



## **UKPRP Network Award, Call 1 – Successful Outline Applicants**

The table below lists the six applicants who were invited to submit full proposals for the UKPRP network award under the current call. Additional information on each outline proposal can be found by clicking on the name of the Principal Investigator. The information provided is taken from the outline applications and provided with the permission of the Principal Investigator (and the network).

### **Network**

<b>Principal Investigator</b>	<b>Institute</b>	<b>Title of proposal</b>
<a href="#">Ms Ruth Dundas</a>	University of Glasgow	Harnessing cross-country administrative data to evaluate national policy impacts on maternal, infant and child health and health inequalities
<a href="#">Professor Paul Kingston</a>	University of Chester	PETRA: Prevention of diseases using trade agreements
<a href="#">Professor Paul Monks</a>	University of Leicester	Non-communicable disease (NCD) and the Indoor Environment
<a href="#">Professor Laurence Moore</a>	University of Glasgow	PHASE: The Population Health Agent based Simulation nEtwork
<a href="#">Professor Gareth Stratton</a>	Swansea University	National Education and Health "Action" Network Development Scheme (NEW-HANDSDwylo-E62Newydd)
<a href="#">Professor Jayne Woodside</a>	Queen's University Belfast	Opportunities for intervention and innovation in the UK School Food System: the GENIUS (Generating Excellent Nutrition In UK Schools) network

Applicant ref.	Research Director	Institution	Title of Proposal
UKPRP_NO1_105	Ms Ruth Dundas	University of Glasgow	Harnessing cross-country administrative data to evaluate national policy impacts on maternal, infant and child health and health inequalities

### Summary

The impact of fetal, infant and child health on subsequent chronic disease is well-recognised. The social determinants of health are complex and inter-related and may be influenced by population characteristics, policies, and service provision.

Innovations in linked, population-level administrative data (which span family members, disciplines and the lifecourse) provide opportunities to identify social and public health strategies and policies for the improvement of chronic disease and the reduction of health inequalities. This network will lay essential foundations, through harmonising whole-country administrative datasets, and identify natural experiments that exploit variation in population characteristics, policies, across the four UK countries. The cross-country network is key as policies diverge with more devolution of powers.

We will develop a multidisciplinary, sustainable network of experts in pre-natal, natal and early years health with experts in social determinants of health, environments and health, and administrative data linkage. Network activities will comprise: i) a series of workshops involving key researchers, policy and service experts in addressing challenges for harmonising cross-country administrative data and develop studies for exploiting policy, context, environmental and service variation; ii) preliminary analyses to demonstrate feasibility of cross-country comparisons; and iii) collaborative funding applications to address modifiable determinants of maternal, infant and child health and in turn, long-term chronic disease.

### **Please describe why you have chosen to focus the network in your chosen area and why there is a need for this in the UK**

Health and wellbeing during the early years (which starts pre-conception) has a crucial impact on chronic disease and inequalities, across the life course and from one generation to the next. For example, there is clear evidence of the impact of intrauterine and infant growth, and preterm birth on cardiovascular health. The determinants of maternal, infant and child health are complex and inter-related, ranging from family socio-economic circumstances and childcare settings to neighbourhood deprivation and pollution. All of these factors are affected by macro-level policies, and all have the potential to improve the health of the mother, the index child, subsequent children and the rest of family; ultimately reduce non-communicable diseases (and inequalities). For example, employment policies impact on family planning decisions, maternal wellbeing before, during and after pregnancy and the health of children from infancy and beyond. The population-level impacts of national policies on long-term health outcomes and inequalities cannot be examined in trial settings. However, policy and service variations between areas and countries present valuable opportunities to conduct natural experiments. Administrative records, spanning families, the lifecourse and disciplines, can be used to react to these opportunities.

Using whole-population administrative datasets from each of the UK countries, we will build on the work of the Administrative Data Research Network (ADRN), and FARR which developed novel cross-jurisdictional data linkages of health, social care, education, registry and other datasets. These data have not been exploited for evaluating country-level policies to improve the health of the UK. Our network aims to harmonise such data to enable evaluations of national-level health and social policy, public services and environmental

effects, on the health of women before and during pregnancy and outcomes in their children.

