

Autumn/ Winter SCPHRP magazine 2013



SCPHRP

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CONTACT US

Scottish Collaboration for Public Health Research and Policy (scphrp) 20 West Richmond Street Edinburgh EH8 9DX

T: +44 (0) 131 651 1594 E: Firstname.surname@ed.ac.uk W: www.scphrp.ac.uk

Twitter @scphrp



Message from John Frank, Director



A swe head into 2014, SCPHRP is supporting a dozen topicspecific subgroups of researchers and research-

users, from across Scotland, who attended our two Joint Working Group Meetings in October and November this year. Nearly 70 persons have signed up for one of these breakout groups, and their topics are both creative and varied, as Ruth Jepson's summary in this issue of our magazine indicates (pages 8 & 9). Over the next few years, our four Post-Doctoral Fellows and staff will support these groups as they seek to develop and pilot novel public health interventions for a healthier and more equitable Scotland. If you are interested in participating in one of these groups, do contact the relevant Fellow, as listed in Ruth's article

In other news, we and our collaborators at Strathclyde University have just had accepted for publication in the journal BMC Public Health, after rigorous peerreview. our East Lothian 2011-12 study* of the acceptability/ feasibility, discriminant validity, and costs of the Early Development Instrument (EDI) - a teachercompleted questionnaire for P1 students that summarizes their developmental status across five functional domains, for use by local communities to improve their preschool programming and facilities.

Although a more technical project report has been up on our website for about a year (www.scphrp. ac.uk\node\340), this more readable paper in a major public health journal will reach a much wider audience. The results? -- in a nutshell, the EDI performed brilliantly, and just as well in East Lothian's six primary school clusters as it has done in several years of use across all of Australia and much of Canada. Minimal adaptation of the questionnaire's language was required. Scottish P1 teachers found it easy to use and helpful in forming their views about which of their students may need more support in primary school.

Less than 2% of parents did not want their children assessed, a very small proportion for this kind of study -- largely because the results are always anonymized and analysed at the school level or higher. The EDI is a communitylevel measure of the cumulative developmental status of children. It has been designed explicitly for community use, not for diagnosis of individual children's educational needs (for which all Scottish schools already have psychometric tools).



EARLY DEVELOPMENT INSTRUMENT a population-based measure for communities

Most importantly, the six communities of parents, teachers, public health staff and local authority personnel, in the primary school clusters of East Lothian, are now using the EDI results for their P1 children, assessed in early 2012, as the basis for establishing new or improved pre-school programming locally, with support from us.

They are already talking about finding the funds, inside the tightly stretched Local Authority budget, to re-deploy the EDI in 2015 (most international settings use it only every three years, to allow local early child development programmes time to improve.) And the cost? For Scotland, with a crude birth rate of about 1% annually, and triennial EDI use, the £20 cost per student-assessed (almost all for replacement-teacher time in the classroom while the questionnaire is being completed) comes to just 7p per annum per capita of local population.

In sum, we found only good things about the EDI in this pilot (it even showed nearly three-fold differences in the local proportions of the 1200 P1 students assessed who were developmentally vulnerable, within East Lothian).

We have presented the results widely, including a meeting of the Association of Scottish Directors of Education last spring. However, these are tough times financially for Local Authorities, so we believe leadership from the Scottish Government will be required to move the use of the EDI out across Scotland – or indeed, the use of any similar standardized measures of child development, as committed to in the current Early Years Collaborative.

We look forward to continuing that dialogue with Scottish authorities over the next year, when we hope the Scottish referendum, no matter which way it goes, will provide an opportunity for Scots to envision the kind of country they want for the future. And we think that vision should include a Scotland where every child reaches his or her full human potential, by optimal early child development programming, in each local neighbourhood.

For that to occur, a standardized, easy-to-use and community-shared measure of child development on school entry is essential.

In closing, we at SCPHRP wish you and yours all the best in 2014!



