

Completed
Projects

Annual
Report

Year Three
2021/22

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

Using data from the England-wide Hospital Episode Statistics database, we looked at the outcomes of 18 common surgical operations carried out in NHS and independent hospitals between 2006 and 2019. We found that length of stay was significantly longer in NHS hospitals, and there was a higher risk of emergency readmission. There was no difference seen in overall death rates, however.

Crothers H, et al. Outcomes for surgical procedures funded by the English health service but carried out in public versus independent hospitals: a database study. *BMJ Qual Saf.* 2022; **31**(7): 515-25.

2 Examining Organisational Responses to Performance-Based Financial Incentive Systems

In 2016 the NHS set a financial incentive to increase the number of staff receiving the flu vaccine. Over the following years, the target for vaccination has ranged from 70-80%. Prior to the incentive, 9-31% of NHS Trusts achieved the set target, which increased to 43-74% in the four years afterwards. Our study looked at threshold effects, where the number of NHS Trusts that just manage to reach the target at the end of the vaccination season is higher than would be expected if the incentive did not have an impact. We found that threshold effects appeared every year; tracking these effects will enable policy-makers to see how an organisation is responding, how the incentive can be improved, and if there are any unexpected effects.

Liaqat A, et al. Examining organisational responses to performance-based financial incentive systems: a case study using NHS staff influenza vaccination rates from 2012/2013 to 2019/2020. *BMJ Qual Saf.* 2022; **31**(9): 642-51.

3 Ethnicity and Prognosis Following a Cardiovascular Event in People With and Without Type 2 Diabetes

We were interested in whether people of different ethnicities had different risks of death and cardiovascular disease (CVD) events following a first CVD event, and how it differed if the person had type 2 diabetes. Data from 5.3 million patients showed that people of South Asian, Black or Mixed/Other ethnicity had a first CVD event at a younger age than White people. However, there were higher risks of death (from any cause and due to CVD) in White males and females, compared to non-White people. Regardless of ethnicity or sex, having type 2 diabetes was also associated with increased risks.

Remsing SC, et al. Ethnicity and prognosis following a cardiovascular event in people with and without type 2 diabetes: Observational analysis in over 5 million subjects in England. *Diabetes Res Clin Pract.* 2022; **189**: 109967.

4 Trends in 30-Day Readmissions Following Hospitalisation for Heart Failure by Sex, Socioeconomic Status and Ethnicity

In recent years, reducing the high number of readmissions after hospitalisation for heart failure (and the associated costs) has become a priority for health policy. We looked at almost 700,000 such admissions in England, and found that in-hospital deaths have been reduced by an average of 0.7% each year over 2002-2018, while deaths at 30-days have remained the same. However, readmissions have increased by 1.4% each year, primarily due to an increase in non-cardiovascular disease causes. This increase has been most pronounced in ethnic minority groups and those in the lowest income group.

Lawson C, et al. Trends in 30-day readmissions following hospitalisation for heart failure by sex, socioeconomic status and ethnicity. *eClinicalMedicine.* 2021; **38**: 101008.

5 Indirect Effects of Peaks in COVID Admissions on Access to Surgery in the English NHS, Differential Effects by Operation Type, Ethnicity and Socio-Economic Status

During the peaks of the COVID pandemic (*March – July 2020, November – December 2020, January – March 2021*), routine hospital services in the English NHS were severely disrupted. Analyses of data from the Hospital Episode Statistics database showed that, while all surgeries declined during the pandemic, emergency and urgent operations held up better than elective cases, and there were rapid rebounds between peaks. Conditions that required urgent and complex treatment, such as organ transplants and certain cancers, were most severely affected.

Remsing S, et al. Indirect effects of peaks in COVID admissions on access to surgery in the English NHS, differential effects by operation type, ethnicity and socio-economic status: a database study. *MedRxiv.* 2021. 10.1101/2021.09.09.21262542.

Ongoing Projects

1 Assessing the Impact and Implementation of NICE Technology Appraisals and NIHR Health Technology Assessment 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.

2 Admissions for Malnutrition and Vitamin Deficiencies in England

In 2013, the Institute for Fiscal Studies reported a decrease in the calories of food purchased and an increase in substituting foods of poor nutritional value, with suggestions of an emerging “*public health emergency*”. A 2018 report suggested the UK was doing poorly in its progress towards Sustainable Development Goal 2 (*Zero Hunger*), and had few policies in place to tackle food insecurity, which was estimated to affect 2.2 million households.

