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Innovative payment mechanisms in Maryland Hospitals: An empirical analysis of readmissions under total patient revenue

Karoline Mortensen [a,*], Chad Perman [b], Jie Chen [a]

[a] Department of Health Services Administration 3310 School of Public Health Building University of Maryland College Park, MD 20742-2611, United States
[b] Health Management Associates, 1350 Connecticut Ave. NW, Suite 605, Washington, DC 20036, United States

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ABSTRACT

Background: The state of Maryland implemented innovative budgeting of outpatient and inpatient services in eight rural hospitals under the Total Patient Revenue (TPR) system in July, 2010.
Methods: This paper uses data on Maryland discharges from the 2009–2011 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID). Individual inpatient discharges from eight treatment hospitals and three rural control hospitals (n=374,353) are analyzed. To get robust estimates and control for trends in the state, we also compare treatment hospitals to all hospitals in Maryland that report readmissions (n=1,997,164). Linear probability models using the difference-in-differences approach with hospital fixed effects are estimated to determine the effect of the innovative payment mechanisms on hospital readmissions, controlling for patient demographics and characteristics.
Results: Difference-in-differences estimates show that after implementation of TPR in the treatment hospitals, there were no statistically significant changes in the predicted probability of readmissions.
Conclusions: Early evidence from the TPR program shows that readmissions were not affected in the 18 months after implementation.
Implications: As the health care system innovates, it is important to evaluate the success of these innovations. One of the goals of TPR was to lower readmission rates, however these rates did not show consistent downward trends after implementation. Our results suggest that payment innovations that provide financial incentives to ensure patients receive care in the most appropriate setting while maintaining quality of care may not have immediate effects on commonly used measures of hospital performance, particularly for rural hospitals that may lack coordinated care delivery infrastructure.

1. Introduction

The US health care system is undergoing rapid transformation in an effort to address high levels of health care expenditures, to control growth in spending, and to reduce widespread inefficiency. Although hospitals account for over one-third of total health care spending,[1] there are few incentives in our primarily fee-for-service payment system to encourage hospitals, physicians and other health care providers to coordinate care.[2] This results in duplication of efforts, overuse of services, and extensive waste.[2,3] There is a consensus that there is a need to move beyond traditional fee-for-service reimbursement strategies, and encourage study of emerging models of provider-payment reform.[2,4–9] Innovative payment mechanisms that discourage volume of care and reward collaborative, efficient care show promise in slowing expenditure growth, especially in the high-cost hospital setting.[10]

1.1. All-payer system in Maryland

The state of Maryland is well-suited to transform its health care delivery system because it is the only state that sets hospital rates for all payers.[3–6] Maryland implemented its system of full rate-setting authority for all payers and all general acute hospitals in 1976.[7] Rates are prospectively set, largely in line with Medicare's hospital prospective payment system (PPS), with no discounts or preference to specific payers.[7] The all-payer system includes pay-for-performance incentives. A value-based purchasing initiative results in redistribution of system revenue from lower-to-higher performing hospitals, and an initiative to reduce hospital acquired infections provides hospitals incentives to reduce preventable conditions.

1.2. Total patient revenue

Maryland is on the forefront of health care reform, with a new system in place to realign providers' incentives through sweeping payment reform. Maryland implemented the Total

* Corresponding author.
E-mail address: karoline@umd.edu (K. Mortensen).

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Patient Revenue (TPR) program in eight rural hospitals on July 1, 2010.[11] TPR is a voluntary alternative hospital financing strategy developed by the Health Services Cost Review Commission (HSCRC) covering all inpatient and outpatient services for rural hospitals.[12–14] TPR revenue constraint systems were made available to hospitals operating in regions of the state characterized by an absence of densely overlapping service areas.[14] The program changed incentives for hospitals by providing a global budget that guarantees a specified annual revenue for each hospital regardless of the number of patients treated and the amount of services provided.[14] This is a significant deviation from the system that financially rewarded admissions and readmissions rather than including strong financial settings to reduce them.

The primary goal of the TPR program is to provide the hospitals with strong incentives to treat its community of patients in the most efficient and clinically effective way, improving the value of the care provided via lower cost and better clinical effectiveness/quality.[14] TPR aligns with several "best practices" of alternative payment systems that influence changes in utilization and quality.[15] Such best practices include quantifying measures that have room for improvement, coordinated program design, and incentives for quality attainment and improvement that are large enough to motivate a behavioral response. Participating hospitals now have incentives to increase efficiency of health care delivery, contain costs, and to reduce avoidable admissions and readmissions.[16] HSCRC staff monitor hospital performance on quality of care metrics, with the expectation that each hospital will, at a minimum, maintain its relative performance ranking on the HSCRC Quality-Based Reimbursement (QBR) and Maryland Hospital Acquired Conditions rankings.[14] There is concern that the initiative may lead to hospitals directing patients to rival facilities, providing insufficient care or selecting healthier patients; HSCRC announced it would closely monitor hospitals' practices.[16]

