

Policy Brief - April 2020

The Effect of the Clinical Environment on Surgeons' Treatment Choices

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Key Findings

- Orthopaedic surgeons vary substantially across (and within) NHS hospitals in their propensity to perform cemented hip replacements
- The clinical environment where surgeons work matters for the treatment decisions they make, and possibly more than their own beliefs and preferences
- We find no evidence that surgeons select their hospital of practice based on their own treatment style

What Problem Was This Research Addressing?

Recent studies show that provider supply-side factors are more important than patient demand-side characteristics in explaining the observed geographic variations in health care. A supply-side explanation for such variations can arise from two distinct sources. One possibility is that the clinical environment wherein physicians practice has causal effects on their treatment decisions, and therefore moving a physician across providers would change his or her practice style. The other possibility is that physicians with more aggressive treatment styles, as a result of alike beliefs or preferences, may flock in the same place, giving rise to hospitals with relatively more aggressive treatment patterns. In this study, we test the relative importance of these hypotheses and provide quasi-experimental evidence of the effect of the clinical environment on physicians' practice style. In particular, we study how quasi-random changes in the clinical environment experienced by NHS orthopaedic surgeons moving across hospitals in the UK affects their own treatment choices between two substitutable methods of fixation – cemented and cementless - in hip replacement surgery.

What This Research Adds

This study contributes to the recent debate on supply-side sources of geographic variation in health care. We build on the work of Molitor (2018) and extend this limited literature in two different ways. First, we investigate this question in a clinical setting that is distinct and has advantages relative to the heart attack context examined by Molitor (2018). Unlike the treatment options for heart attacks, cemented and cementless hip implants are perfect substitutes with similar therapeutic success, they are available in every hospital across the country, and surgeons are trained in both techniques. This purges our analysis from the potential effect of local resource constraints or the clinical superiority of one method over the other. Second, we exploit this question in the English NHS, which is structurally different from the Medicare programme in the US. A distinctive feature is the fact that the NHS covers most of the UK population whereas the US Medicare is restricted to the over-65 population, and thus findings can hardly be generalised to the under-65 population across the country.

Project Partner:

Methods

To measure the extent to which the clinical environment drives the treatment style of surgeons, we make use of patient-level administrative data from all publicly funded care in England, which includes detailed information on patient characteristics, clinical data, and identifiers for the hospital and surgeon responsible for the care. We construct surgeons' employment histories to identify those who move their practice across hospitals. The exogenous shock in the clinical environment that is provided by this quasi-random re-allocation of surgeons to hospitals is then used to estimate the effect of the hospital environment on treatment choices. Since our interest lies in the treatment choice between cemented and cementless hip implants, we characterise the hospital environment by the risk-adjusted rate of cemented hip replacements for all surgeons in the hospital, omitting the moving doctor's own cases.

Research Findings

We first show that there is large variation in cemented rates between (and within) NHS hospitals in the English NHS (see Figure 1). We also find that the hospitals wherein surgeons practice matter for their treatment style: surgeons moving from low- to high-cemented environments proportionally increase the use of cemented implants. A 10 percentage points change in the hospital environment changes a surgeon's likelihood to perform cemented hip replacements by 6.4 percentage points. Symmetrically, moving to low-cemented environments reduces the propensity for cemented implants. In Figure 2, we show two other results. First, surgeons' practice style prior to the move does not vary systematically with the change in environment (premove coefficients are close to zero and insignificant), suggesting that the timing and choice of destination is very unlikely correlated with the practice style of surgeons before the move. Second, surgeons adapt fairly immediately following the move, without any further adjustments over time (postmove coefficients remain flat). Furthermore, we examine whether such quick change in the practice style across the move impacts patients' health outcomes after surgery. We find no effect of the move on 28-day emergency readmissions, one-year revision rates, or patient-reported outcome measures (PROMs).

*Notes: Hospitals (black and bold data points) are ranked in ascending order of hospitals' cemented rate. The light and grey data points are for individual surgeons practicing in that hospital.

Policy Relevance of Research

- There is substantial between and within hospital variation in the proportion of cemented cases across the English NHS
- We show that in trying to tackle such variation, policy makers must target both the institutions and the physicians working in them
- Moving surgeons adapt immediately rather than gradually to the new hospital, implying that changes in the clinical environment could have large effects in the short run
- Simultaneously, the lack of postmove convergence suggests that policies aimed at changing physician-specific factors such as beliefs and preferences may only have an effect in the long run

Figure 1. Distribution of Hospitals and Surgeons Cemented Rate*

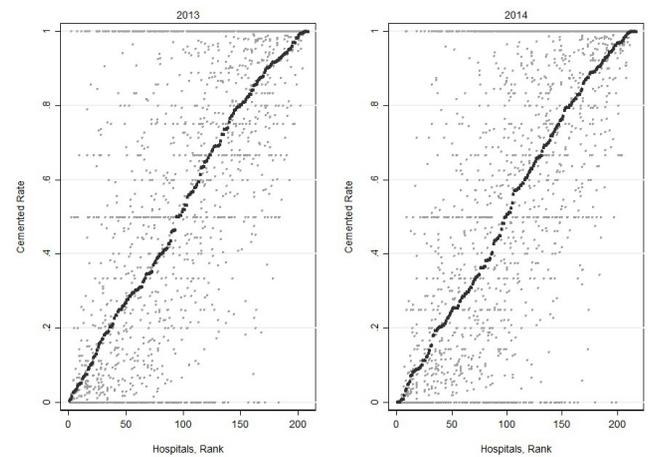
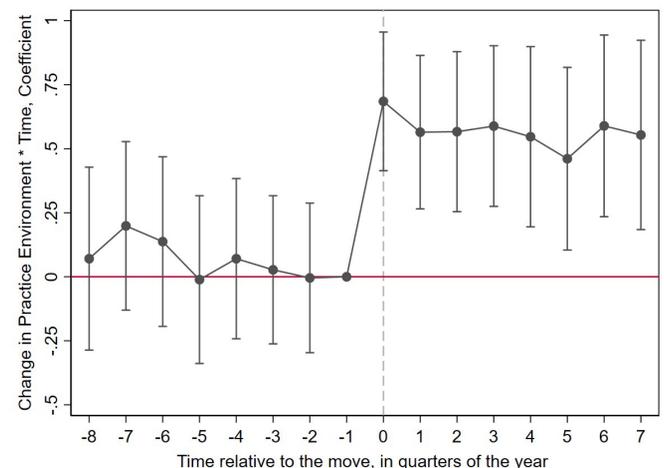


Figure 2. Surgeon's Response to Change in Environment



References

1. Molitor, D. (2018) 'The evolution of physician practice styles: Evidence from cardiologist migration', *American Economic Journal: Economic Policy*, 10(1), pp. 326–356. doi: 10.1257/pol.20160319.

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