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Building Heath Research Capacity: The Impact of a United Kingdom Collaborative Programme

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Building Health Research Capacity: The Impact of a United Kingdom Collaborative Programme

Abstract

Purpose: Strengthening research capacity (RC) amongst health professionals has both organisational and individual benefits. It can increase the quality of research and support the transfer of evidence into practice and policy. However there is little evidence on what works to develop and strengthen RC. This paper contributes to the evidence base by reporting findings from an evaluation of a programme that aimed to build capacity to use and do research amongst NHS and local authority organisations and their staff in a large English research partnership organisation. **Methods:** The evaluation used multiple qualitative methods including semi-structured interviews, focus groups and workshops (n=131 respondents including public advisers, university, NHS, and local government partners). **Results:** The RC building programme provided a range of development opportunities for NHS and local authority staff resulting in increased confidence and skills to undertake, participate in, and use research. Additionally, positive influences on organisational practice and collaborative working were reported. Conversely, challenges to developing research capacity were also identified as were the importance of resources, senior level buy-in, and the relevance of research topic to practice in facilitating participation in the programme. **Conclusion:** Collaboration for Leadership in Applied Health Research and Care North West Coast's (CLAHRC-NWC) RC building programme differed from conventional approaches giving less emphasis to formal teaching and more to experiential learning and focusing on both individual capacities and supporting organisations to integrate RC building into staff development programmes. The findings demonstrate that providing opportunities for staff in NHS and local authority organisations to develop research knowledge and skills alongside an infrastructure that supports and encourages their participation in research can have positive impacts on research capacity and organisational research culture. The potential for generalising this approach to other organisational contexts is discussed

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Purpose: Strengthening research capacity (RC) amongst health professionals has both organisational and individual benefits. It can increase the quality of research and support the transfer of evidence into practice and policy. However there is little evidence on what works to develop and strengthen RC. This paper contributes to the evidence base by reporting findings from an evaluation of a programme that aimed to build capacity to use and do research amongst NHS and local authority organisations and their staff in a large english research partnership organisation. **Methods:** The evaluation used multiple qualitative methods including semi-structured interviews, focus groups and workshops (n=131 respondents including public advisers, university, NHS, and local government partners). **Results:** The RC building programme provided a range of development opportunities for NHS and local authority staff resulting in increased confidence and skills to undertake, participate in, and use research. Additionally, positive influences on organisational practice and collaborative working were reported. Conversely, challenges to developing research capacity were also identified as were the importance of resources, senior level buy-in, and the relevance of research topic to practice in facilitating participation in the programme. **Conclusion:** Collaboration for Leadership in Applied Health Research and Care North West Coast's (CLAHRC-NWC) RC building programme differed from conventional approaches giving less emphasis to formal teaching and more to experiential learning and focusing on both individual capacities and supporting organisations to integrate RC building into staff development programmes. The findings demonstrate that providing opportunities for staff in NHS and local authority organisations to develop research knowledge and skills alongside an infrastructure that supports and encourages their participation in research can have positive impacts on research capacity and organisational research culture. The potential for generalising this approach to other organisational contexts is discussed.

Keywords: research capacity, evaluation, research skills, collaboration CLAHRC

INTRODUCTION

Developing research capacity (RC) amongst health and social care professionals can yield many benefits. Having a research literate workforce can contribute to a country's capacity to lead its own development.¹ It can also help to ensure that high quality research is conducted and the findings inform service policy, planning, commissioning, and practice.^{2,3,4} Finally, practice-based research collaborations can increase the relevance of research and its potential use by those involved.⁵

In the UK, a number of policies and strategies have sought to support research capacity building in the health sector including the National Health Service (NHS) research and development policy "Best Research for Best Health" published in 2006 and the formation of the National Institute for Health Research (NIHR) the same year.⁶ The latter funds research, but also has a strong focus on developing increased capacity for the conduct and uptake of research across health and social care and in public health.^{7,8} More recently, the Health Education England Research and Innovation Strategy, published in 2017, aims to "build capacity and capability amongst the current and future healthcare workforce" to achieve active participation in clinical academic research and innovation.⁹ Public Health England has also published a strategy for research translation and innovation, which prioritises developing public health RC.¹⁰ Many other governments and global partnerships invest considerable funds to support research capacity building in healthcare.¹¹ Initiatives can be found in most high-income countries, where enhanced RC is recognised as an important pathway to improved efficiency and effectiveness of services, for example in Canada, Australia, and Florida.^{12,13,14,15} There are also initiatives that focus on improving research capacity in low and middle income countries such as the World Health Organisation "Planning for success" initiative.¹⁶ However, despite the growing interest in and recognition of the importance of developing RC, relatively little is known about what is effective.¹⁷ Kumar indicates that the literature tends to explore and define methods to build research capacity but gives less attention to organisational strategies that facilitate capacity building in research and evaluation of RC initiatives and strategies.^{18,19}

The Collaboration for Leadership in Applied Health Research and Care for the North West Coast (CLAHRC-NWC) was a partnership between 36 organisations including universities, NHS provider and commissioning organisations, local government agencies, third sector organisations, and the regional innovation agency, working alongside members of the public (known in CLAHRC-NWC as Public Advisors). It was funded by the NIHR from January 2014 to September 2019, and funding has continued to support the collaboration (now the Applied Research Collaboration for the NWC). The collaboration covers an area of 2,400 square miles along the North West coast of England stretching 130 miles from north to south (Figure 1).

The CLAHRC-NWC had developed an infrastructure to support partner and public engagement across all of its work. These mechanisms included the Public Advisor forum and incentives for public involvement, as well as appointing dedicated leads in each partner organisation. More specific resources were allocated to support partner involvement in capacity building which are described below.

Increasing capacity to conduct, engage with and apply research was one of the priorities for CLAHRC-NWC. However, its approach differed from that of most RC strategies, which primarily focus on providing access to taught training courses and formal research training opportunities, (e.g. PhD or Postdoctoral fellowships) aimed at health service staff with some experience of research. In contrast, CLAHRC-NWC provided opportunities for staff in partner organisations with varying levels of research experience to learn "by doing" through formal and informal opportunities that ranged from training, participation in research projects and research activities (such as research design, data collection and analysis), to creating support structures within employing organisations.

This paper presents the findings of an internal evaluation of the CLAHRC-NWC's capacity building programme. It considers the impact on the individuals involved and on research practice and culture within partner organisations.

