Patient Cost-Sharing and Health Care Spending Growth

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Back in 1965, U.S. healthcare spending was 6 percent of GDP. It has now risen to about 17 percent of GDP and is projected to reach 26 percent of GDP as early as 2035 (Congressional Budget Office, 2010). This rapid growth in spending has coincided with a dramatic change in the way healthcare spending is financed. Prior to the introduction of Medicare and Medicaid, more than half of all personal healthcare spending was paid out-of-pocket by the patient. The introduction of these two programs in 1965, combined with an expansion of private health insurance coverage, led to a dramatic reduction, so that only 15 percent of personal healthcare spending was paid out-of-pocket in 2008—which is actually below the average cost-sharing in the other developed OECD countries (Furman, 2007). Figure 1 shows these aggregate cost-sharing trends based on data from the national health expenditure accounts (prepared by Centers for Medicare and Medicaid Services, 2010). However, as a result of the rapid rise in total healthcare spending, even with the shrinking share of expenses paid out-of-pocket, real out-of-pocket spending has almost doubled, rising from less than $500 per person in the early 1960s to more than $900 per person in 2008. Furthermore, even patients with comprehensive insurance still pay a substantial share of their costs: Medicare enrollees paid for more than 17 percent of their costs: Medicare enrollees paid for more than 17 percent of their

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healthcare out-of-pocket (Kaiser Family Foundation and Health Research and Education Trust, 2010; MedPAC, 2010).

The nature of private insurance plans has also changed substantially. In 1988, 73 percent of private insurance policies purchased through employers were “conventional” fee-for-service plans (see Figure 2); by 2010, fee-for-service plans had virtually disappeared, comprising only 1 percent of employer-sponsored plans (Kaiser Family Foundation and Health Research and Education Trust, 2010). These plans have been displaced by various managed care plans, such as health maintenance organizations, preferred provider organizations, and point of service plans (which grew from 30 percent of employer-sponsored policies in 1988 to more than 85 percent today), and high-deductible health insurance plans (which over the last four years have grown from 4 percent of employer-sponsored policies to 13 percent).

Managed care plans have different financial incentives on both the patient and provider sides from the traditional fee-for-service plans of the past or from...
Figure 2
Changes in Types of Insurance Plans Issued by Employers, 1988–2010


Purchasing care without insurance at all. Fee-for-service medicine relied primarily on the demand-side incentives, especially cost-sharing structures, to control spending. The typical managed care plan, in contrast, has a copayment of only $20 per physician visit and $10 per generic prescription—substantially lower than historical coinsurance rates under fee-for-service plans of patients (Kaiser Family Foundation and Health Research and Education Trust, 2010). To control costs, managed care relies more heavily on provider incentives on the supply side by changing reimbursement methods (including capitated payments, fixed based on the number of patients). In practice, insurance plans often use both supply-side and demand-side approaches. Health maintenance organizations, for example, typically charge copayments, require referral from a primary care physician to control use of specialist services, and pay fixed fees to in-house physicians.

In addition to the aggregate decline in cost-sharing and change in the nature of insurance plans in the last 20 years, there is also substantial and evolving heterogeneity in cost-sharing across types of plans and across the income distribution. Table 1 shows cost-sharing for people with different types of plans and at different points in the income distribution from the 1996–2008 Medical Expenditure Panel Survey. Among those obtaining their insurance through their employer (the vast majority of the privately insured), the poorest group saw the largest reduction in cost-sharing.
Figure 3 shows that cost-sharing has drifted down for those obtaining insurance both publicly and privately, but those purchasing insurance on their own have substantially higher levels of cost-sharing than those obtaining insurance through an employer, while the publicly insured have much lower levels of cost-sharing. As we see in Figure 4, cost-sharing is higher for those in smaller firms than those in larger ones.

In this paper, we evaluate the effect of demand-side cost-sharing on healthcare spending. We begin with a conceptual discussion of why determining the appropriate extent of cost-sharing poses difficult practical problems. We then turn to empirical evidence on how demand-side cost-sharing affects the cost of health care and the health of recipients; some spillover effects of cost-sharing; and the possibilities of alternative and more sophisticated cost-sharing structures.

We will argue that while cost-sharing can be a powerful tool to move utilization under comprehensive insurance closer to optimal allocations, it is a blunt tool as

