



Location, quality and choice of hospital: Evidence from England 2002–2013



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ARTICLE INFO

Article history:

Received 18 December 2015

Received in revised form 30 June 2016

Accepted 3 July 2016

Available online 07 July 2016

JEL classification:

I11

I18

L15

R22

Keywords:

Hospital

Choice

Quality

Waiting times

Distance

Rurality

ABSTRACT

We investigate (a) how patient choice of hospital for elective hip replacement is influenced by distance, quality and waiting times, (b) differences in choices between patients in urban and rural locations, (c) the relationship between hospitals' elasticities of demand to quality and the number of local rivals, and how these changed after relaxation of constraints on hospital choice in England in 2006. Using a data set on over 500,000 elective hip replacement patients over the period 2002 to 2013 we find that patients became more likely to travel to a provider with higher quality or lower waiting times, the proportion of patients bypassing their nearest provider increased from 25% to almost 50%, and hospital elasticity of demand with respect to own quality increased. By 2013 average hospital demand elasticity with respect to readmission rates and waiting times were -0.2 and -0.04 . Providers facing more rivals had demand that was more elastic with respect to quality and waiting times. Patients from rural areas have smaller disutility from distance.

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1. Introduction

Healthcare reforms extending the patient's right to choose a provider for hospital care have been introduced in several OECD countries during the last two decades (Vrangbaek et al., 2012). Reducing constraints on choice for planned (non-emergency) healthcare is intended, inter alia, to incentivize hospitals to compete on quality (Besley and Ghatak, 2003), especially in those systems where prices for healthcare are regulated (Gaynor, 2006). It is hoped that with fewer constraints on patient choice of provider, hospitals with higher quality can attract more demand and raise revenues, whereas those with poor quality may lose revenues. However, the success of this incentive mechanism depends crucially on whether patients and demand respond to hospital quality.

In the English National Health Service (NHS) before 2006 the choice of hospitals for elective hospital treatment was generally constrained to the set of local NHS hospitals which had contracts with the patient's local health authority. In 2006 constraints on choice of provider were relaxed with patients having to be offered a choice of at least 4 providers and from 2008 they could choose from any qualified providers wherever located.

Using data from 2002/3 to 2012/13 on choice of hospital for elective hip replacement we address three research questions related to understanding demand-side mechanisms in healthcare: (a) how do distance, quality and waiting times influence choice of hospital, (b) do these factors have different effects on the choices of patients in rural and urban areas, and (c) how does a hospital's elasticity of demand with respect to its quality vary with the number of rivals. We use data over a long period to investigate how the answers to these questions changed over time, especially after the relaxation of constraints on hospital choice in 2006.

These questions have obvious policy relevance. If hospital demand is not responsive to quality then relaxation of constraints on choice is unlikely to stimulate hospital competition via quality. Wider choice sets may contain providers who yield higher utility to patients. But this benefit may be greater in urban areas where patients will have more local providers, whereas rural patients with longer distances to travel to providers may gain less and may change their demands less in response to quality. If demand is more responsive to quality for hospital with more rivals, quality may be higher in more competitive areas and lower in less competitive ones.

We estimate models of hospital choice for elective hip replacement and focus on two dimensions of quality: procedure specific clinical quality and waiting times. The most common adverse outcome after hip replacement surgery is an emergency readmission within 28 days.

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In addition to emergency readmission rates we also measure clinical quality by rates of revisions within a year of discharge and mortality rates within 28 days of discharge.

We find that patients value quality when choosing their preferred provider of care, especially after relaxation of constraints on choice. Specifically, we find that hospitals with higher readmission rates were less likely to be chosen in the years after 2006, while this was not the case in earlier years. Revision rates did not have a consistent effect on choice. Hospitals with long waiting times attracted fewer patients, but only after 2008, while hospitals with higher mortality rates were less likely to be chosen throughout the entire period. As with previous studies, we find distance to be a strong predictor of choice, with patients preferring hospitals close from home.

Marginal utilities for quality are similar for urban and rural patients from 2006 onwards. Marginal disutility of distance did not change much over the period but was smaller for rural patients.

After the introduction of choice policies, the average demand elasticity to readmission rates varied between -0.07 and -0.25 . The average demand elasticity to waiting times was about -0.04 after 2007. Patients are willing to travel 0.5 additional kilometres to avoid an increase of one standard deviation in emergency readmissions. Hospital demand is more elastic with respect to own quality the larger the number of rivals and the effect of having more rivals became greater in later years.

Section 2 provides background by way of short review of the relevant literature and a description of the institutional framework. Section 3 describes the data. Section 4 sets out the methods and Section 5 has the results. Section 6 concludes.

