

Fuse Complex Systems (CS) Research Programme Strategy

Web: www.fuse.ac.uk/research/complexsystems

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Fuse, the Centre for Translational Research in Public Health, brings together the five North East Universities of Durham, Newcastle, Northumbria, Sunderland and Teesside in a unique collaboration to share Fuse's mission to transform health and well-being and reduce health inequalities through the conduct of world-class public health research and its translation into value-for-money policy and practice.

In achieving our vision, we focus on three broad aims:

1. To deliver world-class public health research that focuses on generating and translating evidence for cost effective public health policy and practice
2. To build sustainable capacity for translational public health research, both in academia and in policy and practice
3. To build effective and lasting partnerships with policy and practice for collaborative co-production of public health research.

As part of our core mission of translation of research evidence into policy and practice we launched Fuse's responsive research and evaluation facility 'AskFuse' in June 2013. With the support of Fuse researchers, we help our partners to access existing knowledge or to work in collaboration to develop new research evidence that is relevant, timely and tailored to their needs and enabled them to find answers to issues that matter. This innovative model has attracted considerable national interest.

Fuse continues to build international partnerships to share research with leading scientists and organisations across the globe. In April 2011 Fuse was the founder of the first International Knowledge Exchange in Public Health Conference. The 2021 conference is being held in Newcastle in collaboration with Cornell University, Erasmus University Rotterdam, the Michael Smith Foundation for Health Research, and Tilburg University. Plans are in place to further develop international secondment opportunities.

Fuse Communications aim to maximise the impact and effectiveness of Fuse work, to raise the profile of Fuse as a Centre for excellence in Research and Knowledge Exchange and to build a unity of purpose within Fuse, and between Fuse and our partners. This is achieved by:

1. Examining and recommending action on all issues relating to internal communications, and communications with our partners and funders
2. Having responsibility for external relations with the public and with practice & policy partners by managing the various media through which we present our message and research findings
3. Developing forms of communication which will share learning and help build research capacity.

Fuse has identified the need to develop its strategy for Public Involvement and Engagement (PIE) in research and to give members of the public an influence in the decision-making processes. Work has started to collate the PIE activity within Fuse, this will help to identify any gaps and achieve a more cohesive approach, to ensure Fuse is in a strong position when applying for continued membership of the NIHR School for Public Health Research (SPHR) and future funding opportunities.

Fuse is integral to a number of newly funded public health research infrastructures both regionally and nationally, some with similar research agendas. Fuse will work in synergy with infrastructures such as the NIHR Applied Research Collaboration (ARC) North East and North Cumbria (NENC) and the NIHR Policy Research Unit (PRU) by organising co-badged research meetings with shared agendas. Collaboration opportunities will also be identified within the Fuse research programmes. Work has started to capture the use of Fuse learning and any reference to the success of the Fuse model.

Our six research programmes make substantive contributions to the realisation of Fuse's mission. They also play an important role in achieving our vision. The programmes of research are complementary and collaborative, and explicitly linked together. Some projects draw on skills and expertise from two or more research programmes. The research strategies for each of the six programmes are set out below. They share common deliverables including:

1. Organising engagement events which are a key activity in delivering the Fuse strategy. In particular, Fuse Quarterly Research Meetings which are a key opportunity for research dissemination, dialogue about the implications for policy and practice, making new and strengthening existing contacts, and building a dialogue around research results and potential future projects. All Fuse meetings are free to attend making them available to all of our members.
2. Ensuring research sections on the Fuse website are kept up to date, providing material for research case studies.
3. Highlighting research which has been initiated through AskFuse and showcasing on the Fuse website.
4. Disseminating work through the Fuse blog, research briefs and social media.
5. Developing a strategy for communication with members and maintaining regular contact.
6. Encouraging members to share their relevant existing work and update on a quarterly basis, reporting back to Fuse Research Strategy Group (RSG).
7. Supporting the career development of members through the provision of training, networking, and events to showcase work specifically of early career researchers, practitioner, policy makers, and experts by experience.
8. Meeting regularly with the Fuse Manager to review programme progress and plan for future activity.

Strategic aims and objectives

The Complex Systems Research Programme (CSRP) aims to undertake high quality, policy-relevant research in three key areas:

- Using systems thinking to examine the impact of whole systems and place-based approaches on populations at local, national and global levels.
- Evaluating policies and policy-driven interventions intended to improve public health and wellbeing and reduce health inequalities.
- Developing methodology to understand and evaluate complexity in public health contexts, and exploring ways of applying systems thinking and theory to practice.

