ISSUE

18

Newsletter of the
Academic Unit of Health Economics
University of Leeds

AUHE News

January 2020

Welcome… from Gurdeep Sagoo

Happy New Year and welcome to our first newsletter of 2020. We are delighted to share with you the news that the School of Medicine, within which AUHE sits, has achieved a Gold award in the Athena SWAN Charter. Not only is this the first Gold award for the University of Leeds but we are also the first medical school nationally to achieve this level of award.

This award recognises all the work that has been undertaken since 2012 to demonstrate significant and sustained progression and achievement in promoting gender equality across the entire School. This has included over 230 members of staff across the School with significant representation from AUHE in the Institute Self Assessment Teams, the School Steering Group and the Equality and Inclusion Committees.

In AUHE we are proud of our involvement to date and continue to be avid supporters of this agenda. However, we recognise there is still have much work to do to ensure we continue to provide opportunity for a diverse workforce, culture and embed appropriate behaviours across all aspects of equality and inclusivity, not just gender. So, well done to everyone, but let's continue working towards a better future for all.

Gurdeep Sagoo
Co-Lead, Leeds Institute of Health Sciences Athena SWAN Self Assessment Team, School of Medicine Steering Group Member, and Lecturer in Health Economics

ABOUT THE UNIT

AUHE was established in 2007 to create a health economics research and education centre with a portfolio of applied and methodological research.

The research includes:

- *economic evaluations alongside clinical trials*
- *value of information studies*
- *valuation of health, health care and wellbeing*
- *priority setting in health care*
- *health care policy*
- *early stage efficiency in research and development*

UK-CHINA HEALTH AND ECONOMY PARTNERSHIP

Chris Bojke attended the opening meeting of The 2019 UK-China Health and Economy Partnership in Beijing on 27th October. The partnership between world-class universities in the UK and China, overseen by the British Council, aims to create measurable benefits for Chinese patients and the economy by generating new health economics expertise via a series of collaborations that generates research-led technical advice that supports the reform of Chinese HTA processes and builds in-country capacity in health economics. The partnership involves collaboration from the health economics units of Leeds, Sheffield, Bournemouth and York and three Chinese universities Zhejiang University, Fudan University and Shandong University. The Leeds partnership will build on existing strong relationships between Leeds and Zhejiang University and will deliver a workshop in March 2020 at Zhejiang University on the 'Health Economics of Screening and Diagnostic Testing in China and the UK' to be delivered by AUHE economists **Chris Bojke**, **Ruben Mujica-Mota** and **Alison Smith**.

During the visit Chris also visited Zhejiang University and met with members of the office of global engagement, the new Dean of the School of Public Health and the Director of Health Economics in the University School of Medicine, Professor Hengjin Dong, who by coincidence is a former student at

Leeds. Whilst at the university Chris presented his work on the importance of incorporating heterogeneity in survival models as a Xinglin Forum Presentation.

Chris was also part of the panel for a roundtable discussion on the Meaning of Value-based Healthcare at the 2nd China HTA Conference in Beijing. The panel was chaired by Professor Xie Feng of McMaster University and included Professor Lou Garrison, Professor Simon Dixon, Professor Andrea Manca and Dr Cynthia Iglesias. Topics raised included the purpose of value frameworks, their consideration of opportunity cost, the role of structured deliberation, the role of qualitative data and pros and cons of MCDA.

WELCOME BACK TO: ROBERTA LONGO

The AUHE wishes a warm welcome back to **Roberta** after her 9-month maternity leave during which she enjoyed time with her baby, Luca.

Since she returned, Roberta has re-joined the group led by Hemant Pandit (Leeds Institute of Rheumatic and Musculoskeletal Medicine), who has been awarded £2 million from NIHR Health Technology Assessment Programme to conduct a non-inferiority trial for the treatment of knee osteoarthritis. She also continues her role as co-investigator on two other HTA programmes on diabetic foot ulcers (MIDFUT and CODIFI2).

Roberta has also re-joined ATLANTIS, a national study that is investigating amitriptyline as a second-line treatment for people with irritable bowel syndrome in primary care, and ISCOMAT which studies medicines management for patients with heart failure across a range of health organisations involved in their care.