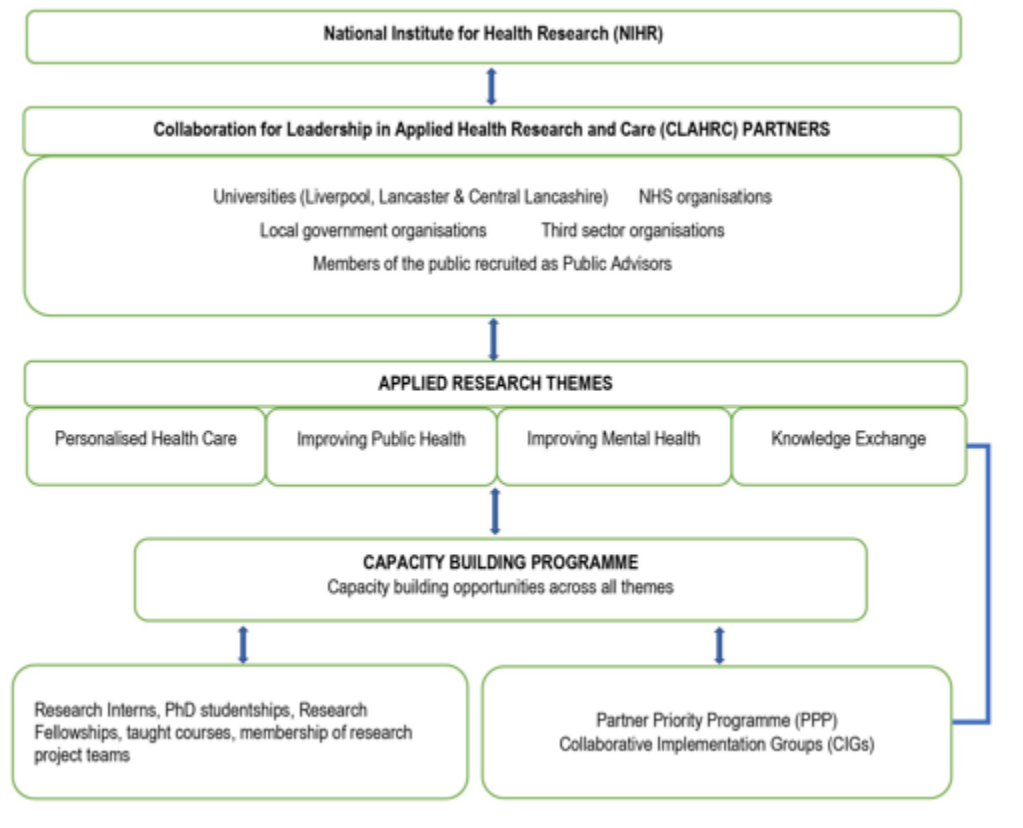


Figure 1. Overview of the structure of the collaborative

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Capacity Building within CLAHRC-NWC

CLAHRC-NWC aimed to contribute to a reduction in health inequalities by ensuring that all activities had a clear equity element and by involving public advisors in all activities. There were five thematic research programmes. Three of these (Managing Complex Needs, Delivering Personalised Health and Care and Improving Mental Health) comprised unrelated projects. The other two involved a single programme of work: the Improving Public Health’ theme’s Neighbourhood Resilience Programme; and the Knowledge Exchange theme’s Partner Priority Programme (PPP).

A capacity building programme, led by a team based at the University of Central Lancashire (UCLan) was established alongside these programmes. It provided opportunities for staff in partner organisations as well as public advisors to

develop skills and knowledge in research, including priority setting, study design, implementation, evaluation and dissemination. Opportunities included membership of research project teams, PhD studentships, research internships, and taught courses. Specific investment to support these activities included financial support (e.g. backfilling of posts, match funding for projects), secondment agreements, and peer support for partners' staff.

Two types of the research internships were provided. General research interns were staff in partner organisations whose time on the RC programme was ring-fenced by their employers. Interns received 8 training days, followed by continued support from CLAHRC-NWC staff to design and conduct a small-scale research or implementation project directly relevant to their work. Internships provided through the PPP, in contrast, provided the opportunity to complete a Masters level module in Implementation Science with the option to gain accreditation through submission of an assignment. Training covered a variety of research methodologies and approaches, research governance, analysis, reporting, dissemination techniques and applying a health equity lens in developing project proposals.

The PPP provided additional intern opportunities. The PPP comprised two waves: the first focused on evaluations of new models of care being developed by CLAHRC-NWC's NHS and Local Authority partners, and the second on the implementation of evidence-based initiatives. Interns were attached to projects, which were clustered into thematic "Collaborative Implementation Groups" (CIG), providing an opportunity for interns to develop their work collaboratively with professionals outside their organisations. Workshops were delivered by CLAHRC-NWC and partner staff along with invited speakers, and covered topics such as literature review, developing logic models, stakeholder analyses, quantitative and qualitative methods and analysis, implementation science, and health inequalities assessments.

Finally, the Capacity Building programme also supported the development of applications for NIHR Fellowships and sponsored eight bursaries for partners' staff to register on a part-time Masters in Clinical Research. Over 20 PhD projects were also funded and supervised by CLAHRC-NWC university partners.

In total, 64 interns from 24 partner organisations were supported directly by the programme (24 doing their own research and 40 linked to PPP projects). Two thirds were clinical/allied health professionals and the remainder included staff from Local Authorities, those in administration roles and Public Advisors.

The Capacity Building programme had an element of training but the opportunities to develop research skills and capacity were much broader. Opportunities spanned the collaboration's six themes and involved more experiential ways of engaging in research which included bringing together different disciplines, sectors, professionals, and members of the public. Therefore, this evaluation explores the impacts on research capacity building across the whole collaboration and RC building activities within all the themes.

METHODOLOGY

A mixed methods evaluation of the CLAHRC-NWC was undertaken in 2017- 2018. This paper reports on the qualitative findings only. The work was undertaken by an internal team of academics and public advisors. In addition, a panel of six public advisors contributed to the study design and the interpretation and dissemination of findings. Although the academics leading and conducting the evaluation had research roles in CLAHRC-NWC, only one was directly involved in delivering the capacity building programme and was not directly involved in the empirical research.

