



Payment systems in the healthcare industry: An experimental study of physician incentives[☆]



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ARTICLE INFO

Article history:

Received 22 July 2013

Received in revised form 8 May 2014

Accepted 31 May 2014

Available online 6 June 2014

JEL classification:

C9

I1

Keywords:

Physician payment system

Laboratory experiment

Fee-for-service

Capitation

Salary

Pay-for-performance

ABSTRACT

Policy makers and the healthcare industry have proposed changes to physician payment structures as a way to improve the quality of health care and reduce costs. Several of these proposals require healthcare providers to employ a value-based purchasing program (also known as pay-for-performance [P4P]). However, the way in which existing payment structures impact physician behavior is unclear and therefore, predicting how well P4P will perform is difficult. To understand the impact physician payment structures have on physician behavior, I approximate the physician–patient relationship in a real-effort laboratory experiment. I study several prominent physician payment structures including fee-for-service, capitation, salary, and P4P. I find that physicians are intrinsically motivated to provide high quality care and relying exclusively on extrinsic incentives to motivate physicians is detrimental to the quality of care and costly for the healthcare industry.

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1. Introduction

Traditionally, physicians are paid for each service that they perform (i.e., fee-for-service). However, in an attempt to curb unnecessary care in the early 1990s, some primary care practices moved away from reimbursing physicians through simple fee-for-service programs to compensation through capitated rates, or a lump sum per patient for a specific illness. Despite this effort, the cost of health care continued to increase by alarming rates through the 2000s. In the early 2000s, value-based purchasing programs were proposed as a way to encourage better care at lower costs. In 2010 applications of these proposals came to fruition under the Patient Protection and Affordable Care Act.

[☆] I would especially like to thank Sheryl Ball and Adrienne Lucas for their useful comments and suggestions. I am also grateful to Landis Atkinson, Kristen Capogrossi, Ben Congleton, Pamela Cubberly, Ryan Donnelly, Saul Hoffman, Russell Osborne, Roger Congleton and seminar participants at the American Economic Association annual conference, Southern Economic Association annual meeting, Society for Medical Decision Making annual meeting, and International Economic Science Association conference for helpful comments. Support from the Institute for Advanced Study and the Making A Difference Scholarship at Virginia Tech is gratefully acknowledged. All errors are my own.

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Value-based purchasing programs (also known as pay-for-performance [P4P]) pay agents for performance according to a set of defined quality measures (e.g., a practice may be compensated based on keeping a percentage of patients with diabetes under a predetermined level of LDL-C or keeping their diabetes “under control”). While P4P payment structures are effective in theory, previous studies of P4P payment structures have shown that P4P failed to improve agent performance and reduce costs (Gillam et al., 2012; Rosenthal et al., 2006; Werner et al., 2011, 2013). Furthermore, the way in which traditional payment structures impact physician behavior is unclear (Gosden et al., 2001; Sørensen and Grytten, 2003). Therefore, the way in which novel payment structures will impact physician behavior remains unknown. This paper uses a real-effort laboratory experiment to improve our understanding of the impact physician payment structures have on behavior.

While physicians often maintain that their behaviors are independent of payment and driven by professional standards of care, many economic theorists argue that payment structure influences a physician’s behavior as predicted by the canonical model (Henrich et al., 2001). For example, some economic theorists argue that under a capitated payment system physicians undertreat patients while treating as many patients as feasible; thereby, maximizing their income (Matsaganis and Glennerster, 1994; Robinson, 2001; Robinson et al., 2004). While the fee-for-service payment system encourages physicians to over-treat patients by paying physicians per service provided.

Empirical research on this topic is mixed. Some studies found that the canonical model accurately predicts the relationship between physician behavior and payment system (Gaynor and Gertler, 1995; Hennig-Schmidt et al., 2011), but other studies have shown that regardless of incentive system, physicians do not change their behavior (Croxson et al., 2001; Devlin and Sarma, 2008). This inconsistency is likely because the studies are set in active physician practices where not all factors can be controlled, accurately measured, or may be endogenously related (Gosden et al., 2000, 2001). Furthermore, payment system changes are typically implemented suddenly, in which case a robust comparison of them before and after the modification is not possible. Consequently, determining if other components of the physician’s payment structure changed simultaneously is difficult (e.g., unaccounted for bonus incentives or converting the internal record keeping system, i.e., electronic medical records). Also, patients and physicians may self-select into practices with specific payment mechanisms, creating another potential source of bias. Lastly, the data required to accurately measure the change to a patient’s health status are not available and researchers are often forced to rely on the self-reported health (Gaynor and Gertler, 1995), which likely differs from reality (Camerer and Hogarth, 1999). For these reasons, in this paper I use a laboratory experiment to isolate the impact of payment systems on physician behavior in a controlled environment.

Experimental literature on physician payment structures is limited. While Fuchs (2000) was the first to acknowledge the potential insights from laboratory experiments, it was not for another decade when Hennig-Schmidt et al. (2011) conducted the first laboratory experiment with specific applications to physician payment structures. Hennig-Schmidt et al. (2011) focused their study on how fee-for-services and capitation influence physician behavior, their main finding was that physician behavior was influenced by payment structures consistent with the predictions of simple theory (i.e., fee-for-service overprovided and capitation underprovided services).

To further our understanding of the effect of physician payment structures on health care provision, this paper expands on the previous literature through the use a real-effort laboratory experiment to study several prominent payment structures’ impact on behavior in a controlled environment. I test five separate payment structures: fee-for-service (FFS), capitation (CAP), salary, P4P, and report cards. FFS and P4P pay retrospectively, and the others pay prospectively. The experimental design for the present study was derived from the multiple principal agent model (Ellis and McGuire, 1986, 1990) and experiments by (Hennig-Schmidt et al., 2011).

The experiment was designed to imitate the relationships among the physician, patient, and healthcare provider (the physician’s employer); however, isolate the interaction between the physician and their patient. As implemented, student subjects who represented physicians were hired to provide proofreading services for a different group of student subjects who represented their patients. The physicians had to make a decision on how many services to provide and for which patients to provide services. The physicians were remunerated for their services by one of the payment structures mentioned above. The experimental design allowed physicians the opportunity to under or over-treat their patients. The physicians’ actions had direct consequences on their patients’ payoff. All experimental parameters remained constant across treatments, aside from the physician’s payment structure.

I find that intrinsic motivations play an important role in physician decision-making and that retrospective payment structures “crowd out” these motivations. Specifically, when pay was retrospective (i.e., the FFS and FFS with P4P), physicians provided a lower overall quality of services. Conversely, when payment structures paid prospectively (i.e., the salary and CAP), physicians provided a higher overall quality of service. This disconnect between physician behavior and monetary incentives demonstrates that monetary incentives can “crowd out” intrinsic motivations that would otherwise motivate subjects to complete the task at higher levels of performance.¹

¹ In this application, several intrinsic motivations are potentially at play, for example, self-determination (Deci and Ryan, 1985), confidence management (Bénabou and Tirole, 2003), other regarding behavior (Hoffman et al., 1994); for a review of intrinsic motivations see Deci et al. (1999).

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