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Cost-sharing: Effects on spending and outcomes

See companion Policy Brief available at *www.policysynthesis.org*

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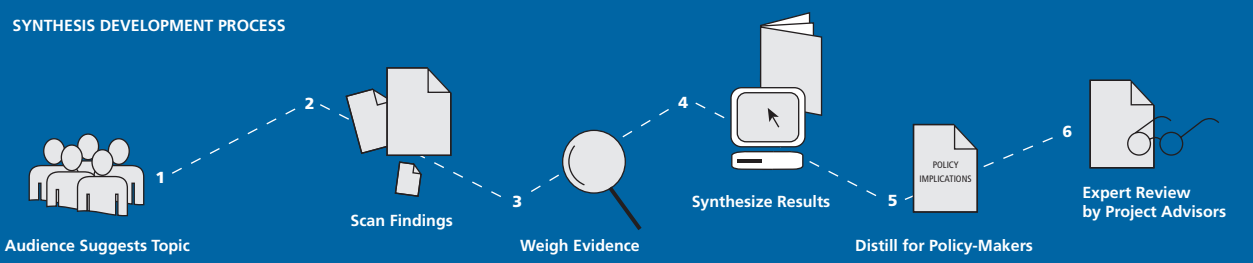
THE SYNTHESIS PROJECT (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at *www.policysynthesis.org*. For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to *pubsrequest@rwjf.org*.



Introduction

With the passage of the Patient Protection and Affordable Care Act (PPACA), efforts at health care reform are focused on two major issues. One is how to implement the expansion of insurance coverage to most of the country's population. The other is how to slow the growth in health care spending. Intertwined in both issues is the question of what form and degree of cost-sharing should be expected of consumers. How medical care costs are shared between patients and insurers in minimally creditable policies could affect both the level and rate of growth of national health care spending.

Health insurance has an inherent tension between the benefit of reducing people's exposure to financial risk and the drawback of increasing people's use of low-value or unnecessary medical care that can drive up health care spending. Exposure to financial risk is greatly reduced as the fraction of health care costs covered by insurance increases. But as insurance covers more costs, people tend to use more care, some of which is unnecessary or low-benefit relative to cost. In particular, people would not use much of this low-value care if they had to pay the full cost. Health insurance design is, as Aaron (1) notes, a "potentially powerful tool for controlling the level and composition, if not the rate of growth, of people's demand for [health] care." (p. 22). Thus, deductibles, coinsurance and co-payments (different forms of consumer cost-sharing) affect people's demand for health care. Cost-sharing also affects demand for specific types of health care differently if the cost-sharing is not applied uniformly and/or benefits from different types of health care vary across people based on their characteristics and risk preferences (1, 135). Policy-makers are acutely aware of this tension in health insurance. Concerns about how much faster health care spending has been growing compared with GDP have been voiced by many public and private sector policy-makers. These concerns have stimulated debates about the merits of increasing cost-sharing to discourage demand for low-value or unnecessary health care.

A synthesis of what we know (and do not know) about the effects of consumer cost-sharing can provide valuable information for policy-makers as the country implements the new health care reform law (PPACA). The law calls for different levels of coverage (bronze, silver, gold and platinum), each of which is designed to provide benefits that are actuarially equivalent to 60%, 70%, 80% and 90%, respectively, of the full actuarial value of the benefits provided under the plan. These plans will be offered through the new Health Insurance Exchanges. These plans also have limits on out-of-pocket expenditures, with the limits reduced for people with incomes below 400% of the federal poverty level. In addition, in July 2010 the administration announced new requirements regarding four sets of preventive services that may not have cost-sharing attached to them for people covered by the new health insurance plans. The assumption is that by omitting cost-sharing more people will make use of these preventive services since they will be free to the consumer, saving medical costs in the long run. The administration estimates that premiums will increase about 1.5 percent to cover the costs of such services.

In spite of the decisions taken with respect to consumer cost-sharing for health plans in the PPACA, substantial ambiguity remains about the effects of cost-sharing on health care use and about which subgroups of people might be adversely affected by increased cost-sharing. If people do not respond to increased cost-sharing by reducing unnecessary or low-value but high-cost care, then increasing patient cost-sharing will not reduce health care spending substantially. Similarly, how people respond to cost-sharing for some services, such as preventive care, may not be how they would respond to the same cost-sharing applied to emergency care or mental health care. Assuming people would respond the same way for all types of services may lead to misestimates of the cost-sharing's effects. Further, different subgroups of the population may respond differently to the same cost-sharing. Increased cost-sharing could simply shift medical costs to the sick, for example, if they respond to cost-sharing differently than healthy people.

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Thus, given the concerns about slowing health care spending, this is an opportune time to review what is known and not known about the effects of consumer cost-sharing.

