



In this issue: • Registered Reports: time to radically rethink peer review • Impact of skill-mix change in neonatal nursing care on effective coverage and budget • Health Economics and the MSc in Precision Cancer Medicine • The case for defining and measuring health poverty • Spotlight on Francesco Salustri • Latest staff news, recently funded projects, seminars, presentations and publications

REGISTERED REPORTS



Registered Reports: time to radically rethink peer review in health economics

Project team: John Buckell, Philip Clarke

Across the sciences, there are known problems that arise from current research practices. Open science advocates around the world are developing ways to counteract these issues to improve the quality of published science. Two problems in particular – publication bias and reproducibility of research findings – have gained considerable attention in recent studies and media reports. Publication bias is the effect of the direction and magnitude of study findings on a reviewer's recommendation to publish (or not) an article. Evidence has shown that this can lead to a disproportionately large number of "positive" findings, leading to misleading conclusions from the accumulated body of evidence in published literature. Reproducibility of study findings, or more specifically lack thereof, poses ontological problems for the credibility of scientific evidence.

These problems have also been recognised in the field of health economics. In 2015, a joint statement from journal editors in the field declared that journals were open to publishing negative findings, and publishing should be based on scientific merit. However, despite recent research suggesting some impact of this statement on the reporting of negative findings, this approach does not guarantee a fix.

One possible solution to these issues is adapting peer reviews of research articles. Registered Reports (RRs) shift the point of peer review from the finished manuscript to the study design stage; that is, articles are reviewed before data are collected and analysed. A second stage of review ensures that the stated steps in the study design have been carried out appropriately. Under this scheme, a study's merit is judged on its research questions, hypotheses, and study design. Importantly, the blinding of all parties to the results removes bias that is driven by the results.

In our recent article published in *PharmacoEconomics Open*, we advocate for the use of RRs in health economics. Further, we are currently petitioning for the implementation of this approach in health economics journals. If you would like to support this cause, please follow this link: <http://chnng.it/tjz2Kd5Gt6>.

For more information: <https://doi.org/10.1007/s41669-019-00190-x>

Picture credit: "Registered Reports: Peer review before results are known to align scientific values and practices" by Chambers C, Banks GC, Bishop D et al. is licensed under CC0 1.0 Universal.



Registered Reports shift the point of peer review from the finished manuscript to the study design stage



Impact of skill-mix change in neonatal nursing care on effective coverage and budget

Project lead: Apostolos Tsiachristas

Worldwide, newborns account for the largest proportion of deaths under the age of five. Almost 99% of the 2.5 million annual neonatal deaths occur in low and middle income countries (LMICs). Tackling neonatal mortality is therefore an urgent policy priority to improve global population health and reduce health inequality. The United Nations' Sustainable Development Goals include a specific neonatal mortality target, however this has not yet been achieved in many countries in sub-Saharan Africa. This may be partially attributed to lack of access to appropriate neonatal nursing care.

As health systems in Kenya and elsewhere seek to tackle increased neonatal mortality by improving the quality of care, one option is to train and employ neonatal health care assistants (NHCAs) to support professional nurses by taking up low-skill tasks. This could free-up time for nurses to focus on more complex tasks.

We performed a Monte Carlo simulation to estimate the potential impact of introducing NHCAs on neonatal nursing care in four public hospitals in Nairobi. This analysis considered effectively treated newborns and captured staff costs over a period of 10 years. The simulation was informed by data from three stakeholder workshops, hospital records, and the scientific literature.

We found that with current budget levels for neonatal nursing care, more than 95% of sick newborns requiring hospital care will receive poor quality care. Improving the quality of neonatal care within any given budget for nursing staff requires the employment of substantially more nurses and the introduction of NHCAs. The neonatal nursing budget would need to be 14 times larger to provide effective coverage to all newborns in need over 10 years, compared with the projected current budget level.

Ongoing policy discussions should consider changing the current skill-mix in neonatal care by employing more nurses and introducing healthcare assistants.