This new community, spanning the four UK countries, will combine a diverse range of expertise with rich administrative data sources to identify effective strategies for improving maternal, infant and child health. International comparisons also provide important insight into how differences in policies and service provision between countries are associated with outcomes. Therefore, we will build on existing international partnerships (with Sweden, Ontario, and Australia) and develop emerging relationships (with Denmark, Finland, Manitoba and New South Wales). These countries have well developed data systems for maternity and birth outcomes and potential for linkage to other cross-sectoral data sources, such as education, and have policies for improving health in the early years that could inform UK policy.

Our network will complement the new Health Data Research UK institute for health and biomedical informatics research. Whilst the HDRUK concentrates on biomedical and clinical risk factors, we will utilise their innovative and cutting-edge methods, analytical tools and expertise, ensuring added value for the HDRUK and our network. The network will complement ongoing evaluations of interventions focussing on vulnerable subgroups (e.g. Family Nurse Partnership and Better Start), healthy city initiatives that evaluate system-wide interventions in local areas (e.g. Bradford), and cohort studies that are linking with administrative data.

**Please provide a summary of the specific network challenge and purpose of the proposed network**

The specific network challenge is to harness and utilise administrative data and cohort linkages to identify the most successful strategies for modifying social and environmental determinants of maternal, infant and child health which can reduce inequalities in adverse outcomes and long-term chronic conditions. The aim is to bring together administrative data linkage specialists and experts in social determinants of health with experts in natural experiments to evaluate upstream social and environment policies.

The network will build a sustainable community of researchers, practitioners, public health bodies and policy makers from education and social welfare, who share expertise, tools, and meta-data, and undertake standardised, whole country, cohort analyses across UK datasets and beyond to address preventable risk factors for long term conditions related to prenatal and perinatal health. The network will drive innovation to develop a cross disciplinary programme grant application to future UKPRP or other funders such as NIHR to evaluate modifiable upstream risk factors for adverse maternal, fetal and child health that affect risks of and inequalities in long-term conditions.

The purpose is to establish a sustainable community of network members who will promote and exchange ideas. To do this we will have three strands: 1) workshops harnessing data linkage opportunities; exploring new methodologies and innovations; and identifying policy variations and natural experiments between UK countries and internationally for future grant applications. 2) Conduct preliminary linkage and harmonisation projects across the UK which arise as priorities from the workshops. 3) Develop multidisciplinary agenda setting research proposals co-produced with users of the research.

<b>Applicant ref.</b>	<b>Research Director</b>	<b>Institution</b>	<b>Title of Proposal</b>
UKPRP_NO1_112	Professor Paul Kingston	University of Chester	PETRA: Prevention of diseases using trade agreements

### **Summary**

The need for a network to develop further expertise in public health and trade policy emerged as a result of discussions at conferences on Brexit during 2016 held by both the UK Public Health Network and the Society for Social Medicine. It became clear that public health expertise on trade is both scarce and scattered widely across the UK. The need to involve trade policy people and legal professionals is also increasingly apparent.

New trade and investment agreements should be based on the highest attainable standards of health from the outset, as the harms caused by “market abuses” are difficult to remedy once they have happened. If the public health community does not make its voice heard during trade negotiations then it is ignoring a potentially powerful route to improving population health and wellbeing. It can only do that by engaging with trade policy groups and developing its understanding of the legal frameworks.

A trade and public health network fits the aims of the UKPRP Network awards by bringing diverse expertise together across historically divided communities to build shared understanding. It represents a novel approach to addressing noncommunicable diseases through collective, interdisciplinary knowledge-sharing.

### **Please describe why you have chosen to focus the network in your chosen area and why there is a need for this in the UK**

Brexit has placed trade high on the agenda but it is an under-developed area for the public health community. There is an urgent need to bring together disparate sectors in order to make a timely contribution to the debate.

