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## The SIPHER Consortium

### Systems science in Public Health & Health Economic Research

SIPHER is a major investment by the UK Prevention Research Partnership (UKPRP), bringing together scientists across six universities, three government partners at local, regional and national level, and ten practice partner organisations. It is led by Prof Petra Meier and Dr Robin Purshouse, University of Sheffield.

**SIPHER's vision is a shift from *health policy* to *healthy public policy*. This means all policy sectors working together to tackle health inequalities and improve the health and wellbeing of the public.**

The conditions in which we are born, grow, live, work and age are key drivers of health, wellbeing and inequalities in life chances. Preventing ill health related to these “social determinants of health” requires well-coordinated policies across many sectors, such as the economy, welfare, housing, education and employment. SIPHER will deliver novel evidence on the complex and interlinked consequences of policy decisions and associated costs and benefits. This will help our policy partner organisations identify opportunities for the strategic alignment of policies across government sectors and give decision makers the confidence to change the way major investment decisions are made.

#### SIPHER's policy areas

In its initial 5-year funding period, September 2019 to August 2024, SIPHER will focus on understanding the impact of interventions in four policy areas on health, wellbeing and inequalities:

- **Inclusive Economic Growth:** policies that promote a more equitable distribution of economic benefits and opportunities across places and communities
- **Adverse Childhood Experiences:** policies that seek to prevent difficult childhoods and the harmful life trajectories that are often associated with them
- **Housing:** policies that promote the availability, affordability, quality and suitability of housing
- **Mental Wellbeing:** policies that promote and maintain good mental health and wellbeing across the whole population.

#### SIPHER partners

SIPHER's **policy partners**, representing local, regional and national governments, are developing new ways of working to tackle key problems, including reducing persistent inequalities and promoting population health. New strategies and frameworks are explicitly place-based and multi-sectoral in approach. Our partners are:

- *Sheffield City Council*
- *Greater Manchester Combined Authority*
- *Scottish Government.*

SIPHER's **academic partners** bring expertise from a wide range of scientific disciplines. Our partners are:

- *School of Health and Related Research, University of Sheffield (lead institution)*
- *Department of Automatic Control and Systems Engineering, University of Sheffield*
- *Department of Economics, University of Sheffield*
- *Leeds Institute of Data Analytics, University of Leeds*
- *School of Social Work & Social Policy, University of Strathclyde*
- *Usher Institute of Population Health Sciences and Informatics, University of Edinburgh*
- *Institute of Health & Society, University of Newcastle*
- *Inclusive Growth Analysis Unit, University of Manchester.*

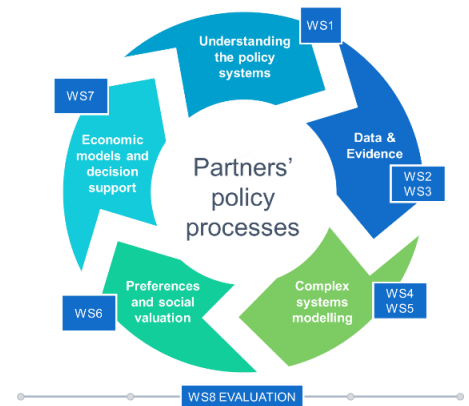
SIPHER's **practice partners** will help us make our work applicable to a wide range of settings and policy questions. Our partners include senior representatives from *Public Health England, NHS Health Scotland, Public Health Wales' WHO Collaborating Centre for Investment in Health & Wellbeing, NICE, Learn Sheffield, Sheffield City Partnership, Northern Health Sciences Alliance*, and the *Local Government Association*. We are also supported by *Edinburgh City Deal* and the *Alan Turing Institute for Data Science and Artificial Intelligence*.

## SIPHER's research

We plan to deliver four outcomes:

- **New insights into the complex links between causes and consequences**, for example the interdependencies between work, income, housing, poverty and health
- **A new systems sciences approach to the economics of prevention**, for example by examining the costs and benefits of policies that have outcomes affecting multiple government sectors
- **A move towards multi-sectoral policy design, appraisal and evaluation**: Our new methods will make transparent trade-offs between outcomes, and opportunities for win-wins. They will also allow the long-term monitoring of policy effects across the whole system to gain insight into expected and unexpected effects.
- **Lasting change to partners' policy processes**: SIPHER will inform the development of cross-governmental business cases and budget allocation decisions by providing new cross-sector cost-benefit analyses.

SIPHER has eight tightly-interwoven WS, using a mix of qualitative and quantitative systems science:



**WS1 - Understanding Policy Processes & Evidence Needs** uses a novel combination of qualitative methods including interviews, system mapping, ethnographic research and documentary analysis.

**WS2 - Evidence Synthesis** develops literature search and review strategies that are suitable for supporting complex systems modelling.

**WS3 - Data & System Monitoring** builds a secure data infrastructure, creates detailed simulated populations and develops a system monitoring function to inform adaptive policymaking.

**WS4 - Causal System Dynamics Modelling** models the dynamics and feedback effects of important causal processes, e.g. the relationships between unemployment, poverty and mortality.

**WS5 - Policy Microsimulation** models the impacts of environment and policy on the characteristics of individuals and households, showing how policy impacts differ across geographic areas and societal groups.

**WS6 - Social Valuation** provides insight into how people value different policy outcomes, and translates the many outcomes that arise from a whole-systems perspective into two common well-being measures needed for economic evaluation.

**WS7 - Economic Evaluation & Decision Support** uses distributed, robust multi-objective optimization to identify those strategies that perform best across outcomes, highlight opportunities for win-wins and make transparent any trade-offs between policy goals.

**WS8 - Evaluation** uses ongoing multi-perspective process evaluation to evaluate SIPHER's contribution and impact.

We will showcase our work at regular events, presentations, newsletters and reports for academic, policy and lay audiences. All our new methods, models, tools and findings will be available on [www.sipher.ac.uk](http://www.sipher.ac.uk).

## For more information

We are keen to develop new links with interested research centres, local and national governments, as well as health- and social justice-focused charities and interest groups. Please get in touch! Consortium Directors Professor Petra Meier [p.meier@sheffield.ac.uk](mailto:p.meier@sheffield.ac.uk) or Dr Robin Purshouse [r.purshouse@sheffield.ac.uk](mailto:r.purshouse@sheffield.ac.uk).

