SIPHER Consortium

Systems science
In Public Health and
Health Economics Research

Mapping the housing & health system:

Methods adopted in participatory systems mapping with Greater Manchester Combined Authority

November 2023

Contents

Acknowledgements

Our grateful thanks to the researchers, analysts and policymakers from Greater Manchester Combined Authority (GMCA) and their colleagues from NHS Greater Manchester, who attending our mapping workshop. This research was conducted as part of the **Systems Science in Public Health and Health Economics Research - SIPHER Consortium** and we thank the whole team for valuable input and discussions that have informed this publication.

Citation: SIPHER Consortium, Mapping the housing & health system: Methods adopted in participatory systems mapping with Greater Manchester Combined Authority, November 2023 (DOI: 10.36399/gla.pubs.310978)

Introduction

Participatory systems mapping is a method used to create visual depictions of the systems we are interested in exploring - in this case, the housing system. The maps created through this process typically consist of a "network of factors and their causal connections, annotated with salient information from stakeholders" (Barbrook-Johnson & Penn, p. 6, 2022). They have a tendency to be large and complex but can be broken down into sub-maps and/or narratives during subsequent analyses.

SIPHER's aim in using participatory systems mapping with our housing policy partners is to help us collectively think about and orientate ourselves towards policy understandings of the pathways from housing to health. Drawing out the system visually enables participants to communicate their perspectives on housing-health links, to us and to one another, which can help identify where perspectives overlap and where they vary, as well as enabling us to assess perceptions and assumptions against available evidence and data. Through this process, we can begin to synthesise and connect different kinds of expertise and evidence about the housing and health system.

Method

Mapping of the housing and health policy system was carried out at an in-person workshop on 21st November 2022, facilitated by SIPHER researchers. The participants were researchers, analysts and policymakers from Greater Manchester Combined Authority (GMCA) Research, Housing Strategy, Homelessness, Ageing in Place, Planning and Population Health teams, as well as colleagues from NHS Greater Manchester, who are working in partnership with GMCA on housing issues for people experiencing poor health. We began the session by talking through and considering, as an example, an initial map of the housing system (see Figure.1). This map had been created by SIPHER researchers prior to the workshop and was based on academic evidence and policy documents that described causal relationships between housing and health (see Appendix Table 1 for a list of sources).

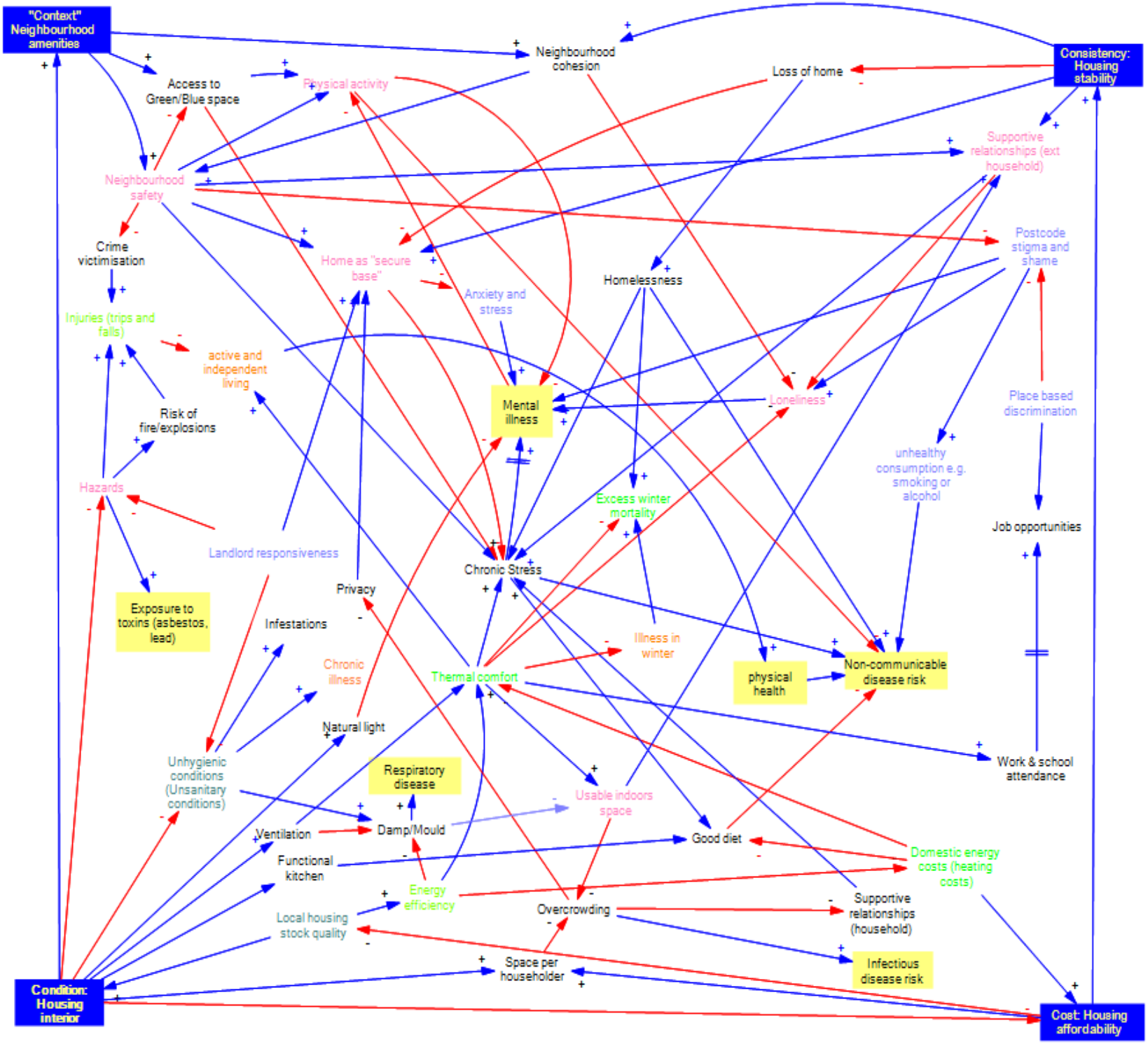
It was created through a multi-stage process that involved:

