Health Economics Research Centre

# HERC news

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UNIVERSITY OF OXFORD

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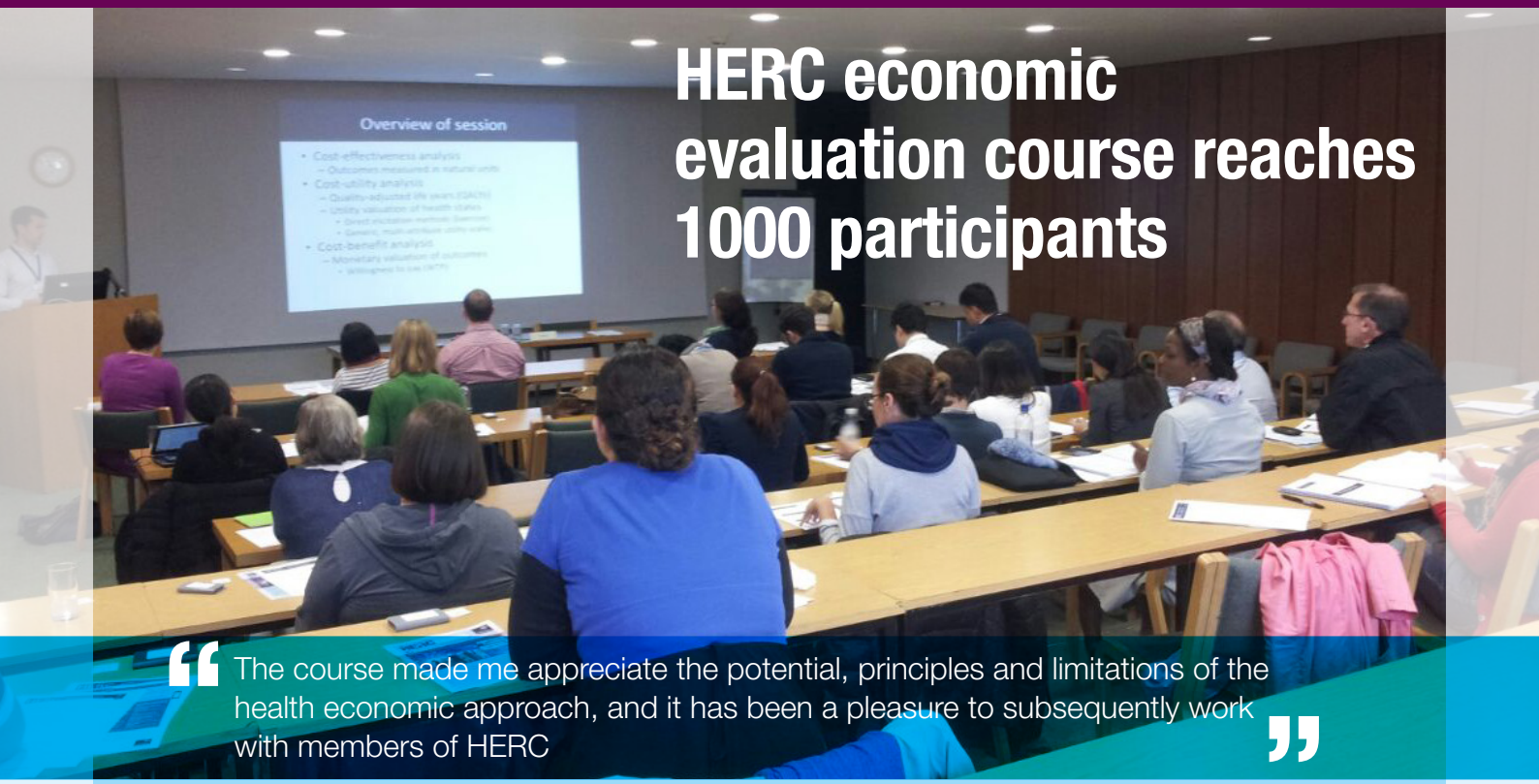