### Table 1

**Cost-Sharing by Type of Insurance, Income, and Firm Size**

<table>
<thead>
<tr>
<th></th>
<th>Average cost-sharing</th>
<th>Out-of-pocket spending (2009 dollars)</th>
<th>Total health spending (2009 dollars)</th>
<th>Percentage of insured population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer/Union group insurance</td>
<td>0.355</td>
<td>0.290</td>
<td>484</td>
<td>671</td>
</tr>
<tr>
<td>Fee for service</td>
<td>0.418</td>
<td>0.299</td>
<td>565</td>
<td>698</td>
</tr>
<tr>
<td>Managed care</td>
<td>0.310</td>
<td>0.287</td>
<td>426</td>
<td>665</td>
</tr>
<tr>
<td>Very poor (&lt;100% poverty line)</td>
<td>0.375</td>
<td>0.260</td>
<td>433</td>
<td>690</td>
</tr>
<tr>
<td>Low income (100%–199%)</td>
<td>0.366</td>
<td>0.289</td>
<td>391</td>
<td>582</td>
</tr>
<tr>
<td>Middle income (200%–399%)</td>
<td>0.349</td>
<td>0.289</td>
<td>431</td>
<td>575</td>
</tr>
<tr>
<td>High income (≥400%)</td>
<td>0.357</td>
<td>0.292</td>
<td>546</td>
<td>740</td>
</tr>
<tr>
<td>Fewer than 10 employees</td>
<td>0.401</td>
<td>0.335</td>
<td>583</td>
<td>804</td>
</tr>
<tr>
<td>10–49 employees</td>
<td>0.381</td>
<td>0.300</td>
<td>521</td>
<td>718</td>
</tr>
<tr>
<td>50–249 employees</td>
<td>0.332</td>
<td>0.304</td>
<td>458</td>
<td>687</td>
</tr>
<tr>
<td>250 or more employees</td>
<td>0.319</td>
<td>0.261</td>
<td>503</td>
<td>653</td>
</tr>
<tr>
<td>Non-group insurance</td>
<td>0.577</td>
<td>0.548</td>
<td>788</td>
<td>874</td>
</tr>
<tr>
<td>Public health insurance</td>
<td>0.122</td>
<td>0.079</td>
<td>157</td>
<td>154</td>
</tr>
<tr>
<td>Medicaid</td>
<td>0.086</td>
<td>0.054</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Average</td>
<td>0.336</td>
<td>0.259</td>
<td>459</td>
<td>593</td>
</tr>
</tbody>
</table>


*Note:* Cost-sharing represents the fraction of total healthcare spending paid out-of-pocket. Average cost-sharing is calculated as the mean of this ratio across individuals, weighted using person-level sample weights. The sample excludes individuals aged 65 years and older, individuals who switched coverage during the year, and individuals without health spending of any kind during the year. The sample sizes are 12,051 and 16,954 individuals in 1996 and 2008, respectively. Health spending adjusted using the U.S. GDP deflator.
Figure 3
Cost-Sharing by Type of Insurance

Note: Cost-sharing represents the fraction of total healthcare spending paid out-of-pocket and is calculated as the mean of this ratio across individuals, weighted using person-level sample weights. This graph excludes individuals aged 65 years and older, individuals who switched coverage during the year, and individuals without health spending of any kind during the year.

Figure 4
Cost-Sharing by Firm Size

Note: Cost-sharing represents the fraction of total healthcare spending paid out-of-pocket and is calculated as the mean of this ratio across individuals, weighted using person-level sample weights. This graph excludes individuals aged 65 years and older, individuals who switched coverage during the year, and individuals without health spending of any kind during the year.
currently deployed in most health insurance plans. Increasing patient cost-sharing does reduce healthcare expenditures, but it can do so in a way that does not discriminate particularly well between high- and low-value use, and that does not take into account important interactions. For example, cost-sharing may not encourage the appropriate use of prescription drugs as compared with other types of health care. Cost-sharing for those under age-65 sometimes seems aimed at postponing care until the recipient becomes eligible for Medicare. Cost-sharing for people in one locality might reflect practice norms in that area, but not represent the long-term interests of patients. In short, the common forms of cost-sharing now built into public and private insurance plans may not align socially optimal outcomes with privately optimal outcomes. The pattern of cost-sharing that we see across different segments of the population does not seem to be consistent with optimally designed insurance. However, we believe that deploying demand-side cost-sharing in a more sophisticated way holds some promise both to slow the growth of healthcare spending and to increase the health that spending buys.

The Conceptual Problem of Optimal Healthcare Cost-Sharing

The problem of optimal cost-sharing for health insurance is more difficult than may be apparent at first. As a starting point, we imagine a situation in which medical status and other patient characteristics were perfectly observable and the cost of care was known in advance but in which people can get a “good” or a “bad” draw in terms of their future health status. In this situation, an efficient insurance contract would pay a fixed amount based on whether enrollees got a good or bad health draw. This policy would also allow patients to allocate those funds to specific care as they saw fit. In this approach, no cost-sharing is needed. Of course, this hypothetical example is not intended to approximate reality, but to clarify the difficulties posed by real-world health insurance.

Unfortunately, the real world is more complicated. First, it is impossible to write down contingent contracts that cover the infinite array of health outcomes. Second, it is impossible to know exactly what harm a patient receives from any health shock (and to monetize it appropriately). Third, the delivery of health care in and of itself—such as surgery—can yield new information about future health needs. As a result, health insurance was traditionally provided on a fee-for-service basis, offering partial insurance against the financial loss from purchasing health care associated with uncertain future health needs.

But fee-for-service insurance raises the problem that neither providers of health care nor consumers of health care have an incentive to weigh the costs of health care against the health benefits that it produces. Healthcare providers find themselves in a situation in which they can prescribe tests or treatments with reduced concern about cost (especially because patients lack the knowledge to evaluate the benefits). Health consumers are affected by the classic problem of moral hazard—that is, the desire of those who are insured to consume more of the insured service than they
would if they faced the full price. Enrollees’ choices today can also affect their future health and health needs, leading to dynamic moral hazard.

The moral hazard argument has been a key concern in the health economics literature. In traditional moral hazard models, full insurance leads to a desire by healthcare consumers for overconsumption. On the other extreme, having healthcare consumers face the full costs of health care would defeat the purpose of health insurance, and would cause healthcare consumers to bear too much risk. As a result, in providing insurance, there is a trade-off between risk-sharing and appropriate incentives, which will affect demand for medical care (Pauly, 1968; Zeckhauser, 1970). In this context, cost-sharing emerges as a tool to influence utilization.