Non-communicable diseases (NCDs) are the greatest burden of ill-health in the UK and a major cause of healthy life expectancy inequalities. As such, NCDs are a significant economic threat, not least because of reduced workforce productivity as a result of ill-health. (1) Maximising healthy life expectancy should be a fundamental part of economic strategy, including trade and investment agreements (TIAs).

The aims of TIAs are often stated as being to protect consumers, raise standards of living, prevent the spread of disease, protect the environment and consider sustainability. The connection between health and trade can be positive; the availability of medicines, for example, has global potential to improve lives – as seen by Merck pharmaceuticals’ distribution of free-of-charge medicines to treat river-blindness.’ (2) However, TIAs carry potentially significant risks to population health. Globalisation has led to increasingly de-regulated international trade with substantial impacts in policy-making, health outcomes, and impacts on vulnerable groups and health determinants. (3) Greater availability of cheap processed food, for example, affects people’s nutritional status and rising intellectual property protections view product labelling as a barrier to trade.

Lessons from trade disputes (4) suggest:

- TIAs should be based on the highest possible health standards from the outset.
- international standards should allow for continuous improvement to reflect current scientific knowledge.

In 2002 the WTO and WHO (1) identified two critical conditions for trade and health policies:

1) a knowledgeable leadership able to identify policy concerns and 2) cross-sector working that feeds into decision-making. However, a search to identify trade and non-communicable diseases literature by UK authors found only a few public health professionals focussing on trade and health. This limited UK expertise is scattered across a number of universities, non-governmental organisations as well as various government agencies. There are even fewer UK lawyers specialising in public health or non-communicable diseases.

The Supreme Court ruling in November 2017, (5) that Scotland's introduction of minimum unit pricing is the best measure of protecting a population from alcohol-related harms, provides a mandate to ensure that trade policies also protect and improve public health and wellbeing.

These factors, taken with this mandate, highlight the role for a UK-wide trade and public health network. PETRA would bridge academic/policy/advocacy expertise across the public health, legal and trade communities to share scarce resources and learn from international experience.

1. Non-communicable diseases: what trade and industry needs to know (2016) Geneva: World Health Organization and United Nations Development Program

<http://www.undp.org/content/dam/undp/library/HIV-AIDS/NCDs/Trade%20and%20Industry.pdf?download>

2. Burton BK, Goldsby M (2005) The golden rule and business ethics: an examination Journal of Business Ethics 56: 371–383

3. Hirono K, Haigh F, Gleeson D et al (2015) Negotiating healthy trade in Australia: health impact assessment of the proposed Trans-Pacific Partnership Agreement. Liverpool, NSW: University of New South Wales Centre for Health Equity Training Research and Evaluation [http://hiaconnect.edu.au/wp-content/uploads/2015/03/TPP\\_HIA.pdf](http://hiaconnect.edu.au/wp-content/uploads/2015/03/TPP_HIA.pdf)

4. Lodge H (2017) A public health guide to trade and investment agreements. London: UK Public Health Network

<http://www.ukpublichealthnetwork.org.uk/ukphnresources/?entryid134=56940&p=2>

5. <https://www.supremecourt.uk/cases/uksc-2017-0025.html>

### **Please provide a summary of the specific network challenge and purpose of the proposed network**

The purpose of establishing PETRA is to:

- Create 'bridging network' opportunities to facilitate cooperation between widely divergent disciplines that have no previous experience of working together.
- Identify the potential for 'bonding networks' to facilitate collaborative working to further the research and development agenda in the field, avoiding duplication of effort and reducing silo- working.
- Create 'network brokerage' communications mechanisms to make effective use of currently limited knowledge and experience in the field across the UK.
- Build expert based capacity across the public health and trade communities to speak confidently about the potential for trade and investment agreements to improve public health and wellbeing.

Bringing together divergent sectors that lack previous experience of collaboration will be challenging. However, shared values among PETRA's likely stakeholders suggest that a network could be constructed. The public health community focusses on addressing non-communicable diseases with the emphasis on the potential negative impact that trade and investment agreements can have on public health and wellbeing. The trade community focusses on addressing economic and political issues in establishing trade and investment agreements that deliver economic growth and efficiency for the UK. Business is aware of

the economic benefits of actively pursuing CSR objectives, which would also facilitate their involvement here.

