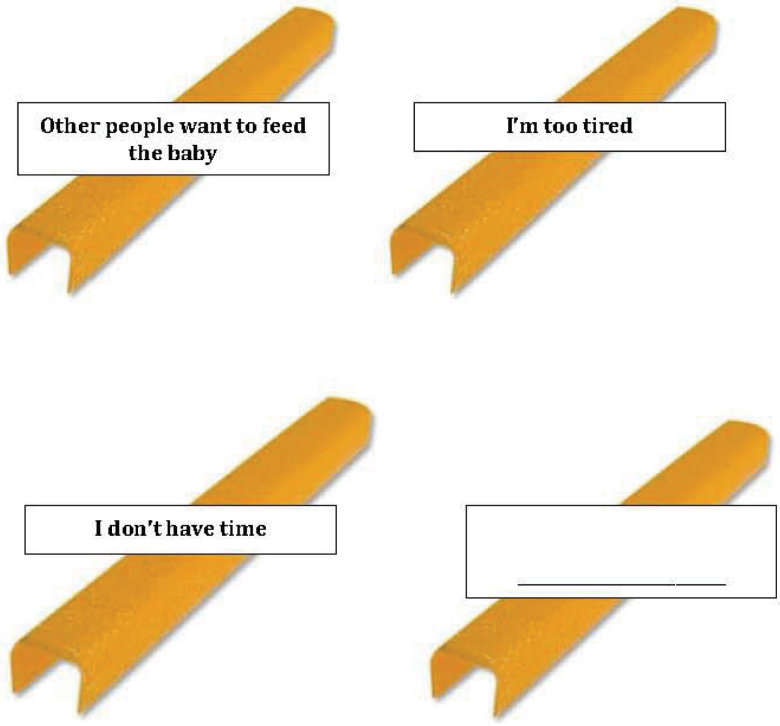
Appendix 4 Aberdeen 'rungs'

Life rungs



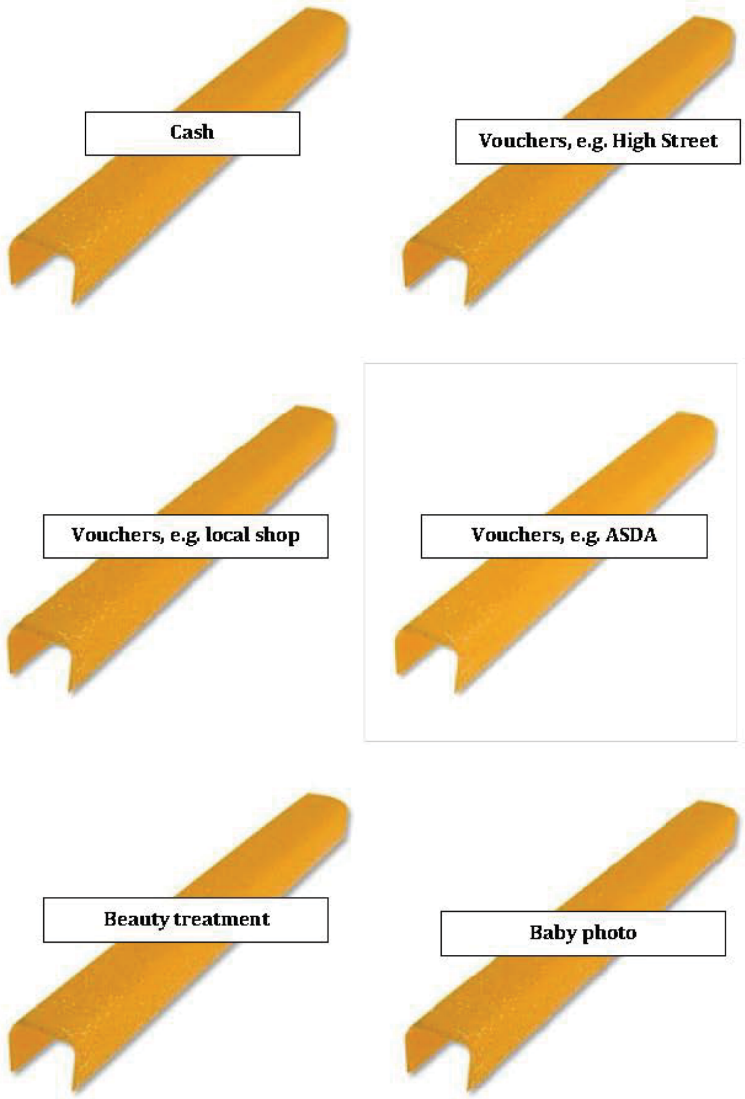
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

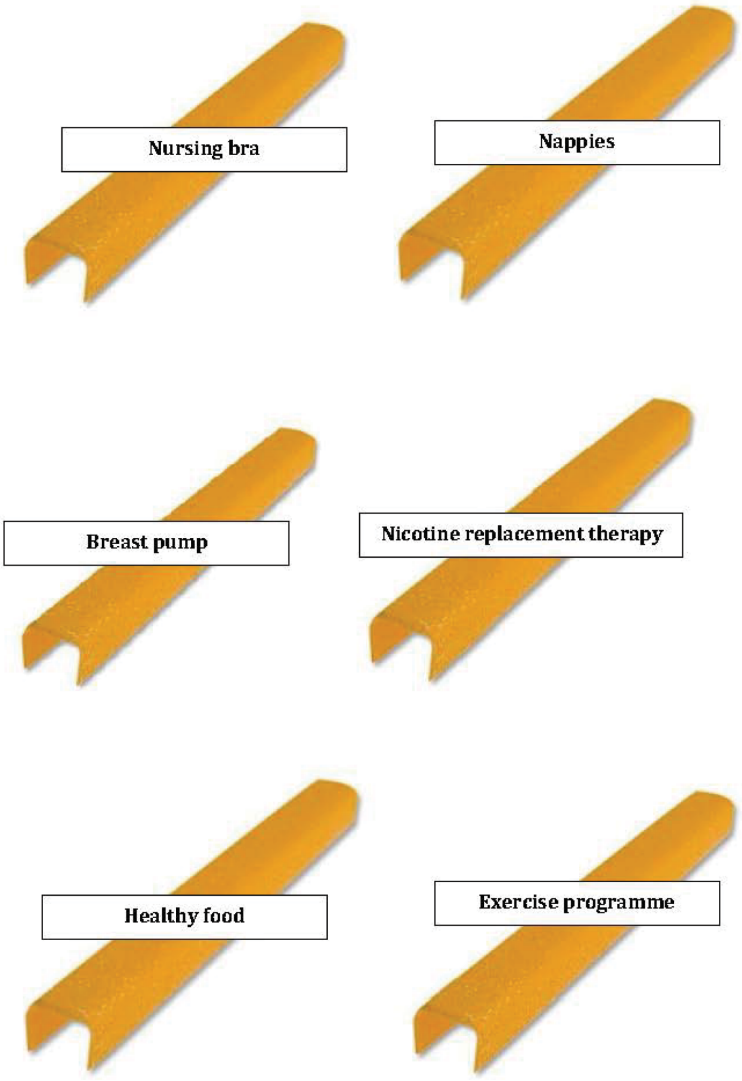

Stress
I like smoking
Smoking on a night out
Managing the school run or working AND breastfeeding
Embarrassed in public
Addiction



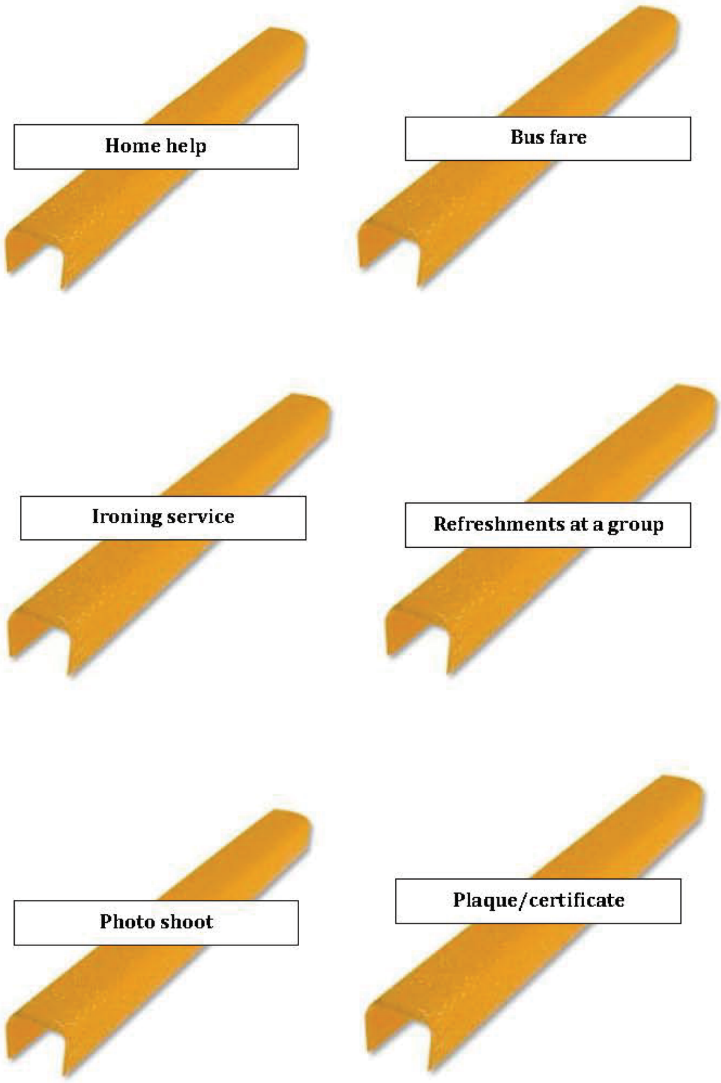
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

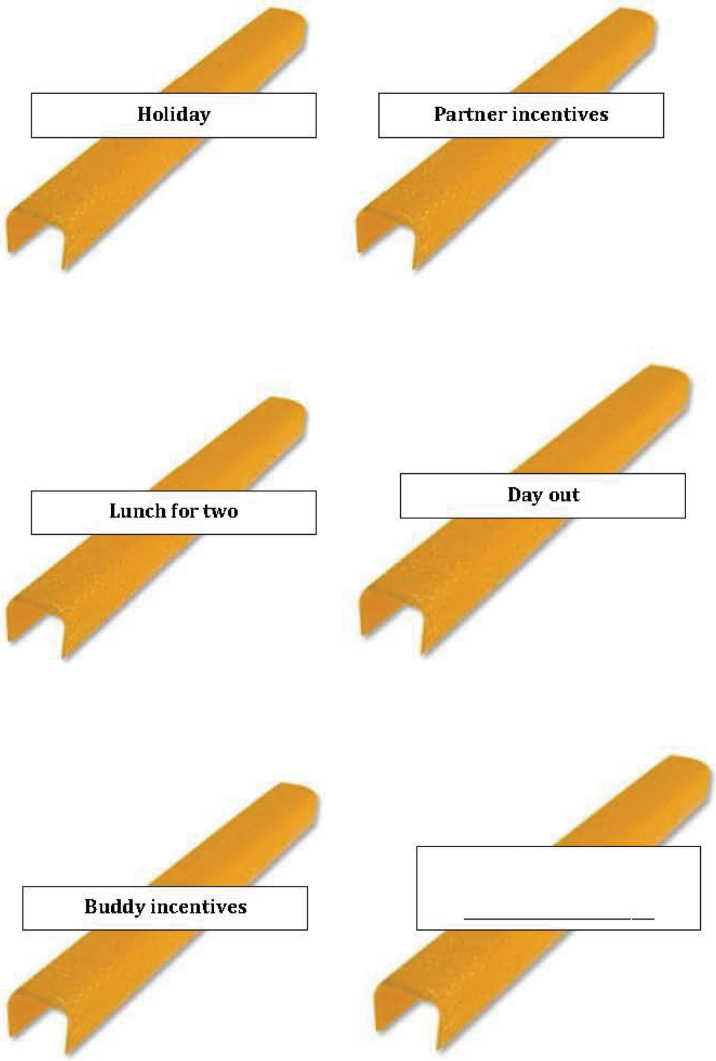
Incentive rungs





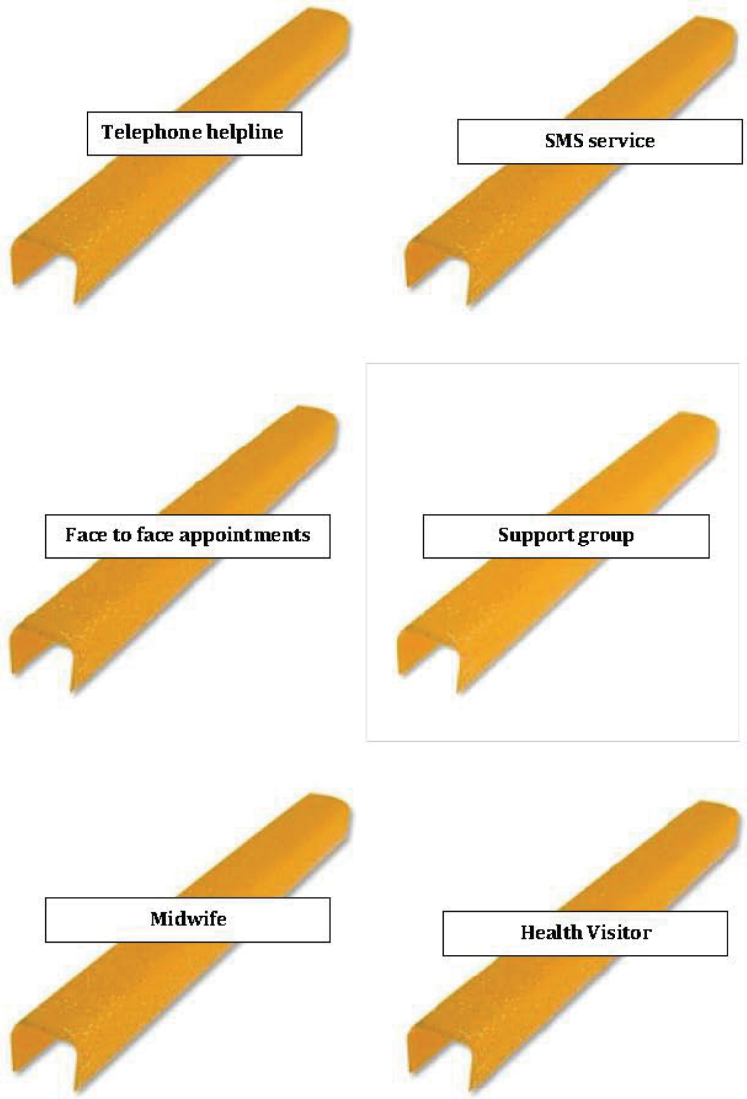
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

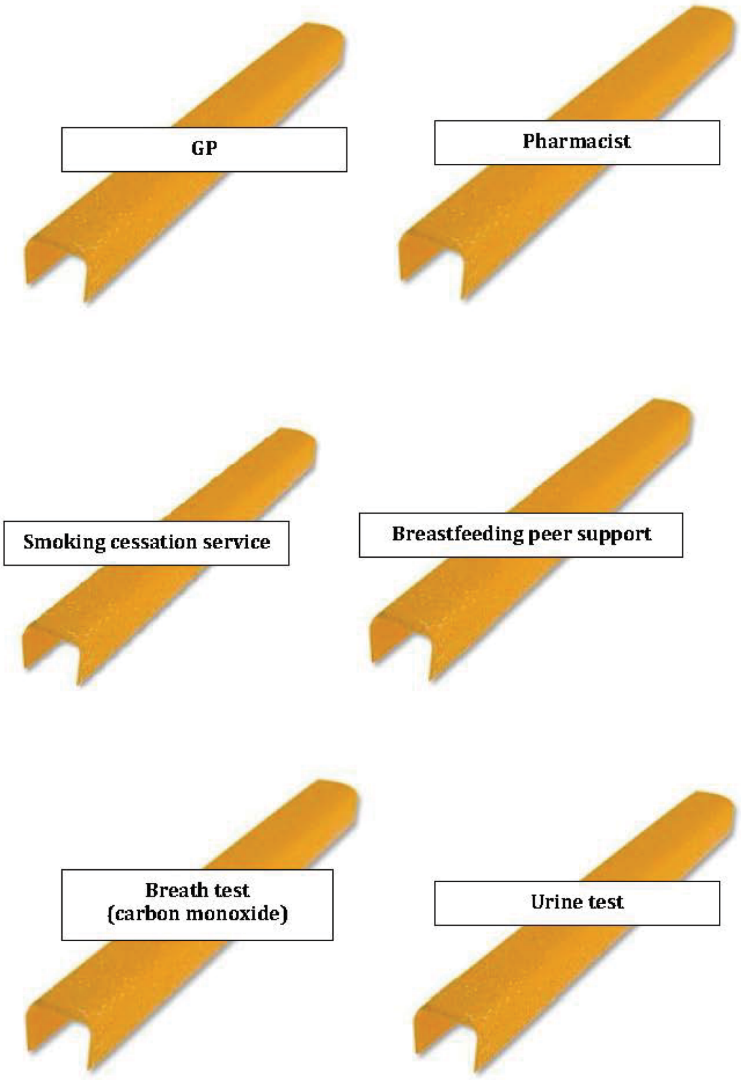

Home help
Bus fare
Ironing service
Refreshments at a group
Photo shoot
Plaque/certificate



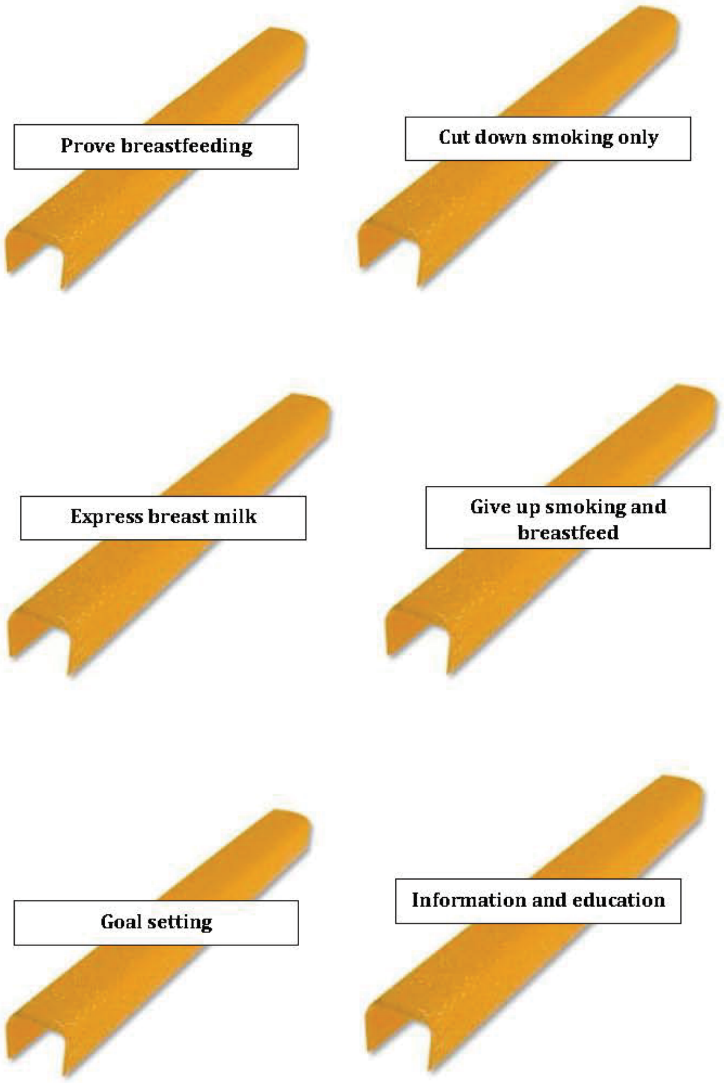
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

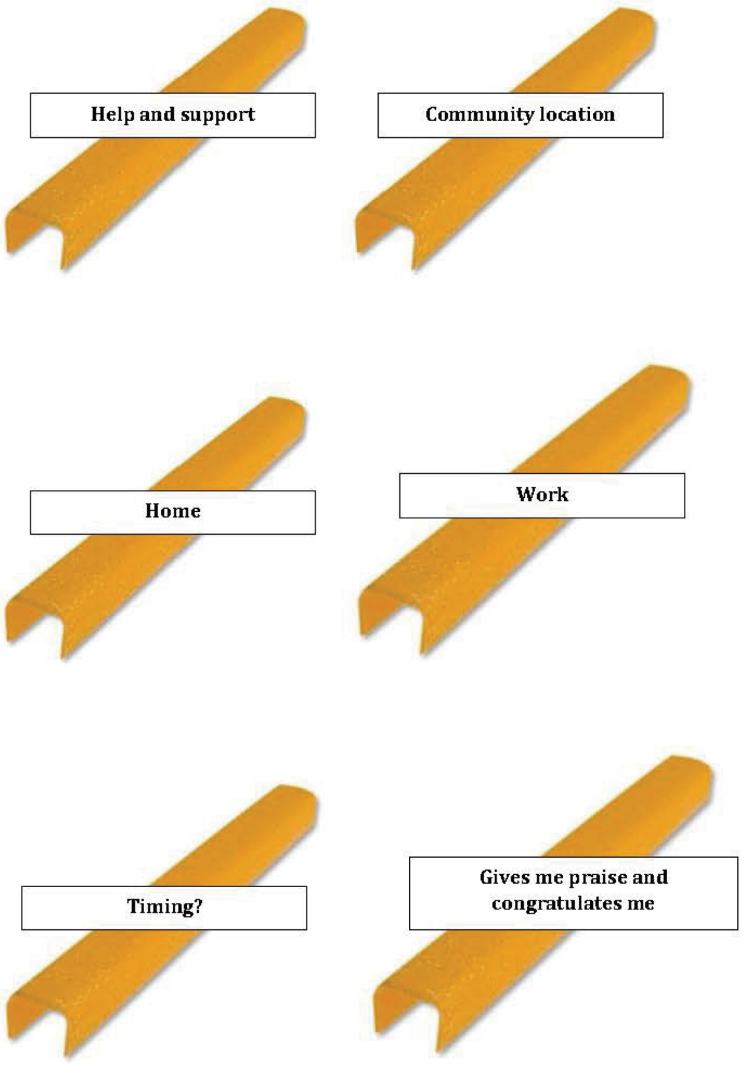
Other rungs


Telephone helpline
SMS service
Face to face appointments
Support group
Midwife
Health Visitor

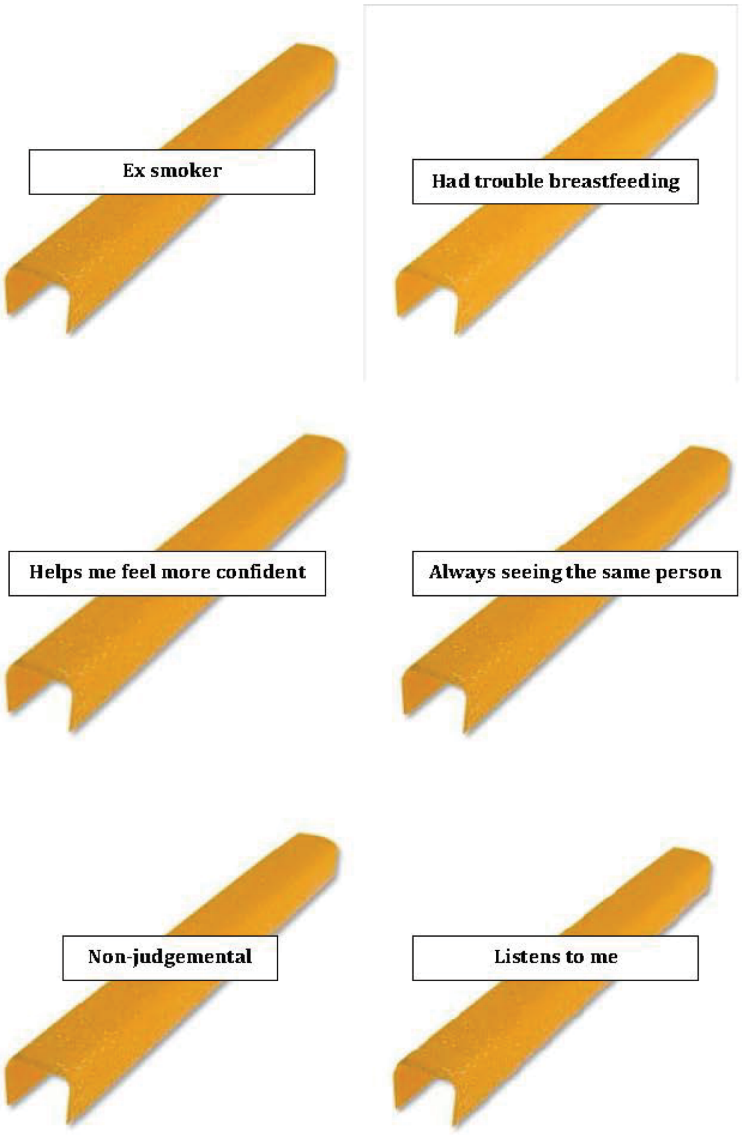


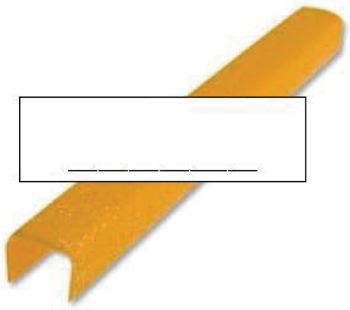
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.


Prove breastfeeding
Cut down smoking only
Express breast milk
Give up smoking and breastfeed
Goal setting
Information and education



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.


Ex smoker
Had trouble breastfeeding
Helps me feel more confident
Always seeing the same person
Non-judgemental
Listens to me



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 5 Blackpool 'ladders'

Ladder A



Other Rungs	
Telephone helpline	
SMS	
Face-to-face contact	
Support group	✓
Midwife	
Health visitor	
GP	
Pharmacist	
Smoking cessation service	
Breastfeeding peer support	✓
Breath test	
Urine test	
Prove breastfeeding	
Expressed breast milk	
Cut down smoking	
Give up smoking and breastfeeding	
Goal-setting	✓
Information and education	
Help and support	✓
Community location	✓
Home	
Work	✓
Timing?	✓
Non-judgemental	
Listens to me	✓
Helps me feel more confident	
Always seeing the same person	
Gives me support and congratulates me	✓

ANY OTHERS??

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Ladder B

Other Rungs	
Ex-smoker	
Had trouble breastfeeding	
Partner stops smoking too	
Smoke-free home/car	✓
Partner encourages me to breastfeed	
Friend who breastfeeds visits regularly	
No-one I know breastfeeds	
Smoking on a night out	✗
Managing the school run or working and breastfeading	
Embarrassed in public	
Stress	
I like smoking	✓
I'm too tired	
I don't have time	



ANY OTHERS??
Continuous chest infections
Coughs
Furry tounge
Smell
Health
Never in control of life if smoke

Ladder C



Other Rungs	
Ex-smoker	✓
Had trouble breastfeeding	✓
Partner stops smoking too	✓
Smoke-free home/car	✓
Partner encourages me to breastfeed	✓
Friend who breastfeeds visits regularly	✓
No-one I know breastfeeds	✓
Smoking on a night out	✗
Managing the school run or working and breastfeading	✗
Embarrassed in public	✓
Stress	✓
I like smoking	✓
I'm too tired	✓
I don't have time	✓

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 6 PROSPERO acknowledgement of receipt

Dear Registrant,

Thank you for submitting details of your systematic review for registration in PROSPERO.

The information you have provided will be checked to make sure that your systematic review is within the register scope. Field content will also be checked for relevance.

Please note that these checks do not constitute peer review or imply approval of your systematic review methods.

You will be notified of publication on the register, asked to provide further information or clarification, or informed of the reasons for non-publication within the next five working days. Please note that during this time the record will be locked and you will not be able to access it.

Yours sincerely

PROSPERO Administrator Centre for Reviews and Dissemination
University of York
York
YO10 5DD
t: +44 (0) 1904 321040
f: +44 (0) 1904 321041
e: CRD-Register@york.ac.uk www.york.ac.uk/inst/crd

CRD is part of the National Institute for Health Research and is a department of the University of York.

E-mail disclaimer: http://www.york.ac.uk/docs/disclaimer/email.htm

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 7 Search strategies

Smoking cessation

MEDLINE (1946 to February Week 1 2012), MEDLINE-in-Process & Other Non-Indexed Citations (1946 to 28 February 2012), EMBASE (1974 to 2012 February 28)

Ovid multifile search: see http://shibboleth.ovid.com/

1. exp Reward/
2. Motivation/
3. gift giving/
4. patient compliance/
5. capitation fee/
6. quality assurance, health care/
7. fee for service plans/use prmz
8. reimbursement, incentive/use prmz
9. "Reinforcement (psychology)"/use prmz
10. employee incentive plans/use prmz
11. "salaries and fringe benefits"/use prmz
12. physician incentive plans/use prmz
13. remuneration/use prmz
14. reinforcement/use oemezd
15. exp personnel management/use oemezd
16. "awards and prizes"/use oemezd
17. reimbursement/use oemezd
18. exp accreditation/
19. punishment/use prmz
20. (incentiv$or competit$or lottery or lotteries or stipend$or bonus$or cash or contest$or discount$or disincentiv$or gift or gifts or price$or prize or prizes or raffle$or reward$or token or tokens or voucher$or win or won or award$or inducement or certifi$or accredit$or quality assurance or (contingen$adj3 payment$) or (tangible adj2 (goods or service$))).tw.
21. (fee or fees or tax or taxes or taxation or fined or fines or charg$or penal$or punish$).tw.
22. or/1–21
23. exp "Tobacco Use Cessation"/
24. tobacco dependence/use oemezd
25. maternal smoking/use oemezd
26. cigarette smoking/use oemezd
27. smoking cessation/use oemezd
28. smoking habit/use oemezd
29. "tobacco use disorder"/
30. (smok$adj3 (cessation or quit$or stop or stopping or stopped or abstain$or reduc$or ceas$or give or gave or giving)).tw.
31. ((cigar$or tobacco) adj3 smok$).tw.
32. ((smok$or tobacco) adj3 control).tw.
33. ((cigar$or tobacco) adj2 (use$or usage or using)).tw.
34. (smok$adj2 (relaps$adj3 (prevent$or recurr$or maintain$or sustain$))).tw.
35. smoking/pc [prevention and control]
36. or/23–35
37. Pregnancy/use prmz
38. exp pregnancy/use oemezd

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

39. puerperium/use oemezd
40. Prenatal Care/
41. pregnant women/use prmz
42. pregnant woman/use oemezd
43. (antenatal or prenatal or prepartum or puerperium or postpartum or pregnan$).tw.
44. exp Perinatal Care/
45. or/37–42
46. 22 and 36 and 45
47. ((smok$or cigar$or tobacco) adj3 pregnan$).tw.
48. 22 and 47
49. 46 or 48
50. exp animals/not humans/
51. 49 not 50
52. remove duplicates from 51

Cumulative Index to Nursing and Allied Health Literature (1981 to February 2012)

URL: see http://search.ebscohost.com

1. (MH "Capitation Fee")
2. (MH "Fee for Service Plans")
3. (MH "Quality Assurance+")
4. TX remuneration or quality assurance
5. TX tangible n2 goods
6. TX tangible n2 service*
7. TX fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
8. (MH "Accreditation+")
9. (MH "Reward")
10. (MH "Motivation+")
11. (MH "Gift Giving")
12. (MH "Patient Compliance+")
13. (MH "Reinforcement (Psychology)+")
14. (MH "Employee Incentive Programs")
15. (MH "Salaries and Fringe Benefits+")
16. (MH "Physician Incentive Plans")
17. (MH "Awards and Honors+")
18. (MH "Reimbursement, Incentive")
19. TX incentive* or competit* or lottery or lotteries or stipend or bonus or cash or contest* or discount* or disincentive* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win* or award* or inducement or certifi* or accredit*
20. TX contingen* n3 payment*
21. S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20
22. (MH "Smoking Cessation Programs")
23. (MH "Tobacco+")
24. TX smok* n3 (cessation or quit* or stop or stopping or stopped or abstain* or reduc* or ceas* or give or gave or giving)
25. (MH "Smoking/PC")
26. (MH "Smoking Cessation")
27. TX smok* AND TX relaps*
28. TX (cigar* or tobacco) n3 (smok* or control*)
29. S22 or S23 or S24 or S25 or S26 or S27 or S28
30. TX smok* n3 pregnan*

31. TX cigar* n3 pregnan*
32. TX tobacco n3 pregnan*
33. S30 or S31 or S32
34. S21 and S33
35. (MH "Pregnancy")
36. (MH "Postnatal Period+")
37. (MH "Postnatal Care+")
38. (MH "Perinatal Care")
39. (MH "Expectant Mothers")
40. TX antenatal or preparum or puerperium or postpartum or pregnan* or postnatal
41. S35 or S36 or S37 or S38 or S39 or S40
42. S21 and S29 and S41
43. S34 or S42
44. Exclude MEDLINE records

PsycINFO (1806 to February 2012)

URL: see http://search.ebscohost.com

1. DE "Incentives" OR DE "Educational Incentives" OR DE "Monetary Incentives"
2. DE "Rewards" OR DE "External Rewards" OR DE "Internal Rewards" OR DE "Monetary Rewards" OR DE "Preferred Rewards"
3. DE "Professional Fees" OR DE "Fee for Service"
4. DE "Treatment Compliance"
5. DE "Quality of Care"
6. DE "Reinforcement" OR DE "Differential Reinforcement" OR DE "Negative Reinforcement" OR DE "Noncontingent Reinforcement" OR DE "Positive Reinforcement" OR DE "Primary Reinforcement" OR DE "Punishment" OR DE "Reinforcement Amounts" OR DE "Reinforcement Schedules" OR DE "Rewards" OR DE "Secondary Reinforcement" OR DE "Self Reinforcement" OR DE "Social Reinforcement"
7. DE "Employee Benefits" OR DE "Bonuses" OR DE "Employee Assistance Programs" OR DE "Employee Health Insurance" OR DE "Employee Leave Benefits" OR DE "Employee Pension Plans" OR DE "Workers' Compensation Insurance"
8. DE "Awards (Merit)"
9. DE "Employee Motivation"
10. DE "Motivation"
11. DE "Hospital Accreditation"
12. TX incentive* or competit* or lottery or lotteries or stipend or bonus or cash or contest* or discount* or disincentive* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win* or award* or inducement or certifi* or accredit*
13. TX tangible n2 good*
14. TX tangible n2 service*
15. TX contingen* n3 payment*
16. fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
17. S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16
18. DE "Smoking Cessation"
19. DE "Tobacco Smoking" OR DE "Passive Smoking"
20. TX smok* n3 (cessation or quit* or stop or stopping or stopped or abstain* or reduc* or ceas* or give or gave or giving)
21. TX smok* n3 relaps*
22. S18 or S19 or S20 or S21
23. pregnan* n3 (smok* or cigar* or tobacco)
24. DE "Pregnancy" OR DE "Adolescent Pregnancy" OR DE "Perinatal Period" OR DE "Postnatal Period" OR DE "Prenatal Care"

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

25. DE "Expectant Mothers"
26. TX antenatal or prenatal or prepartum or puerperium or postpartum or pregnan* or postnatal
27. S24 or S25 or S26
28. S17 and S22 and S27
29. S17 and S23
30. S28 or S29

Science Citation Index, Social Sciences Citation Index, Conference Proceedings Citation Index – Science, Conference Proceedings Citation Index – Social Science & Humanities (1990 to March 2012)

URL: see www.webofknowledge.com

1. TS = (incentiv* or motivat* or tangible* or accredit* or lotter* or raffle* or contest* or competit* or bonus* or stipend* or price* or prize or prizes or reward* or token* or voucher* or discount* or disincentive* or win or won or certif* or quality assurance or gifts or gift or cash or punish* or penal* or fee or fees or fined or fines or tax or taxes or taxation)
2. TS = (pregnan* or postnatal or antenatal or prenatal or puerperium or prepartum or postpartum)
3. TS = ((pregnan*) near/3 (smok* or cigar* or tobacco))
4. TS = ((smok*) near/3 (cessation or cease or ceased or quit* or "give up" or "giving up" or "gave up" or relaps* or "stop" or "stopping" or "stopped" or reduc* or abstain*))
5. #4 AND #2 AND #1
6. #3 AND #1
7. #6 OR #5
8. TS = ((animal* or rat or rats or mouse or mice) NOT (human* or men or women))
9. #7 not #8

Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews (The Cochrane Library, Issue 2, 2012)

URL: see www.thecochranelibrary.com

1. MeSH descriptor Reward explode all trees
2. MeSH descriptor Motivation, this term only
3. MeSH descriptor Gift Giving, this term only
4. MeSH descriptor Patient Compliance explode tree 1
5. MeSH descriptor Capitation Fee, this term only
6. MeSH descriptor Fee-for-Service Plans, this term only
7. MeSH descriptor Quality Assurance, Health Care, this term only
8. MeSH descriptor Reimbursement, Incentive, this term only
9. MeSH descriptor Reinforcement (Psychology), this term only
10. MeSH descriptor Employee Incentive Plans, this term only
11. MeSH descriptor Salaries and Fringe Benefits, this term only
12. MeSH descriptor Physician Incentive Plans, this term only
13. MeSH descriptor Accreditation explode tree 1
14. MeSH descriptor Punishment, this term only
15. incentive* or competit* or lottery or lotteries or stipend* or bonus* or cash or contest* or discount* or disincentive* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement or certifi* or accredit* or quality assurance
16. fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
17. contingen* near/3 payment*
18. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17)
19. MeSH descriptor Tobacco Use Cessation explode all trees
20. MeSH descriptor Tobacco Use Disorder, this term only

21. smok* near/3 (cessation or quit* or stop or stopping or stopped or abstain* or reduc* or ceas* or give or gave or giving)
22. smok* near/5 (relaps* or prevent* or recurr* or maintain* or sustain*)
23. MeSH descriptor Smoking, this term only with qualifier: PC
24. (#19 OR #20 OR #21 OR #22 OR #23)
25. MeSH descriptor Pregnancy, this term only
26. MeSH descriptor Prenatal Care, this term only
27. MeSH descriptor Pregnant Women, this term only
28. antenatal or prenatal or prepartum or puerperium or postpartum or pregnan*
29. MeSH descriptor Perinatal Care explode tree 1
30. (#25 OR #26 OR #27 OR #28 OR #29)
31. pregnan* near/3 (smok* or tobacco or cigar*)
32. (#18 AND #24 AND #30)
33. (#18 AND #31)
34. (#32 OR #33)

Database of Abstracts of Reviews of Effects, NHS Economic Evaluation Database, Health Technology Assessment database (March 2012)

Centre for Reviews and Dissemination: see www.crd.york.ac.uk

1. MeSH DESCRIPTOR Motivation
2. MeSH DESCRIPTOR Gift Giving
3. MeSH DESCRIPTOR Capitation Fee
4. MeSH DESCRIPTOR Fee-for-Service Plans
5. MeSH DESCRIPTOR Reimbursement, Incentive
6. MeSH DESCRIPTOR Reinforcement (Psychology)
7. MeSH DESCRIPTOR Salaries and Fringe Benefits
8. MeSH DESCRIPTOR Physician Incentive Plans
9. incentive* or competit* or lottery or lotteries or stipend* or bonus* or cash or contest* or discount* or disincentive* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement or certifi* or accredit* or quality assurance or fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
10. contingen* adj3 payment*
11. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10
12. MeSH DESCRIPTOR Tobacco Use Disorder
13. MeSH DESCRIPTOR Smoking Cessation EXPLODE ALL TREES
14. smok* adj3 (cessation or quit* or stop or stopping or stopped or abstain* or reduc* or ceas* or give or gave or giving)
15. smok* adj3 (relaps* or prevent* or recurr* or maintain* or sustain*)
16. #12 OR #13 OR #14 OR #15
17. MeSH DESCRIPTOR Pregnancy
18. MeSH DESCRIPTOR Pregnant Women
19. antenatal or prenatal or prepartum or puerperium or postpartum or pregnan*
20. MeSH DESCRIPTOR Prenatal Care EXPLODE ALL TREES
21. MeSH DESCRIPTOR Postnatal Care
22. MeSH DESCRIPTOR Postpartum Period
23. #17 OR #18 OR #19 OR #20 OR #21 OR #22
24. (smok* or cigar* or tobacco) adj3 pregnan*
25. #11 AND #16 AND #23
26. #11 AND #24
27. #25 OR #26

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Applied Social Sciences Index and Abstracts (1987 to March 2012)

URL: see http://search.proquest.com/advanced

1. DE = ("penalties" or "fixed penalties" or "deterrence" or "disincentives" or "extrinsic rewards")
2. KW = (incentiv* or competit* or lotter* or stipend* or bonus* or cash or contest* or discount* or disincentiv* or gift or gifts or price* or prize* or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement* or certifi* or accredit* or quality assurance or contingent payment* or fee or fees or fined or fines or taxes or taxation or tax or charg* or penal* or punish*)
3. #1 or #2
4. DE = (smoking or heavy smoking or moderate smoking or occasional smoking or passive smoking or tobacco smoke)
5. KW = ((smok*) within 3 (cessation or ceas* or give up or gave up or giving up or abstain* or relaps* or stop or stopping or stopped or quit* or reduc*))
6. #4 or #5
7. DE = (maternal health care or antenatal education or perinatal care or pregnancy or antenatal or antenatal care or perinatal or postnatal care)
8. KW = (pregnan* or postnatal or antenatal or prenatal or postpartum or puerperium)
9. #7 or #8
10. #3 and #6 and #9
11. KW = (pregnan* within 3 (smok* or tobacco or cigar*))
12. #11 and #3
13. #10 or #12