## HERC economic evaluation course reaches 1000 participants

> "The course made me appreciate the potential, principles and limitations of the health economic approach, and it has been a pleasure to subsequently work with members of HERC"

**Last month marked an exciting milestone for HERC's "Introduction to Health Economic Evaluation" course: over 1000 participants have now attended the course since it began in 2001.**

The one-day course is designed to give an overview of the basic concepts of health economics and its applicability to the health service and attracts participants from a wide range of health related backgrounds. Past course locations have included Oxford, China, Hong Kong, Cuba, and we have even delivered dedicated courses for institutions including the National Society for the Prevention of Cruelty to Children and Siemens Healthcare.

As we were reaching this landmark, we decided to ask past participants how the course has been useful to them in their subsequent work, and we were delighted to receive many positive responses. Ekechi Okereke (Abt Associates, Nigeria), who participated in 2009, stated that the course *"...contributed in building my capacity to work more confidently within the Nigerian health system. My career has progressed with a realisation that relevant research and evaluations can and should form the basis for improving healthcare services and promoting more equitable health systems".*

Dr Harry Rutter (Senior Clinical Research Fellow, London School of Hygiene and Tropical Medicine) attended the course as a public health trainee in 2002 and noted that *"Economic arguments are increasingly important in public health, and the course has stood me in good stead through my subsequent career. I have been heavily involved in the development of the WHO Health Economic Assessment Tool (HEAT) for walking and cycling, and my learning from the course provided a valuable grounding for this work".*

Finally, Professor Andrew Farmer (Nuffield Department of Primary Care Health Sciences, University of Oxford) was one of the first course participants in 2001: *"The course made me appreciate the potential, principles and limitations of the health economic approach, and it has been a pleasure to subsequently work with members of HERC and others in delivering research that informs knowledge of the costs and benefits of health care".*

In order to accommodate high demand for the course we have recently expanded the number of sessions to four per year, usually held in April and October.

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# Challenges of evaluating screening programmes

**Project team:** Jose Leal, Jane Wolstenholme, Sarah Wordsworth

HERC researchers have been evaluating the impact of UK mass screening for two distinct diseases, prostate cancer and Medium chain acyl-coA dehydrogenase deficiency (MCADD). Key to both economic evaluations is determining the sensitivity of the screening programmes and the true prevalence of disease. However, estimating these parameters directly can be problematic as only individuals with a positive test result receive a definite diagnosis. Furthermore, data on screening test accuracy versus gold standard diagnostic tests rarely exist. In rare newborn diseases such as MCADD, large sample sizes are required to undertake such studies. In prostate cancer, the gold standard diagnostic test involves the removal of the whole prostate gland which is not feasible in all men.

In a study funded by Cancer Research UK and published in the International Journal of Urology, we synthesised data from 25 autopsy studies of men without clinical diagnosis of prostate cancer during their lifetime. The results show that the true prevalence of cancer increases from 1-2% (20-29 years) to 59-72% (90-99 years), and also varies by ethnic group. These findings improve our understanding of the natural history of disease and permit the assessment of the impact of screening on the detection of cancers that would have never become clinically apparent within a patient's lifetime.

In work funded by the Department of Health and published in Clinical Genetics and the Journal of Clinical Epidemiology, the true prevalence of MCADD was estimated after synthesising 43 genotype studies reporting the frequency of its most common mutation over 10 million individuals. Our findings show that the frequency is highest in Western Europe and absent in Asian and Middle Eastern regions. These findings were used to estimate the sensitivity of a pilot MCADD screening programme in England by simultaneously synthesising data from the pilot (apparent prevalence) with genotype data for England (true prevalence), adjusting for ethnicity. Sensitivity of screening was estimated to be 94% compared to a detection rate in non-screened areas of 48% by age 5 years.

