



Demand elasticities and service selection incentives among competing private health plans

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ABSTRACT

We examine selection incentives by health plans while refining the selection index of McGuire et al. (2014) to reflect not only service predictability and predictiveness but also variation in cost sharing, risk-adjusted profits, profit margins, and newly-refined demand elasticities across 26 disaggregated types of service. We contrast selection incentives, measured by service selection elasticities, across six plan types using privately-insured claims data from 73 large employers from 2008 to 2014. Compared to flat capitation, concurrent risk adjustment reduces the elasticity by 47%, prospective risk adjustment by 43%, simple reinsurance system by 32%, and combined concurrent risk adjustment with reinsurance by 60%. Reinsurance significantly reduces the variability of individual-level profits, but increases the correlation of expected spending with profits, which strengthens selection incentives.

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1. Introduction

Under fixed premiums, health plans have incentives to prefer enrolling healthy, low-cost rather than sicker, high-cost enrollees, since premiums do not reflect the full cost differential between sick and healthy enrollees. While governments and employers can regulate plan benefits, and prohibit explicit exclusion of people based on costs or preexisting conditions, it is more difficult to regulate service-level selection, the supply-side availability of provider specialties or types of services. Service-level selection is particularly easy when health plans can design plan benefits such as cost sharing or influence the availability of specific services, in order to attract or deter enrollees expecting to use those services. Risk adjustment, in which plan revenues depend on the age, gender and diagnoses of their enrollees, and reinsurance, in which plans are partially compensated *ex post* for their highest-cost individual patients, are important strategies that can be used to reduce service-level selection incentives, but uncertainties remain about how well they do so.

This paper builds upon the recent literature on service-level selection and makes three contributions. First, we refine the analytical framework to better reflect variation in service-level cost sharing paid by consumers, and premium markups that result in nonzero profits, which can influence plan profits and selection. Second, we improve the empirical measure of service-level selection incentives by including new estimates of service-level demand elasticities, individual-level profit variation, and demand for health insurance in the calculation. Third, we evaluate how well various regulatory strategies reduce selection incentives: prospective risk adjustment, concurrent risk adjustment, individual-level reinsurance and a combination of reinsurance and concurrent risk adjustment.

Our framework is rooted in the service-level selection literature pioneered by Glazer and McGuire (2000) who propose and derive formulas for optimal risk adjustment payments to health plans so as to best offset service-level selection incentives. Frank et al. (2000) extend this framework by explicitly modeling profit maximizing service-level spending in the absence of optimal risk adjustment. They also develop an empirical measure of the incentive to select, and use US Medicaid data to demonstrate that selection incentives vary dramatically across services. By making further simplifying assumptions, Ellis and McGuire (2007) (henceforth EM) derived a selection index that was the product of predictability (i.e., how well

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individuals can predict their subsequent use of each service) and predictiveness (i.e., how well expected spending on each service predicts plan profitability), making the index easier to interpret empirically. Ellis et al. (2013) (henceforth EJK) examined whether prospective, diagnosis-based risk adjustment reduces selection incentives in a study of the privately insured, using an earlier version of the data used here.¹ A weakness of EM and EJK is that both studies calculate empirically only two terms – predictability and predictiveness – in the selection index, and ignore or assume constant the rest of the terms. McGuire et al. (2014) was the first to correct this weakness, by incorporating demand-side cost sharing in their analysis, allowing demand elasticities to vary by type of service, and exploring the effect of multiple health plan payment policies, which reflect both risk adjustment and reinsurance. In this paper, we refine the index of McGuire et al. (2014) and calculate the full selection elasticity, which reflects five terms beyond predictability and predictiveness: (1) demand-side cost sharing, (2) service-level demand elasticities, (3) individual-level profit variation, (4) actual profit levels, and (5) demand responsiveness of health insurance enrollment to expected spending. We show below how these five terms interact with the EM predictability and predictiveness terms and can affect the magnitude and relative importance of selection incentives across services and under alternative payment systems.

Service-level demand elasticities were ignored in the EM selection index largely due to a lack of the empirical estimates of them at the detailed type of service level.² Here, we take advantage of the results from Ellis et al. (2017) (henceforth EMZ) who develop a new instrumental variables method for estimating demand elasticities at the detailed type of service level. Using the identical sample as is used in this paper, EMZ focus their analysis on within-year variation in cost sharing, taking advantage of differences between plans such as preferred provider organizations (PPOs) and health maintenance organizations (HMOs) where cost sharing is often constant during the year and plan types like high deductible health plans (HDHPs) and consumer-driven health plans (CDHPs) where cost shares can change dramatically during the year. The key insight in their work is that although an individual's cost share is endogenous to their own health status and prior spending, the average of other people at the same firm is exogenous to the consumer's choice, and forms a valid instrument. Section 5 provides an overview on how EMZ results are obtained empirically and used in this paper.

