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HERC news

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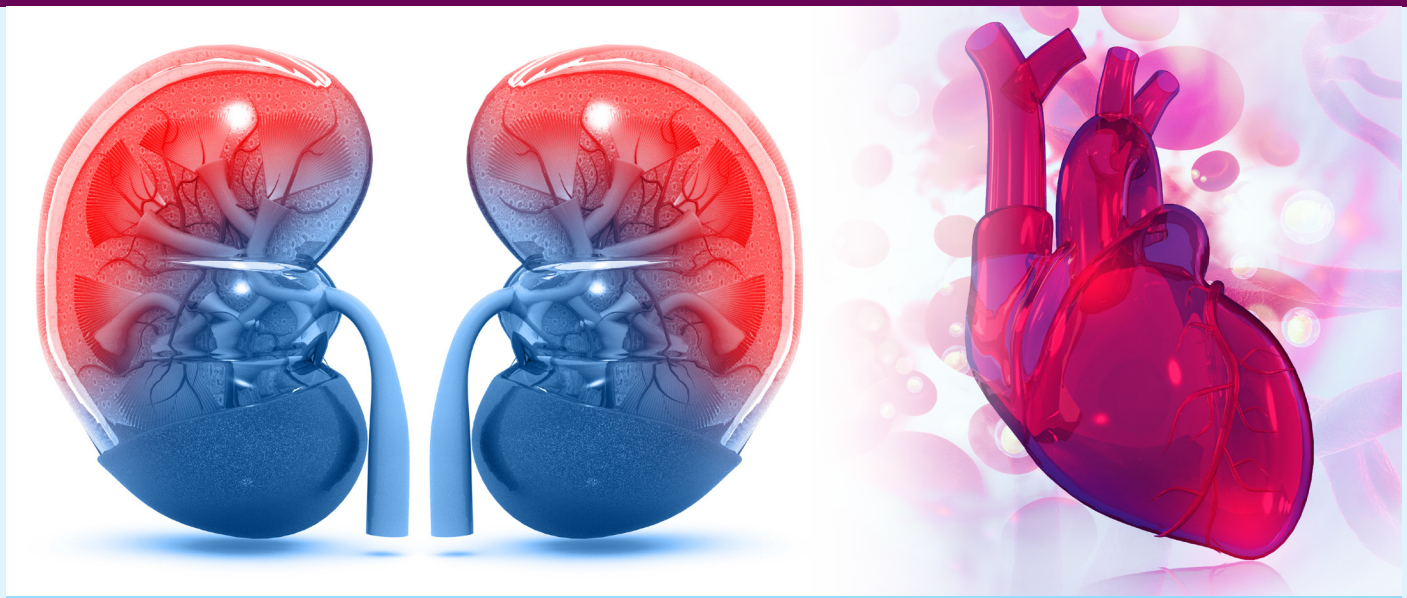


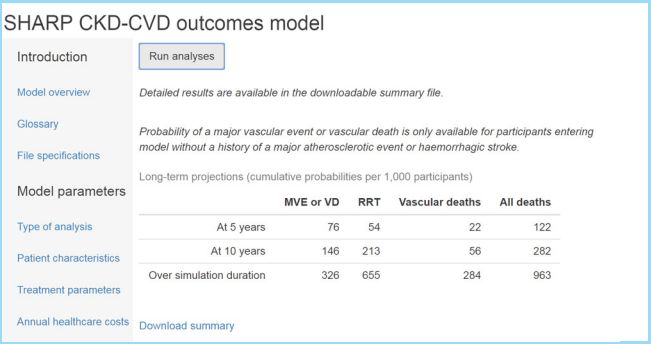
Chronic kidney disease policy model

Project team: Iryna Schlackow, Seamus Kent, Alastair Gray, Boby Mihaylova

Chronic kidney disease (CKD) is highly prevalent in the general population. It leads to increased cardiovascular disease (CVD) risk and, conversely, cardiovascular events may accelerate kidney disease progression. The Study of Heart and Renal Protection (SHARP) CKD-CVD model simulates this interdependence for individual patients' risk profiles, and projects lifetime cardiovascular events, kidney disease progression, (quality-of-life adjusted) survival and healthcare costs.

Individual patient-level data from the 9,300 participants with moderate-to-advanced CKD followed for an average of five years in SHARP were used to develop, in collaboration with SHARP clinicians and epidemiologists, the multi-state SHARP CKD-CVD decision-analytic model. Separate sub-models were developed for kidney disease progression and for cardiovascular events and mortality through a series of risk equations estimated using SHARP participants' demographic, lifestyle and clinical characteristics and up-to-date kidney disease and cardiovascular event histories. Model performance was assessed using three external patient cohorts.

