University of Lancashire

Institute for Planetary Resilience
& Community Transformation (PACT)

2026 Yearbook



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November 2026

Welcome

This Yearbook presents some highlights from the research carried out by members of the Institute for Planetary Resilience and Community Transformation (PACT) as one of the Research and Knowledge Exchange (RKE) Institutes at the University of Lancashire. It covers the period from 1 August 2025 to 31 July 2026.

The Yearbook includes:

- an explanation of the Institute's purpose and activities during the year;
- some illustrative examples and highlights of PACT members' research activity across the research thematic strands we introduced this year. This is not a comprehensive list but provides a flavour of the research that is undertaken by PACT's membership;
- and posters of individual research and other projects that were presented at our annual Convention in April 2026.

We hope you enjoy the variety of research that the Yearbook presents.

Professor Champika Liyanage & Professor Nicky Lowe

PACT Co-Directors

Table of Contents

01 Introduction 1

02 STRAND 1: Communities, place, & social inclusion 7

03 STRAND 2: Healthy communities & health equity 8

04 STRAND 3: Food systems, nutrition, & sustainable agriculture 10

05 STRAND 4: Climate resilience & environmental sustainability 12

APPENDIX A - External events 14

APPENDIX B – Research Conversations 16

APPENDIX C – Research posters 17

01 Introduction

01.01 Background and purpose

During this period as the University of Lancashire updates its strategic plan, the Institute for Planetary Resilience and Community Transformation (PACT) remains one of 13 Research and Knowledge Exchange (RKE) Institutes tasked with developing the University's research environment.

PACT's vision remains consistent as it has been since its formation two years ago: to address major 21st Century challenges to enable human and planetary flourishing. The Institute is underpinned by a commitment to the interconnected values of equity, fairness, justice, democracy and compassion; to facilitating partnership working, participatory methods, co-production, creativity and innovation; and to work that reflects an appreciation of context and complexity, concern to forge links across boundaries, and commitment to connect local and global perspectives.

One notable change this year, however, is in how we are summarising PACT's substantive research coverage. Ever since the Institute was formed from its previous incarnation as the Institute for Citizenship, Society and Change, we have been summarising our research remit through reference to three points, as "including, but not being limited to:"

(1) social, economic, and ecological justice;
(2) citizenship, culture, care and civic renewal; and
(3) sustainability, resilience and the wellbeing of people, places and the planet.

This year the Directors carried out a mapping exercise to confirm if this remit remained valid. Through this mapping exercise the Institute's research summary has been reframed as:

> "community-engaged research addressing health, social inequality, food systems and climate resilience through participatory and place-based approaches".

From this new high-level research analysis, four strands have been identified that describe the activities and interests of our membership:

1. Communities, Place, and Social Inclusion
2. Healthy Communities and Health Equity
3. Food Systems, Nutrition and Sustainable Agriculture
4. Climate Resilience and Environmental Sustainability

with two new cross-cutting themes that run through all our work:

A. Community engagement and co-production
B. Social justice, inclusion and equity

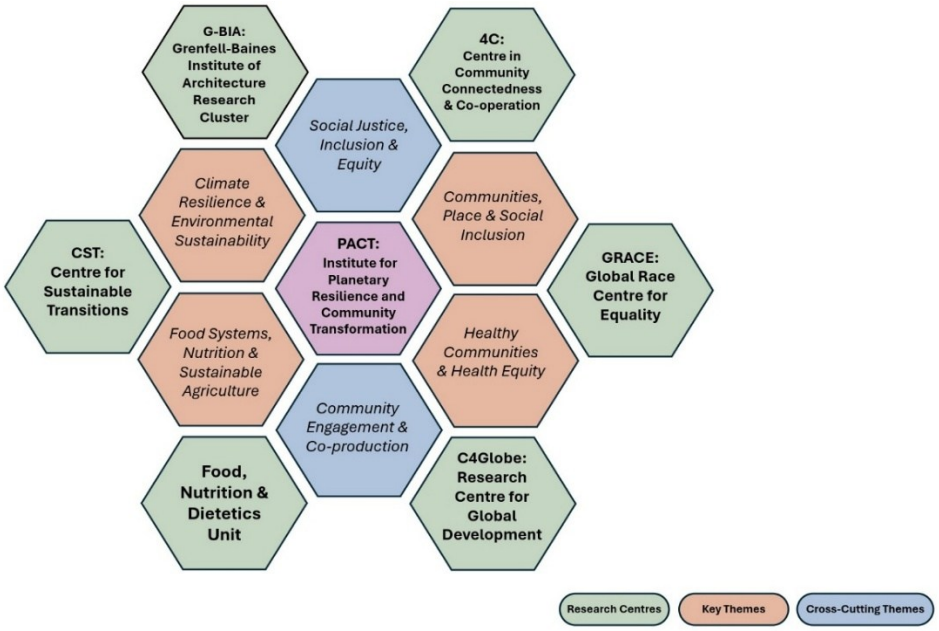
One reason for this change is that, as noted in our previous Yearbook, an increasing number of researchers sit under the general umbrella of PACT rather than being affiliated purely to one of the research centres that have traditionally provided its main structure. A thematic approach allows us to encompass all of our members' research interests more easily. Work produced over the 2025/6 academic year is reported via these new strands and themes in Sections 02-05 below.

Existing Research Centres connected to PACT include the following:

- Centre in Community Connectedness and Co-operation (4C)[1]
- Centre for Global Development (C4Globe)[2]
- Centre for Sustainable Development (CST)[3]
- Global Race Centre for Equality (GRACE)[4]
- Grenfell-Baines Institute of Architecture Research Cluster (G-BIA)[5]

A new Food, Nutrition and Dietetics Unit was established towards the end of the year and will be led by Dr Jan Mei Soon-Sinclair.

Our Steering Group remains the vehicle for setting the strategic direction of our work. Representation on the Group will move in the coming year to reflect the themes set out above.



01.02 Membership

Our core team has remained stable this year. Professor Champika Liyanage and Professor Nicola Lowe remain as Co-Directors of PACT, with Dr Al Farrier and Dr Suzanne Wilson as PACT Deputy Directors.

Part-time Research Associate Dr Clare Mumford and Research Administrator Kate Wilson have been joined by part-time Research Administrator Isla Livesey. We are very grateful for her additional support.

[1] Co-Directors Dr John Lockhart, Professor Julian Manley.

[2] Director Professor Nicola Lowe; Deputy Director Dr Victoria Moran.

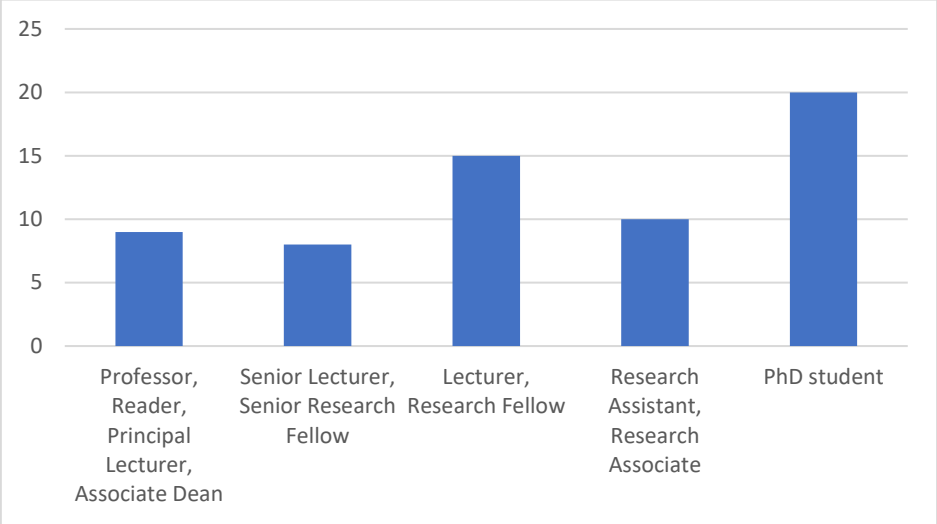
[3] Director Professor Champika Liyanage.

[4] Director Dr John Wainwright.

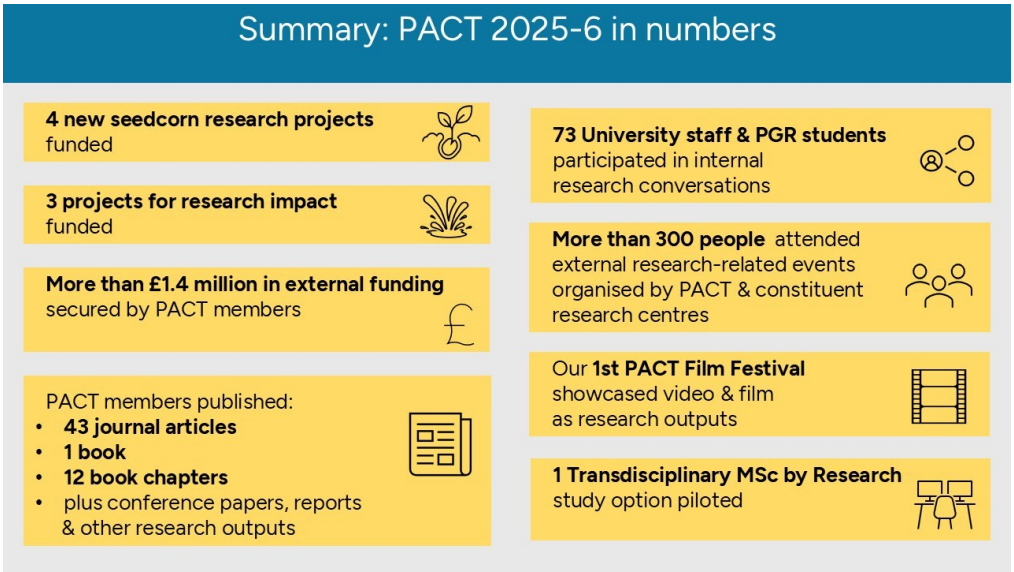
[5] Members Matthew Armitt, Sam Eadington, Ecaterina Stefanescu, Don Subasinghe.