Maternity and Infant Care (1971 to March 2012)

URL: see www.ovid.com/site/catalog/databases/2694.jsp

1. "Salaries and fringe benefits".de.
2. Patient compliance.de.
3. Quality assurance.de.
4. Health promotion.de.
5. Accreditation.de.
6. (incentive$or competit$or lottery or lotteries or stipend$or bonus$or cash or contest$or discount$or disincentive$or gift or gifts or price$or prize or prizes or raffle$or reward$or token or tokens or voucher$or win or won or award$or inducement or certifi$or accredit$or quality assurance or (contingen$adj3 payment$) or (tangible adj2 (goods or service$))).tw.
7. (fee or fees or tax or taxes or taxation or fined or fines or charg$or penal$or punish$).tw.
8. or/1–7
9. (Smoking or Smoking cessation).de.
10. Tobacco.de.
11. (smok$adj3 (cessation or quit$or stop or stopping or stopped or abstain$or reduc$or ceas$or give or gave or giving)).tw.
12. (smok$adj2 (relaps$adj3 (prevent$or recurr$or maintain$or sustain$))).tw.
13. or/9–12
14. ((smok$or cigar$or tobacco) adj3 pregnan$).tw.
15. Pregnancy.de.
16. (Puerperium or Antenatal care or Postnatal care or Postnatal health).de.
17. Antenatal care.de.
18. (antenatal or prenatal or prepartum or puerperium or postpartum or postnatal or pregnan$).tw.
19. or/15–18
20. 8 and 13 and 19
21. 8 and 14
22. 20 or 21

Midwives Information Resource Services (March 2012)

URL: see www.midirs.org

incentiv* OR voucher* OR token* AND FIELD SU = pregnancy AND FIELD SU = smoking cessation

Trials Register of Promoting Health Interventions (March 2012)

URL: see http://eppi.ioe.ac.uk/webdatabases/

1. Type(s) of intervention: incentives
2. Freetext: "incentiv*" or "competit*" or "lotter*" or "stipend*" or "bonus*" or "cash" or "contest*" or "discount*" or "disincentiv*" or "gift" or "gifts" or "price*" or "prize*" or "raffle*" or "reward*" or "token" or "tokens" or "voucher*" or "win" or "won" or "award*" or "inducement*" or "certifi*" or "accredit*" or "quality assurance" or "contingent payment*" or "contingency payment" or "fee" or "fees" or "fined" or "fines" or "taxes" or "taxation" or "tax" or "charg*" or "penal*" or "punish*
3. #1 or #2
4. Freetext: "smok*"
5. Freetext: "pregnan*" or "postnatal" or "antenatal" or "prenatal" or "postpartum" or "puerperium"
6. #3 and #4 and #5

Websites

- WHO (March 2012): see www.who.int
- UNICEF (March 2012): see www.unicef.org
- The King's Fund (March 2012): see www.kingsfund.org.uk/
- Action on Smoking & Health (Scotland) (ASH Scotland): see www.ashscotland.org.uk/
- NICE (March 2012): see www.nice.org.uk
- Treatobacco (March 2012): see www.treatobacco.net
- NHS Centre for Smoking Cessation and Training (March 2012): see www.ncsct.co.uk/
- Joanna Briggs Institute (March 2012): see www.joannabriggs.edu.au

Conference proceedings

- UK Society for Behavioural Medicine (2011): see http://uksbm.org.uk/wp-content/uploads/2012/03/Combined-final-conference-proceedings-UKSBM-ASM-2011.pdf
- UK Society for Behavioural Medicine (2010): see http://dl.dropbox.com/u/37425237/Proceedings/UKSBM-6th-Annual-Scientific-Meeting-Conference-Proceedings.pdf
- Society of Behavioural Medicine (2012): see www.springerlink.com/content/l0883r1057877406/fulltext.pdf
- Society of Behavioural Medicine (2011): see www.springerlink.com/content/w3563281v7567016/fulltext.pdf
- American Public Health Association (2011): see http://apha.confex.com/apha/139am/webprogram/start.html
- American Public Health Association (2010): see http://apha.confex.com/apha/138am/webprogram/start.html
- European Public Health Conference (2011): see http://eurpub.oxfordjournals.org/content/21/suppl_1.toc
- European Public Health Conference (2010): see http://eurpub.oxfordjournals.org/content/20/suppl_1/10.full.pdf+html
- Society for Research on Nicotine and Tobacco (2012): see www.srnt.org/conferences/2012/pdf/2012_Abstracts_H.pdf
- Society for Research on Nicotine and Tobacco (2011): see www.srnt.org/conferences/2011/pdf/2011%20SRNT%20Abstracts%20Web.pdf
- Society for Research on Nicotine and Tobacco Europe (2010): see www.srnt.org/conferences/eu/eu_past/europdf/SRNTEu2010AbstractBook.pdf
- UK National Smoking Cessation Conference (2010): see www.uknscc.org/2010_UKNSCC/posters.html

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Breastfeeding

MEDLINE (1946 to April Week 3 2012), MEDLINE-in-Process & Other Non-Indexed Citations (1946 to 5 May 2012), EMBASE (1974 to 2012 May 5)

Ovid multifile search: see http://shibboleth.ovid.com/

1. exp Reward/
2. Motivation/
3. gift giving/
4. patient compliance/
5. capitation fee/
6. quality assurance, health care/
7. fee for service plans/use prmz
8. reimbursement, incentive/use prmz
9. "Reinforcement (psychology)"/use prmz
10. employee incentive plans/use prmz
11. "salaries and fringe benefits"/use prmz
12. physician incentive plans/use prmz
13. remuneration/use prmz
14. reinforcement/use oemezd
15. exp personnel management/use oemezd
16. "awards and prizes"/use oemezd
17. reimbursement/use oemezd
18. exp accreditation/
19. punishment/use prmz
20. (incentiv$or competit$or lottery or lotteries or stipend$or bonus$or cash or contest$or discount$or disincentiv$or gift or gifts or price$or prize or prizes or raffle$or reward$or token or tokens or voucher$or win or won or award$or inducement or certifi$or accredit$or quality assurance or (contingen$adj3 payment$) or (tangible adj2 (goods or service$))).tw.
21. (fee or fees or tax or taxes or taxation or fined or fines or charg$or penal$or punish$).tw.
22. or/1–21
23. exp Breast Feeding/use prmz
24. milk, human/use prmz
25. exp infant feeding/use oemezd
26. (breast?fe$or breast fe$).tw.
27. breast feeding education/use oemezd
28. (breast?milk or breast milk or baby?milk or baby milk).tw.
29. ((baby or babies or infant$) adj2 feed$).tw.
30. or/23–29
31. 22 and 30
32. Infant Formula/use prmz
33. Artificial milk/use oemezd
34. (baby formula$or formula feed$or milk formula or formula fed or artificial milk or milk substitute$or infant formula$or synthetic milk or artificial feed$or bottle feed$or bottle fed).tw.
35. or/32–34
36. punishment/use prmz
37. (disincentiv$or discourag$or tax or taxes or taxation or fined or fines or charg$or penal$or punish$).tw.
38. or/36–37
39. 35 and 38
40. 31 or 39

41. exp animals/not humans/
42. 40 not 41
43. remove duplicates from 42

Cumulative Index to Nursing and Allied Health Literature (1981 to May 2012)

URL: see http://search.ebscohost.com

1. (MH "Capitation Fee")
2. (MH "Fee for Service Plans")
3. (MH "Quality Assurance+")
4. TX remuneration or quality assurance
5. TX tangible n2 goods
6. TX tangible n2 service*
7. TX disincentiv* or discourag* or fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
8. (MH "Accreditation+")
9. (MH "Reward")
10. (MH "Motivation+")
11. (MH "Gift Giving")
12. (MH "Patient Compliance+")
13. (MH "Reinforcement (Psychology)+")
14. (MH "Employee Incentive Programs")
15. (MH "Salaries and Fringe Benefits+")
16. (MH "Physician Incentive Plans")
17. (MH "Awards and Honors+")
18. (MH "Reimbursement, Incentive")
19. TX incentiv* or competit* or lottery or lotteries or stipend or bonus or cash or contest* or discount* or disincentiv* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win* or award* or inducement or certifi* or accredit*
20. TX contingen* n3 payment*
21. S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20
22. (MH "Breast Feeding+")
23. (MH "Attitude to Breast Feeding")
24. (MH "Breast Feeding Promotion")
25. (MH "Infant Feeding")
26. (MH "Milk, Human")
27. TX breast fe* OR breast#fe*
28. TX breast milk or breast#milk or baby milk or baby#milk
29. TX baby n2 feed*
30. TX babies n2 feed*
31. TX infant* n2 feed*
32. S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31
33. (MH "Infant Formula")
34. (MH "Bottle Feeding")
35. TX baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitute* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed
36. S33 or S34 or S35
37. S7 and S36
38. S21 and S32
39. S37 or S38 Exclude MEDLINE records

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

PsycINFO (1806 to May 2012)

URL: see http://search.ebscohost.com

1. DE "Incentives" OR DE "Educational Incentives" OR DE "Monetary Incentives"
2. DE "Rewards" OR DE "External Rewards" OR DE "Internal Rewards" OR DE "Monetary Rewards" OR DE "Preferred Rewards"
3. DE "Professional Fees" OR DE "Fee for Service"
4. DE "Treatment Compliance"
5. DE "Quality of Care"
6. DE "Reinforcement" OR DE "Differential Reinforcement" OR DE "Negative Reinforcement" OR DE "Noncontingent Reinforcement" OR DE "Positive Reinforcement" OR DE "Primary Reinforcement" OR DE "Punishment" OR DE "Reinforcement Amounts" OR DE "Reinforcement Schedules" OR DE "Rewards" OR DE "Secondary Reinforcement" OR DE "Self Reinforcement" OR DE "Social Reinforcement"
7. DE "Employee Benefits" OR DE "Bonuses" OR DE "Employee Assistance Programs" OR DE "Employee Health Insurance" OR DE "Employee Leave Benefits" OR DE "Employee Pension Plans" OR DE "Workers' Compensation Insurance
8. DE "Awards (Merit)"
9. DE "Employee Motivation"
10. DE "Motivation"
11. DE "Hospital Accreditation"
12. TX incentive* or competit* or lottery or lotteries or stipend or bonus or cash or contest* or discount* or disincentive* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win* or award* or inducement or certifi* or accredit*
13. TX tangible n2 good*
14. TX tangible n2 service*
15. TX contingen* n3 payment*
16. TX disincentiv* or discourag* or fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
17. S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16
18. DE "Breast Feeding"
19. TX breast fe* OR breast#fe*
20. TX breast milk or breast#milk or baby milk or baby#milk
21. TX baby n2 feed*
22. TX babies n2 feed*
23. TX infant* n2 feed*
24. S18 or S19 or S20 or S21 or S22 or S23
25. DE "Bottle Feeding"
26. TX baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitute* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed
27. S25 or S26
28. DE "Punishment" OR DE "Response Cost"
29. S16 or S28
30. S27 and S29
31. S17 and S24
32. S30 or S31

Science Citation Index, Social Sciences Citation Index, Conference Proceedings Citation Index – Science, Conference Proceedings Citation Index – Social Science & Humanities (1990 to May 2012)

URL: see www.webofknowledge.com

1. TS = (incentiv* or motivat* or tangible* or accredit* or lotter* or raffle* or contest* or competit* or bonus* or stipend* or price* or prize or prizes or reward* or token* or voucher* or discount* or disincentive* or win or won or certif* or quality assurance or gifts or gift or cash or punish* or penal* or fee or fees or fined or fines or tax or taxes or taxation)
2. TS = (human milk or breast fed or breast feed* or infant feed* breast*milk or breast milk or baby milk or baby*milk)
3. TS = ((baby or babies or infant*) near/2 feed*)
4. #3 OR #2
5. TS = (baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitute* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed)
6. TS = (disincentiv* or discourag* or tax or taxes or taxation or fined or fines or charg* or penal* or punish*)
7. #4 AND #1
8. #6 AND #5
9. #8 OR #7
10. TS = ((animal* or rat or rats or mouse or mice) NOT (human* or men or women))
11. #9 not #10

Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews (The Cochrane Library, Issue 5, 2012)

URL: see www.thecochranelibrary.com

1. MeSH descriptor Reward explode all trees
2. MeSH descriptor Motivation, this term only
3. MeSH descriptor Gift Giving, this term only
4. MeSH descriptor Patient Compliance explode tree 1
5. MeSH descriptor Capitation Fee, this term only
6. MeSH descriptor Quality Assurance, Health Care, this term only
7. MeSH descriptor Fee-for-Service Plans, this term only
8. MeSH descriptor Reimbursement, Incentive, this term only
9. MeSH descriptor Reinforcement (Psychology), this term only
10. MeSH descriptor Employee Incentive Plans, this term only
11. MeSH descriptor Salaries and Fringe Benefits, this term only
12. MeSH descriptor Physician Incentive Plans, this term only
13. MeSH descriptor Remuneration, this term only
14. MeSH descriptor Accreditation, this term only
15. MeSH descriptor Punishment, this term only
16. incentiv* or competit* or lottery or lotteries or stipend* or bonus* or cash or contest* or discount* or disincentiv* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement or certifi$or accredit* or quality assurance
17. contingen* near/3 payment*
18. fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
19. tangible near/2 (goods or servic*)
20. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR (#9 AND o AND #10) OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19)

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

21. MeSH descriptor Breast Feeding explode trees 1 and 2
22. MeSH descriptor Milk, Human, this term only
23. breast fed or breast feed or breast feeding
24. (breast or baby) near/1 milk
25. (baby or babies or infant*) near/2 feed*
26. (#21 OR #22 OR #23 OR #24 OR #25)
27. MeSH descriptor Infant Formula, this term only
28. baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitut* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed
29. (#27 OR #28)
30. disincentiv* or discourag* or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
31. (#15 OR #30)
32. (#20 AND #26)
33. (#29 AND #31)
34. (#32 OR #33)

Database of Abstracts of Reviews of Effects, NHS Economic Evaluation Database, Health Technology Assessment database (May 2012)

Centre for Reviews and Dissemination: see www.crd.york.ac.uk

1. MeSH descriptor Motivation
2. MeSH descriptor Gift Giving
3. MeSH descriptor Capitation Fee
4. MeSH descriptor Fee-for-Service Plans
5. MeSH descriptor Reimbursement, Incentive
6. MeSH descriptor Reinforcement (Psychology)
7. MeSH descriptor Salaries and Fringe Benefits
8. MeSH descriptor Physician Incentive Plans
9. incentive* or competit* or lottery or lotteries or stipend* or bonus* or cash or contest* or discount* or disincentive* or gift or gifts or price* or prize or prizes or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement or certifi* or accredit* or quality assurance or fee or fees or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
10. contingen* adj3 payment*
11. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10
12. MeSH descriptor Breast Feeding
13. MeSH descriptor milk, human
14. breastfe* or breast fe* or breast-fe*
15. breastmilk or breast milk or babymilk or baby milk
16. ((baby or babies or infant*) adj2 feed*)
17. #12 OR #13 OR #14 OR #15 OR #16
18. MeSH descriptor infant formula
19. baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitute* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed
20. #18 OR #19
21. disincentiv* or discourag* or tax or taxes or taxation or fined or fines or charg* or penal* or punish*
22. #20 AND #21
23. #11 AND #17
24. #22 OR #23

Applied Social Sciences Index and Abstracts (1987 to May 2012)

URL: see http://search.proquest.com/advanced

1. ((DE = (penalties or (fixed penalties) or deterrence) or DE = (disincentives or (extrinsic rewards))) or (KW = (incentiv* or competit* or lotter* or stipend* or bonus* or cash or contest* or discount* or disincentiv* or gift or gifts or price* or prize* or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement* or certifi* or accredit* or quality assurance or contingent payment* or fee or fees or fined or fines or taxes or taxation or tax or charg* or penal* or punish*))) and((DE = ("breastfeeding" or "weaning")) or(KW = ((breastfe* or breast fe* or breast-fe* or breastmilk or breast milk or babymilk or baby milk) or ((baby or babies or infant*) within 2 feed*))))
2. (KW = (baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitute* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed)) and (KW = (disincentiv* or discourag* or tax or taxes or taxation or fined or fines or charg* or penal* or punish*))
3. (((DE = (penalties or (fixed penalties) or deterrence) or DE = (disincentives or (extrinsic rewards))) or (KW = (incentiv* or competit* or lotter* or stipend* or bonus* or cash or contest* or discount* or disincentiv* or gift or gifts or price* or prize* or raffle* or reward* or token or tokens or voucher* or win or won or award* or inducement* or certifi* or accredit* or quality assurance or contingent payment* or fee or fees or fined or fines or taxes or taxation or tax or charg* or penal* or punish*))) and((DE = ("breastfeeding" or "weaning")) or(KW = ((breastfe* or breast fe* or breast-fe* or breastmilk or breast milk or babymilk or baby milk) or ((baby or babies or infant*) within 2 feed*))))) or ((KW = (baby formula* or formula feed* or milk formula or formula fed or artificial milk or milk substitute* or infant formula* or synthetic milk or artificial feed* or bottle feed* or bottle fed)) and (KW = (disincentiv* or discourag* or tax or taxes or taxation or fined or fines or charg* or penal* or punish*)))

Maternity and Infant Care (1971 to May 2012)

URL: see www.ovid.com/site/catalog/databases/2694.jsp

1. "Salaries and fringe benefits".de.
2. Patient compliance.de.
3. Quality assurance.de.
4. Health promotion.de.
5. Accreditation.de.
6. (incentive$or competit$or lottery or lotteries or stipend$or bonus$or cash or contest$or discount$or disincentive$or gift or gifts or price$or prize or prizes or raffle$or reward$or token or tokens or voucher$or win or won or award$or inducement or certifi$or accredit$or quality assurance or (contingen$adj3 payment$) or (tangible adj2 (goods or service$))).tw.
7. (fee or fees or tax or taxes or taxation or fined or fines or charg$or penal$or punish$).tw.
8. or/1–7
9. (Breastfeeding duration or Breastfeeding or Breastfeeding initiation).de.
10. (Infant feeding or Milk – human).de.
11. (breast?fe$or breast fe$).tw.
12. (breast?milk or breast milk or baby?milk or baby milk).tw.
13. ((baby or babies or infant$) adj2 feed$).tw.
14. or/9–13
15. 8 and 14
16. Infant formulae.de.
17. (baby formula$or formula feed$or milk formula or formula fed or artificial milk or milk substitute$or infant formula$or synthetic milk or artificial feed$or bottle feed$or bottle fed).tw.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

18. 16 or 17
19. (disincentiv$or discourag$or tax or taxes or taxation or fined or fines or charg$or penal$or punish$).tw.
20. 18 and 19
21. 15 or 20

Trials Register of Promoting Health Interventions (May 2012)

URL: see http://eppi.ioe.ac.uk/webdatabases/

1. Type(s) of intervention: incentives
2. Freetext: "incentiv*"
3. Freetext: "voucher*"
4. Freetext: "token*"
5. Freetext: stipend
6. Freetext: cash
7. Freetext: bonus
8. Freetext: "discount*"
9. Freetext: "disincentiv*"
10. Freetext: "gift*"
11. Freetext: "reward*"
12. Freetext: "accred*"
13. Freetext: "tax*"
14. Freetext: "penal*" or "punish*"
15. 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15
16. Freetext: "breast feeding"
17. Freetext: breastfeeding
18. Freetext: "breast fed"
19. Freetext: breastfed
20. Freetext: "breast feed"
21. Freetext: breastfeed
22. Freetext: "breast milk"
23. Freetext: "baby milk"
24. 16 OR 17 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24
25. 15 AND 24
26. 9 OR 13 OR 14
27. Freetext: formula
28. Freetext: "bottle feed*"
29. 27 OR 28
30. 26 AND 29
31. 25 OR 30

Websites

- WHO (May 2012): see www.who.int
- UNICEF (May 2012): see www.unicef.org
- The King's Fund (May 2012): see www.kingsfund.org.uk/
- NICE (May 2012): see www.nice.org.uk
- Royal College of Midwives (June 2012): see www.rcm.org.uk
- Academy of Breastfeeding Medicine (June 2012): see www.bfmed.org/

Conference proceedings

- UK Society for Behavioural Medicine (2011): see http://uksbm.org.uk/wp-content/uploads/2012/03/Combined-final-conference-proceedings-UKSBM-ASM-2011.pdf
- UK Society for Behavioural Medicine (2010): see http://dl.dropbox.com/u/37425237/Proceedings/UKSBM-6th-Annual-Scientific-Meeting-Conference-Proceedings.pdf
- Society of Behavioural Medicine (2012): see www.springerlink.com/content/l0883r1057877406/fulltext.pdf
- Society of Behavioural Medicine (2011): see www.springerlink.com/content/w3563281v7567016/fulltext.pdf
- American Public Health Association (2011): see http://apha.confex.com/apha/139am/webprogram/start.html
- American Public Health Association (2010): see http://apha.confex.com/apha/138am/webprogram/start.html
- European Public Health Conference (2011): see http://eurpub.oxfordjournals.org/content/21/suppl_1.toc
- European Public Health Conference (2010): see http://eurpub.oxfordjournals.org/content/20/suppl_1/10.full.pdf+html

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 8 Studies included in the smoking cessation review

Albrecht 1998

Albrecht S, Payne L, Stone CA, Reynolds MD. A preliminary study of the use of peer support in smoking cessation programs for pregnant adolescents. *J Am Acad Nurse Pract* 1998;**10**:119–25.

Cinciripini 2010

Cinciripini PM, Blalock JA, Minnix JA, Robinson JD, Brown VL, Lam C, *et al.* Effects of an intensive depression-focused intervention for smoking cessation in pregnancy. *J Consult Clin Psychol* 2010;**78**:44–54.

Cluss 2011

Cluss PA, Levine MD, Landsittel D. The Pittsburgh STOP program: disseminating an evidence-informed intervention for low-income pregnant smokers. *Am J Health Promot* 2011;**25**:S75–81.

Donatelle 2000

Primary

Donatelle RJ, Prows SL, Champeau D, Hudson D. Randomised controlled trial using social support and financial incentives for high risk pregnant smokers: Significant Other Supporter (SOS) program. *Tob Control* 2000;**9**(Suppl. 3):III67–9.

Secondary

Donatelle RJ, Prows SL, Champeau D, Hudson D. *Using Social Support, Biochemical Feedback, and Incentives to Motivate Smoking Cessation During Pregnancy: Comparison of Three Intervention Trials*. 128th Annual Meeting of the American Public Health Association, Boston, MA, 12–16 November 2000. Abstract 8260.

Donatelle RJ, Hudson D. *Using 5 A's and Incentives to Promote Prenatal Smoking Cessation*. National Conference on Tobacco or Health, San Francisco, CA, 19–21 November 2002.

Edwards 2009

Edwards MJ, Geiser T, Chafin C, Weatherby NL, Smith CM. S.M.A.R.T. mothers are resisting tobacco: prenatal smoking cessation in WIC mothers. *J Allied Health* 2009;**38**:170–6.

Gadomski 2011

Gadomski A, Adams L, Tallman N, Krupa N, Jenkins P. Effectiveness of a combined prenatal and postpartum smoking cessation program. *Matern Child Health J* 2011;**15**:188–97.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Gulliver 2004

Gulliver SB, Colby SM, Hayes K, Raffa SD. Tobacco cessation treatment for pregnant smokers: incorporating partners and incentives. *Med Health R I* 2004;**87**:9–12.

Hartmann 2007

Hartmann KE, Wechter ME, Payne P, Salisbury K, Jackson RD, Melvin CL. Best practice smoking cessation intervention and resource needs of prenatal care providers. *Obstet Gynecol* 2007;**110**:765–70.

Heil 2008

Primary

Heil SH, Higgins ST, Bernstein IM, Solomon LJ, Rogers RE, Thomas CS, *et al.* Effects of voucher-based incentives on abstinence from cigarette smoking and fetal growth among pregnant women. *Addiction* 2008;**103**:1009–18.

Secondary

Heil SH, Higgins ST, Mongeon JA, Badger GJ, Bernstein IM. Characterizing nicotine withdrawal in pregnant cigarette smokers. *Exp Clin Psychopharmacol* 2006;**14**:165–70.

Heil SH, Higgins ST, Solomon LJ, Lynch ME, McHale L, Dumeer A, *et al. Voucher-Based Incentives for Abstinence from Cigarette Smoking in Pregnant and Postpartum Women*. 13th Annual Meeting of the Society for Research on Nicotine and Tobacco, Austin, TX, 21–24 February 2007. Abstract PA6-1.

Reynolds S. Vouchers boost smoking abstinence during pregnancy. *Nida Notes* 2010;**23**:10.

Higgins 2004

Primary

Higgins ST, Heil SH, Solomon LJ. A pilot study on voucher-based incentives to promote abstinence from cigarette smoking during pregnancy and postpartum. *Nicotine Tob Res* 2004;**6**:1015–20.

Secondary

Higgins ST, Heil SH, Dumeer AM, Thomas CS, Solomon LJ, Bernstein IM. Smoking status in the initial weeks of quitting as a predictor of smoking-cessation outcomes in pregnant women. *Drug Alcohol Depend* 2006;**85**:138–41.

Higgins ST, Bernstein IM, Washio Y, Heil SH, Badger GJ, Skelly JM, *et al.* Effects of smoking cessation with voucher-based contingency management on birth outcomes. *Addiction* 2010;**105**:2023–30.

Higgins ST, Heil SH, Badger GJ, Skelly JM, Solomon LJ, Bernstein IM. Educational disadvantage and cigarette smoking during pregnancy. *Drug Alcohol Depend* 2009;**104**:S100–5.

Higgins TM, Higgins ST, Heil SH, Badger GJ, Skelly JM, Bernstein IM, *et al.* Effects of cigarette smoking cessation on breastfeeding duration. *Nicotine Tob Res* 2010;**12**:483–8.

Yoon JH, Higgins ST, Heil SH, Sugarbaker RJ, Thomas CS, Badger GJ. Delay discounting predicts postpartum relapse to cigarette smoking among pregnant women. *Exp Clin Psychopharmacol* 2007;**15**:176–86.

Latts 2002

Latts LM, Prochazka AV, Salas NM, Young DA. Smoking cessation in pregnancy: failure of an HMO pilot project to improve guideline implementation. *Nicotine Tob Res* 2002;**4**(Suppl. 1):25–30.

Lillington 1995

Lillington L, Royce J, Novak D, Ruvalcaba M, Chlebowski R. Evaluation of a smoking cessation program for pregnant minority women. *Cancer Pract* 1995;**3**:157–63.

Lowe 1997

Lowe JB, Windsor R, Balanda KP, Woodby L. Smoking relapse prevention methods for pregnant women: a formative evaluation. *Am J Health Promot* 1997;**11**:244–6.

Lynagh 2011

Lynagh M, Bonevski B, Symonds I, Sanson-Fisher RW. Paying women to quit smoking during pregnancy? Acceptability among pregnant women. *Nicotine Tob Res* 2011;**13**:1029–36.

Mantzari 2012

Mantzari E, Vogt F, Marteau TM. The effectiveness of financial incentives for smoking cessation during pregnancy: is it from being paid or from the extra aid? *BMC Pregnancy Childbirth* 2012;**12**:24.

McBride 2004

McBride CM, Baucom DH, Peterson BL, Pollak KI, Palmer C, Westman E, *et al.* Prenatal and postpartum smoking abstinence – a partner-assisted approach. *Am J Prev Med* 2004;**27**:232–8.

Morgan 2005

Morgan A, Bennett K, Hannon P, Weinberger J. Evaluation of a Smoke Stop service in a Sure Start programme. *MIDIRS Midwifery Digest* 2005;**15**:496–500.

Nichter 2007

Nichter M, Nichter M, Muramoto M, Adrian S, Goldade K, Tesler L, *et al.* Smoking among low-income pregnant women: an ethnographic analysis. *Health Educ Behav* 2007;**34**:748–64.

Pbert 2004

Pbert L, Ockene JK, Zapka J, Ma Y, Goins KV, Oncken C, *et al.* A community health center smoking-cessation intervention for pregnant and postpartum women. *Am J Prev Med* 2004;**26**:377–85.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Radley 2013

Radley A, Ballard P, Eadie D, MacAskill S, Donnelly L, Tappin D. Give it up for Baby: outcomes and factors influencing uptake of a pilot smoking cessation incentive scheme for pregnant women. *BMC Public Health* 2013;**13**:1.

Ripley-Moffitt 2008

Ripley-Moffitt CE, Goldstein AO, Fang WL, Butzen AY, Walker S, Lohr JA. Safe babies: a qualitative analysis of the determinants of postpartum smoke-free and relapse states. *Nicotine Tob Res* 2008;**10**:1355–64.

Ussher 2008

Ussher M, Aveyard P, Coleman T, Straus L, West R, Marcus B, *et al.* Physical activity as an aid to smoking cessation during pregnancy: two feasibility studies. *BMC Public Health* 2008;**8**:8.

Walsh 1997

Primary

Walsh RA, Redman S, Brinsmead MW, Byrne JM, Melmeth A. A smoking cessation program at a public antenatal clinic. *Am J Public Health* 1997;**87**:1201–4.

Secondary

Walsh RA, Redman S, Byrne JM, Melmeth A, Brinsmead MW. Process measures in an antenatal smoking cessation trial: another part of the picture. *Health Educ Res* 2000;**15**:469–83.

Appendix 9 Studies included in the breastfeeding review

Bai 2000

Bai Y, Wunderlich SM, Kashdan R. Inclusion of manual breast pump in hospital discharge bags promotes breastfeeding exclusivity. *J Am Diet Assoc* 2000;**110**(Suppl. 2):A112.

Bliss 1997

Bliss MC, Wilkie J, Acredolo C, Berman S, Tebb KP. The effect of discharge pack formula and breast pumps on breastfeeding duration and choice of infant feeding method. *Birth* 1997;**24**:90–7.

Cattaneo 2001

Cattaneo A, Borgnolo G, Simon G. Breastfeeding by objectives. *Eur J Public Health* 2001;**11**:397–401.

Chamberlain 2006

Chamberlain LB, McMahon M, Philipp BL, Merewood A. Breast pump access in the inner city: a hospital-based initiative to provide breast pumps for low-income women. *J Hum Lact* 2006;**22**:94–8.

Chiasson 2011

Chiasson MA, Findley S, Sekhobo J, Scheinmann R, Edmunds LS, Faly A, *et al.* Changing WIC changes what children eat. *Obesity* 2011;**19**:S48.

Cohen 1994

Cohen R, Mrtek MB. The impact of two corporate lactation programs on the incidence and duration of breast-feeding by employed mothers. *Am J Health Promot* 1994;**8**:436–41.

Dungy 1992

Dungy CI, Christensen-Szalanski J, Losch M, Russell D. Effect of discharge samples on duration of breast-feeding. *Pediatrics* 1992;**90**:233–7.

Finch 2002

Finch C, Daniel EL. Breastfeeding education program with incentives increases exclusive breastfeeding among urban WIC participants. *J Am Diet Assoc* 2002;**102**:981–4.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Hayes 2008

Hayes DK, Prince CB, Espinueva V, Fuddy LJ, Li R, Grummer-Strawn LM. Comparison of manual and electric breast pumps among WIC women returning to work or school in Hawaii. *Breastfeed Med* 2008;**3**:3–10.

Hill 1987

Hill PD. Effects of education on breastfeeding success. *Matern Child Nurs J* 1987;**16**:145–56.

Pugh 1998

Pugh LC, Milligan RA. Nursing intervention to increase the duration of breastfeeding. *Appl Nurs Res* 1998;**11**:190–4.

Rasmussen 2011

Rasmussen KM, Dieterich CM, Zelek ST, Altabet JD, Kjolhede CL. Interventions to increase the duration of breastfeeding in obese mothers: the Bassett Improving Breastfeeding Study. *Breastfeed Med* 2011;**6**:69–75.

Reeves Tuttle 1995

Reeves Tuttle C, Dewey KG. Impact of a breast-feeding promotion program for Hmong women at selected WIC sites in northern California. *J Nutr Educ* 1995;**27**:69–74.

Sciacca 1995

Primary

Sciacca JP, Phipps BL, Dube DA, Ratliff MI. Influences on breast-feeding by lower-income women – an incentive-based, partner-supported educational program. *J Am Diet Assoc* 1995;**95**:323–8.

Secondary

Sciacca JP, Dube DA, Phipps BL, Ratliff MI. A breast-feeding education and promotion program – effects on knowledge, attitudes, and support for breast-feeding. *J Community Health* 1995;**20**:473–90.

Thomson 2012

Thomson G, Dykes F, Hurley MA, Hoddinott P. Incentives as connectors: insights into a breastfeeding incentive intervention in a disadvantaged area of North-West England. *BMC Pregnancy Childbirth* 2012;**12**:22.

Volpe 2000

Volpe EM, Bear M. Enhancing breastfeeding initiation in adolescent mothers through the Breastfeeding Educated and Supported Teen (BEST) Club. *J Hum Lact* 2000;**16**:196–200.

Wolfberg 2004

Wolfberg AJ, Michels KB, Shields W, O'Campo P, Bronner Y, Bienstock J. Dads as breastfeeding advocates: results from a randomized controlled trial of an educational intervention. *Am J Obstet Gynecol* 2004;**191**:708–12.

Wright 2012

Wright SS, Lea CS, Holloman R, Cornett A, Harrison LM, Randolph GD. Using quality improvement to promote breast-feeding in a local health department. *J Public Health Manag Pract* 2012;**18**:36–42.

Zimmerman 1999

Zimmerman DR. You can make a difference: increasing breastfeeding rates in an inner-city clinic. *J Hum Lact* 1999;**15**:217–20.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 10 Grey literature

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 60 Grey literature on incentives provided to women to improve smoking cessation in pregnancy outcomes

Study	Country	Study design	Total *n* participants	Incentive and value when stated	Incentive contingent on smoking cessation	Validation	Primary outcome	Follow-up	Main outcomes reported
NHS North East Essex/ Greenstead, Colchester and Harwich 2010	UK	Non-randomised	49	Food vouchers given at 1 week, 4 weeks and 1 year after quitting	Yes	CO verification	Quit smoking, remain quit	1 year	Of 18 women who were smoke free at 4 weeks, seven remained quit
NHS Telford and Wrekin	UK	Non-randomised	Unclear	Health trainer – weight focus – supervised exercise	Unclear	Unclear	Unclear	Unclear	Unclear
NHS Torbay and Somerset – Smokefree South West M2B (mums to be)	UK	Non-randomised	Unclear	Vouchers	Yes	CO verification	Quit smoking, remain quit	Unclear	Unclear
Robl 2010[342] – abstract	USA	Non-randomised	790 (738 set quit dates)	Incentives at three time points	Yes	CO verification	Quit smoking	Unclear	340 quit smoking
Sheffield SOS[343]	UK	Unclear	490	£140.00	Unclear	Unclear	Unclear	Unclear	Unclear
Tobacco Free Futures[344]	UK	Non-randomised	18	Financial vouchers given monthly	Yes	CO verification	Quit smoking, remain quit	After birth	15/18 quit smoking

TABLE 61 Grey literature on incentives provided to women to improve breastfeeding outcomes

Study	Country	Study design	Total *n* participants	Incentive and value when stated	Contingency	Validation	Primary outcome	Follow-up	Main outcomes reported
Baby Café 2000–2012[286]	UK (and international)	Non-randomised	Rolling programme, drop-in format. Supports 7800 mothers per year (2010–11 figure)	Provision of refreshments at drop-in breastfeeding support centres (provision of enhanced training and development for health professionals to upskill and engage)	Initiation/ duration	Self-report	Any breast milk	None	133 cafés (109 UK, 24 international) 21% of mothers attending Baby Café drop-ins are from low-income families, 20% are from ethnic backgrounds other than white British and 9% are 'young' mums; 12% are antenatal
Best Fed Babies 2002–[345]	UK	Non-randomised	Rolling programme, voluntary	£50.00 voucher each month for up to 6 months antenatally and 3 months postnatally	Initiation/ duration	Self-report with health visitor monitoring	Primary outcome is low birth weight. Any breast milk is a secondary outcome	Survey	Approximately 100 mothers per year, deprived/low-income area
Bristol Social Marketing Centre[346]	UK	Non-randomised, before and after	Unclear – pilot	Bras, gift items, free bus travel	Initiation/ duration	Self-report	Any breast milk	Evaluation	16/85 women still breastfeeding at 1 week, 5/85 at 6 weeks and 3/85 at 6 months, although one figure cites 100 silver awards – unclear
Maternity rights comparison,[347] France, Italy, UK	Europe	NA	NA	Paid maternity leave and paid nursing breaks	NA	NA	NA	NA	Unclear

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 61 Grey literature on incentives provided to women to improve breastfeeding outcomes (*continued*)

Study	Country	Study design	Total *n* participants	Incentive and value when stated	Contingency	Validation	Primary outcome	Follow-up	Main outcomes reported
North West PCTs 2010–11	UK	Thomson *et al.*[112] plus three other similar schemes	Fixed period programme – unclear	Gift items, leisure vouchers, shopping and fruit and vegetable vouchers	Initiation/ duration	Self-report and informal monitoring	Any breast milk	Unclear	Increase in breastfeeding rates: Blackpool – 7.3% ($n = 141$); Ashton, Leigh and Wigan – 9–40% ($n = 111$); Halton and St Helen's – unclear; Tameside and Glossop – unclear
NoSH (Nourishing Start for Health)[348]	UK	Feasibility	Unclear	Financial vouchers	Prevalence and duration	Unclear	Unclear	Evaluation	Unclear
JFL[349]	Canada	Policy, population	Unclear	C$37.50 per month supplement (some subsidised infant formula)	Prevalence	Affidavit from doctor	Any breast milk	Unclear	Unclear

NA, not applicable; PCT, primary care trust.

TABLE 62 Grey literature on incentives for providers to improve smoking cessation in pregnancy outcomes

Study	Country	Study design	Total *n* participants	Incentive and value when stated	Contingency	Validation	Primary outcome	Follow-up	Main outcomes reported
PATH[350]	UK	Non-randomised							
Stop for Life			388	Used PATH funding to support staff to run improved services	No	Self-report (CO at 1 month)	Quit smoking, remain quit	12 months	275 quit episodes, 70 quit at 1 month, 66 at 3 months, 17 at 12 months
Dundee Pregnancy and Smoking Project (DPSP)			74	Used PATH funding to provide a specialised support service	No	Self-report (CO at 1 month)	Quit smoking, remain quit	12 months	13 quit episodes, none quit at 1 month, one at 3 months and none at 12 months
Cross Lanarkshire Action Smoking in Pregnancy (CLASP)			191	Used PATH funding for a member of staff dedicated to a training and buddies programme	No	Self-report (CO at 1 month)	Quit smoking, remain quit	12 months	117 quit episodes, one quit at 1 month, two at 3 months and one at 12 months

TABLE 63 Grey literature on incentives for providers to improve breastfeeding outcomes

Study	Country	Study design	Total *n* participants	Incentive and value when stated	Contingency	Validation	Primary outcome	Follow-up	Main outcomes reported
Payment by results for the family sector[351]	UK	Non-randomised, before and after	Payment by results to children's centres	Unclear	Initiation/ duration	Self-report and informal monitoring	Any breast milk	Unclear	Unclear

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 11 Single electronic mixed-methods data extraction form

BIBS Data Extraction and Assessment Form

Study details

Study ID:	**Report ID :**	Date form completed:
First author:	Year of study:	Data extractor:
Citation (including title):		
REFIDs of possibility related studies (was there a pilot study?):		

1. General Information

Publication type	Journal Article c Abstract c Other (specify e.g. book chapter)_____
Country/countries of study:	
Funding source of study:	Potential conflict of interest from funding? Y / N / unclear
Author(s') disciplinary background(s):	Any other details of researcher(s):
Ethics	Study design (who involved, any pilot?)