A detailed description of the SHARP CKD-CVD model, including two illustrative applications, was recently published in *Heart*. To facilitate model use, a user-friendly web interface with a detailed user guide is freely available at **http://dismod.ndph.ox.ac.uk/kidneymodel/app/**. The model (see image below) allows the user to predict outcomes for individual patients and groups of patients as well as to simulate outcomes with additional cardiovascular interventions. The model is fully parameterised for the UK setting, including parameter uncertainty, and is adaptable to other settings.



We hope that the SHARP CKD-CVD model will be useful to analysts and policymakers to evaluate kidney disease patients' prospects and the (cost-)effectiveness of interventions to reduce cardiovascular risk, as well as to clinicians to estimate their CKD patients' risks and guide treatment discussions.

For more information: HERC

Prevalence and costs of delayed hospital discharges of older people

Project team: Filipa Landeiro, José Leal, Alastair Gray

Delayed discharges from acute hospitals have been a cause of concern worldwide because of the challenges they pose in terms of provision of services and associated costs. Older people are most at risk of having a delayed discharge, especially those with complex health and social care needs. There is, however, considerable uncertainty regarding the resources consumed by these delays and the resulting costs to healthcare systems.

We systematically reviewed the literature to determine the prevalence of delayed discharges of older inpatients and associated costs and included 64 studies in our review. We found that delayed discharges occur in most countries, regardless of how healthcare is funded. However, the number of days of delayed discharge as a proportion of the total hospital stay varies widely, from 1.6% to 91.3%. This variation was also observed in studies from the same country, for example, between 1.6% and 60.0% in the UK. Despite being a long-existing problem, the underlying causes of delayed discharges still persist: over-reliance on informal support, specific needs of certain patient groups, lack of assessment and discharge planning, inadequate notice of discharge or consultation with patients and carers, poor communication between health and social care and between acute and intermediate care, and insufficient statutory service provision.

Although only nine studies estimated the costs of delayed discharges, these were found to be high. Health service costs varied between US$142 and $31,395 (PPP adjusted) per delayed discharge, with variations also observed within the same country. These variations are due to differences between countries, time periods, reported mean days of delayed discharges, differing patient populations, and the components and sources of the unit costs used to estimate the cost of delayed discharge.

Further research is needed to more reliably determine the extent of delayed discharges, and to estimate more accurate and up-to-date costs for these delays. This would help policymakers to design policies to reduce these delayed discharges.

For more information: HERC

Global costs of fragility hip fractures

Project team: Sam Williamson, Filipa Landeiro, José Leal, Thomas McConnell, Lucy Fulford-Smith

Understanding the true cost of sustaining a hip fracture is crucial to planning services and adopting preventative measures to avoid these events from happening. Globally there are an estimated six million hip fractures each year and this is expected to rise dramatically in line with increases in the number of older people. Each hip fracture has a significant impact on that individual's quality of life, and mortality at 30 days is high.

We reviewed the literature and found costs related to a hip fracture for over 670,000 individuals across 27 different countries. Inpatient treatment is the single most costly component in the care of patients following hip fracture. We used regression analysis to identify demographic, geographic and temporal factors that influenced the costs associated with the initial inpatient admission. Men and patients in the USA were likely to have higher costs during the inpatient admission. In real terms, we found that the costs associated with the initial inpatient admission have reduced over time.

The research identified the different methodologies that costing studies have used, including the types of costs assessed and the follow-up period. By using a meta-regression analysis we were able to adjust for some of the observed differences, but were limited to analysing the initial hospital episode. We recommend that costs of care are reported in line with recognised guidance, with clear methods and details of the costs included. This will allow for further research to combine costs from different studies, which in turn will inform policy and commissioning decisions.

For more information: HERC

> "Inpatient treatment is the single most costly component in the care of patients following hip fracture"

The hospital cost of self-harm

Project team: Apostolos Tsiachristas, José Leal

Self-harm by intentional poisoning or self-injury is a very common reason for presentation to hospital, especially in young people. It is often repeated and carries a significant risk of future suicide. Self-harm was included as a key issue in England's National Suicide Prevention Strategy for the first time this year. Until now very little information has been available on the costs of hospital care for people who self-harm.

