Journal of Economic Behavior & Organization 131 (2016) 24–35

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

Incentivizing cost-effective reductions in hospital readmission rates

James C. Cox[a], Vjollca Sadiraj[a], Kurt E. Schnier[b,*], John F. Sweeney[c]

[a] Experimental Economics Center (ExCEN) and Department of Economics, Georgia State University, 14 Marietta St. NW, Atlanta, GA 30303, United States
[b] School of Social Sciences, Humanities and Arts, University of California, Merced, 5200 North Lake Road, Merced, CA 95343, United States
[c] Department of Surgery, Emory University School of Medicine, 201 Dowman Drive, Atlanta, GA 30322, United States

ARTICLE INFO

Article history:
Received 31 October 2014
Received in revised form 17 March 2015
Accepted 27 March 2015
Available online 3 April 2015

Keywords:
Pay-for-performance (P4P)
Healthcare
Experiment

JEL classification:
C91
D81
I10

ABSTRACT

The recent regulatory changes enacted by the Centers for Medicare and Medicaid Services (CMS) have identified hospital readmission rates as a critical healthcare quality metric. This research focuses on the utilization of pay-for-performance (P4P) mechanisms to cost effectively reduce hospital readmission rates and meet the regulatory standards set by CMS. Using the experimental economics laboratory we find that both of the P4P mechanisms researched, bonus and bundled payments, cost-effectively meet the performance criteria set forth by CMS. The bundled payment mechanism generates the largest reduction in patient length of stay (LOS) without altering the probability of readmission. Combined these results indicate that utilizing P4P mechanisms incentivizes cost effective reductions in hospital readmission rates.

1. Introduction

Recently the Institute of Medicine estimated the amount of wasted, excess cost of healthcare to be approximately $765 billion in 2009 (Institute of Medicine, 2012). The growth in our health expenditures relative to GDP makes the United States a clear global outlier (Chandra and Skinner, 2012), but the care being provided merely places us in the middle of the pack (Fuchs and Millstein, 2011). The United States is faced with the challenge of not only decreasing the cost of providing care to its population, but also increasing the quality that is provided. The Centers for Medicare and Medicaid Services (CMS) has recently identified hospital readmission rates as a critical healthcare quality metric within the United States and taken regulatory steps to incentivize hospitals to increase their performance. The incentive mechanism utilized by CMS penalizes hospitals that do not meet their performance targets (i.e., readmission rates that exceed expected levels). Recently, the penalties used by CMS amount to a 1% reduction in reimbursement rates for hospitals that have "too many" patients being

* Corresponding author. Tel.: +1 2092056461; fax: +1 2092284007.
E-mail addresses: jccox@gsu.edu (J.C. Cox), vsadiraj@gsu.edu (V. Sadiraj), kschnier@ucmerced.edu (K.E. Schnier), jfsween@emory.edu (J.F. Sweeney).

http://dx.doi.org/10.1016/j.jebo.2015.03.014
0167-2681/

readmitted within 30 days of hospitalization. The outcome was a total penalty of $280 million in 2013 and the percentage is expected to increase to 3% in 2015 (CMS, 2015; Health Affairs, 2013).[1]

The penalties enacted by CMS come at a considerable cost to hospitals, as any additional preventive care must be covered by the current prospective payment scheme.[2] This research focuses on the utilization of pay-for-performance (P4P) mechanisms that are intended to lower hospital costs without increasing hospital readmission. The incentive mechanisms are designed to better align the financial interests of the physicians and the hospital. The performance metrics we use are hospital length of stay and readmission rates. Given the current prospective payment scheme used in the United States, a reduction of either one without increasing the other improves the quality of care at lower costs.