The evaluation involved four components. Each had their own objectives, so the data collection tools varied in the extent to which they prompted participants about research capacity as described below:

1. The evaluation of the Public Health theme's neighbourhood resilience research programme (PH) involved individual interviews exploring experiences of being involved and impacts both for individuals and their organisations.
2. The PPP evaluation involved group interviews asking about experiences of taking part in research exploring capacity building for evaluation and knowledge mobilisation.
3. The evaluation of the intern programme (IP) comprised individual interviews with interns asking about the impact on individual and organisational research capacity, impacts of involvement and support received and skills gained.
4. Finally, the fourth component focused on the extent to which strategic objectives in relation to public involvement, health equity and research capacity building had been achieved across the collaboration (CC).

This involved individual interviews with a diversity sample exploring experience of involvement in research projects as well as general questions about research and its application to practice.

The findings in this paper are therefore based on analysis of data on the processes, experiences and impact of RC building collated in all four components of the evaluation. Although the detail of data varied across these components, when brought together, they provided a rich picture of capacity building within CLAHRC-NWC.

Participants

In total, data was collected from 131 individuals through face-to-face interviews (n=58), focus groups, and workshops (n=73). A diversity sample was identified from across CLAHRC-NWC partners and included members of the Management Team, Steering Board, people involved in diverse projects in a range of roles from the NHS, LAs, universities and other partner organisations and public advisors. Participants from the intern programme included interns and PhD students. All participants completed consent forms. Information and consent forms emphasised participation was voluntary and how data would be used. All interviews and focus groups were tape recorded. Appendix 1 provides further details of methods and participants.

Data Analysis

Analysis of data from all four components was conducted by a team of 7 academics and 2 Public Advisors. Transcripts were anonymised before analysis; each transcript was given a unique ID (interviewer and number). Framework analysis was used. A priori themes used to structure the analysis were identified from the framework for evaluating RC in health care developed by Cooke which categorises six principles of capacity building shown in Table 1.²⁰ The framework also identifies four structural elements of capacity building activity which include individual, team, organisational and network levels. The six principles are considered to influence the impacts of RC building across these four structural elements.

Table 1: Principles of Capacity Building²⁰

Principle	Activities and Processes
1. Skills and confidence building	Research capacity is built by developing appropriate skills, and confidence, through training and creating opportunities to apply skills
2. Close to practice	Research capacity building should support research 'close to practice' in order for it to be useful
3. Linkages and collaborations	Linkages, partnerships and collaborations enhance research capacity building
4. Appropriate Dissemination	Research capacity building should ensure appropriate dissemination to maximize impact
5. Continuity and sustainability	Research capacity building should include elements of continuity and sustainability
6. Infrastructures	Appropriate infrastructures such as structures and processes that are established to support running of research and enhance research capacity building

The framework principles were set up in Excel and systematically applied to all transcripts. Data analysis was conducted by 2 researchers (KK and AP). Initially, they each coded the same 20 transcripts independently. They then compared their work to identify common or divergent perspectives to support consistency in coding and reach agreement on how the framework themes was applied to remaining transcripts.

Where quotations have been used to illustrate findings, the reference includes the data collection method (int = interview; grp = focus group) with a unique number, respondents organisation (Local Authority = LA, NHS), role (academic, intern, partner, PhD student, public advisor) and the evaluation component (codes detailed above = PPP, CC, PI, PH); e.g. Int30-LA-partner-PH.

Ethics

Ethical approvals were obtained from the university where the lead researchers were based: Lancaster University for research on the Neighbourhood Resilience Programme and CLAHRC-NWC strategic objectives (FHMREC13028, FHMREC17023); University of Liverpool for the Partners Priority Programme (2236); and UCLan (University of Central Lancashire) for the intern programme (STEMH608).

RESULTS

The findings are structured under Cooke's six principles of capacity building: knowledge and skills development; investments in infrastructure; proximity of research to practice; development of linkages and partnerships; dissemination or knowledge exchange; and sustainability and continuity, followed by the consideration of the challenges to capacity building identified by respondents.²⁰ Tables have been used in some sections where there were key themes emerging in the data that related to the principle theme being discussed in each section.

Skills and Confidence Building

There was a general feeling among respondents that they had gained a wide range of skills and knowledge from their participation in CLAHRC-NWC capacity related activities. Skills reported are shown in table 2.

Table 2: Skills and Knowledge Gained from Training and Developmental Opportunities within CLAHRC-NWC

Research Skills	Description
Co-production	Involving members of the public and other stakeholders in research framing and problem solving
Data analysis	Conducting data analysis (quantitative and qualitative), using data analysis software such as NVivo and SPSS
Dissemination through verbal and written outlets	Devising poster presentations and reports to summarise findings, writing papers, developing videos, art-based outputs, presentations to wider audiences, and developing presentation skills
Evaluation	Conducting evaluations, evaluating differential impact
Facilitation	Facilitating meetings and workshops
Identifying and using evidence	Evidence synthesis, using evidence for change, undertaking systematic reviews, using different types of evidence for service improvement, implementation science and policy change
Political economy of context	Gaining deeper understanding of the nature of the socio-political context that frames NHS and Local Authority work
Research methods	Gaining knowledge on a range of quantitative and qualitative methods
Refining research ideas	Developing research proposals and defining research questions/topics
Research ethics	Understanding research ethics and processes for approval

Capacity building opportunities had enabled those with little previous experience to gain confidence in their ability to get involved in and conduct research. As these participants, a research manager and intern, explained:

"I've learnt so much, so many things and there's things that I've applied for which even 12 months ago I couldn't have even dreamt of applying for that and I was pushed forward – go on try it, do it and given support to do it. I've written papers, which again I had never even done before so I've submitted one for before Christmas and that's my first one." (grp1-University-research manager-CC)

"I always wanted to get involved in research but I never knew how to go about doing that. I wanted to do a research project but I didn't want to go through the boring master's modules that you have to do as part of professional radiotherapy masters, I just wanted to jump straight in and get to the research part and this is what

that enabled me to do... as part of my clinical role and subsequently as a result of that applied for a masters so it's been really invaluable and it was great opportunity." (int27-NHS-intern-CC)

The intern quoted above highlights how for some involved in the RC programme the experience set them off in pursuit of further research qualifications. This pathway to enhanced research skills was not uncommon as a manager of staff on the programme highlighted:

"It's actually given them a taster...then they felt that they wanted to do something more; so, they wanted to do some Masters levels, modules or they wanted to apply for a Doctorial Fellowship or a Post Doctorial Fellowship or join other research teams in doing research." (int5-LA-partner-CC)

The Health Inequalities Assessment Toolkit (HIAT) training and its application in practice as well as in developing research proposals was also reported to have increased knowledge and understanding of health inequalities as this intern described:

"Yes, it's definitely widened in that it's not just around discriminating characteristics which I think I was really naïve... and those characteristics that can lead to inequality like age, sex, ethnicity. It's definitely broadened my awareness that there can be factors that potentially can cause inequality that you don't consider so it does... broaden your horizons." (int28-NHS-intern-IP)

Respondents also highlighted the benefits of capacity building opportunities provided for members of the public involved in participative research:

"We've good local [Public] Advisorsnow that are contributing and I think getting quite a lot out of it themselves as individuals. So, I think that's a real positive role and the more support and training we have for people to explore their own issues, confident in raising those issues with professional partners and agencies that can only be a good thing." (int30-LA-partner-PH)

Those with some existing research experience/skills reported that they had the opportunity to refresh and enhance their research competency. In particular, as the quotes below illustrate, individuals had been enabled to do research that they would not necessarily have had the opportunity to get involved in and/or to experiment with new approaches to health problem framing and problem solving.

"I suppose for myself because I'm from analytics I'm usually just getting involved in the number crunching but I've actually been involved in the whole process which is quite good so you are seeing something from start to finish which you don't necessarily get the opportunity to do in our department." (int20-NHS-partner-CC)

"I'm not sure that the evaluation would have been done, certainly to the level that's it's been done, without actually being a part of this programme I think there might well have been you know questionnaires sent out by you know patient experience type things but I don't think there would have been interviews or I don't think there would have been the level of engagement with staff about it without actually having done it as a formal evaluation." (grp7-LA-partner-CC)

Close to Practice

The concept of "research close to practice" refers to research activities that are acceptable, accessible, appropriate, and useful for those involved and the roles they undertake. Research that is close to practice increases its relevance to those involved and the potential for the knowledge and skills generated to have greater use.²⁰ The findings demonstrate that those engaged in CLAHRC-NWC RC building opportunities felt that the research they had been involved in had been relevant for practice and had had a positive impact for them and their organisations. This ranged from the use of evidence in practice to organisational processes used to involve the public in research. The collaborative approach to knowledge mobilisation was felt to be significant because the research was not simply led by academics or based on academic interests, but rather a range of organisations and partners were involved, increasing its potential to be more applicable to practice and/or policy.

"So certainly, the intent and I think that's been realised to a degree that the research work that we're thinking about doing within the University is much more closely aligned to what people want outside the University. It's a much clearer route I think for that work to be applied and have some kind of impact." (Int20-LA-partner-CC)

Respondents described how capacity building activities were useful at both individual practice level and organisationally:

"[The research study] offers insight for me as a clinician into the pitfalls that patients might fall into and then ultimately end up weight regaining and I definitely use that in my clinical practice and I've feed back to my colleagues about the study so they've then gotten more knowledge." (int26-NHS-intern-IP)

"We also had at least one member of staff from a different part of the council who went on the intern programme and I know that she benefitted from that and she did it on a programme that supported the work of our Mental Health and Wellbeing that we were working locally. So that was of benefit to the organisation as well." (int31-LA-partner-PH)

Other respondents described the value of research topics being closely aligned to their clinical practice or contributed to design of services/resources:

"I've done a project with a librarian about facilitating research amongst radiographers and information literacy... we developed workshops around information literacy and research and yes some of the stuff that had been on the training package within the internship helped us develop the way we delivered that." (int28-NHS-intern-IP)

Linkages and Collaborations

Partnerships and collaborative working are considered a key aspect of capacity building.^{20,21,22} CLAHRC-NWC provided partners' staff and public advisors with opportunities to enhance research skills by opening up new spaces for collaborations across diverse organisations and with members of the public. This also included developing new relationships between public sector organisations and universities.

"In terms of collaboration for me very positive in improving the way organisations are collaborating together. I think the most important point for me is for a collaboration of this size with three universities, big number of NHS trusts, CCG's and local authorities each of which are very, very different organisations with different ways of working....it also has supported developing an organisational understanding of the way that academic and public sector links can work better. So, in other words it's opened up an opportunity to collaborate better with academic institutions" (int9-LA-partner-CC)

"I think what it has done is brought a degree of focus to that interface between academia services and the public and brought some focus on working in that space." (int12-University-partner-CC)

The new connections resulting from the involvement with CLAHRC-NWC and the reported impacts of these connections are summarised in Box 1.

Box 1: Impact of New Links

- Local Authorities sitting with academics in decision-making structures such as the CLAHRC-NWC Steering Board/ Management Group of the Public Health Theme
- NHS Trust providing studentship opportunities
- Opportunities for non-clinical professionals to work more closely with specialists who work directly with the patients leading to patient perspectives being incorporated into research
- PhDs, Public Advisors, interns, core staff and others involved with CLAHRC-NWC linking in with colleagues from different professions and creating new research partnerships
- Secondments linking Local Authorities and NHS with universities
- The CLAHRC-NWC Community Research and Engagement Network (COREN) serving as a platform to connect and support COREN facilitators working in third sector organisations in applied research across the NWC
- Increasing knowledge of existing research support services within organisations

Many participants valued these new connections especially in times of significant reductions in public expenditure that had reduced opportunities for professional development and partnership working.

I think the main thing is I've made new connections so there's people round the CLAHRC table, I am talking about the Public Health Management Group here, that I've not had contact with before. So, it has maybe network and a lot of like-minded people particularly the Public Health professionals, we don't do that anymore, it's gone...there's not really the opportunities. (int31-LA-Partner-PH)

Appropriate Dissemination

One measure of the success of capacity building has been described as research that ultimately impacts on practice and health of patients and communities.²³ At the time of writing, CLAHRC-NWC had published 70 peer-reviewed journal articles, but participants highlighted their involvement in the production of a much wider range of outputs and dissemination activities as shown in Box 2:

Box 2: Outputs and Dissemination Activity

- | | |
|---|--|
| • Book chapters | • CLAHRC-NWC open days |
| • Case studies | • Events showcasing good practice in public involvement |
| • Comics | • Newspaper articles |
| • Conference presentations and talks | • Photographic exhibitions and public engagement activities (e.g. Campus in the City in Lancaster) |
| • Media interviews (radio and newspaper) | • Quizzes: snakes and ladders game on health inequalities. |
| • Newsletters and electronic circulation of published outputs | |
| • Posters and poster presentations | |
| • Reports and CLAHRC BITEs | |
| • Videos | |

Interns and Public Advisors new to research described the skills they acquired and the types of dissemination activities they had been involved in with enthusiasm.

