

Cost-Sharing: A Blunt Instrument

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Abstract

Cost-sharing is a health care cost-containment technique in which health care services are partially paid for by patients out of pocket. Cost-sharing can reduce non-cost-effective care, but it can also undermine the financial protection and access values of health insurance. We review the empirical evidence published since the mid-1980s about cost-sharing's effect on utilization, expenditures, health, and adverse consequences, including how the effects vary by form of care, by health status, and by sociodemographic characteristics. Some cost-sharing, such as emergency department copayments, reduces utilization without any harmful effects, whereas other cost-sharing reduces valuable care such as maintenance drug use among the chronically ill. Cost-sharing should be used judiciously, with attention taken not to reduce highly cost-effective care.

Cost-sharing: any kind of out-of-pocket payments made by patients for health care services

Deductibles: the amount patients must pay out of pocket annually before insurance coverage begins

Coinsurance: a fixed percentage of the cost of care (e.g., 20% of hospital costs)

CDHP: consumer-directed health plan

INTRODUCTION

Growth in health expenditures has outpaced economic growth for decades; thus health care costs constitute an ever larger share of public and private resources. General Motors, which pays more in health care costs per car manufactured than it does for steel, exemplifies the challenges faced by employers, both large and small, as well as by governments (27). With the backlash against managed care, and a sense that managed care's cost-containment potential has been reached, the use of cost-sharing, another approach to cost containment, is growing. Deductibles, coinsurance, and other forms of cost-sharing have a long tradition in health insurance, as they have in home, auto, and other forms of insurance. In health insurance, cost-sharing refers to any kind of out-of-pocket payments made by patients for health care services (see sidebar, Forms of Cost-Sharing).

Although cost-sharing has been widespread for some time, its levels have increased considerably in recent years (34, 46). In PPOs (preferred provider organizations), the percent of patients paying a \$20 or higher copayment tripled between 2000 and 2007, increasing from 17% to 61% (12). Over the same time period, deductibles more than doubled from \$187 to \$461. In public programs, Medicare includes substantial cost-sharing, and recent federal legislation permits cost-sharing at higher levels

in Medicaid, which provides coverage for low-income people (13).

In addition to cost-sharing in traditional health insurance, some consumers now have access to new health spending accounts where they spend only their own money up to some "high" deductible at which point a health insurance plan kicks in. Such accounts with high deductible plans are called consumer-directed health plans (CDHPs). CDHPs have not yet proven very popular. Support for CDHPs, like support for cost-sharing in general, is partly ideological: It emphasizes consumer responsibility and consumer autonomy.

Cost-sharing is a seemingly obvious solution to our nation's health care cost problem: If people have to pay more for something, they will buy less of it. However, the potential drawbacks also seem obvious: Cost-sharing could reduce valuable medical care. For example, cutting back on health care might cause health problems in the long run, resulting in avoidable mortality or morbidity and possibly higher long-term health costs. Cost-sharing's usefulness depends on meeting several conditions. First, low-value care, care with relatively low or nonexistent health benefits, must be at least minimally prevalent. Second, cost-sharing must reduce the use of low-value care. Third, cost-sharing must avoid reducing valuable care. To determine the merits of cost-sharing, we need evidence about its effects on utilization, expenditures, and health.

The effects of cost-sharing—and therefore its desirability—are unlikely to be uniform. Cost-sharing may have a different impact on different forms of medical care. For example, the impacts of pharmaceutical cost-sharing may not generalize to mental health or the emergency department. Furthermore, cost-sharing may affect subgroups of people differently. It is not a priori clear how sensitivity to cost-sharing would vary by individuals' health status. Individuals in worse health may be less sensitive because they feel that the health care is more valuable. On the other hand, those with chronic health conditions may be more sensitive, due to the potentially larger financial effects.

FORMS OF COST-SHARING

There are three widely used forms of cost-sharing: copayments, coinsurance, and deductibles. Copayments require patients to pay a flat fee for each medical service sought or product purchased (e.g., \$10 for a doctor visit). Coinsurance requires patients to pay a fixed percentage of the cost of care (e.g., 20% of hospital costs). Deductibles are the amount one must pay out of pocket annually before insurance coverage begins. Insurance coverage also often includes other forms of cost-sharing, such as caps on specific services. Last, some insurance plans have an out-of-pocket maximum, which limits the total out-of-pocket liability, reducing the potential impact of cost-sharing on patients.

Either way, if the chronically ill reduce maintenance care, they could suffer poor health consequences in the long term.

Patients' income or wealth may also affect their sensitivity to cost-sharing because cost-sharing works through financial incentives on patients. Many have voiced concerns about the impact of cost-sharing on vulnerable populations, including those with low incomes and racial and ethnic minorities (3, 47, 48). Some of today's cost-sharing reforms, such as increased cost-sharing in the Medicaid program, affect subgroups that may be more vulnerable. CDHPs, in contrast, disproportionately enroll individuals of higher socioeconomic status, who may be less sensitive (25).

We have several tasks in this review. First, we discuss conceptually the theoretical arguments for and against cost-sharing, including the various ways that cost-sharing could affect health care utilization, health care expenditures, and health. The theoretical analysis is critical for understanding the context of why cost-sharing has its advocates and critics. Second, we review the empirical evidence about the effects of cost-sharing since the mid-1980s. We examine the evidence in each area of medicine on utilization and cost, as well as on downstream utilization and health. We further examine how cost-sharing affects different subgroups, including those with poorer health status and those with varying socioeconomic characteristics.

THEORY OF COST-SHARING

The Value and Harm of Health Insurance

According to traditional economic theory, the reason for insurance—of any kind—is financial protection. If fire destroys your home, insurance provides the funds to replace or rebuild it. Without that insurance, your wealth would be substantially reduced. If you have a heart attack, health insurance pays the hospital, the surgeon, etc. If you paid them out of pocket, your wealth would be substantially reduced.