This divergence will be addressed by recognising that both economic and health issues are part of a single holistic whole. PETRA will provide a forum to encourage economic, trade, policy, legal and public health professionals to discover and develop mutual commonalities. The aim is establish interdisciplinary working. PETRA will therefore work under strict Chatham House rules with a “Cabinet accountability” operation.

Applicant ref.	Research Director	Institution	Title of Proposal
UKPRP_NO1_119	Professor Paul Monks	University of Leicester	Non-communicable disease (NCD) and the Indoor Environment

**Summary**

Sustainable urban living is one of the key challenges for humankind. The indoor environment is integral to daily life with, in developed countries, 90% of time spent indoors, and potential for significant influence on the development of NCD.

Human health (NCD) indoor environment interactions including air quality, lighting, noise, temperature, ventilation interact with broader influences including historic, social, cultural, political and outdoor-environmental drivers. Impacts can have many facets, ranging from poor air quality exacerbating asthma and COPD, noise pollution associated not only with stress but also increased cardiovascular and diabetes risk, overcrowding and poor design leading to social problems and depression, and lack of recreational opportunities leading to diabetes and obesity.

In order to explore these interactions and focus them on NCD prevention, an ambitious, diverse and highly multidisciplinary approach that brings together clinical scientists, public health practitioners, builders, property developers, architects, air quality scientists, local authorities, politicians, social scientists and users stakeholders is required.

The network challenge is to investigate the sources and magnitude of impact of elements of the indoor environment on NCD health outcomes at the population level. Network outcomes will be: multi-disciplinary research agendas, practical advice, interventions, and transformation via policy, regulation or other mechanisms.

**Please describe why you have chosen to focus the network in your chosen area and why there is a need for this in the UK**

Sustainable urban living is one of the key challenges for humankind. The indoor environment is integral to daily life with, in developed countries, 90% of time spent indoors, with potential for significant influence on development of non-communicable disease. This can have many facets ranging from poor air quality causing asthma and COPD, noise pollution associated not only with stress but also increased cardiovascular and diabetes risk, overcrowding and poor design leading to social problems and depression, and lack of recreational opportunities leading to diabetes and obesity.

At the core of this proposal is the vision that regulatory frameworks can be developed that take full account of health effects to prevent or at least mitigate many health problems caused by exposure to a sub-standard indoor environment. At a time when there is considerable concern about the quality of our housing stock, with increased political pressure for more and better homes facilitated by an overhaul of building regulations, it is timely to bring together a wide range of expertise to devise a platform informed by a sophisticated analysis of the health impacts of the indoor environment on health.

While there are a number of bodies that are interested in this area our ambition is to be both more comprehensive and holistic than other groupings, many of which we will engage with this initiative. Perhaps uniquely we will bring together clinical scientists with expertise in disease causation, particularly in at risk groups, with non-clinical academics and interested parties with expertise in the built environment, but not necessarily non-communicable disease (NCD).

In the UK, both in the political and academic sphere relatively little attention has been paid to the role of the indoor environment and NCD. Political responsibility for the indoor environment is shared between local councils and several government departments resulting in fragmentation of responsibilities and actions. In addition, none of the funding councils regard the health effects of the built environment as their responsibility, so there has been relatively little research done in this area compared to the size of the task. As a result building regulation has taken place in a relative vacuum in terms of health effects, with limited evidence to guide policy and few drivers to implement change even when the evidence for a health effect is clear.

In this context, modifications in building design, such as those directed towards the low carbon economy, cost efficiencies, demands on land usage and new materials, have not to any great extent taken health effects into account. Yet there are a myriad of human-indoor environment interactions including air quality, lighting, noise, temperature, ventilation, sitting in a wider envelope of factors including historic, social, cultural, political and outdoor-environmental drivers to be taken into account.

In order to address this gap, we will bring together clinical scientists, public health practitioners, builders, property developers, architects, air quality scientists, local authorities, politicians, social scientists, and users represented by charities and other lay stakeholders in a diverse, multi-disciplinary network to solve this most pressing of problems.