*Woolfson L, Geddes R, Booth J, Frank J. A cross-sectional pilot study of the Early Development Instrument: A tool for reducing inequality. In press, BMC Public Health, 2013.



he UK Welfare Reform Act was passed into law by the UK Parliament on the 8th March 2012. This act proposed changes to the benefits and welfare system throughout the UK, with the notable changes including:

- Introduction of a new single welfare benefit called Universal Credit, set up to replace six of the main means-tested benefits and tax credits including Job Seekers Allowance, Housing Benefit and Child and Working Tax Credits.
- Alterations to the current Housing Benefit criteria to now include a restriction on payments for those living in underoccupied properties (dubbed the 'Bedroom Tax').
- Introduction of a benefit cap, with total benefits limited to £350 for a single person or £500 per week for families.

These welfare changes have also been introduced in the context of further austerity measures in the UK and the current economic recession. Given the strong evidence for links between poorer social and economic circumstances and increased prevalence of both physical and mental ill health, these changes to current welfare provision (in conjunction with the economic recession) have been criticised in a recent NHS report for their potential of 'making a bad situation worse' (http://www.scotpho.org.uk/ publications/reports-and-papers/1109making-a-bad-situation-worse).

There is potential for people across all ages to be affected inluding those

in, and out of, work, but most notably those of working age and their children (given recent improvements in pension provision), women and those with disabilities, and for both economic and health inequalities to increase. The report highlights the potential impacts of decreases in welfare changes and recessiondriven changes in factors such as incomes, rising food/fuel poverty and increasing stigma against benefit claimants that include increases in: cardiovascular disease, obesity, mental ill health and negative health behaviours (e.g. alcohol consumption, drug use).

There is limited, but growing, evidence of the links between the current economic recession and welfare changes and health in Scotland. However, where analyses have taken place, these have been largely restricted to ecological analyses of populations rather than individuals.

There are also complexities around the possible time lag in effects and the potential for other issues to confound any observed relationship. In the coming months and years Tony Robertson, SCPHRP's Working Age/ Adult Life Working Group Fellow will help facilitate novel research and knowledge transfer through engagement within and between the research community, the voluntary sector, the health service, the public sector and with the public to help us better understand, and thereby help to minimise, the current and future impacts of the economy and welfare reforms on the health of the Scottish population.

This work is being carried out in conjunction with a newly formed working group with colleagues from SCPHRP, NHS Scotland, the Universities of Glasgow, Stirling and Aberdeen, The Poverty Alliance, Voluntary Health Scotland and the Improvement Service.

SCPHRP and the Scottish eHealth Informatics Research Centre/Farr Institute

by SCPHRP's Andrew James Williams

n the last issue of the SCPHRP Magazine (Autumn 2013) you may have spotted a new research fellow at the Collaboration who wasn't attached to any of the working groups. In this article I hope to explain how the new post came about and what I'm going to be doing.

The research fellowship is part of the newly formed Scottish eHealth Informatics Research Centre (eHIRC-S)/Farr Institute (http://www.farrinstitute.org/ centre/Scotland/3_About.html).

The eHIRC-S/Farr Institute is a collaboration of six Scottish universities, SCPHRP and NHS Scotland and is funded by the Medical Research Council.

Within Scotland the eHIRC-S/Farr Institute will build on the success of the ScottisH Informatics Programme (SHIP). The aims and themes of the eHIRC-S are listed in Figure 1 which demonstrates the SCPHRP involvement.

John Frank and Ruth Jepson are involved and I was selected as the research fellow on the subtheme of evaluating natural experiments using data linked across sectors.

SCPHRP research fellow Larry Doi is also involved with the eHIRC-S on the topic of life course (childhood obesity) epidemiology.

Natural experimental approaches have been developed to take advantage of 'natural' variation in implementation to evaluate non-randomised intervention (e.g. policy) by using a number of techniques to emulate the 'gold-standard' randomised controlled trial. A number of these techniques are illustrated in Figure 2.