PACT researcher membership in August 2026 stood at 42 with another 20 PhD student members affiliated via their supervisors and research study topic. See Figure 2.

Figure 2: PACT membership as of August 2026.



01.03 PACT's achievements



As we seek to develop ever more **collaborative and interdisciplinary working** between members and across RKE Institutes, two PACT-led activities last year are particularly noteworthy.

Firstly, Professor Champika Liyanage led a QR Enhancing Research Culture project across RKE Institutes and Schools to develop transdisciplinary doctoral training programmes and funding bids that brought together researchers and external partners across Schools of Engineering and Computing, Arts and Humanities, Health, Social Work, and Sport, Psychology and Humanities, and Pharmacy and Biological Sciences. A number of research bids are now being shaped from this project.

Secondly, we piloted a new 12-month Transdisciplinary MSc by Research study option under the PACT banner, not only to bring new students into the university but to develop a pipeline of talent with the research skills and interests to tackle key research questions to enable human and planetary resilience and flourishing. We hope that this initiative will bear fruits in coming years.

To support a **flourishing research culture** at the University we continued to run our regular internal Research Conversation series, open to all staff and research students, as an opportunity to engage with colleagues on particular research topics (see Appendix B, p.15). Our first Film Festival in December served as a point of gathering for exploring new research ideas and methods involving video and film. In addition, two University Undergraduate Internship Programme (UURIP) interns were supported to provide opportunities for undergraduate students in research (see Figure 4).

PACT and constituent research centres continued to run events throughout the year to **share and develop knowledge together with stakeholders** (see Appendix A), with more than 300 participants attending overall.

Alongside events, PACT members published at least 43 journal articles, three monographs, contributed to 21 books, as well as developing other outputs such as conference papers and evaluation reports. The full set of resources can be accessed online via the University's repository https://knowledge.lancashire.ac.uk/.

Through the University's revised system for allocating **internal funding**, PACT reviewed and supported Research England applications from PACT members totaling £44,452 for QR Enhancing Research Culture (ERC), Participatory Research Fund (PRF), Policy Support Fund (PSF) funding. We also submitted our own Institute-level QR/HEIF application for £24,912 to support seedcorn research (Activity 1), events (Activity 2), research impact (Activity 3), and conference knowledge exchange (Activity 4). See Figure 03.

Figure 03: QR and HEIF internal funding awards

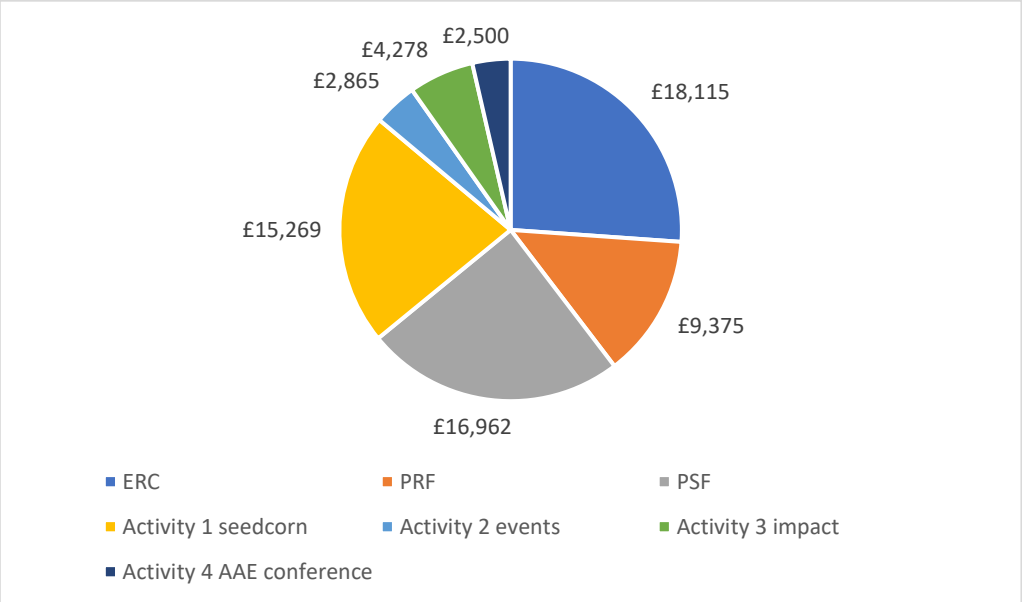
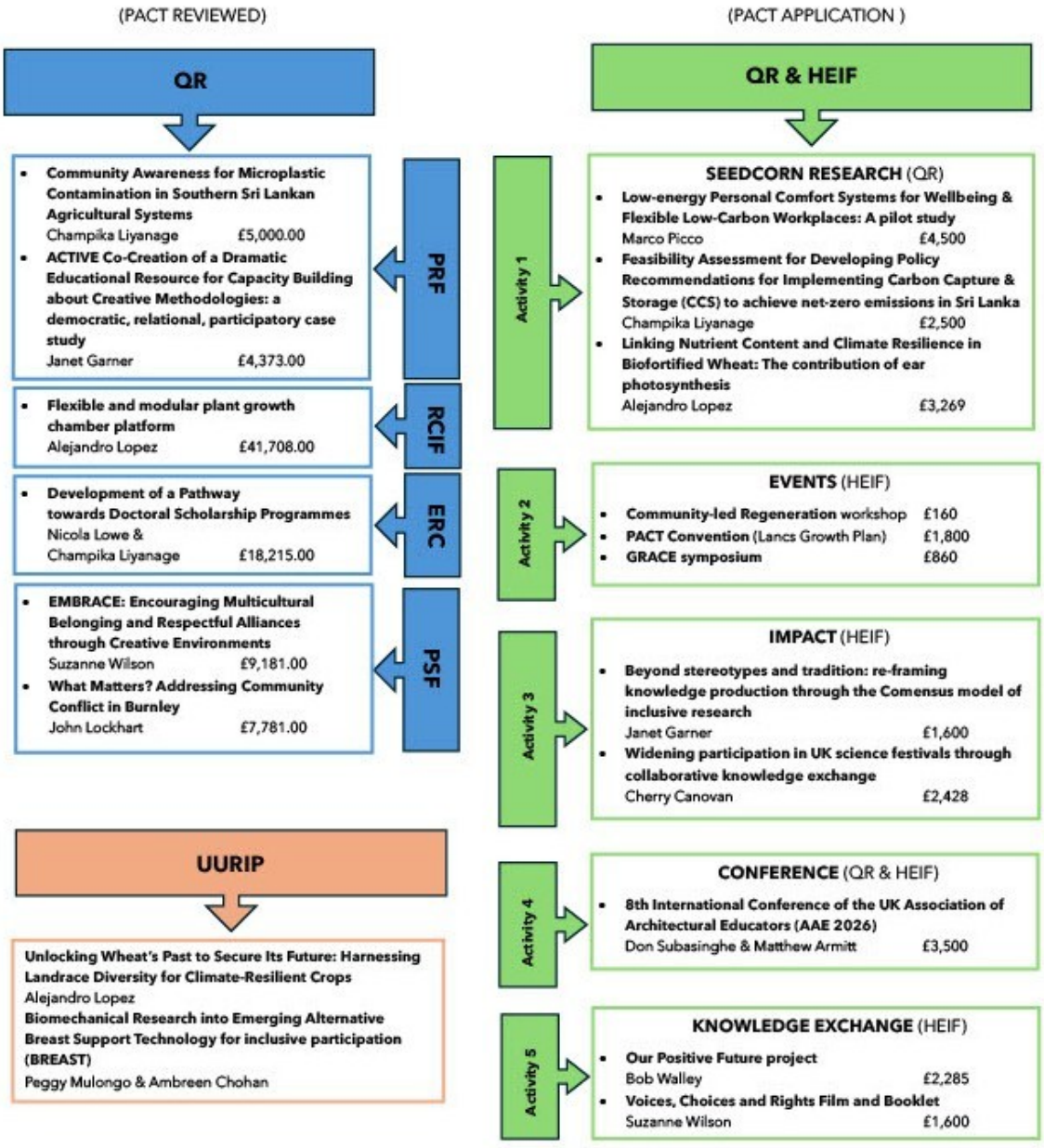


Figure 4 summarises the activity that was delivered on the ground through this internal funding. It includes work that was made possible due to careful regular monitoring of project budgets to identify underspend that was then negotiated and reallocated to new knowledge exchange activity (Activity 5).

Figure 4: Delivered QR and HEIF internally funded activity



Across Sections 02-05 below you can find more details of some of the outputs and outcomes achieved. One emergent focus from the awards this year was on widening participation in higher education:

- Dr Cherry Canovan's impact project (Activity 3) *Widening participation in UK science festivals through collaborative knowledge exchange*, delivered with

research assistant Hibah Sohail, brought together science festival organisers and national and local stakeholders to identify practical steps that could be taken to broaden participation among under-represented groups in science. The work built upon and addressed Cherry's previous research findings that opportunities were often missed to broaden participation and share the benefits of science festivals to less affluent social groups. Project learning has been captured online (see https://www.lancashire.ac.uk/lancashire-science-festival/supporting-us) and collaborations set up through the project are ongoing.

