SPHSU 2022 PhD Studentship proposals

RELATIONSHIPS

How can we better harness community pharmacies as a resource for sexual health and wellbeing within local communities?

Ruth Lewis, Susan Patterson

As general practice and sexual health services continue to struggle following sustained underinvestment, community pharmacies are well-placed to support the sexual health and wellbeing of the local populations that they serve. With long opening hours and wide geographical spread, they offer convenience and ease of access, particularly for those who find it difficult to access appointments or are reluctant to visit traditional sexual healthcare settings (e.g. GPs, sexual health clinics). In Scotland, recent national policies (e.g. the Scottish Government Women's Health Plan) propose a greater role for community pharmacies in provision of routine sexual health services. Working towards this goal requires an enhanced understanding of the role of community pharmacies within the wider system shaping sexual health and wellbeing. This PhD project aims to understand how community pharmacies can be envisaged and harnessed as a *community-based resource* for sexual health and wellbeing in Scotland. It will use participatory approaches and systems thinking to bring together local communities and key stakeholders (e.g. policymakers, pharmacists, and people who deliver sexual health services in other settings) to collaboratively explore how community pharmacies can be re-imagined as a community asset for sexual health and wellbeing.

Adolescent friendships, social support, social networks and health

Mark McCann, Srebrenka Letina, Emily Long

Compared to 20 years ago, young people experience poorer mental health, lower self-esteem and experience body image issues more often. Young people also report smoking, drinking and using substances less often. Many aspects of society have changed in those 20 years, including awareness of health risks, wider society, school pressures, and availability of smartphones. This PhD research project will ask: *how do relationships and interactions affect adolescent health*? This will include studying patterns of offline and online social networks, sources of emotional support, and how peer groups can affect health. The project will involve analysing several large datasets, with information on thousands of school students and their social interactions that have been collected over the past 25 years. This will also include new data being collected in schools in 2022 and 2023.

Social relationships across the life course and healthy ageing

Emily Long, Mark McCann, Ruth Lewis

The important people in our lives change over time. Our relationships with parents, friends, children, work colleagues, and grandchildren are very different comparing early adulthood, middle age and older age; but these relationships can have important positive and negative influences on health and wellbeing. Studying how relationships can improve health, and how changes in our relationships affect health, are important factors to help keep us healthy as we grow older. For example, retirement can mean a change in relationships with work

colleagues, but provide people with more free time to spend with friends and family. Collecting and understanding data on relationships over several decades can be challenging. This project will investigate: how do changes in social networks over the life course influence healthy ageing? The project will involve analysing existing data on the social relationships of older people, and conducting interviews with older people to get a better understanding of the importance of changing relationships over their lifetimes.

INEQUALITIES

How effective is the 'public health approach' to preventing violence?

Andy Baxter, Peter Craig

The Violence Reduction Unit set up by Strathclyde police in 2005 pioneered a 'public health' approach to violence reduction - aiming to treat the social determinants of crime in order to reduce the incidence of violent crime. Following a 35% reduction in homicides from 2010 to 2020, the unit's public health approach has been hailed a success, encouraging the adoption of similar strategies elsewhere. Research using recorded crime and victimisation survey data suggests that, while changes in the pattern of violent crime are consistent with the focus of the new policing strategy, trends in violent crime in Glasgow since 2005 largely follow trends elsewhere in Scotland. The project will take a natural experimental perspective, using causal inference methods applied to hospitalisation and other data to identify the effect of the public health approach to preventing violence.

Workplace wellbeing and health inequalities. A comparative analysis across EU countries

Theocharis Kromydas, Evangelia Demou, Peter Craig

The link between employment status and health inequalities is well-established; however empirical research on the relationship between qualitative elements of work, such as job quality, work-life balance (WLB) and job satisfaction, and health is still very limited. The main hypothesis of this PhD topic is that health inequalities differ by job quality, WLB and job satisfaction across EU workers (including UK workers). These differences can be related not only to individual and workplace characteristics but also to contextual factors and policies across the EU. Secondary data analysis of relevant longitudinal EU-wide surveys will be used to investigate whether qualitative elements of work have changed over time, and how they impact on health inequalities by socio-economic position and gender. Causal modelling approaches will be used to identify specific mechanisms, and then to model the possible impacts on work related inequalities of intervening on those mechanisms. The applicability of natural experiment models on specific policy interventions to improve work and working conditions on an EU and national level will also be explored. This PhD studentship will deliver novel empirical and theoretical understandings of the complex relationships between workplace well-being elements (e.g, job quality, WLB and job satisfaction) and health inequalities.

Anticipating the impacts of income and social security policies on child health and health inequalities: combining causal epidemiology and microsimulation approaches

Anna Pearce, S Vittal Katikireddi

Child poverty and living in a workless household are thought to be major drivers of poor health. These inequalities can arise from less socially advantaged groups being more commonly affected by a cause of poor health (differential exposure), a cause exerting a greater effect among less socially advantaged groups (differential susceptibility), or more likely a combination of the two. This can have major implications for the effectiveness of policies for reducing health inequalities, since addressing some causes of poor health might lead to disproportionate impacts on health inequalities. This PhD project will A) develop

causal estimates for differential exposure and differential susceptibility using survey data, such as Understanding Society and the Millennium Cohort Study, and B) integrate these estimates into microsimulation models to anticipate the likely impacts of income and social security policies, which may reduce or exacerbate child poverty, on child health and health inequalities. There will be a degree of flexibility around the specific research questions addressed, with opportunities for formal and on the job training and writing publications where appropriate.