Roberta is also Health Economics Lead for the Research and Design Service (RDS) at Leeds and as an institute representative on the Faculty Equality and Inclusion committee. An exciting new opportunity coming up for her is future involvement with Athena Swan.

WELCOME TO: RACHAEL JABLONSKI

Rachael is a Specialty Trainee in Restorative Dentistry. She went out of programme in October 2019 to start her PhD and is funded by a NIHR Doctoral Fellowship.

Her research project IMPRESSeD aims to improve facial prosthesis construction for patients with a missing facial part through the development of a digital manufacturing workflow. The fellowship will include a systematic review, laboratory assessment of digital workflows, feasibility cross-over randomised controlled trial and early health technology assessment.

Rachael will be supervised by Professor **Chris Bojke** along with colleagues from the School of Dentistry (Professor Brian Nattress, Professor Sue Pavitt and Dr Andrew Keeling).

PHD SUCCESS: PAOLO CANDIO

Congratulations to **Paolo** for passing his PhD *viva* with minor corrections. Paolo developed his PhD in Health Economics on the methodological challenges in economic evaluation of universal programmes to promote healthy behaviours.

Paolo was supervised by David Meads and Andrew Hill (University of Leeds), and Karen Bloor and Laura Bojke (University of York).

Paolo's research interests include decision-analytic modelling, behaviour change, economics of health promotion and handling of missing data in cost-effectiveness analysis.

In October 2018, Paolo secured a position as a Researcher at the Health Economic Research Centre at the University of Oxford. Over the last year, he has been working on a project which focuses on the economics of stroke. This study will assess the impact of pioneering stroke interventions on population-level costs and outcomes across 32 countries, namely, the current 28 members of the European Union, as well as Iceland, Norway, Switzerland and Israel.

AUHE SEMINAR AND WORKSHOP: DAVID EPSTEIN

On 9th December 2019, the AUHE welcomed **David Epstein** from the **University of Granada**, Spain. David gave a **seminar** titled **"Beyond the cost-effectiveness acceptability curve"**, in which he highlighted a confusion that can arise when several treatment options are evaluated and presented using a cost-effectiveness acceptability curve (CEAC). He argued the CEAC provides a partial view about the uncertainty surrounding net benefits, since it only provides information about the probability that particular options have the highest net benefit, without illustrating the variance that can exist in the ranking of probabilities.

David also gave an interactive **workshop** about **rates and probabilities in Markov models**, in which he addressed potential differences in formulas that can be applied to derive transition probabilities from rates when having a single risk model or competing risks and other multistate models. Participants used Maxima, a computer algebra system, to calculate forward and backward transition probabilities as part of a 4-state Markov model.

YouTube videos of search methods for 'Finding Evidence to Support Your Research Proposal'

Judy Wright (AUHE Senior Information Specialist and NIHR Research Design Service Advisor) has recorded a series of 4 videos in collaboration with Donna Irving (AUHE) and Anthea Sutton (ScHARR).

1. **Is your research question novel?**
2. **Identifying gaps in current research**
3. **Checking ongoing and published research**
4. **Research recommendations**

The videos are available on RDS YH

AUHE Teaching

In September, **Bethany Shinkins** ran a one day course on the economic evaluation of diagnostic tests, hosted by the NIHR In Vitro Diagnostics Co-operative. The course was again well-attended by individuals working in a range of settings, including clinicians, academics, data scientists, lab scientists, commissioners, and those working in industry. To date, the course has been targeted at 'non-health economists' however, due to demand, we are going to extend the course to 2 days next year to include some more advanced modelling content on the sec-ond day. Participants will be able to opt in to attend just one or both days. For further information, please contact **b.shinkins@leeds.ac.uk.**

In January, over 100 undergraduate economics at the University of Leeds Business School (LUB) had exams for our two AUHE undergraduate health economics modules. These second– and third-year modules are led by **Adam Martin** (Introduction to Health Economics) and **Daniel Howdon** (Health Economic Evaluation). Good luck to all students sitting exams!