- Dr Matthew Armitt and Dr Don Subasinghe organised and hosted the Association of Architectural Educators' (AAE) international conference at the University's Preston campus in July 2026, and were able to offer bursaries to support attendance and participation from under-represented groups in architecture (Activity 4 funding). Thirteen PhD students were able to attend the conference through this means, broadening the scope and diversity of the discussions. Matthew and Don received great feedback from participants.

This year PACT members brought **more than £1.4 million in external funding** as income into the University.

A significant portion of this came from Professor Doris Schroeder's work on research ethics. This includes Support for the Activities of the European Group on Ethics project work for the European Commission and a Horizon Europe project *A new era for TRUST and Equity in Research* (TRUST ERA) that will begin in January 2027. The TRUST ERA work aims to improve equitable research practices between higher and lower income regions, and particularly to identify barriers to effective benefit sharing and the reliable prevention of 'ethics dumping'.

Other significant awards this year included the *Connected Communities* funding from the National Lottery (see research poster, p.20) and the *Trust Talks!: Constructive Conversations about health and creative adaptation to climate change* funding from the Welcome Trust. Both awards were led by Dr Suzanne Wilson and Professor Julian Manley with Dr Katherine Jewell.

01.04 The future

As the University moves to organise research increasingly via clusters, we remain committed to activity to build connections between our members, including postgraduate students, and others to support the development of strong transdisciplinary projects with partners. We will seek to identify and strengthen productive thematic connections, not only within PACT's home membership but also with researchers across the University of Lancashire and other Higher Education Institutions and with external organisations, to support mutually beneficial outcomes.

We will also continue to promote our Transdisciplinary Masters by Research study option into its second year.

02 STRAND 1: Communities, place, & social inclusion

This theme focuses on strengthening communities, reducing exclusion, promoting a sense of belonging, supporting local development, and enhancing civic participation. Place-based research commits to understanding how social, economic, and cultural factors shape people's experiences within communities.

Suzanne Wilson's[6] research on the **experiences, inequalities, and aspirations of young people, particularly in low-income coastal communities**, aims to embed young people's voices within regeneration strategies and local governance, and create sustainable community-led change. (See research poster, p.21 on *Connected Communities*.) Suzanne's previous *Coastal Communities* work came to fruition with articles in the national Guardian newspaper and exhibitions in Bristol and Whitehaven, in collaboration with documentary photographer Polly Braden. Most importantly, the young people represented shared their experiences directly with policymakers at an All-Party Parliamentary Group for Coastal Communities session in Westminster. This expanding portfolio of research on low-income coastal communities is also being supported by Dr Katherine Jewell and Dr Jodie Walker.

The Centre for Professional Ethics, led by Doris Schroeder,[7] concluded a five-year project ***Leaving no one behind in research*** (www.leaving-no-one-behind.org/) with Wellcome funding. Almost all qualitative research data were obtained without personal data collection to make research less risky for marginalised populations. One of the project's big successes was the training in Socratic questioning of 10 Indigenous San community researchers in South Africa (photo, right © Iddah Akinyi).



The *Building Refugee Inclusion and Development through Group Engagement* (BRIDGE) project, led by Suzanne Wilson, Ambreen Chohan[8], and Champika Liyanage,[9] explored how creative activities can strengthen **inclusion, belonging, and community cohesion between sanctuary-seeking and established local communities**. Findings summarised in a policy paper highlight the importance of trust, shared experiences, and creative expression in overcoming barriers such as stigma, isolation, discrimination, and language differences. (See research poster, p.27.)

The University's signing of a Memorandum of Understanding (MoU) with **Windrush Initiatives CIC** represents an important example of the Global Race Centre for Equality

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(GRACE)'s **community engagement** work in Preston.[10] An ongoing project with Windrush CIC, exploring how the Windrush Festival subverts and reinterprets the implicit meaning of Victorian spaces such as Avenham Park, has been an important piece of community-based research. An early video output produced by Jonathon Prasad[11] and Adrian Murrell, Director of Windrush Initiatives CIC, from this work was shared and discussed at PACT's Film Festival in December.

Building on their work as participatory researchers with Janet Garner,[12] PARITY members set out to develop and pilot a community training resource. Through collaboration and conversation with fellow PACT researchers, PARITY aimed to highlight the Comensus public involvement group as an untapped resource within the University whilst also developing their own skills and experiences in developing and delivering the 'De-mystifying research' workshop to a community audience in Preston. (See research poster, p.20.)

03 STRAND 2: Healthy communities & health equity

Health-related research forms the second major theme and spans clinical, social, psychological, and public health perspectives. It focuses strongly on health inequalities and under-served populations with a commitment to reducing inequalities and improving individual and community wellbeing through innovative and participatory approaches.

Hel Spandler's[13] Wellcome-funded Hidden from History research about the historical mistreatment of LGBTQ+ people in the mental health system was drawn upon in a recent BBC investigation. The subsequent report and documentary aired on BBC1 in Dec 2025 and a follow-up investigation earlier this year has resulted in more survivors coming forward. Hel was interviewed about this on BBC and local media channels. Lord Chris Smith has demanded a Government inquiry and the Minister for Equalities, Olivia Bailey promised that the Government would bring forward a fully inclusive ban on conversion practices. Hel's work will feature in a forthcoming exhibition at the Queer Britain museum in London. Updates and outputs from the Madzines project can be found on the dedicated website: https://madzines.org/.

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[11] Jonathon Prasad, Research Associate, Global Race Centre for Equality (GRACE) JPrasad@lancashire.ac.uk

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[13] Professor Hel Spandler, Professor of Mental Health Studies, School of Health, Social Work & Sport HSpandler@lancashire.ac.uk

Work on mental health and wellbeing has underpinned other research this year. Research led by Ursula Pool[14] explored **how creative activity can strengthen people's connections with local nature and support wellbeing**. Working with local artists and the environmental charity Groundwork at workshops in Maryport, Cumbria, participants used natural materials to explore their relationships with nearby 'green' (land) and 'blue' (water) spaces. The creative workshop model has since been adopted in other Groundwork Green Hub locations, extending its reach into community practice.

Meanwhile, Al Farrier[15] is working on the *Good Life* evaluation of a community-based therapeutic horticultural programme to demonstrate benefits to the **health and wellbeing of individuals who may be isolated, inactive, or have mild to moderate mental health issues**. He is working with staff, volunteers, and beneficiaries at the non-profit organisation Pendle Leisure Trust (Nelson, Lancashire). The work is part-funded by National Lottery Community Fund.

The *Relationships Matter* evaluation, conducted by Al Farrier, Raeesa Jassatt,[16] and Ursula Pool, examined staff and parents' experiences of Cumberland Council's existing Resolving Parental Conflict support (a range of free support services, evidence-based online courses, and local programmes designed to **reduce parental conflict, improve communication, and protect children from the impact of family arguments**). As a result of the evaluation, Cumberland Council have made alterations in how they provide services, identifying changes in staff training and new resources to support parents and professionals.

Jonathon Prasad's[17] research interests in **poverty, race, inequality, and the social determinants of health** are being applied in the *Mouth as Autobiography* project to examine how experiences of deprivation, food insecurity, housing, place, and access to services become physically embodied in the mouth. Rather than framing poor **oral health** primarily as individual failure, the project asks how wider systems shape people's capabilities to achieve and maintain good health. (See research poster, p.29.)

UURIP[18] intern Aye Mya Sein supported Ambreen Chohan[19] and others with analysis to explore how breast support could be redesigned to support the specific shape and needs of **females during sport**. Aye's research poster received 2nd prize in the recent UURIP poster conference. This knowledge exchange work will continue to develop with an industrial partner in the coming year and will be presented at Posters in Parliament and the British Conference for Undergraduate Research in 2027.

Heidi Bickis[20] is working on an edited book with Tracey Collett (University of Plymouth) that explores **tiredness, fatigue, and exhaustion** through a social lens and foregrounds

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[18] University Undergraduate Research Internship Programme (UURIP)

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the complex ways fatigue is lived, imagined, and produced in the contexts of the everyday, work, and chronic illness. Challenging individualised and biomedical accounts of fatigue, the book will bring attention to how experiences of fatigue intersect with social inequalities and normative assumptions about health, illness, and the body. The book will be published with Elgar and has as a working title, *Figures of fatigue: tiredness, bodies, and the social*.

Emeritus Professors Lynn Froggett and Malcolm Fisk are producing outputs on **ageing and digital technologies**. See Lynn's podcast on chatbots https://audioboom.com/posts/8938281-episode-1-chatbots and Malcolm's book chapter 'Challenges and Opportunities for Standardization in Ageing Societies' in the book *International Standards for Ageing Societies: Tools for Building Inclusive, Safe, and Sustainable Futures*.

04 STRAND 3: Food systems, nutrition, & sustainable agriculture

Projects under this theme address nutritional deficiencies, food security, sustainable agriculture, food safety, and healthier food systems. The portfolio combines nutrition, agriculture, and public health expertise to address food insecurity, hidden hunger, and sustainable food production.

PACT's contribution to the University's 2026 Research and Knowledge Exchange built upon the significant work of Professor Nicola Lowe, Dr Alejandro Perdomo Lopez, and previous 2024/5 research from Dr Ambreen Chohan, Akua Quao, and UURIP intern Kinza Ramzan on 'reinventing' culinary heat, to engage a local audience in discussion about **food resilience and security**. (See Appendix A, *Feeding Tomorrow: Innovative research for resilient food systems*, p.15.)

Nicola Lowe[21] and Stephen Ede[22] in collaboration with Professor James Flemming (GP) from the East Lancashire Alliance have been leading exploratory research in Burnley to understand **why people make the choices that they do in relation to their health, including what constrains their choices, particularly for food**. The study explored more than one modifiable risk factor: diet, physical inactivity, weight, cholesterol, and smoking to inform future context-relevant interventions and service development.

