

The Margaret Peters Centre (MPC) launched in November 2019 as a collaborative centre for data analytics, and brings together the expertise of managers, clinicians and academics with questions that can be answered through the analysis of available data. It is needed to bridge the gap between the routine analysis and processing of data in hospitals, and the interesting questions that exist in clinical and academic teams. Its aim is to build on and enhance the existing capacity and expertise of informaticians and statisticians at University Hospitals Birmingham NHS Foundation Trust (UHBFT).

UHBFT is the host organisation for National Institute for Health Research (NIHR) Applied Research Collaboration (ARC) for the West Midlands. It is an academic collaboration across the universities of Warwick, Birmingham and Keele. UHBFT is one of the largest NHS Trusts in the country with over 20,000 staff across four hospital sites. It has an internationally recognised reputation in health informatics, electronic prescribing and the development and integration of electronic clinical systems.

The Team

Katharine Reeves
Hannah Crothers
Adiba Liaqat
Sandra Remsing
Felicity Evison
Suzy Gallier

Centre Background

Completed Projects with Summary of Findings

Implementation of Research Evidence in Orthopaedics: a Tale of Three Trials

Our aim was to find out whether publication of Health Technology Assessment reports changes practice among clinicians for the ProFHER, DRAAFT and AIM trials. Implementation of results of all three orthopaedic trials favoured the less expensive and less invasive option. In two of the studies, a change in practice, in line with the evidence that eventually emerged, preceded publication of that evidence. A trend or a change in practice at around the start of the trial, indicates that the direction of causation opposes our hypothesis that publication of trial findings would lead to changes in practice. Our results provide provocative insight into the nuanced topic of research and practice, but further qualitative work is needed to fully explain what led to the pre-emptive change in practice we observed and why there was no change in the third case.

Reeves K, Chan S, Marsh A, et al. Implementation of research evidence in orthopaedics: a tale of three trials. *BMJ Qual Saf.* 2020;**29**:374-381.

Randomised Controlled Trial of a Theory-Based Intervention to Prompt Front-Line Staff to Take Up the Seasonal Influenza Vaccine

Our aim in this paper was to evaluate the effectiveness of reminder letters informed by social normative theory (a type of ‘nudge theory’) on uptake of seasonal influenza vaccination by over 8,000 front-line hospital staff. We found no evidence that the uptake of the seasonal influenza vaccination is affected by reminders using social norms to motivate uptake.

Schmidtke KA, Nightingale PG, Reeves K, et al. Randomised controlled trial of a theory-based intervention to prompt front-line staff to take up the seasonal influenza vaccine. *BMJ Qual Saf.* 2020;**29**:189-197.

Hospital Admissions and Outcomes for Stroke and Heart Attack in the Time of COVID-19: Database Study in One Large Hospital

Articles in the UK press claimed that hospital admissions for heart attack and stroke declined during the COVID-19 pandemic. However, data we analysed from the West Midlands Ambulance Service did not show any reduction in call-outs for patients with stroke or ST-Elevation Myocardial Infarction. We then examined data from University Hospital Birmingham NHS Foundation Trust, comparing admissions from week 1 of 2016 to week 17 of 2019, with the same period in 2020, pre- and post-lockdown. The results showed that there was no evidence of a reduction in the overall mean number of admissions of patients with these conditions in the post-lockdown period.

Holmes JL, Brake S, Docherty M, et al. Emergency Ambulance Services for Heart Attack and Stroke During UK’s COVID-19 Lockdown. *Lancet.* 2020; 395:e93-94.

Reeves K, Watson SI, Pankhurst T, et al. No Evidence for Reduced Hospital Admissions or Increased Deaths from Stroke or Heart Attack During COVID-19. *MedRxiv.* 2020. [pre-print]

Ongoing Projects with Brief Description

1 Outcomes for Surgical Procedures Funded by the English Health Service but Carried Out in Public vs Independent Hospitals: a Database Study

We are undertaking a nationwide study to compare the outcomes of NHS patients undergoing routine operations in NHS hospitals vs Independent Sector Healthcare Providers (ISHPs). The aim is to describe and examine differences in length of stay and 28-day emergency readmissions between provider types. We are working towards a final draft of this manuscript.