This suggests an increased risk of malnutrition in England. Our study estimates malnutrition rates and the distribution of cases of malnutrition in England over the period 2001 to 2021.

3 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.

4 Understanding National Readmission Rates Following Childbirth

Prior to the COVID pandemic, experts had highlighted gaps and concerns about postnatal care provision, and its impact on long-term health and wellbeing, and health inequalities. COVID infection control measures have resulted in significant changes to the way postnatal care is delivered in the NHS (e.g. fewer face-to-face contacts with health professionals), and less support for women and neonates, especially in the community. There is a risk that these changes in care may reduce the quality or quantity of care, and lead to a failure to detect and treat problems. There is also concern that some of these changes will be continued post-pandemic without evidence of their effect.

We plan to explore whether, during the pandemic, there were changes in the rates and in the clinical severity of cases of unplanned maternal and neonatal readmissions, in the 30 days post-birth.

5 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.

6 A&E Four-Hour Waiting Time Threshold Analysis

The four-hour A&E waiting time target set out in the Handbook to the NHS constitution states that patients can expect to be admitted, transferred or discharged within a maximum of four hours after arrival at A&E. The operational standard is that 95% of patients should have a wait of at most four hours. This was relaxed from 98% in 2010 and has stayed the same since. We wish to look at how Trusts have responded to the 95% target by examining the data for evidence of “bunching” above the 95% target.

7 Tracking the Use of Effective and Low Value Added Orthopaedic Procedures as Evidence Has Evolved Over the Last Two Decades

The evidence base on the effectiveness or common elective orthopaedic operations has evolved over the last twenty years. From very little evidence, to a large number of randomised trials of the effectiveness of surgery versus conservative management of common elective orthopaedic procedures. A number of these procedures have no detectable advantage over conservative management in terms of intended outcomes. Since invasive procedures entail risks and health service costs, this casts doubt on the continued widespread use of these procedures.

In a landmark paper, Prof Ashley Blom and colleagues analysed the evidence for the ten most commonly performed orthopaedic operations, and found only two, *knee replacement* and *carpal tunnel surgery*, are unequivocally effective. Seven others are without measurable beneficial effects to offset against the risks. *Hip replacement* may be placed in a special category for want of evidence and, arguably, sufficient non-randomised evidence in its effectiveness. Guidelines are broadly consistent with this literature. Nevertheless, we cannot exclude potential for benefits in sub-groups of patients. The consensus therefore, is that these procedures should be done less frequently in the light of the above evidence but that they should not be ruled out.

Our null hypothesis is that there has been a sharp decline in the rate of performance of the seven procedures that appear to be mostly ineffective compared to the effective procedures. Our alternative hypothesis is that there has been a reduction in use in line with the evidence.

8 Independent Hospitals: Prioritisation of Elective Surgery During COVID

Waiting lists for planned surgery have increased rapidly during the COVID pandemic. As of April 2021, 387,000 people in England had been waiting more than a year for elective surgery. In this study we examine the effect of COVID on access to planned surgery. We examined access over the COVID and post-COVID epochs with respect to the historic (pre-COVID) data.

9 The Effect of the COVID Pandemic on Transplants and Cancer-Removal Surgeries

During the COVID pandemic the UK saw two peaks in the prevalence of hospital admissions, resulting in disruption of routine hospital services in the English NHS. This study aims to track the effect of these peaks on various types of surgery representing differences in urgency, importance, and complexity. We aim to find the number of emergency routine surgeries; cancer-removal surgeries; transplant surgeries; renal transplants (deceased and living donors); and elective routine surgeries carried out prior to and during the COVID pandemic.

10 Referral to Treatment Time Threshold Analysis

When patients have breached the 18-week waiting time from referral to treatment, the next target is 52-weeks. We plan to look at patients with an incomplete pathway rather than the admitted and non-admitted because it is essentially a prospective measure. We wish to look at how Hospital Trusts have responded to the 52-week target by examining the data for evidence of “bunching” below the target.

Centre Background

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 MPC Team

Katharine Reeves

Hannah Crothers

Sandra Remsing

Felicity Evison

Suzy Gallier