This standard theory offers some guidance as to what kind of demand-side cost-sharing is appropriate. Coinsurance should be higher the smaller and more certain the risk—since insurance is less valuable in such cases. Coinsurance should also be higher the more elastic the demand for the particular medical services, because in this situation the cost of overconsumption rises. Elasticities for various types of healthcare services do appear to differ: in results from the RAND Health Insurance Experiment (discussed at greater length in the next section), demand for dental and mental health services were more responsive to changes in copayments than demand for other outpatient care or inpatient care. This finding partially explains why virtually every health insurer covers hospital and outpatient care but not necessarily these other services. Even when such services are covered, they often have much greater cost-sharing.

In addition to moral hazard issues, there is the problem that healthcare is not just a single good. Cost-sharing will affect not just those services directly affected by a price change, but also the complements of and substitutes for those services. For example, rising prices of pharmaceuticals may make surgical alternatives more attractive, or rising prices of physician visits may make it less likely that patients receive a prescription. Thus, even highly elastic demand for prescription drugs may warrant generous coverage if drug consumption lowers the use of other medical services; and in fact, new drugs often have low copayments. More precisely, holding other factors constant, if an insured good has many other insured services that are substitutable, then its optimal copayment will be lower than traditionally argued—because raising its price will lead to additional use of those substitutable services. By the same argument, if those other services are complementary, the optimal copayment for the initial good will be higher. In other words, optimal cost-sharing depends not only on own-price elasticities, but also on cross-price elasticities (Goldman and Philipson, 2007).

A second conceptual difficulty akin to the spillover across services is the spillover across insurers over time. Many investments in health today affect future health costs that for many people will be borne by Medicare once they turn 65, while those who become uninsured may consume healthcare subsidized by taxpayers or insured populations. Another difficulty is the classic problem of adverse selection. When insurers cannot observe underlying health risk, insurance plans with lower cost-sharing may attract populations with (unobservably) higher expected
costs—another form of spillover across insurers. Systemwide spillovers arising from the diffusion of technology and practice patterns are discussed in more detail below.

Yet another conceptual difficulty with cost-sharing is the implicit assumption that patients are gatekeepers in a good position to decide what care is necessary and worthwhile. While patients should certainly play a role in managing their care—like whether it is worth visiting the emergency room for a sniffl e or a low-grade fever—in many other cases, patients will lack the expertise to weigh the costs and benefits of the potential treatments available. Even if this knowledge were fully available and known, patients will not necessarily make good decisions about health services—say, about recommended screenings and preventive care—because they may underweight future benefits relative to present costs.  

In short, optimal cost-sharing is not just about the trade-off between the incentives that insured patients face for potential overconsumption of healthcare and the exposure to uninsured financial risk. Even if the empirical issues facing that approach could be plausibly addressed, it could still be the case that society would wish to use cost-sharing to provide greater incentives for some kinds of care or lesser incentives for other kinds of care, either because of cross-price elasticities that make certain kinds of care especially cost-effective, or simply because many patients will make nonoptimal health decisions even spending their own money.

**Effects of Cost-Sharing**

There is limited evidence on the effects of cost-sharing on utilization and, ultimately, on health outcomes. A change in the price patients face for a particular service may affect consumption of that service, but it may also affect consumption of complementary or substitutable services.

It is difficult to isolate the causal effect of cost-sharing outside of a controlled experiment because of potential selection. A simple comparison of the utilization or health outcomes of those with high cost-sharing versus those with low cost-sharing can be quite misleading: any difference in utilization or outcomes could be because of cost-sharing, or it could occur because patients in different types of insurance policies may have very different health risks and other characteristics. For example, enrollees may choose more generous health plans if they expect their health costs to be higher—classic adverse selection. There are other

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1 A growing body of research in behavioral economics, beyond the scope of this paper, has found that patients may not make decisions that maximize their long-run health and well-being even without price distortions. This suggests an alternative set of tools for demand-side management that might increase use of high-value but underused care. Several of the behavioral interventions that have been studied in randomized controlled trials are based on reminders to follow-up on certain care or treatment using phone calls or text messages. Such reminders seem to generate small improvements in adherence across a range of treatments, such as taking medication for asthma (Strandbygaard, Thompsen, and Backer, 2010) and completing mammography screening (Parkington, Faine, Nguyen, Lowry, and Virginkar, 2009). However, evidence of the sustainability and cost-effectiveness of such interventions is mixed.
mechanisms as well, though: for example, larger companies may be more likely to offer plans with a particular form of cost-sharing, and the employees of larger companies may be systemically different in terms of health, age, income, and preferences for risk. Of course, a careful researcher can try to control for many of these factors, but even with controls, there is always the risk of unmeasured covariates. Furthermore, the downstream effects of changes in the bundle of services consumed may not be realized for years.

In her excellent review of the cost-sharing literature, Swartz (2010) also notes that much of the evidence comes from the context of managed care and may not generalize to other insurance settings. Nevertheless, there is some compelling evidence that patients do indeed respond to prices—although not necessarily in a way that is consistent with careful and farsighted analysis of the costs versus benefits of care.