"So, one of the sessions for the internship was producing a poster. So, I then used that and presented that at a couple of conferences...and as a result of some of the contacts that I made through presenting the poster from my internship I'm still in touch with the chair who is now actually helping me with recruitment for my MSc project so that's been really useful. (Int27-NHS-intern-IP)

"When (x) told us as an advisory panel we are going to present so it's [the training] given us some ideas how to present. We prepared a PowerPoint presentation so it's given me as a Public Advisor some confidence to present my work, to disseminate our work as a team in front of all the PPP participants." (grp15-public advisor-PPP)

Examples of sharing knowledge from projects and research activity to influence practice were also highlighted by those involved in the collaboration.

"Academic leads and service personnel have got closer together and they have shared the analysis and people have taken away the evidence of good practice or effectiveness so there's been sharing." (int4-NHS-partner-CC)

"We are engaging with lots of different partners to make sure they understand what we're trying to do. Where the data is available for us to be able to share that data results which may lead to changes in practice, we are trying to do that." (int20-University-partner-CC)

Other examples of more innovative outputs incorporating a health inequalities lens co-produced by academic, partner staff and members of the public include:

- Game: [Snakes and Ladders](#) was showcased in a Campus in the City event organised by Lancaster University as part of the 2016 Lancashire Festival.

- Video: [The Way We Were...Now!](#) brought together Lancashire County Council, East Lancashire Hospitals NHS Trust and residents of Marsden Grange Residential Care Home for the Elderly in Nelson, demonstrating the outcome of collaborative work aimed at reducing admissions into hospital by improving residents' mental wellbeing.
- Comic: [What's Your Story?](#) An artist worked with Lancashire County Council, academics, and residents in Haslingden to capture their reflections while they investigated how "social connectedness" affects wellbeing and health inequalities in their community.

Continuity and Sustainability

Effective capacity building needs to include elements aimed at promoting and enabling sustainability to ensure continued development of skills, knowledge and structures to undertake research. Within CLAHRC-NWC, this has happened in modest ways. On an individual level, some participants reported progressing on to further study and research-based courses as well as fellowships and PhDs. Some also reported accessing funding (from CLAHRC-NWC and externally) to undertake further research, as a university academic explained:

"There's work that came out of the [project name] that I have been involved in; (...) I had funding now three times for three different aspects since the work that they did as part of their [project name]. If CLAHRC hadn't given that opportunity they wouldn't have progressed in that way" (grp1-University-partner-CC).

The evaluation also identified examples of organisational changes supporting sustainability of RC. These included job descriptions being revised to include a research element and research support being integrated into existing posts. This Local Authority Partner described a shift in "organisational mind-set" about the benefits of research:

"It's our philosophy of approach now in our Local Authority: our senior levels from our Chief Exec down accept that it's almost a need to collaborate with the academic sector and to be able to benefit from academic expertise, knowledge and innovation, which will have great benefit for the things that we're trying to do in the Local Authorities which is to improve quality of life for our residents." (int9-LA-partner-CC)

Infrastructure

CLAHRC-NWC operated in a context marked by dramatic cuts in public expenditure as the UK austerity policies were implemented from 2010. Local authorities in the North of England experienced the greatest budget cuts which affected many of the CLAHRC-NWC partner organisations.²⁴ Respondents emphasised the impacts this climate had had on their workloads and the difficulties they had accessing funds for professional development and/or to conduct research in their organisations. In this context, CLAHRC-NWC's investment in infrastructure was perceived as pivotal. This included the general structures in place to support partners to engage with CLAHRC-NWC overall but more so the specific investments linked directly to research capacity building described earlier, such as the provision of funds to backfill of posts for staff involved in capacity building activities and explicit formal secondment agreements.

These structures and processes were considered key factors facilitating greater involvement in RC as described by one partner below:

"It couldn't have happened without CLAHRC because CLAHRC and all that hard work and... backbreaking stuff you've done in terms of getting partners together and you know having the steering group and having this whole process has enabled this to happen, I mean I don't think this would have happened without that structure with CLAHRC and all that because you need that top-level engagement to get the lower level." (grp11-University-partner-PPP)

The importance of protected time and senior level buy-in was particularly emphasised by those working in the NHS and Local authorities.

"I had quite supportive managers who when it came to data collection when I was doing the interviews they were quite flexible with allowing me to move the research day around so that I could fit my time around participants rather than them having to fit around me and sometimes I was allowed to interview staff when I should be working because it was outside of my research day as long I made the time back up." (int27-NHS-Intern-IP)

Because we have got the backing of our Director of Public Health, which is really good otherwise we would have probably not been able to do it [project].” (int35-LA-partner-PH)

Table 3 summarises the ways in which CLAHRC-NWC's infrastructures were reported to have enabled Partner and Public involvement in the RC programme and the types of outcomes reported:

Table 3: Approaches to Capacity Building and Outcomes

Infrastructure	Outcomes
Financial support	NHS and Local Authority Partner internships with back filling of posts to free up staff time for research; PhD studentships, research projects. Remuneration to Public Advisors for their time and input across CLAHRC-NWC activities
Senior level involvement	Senior level buy-in encouraged and accommodated Partner and Public involvement in applied research
Agreements to protecting Partner staff's time and accommodating role	Facilitated opportunities to be involved in applied research activities, training and attending meetings
Making research more visible/credible within Partner organisations	Organisations experienced and valued different research methods
Provision of training and access to a range of research opportunities	Skills gained as shown in Table 1 on page 4

Challenges and Barriers to Developing Research Capacity

As the findings reported above illustrate, respondents were broadly very positive about the personal and organisational benefits arising from the capacity building opportunities provided by CLAHRC-NWC's, but they also identified factors that have limited their full potential. In particular, participation of NHS and local authority staff depended largely on senior level buy-in. Where individuals did not have agreements about a specific time allocation, they struggled to balance their desire to get involved in research with their work commitments. Additionally, although respondents valued the research and the ethos of the CLAHRC-NWC collaboration, these individuals did not always have the expertise, legitimacy or influence to drive change in their organisations.

The geography of CLAHRC-NWC also created barriers. Some partners with demanding workloads had to travel long distances to attend meetings or training, but as this university staff member notes, this was necessary for collaboration to happen:

“There has been some challenges that we've all had. I think that distance can be quite unhelpful, you know, you see people along the corridor it's easier but it is just the nature of the collaboration I guess.” (Int15-University-partner).