For more information:

<https://doi.org/10.1136/bmjgh-2019-001817>



Health Economics and the MSc in Precision Cancer Medicine

Project team: Liz Morrell, Sarah Wordsworth

HERC has an established reputation for research on the economics of genomic medicine. In particular, we have an interest in the economics of translating high-throughput sequencing technologies into health care, especially for patients with rare diseases and cancer. The new MSc in Precision Cancer Medicine – developed jointly by academics from the Department of Oncology and the Nuffield Department of Population Health, and co-directed by Sarah Wordsworth from HERC – has a clear focus on translation into practice, and one of the eight taught modules on the course is Ethics and Health Economics. HERC staff working in Genomics (Sarah Briggs, James Buchanan, John Buckell, Patrick Fahr, Rositsa Koleva-Kolarova, Liz Morrell, Apostolos Tsiachristas, Sarah Wordsworth) will be involved in teaching the modules and tutoring students.

The Health Economics teaching will first introduce economic evaluation as a framework to support resource allocation decisions. Students will learn about the economics of supply and demand, how healthcare behaves differently from the perfectly competitive market, and the types of economic evaluation.

The module will then focus on the elements of economic evaluation that are unique to cancer genomics. Economic models developed by HERC will be used to illustrate how we can evaluate the use of polygenic risk scores in personalised cancer prevention. We will introduce our work on stakeholder preferences, which highlights aspects of decision making beyond the standard framework, such as unmet need, and the value of a diagnosis even in the absence of treatment. Discussion of policy impact will also include alternative value-based reimbursement mechanisms for high-cost drugs.

We are still accepting applications for this distance-learning MSc, so please get in touch if you think you would benefit from Masters level study on this topic. We are looking forward to welcoming the first students on this course in October 2020.

For more information:

<https://www.oncology.ox.ac.uk/study-with-us/taught-msc/msc-in-precision-cancer-medicine>

HERC Courses

HERC currently offers two short courses in health economics.

Introduction to Health Economic Evaluation is a one-day course on the basics of health economics and its relevance to the health service.

Applied Methods of Cost-Effectiveness Analysis is a three-day course for those who wish to learn in detail about the analytic methods of cost-effectiveness analysis for healthcare interventions, and to give participants 'hands on' experience, through the use of computer-based exercises with real data.

These courses usually run in separate months of the year, but we are trialling a combined approach in March 2020: the Introduction to Health Economic Evaluation and Applied Methods of Cost-Effectiveness Analysis will run across four days. This is currently proving to be very popular.

The next Applied Methods of Cost-Effectiveness Analysis course will take place on 8-10th July 2020. The dates of our Autumn/Winter 2020 courses will be confirmed in the next couple of months.

If you would like more information on course content or how to reserve a place, please visit: <https://www.herc.ox.ac.uk/herc-short-courses>



The case for defining and measuring health poverty

Project lead: Philip Clarke

Philip Clarke recently published a study on defining and measuring health poverty in *Social Science & Medicine*. He argues that health poverty measures are useful for monitoring deprivation in the domain of health, can accord closely with threshold-based practices in medicine, and can be applied to disease risk, life expectancy and quality of life. The study was covered on the Australian radio programme the Health Report and the host, Dr Norman Swan interviewed Philip. There is an edited transcript of this interview below, and you can listen to the full interview at <https://www.abc.net.au/radionational/programs/healthreport/designing-a-health-poverty-line/11779588>.

What are the problems you are trying to solve?

Norman

For a long-time people have measured what's called income poverty, which is the amount to income you need for the necessities of life. The idea in this new study is that we really need the same concept in health, particularly because doctors often use thresholds to measure who needs to be treated.

Philip

And we are calling it health poverty, so it sounds as if you are conflating the two; poverty and poor health.

Norman

Well, poverty is a multidimensional concept, and so income is obviously one dimension and health is potentially another dimension.

Philip

I suppose people have thought that poor health is tightly linked to things like postcode and income, but you are suggesting that it might not be as tight as that or as clear.