Health insurance has another value: health protection. If you have a heart attack, you might not have sufficient funds to pay for all the recommended care. Or you might decide that those funds—much of your accumulated wealth—are needed for housing and education. In those cases, without health insurance you would receive less health care. Health insurance provides access to health care, usefully increasing the care one receives (40, 41).

Unfortunately, health insurance has an undesirable side effect: It also increases the use of care that has little value. If patients are not paying out of pocket and/or physicians benefit financially from treatment, treatment decisions are made without regard for the financial costs. Care that is high cost and low (or even negative) benefit may be chosen: care that is not cost-effective. Health insurance, therefore, can result in excessive health care.

Health care costs paid by insurance are ultimately paid for through health insurance premiums. Premiums may be paid directly by consumers; through taxes for government-provided insurance such as Medicare; or through lower wages, higher goods prices, or lower profits for employer-provided insurance. Ultimately, all health care costs are paid by people who give up other things. Therefore, we want to use only care that is cost-effective—worth what we are giving up to pay for it—and we need cost-containment techniques to ensure that this occurs.

Cost-Sharing: Savior and Destroyer of Health Insurance

The traditional economic argument for cost-sharing is as follows: In a regular market, goods and services are bought without insurance, and consumers trade off the benefits of purchasing more and better goods with the costs. Consumers reveal the benefits of a good by their willingness to pay for it. Only goods whose benefits exceed their costs are consumed. In contrast, with health insurance, consumers pay little or none of the health care costs. So, they consume more health care than they would if

Copayments: a flat fee for each medical service sought or product purchased (e.g., \$10 for a doctor visit)

they paid for the care in full. The cure for this excessive care is cost-sharing, the partial undoing of insurance to bring the health care consumed closer to what it would be without insurance.

Nyman (40, 41) has analyzed the traditional argument, illustrating several interrelated problems. First, the argument implicitly defines the benefits of health care only by willingness to pay out of pocket: If one would not pay for it out of pocket, it is not worth it, and society wants cost-sharing to eliminate it. Second, with the traditional argument, the value of insurance is only financial protection, not access. In contrast to the traditional argument, it is in society's interest to reduce the excessive use of care caused by insurance but not the use of valuable care.

What if cost-sharing does not reduce care at all? Glied & Cuellar (21) illustrate that if cost-sharing does not reduce care at all, then it reduces financial protection for less healthy individuals without providing any cost-containment. Cost-sharing with no impact on utilization is harmful to financial protection and thus undesirable.

Traditional economic analysis is based on the idea that individuals, within the constraints of their knowledge, make rational trade-offs on the basis of the costs and benefits of alternatives. However, an extensive psychology and behavioral economics literature shows that people are systematically biased, particularly for decisions that involve uncertainty or trade-offs over time (16). For example, people consistently favor the present over the future. Health care decisions almost always involve uncertainty and often involve the future. Even modest cost-sharing may dissuade people from preventive care that might provide great value in the future. Behavioral economics suggests that cost-sharing should exclude valuable care that people systematically under value.

In sum, we need cost-containment techniques to reduce the excessive care caused by health insurance, and cost-sharing can do that. Unfortunately, cost-sharing can also reduce both the access and the financial protection val-

ues of health insurance. Cost-sharing could be useful provided it (a) reduces harmful, worthless, or non-cost-effective care; (b) does not reduce cost-effective care; (c) does not cause substantial financial harm; and (d) does not create other harmful side effects.

Cost-Sharing Mechanisms

The mechanisms through which cost-sharing reduces expenditures are critical to judging its usefulness and to evaluating the generalizability of particular studies. Initial theoretical and empirical treatment of cost-sharing focused on its potential to reduce expenditures by reducing the quantity of care. For pharmaceuticals, this could mean never filling an initial prescription, discontinuing a medication, or taking less than prescribed later on. Visit copayments could affect any kind of visit, whether preventive, maintenance for chronic condition, or acute. If such visits improve health in a way that reduces further more intensive care, reducing the number of visits could backfire in the long run. However, the small area variations literature suggests that some visits are of very little value (e.g., 42).

Current advocates of CDHPs also emphasize the potential for cost-sharing to cause price comparison shopping and thus reduce the price of health care. Examples include shopping for a doctor who charges less for office visits, researching which hospital has the lowest price for a given service, switching to a cheaper mail-order pharmacy, or substituting a generic or lower-tier brand drug. Such an effect would seem valuable because growing evidence suggests that U.S. health expenditures are larger than those in other countries because of our higher prices, particularly in physician salaries and pharmaceutical prices (1).

Another possible mechanism through which higher cost-sharing could reduce expenditures is sparking improved self-care, such as exercise and diet, which reduces the need for medications or other care. Obviously, this channel would be a win for everyone.

The literature typically assumes that patients will be the ones reacting to cost-sharing. However, treatment decisions are made largely

by physicians. Whether or not physicians are aware of patient cost-sharing and how they would react to that knowledge are extremely important areas of concern (44).

So far, we have spoken of cost-sharing in general terms. However, coinsurance, deductibles, and copayments are all different (see sidebar), and they may produce different effects. Coinsurance makes those with high expenditures, such as those taking high-priced drugs, more vulnerable. The cost-sharing forms can also interact with the maximum out-of-pocket limits that some health plans have. Raising the deductible without raising the out-of-pocket maximum actually reduces the amount of cost-sharing for many, particularly those with higher expenditures (46). Even when different cost-sharing forms affect the same form of medical care (e.g., pharmaceuticals or hospital care) to the same degree, it is not clear that patients would perceive them to be the same.