Scottish eHealth Informatics Research Centre

Subthemes

Eight Aims

- 1. To be a national focus for high-quality cutting-edge research using electronic health records.
- 2. To playing a leadership role in the United Kingdom (UK) wide network.
- 3. To develop innovative training programmes.
- 4. To establish novel ethical, legal and social programmes to answer important questions relevant to medicine, society and policy makers.
- To develop cutting-edge inter-disciplinary analytical approaches to data manipulation, linkage and analysis.
- 6. To create opportunities for new data linkages.
- 7. To collaborate with world leading experts.
- 8. To develop innovative partnerships with industry, policy makers and clinical trials units.

External Collaborators

> Generation Scotland

> University of Leicester

> UK Biobank

> Wellcome Trust Sanger Institute

> European Bioinformatics Institute

> Clinical Practice Research Datalink

Collaborators

> University of Aberdeen

- > University of Dundee
- > University of Edinburgh
- > University of Glasgow
- > University of St. Andrews
- > University of Strathclyde
- > Scottish Collaboration for Public Health Research & Policy

> NHS Scotland

Health, illness and society through time*

- Early life[†]
- Epidemiology of chronic disease
- Co-morbidity
- Ageing

Clinical trialsPharmacoepidemiology

Studies of interventions

- and pharmacovigilance
- Evaluating natural experiments using data linked across sectors*[‡]
- Related health
 economic evaluation

Training and career development

Public engagement, ethics and research governance

Methodological innovation

Industry and policy maker interaction



*John Frank and Ruth Jepson are coinvestigators on these two subthemes [†]Research Fellow – Larry Doi [‡]Research Fellow – Andrew James Williams Natural experimental approaches can be used to evaluate a variety of non-randomised interventions from nationwide policies through to local charity-funded programmes.

The number and combination of natural experimental techniques (in bold in Figure 2) used will depend on the nature of the intervention being evaluated.

However, the wealth of routinely collected and linkable data in Scotland, offer plenty of opportunities for natural experiments, so I am going to be busy.

Unlike clinical research, public health research endeavours to relate to the whole public not just those with specific diseases or conditions.

In order to ensure that our research is for the benefit of

the public we attempt to involve you with what we do. However, as the research I undertake doesn't tend to require data collection from the public (as it has already been collected for administrative purposes) we have to seek new and innovative ways for you to become involved.

Subsequently, the eHIRC-S/Farr Institute have employed a research fellow on public engagement, Mhairi Aitken (mhairi.aitken@ed.ac.uk) so I would encourage you to look out for opportunities to be involved.

If you have any questions or want to know more it would be great to hear from you.

Email me Andrew at a.j.williams@ed.ac.uk

Natural experimental approaches PRandomised controlled trials Randomisation means that Randomisation means that The outcome of interest is The effect of the intervention each person in the sample measured at the beginning any differences between the is calculated as the difference has the same chance of (baseline) and end (end-point) intervention and control Sample of eligible in outcome between the receiving the intervention of the intervention period. The group are due to chance people who have intervention and control and subsequently any or the control. Therefore, given informed outcome may also be measured groups having adjusted for membership of the differences in outcome at months or years after the consent to baseline outcome values intervention or control intervention (follow-up) to see the end of the trial can be participate in the The use of randomisation and groups is not dependent whether any effect is sustained. attributed to the intervention. trial controls mean that we know on any characteristics of this effect is caused by the the individual. intervention. Data collection Intervention/Exposed Result Sample Randomise (effect) Control/Unexposed A method similar to that used NO BANDOMISATION Alongside outcome data, other Without randomisation there Sample of in randomised controlled trials Without randomisation it is data (confounders) are eligible people could be systematic is used in natural experiments possible that exposure to a collected. Sometimes it is not (difference in differences). whose consent differences between the possible to identify a control policy is dependent on some could be explicit intervention and control The difference in outcome criteria (e.g. benefits). group (e.g. nationwide policy) groups. Observable or granted by a from baseline to the end-point Techniques such as and subsequently multiple differences can be accounted data custodian of the study is calculated instrumental variables or pre- and post-exposure (e.g. a Caldicott for through matching, separately for intervention regression discontinuity can measurements can be used Guardian). regression adjustment, and control groups. The approximate randomisation. with each individual being their propensity scores or difference between these own control. multiple exposed and differences is then calculated unexposed groups using the as the effect, but this cannot Strengthening causal inference in NEAs additional data collected always be considered Information on mediators of change causal.* > Non-equivalent dependent variables Combining methods and comparing results Sensitivity analysis Developed from Craig et al. (2011) Replication Natural experiment techniques in **bold**