1. A search for published evidence reviews describing associations or causal links between characteristics of housing and either inclusive economy or health outcomes. Relevant systematic reviews and papers presenting conceptual models from this search were used to populate two initial systems maps that: (a) described direct links between housing characteristics and health outcomes; and (b) described links from housing to income and employment outcomes (as key social determinants of health that featured prominently in SIPHER's existing system maps of inclusive economic policy).

2. A search for qualitative research that reported ‘lay’ (public) experiences of housing and the causal connections to health experiences. The links made explicit in these studies that had not already been identified via more traditional systematic reviews were added into the housing and health review evidence map.

3. A review of key housing policy documents that identified articulated links between housing and health. These causal chains were then also incorporated into the housing and health systems map (where they were not already present).

Figure.1: Housing and health literature-based system map compiled by SIPHER researchers, Nov 2022



	Description
Blue box	Core concept
Red arrow	
Blue arrow	Reinforcing relationship
Yellow box	Health outcome
	Evidence source
Black text	Academic reviews
Orange text	Policy docs
Green text	Policy docs & Academic reviews
Purple text	Academic qualitative literature
Pink text	Academic reviews & Academic qualitative literature
Grey text	All

This literature-based map was constructed around four conceptual pillars of housing (Swope and Hernandez, 2019), which are represented by blue boxes on the map in Figure.1:

