What can routine collection of patient reported outcome measures tell us about waiting times?

Matt Sutton, Silviya Nikolova

Background: A critical consideration for the management of waiting times is whether the length of wait affects the patient’s health outcome. Since 2009, providers of elective surgery funded by the NHS in England have been required to collect and submit Patient Reported Outcome Measures (PROMs) for patients undergoing four large-volume procedures. This large and rich dataset has the potential to provide new evidence on how waiting times and outcomes are linked at patient and provider level.

Aims: To examine the relationship between waiting times and health outcomes in routine practice.

Data: Preliminary analysis uses data on 24,000 patients undergoing hip replacement at 158 hospital Trusts.

Methods: Using parametric and non-parametric regression techniques, we estimate: (i) how waiting time is related to health state prior to surgery; (ii) how health outcome after surgery depends on pre-surgery waiting time; (iii) how waiting times affect health gain; and (iv) whether the relationships between waiting times and health outcomes are provider- and/or patient-level relationships.

Results: There is substantial variation in waiting times (decile range: 3-19 weeks). Patients in worse health states are prioritised and experience lower waiting times. The patients that waited longest have lower post-surgery health outcomes. The health gains are therefore quite substantially decreasing in the pre-surgery waiting time (difference of 0.1 on the EQ-5D utility score between upper and lower decile). Hospital Trusts with higher average waiting times also have worse patient outcomes after surgery. This hospital-level relationship can be explained by differences in the severity of patients treated.
Evaluating the economic impact of technological advances in diagnostics: the case of high throughput sequencing for hereditary breast cancer

Ian Jacob and Katherine Payne

This paper describes an application of a discrete event simulation (DES) modelling approach to evaluate the economic impact of new diagnostic technologies using the case study of BRCA1/2 genetic testing to diagnose the risk of breast cancer. Diagnostic benefits are generally centred on test accuracy measures but additional benefits of diagnostics may include: reduced laboratory time; reduced time to results and capacity to increase the number of tests performed. Current BRCA1/2 testing technologies are limited by long (one-year) turnaround times, which together with limited resources to increase the volume of tests and associated genetic counselling, has driven the use of a ‘risk threshold’ to target women eligible for BRCA1/2 testing. New technological developments, called high throughput sequencing (HTS), offer the opportunity of decreased turnaround time and increased volume of BRCA1/2 tests, which will impact on the benefits and costs associated with the diagnostic service. Systematic reviews have identified Markov-type models as the dominant modelling methodology for the assessment of genetic testing. In this paper we propose that discrete event simulation (DES) is the appropriate model type to quantify the economic impact of HTS BRCA1/2 testing as it allows evaluation of the impact of capacity constraints and increased turnaround time on the costs and benefits of this new diagnostic technology. Importantly, DES also allows for the assessment of structural uncertainty by considering changes in patient pathways when using a new diagnostic technology. The paper describes the implications of using DES in this context and the type of data required.
How do financial incentives impact on the distribution of the quality of care? Evidence from the Advancing Quality (AQ) initiative

Mason, T, Lau, YS, and Sutton, M

Background
Evidence suggests that financial incentives can increase the quality of care patients receive. However, less is understood regarding the consequences for the distribution of quality. Providers may select easier patients or be induced to treat harder patients.

Aims
In this study we consider: (i) whether hospitals select patients based on their characteristics; (ii) how such selection may impact on equity; and (iii) whether hospital characteristics are correlated with declared rates of eligibility and rates of achievement.

Data
We investigate the specific case of the Advancing Quality (AQ) initiative incepted into hospitals in the North West of England. We linked two datasets, firstly we have data on characteristics of all patients across four health conditions (n=165,000); linked with records of whether quality was received. These data cover eleven quarters from October 2008 until June 2011 and comprise a unique dataset regarding who receives quality and who is declared ineligible.

Methods
Standard econometric analysis - regression methods.

Results
The distribution of quality varies by quality indicator. There is a substantial age gradient in both rates of achievement and ineligibility which persists over time. There is also evidence of significant differences between deprivation quintiles and gender, however these results less consistent across indicators, conditions and over time than for age. We find evidence of correlations between hospital characteristics and exclusion rates.

Implications
Financial incentive initiatives impact on equity via the distribution of quality. Hospitals can use ineligibility reporting to maximise revenue.
How should we assess whether financial incentives for providers are cost-effective?

Rachel Meacock, Søren Kristensen, Matt Sutton

**Background:** Despite growing widespread adoption of pay-for-performance (P4P) programmes in health care and much research by economists on this topic, there remains remarkably little evidence on the cost-effectiveness of such schemes.

**Aims:** To develop an analytical framework for assessing the cost-effectiveness of P4P programmes, and apply this to the Advancing Quality (AQ) scheme introduced in the North West of England in 2008.

**Methods:** We review the limited number of studies which have considered the cost-effectiveness of P4P schemes. We critique the frameworks adopted and the narrow range of costs and outcomes considered, before proposing a new more comprehensive framework. This highlights the need to consider who the residual claimant is on any cost savings, the possibility of positive and negative spillovers, and whether performance improvement is a transitory or investment activity. We then apply this framework to the AQ initiative, noting the key areas of uncertainty and priorities for future data collection and research.

**Preliminary findings:** Commissioners paid out £4.8million in incentive payments in the first 18 months. Previous research has estimated that this resulted in 1,900 fewer deaths. Whilst this would suggest that the AQ initiative was likely to have been a cost-effective intervention at commissioners’ standard willingness to pay thresholds, we have yet to take into account the set-up and running costs of the scheme and possibility of negative spillover effects into clinical areas not covered by the programme. We also need to consider what further quality improvements would be required to maintain cost-effectiveness in the future.