**Own-Price Effects**

Estimates of how demand-side cost-sharing affects individual behavior inevitably begin with the RAND Health Insurance Experiment, which still, more than 40 years later, offers the best experimental evidence we have on the effect of cost-sharing on utilization and health outcomes. This study randomly placed 2,750 families in plans with different levels of cost-sharing ranging from free care to 95 percent coinsurance during the late 1970s. Individuals subject to higher coinsurance rates reduced their demand for care. Spending in the catastrophic plan was 31 percent lower than what was observed in the free plan, corresponding to a price elasticity of approximately −0.2. Surprisingly, inpatient care was almost as responsive to price as outpatient care (Manning, Newhouse, Duan, Keeler, and Leibowitz, 1987). In the intervening decades, a number of researchers have sought to take advantage of natural experiments based on plausibly exogenous changes in copayments (or the introduction of new insurance coverage) in private and public insurance plans to draw a causal inference on how changes in cost-sharing affect the utilization of healthcare services. The estimates of the RAND Health Insurance Experiment have been proven remarkably resilient in such studies over time.

As a recent example, Chandra, Gruber, and McKnight (2010) take advantage of state-level changes in cost-sharing for California public retirees to isolate the causal effects of changes in cost-sharing for different services. Because the enrollees’ coverage was changed exogenously (and with variation in timing and type of change across plans), they were able to abstract from the selection problems of typical observational studies. They found price elasticities similar to those of the RAND Health Insurance Experiment. Estimated elasticities varied across services, with pharmaceutical use seeming more price sensitive (discussed in detail below).

Emergency department use—particularly for nonemergency situations—also seems sensitive to copayments, with several quasi-experimental studies finding substantial reductions in utilization upon the introduction of copayments (Selby, Fireman, and Swain, 1996; Hsu, Price, Brand, Ray, Fireman, Newhouse, and Selby, 2006; Wharam, Landon, Galbraith, Kleinman, Soumerai, and Ross-Degnan, 2007). Hsu and colleagues, for example, study the effect of a discrete jump in
emergency department copays implemented by an employer in the Kaiser healthcare delivery system and found that imposing copayments of $20 to $100 led to a 12–23 percent decline in emergency department use (with no observable adverse health consequences). Evidence on the effect of cost-sharing for nonemergency outpatient utilization is more mixed (Cherkin, Grothaus, and Wagner, 1989; Remler and Greene, 2009).

**Cross-Price Effects**

Changing generosity for one healthcare service has both short and long-term implications for spending in other areas. Increasing copayments for outpatient care might decrease the number of office visits but increase hospitalizations or emergency department visits, for example. Chandra, Gruber, and McKnight (2010) found substantial offsetting increases in hospitalizations when copayments for outpatient and pharmaceutical use were increased. In this case, the cost of hospitalizations was borne by Medicare, while the benefits of the reduction in prescription use accrued to the state’s supplemental retiree plan. Gaynor, Li, and Vogt (2007) found that while increased copayments for prescription drugs reduced drug utilization and drug spending, consumers substituted towards other outpatient care. Other studies have also documented increased hospitalizations due to higher cost-sharing for either outpatient care or pharmaceuticals (Goldman, Joyce, and Zheng, 2007; Trivedi, Moloo, and Mor, 2010). The RAND Health Insurance Experiment found little effect of cost-sharing on overall subsequent utilization, with some exceptions described below.

Relative to trade-offs involving pharmaceuticals, trade-offs across other types of medical services are less clear. Phelps and Mooney (1993) analyzed utilization of common, and expensive, procedures in hospitals around the state of New York. Examples of the types of procedures include treatment for low-back injury, where the options are medical or surgical treatment. Another example is treatment of heart disease using bypass surgery (CABG, or coronary artery bypass graft) or balloon angioplasty (PTCA, or percutaneous transluminal angioplasty). The persistent finding is positive correlations between treatments, suggesting these do not substitute for each other in care.

**Cost-Sharing and Health**

Overall, considerable evidence suggests that demand-side cost-sharing affects utilization of healthcare services in quantitatively important ways. However, the optimal level and design of cost-sharing depends not just on how cost-sharing affects the quantity of health care consumed, but also on the health that consumption generates.

More generous health insurance coverage may accomplish a number of different social objectives—such as providing financial protection—but the incremental effect of cost-sharing on population health is likely quite modest. After all, medical and surgical treatments have a limited effect on health. As one example, between 1980 and 2000, the death rate for coronary heart disease was cut in half
(Ford et al., 2007), but only about half of this reduction came from better medical and surgical therapies. The rest came from behavioral changes like less smoking, a combination of behavior and pharmaceuticals that led to lower blood pressure and lower cholesterol, and other factors. Numerous other studies, such as the work of the Dartmouth Atlas documenting regional variation in the use of medical care (Wennberg, Cooper, and Dartmouth Atlas of Health Care Working Group, 1999), have found that greater utilization is not associated with better health outcomes (or worse initial health status or patient satisfaction with care) in the traditional Medicare system. In this large body of work, Wennberg and colleagues have demonstrated that end-of-life spending by Medicare beneficiaries varies widely across regions. Enrollees in higher-spending regions receive more care, but do not appear to live longer or otherwise experience better health outcomes (Fisher, Wennberg, Stukel, Gottlieb, Lucas, and Pinder, 2003b; Baicker and Chandra, 2004). Baicker, Buckles, and Chandra (2006) find similar results for the use of Caesarean-sections across counties: areas with high use seem to perform C-sections on incrementally healthier mothers, and additional use of this expensive procedure has no discernible beneficial effects on either maternal or neonatal mortality.