**Please provide a summary of the specific network challenge and purpose of the proposed network**

The specific network challenge is to capture and document the sources and magnitude of impact of the indoor environment on NCD health outcomes at the population level, which can be addressed by policy, regulatory or other mechanisms. For a series of impacts identified, the networked research community will conduct activities to set a research agenda and needs analysis with a pathway towards education, policy co-creation and implementation activities.

There are a number of facets and challenges relevant to the theme of the indoor environment which will be explored within the network activities. As a starting point, and to enable compilation of the initial membership of the group, we have identified a number of sub-themes that will be developed by the network partners:

- indoor air pollution sources and impacts on health encompassing both gaseous and aerosol phases
- impact of environmental drivers including noise, lighting, ventilation, damp, microbial contamination (especially by allergenic fungi and their allergens) and temperature extremes on health
- understanding the socio-economic cost and inequalities associated with the indoor environment
- housing design impacts on psychological and physical health effects
- indoor environment health outcomes on mental, respiratory, cardiovascular, paediatric health
- indoor environment and improvement of lifestyle, resilience and well-being
- monitoring, modelling and health impact assessment methods to assess the linkages between the indoor/outdoor/workplace environment and health
- health impacts of the indoor environment in specific settings e.g. the prison, hospital, school or workplace (e.g. call-centre) environments
- how building regulations and standards can be used to mitigate negative indoor environment-health impacts

<b>Applicant ref.</b>	<b>Research Director</b>	<b>Institution</b>	<b>Title of Proposal</b>
UKPRP_NO1_120	Professor Laurence Moore	University of Glasgow	PHASE: The Population Health Agent based Simulation nEtnwork

### **Summary**

There have long been calls for complex systems approaches, and agent-based models (ABM) in particular, to be applied to public health problems. Despite these, ABM remains an under-utilised approach among the public health community. While health-related ABMs do exist, their development thus far has been piecemeal and inconsistent. In order for ABM to be applied sensibly to large-scale population health improvement projects, we must i) engage fully with their established application in other disciplines to avoid 'reinventing the wheel', ii) address the current inconsistencies in standards and approaches and, most importantly, iii) create a climate in which funders and users of research recognise the value of ABMs and drive their development to be maximally relevant to complex population health challenges. PHASE aims to 'normalise' the use of ABMs in public health research. It will: establish new connections between current health, and non-health ABM practitioners; generate and publish guidance for best practice in developing and applying ABMs; establish an ABM 'registry'; and engage throughout with cross-sectoral, multidisciplinary population health practitioners and scientists, funders and journal editors. PHASE will create an identifiable population health-focussed interdisciplinary research community that can optimally lead and support the application of ABMs to pressing population health challenges.

### **Please describe why you have chosen to focus the network in your chosen area and why there is a need for this in the UK**

The recent "Improving the Health of the Public by 2040" report from the Academy of Medical Sciences is clear that current biomedical approaches to research and intervention are failing to achieve sufficient progress in improving population health and reducing inequalities. Approaches rooted in clinical epidemiology, under-pinned by linear 'cause and effect' modes of thinking, seem to have reached their limit of effectiveness; many interventions achieve small or no impacts and widen inequalities. The report recognises the potential value of complex systems simulation approaches, particularly agent-based modelling (ABM), to help address these challenges. Despite numerous calls in recent years for public health to adopt such approaches, actual applications of ABMs remain relatively unusual. We contend that this is at least in part because: simulations are misunderstood by, or unknown to, many academics and public health practitioners; and the simulation science and population health communities are not sufficiently connected.

ABM is a computational methodology in which systems of heterogeneous simulated agents interact with one another and their environment, with their behaviours driven by relatively simple interaction rules; in the context of health research, this approach allows us to model individual health behaviours, social factors, environmental effects and their interactions explicitly. ABM has been used extensively to model social behaviour; the origin of this discipline of social simulation is usually credited to Thomas Schelling (1971) and his famous model of residential segregation. The approach has since become one of the core methods of interdisciplinary complex systems science, and as such has been applied in numerous domains throughout the natural, engineering and social sciences.