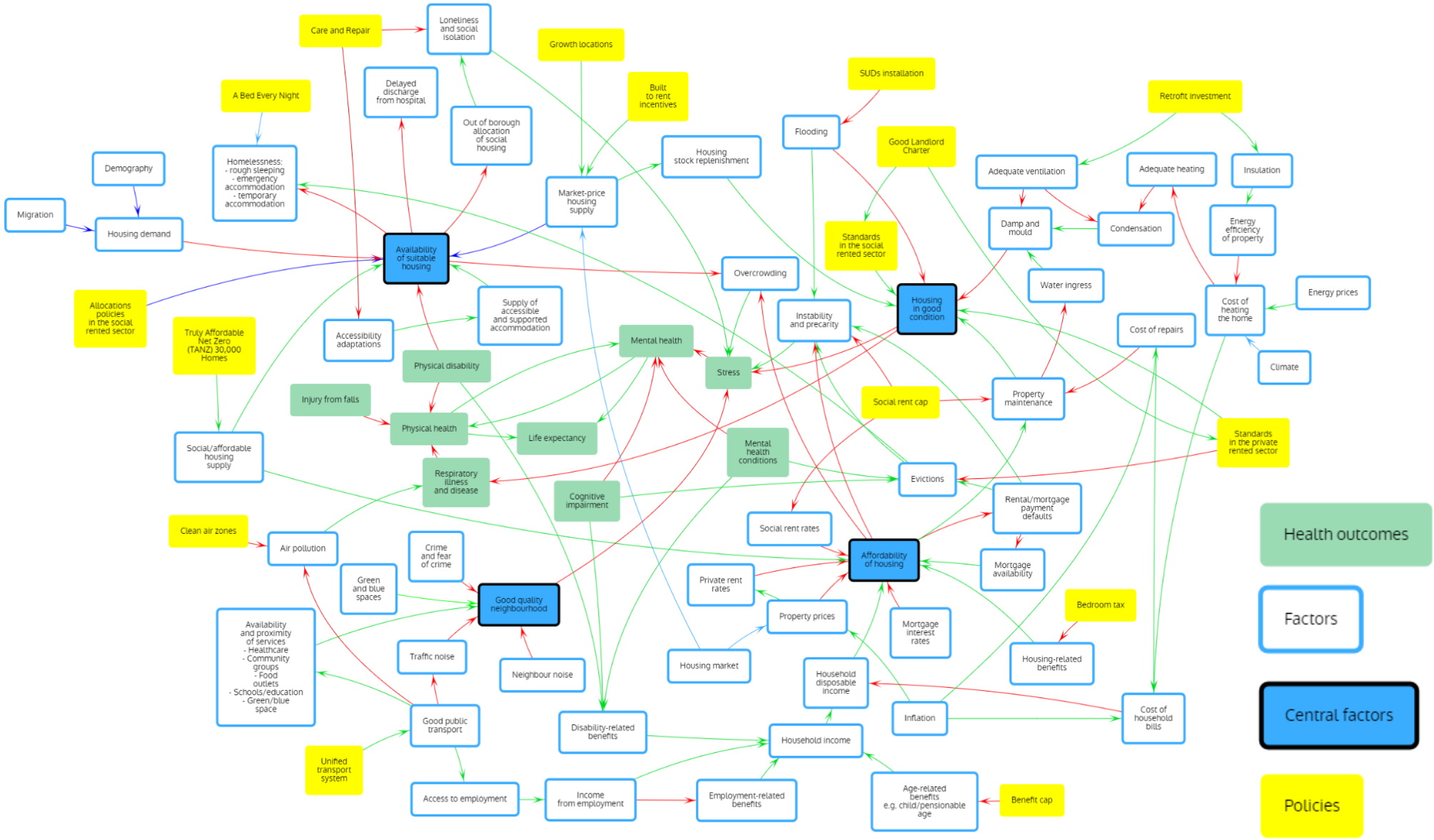
- **Cost:** which addresses housing affordability
- **Condition:** which covers housing quality
- **Context:** which takes in aspects of neighbourhood quality
- **Consistency:** which refers to housing stability

After reviewing and discussing this map, participants were split into three groups and asked to think through the relationships between housing and health in GMCA, with each group collaboratively creating a map that represented their understanding of the housing-health system, using post-it notes on a large, blank sheet of paper. They were additionally asked to consider which policy goals or levers might produce change within that system and to include them on the map.

- Group 1's map was primarily focused on housing cost, condition and context, with an emphasis on housing supply as an upstream 'cause' and social isolation as a mediating factor between housing and health.
- Group 2's map similarly focused on context and (affordable) housing supply, with the addition of more detailed pathways relating to housing cost and affordability and the impacts of repossession and eviction.
- Group 3's map had the largest number of factors and pathways, although almost all appeared in some form in the Group 1 and 2 maps.

Following the workshop, these three maps were amalgamated by SIPHER researchers to produce one, integrated GMCA housing and health system map, shown in Figure.2.

Figure.2: GMCA housing and health systems map, generated through a participatory mapping workshop in Nov 2022 and later amalgamated by SIPHER researchers. Note: Green arrows represent reinforcing relationships and Red arrows represent inverse relationships.