We report the results from two experiments. Experiment 1 investigates the efficacy of two alternative P4P mechanisms, bonus and bundled payments, that tie physicians' payments to performance. We ask whether the P4P mechanisms can be used to reduce hospital costs, without increasing readmissions, compared to baseline outcomes with fee-for-service compensation.[3] Experiment 2 investigates the robustness of the P4P incentive effects in an environment with richer information provided to physicians. Our results suggest that either bonus or bundled P4P physician compensation reduces hospital length of stay for patients but the bundled compensation does so without increasing readmission rates. Additional reductions are observed when we combine the bundled payment mechanism with providing physicians information on the likelihood of readmissions.

Design of an efficient healthcare system, including physician compensation and insurance markets, has been extensively studied in the economics literature beginning with the work of Arrow (1963). In light of the asymmetric information and informational uncertainties in the healthcare market, Arrow (1963) highlighted the need for payment of services, either to physicians or incorporated into insurance markets, to be based on the efficacy of a patient's treatment. This form of compensation is rarely if ever used in current practice. P4P mechanisms are an attempt in this direction as many P4P programs are based on the quality of care, which presumably is correlated with patient health outcomes. This said, the most common forms of healthcare payment are fee-for-service, prospective payment (i.e., diagnosis related groups or DRGs), patient-based capitation (i.e., health maintenance organizations or HMOs) and salaries. The existing economic literature, as discussed below, has compared these incentive structures extensively.

The next section focuses on the literature and discusses the contributions of our research. Sections 3 and 4 report on the details and results of Experiment 1 that we conduct to investigate the efficacy of P4P programs to cost-effectively lower hospital readmission rates with patient information from electronic medical records, as currently provided in hospitals. Section 5 reports on the efficacy of P4P mechanisms in a richer information setting. The final section summarizes our research and provides some additional guidance regarding future research needs in this area.

2. Literature review

In this section we review theoretical, empirical and experimental studies on the effect of payment schedules on physicians' choice of care for their patients. The main finding is that physicians' selections of diagnostic methods, referrals, and care treatments vary greatly across different payment schemes.

2.1. Theoretical studies

Allard et al. (2011) theoretically investigate the incentives and outcomes of general practitioners (GPs) under three compensation schemes: (1) fee-for-service (FFS), (2) capitation, and (3) fundholding.[4] Fee-for-service pays for all services rendered, capitation pays a flat fee per patient per year with the GPs being responsible for all care costs they provide, whereas fundholding builds on capitation by making GPs financially responsible not only for the care they provide but also for the care provided by specialists. A fee-for-service payment mechanism creates an incentive for physicians to over-treat their patients, which increases treatment costs but not necessarily the quality of care. The capitation payment scheme pays physicians a flat rate for each patient under their care; it was introduced to internalize the incentive problems of over-treatment associated with FFS. A central research question is whether the compensation scheme, combined with GP ability and preferences, alters the treatment and referral rates of "gatekeeper" GPs.

Allard et al. (2011) show that: (i) under a capitation scheme GPs are better off referring their patients to a specialist to minimize their own treatment costs; (ii) GPs compensated under a fee-for-service system are less likely to refer a patient; and

[1] The current regulations only address hospital readmissions for patients being treated for three medical conditions: heart attack, heart failure and pneumonia. The $280 million in penalties was spread out across over 2200 hospitals in fiscal year 2013 (Health Affairs, 2013). The scope, and therefore the penalties, of the CMS regulations are expected to increase in the future (CMS, 2015).

[2] The prospective payment scheme is implemented in the United States using Diagnosis Related Group (DRG) payments. A hospital receives a flat DRG payment for each patient and procedure event with the payment not varying by the patient's hospital length of stay. An alternative to this is the fee-for-service (FFS) system where a hospital receives payment for each service provided.

[3] Our baseline treatment is fee-for-service because prospective payments predominately apply to hospital compensation, whereas physicians still receive fees for the services they provide.

[4] Fundholding was created under the changes to the United Kingdom's health care system in 1991 in an effort to separate the physician and hospital care markets. For a more detailed review of the fundholding program see Croxson et al. (2001) and Matsaganis and Glennerster (1994).