Developing ABMs for health research is a complex undertaking. While we can build upon the foundations laid by the social simulation field over the last several decades, most social simulations intentionally limit their complexity in order to develop simulations with explanatory aims rather than predictive ones. Health science, in contrast, is frequently concerned with predicting possible health outcomes or the results of interventions or policies, both of which require a higher degree of accuracy both in agent behavioural

models and the processes driving those behaviours.

The application of ABMs to population health problems requires a conceptual framework which is very different from conventional epidemiological or public health models. For example, notions that simulations based on simple interactions can be useful, that variables might simultaneously be 'exposures' and 'outcomes' and that an ABM may suggest that the most effective intervention for a problem might be in a seemingly distal part of the social system and often outside the usual scope of public health practice, can all be daunting and difficult to accept.

We posit that the current limited use of ABMs in health is likely to remain unchanged unless a process of 'normalisation' takes place. This would shift the current 'bottom up' development of ABM use in public health, driven by small-scale, small-team efforts, to one in which funders, journal editors and - most importantly - users, recognise the value of ABMs and themselves drive demand for the application of ABMs.

**Please provide a summary of the specific network challenge and purpose of the proposed network**

The purpose of PHASE is to normalise the application of ABMs as an additional tool to help understand and tackle public health problems. Medium-term markers of success would be that i) a wider-range and greater number of health stakeholders, research funders and journal editors recognise the utility of appropriate ABM application and drive development of the field themselves and that ii) the simulation and population health science communities achieve a deep and sustainable connection. In the long term, PHASE aims to spawn a number of interdisciplinary teams taking forward ambitious ABM projects applied to specific NCD prevention issues.

The challenges for the network are substantial. Although complex systems approaches are gaining significant attention in public health research and practice as they speak to the complexity of the wicked issues that dominate population health priorities, awareness of the concepts, methods and language to simultaneously study multiple processes at both individual, population and intermediate levels, and their interdependence, is very limited. Many health researchers remain unfamiliar with computational modelling, and most ABM-based studies remain small in scope. Significant challenges remain to be resolved in the disciplinary interface between simulation and public health in collating, agreeing, disseminating and embedding: an understanding of when an ABM might be useful; an understanding of when and how ABMs can (and cannot) help identify and fix population health problems; best practice in developing and using an ABM; the technical skills required to build, test and operate an ABM and; appraising and understanding health-related ABM studies.

Applicant ref.	Research Director	Institution	Title of Proposal
UKPRP_NO1_124	Professor Gareth Stratton	Swansea University	National Education and Health "Action" Network Development Scheme (NEW-HANDS-Dwylo-Newydd)

### Summary

Primary school experiences influence adolescent and adult health. This project develops a National Education and Health "Action" Network Development Scheme (NEW-HANDS) across Wales to evaluate and compare interventions for child health and wellbeing delivered in the primary school environment. The work will bring together linked routine data (health and education) and objectively collected data from the child. We have over 25 years' experience working in a multidisciplinary environment to help create evidence based change to improve children's health and academic development. Different to other health networks our focus is on creating change through the development of a "what works" approach which is based on co-production. We will build a business model to help sustain the network. Services will be provided on a non-for-profit bases delivering to school needs. This approach will give a sustainable network that delivers key measurable outcomes as set by members, e.g. evidence to improve academic attainment (schools), evidence to improve health (health providers), evidence to improve engagement in active opportunities (local council), high quality publishable evaluations (University). The network will provide pump priming funds to compare methods and policies in different areas and to facilitate the adoption of successful evidence based interventions in deprived community schools.