Evidence on the ultimate effect of cost-sharing on health outcomes is sparse. Many studies compare the insured to the uninsured (who have greater cost-sharing almost by definition), but as discussed above, such studies rarely account for all the other differences between the insured and uninsured—what they eat, where they live, whether they smoke or drink, social stressors, and even their genetic predisposition to disease. While there is strong suggestive evidence from observational and quasi-experimental studies that the uninsured have worse health outcomes than the insured, causality will be hard to pin down until results from a controlled experiment are available (Institute of Medicine, 2003; Institute of Medicine, 2009; Allen, Baicker, Finkelstein, Taubman, Wright, and Oregon Health Study Group, 2010).

Again, the RAND Health Insurance Experiment provides the baseline evidence. While families in the least generous plan spent nearly 30 percent less on medical care, there was little or no difference in general health. Of course, medicine has advanced since the 1970s, when that evidence was gathered. One particular change of note is that better but more costly drugs for many diseases are now available, often with substantial cost-sharing. As we discuss below, copayments can reduce compliance with recommended treatments, which can lead to worse health outcomes and higher medical costs (Goldman, Joyce, and Zheng, 2007).

Related concerns have been expressed about the role of cost-sharing in preventive care—one of the reasons that health saving account legislation and the recent Patient Protection and Affordable Care Act have special provisions to limit cost-sharing for preventive care. Many of the benefits of primary prevention accrue at older ages (Goldman et al., 2009). With average tenure in health plans sometimes as low as four years—and with the government financing care after age 65—employers and health plans clearly have an incentive to underinvest in preventive care that would increase health costs now but reduce such costs later.
The level of cost-sharing for prevention is quite likely higher than would be socially optimal.

**Heterogeneity in Effects of Cost-Sharing**

The social welfare effects of cost-sharing also depend on which patients are most price-sensitive—both in terms of health and in terms of demographics over which society may have distributional preferences. There is some evidence that the frequent users of health care (the sickest) are more likely to adjust utilization in response to changes in cost-sharing (Cherkin, Grothaus, and Wagner, 1989). While there is a lot of speculation that the poor have more-elastic demand, there is little evidence—in part because most studies rely on administrative claims data that do not include reliable information on characteristics such as race, education, or wealth (Goldman and Smith, 2002). Beyond the RAND Health Insurance Experiment, which found greater effects on low-income and sicker populations, most of the evidence on this point comes from nonexperimental studies of state Medicaid programs that introduced very modest copayments (Reeder and Nelson, 1985; Stuart and Zacker, 1999). Overall, the evidence to support the contention that low-income groups are more price sensitive is suggestive, but seems less than fully reliable.

Low-income sick populations may also be more likely to suffer adverse health outcomes from increased cost-sharing. The RAND Health Insurance Experiment examined many medical outcome measures in various subgroups of enrollees. Although there was no compelling evidence that higher cost-sharing led to worse health outcomes for the population as a whole, low-income participants who were in poor health appeared more vulnerable to adverse outcomes from higher cost-sharing. For example, poor people with high blood pressure had slightly higher mortality rates if they had high copayments. In addition, participants in the high-copayment group were as likely to reduce “appropriate” as “inappropriate” care, as defined by groups of medical experts. These findings mirror the evidence from the most careful studies in this area, as Levy and Meltzer (2004) conclude in their review.

**The Special Case of Pharmaceuticals**

Prescription drugs comprise a small but rapidly rising share of health spending—rising from 5 percent of national health expenditures in 1980 to more than 10 percent in 2009 (based on CMS National Health Expenditure data). We examine pharmaceuticals separately for several reasons. Pharmaceuticals are a healthcare good characterized by low marginal costs, relatively certain expenditure conditional on diagnosis, and chronic use. Pharmaceutical use is likely to be substitutable for some health services and complementary to others, but is often insured separately. The rapid change in insurance benefit design in this area—in both the private and public sectors, including the introduction of Medicare coverage—has allowed more sophisticated estimates of the effects of cost-sharing and benefit management.
Pharmacy benefits are often administered separately from the rest of health insurance by national firms whose enrollment can number in the tens of millions: Medco Health Solutions, for example, has 65 million members; approximately twice the number in Medicare. Most beneficiaries, including 90 percent of people covered by employer-based plans, are now covered by incentive-based formularies in which drugs are assigned to one of several tiers based on their cost to the health plan, the number of close substitutes, and other various factors (Kaiser Family Foundation and Health Research and Educational Trust, 2009). These formularies steer patients to generic or low-cost brand-name medications and encourage manufacturers to offer price discounts in exchange for getting their brand name products included in a preferred tier. These cost-sharing tools are often coupled with other mechanisms to control utilization, such as limiting access to specialists by requiring a referral from a primary care physician or prior authorization from the insurer, restriction of access to drugs through limited formulary lists of covered drugs, or a requirement to try cheaper drugs before moving on to more expensive ones.

In pharmaceuticals, the earliest studies on the link between cost-sharing and use find relatively modest effects, but they focus on small changes in copayments. More recent work indicates that the responses to increased patient cost-sharing are stronger (Joyce, Escarce, Solomon, and Goldman, 2002). Overall, these studies suggest a price elasticity for drug expenditures of 0.2 to 0.6, similar to results from the RAND Health Insurance Experiment. The range reflects differences in responsiveness by drug class and its importance; for example, increased cost-sharing may decrease “nonessential” drug use, like antihistamines, more than “essential” drug use such as antihypertensives and oral hypoglycemics (Goldman et al., 2004).

