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# The effect of hospital ownership on quality of care: Evidence from England

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ABSTRACT

We investigate whether quality of care differs between public and private hospitals in England using data on 3.8 million publicly-funded patients receiving 133 planned (non-emergency) treatments in 393 public and 190 private hospital sites. Private hospitals treat patients with fewer comorbidities and past hospitalisations. Controlling for observed patient characteristics and treatment type, private hospitals have fewer emergency readmissions. But patients' choice of hospital may influenced by their unobserved morbidity. After instrumenting the choice of hospital type by the difference in distances from the patient to the nearest public and the nearest private hospital, the effect of private ownership changes sign and is statistically insignificant. Similar results are obtained with coarsened exact matching. We also find no quality differences between hospitals specialising in planned treatments and other hospitals, nor between for-profit and not-for-profit private hospitals. Our results show the importance of controlling for unobserved patient heterogeneity when comparing quality of public and private hospitals.



## 1. Introduction

Countries differ in the mix of public and private providers treating publicly-funded patients (Barros and Siciliani, 2011). For example, in the USA 60% of hospitals are private not-for-profit, 20% are private for-profit, and 20% are public. In France 60% of hospitals are private. In Germany 30% are public, 35% are private not-for-profit and 35% are for-profit hospitals. In the Netherlands, all hospitals are private. In the United Kingdom and Norway most hospitals are public. Overall an increasing proportion of publicly-funded patients are treated in private hospitals (Siciliani et al., 2017). In England the proportion of publicly-funded patients treated by private providers increased from almost zero at the start of the 2000s to 4.5% of all non-emergency treatments in 2013, and public health service expenditure on private sector providers has increased from £4bn in 2009 to £9bn in 2016.[1]

Private hospitals have strong incentives to maximise profits since they keep any financial surplus. Public hospitals are generally restricted in the use of financial surpluses, which have to be either re-invested or returned to the funder. A key

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[1] 'NHS: How much does it spend on the private sector?' http://www.bbc.co.uk/news/health-44043959 [published: 08/05/18; last accessed: 18/05/18].

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policy issue is whether particular types of hospital ownership should be encouraged (Pollock, 2004; Leys and Toft, 2015). This depends in part on how ownership and the profit motive affect quality. The economic theory highlights two key mechanisms, which work in opposite directions. Driven by their financial motive, private hospitals may have a stronger incentive to increase quality in order to attract more patients, which will increases profits if the revenue from additional patients exceeds their costs of treatment. But if demand is not responsive to quality, perhaps because quality is difficult for patients to observe, private hospitals may have a stronger incentive to skimp on quality (Brekke et al., 2014; Glaeser and Shleifer, 2001; Sloan, 2000). Public hospitals may also attract more altruistic workers with a stronger preference for quality (Lakdawalla and Philipson, 2006).[2]

We investigate empirically whether there are differences in quality between public and private hospitals treating publicly-funded patients in England who seek planned (non-emergency) treatment. We use data on 3.8 million publicly-funded patients receiving one of 133 types of planned treatment across 393 NHS and 190 private hospital sites between April 2013 and February 2014. (We do not examine the effects of ownership on patients admitted as emergency as publicly-funded emergency patients are treated only in public hospitals.) We measure hospital quality for patients having planned treatments as the probability that they have a subsequent *emergency readmission* (in the same hospital or any other hospital in England) within 28 days.

A key issue in the comparison of quality between public and private providers of planned care is that there may be unobserved differences in the morbidity of their patients. Patients choose their provider and their choices may be affected by their morbidity. Private providers may also have stronger incentives to avoid more severe and expensive patients and consequently may appear to provide better quality if there is no adequate adjustment for case-mix. We include an extensive range of control variables in our analysis to capture morbidity (including the Elixhauser comorbidities, and previous emergency hospitalisations in the year prior to the planned hospital admission for each patient in our sample). We deal with unobserved heterogeneity in case-mix by using the difference between the distances from the patient's residence to the nearest public and nearest private hospital as a strong instrument for choice of provider type.

We find that private providers have lower unadjusted emergency readmission rates i.e. higher quality. But they also treat patients with fewer co-morbidities and past emergency hospitalisations. Even after controlling for observed case-mix, ordinary least squares (OLS) estimates suggest that private hospitals have an emergency readmission rate which is one third smaller than the 2.3% rate of NHS hospitals. But instrumental variable (IV) estimates show that the choice of provider type is endogenous and, when this is allowed for, there is no difference in quality between public and private hospitals. We obtain similar results when we use OLS and instrumental variables models on a sample selected by coarsened exact matching. We check the plausibility of our IV results using a test, suggested by Altonji et al. (2005) and extended by Oster (2017), which is based on the changes in the OLS coefficient as observed confounders are included. The test suggests that the OLS estimate is indeed biased in favour of private hospitals, thereby supporting the results from our IV models. Our analyses suggest that controlling for a rich set of covariates is not sufficient by itself to adequately account for differences in case-mix between public and private providers.

Private providers can be for-profit or not-for-profit and the resulting differences in incentives might affect quality. We therefore also compare quality in public providers, private for-profit and private not-for-profit providers. Using differential distances between the three types of provider to instrument for the choice of provider type we again find that patient choice of provider type is endogenous. After allowing for endogenous choice of provider there is no difference in quality across the three types of provider.

Some providers, known as treatment centres, specialise in a limited set of planned treatment types (e.g. cataract surgery, hip and knee replacements) and do not treat any emergency patients. Since such specialisation could affect quality and most treatment centres are private, we also compare quality across four types of provider: public non-treatment centres, public treatment centres, private non-treatment centres and private treatment centres. After instrumenting for choice of provider type with differential distances, we find no difference between public non-treatment centres, private non-treatment centres, and private treatment centres but public treatment centres have higher emergency readmission rates compared to public non-treatment centres. However, there are only six public treatment centres in our sample, and their quality is not statistically different from that of private treatment centres. We conclude that not only is there no overall quality difference between public and private providers there is also no difference in quality between public and private providers of the same degree of specialisation

We also examine if the effect of ownership varies by type of patient. Stratifying patients by observable morbidity makes no difference to our results: there is no difference in quality between private and public providers for high and low morbidity patients. When we split the sample by age or by deprivation, quality is higher in private providers for less deprived and younger patients. But for more deprived or older patients, quality is lower in private providers.

Finally, we estimate separate models for different type of treatment and find that private providers have lower quality for non-diagnostic treatments and higher quality for diagnostic treatments. In four of the five non-diagnostic procedures (non-trauma knee, cataract, hernia, non-trauma hip) with the highest number of private patients, there is no difference in quality between private and public providers.

[2] We provide a more formal analysis of these different mechanisms in Section 1.1.