Specific questions that guide this synthesis are:

1. What are the effects of cost-sharing on the distribution of spending and total spending?
2. What are the effects of increased cost-sharing on health outcomes?
3. How do responses to cost-sharing differ by socioeconomic factors and health status?
4. What is the effect of cost-sharing on different types of services?
5. What are the effects of increased cost-sharing for prescription drugs?

The conclusions that can be drawn from the hundreds of studies that address each of these questions are not independent, of course. The synthesis is organized around these questions in turn to keep findings manageable. Overall conclusions and policy implications are discussed in the concluding sections.

Results from the RAND Health Insurance Experiment (HIE) provide a baseline for answering these questions. However, health insurance and medical care have changed tremendously since the late 1970s when the RAND HIE was conducted, and so the emphasis in this synthesis will be on findings from research conducted since the mid-1990s.

Changes in health insurance and medical care since the 1970s

The RAND Health Insurance Experiment (see Appendix II) was designed between 1970 and 1974 and conducted between 1975 and 1978, with some people continuing in the experiment through 1980. Since then there have been enormous changes in health insurance design, medical care itself, and the health care delivery system (51). There are many more diagnostic tests, more drugs that can be prescribed for people with chronic conditions, more options for less-invasive surgery, and more alternatives for treating cancer. To put the changes in perspective, it is useful to remember that magnetic resonance imaging machines (MRIs) have been available only since 1983. Finally, our ability to analyze alternative options for treating symptoms and conditions to determine what is effective versus ineffective care (and for whom) has grown tremendously in the past 40 years. All of these changes had an impact on health insurance design and the mix of services that are covered by health insurance.

In the early 1970s, health insurance designs were far simpler than they are today. There were basically two choices of health insurance: indemnity, which the vast majority of Americans with health insurance had, and health maintenance organization (HMO) coverage, which was available primarily on the West Coast. Indemnity insurance had a deductible and a coinsurance rate (that is, a percentage of the charges which the patient had to pay even after the deductible was met); flat dollar co-payments were introduced by HMOs. In general, anyone enrolled in an HMO did not face a deductible. In the mid-1970s, a typical employer-group indemnity policy had (in nominal dollars) a deductible of less than $100 per person or a $250 deductible for a family, and a coinsurance rate of 20 percent. Many policies also had a $25 co-payment for an emergency department visit if a person was not admitted to the hospital from the emergency department. To put these numbers in perspective, the median

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household income in 1974 was $11,101 and in 1975 the Medicare Part A deductible was raised to $92 per year (in 2009, these numbers were about $50,000 and $1,100, respectively). Further, the distribution of household incomes was more equal in 1974 than it is today.[1] Finally, in the mid-1970s, few insurance plans covered the costs of prescription drugs or mental health and substance abuse care.

Today there is significant variation in the types and levels of cost-sharing among employees who have employer-sponsored insurance (ESI) (56). Among people with ESI, the majority (58%) are in preferred provider organizations (PPOs); 19% are in HMOs; 13% are in high-deductible plans; and 8% are in point-of-service plans.[2, 3] A majority of people with ESI face a deductible before most of the covered medical services are paid for in part by the plans. Thus, even though health insurance plan options are far more varied than they were when the HIE was designed, it is still the case that a majority of people are subject to a deductible. Three-quarters of workers with ESI pay a co-payment when they see a physician (primary care or specialist) and 16% pay a coinsurance rate.[4] Among workers with ESI who paid a co-payment for a primary care physician (PCP) office visit, there is a large variation in co-payments – in 2010, 26% paid $15 or less, 33% paid $20, and 37% paid $25 or $30. The average co-payment for seeing a PCP in-network is $22 and the average co-payment for seeing a specialist is $31. The vast majority of employer-sponsored health plans began to cover prescription drugs by the late 1980s, although there has been great variation in coverage limits and cost-sharing for this benefit. Finally, since the 1970s, insurance coverage of mental health and substance abuse care has increased dramatically. Parity of treatment of mental and physical illnesses is now required by the Mental Health Parity and Addiction Equity Act of 2008 (MHPAEA); the law bans insurance plans from setting higher co-payments and deductibles for mental health care than for acute-physical health care, and from setting caps on the number of outpatient therapy sessions and the number of inpatient days. The law is estimated to cover about 113 million people who are covered by employer-sponsored health plans; companies with fewer than 50 employees are exempt.[5] The PPACA extends the parity requirements under the MHPAEA to qualified health plans to be sold through the Exchanges as well as plans sold in the individual insurance market.

1 During the 1970s, households in the top quintile had about 44 percent of all income whereas in 2008 they had half of all income. The Gini index of income inequality was around 0.4 during the 1970s (it was 0.395 in 1974) and by 2008 it had increased to 0.466 — a clear indication that there has been a growing inequality in incomes.

2 Point-of-service plans are a type of managed care plan. They require enrollees to choose a primary care physician from among a network of physicians who have agreed to accept reduced reimbursement fees to be in the network. POS plans permit enrollees to obtain care from health care providers outside the approved network of providers, but then the enrollee pays a larger share of the charges of such providers.