Alejandro Perdomo Lopez[23] leads a programme of research on **crop cultivation techniques and climate resilience**. Using PACT Activity 1 funding for seedcorn research,

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[22] Dr Stephen Ede, Lecturer in Physiotherapy, School of Health, Social Work & Sport SEde@lancashire.ac.uk

[23] Dr Alejandro Perdomo Lopez, Lecturer in Biology, School of Pharmacy & Biomedical Sciences, APerdomoLopez@lancashire.ac.uk. With Research Assistant Asaad Fiaz and UURIP intern James Sumner.

this year he investigated the performance of elite biofortified wheat varieties under simulated climate change conditions. The study compared five elite biofortified wheat lines with a commercial non-biofortified wheat variety under high-temperature and elevated CO_2 conditions. (See research poster, p.28.) The project delivered essential proof-of-concept information and the technical foundations for future investigations into climate-resilient and nutritionally enhanced wheat as well as developing research infrastructure that can also be utilised by students and industry partners.

Noor-ul-ain Shah's[24] PhD research this year is translating key research findings on **nutrition and dietary diversity** into action within a marginalized community in **Khyber Pakhtunkhwa, Pakistan** in collaboration with charity partners, Abaseen Foundation. In an area where the typical staple diet often fails to support optimal health and nutrition literacy is low, she is designing and delivering a modern nutrition syllabus for primary school children and educator toolkits and capacity-building workshops for parents tailored for the community context. The work will provide participants with the knowledge and skills to improve diets using locally available foods.

An international study ***How do Consumers Wash and Handle Eggs in Southeast Asia?*** led by Jan Mei Soon-Sinclair[25] in collaboration with researchers across Southeast Asia investigated consumer egg washing and handling practices in eight countries to investigate how cross-contamination of food may occur. Drawing on a survey of 2,422 consumers alongside household kitchen observations and interviews, the study highlights how cultural habits, perceptions of cleanliness, and food safety concerns influence consumer behaviour in ways that do not necessarily result in optimal food safety. (See journal article: https://www.sciencedirect.com/science/article/pii/S0956713526006237.)

PhD student Obabiyi Solomon Ajao's[26] roundtable symposium proposal **Breaking Barriers: enhancing food safety culture through inclusive communication** was approved for the International Association for Food Protection annual meeting held in New Orleans, USA. The roundtable symposium featured a panel of speakers from academia, consultancy, and industry practitioners, sharing research, best practices, and opportunities around communications at food manufacturing frontline, especially around reading comprehension and language barriers. (See research poster, p.26.)

PhD student Blessing Okonji[27] with her supervisor Dr Jan Mei Soon Sinclair won PACT's 2025/6 poster competition for the 'most relevant research to society'. Her research is exploring **consumer awareness and perceptions of food fraud - including illegal food production, adulteration, counterfeiting, and smuggling - in Nigeria.** (See research

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[27] Blessing Okonji, PhD student, School of Health, Social Work & Sport BAOkonji@lancashire.ac.uk

poster, p.22.) Blessing has successfully published two research papers this year, focusing on food fraud in Nigeria.

- *'If fake food doesn't kill you, just eat it': Consumer perceptions and normalisation of food fraud in Nigeria*
- *Food fraud in Nigeria: A qualitative study of food supply chain actors, healthcare professionals, and regulatory officials*

05 STRAND 4: Climate resilience & environmental sustainability

Climate resilience and environmental sustainability emerges as the final theme, linked to community resilience, social justice, and net zero transitions. It spans environmental protection, climate adaptation, biodiversity conservation and low-carbon innovation.

Champika Liyanage[28] is collaborating on a number of research projects with colleagues in Sri Lanka at the University of Ruhuna and the Alliance for Aquatic Research and Conservation. This year they collaborated on a QR-funded feasibility assessment for developing policy recommendations for implementing **carbon capture and storage (CCS) to achieve net-zero emissions** in Sri Lanka. The seedcorn research involved a comparative review of national policy frameworks with the UK, India, and Malaysia, data collection on current carbon management and CCS policy adoption, and interviews and consultations with Sri Lanka Ministry of Environment and industry representatives. A report is now being drafted for distribution and discussion with stakeholders as the basis for comprehensive CCS policy development. (See research poster, p.24.)

The same partners in Sri Lanka worked with Champika Liyanage, Nicola Lowe and Swarnim Gupta on a QR participatory research project to raise community awareness for **microplastic contamination** in southern Sri Lankan agricultural systems. (See research poster, p.25.)

Marco Picco's[29] seedcorn project this year advanced a programme of research on **low-energy, conductive–radiative personal comfort systems (PCS)**. Although the potential for heated desks for thermal comfort in offices had previously been identified, subsequent experiments had also shown the importance of distributing heat between body regions for beneficial effects. PACT Activity 1 funding supported Marco to develop a modular next-generation prototype and move towards further experimental and

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[29] Dr Marco Picco, Lecturer in Building Services Engineering, School of Engineering & Computing MPicco@lancashire.ac.uk

numerical optimisation. Next steps will include workstation modelling and human-centred testing and a future funding proposal for low-carbon personal heating solutions.

With a small pot of PACT Activity 5 funding, Bob Walley[30] with the artist Rebecca Freeman and the Planetary Lab (Exeter Science Centre) engaged over 80 people at the Pilton Green Man event in Barnstaple to talk about changes people would like to see for a more **sustainable and resilient community in the face of the climate and ecological emergency**. Participants were encouraged to collectively create a future re-imagining mural to represent what Barnstaple could look like in 30 years' time (see Yearbook front cover and website Our Positive Future on tour). Bob and collaborators will continue this research in coming years to explore possibilities and engage with communities on responses to the climate and ecological emergency.

Don Subasinghe's[31] research on the role of **'micro human efforts' (MHEs) in disaster rebuilding** offers a novel sustainable approach to disaster recovery following climate-induced disasters. An accepted article in *Journal of Cultural Heritage Management and Sustainable Development* establishes a methodological framework for integrating intangible cultural heritage into collective recovery strategies to promote long-term resilience to future disasters.

Research findings by Chloe Heys[32] *et al.* on **birds' sexual behaviour** was widely picked up in media across the world (see the University website and The Conversation). The findings have important implications for bird welfare and captive breeding programmes since they show that masturbatory behaviour is not an outcome of stress, bad health, or poor environment in captive birds.

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APPENDIX A - External events

Some of the events that were open to partners, stakeholders and the general public were supported by internal funding. Our thanks to Westlakes Research Ltd for financial support for the *Community-Led Regeneration* workshop. Our thanks to the University's Research & Knowledge Exchange (RKE) Festival support for the *Feeding Tomorrow* session.

NOVEMBER 2026 - 4C webinar *Is there a place for civic leadership in universities?*
A seminar/webinar organised by the Centre in Community Connectedness and Co-operation, to discuss Matthew Guest's PhD research, examine what civic leadership may be, and open up discussions about the leadership role of universities in their wider communities.

Speaker: Matthew Guest

DECEMBER 2025 – PACT 1st Film Festival
To showcase and discuss video and film outputs in research.

Speakers: Professor Nicola Lowe, Dr Al Farrier, Jonathon Prasad and Adrian Murrell, Bob Walley

JANUARY 2026 – 4C webinar From Dreams to Justice: Social Dreaming as a Practice of Community Connectedness in Decolonising Higher Education
To explore social dreaming practice as practical method for social justice work in higher education and community contexts.

Speaker: Dr Neo Pule (University of Johannesburg), Professor Julian Manley

FEBRUARY 2026 - 4C webinar "More than a Funder": Towards Community-Driven Philanthropy
A webinar to introduce, and explain the background to, a new five-year Lottery-funded project being rolled out in locations across Cumberland which will use the Connected Communities approach as a vehicle for identifying funding priorities in local areas.

Speakers: Mark Wear (National Lottery), Dr Suzanne Wilson, Dr Katherine Jewell

FEBRUARY 2026 – 4C seminar YourMap: Community Intelligence for Place, Pride, and Community Wealth
A seminar to discuss how local communities can be supported by intelligent digital support, using the example of a community group from Brookfield providing the local people knowledge, and NewsSocial Coop providing the AI support.

Speakers: Chris Davis (Brookfield), Ali Al-Assam (NewsSocial)

MARCH 2026 – Workshop *Community-Driven Regeneration*
A workshop at Westlakes West Cumbria campus to showcase the University's expertise on regeneration and its relevance to the UK Government's new Pride in Place programme.

Speakers: Dr Suzanne Wilson (convenor), Dr Al Farrier, Professor Julian Manley, Dr Ursula Pool, Dr John Scanlan, Ecaterina Stefanescu, and Dr Don Subasinghe.

APRIL 2026 – PACT Annual Convention *What does the Lancashire Growth Plan mean for us & our research?*
To explore the Lancashire Growth Plan in more depth and understand the opportunities it presents for researchers to take forward meaningful collaboration with local partners.

Speakers: Andy Walker (Lancashire County Council) and Matthew Guest.

MAY 2026 – *Feeding tomorrow: Innovative research for resilient food systems*
A contribution to the RKE Festival with three research presentations to discuss a range of emerging food technologies that offer hope for food security and resilient food systems and the conditions in which to roll them out sustainably and equitably.

Speakers: Professor Nicky Lowe, Akua Quao, Dr Alejandro Perdomo Lopez

JUNE 2026 – GRACE symposium *Exploring Race, Inequality, and Social Justice in a Changing World*
An interdisciplinary symposium showcasing cutting-edge research and an opportunity to engage with emerging evidence, critical perspectives, and innovative approaches to addressing racial inequality across multiple domains. Organised by the Global Race Centre for Equality (GRACE).