Norman

There are many factors. We've actually calculated individual risks of mortality using Australian data, and there is a large range of factors that impact on your risk, including your health status of course, as well as income and education.

Philip

So give me an example of where defining health poverty gives you a more directed spend. Because presumably what you are talking about, as an economist, are things like incentives and resource allocation.

Norman

What we need to do is measure where we are falling below the way people should be treated. A very good example is treatment of cardiovascular risk. We have very good, effective and cheap drugs, such as the cholesterol-lowering drugs, statins. But often about 50% of people who should be taking them aren't, and a health poverty measure is one way to measure what proportion of the population are still at a risk level that they would need to take these drugs.

Philip

Philip, we will watch this space, it's a shot across the bows. Thank you very much for joining us.

Norman

For more information: <https://doi.org/10.1016/j.socscimed.2019.112633>

Spotlight on Francesco Salustri



I joined HERC in September 2018 as a Senior Researcher. Together with Joel Smith and the behavioural and experimental network of the Oxford Biomedical Research Centre, I am currently working on a number of projects on ambiguity in clinical decision-making. Ambiguous decisions characterise many different medical contexts, including early-phase biomedical research and clinical decisions without a robust evidence base.

For example, how do clinicians decide between an established but only partially effective drug and a newly-discovered unknown drug? How would patients make the same decisions? I investigate these questions and other similar decision-making processes by means of laboratory and online experiments, a methodology that is widely used in social science to explore behavioural attitudes in controlled settings. Alongside this experimental research, I am involved in a cost analysis of early-phase clinical trials in the field of cardiac surgery. This study is also linked to ambiguous decisions as clinicians and patients choose the timing of surgery based on preliminary evidence.

Prior to joining HERC, I studied Mathematics in Rome and Economics in Toulouse. In 2018 I obtained a PhD from the University of Rome "Tor Vergata" with a thesis on the behavioural economics of responsible consumption. More recently, I worked in Turin as a post-doctoral researcher on the effects of socio-economic shocks on individual trust and subjective life expectancy. Joining the HERC team has given me the opportunity to nourish my mind with novel and interesting research questions, and I have thoroughly enjoyed my time here so far.

Oxford Workshop: Ageing Without Living Longer Tuesday 31st March 2020, Merton College, Oxford

HERC is organising a one-day workshop, in collaboration with the **Australian Research Council Centre of Excellence in Population Ageing Research**.

This workshop aims to bring together researchers from a range of perspectives to better understand trends in mortality and life expectancy in the UK and to explore the factors behind these trends.

In recent years there has been a marked change in long-term mortality trends in the UK. Recent mortality statistics show little or no improvements in life expectancy after decades of steady improvement. What has caused these recent trends? Can they be reversed? What are the implications for health and social care policy?

This workshop aims to bring together researchers from a range of perspectives to better understand trends in mortality and life expectancy in the United Kingdom and to explore the factors behind these trends.

For further information and registration: <https://www.herc.ox.ac.uk/news/oxford-workshop-ageing-without-living-longer>

Staff News

Welcome to:



Callum Harris who is a Foundation Doctor on a 4-month rotation in HERC working with Filipa Landeiro, Ramón Luengo Fernández, José Leal and Alastair Gray on the economic burden of dementia, cancer, stroke and heart disease and associated research funding in the UK.



Behrouz Nezafat Maldonado who is a Foundation Doctor on a 4-month rotation in HERC working with Filipa Landeiro and Alastair Gray on a systematic review of the literature on economic models for Alzheimer's disease as part of the ROADMAP project.



Esther van den Bogaart who is a PhD student from Maastricht University visiting HERC from January to March. She is working with Apostolos Tsiachristas on the cost evaluation of a Dutch intermediate care intervention. This intervention, called Primary Care Plus, is focussing on shifting care out of hospitals into the community. The cost evaluation will be designed according to the Multi-Criteria Decision Analysis (MCDA) framework in which a weight-elicitation method will be used to determine the importance of the different Triple Aim outcomes.

HERC Seminars

Convenor: Matthew Little

HERC runs a series of seminars with invited speakers from the health economics community who talk on a wide range of applied and methodological topics.