Tensions also arose because of the diversity of professional disciplines and organisational cultures that had come together in CLAHRC-NWC. This led to different and at times conflicting perspectives on research, health inequalities, and/or public engagement as well as to concerns amongst some NHS and local authority partners that at least early research was too far removed from their daily priorities.

“There is inevitably a tension about which Partners' priorities we can look at. And that has been a tension again within CLAHRC because our CLAHRC is massive in terms of the number of organisations involved. They've all put their hands in the pocket and put something in the pot but not all of the Partners are going to have any of their priorities looked at”. (Int12-University-partner-CC)

A lack of clarity about roles on projects (an issue for academics, non-university staff and Public Advisors alike) may also have limited the potential for activities to increase RC for individuals as this respondent highlighted:

"The job role was so varied and what I was doing wasn't research and it wasn't academic, it was administrative... it was very much administrative. It wasn't clear where my research focus was, what papers I would be focusing on..." (grp1-University-partner-CC)

There were also instances where communication had been a problem. It was suggested, for example, that information about capacity building opportunities were sometimes received by senior managers who did not share them widely, thus limiting the potential for involvement to a selected few.

Other factors reported to have had a negative impact on the sustainability of research capacity acquired in CLAHRC-NWC included the limitations of short-term funding for research roles and shrinking organisational capacity, linked to austerity. As a University Partner explained:

"There's one local authority when they came into CLAHRC they had four full time equivalents, two years in they were down to one, how could they have capacity?" (int1-University-partner-CC).

DISCUSSION

As noted earlier, the evaluation reported in this paper was undertaken by an internal team, which had benefits, for example ease of access, but it also increased the potential for bias. Efforts were taken to avoid this by ensuring that interviews and focus groups were conducted by individuals who did not work directly with participants, having two researchers coding transcripts, and using an established thematic framework. Another potential limitation of the evaluation was that not all those invited agreed to take part in interviews/focus groups, and therefore the findings may not reflect the full range of perspectives and experiences across CLAHRC-NWC. In order to support future evaluations, programmes can consider building in agreements to obtain feedback and participation in evaluation at the onset to ensure all participants contribute. Finally, the evaluation did not explore the impact of capacity building activities on research outcomes as the evaluation was conducted too early for impacts on the research outputs of participants in the programme. This could be addressed in future evaluations of the ongoing collaboration by building in mechanisms to follow-up participants and exploring with them research outcomes and how their involvement in RC initiatives may have influenced these.

Notwithstanding these limitations, the findings suggest that CLAHRC-NWC's research capacity building approach has had positive impacts at both individual and organisational levels. Applying Cooke's evaluative framework principles has provided a useful lens to explore the impacts of RC initiatives beyond the more traditional focus on training delivered and outputs achieved typically formal qualifications, increased research activity through grants and publications.^{19,20,25,26,27} By considering the processes involved in supporting capacity building, we have been able to identify changes albeit modest in organisational culture, research experience, knowledge, and skills as well as the impact of collaborative working across different sectors, professionals, and members of the public.

CLAHRC-NWC's approach to research capacity building gave greater emphasis to learning from active involvement in research and to changes in organisational culture, structures, and processes than conventional RC building initiatives. Additionally, research capacity building opportunities were provided beyond academic settings and individuals were able to participate in activities across all stages of the research process from question development to knowledge mobilisation. Individuals could join existing research projects or develop their own. There was a strong focus on building capacities in research/practice/policy collaborations to support research implementation and knowledge transfer. For example, the PPP actively focused on implementation and enabled interns to work collaboratively with professionals outside of their own organisations. This was facilitated in a structured way and the onus was not left on interns to make those connections which often happens when individuals are simply funded to undertake PhDs or undertake research training.

The structured "learning through experience" approach adopted across CLAHRC-NWC was inclusive and developmental, encouraging involvement of individuals with a range of experience including those with no previous engagement in research. The importance of experiential learning was also highlighted in the evaluation of another CLAHRC programme, which found it helped to break down barriers between research and practice as well as build trust and mutual understanding amongst those involved.²⁸ Staff from all types of partner organisations and members of the public involved in the collaboration have developed knowledge and skills in undertaking research, evidence synthesis, knowledge exchange, and dissemination.

Previous research has highlighted the importance of RC building initiatives supporting the development of networks, strategic collaborations and partnerships working across organisations.^{29,30} This was a prominent element of CLAHRC-NWC's approach as illustrated in the use of CIGs in the PPP. This encouraged and supported interns from across different sectors to work collectively and with other members of research teams on a specific research project and share knowledge and experience.

Some of the impacts reported in our evaluation are not unique to the RC building approach adopted by CLAHRC-NWC. Evaluations have shown that formal research training through taught courses and post graduate study increase knowledge of research processes and skills amongst individuals and post-graduate training clearly involves the application of this knowledge and skills to the conduct of research. However, the CLAHRC-NWC approach emphasising "learning through experience" helped to embed research knowledge and skills and increased confidence in the use of research evidence across a very diverse cohort of staff, including many who would be unlikely to register for postgraduate training. Studies have identified that non-medical practitioners often face additional barriers when wishing to get involved and undertake research. These barriers include the lack of funding, limited research knowledge or experience and the lack of confidence and support.^{31,32} The CLAHRC-NWC approach supported the engagement of non-clinical staff from partner organisations and helped to address some of these barriers.

Similarly, other benefits reported in our evaluation (such as reports of the increased practice relevance of the research conducted, the greater likelihood of findings being taken up by NHS and local authority partner organisations and the integration of research capacity building into general staff development programmes) are less likely to emerge from approaches that only focus on research training and skilling up individuals to undertake research. Approaches that include senior management and leadership support for research have been reported to have more impact on an organisations' research culture as well as individual engagement in research.^{30,33,34}

CLAHRC-NWC's approach to RC building was not without its challenges. Clear roles are required both for those supporting and engaging in RC building activities. The focus of research also needs to be meaningful for all those involved, bridging the academic and "policy/practice" cultures of different professionals and organisations.

A key enabler was the availability of resources to support dedicated infrastructures and processes enabling individuals and partner organisations to avoid having to fit research into existing resources and remits. Senior staff commitment is vital. Financial resources from the English NIHR were used to fund partner staff and members of the public to participate in research internships, PhD studentships, and in research projects more generally. The need for resources and time to support research capacity building has been emphasised as key components in developing frameworks to embed research culture.¹⁹ CLAHRC-NWC's resources meant specialist staff could be appointed to provide capacity building support. These staff also engaged in discussions at national meetings with other CLAHRCs, allowing them the opportunity to consider supporting similar schemes and programmes within their regions.