New projects

Risk Assessment Tool for Suspected Breast Cancer: an economic evaluation
Breast cancer is the most common cancer in the UK, accounting for 15% of all new cancer cases. GP urgent referrals to breast cancer specialists (the Two Week Wait referral pathway) in England are growing year-on-year. Although large numbers of patients are referred, the vast majority of these patients do not have cancer. This is estimated to cost NHS England over £176 million per year in unnecessary testing and has created a huge bottleneck in breast cancer diagnostic services. This is further exacerbated by the current workforce crisis within breast imaging. **PinPoint Data Science Ltd** is developing a test to efficiently triage patients referred on the Two Week Wait pathway to ensure that only those with a higher risk of cancer undergo further testing. In collaboration with PinPoint Data Science Ltd, the University of Leeds and Leeds Teaching Hospitals NHS Trust have been awarded funding from Innovate UK to evaluate this technology in patients referred with suspected breast cancer. **Samuel Frempong** and **Bethany Shinkins** and will be leading the health economic work package.

NIHR promotion of good mental health project
AUHE are delighted to be part of an NIHR promotion of good mental health project recently awarded to Prof John Baker of the School of Healthcare at Leeds. The 30 month project entitled ' Developing a service user centred co-designed patient safety intervention for acute mental health wards: A mixed methods process evaluation' and starting in Jan 2020, seeks to develop and test a real-time measure of the perceived safety in high-risk acute mental health wards. Acute mental health wards are considered high-risk environments with approximately quarter of a million incidences, including violence and self-harm, occurring in 2016/17. Although measures exist that capture the safety environment such as the Mental Health Safety Thermometer, they are retrospective measures. The objective of the current project is to develop a real-time measure that enables staff to monitor the environment and take effective steps before safety incidents occur. The project adds to the growing portfolio of mental health work, led by **Chris Bojke**, that the AUHE contributes to, including evaluation that uses quasi-experimental techniques.
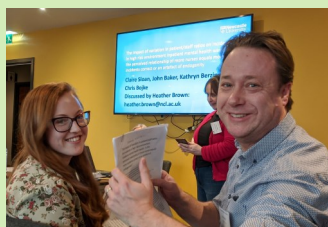
AUHE at HESG

Sarah Abraham, Chris Bojke, Adam Martin, Gurdeep Sagoo, and **Claire Sloan** attended HESG in Newcastle.

Claire Sloan and **Chris Bojke** had a paper presented on the relationship between patient-staff ratios and rates of incidents on inpatient mental health wards. Using longitudinal data from 9 wards from a single trust over a period of 3 months, they identified different ratios between wards that are not fully explained by observable patient characteristics. They conclude that variations in patient/staff ratios are likely to be endogenous, perhaps because more registered nurses would be systematically allocated to wards where there is an expectation of higher rates of incidences. This finding thus challenges the conclusions of existing literature, including a prominent observational study (Bowers & Crowder 2012) that made a surprising statement that more qualified nurses leads to an increased probability of conflicts and incidents.

Sarah Abraham presented a poster that included results of a study that examined the measurement of health outcomes in children and the use of parent or carer proxies to measure health-related quality of life. The data for the study came from the TIGA-CUB trial that is investigating conduct disorders in 5–11 year olds.

AUHE Visits

Manchester
On 12th September, the University of Manchester (UoM) hosted the second annual Methods for the Economic Evaluation of Diagnostics (MEED) research forum. Organised by **Alison Smith** (AUHE), Alex Thompson (UoM) and Sean Gavan (UoM), MEED aims to bring together health economists from across the UK to discuss advances in the field of test evaluation. **Bethany Shinkins** and **Paula Cocco**, members of the AUHE Test Evaluation Group (TEG), also presented at this event. Details of MEED 2020 will be released shortly in the new year.

Adelaide
In October 2019, **Alison Smith** spent three weeks visiting researchers in Australia as part of her 3-year NIHR Doctoral Fellowship. As part of her trip, Alison presented to groups based at the University of Sydney and the University of Adelaide, and delivered a plenary session at the Australasian Association for Clinical Biochemistry (AACB) 57th Annual Scientific Conference. Alison is working closely with members of the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) based in Australia, to improve test evaluation and implementation methodology.