THE RAND HEALTH INSURANCE EXPERIMENT OF THE 1970s AND THE NEED FOR MORE RECENT EVIDENCE

The debate over the impact of cost-sharing has gone on for decades. The RAND health insurance experiment (HIE) of the 1970s still provides the gold standard of empirical evidence on the topic, informing policy today. The HIE randomly assigned people to different coinsurance levels and was therefore able to draw strong conclusions about the causal effects of cost-sharing. It found that those with higher coinsurance rates used less care than did those who had plans with less cost-sharing, reducing health care expenditures. The vast majority of participants experienced no detectible adverse health consequences from the reductions (39).

However, the HIE also found that cost-sharing reduced both appropriate and inappropriate health utilization, including preventive care. Moreover, cost-sharing resulted in worse health outcomes for the sick poor, including 10% higher mortality for poor individuals with hypertension.

Generalizing the HIE's 1970s findings to cost-sharing expansions today may not be appropriate for several reasons. First, medical technology has changed dramatically, including for some very prevalent conditions. For example, more flexible, convenient, and effective insulins and blood sugar meters may help improve long-term health; therefore, diabetics who pick the cheaper versions owing to cost-sharing may suffer in the long run. Second, the prevalence of conditions has also changed, with the growth of diabetes, the decline of cardiovascular disease, and entirely new conditions, such as HIV/AIDS. Third, some advocate cost-sharing at levels that are higher than utilized in the HIE. Cost-sharing that applies only when overall health expenditures are modest will likely have quite different effects from that which applies to much higher levels of health care expenditures. Fourth, other aspects of the health care delivery system, such as the use of cost-containment techniques such as utilization review (UR), have changed substantially since the 1970s. Using UR, insurers must approve the medical necessity of hospitalizations on the basis of a patient's clinical condition, before agreeing to cover it, reducing low-value inpatient visits that cost-sharing could eliminate. Fifth, the HIE deliberately studied a nonelderly and basically healthy population. Its effects may not generalize to the elderly or to an even slightly less healthy population.

REVIEW OF EMPIRICAL EVIDENCE

We review the empirical evidence on cost-sharing since the mid 1980s. First, we examine for different types of health care the effects of cost-sharing on utilization and costs. Where possible, we also examine the effects on health or potential adverse outcomes, such as subsequent hospitalizations. We then review evidence on how the effects of cost-sharing (across all forms of medical care) vary by subgroups based on health status and sociodemographics.

No other randomized experiments have been performed since the HIE; therefore, all

Health insurance experiment (HIE): a randomized experiment in the 1970s that found that cost-sharing reduced health care utilization and expenditures with almost no effect on health

UR: utilization review

the empirical literature reviewed is based on observational studies. People often have substantial choice in how much cost-sharing their plan has, and their choice may be driven in part by their health status or health care utilization. Therefore, simple cross-sectional studies may suffer from (cost-sharing) selection bias and may not be trustworthy. Studies with control variables reduce the selection bias and are somewhat more compelling. Cross-sectional studies are most compelling when cost-sharing variation is exogenous, not driven by anything related to enrollees' health or utilization. Natural experiments in which people's cost-sharing changes on the basis of factors beyond their choice (e.g., employer changing options) provide fairly compelling evidence. Studies that compare the impact of a natural experiment with what happens to a similar comparison group not exposed to the change provide the most compelling available evidence.

We do not have sufficient page lengths to discuss the methodologies of particular studies. However, in our review we give greater weight to studies with more compelling causal evidence. Because the effects of cost-sharing could be long-term, the (rare) longitudinal studies that examine longer-term outcomes are given particular weight. We also try to consider the practical significance of the magnitude of the effects, as well as their statistical significance. Now is an exciting time to review this literature because several recent studies are methodologically strong and have considered outcomes spanning several years.

COST-SHARING FOR DIFFERENT TYPES OF MEDICAL CARE

All Forms of Health Care Utilization

The cost-sharing in the HIE was coinsurance that applied to all forms of medical care, including inpatient hospital care. Since then, no literature has examined the effects of cost-sharing applied to all forms of medical care per se. However, we can use the literature on Medicare supplemental insurance and CDHPs to learn about

the effects of cost-sharing applied to all forms of care.

Medicare has substantial cost-sharing for both physician and hospital care. Beneficiaries may have supplemental insurance that largely reduces the cost-sharing. Unfortunately, selection—differences between those with and without supplemental insurance—diminishes our ability to draw strong conclusions. Atherly (2) reviewed the literature on supplemental insurance for Medicare. Studies, particularly those that controlled for selection, implied that supplemental insurance increased expenditures, often by more than 10%, although that was not a uniform finding. Those subject to Medicare's cost-sharing tend to have lower utilization, including preventive services, and may not receive care considered adequate by some in the medical community. However, direct evidence has not demonstrated any effects on health.

The cost-sharing of CDHPs is a high deductible that applies to all forms of care, sometimes excepting preventive care. A small and very recent literature examines the effects of CDHPs. We examine the effects of CDHPs on various forms of medical care in the sections on cost-sharing for those forms of care.

Inpatient Care

The last study to address hospital deductibles specifically was published in 1984 and analyzed a brief United Mine Workers episode widely anticipated (correctly) to be temporary (51). It found that hospital admissions fell by 29%, but expenditures per admission increased. Although the evidence from Medicare supplemental insurance is relevant to cost-sharing specifically directed at inpatient care, we have no ability to disentangle the inpatient care cost-sharing.

In theory, CDHPs have high deductibles and thus the potential to affect inpatient care decisions. In practice, however, many employer-based CDHPs have deductibles of ~\$1500, and these are the CDHPs that investigators have studied. The specialist care likely to

accompany a hospitalization will eat up a substantial share of the deductible. Therefore, the deductible is unlikely to influence intensity of care during hospitalization and may have little influence over whether to be hospitalized.