3 As further evidence of how much health insurance coverage has changed, among people with ESI in 1987 from medium-sized to large employers, 73% were in indemnity fee-for-service (FFS) plans, 16% were in HMOs and 11% were in preferred provider organization (PPO) plans (37).

4 Three percent pay both a co-payment and a coinsurance rate (usually whichever yields a higher amount for the physician visit) and 5% do not have a cost-sharing requirement for an outpatient physician office visit (56).

5 The New York Times reported on May 10, 2010 that insurers and employers were lobbying the White House to delay and revise recently released regulations issued to implement the 2008 law. The insurers objected to a regulation that requires a single deductible for medical and mental health services rather than the industry practice of separate deductibles. Under MHPAEA, insurers cannot set higher co-payments and deductibles or stricter limits on mental health benefits than they set for services related to physical (medical) illnesses and conditions. Insurers also objected to the new regulations of "nonquantitative treatment limits," which include practices used by insurers to manage mental health care, criteria for the selection of health care providers, and rates paid to such providers. Mental health advocates argue, however, that the regulations are needed because when patients cannot access care on a timely basis from mental health experts in a health plan's network of providers, they may have to go outside the network where typically they pay more out-of-pocket or they go without needed care.

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Recent trends in health insurance

Two different trends with health insurance have occurred in the past decade. One is expansion of the number of employers sponsoring health insurance plans with high deductibles and the second is increasing interest in varying the cost-sharing in accordance with the expected value of the health service. Cost-sharing in the form of high deductibles (where a "high deductible" is at least $1,000 for an individual and $2,000 for a family) has become more popular among employers since the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003 was passed.[6] These plans are often referred to as consumer-directed health plans (CDHPs).[7] Two studies have compared the effects of these high deductible plans offered by a single employer (in each case) along with traditional health plans (28, 50), and a new study by Lo Sasso, Shah, and Frogner (77) analyzed data from a large insurer that sold CDHPs to midsize and small firms. Feldman et al. (28) found that the CDHP was not able to control medical expenditures over time and it appears that the enrollees in the CDHP spent more on hospital care than enrollees in the traditional plans. Greene et al. (50) found that CDHP enrollees were more likely to discontinue some prescription drugs. The findings of Lo Sasso et al. (77) also suggest that CDHPs had larger relative effects on spending for prescription drugs than for outpatient or hospital spending. The findings from these three studies are consistent with expectations about deductibles — once the deductible has been met, there are no longer strong incentives for an enrollee to be concerned about further health care expenditures. People who are quite sick are particularly unlikely to reduce health care use once they have expenditures that exceed the deductible — even if they do not have a maximum limit on the out-of-pocket expenditures. The patient cost-sharing under a CDHP may be lower once the decuctible is met than what they might face with more traditional health plans (99).

Health plans with high deductibles and uniformly applied co-payments or coinsurance rates are often referred to as "blunt instruments" for reducing unnecessary health care expenditures because evidence is mounting that people reduce both essential and nonessential care (100, 97). As discussed below, uniformly applied cost-sharing particularly causes people to reduce their use of prescription drugs, which in turn seems to lead to use of more expensive types of care that are indicative of adverse events and poor health outcomes. As a result, a variation on CDHPs known as Value-Based Insurance Design (VBID) has gained traction in the last decade (29, 17, 31, 32, 20). The concept behind VBID is that CDHPs (and health plans in general) would be more effective in reducing use of care that is only marginally beneficial if cost-sharing varied according to the relative value of a service for the individual. Thus, cost-effective preventive care (for example, childhood immunizations and some cancer screening tests) could be exempt from deductibles and co-payments or coinsurance payments. Health care services that are deemed of low value to everyone or low value to people who do not meet certain criteria (perhaps severity of chronic disease) would have higher cost-sharing. Not many employers have shifted employees to VBID plans yet, and it is perhaps too soon to evaluate their effects. To date, the handful of studies on the effects of VBID have been conducted by advocates of VBID (32, 20). The studies suggest that spending on health care could be more efficient with nonuniformly applied cost-sharing, but more studies of natural experiments along with greater variation in the cost-sharing incorporated into VBID need to be conducted.

6 In many states, people who have to purchase health insurance through the state's non-group market have increasingly had little choice but to purchase policies with very high deductibles ($5,000 for a family policy is common) and it is not unusual for such policies to exclude coverage of well-baby, well-adult, and even general physician office visits — which means that out-of-pocket expenditures for such care do not count towards satisfying the deductible.

7 People with such insurance pay for all of their medical expenses below the deductible with their own money or with money from an account (sometimes called a health savings account) that is funded by the person and/or the person's employer. The latest Kaiser Family Foundation/HRET survey of employer health benefits found that among employers offering health benefits, 15 percent offered a CDHP in 2010 and 13 percent of covered employees were enrolled in such plans (56). Among employers with 200 or more employees that offered health benefits, 25 percent offered a CDHP plan. Enrollment rates were higher among workers in smaller firms offering CDHPs than among workers in large firms. This could be because premiums are lower for CDHP plans as a result of enrollees having to pay for all health care expenses below the deductible. Since smaller firms typically have higher premiums per person than large firms, workers in small firms may be choosing the high deductible plans to obtain lower premiums.