We use US employer-based health insurance data to implement our service-level selection framework and simulate different payment systems. While neither risk adjustment nor reinsurance is currently in place for the employer-based insurance market, simulations using this data shed light on variations in service selection incentives and how payment policies change those incentives.

To give a preview of our results, we find that incorporating cost sharing, demand responsiveness and profit variation into our selection calculations makes meaningful changes: higher cost sharing services become less attractive to underprovide, while more demand elastic services (e.g., pharmaceuticals) become more attractive to distort relative to inelastic services (e.g., prevention). We find that concurrent diagnosis-based risk adjustment (using only current year information) makes only a modest improvement

in selection incentives relative to prospective models (using only information from the previous year), despite a much higher R^2 . Both risk adjustment models appear to perform better than simple reinsurance at mitigating selection incentives, even though reinsurance achieves a higher R^2 than either concurrent or prospective risk adjustment. Our analysis of the underlying components of the selection formula also suggests why this is so: by eliminating some of the noise in the upper spending tail, reinsurance tends to increase the positive correlation between service-level spending and reinsured total spending, hence improving the predictiveness of some services, and hence the desirability of underproviding those services.

The rest of the paper is structured as follows. Section 2 provides an introduction to the US health plan types, with a focus on their varying degrees of restrictions on patient choice of providers or services, the resulting selection incentives and efforts to mitigate them. Section 3 reviews the Selection Index in EM and McGuire et al. (2014) which form the basis of our new full selection elasticity (FSE). The data used for this study is summarized in Section 4, while Section 5 describes the estimation strategy. Section 6 presents our empirical results. Section 7 includes brief concluding remarks as well as suggestions for future research.

2. Background

Recent theoretical and empirical studies in the health care literature, summarized in Layton et al. (2017), have focused on identifying and correcting service-level selection incentives, by which we mean the incentives to influence enrollee types by over- or under-supplying certain health care services. Service distortions are of particular concern with managed care health plans that are more closely involved in selective contracting with providers. In the US, a rich array of health plan types have emerged that differ in the extent to which they encourage or discourage use of specific health care services by consumers, and this variation provides a natural experiment for examining how plans with alternative management contracts differ in the services they offer. Among the traditional types of health plans, comprehensive plans (COMP) place the least restrictions on patient choice of providers or choice of services: patients can for the most part visit any provider at any time and will have coverage for almost any services. Substantially less free are health maintenance organizations (HMOs) which selectively contract with a subset of doctors and hospitals in an area, and often require *ex ante* preauthorization or *ex post* justification of services received. In between these two extremes, preferred provider organizations (PPOs) generally use selective contracting with certain but not all providers and generally arrange provider discounts to control costs. Point of service (POS) plans generally combine management services of HMOs with relatively unrestricted access to providers outside of the negotiated provider network, and hence represent a form of managed care that is looser than HMOs but tighter than PPOs or COMP.

The last ten years, in particular, have seen a rapid growth in offerings of new plan types that allow even greater opportunity for service selection. In contrast to HMOs, PPOs, and POSs, consumer-driven health plans (CDHPs) and high deductible health plans (HDHPs) charge both higher deductibles and higher coinsurance rates, which may allow favoring or discouraging services selectively through their benefit coverage. A key research question that we address is whether narrow provider panels (HMOs) or stingy benefit designs (CDHPs and HDHPs) are more effective at reducing the attractiveness of a health plan to high cost individuals via service-level selection incentives.

In order to reduce selection problems, it is common to use diagnosis-based “risk adjustment” to change incentives, where

¹ Layton et al. (2017) (LEMvK) provide an overview of the literature on service-level selection and evaluate alternative premium, risk adjustment, and reinsurance systems. They separately develop welfare-based measures that can be used to evaluate demand-side premiums, supply-side revenue, and incentives for service selection.

² McGuire et al. (2014) take a step forward in their calculation of the demand elasticities in that they allow them to vary across services. They assume two different levels of elasticities among the seven types of services they consider: -0.4 for mental health and substance abuse services, and -0.2 for everything else.

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