Feldman and colleagues (14, 43) examined CDHPs with such relatively low “high” deductibles (\$1500 for individual policies). They found that hospitalizations actually increased for CDHPs relative to all plans, although other forms of care fell relative to some other plans. The reasons for these inconsistent results were not clear. CDHP members may have used less outpatient care and consequently got sicker and needed more inpatient care. Perhaps the very generous CDHP terms actually reduced cost-sharing for the CDHP relative to other options and encouraged inpatient care. Or perhaps the relatively high-income people in the study are less sensitive to cost-sharing. Several other explanations are also possible.

Pharmacy Cost-Sharing

The post-HIE literature on cost-sharing is overwhelmingly dominated by pharmaceutical cost-sharing. An entire journal issue on pharmaceutical cost-sharing illustrates the continued growth, which stems in part from changes in pharmaceutical cost-sharing providing opportunities for strong empirical studies (15). Recently, Goldman et al. (23) and Gibson and colleagues (20) reviewed the 1985–2006 and 1974–2005 pharmaceutical cost-sharing literatures, respectively. In assessing pharmacy cost-sharing, we primarily summarize their findings and discuss a few important recent publications and working papers.

On average, a 10% increase in pharmaceutical cost-sharing (measured as equivalent coinsurance) results in decreases of 2%–6% in pharmaceutical spending. Ideally, the reduced usage occurs primarily from less valuable drug usage, whereas use of valuable drugs, particularly underused drugs such as antihypertensives, antidiabetics, and bronchodilators, is not reduced much. Several studies compared sensitivities to cost-sharing between more and less

essential drugs, although essential drugs were not defined consistently. The evidence is mixed. Some studies (many with the stronger designs) find less cost-sharing sensitivity among users of essential drugs. Still, many studies, particularly those focused on chronically ill subgroups, show that cost-sharing reduces use of essential drugs.

Even modest reductions in essential drugs could hurt health outcomes. They could even undermine the original cost savings if they result in increases in other medical care—outpatient, inpatient, or emergency care. Very little direct evidence exists on the effects of pharmaceutical cost-sharing on health outcomes. However, some evidence suggests that pharmaceutical cost-sharing increases emergency department use and hospitalizations [summarized in Goldman et al. (23)]. There is less evidence about resulting increases in outpatient care. A before-and-after study in Quebec found that increased pharmaceutical cost-sharing reduced the use of essential drugs, which in turn increased emergency department visits but not heart attack mortality (58). It also reduced the use of nonessential medications without apparent adverse effect.

Some recent working papers suggest that the costs of additional inpatient care could mean net cost increases, driven largely by the chronically ill (6, 19). Several studies that focus solely on chronically ill subgroups (including patients with rheumatoid arthritis, heart failure, diabetes, schizophrenia, and lipid disorders) show that cost-sharing increases at least one of the following: office visits, hospitalizations, or emergency care. Some studies examined a selective reduction in cost-sharing for selected important chronic medications and found practically significant increases in their use that might be associated with practically significant reductions in emergency room and hospital usage (11, 22). Zeber et al. (64) found that schizophrenic veterans reduced their refills of psychiatric drugs, resulting in a modest increase in inpatient admissions. Although the result was a net cost savings for the veterans health care system, the reduced psychiatric drug usage

could have hurt veterans' health and society at large.

However, in another recent working paper, Khan and colleagues (33) use time variation in pharmaceutical drug overcoverage among Medicare beneficiaries to see if there is associated time variation in health measures, including self-reported health status and activities of daily living. They find no relationship. However, their results have large confidence intervals, so they cannot rule out practically significant effects on hospitalization or moderately practically significant effects on health status.

Moreover, some detrimental health effects may take many years to present, for example, those resulting from cutting out antihypertensives or antidiabetics. Greene et al. (24) found that CDHP cost-sharing did not cause participants to reduce drugs that affected their quality of life, including antidepressives. However, they did reduce antihypertensives and lipid-lowering drugs that affect health in the long run.

The mechanism of reduced usage with pharmaceutical cost-sharing is clearly important. Many pharmacy cost-sharing schedules have different rates for generic drugs, preferred brand-name drugs, and nonpreferred brand names. The changes to those regimes provide examples for studying responsiveness to financial incentives. Some evidence demonstrates that patients switch to preferred brand names, mail-order pharmacy, and over the counter for cost savings. Other evidence indicates a reduction in therapy adoption and the evidence about adherence (refill compliance) and generic substitution is mixed. Overall, sizable changes in cost-sharing seem to have an effect on behavior, and this effect occurs among the chronically ill.

This is a rapidly evolving literature. Several things are needed to obtain clear conclusions: long-term health outcomes, methods that control for selection bias, and sufficient power to detect changes in small (susceptible) portions of the population. The lack of direct evidence about pharmaceutical cost-sharing's effect on

health is a glaring gap in a substantial and explosive literature. Unfortunately, because so many individuals change employers and thus insurance plans, such studies are very difficult in the United States.

Office Visit Cost-Sharing

Most studies find that greater physician visit cost-sharing is associated with fewer office visits. Recently, Chandra and colleagues (6) found that instituting a \$10 copayment resulted in a 10% decline in office visits and a corresponding 14% decline in expenditures among retired state government employees. Two earlier studies also found that instituting small copayments (\$5) decreased physician visits to a similar or even larger extent (7, 49). Enrollment in CDHPs has been associated with 15%–22% reductions in physician visits (14, 29). However, the one study that followed enrollees for three years saw an increase in utilization in the third year (14).