Speakers: Professor Abdul Razaq (Director of Public Health, Blackburn with Darwen Borough Council / GRACE), Jonathon Prasad, Shingai Musuka, Che McGarvey Gill, Adrian Murrell (Windrush Initiatives CIC), Christine Channer (University of Bedfordshire), Rebecca Hibbin, Allwell Uwazuruike, Komali Kantamaneni, Chinyere Ajayi, John Wainwright, Rachel Nir

JUNE 2026 – 4C webinar *Reframing Rochdale: Centring Race and Indigeneity in Co-operation across the Americas*

A webinar to explore the arguments in Dr Spicer's book *Co-operative Enterprise in Comparative Perspective: Exceptionally Un-American?* (2024) which asked why co-operatives scaled in some wealthy democracies yet never institutionalized nationally in the United States, concluding that the cause lay not in any cultural aversion to co-operation, but in state-mediated institutional arrangements. The webinar revisited the standard "Rochdale origin story" of co-operation through the lenses of settler colonialism and racial capitalism, using three cases: the United States, Canada, and Brazil.

Speaker: Dr Jason Spicer (City University, New York).

APPENDIX B – Research Conversations

Research conversations are internal, informal sessions designed to bring together researchers and other staff from across the University of Lancashire. In 2025/6 our series comprised sessions led by individual staff focusing on their particular research interest. We encouraged in-person attendance at our Preston campus, with the intention to develop stronger personal connections between people, and provided online joining links to colleagues at other campus locations if required.

21 October 2025 – Fleeing and walking: escaping trauma and walking into your place identity with Kate Wilson, to talk about walking as a method of research in improving mental health, place identity, and creating a sense of belonging.

5 November 2025 - Negotiating research boundaries: lessons learnt from working with prison populations with Dr Al Farrier, to discuss practical research methods and tips for researching in high-security environments and across multiple organisational boundaries.

13 January 2026 - Post-PhD preparation: Knowing your options and working out how to get on (and stay on) the right career track with Dr Tamsin Walker, to discuss how best to position yourself for a successful research career post-PhD completion.

4 February 2026 - Rethinking tiredness through a sociological lens with Dr Heidi Bickis, to discuss Heidi's work in progress thinking about the body and fatigue through a sociological lens.

11 March 2026 - Comensus: community researchers on your doorstep! with Dr Janet Garner, Kizzy Felstead, Sue McClenaghan, and Raj Tayya to discuss Comensus group's work and the experiences of people acting in the role of 'community researcher'.

10 June 2026 - REF 2029: Preparing for it together with Jehan Rehani (RKES) and Professor Nicky Lowe, to understand the Research Excellence Framework and what is new in this round, and how we might work across Units of Assessment.

APPENDIX C – Research posters

The posters presented on the following pages were produced from research and other activities carried out by PACT members between 1 August 2025 and 31 July 2026. They were displayed at PACT's Annual Convention in April 2026.

The posters are in **alphabetical order by poster title**.

PAGE	POSTER DETAILS
19	**Alternative Futures** Sam Eadington, Ecaterina Stefanescu & Wharf Building technical team
20	**Beyond stereotypes and tradition: Reframing knowledge production through the Comensus model of inclusive research** PARITY research group: Kizzy Felstead, Sue McClenaghan, Angela Melling, Raj Tayya, & Janet Garner
21	**Connected communities** Suzanne Wilson, Katherine Jewell, Julian Manley, Mark Wear, Lynsey Crosthwaite, and Emma Williamson
22	**Critical pedagogy in pictures** Katherine Jewell
23	**Food fraud awareness and perceptions in Nigeria** Blessing Okonji with Jan Mei Soon-Sinclair
24	**From smoke to storage** Champika Liyanage with KMTS Bandara and W Sanjaya Weerakkody, University of Ruhuna, Sri Lanka, and RR Jayasinghe, Alliance for Aquatic Research and Conservation, Sri Lanka.
25	**Microplastics in farming** Champika Liyanage, Swarnim Gupta, Nicky Lowe, KMTS Bandara and W Sanjaya Weerakkody, University of Ruhuna, and RR Jayasinghe, Alliance for Aquatic Research and Conservation, Sri Lanka.
26	**Overcoming communication and engagement barriers to strengthen food safety culture** Obabiyi Solomon Ajao with Jan Mei Soon-Sinclair, Carol Wallace, Lone Jespersen, Sophie Wu

PAGE	POSTER DETAILS
27	**Rethinking community cohesion: Exploring community cohesion through creative practice in a UK coastal community** Suzanne Wilson, Lavinia Haslam, Champika Liyanage, Asha Haputhanthirige, Ambreen Chohan
28	**Smart fertilisers: A strategy to enhance nitrogen use efficiency for sustainable agriculture** Asad Fiaaz, Alejandro Perdomo Lopez
29	**The mouth as autobiography** Jonathon Prasad



Master of Architecture student work: urban and historical analysis ; proposal for a new civic typology of care, share and repair

ALTERNATIVE FUTURES

Project team: Sam Eadington, Lee Ivett, Ecaterina Stefanescu + technical team, Wharf Building
Master of Architecture tutors: Lee Ivett, Nyima Murry, Sam Eadington
External collaborators: GlassBall Studio, Lancashire Archives, Skelmersdale Library
Exhibition: Skelmersdale Library, from 18 May 2026

This project is a collaboration with arts organisation Glassball and Lancashire Conservation Studios to conceive, design and create a public exhibition of architectural models relevant to the creation of Skelmersdale New Town. The project explores new ways of connecting a community that is subject to contested regeneration narratives and processes with its origin story as a progressive modernist new town. This significant and fundamental aspect of the town's history is often forgotten within the conversation about the town's future and the *Alternative Futures* project seeks to celebrate this architectural heritage and reposition it as a source of pride, importance and identity.

Working with Glassball and the Master of Architecture students (cohorts 2024/2025 + 2025/2026) we have designed and developed an adaptable, flexible and mobile system of exhibition and display infrastructure that supports the showcase of the original collection of Skelmersdale New Town architectural models that are over 50 years old and, now considered heritage and conservation assets in themselves. These models have been undergoing restoration at Lancashire Conservation Studios and have never been exhibited publicly since their initial use by the Lancashire County Council and the County Architects Department for public engagement. This project therefore also seeks to understand and appreciate how these processes impact upon the exhibition and public access to these heritage objects.

The mobile exhibition system has been co-designed with the project stakeholders using scale models, and pre-fabricated using the waterjet cutter in the Wharf Building Engineering and Architecture Workshops, with help with the technical team. They are due to be assembled on site in Skelmersdale Library for the months-long free public exhibition in May 2026.



Photographs of some of the original Skelmersdale architecture models undergoing conservation and being documented and digitised by GlassBall.

University of Lancashire Master of Architecture students and project stakeholders during a co-design and development session at the Lancashire Conservation Studios



The development and design process, using 1:10 scale models and prototypes cut using the fabrication technologies in the Wharf Building. The tabletops require treating to protect the fragile Skelmersdale architectural models. New designed and fabricated brackets are used to fix the models in place.

Beyond stereotypes and tradition: re-framing knowledge production through the Comensus * model of inclusive research



*Comensus supports the University of Lancashire to co-create curriculum content in partnership with service users, carer, patients, and the public. There are over 100 public members who share their lived experience of health and social care conditions.

Contact:Comensusoffice@lancashire.ac.uk 01772 893818

University of Lancashire

COMMUNITY FUND

CONNECTED COMMUNITIES

Dr Suzanne Wilson, Dr Katherine Jewell & Professor Julian Manley (University of Lancashire), Mark Wear (The National Lottery Community Fund), Lynsey Crosthwaite (Cumberland Council) and Emma Williamson (BEC)

Aim

Pilot a youth-driven citizen researcher community methodology to identify place-based grant-making priorities for the National Lottery Community Fund.

Objectives

Between 2026 and 2031, Connected Communities for Change will:

- Work with local stakeholders to recruit and train ~150 young community researchers (YCR) aged 10-16 years old.
- Collaborate with local institutions and the third sector to support data collection (door-to-door interviews) and foster trust, relationships, engagement and participation.
- Support YCRs in the co-analysis of data to understand community perceptions of local assets, needs and priorities, in relation to the National Lottery Community Fund's strategies and priorities.
- Bring YCR together with key partners and stakeholders to a) identify place-based grant-making priorities and b) create the conditions for co-production and capacity building.
- Create a forum for the present and future development of participation in democratic governance by and for the community.

Locations

Five locations in Cumberland, Cumbria have been selected, based on their different physical, economic and social characteristics.

- Aspatria
- Ewanrigg
- Northside
- Egremont
- Millom



Research Process

The same youth participatory action research process will take place across all the research locations. However, recruitment and sampling (the young people we seek to work with and how we approach them) will vary across the locations, as will the specific research methods.



Community engagement and relationship building

- Collaborate with stakeholder organisations
- Co-produce training programme
- Finalise training programme

Community researcher training

- Recruit Community Researchers
- Community Researcher training
- Community Researcher graduation





Data collection, analysis and presentation

- Data collection
- Co-analysis
- Community presentation

Community response, organising and capacity building

- Community response
- Community organising
- Capacity building

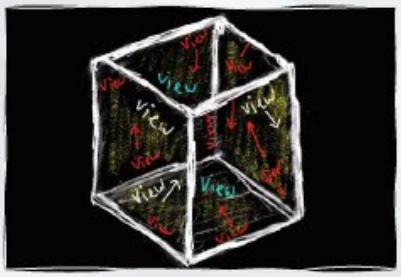


Impact

- Individual: Young people will develop new skills and have access to unique opportunities to gain experience in community research and leadership.
- Community: Communities will benefit from funding to respond to the findings of the community research, building capacity and provision.
- Organisational: The National Lottery Community Fund will have a new model to support them in embedding their commitment to becoming 'more than a funder' and ensuring community power is central to the grant making process.