2 Discontinuity Analysis: Examining Organisational Responses to Incentives

Hospitals in England receive a financial incentive to vaccinate frontline staff against influenza each autumn. We are examining data to find any evidence of a threshold effect at the uptake level which triggers a CQUIN payment. We are working towards a final draft of this manuscript.

3 Age at Onset, Mortality, and Life-Years Lost for Five Cardiovascular Disease Conditions: Differences by Ethnicity and Diabetes Status

Compared to other ethnicities, South Asians have remarkably higher risks of diabetes and cardiovascular diseases. Diabetes is about three times more prevalent in South Asians than in White Europeans and occurs over a decade earlier. South Asians with diabetes are also at increased risk of diabetes complications and have a higher mortality rate from coronary heart disease and stroke. Our aim is to investigate contemporary trends by ethnicity of several cardiovascular outcomes and life expectancy in people with and without type 2 diabetes. Analysis for this project is underway, in collaboration with ARC East Midlands.

4 Age-Standardised Trends in Causes and Predictors of In-Hospital Stay and 30-Day Readmissions in Heart Failure: a Population-Based Analysis of Deprivation, Sex and Ethnicity in England

There are three main aims in this study: [1] to describe trends in emergency admissions for heart failure and subsequent readmissions within 30 days; [2] to analyse whether these trends vary by age, sex, ethnic group or deprivation; [3] to establish key predictive factors for 30-day readmissions split by cause and by time window. First draft of this manuscript is currently being written. Analysis for this project is underway, in collaboration with ARC East Midlands.

5 Assessing the Impact and Implementation of NICE TA and NIHR HTA Signals on NHS Clinical Practice

Following on from our previous work looking at the uptake of recommendations made in Health Technology Reports, we plan to track changes over time in uptake for six further trials. This study is in the early stages and will provide further insight into the effects of HTA recommendations.

6 The Impact of Food Banks on Malnutrition

Over the past ten years, the number of food banks and the number of food parcels they dispense has increased every year. The aim of this project is to investigate the relationship between the existence of food banks and the risk of diseases of poverty, particularly malnutrition, using geostatistical modelling.

7 An Evaluation of Community Assessment, Diagnosis and Incidence of Neonatal Jaundice in Birmingham and Solihull Local Maternity System

We are focussing on neonatal jaundice assessments in the community, looking at both transcutaneous bilirubin and serum bilirubin results and establishing any trends. In addition, we are looking at whether transcutaneous testing can reduce the need for invasive serum bilirubin testing and plan to use the findings to influence the design of a new clinical pathway.

8 Obstetric Anal Sphincter Injuries (OASIS) Clinics

The aim of this research is to establish whether specialised Obstetric Anal Sphincter Injuries (OASIS) clinics diagnose and treat post-birth injuries sooner. We are investigating this by focusing on three questions: [1] Does having an OASIS clinic reduce the length of time between giving birth and having a post-birth injury operation? [2] Does having an OASIS clinic increase the number of day case operations as a percentage of the total? [3] Are patients travelling further to a trust with an OASIS clinic in order to have their post-birth operation?

9 Birmingham and Lambeth Liver Evaluation Testing Strategies (BALLETS) Follow-On Study

This is a follow-up to our previous work (2005-10), which evaluated mildly abnormal liver function test results in patients with no known liver disease. The aim is to compare various outcomes (inpatient admissions, outpatient appointments, A&E attendance, death) in people who did or did not have fatty livers in the original study, to gain a better understanding of longer-term health outcomes.

We were invited to present at the HSR UK Conference 2020 in July. The presentation can be found online at: <https://youtu.be/SCLvG03E4ko>

Adiba Liaqat has started studying for her MSc in Data Analytics at Aston University, with her course fully funded by ARC West Midlands.

In Addition...