The Medicare Part D program—introduced in 2006—constitutes a research-friendly experiment in cost-sharing. Providing insurance to a broad swath of elderly led to a 13 percent increase in prescription drug use and a 19 percent reduction in out-of-pocket spending on drugs (Lichtenberg and Sun, 2007). The legislation that enacted Part D gave plans broad discretion, within certain guidelines, to decide which drugs to include in their formularies; the strengths and dosage of covered drugs; cost-sharing arrangements; and types of utilization management to control drug costs and use. The hope is that this competition will foster further innovation in the form of insurance benefits that will ultimately improve beneficiary health. Furthermore, work by Duggan and Scott Morton (2010) suggests that insurers’ bargaining power over pharmaceutical manufacturers may have more than offset the moral hazard generated by increased insurance coverage.

There are also substantial cross-price effects from changing copayments for pharmaceuticals. Overall, Gaynor, Li, and Vogt (2007) find that increasing drug copayments in private insurance plans leads to a persistent decrease in drug spending but that 35 percent of those savings are offset by increases in other medical spending. Chandra, Gruber, and McKnight (2007) find similar effects among retired public employees in California. In fact, among the subpopulation of chronically ill seniors, the increase in inpatient expenditures exceeds the cost-savings resulting from lower prescription drug use and office visits. This vulnerability of frail populations to
cost-sharing has been identified in other work as well (Tamblyn et al., 2001; Soumerai, Ross-Degnan, Avorn, McLaughlin, and Choodnovskiy, 1991).

A number of studies have looked at the possible health consequences of cost-sharing and drugs. Most studies do not look at health directly, but rather markers such as hospitalizations and changes in spending on other medical services. Goldman, Joyce, and Zheng (2007) review the literature. Better but more costly drugs for heart disease, cancer, mental illness, and other diseases are available, but these require patients to pay more money out-of-pocket. As a result of these higher out-of-pocket payments, some share of patients prescribed these better drugs do not take their medication. Their poor compliance can lead to worse health outcomes through uncontrolled hypertension, high cholesterol, untreated psychiatric illness, and resistant bacterial infection to name a few. It can reduce productivity and significantly increase medical costs as well. The authors find that the optimal copayment for cholesterol-lowering therapy is $0 or may even be negative—that is, patients should be paid to take their drugs. Adverse health consequences of cost-sharing have been found for patients with congestive heart failure, lipid disorders, diabetes, and schizophrenia (Soumerai, McLaughlin, Ross-Degnan, Casteris, and Bollini, 1994).

**Spillover Effects of Cost-Sharing on Aggregate Spending**

The socially optimal level of cost-sharing may be different from the privately optimal level, insofar as the care received by one patient may have spillover effects to the care received by others. Changes in insurance structure for one group can have broader ramifications for practice style, because patients with different types of insurance are often served by the same networks of healthcare providers. For example, the average managed care patient in the 1990s was treated by physicians whose patient panel was comprised of at least 25 percent fee-for-service Medicare patients as well as additional privately insured patients not in managed care (Glied and Zivin, 2002). To the extent that cost-sharing affects one patient’s preferences for intensity of care, those changes may be transmitted to the wider set of patients because providers adopt consistent practice styles and hospitals invest in fixed-cost technologies that are then used more widely.

For purposes of thinking about demand-side cost-sharing, the existing evidence on spillovers has two main weaknesses. First, it is focused mainly on how the spread of managed care affects practice patterns for those not in the managed care program. But while managed care often has different demand-side cost-sharing, it also has very different supply-side payment incentives. Furthermore, while managed care plans had substantially lower average cost-sharing than fee-for-service plans in the 1990s, as Table 1 shows, in recent years average cost-sharing in fee-for-service plans has dropped (perhaps reflecting in part a different mix of patients remaining in the smaller fee-for-service pool). Second, the existing evidence focuses primarily on short-term spillovers, while the largest spillovers may arise in the long run, driven by changes in system infrastructure and capacity, as well as in workforce composition.
That said, the evidence on the systemwide effects of changes in insurance coverage does suggest that optimal insurance design could yield greater benefits than an examination of individual responses alone would imply.

Several studies provide evidence that physicians adopt practice styles that apply across differently insured patients, and managed care penetration affects practice patterns for both managed and non-managed care patients across a variety of realms (for example, Glied and Zivin, 2002; Baker and McClellan, 2001). Managed care is intended to constrain the use of high-cost services, and to the extent that it succeeds, there is some evidence that physicians adopt that lower-intensity style with non-managed care patients and that there is less investment in infrastructure that would drive higher systemwide use. Managed care penetration is related to the physician workforce, hospital capacity, and adoption of new technologies. As one example, Baker and Wheeler (1998) find that greater managed care penetration is associated with slower diffusion of the use of MRIs and MRI facilities. The reduced utilization and slower technological diffusion that come with increased managed care also seems to reduce use in non-managed care populations (Baker, 1997; Chernew, DeCicca, and Town, 2008). A review of the literature by Chernew, Hirth, Ermann, and Fendrick (1998) concludes that managed care appears to moderately slow overall spending growth, although not by enough to keep healthcare spending from growing as a share of GDP.

Short-run spillovers in practice patterns may be swamped by long-run effects on investment in fixed-cost infrastructure. One of the best pieces of evidence on the systemwide effects of large-scale changes in patient cost-sharing comes from Finkelstein (2007). She estimates that the introduction of Medicare (which dramatically reduced the price of health care for millions of patients) was associated with a 37 percent increase in hospital expenditures, stemming from both higher spending at existing hospitals and new hospital entry. This increased spending suggests that the introduction of Medicare was associated with fixed-cost investments that likely spilled over to all payers in the market.