Shandong
In December 2019, **Zhuxin Mao** presented her work titled "Does EQ5D work in China? Exploring cultural differences in measuring health", at the School of Health Care, Shandong University.

OTHER NEWS

Edward Webb attended the International Choice Modelling Conference in Kobe, Japan, on August 19-21. He presented his work titled "Joint modelling of choice and rating data: theory and examples".

Davide Tebaldi attended the 40th Nordic Health Economic Study Group Meeting in Reykjavik, Iceland, on August 21-23. He was also present at the 6th EuHEA Early Career Researcher Conference in Porto, Portugal, on September 4-6.

John O'Dwyer attended the Health Economics Network Symposium at the Trinity College Dublin, on September 12. He presented his work with the title "A Systematic Review of Self-reported Quality of Life Measures for Adults with Mild to Moderate Learning Disabilities".

Bethany Shinkins was present at the MEED conference in Manchester, on September 12. She also attended a conference on "Rapid Evidence Assessment and Generation for the MedTech Industry", hosted by Imperial College London, in London, on November 7.

Paul Kind and *Zhuxin Mao* took part in the 36th EuroQol Plenary Meeting, in Brussels, Belgium, on September 18-21. At this meeting, Zhuxin presented two posters: "Exploring Subjective Constructions of Health in China: a Q-methodological Investigation" and "Similarities and Differences in HRQoL concepts between China and the West — a literature review of Chinese-developed HRQoL questionnaires".

Florien Boele presented her work "Healthcare utilization, medication use, and productivity loss in glioma patients with depressive symptoms and their family caregivers" at the European Association for Neuro-Oncology Conference in Lyon, France, on September 19-22. At the same conference other work of hers titled "Development of an EORTC questionnaire measuring instrumental activities of daily living (IADL) in patients with brain tumours: phase I-III." was presented by a co-author. Still at this conference, she was invited to present during the Educational Day for Nurses & AHPs and chaired two other sessions.

Sarah Abraham and *Claire Sloan* attended a two-day causal inference workshop at the University of Manchester, in October. Led by Scott Cunningham (Baylor University), the workshop covered randomisation inference, instrumental variables, differences-in-differences, synthetic control and regression discontinuity. It included numerous examples ranging from 19th century London water supply infrastructure to American state federalism policy experiments on Gun laws, and guidance on implementing the techniques in statistical programs such as R and Stata.

Florien Boele attended the NCRI Cancer Conference in Glasgow, United Kingdom, in November, where her work titled "Support needs and experiences of people living with advanced incurable cancer" was presented.

AUHE's TEST EVALUATION GROUP:
INTEGRATING HEALTH ECONOMICS INTO THE DEVELOPMENT AND EVALUATION PIPELINE FOR MEDICAL TESTS

The Test Evaluation Group (in collaboration with the NIHR Leeds In Vitro Diagnostics Co-operative) have been busy developing a portfolio of research that explores how economic evaluation methods can improve the development and evaluation pipeline for medical tests. Early economic evaluation is a methodology the team have been promoting for a good few years now, and the MICs have recently collaborated on a publication for Medical Decision Making which describes their experiences of applying this methodology to diagnostic technologies.

Paola Cocco is building on this work by exploring existing methods for developing Target Product Profiles for medical tests and combining these with early economic evaluation to determine the optimal properties of a new infection diagnostic. The goal is that these combined methodologies will provide a mechanism for driving innovation in diagnostics based on clinical unmet need and cost-effectiveness.

Bethany Shinkins recently co-authored (with Professor Chris McCabe, IHE) guidance for CADTH on the economic evaluation of treatments with companion diagnostics.

Pedro Rodrigues and *Bethany Shinkins* are working on the OPTIMA trial (PI: Professor Rob Stein) in collaboration with Warwick Clinical Trials Unit and Peter Hall (Edinburgh University). This project, funded by the NIHR Health Technology Assessment programme, has recently been highlighted in a Value in Health systematic review as an exemplar of using early economic modelling, value of information analysis, and adaptive trial design methodology.

Alison Smith is close to submitting her PhD in which she has developed a framework for assessing the impact of test measurement uncertainty on clinical and health-economic outcomes. The latest paper from her PhD, a systematic review of indirect methods for evaluating the impact of measurement uncertainty on clinical outcomes, was recently published in Clinical Chemistry.