Natural Experimental Approaches (NEAs)

Figure 2

Reference

Craig, P., Cooper, C., Gunnell, D., Haw, S., Lawson, K., Macintyre, S., Ogilvie, D., Petticrew, M., Reeves, B., Sutton, M. & Thompson, S. 2011. Using natural experiments to evaluate population health interventions: guidance for producers and users of evidence, London, Medical Research Council. Available: http://www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC008043 [Accessed 17 December 2013]

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The Biology of Disadvantage

Take 5 minutes..



Take 5 minutes to better understand how our social and economic circumstances can influence our health.

Tony Robertson from SCPHRP takes us on a whistle-stop tour of one of the possible biological mechanisms.

S ocial inequalities in health, with people experiencing progressively worse health with increasing deprivation, are present throughout the world. In Scotland, this inequality in life expectancy difference by the most versus the least 20% deprived stands at 11 and 7.5 years for men and women, respectively (Audit Scotland, 2011).

Life expectancy is lower and mortality-risk is higher in Scotland than in the rest of the UK and most Western European countries (Whyte & Ajetunmobi, 2012).

Inequalities in health are not only limited to mortality, with the incidence of physical and mental conditions being higher for individuals with what we describe as lower socioeconomic position (SEP – measured via factors such as education, income or social class), including most cancers, heart disease, diabetes, depression and multimorbidity (more than two chronic diseases occurring at the same time in a person). However, the underlying biological processes linking poorer SEP and ill health are not well understood. Understanding the causal links between SEP and health can help in the development of disease risk predictors and designing interventions that will be essential if inequalities are to be reduced in Scotland and elsewhere.

The Scottish Government's Ministerial Taskforce on Health Inequalities has highlighted that reducing the health gap between our richest and poorest communities is among the greatest "of all the challenges facing Scotland" (Scottish Government, 2012).

Given the wide range of conditions that vary by SEP, it has been proposed that there are some common biological pathways for how SEP can 'get under the skin' (Adams & White, 2004). One of the possible mechanisms posited is through more rapid biological ageing in those with lower SEP. Biological ageing is the rate at which our cells and organs deteriorate and our bodies lose function.

One proposed way of measuring biological ageing is by using a biomarker called telomere length.

As we age, our telomeres (small sections of DNA at the ends of our chromosomes) get progressively shorter, although the rate of this shortening is not identical for people of the same chronological age.

Shorter telomere length has been shown to be associated with some key age-related diseases such as dementia and some cancers. This effectively makes telomere length a type of 'biological clock'.

It is not clear if telomeres have a causal relationship with subsequent health conditions or if they are simply a marker of biological ageing.

Although there have been some notable studies identifying a link between lower SEP and shorter telomeres, the evidence is not convincing.

A recent systematic review and meta-analysis found that telomere length was significantly shorter in people with lower educational attainment, but there was no evidence for an association between telomere length and contemporaneous or childhood socioeconomic circumstances (Robertson et al, 2013).

The reason for these findings may be because education is an indicator of socioeconomic circumstances at the onset of adult life (when we move from our parents' socioeconomic position to our own) that sets an individual's socioeconomic trajectory for the future.

Effects of socioeconomic circumstances on telomeres may take many years to accumulate, so education may provide a more robust indicator of socioeconomic

This effectively makes telomere length a type of 'biological clock'.

Tony Robertson

circumstances through early adult life and middle age than measures taken at the time of the study.

It is hoped that we will be able to analyse repeatmeasures of telomere length in the coming years, a measure limited by the relative novelty of the measure.