For more information contact Suzanne Wilson: swilson21@lancashire.ac.uk

Critical Pedagogy in Pictures











Dr Katherine Jewell
kjewell1@lancashire.ac.uk

Food Fraud Awareness and Perceptions in Nigeria

Blessing Okonji (Baokonji@uclan.ac.uk) and Dr. Jan Soon-Sinclair.
University of Lancashire, Preston. PR1 2HE/ School of Health, Social Work and Sport.

Introduction

Food fraud is a crucial global concern posing and public health threat to consumers, the food supply chain, and the economy of a country. In Nigeria, affecting both safety and quality reported food fraud activities, include food adulteration, counterfeiting, illegal food production, and smuggling activities around the borders.

Literature Review



Research Objectives

- To ascertain consumer's awareness and perceptions of food fraud.
- To identify and map vulnerable food and the food supply chain.

Methodology



Results

Food fraud consumer awareness:

- 50% of the respondents were aware of food fraud, 38% were unfamiliar with the term, and 15% were unsure.
- The ease of committing food fraud and financial benefits were indicated as food fraud's primary motive.
- 86% of respondents identified adulteration as a major form of food fraud act.

Vulnerable food supply chain, food and states:

- The food production sector was identified as the most susceptible in the food supply chain.
- Fat and oils, as well as herbs and spices, were regarded as the most vulnerable food items.
- Abia State was indicated to have the highest food fraud activities, with Abuja and Lagos being the next most probable states.

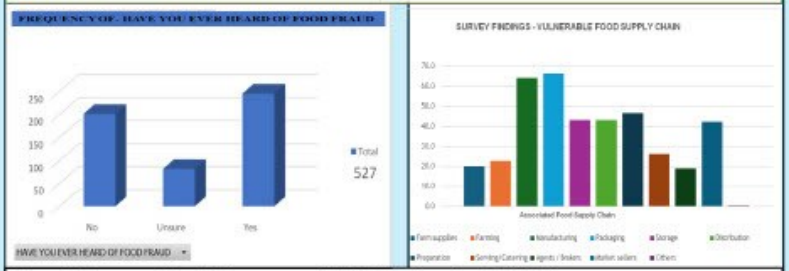


Figure 1: Frequency of food fraud awareness and is food fraud a problem in Nigeria?



Figure 2: Food Fraud Incident in Nigeria.

Findings

Based on the correlation test;

- ✓ Both male and female consumers of all age groups ascertained that food fraud threat in Nigeria owing to the heightened food fraud incidents in the country.
- ✓ Consumers with high educational level as well as consumers who were employed revealed a high level of food fraud awareness owing to their exposure to academic literatures and professional network.

Conclusion

This study demonstrated that food fraud activities is prevalent in Nigeria, and consumers who are aware of food fraud indicated its threat to the food consumers. Hence, a joint effort was recommended to create food fraud awareness, prevention, and control.

Reference

National Agency for Foods and Drugs Administration and Control (NAFDAC). (2023). NAFDAC Bursts Large Hauls of Fake Wines, Soft Drinks, and Consumables – NAFDAC. Nafdac.gov.ng. https://old.nafdac.gov.ng/nafdac-bursts-large-hauls-of-fake-wines-soft-drinks-and-consumables/

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Soon-Sinclair, J. M., Imathiu, S., Obadina, A. O., Dongho Dongmo, F. F., Kamgain, A. D. T., Mcholisa, E., Saba, C. K. S., Walekhwa, A. W., Hunga, H., & Kuasaga, J. (2023). How Worried Are You about Food Fraud? A Preliminary Multi-Country Study among Consumers in Selected Sub-Saharan African Countries. Foods, 12(19), 3627. https://doi.org/10.3390/foods12193627

Acknowledgment

Acknowledging Prof. Carol Anne Wallace, Dr. Jan Mei Soon-Sinclair, and Dr. Shingai Nyarugwe from the University of Central Lancashire. Prof. Kemka Humphery and Dr Stephen Okonji.

FROM SMOKE TO STORAGE

"CCS POLICY FEASIBILITY FOR NET-ZERO SRI LANKA"

What is CCS?

CCS *(CARBON CAPTURE AND STORAGE)* traps CO_2 from industries and stores it safely underground to fight Climate Change

Why it matters?

- Reduces industrial CO_2 emissions
- Prevents greenhouse gases from entering the atmosphere
- Supports a cleaner, sustainable planet
- Helps slow climate change

Our Goal

In this project, we aim to support Sri Lanka's journey to net-zero CO_2 emissions by providing insights to guide future government policies







What We Do?

- Review Sri Lanka's climate policies, emissions, and key industries
- Engage government bodies and major industrial sectors
- Conduct interviews and discussions to understand challenges and readiness
- Propose practical steps for future CCS policy development
- Evaluate technical, economic, and policy readiness for CCS
- Compare with global CCS practices and identify policy and capacity gaps

Contact: Dr Clare Mumford, University of Lancashire
Email: CMumford@lancashire.ac.uk

Funded by : PACT : Seedcorn Research/Knowledge Exchange 2025-6

University of Lancashire

AARC

OPEN LAB

MICROPLASTICS IN FARMING

Microplastics are tiny plastic particles that contaminate irrigation water and soil





Why It Matters?

1. *Affects soil health*
2. *Enters the food chain through crops*
3. *Contaminates irrigation and drinking water*
4. *Poses health risks to farming communities*





What This Project Does?

- ✓ Raise awareness among farmers through workshops
- ✓ Identify contamination sources using questionnaires and discussions
- ✓ Raise awareness through street dramas, poster and video competitions
- ✓ Empowering communities to protect soil, water, and future food security.

Contact: Prof. Champika Liyanage , University of Lancashire
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University of Lancashire

AARC

OPEN LAB

Funded by - PACT : Participatory Research Fund 2025/26

Overcoming Communication and Engagement Barriers to Strengthen Food Safety Culture

Obabiyi Solomon Ajao | Supervisors: Dr Jan Mei Soon-Sinclair, Emeritus Prof Carol Wallace, Dr Lone Jespersen, Dr Sophie Wu
School of Health, Social Work and Sport, University of Lancashire, UK • In partnership with Cultivate SA

BACKGROUND

Communication barriers weaken food safety systems and create real risk.

Food Safety Culture: the human-behaviour side of safety, is now central to compliance, and communication is one of its core dimensions.

A linguistically diverse workforce and overlooked shopfloor workers (including those with limited education or learning difficulties) create persistent blind spots.

Food safety culture assessment tools are built by experts and rarely fit the workers they're meant to measure.

WHY IT MATTERS

600M people affected by foodborne illness each year *(WHO, 2022)*

> ***Effective communication across the food chain is one of the few preventable factors we can fix.***

AIM & OBJECTIVES

AIM

Investigate communication challenges in the food manufacturing context. Mitigate communication barriers in assessing food safety culture and subsequently assess the food safety culture maturity profile of participating food manufacturing companies.

OBJECTIVES

1 Assess reading & comprehension skills of food handlers and examine organisational and national cultural influence on communication.

2 Adjust and translate the FSC assessment tool to accommodate lower reading and comprehension levels.

3 Assess FSC maturity profile per site using a mixed-method approach (survey + focus group / interview).

PARTICIPANTS

FMC-A • Meat	FMC-B • Seafood
n = 68	**n = 49**
4 plant sites (USA)	3 operational units (USA)
81% non-natives	50% non-natives
18% no English fluency	0% no fluency
Mainly secondary education	72% tertiary education

METHODS

1 Company selection
English-speaking, high-immigration; Global standards framework benchmarked (e.g., BRCGS / GFSI).

2 RCS Assessment
Online Qualtrics survey adapted from Read Forward (a free online adult literacy assessment tool), based on the IALS framework and aligned with NAAL (USA), SLS (UK) and ALLS (AUS).

3 English text simplification
A simple step-by-step method for adjusting and simplifying English texts (Rets et al., 2022; Read Forward):

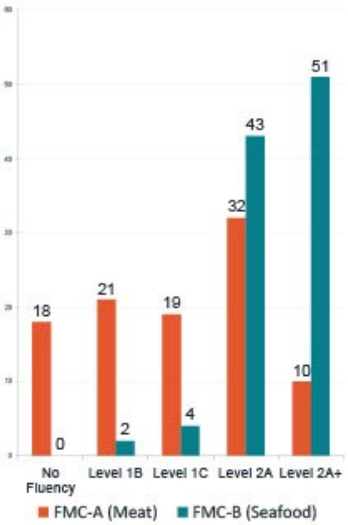
- Know the audience
- Keep the original text
- Find the main message
- Find the hard parts of the text
- Do a quick first rewrite
- Fix the words
- Fix the sentences
- Fix the order of ideas
- Make abstract ideas real
- Make the action clear
- Check the tone
- Fix the layout

4 FSC Maturity Assessment
Assessment of maturity profile using the adjusted and translated Cultivate SA food safety culture model 3.0. Online survey (open and closed-ended questions) combined with focus group discussion.