HERC researchers have recently undertaken the most detailed analysis to date of the immediate costs of self-harm in an English general hospital, estimating the costs of psychosocial assessment and providing cost estimates for different types of self-harm. Our findings show that the mean hospital cost per episode of self-harm was £809. Treatment of combined self-poisoning and self-injury is the most complex type of self-harm, costing £987 per episode. Psychosocial assessment costs a mean of £254; £392 per assessment for patients younger than 18 years and £228 for assessments of adults.

Extrapolating our findings to the whole of England, the overall costs for self-harm management in general hospitals (assuming 75% of cases, as in the study hospital, include psychosocial assessment) are £162 million per year. Using our costings, if psychosocial assessment were done for every self-harm presentation, as suggested in NICE guidelines, this would cost around £51 million per year.

The findings of this study provide information that can be used to inform economic modelling analyses to better assess the potential costs and benefits of interventions for self-harm. These findings also highlight the need for high quality services for people who self-harm, to provide effective medical care and to ensure that patients receive careful psychiatric assessment in order to plan suitable aftercare. Finally, the findings underline the need for large-scale initiatives to prevent self-harm, such as school-based psychological well-being classes and other community programmes aimed at improving emotional health.

For more information: HERC

> "…the overall costs for self-harm management in general hospitals… are £162 million per year"

Recently Funded

Sarah Wordsworth and **Liz Stokes** are collaborating with researchers at the University of Bristol and the NIHR Respiratory Biomedical Research Unit on an NIHR Health Technology Assessment funded project entitled: *"Effectiveness and cost-effectiveness of INSPIRatory muscIE training (IMT) for reducing postoperative pulmonary complications (PPC): a sham-controlled randomised controlled trial (RCT) (INSPIRE)".* IMT involves breathing in and out of a handheld device that makes breathing difficult to improve the strength and endurance of chest muscles which control breathing. The study, which will be conducted over the next four years, aims to compare the risk of lung complications after major surgery in three groups of patients: IMT, sham IMT (low 'power' IMT) and usual care, to establish if breathing training is beneficial to patients.

HERC Seminars

Convenor: Brett Doble

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 early October, **Dr Aileen Murphy**, Lecturer in Economics, University College Cork, Ireland visited to present her work on: *Use of Rapid Reviews in Health Technology Assessment Processes – Effective or Impractical? A Review of the Irish System & Lessons for Others.*

Later in October, **Thomas Hoe**, a PhD student from the Economics Department at UCL, came to HERC to present his work on: *Are Public Hospitals Overcrowded? Evidence from Trauma and Orthopaedics in England.*

Finally, in November **Dr William Padula**, Assistant Professor of Health Economics, Johns Hopkins University, USA, presented on: *Developing New Policies in Response to Rising Drug Prices in the U.S.*

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@dph.ox.ac.uk**

Spotlight on BRETT DOBLE

I joined HERC in November 2016 to conduct economic analyses alongside two NIHR funded projects. The first project is the By-Band-Sleeve randomised controlled trial, which is comparing different approaches to bariatric surgery for the treatment of severe obesity. The second project is a population-based cohort study, known as ADAPTT, which aims to ascertain the impact of bleeding events in patients prescribed dual antiplatelet therapy after coronary interventions. I am also involved in work using routinely collected administrative healthcare data linked to the 100,000 Genomes Project to assess the potential impact of funding whole genome sequencing on the NHS.

Prior to joining HERC, I was a Research Associate in Health Economics at the Cambridge Centre for Health Services Research (CCHSR), University of Cambridge. At CCHSR, I worked on trial-based economic evaluations of primary care interventions as well as an analysis of the Clinical Practice Research Datalink that compared medication wastage for different prescription lengths in common chronic conditions. I also previously worked with the Garvan Institute of Medical Research in Australia on projects related to the economic impacts of implementing whole genome sequencing into routine clinical practice.

I received a PhD in Health Economics from the Centre for Health Economics, Monash University in Australia where I was the recipient of the Donald Cochrane Research Scholarship. My PhD involved working alongside a longitudinal, genomic cohort study in newly diagnosed cancer patients, known as Cancer 2015, to assess the value of implementing tumour genomic testing in routine cancer care. I also received a BSc in Biochemistry and MSc in Clinical Epidemiology and Biostatistics from McMaster University.

My brief time at HERC has allowed me to be involved in innovative research projects that will ultimately facilitate evidence-based decision-making and translate into improved patient outcomes. I look forward to the challenges that lie ahead in tackling some of the most important issues presently facing the NHS and healthcare systems worldwide.

staff • visitors • students • publications • presentations • seminars

Staff News – Welcome to:

In December 2016 we said a fond farewell to **Barbara Kitchener**, who took up a position within the Nuffield Department of Population Health's finance team after three years in HERC as Administrator and Assistant to Professors. During this time she contributed hugely to the production of the newsletter and many other aspects of the group. She was greatly missed and so we are delighted to welcome Barbara back as HERC's new Unit Administrator. We look forward to working with her again and having her lead our admin team into the future. Happy return!