Thus, while the literature provides evidence of the interconnectedness of healthcare markets, the issue of how demand-side cost-sharing for some might affect practice patterns more broadly has yet to be developed. It is possible that demand-side cost-sharing might have smaller (and shorter-term) spillovers than the spread of managed care, because demand-side incentives have less of a direct effect on the incentives of healthcare providers. However, if demand-side cost-sharing were increased, the long-term effects on size and composition of the physician workforce, hospital capacity, and use and adoption of medical equipment and technologies might be substantial.

**Alternative Cost-Sharing Designs**

Cost-sharing has always been seen as a way to protect against moral hazard and discourage overconsumption of services with little social value. However, with
the introduction of better information about demand and health consequences, the design of insurance benefits and cost-sharing takes on the additional role of providing incentives for some kinds of care and disincentives for others.

In some cases, health insurers are liable to reduce or eliminate cost-sharing for services that both save money and improve health. Genuinely cost-saving interventions are rare, but they do exist. Rosen, Hamel, Weinstein, Cutler, Fendrick, and Vijan (2005), for example, find that making ACE inhibitors (which dilate blood vessels to reduce blood pressure) freely available under Medicare both improves survival and reduces total Medicare spending. Drugs become an especially likely category in which to find cost-saving interventions once one recognizes that the true (social) cost of producing more units of an already-invented drug is tiny, perhaps pennies.

One difficulty, of course, is identifying the services that are cost-saving or cost-effective and then ensuring that only the population with those high benefits has access to the lowest cost-sharing. Even medical technologies that start off as cost-saving for a small population often diffuse to marginal populations who pay the same cost but derive little, if any, therapeutic benefit. The challenge is to design a cost-sharing arrangement that reflects the heterogeneity in treatment response—which will require both additional research and innovative insurance approaches.

**Value-Based Design**

Value-based insurance design is one such approach. It is built on the premise that more-sophisticated cost-sharing structures can produce more-efficient utilization outcomes (Chernew, Rosen, and Fendrick, 2007; Chernew et al., 2010). The idea is to set up guidelines that would reduce copayments for patients who are most likely to benefit from a service, as determined using available clinical evidence. Patients for whom the therapeutic benefit is modest—or the evidence is mixed—would face higher cost-sharing. For example, a plan might charge lower or no copayment for cholesterol-lowering drugs to those at high risk for an adverse cardiac event and higher copayments for those at low risk. Optimal copayment structures would take own-price and cross-price elasticities into account. If raising copayments for a drug would reduce pharmaceutical use but increase hospital use, an insurer covering both of those services should set copayments accordingly. The newly-enacted health reform also bases cost-sharing on income (see also Furman, 2007).

Careful empirical studies suggest modest benefits from a value-based approach to drug therapy (Rosen, Hamel, Weinstein, Cutler, Fendrick, and Vijan, 2005; Goldman, Joyce, and Karaca-Mandic, 2006; Chernew, Rosen, Fendrick, 2006; Chernew et al., 2008.). For example, Goldman, Joyce, and Karaca-Mandic (2006) estimate that free provision of drugs to patients on cholesterol-lowering therapy would reduce their total health costs by 3–5 percent over the next four years. Anecdotal evidence suggests more dramatic savings. The most publicized example of value-based design comes from employees of Pitney Bowes (Mahoney, 2008). Over time, the firm reduced copayments for several classes of medications for chronic conditions, including diabetes, hypertension, and asthma, in combination
with other health initiatives. Internal assessments of the changes suggest that that higher pharmacy costs to the employer have been more than offset by lower rates of emergency department visits and avoidable hospitalizations, with the causal pathway being improved medication compliance. While the results are striking, it is difficult to isolate the effects of benefit redesign from disease management programs, wellness initiatives, and other approaches the firm has used to improve employee health. Further, there has been little discussion of the costs of administering these programs.

Value-based insurance design for demand-side cost-sharing seems potentially a very useful tool for restraining the rise in healthcare costs with little or no cost to health—indeed, by encouraging the use of certain services, it may even improve health. But it faces some challenges, as well.

First, considerable research needs to be done on what guidelines should be used to classify patients and to set the level of copayments or deductibles; in particular, it would help to look at a variety of contexts other than pharmaceuticals used for treatment of chronic conditions. Identifying high- and low-risk patients across a wide array of clinical conditions can be expensive and at times imprecise. Insurance design is further complicated by the likely reality that patients often do not act as far-sighted rational consumers. Pauly and Blavin (2008) note that in value-based insurance design, optimal cost-sharing should be determined not just by a comparison of true resource costs and associated improvements in health; in particular, if many patients are short-sighted or myopic and undervalue certain types of care, cost-sharing for that care could be reduced. Similarly, Newhouse (2006) suggests subsidization of cost-effective care whose benefit is not immediately apparent. If these guidelines aren’t carefully drawn, they can lead to perverse incentives: if sicker people are charged lower copayments than healthy people, some price-sensitive, relatively healthy people could in theory postpone medical care until they are sicker, or may even behave in ways that make themselves sicker in order to be eligible for lower copayments.