5 Analysis
Descriptive statistics, Chi-square (χ^2) associations and Cronbach's Alpha (α) reliability — SPSS v29.

KEY RESULTS: RCS DISTRIBUTION

Reading & Comprehension Skill Level by FMC (% of respondents, N=68 & 49 for FMC-A and FMC-B



KEY FINDINGS

- **Literacy gaps are real and measurable** — A significant share of food handlers read at Level 1B–1C; in FMC-A, 18% had no English fluency.
- **Language drives comprehension — not education** — No significant association between formal education and RCS. First-language dominance matters more than qualifications.
- **Production unit & site matter** — Moderate, significant links between RCS and operational site (FMC-A, p = 0.045) and department (FMC-B, p = 0.038) — not age or experience.
- **Workforce profiles differ sharply** — FMC-A (meat) attracts recent immigrants with lower English proficiency; FMC-B (seafood) is more educated and fluent.
- **Significant difference in readability** — The initial text and the final simplified / adjusted text were assessed for readability (a measure of how easy a piece of text is to read).

RELIABILITY OF THE ADJUSTED SURVEY

Table 1: Result of Cronbach's Alpha Analysis for test of reliability of the adjusted & simplified version of the food safety culture survey (Pilot Test)

Dimension	N (Total N=147)	No. of items	Cronbach's α
Food Safety Culture	135	15	0.963
Vision and Mission	142	3	0.881
People	145	3	0.835
Consistency	141	3	0.833
Adaptability	144	3	0.871
Risk	141	3	0.844

ORIGINAL CONTRIBUTION

- **First study** to investigate reading & comprehension skills within FMCs and examine their implications for FS risk, practices and compliance.
- **Captures diverse literacy profiles** in multi-ethnic FMC workforces and demonstrates the extent of communication challenges in the industry.
- **Establishes the need for translation,** simplification and visual aids in FS communication and FSC assessment instruments.
- **Developed a step-by-step process** / guide that can be applied to improving food safety messages in the food manufacturing industry.

ONGOING / FURTHER WORK

- **Assess FSC maturity** of each site — mixed-methods: online survey + focus groups / semi-structured interviews.
- **Compare FSC patterns** and gain further insights into communication strategies / challenges in the organisations through the group discussions.

KEY REFERENCES: *Jespersen et al. (2016) Food Control; Nayak & Waterson (2017) Food Control; Sharman, Wallace & Jespersen (2020) Trends Food Sci Tech; WHO (2022); Bow Valley College (2014) Read Forward.*

Contact: OAjao@lancashire.ac.uk • University of Lancashire • School of Sport and Health Sciences • Industry partner: Cultivate SA

Rethinking Community Cohesion: Exploring Community Cohesion Through Creative Practice in a UK Coastal Community

Suzanne Wilson[1], Lavinia Haslam[1], Champika Liyanage[1], Asha Haputhanthirige[1], Ambreen Chohan[2]

[1] Institute for Planetary Resilience and Community Transformation, University of Lancashire, Preston, UK

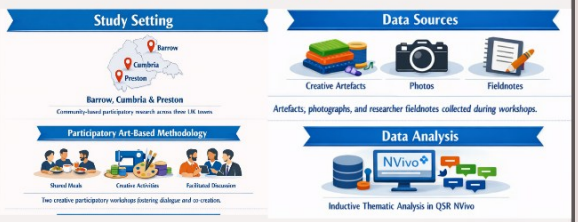
[2] Global Race Centre for Equality, University of Lancashire, Preston, UK



Introduction

The 2024 riots across twenty-five towns in the United Kingdom exposed deep-rooted challenges at the intersection of community cohesion, public perception, and immigration discourse. While existing policy frameworks have prioritised strengthening community networks and addressing social inequalities, they often overlooked the multi-layered nature of integration and community cohesion. This gap highlights the need for innovative, creative, and capacity-building approaches that can foster meaningful inclusion, belonging, and cohesion within diverse communities.

Method



Aim

This study aimed to explore the barriers and enablers to inclusion in transitional spaces for sanctuary seekers through creative approaches.

Results







Figure 1: Art-based participatory workshop set up and creations (above)



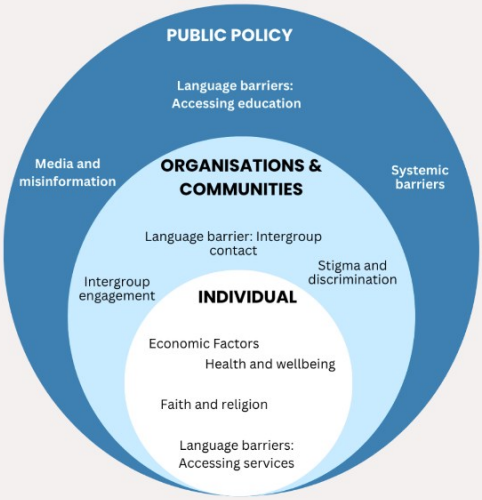


Figure 2: Multi-level barriers to community cohesion

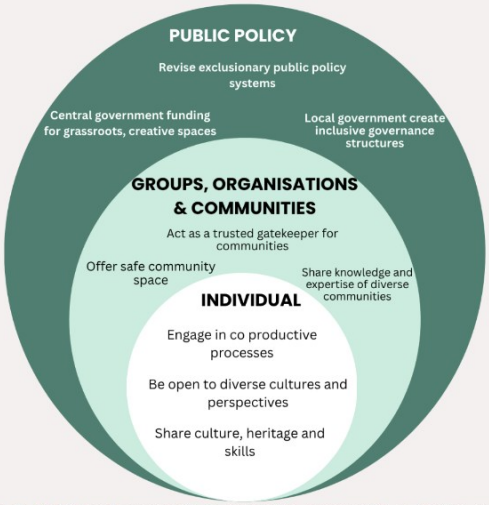


Figure 3: Multi-level approach to promote community cohesion using creative spaces

Conclusion

- Inclusion and community cohesion are multi-dimensional, operating on individual, community and policy levels.
- Creative methods can support inclusive and accessible environments between diverse communities by:
  - **Reducing language barriers** through creative expression, to **reduce isolation, stigma and discrimination** and **improve wellbeing**.
  - Supporting diverse communities in navigating trauma, building resilience and confidence in communities.
  - Celebrating shared heritage and making space to share creative skills, create new opportunities for diverse communities.
- Creative approaches address multi-layered dynamics of **inclusion and community cohesion** through inclusive **governance,** serving as a vehicle for **intercommunity education.**

References **Scan to read our policy document**

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Smart Fertilisers: A Strategy to Enhance Nitrogen Use Efficiency for Sustainable Agriculture

Asad Fiaaz - Masters by Research School of Pharmacy and Biomedical Sciences
Supervised by Dr Alejandro Perdomo Lopez

University of Lancashire

Levity CROP SCIENCE

BACKGROUND & RATIONALE

Why nitrogen use efficiency matters

Nitrogen is the primary determinant of photosynthetic capacity, grain yield and quality in cereal crops. Modern agriculture depends on synthetic nitrogen fertilisers, yet a substantial proportion of applied nitrogen is lost through volatilisation, leaching and denitrification, contributing to greenhouse gas emissions and water contamination.

Improving Nitrogen use efficiency (NUE) is therefore an important factor for developing more sustainable agricultural systems as it enables a reduction in fertiliser input requirements and minimises nitrogen losses to the environment.

Smart fertilisers, such as stabilised amine nitrogen (SAN) formulations, offer a promising route to improved NUE, but existing research focuses almost entirely on agronomic outcomes. The physiological and biochemical mechanisms behind any improvement remain unknown. This project aims to address that gap directly.

AIMS

This study aims to (i) assess the effects of SAN fertiliser on plant growth and photosynthetic performance, and (ii) evaluate its impact on nitrogen metabolism and associated biochemical markers linked to NUE, by directly comparing SAN (Lono) with conventional fertilisers,

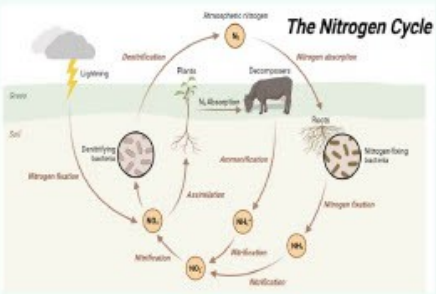

Image 1: Overview of the nitrogen cycle, adapted from Sharma (2025)

CONVENTIONAL FERTILISERS VS STABILISED AMINE NITROGEN (SAN)



Image 2: Comparison of conventional vs SAN fertiliser, adapted from Amra Bratovcic (2022).

	Conventional	Stabilised Amine Nitrogen
Nitrogen form	Inorganic (Urea/nitrate)	Stabilised amine
Application	Soil-applied	Foliar spray
N Losses	High – up to 50%	Significantly reduced
Availability	Rapid – then lost	Prolonged
Nitrogen Use Efficiency (NUE)	Low	Potentially higher
N Input Rate	80 kg N/ha	1.44 kg N/ha

Table 1. Comparison of conventional nitrogen fertilisers and stabilised amine nitrogen (SAN; Lono)

EXPERIMENTAL DESIGN

Research approach

Spring barley (*Hordeum vulgare*) grown from seed in a controlled glasshouse environment: 12-hour photoperiod, 1000–1200 µmol m^{-2} s^{-1} PPFD, temperatures above 14°C.
Five treatment groups, 10 biological replicates each (n = 50) *(figure 1)*. Application rates reflect commercially recommended practice for each product, allowing NUE to be assessed on a per-unit nitrogen basis.

SAN (Lono)	Urea	Sulphate of ammonia	Calcium nitrate	Untreated
KEY	CONVENTIONAL	CONVENTIONAL	CONVENTIONAL	Control

- Plant height, tiller number and growth stage recorded weekly throughout the experiment. At senescence, grain yield and total dry biomass will be harvested and weighed.
- Gas exchange and chlorophyll fluorescence measured in the flag leaf at booting stage (GS 45–47) using an LI-6800 portable photosynthesis system (*figure 2*). Leaf nitrogen content tracked weekly using PhotosynQ.
- Leaf tissue snap-frozen at booting stage. Total soluble protein and chlorophyll content quantified by biochemical assay. Abundance of four key proteins — RuBisCO, RCA, GS and GOGAT — determined by Western blotting.