Patrick Fahr joined the department as a DPhil student in October this year. His research will focus on how to measure the clinical utility of genomic testing for rare diseases, using data from the Genomics England 100,000 Genomes Project. He will be supervised by James Buchanan and Sarah Wordsworth.

Inna Thalmann joined HERC in October 2017 as a DPhil student. Her research will investigate the trends, determinants and persistence of cholesterol- and blood pressure-lowering drug use for the primary and secondary prevention of cardiovascular diseases in the UK and Europe, using data from the English Longitudinal Study of Ageing and the UK Biobank. She will be supervised by Boby Mihaylova, Iryna Schlackow, Alastair Gray and David Preiss.

Farewell to:

In September, HERC was sad to say farewell to **Richéal Burns**. Richéal is a talented and conscientious researcher who worked on a number of collaborative research projects including studies on the care and treatment of prostate cancer, sore throat, cardiology, blood disorders, and organ donation. She has also contributed to ongoing work on the HERC database of mapping studies (https://www.herc.ox.ac.uk/downloads/herc-database-of-mapping-studies) and has been a constant and highly regarded presence in HERC's teaching activities, including our short courses in Oxford. Richéal has taken up a position as Programme Director and Lecturer in Economics, St. Angela's College Sligo, a College of National University of Ireland, Galway. We wish her every success and happiness in the future.

We were also sorry to say farewell to **Francesco Fusco** in October. Francesco first joined HERC in 2014 as a visiting student from the Sant'Anna School of Advanced Studies, Pisa where he was completing his PhD. After enjoying his time in Oxford so much during his doctoral studies, he returned again to HERC as a visiting student in 2015 and as a full time member of staff after completing his PhD. During his time in HERC, Francesco further developed his expertise in economic evaluations in the areas of cancer and orthopaedics. Francesco has moved to take up an exciting position at the University of York and all at HERC wish him every success and happiness for the future.

Awards:

Congratulations to **Jane Wolstenholme** who has been awarded the title of Associate Professor. Jane has vast experience in conducting economic evaluations for health policymakers and has been a health economist at HERC since 1998. Congratulations on a thoroughly deserved award.

Presentations by members of HERC

Worldwide Antimalarial Resistance Network
Oxford, July 2017
Ines Rombach
Handling missing data in longitudinal follow-up with multiple imputation and maximum likelihood estimation and the importance of sensitivity analysis

Arthritis Research UK Intern Training Day
Oxford, July 2017
Ines Rombach
Lectures on statistics and trial design

European Meeting of the Econometric Society
Lisbon, Portugal, August 2017
Laurence Roope
Critical Percentiles for Equalizing Growth

European Society of Cardiology Congress
Barcelona, Spain, August 2017
Ramón Luengo Fernandez
Economic burden of cardiovascular disease (CVD) across the European Union: trends over the last decade

European Society for Medical Oncology
Madrid, Spain, September 2017
Alastair Gray
Quality of life in patients with liver metastases from colorectal cancer treated with first-line selective internal radiotherapy (SIRT): results from the FOXFIRE, FOXFIRE-Global and SIRFLOX prospective randomised studies

37th Spanish National Conference on Health Economics
Barcelona, Spain, September 2017
Filipa Landeiro
Can delayed discharges be reduced through interventions to alleviate social isolation?

German Statistical Week 2017, German Society for Demography
Rostock, Germany, September 2017
Peter Eibich
Retirement and mammography use: The role of organized screening programs

15th Portuguese National Conference on Health Economics
Coimbra, Portugal, October 2017
Filipa Landeiro
The cost of social isolation for elderly hip fracture patients in England: delayed discharges

Royal Society of Medicine: Interface and community geriatric medicine for the generalist: the benefits of all integrated services
London, October 2017
Apostolos Tsiachristas
Cost effectiveness and health economics – hospitals at home

ISPOR 20th Annual European Congress
Glasgow, November 2017
Francesco Fusco
Selective internal radiotherapy (SIRT) in metastatic colorectal cancer patients with liver metastases: Preliminary primary care resource use and utility results from the FOXFIRE randomised control trial