Work to adapt this approach to estimate the sensitivity of screening programmes and over-detection rates in prostate cancer is ongoing. Such estimates will inform full economic evaluations of the screening programmes. Keep an eye on our website for further updates.

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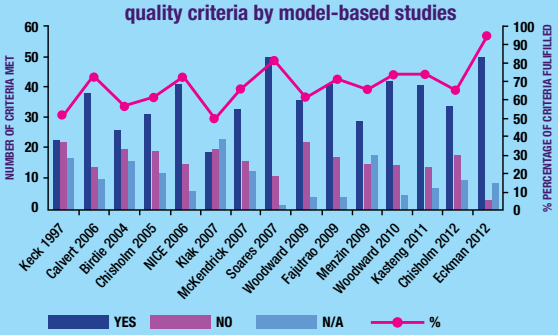
# Economic evaluations in bipolar disorder: room for improvement in methods

**Fig 1: Chart showing the fullfillment of quality criteria by model-based studies**




**Project team:** Anees Abdul Pari, Judit Simon, Jane Wolstenholme

Bipolar disorder (BD) is a chronic illness and one of the leading causes of disability worldwide. However, there is a dearth of evidence evaluating the economic impact of alternative disease management strategies. We reviewed and critically appraised the available published economic evidence on BD management. Trial-based evaluations were assessed using the checklist produced by the Centre for Reviews and Dissemination (Guidance for Undertaking Reviews in Health Care (2009)). For model-based economic evaluations, we adhered to best practice guidelines proposed by Philips and colleagues (2006).

Of the 20 studies included in the review, 14 (70%) investigated pharmaceutical management strategies and 4 (20%) investigated collaborative care or system-level interventions. Overall, the trial-based economic evaluations were of lower quality and scored from 42%-69% on the recommended checklist. The quality of the modelling studies varied substantially, ranging from 51%-94%. Only two studies scored above 80%, which included one Markov model and one discrete event simulation (Figure 1 above).

This review identified that there is a great deal of methodological heterogeneity in existing studies, and some ambiguity about the correct evaluation methods. Given the variability in the methods and quality of the identified studies, it is difficult to provide a conclusive recommendation for the most cost-effective therapy for BD based on existing evidence.

With regards to pharmacotherapies, the two model-based studies of high quality support the cost-effectiveness of Lithium or Lithium+Imipramine combination, and Quetiapine in the management of BD. Both system-level collaborative care studies generated favourable outcomes, but were of insufficient time duration and scored poorly on the quality checklist.

Improvement in methods could be achieved through the use of the Philips checklist in combination with a published hierarchy of clinical evidence.

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# Summer 2014 Placements in Oxford

**Two students visited us between July and September: Oliver Verran from the University of Oxford completed a 10 week research internship, while Ben Parker from the University of York completed his MSc dissertation research**

## Management of low-grade dysplasia in ulcerative colitis: an economic evaluation

**Project team:** Ben Parker, James Buchanan, Sarah Wordsworth

Over the summer I undertook my MSc dissertation placement at HERC, under the supervision of James Buchanan and Sarah Wordsworth. The project investigated the cost-effectiveness and cost-utility of ongoing surveillance versus immediate surgery in ulcerative colitis (UC) patients, following a finding of low-grade dysplasia in the colon.

Patients with UC are at increased risk of developing colorectal cancer (CRC) and as such receive endoscopic surveillance of the colon at regular intervals. Surveillance allows the discovery of CRC before symptoms develop, and also permits the detection of different types of precancerous lesion. This latter discovery can trigger early surgical intervention, but for some types of lesion such as endoscopically non-visible low-grade dysplasia, published estimates of cancer risk vary widely and best practice is unclear, particularly as surgical risk can vary considerably by age and the presence of comorbidities. The aim of the project was to clarify this decision.