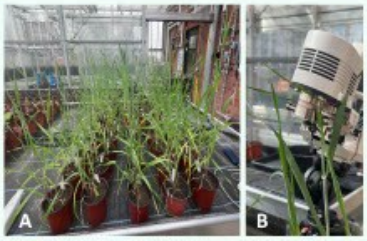

Figure 1. (A) Hordeum vulgare grown under controlled glasshouse conditions. (B) Measurement of leaf photosynthesis using a LI-6800 portable gas exchange system.

BIOCHEMICAL ANALYSIS - KEY TARGET PROTEINS

Study measurements

Flag leaf tissue snap-frozen in liquid nitrogen at booting stage. Total soluble protein (Bradford assay) and chlorophyll content (spectrophotometry) quantified alongside target protein abundance via SDS-PAGE and Western blotting using specific primary antibodies.

Glutamine Synthetase (GS)
Catalyses the incorporation of ammonium into glutamate to form glutamine.
The primary route of nitrogen assimilation.

Why it matters - Reflects the plant's capacity to assimilate applied nitrogen and is a key indicator of NUE.

Glutamate Synthase (GOGAT)
Functions alongside GS, transferring the amide group from glutamine to regenerate glutamate.

Why it matters - Together with GS, represents overall nitrogen assimilation capacity - limitations at either step reduce efficient incorporation into protein.

Rubisco
Primary enzyme of carbon fixation and the most abundant protein in C_3 leaves, representing the largest nitrogen investment in the plant.

Why it matters - Links nitrogen availability to photosynthetic capacity and growth.

Rubisco Activase
Maintains Rubisco in an active state by removing inhibitory sugar phosphates from its active site.

Why it matters - Allows distinction between photosynthetic capacity (Rubisco abundance) and functional efficiency (Rubisco activation).

More N assimilated (GS & GOGAT activity) > **Greater RuBisCO abundance** (N allocated to photosynthesis) > **Higher photosynthetic capacity** (RCA activation) > **Improved yield & NUE** (core project outcome)

SIGNIFICANCE & IMPACT

Why this research matters

If SAN fertilisers can maintain crop productivity with less nitrogen input, the environmental and economic benefits are substantial

Reduced Environmental Impact
- Improving NUE means less nitrogen lost to air and soil
- Reduces nitrous oxide emissions and pollution

Protection of Water Systems
- Lower nitrate leaching into rivers and groundwater
- Helps protect aquatic ecosystems and water quality

More Efficient Agriculture
- Potential to maintain yield with lower nitrogen input
- Reduces fertiliser use and associated cost

Mechanistic Understanding
- Identifies how fertilisers affect cellular plant function
- Supports optimisation of fertiliser strategies

Better NUE > **Lower emissions + Cleaner water** > **Less loss** > **Sustainable production**

REFERENCES



The Mouth as *Autobiography*

A conceptual exploration of how structural deprivation writes itself into oral tissue across the life course — and why reading that record is an act of political and moral reckoning

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KEYWORDS

Oral health inequalities · Dental inscription · Structural violence
Capabilities approach · Embodiment · Post-industrial poverty · Health justice

> *Every mouth tells a story. The decay, the extractions, the enamel formed in the first years of life — these are not features of individual biology. They are* **chapters written by circumstance**: *by diet and nutrition, by housing, by work, by services, and by political decisions made long before a person was born. To read the mouth is to read a life. To read that life honestly is to encounter* **structural injustice.**

THE AUTOBIOGRAPHY OF THE MOUTH — ACCUMULATION OF DENTAL INSCRIPTION ACROSS THE LIFE COURSE

PRE-NATAL — Before Birth
Maternal poverty
Nutritional deprivation
Chronic stress
↓
Enamel formation disrupted in utero

EARLY LIFE — Ages 0–5
Sugar environment
Illness & infection
Overcrowded housing
↓
Enamel hypoplasia early decay begins

CHILD-HOOD — Ages 6–16
School disruption
Inconsistent NHS access
Food poverty
↓
Untreated caries first extractions

ADULT-HOOD — Ages 17–50
Precarious work
Chronic stress
Bruxism, gum disease
↓
Cumulative tooth loss periodontal disease

LATER LIFE — Ages 50+
Edentulism
Oral cancer risk
Social isolation
↓
Full biographical inscription complete

OUTCOMES

Capability deprivation

Stigma & social exclusion

Inequality reproduced

Position I - The Problem: THE NEGLECTED MOUTH

Tooth decay is the leading cause of hospital admission for children aged 5–9 in England, with over 35,000 undergoing dental extractions under general anaesthetic each year. This burden is not randomly distributed: it follows the social gradient with a precision that should disturb us far more than it does.

The dominant response, behavioural public health, addresses diet, brushing, and attendance. This is not wrong, but it is incomplete — it reads the symptoms without reading the story, treating the mouth as a site of personal failure rather than a record of structural conditions people did not choose. This research argues that oral health is a neglected domain of health justice, and that this neglect is itself an injustice demanding both conceptual reframing and political response.

Position II - The Concept: DENTAL INSCRIPTION

I propose dental inscription as a conceptual framework naming the process by which structural deprivation is materially written onto oral tissue over time, rendering the mouth a biological archive of social inequality (Prasad, 2026).

Krieger's Ecosocial Theory (1994; 2021) argues that social and material conditions are biologically embodied over the life course. Oral health illustrates this with unusual vividness. Enamel hypoplasia encodes early-life deprivation permanently in dental tissue; patterns of decay and tooth loss narrate socioeconomic history. A clinician examining the mouth of a patient from a deprived community is, in a precise sense, reading a life.

The question is not why these individuals made poor choices — it is what society inscribed on their bodies, and whether we are prepared to take responsibility for it. Poor oral health is not only an outcome of inequality but a mechanism of its reproduction: through stigma, reduced employability, and the curtailment of social participation across the life course.

Position III - THEORETICAL FRAMEWORK

- **Nancy Krieger. (Methods for the Scientific Study of Discrimination and Health: An Ecosocial Approach, 2012)**
  Ecosocial theory; embodiment — social conditions become materially inscribed in biological tissue over the life course
- **Paul Farmer. (An Anthropology of Structural Violence, 2001)**
  Structural violence — avoidable suffering concentrated in the powerless is injustice, not misfortune or natural variation
- **Amartya Sen & Martha Nussbaum. (The Quality of Life, 1993)**
  Capabilities approach — health as foundational to human freedom, dignity, and full social participation
- **Sridhar Venkatapuram. (Health Justice: An Argument from the Capabilities Approach, 2011)**
  Health justice — the capability to be healthy as a fundamental moral claim that society is obligated to honour
- **Michael Marmot. (The Health Gap, 2015)**
  Social gradient; health equity — avoidable inequality running through the full social hierarchy is unjust
- **Norman Daniels. (Just Health: Meeting Health Needs Fairly, 2012)**
  Justice and opportunity — health is foundational to fair equality of opportunity in any just social arrangement

#1	35k+	3×	↓NHS
Leading cause of hospital admission for children aged 5–9 in England	*Children receive dental extractions under general anaesthetic annually — mostly preventable*	*Higher rates of tooth decay in most deprived communities versus the most affluent*	*Dental access declining sharply in post-industrial communities — de facto exclusion*
NHS Digital, 2023	NHS England, 2023	Child Dental Health Survey	BDA / OHID, 2022–24

Position IV - KEY ARGUMENTS

ARGUMENT 01
Structural, Not Behavioural
Oral health inequalities are produced by structural conditions — poverty, disinvestment, inaccessible care — not individual failure. Behavioural frameworks misread the cause and displace responsibility onto those least able to bear it.

ARGUMENT 02
The Mouth Tells the Truth
Dental tissue functions as a biological archive of inequality. Enamel hypoplasia, patterns of tooth loss, and untreated disease record the social history of the body with unusual permanence. The mouth does not lie about where it has been.

ARGUMENT 03
A Deprivation of Capability
Poor oral health deprives people of central human capabilities: freedom from pain, the confidence to speak and present, and the ability to affiliate socially without shame. These are violations of the conditions for a fully human life.

ARGUMENT 04
Violence by Another Name
The oral health burden in deprived communities meets Farmer's criteria for structural violence: avoidable, concentrated in the least powerful, and the foreseeable consequence of political choices that could have been made differently.

ARGUMENT 05
Inequality Reproduced
Poor oral health is not only an outcome of inequality but a mechanism of its continuation — through stigma, employment barriers, social withdrawal, and the normalisation of dental disease as simply how things are in deprived communities.

ARGUMENT 06
A Justice Claim Ignored
Oral health is systematically marginalised within health justice discourse. This reflects a cultural hierarchy in which the bodies and suffering of the poor remain at the edges of moral concern — a neglect that is itself unjust.

Position V - Conclusion

To take seriously the mouth as autobiography *is to insist that these lives — and the structural conditions that shaped them — deserve to be read. And that reading them honestly, without flinching, is not an academic exercise. It is the first act of a justice response.*

IMPLICATIONS FOR RESEARCH, POLICY AND PRACTICE

Policy	— structural intervention, not hygiene promotion
Access	— NHS dentistry as a right, not a market commodity
Prevention	— fluoridation, supervised brushing, early years investment
Research	— oral health as a core domain of health justice scholarship
Advocacy	— naming dental disease as avoidable structural harm
Practice	— community-based, capability-restoring approaches

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