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Short communication

The effect of reimbursement on medical decision making: Do physicians alter treatment in response to a managed care incentive?

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ABSTRACT

The empirical literature that explores whether physicians respond to financial incentives has not definitively answered the question of whether physicians alter their treatment behavior at the margin. Previous research has not been able to distinguish that part of a physician response that uniformly alters treatment of all patients under a physician's care from that which affects some, but not all of a physician's patients. To explore physicians' marginal responses to financial incentives while accounting for the selection of physicians into different financial arrangements where others could not, I use data from a survey of physician visits to isolate the effect that capitation, a form of reimbursement wherein physicians receive zero marginal revenue for a range of physician provided services, has on the care provided by a physician. Fixed effects regression results reveal that physicians spend less time with their capitated patients than with their non-capitated patients.

1. Introduction

Service providers in the United States are paid for their work in a variety of ways. Employers in service industries pay commission, implement reward programs, delay compensation and dock pay for shoddy work to incent their employees to perform efficiently. Consumers who negotiate directly with their service providers demand estimates of bundles of services and guarantees that costs would not rise more than a set amount above these estimates. It is often asserted that ethical obligations associated with providing healthcare make physicians less likely than other service providers to respond to financial incentives by deviating from a practice pattern that maximizes a patient health status (Robinson, 2001). However, the fact that private health plans and public healthcare programs use some of these same tools to incent physicians to practice differently suggests a belief that physicians respond to financial incentives in a profit maximizing way. The intended and unintended consequences of these payment mechanisms – particularly those intended to control healthcare costs – are not well understood, and have timely policy implications.

The empirical literature that explores whether physicians respond to financial incentives has not definitively answered the question of whether physicians alter their treatment behavior at the margin. Previous research has not been able to distinguish that part of a physician response that uniformly alters treatment of all patients under a physician's care from that which affects some, but not all of a physician's patients. To explore physicians' marginal responses to financial incentives, I use data from a survey of physician visits to isolate the effect that capitation, a form of reimbursement wherein physicians receive zero marginal revenue for a range of physician provided services, has on the care provided by a physician. Specifically, I exploit within-physician variation in reimbursement received for the provision of care to patients to determine whether physicians respond to financial incentives by altering the time they spend with patients in the way economic theory predicts.

2. Background and literature review

In 1972, when the majority of patients were covered by traditional fee-for-service (indemnity) plans, there was no cost downside for the physician to providing additional treatment. In general, the more services a doctor provided, the more she was paid (Kwon, 1996). Asymmetric information between physicians, patients, and insurance companies about appropriate medical treatment (Arrow, 1963) provided physicians with the opportunity to boost their incomes by providing a higher or lower level of care than a fully informed or financially liable patient would have accepted. As innovative, more expensive therapies became available, healthcare costs spiraled and employers demanded "more affordable" healthcare. Health Maintenance Organizations (HMOs), claiming to provide healthcare more efficiently, became popular

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with employers and employees who were seeking lower premiums. In the years between 1973 and 2008 the number of lives covered by an HMO has increased from 4.5 million to 88.8 million patients in the U.S. (MCOL, 2008).

As physicians began entering into managed care contracts with HMOs, they found themselves facing treatment restrictions and financial incentives, which had been non-existent under the fee-for-service system. In the 1990s, managed health care plans increasingly reimbursed physicians via "capitation" contracts to hold down average costs. Though over the next 15 years, the prevalence of "capitation", a financial arrangement wherein physicians receive a set fee per enrolled patient each month that is meant to reflect the actuarial cost of care the patient is expected to require, has waxed and waned, it is still widely utilized in the United States and other countries (Rice and Smith, 2001; O'Malley et al., 2007.) Though there is variation among MCOs and over time in how capitation payments are made, during the time period in which my data were collected, plans paid physicians a pre-agreed upon fixed amount according to age/gender mix of the plan's enrollees under the physician's care. Over the course of the contract period, a physician paid for the healthcare services she provided to these enrollees out of her pool of capitated payments.

For capitated and non-capitated physicians alike, net revenue for physicians increments according to the marginal revenue and marginal cost of services provided to individual patients. Whereas, under fee for service reimbursement, physicians' income increases with the provision of services, under capitation, for a given set of symptoms, in the realm of acceptable practice, the marginal revenue from providing additional tests and procedures to a capitated patient is zero. The marginal cost of providing services to individuals is positive however. In addition, because providing additional services to a capitated patient requires a physician to allocate time to the care of the patient, the marginal opportunity cost of providing care to a capitated patient for a physician who also treats patients for whom she is incrementally reimbursed is non-negligible.