In November, **Talitha Feenstra**, University of Groningen visited HERC to present her work on: *A personalized screening strategy for diabetic retinopathy: a cost-effectiveness perspective*.

In January, **Gianluca Baio**, University College London presented his work on: *Dynamic Bayesian Markov model for health economic evaluations of interventions in infectious disease*.

Later in January, **Sanghamitra Bandyopadhyay**, Queen Mary University London presented on: *Rise or fall in inequality? The dynamics of inequality measures*.

In February, **Eline Krijkamp**, Netherlands Institute of Health Sciences, and **Petros Pechlivanoglou**, University of Toronto, presented on: *Advances in decision modelling using R. Collaborating in an open source space*.

Details of forthcoming talks can be found on the HERC website: <http://www.herc.ox.ac.uk>. To be added to our mailing list for future seminars, email us at herc@ndph.ox.ac.uk

Presentations by members of HERC

Optimising Trial Designs for Treatment Durations Workshop, University College London
London, January 2020

Koen Pouwels
Optimising trial design to identify appropriate antibiotic treatment durations

Prospective quasi-randomised trial of different antibiotic treatment durations for urinary tract infections in dogs

Health Economists' Study Group Winter 2020, Newcastle University
Newcastle, January 2020

Inna Thalmann
Socioeconomic differences in medication use for the secondary prevention of cardiovascular disease in 2009-2017 Scotland [Poster]

Diet, Obesity and Lifestyle Theme Networking Event
Oxford, January 2020

John Buckell
BMI and Health-Related Quality of Life (HRQoL): Evidence from Randomized Controlled Trials

Queen Mary University of London Institute of Population Health Sciences Seminar Series
London, January 2020

Laurence Roope
Antibiotic use and resistance: an economic overview and a randomised experiment

A number of HERC researchers presented at the Nuffield Department of Population Health Annual Symposium, University of Oxford, in January 2020

15 Minute Presentations

Mara Violato
Keep it in mind: the lifelong importance of mental health

5-by-5 Talks (5 slides in 5 minutes)

Frauke Becker
Hitting the ceiling? Quality of life in a Chinese population with prediabetes

James Buchanan
Genomic tests in the NHS: do health professionals believe the hype?

Paolo Candio
The economic impact of mechanical thrombectomy across Europe

Patrick Fahr
Big data for small diseases: costing rare disease diagnosis in the 100,000 Genomes project

Alastair Gray
A model to estimate the health outcomes and costs of patients with prediabetes in China

Rositsa Koleva-Kolarova
Using economics to improve population health via personalised medicine

Filipa Landeiro
Fighting social isolation: which interventions work?

José Leal
A framework to estimate the worth of delaying diabetes in a UK and US setting

Ines Rombach
How well are binary outcomes analysed and the findings reported? A systematic review of randomised trials

Speed Geeking (10 minute small group presentations)

John Buckell
Addressing publication bias in health economics: the case for registered reports

Koen Pouwels
Impact of infections in critical care: getting the numbers right in the presence of time-varying confounding

Laurence Roope
Measuring Inequality of Exposure to Ambient Air Pollution

Iryna Schlackow
Lifetime benefits of cardiovascular medication in people with impaired kidney function

Apostolos Tsiachristas
Incidence and general hospital costs of self-harm across England: estimates based on the Multicentre Study of Self-harm

Recent Publications

1. Adams N, Byrne L, et al. [includes **Violato M**]. *Sociodemographic and clinical risk factors for paediatric typical haemolytic uraemic syndrome: retrospective cohort study*. *BMJ Paediatr Open*. 2019. 3(1):e000465. doi:10.1136/bmjpo-2019-000465

2. Bhatnagar R, Plotrowska HEG, et al. [includes **Luengo-Fernandez R, Little MHR**]. *Effect of Thoracoscopic Talc Poudrage vs Talc Slurry via Chest Tube on Pleurodesis Failure Rate Among Patients With Malignant Pleural Effusions: A Randomized Clinical Trial*. *JAMA*. 2019. doi:10.1001/jama.2019.19997