A Markov model was constructed to determine the point at which ongoing surveillance becomes cost-effective relative to immediate surgery, across a range of age groups and in the presence of different comorbidities. The main result was that ongoing surveillance was found to be cost-effective from the age of 62 in the presence of no comorbidities, using a cost-effectiveness threshold of £30,000/QALY gained. When two comorbidities were present, the age at which ongoing surveillance became cost-effective was 51. The results of my project add clarity to the decision of when to offer ongoing surveillance and when to offer surgery, which will hopefully be of value in clinical decision-making. A paper reporting these results is currently being prepared for submission to a peer-reviewed journal.

I would like to thank everyone at HERC for integrating me into the department and my supervisors in particular for their guidance and support. I learnt a great deal over the three months which I am sure will prove useful in the future.

## Long-term disease models to study cost-effectiveness of interventions to prevent cardiovascular disease

**Project team:** Oliver Verran, Claire Simons, Iryna Schlackow and Boby Mihaylova

I arrived at HERC at the beginning of July 2014 fresh from my second year mathematics exams. I was sentenced to an intense 10 week research internship, charged with validating the Cholesterol Treatment Trialists' collaboration (CTT) economics model, supervised by Claire Simons, Iryna Schlackow and Boby Mihaylova.

Statins are one of the most prescribed drugs in the western world. Over the last four years, Boby, Claire and Iryna, in collaboration with CTT, have developed a sophisticated Markov model simulating the progression of cardiovascular disease. This model uses far more data than previous models and is being used to evaluate the cost effectiveness of statins. In any Markov model you need to find some method of determining the transition probabilities between states. We used standard techniques from survival analysis, all of which depend upon a probability distribution. My main task was to check that appropriate probability distributions had been chosen for this model. The results of my efforts meant that several adjustments needed to be made to the model. I also carried out a small amount of sensitivity analyses on the model, and towards the end of my time at HERC I began to migrate a previous model (the Heart Protection Study model) from SAS/Excel to R.

After my placement ended, I began the third year of my mathematics degree at Brasenose College in Oxford. Contrary to what you might expect from reading the first few sentences, I thoroughly enjoyed my time at HERC. Claire, Iryna and Boby made me feel very welcome and I felt extremely lucky to be able to carry out research in such a friendly environment.

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## Spotlight on INES ROMBACH

I joined HERC in October 2013 to undertake a DPhil in Public Health funded by the Medical Research Council. My project is focussing on the handling, analysis and reporting of missing data in Patient Reported Outcome Measures (PROMs) for randomised controlled trials (RCTs).

Missing data is an area that is receiving increased attention from regulators, funding bodies and journal editors, but in which there is a well-documented discrepancy between the available methodology and the current practice.

One component of my project is a review assessing how missing data are handled, reported and analysed in the literature compared to the contemporary methodology.

In addition, I will compare and contrast different approaches to statistical analysis that can take missing data into account; a separate aspect of the project will consider the practical implementation of sensitivity analyses to assess the robustness of the study results with regards to changing the assumed underlying missing data mechanisms.

My interest in the analysis of RCTs, PROMs and missing data stems from my previous work as a clinical trials statistician at the Surgical Intervention Trials Unit (University of Oxford) and the Clinical Trials Research Unit (University of Leeds), where I was involved in the planning, conduct and analysis of RCTs within the orthopaedics and cancer portfolios.

I am thoroughly enjoying my time in HERC, and am grateful for the chance to be involved in a very methodological aspect of clinical research. On completion of my project, I am planning to return to my previous role as a clinical trials statistician with a view to maintaining some methodological aspects within my post.

# staff • visitors • students • funding • publications • presentations • seminars

## Staff News – Welcome to:

### Kusal Lokuge

Kusal joined HERC in October 2014, as a graduate reading for a DPhil in Population Health, looking at the cost effectiveness of treatment strategies in people with increased stroke risk due to carotid stenosis. His previous work experience includes equity and macroeconomic research in Sri Lanka. Kusal completed his BA (Hons) in Economics and Mathematics at the University of Liverpool, before going onto finish his MPhil in Finance at the University of Cambridge.