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As noted, the PPACA calls for insurers to offer a uniform benefits package with four different levels of coverage (bronze, silver, gold and platinum). Each level reflects how much of the full actuarial value of the benefits package will be covered by the insurer and therefore how much of the actuarial value an individual might expect to pay (respectively, 40%, 30%, 20% and 10%). These percentages provide individuals with an approximation of how much of the covered benefits' costs they will be responsible for under each plan level. The benefits plans will be offered through the new Exchanges, which will operate as markets for individuals who do not have access to ESI and small firms that want to provide a choice of policies for their employees. In individual insurance markets today, traditional indemnity insurance policies with cost-sharing of 20% to 30% are common and it is no longer uncommon to find policies with 40% coinsurance rates. Such indemnity policies typically have deductibles of $1,000 to $2,500 for individuals and $5,000 or more for family policies. Managed care and HMO policies in the individual markets generally have co-payments for physician office visits of $20 to $30 and even $50.

Thus, today we are in a situation where there are many different ways in which consumers share in the costs of medical care. But although we have learned a lot about responses to patient cost-sharing in particular situations and for particular types of health care, the findings from these studies resemble pieces of a puzzle that have not been brought together in a coherent picture. This synthesis tries to assemble the findings from the large number of studies of the effects of different types of cost-sharing. Given the need to slow the growth in health care spending, there is some urgency to more fully understand the impacts of various types of consumer cost-sharing and to see the big picture.

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Types of consumer cost-sharing

Deductible: A deductible is a lump-sum amount of spending that an insured person or family has to spend out-of-pocket before a health insurance policy pays any of the person's medical expenses. In general, health insurance policies count only out-of-pocket expenditures on covered services (that is, health care that is covered by the policy) towards the deductible. A deductible has the effect of being a deterrent to people's use of medical care since they are responsible for the full cost of care until the deductible has been met. When the deductible is a substantial percentage of a person's income, the deterrent can be perceived to be severe. To prevent the deductible from becoming a deterrent to using some services that have been deemed cost-effective, some plans pay for selected services (typically preventive services such as mammograms) before the deductible is met.

Coinsurance: Coinsurance is the percentage of medical costs for which a person is responsible — typically for medical costs above the deductible. The coinsurance rate is usually applied to the negotiated reimbursement amount that an insurer has agreed to pay a health care provider. Most insurance policies with coinsurance as a cost-sharing mechanism have coinsurance rates between 10 percent and 25 percent. Note that a key feature of coinsurance is that the out-of-pocket amount that a person pays is directly tied to the cost of the health care service(s) used so the insured person is at least somewhat aware of the full price of the care.

Co-payments: A co-payment is a flat amount that a person has to pay out-of-pocket when obtaining medical care. Typical co-payments for physician office visits range from $10 to $20 for people with employer-sponsored coverage. Unlike coinsurance, co-payments are not tied to the full price of the services that a person may use during an encounter with a medical provider. However, because the co-payments are usually collected by the health care provider when a person arrives for an office visit or diagnostic test, the payments are widely viewed as providing a reminder that health care is not free.

Out-of-pocket maximum: A limit on the total amount of cost-sharing an individual or family has to pay in a year. There is wide variation in the types of out-of-pocket expenses that can be counted towards the annual maximum. Three-quarters of workers in a preferred provider plan (PPO) who had an out-of-pocket maximum could not count physician office visit co-payments; a third could not count spending toward the deductible; and 85 percent could not count spending on prescription drugs toward the maximum (56).

Lifetime or annual caps: Some plans limit the amount of risk they insure by placing a lifetime or annual cap on total medical expenses. Lifetime maximums of $1 million to $2 million are common (56). PPACA eliminates or restricts these types of caps.

Gaps in coverage: Gaps in coverage typically are services that are not covered (for example, well-adult or well-child visits, vaccines, substance abuse treatments, and rehabilitation therapy). But gaps in coverage can also look like the equivalent of a deductible somewhere in the middle of the distribution of medical expenses. The most common example is the "doughnut hole" in the Medicare prescription drug benefit. In 2010, under the standard Part D prescription drug benefit, Medicare beneficiaries are responsible for all prescription drug costs after their covered prescription drug costs reach $2,830. At that point, the beneficiaries are in the "doughnut hole." They remain in this gap in coverage until their out-of-pocket drug spending reaches $4,550 (equivalent to $6,440 in total drug costs under the standard benefit). At that point, reimbursement is once again provided for under Medicare. This gap will gradually be eliminated by the PPACA.

