Exploring the relationship between primary care expenditure, outcomes and overall NHS expenditure

Authors: James McDonald; Matt Sutton

Background
The recent NHS reforms offer new opportunities to change the balance of expenditure on primary and secondary care. Little is known on the relationship between primary and secondary care expenditure. In addition, the existing literature suggests mixed evidence on the effect of increasing primary care expenditure on population health and does not reflect the current context for England.

Aim
To examine the impact of variations over time in primary care expenditure on population health and secondary care expenditure.

Data
We created a longitudinal Primary Care Trust (PCT) level data set using data published by the NHS Information Centre and the Department of Health. Our measures of primary care expenditure were the number of GPs within a PCT and the PCT’s primary care prescribing costs. Population health was measured through rates of overall mortality, child mortality and deaths amenable to health care. Total secondary care costs were available for each PCT.

Methods
The availability of repeated observations over time for each PCT (2006 to 2009) allows us to use a fixed effects estimation method, this controls for time-invariant PCT characteristics that may be correlated with our explanatory variables.

Results
An increase in primary care expenditure whether through increasing the number of GPs within a PCT or a PCT’s expenditure on primary care prescribing was associated with reductions in all measures of mortality. However, it was also associated with increases in secondary care expenditure. For example, a unit increase in the number of GPs per 100,000 of the population was associated with a reduction of 0.241 deaths amenable to health care per 100,000 of the population, but also an increase in secondary care expenditure of £18.58 per capita. An increase of £10 per capita on prescribing expenditure was associated with a reduction of 0.071 deaths amenable to health care, but also an increase in secondary care expenditure of £17.81 per capita.

Implications
Our results suggest that increases in primary care expenditure do have positive effects on population health but are also associated with higher secondary care expenditure. These results raise questions on the cost-effectiveness of increasing primary care expenditure on mortality.
Valuing Preferences for the process and outcome of Clinical Genetics Services: a Pilot Study

Authors: Ewan Gray; Martin Eden; Caroline Vass; Jordan Louviere; Katherine Payne

Background
Clinical genetics services continue to evolve, in part, as a response to technological advances in genetic-based diagnostics. Clinical genetics services are complex interventions; outcomes are multifaceted and various process attributes also shape the service users’ experience of care. A necessary piece of information for service providers seeking to improve, or modify, clinical genetics services is to understand whether process or outcome attributes are the key driver of preferences. The nature of the outcome attribute for clinical genetics services (informed decision making), which cannot be readily quantified introduced a considerable challenge for this stated preference study.

Aim
To identify if a linked conjoint analysis (CA) and discrete choice experiment (DCE) can be used to quantify the relative importance of process and outcome attributes for a ‘generic’ clinical genetics service.

Methods
A two-step stated preference survey, using CA followed by a DCE, was administered (online) to a pilot sample of service users (completed face to face) with experience of clinical genetic services and members of the public (via remote electronic completion). The CA component was designed to elicit which of 13 attributes influenced preferences on ‘ability to make an informed decision’, using a rating scale ranging from 1 to 9. The DCE that followed comprised six attributes (location of the service; pre-consultation contact; turnaround time for a test result; follow-up contact; cost of services; and a scale rating the ability to make an informed decision). The discrete choice task asked respondents to choose a service and then which, if any, they felt they would actually use in real life. An orthogonal main effects design was used to generate choice sets for the CA and DCE. A three-step approach was taken to analyse data (i) random effects probit regression to identify preferences for the preferred service (ii) standard logit model to identify preferences for the services they would actually use and (iii) estimation of the value of the 13 service characteristics in the CA relative to other attributes in the DCE.

Preliminary Results
The stated preferences of respondents (n=37) revealed most would prefer a service better at helping them make an informed decision, to wait less time, pay less and receive pre-consultation contact. Therefore, an outcome rather than process attribute was the key driver of preferences. The implications of the design and findings of this pilot study will be discussed in the context of designing stated preference surveys of complex interventions.
Identifying differences in performance when choice of provider is endogenous: application of the Hausman-Taylor estimator to unbalanced panel data

Authors: Alex Turner; Silviya Nikolova; Matt Sutton

Background
In England patients can receive treatment for NHS elective procedures either at independent sector treatment centres (ISTCs), which are privately operated, or with the NHS. In line with the intention of ISTC contracts, patients’ assignment to providers is not exogenous. ISTCs differ from NHS providers in terms of patient case-mix, workforce profile, and the regulatory framework they operate in. However, none of the previous studies in this area have allowed for this endogeneity in patient assignment.