The budget for each hospital is based on the hospital's revenue from the prior fiscal year.[13] Base year patient revenues are adjusted for price variance from approved rates, for volume variances, and change in differential due to changes in payer mix.[14] The approved revenue is adjusted based on each hospital's relative performance on specific quality measures.[12] Annual adjustments to the budget also include adjustment for population changes and growth, reversal of any previous retroactive adjustments, and differential readjustments due to payer mix changes and bad debt.[14] If participating hospitals lower spending by reducing admissions, readmissions or by other strategies, they keep the resulting savings.[12] However, if costs increase beyond the budget allotment, the hospital bears financial risk, and can adjust its prices within a 5% corridor in the next year.[13,14,17] Focusing efforts on reducing readmission rates to improve quality of care and reduce costs is a strategy that has proven to be effective.[18,19]

Readmission rates are increasingly used in assessment of health care system performance[20]; they have advantages and limitations as measures of quality of health care.[21,22] Readmissions may be appropriate under certain circumstances, but they occur often at significant additional financial and health expense.[18,23] There has been very little improvement in national average 30-day readmission rates in recent years.[23] The Affordable Care Act (ACA) of 2010 authorizes penalties for hospitals with Medicare admissions that exceed a hospital's average, risk-adjusted 30 day readmission rate for specific diagnoses.[20,21,24] Hospitals have naturally shifted focus to reducing readmission rates in effort to improve quality of care and reduce costs.[18,19] Readmissions are an important metric of quality of care, and hospitals did not have adequate financial incentives to reduce readmissions before the state of Maryland altered their incentive structure in 2010 to "aggressively reduce readmissions" – the focus of this analysis.[14,25] To our knowledge, Maryland is the first state to implement global budgeting of hospital and outpatient services (Rochester, New York globally budgeted only inpatient services in the 1980s[26]). The goal of this paper is to analyze the early effects of implementation of the TPR program on hospital readmissions.

2. Material and methods

2.1. Data

This analysis uses patient-level discharge data for Maryland from the State Inpatient Database (SID) core data file for 2009, 2010, and 2011 (the most recent year available).[27] The SID data are from the Healthcare Cost and Utilization Project (HCUP) dataset sponsored by the Agency for Healthcare Research and Quality and the Department of Health and Human Services. The HSCRC supplies these state-level data on the universe of discharges in Maryland for HCUP. Authorized use of the SID data comes with limitations. Researchers agree to report only aggregate level statistics, so this analysis does not tabulate any data at the individual hospital level beyond data already publicly available. Researchers agree not to contact establishments included in the data.[6]

We identify the eight rural treatment hospitals that began participating in the TPR program in July, 2010. Two of the participating hospitals report their data together (Dorchester General and The Memorial Hospital at Easton), so the treatment hospitals include data reported from seven sources. TPR was already implemented in two rural hospitals, Edward. W. McCready Memorial Hospital and Garrett County Memorial Hospital, so these two hospitals are excluded from the analysis.

There are a total of 46 non-federal, short-term acute care hospitals in Maryland (http://www.ahd.com/states/hospital_MD.html). We use the remaining 36 that are not participating in TPR as the universe for our two control groups (Fig. 1). For the first control group, we identify the remaining seven hospitals that are classified as rural hospitals.[28] Two of these hospitals (Peninsula Regional Medical Center and Atlantic General Hospital) did not report readmissions data in the SID, so they are excluded from the analysis. Of the remaining five rural hospitals, we select three hospitals that did not participate but were identified by HSCRC as potential participants in TPR in the future to serve as controls.[29] These three rural hospitals include Civista Medical Center, Frederick Memorial Hospital, and Upper Chesapeake Medical Center.

The second control group that includes the three rural controls, two additional rural hospitals, and the remaining 25 Maryland hospitals that report readmissions data (four additional hospitals in the state did not have readmission data in the SID). The data set has 1,997,164 observations representing patient admissions for the 37 reporting hospital units included in this analysis.

2.2. Variables

The analysis controls for characteristics that proxy for risk adjustment. The demographic variables include patient's age, sex, race (white, black, other race), and ethnicity (Hispanic). The primary payer for the discharge is categorized as private insurance, Medicare, Medicaid, self-pay, and no payment. We include the count of unique chronic diagnoses reported on the discharge as a measure for risk-adjustment. Estimated median household income measured at the patient's zip code of residence is included in quartiles, with classification cut-off values varying by year.[30] Patients discharged from small hospitals have been found to have higher readmission rates than those discharged from large hospitals.[19] With the exception of one medium-sized hospital, all of the hospitals in the treatment and rural controls fall under the