SYSTEMS SCIENCE

Simulating the health impacts of individual policies

Supervisors: Alison Heppenstall, Petra Meier, Gerard McCartney (Social Sciences)

There are ongoing efforts to create modelling tools that are able to simulate impacts of health policies at the individual-level. One of the more prominent tools is the Public Health Observatory Triple I tool. This is a spreadsheet that is designed to be accessible to stakeholders and can approximate the impact of various policies on the population. Whilst this tool is a positive step to bridge academic research and stakeholder engagement, it contains a number of key assumptions. These include an assumed causal relationship between income and mortality, linear relationship between health and mortality and no individual behavioural changes in response to policy changes.

This PhD will use System Science approaches, such as agent-based and causal inference modelling to address key assumptions within the Triple I.   It will focus on exploring questions around the impact of an increase/shift in wealth on individual health through combining an individual-based modelling approach with casual inference modelling. Through a relationship facilitated by McCartney, the student will have access to key data and experts at the Public Health Observatory. These will shape and inform the direction of the model.

PLACES

Nature, physical activity, and health and wellbeing: a mixed methods co-production approach to develop impact activities with and for young people

Supervisors: Paul McCrorie, Avril Johnstone

This mixed-method PhD aims to explore the relationship between access to nature, physical activity, and children's health and wellbeing. Using secondary data analysis, the Studying Physical Activity in Children's Environments across Scotland (SPACES) dataset (rich GPS and accelerometery data for approximately 700 children) will be utilised to inform the co-production and development of impact activities with and for young people. An evaluative approach will be embedded to understand if and how children can use existing public health research to impact children's relationship with nature, physical activity, and health and wellbeing in Scotland.

Longitudinal assessment of neighbourhood characteristics, mental health and well-being

Supervisors: Jonathan Olsen, Elise Whitley, Fiona Caryl

Local environmental bads (gambling, unhealthy foods, and tobacco/alcohol outlets) and goods (physical activity facilities, fruit and vegetable outlets, and supermarkets) cluster in geographical areas, which are patterned by area-level deprivation. Associations between these environmental factors and where people with higher risk for negative health outcomes reside have been reported (1)(2) but are based largely on cross-sectional data. More robust, causal evidence for the impact of neighbourhood environment on health requires a longitudinal approach. However, the feasibility of measuring environmental bad and good locations over time for use as area-based trajectories of neighbourhood change (declining/improving areas), and their relationship with longitudinal mental health and wellbeing outcomes has not been assessed. The aim of this studentship is to create a longitudinal dataset of local environmental goods and bads using, for example, Ordnance Survey Point of Interest facility/amenity location data and, from this, to develop a local area-based trajectory of environmental goods/bads change indicator. This indicator will be linked to appropriate longitudinal data, for example Understanding Society (3), to explore longitudinal associations with mental health and wellbeing outcomes and the potential mediating role of subjective neighbourhood perceptions. Further analyses will explore the relative importance of different environmental factors to groups with different priorities and needs, for example younger versus older adults, who have been identified as a priority group by WHO (4).

COMPLEXITY

Systems or network approaches to improving sleep and mental health in young people

Supervisors: Sharon Simpson, Jo Inchley, Anne Martin

In recent years there has been a shift towards reduced sleep among young people. Inadequate sleep can impact on young people's physical and mental health and wellbeing. This studentship will explore young people's and other key stakeholders (eg family, schools) understanding of the links between sleep and mental health/wellbeing, barriers to obtaining good sleep and identification of potential leverage points for intervention and could employ a range of methods, e.g. reviews, surveys, systems mapping approaches and qualitative work.

Parenting strategies in relation to adolescent sleep and social media use

Supervisors: Sharon Simpson, Jo Inchley, Anne Martin

Parents have a critical role to play in promoting adolescent health and wellbeing within the home environment. There is evidence that sleep problems are increasing among the adolescent population and digital technology has been proposed as one potential contributory factor. Various mechanisms may explain the link between digital technology and sleep, including delayed bedtimes, cognitive over-stimulation, fear of missing out and blue light exposure affecting circadian rhythms. Given that natural sleep cycles are delayed during the adolescent years, implementing healthy sleep routines at home is particularly important. This studentship will aim to address the gap in knowledge about the strategies that parents use to encourage healthy adolescent sleep routines and monitor the use of digital media at bedtime, and how these impact on adolescent behaviours and mental health.

Agent based models and population health

Supervisor: Eric Silverman

Population health research has made significant strides in recent decades, but some health challenges facing society remain very difficult to study. Issues like the ageing population, increasing obesity, and multi-morbidity are driven not by simple cause-and-effect relationships, but are influenced by behavioural, environmental and social factors. Increasingly, we are turning toward interdisciplinary computational modelling techniques such as agent-based modelling (ABM) to unravel the complex interplay of factors that drive these urgent problems in population health. ABMs are computer simulations that model the behaviours of individual people in complex virtual environments, and consequently help us better understand how the interaction of the individual, the environment, and the social realm lead to poor health.

This project will tackle this exciting area of research head-on by applying ABM to key problems in population health and using cutting-edge AI techniques to better understand the behavior of these complex models. Machine- and deep-learning methods can improve the theoretical understanding of the ABM, help calibrate the model, and facilitate interpretation of the results relevant to end users. The PhD candidate will develop novel frameworks for the analysis of large simulation models using machine learning and deep neural networks. These innovations will facilitate the development of new techniques, protocols and software for the analysis and dissemination of complex simulation studies in population health, opening up new avenues of research on major health challenges.