3. **Clarke P, Buckell J, Barnett A**. *Registered Reports: Time to Radically Rethink Peer Review in Health Economics*. *PharmacoEconomics Open*. 2020. doi:10.1007/s41669-019-00190-x

4. **Clarke P, Erreygers G**. *Defining and measuring health poverty*. *Soc Sci Med*. 2020. 244:112633. doi:10.1016/j.socscimed.2019.112633

5. **Fahr P, Buchanan J, Wordsworth S**. *A review of health economic studies comparing traditional and massively parallel sequencing diagnostic pathways for suspected genetic disorders*. *PharmacoEconomics*. 2019. doi:10.1007/s40273-019-00856-8

6. Inês M, Coelho T, et al. [includes **Landeiro F**]. *Societal costs and burden of hereditary transthyretin amyloidosis polyneuropathy*. *Amyloid*. 2019. doi:10.1080/13506129.2019.1701429

7. Knight R, Poulton L, et al. [includes **Leal J**]. *Study of Peri-Articular Anaesthetic for Replacement of the Knee (SPAARK): study protocol for a patient-blinded, randomised controlled superiority trial of liposomal bupivacaine*. *Trials*. 2019. 20:732. doi:10.1186/s13063-019-3826-1

8. **Jones DA, Mistry P, et al.** [includes **Gray AM**]. *Concurrent cisplatin or cetuximab with radiotherapy for HPV-positive oropharyngeal cancer: Medical resource use, costs, and quality-adjusted survival from the De-ESCALaTE HPV trial*. *Eur J Cancer*. 2020. 124:178-185. doi:10.1016/j.ejca.2019.10.025

9. Peters M, Crocker H, Jenkinson C, **Violato M**. *Withdrawing gluten free food from prescriptions in England: a mixed methods study to examine the impact of policy changes on quality of life*. *J Hum Nutr Diet*. 2019. doi:10.1111/jhn.12728

10. **Pritchard M, Murphy J, et al.** [includes **Cheng L, Janarthanan R, Leal J**]. *Enhanced recovery following hip and knee arthroplasty: A systematic review of cost-effectiveness evidence*. *BMJ Open*. 2020. 10:e032204. doi:10.1136/bmjopen-2019-032204

11. Reed SD, Li Y, et al. [includes **Dakin HA, Becker F, Leal J, Gray AM**]. *Within-Trial Evaluation of Medical Resources, Costs, and Quality of Life Among Patients With Type 2 Diabetes Participating in the Exenatide Study of Cardiovascular Event Lowering (EXSCEL)*. *Diabetes Care*. 2019. doi:10.2337/dc19-0950

12. **Rocks S, Fazel M, Tsiachristas A**. *The impact of transforming mental health services for young people in England on patient access, resource use, and health: a quasi-experimental study*. *BMJ Open*. 2020. 10:e034067. doi:10.1136/bmjopen-2019-034067

13. **Tsiachristas A, Gathara D, et al.** *Effective coverage and budget implications of skill-mix change to improve neonatal nursing care: an explorative simulation study in Kenya*. *BMJ Glob Health*. 2019. 4(6):e001817. doi:10.1136/bmjgh-2019-001817

14. **Wolstenholme J, Fusco F, et al.** [includes **Gray AM**]. *Quality of life in the FOXFIRE, SIRFLOX, and FOXFIRE-Global randomised trials of selective internal radiotherapy for metastatic colorectal cancer*. *Int J Cancer*. 2019. doi:10.1002/ijc.32828

Health Economics Research Centre
Nuffield Department of Population Health, University of Oxford
Old Road Campus, Headington, Oxford OX3 7LF UK
tel: +44 (0) 1865 289272/3 • email: herc@ndph.ox.ac.uk

To receive this newsletter quarterly email herc@ndph.ox.ac.uk

Academic editorial team: James Buchanan, Liz Stokes, Filipa Landeiro
Production co-ordinator: Teresa Day



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