Methodology Overview

The rapid changes in medical care along with changes in health insurance cost-sharing provisions make studies done before 1990 less relevant for this review. Because it is so expensive to conduct a large randomized experiment such as the RAND Health Insurance Experiment, no experiments with variations in health insurance design have been conducted since the HIE. Instead, findings come from several types of studies. The best are those that take advantage of a "natural experiment" where a group of people suddenly face a change in their cost-sharing arrangement, the change occurs for reasons outside their control, and their responses to the change can be compared with actions and health outcomes of a similar group of people who did not experience the change. The next best studies are those where a natural experiment occurs but the subsequent utilization and health outcomes of the people affected by the change cannot be compared with the health care use and health outcomes of a comparison group during the same observation period. Good studies of such natural experiments try to show that no other outside event could explain a change in health care use or outcomes other than the change in cost-sharing.

Unfortunately, many of the empirical studies of the effects of patient cost-sharing are based on cross-sectional data, which are collected at only one point in time. The problem with using cross-sectional data to analyze the effects of cost-sharing is that individuals often have some choice about the type of health insurance they have, and the choice of cost-sharing requirements could be driven in part by how healthy a person is or how much care the person expects to use. In this case, it is hard to disentangle the effect of cost-sharing from the effect of, say, the individual's health. Researchers often attempt to control for this by controlling for factors assumed to be related to a person's choice of insurance – for example, age, education, income, and presence of chronic conditions. Nonetheless, the findings from such analyses are less convincing than those that come from natural experiments, especially studies of natural experiments where comparisons can be made with a similar group of people who were not affected by the change observed in the natural experiment.

Critically reviewing the particular methodologies of each of the studies reviewed here is beyond the scope of this synthesis. In general, however, greater weight is given to studies that used data from natural experiments with credible comparison groups, as well as studies that relied on data from larger numbers of people and from people who were representative of subgroups of people. The underlying objective is to reach conclusions about the effects of cost-sharing when findings could be viewed as robust and generalizable, and otherwise to note when questions about the effects remain unanswered.

One more methodological point needs to be made before turning to the synthesis results. The RAND HIE measured utilization outcomes in units of services used (visits to a physician, inpatient hospital stays, emergency room visits, prescriptions filled) and dollars spent on such services. Responses to the different levels of patient cost-sharing were reported as differences in use relative to the use by people who faced zero cost-sharing. Most of the studies reviewed in this synthesis also reported their findings in terms of differences in the number of services used or dollars spent – in some cases comparing use before and after cost-sharing was changed and in other cases comparing use between people who did and people who did not face a particular level of cost-sharing.

Unfortunately, many of these studies shift to discussing *responsiveness* to cost-sharing in terms of changes in the actual numbers of units of services consumed or dollar differences in what was spent. To see why this can be misleading, consider a person who reduces his visits to physicians by two visits per year after cost-sharing has increased. This is a responsive change if he had six visits to physicians in the previous year but it would not be viewed as responsive if the previous

pattern had been a visit every other week. For this reason, economic studies generally report responsiveness with a measure of elasticity – the percentage change in quantity bought caused by a relative change in price of, say, 10 percent. The key issue here is that the percentage change in the amount bought is a relative measure – it depends on the initial amount bought. People's responsiveness to a change in the price of something is rarely constant across a range of initial quantities purchased – people who buy a lot of some good may well reduce their consumption of that good if the price increases, but the change measured in units or dollars may be more or less than the change in amount purchased by someone who only occasionally buys the good. Thus reporting responsiveness in terms of unit changes can lead to different conclusions than if responsiveness were reported in terms of a price elasticity. In the first case, a person who has a bigger change in units purchased will be referred to as more responsive, but in the second case, a person whose relative change is bigger will be more responsive.

This difference in how responsiveness is reported is a key issue in sorting through the findings of the research on the effects of patient cost-sharing. Since people's responsiveness to changes in cost-sharing depends on the amount of medical care they generally consume, a change in cost-sharing can produce different responses from different types of people. Income and health status are two factors that many believe could affect the amount of health care people consume and therefore their responsiveness to a change in cost-sharing. The RAND HIE analyses of the effects of cost-sharing on different income groups were complicated by the fact that the experiment set a limit on the amount any family had to pay out-of-pocket for care. The limit was specified as a share of family income (5%, 10% or 15%) but no family could spend more than $1,000 out-of-pocket. Poorer people were much more likely to hit their limit on out-of-pocket expenditures and once they did, they did not face any cost-sharing. The RAND researchers were not able to find a statistically significant difference among people divided into three different health status groups but nonetheless they suggested that the sick are more responsive to price (85).

Thus, accurate estimates of the likely changes in the country's aggregate health spending and distribution of spending have to take into account whether people who differ in terms of a factor related to the use of health care will react differently to increased cost-sharing. Three factors of particular interest are income, health status, and race/ethnicity because each factor has been shown to be related to overall health care use. The next section reports on findings from recent research that examined cost-sharing independent of these factors. The sections that follow focus on what recent research has shown about the effects of cost-sharing when these factors are considered.