However, it is important to emphasise that the research capacity outcomes of CLAHRC-NWC are not all attributable simply to the additional funds it received from the English NIHR. The University, NHS and local authority partners in CLAHRC-NWC also contributed significant resources in cash and kind. Some of the specialist staff providing research capacity support were on secondment from partner organisations and matched resources from partners also supported specific research projects. Key elements that supported research capacity building also arose from the nature of the collaboration and the partnership working that developed across academics, practitioners and service provider organisations. Organisations that partnered in CLAHRC-NWC were encouraged to integrate research capacity opportunities into their staff development programmes these initiatives did not require extra funds.

Other aspects of the CLAHRC-NWC approach that can potentially be implemented without significant resources include universities working together to identify and build capacity building opportunities not just within academic settings, but with their existing partner organisations and by forming new partnerships across sectors. Learning through experience opportunities can also be built into any research funding applications, with funds being requested to support the involvement of practice and policy partners in order to build RC as well as enhance relevance and uptake.

Though the research was based in the UK, the study highlights aspects of issues that organisations based in other countries can consider as part of their strategies to develop and enhance research capacity. For example, universities and other public sector organisations are already beginning to provide the type of infrastructure developed in CLAHRC-NWC, such as outreach initiatives and/or forums to engage the public in their work and establishing networks of

academic, practice and policy partners.^{35,36} By identifying opportunities to develop research capacity in its wider sense beyond training and qualifications, universities can help build RC in a wide range of individuals and organisations and increase the relevance and utility of the research they do. Finally, working with local universities, RC building opportunities such as those provided by CLAHRC-NWC (e.g. internships) could be integrated into non-academic organisations staff development programmes at little extra costs.

CONCLUSION

It is too early to assess whether CLAHRC-NWC capacity building activities have contributed to a sustainable culture of research in non-university partner organisations. However, CLAHRC-NWC has planted the seeds in which an organisational culture sensitive to research can flourish. It has developed new research knowledge and skills amongst a significant number of individuals and built structures and networks across the region that support engagement of professionals and members of the public in applied research and implementation focussed on reducing health inequalities. The impact of those engaged in research has the potential to have wider effects within their teams and organisations through the prospective 'flow-on' effect and diffusion to others professionals and clinicians.^{37,38}

Some of the individual benefits we have identified, particularly increased knowledge about research processes, methods and skills, are as likely to emerge from more conventional teaching-based RC building programmes. However, we would argue that the "learning through experience" approach adopted by CLAHRC-NWC has embedded these benefits more firmly across a diverse cadre of partner staff. It has also had wider impacts on structures and processes within partner organisations and on the relevance and utility of the research conducted. These impacts would be less likely to arise from conventional RC programmes. Enhancing research capacity is likely to be on the periphery and "incidental" to the work of health and social care organisations, particularly as they recover from the COVID19 pandemic, if it is not prioritised and actively supported.³⁹ CLAHRC-NWC's inclusive developmental approaches to capacity building have also supported the emergence of more research-friendly cultures in organisations that do not primarily conduct and deliver research. These are changes that will contribute to the sustainability of the benefits we have described.

Finally, it is important to acknowledge that to some extent the CLAHRC-NWC approach depended on the availability of the NIHR research grant. But as we have suggested above, many elements of the "learning by doing" approach to research capacity building can be developed without significant additional financial investments. Where additional resources are required, our evaluation suggests that they can be offset to some extent by the increased relevance of the research that is done and the value it can therefore bring to organisations who support staff to build their research capacity.

Conflicts of interest

The authors report no conflicts of interest in this work, research, authorship, and/or publication of this article.

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REFERENCES

1. Vogel I. *Research Capacity Strengthening. Learning from experience*. Synthesis report of workshop held by UK Collaborative on Development Sciences (UKCDS) in September 2019 UKCDS; 2012.
2. Matus J, Walker, A Mickan S. Research capacity building framework for allied health professionals. A systematic Review. *BMC Health Serv Res*. 2018; 18:716. [PMID: 302190650]