2. Study Eligibility

Study Characteristics			**Page/ Para/ Figure #**
Type of study (Review authors to add/remove designs based on criteria specified in protocol)	c Randomised Controlled Trial (RCT) c Cluster Randomised Controlled Trial (cluster RCT)	c Non-randomised study	
	c A process evaluation of an included study design	c Other design (specify):	
	Description in text:		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

3. Study details

Study intention	Descriptions as stated in the report/paper	Page/ Para/ Figure #
Epistemological perspective		
Aim of intervention	*What was the problem that this intervention was designed to address?*	
Aim of study (outcomes)	*What was the study designed to assess? Are these clearly stated?*	
Equity pointer: Social context of the study	*e.g. was study conducted in a particular setting that might target/exclude specific population s? See also Inclusion/exclusion criteria under Methods, below.*	
Start and end date of the study	*Identify which elements of planning of the intervention should be included*	
Total study duration		

Methods	Descriptions as stated in the report/paper	Page/ Para/ Figure #
Method/s of recruitment of participants *(How were potential participants approached and invited to participate? Where were participants recruited from? Does this differ from the intervention setting?)*		
Inclusion/exclusion criteria for participation in study		
Representativeness of sample: Are participants in the study likely to be representative of the target population?**		
Total number of groups		
Assumed risk estimate *(e.g. baseline or population risk noted in Background)*	*References:*	
Sample size calculation:** What assumptions were made? Were these assumptions appropriate?	*(Yes/No/Unclear)*	
What was the unit of analysis (e.g. cluster/patient)? Is this the same as the unit of randomisation? (Yes/No/Unclear)		
Statistical methods used and appropriateness of these methods**	(Check with your statistician if unsure about appropriateness)	

** - will be determined in separate quality assessment form for quantitative studies

Results

Participants *Include if relevant*	**Include information for each group (i.e. intervention and controls) under study**	**Page/ Para/ Figure #**
What percentage of selected individuals agreed to participate (were sampling criteria met)?		
Total number randomised (or total pop. at start of study for NRCTs)		
Number allocated to each intervention group (no. of individuals)		
For cluster trials, number of clusters, number of people per cluster		
Where there any significant baseline imbalances?**	Yes c No c Unclear c Details:	
Number and reason for (and sociodemographic differences of) withdrawals and exclusions for each intervention group)		
Were patients who entered the study adequately accounted for?**		
What percentage of patients completed the study?		
What percentage of participants received the allocated intervention or exposure of interest?		
Is the analysis performed by intervention allocation status (intention to treat) rather than the any attempts been made to impute actual intervention received? Have missing data?)		
Age (median, mean and range if possible)		
Sex		
Race/Ethnicity		
Relationship status		
Household behaviour (smoking in household)		
Principal behavior (incl. stage/type of pregnancy)		
Principal health condition (incl. details of smoking behavior)		
Diagnostic criteria (how behaviour is assessed)		
Co-morbidity		
Other sociodemographics (e.g. Educational level, literacy level, soci-economic status, first language, place of residence, occupation, religion, social capital. Also consider possible proxies for these e.g. low baseline nutritional status)		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

intervention Groups

Group names:	*(State brief name for this intervention group.)*	*(State brief name for this intervention group.)*	*(State brief name for this intervention group.)*	*(State brief name for this intervention group.)*	**Page/ Para/ Figure #**
Details of intervention or control condition *(Include if relevant in sufficient detail for replication)* ***Where appropriate state how measured***					
Setting *e.g. multicentre, university teaching hospitals, rural, metropolitan, school, workplace, community, GP clinic, etc.*					
Theoretical basis (include key references to literature and any					
Content (list the strategies intended and delivered, including					
Did the intervention include strategies to address diversity/disadvantage?	*Enter a description of any relevant strategies*				
Delivery (e.g. Stages (sequential or simultaneous), timing, frequency, duration, intensity, follow-up, fidelity – process indicators, communication)					
Providers (who, number, education/training in intervention delivery, ethnicity etc. if potentially relevant to acceptance and uptake by participants or because of possible bias in data collection)					
Co-interventions					
Was sustainability discussed by the authors? Was it a consideration in study development?					
Economic variables i.e. costs of the intervention, and changes in other (e.g. health care) costs as result of intervention *	Yes c **List in Outcome section if appropriate** No c Unclear c Details:				

Other economic information (from a societal, non-healthcare view – e.g. lost wages, time)	Yes c No c Details:	
Resource requirements to replicate intervention (e.g. staff numbers, hours of implementation, equipment?)		
What are the moderators/mediators		
Barriers/facilitators		
Intrinsic/extrinsic motivators		
Do the authors describe any political or organisational context?	*List relevant dot points*	
Were any partnerships referred to?	*List these as dot points*	
Were service users involved in the intervention design?		
Was a process evaluation conducted?	*What components were included in the process evaluation? (e.g.*	
Participants' perceptions of intervention (acceptability and feasibility)		
Any other method details/suggestions regarding the method?		

* Costs associated with the intervention can be linked with provider or participant outcomes in an economic evaluation (depends on the type of economic evaluation)

Outcomes

Question	General outcome details	Page/ Para/ Figure #
Is there an analytic framework applied (e.g. logic model, conceptual framework)?		
List of definitions for each outcome (with diagnostic criteria if relevant)		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

List outcome types: Is each outcome a modifiable variable (Community level, neighbourhood level, individual level) or desired health outcome					
Is there adequate latency for the outcomes to be observed?**					
How are the outcomes reported? Self or study assessor					
Is this outcome/tool validated?					
…And has it been used as validated?**					
Is it a reliable outcome measure?**					
Is there adequate power for this outcome?**					
List any subgroups for which data are available for each arm.					
Specific outcome details	*(State brief name for this intervention group.)*	*(State brief name for this intervention group.)*	*(State brief name for this intervention group.)*	*(State brief name for this intervention group.)*	
Outcome 1: Observed at: Unit of measurement: Subgroup data Y/N (see					
Outcome 2: Observed at: Unit of measurement: Subgroup data Y/N (see					
Outcome 3: Observed at: Unit of measurement: Subgroup data Y/N (see					
Outcome 4: Observed at: Unit of measurement: Subgroup data Y/N (see					
Outcome 5: Observed at: Unit of measurement: Subgroup data Y/N (see					

Subgroup of: for outcome: Observed at: Unit of measurement:					
Subgroup of: for outcome: Observed at: Unit of measurement:					
Subgroup of: for outcome: Observed at: Unit of measurement:					
Adverse event (*brief description*):					
Adverse event (*brief description*):					
Adverse event (*brief description*):					
Adverse event (*brief description*):					
Adverse event (*brief description*):					
Withdrawals/exclusions:					
Withdrawals/exclusions:					
Withdrawals/exclusions:					
Additional details on outcomes reported:					

Other relevant information

Were outcomes relating to harms/unintended effects of the intervention described? ** Include any data for these in the outcomes tables above	
Potential for author conflict *i.e. evidence that author or data collectors would benefit if results favoured the intervention under study or the control*	
Key conclusions of the study authors	
Could the inclusion of this study potentially bias the generalisability of the review?** Equity pointer: Remember to consider whether disadvantaged populations may have been excluded from the study.	

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Is there potential for differences in relative effects Between advantage and disadvantaged populations? (e.g. are children from lower income families less likely to wear bicycle helmets)	
Are interventions likely to be aimed at the disadvantaged? (e.g. school meals aimed at poor children).	
Issues affecting directness** (*Note any aspects of population, intervention, etc. that affect this study's direct applicability to the review question)*	
Strengths and limitations recognised by author(s)	
Strengths and limitations recognised by reviewer(s)	
Additional notes by review authors (any additional emergent themes not covered?)	

Appendix 12 Critical Appraisal Skills Programme quality assessment tool for qualitative data included in review studies[135]

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Screening questions	***Consider***	***Yes***	***No***	***Score***	***Comments***
1. Was there a clear statement of the aims of the research?	*– what the goal of the research was* *– why it is important* *– its relevance*				
2. Is a qualitative methodology appropriate?	*– if the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants*				
Is it worth continuing?					
Detailed questions	***Consider***	***Yes***	***No***	***Score***	***Comments***
Appropriate research design **3. Was the research design appropriate to address the aims of the research?**	*– if the researcher has justified the research design (e.g. have they discussed how they decided which methods to use?)*				
Sampling **4. Was the recruitment strategy appropriate to the aims of the research?**	*– if the researcher has explained how the participants were selected* *– if they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study* *– if there are any discussions around recruitment (e.g. why some people chose not to take part)*				
Data collection	*– if the setting for data collection was justified – if it*				

5. Were the data collected in a way that addressed the research issue?	*is clear how data were collected (e.g. focus group, semi-structured interview etc)* *– if the researcher has justified the methods chosen* *– if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted, did they used a topic guide?)* *– if methods were modified during the study. If so, has the researcher explained how and why?* *– if the form of data is clear (e.g. tape recordings, video material, notes etc)* *– if the researcher has discussed saturation of data*				
Reflexivity (research partnership relations/recognition of researcher bias) **6. Has the relationship between researcher and participants been adequately considered?**	*– if it is clear that the researcher critically examined their own role, potential bias and influence during:* • *formulation of research questions* • *data collection, including sample recruitment and choice of location* *– how the researcher responded to events during the study and whether they considered the implications of any changes in the research design*				
Ethical Issues	*– if there are sufficient details of how the research*				

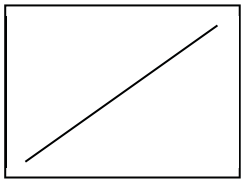
© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

NIHR Journals Library www.journalslibrary.nihr.ac.uk

7. Have ethical issues been taken into consideration?	*was explained to participants for the reader to assess whether ethical standards were maintained* *– if the researcher has discussed issues raised by the study (e. g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)* *– if approval has been sought from the ethics Committee*				
Data Analysis **8. Was the data analysis sufficiently rigorous?**	*– if there is an in-depth description of the analysis process* *– if thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?* *– whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process* *– if sufficient data are presented to support the findings* *– to what extent contradictory data are taken into account* *– whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation*				

Findings **9. Is there a clear statement of findings?**	*– if the findings are explicit* *– if there is adequate discussion of the evidence both for and against the researcher's arguments* *– if the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst.)* *– if the findings are discussed in relation to the original research questions*				
Value of the research **10. Does the research add value to the review?**	*– if the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy or relevant research-based literature?)* *– if they identify new areas where research is necessary* *– if the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used*				

TOTAL SCORE



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

DOI: 10.3310/hta19300

Appendix 13 Quality of the studies included in the review of smoking cessation in pregnancy

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Study	Were the inclusion/ exclusion criteria clearly described?	Was data collection undertaken prospectively?	Were participants a representative sample selected from a relevant patient population?	Was the selection of patients consecutive (for non-randomised studies/ comparisons)?	Was the allocation sequence adequately generated (randomised studies/ comparisons)?
Albrecht 1998[138]	Y	Y	U	U	
Cinciripini 2010[139]	Y	Y	U	N	
Cluss 2011[140]	Y	Y	Y	N	
Donatelle 2000[141]	Y	Y	Y	U	
Edwards 2009[142]	U	N	U	Y	
Gadomski 2011[143]	Y	Y	Y	Y	
Gulliver 2004[104]	Y	Y	U	U	
Heil 2008[105]	Y	Y	Y	U	
Higgins 2004[144]	Y	Y	Y	U	
Lillington 1995[145]	Y	Y	Y	U	
Lowe 1997[146]	Y	Y	Y	U	
Mantzari 2012[109]	U	Y	U	N	
McBride 2004[147]	Y	Y	Y	U	
Morgan 2005[148]	N	N	U	U	
Nichter 2007[110]	Y	Y	U	U	
Pbert 2004[149]	Y	Y	Y	U	
Radley 2013[113]	Y	Y	Y	Y	
Ripley-Moffitt 2008[111]	Y	Y	U	U	
Ussher 2008[150]	Y	Y	Y	Y	
Walsh 1997[108]	Y	Y	Y	Y	
Y	17	18	12	5	
N	1	2	0	3	
U	2	0	8	12	
NA	0	0	0	0	
Total	20	20	20	20	
% Y	85	90	60	25	
% N	5	10	0	15	
% U	10	0	40	60	
% NA	0	0	0	0	
Total	100	100	100	100	

Was allocation adequately concealed?	Were participants blind to treatment status?	Were the groups comparable on demographic characteristics and clinical features?	Were participants entering the study at a similar point in their disease progression?	Was the intervention (and comparison) clearly defined?	Was follow-up long enough to detect important effects on outcomes?	Was the length of follow-up similar between comparison groups?
U	N	U	Y	Y	Y	Y
U	U	Y	N	Y	Y	Y
NA	NA	NA	N	Y	Y	NA
U	N	Y	Y	Y	Y	Y
NA	NA	NA	N	Y	Y	NA
NA	U	N	U	Y	Y	Y
U	N	U	U	Y	Y	Y
U	N	Y	Y	Y	Y	Y
U	U	Y	U	Y	Y	Y
U	N	Y	N	Y	Y	Y
U	U	Y	Y	Y	Y	Y
NA	N	Y	U	U	Y	U
U	N	Y	Y	Y	Y	Y
NA	NA	NA	N	Y	Y	NA
NA	NA	NA	N	Y	U	NA
U	U	Y	Y	Y	Y	Y
NA	NA	NA	U	Y	Y	NA
NA	NA	NA	Y	U	Y	NA
NA	NA	NA	Y	Y	Y	NA
Y	N	Y	U	Y	Y	Y
1	0	10	8	18	19	12
0	8	1	6	0	0	0
10	5	2	6	2	1	1
9	7	7	0	0	0	7
20	20	20	20	20	20	20
5	0	50	40	90	95	60
0	40	5	30	0	0	0
50	25	10	30	10	5	5
45	35	35	0	0	0	35
100	100	100	100	100	100	100

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Study	Were the groups treated identically other than for the named intervention?	Was the intervention undertaken by someone experienced at performing the procedure?	Were the staff, place and facilities where the patients were treated appropriate for performing the procedure?	Were health-care providers 'blind' to treatment status?	Were all of the important outcomes considered?
Albrecht 1998[138]	Y	Y	U	N	Y
Cinciripini 2010[139]	Y	Y	Y	N	Y
Cluss 2011[140]	NA	Y	Y	NA	Y
Donatelle 2000[141]	Y	Y	Y	U	Y
Edwards 2009[142]	NA	Y	Y	NA	Y
Gadomski 2011[143]	N	Y	Y	N	Y
Gulliver 2004[104]	Y	Y	Y	N	U
Heil 2008[105]	Y	Y	Y	U	Y
Higgins 2004[144]	Y	Y	Y	U	Y
Lillington 1995[145]	Y	Y	Y	U	Y
Lowe 1997[146]	U	Y	Y	N	Y
Mantzari 2012[109]	U	U	U	U	U
McBride 2004[147]	Y	Y	Y	N	Y
Morgan 2005[148]	NA	Y	Y	NA	Y
Nichter 2007[110]	NA	Y	Y	NA	Y
Pbert 2004[149]	Y	Y	Y	N	Y
Radley 2013[113]	NA	Y	Y	NA	Y
Ripley-Moffitt 2008[111]	NA	Y	Y	NA	Y
Ussher 2008[150]	NA	Y	Y	NA	Y
Walsh 1997[108]	Y	Y	Y	N	Y
Y	10	19	18	0	18
N	1	0	0	8	0
U	2	1	2	5	2
NA	7	0	0	7	0
Total	20	20	20	20	20
% Y	50	95	90	0	90
% N	5	0	0	40	0
% U	10	5	10	25	10
% NA	35	0	0	35	0
Total	100	100	100	100	100

N, no; NA, not applicable; U, unclear; Y, yes.

Were all outcomes reported?	Were objective (valid and reliable) outcome measure(s) used?	Was the assessment of main outcomes blind?	Was there a description of withdrawals, dropouts and those lost to follow-up?	Was the analysis ITT in that trial results were reported for everyone who entered the trial?	Was the analysis ITT in that participants were analysed in the groups that they were originally allocated to?	Were participants lost to follow-up likely to introduce bias?
Y	U	U	Y	N	N	U
N	Y	U	Y	Y	Y	U
Y	Y	NA	N	Y	NA	U
Y	Y	U	Y	Y	Y	U
Y	N	NA	N	N	NA	U
N	Y	U	Y	N	N	U
N	Y	U	N	U	U	U
Y	Y	U	Y	Y	Y	U
Y	Y	U	Y	Y	Y	U
Y	N	U	U	N	Y	U
Y	Y	U	N	Y	Y	U
U	N	U	N	U	Y	U
Y	N	U	Y	Y	Y	U
Y	Y	NA	N	U	NA	U
Y	Y	NA	N	U	NA	U
Y	Y	U	Y	N	Y	U
Y	Y	NA	N	Y	NA	U
Y	Y	NA	N	U	NA	U
Y	Y	NA	N	U	NA	U
Y	Y	U	U	Y	Y	U
16	15	0	8	9	10	0
3	4	0	10	5	2	0
1	1	13	2	6	1	20
0	0	7	0	0	7	0
20	20	20	20	20	20	20
80	75	0	40	45	50	0
15	20	0	50	25	10	0
5	5	65	10	30	5	100
0	0	35	0	0	35	0
100	100	100	100	100	100	100

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 14 Quality of the studies included in the review of breastfeeding

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Study	Were the inclusion/ exclusion criteria clearly described?	Was data collection undertaken prospectively?	Were participants a representative sample selected from a relevant patient population?	Was the allocation sequence adequately generated?	Was allocation adequately concealed?	Were participants blind to treatment status?
Bliss 1997[167]	Y	Y	Y	N	U	NA
Cattaneo 2001[168]	Y	Y	Y	NA	NA	NA
Chamberlain 2006[103]	N	N	U	Y	NA	NA
Cohen 1994[169]	Y	Y	U	U	NA	NA
Dungy 1992[170]	Y	Y	N	U	U	N
Finch 2002[171]	Y	Y	Y	U	U	N
Hayes 2008[172]	Y	Y	Y	U	NA	NA
Hill 1987[173]	Y	Y	Y	U	U	N
Pugh 1998[106]	Y	Y	Y	U	U	NA
Rasmussen 2011[174]	Y	Y	Y	U	NA	NA
Reeves Tuttle 1995[175]	Y	N	Y	U	NA	NA
Sciacca 1995[176]	Y	Y	Y	U	U	N
Thomson 2012[112]	N	N	Y	U	NA	NA
Volpe 2000[107]	N	U	Y	U	NA	NA
Wolfberg 2004[178]	Y	Y	Y	U	U	N
Zimmerman 1999[179]	Y	N	Y	U	NA	NA
Y	13	11	13	1	0	1
N	3	4	1	1	0	5
U	0	1	2	13	7	0
NA	0	0	0	1	9	10
Total	16	16	16	16	16	16
% Y	81.3	68.8	81.3	6.3	0.0	6.3
% N	18.8	25.0	6.3	6.3	0.0	31.3
% U	0.0	6.3	12.5	81.3	43.8	0.0
% NA	0.0	0.0	0.0	6.3	56.3	62.5
Total	100	100	100	100	100	100

Were the groups comparable on demographic characteristics and clinical features?	Were participants entering the study at a similar point in their disease progression?	Was the intervention (and comparison) clearly defined?	Was follow-up long enough to detect important effects on outcomes of interest?	Was length of follow -up similar between comparison groups?	Were the groups treated identically other than for the named intervention?
U	Y	Y	Y	Y	Y
NA	Y	Y	Y	Y	U
U	Y	Y	Y	Y	U
NA	Y	Y	Y	NA	NA
U	Y	Y	Y	Y	Y
U	Y	N	Y	Y	Y
Y	Y	Y	Y	Y	Y
N	U	Y	Y	Y	Y
Y	Y	Y	Y	Y	Y
Y	Y	Y	Y	Y	Y
U	Y	N	Y	Y	Y
N	Y	N	Y	Y	Y
Y	U	Y	Y	Y	U
Y	Y	Y	Y	Y	Y
Y	Y	Y	Y	Y	Y
N	Y	Y	Y	Y	U
6	14	13	16	15	11
3	0	3	0	0	0
5	2	0	0	0	4
2	0	0	0	1	1
16	16	16	16	16	16
37.5	87.5	81.3	100.0	93.8	68.8
18.8	0.0	18.8	0.0	0.0	0.0
31.3	12.5	0.0	0.0	0.0	25.0
12.5	0.0	0.0	0.0	6.3	6.3
100	100	100	100	100	100

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Study	Was the intervention undertaken by someone experienced at performing the procedure?	Were the staff, place and facilities where the patients were treated appropriate for performing the procedure?	Were health-care providers 'blind' to treatment status?	Were all of the important outcomes considered?	Were all outcomes reported?
Bliss 1997[167]	Y	Y	NA	Y	Y
Cattaneo 2001[168]	Y	Y	NA	Y	N
Chamberlain 2006[103]	Y	Y	NA	Y	N
Cohen 1994[169]	Y	Y	NA	Y	Y
Dungy 1992[170]	Y	Y	Y	Y	Y
Finch 2002[171]	Y	Y	N	Y	Y
Hayes 2008[172]	Y	Y	NA	Y	Y
Hill 1987[173]	U	Y	N	Y	Y
Pugh 1998[106]	Y	Y	NA	Y	Y
Rasmussen 2011[174]	Y	Y	Y	Y	U
Reeves Tuttle 1995[175]	Y	Y	NA	Y	Y
Sciacca 1995[176]	Y	Y	N	Y	Y
Thomson 2012[112]	Y	Y	NA	Y	Y
Volpe 2000[107]	Y	Y	NA	Y	N
Wolfberg 2004[178]	Y	Y	N	Y	Y
Zimmerman 1999[179]	Y	Y	NA	Y	Y
Y	15	16	2	16	12
N	0	0	4	0	3
U	1	0	0	0	1
NA	0	0	10	0	0
Total	16	16	16	16	16
% Y	93.8	100.0	12.5	100.0	75.0
% N	0.0	0.0	25.0	0.0	18.8
% U	6.3	0.0	0.0	0.0	6.3
% NA	0.0	0.0	62.5	0.0	0.0
Total	100	100	100	100	100

N, no; NA, not applicable; U, unclear; Y, yes.

Were objective (valid and reliable) outcome measure(s) used?	Was the assessment of the main outcomes blind?	Was there a description of withdrawals, dropouts, and those lost to follow-up?	Was the analysis ITT in that trial results were reported for everyone who entered the trial?	Was the analysis ITT in that participants were analysed in the groups that they were originally allocated to?	Were participants lost to follow-up likely to introduce bias?
Y	U	Y	U	Y	U
Y	NA	N	NA	NA	U
U	NA	NA	NA	NA	U
Y	NA	N	NA	NA	U
U	U	Y	N	Y	Y
U	U	N	N	Y	Y
U	U	N	N	Y	U
U	U	N	Y	Y	U
U	U	N	U	U	U
Y	Y	N	Y	U	U
U	NA	N	NA	NA	U
U	U	N	N	Y	U
Y	NA	Y	NA	NA	U
U	NA	NA	NA	NA	U
U	U	Y	N	Y	Y
U	NA	Y	NA	NA	U
5	1	5	2	7	3
0	0	9	5	0	0
11	8	0	2	2	13
0	7	2	7	7	0
16	16	16	16	16	16
31.3	6.3	31.3	12.5	43.8	18.8
0.0	0.0	56.3	31.3	0.0	0.0
68.8	50.0	0.0	12.5	12.5	81.3
0.0	43.8	12.5	43.8	43.8	0.0
100	100	100	100	100	100

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 15 Illustrative topic guide

BIBS: Benefits of Incentives for Breastfeeding and Smoking cessation

Introduction

- Provide a reminder of the purpose and main focus of the study.
- Explain that the focus is on opinions and experiences (it is not a test).
- Provide the opportunity to ask *'any questions'*.
- Introduce the audio recorder, underlining the importance of **confidentiality**.

Topic guide

- What do you think about public health messages that target specific behaviours (e.g. not smoking/drinking during pregnancy, women breastfeeding their infants, eating 5 a day)?
  Prompts:
  - Are they effective?
  - If not – why not?
  - Why do you think people may not act on these messages?

- What do you think might influence or help change people's behaviours?
  Prompts:
  - Internal motivators (e.g. motivation, determination).
  - External (e.g. family members and family structure, social network, economic) motivators.
  - Explore personal histories in terms of those who smoke/previously quit and who breastfed/did not breastfeed to explore motivations and influences on these behaviours.

- Did you know that incentives have been used to promote healthy messages and to try and change people's behaviours (e.g. for smoking cessation, breastfeeding, weight loss)? These interventions have involved financial elements (e.g. giving people vouchers or gifts or offering crèche facilities or ironing) and/or non-financial elements (e.g. education, counselling, leaflets).

- Have you ever been involved in any schemes or programmes that have used 'incentives' (financial or non-financial)?
  Prompts:
  - What incentives were there?
  - Context of delivery (who delivered, where, timing).
  - Success of schemes/reasons for failure.
  - Attitudes towards incentives.

- Introduce vignettes and explain to the participant that we are asking them to read real studies that have involved incentive interventions for pregnant women to encourage them to stop smoking or to start and continue breastfeeding. Any feedback?

- Ask about what types of 'incentive' the participant thinks may/would work and why (tease out differences for smoking and for breastfeeding where appropriate).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Prompts:

- Who should be incentivised (individuals, organisations or both)?
- Do you think that incentive programmes need to include financial elements (e.g. vouchers, gifts), non-financial elements (e.g. support/education) or both?
- What (non-financial) elements should the incentive programme include and why? Explore opinions regarding different intervention components, (e.g. education, counselling, information leaflets including social support).
- What (if any) financial incentives should be provided (e.g. vouchers, gifts, money, baby products)? What should be the value of these financial incentives?
- Who should deliver the incentives (e.g. health professionals, GPs, voluntary sector)?
- When should they be delivered (e.g. after the 'target' behaviour is achieved or ongoing)?
- How many times should the incentive be provided (e.g. voucher each time or name in a monthly raffle)?
- How many contacts should be provided (e.g. every day, every week, every month)?
- How long should the incentive intervention last?
- How should the incentive intervention be delivered (e.g. group, individual, with partner/friend)?
- Where should incentives be delivered (e.g. hospital, community, clinic, home)?
- How should 'compliance' be assessed (e.g. saliva samples, CO samples) and how often? What about compliance for breastfeeding women – should this be assessed and how?

- Any final comments/feedback?

Appendix 16 Vignettes for health professionals

BIBS: Benefits of Incentives for Breastfeeding and Smoking Cessation

Heil and colleagues[105]

At 18 weeks' gestation, women are recruited to a smoking cessation intervention that involves daily, biweekly and then weekly contacts until the baby is born, with further weekly and fortnightly contacts up to 12 weeks postnatally (with a final contact at 24 weeks). Urine and CO tests are used to confirm smoking status on each occasion, and women are given opportunities to read/review smoking cessation information with a health worker. A voucher is given that increases in value (maximum of £40.00) each time a negative smoking test is confirmed, but values are reset if a positive test is received.

Chamberlain and colleagues[103]

A mother is offered a personal-use double electric breast pump (worth £120.00–225.00, her brand of choice), which can be delivered to the hospital or to her home following the birth of her baby. While the mother is breastfeeding, she will have access to a breastfeeding specialist in the hospital and be given a number for a breastfeeding telephone support line that she can call from home.

Cattaneo and colleagues[168]

The regional health authority has requested that LHAs develop local work plans and targets to increase breastfeeding rates (at birth and 16–19 weeks postnatally). All staff working within the health authority are told that a financial penalty will be applied if they do not achieve their objectives and targets.

Tappin and colleagues[88]

Pregnant smokers are given a £50.00 voucher for attending an appointment with a NHS Smokefree Pregnancy advisor and setting a quit date. They are given an additional £50.00 voucher for being smoke free 4 weeks after their quit date and another £100.00 voucher for being smoke free after 12 weeks. If they are still smoke free towards the end of their pregnancy, they are given a further £200.00 voucher. Vouchers can be exchanged at many retailers.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 17 The Cessation in Pregnancy Incentives Trial illustrative topic guide: one-to-one interviews with pregnant women participating in study

Themes for interviews with pregnant women who have agreed to be interviewed when first approached about the trial

One-to-one interviews with pregnant women (all of whom have engaged with the cessation service and the CPIT and agreed to be interviewed) aim to explore views on issues around the delivery and promotion of the cessation service, responses to incentive features and randomisation and any unintended consequences.

Respondents will be asked to respond to the concept of the incentives and the trial elements in addition to experience of the routine services.

Interviews will be adapted depending on experience, for example intervention or control status, successful quit or relapse.

The topic guide is intended to ensure coverage of key topics while at the same time giving respondents the freedom to express their own feelings and views as part of an open discussion.

Introduction

- Provide a reminder of the purpose and main focus of the study.
- Explain that the focus is on opinions and experiences (not a test).
- Provide an opportunity to ask *'any questions'*.
- Introduce the audio recorder, underlining the importance of **confidentiality**.

A. Background: broad smoking history and pregnancy/ child responsibilities

- How long smoked/how many a day/how easy to stop (anticipated/experienced)?
- Any previous quit attempts/relapse events (including any previous pregnancies)?
- Number of (non-)smokers in household?
- Number of children in household (including ages)?
- When baby due?
- Any arrangements/consideration given to smoking in the home (self and others)?

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

B. Focus on service experience in this pregnancy

Events/circumstances leading up to quit attempt

- Motives for trying to quit, extent to which planned and significant trigger events – what prompted action/decision (including health, incentive, client–advisor/midwife relationship, pregnancy, partner's influence)?
- Initial awareness of quit support in pregnancy, for example leaflets, interpersonal recommendation from professionals or peers, local pharmacist.

Initial contact(s) with NHS Smokefree Pregnancy service adviser

Explore telephone explanation or drop in.

- Expecting a telephone call from the advisor (e.g. aware of opportunity to opt out of call, giving permission).
- Initial explanation of study (by telephone or at drop in).
- Giving permission for name to be passed to The Listening Company (TLC) (now called Serco Ltd), which was the call centre company that obtained the formal telephone consent in CPIT.
- Initial visit.
- Motivation to attend for first visit (e.g. health of self/baby, any feeling of compulsion from professionals or significant others).
- Steps involved in the first visit (e.g. timing of appointment, location, how long did it take, how much help was provided, ways it could be improved).
- Setting a quit date (e.g. advice on choice, influences on success).
- Understanding about any further support from adviser (e.g. telephone contacts, frequency).

Further contacts by NHS Smokefree Pregnancy service adviser

(Typically telephone)

- Experience of any further contacts/support.
- Response, for example helpful, intrusive.
- Impact, for example encouraging, positive, annoying, guilt inducing.

Experience of visit(s)/contacts at community pharmacists if any

- Use of pharmacological aids to help give up (e.g. NRT).
- Steps involved in the first visit to pharmacy (e.g. timing, location, staff giving support, how long did it take, how much help was provided, ways it could be improved).
- Anticipate returning for any follow-up visits (e.g. CO breath tests, NRT provision, staff seen, additional benefits/drawbacks).
- Perceived support (e.g. how helpful/supportive/how did they help/same person each time/any restrictions on when/where, level of privacy provided?)

Initial contact by the NHS Smoking Helpline (TLC)

Explore initial call:

- response to contact details being routinely passed to helpline and memory of being asked and giving verbal consent
- contact practicalities, for example time of day/week, impact on activities at that time
- recognition of number when called – remembered that told might be called
- response to time delay for TLC call from when agreed with advisor (too long a delay, too quick?)
- response to explanation given of the study please note Incentives and Control and RCT
- understanding of vouchers/gift card and how triggered and delivered
- extent to which the contact fitted expectations
- motivation to commit to the study.

C. Focus on the incentives

Initially unprompted and general (explain process as needed)

- Ever heard of incentives to encourage quitting before (financial or alternative)?
- General response to concept of incentives to quit (financial or alternatives).
- What might change people's commitment?

Explore respondent's understanding of the voucher structure.

Prompt as required:

Incentive group

- £50.00 if attend and set quit date.
- £50.00 if quit at 4 weeks – CO validated (Smokefree Pregnancy service advisor telephones, research nurse visits self-reported non-smokers for CO reading).
- £100.00 if quit at 12 weeks – CO validated (telephone call, research nurse visits self-reported non-smokers for CO reading).
- £200.00 if still quit at end of pregnancy – cotinine validated at 34–38 weeks.
- £25.00 if not quit at 34–38 weeks – cotinine validated at 34–38 weeks.

Control group

£25.00 for control participants at 34–38 weeks if agree and give sample for cotinine testing.

- Impact of incentive on motivation, for example initial seeking of support, ongoing resolve.
- Ways they would use/have used incentives, for example to buy routine items, save for a 'big' thing.
- Views on payment points and amounts/breakdown of voucher values.
- Would a different amount of money make a difference?
- Is £25.00 enough to support contact in late pregnancy and sample collection for control quitters?

Monitoring

- CO reading at 4 and 12 weeks – incentive group.
- Saliva/urine test with visit near end of pregnancy – all claiming non-smokers.
    - Views on monitoring – is this enough monitoring, easy/fair/effective?
    - Intrusion factor.
    - Arranging visit for monitoring.
    - Experience of monitoring visits (and/or any anticipated issues).

Receiving vouchers/card (as appropriate)

- How have they arrived? Timing, format, fit with expectations.
- Timing of arrival.
- Ease of using in store – which store, staff response, any awareness that on a 'scheme'?
- Views on any additional benefits that could be included as part of the scheme – for mum/significant others.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

- Any other ways would benefit from the scheme, for example well-being, involvement in a study, encouraged others to stop/cut down/modify where and when they smoke?
- Likelihood of anyone trying to get around the rules/likelihood of happening.

Promoting the incentive scheme

- Key messages/ideas on 'selling points' for women.
- Ways/routes to promote incentives and the general service.

Appendix 18 The Cessation in Pregnancy Incentives Trial illustrative topic guide: interviews with professionals with a relevant role (e.g. with pregnant smokers, cessation services and/or the trial)

Interviews with professionals aim to explore issues around implementation of the intervention and the trial elements, identify challenges and ways they have been overcome, and perceived response among participants.

Interviews will be adapted depending on respondents' experience.

The topic guide is intended to ensure coverage of key topics while at the same time giving respondents the freedom to express their own feelings and views as part of an open discussion.

Introduction

- Provide a reminder of the purpose and main focus of the study.
- Explain that the focus is on opinions and experiences (not a test).
- Provide an opportunity to ask '*any questions*'.
- Introduce the audio recorder, underlining the importance of **confidentiality**.

A. Background: overview of role and relevant involvement

- General role.
- Involvement with cessation of smoking in pregnancy.
- Involvement in the trial.

B. Focus on NHS Smokefree Pregnancy service and key trial elements

Service developments to facilitate the intervention

- Cessation specialist staffing – extra specialist staff, training, funding issues.
- Clerical staffing – training, base location, etc.
- Information technology needs – programme systems, computers, issues around office space/location.
- Routine CO testing at antenatal clinic to trigger referrals.
- Making midwifery staff aware – how, at what stage?
- Any links with community pharmacists.
- Explore challenges and opportunities in preparation for this intervention, for example caseloads, telephone contacts.
- Perceived response from range of staff.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Then . . :

- explore general awareness of elements of the support services and response to delivery issues aware of, including key opportunities and challenges
- explore general awareness of the trial elements and response to implementation issues that they are aware of, including key opportunities and challenges.

Focus on the following key elements and stages. When not already covered in the initial discussion, obtain response to relevant issues.

For each one, first explore initial awareness and perceptions, then explain the element if required and explore responses. Not all will be relevant to individual experience.

Initial booking visit

- Asking pregnant women about their smoking.
- Taking CO readings and recording.
- Asking permission to send information to the NHS Smoking Helpline.
- Explore challenges and opportunities, for example demanding appointment session, smokers' responses, preparation for this activity.
- Any previous awareness of incentives and RCT among women/comments?

First telephone contact with NHS Smokefree Pregnancy adviser

- Challenges of making contact by telephone (including out of hours).
- Informing about the study.
- Verbal permission to forward details to TLC.
- Perceived clients' response to service (e.g. attending session, challenges to quitting).
- Any raising of trial and trial status by clients.
- Perceived clients' response to trial (e.g. impact of incentives, random allocation).
- Implementation issues (e.g. capacity issues in covering appointments).

Explore 'drop-ins' – process, benefits and draw-backs.

First telephone contact by TLC (NHS Helpline)

- Smokers contacted by TLC.
- Giving eligible smokers information about the trial.
- Obtaining verbal consent.
- Random allocation made.
- Explore views on challenges experienced or anticipated (e.g. contact successes, explaining complex issues, response to random allocation, perceived effect on engaging with services).

First face-to-face contact with NHS Smokefree Pregnancy adviser (£50.00 voucher)

- Discussion about smoking and pregnancy.
- Setting quit date.
- Assess for NRT use/local pharmacy identified.
- Returning attendance information to trial manager.
- Perceived clients' response to service (e.g. attending session, challenges to quitting).

- Any raising of trial and trial status by clients.
- Perceived clients' response to trial (e.g. impact of incentives, random allocation).
- Implementation issues (e.g. capacity issues in covering appointments, additional work loads, extra staff).

Follow-up telephone support/contact from NHS Smokefree Pregnancy service

- Telephone support provided weekly until 4 weeks after quit date to support quit attempt.
- Follow-up telephone contact at 4 weeks after quit date (further discussion and information on self-reported outcome at 4 weeks).
- Capacity issues, making contact, client availability/co-operation, records, etc.

Attendance at local community pharmacy for nicotine replacement therapy

- Patient attends local pharmacy to receive NRT.
- CO breath test carried out and link with NRT provision.
- Weekly repeat CO breath tests and further NRT for 4 weeks.
- Implementation issues, training, any additional workloads, record keeping, etc.

Follow-up telephone contact from NHS Smokefree Pregnancy service (£50.00, 4-week quit)

- Telephone support provided weekly until 4 weeks after quit date to support quit attempt.
- Follow-up telephone contact at 4 weeks after quit date (further discussion and information on self-reported outcome at 4 weeks).
- Capacity issues, making contact, client availability/co-operation, records, etc.

Check respondent understanding of voucher structure and explore their response

Prompt as required or use flow chart:

Incentive group

- £50.00 if attend and set quit date.
- £50.00 if quit at 4 weeks – CO validated (Smokefree Pregnancy service advisor telephones, Margaret visits self-reported non-smokers for CO reading).
- £100.00 if quit at 12 weeks – CO validated (??? telephones, Margaret visits self-reported non-smokers for CO reading).
- £200.00 if still quit at end of pregnancy – cotinine validated at 34–38 weeks.
- £25.00 if not quit at 34–38 weeks – cotinine validated at 34–38 weeks.

Control group

- £25.00 for control participants at 34–38 weeks if agree and give sample for cotinine testing.

Research nurse visits:

Carbon monoxide monitoring of incentive group who report abstinence

- Smokefree Pregnancy service advisors contact to ascertain status.
- Arranging home visit.
- Issues in the home setting.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

End-stage assessment of outcomes at 34–38 weeks' gestation, contact with research nurse for participants who self-report as abstinent

- NHS Smoking Helpline makes telephone contact to ascertain self-report?
- If not currently abstinent then £25.00 voucher sent to participant.
- If abstinent research nurse visit to check on abstinence by urine/saliva test for cotinine.
- Implementation issues, telephone contacts, home visits, sample collection.

Central recording and posting out of vouchers

- Set a quit date and arrived at face-to-face appointment.
- Self-report abstinent intervention participants at 4 weeks.
- Self-report abstinent intervention participants at 12 weeks.
- Chemically confirmed abstinence at 34–38 weeks.
- Others providing information at 34–38 weeks, for example control participants, non-abstinent.
- Issues regarding obtaining and collating records from varied sources.

C. Overview

Responses to concept of incentives: respondent's views and perceptions of views of others (e.g. pregnant women, professionals and general public)

- Incentives in general to support behaviour change (financial and alternatives).
- Incentives as provided in current RCT.
- Perceptions of any benefits from incentives in supporting quitting – pregnant women/other smokers.
- Perceptions of any unintended outcomes.
- Implications for those not receiving incentives.

Capacity and professional support issues

- Training needs and support (e.g. time issues).
- Capacity/any extra workload.
- Support in changes required by the study.
- Access to central advice if needed (e.g. regarding study, regarding cessation in pregnancy).

Comparative overview

- Elements of the service that appear most/least useful – why?
- Comparison of the likely impact of incentives with the other elements of the service in terms of its help/usefulness in the early stages (getting started)/later stages (keeping stopped).
- Likely impact of being part of a study.
- Terms to describe the incentive scheme to pregnant women/what are key aspects that women need to know/how best communicated.
- Main benefits/main drawbacks.
- Things that might help more/improve the service.

Impressions on progress

Any additional learning for future studies?

D. Focus on trial

Explore understanding of randomised controlled trial, randomisation, incentives

Prompt with process as needed:

- Response to being 'randomised' to one or the other.
- Likely impact of exclusion from incentives among control participants because of study.
- What would women want to know?
- Likely motivation to commit to the study.
- Potential to break the rules?

E. Any additional support: 'professionals'

- Any other support from 'professionals' to help give up – what, how often, who from (e.g. midwife, GP, other)?
- Most important features of any other professional support received – why/any way it could be improved?
- Any discouraging responses from 'professionals'.

F. Any additional support: family and friends

- Support/dis-encouragement from other family members.
- Any 'significant others' changed their smoking behaviour/used quit support.
- Attend stop smoking sessions with anyone else for support.

G. Review of quit/smoking experience in this pregnancy (if not already covered)

- Extent quit in this pregnancy thus far, for example non-smoking, cut down, relapses.
- When stopped, how long for, when any relapses.
- Expectations for future during pregnancy, after pregnancy.

H. Overview/comparisons

- Elements of the service that are most/least useful – why?
- Relative usefulness of key elements in the early stages (getting started)/later stages (keeping stopped).
- Impact of being part of a study, for example motivation, impact of being a 'control' participant.
- Terms to describe the incentive scheme to another pregnant mother/what are key aspects women need to know?
- Main benefits/drawbacks.
- Things that might help more/improve the service.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 19 Final framework used in NVivo10

1. What is an incentive and what do incentives mean to parents?

    - Hedonic – shopping vouchers.
    - Behaviour related, for example breast pumps, nursing bras.
    - Personal well-being – massage, beauty treatment.
    - Baby or pregnancy related, for example baby gifts, nappies, bibs, car seats.
    - Health related – fruit and vouchers.
    - Household/time (to breastfeed)-related services – ironing, crèche, school run, meals.
    - Individualised incentives.
    - Negative attitudes towards incentives (undefined/general remarks).

2. Would incentives work and how might they work? (Fit with behaviour change theory evidence, interactions of incentives with intrinsic motivation.)

    - Incentives to encourage women to turn up for support/participate in a programme or research (recruiting and retaining).
    - Incentives to prevent smoking relapse/stopping breastfeeding.
    - Incentives contingent on success.
    - Predictable or unpredictable (raffles, competitions).
    - Monitoring and proof.
    - Gaming, cheating.
    - Goal-setting – experiences, breastfeeding duration goal, exclusivity goal, setting a quit date.
    - Incentives for those already engaged (boosters) or 'ready' (motivated) to change.
    - Confidence/self-efficacy/pressure.
    - Negative views – beliefs that incentives will not work.
    - Incentivising more than one behaviour.