### Please describe why you have chosen to focus the network in your chosen area and why there is a need for this in the UK

In Wales there is a widening health inequalities gap suggesting that policy, strategy and implementation have not been bridged effectively. Currently the School Curriculum in Wales is undergoing transition as a result of Lord Donaldson's review in 2015. Donaldson has challenged schools to develop "healthy, confident individuals ready to lead fulfilling lives as valued members of society." While there is imminent curriculum change that emphasises "whole-child" development, Welsh Government has placed on statue the Well-Being of Future Generations Act for Wales (FGAW, 2015) the centre of which emphasises "a good start in life." This major policy development aims to develop a resilient, prosperous and healthy nation and places significant emphasis of the role of schools in helping achieve these goals. Both the Donaldson report and the FGAW intimate that action is required and have structured public body governance systems to implement the act. There are 19 Public Service Boards (PSBs) in place across Wales. Each PSB has statutory members (Local authority, Local Health Board, Fire and Rescue Authority, Natural Resources Wales) and invitees (Police, Probation, Voluntary, Education and Business) that work together to generate data and promote health in their constituents. We have linked with PSBs through HAPPEN (<https://www.happenswansea.co.uk/>) in Swansea by engaging the council, schools, university, local public health (e.g. healthy schools), local services (police, fire), local activity providers, third sector charities and voluntary organisations to work together on child health. This approach has been successful in stimulating 'evidence based' change in identifying factors that improve attainment, promote health and well-being and influence how schools, the local council and local service providers work together to co-produce curricula that positively impact on children's health and maximise the use of available resources. For example, we have found the need to increase support to schools in deprived areas as this is where interventions are less likely to be adopted, yet ironically where they are likely to have the greatest effect at reducing health inequalities. Data collected from school children can also be linked to national education records (including secondary school attainment), and routine data health records (GP and hospital admissions) using the Welsh Government funded Secure Anonymised Information Linkage (SAIL) database. This can be used to

quantify a systems approach and allow long term follow up of the effects of policy changes and local interventions, whilst adjusting for confounders. We have successfully developed the network in partnership with schools and stakeholders using an organic bottom up approach and a co-produced mission for all partners. The current infrastructure has been highly successful at a local level and it exists as a good pilot for the design of a NEWHANDS across Wales. This network will build on recent developments including the work of the Administrative Data Research Network (ADRN), FARR, working with other UKPRP networks and consortiums and collaborating with others in England, Scotland and N. Ireland who are working in schools health to share and compare knowledge on what works in different areas.

**Please provide a summary of the specific network challenge and purpose of the proposed network**

The challenge to the Health Action Network is (A) to (i) provide an infrastructure that enables schools (ii) select interventions that work, (iii) co-produce interventions that most suit their needs and (iv) allow interventions to be evaluated and findings fed back to schools and network partners, and (B) to (i) roll out the health action network across Wales and (ii) develop a sustainable business model.

Our “action goals” and thus purpose are to facilitate evidence based health promotion in schools and to share effective practice both within and outside Wales. We want to help schools create healthy active learning environments, promote active learning and act as beacons within their communities. Our challenge is to develop a business approach that focuses on investment in interventions that work and to disinvest in those that do not. For example, schools report they want interventions that align with the needs of their students and are cognisant of local challenges and community assets. We also want to evaluate and communicate the effectiveness of the network and highlight effective process and outstanding practice. Another challenge in creating the network will be how to best communicate and use social media to complement our existing methods of communicating health related data with schools, this will include, running meetings and webinars and online workshops and publishing case reports of successful interventions/policies. to engage stakeholders at a local and national level. Therefore our purpose is to support schools in promoting physical activity and subsequent health outcomes of children and by extension families.

Applicant ref.	Research Director	Institution	Title of Proposal
UKPRP_NO1_131	Professor Jayne Woodside	Queen's University Belfast	Opportunities for intervention and innovation in the UK School Food System: the GENIUS (Generating Excellent Nutrition In UK Schools) network

### Summary

The school food system has a major influence on the quality of children's diet away from home and has the potential to reduce diet inequalities. Diet quality in childhood impacts on developmental, attainment, health and well-being outcomes, and is critical in the establishment of life-long diet. This project aims to: (1) develop a network of academics and non-academics across the UK actively researching and influencing the school food system; (2) understand the current UK school food system, including similarities and differences between the home nations, and (3) explore opportunities for population and system level interventions that will positively impact diet quality and inequalities. This network will use a combination of workshops, working groups and small pump-priming projects to explore five themes: school food policies/standards, school food procurement/provision, the physical school food environment, school food system data collection and utilisation, and feasibility of school setting (i.e. population level) interventions to improve diet quality and reduce diet inequalities. These findings will be disseminated widely, building upon existing and new academic and non-academic networks. Funding applications will be developed based on these findings, working in partnership with policy makers and schools, to ensure maximum engagement and future sustainability of the network.

