

## Newsletter Winter 2021

### Prizewinning CaHRU paper presented at Royal College of General Practitioners' online conference



Dr Julie Pattinson from the University of Lincoln presented her prizewinning paper, which was awarded the Royal College of General Practitioners (RCGP) Research Paper of the Year 2019 in Medical Education, at this year's RCGP online conference. The conference: A fresh approach to General Practice, took place on 11-12th February 2021, and Julie presented in the winner's enclosure session on the first day of the event.

The study, '[Exploring reasons for differences in performance between UK and international medical graduates in the Membership of the Royal College of General Practitioners Applied Knowledge Test: a cognitive interview study](#)' explored the reasons for differences in candidate performance in medical licensing examinations such as Membership of the Royal College of General Practitioners (MRCGP) between International and UK medical graduates.

The study found that real life experience was better than the classroom, clinical exposure to specialties (e.g. ophthalmology) or specialty topics helped, while textbook learning and memorisation were helpful for rare diagnoses. Recent and repeated exposure was helpful but there was limited opportunity for gaining experience where gender barriers, uncommon presentations, or data interpretation and statistics were involved. Topics considered less relevant to general practice were less well answered. Overconfidence sometimes led to inaccurate self-evaluation.

Cultural barriers included lack of familiarity with the NHS, national (NICE) guidance, abbreviations and exam formats. All candidates found difficulties answering certain questions which may be addressed through training. International graduates faced additional difficulties due to differences in educational experience, content familiarity and language barriers – all potentially amenable to additional training support.

### Improvement science and research methods seminar February 2021: Case study methods

The February 2021 Improvement Science and Research Methods seminar from CaHRU was presented by Prof Niro Siriwardena on 'Case study designs: a refreshing alternative that other methods can't always reach'. The seminar focused on use of single and multiple case study methods in health research, using these designs to explore the reality and complexity of healthcare organisations and interventions.



The seminar provided an overview of what case study designs are, why they are useful, when to use them, and how to apply and analyse them to answer real-world and complex research questions, with examples of where they have been or are being used in studies led by or involving CaHRU. This included different types of case study, including descriptive, exploratory, and explanatory approaches, using single, multiple and embedded designs, with quantitative, qualitative, multimethod or mixed methods.

Design of case study research touched on theory and logic models and the use of different techniques such as pattern matching and replication logic to build explanations to answer 'how' and 'why' type research questions. Finally, examples were provided from the [GPs in EDs study](#), the [Heritage at risk and wellbeing study](#), and the [Ambulance Services Cardiovascular Quality Initiative](#) to illustrate the methods and techniques.

Future seminars include "Analysis of repeated measures and longitudinal data in health research" on 17th March and "A review of published Health Economics Analysis Plans (HEAPs)" on 21st April. Contact Sue Bowler sbowler@lincoln.ac.uk if you would like to attend.

## Improvement science and research methods seminar January 2021: Reflections on stepped-wedge trials



The first Improvement science and research methods seminar in 2021, featured Dr Vanessa Botan who presented her '[Reflections on stepped-wedge trials: rationale, design, and analysis](#)'. Vanessa is a postdoctoral research associate in medical statistics, working on two major NIHR funded studies and a number of other projects at CaHRU since she completed her PhD at the University of Sussex. In her PhD she used psychological, physiological, and neuroscientific methods to investigate the relationship between vicarious pain perception and bodily consciousness. Prior to this she worked as a research assistant in social and clinical psychology having gained an MSc in Cognitive Neuroscience, a BSc in Biomedical Sciences and is an associate fellow of the Higher Education Academy.

Vanessa described stepped wedge designs and their origins in the Gambia Hepatitis Intervention Study which investigated vaccination to prevent hepatitis in the 1980s. She went on to describe the advantages of this study design such as providing alternatives to individual randomization, when not offering an intervention or where randomisation may be logistically difficult or deemed unethical, allowing flexibility of cluster size, and taking into account differences between communities while measuring outcomes at an individual level.

She also discussed problems of contamination and time bias and went on to discuss the ways of analysing data in such designs and how these related to interrupted time series designs using the NIHR Applied Research Collaboration East Midlands funded, 'Hypos can strike twice' intervention study as an example. To view the presentation please go to the CaHRU blog [www.cahru.org.uk](http://www.cahru.org.uk) or email Sue Bowler [sbowler@lincoln.ac.uk](mailto:sbowler@lincoln.ac.uk)

## Systematic review of experiences of people with Guillain-Barré syndrome published in PLOS One

The latest study from CaHRU, '[Patients' experiences and perceptions of Guillain-Barré syndrome: a systematic review and meta-synthesis of qualitative research](#)' was published in the international journal, PLOS One, this February 2021. The study was funded by the GAIN charity and led by Prof Niro Siriwardena, with a team including Despina Laparidou and Dr Joseph Akanuwe from CaHRU, Dr Ffion Curtis from the Lincoln International Institute for Rural Health, Dr Jennifer Jackson (Lincoln International Business School) and Professor Tim Hodgson (School of Psychology).