### Sam O'Neill

Sam is a foundation year 2 doctor on a four-month public health placement at HERC until December 2014. Sam is performing a review update with Ramón Luengo-Fernandez on stroke and quality of life. He is also collecting data for the Fracture Free study with Filipa Landeiro.

### Gunveer Plahe

Gunveer, a foundation doctor, is visiting HERC from August-December 2014 on a four-month public health placement. She is working on a literature review on chronic kidney disease progression, as well as collecting data for the Fracture Free study.

### Thomas Rouyard

Thomas joined HERC in October 2014. He is undertaking a DPhil under the supervision of Alastair Gray and José Leal, investigating new ways of providing lifetime risks information to both patients and health professionals in the area of Type 2 diabetes. Thomas holds a Doctorate in Pharmaceutical Sciences from the University of Paris and a MSc in Economics from the Paris School of Economics.

## Congratulations to:

Seamus Kent on the award of a NIHR Doctoral Research Fellowship in which he is studying the impact of overweight and obesity on long-term health and healthcare resource use using the Million Women Study and linked administrative data sets.

## Recruitment:

**DPhil Projects 2015**

HERC has a number of projects available to potential DPhil students applying for admission in October 2015. Please see the links at the end of this section for details of the application process. Below are the projects supervised by HERC's senior academics:

1. **A longitudinal study of child asthma in the UK: the role of income and other risk factors**

   *Supervisors:* Mara Violato, Senior Researcher in Health Economics and Maria Quigley, Professor of Statistical Epidemiology

2. **Conducting economic evaluations of perinatal interventions from a family perspective: identification of challenges for analyses and exploration of potential solutions**

   *Supervisor:* Oliver Rivero-Arias, Senior Health Economist

3. **Socio-economic and behavioural aspects of alcohol consumption effects on health outcomes and healthcare costs**

   *Supervisors*: Iryna Schlackow, Senior Researcher in Health Economics and Borislava Mihaylova, University Research Lecturer and Senior Researcher in Health Economics

A number of competitive DPhil scholarships are available, which cover fees and maintenance, for the best prospective students. Details on the process for applying for a DPhil can be found at **http://www.ndph.ox.ac.uk/study/dphil-population-health**, whilst information on the combined MSc in Global Health Science/DPhil in Population Health (four-year funded) programme can be found at **http://ndph.medsci.ox.ac.uk/study/4-year-funded-dphil**.

## Presentations by members of HERC

**UNU-WIDER Conference on 'Inequality – Measurement, Trends, Impacts, and Policies'**
Helsinki, 6 September 2014
**Laurence Roope, Paul Anand, Alastair Gray**
*New approaches to the measurement of progress (two paper summary)*

**A half-day mini Mount Hood event organised by: Department of Health Economics, Medical University of Vienna**
15 September 2014
**Alastair Gray**
*Diabetes simulation models as prognostic tools*

**EASD Annual Meeting 2014**
Vienna, Austria, 16 September 2014
**Alastair Gray, José Leal, Rivero-Arias**
*Can delaying onset of Type 2 diabetes be cost-effective*?

**22nd Cochrane Colloquium, Poster presentation**
Hyderabad, India, 22-28 September 2014
**Rachael Morton, Iryna Schlackow, Boby Mihaylova, Alastair Gray**
*Can analysis of the effect of social disadvantage on health outcomes be improved through the use of causal pathways?*

Discussions at the 22nd Cochrane Colloquium

**United European Gastroenterology week, Poster of Distinction**
Vienna 18-22 October 2014
**Helen Campbell, Elizabeth Stokes, Danielle Bargo**
*Healthcare Costs And Quality Of Life Associated With Acute Upper Gastrointestinal Bleeding In The UK. TRIGGER Investigators*