3. What else would help as well as/besides an incentive? (Other intervention components.)

    - What would help most – incentive vs. other support?
    - Psychosocial component (only when referred to in conjunction with incentive programme).
    - Pharmacological support (e.g. NRT).
    - Who would be the best person to provide this?

        - Psychologist.
        - Maternity professional (midwife/health visitor).
        - GP/pharmacist.
        - Peer supporter.
        - 'Other'.
        - Specialist service (smoking/breastfeeding is all they do).
        - Known vs. unknown (continuity of care).
        - First-hand experience (could apply to peer or professional).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

4. Incentivising other people

- Woman alone.
- All women vs. targeting most disadvantaged women.
- Woman plus supporter.
- Family/home.
- Individual health professionals to provide support.
- The local health service – to reach targets.
- 'Other'.
- If others incentivised – same or different value of incentive as for women.

5. Value/costs

- Financial value of the incentive.
- Consistent or variable value, for example increase the longer the woman is quit for, for example increase at specific time points such as birth.
- Who pays for incentives?
- Local or national businesses contributing (vouchers/support).

6. Views of/effects on others

- Non-smokers/bottle feeders.
- Targeted to most disadvantaged vs. universal incentives.
- General public/taxpayers.
- Incentives perceived as acceptable to others because of benefits to child health when pregnant compared with smoking/good nutrition/healthy lifestyle for everyone (all ages, genders).
- Unintended consequences for those not receiving incentives, for example friends, families more generally.

7. Intensity and duration (appointments/sessions)

- How often/frequent/appointment duration – small and often vs. longer but less frequent?
- Constant or tailored – more frequent to begin with, frequent after birth to prevent relapse, around life events/periods of stress?
- Start of programme – when in pregnancy? End point – after birth, how long after birth?

8. Setting and delivery: how would it be best to provide the incentive?

- Post.
- Part of the health service.
- Separate from the health service.
- Home.
- Telephone call/text message.
- Other location.
- Format – one-to-one, group.

9. Other sources of help/encouragement/barriers to quitting smoking/breastfeeding that do not fit into any of the above themes

    - Intrinsic barriers/demotivators.
    - Intrinsic facilitators/motivators

        - health.

    - Extrinsic barriers/demotivators.
    - Extrinsic facilitators/motivators.
    - Psychosocial 'other' (relates to any other reference to education, support, information required to try and change behaviours).
    - Negative attitudes towards smoking.
    - Consequences of smoking/not breastfeeding, for example guilt.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 20 Interviews: mothers/partners

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Participant code[a]	Parent status[b]	Age (years)	Marital status[c]	Ethnicity[d]	Education[e]	Employed (yes/no)	Smoking status[f]	Lives with smoker (yes/no)	Currently pregnant – infant feeding intentions[g]	Previous infant feeding experiences[h]	Experience of incentives[i]
1	Mother*	26	1	1	3	Yes	5	No	1	1	No
2	Mother	25	1	1	1	Yes	2	No	NA	2	SC
3	Mother	38	1	1	3	Yes	5	No	NA	1	No
T4	Mother	30	1	1	2	Yes	4	No	NA	1	BF
5 and T6[j]	Woman	31	1	1	2	Yes	4	No	1	1	BF
7	Woman	29	1	1	1	Yes	1	No	1	NA	No
8	Woman	35	1	2	2	No	2	No	1	NA	No
T9	Mother	31	1	1	1	Yes	2	Yes	NA	1	BF
T10 and T11[j]	Mother*	29	1	1	3	No	2	Yes	1	1	BF
12	Mother*	31	1	2	3	Yes	4	No	2	1	No
13	Mother*	22	1	1	3	No	5	Yes	2	1	No
14	Mother*	26	1	1	3	No	4	Yes	1	1	SC
T15	Woman	19	1	2	3	Yes	1	No	1	NA	No
16	Mother	39	2	1	3	No	1	No	NA	1	No
17	Mother	53	2	1	1	No	1	No	NA	1	No
18	Mother*	36	1	2	1	Yes	1	No	1	1	No
19	Father	38	1	1	3	Yes	1	Yes	NA	1	No
20	Father	34	1	1	3	No	5	Yes	NA	1	No
21	Father	48	2	1	3	No	5	No	NA	1	No
22	Father	44	1	1	3	No	5	No	NA	2	No

Participant code[a]	Parent status[b]	Age (years)	Marital status[c]	Ethnicity[d]	Education[e]	Employed (yes/no)	Smoking status[f]	Lives with smoker (yes/no)	Currently pregnant – infant feeding intentions[g]	Previous infant feeding experiences[h]	Experience of incentives[i]
23	Man	23	1	1	3	No	5	Yes	2	NA	No
24	Mother*	25	1	1	4	No	5	No	3	2	No
25	Mother	51	1	1	3	No	5	Yes	NA	NR	No
26	Woman	18–24	1	1	NR	No	5	NR	NR	NR	SC
27	Woman	18–24	2	1	NR	No	2	NR	NR	NR	SC
28	Mother*	25–35	1	1	NR	No	2	NR	NR	NR	SC
29	Mother*	25–35	1	1	NR	NR	5	NR	NR	NR	SC
30	Woman	< 18	1	1	NR	No	2	NR	NR	NR	SC
31	Mother*	25–25	1	1	NR	No	2	NR	NR	NR	SC
32	Woman	18–24	NR	1	NR	NR	5	NR	NR	NR	SC
33	Woman	25–35	2	1	NR	No	2	NR	NR	NR	SC
34	Mother*	18–24	2	1	NR	No	2	NR	NR	NR	SC
35	Woman	25–35	1	1	NR	No	2	NR	NR	NR	SC
36	Mother*	25–25	1	1	NR	Yes	5	NR	NR	NR	SC
37	Mother*	25–35	1	1	NR	Yes	2	NR	NR	NR	SC
38	Woman	18–24	2	1	NR	Yes	5	NR	NR	NR	SC
39	Mother*	36+	2	1	NR	No	5	NR	NR	NR	SC
40	Woman	18–24	2	1	NR	No	2	NR	NR	NR	SC
41	Woman	18–24	1	1	NR	No	5	NR	NR	NR	SC
42	Woman	18–24	2	1	NR	No	5	NR	NR	NR	SC
43	Woman	18–24	2	1	NR	No	5	NR	NR	NR	SC

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Participant code[a]	Parent status[b]	Age (years)	Marital status[c]	Ethnicity[d]	Education[e]	Employed (yes/no)	Smoking status[f]	Lives with smoker (yes/no)	Currently pregnant – infant feeding intentions[g]	Previous infant feeding experiences[h]	Experience of incentives[i]
44	Woman	25–35	1	1	NR	Yes	2	NR	NR	NR	SC
45	Mother*	36+	1	1	NR	NR	2	NR	NR	NR	SC

BF, breastfeeding; NA, not applicable; NR, not recorded; NVQ, National Vocational Qualification; SC, smoking cessation.
a 'T' relates to a telephone interview; no letter refers to a face-to-face interview.
b 'Mother'/'father' relates to those who have older children (who may/may not be currently pregnant); 'mother*' relates to women who have older children and who are pregnant; 'woman'/'man' relates to those who are pregnant/expecting first child.
c 1, participant married/living together/in a relationship; 2, single/divorced.
d 1, white; 2, black or minority ethnic classifications.
e 1, degree-level qualification; 2, A-level or equivalent; 3, GCSE/NVQ or equivalent; 4, no formal qualifications.
f 1, never smoked; 2, quit during pregnancy; 3, cut down during pregnancy; 4, quit before pregnancy; 5, currently smoking.
g Code relates to women who are currently pregnant: 1, plan to breastfeed; 2, plan to mixed feed; 3, plan to formula feed.
h Code relates to families with older children/interviewed in the postnatal period: 1, previous experience of breastfeeding; 2, never breastfed.
i SC, experience of smoking cessation incentive intervention; BF, experience of breastfeeding incentive intervention.
j Mothers participated in an antenatal and a postnatal interview.

Appendix 21 Focus groups: mothers

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Participant code	Parent status[a]	Age (years)	Marital status[b]	Ethnicity[c]	Education[d]	Employed (yes/no)	Smoking status[e]	Lives with smoker (yes/no)	Currently pregnant – infant feeding intentions[f]	Previous infant feeding experiences[g]	Experience of incentives[h]
FG1	Mother	28	1	1	1	Yes	4	No	NA	1	No
FG1	Mother	38	1	2	1	Yes	4	No	NA	1	No
FG1	Mother	33	1	1	1	Yes	1	Yes	NA	1	No
FG1	Mother	26	1	1	1	Yes	4	No	NA	1	No
FG1	Mother	26	1	1	1	Yes	1	No	NA	1	No
FG1	Mother	21	1	1	3	No	2	Yes	NA	1	No
FG1	Mother	39	1	1	1	Yes	4	No	NA	1	No
FG1	Mother	34	1	1	1	Yes	1	No	NA	1	No
FG1	Mother	36	1	1	3	Yes	1	No	NA	1	No
FG2	Mother	62	1	1	3	No	1	No	NA	1	No
FG2	Mother*	26	1	1	3	Yes	1	No	1	1	No
FG2	Mother	28	1	1	3	Yes	1	No	NA	1	No
FG2	Mother*	27	1	1	3	Yes	4	No	1	1	No
FG3	Woman	17	2	1	4	No	5	Yes	3	NA	No
FG3	Woman	17	2	1	4	No	1	Yes	2	NA	No
FG3	Mother	19	1	1	3	No	4	Yes	NA	1	No
FG3	Mother	18	1	1	NR	Yes	1	NR	NA	1	No
FG3	Mother	17	1	1	2	No	5	Yes	NA	1	No
FG4	Mother	21	1	1	3	No	5	Yes	NA	2	No
FG4	Mother	40	1	1	3	Yes	1	No	NA	1	No
FG4	Mother*	30	1	1	2	No	1	No	1	1	No

Participant code	Parent status[a]	Age (years)	Marital status[b]	Ethnicity[c]	Education[d]	Employed (yes/no)	Smoking status[e]	Lives with smoker (yes/no)	Currently pregnant – infant feeding intentions[f]	Previous infant feeding experiences[g]	Experience of incentives[h]
FG4 and FG5[i]	Mother*	22	2	1	3	Yes	1	No	3	1	No
FG4 and FG5	Mother	32	1	1	3	No	5	No	NA	1	No
FG6	Mother	34	2	1	3	Yes	3	No	NA	1	No
FG6	Mother	30	1	1	NR	Yes	4	No	NA	1	No
FG6	Mother	34	1	1	1	Yes	4	No	NA	1	No
FG6	Mother	28	1	1	3	Yes	2	No	NA	1	No
FG7[i]	Mother	36	1	1	3	Yes	4	No	NA	1	No
FG7	Mother	28	1	2	1	Yes	1	No	NA	1	No
FG7	Mother	35	1	1	1	Yes	1	No	NA	1	No
FG7	Mother	36	1	2	1	Yes	1	No	NA	1	No
FG7	Mother	28	1	1	1	No	4	No	NA	1	No
FG7	Mother	41	1	2	3	Yes	3	Yes	NA	1	Other
FG7	Mother	36	1	1	1	Yes	1	No	NA	1	No
FG7	Mother	29	1	1	1	Yes	1	No	NA	1	No
FG7	Mother	36	1	1	2	Yes	4	No	NA	1	No
FG7	Mother	33	1	2	NR	NR	1	No	NA	1	No
FG7	Mother	30	1	1	1	Yes	1	No	NA	1	No
FG7	Mother	32	2	1	3	No	5	No	NA	1	No
FG7	Mother	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Participant code	Parent status[a]	Age (years)	Marital status[b]	Ethnicity[c]	Education[d]	Employed (yes/no)	Smoking status[e]	Lives with smoker (yes/no)	Currently pregnant – infant feeding intentions[f]	Previous infant feeding experiences[g]	Experience of incentives[h]
FG8[i]	Mother*	19	2	1	2	No	3	No	2	1	Other
FG8	Mother	20	1	1	3	No	3	Yes	NA	1	Other
FG8	Mother	20	1	1	2	No	5	No	NA	NR	No
FG8	Mother	19	2	1	3	No	3	No	NA	1	No
FG8	Mother	21	1	1	3	Yes	1	No	NA	2	Other

NA, not applicable; NR, not recorded; NVQ, National Vocational Qualification.

a 'Mother' relates to those who have older children (who may/may not be currently pregnant); 'mother*' relates to women who have older children and who are pregnant; 'woman' relates to those who are pregnant/expecting first child.

b 1, participant married/living together/in a relationship; 2, single/divorced.

c 1, white; 2, black or minority ethnic classifications.

d 1, degree-level qualification; 2, A-level or equivalent; 3, GCSE/NVQ or equivalent; 4, no formal qualifications.

e 1, never smoked; 2, quit during pregnancy; 3, cut down during pregnancy; 4, quit before pregnancy; 5, currently smoking.

f Code relates to women who are currently pregnant: 1, plan to breastfeed; 2, plan to mixed feed; 3, plan to formula feed.

g Code relates to families with older children/interviewed in the postnatal period: 1, previous experience of breastfeeding; 2, never breastfed.

h 'Other' relates to those involved in Barnardo's Early Years Early Action Fund (see www.barnardos.org.uk/media_centre/press_releases.htm?ref=81644; accessed 12 November 2014).

i Providers also took part in FG5, FG7 and FG8.

Appendix 22 Interviews: providers/experts

Participant code[a,b]	Profession	Provider/expert
T46	Consultant obstetrician	Provider
T47	Research manager, voluntary sector	Expert
T48	Public health consultant	Expert
T49	Health visitor	Provider
T50	Health visitor	Provider
T51	Lead health trainer – smoking cessation	Expert
52	Specialist midwife (substance misuse)	Provider
53	Hospital midwife	Provider
T54	Senior clinical lecturer/ethics committee member	Expert
T55	Consultant obstetrician	Provider
T56	Tobacco trainer – tobacco control team	Provider
T57	Stop smoking service manager	Expert
T58	Smoking awareness co-ordinator	Expert
T59	Midwife	Provider
T60	Infant feeding co-ordinator	Expert
T61	Smoking cessation advisor	Provider
62	Ethics committee member	Expert
T63	GP	Provider
T64	Paediatrician (neonatal)	Provider
T65	Paediatrician (general and respiratory)	Provider
66	Health improvement senior officer	Expert
67	Helpline manager	Expert
68	Midwife	Provider
69	Community midwife	Provider
70	Research nurse	Provider
71	Senior midwife	Provider
T72	Smoking cessation advisor	Provider
T73	Smoking cessation advisor	Provider
T74	Incentive scheme administrator	Provider

a Nine CPIT providers/experts took part in an interview; two experts were involved in a voucher incentive intervention for smoking cessation.
b 'T' denotes a telephone interview; no letter denotes a face-to-face interview.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 23 Focus groups and interactive discussions: providers/experts

Participant code[a]	Profession	Provider/expert
FG5	Peer supporter[b]	Provider
FG7	Health visitor[b]	Provider
FG7	Health visitor[b]	Provider
FG7	Student nurse/health visiting[b]	Provider
FG8	Liaison worker for young mums – voluntary sector[b]	Provider
FG9	Senior public health co-ordinator	Expert
FG9	Assistant director of nursing and families	Expert
FG9	Infant feeding consultant	Expert
FG9	Infant feeding co-ordinator[c]	Expert
FG9	Baby Friendly co-ordinator	Expert
FG10	Public health specialist	Provider
FG10	Parentcraft and infant feeding co-ordinator[d]	Expert
FG10	Children's centre development officer	Expert
FG10	Infant feeding co-ordinator	Expert
FG10	Breastfeeding peer support branch manager	Expert
FG10	Breastfeeding peer support operations manager	Expert
FG10	Breastfeeding peer support co-ordinator	Expert
FG10	Public health co-ordinator	Expert
FG10	Health co-ordinator, children's centres	Expert
FG11	Health visitor	Provider
FG11	Health visitor	Provider
FG11	Health visitor	Provider
FG11	Health visitor	Provider
FG11	Health visitor	Provider
FG11	Health visitor	Provider
FG11	Health visitor	Provider
FG12	Public health practitioner	Provider
FG12	Health education practitioner	Provider
FG13	Community midwife	Provider
FG13	Community midwife	Provider
FG13	Community midwife	Provider
FG13	Community midwife	Provider
FG13	Community midwife	Provider
FG13	Community midwife co-ordinator	Expert
FG14	Community pharmacist	Provider

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Participant code[a]	Profession	Provider/expert
FG14	Community pharmacist	Provider
FG14	Community pharmacist	Provider
FG14	Community pharmacist	Provider
FG14	Community pharmacist	Provider
FG14	Community pharmacist	Provider
FG14	Community pharmacist	Provider
FG15	Smoking cessation advisor	Provider
FG15	Smoking cessation advisor	Provider
FG15	Smoking cessation advisor	Provider
FG15	Smoking cessation advisor	Provider
FG15	Smoking cessation advisor	Provider
FG16	Helpline staff	Provider
FG16	Helpline staff	Provider
Interactive discussions[e]		
IA1	Nutrition and Nurture Conference, June 2011, Grange-over-Sands, Cumbria ($n = 30+$)	Providers and experts
IA2	Nutrition and Nurture Conference, June 2013, Grange-over-Sands, Cumbria ($n = 15$)	Providers and experts
IA3	(Scottish) Faculty of Public Health, November 2012, Crieff Hydro, Crieff, Perthshire ($n = 18$)	Providers and experts

a 14 CPIT providers took part in focus groups; one expert was involved in a North West England breastfeeding incentive intervention.
b Participants took part in focus groups with women.
c Participant also took part in FG10.
d Participant also took part in FG12.
e Participants included a mixture of practitioners and experts, a number of whom had been involved in smoking cessation/breastfeeding incentive interventions.

Appendix 24 Background to Ipsos MORI Computer Assisted Personal Interviewing

Ipsos MORI
Global Omnibus Services

Background to Capibus

Ipsos MORI's weekly face-to-face omnibus, *Capibus,* is well-established; it was launched in 1992 and was the **first omnibus** of its kind to use 'computer assisted personal interviewing' (CAPI) to administer the questionnaire. This new approach instantly improved the quality and accuracy of the information collected and has become a quality standard in the omnibus industry worldwide.

Capibus is run every week with fieldwork lasting one week in total. The length of time allocated to complete Ipsos MORI's omnibus, combined with the Capibus interviewing style of completing the survey **in home** instead of the on the doorstep, or in a hall, ensures that interviewers spend time with the respondents, building a rapport. This in turn engages respondents and fundamentally improves the quality of responses.

The key advantages that Capibus has over other face-to-face omnibus surveys are available in Britain is the high quality sample design which incorporates a range of variables to ensure a robust, representative and consistent sample is achieved on a weekly basis. Factored in to the design is the larger number of sampling points to underpin coverage, the week's fieldwork allocated to the interviewing period and the interviewing style. Our demographics are also designed to enhance any research required by both our public and private sector clients - to do this we are pleased to be able to offer a comprehensive list of more than 30 demographics free of charge.

Capibus therefore provides you with **considerable flexibility** and means that we have no problem whatsoever in running tracker questions when required nor ad hoc needs as and when they may potentially arise.

The Sample

Capibus uses a unique and rigorous sampling method - a controlled form of random location sampling (known as 'random locale', a dual stage sampling design). Ipsos MORI uses a control method applied to field region and sub-region over a robust number of sample points (typically 155-180) to ensure we get a good geographical spread. We then set our interviewer quotas for sex, age, working status and tenure to ensure our sample is nationally representative - we use the CACI ACORN geo-demographic system in the selection process.

The use of ACORN ensures all types of area are fully represented and that selection of respondents is largely taken out of the hands of the interviewers, helping to eliminate any possible bias in the sample caused by interviewing people all with the same background.

On Ipsos MORI Face-to-Face Omnibus the interviewer is required to achieve interviews with respondents from a small set of homogenous streets, selected with probability proportional to population after stratification by ACORN characteristics and region

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Ipsos MORI
Global Omnibus Services

Because the sampling process is repeated every week, the Capibus sample is matched wave on wave, making it ideal for taking successive measurements on the same issue so there should be no concerns about running questions over a number of weeks.

Ipsos MORI's reputation has largely been built on our high-profile political and other opinion research over several decades. We have a strong image among the public, the media and other key opinion formers for conducting rigorous, independent research to high standards. As a result, we do believe that the Ipsos MORI name adds value to the research projects we conduct and assists significantly in maximising response rates and in the publication and dissemination of findings.

Quality Plan

There are dozens of quality issues which make the difference between robust and unreliable data. These will have a direct impact on your ability to make the right decisions with confidence and to maximise the value of the resources you invest in the research you have in mind.

Ipsos MORI can guarantee securing robust data because we have to undergo stringent independent audits of our quality systems. As a result, we have a proven record on **quality and industry leadership** in this area. Our clients tell us that this is what sets us apart from other agencies and this is upheld by our record in terms of independent assessments.

MRS Company Partnership - In 2005 we were the first market research company to sign our organisation up to the rigours of the Market Research Society (MRS) Code. With the increasing importance of self-regulation, we wanted to be at the forefront of supporting the ethics and quality of our industry by applying the industry's professional Code to our entire organisation including all our interviewers. Previous to this, the Code applied solely to individuals who are members.

There are now over 350 MRS company partners who have followed our lead.

In 1996, MORI became **one of just two** companies to achieve accreditation under MRQSA (Market Research Quality Standards Association). This sets out minimum standards for each stage of a market research project and is designed to enable accredited companies to provide a superior service to their clients. We have passed a series of inspections since then with flying colours.

We are also a member of the Market Research Society and ESOMAR (the European Society for Opinion and Marketing Research), and as such, adhere to their Codes of Conduct.

Ipsos MORI was the **first company in the world to** gain ISO 20252:2006 accreditation - the international market research specific standard that supersedes BS 7911 / MRQSA and incorporates IQCS (Interviewer Quality Control Scheme); it covers the five stages of a Market Research project.

ISO 27001:2005 - International standard for information security designed to ensure the selection of adequate and proportionate security controls. Ipsos MORI was the **first research company in the UK** to be awarded this in August 2008.

Appendix 25 Ipsos MORI survey of the general public

Lifestyle survey: CS module CAPIBUS week 12

(Sample = adults aged 18+ years)

[Computing, please rotate so that half of the sample are asked smoking questions (smoking intro plus CS01–05) first and half of the sample are asked breastfeeding questions (breastfeeding intro plus CS06–CS10) first]

(Computing: please ensure all DK, REF and NULL are treated as hidden responses)

Interviewer: this section does not have showcards. On-screen instructions will indicate when to show and when not to show screen to the respondent. Please note: there may be questions that allow don't know, none of these or refused. Please type DK for don't know, REF for refused and NULL for none of these.

(New screen)

INTERVIEWER: PLEASE SHOW SCREEN UNTIL OTHERWISE INSTRUCTED.

I WOULD NOW LIKE TO ASK YOU SOME QUESTIONS ABOUT SMOKING DURING PREGNANCY . . .

CS01. Stopping smoking in pregnancy benefits the health of the baby and the mother. Research shows that providing shopping vouchers to women who prove that they have stopped smoking during pregnancy increases the number of women who stop. While some people feel that providing vouchers is appropriate, others feel that it is wrong or unfair.

Do you agree or disagree that shopping vouchers should be provided to women who prove that they have stopped smoking during pregnancy?

(Single code; reverse order between interviews)

Strongly agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Strongly disagree

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

If CODE STRONGLY AGREE, TEND TO AGREE OR NEITHER AGREE NOR DISAGREE AT CS01, ASK:

CS02. What is the highest amount of shopping voucher you think it would be acceptable to provide to a woman who proves that she has stopped smoking during pregnancy?

(Single code; reverse order between interviews)

(a) £2.00 per month
(b) £10.00 per month
(c) £20.00 per month
(d) £40.00 per month
(e) £60.00 per month
(f) £80.00 per month

If CODE STRONGLY AGREE, TEND TO AGREE OR NEITHER AGREE NOR DISAGREE AT CS01, ASK:

CS03. Do you think that it is acceptable to provide shopping vouchers to women who prove that they have stopped smoking during pregnancy, regardless of their income, or only to women on low incomes?

(Single code)

To all women, regardless of income
Only to women on low incomes

ASK ALL

CS04. Some women start smoking again after the birth of their baby, particularly if their partner or someone at home smokes. Please tell me whether you agree or disagree with each of the following statements.

Statements:

It is acceptable to provide shopping vouchers to a woman for 2 months after the birth of her baby if she proves that she is still not smoking.

It is acceptable to provide shopping vouchers to a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home.

(Single code for each statement; reverse order of list between interviews)

Precode list:

Strongly agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Strongly disagree

CS05. Do you agree or disagree that local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy?

(Single code; reverse order of list between interviews)

Precode list:

Strongly agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Strongly disagree

I WOULD NOW LIKE TO ASK YOU SOME QUESTIONS ABOUT BREASTFEEDING . . .

CS06. Breastfeeding benefits the health of the baby and the mother. While some people feel it is appropriate to provide shopping vouchers to encourage breastfeeding, other people feel it is wrong or unfair.

Do you agree or disagree that shopping vouchers should be provided to women who breastfeed for the first 6 months after the birth of their child?

(Single code; reverse order of list between interviews)

Precode list:

Strongly agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Strongly disagree

IF CODE STRONGLY AGREE, TEND TO AGREE OR NEITHER AGREE NOR DISAGREE AT CS06, ASK:

CS07. What is the highest amount of shopping voucher you would consider acceptable for women who breastfeed?

(Single code; reverse order between interviews)

(a) £2.00 per month
(b) £10.00 per month
(c) £20.00 per month
(d) £40.00 per month
(e) £60.00 per month
(f) £80.00 per month

IF CODE STRONGLY AGREE, TEND TO AGREE OR NEITHER AGREE NOR DISAGREE AT CS06, ASK:

CS08. Do you agree or disagree that shopping vouchers should be provided to all women who breastfeed, regardless of their income, or only to women on low incomes?

(Single code)

To all women, regardless of income
Only to women on low incomes

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

ASK ALL

CS09. Do you agree or disagree that local health services should receive additional funding if they reach targets for the number of women who breastfeed?

(Single code; reverse order of list between interviews)

Precode list:

Strongly agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Strongly disagree

(New screen)

INTERVIEWER: THE WORDING OF THE NEXT QUESTION ABOUT BREASTFEEDING IS A BIT SENSITIVE. PLEASE COULD YOU TURN THE NEXT SCREEN TO THE RESPONDENT AND ASK THEM TO READ THE QUESTION THEMSELVES. THEY CAN JUST GIVE YOU THEIR ANSWER FOR YOU TO INPUT

ASK ALL

CS10. Some women who breastfeed like to express milk. This allows babies to receive breast milk when mother and baby are apart.

To express milk, some women find a breast pump useful. Women can buy breast pumps ranging from £20.00 to over £100.00. Do you agree or disagree that a breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding?

(Single code; reverse order of list between interviews)

Precode list:

Strongly agree
Tend to agree
Neither agree nor disagree
Tend to disagree
Strongly disagree

TO FIT WITH OMNIBUS DEMOG QUESTIONS, IF NOT RECORDED ANY CHILDREN IN OMNIBUS DEMOG QUESTIONS, ASK:

CS11. Do you have any children? Please include any children who are grown up now and any children who do not live with you.

(Single code)

Yes
No

IF HAVE CHILDREN (FROM OMNIBUS DEMOGS OR CS11), ASK:

CS12. Have any of your children ever been breastfed or received breast milk, even if only for a day or two?

(Single code, allow DK and REF)

Yes
No

ASK ALL

CS13. Do you currently smoke or have you ever smoked?

Yes, I currently smoke every day
Yes, I currently smoke, but not every day
Yes, I used to smoke but have quit
No, I have never smoked
I prefer not to answer

IF CODE 1 OR 2 AT CS13, ASK:

CS14. Have you ever tried to stop smoking?

(Single code)

Yes
No

CLOSE

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 26 Survey of health professionals

***1. Stopping smoking in pregnancy benefits the health of the baby and the mother. Research shows that providing shopping vouchers to women who prove that they have stopped smoking during pregnancy increases the number of women who stop. While some people feel that providing vouchers is appropriate, others feel that it is wrong or unfair.**

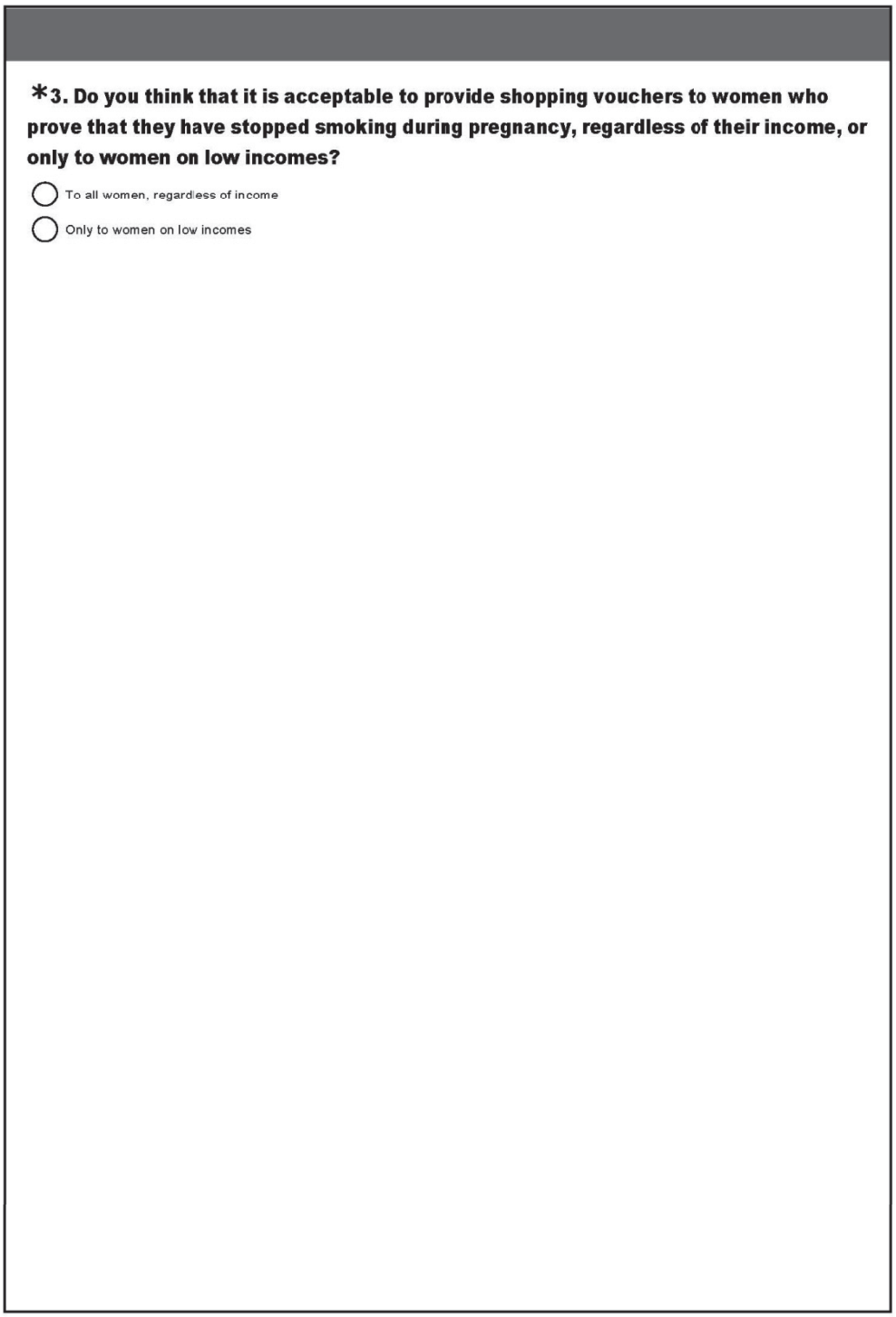
Do you agree or disagree that shopping vouchers should be provided to women who prove that they have stopped smoking during pregnancy?

- ◯ Strongly agree
- ◯ Tend to agree
- ◯ Neither agree nor disagree
- ◯ Tend to disagree
- ◯ Strongly disagree

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***2. What is the highest amount of shopping voucher you think it would be acceptable to provide a woman who proves that she has stopped smoking during pregnancy?**

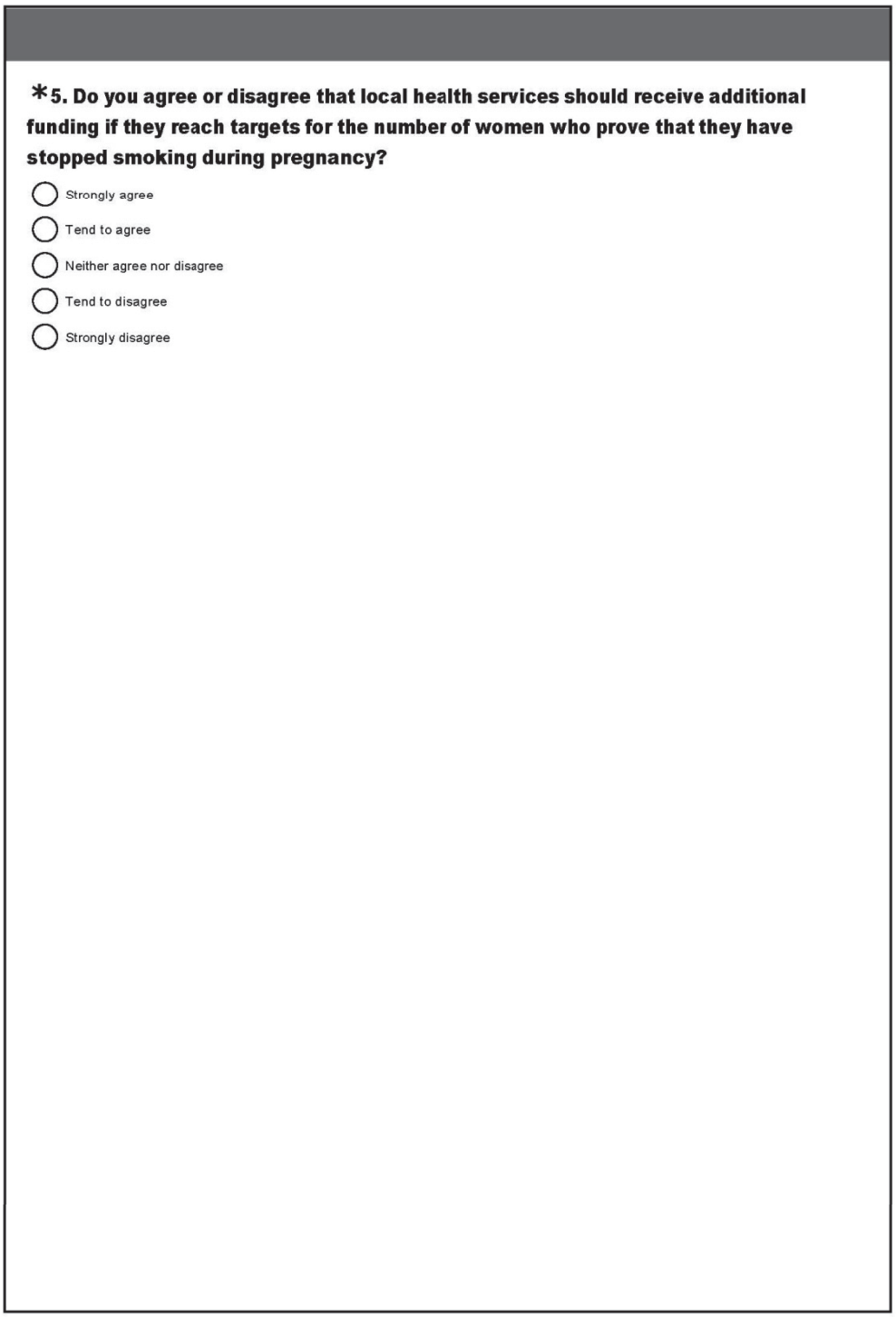
- ◯ £2 per month
- ◯ £10 per month
- ◯ £20 per month
- ◯ £40 per month
- ◯ £60 per month
- ◯ £80 per month



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***4. Some women start smoking again after the birth of their baby, particularly if their partner or someone at home smokes. Please tell us whether you agree or disagree with each of the following statements.**

	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree
It is acceptable to provide shopping vouchers to a woman for two months after the birth of her baby if she proves that she is still not smoking	○	○	○	○	○
It is acceptable to provide shopping vouchers to a woman for two months after the birth of her baby if she never lets anyone smoke in her home	○	○	○	○	○



***5. Do you agree or disagree that local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy?**

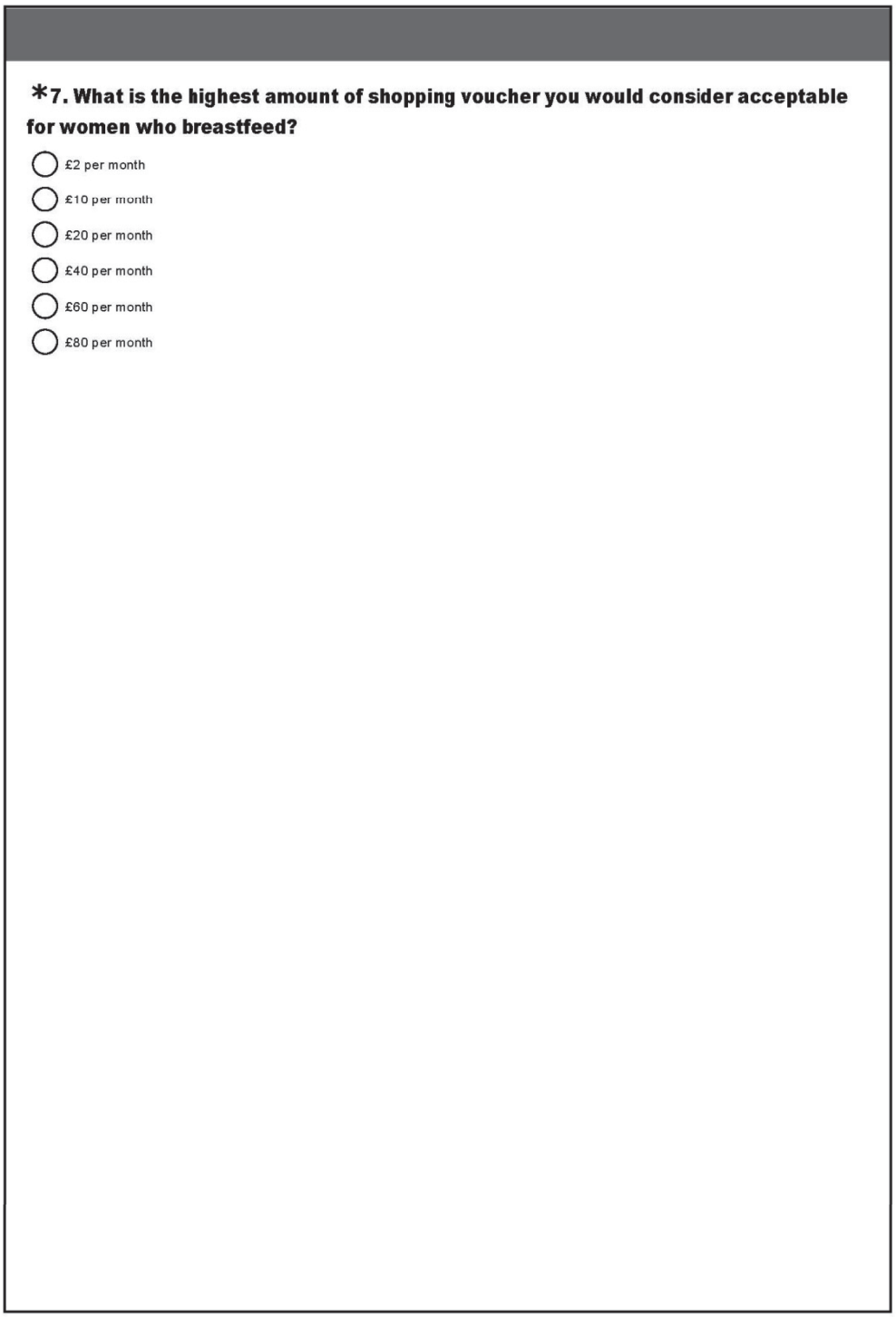
- ◯ Strongly agree
- ◯ Tend to agree
- ◯ Neither agree nor disagree
- ◯ Tend to disagree
- ◯ Strongly disagree

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***6. Breastfeeding benefits the health of the baby and the mother. While some people feel it is appropriate to provide shopping vouchers to encourage breastfeeding, other people feel it is wrong or unfair.**

Do you agree or disagree that shopping vouchers should be provided to women who breastfeed for the first six months after the birth of their child?