3. Sarre G and Cooke J. Developing indicators for measuring research capacity development in primary care organisations: a consensus approach using a nominal group technique. *Health Soc Care Community*. 2008; 17(3): 244–253. [PMID: 19040697]
4. Pager S, Holden L, & Golenko X. Motivators, Enablers, and Barriers to building allied health research capacity. *Journal of Multidiscip Healthc*. 2012; 5:53–59. [PMID: 22396626]
5. Rycroft-Malone J. From knowing to doing - from the academy to practice. Comment on “The many meanings of evidence: implications for the translational science agenda in healthcare”. *Int J Health Policy Manag*. 2014 Dec 10; 2:1–2. [PMID: 24596897]
6. Best Research for Best Health. A new national health research strategy. London, UK: Department of Health; 2006.
7. Gee M, Cooke J. How do NHS organisations Plan Research Capacity Development? Strategies, Strengths, and Opportunities for Improvement. *BMC Health Serv Res*. 2018; 18(1):198. [PMID: 29566696]
8. Schools for Primary Care, Social Care and Public Health Research. National Institute for Health Research website. <https://www.nihr.ac.uk/about-us/documents/3.03-Research-Schools.pdf> [Accessed 20/03/19]
9. Developing a Flexible Workforce that Embraces Research and Innovation. Research and Innovation Strategy. Leeds, UK: Health Education England; 2017, pp. 3
10. Doing, Supporting and Using Public Health Research. The Public Health England Strategy for Research, Translation and Innovation. London, UK: Public health England; 2014.
11. Cooke J, Gardios P, Booth A. Uncovering the mechanism of RC development in health and social care: a realist synthesis. *Health Res Policy Syst*. 2018; 16:93. [PMID: 30241484]
12. Canadian Institute of Health Research (2015) Strategy for Patient Orientated Research. Capacity Building Framework. Canada: Canadian Institutes of Health Research, <http://publications.gc.ca/site/eng/441528/publication.html> [Accessed 12/06/19]
13. Pain T, Petersen M, Fernando M. Building Allied Health Research Capacity at a Regional Australian Hospital: Follow-up Study *Internet J Allied Health Sci Pract*. 2018 Oct 09; 16(4), Article 8.
14. Nova Southeastern University (2020) Navigating Healthcare Science Student learning and engagement through the implementation of a virtual classroom https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1421&context=cns bio_facpres [Accessed 5/01/21]
15. Arguello, Georgina; De, Santanu; and Orta, Silvia, "An Analysis of STEM Education at the College Level: Stakeholders' Perspectives" (2020). Biology Faculty Proceedings, Presentations, Speeches, Lectures. 426. https://nsuworks.nova.edu/cns bio_facpres/426 [Accessed 5/01/21]
16. Gómez L, Jaramillo A, Halpaap B, Launois P, Cuervo LG, Saravia NG. Building research capacity through “Planning for Success”. *PLoS Negl Trop Dis*. 2019 13:8. [PMID: 31369556]
17. Cooke J, Gardios P & Booth A. Uncovering the mechanism of research capacity development in health and social care: a realist synthesis. *Health Res Policy Syst*. 2018;16:93.[PMID: 30241484]
18. Kumar S, Ducat WQ. Building Research Capacity in Regional, Rural and Remote Allied Health Services. Lessons from Evidence and Experience. *Internet J Allied Health Sci Pract*. 2014 Jul 01; 12(3) Article 3.
19. Hulcombe J, Sturgess J, Souvlis T, Fitzgerald C. An approach to building research capacity for health practitioners in a public health environment: an organisational perspective. *Aust Health Rev*. 2014; 38:252-258. [PMID: 24785693]
20. Cooke J. A framework to evaluate research capacity building in health care. *BMC Fam Pract*. 2005;6(44). [PMID: 16253133]
21. Crisp BR, Swerissen H, Duckett SJ. Four approaches to capacity building in health: consequences for measurement and accountability. *Health Promot Int*. 2000; 15:99–107.
22. Griffiths F, Wild A., Harvey J, Fenton E. The Productivity of Primary Care Research networks. *Br J Gen Pract*. 2000; 50:913–915. [PMID: 11141879]
23. Smith, R. Measuring the social impact of research. *BMJ*. 2001; 323(7132):528.[PMID: 11546684]
24. Inquiry Panel of Health Equity for the North of England (2014) *Due North Report of the Inquiry on Health Equity for the North*. Liverpool, UK; University of Liverpool Centre for Local Economic Strategies
25. Pickstone C, Nancarrow S, Cooke J, Vernon W, Mountain G, Boyce RA, Campbell J. Building research capacity in the allied health professions. *Evid Policy* 2008; 4(1): 53–68.
26. Perry L, Grange A, Heyman B, Noble P. Stakeholders' perceptions of a research capacity development project for nurses, midwives and allied health professionals. *J Nurs Manag*. 2008;16(3):315–326. [PMID:18324991]
27. Cooke J, Nancarrow S, Dyas J, Williams M. An evaluation of the “Designated Research Team” approach to building research capacity in primary care. *BMC Fam Pract*. 2008;9:37. [PMID: 18588685]

28. Ariss, S, Cooke J, Smith C, Read J, Nancarrow S. NIHR CLAHRC for South Yorkshire Internal Evaluation Report November 2011: Executive summary pp.1-12
29. Mattia Fosci, Lucia Loffreda, Lennart Velten, Rob Johnson. Research Capacity Strengthening in Low- and Middle-Income Countries. Research Consulting; 2019.
https://assets.publishing.service.gov.uk/media/5d42be4eed915d09d8945db9/REA_Research_Capacity_Strengthening_in_LMICs_FINAL_June_2019.pdf
30. Matus J, Walker A, Mikan S. Research capacity building frameworks for allied health professionals- A systematic Review. *BMC Health Serv Res* 2018; 18:716. [PMID: 30219065]
31. Cooke A., Green B. & Coleman M. (2001) A case study and evaluation of the strategies employed to develop the nursing and midwifery capacity of the School of Health Science. School of Health Science Occasional Paper Number 1. University of Wales, Swansea.
32. McMahon A. & Kitson A. (1997) Supporting R&D: the role of a professional organisation. Part 1. *Nursing Standard* 12 (11),36–38
33. Slade SC, Philip K, Morris ME. Frameworks for embedding a research culture in allied health practice: a rapid review. *Health Res Policy Syst.* 2018;16(1):29.
34. Williams C, Miyazaki K, Borkowski D, McKinstry C, Cotchet M, Haines T. Research capacity and culture of the Victorian public health allied health workforce is influenced by key research support staff and location. *Aust Health Rev.* 2015;39(3):303–11.
35. National Institute for Health Research. Patient and public involvement in health and social care research: a handbook for researchers. National Institute for Health Research London, 2010.
36. Tabak RG, Khoong EC, Chambers DA, Brownson RC. Bridging research and practice: models for dissemination and implementation research. *Am J Prev Med.* 2012;43(3):337-350. [PMID: 22898128]
37. Wenke R, Ward E, Hickman I, et al. Allied health research positions: a qualitative evaluation of their impact. *Health Res Policy Syst.* 2017;15(1):6. [PMID: 28166817]
38. Wenke R, Weir KA, Noble C, Mahoney J, Mickan S. Not enough time for research? Use of supported funding to promote allied health research activity. *J Multidiscip Healthc.* 2018;11:269-277. [PMID: 29950853]
39. Barrett, A., Crossley, MW. and Dachi, HA. International partnerships, collaborations and capacity building in educational research: the EdQual experience. EdQual Working Paper No. 26, Bristol, UK; 2010.

Appendix 1: Structure of the Collaborative

Evaluation component	Methods and Participants	Researchers
Cross CLAHRC-NWC (CC)	Interviews with Steering Board Chair, senior management, partners involved in research and implementation projects (n=20) Focus group with research managers from university partners (n=7) 2 participatory workshops with Public Advisors (n=26)	AP,SH,FW
Capacity Building - intern programme (IP)	Interviews with Interns from partner organisations (n=8)	GG,JH
Partner Priority Programme (PPP)	7 Focus groups with: Public Advisors x 2 (n=5) Project leads from NHS and Local Authority partners (n=6) Research and development leads from NHS partners (n=4) Interns from NHS and Local Authority partners (n=5)	SH,EK,AP

	University partners who developed and supported the delivery of the PPP (n=8)	
	Research and implementation project designers from university, local government and NHS partners (n=6)	
Public Health Neighbourhood Resilience (NR) Programme (PH)	Interviews with staff from local government partners (n=9)	GS
	Peer to Peer interviews with Public Advisors (n=21)	KK
	Focus group with community research network facilitators (n=6)	KK