Second, any party offering value-based insurance design must be concerned about risk segmentation. For example, a health plan that provides outstanding treatment for heart disease or heart attacks, and that makes this expertise widely known, could find itself at a competitive disadvantage because it would tend to attract a population with severe heart disease. Would an employer really want to be known as the company where the really sick employees get the best health benefits? Selection is mitigated if a regulator or purchaser develops a comprehensive risk adjustment scheme, if all people participate in health insurance plans with similar actuarial value, or if it is difficult for outsiders to observe the quality of care. An ongoing research effort has sought to develop systems that adequately measure patients’ health risks. There is less evidence on how individual features of a plan’s benefit package affect the mix of health risks, although some anecdotal evidence suggests that offering more generous drug benefits makes a plan less competitive relative to its peers (Hellinger and Wong, 2000). An employer or health plan that is considering value-based insurance design must be concerned
that it will attract those with the greatest health risks and the least incentives to improve their health.

Two-Part Pricing and Copayments

Our recommendation that certain healthcare services, like pharmaceuticals used for managing chronic healthcare conditions, might optimally have low or even zero copayments raises other questions about optimal pricing.

Goldman, Jena, Philipson, and Sun (2008) have proposed an alternative approach to pricing pharmaceuticals that holds promise for improving patient compliance with lower copayments, and without increased costs to insurers or lower profits to manufacturers. In this model, pharmaceutical firms would charge health insurers a license fee for each patient receiving unfettered access to their product(s) up to some therapeutically optimal level (for example, twelve monthly prescriptions per year). In return, pharmaceutical firms would sell their drugs to the plan at very low cost, rather than at the typical mark-ups that characterize patent-protected, brand medications. The health plan would then pass this cost structure on to its beneficiaries. That is, patients would also pay an annual “licensing fee” for each drug they take, at the time they start taking it; after paying that fee, patients would then obtain medication with nominal or nonexistent copayments. In effect, insurers would purchase drug licenses from manufacturers and patients would purchase drug licenses from insurers.

The nonmedical world offers numerous examples of this kind of pricing structure. Rather than charging a fee every time people start their computers, Microsoft essentially charges a one-time fee for the use of Windows. What makes pharmaceuticals similar to these products—and distinguishes them from other health services—is the very low cost of production and few good substitutes. A properly chosen drug licensing fee combined with very low copayments seems like a potential win for patients, health plans, insurance companies, and pharmaceutical firms.

Of course, not all drugs would be good candidates for this approach. Two-part pricing is least distortionary when the benefits of treatment can be readily observed and occur with some immediacy, and when the course of treatment is more than a few doses. Some worry that high up-front costs might discourage the initiation of treatment, although this concern is mitigated when the insurer is paying the fee, or perhaps it might even be mitigated through consumer loans. With the continued arrival of expensive specialty pharmaceutical products and devices, further exploration of this pricing model is well warranted.

Discussion and Broader Implications

Demand-side cost-sharing can play a role in addressing the problems of high and rapidly rising healthcare spending and the prospect of substantial future increases. But increases in demand-side cost-sharing should not be uniform. Even
as cost-sharing should rise substantially in many areas, certain health goods and services, and certain populations, should probably face lower demand-side cost-sharing. How might public policy seek to bring about this outcome?

On the public side, the government plays an enormous role as a purchaser in the U.S. healthcare system. Yet much of the recent Medicare reform effort focuses on the supply side of the market; for example, making providers more accountable for patient outcomes, changing the way providers are reimbursed, and the like. Less attention has been focused on the demand side. Even the limited cost-sharing in the Medicare program now is often undone by the purchase of wrap-around insurance plans that pick up copayments, replacing the limited potential exposure of beneficiaries to marginal costs with a fixed premium (and generating increased utilization with costs that are largely borne by the Medicare program rather than the secondary insurer). Numerous studies, such as the work of the Dartmouth group on regional variation in the use of medical care, have found that greater utilization is not associated with better health outcomes in this population (Fisher, Wennberg, Stuckel, Gottlieb, Lucas, and Pinder, 2003a, b), and spending can differ across regions substantially. The evidence from the RAND Health Insurance Experiment suggests that replacing the Medicare benefit with a catastrophic plan would reduce costs by about 30 percent. The federal government has additional policy levers in its role as employer: with about eight million covered lives in the Federal Employee Health Benefit Plan, there is an opportunity to implement more sophisticated insurance design. The most popular plan now has copayments similar to the typical private employment-based managed care plan.

However, as this paper has emphasized, an across-the-board rise in demand-side cost-sharing would reduce use of both low-value and high-value services. Ideally, higher copayments should take into account those situations in which discouraging the use of one health service—like preventive care or pharmaceuticals to manage chronic disease—could lead to worse health and higher medical spending in the future. Making such connections requires looking across the artificial administrative divisions in these programs. For example, Medicare separates drug coverage under Part D from medical coverage under Parts A and B. The private plans that provide stand-alone Part D drug insurance coverage do not accrue any savings if they design their cost-sharing in a way that will reduce other inpatient and outpatient spending. This discourages pharmacy benefit designs that—while they may be slightly more expensive—could improve patient health. (This design also may give an advantage to Medicare Advantage managed care plans with integrated drug benefits, which are at-risk for all of a beneficiary’s care. These plans internalize all the benefits from strategic formulary design, and an open research question is whether this will lead to different formularies for these plans versus the Part D stand-alone plans.)

On the private insurance side, there may be regulatory barriers to adjusting copayments in the ways the value-based insurance design literature suggests. Varying copayments for different services is surely allowable, but variations based on individual health or on dividing the population into certain groups might run afoul of current regulations. In addition, the short-term nature of annual private
health insurance contracts leads to underprovision of coverage of those services that save money in the long-run. Attempts to address this contracting problem in the private sector—perhaps through long-term health insurance contracts—would create strong incentives to develop better cost-sharing arrangements.

References


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