Changes in telomere length following exposure to distinct changes in SEP may allow us to identify if more rapid biological ageing is indeed consistently evident.



Adams JM, White M. Biological ageing: a fundamental, biological link between socio-economic status and health? Eur J Public Health. 2004;14(3):331-334.

Audit Scotland. Life Expectancy in Scottish Council Areas split by Deprivation, 2005-2010.

Edinburgh: Audit Scotland;2011.

Robertson T, Batty GD, Der G, Fenton C, Shiels PG, Benzeval M. Is socioeconomic status associated with biological aging, as measured by telomere length? Epidemiologic Reviews. 2013; 35(1):98-111.

Scottish Government. Tackling health inequalities November 29th 2012.

Whyte B, Ajetunmobi T. Still the "sick man of Europe"? Glasgow, UK: Glasgow Centre for Population Health; 2012.



SCPHRP's Working Groups

In October and November this year we held two facilitated meetings to bring together our four Working Groups (Early Years, Adolescence and Young People, Adult Life and Later Life). The aim of the meetings was to:

- Get to know each other
- Decide on up to four sub-group topic areas for each working group
- Discuss ideas to take forward

B oth days were very well attended by a range of people from policy, practice and research. Each session began with a plenary speaker follow by a short response from 3 panel members.

All the talks and panel responses were recorded and are available on our youtube channel (see below).

DAY ONE focused on the Early Years Working Group and Adolescence Working Group and began with a plenary from Alan Sinclair (Scottish Policy Advisor) on 'Delivering Early Years and Parenting Support: Where Public Health Meets Public Policy' which was followed by a panel response from Dona Milne (NHS Lothian), Rachael Wood (NHS National Services Scotland), and Marion Macleod (Children in Scotland)⁻

DAY TWO focused on Adult Life and Later Life and began with a plenary from David Bell on 'Later Working Life/Elderly Health & Policy Changes in Scotland' and was followed by a panel response from Miles Witham (Clinical Reader in Ageing and Health, University of Dundee), Glenda Watt (Strategy Manager, Health and Social Care, The City of Edinburgh Council), and Lisa Cohen (Evaluation Team, Health Scotland).

Youtube clips

- Alan Sinclair (http://www.youtube.com/ watch?v=DSY8vS0yTz8)
- Panel response (Day 1) (http://www.youtube.com/ watch?v=wEvYxebPxLI)
- David Bell (http://www.youtube.com/ watch?v=OJKxgMQcFnY)
- Panel response (http://www.youtube.com/ watch?v=ntTEeMT3T_E&feature=youtu.be)

Following discussions 12 new sub-groups were formed across the four Working Groups and the titles are provided in the table below. The first meetings of all the subgroups will take place early 2014.

Working Groups	Sub-Groups	Contact
Early Years	 Effective, equity promoting universal support services/training, support and remuneration to promote high quality workforce Changing environment, context and structures Partnerships or relationships for health and wellbeing 	Lawrence Doi Email: larry.doi@ed.ac.uk
Adolescence & Young people	 Increasing attendance at school Working with existing structures to improve health Protecting young people in transition Social connectedness 	John McAteer Email: john.mcateer@ed.ac.uk
Working Age/Adult Life	 Ageing well: Healthier futures (health in adulthood) The economy and health Social change and health (novel methods for reducing inequalities) 	Tony Robertson Email: tony.robertson@ed.ac.uk
Later Life	Complexity/ multi- morbiditySocial connectedness	Morag Treanor Email: morag.treanor@ed.ac.uk

If you are interested in attending one of the groups, please contact the relevant research fellow (listed above in bold)

What is a Working Group?

A network of people from various disciplines, including researchers, decision-makers and practitioners.

What are the aims of a SCPHRP Working Group?

- To catalyse strong researcher/ research-user collaborations around solving a shared problem
- To share ideas and knowledge on specific topic areas, particularly around new policies and innovations
- To collaborate on projects/ grants, and developing novel policy/practice ideas to benefit Scotland and reduce inequalities

Why be part of a SCPHRP Working Group?