To assess the value of the care that is reduced, researchers have sought to identify what types of office visits are reduced, focusing on cost-sharing's effect on recommended preventive care. These studies produced mixed results. Cherkin and colleagues (8) found that instituting a \$5 copayment for office visits decreased physical exams and primary care visits for those with cardiac disease, but it did not influence childhood immunizations, cancer screenings, or specialist visits for those with cardiac disease. Roddy et al. (49) found that the reductions in physician visits were highest for acute self-limiting visits (conditions that would clear up on their own) but were also substantial for prevention. Hibbard et al. (29) found reductions both for care that is considered highly effective and for care with lower effectiveness (as defined by the State of Oregon's Prioritized List of Health Services).

With one exception, these studies do not examine whether there are downstream impacts from office visit reductions. The sole study, by Chandra and colleagues (6), finds an increase in hospitalizations, but this result

cannot be clearly attributed to office visit cost-sharing because pharmacy cost-sharing was also altered.

Few studies examined how long lasting the impact of cost-sharing is, and the findings to date are mixed. Roddy and colleagues found that the reduction in office visits lasted for only one year. In the second year of cost-sharing, visit rates returned to the baseline rate. Hibbard and colleagues, on the other hand, found that the reduction in office visits among CDHP enrollees was maintained in the second year.

Prevention

The evidence consistently suggests that cost-sharing for preventive care is associated with lower levels of preventive services. A recent study of Medicare recipients found that mammogram rates decreased by 6% when cost-sharing for mammograms was initiated (59). Cross-sectional studies confirm the negative relationship between cost-sharing and prevention across a wide range of services, including Pap smears, preventive counseling, clinical breast exams, and self-monitoring of blood glucose for diabetics (32, 54). We have no direct evidence about whether cost-sharing-induced reductions in preventive care affect health. The clinical literature suggests some forms of preventive care would produce some effect, but not others.

Recently, plans that exempt preventive care from cost-sharing have been instituted, with the intent of reducing overall costs but maintaining high levels of preventive services. Two studies have examined what happens to prevention levels when office visit cost-sharing is implemented but preventive services are covered in full (5, 50). Both studies found no change in preventive care.

Emergency Department Cost-Sharing

Since the HIE, three well-designed, quasi-experimental studies have examined the impact of emergency department (ED) cost-sharing on ED utilization and related health outcomes. In each case, usage one year before and one year

after the ED cost-sharing increase was tracked, and the changes among those with ED use were compared with the changes in a comparison group. The studies have consistently found that ED cost-sharing reduces ED utilization (31, 52, 61).

Hsu and colleagues (31) found a dose-response relationship between copayments and ED visit reductions. Wharam and colleagues (61) tracked people during their first year enrolled in a high-deductible health plan (\$500–2000 for individuals). ED use fell by 10% in this study. Almost all the reduction was concentrated in repeat ED visits, underscoring the importance of enrollees' awareness of cost-sharing levels for impacting behavior.

To examine which type and value of ED visits were reduced by cost-sharing, the studies used different schemas to categorize visits. They consistently found that high-value visits ("high severity," "time sensitive," or "always an emergency") were not significantly reduced by ED cost-sharing. Large reductions were observed in ED visits considered "low severity" or "often not an emergency." Moreover, an additional study found that cost-sharing did not impact the time that lapsed between having a heart attack and arriving at an ED (37).

Consistent with the findings that ED cost-sharing reduces inappropriate ED use, the studies showed no increases in hospitalizations, intensive care unit admissions, or mortality rates. This conclusion's strength is somewhat limited because all studies tracked individuals for just one year and because adverse outcomes are uncommon occurrences. Nonetheless, ED cost-sharing at the levels tested (up to a \$100 copayment and in a high-deductible plan) appears to selectively reduce inappropriate use of the ED and does not appear to produce unintended consequences.

Behavioral Health Care Cost-Sharing

Cost-sharing levels for behavioral health visits are generally higher than for physical health. In managed care plans nationally, coinsurance and copayment levels for mental health and

ED: emergency department

substance abuse were respectively 184% and 142% higher in 1999 than were rates for physical health (30). Despite the high levels of cost-sharing, few studies since the HIE have reported on its impact on mental health and substance abuse care.

A 1986 study of retired mine workers and their dependents found that instituting a \$5 copayment for physician visits, including mental health visits, reduced outpatient mental health visits by 40%—almost twice the reduction observed for outpatient visits overall (23%) (60). Inpatient mental health care was not substituted: Its rate also fell after copayment implementation. A decade later, Simon and colleagues (53) found that instituting a \$20 copayment for outpatient mental health services reduced the likelihood of receiving outpatient mental health care by 7% compared with an almost 9% increase for a comparable group not subject to the copayment. These reductions occurred to the same extent for those patients with both low and high need (defined as those taking lithium or an antipsychotic). A subsequent increase in copayment from \$20 to \$30 did not further reduce the likelihood of receiving any mental health care. No health outcomes were studied.

Recently, Lo Sasso and colleagues (35) examined an employer who simultaneously reduced cost-sharing for mental health care, launched a destigmatization campaign, and changed contracting with mental health providers. They found an increase in initiation of depression treatment and an increase in visits among those receiving care for depression.

Several cross-sectional studies have investigated the relationship between cost-sharing and substance abuse treatment. Stein and colleagues (55) examined cost-sharing within a managed behavioral care plan, a very common arrangement in which behavioral health is “carved out” by the main insurer and covered by a plan that specifically handles behavioral health (17). They found that among those discharged from inpatient detoxification, having a copayment reduced the likelihood of patients seeking recommended outpatient follow-up treatment and,

furthermore, that the higher the copayment, the lower the likelihood. LoSasso & Lyons (36) found that higher copayments for outpatient substance abuse treatment were associated with lower health plan costs but also with an increased likelihood of recurrence of substance abuse treatment. For \$1 more in copayment, the health plan saves ~\$110 in per-episode spending, minus \$13, which is the projected cost of increased reoccurrence. Thus, cost-sharing reduced expenditures but at the cost of worsened outcomes.