Findings

A broad range of policies are implicated in the housing-health system, which sit within various domains including planning, sustainability/net zero, social security, macroeconomics, transport, social care and tax. These are in addition to those policies that sit within the (often separated) housing and homelessness domains. As such, they explicate the ways in which the long causal chains from housing experiences to health outcomes weave through a complex, interconnected landscape of policies from several different (sometimes competing) domains. Systems approaches provide opportunities to reflect on the potential implications and benefits of collaboration across these policy domains and across the multiple sectors and organisations involved (e.g. NHS and local, regional, and national governments, third sector and private sector).

Moreover, housing policy and research is typically segmented along tenure lines, which often separates policy development and implementation relating to the social rented sector from that relating to the private rented sector and (the much sparser policy landscape of) homeownership. In the housing policy context in particular, systems approaches offer a means through which the interaction of these tenures can be more fully and effectively examined, both as interdependent sectors in the housing economy and as the complex background against which households negotiate their access to decent housing.

These maps both offer a means to explore reinforcing systems and feedback loops. One example from Figure.2 is the looped interaction between poor health, which (in combination with disability benefits) impacts upon household income, thereby impacting upon housing affordability and, therefore, housing stability, which in turn impacts upon mental health. While this causal loop is already well recognised in the housing and public health spheres, it is currently expressed in policy as a problem of a lack of access to suitable and affordable housing for those with significant support needs. This results in policies that target accessibility adaptations or mental health support to enable independent living for those who are already experiencing severe health difficulties and disabilities (for example, GMCA's Healthy Homes initiative).

However, a systems perspective on this causal loop clearly and tangibly demonstrates that the demand for complex housing support services is, at least in part, an acute symptom of a much wider, systemic problem embedded within the health->income->housing affordability->housing stability->health feedback loop. That is, policy interventions further 'upstream' in this longer causal chain that loops from health outcomes, through housing availability and affordability, and back around to health outcomes again, could prove effective and, in the long term, a more efficient approach to resource allocation. Mapping therefore provides space to open up conversations about other potential interventions at alternative points along this feedback loop, particularly those which cut across policy silos and take a longer-term cost-saving approach.

Finally, in designing approaches to tackling such complex problems, particularly those which emerge from complex systems, it is crucial to take into account the potential for unintended (negative) consequences. One example might be a policy to cap increases in social rent rates,

with the aim of improving (or preventing too rapid a decline in) housing affordability. As is clear from Figure.2, this has the potential to have a negative impact on housing quality in the social rented sector, by reducing landlords' financial capacity to invest in property maintenance and repairs. While housing policy makers are already acutely aware of this particular trade-off, systems approaches have the potential to provide a framework to test the relative impacts of such competing factors on an outcome of interest, by taking account of the wider system in which that relationship sits. This has the potential to generate better informed decisions, grounded in a more comprehensive assessment of the system-wide trade-offs inherent in a policy decision that is suspected to have potentially negative side-effects. Taken together, this provides scope for more effective policy decision-making, in which unintended consequences can be better acknowledged and anticipated.

Next steps for SIPHER

SIPHER is developing a range of products and outputs on the topic of housing and health that aim to respond to these potential benefits of systems approaches, including:

- **SIPHER Synthetic Population** that can be used to project the impacts of policy interventions within the housing system on housing and health outcomes, to support policy decision-making where existing real-world data is poor quality or has poor coverage.
- **SIPHER Microsimulation for Interrogation of Social and Health Systems (MINOS)** quantifies the impacts of changes in housing quality and cost on health outcomes at the household level. This helps to model differential effects of housing on health for different population groups (e.g. social vs private renters).
- **SIPHER Mapping Tool** that embeds insights from those with lived experience of inequalities onto the housing-health system map shown in Figure.1, and links to established evidence on pathways that have proven challenging to quantify.