- ◯ Strongly agree
- ◯ Tend to agree
- ◯ Neither agree nor disagree
- ◯ Tend to disagree
- ◯ Strongly disagree



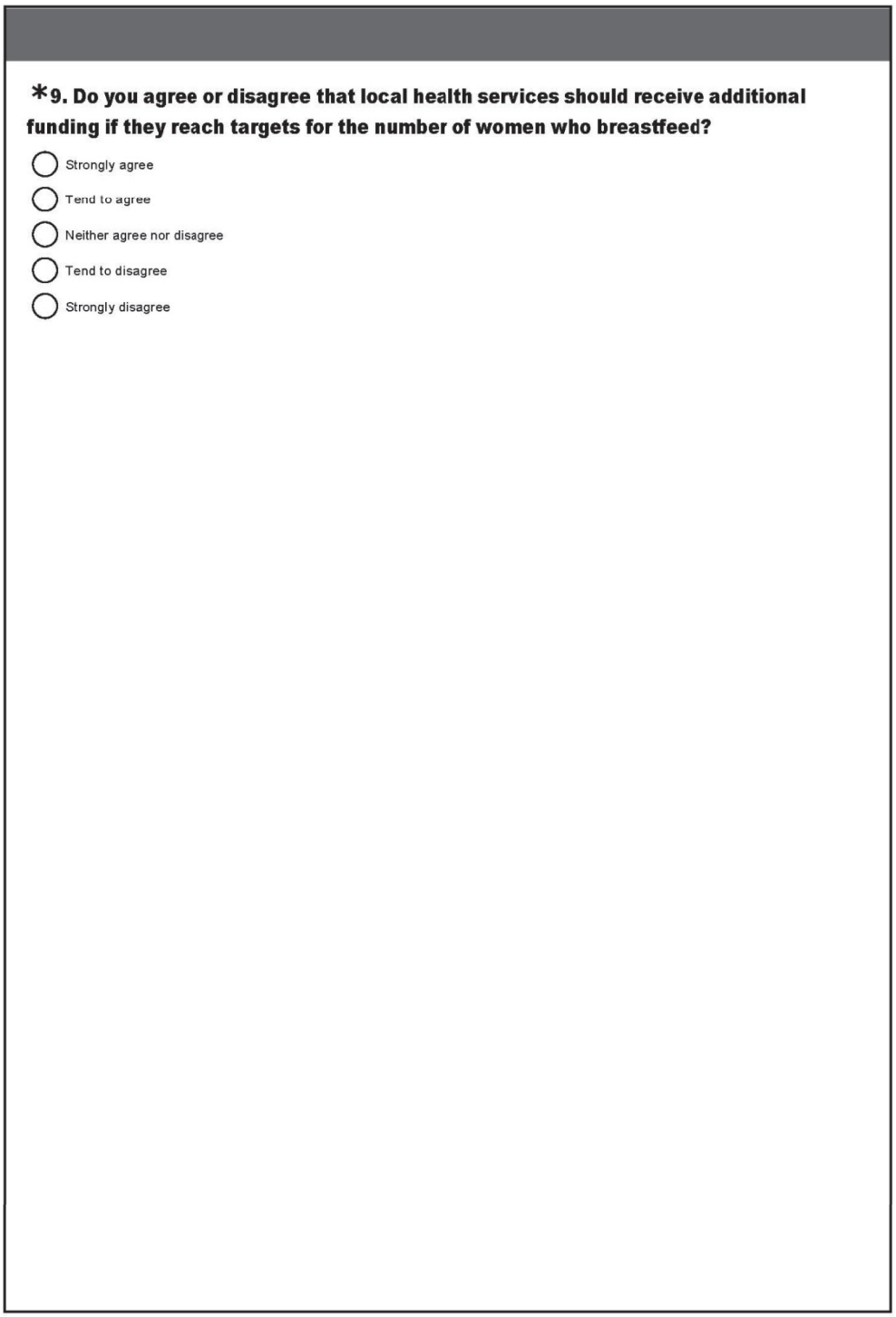
***7. What is the highest amount of shopping voucher you would consider acceptable for women who breastfeed?**

- ◯ £2 per month
- ◯ £10 per month
- ◯ £20 per month
- ◯ £40 per month
- ◯ £60 per month
- ◯ £80 per month

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***8. Do you agree or disagree that shopping vouchers should be provided to all women who breastfeed, regardless of their income, or only to women on low incomes?**

- ◯ To all women, regardless of income
- ◯ Only to women on low incomes



*9. Do you agree or disagree that local health services should receive additional funding if they reach targets for the number of women who breastfeed?

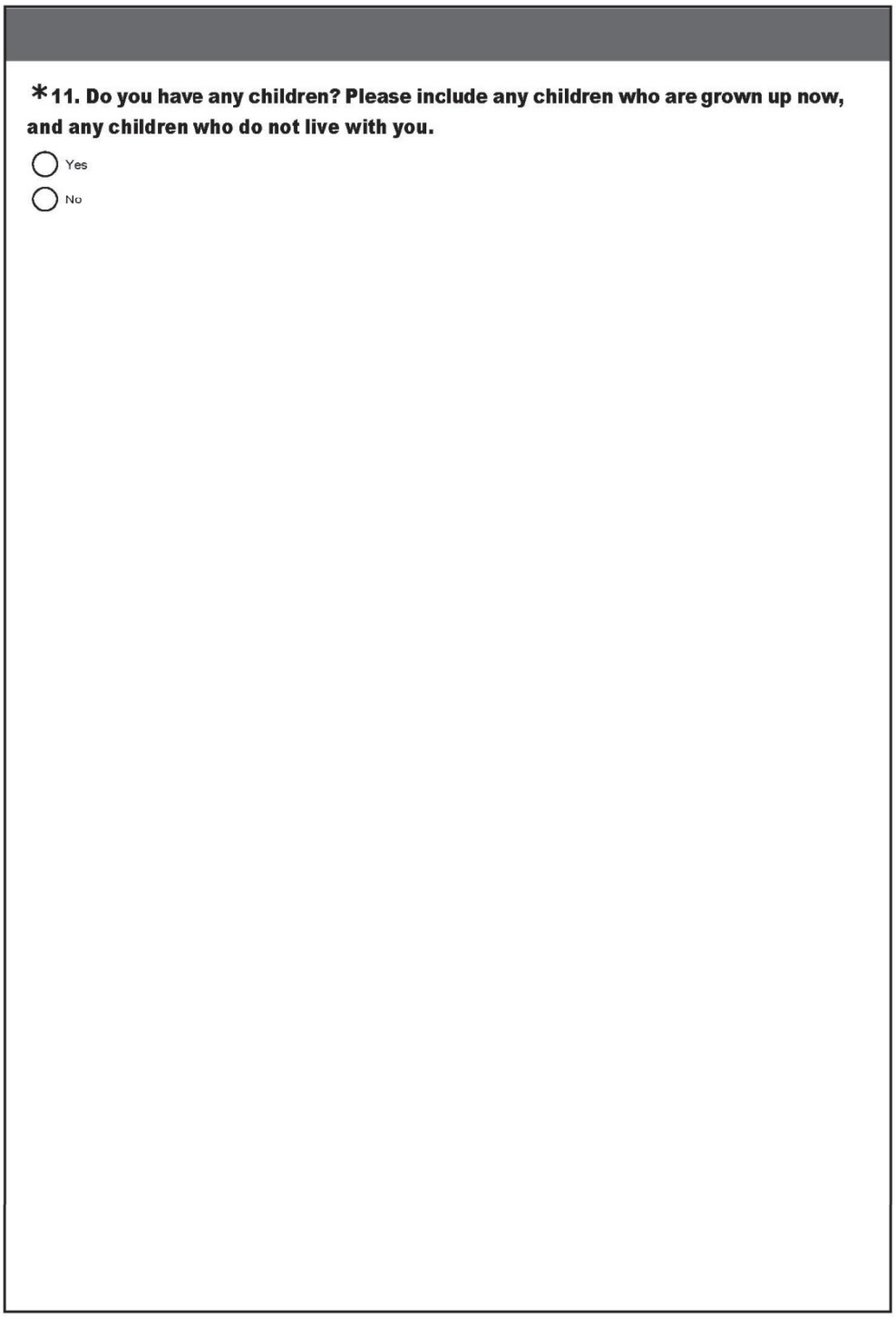
- ◯ Strongly agree
- ◯ Tend to agree
- ◯ Neither agree nor disagree
- ◯ Tend to disagree
- ◯ Strongly disagree

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***10. Some women who breastfeed like to express milk. This means that they can get breast milk when mother and baby are apart.**

To express milk, some women find a breast pump useful. Women can buy breast pumps ranging from £20 to over £100. Do you agree or disagree that a breast pump costing around £40 should be available for free on the NHS, to help women to continue breastfeeding?

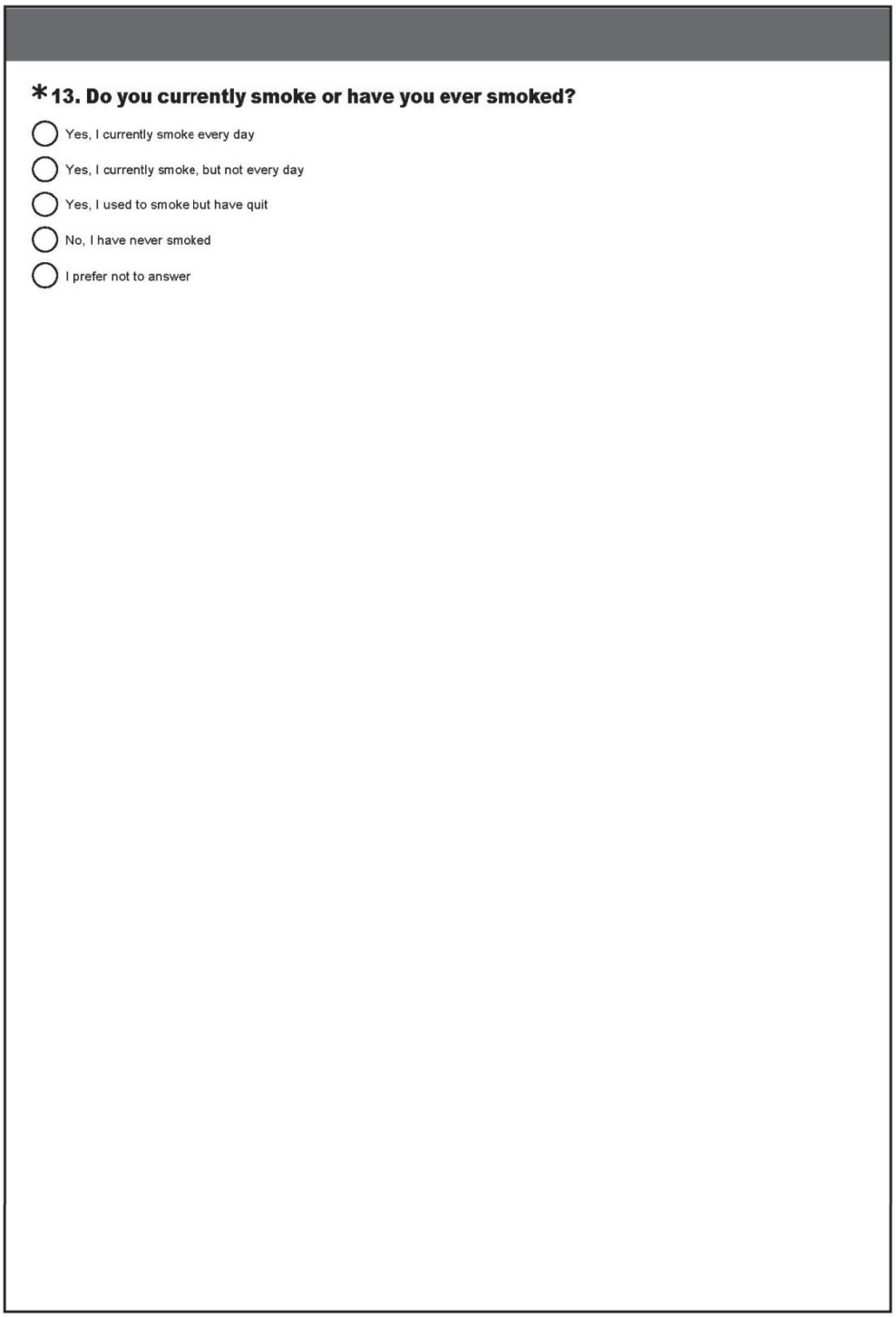
- ◯ Strongly agree
- ◯ Tend to agree
- ◯ Neither agree nor disagree
- ◯ Tend to disagree
- ◯ Strongly disagree



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***12. Have any of your children ever been breastfed or received breast milk, even if only for a day or two?**

- ◯ Yes
- ◯ No



***13. Do you currently smoke or have you ever smoked?**

- ◯ Yes, I currently smoke every day
- ◯ Yes, I currently smoke, but not every day
- ◯ Yes, I used to smoke but have quit
- ◯ No, I have never smoked
- ◯ I prefer not to answer

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***14. Have you ever tried to stop smoking?**

◯ Yes

◯ No

15. We would like you to imagine that your local health service is going to run a scheme that provides incentives for stopping smoking in pregnancy. What do you think the consequences might be for participants and/or staff?

Positive consequences

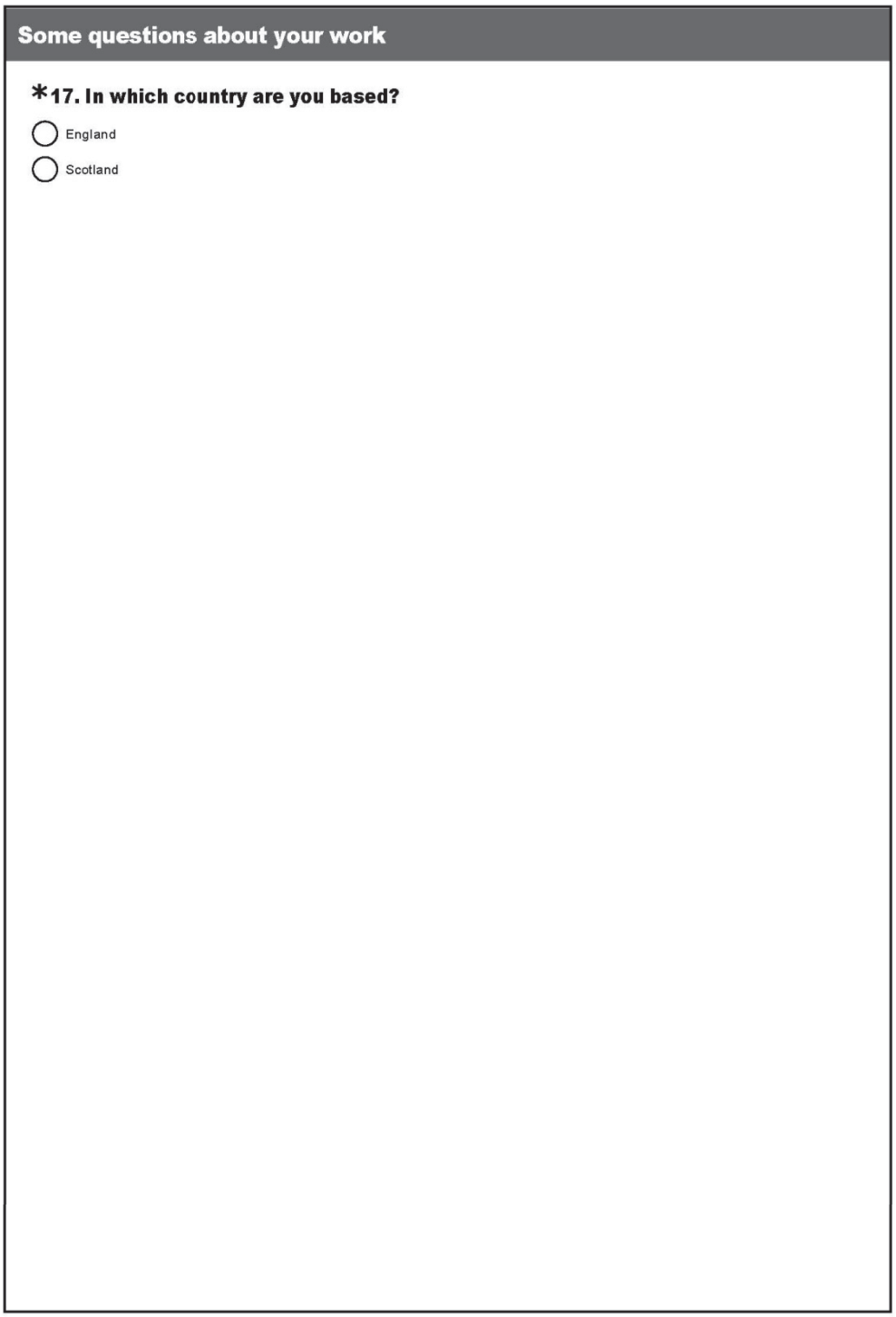
Negative consequences

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

16. Similarly, we would like you to imagine that your local health service is going to run a scheme that provides incentives for breastfeeding. What do you think the consequences might be for participants and/or staff?

Positive consequences

Negative consequences


Some questions about your work

*17. In which country are you based?

England

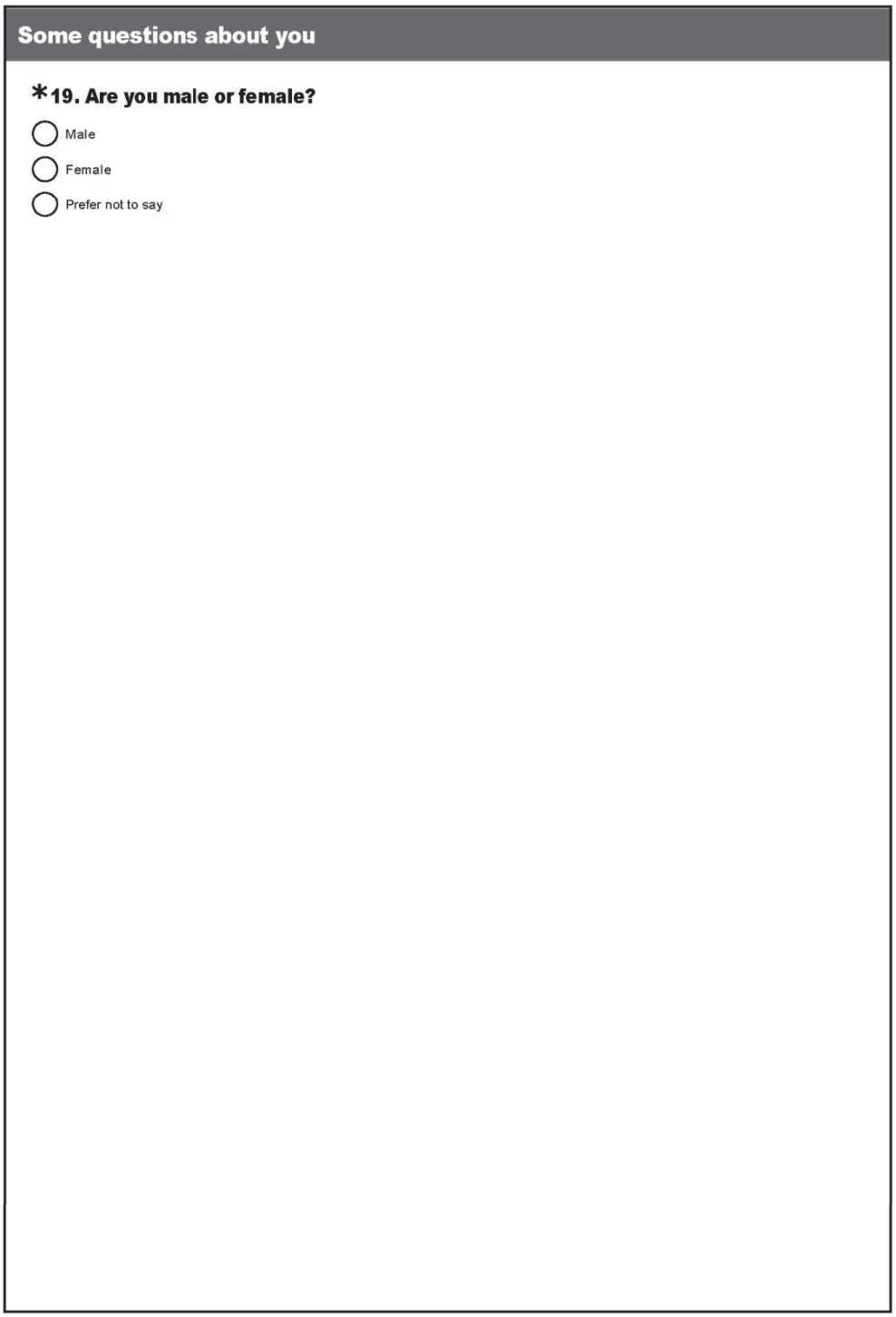
Scotland

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***18. What is your job or role?**

- ◯ Midwife
- ◯ Other maternity nursing or caring staff (e.g. nursery nurse, RGN)
- ◯ Health visitor
- ◯ Health visitor assistan:
- ◯ Paediatrician
- ◯ Obstetrician
- ◯ General practitioner
- ◯ Practice nurse
- ◯ Public health doctor or practitioner
- ◯ Manager of the above
- ◯ Student (please specify below)
- ◯ Other (please specify below)

My job or role is:



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***20. Which category below includes your age?**

- ◯ 16-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55-64
- ◯ 65 and over
- ◯ Prefer not to say

***21. Please describe your ethnicity**

- ◯ White - White
- ◯ White - British
- ◯ White - Irish
- ◯ White - Other White background
- ◯ Mixed - White and Black Caribbean
- ◯ Mixed - White and Black African
- ◯ Mixed - White and Asian
- ◯ Mixed - Other Mixed background
- ◯ Asian or Asian British - Indian
- ◯ Asian or Asian British - Pakistani
- ◯ Asian or Asian British - Bangladeshi
- ◯ Asian or Asian British - Other Asian background
- ◯ Black or Black British - Caribbean
- ◯ Black or Black British - African
- ◯ Black or Black British - Other Black background
- ◯ Black or Black British - All Black Groups
- ◯ Chinese or Other Ethnic Groups - Chinese
- ◯ Chinese or Other Ethnic Groups - Other Ethnic Group
- ◯ Prefer not to say

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

***22. We would like to invite you to participate in a short 15 minute telephone interview to tell us more about your views. If you are interested, we will request your consent to record the interview, which will be confidential and anonymous. Would you be interested in being interviewed?**

◯ No, thank you

◯ Yes, and I have entered my contact details below

My email address and contact telephone number (mobile preferred) are:

***23. THANK YOU FOR PARTICIPATING IN OUR SURVEY**

40 x £5 Amazon (www.amazon.co.uk) vouchers are available to be won. To enter, please type your email address below. Please note that your email address will be used for the prize draw only and you will not be contacted by researchers again unless you expressed an interest in being interviewed on the previous page.

◯ No, thank you. Please take me to the end of the survey.

◯ I would like to enter the prize draw and my email address is:

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 27 Distribution of the health professional survey

TABLE 64 Survey distribution to primary care staff in Scotland through the SPCRN

SPCRN node	Practice managers who received and distributed the survey	Practice staff responses received
East (Tayside, Fife, Forth Valley)	183	55
North (Highland, Western Isles)	83	32
North East (Grampian, Orkney, Shetland)	80	102
South East (Lothian, Borders)	151	5
West (Dumfries and Galloway, Lanarkshire, Greater Glasgow and Clyde, Ayrshire and Arran)	417	30
Total		224

TABLE 65 Survey distribution to hospital maternity and early years staff through health boards and R&D departments

Health board/R&D department	Responses received
NHS Ayrshire and Arran	0
NHS Borders	0
NHS Dumfries and Galloway	78
NHS Fife	1
NHS Forth Valley	10
NHS Grampian	77
NHS Greater Glasgow and Clyde	1
NHS Highland	0
NHS Lanarkshire	0
NHS Lothian	37
NHS Orkney	1
NHS Shetland	5
NHS Tayside	0
NHS Western Isles	3
Total	213

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 66 Survey distribution to stakeholders in Scotland through identified personal contacts who were e-mail list gatekeepers

Stakeholders	Denominator, if known	Responses received	% response rate
Paediatricians in training	28	6	21.4
Public health doctors	123	13	10.6
Scottish government – two contacts asked to distribute	Unknown	0	0
Total	151	19	12.6

TABLE 67 Survey distribution to maternity and early years health professionals in North West England through Binley's

Health professionals	Denominator	Responses received	% response rate
NHS managers: clinical directors, directorate managers, directorate nurse manager, directorate service manager and other directorate managers within the maternity, obstetrics and gynaecology and paediatrics services	141	0	0
General practices: health visitors, midwives, GP partners, practice nurses, GP registrar, head of midwifery, other GP, senior midwife, senior practice nurse, team leader – health visitor, team leader – midwife	3721	26	0.01
Specialist nurses: public health medicine, obstetrics and gynaecology, paediatrics	446	1	< 0.01
Hospital doctors: public health medicine, obstetrics and gynaecology, paediatrics	513	11	0.02
Unknown	0	5	
Total	4821	43	0.01

TABLE 68 Survey distribution to UCLan midwifery and health visiting students

Students	Number sent	Responses received
Midwifery and health visiting	139	5
Other	Unknown	2
Total	Unknown	7

TABLE 69 Survey distribution to maternity and early years health professionals through R&D departments within the North West trusts

R&D departments	Number sent	Responses received
North West trusts	Unknown	13
Total	Unknown	13

Appendix 28 Detailed results of the Ipsos MORI survey

TABLE 70 Response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy', by independent variable, from the Ipsos MORI survey

Variable	SD	D	N	A	SA
Age category (years)					
18–24	30 (17.6)	34 (20.0)	34 (20.0)	48 (28.2)	24 (14.1)
25–34	32 (18.3)	32 (18.3)	27 (15.4)	50 (28.6)	34 (19.4)
35–44	31 (17.1)	29 (16.0)	33 (18.2)	46 (25.4)	42 (23.2)
45–54	44 (27.7)	28 (17.6)	29 (18.2)	32 (20.1)	26 (16.4)
55–59	23 (31.9)	13 (18.1)	12 (16.7)	16 (22.2)	8 (11.1)
60–64	28 (29.8)	13 (13.8)	13 (13.8)	24 (25.5)	16 (17.0)
65+	107 (36.5)	40 (13.7)	49 (16.7)	53 (18.1)	44 (15.0)
Breastfeeding					
Children not breastfed	154 (24.4)	113 (17.9)	135 (21.4)	138 (21.8)	92 (14.6)
Children breastfed	141 (27.5)	76 (14.8)	62 (12.1)	131 (25.6)	102 (19.9)
Children					
No children	90 (22.4)	79 (19.7)	81 (20.1)	98 (24.4)	54 (13.4)
Have children	205 (27.6)	110 (14.8)	116 (15.6)	171 (23.0)	140 (18.9)
Ethnicity					
White	280 (28.4)	163 (16.5)	167 (17.0)	212 (21.5)	163 (16.5)
Other ethnicity	15 (9.4)	26 (16.4)	30 (18.9)	57 (35.8)	31 (19.5)
Sex					
Male	120 (22.2)	83 (15.4)	106 (19.6)	128 (23.7)	103 (19.1)
Female	175 (29.0)	106 (17.5)	91 (15.1)	141 (23.3)	91 (15.1)
Education					
University	65 (22.0)	46 (15.6)	44 (14.9)	77 (26.1)	63 (21.4)
GCSE	98 (28.7)	54 (15.8)	57 (16.7)	80 (23.4)	53 (15.5)
A-level	48 (24.9)	43 (22.3)	32 (16.6)	36 (18.7)	34 (17.6)
No formal qualification	59 (29.9)	24 (12.2)	47 (23.9)	45 (22.8)	22 (11.2)
Other, still studying, don't know	25 (21.4)	22 (18.8)	17 (14.5)	31 (26.5)	22 (18.8)
Social grade					
AB	71 (29.7)	37 (15.5)	30 (12.6)	59 (24.7)	42 (17.6)
C1	103 (27.8)	67 (18.1)	68 (18.4)	73 (19.7)	59 (15.9)
C2	57 (24.2)	38 (16.1)	44 (18.6)	55 (23.3)	42 (17.8)
D	40 (24.7)	29 (17.9)	28 (17.3)	38 (23.5)	27 (16.7)
E	24 (17.5)	18 (13.1)	27 (19.7)	44 (32.1)	24 (17.5)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 70 Response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy', by independent variable, from the Ipsos MORI survey (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	147 (25.7)	102 (17.8)	97 (16.9)	144 (25.1)	83 (14.5)
Previous smoker	84 (29.9)	49 (17.4)	43 (15.3)	64 (22.8)	41 (14.6)
Current (tried quitting)	38 (21.7)	22 (12.6)	31 (17.7)	34 (19.4)	50 (28.6)
Current (not tried quitting)	15 (23.8)	9 (14.3)	10 (15.9)	16 (25.4)	13 (20.6)
Refused to answer	11 (21.2)	7 (13.5)	16 (30.8)	11 (21.2)	7 (13.5)
Area					
North	24 (31.2)	17 (22.1)	11 (14.3)	10 (13.0)	15 (19.5)
North West	19 (13.4)	25 (17.6)	38 (26.8)	41 (28.9)	19 (13.4)
Yorkshire and Humberside	40 (38.5)	11 (10.6)	13 (12.5)	22 (21.2)	18 (17.3)
East Midlands	25 (22.9)	28 (25.7)	14 (12.8)	29 (26.6)	13 (11.9)
West Midlands	22 (33.3)	10 (15.2)	12 (18.2)	12 (18.2)	10 (15.2)
East Anglia	10 (24.4)	6 (14.6)	5 (12.2)	10 (24.4)	10 (24.4)
South East	20 (24.7)	9 (11.1)	17 (21.0)	15 (18.5)	20 (24.7)
South West	55 (27.5)	26 (13.0)	40 (20.0)	47 (23.5)	32 (16.0)
London	17 (11.4)	31 (20.8)	19 (12.8)	59 (39.6)	23 (15.4)
Wales	29 (43.9)	9 (13.6)	6 (9.1)	10 (15.2)	12 (18.2)
Scotland	34 (31.2)	17 (15.6)	22 (20.2)	14 (12.8)	22 (20.2)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 71 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	1.66	1.19 to 2.31	0.003	1.67	1.10 to 2.54	0.016
25–34	1.92	1.37 to 2.69	< 0.001	1.71	1.17 to 2.49	0.006
35–44	2.15	1.54 to 3.00	< 0.001	1.88	1.30 to 2.72	0.001
45–54	1.29	0.91 to 1.82	0.16	1.27	0.87 to 1.84	0.21
55–59	1.04	0.66 to 1.65	0.87	1.03	0.63 to 1.66	0.91
60–64	1.39	0.91 to 2.12	0.13	1.42	0.92 to 2.20	0.12
Breastfeeding						
Children breastfed	1.15	0.94 to 1.42	0.18	1.26	0.94 to 1.69	0.12
Children						
Have children	1.05	0.85 to 1.30	0.67	1.17	0.86 to 1.59	0.33

TABLE 71 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Ethnicity						
Other ethnicity	1.94	1.46 to 2.59	< 0.001	1.42	1.01 to 1.99	0.047
Sex						
Female	0.75	0.61 to 0.92	0.006	0.71	0.57 to 0.88	0.002
Education						
GCSE	0.70	0.53 to 0.93	0.014	0.59	0.43 to 0.81	0.001
A-level	0.72	0.52 to 0.99	0.042	0.63	0.44 to 0.90	0.010
No formal qualification	0.64	0.46 to 0.87	0.005	0.63	0.42 to 0.95	0.029
Other, still studying, don't know	0.92	0.63 to 1.34	0.66	0.84	0.55 to 1.28	0.41
Social grade						
C1	0.92	0.68 to 1.23	0.57	1.03	0.75 to 1.42	0.87
C2	1.12	0.81 to 1.55	0.48	1.25	0.85 to 1.83	0.26
D	1.06	0.74 to 1.51	0.75	1.27	0.83 to 1.94	0.27
E	1.48	1.03 to 2.15	0.036	1.74	1.12 to 2.70	0.014
Smoking status						
Previous smoker	0.88	0.68 to 1.13	0.32	0.97	0.74 to 1.28	0.83
Current (tried quitting)	1.59	1.17 to 2.16	0.003	1.63	1.18 to 2.26	0.003
Current (not tried quitting)	1.28	0.80 to 2.04	0.30	1.31	0.81 to 2.12	0.28
Refused to answer	1.08	0.66 to 1.74	0.77	0.93	0.56 to 1.55	0.78
Area						
North	0.50	0.30 to 0.81	0.005	0.66	0.39 to 1.10	0.11
North West	0.82	0.56 to 1.21	0.33	1.03	0.69 to 1.56	0.87
Yorkshire and Humberside	0.49	0.31 to 0.76	0.002	0.62	0.38 to 1.01	0.054
East Midlands	0.58	0.38 to 0.89	0.012	0.70	0.45 to 1.09	0.12
West Midlands	0.49	0.29 to 0.81	0.006	0.68	0.39 to 1.16	0.16
East Anglia	0.86	0.46 to 1.60	0.63	1.06	0.56 to 2.00	0.86
South East	0.82	0.51 to 1.33	0.42	1.26	0.75 to 2.11	0.38
South West	0.63	0.44 to 0.92	0.015	0.97	0.64 to 1.45	0.86
Wales	0.37	0.22 to 0.64	< 0.001	0.55	0.31 to 0.97	0.040
Scotland	0.54	0.35 to 0.84	0.006	0.78	0.49 to 1.26	0.31

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 72 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–24	31 (18.2)	36 (21.2)	37 (21.8)	47 (27.6)	19 (11.2)
25–34	33 (18.9)	41 (23.4)	32 (18.3)	46 (26.3)	23 (13.1)
35–44	36 (19.9)	38 (21.0)	28 (15.5)	52 (28.7)	27 (14.9)
45–54	44 (27.7)	33 (20.8)	26 (16.4)	40 (25.2)	16 (10.1)
55–59	29 (40.3)	14 (19.4)	6 (8.3)	16 (22.2)	7 (9.7)
60–64	28 (29.8)	12 (12.8)	15 (16.0)	25 (26.6)	14 (14.9)
65+	118 (40.3)	38 (13.0)	52 (17.7)	56 (19.1)	29 (9.9)
Breastfeeding					
Children not breastfed	160 (25.3)	123 (19.5)	141 (22.3)	138 (21.8)	70 (11.1)
Children breastfed	159 (31.1)	89 (17.4)	55 (10.7)	144 (28.1)	65 (12.7)
Children					
No children	89 (22.1)	82 (20.4)	91 (22.6)	100 (24.9)	40 (10.0)
Have children	230 (31.0)	130 (17.5)	105 (14.2)	182 (24.5)	95 (12.8)
Ethnicity					
White	302 (30.7)	184 (18.7)	162 (16.4)	227 (23.0)	110 (11.2)
Other ethnicity	17 (10.7)	28 (17.6)	34 (21.4)	55 (34.6)	25 (15.7)
Sex					
Male	123 (22.8)	97 (18.0)	109 (20.2)	138 (25.6)	73 (13.5)
Female	196 (32.5)	115 (19.0)	87 (14.4)	144 (23.8)	62 (10.3)
Education					
University	68 (23.1)	54 (18.3)	49 (16.6)	79 (26.8)	45 (15.3)
GCSE	102 (29.8)	68 (19.9)	57 (16.7)	75 (21.9)	40 (11.7)
A-level	55 (28.5)	37 (19.2)	30 (15.5)	52 (26.9)	19 (9.8)
No formal qualification	67 (34.0)	29 (14.7)	44 (22.3)	43 (21.8)	14 (7.1)
Other, still studying, don't know	27 (23.1)	24 (20.5)	16 (13.7)	33 (28.2)	17 (14.5)
Social grade					
AB	71 (29.7)	41 (17.2)	36 (15.1)	59 (24.7)	32 (13.4)
C1	110 (29.7)	85 (23.0)	52 (14.1)	83 (22.4)	40 (10.8)
C2	58 (24.6)	41 (17.4)	47 (19.9)	57 (24.2)	33 (14.0)
D	48 (29.6)	26 (16.0)	32 (19.8)	42 (25.9)	14 (8.6)
E	32 (23.4)	19 (13.9)	29 (21.2)	41 (29.9)	16 (11.7)

TABLE 72 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking', by independent variable (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	154 (26.9)	110 (19.2)	100 (17.5)	151 (26.4)	58 (10.1)
Previous smoker	100 (35.6)	54 (19.2)	41 (14.6)	58 (20.6)	28 (10.0)
Current (tried quitting)	39 (22.3)	31 (17.7)	28 (16.0)	41 (23.4)	36 (20.6)
Current (not tried quitting)	13 (20.6)	11 (17.5)	15 (23.8)	17 (27.0)	7 (11.1)
Refused to answer	13 (25.0)	6 (11.5)	12 (23.1)	15 (28.8)	6 (11.5)
Area					
North	24 (31.2)	18 (23.4)	11 (14.3)	13 (16.9)	11 (14.3)
North West	21 (14.8)	22 (15.5)	40 (28.2)	41 (28.9)	18 (12.7)
Yorkshire and Humberside	42 (40.4)	11 (10.6)	15 (14.4)	21 (20.2)	15 (14.4)
East Midlands	30 (27.5)	27 (24.8)	18 (16.5)	26 (23.9)	8 (7.3)
West Midlands	25 (37.9)	14 (21.2)	6 (9.1)	16 (24.2)	5 (7.6)
East Anglia	10 (24.4)	7 (17.1)	4 (9.8)	11 (26.8)	9 (22.0)
South East	24 (29.6)	7 (8.6)	17 (21.0)	20 (24.7)	13 (16.0)
South West	56 (28.0)	36 (18.0)	43 (21.5)	47 (23.5)	18 (9.0)
London	16 (10.7)	38 (25.5)	17 (11.4)	55 (36.9)	23 (15.4)
Wales	29 (43.9)	9 (13.6)	5 (7.6)	15 (22.7)	8 (12.1)
Scotland	42 (38.5)	23 (21.1)	20 (18.3)	17 (15.6)	7 (6.4)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 73 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	1.89	1.35 to 2.64	< 0.001	1.51	1.00 to 2.30	0.053
25– 4	1.88	1.34 to 2.62	< 0.001	1.42	0.97 to 2.08	0.068
35–44	2.04	1.46 to 2.85	< 0.001	1.65	1.14 to 2.39	0.007
45–54	1.42	1.00 to 2.01	0.048	1.26	0.87 to 1.84	0.23
55–59	0.95	0.59 to 1.54	0.85	0.95	0.58 to 1.56	0.83
60–64	1.70	1.11 to 2.61	0.015	1.65	1.05 to 2.57	0.028
Breastfeeding						
Children breastfed	1.00	0.81 to 1.23	0.98	1.16	0.86 to 1.56	0.34

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 73 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Children						
Have children	0.88	0.71 to 1.09	0.24	1.02	0.75 to 1.39	0.90
Ethnicity						
Other ethnicity	2.12	1.59 to 2.83	< 0.001	1.39	0.98 to 1.95	0.062
Sex						
Female	0.69	0.56 to 0.85	0.001	0.68	0.55 to 0.85	0.001
Education						
GCSE	0.71	0.53 to 0.93	0.014	0.62	0.45 to 0.85	0.003
A-level	0.75	0.55 to 1.04	0.084	0.68	0.48 to 0.96	0.028
No formal qualification	0.60	0.44 to 0.83	0.002	0.64	0.42 to 0.96	0.032
Other, still studying, don't know	0.98	0.67 to 1.43	0.90	0.93	0.61 to 1.43	0.75
Social grade						
C1	0.73	0.56 to 0.94	0.016	0.87	0.66 to 1.14	0.32
C2	1.45	1.07 to 1.97	0.017	1.64	1.18 to 2.27	0.003
D	1.22	0.78 to 1.92	0.38	1.31	0.82 to 2.10	0.26
E	1.22	0.74 to 2.01	0.43	1.18	0.70 to 1.99	0.54
Smoking status						
Previous smoker	0.85	0.64 to 1.14	0.28	0.94	0.68 to 1.29	0.69
Current (tried quitting)	1.15	0.83 to 1.58	0.40	1.23	0.84 to 1.81	0.28
Current (not tried quitting)	0.92	0.64 to 1.31	0.64	1.11	0.73 to 1.70	0.62
Refused to answer	1.25	0.86 to 1.81	0.24	1.37	0.87 to 2.15	0.17
Area						
North	0.46	0.28 to 0.75	0.002	0.60	0.36 to 1.01	0.054
North West	0.84	0.57 to 1.25	0.38	1.02	0.67 to 1.55	0.92
Yorkshire and Humberside	0.42	0.27 to 0.67	< 0.001	0.51	0.31 to 0.83	0.007
East Midlands	0.46	0.30 to 0.71	< 0.001	0.56	0.36 to 0.88	0.012
West Midlands	0.36	0.21 to 0.61	< 0.001	0.49	0.28 to 0.85	0.011
East Anglia	0.85	0.45 to 1.61	0.62	1.13	0.58 to 2.20	0.71
South East	0.67	0.41 to 1.08	0.10	1.01	0.60 to 1.70	0.97
South West	0.51	0.35 to 0.74	< 0.001	0.73	0.49 to 1.10	0.14
Wales	0.35	0.21 to 0.61	< 0.001	0.51	0.29 to 0.91	0.022
Scotland	0.31	0.20 to 0.49	< 0.001	0.44	0.28 to 0.71	0.001