In sum, although the literature is not extensive, cost-sharing for behavioral health reduces utilization, perhaps even more than for physical health visits. However, the reductions in care are not well targeted and may worsen outcomes. Because many people are undertreated for mental health conditions (38), cost-sharing in behavioral health merits further investigation.

VARIATION BETWEEN SUBGROUPS

Variation by Health Status and Chronic Illness

Only a few studies compare the impact of cost-sharing on different health status groups. Stuart and Zacker (57) used cross-state variation in drug copayments among Medicare-Medicaid dual eligibles. They found that most of the reduced drug consumption due to higher cost-sharing was from reduced consumption of those in poor and fair health. Remler & Atherly (45) looked at the effect of having supplemental insurance (and therefore much less cost-sharing) on Medicare beneficiaries usage. They found that those with poorer self-reported health status or poorer functional health were less sensitive to cost-sharing for hospital care. (They found no statistically significant results for physician care.)

Chandra et al. (6) found that prescription and office copayments caused the chronically ill and previously higher spending patients to cut back more than others on drug usage. However, these cutbacks were measured in absolute

dollar terms, so it is likely that the percentage reductions were smaller for those in poorer health and with chronic disease. Most strikingly, poorer health and chronically ill individuals therefore had much greater increases in hospital care, resulting in a net increase in expenditures for these subgroups. The most obvious interpretation is that cutting back on drugs and office visits caused greater subsequent problems. When combined with the time-lag results by Gaynor et al. (19), this evidence causes some investigators to fear that this effect could worsen over time.

Several studies conducted on chronically ill populations (including those with rheumatoid arthritis, heart failure, diabetes, schizophrenia, and lipid disorders) found unambiguous reductions in the use of drugs regarded as important for maintaining the health of the chronically ill. Some evidence suggests that those under the regular care of a physician are less likely to reduce their use of medications. Such studies cannot inform us about the comparison between the use reductions of the chronically ill and others, but they suggest concerns about the worse health effects among the chronically ill.

Variation by Income

Some have expressed concern that cost-sharing will have a greater financial impact on low-income individuals, disproportionately deterring high-value care (18, 48). Consequently, some researchers have called for cost-sharing that scales out-of-pocket costs on the basis of one's income level (4, 48). The empirical work, however, has not consistently shown a relationship between income and cost-sharing effects. The research is limited because studies have examined primarily employed populations, a practice that excludes very-low-income individuals and, because income has been proxied by mean income of neighborhood (e.g., zip code or census block) of residence, which may attenuate the effect of income.

Several studies found that (proxied) income is indeed related to cost-sharing responsiveness. Trevedi and colleagues (59) found that low-

income women were more likely than high-income women to reduce mammogram use when subject to cost-sharing (8% versus 5%). Hibbard and colleagues (29) found that reductions in ambulatory care for CDHP enrollees were greater among hourly employees than salaried. In another study, individuals in low-income neighborhoods were more likely to reduce ED use with cost-sharing than were those in higher-income areas (31). However, the greater reductions caused no negative consequences and may simply have reflected a higher baseline use of nonemergent ED.

Other studies found no relationship between income and cost-sharing responsiveness. Cherkin and colleagues (9) found that higher- and lower-income public employees equally reduced primary care visits when a \$5 copayment was introduced. Another study found that low- and high-income public sector retirees were equally likely to cut back on office visits and medications when small copayments were introduced (6).

In sum, the findings are mixed and not conclusive, and the work is limited by the relatively homogenous populations and proxy measures of income. In those cases in which lower-income individuals are more responsive to cost-sharing, both high-value care (such as mammogram use) and lower-value care were reduced.

Variation by Race/Ethnicity

U.S. minorities are, on average, lower income, less wealthy, and more likely to be ill than are whites. Therefore, they may face a greater financial burden from cost-sharing and may be more deterred from seeking valuable care. Consequently, some researchers have argued that cost-sharing is "de facto discrimination" and that it will deepen racial and ethnic disparities (3, 47). Minorities may also face cultural barriers to care that cost-sharing could exacerbate (3).

Very little empirical evidence has been reported on the topic. The limited number of studies suggests that cost-sharing may have a differential impact, although not always in

the theorized direction. Trivedi and colleagues (59), for example, found that black women had higher mammogram levels when cost-sharing was required compared with white women, controlling for zip code, income, educational level, and other demographic factors. Steinman (56), however, examined national survey data of older adults who had no pharmacy coverage and found that minorities were more than three times as likely to report restricting use of prescriptions because of cost than were whites, even controlling for income and other demographic factors. Once again, this area could benefit from further research, particularly from studies sufficiently powered to examine differences among the different racial and ethnic groups rather than comparing whites against all minorities grouped together or just African Americans.

Variation by Age

Cost-sharing studies have generally focused on either working populations or older adults. Very few studies have compared the influence of cost-sharing across different age groups. Hsu and colleagues's (31) study of ED copayments included both elderly (Medicare) and working-age (commercial) individuals. They found that copayment-related reductions in ED use were smaller among the elderly than among younger adults. Another study found that introducing a \$5 copayment for office visits reduced physical examinations for children more than for adults (8). Yet, children did not have lower rates of immunizations after the copayment was required.

Other research examined differences in cost-sharing's impact across age groups within either older adults or working adults. Chandra and colleagues (6) found that adults aged 85 years and older cut back less on office visits, when subject to copayments, than did those adults ages 65–74, whereas prescription drug reductions were similar. The older group, however, experienced twice the level of subsequent hospital expenditure increases compared with the younger group. Another study (using self-reports) found differences by age in the health

consequences of cost-sharing: Heisler and colleagues (28) found that adults aged 72 years and older who cut back on medications to save money experienced substantially higher odds of poor health outcomes than did older adults ages 55–65. Among an employed population and their dependents, copayments initiated for most forms of medical care (e.g., primary, specialty, optometry or mental health) produced no significant differences by age (7). When facing a copayment, women over 40 years old were more likely to reduce OB-GYN visits than were women of childbearing age.

