



Competition and the impact of online hospital report cards



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ABSTRACT

Information on the quality of healthcare gives providers an incentive to improve care, and this incentive should be stronger in more competitive markets. We examine this hypothesis by studying Pennsylvania hospitals during the years 1995–2004 to see whether those hospitals located in more competitive markets increased the quality of the care provided to Medicare patients after report cards rating the quality of their Coronary Artery Bypass Graft programs went online in 1998. We find that after the report cards went online, hospitals in more competitive markets used more resources per patient, and achieved lower mortality among more severely ill patients.

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“Public Information + Competition = High Quality, Cost Effective Health Care”

– Pennsylvania Health Care Cost Containment Council, 1999

1. Introduction

The internet has given healthcare consumers unprecedented access to information about the quality of health care providers. Over the past 15 years, the percentage of American adults with internet access has increased dramatically, rising from 10% in 1995, to 50% in 2000, to 75% in 2005; among those users, 61% have looked for health or medical information on the Internet (Fox and Jones, 2009). Given the willingness of internet users to search online for information about healthcare, the increased access that the net provides to credible ratings of the clinical quality of different healthcare providers may significantly affect the nature and degree

of competition among those providers, and thus the quality of the health care they deliver.

Early in the debate on the effects of competition in health care markets commentators pointed out that competition would more effectively improve outcomes if information on the clinical quality of healthcare were available to consumers (Brook and Kosecoff, 1988; Ginsburg and Hammons, 1988). Information about clinical quality seems very likely to affect the quality provided by hospitals because “even a small amount of information imperfection” can lead to market failure (Stiglitz, 2000), and asymmetric information in healthcare markets is profound (Arrow, 1963). Publicly available data on the quality of care should therefore give competitors an incentive to improve care, and this incentive should be stronger in more competitive markets, because consumers have more choices. Thus, we expect higher quality in those markets where firms face more competition *and* where consumers are well-informed about quality.

As discussed further below, economists have now done a number of studies examining whether quality reports rating hospitals affect patients’ choices or health outcomes, as well as on whether competition improves the quality of healthcare in hospital markets. However, none have examined whether providing quality information to consumers makes competition more effective in improving the clinical quality of hospital services. In this paper, we study

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the relationship between online performance grades, competition, and the quality of health services by examining how the online publication of hospital report cards affected health outcomes for Medicare patients living in Pennsylvania hospital markets with different degrees of competition.

Pennsylvania, through the Pennsylvania Health Care Cost Containment Council (PHC4), has been a pioneer in developing performance grades on Coronary Artery Bypass Graft Surgery for health care providers and posting them online (called CABG report cards hereafter). Of course, Pennsylvanians have information about the likely quality of different hospitals other than the CABG report cards. For example, they may form an opinion based on a hospital's size, reputation, or its teaching status, from their individual experience with it, or from the experiences of others. However, when the PHC4 began publishing CABG report cards for hospitals online in May 1998, it made easily available much more precise data on the aspect of quality most difficult for individual patients to identify: risk-adjusted health outcomes data for a specific serious procedure. We use these report cards to examine whether those hospitals located in more competitive markets increased the quality of their care after report cards rating their Coronary Artery Bypass Graft (CABG) surgery programs went online in 1998.

The PHC4 has been publishing *Pennsylvania's Guide to Coronary Artery Bypass Graft Surgery* since the early 1990s. The initial two CABG reports (the first was published in 1994, and the second in the fourth quarter of 1995) were printed documents; while they were distributed to hospitals, surgeons, public libraries, business groups, legislature, the media, and any individual who requested them (Schneider and Epstein, 1998), they were nevertheless relatively difficult to access. With the publication of its May 1998 CABG report card on the agency's website (www.phc4.org), the PHC4 has made the information easily accessible to patients, physicians, hospitals, and health insurance companies.