A physician who reduces the number of services provided to her capitated patients by one procedure or test can increase her income substantially. Small time savings add up so that by spending 2–5 min less with her capitated patients than with her non-capitated patients, the average physician can save 6.72–16.8 min a day. Using this time to schedule new patients, she could add 81–202 additional visits per year. Assuming 70% of the patients in a physician's panel visit the doctor an average of 2.75 times a year, this means the physician can add 42–105 new capitated patients to her panel. The addition of average ($61) per member per month payments from these patients may amount to $30,744 to $76,860 per year. Conservative assumptions mean this is an underestimate of salary gains from allocating a physician's time differently, and does not include costs averted by avoiding costly procedures, tests, etc. If physicians are profit maximizing and respond to financial incentives in the way economic theory predicts, they should be observed to spend less time with capitated patients than with non-capitated patients.

This paper contributes to the literature by addressing the question of whether physicians respond to a financial incentive at the margin by altering behavior on a patient-by-patient basis. This question has not been addressed in either the managed care or financial incentive literature. However, researchers have sought to understand the impact of managed care on healthcare delivery by comparing health outcomes (Udvarhelyi et al., 1991; Murray et al., 1992; Greenfield et al., 1995; Miller and Luft, 1994; Lurie et al., 1994; Gaynor et al., 2001), quantity of services provided (Epstein et al., 1986; Clancy and Hillner, 1989; Retchin and Brown, 1990; Phillips et al., 2000) and physician behavior (Mechanic et al., 2001; Hadley and Mitchell, 1997; Simon et al., 1997) in different types of clinical settings and in areas with different rates of managed care penetration. Tai-Seale et al. (2007) find variation in the amount of time spent discussing "major topics" during primary care office visits based on physicians' practice setting and compensation method. Glied and Zivin (2002), who use an earlier version of the same dataset used here (NAMCS) to investigate the effect of market- and physician-level managed care penetration on physician behavior, find a negative relationship between the percent of a physician's patients who are HMO members and average visit durations. The authors find a positive relationship between percent of practice that are HMO members and resource intensity of services provided during the visit. The inability of previous studies to account for the selection of physicians into different financial arrangements (such as managed care organizations [MCOs]), decisions that are partially determined by unobserved factors that may also affect other aspects of physician behavior, were instrumental in determining the methodological and empirical approach in this study.[1]

In addition, none of these studies isolates the effect of a single financial incentive on physician behavior. This is problematic because the predicted impact of "HMO" and "MCO" status on physician behavior is not so clear cut. Relatively low reimbursement by managed care plans may cause a physician to substitute care away from her HMO patients toward her more lucrative patients—resulting in a decreased time spent with managed care patients. To the extent that a physician who takes on managed care patients for reduced, yet incremental reimbursement chooses to earn additional income by inducing demand for medical care services per patient, HMO status should have the opposite effect on this outcome—increasing the time the physician spends with each of his/her patients. In addition, the effect of managed care status on time spent with patient depends not only on the magnitude of the associated income and substitution effects, but also on the impacts of other non-monetary incentives utilized by MCOs to influence physician behavior. In contrast, the expected income and substitution effect of capitation on time spent with patient is unambiguous. Through the income effect, physicians constrained not to differentiate care by insurance status should decrease the duration of all of their patient encounters in order to squeeze more visits into a day. The substitution effect of the visit should cause a profit-maximizing physician to allocate less time to their capitated patients, in order to have more time to treat patients for whom marginal revenue is greater than zero (or increase leisure time).

I avoid the pitfalls of the previous literature by examining the effect of managed care on physician behavior by utilizing panel data techniques to look at the effect of a single managed care financial incentive on time spent with patient, a physician behavioral outcome that is likely correlated with treatment intensity.

3. Data

The survey data used in my analysis, the National Ambulatory Medical Care Survey (NAMCS) dataset, is a nationally representative dataset that is collected annually by the National Center for Health Statistics (NCHS), and contains the rich detail needed to address the question of whether physicians respond to financial incentives. In 1998, the survey was distributed to 1226 office-based physicians and collected information about a random sample of weekly ambulatory patient encounters. The one page patient record form collected reason for visit, tests ordered, diagnosis, device given,

[1] Studies that suggest that physicians who join managed care companies have different personal and practice characteristics than other physicians (Freund and Allen, 1985) make it a non-trivial risk that omitted variables may cause bias in the coefficients of interest.