Compensation or Information? Understanding the Role of Information Technology in Physician Response to Pay-for-Performance

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Abstract:

Standard models of piece rate incentives – whether for fruit pickers or physicians – assume that, conditional on the contract, agents optimize their effort. This model underlies the numerous pay-for-performance (P4P) initiatives adopted to address the quality and cost of health care delivered in the U.S. In this paper, we study the response to piece rate incentives in a setting in which the information and management resources available to physicians are limited. Specifically, we study the interaction of P4P with the availability of Information Technology (IT). In the absence of IT tools physicians may have difficulty responding to even the strongest P4P incentives if they are unaware of the production function for improvement. Our simple model demonstrates the dilutive effect of asymmetric information on response to P4P as well as the potential for IT tools to overcome these constraints.

We then estimate our model using unique panel data on a set of long running P4P initiatives for primary care physicians. We combine these data with individually linked "click-stream" data on physician use of IT tools. The granularity of the data as well as the detailed rules and large changes in the P4P program identify our model. We estimate the impact of P4P in a causal framework as well as whether IT is a complement or substitute for P4P incentives.

Changes to the structure of payment incentives over time allow us to estimate models of physician response using a set of different natural experiments. First, incentives are linked to discrete percentiles of the national performance distribution. We rely on these discontinuities to study the impact of increasing incentives on subsequent improvement. Second, our sample covers a large change in the magnitude of the incentives provided. Using this direct change in incentives we estimate a second elasticity and compare this to our estimates from the regression discontinuity design. After estimating the direct response to pecuniary incentives, we then study the impact of access to a web-based tool that allowed physicians (and their staff) to identify patient's eligibility and whether the patients received the P4P target treatments (e.g. appropriate screening). We study who uses this information, the role of information in subsequent quality improvement and how access to information technology affects the production function for care.

Complementarities between information technology and P4P incentives argue against the standard model in which the physician is assumed to understand the necessary steps to improve performance and increase payment. Relying on our model and empirical estimates we compare counterfactual incentive policies.