**St. Luke's Clinical Education and Research Seminar: Cost-Effectiveness & Health Policy**
Tokyo, 1 November 2014
**Alastair Gray**
*Using Cost Effectiveness Analysis to Inform Health Policy: Lessons from the UK*

## HERC Seminars Convenor: Jilles Fermont

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 September we welcomed **Nick Bansback**, Assistant Professor, School of Population and Public Health, University of British Columbia who presented *Can patient centred care improve outcomes and save costs?* Also in September, we welcomed **Katharina Hauck**, Senior Research Fellow, Imperial College Business School, London who spoke about *The social determinants of health: does the data support the rhetoric?*

In October, HERC welcomed **Brendan Walsh**, Research Associate, School of Health Sciences, City University London. Decomposition analysis in health inequalities and **James Raftery,** Professor of HTA, University of Southampton *NICE: how much has it saved the NHS? Would cross-the-board price cuts save more?* Details of forthcoming talks can be found on the HERC website.

**To be added to our mailing list for future seminars, email us at herc@dph.ox.ac.uk**

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## Recent Publications

For a complete list of HERC-authored publications to date and in press, visit our website.

**Stokes E**, **Campbell H, Bargo D**, Murphy M, Logan R, and Jairath V (2014). PTU-148 *Healthcare Costs And Quality Of Life Associated With Acute Upper Gastrointestinal Bleeding In The UK*. Gut 63 2014, (Suppl 1):A103-4.

**Dakin H**, Devlin N, Feng Y, Rice N, O'Neill P, and Parkin D (2014). *The influence of cost-effectiveness and other factors on NICE decisions*. Health Econ, EPub (doi: 10.1002/hec.3086).

Watts CG, Dieng M, **Morton RL**, Mann GJ, Menzies SW, and Cust AE (2014). *Clinical practice guidelines for identification, screening and follow-up of individuals at high risk of primary cutaneous melanoma: a systematic review*. Br J Dermatol, Epub (DOI: 10.1111/bjd.13403).

**Burns RM**, Sharp L, Sullivan FJ, Deady SE, Drummond FJ, and O'Neill C (2014). *Factors driving inequality in prostate cancer survival: a population based study*. PLoS One, 9(9):e106456.

Pankhurst L, Macfarlane-Smith L, **Buchanan J**, Anson L, Davies K, O'Connor L, Ashwin H, Pike G, Dingle KE, Peto TE, **Wordsworth S**, Walker AS, Wilcox MH, and Crook DW (2014). *Can rapid integrated polymerase chain reaction-based diagnostics for gastrointestinal pathogens improve routine hospital infection control practice? A diagnostic study.* Health Technol Assess, 18(53):1-167.

**Dakin HA**, **Wordsworth S**, Rogers CA, Abangma G, Raftery J, Harding SP, Lotery AJ, Downes SM, Chakravarthy U and Reeves BC (2014). *Cost-effectiveness of ranibizumab and bevacizumab for age-related macular degeneration: 2-year findings from the IVAN randomised trial*. BMJ Open, 4(7):e005094.

Pandey S, McLernon DJ, Scotland G, Mollison J, **Wordsworth S** and Bhattacharya S (2014). *Cost of fertility treatment and live birth outcome in women of different ages and BMI.* Hum Reprod, 29(10):2199-211.

Foote C, **Morton RL**, Jardine M, Gallagher M, Brown M, Howard K, Cass A. CONSIDER – *COnsiderations of Nephrologists when Suggesting Dialysis in Elderly patients with Renal failure: A discrete choice experiment.* Nephrology Dialysis Transplantation. (2014).

Alva ML, **Gray A**, **Mihaylova B**, **Leal J**, R. R. Holman (2014). *The impact of diabetes-related complications on healthcare costs: new results from the UKPDS (UKPDS 84)*. Diabetic Medicine.


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