### Please describe why you have chosen to focus the network in your chosen area and why there is a need for this in the UK

Diet is a key, modifiable health determinant. However, despite this, UK children's diets are high in fat and sugar, and low in fibre and fruit and vegetables. For example, only 8% of UK 11-18 year olds are meeting the "5-a-day" guideline, with socioeconomic differentials. We need effective and sustainable ways of helping young people, particularly in areas of social and economic disadvantage, choose a better diet.

Schools play a crucial role in improving children's health, and are an obvious setting for population-level public health interventions. They provide easy access to pupils of various ages, with children spending approximately 40% of week days at school. A systematic review of interventions to prevent childhood obesity highlighted 'establishing environments and cultural practices within schools that support children eating healthier foods throughout the day' as an effective intervention strategy.

UK school food was deregulated in 1980, and between 2000 and 2013, each nation re-introduced school food standards across primary and secondary schools. All four countries have food-based standards for lunch and for food provision other than lunch. England, Scotland and Wales also have nutrient-based standards for lunch. These standards varied in content and timetable for implementation, but are now compulsory, except for English academies.

Each country's standards have been reviewed by our network members. Evaluations of standards have varied in scope, detail and timing. Where standards have been implemented, the quality and nutritional value of food provided has improved, both within and beyond the school canteen and, indeed, the school setting, children from all socio-economic groups have benefitted. However, little research has been conducted nationwide, owing to regional differences including implementation, data collection, and monitoring.

There is currently no formalised research network bringing UK partners together to understand best practice.

Little is known nationally about school food procurement, physical food environment, routine data collection, and the diets and food choices of pupils in school. The parliamentary office for science has highlighted healthy school food as a priority area for briefing parliament in 2018. There are examples of innovative school setting interventions, but it is not clear to what extent isolated pieces of research have informed ongoing policy development. Furthermore, studies have illustrated some good practice and provided future implementation models, but the extent to which this is acted upon is uncertain. There is also much to learn regionally, for example, regarding novel interventions, environment changes and data collection that could be applied nationally.

It is critical to policy development that the value of investment/innovation in the school food system is measured and protected using planned, appropriate, robust and timely evaluations, working across government departments and between countries. Broader insight is needed to provide a foundation for future actions, in terms of activities ripe for innovation, intervention development/testing, and effective routes to influence policy. Hence, we propose a UK school food system network (GENIUS) considering the food system in its broadest sense, across the preschool, primary and secondary settings, and including all school food provision, within canteens, vending machines, shops and home-prepared packed lunches.

**Please provide a summary of the specific network challenge and purpose of the proposed network**

There is a huge opportunity to better harness school food to improve population health, but regional school food policies have done nothing to identify and disseminate best practice across the UK. Schools play an important role in promoting healthy eating habits to children, and should provide healthy, balanced and nutritious food and drink with the appropriate amount of energy/nutrients pupils need. The school landscape has changed markedly over the last 2-3 decades and continues to evolve. The purpose of this network is to bring together a multidisciplinary team to holistically examine school food in its broadest sense under five key themes. Scoping of these five themes and building network expertise will advance research and policy around food in schools. Inclusion of researchers and non-academic partners from across the UK will allow the strengths and weaknesses of each individual country to be examined. Overall, consideration of each theme will allow the generation of a series of recommendations for future research and priority areas for intervention, i.e. short term "quick wins" and longer term ventures.

We are aware of other consortium and network applications focusing either on primary and secondary schools, or on childhood obesity and/or physical activity that will to some extent include the school environment, but none of these specifically focuses on school food. We have engaged with these research teams and have agreed that, if successful in gaining funding, activities will be carried out in a collaborative manner, and activities advertised across consortia and networks to maximise learning.