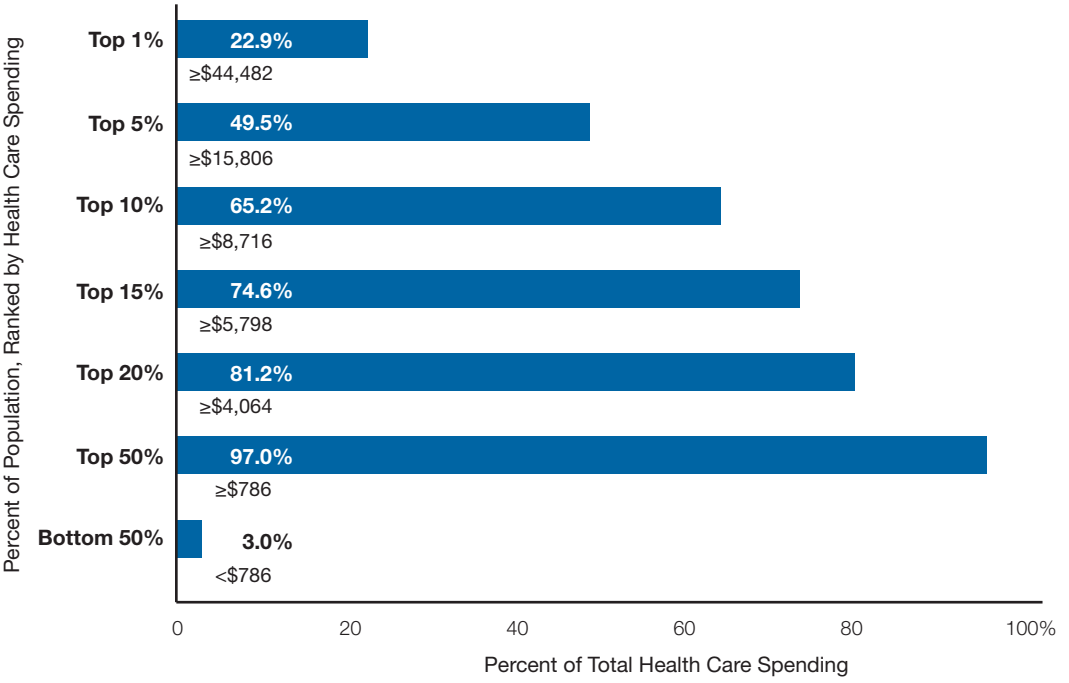
Findings

What are the effects of cost-sharing on the distribution of health care spending and on total health care spending?

The RAND HIE showed that higher coinsurance rates led to declines in medical care use and spending by individuals. However, the declines in medical care use and spending came from declines in patient-initiated visits to physicians or other medical providers rather than from lower intensity of services provided once a person was seen by a health care provider (80, 85). This delineation as to where cost-sharing affects health care use has important implications for estimating the likely effects of changes in patient cost-sharing on the country's aggregate health spending and on which people will be most affected.

It is not clear how the distribution of health care spending would be affected by increased patient cost-sharing. To see why the distinction between the types of health care use that cost-sharing does and does not affect is important, consider how the U.S. population is distributed by shares of the total amount of health care spending. The distribution of health care spending in the United States is highly skewed – that is, most of the spending is for a small share of the population (see Figure 1). In any given year, about half of the civilian, noninstitutionalized population accounts for only 3 percent of total health care spending while people in the top 5 percent in health care spending account for about half of all spending (8, 82, 22). How this distribution might be affected by various levels of increased cost-sharing is not clear based on what we know from the RAND HIE and research done since the HIE was conducted. A greater array of diagnostic tests, surgeries and procedures, chemotherapies and prescription drugs can be provided today than three decades ago. But it is still the case that when people seek physician care or go to hospitals for care, the intensity of services provided reflects norms of care and decisions made by the providers rather than patients.

Figure 1. Concentration of Health Care Spending in the U.S. Population, 2007



Note: Dollar amounts are the annual expenses per person in each percentile. Population is the civilian noninstitutionalized population, including those without any health care spending. Health care spending is total payments from all sources (incuding direct payments from individuals, private insurance, Medicare, Medicaid, and miscellaneous other sources) to hospitals, physicians, other providers (including dental care), and pharmacies; health insurance permiums are not included.

Source: Kaiser Family Foundation using data from the Medical Expenditure Panel Survey (67)

Thus the issue of how the distribution of expenditures might change in response to increased cost-sharing hinges on three factors: how large the cost-sharing increases are relative to the cost-sharing most people face today, whether they are applied uniformly to all services, and who elects to reduce visits to providers. The assumption is that the relative size of increases in cost-sharing will be within the range of increases in cost-sharing during the past decade.