In sum, this limited literature suggests that older adults may be less likely to respond to cost-sharing, yet those that do have worse health-related utilization and outcomes than do other adults.

Variation by Gender

Very few studies have investigated differences by gender in the effects of cost-sharing. In one study, the introduction of a \$5 office visit copayment had no effect on physical exam rates for men, but the rates for females decreased significantly (8). A second study found office visit copayments influenced men and women similarly in the first year, but a decrease was maintained among women while not for men (49). Another study found an interaction effect between age and gender. The copayment impact was twice as great for females under 40 compared with men of the same age. However, there was no gender difference in impact among those 40 years or older (7). In sum, the limited evidence suggests that women in some contexts may be more responsive to cost-sharing than men.

DISCUSSION AND CONCLUSIONS

As health care expenditures continue to consume an ever-growing share of resources in the United States, containing costs will become even more important. Cost-sharing is one of several possible health care cost-containment techniques. Like all cost-containment

techniques, it should be judged by the extent to which it reduces the excessive care due to health insurance without undermining either the access or the financial protection values of insurance. More specifically, it should be judged by the extent that it (*a*) reduces harmful, worthless, or non-cost-effective care; (*b*) does not reduce cost-effective care; (*c*) does not cause great financial harm; and (*d*) does not create other harmful side-effects.

The best cost-containment choice(s) will vary depending on the type of medical care and on the characteristics of the individuals whose care will be affected. Therefore, our review of cost-sharing was broken down by the form of medical care and, where possible, relevant subgroups. Overall, our review found that cost-sharing is a blunt instrument. It can usefully reduce low-value care, but it can also reduce valuable, cost-effective care and cause excessive financial harm. It should be used judiciously.

The most strikingly favorable evidence for cost-sharing is for emergency department (ED) copayments. Strong and consistent evidence demonstrates that ED copayments up to \$100 reduce ED visits with no resulting adverse consequences. Apparently, people who ought to go to the ED are not deterred by the copayments, whereas at least some of those who should not be using the ED are deterred.

On the other hand, evidence of the bluntness of cost-sharing comes from cost-sharing for preventive care, which reduces some cost-effective preventive care such as mammograms. Office visit copayments have also reduced both high-priority and low-priority care. Evidence on cost-sharing for behavioral health also suggests that the impact is blunt, reducing high-value care.

The impact of cost-sharing differs by subgroups. No evidence has shown that modest pharmaceutical copayments harm the health of basically healthy, nonelderly people, despite reducing their utilization. In contrast, pharmaceutical cost-sharing for the chronically ill reduces the use of cost-effective drugs. Some evidence suggests that cost-sharing among the

chronically ill somewhat increases subsequent hospitalizations and office visits. One recent study finds that among the quite chronically ill elderly, expenditures experience net increases from cost-sharing increases (6). Some early evidence, consistent with behavioral economics, suggests that cost-sharing does not reduce the use of chronic illness drugs with immediate effects on health, but it causes more significant reductions in the use of drugs whose effects are not immediately felt, such as lipid-lowering medications and antihypertensives. These findings suggest that cost-sharing should exclude certain categories of drugs or certain drugs for particular patients. Below we discuss such cost-sharing policies.

The elderly may also be affected differently. Some evidence suggests that the health of even relatively healthy elderly individuals may be hurt by cost-sharing-induced reductions in care (6, 28). The negative effects seem to rise with age among the elderly.

Given the mechanism through which cost-containment is expected to work, we would expect its effects to vary by income and wealth. Surprisingly, evidence of cost-sharing sensitivity variation by income is mixed, but we cannot draw strong conclusions because of study limitations.

We have described cost-sharing as a blunt instrument for cost containment partly because of the evidence cited about its effects on the chronically ill. However, theory and introspection also reveal its bluntness. Treatment decisions under cost-sharing are sensitive to expected health benefits of care only to the extent that patients can accurately predict them (or to the extent that physicians are aware of cost-sharing, internalize it, and accurately assess patient benefits). The value of a particular test, procedure, or drug is often sensitive to the patient's clinical characteristics. That value can be hard to judge, particularly for those lacking medical expertise. Many tests, procedures, and drugs can be extremely valuable in some contexts, useless or even harmful for others, or somewhere in the middle; MRIs of the brain are just one example.

Some cost-containment techniques are more sensitive than cost-sharing to the value of medical care in individual circumstances. For example, UR is a cost-containment technique by which insurers determine whether they will cover care for a particular patient on the basis of whether those clinical characteristics make the treatment “medically necessary.” UR of course has many of its own drawbacks (62).

Findings that cost-sharing reduces some cost-effective care, particularly among the chronically ill, have supported the idea of value-based cost-sharing (VBCS) (10, 15). VBCS tries to identify high-value health care and exclude it from or reduce its cost-sharing. Recent evidence has shown that exempting prevention from office visit cost-sharing maintains the level of preventive care. Thus VBCS seems promising and our review supports its growing use.

Unfortunately, VBCS cannot shield all forms of cost-effective care from cost-sharing, nor can it ensure that cost-sharing reaches all non-cost-effective care. Applying VBCS to MRIs and similar treatments would require effectively combining UR with cost-sharing. Individual clinical characteristics would need to be reviewed by insurers to determine cost-sharing in the same way that insurers now use UR to determine coverage (effectively a decision for full out-of-pocket versus zero or very modest cost-sharing). Although there is some logic to this approach, the complexity of such policies would surely be difficult for consumers to comprehend. The implementation costs of applying VBCS to expensive procedures and tests would also be large, effectively adding those of UR to those of cost-sharing.