2. Background

2.1. Related literature

Our study contributes to the small but growing literature on hospital choice and how it relates to quality (see Brekke et al. (2014) for a review). In the US, Luft et al. (1990) find that hospitals with poorer than expected mortality or complication rates attracted significantly fewer admissions. Similar results are obtained by Hodgkin (1996) and Tay (2003) using health outcomes for patients with cardiac conditions, Howard (2005) using graft failure rate one year following kidney transplantation, and Pope (2009) using hospital quality rankings. Several studies have also investigated the effect of releasing hospital quality information on patient choice and health outcomes. Wang et al. (2011) show that the publication of report cards decreased the probability of receiving CABG surgery by poorly performing surgeons. Using Italian data from Lombardy, Moscone et al. (2012) find that the presence of social interactions across patients who are in lack of official information to rate hospitals may mislead patients in choosing lower providers of care.

Three recent studies are from England. Gaynor et al. (2012) investigate the introduction of choice policies in England for patients in need of a coronary artery bypass graft (CABG) using data for 15 months before (January 2004 to March 2005) and 15 months after (January 2007 to March 2008). They find that patients are responsive to quality, and that the introduction of hospital choice led to a reduction in mortality and to increased patients' welfare. The market for hip replacement is very different from that for CABG. The number of hip replacements has increased over time whereas CABG demand has fallen.¹ The market for hip replacement is less concentrated: CABG surgery is highly specialised and provided by only 30 hospitals. Hip replacements are performed in most hospitals in England and the market has grown substantially over time from 187 providers in 2002/3 to 297 in 2012/13 as a result of the entry of private providers. The mortality risks of the two procedures also differ: 30-day mortality after non-emergency CABG is 1.17%, compared with non-emergency hip replacement mortality of 0.35%.

¹ Hip replacements increased by 30% over our period compared with a reduction of 20% in CABG.

Beckert et al. (2012) use English data for elective hip replacement for 2009/10 and measure hospital quality by overall hospital mortality, MRSA infection rates, hip replacement waiting times and numbers of doctors and nurses. In keeping with the broader literature on hospital choice, they find that patients are responsive to quality. By contrast we use condition specific clinical quality measures (post-operative emergency readmissions, revision rates, and mortality rates). Moreover, we investigate how demand responsiveness has changed over a ten-year period before and after relaxation of constraints on choice.

Gutacker et al. (2015) analyse choice of provider for elective hip replacement surgery in the English NHS between 2009 and 2013 making use of newly available data on patient reported outcomes (PROMs) and find that using PROMs in addition to conventional quality measures such as revision and readmission rates improves predictions of hospital choice. Since PROMs data are only available from April 2009, we use the conventional measures to examine choices before and after relaxation of constraints on choice.

The literature on rural and urban hospitals is mainly US focused and has mostly investigated differences in quality of urban/rural hospitals (Adams et al., 1991; Goody, 1993; Ferrier and Valdmanis, 1996; Baldwin et al., 2004). Differences in choice of healthcare provider and targeting of rural patients have been investigated by Tai et al. (2004) and Roh et al. (2008). These studies focus on the effect of patients' characteristics (e.g. age, comorbidities, past medical utilisation) and organization characteristics (e.g. volume, type of hospitals, number of beds, ownership status) on demand for rural hospitals. Conversely, we focus on differences in choices (and preferences) between urban and rural patients.

2.2. Institutional background

The England NHS is funded by taxation and free to patients at point of use. Local purchasing bodies receive budgets from the Department of Health to contract healthcare provision for their resident populations from primary care and hospital providers.² As part of the re-introduction of the internal market (Dixon et al., 2011), prospective payment for hospitals was rolled out incrementally from April 2003 onwards, so that increasingly money followed the patient (Farrar et al., 2009). Previously, health authorities negotiated block contracts with their local providers under which the provider agreed to treat fixed number of patients in return for a fixed sum, with some adjustment to the payment if the number treated differed from the contracted number. Choice was not entirely constrained. In principle GPs could refer patients to other providers who would then be remunerated per patient but this was not encouraged by health authorities. In 2002/3 the average practice referred patients to over 7 different providers over all types of elective care (Dusheiko et al., 2008). Private independent sector providers (ISPs) were allowed to enter the NHS market for planned care from 2003 onwards; until then only public NHS hospitals could provide inpatient care.³

In 2006, patients were given the right to choose from at least 4 providers of non-emergency care; and from 2008 they could choose any qualified provider wherever located. An electronic booking system (Choose and Book) was introduced in 2005/6 to allow direct booking of referrals from general practices. By 2012/13, 50% of all referrals were made via the system (Dusheiko and Gravelle, 2015). Since 2007 the NHS Choices website has provided public information on the location, services and quality of providers.

3. Data

We use individual level data from Hospital Episode Statistics (HES) on all elective admissions for NHS-funded elective primary

² The English local purchasing authorities are Primary Care Trusts (PCTs) until April 2013, after which they have been replaced by Clinical Commissioning Groups (CCGs).

³ By 2010/11, private providers treated 4% of NHS elective patients, concentrating on a small number of high volume procedures such as hip replacements (Hawkes, 2012).

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