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

TABLE 74 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–24	27 (15.9)	35 (20.6)	43 (25.3)	49 (28.8)	16 (9.4)
25–34	31 (17.7)	38 (21.7)	41 (23.4)	44 (25.1)	21 (12.0)
35–44	38 (21.0)	37 (20.4)	35 (19.3)	41 (22.7)	30 (16.6)
45–54	43 (27.0)	33 (20.8)	25 (15.7)	42 (26.4)	16 (10.1)
55–59	30 (41.7)	14 (19.4)	6 (8.3)	11 (15.3)	11 (15.3)
60–64	32 (34.0)	11 (11.7)	16 (17.0)	22 (23.4)	13 (13.8)
65+	110 (37.5)	47 (16.0)	58 (19.8)	38 (13.0)	40 (13.7)
Breastfeeding					
Children not breastfed	161 (25.5)	124 (19.6)	146 (23.1)	127 (20.1)	74 (11.7)
Children breastfed	150 (29.3)	91 (17.8)	78 (15.2)	120 (23.4)	73 (14.3)
Children					
No children	90 (22.4)	81 (20.1)	94 (23.4)	91 (22.6)	46 (11.4)
Have children	221 (29.8)	134 (18.1)	130 (17.5)	156 (21.0)	101 (13.6)
Ethnicity					
White	296 (30.1)	192 (19.5)	183 (18.6)	191 (19.4)	123 (12.5)
Other ethnicity	15 (9.4)	23 (14.5)	41 (25.8)	56 (35.2)	24 (15.1)
Sex					
Male	128 (23.7)	92 (17.0)	125 (23.1)	116 (21.5)	79 (14.6)
Female	183 (30.3)	123 (20.4)	99 (16.4)	131 (21.7)	68 (11.3)
Education					
University	66 (22.4)	50 (16.9)	58 (19.7)	74 (25.1)	47 (15.9)
GCSE	102 (29.8)	62 (18.1)	63 (18.4)	75 (21.9)	40 (11.7)
A-level	55 (28.5)	42 (21.8)	40 (20.7)	37 (19.2)	19 (9.8)
No formal qualification	64 (32.5)	32 (16.2)	44 (22.3)	36 (18.3)	21 (10.7)
Other, still studying, don't know	24 (20.5)	29 (24.8)	19 (16.2)	25 (21.4)	20 (17.1)
Social grade					
AB	66 (27.6)	48 (20.1)	39 (16.3)	49 (20.5)	37 (15.5)
C1	111 (30.0)	81 (21.9)	68 (18.4)	73 (19.7)	37 (10.0)
C2	57 (24.2)	41 (17.4)	48 (20.3)	56 (23.7)	34 (14.4)
D	48 (29.6)	24 (14.8)	39 (24.1)	32 (19.8)	19 (11.7)
E	29 (21.2)	21 (15.3)	30 (21.9)	37 (27.0)	20 (14.6)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 74 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home', by independent variable (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	147 (25.7)	108 (18.8)	112 (19.5)	142 (24.8)	64 (11.2)
Previous smoker	100 (35.6)	55 (19.6)	48 (17.1)	48 (17.1)	30 (10.7)
Current (tried quitting)	38 (21.7)	33 (18.9)	32 (18.3)	36 (20.6)	36 (20.6)
Current (not tried quitting)	13 (20.6)	10 (15.9)	19 (30.2)	10 (15.9)	11 (17.5)
Refused to answer	13 (25.0)	9 (17.3)	13 (25.0)	11 (21.2)	6 (11.5)
Area					
North	21 (27.3)	19 (24.7)	10 (13.0)	14 (18.2)	13 (16.9)
North West	21 (14.8)	21 (14.8)	44 (31.0)	35 (24.6)	21 (14.8)
Yorkshire and Humberside	38 (36.5)	15 (14.4)	23 (22.1)	14 (13.5)	14 (13.5)
East Midlands	29 (26.6)	30 (27.5)	22 (20.2)	19 (17.4)	9 (8.3)
West Midlands	28 (42.4)	11 (16.7)	8 (12.1)	11 (16.7)	8 (12.1)
East Anglia	10 (24.4)	7 (17.1)	6 (14.6)	9 (22.0)	9 (22.0)
South East	23 (28.4)	8 (9.9)	18 (22.2)	22 (27.2)	10 (12.3)
South West	54 (27.0)	41 (20.5)	47 (23.5)	35 (17.5)	23 (11.5)
London	15 (10.1)	35 (23.5)	22 (14.8)	55 (36.9)	22 (14.8)
Wales	29 (43.9)	9 (13.6)	6 (9.1)	12 (18.2)	10 (15.2)
Scotland	43 (39.4)	19 (17.4)	18 (16.5)	21 (19.3)	8 (7.3)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 75 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	1.87	1.34 to 2.60	< 0.001	1.55	1.02 to 2.35	0.040
25–34	1.80	1.29 to 2.50	0.001	1.42	0.97 to 2.07	0.068
35–44	1.83	1.31 to 2.56	< 0.001	1.51	1.04 to 2.17	0.028
45–54	1.40	0.99 to 1.98	0.058	1.26	0.86 to 1.83	0.23
55–59	0.89	0.54 to 1.44	0.63	0.88	0.53 to 1.46	0.62
60–64	1.36	0.88 to 2.09	0.16	1.28	0.82 to 2.00	0.28
Breastfeeding						
Children breastfed	1.03	0.83 to 1.26	0.81	1.27	0.95 to 1.71	0.11
Children						
Have children	0.87	0.70 to 1.08	0.21	0.96	0.70 to 1.31	0.78

TABLE 75 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Ethnicity						
Other ethnicity	2.26	1.70 to 3.01	< 0.001	1.49	1.06 to 2.08	0.021
Sex						
Female	0.75	0.61 to 0.92	0.005	0.72	0.58 to 0.90	0.003
Education						
GCSE	0.70	0.53 to 0.92	0.012	0.60	0.44 to 0.83	0.002
A-level	0.64	0.47 to 0.89	0.007	0.56	0.39 to 0.79	0.001
No formal qualification	0.62	0.45 to 0.86	0.004	0.66	0.44 to 1.00	0.048
Other, still studying, don't know	0.93	0.64 to 1.37	0.73	0.90	0.59 to 1.38	0.64
Social grade						
C1	0.80	0.60 to 1.07	0.13	0.84	0.61 to 1.16	0.29
C2	1.15	0.83 to 1.59	0.39	1.22	0.83 to 1.79	0.30
D	0.91	0.64 to 1.31	0.62	1.05	0.69 to 1.61	0.81
E	1.33	0.92 to 1.93	0.13	1.37	0.88 to 2.15	0.17
Smoking status						
Previous smoker	0.67	0.52 to 0.87	0.002	0.79	0.60 to 1.04	0.089
Current (tried quitting)	1.33	0.98 to 1.80	0.065	1.48	1.08 to 2.04	0.016
Current (not tried quitting)	1.22	0.77 to 1.92	0.40	1.31	0.81 to 2.11	0.27
Refused to answer	1.00	0.61 to 1.64	0.99	0.95	0.57 to 1.59	0.85
Area						
North	0.53	0.32 to 0.87	0.012	0.74	0.44 to 1.24	0.25
North West	0.84	0.57 to 1.25	0.39	1.06	0.70 to 1.60	0.80
Yorkshire and Humberside	0.40	0.26 to 0.63	< 0.001	0.50	0.31 to 0.81	0.005
East Midlands	0.43	0.28 to 0.65	< 0.001	0.53	0.34 to 0.82	0.004
West Midlands	0.32	0.19 to 0.55	< 0.001	0.47	0.27 to 0.82	0.00
East Anglia	0.77	0.41 to 1.45	0.42	1.08	0.57 to 2.06	0.82
South East	0.63	0.39 to 1.01	0.057	1.06	0.64 to 1.75	0.84
South West	0.49	0.34 to 0.71	< 0.001	0.77	0.51 to 1.15	0.20
Wales	0.35	0.20 to 0.60	< 0.001	0.56	0.32 to 1.01	0.054
Scotland	0.33	0.21 to 0.52	< 0.001	0.52	0.32 to 0.83	0.006

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 76 Response to 'Shopping vouchers for women who breastfeed for the first 6 months after the birth of their child', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–24	20 (11.8)	32 (18.8)	58 (34.1)	42 (24.7)	18 (10.6)
25–34	23 (13.1)	30 (17.1)	45 (25.7)	47 (26.9)	30 (17.1)
35–44	25 (13.8)	36 (19.9)	46 (25.4)	39 (21.5)	35 (19.3)
45–54	32 (20.1)	34 (21.4)	40 (25.2)	34 (21.4)	19 (11.9)
55–59	18 (25.0)	20 (27.8)	16 (22.2)	7 (9.7)	11 (15.3)
60–64	31 (33.0)	15 (16.0)	19 (20.2)	18 (19.1)	11 (11.7)
65+	87 (29.7)	44 (15.0)	82 (28.0)	48 (16.4)	32 (10.9)
Breastfeeding					
Children not breastfed	114 (18.0)	120 (19.0)	216 (34.2)	128 (20.3)	54 (8.5)
Children breastfed	122 (23.8)	91 (17.8)	90 (17.6)	107 (20.9)	102 (19.9)
Children					
No children	61 (15.2)	73 (18.2)	138 (34.3)	93 (23.1)	37 (9.2)
Have children	175 (23.6)	138 (18.6)	168 (22.6)	142 (19.1)	119 (16.0)
Ethnicity					
White	226 (22.9)	194 (19.7)	265 (26.9)	184 (18.7)	116 (11.8)
Other ethnicity	10 (6.3)	17 (10.7)	41 (25.8)	51 (32.1)	40 (25.2)
Sex					
Male	93 (17.2)	84 (15.6)	180 (33.3)	115 (21.3)	68 (12.6)
Female	143 (23.7)	127 (21.0)	126 (20.9)	120 (19.9)	88 (14.6)
Education					
University	58 (19.7)	59 (20.0)	72 (24.4)	61 (20.7)	45 (15.3)
GCSE	66 (19.3)	63 (18.4)	90 (26.3)	72 (21.1)	51 (14.9)
A-level	47 (24.4)	40 (20.7)	52 (26.9)	29 (15.0)	25 (13.0)
No formal qualification	43 (21.8)	28 (14.2)	66 (33.5)	37 (18.8)	23 (11.7)
Other, still studying, don't know	22 (18.8)	21 (17.9)	26 (22.2)	36 (30.8)	12 (10.3)
Social grade					
AB	59 (24.7)	40 (16.7)	61 (25.5)	45 (18.8)	34 (14.2)
C1	82 (22.2)	86 (23.2)	85 (23.0)	74 (20.0)	43 (11.6)
C2	41 (17.4)	40 (16.9)	73 (30.9)	50 (21.2)	32 (13.6)
D	31 (19.1)	26 (16.0)	52 (32.1)	33 (20.4)	20 (12.3)
E	23 (16.8)	19 (13.9)	35 (25.5)	33 (24.1)	27 (19.7)

TABLE 76 Response to 'Shopping vouchers for women who breastfeed for the first 6 months after the birth of their child', by independent variable (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	113 (19.7)	104 (18.2)	142 (24.8)	139 (24.3)	75 (13.1)
Previous smoker	70 (24.9)	59 (21.0)	72 (25.6)	45 (16.0)	35 (12.5)
Current (tried quitting)	27 (15.4)	33 (18.9)	53 (30.3)	26 (14.9)	36 (20.6)
Current (not tried quitting)	14 (22.2)	11 (17.5)	19 (30.2)	16 (25.4)	3 (4.8)
Refused to answer	12 (23.1)	4 (7.7)	20 (38.5)	9 (17.3)	7 (13.5)
Area					
North	16 (20.8)	16 (20.8)	19 (24.7)	8 (10.4)	18 (23.4)
North West	15 (10.6)	26 (18.3)	41 (28.9)	36 (25.4)	24 (16.9)
Yorkshire and Humberside	28 (26.9)	15 (14.4)	32 (30.8)	21 (20.2)	8 (7.7)
East Midlands	22 (20.2)	26 (23.9)	33 (30.3)	22 (20.2)	6 (5.5)
West Midlands	23 (34.8)	14 (21.2)	15 (22.7)	7 (10.6)	7 (10.6)
East Anglia	4 (9.8)	11 (26.8)	8 (19.5)	10 (24.4)	8 (19.5)
South East	14 (17.3)	11 (13.6)	28 (34.6)	15 (18.5)	13 (16.0)
South West	52 (26.0)	37 (18.5)	61 (30.5)	33 (16.5)	17 (8.5)
London	14 (9.4)	25 (16.8)	27 (18.1)	56 (37.6)	27 (18.1)
Wales	23 (34.8)	13 (19.7)	10 (15.2)	9 (13.6)	11 (16.7)
Scotland	25 (22.9)	17 (15.6)	32 (29.4)	18 (16.5)	17 (15.6)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 77 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who breastfeed for the first 6 months after the birth of their child'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	1.71	1.23 to 2.37	0.001	1.71	1.13 to 2.60	0.012
25–34	2.09	1.49 to 2.92	< 0.001	1.91	1.31 to 2.80	0.001
35–44	1.94	1.39 to 2.71	< 0.001	1.73	1.20 to 2.50	0.003
45–54	1.32	0.94 to 1.86	0.11	1.38	0.95 to 2.01	0.090
55–59	0.96	0.60 to 1.52	0.85	1.02	0.63 to 1.64	0.95
60–64	0.94	0.61 to 1.44	0.78	1.01	0.65 to 1.59	0.95
Breastfeeding						
Children breastfed	1.19	0.96 to 1.46	0.11	1.67	1.24 to 2.25	0.001

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 77 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who breastfeed for the first 6 months after the birth of their child' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Children						
Have children	0.90	0.73 to 1.11	0.31	0.80	0.59 to 1.08	0.15
Ethnicity						
Other ethnicity	3.04	2.26 to 4.10	< 0.001	2.03	1.43 to 2.88	< 0.001
Sex						
Female	0.80	0.65 to 0.99	0.037	0.77	0.62 to 0.95	0.016
Education						
GCSE	1.03	0.78 to 1.36	0.84	1.01	0.74 to 1.40	0.93
A-level	0.76	0.55 to 1.04	0.089	0.71	0.50 to 1.02	0.061
No formal qualification	0.91	0.66 to 1.25	0.56	1.22	0.82 to 1.82	0.33
Other, still studying, don't know	1.07	0.74 to 1.57	0.71	1.10	0.72 to 1.67	0.67
Social grade						
C1	0.93	0.70 to 1.25	0.63	0.84	0.61 to 1.16	0.29
C2	1.23	0.90 to 1.70	0.20	0.96	0.66 to 1.40	0.83
D	1.14	0.80 to 1.63	0.46	0.92	0.60 to 1.40	0.6
E	1.62	1.11 to 2.37	0.012	1.21	0.77 to 1.89	0.41
Smoking status						
Previous smoker	0.73	0.56 to 0.94	0.014	0.89	0.67 to 1.17	0.40
Current (tried quitting)	1.17	0.87 to 1.58	0.31	1.17	0.85 to 1.61	0.34
Current (not tried quitting)	0.78	0.50 to 1.23	0.29	0.75	0.47 to 1.19	0.22
Refused to answer	0.97	0.59 to 1.59	0.89	0.91	0.55 to 1.51	0.71
Area						
North	0.53	0.32 to 0.88	0.014	0.79	0.47 to 1.35	0.39
North West	0.76	0.51 to 1.13	0.18	1.01	0.66 to 1.55	0.95
Yorkshire and Humberside	0.38	0.25 to 0.60	< 0.001	0.56	0.35 to 0.90	0.016
East Midlands	0.38	0.25 to 0.59	< 0.001	0.46	0.29 to 0.71	< 0.001
West Midlands	0.25	0.15 to 0.42	< 0.001	0.40	0.23 to 0.69	0.001
East Anglia	0.73	0.40 to 1.35	0.32	0.98	0.52 to 1.85	0.94
South East	0.60	0.38 to 0.97	0.039	1.01	0.61 to 1.69	0.96
South West	0.36	0.25 to 0.52	< 0.001	0.62	0.41 to 0.93	0.021
Wales	0.30	0.18 to 0.52	< 0.001	0.53	0.30 to 0.94	0.029
Scotland	0.48	0.31 to 0.75	0.001	0.84	0.52 to 1.36	0.47

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

TABLE 78 Response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–24	10 (5.9)	21 (12.4)	58 (34.1)	52 (30.6)	29 (17.1)
25–34	18 (10.3)	17 (9.7)	48 (27.4)	57 (32.6)	35 (20.0)
35–44	22 (12.2)	24 (13.3)	37 (20.4)	57 (31.5)	41 (22.7)
45–54	27 (17.0)	24 (15.1)	34 (21.4)	44 (27.7)	30 (18.9)
55–59	10 (13.9)	13 (18.1)	19 (26.4)	22 (30.6)	8 (11.1)
6 –64	22 (23.4)	10 (10.6)	23 (24.5)	21 (22.3)	18 (19.1)
65+	56 (19.1)	38 (13.0)	89 (30.4)	63 (21.5)	47 (16.0)
Breastfeeding					
Children not breastfed	93 (14.7)	79 (12.5)	210 (33.2)	164 (25.9)	86 (13.6)
Children breastfed	72 (14.1)	68 (13.3)	98 (19.1)	152 (29.7)	122 (23.8)
Children					
No children	49 (12.2)	50 (12.4)	132 (32.8)	119 (29.6)	52 (12.9)
Have children	116 (15.6)	97 (13.1)	176 (23.7)	197 (26.5)	156 (21.0)
Ethnicity					
White	158 (16.0)	132 (13.4)	252 (25.6)	265 (26.9)	178 (18.1)
Other ethnicity	7 (4.4)	15 (9.4)	56 (35.2)	51 (32.1)	30 (18.9)
Sex					
Male	70 (13.0)	62 (11.5)	174 (32.2)	142 (26.3)	92 (17.0)
Female	95 (15.7)	85 (14.1)	134 (22.2)	174 (28.8)	116 (19.2)
Education					
University	31 (10.5)	36 (12.2)	75 (25.4)	87 (29.5)	66 (22.4)
GCSE	54 (15.8)	40 (11.7)	98 (28.7)	89 (26.0)	61 (17.8)
A-level	30 (15.5)	25 (13.0)	51 (26.4)	49 (25.4)	38 (19.7)
No formal qualification	36 (18.3)	29 (14.7)	56 (28.4)	51 (25.9)	25 (12.7)
Other, still studying, don't know	14 (12.0)	17 (14.5)	28 (23.9)	40 (34.2)	18 (15.4)
Social grade					
AB	36 (15.1)	32 (13.4)	55 (23.0)	59 (24.7)	57 (23.8)
C1	57 (15.4)	58 (15.7)	98 (26.5)	99 (26.8)	58 (15.7)
C2	33 (14.0)	23 (9.7)	76 (32.2)	71 (30.1)	33 (14.0)
D	26 (16.0)	20 (12.3)	43 (26.5)	44 (27.2)	29 (17.9)
E	13 (9.5)	14 (10.2)	36 (26.3)	43 (31.4)	31 (22.6)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 78 Response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding', by independent variable (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	71 (12.4)	68 (11.9)	167 (29.1)	173 (30.2)	94 (16.4)
Previous smoker	50 (17.8)	43 (15.3)	64 (22.8)	76 (27.0)	48 (17.1)
Current (tried quitting)	27 (15.4)	22 (12.6)	40 (22.9)	38 (21.7)	48 (27.4)
Current (not tried quitting)	8 (12.7)	7 (11.1)	17 (27.0)	19 (30.2)	12 (19.0)
Refused to answer	9 (17.3)	7 (13.5)	20 (38.5)	10 (19.2)	6 (11.5)
Area					
North	14 (18.2)	11 (14.3)	13 (16.9)	21 (27.3)	18 (23.4)
North West	7 (4.9)	14 (9.9)	46 (32.4)	49 (34.5)	26 (18.3)
Yorkshire and Humberside	21 (20.2)	3 (2.9)	25 (24.0)	28 (26.9)	27 (26.0)
East Midlands	18 (16.5)	28 (25.7)	32 (29.4)	20 (18.3)	11 (10.1)
West Midlands	9 (13.6)	12 (18.2)	13 (19.7)	21 (31.8)	11 (16.7)
East Anglia	5 (12.2)	6 (14.6)	10 (24.4)	13 (31.7)	7 (17.1)
South East	5 (6.2)	8 (9.9)	26 (32.1)	20 (24.7)	22 (27.2)
South West	36 (18.0)	23 (11.5)	70 (35.0)	39 (19.5)	32 (16.0)
London	7 (4.7)	15 (10.1)	37 (24.8)	68 (45.6)	22 (14.8)
Wales	21 (31.8)	13 (19.7)	7 (10.6)	13 (19.7)	12 (18.2)
Scotland	22 (20.2)	14 (12.8)	29 (26.6)	24 (22.0)	20 (18.3)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 79 Simple univariable and multiple ordered logit regression models for response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	1.60	1.15 to 2.22	0.005	1.74	1.14 to 2.63	0.010
25–34	1.73	1.24 to 2.41	0.001	1.63	1.11 to 2.37	0.012
35–44	1.72	1.23 to 2.40	0.002	1.57	1.08 to 2.27	0.017
45–54	1.24	0.88 to 1.76	0.22	1.22	0.84 to 1.78	0.30
55–59	1.06	0.68 to 1.67	0.79	0.92	0.57 to 1.48	0.74
60–64	1.04	0.68 to 1.59	0.87	0.90	0.58 to 1.41	0.65
Breastfeeding						
Children breastfed	1.49	1.21 to 1.84	< 0.001	1.84	1.36 to 2.49	< 0.001

TABLE 79 Simple univariable and multiple ordered logit regression models for response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Children						
Have children	1.13	0.91 to 1.39	0.27	0.95	0.70 to 1.30	0.75
Ethnicity						
Other ethnicity	1.46	1.10 to 1.95	0.009	1.07	0.76 to 1.51	0.70
Sex						
Female	1.02	0.83 to 1.26	0.84	0.95	0.77 to 1.18	0.66
Education						
GCSE	0.73	0.55 to 0.97	0.028	0.70	0.51 to 0.96	0.026
A-level	0.76	0.55 to 1.05	0.099	0.73	0.52 to 1.04	0.085
No formal qualification	0.57	0.41 to 0.78	0.001	0.62	0.41 to 0.93	0.020
Other, still studying, don't know	0.82	0.56 to 1.19	0.29	0.87	0.57 to 1.33	0.53
Social grade						
C1	0.77	0.57 to 1.03	0.076	0.84	0.61 to 1.15	0.28
C2	0.86	0.62 to 1.18	0.34	0.92	0.63 to 1.34	0.67
D	0.85	0.59 to 1.22	0.38	1.02	0.67 to 1.55	0.93
E	1.25	0.86 to 1.82	0.24	1.57	1.00 to 2.46	0.050
Smoking status						
Previous smoker	0.82	0.64 to 1.06	0.14	0.93	0.71 to 1.23	0.62
Current (tried quitting)	1.16	0.85 to 1.59	0.35	1.13	0.81 to 1.57	0.47
Current (not tried quitting)	1.09	0.69 to 1.73	0.71	1.25	0.78 to 2.01	0.36
Refused to answer	0.64	0.39 to 1.05	0.076	0.67	0.41 to 1.12	0.12
Area						
North	0.71	0.43 to 1.18	0.19	0.86	0.51 to 1.45	0.56
North West	0.93	0.63 to 1.38	0.73	1.15	0.77 to 1.74	0.49
Yorkshire and Humberside	0.87	0.56 to 1.37	0.55	1.05	0.65 to 1.70	0.84
East Midlands	0.36	0.24 to 0.55	< 0.001	0.41	0.26 to 0.64	< 0.001
West Midlands	0.65	0.39 to 1.08	0.096	0.81	0.47 to 1.41	0.46
East Anglia	0.71	0.39 to 1.30	0.26	0.78	0.42 to 1.48	0.45
South East	1.04	0.65 to 1.68	0.86	1.40	0.85 to 2.31	0.19
South West	0.51	0.35 to 0.73	< 0.001	0.68	0.45 to 1.02	0.065
Wales	0.32	0.19 to 0.55	< 0.001	0.44	0.25 to 0.79	0.006
Scotland	0.53	0.34 to 0.82	0.004	0.73	0.45 to 1.18	0.20

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 80 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–24	19 (11.2)	29 (17.1)	40 (23.5)	61 (35.9)	21 (12.4)
25–34	22 (12.6)	32 (18.3)	42 (24.0)	57 (32.6)	22 (12.6)
35–44	23 (12.7)	32 (17.7)	43 (23.8)	56 (30.9)	27 (14.9)
45–54	32 (20.1)	28 (17.6)	40 (25.2)	35 (22.0)	24 (15.1)
55–59	17 (23.6)	15 (20.8)	10 (13.9)	20 (27.8)	10 (13.9)
60–64	29 (30.9)	10 (10.6)	22 (23.4)	24 (25.5)	9 (9.6)
65+	92 (31.4)	46 (15.7)	70 (23.9)	53 (18.1)	32 (10.9)
Breastfeeding					
Children not breastfed	125 (19.8)	111 (17.6)	151 (23.9)	168 (26.6)	77 (12.2)
Children breastfed	109 (21.3)	81 (15.8)	116 (22.7)	138 (27.0)	68 (13.3)
Children					
No children	75 (18.7)	66 (16.4)	97 (24.1)	117 (29.1)	47 (11.7)
Have children	159 (21.4)	126 (17.0)	170 (22.9)	189 (25.5)	98 (13.2)
Ethnicity					
White	224 (22.7)	169 (17.2)	223 (22.6)	248 (25.2)	121 (12.3)
Other ethnicity	10 (6.3)	23 (14.5)	44 (27.7)	58 (36.5)	24 (15.1)
Sex					
Male	101 (18.7)	91 (16.9)	130 (24.1)	149 (27.6)	69 (12.8)
Female	133 (22.0)	101 (16.7)	137 (22.7)	157 (26.0)	76 (12.6)
Education					
University	51 (17.3)	45 (15.3)	68 (23.1)	87 (29.5)	44 (14.9)
GCSE	75 (21.9)	59 (17.3)	83 (24.3)	86 (25.1)	39 (11.4)
A-level	39 (20.2)	41 (21.2)	39 (20.2)	48 (24.9)	26 (13.5)
No formal qualification	48 (24.4)	28 (14.2)	50 (25.4)	51 (25.9)	20 (10.2)
Other, still studying, don't know	21 (17.9)	19 (16.2)	27 (23.1)	34 (29.1)	16 (13.7)
Social grade					
AB	50 (20.9)	34 (14.2)	51 (21.3)	70 (29.3)	34 (14.2)
C1	88 (23.8)	76 (20.5)	76 (20.5)	91 (24.6)	39 (10.5)
C2	41 (17.4)	42 (17.8)	59 (25.0)	62 (26.3)	32 (13.6)
D	29 (17.9)	23 (14.2)	44 (27.2)	42 (25.9)	24 (14.8)
E	26 (19.0)	17 (12.4)	37 (27.0)	41 (29.9)	16 (11.7)

TABLE 80 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy', by independent variable (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	104 (18.2)	99 (17.3)	135 (23.6)	167 (29.1)	68 (11.9)
Previous smoker	75 (26.7)	48 (17.1)	66 (23.5)	62 (22.1)	30 (10.7)
Current (tried quitting)	32 (18.3)	27 (15.4)	37 (21.1)	43 (24.6)	36 (20.6)
Current (not tried quitting)	13 (20.6)	13 (20.6)	14 (22.2)	16 (25.4)	7 (11.1)
Refused to answer	10 (19.2)	5 (9.6)	15 (28.8)	18 (34.6)	4 (7.7)
Area					
North	19 (24.7)	18 (23.4)	11 (14.3)	17 (22.1)	12 (15.6)
North West	15 (10.6)	26 (18.3)	42 (29.6)	42 (29.6)	17 (12.0)
Yorkshire and Humberside	30 (28.8)	11 (10.6)	20 (19.2)	26 (25.0)	17 (16.3)
East Midlands	24 (22.0)	24 (22.0)	25 (22.9)	28 (25.7)	8 (7.3)
West Midlands	19 (28.8)	9 (13.6)	15 (22.7)	17 (25.8)	6 (9.1)
East Anglia	10 (24.4)	6 (14.6)	8 (19.5)	9 (22.0)	8 (19.5)
South East	9 (11.1)	8 (9.9)	25 (30.9)	23 (28.4)	16 (19.8)
South West	53 (26.5)	35 (17.5)	56 (28.0)	43 (21.5)	13 (6.5)
London	8 (5.4)	25 (16.8)	34 (22.8)	59 (39.6)	23 (15.4)
Wales	20 (30.3)	7 (10.6)	9 (13.6)	17 (25.8)	13 (19.7)
Scotland	27 (24.8)	23 (21.1)	22 (20.2)	25 (22.9)	12 (11.0)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 81 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	2.24	1.60 to 3.14	< 0.001	2.28	1.50 to 3.49	< 0.001
25–34	2.05	1.47 to 2.86	< 0.001	1.83	1.26 to 2.67	0.002
35–44	2.15	1.54 to 3.00	< 0.001	1.90	1.32 to 2.74	0.001
45–54	1.58	1.11 to 2.23	0.010	1.57	1.08 to 2.28	0.017
55–59	1.46	0.91 to 2.35	0.11	1.43	0.87 to 2.34	0.16
60–64	1.18	0.77 to 1.80	0.44	1.05	0.68 to 1.63	0.82
Breastfeeding						
Children breastfed	1.02	0.83 to 1.26	0.83	1.12	0.83 to 1.50	0.45

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 81 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Children						
Have children	0.92	0.74 to 1.13	0.42	1.08	0.79 to 1.49	0.62
Ethnicity						
Other ethnicity	1.91	1.43 to 2.56	< 0.001	1.27	0.90 to 1.79	0.18
Sex						
Female	0.90	0.73 to 1.10	0.30	0.85	0.69 to 1.06	0.16
Education						
GCSE	0.74	0.56 to 0.97	0.030	0.71	0.51 to 0.97	0.033
A-level	0.77	0.56 to 1.06	0.11	0.68	0.48 to 0.97	0.032
No formal qualification	0.70	0.51 to 0.97	0.032	0.90	0.60 to 1.35	0.60
Other, still studying, don't know	0.93	0.64 to 1.36	0.71	1.12	0.73 to 1.70	0.60
Social grade						
C1	0.72	0.54 to 0.96	0.025	0.68	0.50 to 0.94	0.019
C2	0.97	0.70 to 1.34	0.86	0.88	0.60 to 1.28	0.49
D	1.03	0.72 to 1.47	0.85	0.97	0.64 to 1.47	0.88
E	1.00	0.69 to 1.46	0.99	0.94	0.60 to 1.47	0.78
Smoking status						
Previous smoker	0.70	0.54 to 0.90	0.006	0.86	0.65 to 1.13	0.27
Current (tried quitting)	1.24	0.91 to 1.68	0.18	1.26	0.91 to 1.75	0.16
Current (not tried quitting)	0.83	0.53 to 1.32	0.44	0.87	0.54 to 1.41	0.58
Refused to answer	1.04	0.63 to 1.69	0.89	0.96	0.57 to 1.59	0.86
Area						
North	0.45	0.27 to 0.73	0.001	0.57	0.34 to 0.96	0.036
North West	0.68	0.46 to 1.01	0.058	0.83	0.55 to 1.27	0.39
Yorkshire and Humberside	0.51	0.32 to 0.81	0.004	0.60	0.37 to 0.98	0.040
East Midlands	0.42	0.27 to 0.64	< 0.001	0.47	0.30 to 0.74	0.001
West Midlands	0.40	0.24 to 0.68	0.001	0.56	0.32 to 0.96	0.037
East Anglia	0.57	0.30 to 1.08	0.086	0.72	0.37 to 1.39	0.33
South East	0.93	0.58 to 1.48	0.75	1.42	0.86 to 2.35	0.17
South West	0.36	0.25 to 0.52	< 0.001	0.53	0.35 to 0.80	0.002
Wales	0.56	0.32 to 0.96	0.035	0.81	0.46 to 1.45	0.48
Scotland	0.41	0.27 to 0.64	< 0.001	0.55	0.34 to 0.88	0.014

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

TABLE 82 Response to 'Local health services should receive additional funding if they reach targets for the number of women who breastfeed', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–24	19 (11.2)	33 (19.4)	46 (27.1)	56 (32.9)	16 (9.4)
25–34	22 (12.6)	27 (15.4)	55 (31.4)	49 (28.0)	22 (12.6)
35–44	25 (13.8)	35 (19.3)	37 (20.4)	52 (28.7)	32 (17.7)
45–54	32 (20.1)	32 (20.1)	39 (24.5)	36 (22.6)	20 (12.6)
55–59	18 (25.0)	16 (22.2)	12 (16.7)	17 (23.6)	9 (12.5)
60–64	34 (36.2)	14 (14.9)	21 (22.3)	15 (16.0)	10 (10.6)
65+	86 (29.4)	48 (16.4)	77 (26.3)	53 (18.1)	29 (9.9)
Breastfeeding					
Children not breastfed	117 (18.5)	115 (18.2)	192 (30.4)	146 (23.1)	62 (9.8)
Children breastfed	119 (23.2)	90 (17.6)	95 (18.6)	132 (25.8)	76 (14.8)
Children					
No children	63 (15.7)	72 (17.9)	123 (30.6)	107 (26.6)	37 (9.2)
Have children	173 (23.3)	133 (17.9)	164 (22.1)	171 (23.0)	101 (13.6)
Ethnicity					
White	229 (23.2)	189 (19.2)	249 (25.3)	214 (21.7)	104 (10.6)
Other ethnicity	7 (4.4)	16 (10.1)	38 (23.9)	64 (40.3)	34 (21.4)
Sex					
Male	97 (18.0)	85 (15.7)	163 (30.2)	131 (24.3)	64 (11.9)
Female	139 (23.0)	120 (19.9)	124 (20.5)	147 (24.3)	74 (12.3)
Education					
University	58 (19.7)	52 (17.6)	70 (23.7)	79 (26.8)	36 (12.2)
GCSE	69 (20.2)	65 (19.0)	89 (26.0)	79 (23.1)	40 (11.7)
A-level	47 (24.4)	29 (15.0)	49 (25.4)	43 (22.3)	25 (13.0)
No formal qualification	42 (21.3)	34 (17.3)	58 (29.4)	41 (20.8)	22 (11.2)
Other, still studying, don't know	20 (17.1)	25 (21.4)	21 (17.9)	36 (30.8)	15 (12.8)
Social grade					
AB	54 (22.6)	40 (16.7)	59 (24.7)	53 (22.2)	33 (13.8)
C1	84 (22.7)	73 (19.7)	91 (24.6)	89 (24.1)	33 (8.9)
C2	46 (19.5)	37 (15.7)	71 (30.1)	55 (23.3)	27 (11.4)
D	27 (16.7)	29 (17.9)	37 (22.8)	44 (27.2)	25 (15.4)
E	25 (18.2)	26 (19.0)	29 (21.2)	37 (27.0)	20 (14.6)

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 82 Response to 'Local health services should receive additional funding if they reach targets for the number of women who breastfeed', by independent variable (*continued*)

Variable	SD	D	N	A	SA
Smoking status					
Never smoked	108 (18.8)	99 (17.3)	137 (23.9)	166 (29.0)	63 (11.0)
Previous smoker	73 (26.0)	57 (20.3)	70 (24.9)	52 (18.5)	29 (10.3)
Current (tried quitting)	32 (18.3)	31 (17.7)	48 (27.4)	29 (16.6)	35 (20.0)
Current (not tried quitting)	12 (19.0)	13 (20.6)	17 (27.0)	15 (23.8)	6 (9.5)
Refused to answer	11 (21.2)	5 (9.6)	15 (28.8)	16 (30.8)	5 (9.6)
Area					
North	14 (18.2)	21 (27.3)	17 (22.1)	15 (19.5)	10 (13.0)
North West	17 (12.0)	26 (18.3)	44 (31.0)	35 (24.6)	20 (14.1)
Yorkshire and Humberside	25 (24.0)	15 (14.4)	26 (25.0)	24 (23.1)	14 (13.5)
East Midlands	21 (19.3)	21 (19.3)	31 (28.4)	30 (27.5)	6 (5.5)
West Midlands	17 (25.8)	15 (22.7)	16 (24.2)	14 (21.2)	4 (6.1)
East Anglia	6 (14.6)	7 (17.1)	7 (17.1)	10 (24.4)	11 (26.8)
South East	15 (18.5)	8 (9.9)	23 (28.4)	23 (28.4)	12 (14.8)
South West	56 (28.0)	33 (16.5)	61 (30.5)	32 (16.0)	18 (9.0)
London	13 (8.7)	26 (17.4)	26 (17.4)	65 (43.6)	19 (12.8)
Wales	20 (30.3)	11 (16.7)	14 (21.2)	10 (15.2)	11 (16.7)
Scotland	32 (29.4)	22 (20.2)	22 (20.2)	20 (18.3)	13 (11.9)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).
Note
All numbers are given as actual numbers and then percentages as follows – *n* (%).