Finally, *Samuel Frempong* and *Bethany Shinkins* will are working with PinPoint Data Science to evaluate a test which aims to identify who should be referred from primary care for further investigation for breast cancer. See full details on the previous page.

RECENT SELECTED PUBLICATIONS

ABEL, L., **SHINKINS, B.**, **SMITH, A.**, SUTTON, A. J., **SAGOO, G.**, UCHEGBU, I., ALLEN, A. J., GRAZIADIO, S., MOLONEY, E., YANG, Y. & HALL, P. 2019. Early Economic Evaluation of Diagnostic Technologies: Experiences of the NIHR Diagnostic Evidence Co-operatives. *Med Decis Making*, 39, 857-866.

BRADLEY, S. H., **ABRAHAM, S.**, CALLISTER, M. E., GRICE, A., HAMILTON, W. T., LOPEZ, R. R., **SHINKINS, B.** & NEAL, R. D. 2019. Sensitivity of chest X-ray for detecting lung cancer in people presenting with symptoms: a systematic review. *Br J Gen Pract*, 69, e827-e835.

DRAYSON, M. T., BOWCOCK, S., PLANCHE, T., IQBAL, G., PRATT, G., YONG, K., WOOD, J., RAYNES, K., HIGGINS, H., **DAWKINS, B.**, **MEADS, D.**, HULME, C. T., MONAHAN, I., KARUNANITHI, K., DIGNUM, H., BELSHAM, E., NEILSON, J., HARRISON, B., LOKARE, A., CAMPBELL, G., HAMBLIN, M., HAWKEY, P., WHITTAKER, A. C., LOW, E., DUNN, J. A., TEAMM TRIAL MANAGEMENT GROUP & TRIAL INVESTIGATORS 2019. Levofloxacin prophylaxis in patients with newly diagnosed myeloma (TEAMM): a multicentre, double-blind, placebo-controlled, randomised, phase 3 trial. *Lancet Oncol*, 20, 1760-1772.

FREMPONG, S., SUTTON, A. J., DAVENPORT, C. & BARTON, P. 2019. Early Economic Evaluation to Identify the Necessary Test Characteristics of a New Typhoid Test to be Cost Effective in Ghana. *Pharmacoecon Open*.

HORTON, M. C., OYEBODE, J., CLARE, L., MEGSON, M., SHEARSMITH, L., BRAYNE, C., **KIND, P.**, HOARE, Z., AL JANABI, H., HEWISON, V., TENNANT, A. & WRIGHT, P. 2019. Measuring Quality of Life in Carers of People With Dementia: Development and Psychometric Evaluation of Scales measuring the Impact of DEmentia on CARers (SIDECAR). *Gerontologist*.

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HOWDON, D. , LOMAS, J. R. S. & PAULDEN, M. 2019. Implications of Nonmarginal Budgetary Impacts in Health Technology Assessment: A Conceptual Model. *Value in Health*, 22, 891-897.

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MARTIN, A., **MEADS, D.**, GRIFFITHS, A. W. & SURR, C. A. 2019. How Should We Capture Health State Utility in Dementia? Comparisons of DEMQOL-Proxy-U and of Self- and Proxy-Completed EQ-5D-5L. *Value in Health*, 22, 1417-1426.

MEADS, D., **MARTIN, A.**, GRIFFITHS, A., KELLEY, R., CREESE, B., ROBINSON, L., MCDERMID, J., WALWYN, R., BALLARD, C. & SURR, C. A. 2019. Cost-Effectiveness of Dementia Care Mapping in Care-Home Settings: Evaluation of a Randomised Controlled Trial. *Applied Health Econ Health Policy*.

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SMITH, A. F., **SHINKINS, B.**, HALL, P. S., HULME, C. T. & MESSENGER, M. P. 2019. Toward a Framework for Outcome-Based Analytical Performance Specifications: A Methodology Review of Indirect Methods for Evaluating the Impact of Measurement Uncertainty on Clinical Outcomes. *Clin Chem*, 65, 1363-1374.

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