Further Reading

- Barbrook-Johnson & Penn, Systems Mapping: how to build causal models of systems, Palgrave Macmillan (2022) https://link.springer.com/book/10.1007/978-3-031-01919-7
- Swope, C. and Hernandez, D., Housing as a determinant of health equity: a conceptual model, Social Science and Medicine, vol. 243 (2019): https://doi.org/10.1016/j.socscimed.2019.112571
- GMCA's Healthy Homes initiative https://democracy.greatermanchester-ca.gov.uk/mgConvert2PDF.aspx?ID=25492

- SIPHER's existing system maps of inclusive economic policy.

https://intranet.sphsu.gla.ac.uk/pg/#systemdynamicslink

- SIPHER Synthetic Population https://intranet.sphsu.gla.ac.uk/pg/#synthpoplink
- SIPHER Microsimulation for Interrogation of Social and Health Systems (MINOS)

https://intranet.sphsu.gla.ac.uk/pg/#dynamicmicrosimulationlink

Appendix

Table 1: Sources used to compile literature-based map shown in Figure.1

Title	Author	Date	Type	Model
Housing improvements for health and associated socio-economic outcomes	Thomson et al	2013	systematic review	-
Developing empirically supported theories of change for housing investment and health	Thomson and Thomas	2015	systematic review	theory of change
Housing as a determinant of health equity: A conceptual model	Swope and Hernandez	2019	narrative review	conceptual model
Housing Disadvantage and Poor Mental Health: A Systematic Review	Singh et al	2019	systematic review	none
The relationship between buildings and health	Black et al	2019	systematic review	none
Housing and health inequalities: A synthesis of systematic reviews of interventions aimed at different pathways linking housing and health	Gibson et al	2010	systematic review	none
Housing and Public Health	Shaw	2004	narrative review	conceptual model
Housing and Health: An overview	D'Allessandro and Apolloni	2020	narrative review	none
Building health equity through housing policies: critical reflections and future directions for research	Leifheit et al	2022	primary research	conceptual model
A comprehensive review of prioritised interventions to improve the health and wellbeing of persons with lived experience of homelessness	Moledina et al	2021	systematic review	none
Housing as a social determinant of health and wellbeing: developing an empirically informed realist theoretical framework	Rolfe et al	2022	primary research	theory of change

The impact of social housing: economic, social, health and wellbeing	Gibb et al (CaCHE)	2020	-	-
Housing insecurity and mental health in Wales	Preece and Bimpson (CaCHE)	2019	-	-
Health and wellbeing in the private rented sector	Harris and McKee (CaCHE)	2021	-	-
Housing policy and poor-quality homes	Preece et al (CaCHE)	2021	-	-
Housing wealth inequalities in Scotland: An evidence review	Soaita et al (CaCHE)	2019	-	-
How should affordability be measured?	Meen (CaCHE)	2018	-	-
Policy Approaches for improving affordability	Meen (CaCHE)	2018	-	-
The links between housing and poverty: an evidence review	Tunstall et al (JRF)	2013/ 2015	-	-
How does housing affect work incentives for people in poverty?	Gibb et al (for JRF)	2016	-	-
Making connections: housing, productivity and economic development	Maclennan et al (AHURI)	2015	-	-
Greater Manchester Housing Strategy	-	2019-2026	Policy document	-
Sheffield Housing Strategy	-	2013-2023	Policy document	
Scottish Government Housing to 2040		2021-2040	Policy document	

Working together to tackle health inequalities and improve the health of the public.

The conditions in which we are born, grow, live, work, and age are key drivers of health and health inequalities. Preventing illness related to these 'social determinants of health' requires well-coordinated policies across many sectors, such as the economy, welfare, housing, education, and employment.

SIPHER's innovative systems science approach offers a powerful framework to explore the complex real-world relationships and interdependencies of diverse policies that shape our public health and wellbeing.

A major research investment by UKPRP, the SIPHER Consortium is a collaboration of policy and academic experts working with practice partner organisations to create evidence-based products that deliver improved public health policy.

Policy Partners

Sheffield City Council

GMCA Greater Manchester Combined Authority

Public Health Scotland

Scottish Government Riaghaltas na h-Alba

Academic Partners

University of Glasgow

University of Sheffield

University of Strathclyde Glasgow

University of Leeds

Newcastle University

Manchester 1824 The University of Manchester

University of Nottingham UK | CHINA | MALAYSIA

UKPRP Prevention Research Partnership Joint action for a healthier, fairer future

The SIPHER Consortium is supported by the UK Prevention Research Partnership (Grant MR/S037578/2), which is funded by the British Heart Foundation, Cancer Research UK, Chief Scientist Office of the Scottish Government Health and Social Care Directorates, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Health and Social Care Research and Development Division (Welsh Government), Medical Research Council, National Institute for Health Research, Natural Environment Research Council, Public Health Agency