Potential Savings from Cost-Sharing

What potential does cost-sharing have for significantly affecting overall health care expenditures? Health expenditures are extremely concentrated, with 49% of all expenditures generated by 5% of individuals and 22% of all expenditures generated by just 1% (63). For any cost-containment technique to have a significant effect on expenditures, it must some-

how, directly or indirectly, affect expenditures of the more expensive individuals. Even current CDHPs often have cost-sharing, which applies to a small fraction of total expenditures (46).

The reach of cost-sharing could be extended to higher expenditure patients and treatments. For example, coinsurance could extend up to \$50,000 episodes. Obviously, however, such cost-sharing would reduce both the access and the financial protection values of insurance. Without significantly undermining the value of insurance, it is hard to see how cost-sharing could have a major quantitative effect on expenditures. Consequently, cost-sharing alone can never be the magic bullet that solves all our health care cost problems. Other cost-containment techniques, such as UR, that are more suited to very expensive treatments are also needed. Moreover, our review suggests that cost-sharing has a negative impact on health for the chronically ill and, in some cases, results in greater overall expenditures.

The concentration of health care expenditures also affects the generalizability of some studies demonstrating that cost-sharing reduces overall expenditures. Some evidence suggests that those in poorer health are less sensitive to cost-sharing than others are, at least in percentage terms. Given the lower sensitivity, findings of net cost-savings in healthier populations, such as employed groups, will not apply to less healthy populations, and possibly not even to the general population (45).

Limitations of the Current Empirical Literature

We have reviewed the post-HIE literature on the effects of cost-sharing. Most of the evidence comes from modest levels of cost-sharing in the form of copayments. Indeed, except for evidence from Medicare supplemental insurance and recent evidence from CDHPs, almost all the post-HIE evidence comes from relatively modest copayments. Moreover, a significant share of this evidence is from pharmaceutical cost-sharing. Therefore, our findings may not generalize to many of the emerging

and proposed cost-sharing policies. For example, some insurers are moving away from copayments and toward coinsurance for pharmaceuticals, with patients paying a given percentage of the drug price (34). The effects of coinsurance could differ substantially from the effects of copayments that we describe. Similarly, the effects may not generalize to very high deductibles that would hit acute hospitalizations.

Several areas of cost-sharing literature are still not well developed. There is very little post-HIE evidence about the effects of hospital or all-care cost-sharing. We know little about how impacts differ depending on income or racial or ethnic background. The evidence of different effects by health status should be expanded to include more sensitive and more substantive health categories.

Supporters of CDHPs frequently note that cost-sharing provides consumers with an incentive to seek out lower prices, as well as an incentive to reduce utilization. We have virtually no evidence about possible effects of cost-sharing on price.

In addition to the effects of cost-sharing on utilization, expenditures, and health status, cost-sharing could also affect other aspects of well-being. Cost-sharing is meant to make individuals think twice about treatment choices and (possibly) to engage in comparison shopping. Both actions require time, energy, and skill to gather information and consider options. Both actions involve health and finances, very sensitive subjects likely to cause stress during what may already be stressful times. Trading off health and money may be excruciating for some. The psychology and behavioral economics literatures suggest that people do this poorly. Moreover, the literacy and numeracy skills needed to gather information and make trade-offs are not evenly distributed, and less-

educated individuals may make comparatively poorer decisions (26). Studies should examine the effects of cost-sharing on other aspects of well-being.

Perhaps the most important limitation is the lack of evidence on the effects, particularly long-term effects, of cost-sharing-induced care reductions on health. We have only a few, very recent studies that examine outcomes a few years later, either adverse events, such as hospitalization, or self-reported health status. Most studies examine only contemporaneous utilization and expenditures.

Conclusion

Cost-sharing is a blunt instrument. It may damage the health of ill individuals and/or their financial well-being. By its very nature, cost-sharing partially undoes insurance, so it is not surprising that it can undermine exactly what insurance hopes to protect. Evidence, indeed, shows that among some subgroups cost-sharing reduces cost-effective care. Still, cost-sharing successfully reduces utilization and expenditures, including some reductions in low-value health care.

All cost-containment techniques have their drawbacks. The bar cannot be held unreasonably high because the costs of letting all health care treatment go completely unchecked are (literally) too high. Modest cost-sharing can be used judiciously, particularly if it is value based. We need continued studies to determine its effects, particularly as its form and reach evolve, and especially on long-term health. Moreover, cost-sharing should never be our only cost-containment technique: We also need techniques that are better suited to very expensive treatments and are more directly sensitive to the value of care in individual circumstances.

SUMMARY POINTS

1. Health insurance reduces or eliminates cost considerations from health care treatment decisions, necessitating cost containment to reduce non-cost-effective care.

2. Cost-sharing partially undoes insurance and therefore can reduce the financial protection and access that health insurance provides.
3. Emergency department (ED) cost-sharing reduces ED utilization without any harm to health.
4. Pharmaceutical cost-sharing among those with chronic disease sometimes reduces the use of valuable drugs.
5. Office cost-sharing that excludes preventive care (a form of value-based cost-sharing) can avoid reducing preventive care.
6. Cost-sharing must be used judiciously to avoid reducing cost-effective care.
7. Cost-sharing alone cannot provide sufficient cost-containment.

FUTURE ISSUES

1. Research is needed on the long-term health and utilization effects of cost-sharing.
2. More information is needed on how cost-sharing affects a variety of subgroups.
3. Analyzing the effects of cost-sharing with more substantial out-of-pocket costs and how it might affect expensive acute episodes is also necessary.

DISCLOSURE STATEMENT

The authors are not aware of any biases that might be perceived as affecting the objectivity of this review.

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