TABLE 83 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who breastfeed'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–24	1.90	1.36 to 2.64	< 0.001	1.63	1.07 to 2.49	0.022
25–34	1.96	1.41 to 2.72	< 0.001	1.64	1.13 to 2.38	0.010
35–44	2.14	1.53 to 3.00	< 0.001	1.91	1.32 to 2.76	0.001
45–54	1.41	1.00 to 1.99	0.051	1.38	0.95 to 2.00	0.088
55–59	1.21	0.76 to 1.94	0.43	1.23	0.76 to 2.01	0.40
60–64	0.81	0.53 to 1.25	0.34	0.79	0.50 to 1.23	0.30
Breastfeeding						
Children breastfed	1.07	0.87 to 1.32	0.54	1.20	0.89 to 1.61	0.24

TABLE 83 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who breastfeed' (*continued*)

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Children						
Have children	0.88	0.71 to 1.09	0.23	0.97	0.71 to 1.33	0.86
Ethnicity						
Other ethnicity	3.23	2.40 to 4.35	< 0.001	2.31	1.63 to 3.29	< 0.001
Sex						
Female	0.84	0.68 to 1.03	0.099	0.85	0.69 to 1.06	0.15
Education						
GCSE	0.90	0.68 to 1.19	0.47	0.92	0.67 to 1.25	0.58
A-level	0.87	0.63 to 1.21	0.41	0.86	0.61 to 1.22	0.40
No formal qualification	0.85	0.62 to 1.18	0.33	1.13	0.76 to 1.67	0.56
Other, still studying, don't know	1.10	0.75 to 1.61	0.62	1.24	0.81 to 1.89	0.32
Social grade						
C1	0.87	0.65 to 1.16	0.33	0.76	0.55 to 1.04	0.086
C2	1.05	0.76 to 1.44	0.77	0.84	0.57 to 1.22	0.35
D	1.30	0.91 to 1.86	0.15	1.07	0.70 to 1.62	0.77
E	1.20	0.82 to 1.75	0.34	0.96	0.62 to 1.50	0.86
Smoking status						
Previous smoker	0.66	0.52 to 0.86	0.002	0.83	0.63 to 1.09	0.18
Current (tried quitting)	1.07	0.79 to 1.45	0.67	1.08	0.78 to 1.49	0.64
Current (not tried quitting)	0.85	0.54 to 1.33	0.47	0.80	0.50 to 1.28	0.34
Refused to answer	1.04	0.63 to 1.71	0.89	0.87	0.52 to 1.45	0.60
Area						
North	0.48	0.30 to 0.78	0.003	0.76	0.46 to 1.27	0.29
North West	0.71	0.47 to 1.05	0.086	1.00	0.66 to 1.53	0.98
Yorkshire and Humberside	0.53	0.34 to 0.83	0.005	0.79	0.49 to 1.29	0.35
East Midlands	0.49	0.32 to 0.75	0.001	0.62	0.40 to 0.97	0.036
West Midlands	0.36	0.22 to 0.60	< 0.001	0.64	0.37 to 1.10	0.11
East Anglia	1.03	0.54 to 1.95	0.93	1.55	0.79 to 3.02	0.20
South East	0.74	0.46 to 1.19	0.21	1.31	0.79 to 2.19	0.30
South West	0.37	0.25 to 0.53	< 0.001	0.65	0.43 to 0.99	0.044
Wales	0.41	0.24 to 0.69	0.001	0.75	0.42 to 1.31	0.31
Scotland	0.37	0.24 to 0.58	< 0.001	0.61	0.37 to 0.99	0.046

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age 65+ years, no children breastfed, no children, white ethnicity, male sex, university education, social grades A and B combined, never smoked and residence London.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 29 Detailed results of the Ipsos MORI survey: health economics

TABLE 84 Results from the two-part model to estimate the acceptable values for shopping vouchers among those who agreed with providing vouchers to mothers for smoking cessation

	Probit (agree or not)			Amount of shopping voucher		
Variable	ββ	95% CI	*p*-value	βββ	95% CI	*p*-value
Age	–0.01	–0.02 to 0.00	0.10	–0.09	–0.27 to 0.09	0.33
Region (base category: Greater London)						
North	–0.40	–0.77 to –0.03	0.04	–4.07	–13.28 to 5.15	0.39
North West	0.17	–0.15 to 0.48	0.30	–0.59	–7.31 to 6.13	0.86
Yorkshire and Humberside	–0.27	–0.61 to 0.08	0.13	–3.80	–12.28 to 4.69	0.38
West Midlands	–0.31	–0.63 to 0.02	0.07	–3.65	–11.57 to 4.27	0.37
East Midlands	–0.18	–0.56 to 0.21	0.38	–8.59	–18.26 to 1.08	0.08
East Anglia	–0.02	–0.48 to 0.43	0.92	5.56	–4.82 to 15.94	0.29
South West	0.22	–0.15 to 0.59	0.24	–9.13	–16.14 to –2.12	0.01
South East	0.07	–0.23 to 0.37	0.64	–8.80	–15.09 to –2.51	0.01
Wales	–0.40	–0.79 to –0.01	0.05	–2.82	–12.40 to 6.76	0.56
Scotland	–0.14	–0.49 to 0.20	0.42	–6.43	–14.83 to 1.97	0.13
Education (base category: university)						
GCSE	–0.30	–0.53 to –0.07	0.01	–2.03	–6.74 to 2.68	0.40
A-level	–0.35	–0.60 to –0.10	0.01	–4.07	–9.35 to 1.22	0.13
No formal qualification	–0.07	–0.36 to 0.21	0.62	2.20	–3.95 to 8.35	0.48
Other, still studying, don't know	–0.12	–0.42 to 0.18	0.42	–3.97	–10.24 to 2.30	0.21
Smoking status (base category: never smoked)						
Previous smoker	–0.02	–0.22 to 0.17	0.81	–1.04	–5.16 to 3.08	0.62
Current (tried quitting)	0.24	0.01 to 0.47	0.04	5.27	0.00 to 10.54	0.05
Current (not tried quitting)	0.05	–0.30 to 0.41	0.76	3.53	–5.31 to 12.37	0.43
Refused to answer	0.14	–0.25 to 0.52	0.49	–3.26	–9.64 to 3.12	0.32
Breastfeeding experience (base category: no children)						
Yes	0.22	0.03 to 0.42	0.02	4.59	0.46 to 8.73	0.03
No	0.17	–0.05 to 0.39	0.14	–0.55	–5.57 to 4.47	0.83

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 84 Results from the two-part model to estimate the acceptable values for shopping vouchers among those who agreed with providing vouchers to mothers for smoking cessation (*continued*)

	Probit (agree or not)			Amount of shopping voucher		
Variable	ββ	95% CI	*p*-value	βββ	95% CI	*p*-value
Social grade (base category: A or B)						
C1	0.01	–0.21 to 0.24	0.90	–0.21	–5.02 to 4.60	0.93
C2	0.13	–0.14 to 0.40	0.35	3.77	–2.03 to 9.57	0.20
D	0.09	–0.21 to 0.39	0.55	–1.06	–7.35 to 5.24	0.74
E	0.41	0.09 to 0.73	0.01	1.35	–5.56 to 8.25	0.70
Childbearing age (= 1 if age < 45 years)	0.08	–0.22 to 0.38	0.62	1.96	–4.80 to 8.71	0.57
Female (= 1 if female)	–0.27	–0.43 to –0.11	0.00	0.79	–2.59 to 4.18	0.64
White (= 1 if ethnic origin is white)	–0.31	–0.57 to –0.05	0.02	–5.21	–10.87 to 0.44	0.07
Constant	0.90	0.31 to 1.48	0.00	34.22	21.52 to 46.92	0.00
R^2				0.1065		
Pseudo R^2	0.0598					
n	1144			660		

TABLE 85 Results from the two-part model to estimate the acceptability of targeting incentives to low-income women only among those who agreed with providing vouchers to mothers for smoking cessation

	Probit (agree or not)			Probit (women on a low income or all)		
Variable	βββ	95% CI	*p*-value	βββ	95% CI	*p*-value
Age	–0.01	–0.02 to 0.00	0.10	0.00	–0.01 to 0.01	0.66
Region (base category: Greater London)						
North	–0.40	–0.77 to –0.03	0.04	–0.19	–0.71 to 0.34	0.48
North West	0.17	–0.15 to 0.48	0.30	0.12	–0.25 to 0.48	0.52
Yorkshire and Humberside	–0.27	–0.61 to 0.08	0.13	–0.09	–0.55 to 0.36	0.69
West Midlands	–0.31	–0.63 to 0.02	0.07	–0.01	–0.44 to 0.43	0.97
East Midlands	–0.18	–0.56 to 0.21	0.38	–0.43	–0.98 to 0.12	0.13
East Anglia	–0.02	–0.48 to 0.43	0.92	0.35	–0.22 to 0.92	0.23
South West	0.22	–0.15 to 0.59	0.24	0.48	0.02 to 0.93	0.04
South East	0.07	–0.23 to 0.37	0.64	0.17	–0.21 to 0.54	0.38
Wales	–0.40	–0.79 to –0.01	0.05	–0.12	–0.70 to 0.46	0.68
Scotland	–0.14	–0.49 to 0.20	0.42	0.81	0.34 to 1.27	0.00
Education (base category: university)						
GCSE	–0.30	–0.53 to –0.07	0.01	–0.22	–0.52 to 0.09	0.16
A-level	–0.35	–0.60 to –0.10	0.01	0.09	–0.24 to 0.42	0.59
No formal qualification	–0.07	–0.36 to 0.21	0.62	–0.28	–0.66 to 0.09	0.14
Other, still studying, do not know	–0.12	–0.42 to 0.18	0.42	–0.14	–0.52 to 0.25	0.49
Smoking status (base category: never smoked)						
Previous smoker	–0.02	–0.22 to 0.17	0.81	–0.08	–0.35 to 0.19	0.57
Current (tried quitting)	0.24	0.01 to 0.47	0.04	–0.04	–0.33 to 0.24	0.77
Current (not tried quitting)	0.05	–0.30 to 0.41	0.76	–0.12	–0.57 to 0.32	0.59
Refused to answer	0.14	–0.25 to 0.52	0.49	–0.00	–0.46 to 0.46	0.99
Breastfeeding experience (base category: no children)						
Yes	0.22	0.03 to 0.42	0.02	0.08	–0.17 to 0.33	0.53
No	0.17	–0.05 to 0.39	0.14	0.20	–0.09 to 0.49	0.18
Social grade (base category: A or B)						
C1	0.01	–0.21 to 0.24	0.90	0.15	–0.15 to 0.46	0.32
C2	0.13	–0.14 to 0.40	0.35	0.12	–0.24 to 0.49	0.51
D	0.09	–0.21 to 0.39	0.55	0.23	–0.16 to 0.63	0.25
E	0.41	0.09 to 0.73	0.01	0.18	–0.23 to 0.59	0.38
Childbearing age (= 1 if age < 45 years)	0.08	–0.22 to 0.38	0.62	–0.00	–0.40 to 0.39	0.99
Female (= 1 if female)	–0.27	–0.43 to –0.11	0.00	–0.17	–0.37 to 0.04	0.11
White (= 1 if ethnic origin is white)	–0.31	–0.57 to –0.05	0.02	0.12	–0.18 to 0.43	0.43
Constant	0.90	0.31 to 1.48	0.00	–0.46	–1.23 to 0.32	0.25
Pseudo R^2	0.0598			0.0523		
n	1144			660		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 86 Results from the two-part model to estimate the acceptable value for shopping vouchers among those who agreed with providing vouchers for breastfeeding

	Probit (agree or not)			Amount of shopping voucher		
Variable	ββββ	95% CI	*p*-value	ββββ	95% CI	*p*-value
Age	–0.01	–0.01 to 0.00	0.18	–0.12	–0.29 to 0.05	0.17
Region (base category: Greater London)						
North	–0.21	–0.60 to 0.17	0.27	–2.26	–10.77 to 6.25	0.60
North West	0.00	–0.32 to 0.33	0.98	–1.36	–7.96 to 5.23	0.69
Yorks and Humberside	–0.25	–0.60 to 0.10	0.17	–4.08	–12.30 to 4.13	0.33
West Midlands	–0.39	–0.73 to –0.06	0.02	–4.02	–11.15 to 3.10	0.27
East Midlands	–0.53	–0.93 to –0.13	0.01	–12.68	–21.34 to –4.02	0.00
East Anglia	–0.09	–0.57 to 0.38	0.70	–1.73	–12.38 to 8.92	0.75
South West	0.23	–0.16 to 0.61	0.24	–7.50	–14.56 to –0.45	0.04
South East	–0.17	–0.47 to 0.14	0.29	–11.37	–17.49 to –5.26	0.00
Wales	–0.45	–0.85 to –0.05	0.03	–10.66	–19.14 to –2.18	0.01
Scotland	–0.05	–0.41 to 0.31	0.78	–11.57	–18.62 to –4.52	0.00
Education (base category: university)						
GCSE	0.05	–0.19 to 0.29	0.67	2.31	–2.32 to 6.93	0.33
A-level	–0.20	–0.45 to 0.05	0.11	1.74	–3.76 to 7.25	0.53
No formal qualification	0.31	0.01 to 0.61	0.04	5.43	–0.47 to 11.34	0.07
Other, still studying, don't know	0.10	–0.21 to 0.40	0.54	–0.13	–5.48 to 5.23	0.96
Smoking status (base category: never smoked)						
Previous smoker	–0.10	–0.29 to 0.10	0.33	0.39	–3.85 to 4.64	0.86
Current (tried quitting)	0.06	–0.17 to 0.30	0.61	4.70	–0.40 to 9.81	0.07
Current (not tried quitting)	–0.23	–0.58 to 0.12	0.19	–1.66	–8.43 to 5.11	0.63
Refused to answer	0.09	–0.30 to 0.48	0.65	–2.39	–9.95 to 5.16	0.53
Breastfeeding experience (base category: no children)						
Yes	–0.01	–0.20 to 0.18	0.91	6.88	2.77 to 10.99	0.00
No	–0.16	–0.38 to 0.06	0.16	–0.54	–4.87 to 3.79	0.81
Social grade (base category: A or B)						
C1	–0.20	–0.42 to 0.03	0.09	–3.85	–8.80 to 1.09	0.13
C2	0.02	–0.26 to 0.29	0.91	–5.36	–10.64 to –0.07	0.05
D	–0.01	–0.31 to 0.30	0.95	–5.43	–11.37 to 0.51	0.07
E	0.06	–0.26 to 0.39	0.70	–3.42	–10.14 to 3.30	0.32
Childbearing age (= 1 if age < 45 years)	0.10	–0.20 to 0.40	0.52	0.35	–6.30 to 6.99	0.92
Female (= 1 if female)	–0.33	–0.49 to –0.17	0.00	2.95	–0.38 to 6.27	0.08
White (= 1 if ethnic origin is white)	–0.52	–0.81 to –0.23	0.00	–8.44	–13.82 to –3.06	0.00
Constant	1.38	0.77 to 1.99	0.00	38.66	26.40 to 50.92	0.00
R^2				0.1390		
Pseudo R^2	0.0750					
n	1144			697		

TABLE 87 Results from the two-part model to estimate the acceptability of targeting to low-income women only among those who agreed with providing vouchers for breastfeeding

	Probit (agree or not)			Probit (women on a low income or all)		
Variable	ββββ	95% CI	*p*-value	ββββ	95% CI	*p*-value
Age	–0.01	–0.01 to 0.00	0.18	0.01	–0.00 to 0.02	0.10
Region (base category: Greater London)						
North	–0.21	–0.60 to 0.17	0.27	–0.05	–0.53 to 0.43	0.84
North West	0.00	–0.32 to 0.33	0.98	0.18	–0.18 to 0.54	0.33
Yorks and Humberside	–0.25	–0.60 to 0.10	0.17	0.18	–0.25 to 0.61	0.41
West Midlands	–0.39	–0.73 to –0.06	0.02	–0.07	–0.49 to 0.34	0.73
East Midlands	–0.53	–0.93 to –0.13	0.01	–0.01	–0.58 to 0.55	0.96
East Anglia	–0.09	–0.57 to 0.38	0.70	0.53	–0.04 to 1.10	0.07
South West	0.23	–0.16 to 0.61	0.24	0.65	0.21 to 1.10	0.00
South East	–0.17	–0.47 to 0.14	0.29	0.18	–0.19 to 0.55	0.34
Wales	–0.45	–0.85 to –0.05	0.03	0.31	–0.24 to 0.86	0.27
Scotland	–0.05	–0.41 to 0.31	0.78	0.60	0.18 to 1.03	0.01
Education (base category: university)						
GCSE	0.05	–0.19 to 0.29	0.67	0.06	–0.23 to 0.35	0.68
A-level	–0.20	–0.45 to 0.05	0.11	–0.00	–0.32 to 0.32	1.00
No formal qualification	0.31	0.01 to 0.61	0.04	0.11	–0.26 to 0.49	0.55
Other, still studying, don't know	0.10	–0.21 to 0.40	0.54	0.24	–0.14 to 0.62	0.22
Smoking status (base category: never smoked)						
Previous smoker	–0.10	–0.29 to 0.10	0.33	–0.07	–0.34 to 0.19	0.59
Current (tried quitting)	0.06	–0.17 to 0.30	0.61	–0.10	–0.38 to 0.19	0.50
Current (not tried quitting)	–0.23	–0.58 to 0.12	0.19	–0.13	–0.56 to 0.30	0.56
Refused to answer	0.09	–0.30 to 0.48	0.65	0.13	–0.31 to 0.57	0.56
Breastfeeding experience (base category: no children)						
Yes	–0.01	–0.20 to 0.18	0.91	–0.06	–0.30 to 0.18	0.62
No	–0.16	–0.38 to 0.06	0.16	0.04	–0.24 to 0.33	0.76
Social grade (base category: A or B)						
C1	–0.20	–0.42 to 0.03	0.09	–0.20	–0.49 to 0.10	0.19
C2	0.02	–0.26 to 0.29	0.91	–0.09	–0.44 to 0.25	0.60
D	–0.01	–0.31 to 0.30	0.95	–0.11	–0.48 to 0.27	0.58
E	0.06	–0.26 to 0.39	0.70	–0.15	–0.55 to 0.25	0.45
Childbearing age (= 1 if age < 45 years)	0.10	–0.20 to 0.40	0.52	0.23	–0.16 to 0.61	0.25
Female (= 1 if female)	–0.33	–0.49 to –0.17	0.00	–0.28	–0.48 to –0.08	0.01
White (= 1 if ethnic origin is white)	–0.52	–0.81 to –0.23	0.00	–0.13	–0.42 to 0.16	0.37
Constant	1.38	0.77 to 1.99	0.00	–0.47	–1.21 to 0.27	0.21
Pseudo R^2	0.0750			0.0416		
n	1144			660		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 30 Detailed results of the health professional survey

TABLE 88 Response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy', by independent variable, from the health professional survey

Variable	SD	D	N	A	SA
Age category (years)					
18–34	22 (24.2)	37 (40.7)	3 (3.3)	25 (27.5)	4 (4.4)
35–44	20 (17.5)	36 (31.6)	15 (13.2)	37 (32.5)	6 (5.3)
45–54	37 (20.3)	54 (29.7)	21 (11.5)	53 (29.1)	17 (9.3)
55+	20 (23.5)	27 (31.8)	14 (16.5)	17 (20.0)	7 (8.2)
Missing	6 (24.0)	9 (36.0)	4 (16.0)	5 (20.0)	1 (4.0)
Breastfeeding					
Children not breastfed	26 (23.6)	34 (30.9)	12 (10.9)	31 (28.2)	7 (6.4)
Children breastfed	79 (20.4)	129 (33.3)	45 (11.6)	106 (27.4)	28 (7.2)
Children					
No children	23 (24.0)	31 (32.3)	8 (8.3)	28 (29.2)	6 (6.3)
Have children	82 (20.4)	132 (32.9)	49 (12.2)	109 (27.2)	29 (7.2)
Ethnicity					
White	88 (19.8)	148 (33.3)	52 (11.7)	125 (28.2)	31 (7.0)
Other ethnicity	17 (32.1)	15 (28.3)	5 (9.4)	12 (22.6)	4 (7.5)
Sex					
Male	21 (32.8)	12 (18.8)	7 (10.9)	17 (26.6)	7 (10.9)
Female	79 (19.2)	141 (34.3)	46 (11.2)	118 (28.7)	27 (6.6)
Missing	5 (22.7)	10 (45.5)	4 (18.2)	2 (9.1)	1 (4.5)
Profession					
Doctor	36 (23.1)	52 (33.3)	17 (10.9)	44 (28.2)	7 (4.5)
Midwife/health visitor/maternity care	31 (15.7)	72 (36.5)	22 (11.2)	56 (28.4)	16 (8.1)
Other	38 (26.4)	39 (27.1)	18 (12.5)	37 (25.7)	12 (8.3)
Smoking status					
Never smoked	78 (21.2)	119 (32.3)	40 (10.9)	106 (28.8)	25 (6.8)
Previous smoker/current smoker/declined to answer	27 (20.9)	44 (34.1)	17 (13.2)	31 (24.0)	10 (7.8)
Area					
North	96 (22.0)	143 (32.7)	52 (11.9)	117 (26.8)	29 (6.6)
North West	9 (15.0)	20 (33.3)	5 (8.3)	20 (33.3)	6 (10.0)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 89 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they have stopped smoking during pregnancy'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	0.86	0.51 to 1.47	0.58	0.85	0.48 to 1.48	0.56
35–44	1.31	0.80 to 2.17	0.28	1.39	0.83 to 2.33	0.21
45–54	1.32	0.83 to 2.10	0.24	1.26	0.79 to 2.02	0.33
Missing	0.85	0.39 to 1.87	0.69	2.03	0.45 to 9.19	0.36
Breastfeeding						
Children breastfed	1.08	0.74 to 1.59	0.69	0.90	0.34 to 2.40	0.83
Children						
Have children	1.11	0.74 to 1.66	0.62	1.08	0.38 to 3.08	0.89
Ethnicity						
Other ethnicity	0.67	0.39 to 1.14	0.14	0.67	0.32 to 1.41	0.29
Sex						
Female	1.16	0.70 to 1.91	0.57	1.02	0.59 to 1.77	0.94
Missing	0.69	0.29 to 1.63	0.40	0.56	0.11 to 2.90	0.49
Profession						
Midwifes/health visitor/maternity care	1.31	0.90 to 1.90	0.16	1.32	0.87 to 2.02	0.19
Other	1.04	0.69 to 1.57	0.85	1.12	0.71 to 1.77	0.62
Smoking status						
Previous smoker/current smoker/declined to answer	0.95	0.66 to 1.36	0.77	0.90	0.62 to 1.30	0.56
Area						
England	1.46	0.90 to 2.37	0.13	1.55	0.94 to 2.56	0.086

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

TABLE 90 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–34	23 (25.3)	33 (36.3)	1 (1.1)	27 (29.7)	7 (7.7)
35–44	20 (17.5)	34 (29.8)	11 (9.6)	39 (34.2)	10 (8.8)
45–54	31 (17.0)	58 (31.9)	14 (7.7)	50 (27.5)	29 (15.9)
55+	20 (23.5)	25 (29.4)	6 (7.1)	26 (30.6)	8 (9.4)
Missing	5 (20.0)	9 (36.0)	4 (16.0)	5 (20.0)	2 (8.0)
Breastfeeding					
Children not breastfed	23 (20.9)	34 (30.9)	10 (9.1)	30 (27.3)	13 (11.8)
Children breastfed	76 (19.6)	125 (32.3)	26 (6.7)	117 (30.2)	43 (11.1)
Children					
No children	20 (20.8)	32 (33.3)	7 (7.3)	27 (28.1)	10 (10.4)
Have children	79 (19.7)	127 (31.7)	29 (7.2)	120 (29.9)	46 (11.5)
Ethnicity					
White	83 (18.7)	145 (32.7)	30 (6.8)	133 (30.0)	53 (11.9)
Other ethnicity	16 (30.2)	14 (26.4)	6 (11.3)	14 (26.4)	3 (5.7)
Sex					
Male	20 (31.3)	11 (17.2)	6 (9.4)	18 (28.1)	9 (14.1)
Female	74 (18.0)	138 (33.6)	27 (6.6)	126 (30.7)	46 (11.2)
Missing	5 (22.7)	10 (45.5)	3 (13.6)	3 (13.6)	1 (4.5)
Profession					
Doctor	34 (21.8)	52 (33.3)	15 (9.6)	47 (30.1)	8 (5.1)
Midwife/health visitor/maternity care	28 (14.2)	71 (36.0)	13 (6.6)	59 (29.9)	26 (13.2)
Other	37 (25.7)	36 (25.0)	8 (5.6)	41 (28.5)	22 (15.3)
Smoking status					
Never smoked	72 (19.6)	120 (32.6)	25 (6.8)	110 (29.9)	41 (11.1)
Previous smoker/current smoker/declined to answer	27 (20.9)	39 (30.2)	11 (8.5)	37 (28.7)	15 (11.6)
Area					
North	90 (20.6)	139 (31.8)	34 (7.8)	126 (28.8)	48 (11.0)
North West	9 (15.0)	20 (33.3)	2 (3.3)	21 (35.0)	8 (13.3)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 91 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she proves that she is still not smoking'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	0.82	0.48 to 1.40	0.47	0.80	0.45 to 1.41	0.44
35–44	1.22	0.74 to 2.01	0.44	1.28	0.76 to 2.15	0.35
45–54	1.34	0.84 to 2.13	0.22	1.26	0.79 to 2.02	0.34
Missing	0.89	0.41 to 1.93	0.76	3.06	0.74 to 12.63	0.12
Breastfeeding						
Children breastfed	1.04	0.71 to 1.52	0.85	0.69	0.25 to 1.93	0.48
Children						
Have children	1.11	0.74 to 1.65	0.62	1.38	0.47 to 4.10	0.56
Ethnicity						
Other ethnicity	0.63	0.38 to 1.06	0.079	0.63	0.31 to 1.27	0.20
Sex						
Female	1.16	0.71 to 1.91	0.55	0.98	0.57 to 1.68	0.93
Missing	0.64	0.27 to 1.50	0.31	0.31	0.06 to 1.49	0.14
Profession						
Midwifes/health visitor/maternity care	1.45	1.00 to 2.11	0.048	1.44	0.95 to 2.19	0.089
Other	1.24	0.82 to 1.87	0.31	1.35	0.85 to 2.14	0.20
Smoking status						
Previous smoker/current smoker/declined to answer	0.99	0.69 to 1.42	0.95	0.90	0.62 to 1.30	0.57
Area						
England	1.32	0.81 to 2.14	0.26	1.48	0.89 to 2.45	0.13

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

TABLE 92 Response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–34	20 (23.5)	22 (25.9)	14 (16.5)	21 (24.7)	8 (9.4)
35–44	29 (31.9)	28 (30.8)	5 (5.5)	23 (25.3)	6 (6.6)
45–54	26 (22.8)	31 (27.2)	15 (13.2)	26 (22.8)	16 (14.0)
55+	36 (19.8)	58 (31.9)	22 (12.1)	37 (20.3)	29 (15.9)
Missing	7 (28.0)	5 (20.0)	5 (20.0)	7 (28.0)	1 (4.0)
Breastfeeding					
Children not breastfed	30 (27.3)	31 (28.2)	19 (17.3)	19 (17.3)	11 (10.0)
Children breastfed	88 (22.7)	113 (29.2)	42 (10.9)	95 (24.5)	49 (12.7)
Children					
No children	27 (28.1)	30 (31.3)	15 (15.6)	16 (16.7)	8 (8.3)
Have children	91 (22.7)	114 (28.4)	46 (11.5)	98 (24.4)	52 (13.0)
Ethnicity					
White	100 (22.5)	134 (30.2)	53 (11.9)	101 (22.7)	56 (12.6)
Other ethnicity	18 (34.0)	10 (18.9)	8 (15.1)	13 (24.5)	4 (7.5)
Sex					
Male	22 (34.4)	11 (17.2)	8 (12.5)	16 (25.0)	7 (10.9)
Female	90 (21.9)	128 (31.1)	48 (11.7)	93 (22.6)	52 (12.7)
Missing	6 (27.3)	5 (22.7)	5 (22.7)	5 (22.7)	1 (4.5)
Profession					
Doctor	40 (25.6)	48 (30.8)	21 (13.5)	36 (23.1)	11 (7.1)
Midwife/health visitor/maternity care	36 (18.3)	67 (34.0)	25 (12.7)	40 (20.3)	29 (14.7)
Other	42 (29.2)	29 (20.1)	15 (10.4)	38 (26.4)	20 (13.9)
Smoking status					
Never smoked	86 (23.4)	105 (28.5)	47 (12.8)	88 (23.9)	42 (11.4)
Previous smoker/current smoker/declined to answer	32 (24.8)	39 (30.2)	14 (10.9)	26 (20.2)	18 (14.0)
Area					
North	105 (24.0)	125 (28.6)	54 (12.4)	102 (23.3)	51 (11.7)
North West	13 (21.7)	19 (31.7)	7 (11.7)	12 (20.0)	9 (15.0)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 93 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for a woman for 2 months after the birth of her baby if she never lets anyone smoke in her home'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	0.68	0.40 to 1.16	0.16	0.74	0.42 to 1.30	0.30
35–44	1.09	0.66 to 1.79	0.73	1.13	0.68 to 1.89	0.63
45–54	1.14	0.72 to 1.79	0.58	1.11	0.70 to 1.76	0.65
Missing	0.87	0.40 to 1.91	0.74	1.27	0.28 to 5.75	0.76
Breastfeeding						
Children breastfed	1.30	0.89 to 1.89	0.18	0.60	0.22 to 1.64	0.32
Children						
Have children	1.47	0.99 to 2.17	0.058	2.15	0.75 to 6.18	0.16
Ethnicity						
Other ethnicity	0.74	0.44 to 1.25	0.26	0.70	0.34 to 1.43	0.33
Sex						
Female	1.24	0.76 to 2.02	0.39	1.12	0.66 to 1.90	0.66
Missing	1.00	0.42 to 2.35	1.00	0.96	0.18 to 5.22	0.96
Profession						
Midwifes/health visitor/maternity care	1.36	0.94 to 1.97	0.10	1.32	0.87 to 2.00	0.20
Other	1.25	0.83 to 1.88	0.29	1.24	0.79 to 1.95	0.34
Smoking status						
Previous smoker/current smoker/declined to answer	0.95	0.66 to 1.36	0.78	0.85	0.59 to 1.24	0.40
Area						
England	1.07	0.66 to 1.73	0.78	1.15	0.70 to 1.90	0.58

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

TABLE 94 Response to 'Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–34	20 (23.5)	27 (31.8)	14 (16.5)	17 (20.0)	7 (8.2)
35–44	22 (24.2)	37 (40.7)	3 (3.3)	25 (27.5)	4 (4.4)
45–54	20 (17.5)	36 (31.6)	15 (13.2)	37 (32.5)	6 (5.3)
55+	37 (20.3)	54 (29.7)	21 (11.5)	53 (29.1)	17 (9.3)
Missing	6 (24.0)	9 (36.0)	4 (16.0)	5 (20.0)	1 (4.0)
Breastfeeding					
Children not breastfed	26 (23.6)	34 (30.9)	12 (10.9)	31 (28.2)	7 (6.4)
Children breastfed	79 (20.4)	129 (33.3)	45 (11.6)	106 (27.4)	28 (7.2)
Children					
No children	23 (24.0)	31 (32.3)	8 (8.3)	28 (29.2)	6 (6.3)
Have children	82 (20.4)	132 (32.9)	49 (12.2)	109 (27.2)	29 (7.2)
Ethnicity					
White	88 (19.8)	148 (33.3)	52 (11.7)	125 (28.2)	31 (7.0)
Other ethnicity	17 (32.1)	15 (28.3)	5 (9.4)	12 (22.6)	4 (7.5)
Sex					
Male	21 (32.8)	12 (18.8)	7 (10.9)	17 (26.6)	7 (10.9)
Female	79 (19.2)	141 (34.3)	46 (11.2)	118 (28.7)	27 (6.6)
Missing	5 (22.7)	10 (45.5)	4 (18.2)	2 (9.1)	1 (4.5)
Profession					
Doctor	36 (23.1)	52 (33.3)	17 (10.9)	44 (28.2)	7 (4.5)
Midwife/health visitor/maternity care	31 (15.7)	72 (36.5)	22 (11.2)	56 (28.4)	16 (8.1)
Other	38 (26.4)	39 (27.1)	18 (12.5)	37 (25.7)	12 (8.3)
Smoking status					
Never smoked	78 (21.2)	119 (32.3)	40 (10.9)	106 (28.8)	25 (6.8)
Previous smoker/current smoker/declined to answer	27 (20.9)	44 (34.1)	17 (13.2)	31 (24.0)	10 (7.8)
Area					
North	96 (22.0)	143 (32.7)	52 (11.9)	117 (26.8)	29 (6.6)
North West	9 (15.0)	20 (33.3)	5 (8.3)	20 (33.3)	6 (10.0)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 95 Simple univariable and multiple ordered logit regression models for response to 'Shopping vouchers for women who prove that they are breastfeeding for the first 6 months after birth'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	0.39	0.23 to 0.68	0.001	0.41	0.23 to 0.72	0.002
35–44	0.59	0.36 to 0.98	0.040	0.70	0.42 to 1.17	0.18
45–54	0.83	0.52 to 1.32	0.43	0.80	0.51 to 1.28	0.36
Missing	0.91	0.40 to 2.04	0.81	1.65	0.44 to 6.25	0.46
Breastfeeding						
Children breastfed	1.26	0.86 to 1.85	0.23	1.33	0.46 to 3.84	0.60
Children						
Have children	1.20	0.81 to 1.80	0.37	0.76	0.25 to 2.32	0.63
Ethnicity						
Other ethnicity	1.01	0.60 to 1.70	0.96	0.89	0.44 to 1.80	0.75
Sex						
Female	1.48	0.91 to 2.39	0.11	1.16	0.68 to 1.95	0.59
Missing	1.44	0.58 to 3.57	0.43	0.83	0.18 to 3.91	0.81
Profession						
Midwifes/health visitor/maternity care	1.97	1.35 to 2.86	< 0.001	1.84	1.21 to 2.79	0.005
Other	0.97	0.65 to 1.47	0.90	0.96	0.61 to 1.51	0.87
Smoking status						
Previous smoker/current smoker/declined to answer	0.98	0.68 to 1.40	0.89	0.89	0.61 to 1.29	0.53
Area						
England	1.40	0.88 to 2.22	0.16	1.39	0.85 to 2.26	0.19

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

TABLE 96 Response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–34	5 (5.5)	12 (13.2)	6 (6.6)	38 (41.8)	30 (33.0)
35–44	5 (4.4)	14 (12.3)	15 (13.2)	53 (46.5)	27 (23.7)
45–54	9 (4.9)	32 (17.6)	20 (11.0)	74 (40.7)	47 (25.8)
55+	6 (7.1)	17 (20.0)	8 (9.4)	30 (35.3)	24 (28.2)
Missing	4 (16.0)	5 (20.0)	2 (8.0)	9 (36.0)	5 (20.0)
Breastfeeding					
Children not breastfed	5 (4.5)	21 (19.1)	11 (10.0)	48 (43.6)	25 (22.7)
Children breastfed	24 (6.2)	59 (15.2)	40 (10.3)	156 (40.3)	108 (27.9)
Children					
No children	5 (5.2)	17 (17.7)	11 (11.5)	42 (43.8)	21 (21.9)
Have children	24 (6.0)	63 (15.7)	40 (10.0)	162 (40.4)	112 (27.9)
Ethnicity					
White	22 (5.0)	72 (16.2)	45 (10.1)	185 (41.7)	120 (27.0)
Other ethnicity	7 (13.2)	8 (15.1)	6 (11.3)	19 (35.8)	13 (24.5)
Sex					
Male	3 (4.7)	10 (15.6)	10 (15.6)	22 (34.4)	19 (29.7)
Female	22 (5.4)	66 (16.1)	38 (9.2)	176 (42.8)	109 (26.5)
Missing	4 (18.2)	4 (18.2)	3 (13.6)	6 (27.3)	5 (22.7)
Profession					
Doctor	8 (5.1)	27 (17.3)	17 (10.9)	68 (43.6)	36 (23.1)
Midwife/health visitor/maternity care	10 (5.1)	36 (18.3)	20 (10.2)	74 (37.6)	57 (28.9)
Other	11 (7.6)	17 (11.8)	14 (9.7)	62 (43.1)	40 (27.8)
Smoking status					
Never smoked	23 (6.3)	59 (16.0)	39 (10.6)	156 (42.4)	91 (24.7)
Previous smoker/current smoker/declined to answer	6 (4.7)	21 (16.3)	12 (9.3)	48 (37.2)	42 (32.6)
Area					
North	28 (6.4)	72 (16.5)	45 (10.3)	178 (40.7)	114 (26.1)
North West	1 (1.7)	8 (13.3)	6 (10.0)	26 (43.3)	19 (31.7)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 97 Simple univariable and multiple ordered logit regression models for response to 'A breast pump costing around £40.00 should be available for free on the NHS, to help women to continue breastfeeding'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	1.48	0.86 to 2.57	0.16	1.69	0.94 to 3.02	0.077
35–44	1.13	0.68 to 1.89	0.63	1.19	0.70 to 2.01	0.52
45–54	1.06	0.66 to 1.70	0.82	1.04	0.64 to 1.68	0.87
Missing	1.48	0.86 to 2.57	0.16	0.98	0.23 to 4.15	0.97
Breastfeeding						
Children breastfed	1.16	0.79 to 1.70	0.44	0.96	0.34 to 2.69	0.94
Children						
Have children	1.20	0.80 to 1.79	0.37	1.41	0.47 to 4.19	0.54
Ethnicity						
Other ethnicity	0.71	0.42 to 1.21	0.21	0.88	0.45 to 1.75	0.72
Sex						
Female	1.00	0.62 to 1.63	0.99	0.90	0.54 to 1.52	0.70
Missing	0.49	0.20 to 1.23	0.13	0.51	0.11 to 2.49	0.41
Profession						
Midwifes/health visitor/maternity care	1.13	0.77 to 1.65	0.54	1.16	0.75 to 1.79	0.50
Other	1.20	0.80 to 1.81	0.38	1.32	0.84 to 2.06	0.23
Smoking status						
Previous smoker/current smoker/declined to answer	1.28	0.89 to 1.86	0.19	1.24	0.85 to 1.81	0.27
Area						
England	1.43	0.88 to 2.33	0.15	1.49	0.90 to 2.47	0.13

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

TABLE 98 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–34	6 (6.6)	20 (22.0)	20 (22.0)	30 (33.0)	15 (16.5)
35–44	11 (9.6)	24 (21.1)	15 (13.2)	48 (42.1)	16 (14.0)
45–54	20 (11.0)	29 (15.9)	34 (18.7)	72 (39.6)	27 (14.8)
55+	11 (12.9)	14 (16.5)	17 (20.0)	32 (37.6)	11 (12.9)
Missing	3 (12.0)	4 (16.0)	6 (24.0)	8 (32.0)	4 (16.0)
Breastfeeding					
Children not breastfed	7 (6.4)	20 (18.2)	21 (19.1)	45 (40.9)	17 (15.5)
Children breastfed	44 (11.4)	71 (18.3)	71 (18.3)	145 (37.5)	56 (14.5)
Children					
No children	7 (7.3)	18 (18.8)	19 (19.8)	37 (38.5)	15 (15.6)
Have children	44 (11.0)	73 (18.2)	73 (18.2)	153 (38.2)	58 (14.5)
Ethnicity					
White	44 (9.9)	83 (18.7)	79 (17.8)	173 (39.0)	65 (14.6)
Other ethnicity	7 (13.2)	8 (15.1)	13 (24.5)	17 (32.1)	8 (15.1)
Sex					
Male	15 (23.4)	12 (18.8)	12 (18.8)	17 (26.6)	8 (12.5)
Female	35 (8.5)	75 (18.2)	74 (18.0)	166 (40.4)	61 (14.8)
Missing	1 (4.5)	4 (18.2)	6 (27.3)	7 (31.8)	4 (18.2)
Profession					
Doctor	26 (16.7)	36 (23.1)	31 (19.9)	51 (32.7)	12 (7.7)
Midwife/health visitor/maternity care	13 (6.6)	34 (17.3)	33 (16.8)	79 (40.1)	38 (19.3)
Other	12 (8.3)	21 (14.6)	28 (19.4)	60 (41.7)	23 (16.0)
Smoking status					
Never smoked	37 (10.1)	72 (19.6)	66 (17.9)	143 (38.9)	50 (13.6)
Previous smoker/current smoker/declined to answer	14 (10.9)	19 (14.7)	26 (20.2)	47 (36.4)	23 (17.8)
Area					
North	48 (11.0)	82 (18.8)	84 (19.2)	167 (38.2)	56 (12.8)
North West	3 (5.0)	9 (15.0)	8 (13.3)	23 (38.3)	17 (28.3)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 99 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they have stopped smoking during pregnancy'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	1.11	0.66 to 1.89	0.69	1.16	0.66 to 2.03	0.61
35–44	1.15	0.69 to 1.90	0.60	1.45	0.86 to 2.47	0.16
45–54	1.16	0.73 to 1.85	0.53	1.10	0.69 to 1.77	0.68
Missing	1.03	0.46 to 2.30	0.94	0.36	0.06 to 1.97	0.24
Breastfeeding						
Children breastfed	0.82	0.56 to 1.19	0.29	0.62	0.23 to 1.65	0.34
Children						
Have children	0.89	0.60 to 1.32	0.56	1.31	0.47 to 3.68	0.61
Ethnicity						
Other ethnicity	0.87	0.52 to 1.45	0.60	0.82	0.41 to 1.62	0.56
Sex						
Female	2.04	1.25 to 3.33	0.005	1.50	0.87 to 2.56	0.14
Missing	2.12	0.89 to 5.07	0.090	4.86	0.76 to 31.21	0.095
Profession						
Midwifes/health visitor/maternity care	2.32	1.58 to 3.41	< 0.001	2.35	1.51 to 3.64	< 0.001
Other	2.10	1.39 to 3.16	< 0.001	2.18	1.38 to 3.44	< 0.001
Smoking status						
Previous smoker/current smoker/declined to answer	0.95	0.66 to 1.36	0.77	0.90	0.62 to 1.30	0.56
Area						
England	1.16	0.81 to 1.67	0.42	0.95	0.65 to 1.38	0.78

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

TABLE 100 Response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they are breastfeeding', by independent variable

Variable	SD	D	N	A	SA
Age category (years)					
18–34	16 (17.6)	21 (23.1)	14 (15.4)	25 (27.5)	15 (16.5)
35–44	17 (14.9)	30 (26.3)	24 (21.1)	32 (28.1)	11 (9.6)
45–54	25 (13.7)	41 (22.5)	28 (15.4)	62 (34.1)	26 (14.3)
55+	13 (15.3)	20 (23.5)	14 (16.5)	26 (30.6)	12 (14.1)
Missing	6 (24.0)	3 (12.0)	6 (24.0)	9 (36.0)	1 (4.0)
Breastfeeding					
Children not breastfed	13 (11.8)	29 (26.4)	22 (20.0)	33 (30.0)	13 (11.8)
Children breastfed	64 (16.5)	86 (22.2)	64 (16.5)	121 (31.3)	52 (13.4)
Children					
No children	12 (12.5)	26 (27.1)	20 (20.8)	26 (27.1)	12 (12.5)
Have children	65 (16.2)	89 (22.2)	66 (16.5)	128 (31.9)	53 (13.2)
Ethnicity					
White	65 (14.6)	107 (24.1)	76 (17.1)	137 (30.9)	59 (13.3)
Other ethnicity	12 (22.6)	8 (15.1)	10 (18.9)	17 (32.1)	6 (11.3)
Sex					
Male	18 (28.1)	21 (32.8)	10 (15.6)	8 (12.5)	7 (10.9)
Female	55 (13.4)	91 (22.1)	70 (17.0)	139 (33.8)	56 (13.6)
Missing	4 (18.2)	3 (13.6)	6 (27.3)	7 (31.8)	2 (9.1)
Profession					
Doctor	38 (24.4)	44 (28.2)	28 (17.9)	37 (23.7)	9 (5.8)
Midwife/health visitor/maternity care	18 (9.1)	40 (20.3)	30 (15.2)	75 (38.1)	34 (17.3)
Other	21 (14.6)	31 (21.5)	28 (19.4)	42 (29.2)	22 (15.3)
Smoking status					
Never smoked	55 (14.9)	90 (24.5)	66 (17.9)	111 (30.2)	46 (12.5)
Previous smoker/current smoker/declined to answer	22 (17.1)	25 (19.4)	20 (15.5)	43 (33.3)	19 (14.7)
Area					
North	70 (16.0)	103 (23.6)	78 (17.8)	133 (30.4)	53 (12.1)
North West	7 (11.7)	12 (20.0)	8 (13.3)	21 (35.0)	12 (20.0)

A, agree; D, disagree; N, neither agree not disagree; SA, strongly agree; SD, strongly disagree.
Cells are number (row percentages).

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 101 Simple univariable and multiple ordered logit regression models for response to 'Local health services should receive additional funding if they reach targets for the number of women who prove that they are breastfeeding'

	Simple regression model			Multiple regression model		
Variable	OR	95% CI	*p*-value	OR	95% CI	*p*-value
Age category (years)						
18–34	0.97	0.57 to 1.66	0.91	1.01	0.57 to 1.77	0.98
35–44	0.83	0.50 to 1.36	0.46	1.01	0.60 to 1.69	0.97
45–54	1.12	0.70 to 1.77	0.64	1.03	0.65 to 1.65	0.89
Missing	0.76	0.34 to 1.67	0.49	0.30	0.06 to 1.53	0.15
Breastfeeding						
Children breastfed	1.00	0.69 to 1.45	0.99	0.68	0.26 to 1.80	0.44
Children						
Have children	1.06	0.72 to 1.57	0.75	1.47	0.53 to 4.08	0.46
Ethnicity						
Other ethnicity	0.88	0.53 to 1.47	0.63	1.12	0.55 to 2.28	0.76
Sex						
Female	2.60	1.61 to 4.21	< 0.001	1.79	1.06 to 3.03	0.029
Missing	2.19	0.93 to 5.16	0.072	4.01	0.68 to 23.84	0.13
Profession						
Midwifes/health visitor/maternity care	2.88	1.96 to 4.22	< 0.001	2.54	1.65 to 3.91	< 0.001
Other	2.02	1.34 to 3.04	0.001	1.94	1.23 to 3.05	0.004
Smoking status						
Previous smoker/current smoker/declined to answer	1.14	0.79 to 1.63	0.48	0.91	0.63 to 1.32	0.63
Area						
England	1.60	0.98 to 2.62	0.059	1.81	1.09 to 3.00	0.023

Simple univariable regression models included only the categories for that variable; multiple regression models included all variables. Reference categories were age ≥ 55 years, no children breastfed, no children, white ethnicity, male sex, doctor, never smoked and residence Scotland.