Reductions in patient-initiated care in response to increases in cost-sharing are likely to come predominantly from the half of the population who have low medical expenses — people who most likely are healthy. Increases in patient cost-sharing might reduce this half of the population's spending from the current 3 percent to 2 percent or perhaps 1 percent of total spending. People who have expenditures that place them between the 50th and 90th percentiles may also reduce their contacts with providers in response to increased cost-sharing. Currently they account for 33 percent of all health spending. If they also were to reduce their use of health care in response to increased cost-sharing, the distribution of spending would become more skewed than it is now. People who are very sick will then account for more of the total expenditures. Anyone in the top 10 percent – especially anyone who is among the top 5 percent of spenders – has had a serious acute care episode or has one or more serious chronic conditions. Such people have very little control over the medical care they receive once they initiate care because physicians and other providers follow norms of care. It is not realistic to expect that increased cost-sharing for all covered services would have much impact on decisions by very sick people about their care. Thus, it is not clear what the effect of increased cost-sharing might be on the shape of the distribution of total health care spending, but almost certainly increased cost-sharing will increase the share of total spending attributed to the population in the top 10 percent of health care spending.

Little is known from recent studies about the impact of increased patient cost-sharing on total spending. In spite of the substantial changes in medical care and health insurance design since the HIE was conducted, there has not been a well-done study that has estimated how total spending is affected by the same co-payments or the same coinsurance rate applied to all health care services covered by an insurance policy. Almost all post-HIE studies of how patient cost-sharing affects medical care use have examined a change that affected just one or two types of services (for example, prescription drugs or emergency room use). Lee and Tollen (75) estimated how much premiums might be reduced by increases in cost-sharing provisions that applied to all covered services but the authors made assumptions about how much demand would decline based on the RAND HIE results, so the estimated premium reductions are driven by the assumptions.

Nonetheless, based on the HIE's findings, there is a common assumption that increasing patient cost-sharing by amounts within the range of increases during the past decade for most covered services could cause a substantial slowdown or perhaps even a decline in total health care spending. In the most general terms, for this scenario to occur, the reductions in health care spending by people in the bottom 90 percent of the spending distribution would have to be large enough to meet or almost match expected increases in the costs of new procedures and forms of care for the sickest 10 percent of the population. It is impossible to know what breakthroughs in medicine and new procedures or drugs will be available in the next decade or two and what they will cost. Because of the uncertainties around future advances in medicine, it is beyond the scope of this synthesis to estimate how increases in cost-sharing applied to most services would affect expected total health care spending and the growth in health care spending. A cautionary note about the effects of advances in medicine on spending: advances during the past few decades reduced the costs per person of treating some conditions and diseases – enabling more people with these conditions to be treated, and increasing total spending.

Findings

Increasing cost-sharing for some, but not all, services could cause people to substitute more expensive forms of care, thereby potentially increasing total spending. As noted in the Introduction, insurance reduces financial risk by reducing the price people pay out-of-pocket for health services. But this creates an incentive for people to use more medical care than they might otherwise. Numerous studies of the effect of Medicare supplemental insurance policies have shown an association between having such policies and the overall use of medical care and spending (see reviews by Atherly (2, 3) and Rice and Matsuoka (101)). The supplemental policies effectively reduce the out-of-pocket prices paid by beneficiaries for Medicare-covered services. The association between Medicare supplemental coverage and beneficiaries' use of medical care has caused many to propose raising the supplemental insurance cost-sharing required of some services. However, the association does not necessarily mean that Medicare supplemental insurance causes beneficiaries to use more medical care. The difficulty with the causality argument is that people who expect they will have medical problems in retirement may choose to work for employers that provide retiree health insurance or choose to purchase more generous supplemental (Medigap) policies while people who do not expect such problems may not obtain supplemental insurance. It is not easy to account for these choices by people. The result is that the effect of supplemental insurance itself is not clearly distinguished from unobserved personal characteristics that are associated with both higher medical spending and having supplemental insurance in almost all studies.

A recent study by Chandra, Gruber and McKnight (16) provides a cautionary note to those who believe Medicare spending could be reduced simply by increasing the amount of cost-sharing that beneficiaries are responsible for with supplemental insurance. Chandra et al. avoid the problem of who is more likely to have supplemental insurance by focusing on a group of retirees who have Medicare and retiree supplemental insurance from the same organization (CalPERS). They analyzed what happened when some of the supplemental insurance plans raised the retirees' cost-sharing for physician visits and prescription drugs. They found that Medicare had substantially higher expenditures due to greater inpatient hospital care for chronically ill beneficiaries who faced increased cost-sharing. This suggests that at least for elderly people in poor health, increasing supplemental insurance cost-sharing for some services to try to reduce overall spending will have limited success, and such moves could lead to Medicare paying more altogether because such beneficiaries end up using more expensive care. Significantly, the June 2010 Medicare Payment Advisory Commission's *Report to the Congress* (81) suggests changing the benefit designs of Medicare and supplemental insurance policies – but doing so in such a way that the changes are coordinated and do not lead to unintended consequences on people's health and Medicare spending. The strategies mentioned include cost-sharing protections for low-income beneficiaries and exceptions for cost-sharing for services that are deemed to have substantial clinical benefit.