Guillain-Barré syndrome (GBS) is a rare condition which rapidly affects the myelin sheath of nerve cells, often leading very rapidly to complete paralysis including of the muscles enabling us to breathe, so that people with the condition often require intensive care and ventilator support. Fortunately, most people fully recover during the next two years or longer, but others experience longer-term physical, psychological or social problems. The team conducted the first systematic review of qualitative studies exploring experiences of people with GBS.

The University of Lincoln researchers searched twelve electronic databases, supplemented with internet and reference searches, and identified five studies for review from over 5000 citations. The detailed analysis of these five studies provided an in-depth perspective of the patient with GBS' journey from suspecting that they had a problem, to admission to hospital, their experience of ongoing difficulties, and slow recovery from GBS. The themes identified, 'from uncertainty to hope', 'feeling lost in a changing life', 'fractured care', 'positivity towards recovery', 'adjustment' and 'towards a new self', showed the challenges for an individual's body, mind, relationships, work, and their future lives, as well as health care needs, as they came to terms with their illness.





## Improvement science and research methods seminar December 2020: Interrupted time series, COVID lockdown and ambulance data

In the December Improvement science and research methods seminar, Professor Graham Law discussed 'Interrupted time series, COVID lockdown and ambulance data'. Graham Law is a Professor in Medical Statistics in the College of Social Science and a senior member of CaHRU. He has published extensively in epidemiology and medical statistics, focusing on sleep and the consequences of good and poor sleep on metabolic and cardiovascular health.

Interrupted Time Series Analysis is a quasi-experimental design that can be used to evaluate interventions using longitudinal data collected over a period of time. It is arguably the "next best" approach for dealing with interventions when randomisation is not possible, for example in the case of 'natural experiments'. The COVID-19 lockdown provided a natural experiment involving a clear 'intervention' that allowed this approach.

Graham explained the methods, how these can be interpreted, the drawbacks and future areas for research. He started by explaining the concept of a counterfactual. He then went on to describe time series and the approach to modelling this mathematically. He then discussed approaches to timing of the interruption, the shape of the distribution, the importance of stationary data and the use of moving averages using ambulance data during the period of COVID-19 lockdown to illustrate this.

### Funding

Sanderson K, Bell F, Siriwardena AN, Wankhade P, Phung VH, Porter B. Preventing suicide in ambulance staff: Ambulance Trust Implementation Support Tool. Health Education England, February 2021, £16,706

Siriwardena AN, Law GR, Botan V, Laparidou D. Digital Deterioration Monitoring evaluation. MIHR East Midlands Academic Health Science Network, January 2021, £14,948.

### Publications

Whitley GA, Hemingway P, Law GR, Siriwardena AN (2021). Ambulance clinician perspectives of disparity in pre-hospital child pain management: A mixed methods study. Health Science Reports (in press).

Yu M, Kollias D, Wingate J, Siriwardena AN, Kollias S. Machine learning for predictive modelling of ambulance calls. Electronics 2021; 10(4): 482.

Laparidou D, Curtis F, Akanuwe J, Jackson J, Hodgson TL, Siriwardena AN (2021). Patients' experiences and perceptions of Guillain-Barré syndrome: a systematic review and meta-synthesis of qualitative research. PLOS ONE 16(2): e0245826.

Choudhry M, Edwards M, Cooper A, Anderson P, Carson-Stevens, A, Cooke M, Dale J, Hibbert P, Hughes T, Porter A, Rainer T, Siriwardena AN, Edwards A (2021). Senior clinical and business managers' perspectives on the influence of different funding mechanisms, and barriers and enablers to implementing models of employing General Practitioners in or alongside Emergency Departments: qualitative study. Health policy (online first).

Watkins CL, Jones SP, Hurley MA, Benedetto V, Price CIM, Sutton CJ, Quinn T, Bangee M, Chesworth B, Miller C, Doran D, Siriwardena AN, Gibson J (2021). Predictors of recognition of out of hospital cardiac arrest by emergency medical services call handlers in England: a mixed methods diagnostic accuracy study. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 29:7.