Appendix 31 Detailed results of the health professional survey: health economics

TABLE 102 Results from the two-part model to estimate the acceptable values for shopping vouchers among those who agreed with providing vouchers to mothers for smoking cessation

	Probit (agree or not)			Amount of shopping voucher		
Variable	ββ	95% CI	*p*-value	ββ	95% CI	*p*-value
Age category (years) (base category: ≥ 55 years)						
16–24	–1.32	–2.42 to –0.23	0.02	–15.85	–26.56 to –5.13	0.00
25–34	–0.17	–0.57 to 0.24	0.42	–0.57	–9.10 to 7.97	0.90
35–44	0.18	–0.18 to 0.54	0.32	–3.91	–10.72 to 2.89	0.26
45–54	0.11	–0.21 to 0.44	0.49	3.06	–3.98 to 10.10	0.39
Missing	0.60	–0.44 to 1.64	0.26	8.54	–32.60 to 49.69	0.68
Country of residence (base category: Scotland)						
England	0.24	–0.12 to 0.60	0.19	–2.39	–9.81 to 5.03	0.53
Smoking status (base category: never smoked)						
All else	–0.07	–0.33 to 0.19	0.60	2.77	–3.73 to 9.27	0.40
Breastfeeding experience (= 1 if yes)	–0.10	–0.39 to 0.18	0.48	–8.47	–15.99 to –0.95	0.03
Profession (base category: doctor)						
Health professional routinely dealing with pregnant women	0.19	–0.11 to 0.50	0.22	–3.20	–9.85 to 3.45	0.34
All others	0.18	–0.13 to 0.49	0.25	2.82	–4.04 to 9.68	0.42
Sex (base category: female)						
Male	–0.12	–0.48 to 0.25	0.53	1.18	–6.18 to 8.54	0.75
Missing	–0.91	–2.04 to 0.22	0.12	–17.55	–60.17 to 25.07	0.42
White (= 1 if ethnic origin is white)	0.15	–0.32 to 0.62	0.52	–0.15	–9.93 to 9.62	0.98
Constant	–0.23	–0.84 to 0.38	0.47	29.23	16.13 to 42.32	0.00
R^2				0.0733		
Pseudo R^2	0.0266					
n	497			232		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 103 Results from the two-part model to estimate the acceptability of targeting incentives to low-income women only among those who agreed with providing vouchers to mothers for smoking cessation

	Probit (agree or not)			Probit (women on a low income or all)		
Variable	ββ	95% CI	*p*-value	ββ	95% CI	*p*-value
Age category (years) (base category: ≥ 55 years)						
16–24	–1.32	–2.42 to –0.23	0.02			
25–34	–0.17	–0.57 to 0.24	0.42	–0.36	–0.99 to 0.27	0.27
35–44	0.18	–0.18 to 0.54	0.32	–0.36	–0.91 to 0.19	0.20
45–54	0.11	–0.21 to 0.44	0.49	–0.27	–0.76 to 0.21	0.27
Missing	0.60	–0.44 to 1.64	0.26	–0.27	–1.85 to 1.31	0.74
Country of residence (base category: Scotland)						
England	0.24	–0.12 to 0.60	0.19	–0.51	–1.10 to 0.07	0.09
Smoking status (base category: never smoked)						
All else	–0.07	–0.33 to 0.19	0.60	–0.24	–0.66 to 0.18	0.25
Breastfeeding experience (= 1 if yes)	–0.10	–0.39 to 0.18	0.48	0.17	–0.26 to 0.61	0.43
Profession (base category: doctor)						
Health professional routinely dealing with pregnant women	0.19	–0.11 to 0.50	0.22	–0.17	–0.64 to 0.30	0.48
All others	0.18	–0.13 to 0.49	0.25	0.15	–0.32 to 0.62	0.54
Sex (base category: female)						
Male	–0.12	–0.48 to 0.25	0.53	–0.08	–0.62 to 0.45	0.76
Missing	–0.91	–2.04 to 0.22	0.12	0.04	–1.89 to 1.98	0.97
White (= 1 if ethnic origin is white)	0.15	–0.32 to 0.62	0.52	0.05	–0.70 to 0.81	0.89
Constant	–0.23	–0.84 to 0.38	0.47	–0.15	–1.08 to 0.78	0.76
Pseudo R^2	0.0266			0.0337		
n	497			231		

TABLE 104 Results from the two-part model to estimate the acceptable value for shopping vouchers among those who agreed with providing vouchers for breastfeeding

	Probit (agree or not)			Amount of shopping voucher		
Variable	ββ	95% CI	*p*-value	ββ	95% CI	*p*-value
Age category (years) (base category: ≥ 55 years)						
16–24	–0.56	–1.44 to 0.32	0.21	11.48	–12.98 to 35.95	0.36
25–34	–0.52	–0.93 to –0.11	0.01	0.79	–9.12 to 10.71	0.88
35–44	–0.17	–0.53 to 0.19	0.36	–2.46	–9.17 to 4.25	0.47
45–54	–0.16	–0.49 to 0.17	0.35	–0.88	–7.52 to 5.77	0.79
Missing	0.76	–0.46 to 1.98	0.22	–4.81	–31.00 to 21.38	0.72
Country of residence (base category: Scotland)						
England	0.20	–0.16 to 0.55	0.27	–0.08	–7.69 to 7.53	0.98
Smoking status (base category: never smoked)						
All else	–0.16	–0.42 to 0.11	0.24	2.10	–3.63 to 7.83	0.47
Breastfeeding experience (= 1 if yes)	0.02	–0.27 to 0.30	0.90	–2.98	–10.32 to 4.35	0.42
Profession (base category: doctor)						
Health professional routinely dealing with pregnant women	0.33	0.02 to 0.63	0.03	1.22	–5.56 to 8.01	0.72
All others	0.06	–0.26 to 0.37	0.72	6.17	–0.86 to 13.20	0.09
Sex (base category: female)						
Male	0.25	–0.12 to 0.63	0.18	–2.57	–11.95 to 6.81	0.59
Missing	–0.67	–2.17 to 0.84	0.38	–14.53	–36.86 to 7.79	0.20
White (= 1 if ethnic origin is white)	–0.20	–0.68 to 0.29	0.43	–3.35	–15.96 to 9.26	0.60
Constant	–0.15	–0.77 to 0.47	0.64	30.96	16.07 to 45.85	0.00
R^2				0.0576		
Pseudo R^2	0.0391					
n	497			221		

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 105 Results from the two-part model to estimate the acceptability of targeting to low-income women only among those who agreed with providing vouchers for breastfeeding

	Probit (agree or not)			Probit (women on a low income or all)		
Variable	ββ	95% CI	*p*-value	ββ	95% CI	*p*-value
Age category (years) (base category: ≥ 55 years)						
16–24	–0.56	–1.44 to 0.32	0.21			
25–34	–0.52	–0.93 to –0.11	0.01	–1.21	–2.08 to –0.35	0.01
35–44	–0.17	–0.53 to 0.19	0.36	–0.48	–1.05 to 0.09	0.10
45–54	–0.16	–0.49 to 0.17	0.35	–0.29	–0.76 to 0.19	0.24
Missing	0.76	–0.46 to 1.98	0.22	–0.30	–1.52 to 0.92	0.63
Country of residence (base category: Scotland)						
England	0.20	–0.16 to 0.55	0.27	–0.84	–1.46 to –0.22	0.01
Smoking status (base category: never smoked)						
All else	–0.16	–0.42 to 0.11	0.24	–0.40	–0.86 to 0.07	0.09
Breastfeeding experience (= 1 if yes)	0.02	–0.27 to 0.30	0.90	–0.17	–0.66 to 0.31	0.49
Profession (base category: doctor)						
Health professional routinely dealing with pregnant women	0.33	0.02 to 0.63	0.03	–0.20	–0.73 to 0.33	0.46
All others	0.06	–0.26 to 0.37	0.72	–0.08	–0.64 to 0.47	0.77
Sex (base category: female)						
Male	0.25	–0.12 to 0.63	0.18	0.23	–0.46 to 0.91	0.52
Missing	–0.67	–2.17 to 0.84	0.38	0.16	–1.33 to 1.65	0.83
White (= 1 if ethnic origin is white)	–0.20	–0.68 to 0.29	0.43	–0.47	–1.16 to 0.22	0.18
Constant	–0.15	–0.77 to 0.47	0.64	0.52	–0.42 to 1.46	0.28
Pseudo R^2	0.0391			0.0576		
n	497			221		

Appendix 32 Framing effects in the Ipsos MORI survey

Variable	Topic covered first	SD	D	N	A	SA
Pregnant women SC – vouchers	Smoking	154 (26.3)	94 (16.0)	103 (17.6)	131 (22.4)	104 (17.7)
	Breastfeeding	141 (25.3)	95 (17.0)	94 (16.8)	138 (24.7)	90 (16.1)
	OR (95% CI), *p*-value	1.00 (0.82 to 1.23), 0.98				
Women after birth SC – vouchers	Smoking	167 (28.5)	113 (19.3)	98 (16.7)	135 (23.0)	73 (12.5)
	Breastfeeding	152 (27.2)	99 (17.7)	98 (17.6)	147 (26.3)	62 (11.1)
	OR (95% CI), *p*-value	1.06 (0.86 to 1.31), 0.57				
Smoke-free home after birth – vouchers	Smoking	162 (27.6)	113 (19.3)	113 (19.3)	121 (20.6)	77 (13.1)
	Breastfeeding	149 (26.7)	102 (18.3)	111 (19.9)	126 (22.6)	70 (12.5)
	OR (95% CI), *p*-value	1.05 (0.85 to 1.29), 0.65				
Health service payment for meeting SC targets	Smoking	127 (21.7)	95 (16.2)	130 (22.2)	155 (26.5)	79 (13.5)
	Breastfeeding	107 (19.2)	97 (17.4)	137 (24.6)	151 (27.1)	66 (11.8)
	OR (95% CI), *p*-value	1.01 (0.82 to 1.24), 0.93				
BF women after birth – vouchers	Smoking	152 (25.9)	134 (22.9)	138 (23.5)	99 (16.9)	63 (10.8)
	Breastfeeding	84 (15.1)	77 (13.8)	168 (30.1)	136 (24.4)	93 (16.7)
	OR (95% CI), *p*-value	2.00 (1.61 to 2.46), < 0.001				
Health service payment for meeting BF targets	Smoking	145 (24.7)	113 (19.3)	134 (22.9)	125 (21.3)	69 (11.8)
	Breastfeeding	91 (16.3)	92 (16.5)	153 (27.4)	153 (27.4)	69 (12.4)
	OR (95% CI), *p*-value	1.44 (1.17 to 1.77), 0.001				
Breast pumps	Smoking	105 (17.9)	76 (13.0)	150 (25.6)	157 (26.8)	98 (16.7)
	Breastfeeding	60 (10.8)	71 (12.7)	158 (28.3)	159 (28.5)	110 (19.7)
	OR (95% CI), *p*-value	1.32 (1.08 to 1.62), 0.008				

A, agree; BF, breastfeeding; D, disagree; N, neither agree not disagree; SA, strongly agree; SC, smoking cessation; SD, strongly disagree.
Cells are number (row percentages).

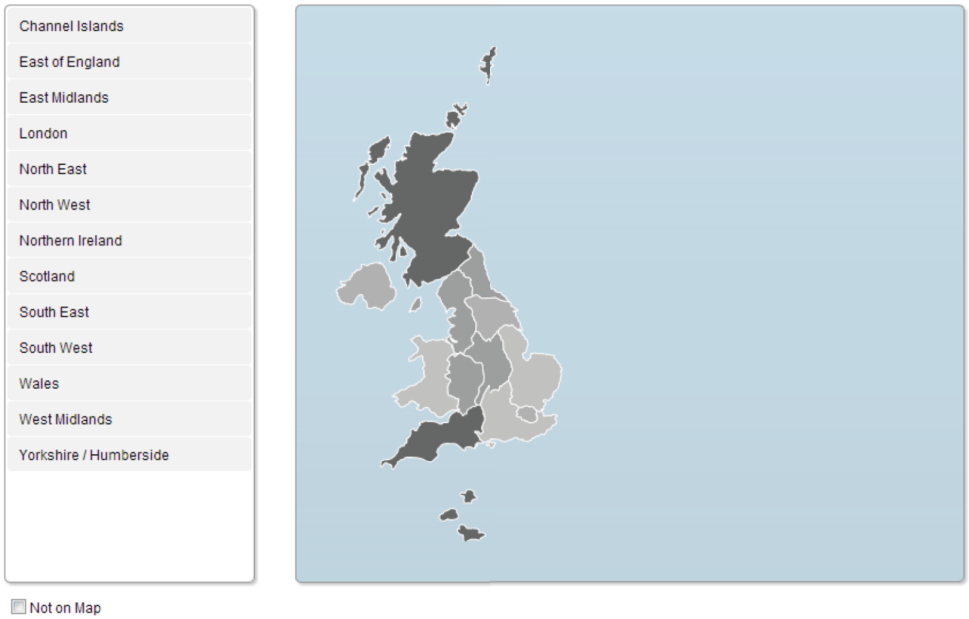
Note
An OR > 1 indicates that respondents asked about breastfeeding incentives first were more likely to agree than respondents asked about smoking cessation incentives first.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 33 Discrete choice experiment questionnaire



Which area on this map best reflects where you live?



© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Which of the following statements best describes you?

- ○ Yes, I am a smoker
- ○ Yes, I am a smoker who wants to quit or reduce smoking
- ○ I have recently quit smoking by using nicotine patches and/or gum
- ○ I have recently quit smoking by other means
- ○ I was a regular smoker but gave up a long time ago
- ○ I was an irregular smoker but do not smoke now
- ○ I have never smoked

How many cigarettes did you used to smoke a day?

[ ]

We would like to know your views on the type of services you think would be most likely to help women to stop smoking during pregnancy and during the first couple of months after their baby is born.

Why stop smoking?
Pregnant women are advised to stop smoking for their own health and for the health of their baby. This is important during pregnancy and once their baby has been born. Smoking can harm the baby in many ways.

Smoking during pregnancy can
- slow down the baby's growth in the womb and increase the chance of low birth weight
- increase the risk of premature birth
- increase the risk of still birth
- increase the risk of sudden infant death or cot death
- increase the risk of caesarean section

Smoking around a baby can
- increase the risk of chest infections, ear infections, chronic bronchitis
- increase the risk of asthma
- increase the risk of sudden infant death or cot death.

Imagine that you find out you are pregnant and you are smoking around 10 cigarettes a day. You are offered an appointment with an expert on quitting smoking to help you stop. At your first meeting you talk about the different ways to stop smoking and you are given leaflets with information about the importance of stopping for the health of you and your baby.

Would you want to

- ○ Stop smoking completely
- ○ Limit your smoking to a couple of cigarettes a week
- ○ Limit your smoking to a couple of cigarettes a day
- ○ Keep smoking the same as before you were pregnant?
- ○ Other (please specify) [ ]

How easy or difficult do you think you would find it stopping smoking if you were pregnant?

- ○ Very difficult
- ○ Quite difficult
- ○ Quite easy
- ○ Very easy
- ○ Don't know
- ○ I wouldn't try

What do you think would be the most likely result if you tried to stop smoking while pregnant?

- ○ Stop smoking completely
- ○ Limit your smoking to a couple of cigarettes a week
- ○ Limit your smoking to a couple of cigarettes a day
- ○ Keep smoking the same as before you were pregnant
- ○ Smoke more
- ○ Other (please specify) [ ]

Imagine you are offered a service to help you quit smoking when you find out you are pregnant.

Everyone is offered a meeting with a smoking quitting expert to get help to quit and to set a quitting date.

After that first meeting the service you are offered may vary. There are four key parts of the service that may vary.

We are interested in how these parts affect whether you would quit smoking during pregnancy and stay quit in the early months of your baby's life.

On this page we describe these four parts and on the next page we ask how important you think these would be to you in helping you quit and stay quit in the early months of your baby's life.

Click 'next' to read the description

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Read this page and then go to the next page to say how important you think they are

Description of the service

1. During your pregnancy and until your baby is two months old you will have regular meetings to get face to face help from your quitting expert, to have your smoking status checked and to receive a voucher for staying quit. You will be asked to give a small sample of your saliva to confirm that you have stopped smoking. Before your baby is born, these will be in a local clinic and after your baby is born, if you would like, they can be at your home.

The meetings will be:

- **Once a week; or**
- **Once every two weeks.**

2. During the first week after deciding to quit you will receive support to help you stop smoking.

This will be in the form of:

- **A visit to the clinic every day to meet with your quitting expert; or**
- **A phone call every day from your quitting expert; or**
- **A text every day from your quitting expert.**

3. You will receive a voucher after each meeting if the saliva test shows you have not smoked.

If you have stayed quit these will add up to a value each month of

- **No vouchers; or**
- **£20; or**
- **£40; or**
- **£80.**

4. Some women find it helpful when they are trying to stop smoking if someone close to them helps them to quit. The service you are offered may allow you to chose a 'quitting pal' who is a friend or relative.

You may be offered:

- **No 'quitting pal'; or**
- **A 'quitting pal' who receives information on how to help you when you first see your quitting expert; or**
- **A 'quitting pal' who receives help and information when you first see your quitting expert and a text after each saliva test to let them know your result; or**
- **A 'quitting pal' who receives information on how to help you when you first see your quitting expert, a text after each saliva test to let them know your result and a £20 voucher every month you stay quit.**

Please click "Next" to continue...

How important do you think the following would be in helping you to quit smoking during your pregnancy and the first couple of months after your baby is born?

Tick one box for each row.

	Very important	Important	Quite important	Not very important	Not at all important	Don't know
Having a friend or relative helping me to stop who receives information on my smoking test and a voucher if I stop	○	○	○	○	○	○
Receiving early help in the form of daily texts	○	○	○	○	○	○
Face to face meeting with quitting expert to get help to stop smoking and agree quitting date	○	○	○	○	○	○
Receiving early help in the form of daily meetings	○	○	○	○	○	○
Receiving rewards if my test for smoking confirms that I have stopped	○	○	○	○	○	○
Being tested to prove I have stopped smoking	○	○	○	○	○	○
Having a friend or relative helping me to stop	○	○	○	○	○	○
Having a friend or relative helping me to stop who receives information on my smoking test results	○	○	○	○	○	○
Receiving face to face support every two weeks	○	○	○	○	○	○
The amount of the reward for stopping smoking	○	○	○	○	○	○
Receiving face to face support every week	○	○	○	○	○	○
Receiving early help in the form of daily phone calls	○	○	○	○	○	○

We are now going to give you some choices about what type of service would help you to quit smoking. Please complete them all. We understand that some of the choices might be difficult to make. There are no right or wrong answers. Your personal opinion is what matters. There are 10 choices for you to make.
Please think about these different ways of helping you to stop smoking

Which service would be most likely to help you stop smoking?

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once a week	Once every two weeks	None
Method of support	A phone call every day from your quitting expert	A text every day from your quitting expert	None
Incentives	No vouchers	£20	None
Quitting Pal	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert, a text after each test to let them know your result and a £20 voucher every month you stay quit	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once every two weeks	Once a week	None
Method of support	A visit to the clinic every day to meet with your quitting expert	A phone call every day from your quitting expert	None
Incentives	No vouchers	£80	None
Quitting Pal	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert	Your 'quitting pal' will receive help and information when you first see your quitting expert and a text after each test to let them know your result	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once a week	Once every two weeks	None
Method of support	A phone call every day from your quitting expert	A text every day from your quitting expert	None
Incentives	£20	£80	None
Quitting Pal	No 'quitting pal'	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert, a text after each test to let them know your result and a £20 voucher every month you stay quit	None
Please select your answer here:	○	○	○

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once every two weeks	Once a week	None
Method of support	A text every day from your quitting expert	A phone call every day from your quitting expert	None
Incentives	No vouchers	£40	None
Quitting Pal	Your 'quitting pal' will receive help and information when you first see your quitting expert and a text after each test to let them know your result	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once a week	Once every two weeks	None
Method of support	A visit to the clinic every day to meet with your quitting expert	A phone call every day from your quitting expert	None
Incentives	£40	£20	None
Quitting Pal	No 'quitting pal'	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert, a text after each test to let them know your result and a £20 voucher every month you stay quit	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once every two weeks	Once a week	None
Method of support	A visit to the clinic every day to meet with your quitting expert	A text every day from your quitting expert	None
Incentives	£40	No vouchers	None
Quitting Pal	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert, a text after each test to let them know your result and a £20 voucher every month you stay quit	No 'quitting pal'	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once a week	Once every two weeks	None
Method of support	A text every day from your quitting expert	A visit to the clinic every day to meet with your quitting expert	None
Incentives	£80	£20	None
Quitting Pal	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert	Your 'quitting pal' will receive help and information when you first see your quitting expert and a text after each test to let them know your result	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once a week	Once every two weeks	None
Method of support	A phone call every day from your quitting expert	A visit to the clinic every day to meet with your quitting expert	None
Incentives	£20	No vouchers	None
Quitting Pal	No 'quitting pal'	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once a week	Once every two weeks	None
Method of support	A phone call every day from your quitting expert	A visit to the clinic every day to meet with your quitting expert	None
Incentives	No vouchers	£20	None
Quitting Pal	Your 'quitting pal' will receive information on how to help you when you first see your quitting expert, a text after each test to let them know your result and a £20 voucher every month you stay quit	Your 'quitting pal' will receive help and information when you first see your quitting expert and a text after each test to let them know your result	None
Please select your answer here:	○	○	○

Please click here to review the description of the service again

Description	Option A	Option B	Option C
First meeting with expert advisor to get help to stop smoking and agree your quitting date	Yes	Yes	Yes
Visits	Once every two weeks	Once a week	None
Method of support	A text every day from your quitting expert	A phone call every day from your quitting expert	None
Incentives	£40	£80	None
Quitting Pal	No 'quitting pal'	Your 'quitting pal' will receive help and information when you first see your quitting expert and a text after each test to let them know your result	None
Please select your answer here:	○	○	○

Can you please tell us a little bit about yourself? Your answers will be treated as confidential. We will use the information to compare responses by groups of people not individuals.

Please click "Next" to continue...

Do you have any children?

- ○ Yes
- ○ No

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Did you try to stop smoking during your most recent pregnancy?

- ○ No, I wasn't smoking then
- ○ Yes and I have stayed quit
- ○ Yes and started again before my baby was born
- ○ Yes and started again after my baby was born
- ○ Other (please specify) ____

How old is your youngest child?

____

How many children (under 16 years of age) are there in your household?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4 or more

What is the highest level of education you have completed?

Tick one.

- ○ No formal qualifications
- ○ GCSE, O-Level, CSE, O Grade, Standard Grade
- ○ Vocational qualifications (e.g. NVQ1 o r2, SVQ 1 or 2, SCOTVEC module)
- ○ A-Level, higher, advanced higher or equivalent (NVQ3, SVQ3, ONC, OND, SCOTVEC Dip)
- ○ Bachelor Degree or equivalent (HNC, HND, SVQ 4 or 5, NVQ4)
- ○ Masters/PhD or equivalent
- ○ Don't Know
- ○ Other (please specify) ____

Please select the category that best describes your current employment status

- ○ Working full-time (30 hrs or more per week)
- ○ Working part-time (less than 30 hrs per week)
- ○ At home and not looking for paid work
- ○ Unable to work because of illness or disability
- ○ Student
- ○ Unemployed and looking for work
- ○ Retired
- ○ Other (please specify) ____

Could you please provide an estimate of your annual household income (before tax and including your partner/spouse)?

- ○ Up to £9,999
- ○ £10,000 to £19,999
- ○ £20,000 to £29,999
- ○ £30,000 to £39,999
- ○ £40,000 to £49,999
- ○ £50,000 or over
- ○ Would rather not say

Thank you for completing this questionnaire and helping us to design better services for pregnant women who want to stop smoking

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 34 Discrete choice experiment technical appendix

Discrete choice experiment regression equation:

$$\begin{aligned} V &= f(\text{First meeting, Frequency of meeting, Method of support, Incentive, Quit pal}) \\ &= \beta + \beta_0 + \beta_1 \text{Onceaweek} + \beta_2 \text{Telephone call} + \beta_3 \text{Text} + \beta_4 \text{Incentive} + \beta_5 \text{Quit Pal_info} \\ &\quad + \beta_6 \text{Quit Pal_help} + \beta_7 \text{Quit Pal_voucher} + \varepsilon \end{aligned} \quad (1)$$

Effects coding

The estimated coefficient, β_i, on effects-coded variables is interpreted as the change in *V* from the overall mean for the given variable level. As the mean for effects-coded variables is zero, the estimated coefficient for each level of the variable measures the difference in *V* for those who choose that level. β values and SEs for the base category can be retrieved using the formula based on the coding (*Equations 2* and *3*).

$$\beta_{Visit\ to\ clinic} = -(\beta_{Phone\ call} + \beta_{Text}) \quad (2)$$

$$se_{Visit\ to\ clinic} = \frac{(se_{Phone\ call} + se_{Text})}{2} \quad (3)$$

Using the conditional logit model results from estimating *Equation 1*, the perceived likelihood of quitting for a given smoking cessation service, *V*, is defined as the sum of the coefficients relevant to the configuration of the selected service. In other words:

$$V = \sum_{i=0}^{n} x_1 \beta_1 \quad (4)$$

as in *Equation 1*.

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Appendix 35 Discrete choice experiment results tables for subgroup analysis

TABLE 106 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by smoking status subgroup

Variable	Regression output (β estimate, SE and 95% CI)	Smoker	Ex-smoker
Constant (= 1 if option A or B)	β	1.500	1.127
	SE	0.098	0.083
	95% CI	1.309 to 1.691	0.964 to 1.290
Frequency of meeting			
Once a week	β	–0.056	0.123
	SE	0.033	0.033
	95% CI	–0.121 to 0.009	0.059 to 0.187
Once every 2 weeks	β	0.056	–0.123
	SE	0.033	0.033
	95% CI	–0.009 to 0.121	–0.187 to –0.059
Method of support in the first week			
Daily visit to the clinic	β	–0.347	–0.392
	SE	0.053	0.052
	95% CI	–0.452 to –0.243	–0.493 to –0.291
Daily telephone call	β	0.216	0.174
	SE	0.053	0.052
	95% CI	0.112 to 0.320	0.073 to 0.275
Daily text message	β	0.131	0.218
	SE	0.054	0.052
	95% CI	0.026 to 0.236	0.117 to 0.319
Monthly financial incentive			
£0.00	β	–0.902	–0.477
	SE	0.067	0.066
	95% CI	–1.034 to –0.770	–0.606 to –0.348
£20.00	β	–0.125	–0.139
	SE	0.067	0.064
	95% CI	–0.255 to 0.006	–0.265 to –0.013

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 106 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by smoking status subgroup (*continued*)

Variable	Regression output (β estimate, SE and 95% CI)	Smoker	Ex-smoker
£40.00	β	0.238	0.221
	SE	0.065	0.065
	95% CI	0.110 to 0.367	0.093 to 0.349
£80.00	β	0.788	0.394
	SE	0.070	0.068
	95% CI	0.651 to 0.925	0.261 to 0.528
Quitting pal			
No pal	β	–0.223	–0.438
	SE	0.069	0.066
	95% CI	–0.359 to –0.087	–0.568 to –0.309
Pal with information[a]	β	–0.022	0.111
	SE	0.071	0.068
	95% CI	–0.161 to 0.118	–0.021 to 0.245
Pal with support and text[b]	β	0.153	0.263
	SE	0.068	0.066
	95% CI	0.019 to 0.287	0.133 to 0.392
Pal with voucher[c]	β	0.092	0.064
	SE	0.069	0.064
	95% CI	–0.042 to 0.226	–0.062 to 0.190
Log likelihood		–1050.3683	–1173.7013
Pseudo R^2		0.2531	0.1654
Log likelihood ratio test		$\chi^2 = 63.42$ (df = 12, $p < 0.0001$)	
n (observations)		3840	3840
n (respondents)		160	160

df, degrees of freedom.
a Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser.
b Quitting pal will receive support and information at the first meeting with a quitting expert adviser and a text after each test about the result.
c Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser, a text after each test about the result and a £20.00 voucher every month that a woman stays quit.

TABLE 107 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by age group

Variable	Regression output (β estimate, SE and 95% CI)	16–20 years	21–25 years	26–30 years	31–35 years	36–40 years
Constant (= 1 if option A or B)	*β*	1.647	1.564	1.675	1.160	1.140
	SE	0.304	0.212	0.164	0.106	0.105
	95% CI	1.052 to 2.242	1.149 to 1.980	1.354 to 1.996	0.953 to 1.368	0.933 to 1.346
Frequency of meeting						
Once a week	*β*	0.076	–0.019	0.048	0.005	0.052
	SE	0.096	0.070	0.053	0.040	0.041
	95% CI	–0.113 to 0.265	–0.157 to 0.118	–0.056 to 0.153	–0.074 to 0.084	–0.029 to 0.134
Once every 2 weeks	*β*	–0.076	0.019	–0.048	–0.005	–0.052
	SE	0.096	0.070	0.053	0.040	0.041
	95% CI	–0.265 to 0.113	–0.118 to 0.157	–0.153 to 0.056	–0.084 to 0.074	–0.134 to 0.029
Method of support in the first week						
Daily visit to the clinic	*β*	–0.200	–0.517	0.140	–0.389	–0.335
	SE	0.155	0.113	0.084	0.065	0.066
	95% CI	–0.504 to 0.104	–0.739 to –0.295	–0.025 to 0.304	–0.516 to –0.262	–0.464 to –0.206
Daily telephone call	*β*	–0.009	0.270	0.196	0.202	0.231
	SE	0.156	0.112	0.087	0.065	0.066
	95% CI	–0.314 to 0.297	0.051 to 0.489	0.025 to 0.368	0.075 to 0.328	0.101 to 0.362
Daily text message	*β*	0.209	0.247	0.194	0.187	0.104
	SE	0.154	0.114	0.088	0.065	0.065
	95% CI	–0.094 to 0.511	0.023 to 0.471	0.022 to 0.365	0.060 to 0.315	–0.024 to 0.232
Monthly financial incentive						
£0.00	*β*	–0.570	–0.756	–0.973	–0.523	–0.683
	SE	0.194	0.144	0.108	0.082	0.083
	95% CI	–0.950 to –0.190	–1.038 to –0.474	–1.185 to –0.761	–0.685 to –0.362	–0.846 to –0.521
£20.00	*β*	–0.083	–0.110	–0.109	–0.099	–0.170
	SE	0.196	0.141	0.102	0.082	0.083
	95% CI	–0.467 to 0.302	–0.386 to 0.166	–0.310 to 0.092	–0.260 to 0.061	–0.334 to –0.007
£40.00	*β*	0.238	0.231	0.233	0.115	0.284
	SE	0.190	0.140	0.105	0.081	0.082
	95% CI	–0.135 to 0.612	–0.043 to 0.506	0.027 to 0.438	–0.044 to 0.274	0.123 to 0.444

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 107 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by age group (*continued*)

Variable	Regression output (β estimate, SE and 95% CI)	16–20 years	21–25 years	26–30 years	31–35 years	36–40 years
£80.00	β	0.414	0.635	0.849	0.507	0.570
	SE	0.195	0.151	0.117	0.084	0.084
	95% CI	0.031 to 0.797	0.339 to 0.930	0.619 to 1.078	0.342 to 0.673	0.406 to 0.734
Quitting pal						
No pal	β	–0.436	–0.257	–0.368	–0.308	–0.294
	SE	0.197	0.147	0.112	0.083	0.085
	95% CI	–0.822 to –0.051	–0.545 to 0.032	–0.587 to –0.149	–0.471 to –0.145	–0.461 to –0.128
Pal with information[a]	β	0.177	–0.001	0.194	–0.012	0.023
	SE	0.194	0.155	0.116	0.086	0.086
	95% CI	–0.204 to 0.558	–0.305 to 0.302	–0.033 to 0.422	–0.180 to 0.157	–0.145 to 0.191
Pal with support and text[b]	β	0.105	0.122	0.154	0.165	0.287
	SE	0.202	0.144	0.111	0.081	0.085
	95% CI	–0.292 to 0.502	–0.160 to 0.403	–0.064 to 0.372	0.006 to 0.325	0.120 to 0.455
Pal with voucher[c]	β	0.154	0.136	0.020	0.154	–0.016
	SE	0.194	0.142	0.108	0.082	0.083
	95% CI	–0.225 to 0.534	–0.143 to 0.415	–0.192 to 0.232	–0.007 to 0.315	–0.179 to 0.148
Log likelihood		–122.140	–231.194	–403.388	–743.712	–733.288
Pseudo R^2		0.2279	0.2484	0.2829	0.1622	0.1820
Log likelihood ratio test		$\chi^2 = 44.11$ (df = 42, $p = 0.3824$)				
n (observations)		432	840	1536	2424	2448
n (respondents)		18	35	64	101	102

df, degrees of freedom.

a Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser.

b Quitting pal will receive support and information at the first meeting with a quitting expert adviser and a text after each test about the result.

c Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser, a text after each test about the result and a £20.00 voucher every month that a woman stays quit.

TABLE 108 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by perceived ease or difficulty of smoking cessation when pregnant

Variable	Regression output (β estimate, SE and 95% CI)	Very difficult	Quite difficult	Quite easy	Very easy	Don't know
Constant (= 1 if option A or B)	*β*	1.947	1.415	1.548	0.595	1.982
	SE	0.194	0.124	0.142	0.104	0.330
	95% CI	1.567 to 2.327	1.172 to 1.659	1.270 to 1.826	0.392 to 1.367	1.335 to 2.630
Frequency of meeting						
Once a week	*β*	–0.106	0.030	0.117	0.075	0.062
	SE	0.055	0.043	0.047	0.050	0.094
	95% CI	–0.214 to 0.001	–0.055 to 0.116	0.024 to 0.210	–0.022 to 0.172	–0.122 to 0.245
Once every 2 weeks	*β*	0.106	–0.030	–0.117	–0.075	–0.062
	SE	0.055	0.043	0.047	0.050	0.094
	95% CI	–0.001 to 0.214	–0.116 to 0.055	–0.210 to –0.024	–0.173 to 0.022	–0.245 to 0.122
Method of support in the first week						
Daily visit to the clinic	*β*	–0.182	–0.412	–0.391	–0.349	–0.649
	SE	0.089	0.070	0.076	0.077	0.150
	95% CI	–0.356 to –0.008	–0.549 to –0.275	–0.539 to –0.243	–0.500 to –0.197	–0.943 to –0.355
Daily telephone call	*β*	0.188	0.211	0.136	0.179	0.292
	SE	0.088	0.070	0.074	0.078	0.150
	95% CI	0.015 to 0.361	0.074 to 0.349	–0.009 to 0.282	0.027 to 0.332	–0.003 to 0.587
Daily text message	*β*	–0.006	0.201	0.254	0.169	0.357
	SE	0.089	0.070	0.077	0.077	0.150
	95% CI	–0.181 to 0.169	0.064 to 0.338	0.103 to 0.405	0.018 to 0.320	0.064 to 0.650
Monthly financial incentive						
£0.00	*β*	–0.968	–0.675	–0.583	–0.549	–0.785
	SE	0.112	0.089	0.096	0.098	0.193
	95% CI	–1.189 to –0.747	–0.849 to –0.501	–0.772 to –0.394	–0.742 to –0.357	–1.165 to –0.405
£20.00	*β*	–0.084	–0.210	–0.108	–0.139	–0.053
	SE	0.109	0.089	0.092	0.099	0.188
	95% CI	–0.297 to 0.129	–0.384 to –0.035	–0.288 to 0.072	–0.333 to 0.055	–0.422 to 0.315
£40.00	*β*	0.132	0.338	0.206	0.207	0.126
	SE	0.110	0.086	0.095	0.097	0.186
	95% CI	–0.084 to 0.348	0.169 to 0.508	0.020 to 0.392	0.017 to 0.397	–0.239 to 0.490

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 108 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by perceived ease or difficulty of smoking cessation when pregnant (*continued*)

Variable	Regression output (β estimate, SE and 95% CI)	Very difficult	Quite difficult	Quite easy	Very easy	Don't know
£80.00	*β*	0.920	0.546	0.485	0.481	0.713
	SE	0.119	0.090	0.102	0.098	0.207
	95% CI	0.687 to 1.154	0.369 to 0.724	0.285 to 0.685	0.289 to 0.673	0.307 to 1.118
Quitting pal						
No pal	*β*	–0.293	–0.276	–0.486	–0.228	–0.381
	SE	0.116	0.090	0.097	0.100	0.198
	95% CI	–0.520 to –0.066	–0.452 to –0.100	–0.676 to –0.295	–0.424 to –0.032	–0.770 to 0.008
Pal with information[a]	*β*	–0.066	0.072	–0.033	0.165	0.203
	SE	0.116	0.092	0.101	0.100	0.208
	95% CI	–0.294 to 0.162	–0.108 to 0.253	–0.232 to 0.165	–0.032 to 0.362	–0.205 to 0.611
Pal with support and text[b]	*β*	0.290	0.178	0.278	0.124	0.055
	SE	0.114	0.089	0.097	0.101	0.200
	95% CI	0.067 to 0.513	0.003 to 0.352	0.089 to 0.468	–0.074 to 0.322	–0.338 to 0.448
Pal with voucher[c]	*β*	0.069	0.026	0.241	–0.061	0.123
	SE	0.117	0.088	0.094	0.099	0.186
	95% CI	–0.161 to 0.299	–0.147 to 0.199	0.058 to 0.424	–0.255 to 0.132	–0.243 to 0.488
Log likelihood		–352.769	–622.902	–514.764	–579.665	–122.961
Pseudo R^2		0.3197	0.2212	0.2293	0.0965	0.3338
Log likelihood ratio test		$\chi^2 = 125.44$ (df = 42, $p < 0.0001$)				
n (observations)		1416	2184	1824	1752	504
n (respondents)		59	91	76	73	21

df, degrees of freedom.

a Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser.

b Quitting pal will receive support and information at the first meeting with a quitting expert adviser and a text after each test about the result.

c Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser, a text after each test about the result and a £20.00 voucher every month that a woman stays quit.

TABLE 109 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by educational attainment

Variable	Regression output (β estimate, SE and 95% CI)	GCSE	A-level	University
Constant (= 1 if option A or B)	β	0.776	1.489	1.494
	SE	0.126	0.110	0.106
	95% CI	0.529 to 1.024	1.274 to 1.704	1.286 to 1.701
Frequency of meeting				
Once a week	β	0.004	0.016	0.075
	SE	0.056	0.037	0.036
	95% CI	–0.107 to 0.114	–0.057 to 0.089	0.005 to 0.145
Once every 2 weeks	β	–0.004	–0.016	–0.075
	SE	0.056	0.037	0.036
	95% CI	–0.114 to 0.107	–0.089 to 0.057	–0.145 to –0.005
Method of support in the first week				
Daily visit to the clinic	β	–0.197	–0.409	–0.392
	SE	0.089	0.060	0.058
	95% CI	–0.371 to –0.024	–0.527 to –0.291	–0.505 to –0.279
Daily telephone call	β	0.137	0.153	0.224
	SE	0.089	0.060	0.057
	95% CI	–0.038 to 0.312	0.036 to 0.270	0.112 to 0.336
Daily text message	β	0.060	0.256	0.168
	SE	0.088	0.061	0.058
	95% CI	–0.113 to 0.233	0.137 to 0.375	0.054 to 0.282
Monthly financial incentive				
£0.00	β	–0.528	–0.724	–0.673
	SE	0.112	0.076	0.073
	95% CI	–0.747 to –0.309	–0.874 to –0.575	–0.816 to –0.529
£20.00	β	–0.079	–0.164	–0.149
	SE	0.114	0.075	0.071
	95% CI	–0.301 to 0.144	–0.311 to –0.018	–0.288 to –0.009
£40.00	β	0.133	0.265	0.188
	SE	0.111	0.074	0.072
	95% CI	–0.085 to 0.351	0.120 to 0.411	0.048 to 0.329
£80.00	β	0.473	0.624	0.633
	SE	0.110	0.079	0.077
	95% CI	0.257 to 0.689	0.468 to 0.779	0.482 to 0.783

continued

© Queen's Printer and Controller of HMSO 2015. This work was produced by Morgan *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

TABLE 109 Conditional logit estimation of the perceived likelihood of the ISCS helping women to quit smoking by educational attainment (*continued*)

Variable	Regression output (β estimate, SE and 95% CI)	GCSE	A-level	University
Quitting pal				
No pal	β	–0.222	–0.311	–0.403
	SE	0.113	0.078	0.074
	95% CI	–0.444 to 0.001	–0.463 to –0.159	–0.548 to –0.257
Pal with information[a]	β	0.065	0.069	0.055
	SE	0.113	0.080	0.077
	95% CI	–0.156 to 0.285	–0.088 to 0.226	–0.095 to 0.205
Pal with support and text[b]	β	0.172	0.212	0.176
	SE	0.114	0.077	0.074
	95% CI	–0.053 to 0.396	0.061 to 0.362	0.031 to 0.321
Pal with voucher[c]	β	–0.015	0.030	0.172
	SE	0.113	0.076	0.072
	95% CI	–0.237 to 0.208	–0.119 to 0.180	0.031 to 0.313
Log likelihood		–428.085	–823.764	–890.672
Pseudo R^2		0.0980	0.2317	0.2323
Log likelihood ratio test		$\chi^2 = 38.74$ (df = 20, $p = 0.0072$)		
n (observations)		1296	2928	3168
n (respondents)		54	122	132

df, degrees of freedom.
a Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser.
b Quitting pal will receive support and information at the first meeting with a quitting expert adviser and a text after each test about the result.
c Quitting pal will receive information on how to support at the first meeting with a quitting expert adviser, a text after each test about the result and a £20.00 voucher every month that a woman stays quit.

EME
HS&DR
HTA
PGfAR
PHR

Part of the NIHR Journals Library
www.journalslibrary.nihr.ac.uk

This report presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health

Published by the NIHR Journals Library