To mix with a range of policy makers, researchers and practitioners/third sector organisations

To make contacts with people who are interested in research in your topic area

To work towards developing or evaluating innovative, policy relevant research and interventions

To have structured on-going support from the SCPHRP team



Parkinson's UK

An article by SCPHRP's Catherine Bromley

t is six months since I started working on my PhD looking at the issue of multiple long-term health conditions. In contrast to the work I did in my previous life, this is the first time I've had the luxury of extended (though admittedly, not infinite) time to consider a topic deeply and allow myself to explore areas related to it that I didn't anticipate at the outset.

For example, I'm currently reading some very interesting literature in the emerging sociology of diagnosis field, and looking forward to attending an event in York in January as part of the ESRC seminar series on the role of diagnosis in health and wellbeing.

Someone with a pre-existing condition is likely to have a different experience of receiving the diagnosis of a new condition, and possibly a different prognosis, than someone going through this process for the first time.

Academic research not only has the potential to unfold in new and unexpected ways, but it also eventually starts to infiltrate the rest of your life.

Last week I went to the Parkinson's UK annual festive show, featuring a mixture of singing, musical performances and a very entertaining version of John Betjeman's Christmas, adapted to an Edinburgh setting by Margo MacDonald MSP. Much of the literature on multiple conditions discusses the need for health care delivery to be better coordinated and person, rather than disease, focused, to reflect the fact that many people with a long-term condition often have more than one.

However, spending an evening at an event with a very prominent single disease focus got me thinking.

For example, the literature I've been reviewing contains many debates about how best to define and measure the prevalence of multiple conditions, and the distinction between comorbidity and multimorbidity.

Comorbidity tends to be used when the focus is people with a specific condition of interest, who also have other conditions. Multimorbidity is used when the main interest is simply the presence of multiple conditions, with no one condition being the focus of attention.

A condition like Parkinson's affects multiple aspects of a person's life, including communication, thinking and mobility; in many cases with very debilitating consequences. Given the option, I suspect that many people with Parkinson's and an additional condition would think of themselves as a person with comorbidity rather than multimorbidity, and many would probably prefer that their Parkinson's management and care is kept at the forefront when any efforts are made to improve their experiences of interacting with other parts of the health service for additional conditions.

But of course, people with a single condition such as Parkinson's (or diabetes, or arthritis, or heart disease..) are not a homogenous group, and their diversity mustn't be lost in the research or treatment process. Similarly, people with multiple conditions are probably one of the least homogenous groups imaginable.

Finding a way to explore and reflect the diversity of experiences of people with multiple conditions – using quantitative methods – without losing coherence will certainly be a key challenge for the next stage of my work.



Useful links and references:

Parkinson's UK: http://www.parkinsons.org.uk/

International Research Community on Multimorbidity: http://crmcspl-blog.recherche.usherbrooke.ca/

Two useful recent articles: Almirall and Fortin (2013) "The coexistence of terms to describe the presence of multiple concurrent diseases". Journal of Comorbidity. http://jcomorbidity.com/index.php/test/article/view/22 and Smith et al (2013) "How to design and evaluate interventions to improve outcomes for patients with multimorbidity". Journal of Comorbidity. http://jcomorbidity.com/index.php/test/article/ view/21



Merry Christmas from all at SCPHRP and a very Happy New Year

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sure I would even see.

Graduation memory by SCPHRP's Morag Treanor

When I started my PhD in 2009, it

was on a part-time basis as I was also working as a senior research and policy officer at a children's organisation, which was demanding in itself.

After a while I decided that one of them had to go if I was going to do either of them well. After much musing I gave up my job and became a full-time student, which was both liberating and terrifying.

Thankfully, the right choice was made: fast-forward a few years and I found myself on a beautiful autumn morning graduating at the impressive McEwan hall with my 14 year old daughter in tow.

Her summary of the day: "It was inspirational. I'm proud of you". I was touched and delighted. How many mums get to say that their teenager is proud of them? Needless to say, normal service is now resumed.