The objectives of the programme are to:

- Develop and sustain a platform which supports and stimulates complex systems research, building on collaborations within Fuse, NIHR School for Public Health Research (SPHR), and with policy and practice partners.
- Share learning from existing projects.
- Support the building of research capacity and foster career development for early career researchers in relation to complex systems.
- Develop links and synergies between Fuse staff/students and collaborators working in all sectors on aspects of complexity and complex systems research.
- Carry out knowledge-sharing activities and translate research findings into recommendations for policy and practice relating to public health.
- Inform and take part in public, policy and academic debate on complex systems.
- Contribute to wider Fuse activities and outputs, such as the Fuse website, quarterly research meetings, research briefs and blog entries.

We consider the CSRP to be cross-cutting and therefore anticipate working collaboratively with the other Fuse research programmes, in particular the Translational Research Programme. The CSRP involves regional and national collaborations with partners from Fuse, NIHR SPHR (in particular, the *Efficient and equitable public health systems cross-cutting programme*), Public Health England and the Local Government Association, and international collaborations with the World Health Organization and others working with or within complex systems to achieve improvements in population health and wellbeing.

CSRP projects and research questions

Due to the cross-cutting nature of this research theme, the programme covers a range of topics that is largely shaped by the academic interests and membership of the theme. However, the current projects and research interests can be categorised into the following: decision-making regarding resource allocation to enhance equity, efficiency; wellbeing of children and young people, food and alcohol policy; mental health and vulnerable groups; physical activity; health and social care policies; and methods development. It is acknowledged that these are not mutually exclusive with overlap between themes and research across the wider Fuse research programmes.

Decision making for commissioning

The health economics group at Newcastle (led by Vale) and Northumbria (led by Gray) continues to develop methods to evaluate policy changes in complex systems to assist with priority-setting. Further work focuses on assessing the impact of new commissioning

arrangements on inequalities in health and wellbeing, and applications of different modelling techniques (such as econometrics methods) to explore the complexity at all scales ranging from the individual to the societal. The Fuse PhD student appointed to this programme (Sarah Hill) will soon complete a study on the development of health economic methods for measuring and valuing the impacts of cross-sectoral, complex interventions on health outcomes, service delivery and public perceptions. Additionally, work is being undertaken with regards to social return on investment (Gray) and contractual levers for public health outcomes (Visram, Lloyd).

Wellbeing of children & young people

A number of researchers (including Phillips, Bell, Close, Wood, Sattar) are involved in research on topics including child poverty, neglect and domestic violence. Follow-on research from the babyClear study (Jones), which involved determining the effectiveness of a midwifery-based intervention to reduce smoking in pregnancy is ongoing.

Food and alcohol policy

Research currently underway includes: an exploration of the factors influencing co-consumption of food and alcohol by young people in the context of austerity (Scott, Muir); researching obesogenic environments (Lake, Rose); food waste (Stewart); breakfast clubs (Graham); food insecurity across the life course, including those in secure settings (Scott); and understanding the impact of changes in local alcohol policy (Mooney).

Mental health and vulnerable groups

Cheetham and Moffat are involved in research exploring the impact of Universal Credit. Dyer is involved in the development of the first prison unit in England/Wales for prisoners with serious mental illness with research aiming to explore impact within a complex realist framework.

Physical activity

Azevedo, Lloyd and several other collaborators, are involved in evaluation of the Sport England Local Delivery Pilot, which involves taking a whole systems approach to increasing physical activity levels. Other members are involved in research on active travel (Cara-Collins) and holiday clubs to keep children active outside of term time (Graham).

Health and social care policies

A wide range of research projects are being undertaken within this theme and involve evaluations of the impact of national and local policies in diverse health and social care settings. Examples include an evaluation of social prescribing (Moffatt, Pollard, Gibson, Wildman and Wildman). Bate also has projects regarding social network analysis of out of hours palliative care and communication and understanding the scope and value of the Parkinson's nurse.

Method development

There is a wide range of relevant expertise within the membership around participatory approaches, realist approaches, embedded research and ethnography, as well as economic evaluation and natural experiments.

Timeline and deliverables in addition to common deliverables (as listed above)

Over the 3 year period (up to March 2022), we plan to achieve the following:

- Year 1 (up to March 2020)
 - Inaugural CSRP event (February 2019), including external speaker
 - Links established with SPHR Efficiency and Equity cross-cutting programme (Vale, Gray),

- Year 2 (April 2020 to March 2021)
 - Collaborate on at least one new CSRP research project with policy and practice partners
 - Produce at least one research paper taking a complex systems perspective.

- Year 3 (April 2021 to March 2022)
 - Collaborate on at least one new CSRP research project with policy and practice partners
 - Produce at least one research paper taking a complex systems perspective
 - Final CSRP event to synthesise and disseminate research portfolio.