Publications

1. Adams N, Rose T, et al. [includes **Violato M**] *Does socioeconomic status influence risk of gastrointestinal infections in the community in the UK?* European Journal of Public Health. 2016. 26(Suppl 1):396. doi:10.1093/eurpub/ckw174.167

2. Adams N, Rose T, et al. [includes **Violato M**]. *Socioeconomic status and infectious intestinal disease in the community: a longitudinal study (IID2 study).* European Journal of Public Health. 2017. doi:10.1093/eurpub/ckx091

3. **Doble B**, Langdon PE, et al. *Economic Evaluation alongside a Randomised Controlled Crossover Trial of Modified Group Cognitive Behavioural Therapy for Anxiety Compared to Treatment-as-Usual in Adults with Asperger Syndrome.* Medical Decision Making Policy & Practice. 2017. doi:10.1177/2381468317729353

4. **Eibich P**, Green A, et al. [includes **Gray AM**]. *Costs and treatment pathways for type 2 diabetes in the UK: A Mastermind cohort study.* Diabetes Therapy. 2017. doi:10.1007/s13300-017-0296-x

5. Ellis G, Gardner M, et al. [includes **Tsiachristas A**]. *Comprehensive geriatric assessment for older adults admitted to hospital.* Cochrane Database of Systematic Reviews. 2017. doi:10.1002/14651858.CD006211.pub3

6. Morrell L, **Wordsworth S**, et al. *Cancer drug funding decisions in Scotland: impact of new end-of-life, orphan and ultra-orphan processes.* BMC Health Services Research. 2017. 17:613. doi: 10.1186/s12913-017-2561-0

7. Murphy GJ, Mumford AD, et al. [includes **Wordsworth S**, **Stokes EA**]. *Diagnostic and therapeutic medical devices for safer blood management in cardiac surgery: systematic reviews, observational studies and randomised controlled trials.* Programme Grants Appl Res. 2017. 5(17). doi:10.3310/pgfar05170

8. **Murphy J**, Halloran S, **Gray A**. *Cost-effectiveness of the faecal immunochemical test at a range of positivity thresholds compared with the guaiac faecal occult blood test in the NHS Bowel Cancer Screening Programme in England.* BMJ Open 2017. doi: 10.1136/bmjopen-2017-017186

9. Parker B, **Buchanan J**, et al. (includes **Wordsworth S**]. *Managing ulcerative colitis patients with endoscopically invisible low-grade dysplasia: Is immediate surgery more cost-effective than ongoing surveillance?* Gastrointestinal Endoscopy. 2017. doi:10.1016/j.gie.2017.08.031

10. Rogers CA, Reeves BC, et al. [includes **Wordsworth S**]. *Adaptation of the By-Band randomized clinical trial to By-Band-Sleeve to include a new intervention and maintain relevance of the study to practice.* British Journal of Surgery. 2017. doi:10.1002/bjs.10562

11. Rogers CA, Stoica S, et al. [includes **Stokes EA**, **Wordsworth S**] *Randomized trial of near-infrared spectroscopy for personalized optimization of cerebral tissue oxygenation during cardiac surgery.* British Journal of Anaesthesia. 2017. 119(3):384–93. doi:10.1093/bja/aex182

12. Rose T, Adams N, et al. [includes **Violato M**]. *Relationship between socioeconomic status and measures of infectious intestinal disease severity.* European Journal of Public Health. 2016. 26:97-98. doi:10.1093/eurpub/ckw166.060

13. **Schlackow I**, **Kent S**, et al. [includes **Gray A**, **Mihaylova BN**]. *A policy model of cardiovascular disease in moderate-to-advanced chronic kidney disease.* Heart. 2017. doi: 10.1136/heartjnl-2016-310970

14. Thorn JC, Brookes ST, et al. [includes **Wordsworth S**]. *Core Items for a Standardized Resource Use Measure (ISRUM): Expert Delphi Consensus Survey.* Value in Health. 2017. doi:10.1016/j.jval.2017.06.011

15. **Tsiachristas A**, & Rutten-van Mölken M. *Economic evaluation of integrated care.* In: Handbook Integrated Care. Springer. 2017.

16. **Tsiachristas A**, McDaid D, et al. [includes **Leal J**]. *General hospital costs in England of medical and psychiatric care for patients who self-harm: a retrospective analysis.* Lancet Psychiatry. 2017. 4(10):759-767. doi:10.1016/PII

17. Williamson S, **Landeiro F**, et al. [includes **Leal J**]. *Costs of fragility hip fractures globally: a systematic review and meta-regression analysis.* Osteoporosis International. 2017. doi:10.1007/s00198-017-4153-6

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