The year 1998 was a landmark year for the PHC4 for several reasons. In addition to posting the CABG report online, the agency upgraded its computer system, moving from a mainframe to a client-server network system, which improved the timeliness of the data used in its reports. In 2000 and 2001 the agency introduced interactive reports on a redesigned website, making the report card information easier to find and use. The result of these changes has been to make the data more easily available and more relevant; the number of hits on the PHC4 website grew rapidly from an average of 1800 per month in 1998 to an average of over 30,000 per month in 2001 (PHC4, *Annual Report, various issues*). While it is impossible to determine who is accessing the site, the PHC4 states that "Many of PHC4's Web inquiries are from consumers who have an immediate need for the reports. The Web site presents the public with a quick, simple means of obtaining a copy of our public reports – information that can be downloaded with the click of a mouse" (PHC4, *Annual Report for 1999*). In 2002, 20,000 copies of the CABG reports were downloaded (PHC4, *Annual Report for 2002*).

We study the impact of newly available quality information on the outcomes for CABG patients covered by Medicare, because reimbursement for these patients is fixed. Economic theory predicts that the relationship between quality and competition is ambiguous when firms may alter both price and quality, but that firms competing in markets where prices are fixed, as is the case for Medicare patients, will use quality in place of price to attract customers.¹ We therefore expect higher quality in more

competitive markets,² but investigate whether that relationship is magnified by improved availability of credible information about quality in markets with higher levels of competition.

Concentration in hospital markets has increased substantially since the mid 1990s (Gaynor, 2006), making it increasingly important to understand the potential impact of competition on health care quality, and the role that quality information plays in that relationship. However, in studies of the effects of market concentration on health outcomes, potential endogeneity poses a major challenge because unobserved heterogeneity may determine both health outcomes and the extent of market competition. We address this problem by estimating conditional logits of hospital choice to generate predicted market shares, and using predicted rather than actual market shares to measure market competitiveness (Kessler and McClellan, 2000).

We find a very robust shift in CABG outcomes at the time of online publication in more competitive markets, suggesting that improved quality information caused hospitals in more competitive markets to use more resources to provide better health outcomes for Medicare patients. Specifically, in more competitive hospital markets the online publication of CABG report cards resulted in a roughly 5–10% reduction in mortality at an additional cost of approximately 2000 dollars per case. Our results suggest that better outcomes may be achieved in competitive hospital markets where patients have easy access to quality information, and thus that publically provided quality information made available on the web may play an important role in improving health care quality in these markets. To the best of our knowledge, this is the first study of the role of quality information in determining the impact of market competition on quality in hospital markets.

In the next section we review theoretical and empirical literature on relationships between quality information, quality, and market concentration. We describe the Pennsylvania CABG report card program in Section 3, and our data and sample in Section 4. In Section 5 we describe our basic specifications, the variables, and the calculation of our measure of hospital market concentration. We present our results in Section 6, examine the possibility of cream-skimming in Section 7, and end with a discussion of our results in Section 8.

2. Literature review

Analyses of the relationship between competition and quality assume that consumers are aware of the quality of firms' goods or services, so that competing in terms of quality makes sense for firms that cannot compete in price.³ But if consumers have difficulty determining the quality of the good or service, then improving that information may give firms a greater incentive to increase quality.⁴

number of firms increased. For examples, see White (1972) and Douglas and Miller (1974).

² A number of empirical studies of hospital markets do find that quality is higher in more competitive markets (Kessler and McClellan, 2000; Kessler and Geppert, 2005; Shen, 2003; Tay, 2003; Cooper et al., 2011; Gaynor et al., 2013), although some find mixed relationships, a negative relationship, or no relationship at all (Mutter et al., 2008; Gowrisankaran and Town, 2003; Mukamel et al., 2002; Shortell and Hughes, 1988). See Gaynor (2006) for a critical review of this literature.

³ Cooper et al. (2011) and Gaynor et al. (2013), both of which examine the effect of increased hospital competition in the U.K. on hospital quality, do describe steps the British government has taken to disseminate information about the quality of hospitals' health outcomes. However, these studies focus on the impact on health outcomes of the change in competitive conditions rather than the change in availability of information.

⁴ Mutter et al. (2008) hypothesize that their mixed results on the relationship between competition and hospital quality may be explained in part by differences in patients' ability to assess the quality of hospital services.

¹ The analysis of quality competition among price-regulated firms was developed by economists studying competition between firms such as airlines: a series of papers established that firms unable to compete on price would instead compete on the basis of quality, and that the incentive to compete would be greater as the

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