Study Question
To compare patient reported outcomes after elective surgery for hip replacement in independent sector treatment sector centres (ISTCs) and NHS providers allowing for endogeneity.

Methods and Data
While we partially control for the difference between providers by introducing a time-invariant indicator for provider type, a part of this difference likely remains unexplained. Accounting for the unbalanced panel nature of the data, we use a range of methods (Random Effects (RE), Mundlak and Hausman-Taylor) to control for the correlation between the unobserved provider effect and the explanatory variables. We apply these to a sample of 43,258 hip replacement patients admitted for treatment in the financial years 2009/10 and 2010/11, and recorded in the Patient Reported Outcome Measures (PROMs) data set.

Results
Patients treated at ISTCs were healthier and had less severe symptoms. After risk-adjusting and accounting for provider endogeneity we find larger improvements in outcomes for ISTC patients. However, depending on the assumptions made regarding the exogeneity of different types of covariates, the magnitude and significance of results change. The ISTC effect can increase up to a factor of 2.2 compared to the RE case which assumes exogeneity of all covariates with respect to the unobserved provider effect.

Conclusions
There is a definite lack of evaluation of the effects of ISTCs on patient outcomes. As the NHS moves towards greater involvement of the independent sector in the provision of health services, it is important to develop an appropriate methodological framework to ensure that their performance is correctly evaluated.
How do financial incentives to improve the quality of care lead to better patient outcomes?

Authors: Yiu-Shing Lau; Matt Sutton

Background
Pay-for-Performance (P4P) schemes typically reward improvements in specific process measures of the quality of care and result in small improvements in these measures. We aim to examine whether the improvements in health outcomes associated with introduction of P4P can be linked to improvements in the quality of care received at patient and/or organisational level for patients with Pneumonia.

Data
Two datasets linked at individual level containing a rich set of provider, area and patient characteristics derived from hospital care records, five process measures of quality, and patient mortality. Our final sample consists of over 98,000 individuals spanning 18 quarters from 2008-2012.

Methods
Cross section and panel data models.

Results
Some of the process quality measures are significantly associated with better health outcomes at a trust level but the magnitudes of the estimated coefficients are too large to represent clinically plausible direct consequences of these process measures.

Conclusion
Our findings suggest that these financial incentives to improve quality weakly lead to improved patient outcomes through their direct effects on the process measures that were incentivised. This P4P scheme appears to have also led to improved patient outcomes by inducing positive spillovers in terms of wider improvements in care quality across unmeasured dimensions and improvements in care for all patients.
Smile, but only if your parents can afford it - identifying socio-economic inequalities in access to orthodontic dental care

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Aims
Orthodontics is a dental specialty that is concerned with the straightening of misaligned teeth and jaws. Approximately 30% of 12-14 year olds in the United Kingdom have NHS orthodontic care and although this figure is rising year on year, there is little evidence of an increase in clinical need for orthodontic care. Utilisation and the need for health care may not coincide. Use is determined by the need for care, but also the availability and accessibility of services, affordability of treatment and acceptability of the patient to seek and complete treatment. This paper aims to test whether the use of orthodontic services is aligned to need and whether socio-economic inequalities exist in service use.

Data and Methods
Using NHS orthodontic activity records for Greater Manchester in the North-West of England (2008-2012), three different models were developed. The first models test whether there are differences in the use of orthodontic care by age, socio-economic status (SES, as measured by quintiles of the Index of Multiple Deprivation derived from the patient’s postcode), and provider availability (measured by distance to closest provider); each conditional on need (as measured by clinical data).

Socio-economic inequalities may be driven through choices of the patient or practitioner. The second set of models use information on patient refusal for treatment in the data to examine patient acceptability of care, determining whether there is any statistically significant difference in the uptake of treatment by SES.

The third set of models examine the decisions made by practitioners. Referrals from dental to orthodontic practitioners result in either: treatment, a decision not to treat, or delayed assessment. The latter is common when the patient is judged to have teeth that require alignment, but the patient has poor oral hygiene that requires improving or there is a need to wait for further tooth or jaw movement. For each type of outcome we test for socio-economic inequalities conditional on need.

Results
We find the use of orthodontic care, patient acceptance of treatment, and delayed assessment are each significantly associated with SES and this persists when the clinical need for care is controlled for.

Conclusions
Our results suggest policies aimed at reducing socio-economic inequalities in orthodontic care should tackle provider availability, encourage patient acceptance amongst patients of lower SES and develop ways to support/target oral health improvements for lower SES.