What are the effects of increased cost-sharing on health outcomes?

There has not been a study of the effects of increased cost-sharing on the health of a general population since the RAND HIE. The HIE found that, for the average person under the age of 62, there were no adverse health effects due to reductions in use of health care caused by the cost-sharing. As noted above, however, the HIE found that people with higher cost-sharing reduced their use of both appropriate and inappropriate health care services about equally. One hypothesis from this finding is that any negative effects due to reducing appropriate health care were matched by reducing inappropriate care that sometimes causes adverse health events leading to hospitalizations.

Findings

Although most people with cost-sharing in the HIE did not experience short-term adverse health outcomes from their reduced use of health care, poor people with hypertension who were on the free plan had large reductions in their blood pressure relative to poor people on the cost-sharing plans. While the results were not statistically significant, the effects were large enough to raise concerns that low-income people who also have an underlying chronic condition such as hypertension could be adversely affected by reductions in health care due to cost-sharing. Such concerns spurred much of the research on the effects of cost-sharing on vulnerable populations. Elderly people were of particular interest for research concerned about vulnerable populations because the HIE excluded people older than 62 and older people are more likely to be both low-income and have chronic conditions that are generally treated with prescription drugs.

In spite of the interest in cost-sharing's effects on health outcomes among vulnerable populations, few studies conducted over the past two decades have had both good control groups and collected data on good measures of adverse health events or outcomes. The better studies reinforce the HIE findings that low-income people in poor health are more likely to suffer adverse health outcomes, such as increased rates of emergency department (ED) use, hospitalizations, admission to nursing homes, and death, when increased cost-sharing causes them to reduce their use of health care, particularly prescription drugs (see, for example, Soumerai et al. (118, 119); Tamblyn et al. (123); Hsu et al. (63); Chandra et al. (16)). Most of the research on health effects of cost-sharing for vulnerable populations has involved people with particular chronic conditions and/or the elderly and what happens to their use of medications after they face higher cost-sharing for prescription drugs (45, 46, 109, 117). Such studies suggest likely adverse health outcomes and higher overall medical expenses due to reductions in drug use since the people studied have a chronic condition that is generally well-controlled when people adhere to prescribed medications. Rosen et al. (105) simulated the effects of a zero co-payment for Medicare beneficiaries with diabetes for ACE inhibitors, and estimated that such a strategy saved lives and reduced expenditures by preventing adverse medical events related to risks from diabetes.

Increased cost-sharing for prescription drugs appears to cause increased expenditures on emergency department services and inpatient hospitalizations by elderly and welfare beneficiaries. Tamblyn et al. (123), found that after Quebec implemented a significant increase in cost-sharing for prescription drugs, there was a significant increase in emergency department (ED) visits, hospitalizations, and admissions to a long-term-care facility due to people reducing their use of essential drugs. The study also found a higher rate of death among the elderly and welfare beneficiaries after the patient cost-sharing was increased. Hsu et al. (63) found higher rates of hospitalizations and death among Medicare beneficiaries who faced a cap on their pharmacy benefits under a Medicare+Choice plan compared with beneficiaries in the same Medicare+Choice plan who did not have a cap on pharmacy benefits. In a study that reduced cost-sharing for some drugs, Goldman, Joyce and Karaca-Mandic (46) estimated that zero co-payments for cholesterol-lowering drugs for people who were medium- or high-risk for coronary heart disease increased compliance with taking the drugs and thereby reduced ED and hospital inpatient costs by more than $1 billion annually. The results of Chandra et al. (16) are consistent with these three studies. While Chandra et al. do not specifically estimate the cost-sharing effects on health outcomes, the findings that chronically ill people are more likely to be hospitalized and expenditures for them are significantly higher as a result suggest quite negative effects on the health of chronically ill older people.

Findings

In their comprehensive review of the literature on the effects of prescription drug cost-sharing, Goldman et al. (47) argue that the evidence is unambiguous for people with chronic illnesses that higher cost-sharing leads to greater use of hospital inpatient and emergency department services, presumably because the people cut back on their use of essential drugs. In contrast, as Goldman et al. note, studies that focused on cost-sharing more broadly (for all types of drugs) or that involved population groups who were not chronically ill did not find adverse health effects or had ambiguous findings with respect to health outcomes (for example, Johnson et al. (66); Motheral and Fairman (83)).

How do responses to cost-sharing differ by socioeconomic factors and health status?

Increased cost-sharing for low-income populations may shift the types of services used, some of which are costly, rather than reduce overall health care expenditures. A study of Oregon's change to its Medicaid program did not find budgetary savings resulting from increased cost-sharing (129). Although overall use of services declined, the mix of services that were used was more expensive so the total expenditures per person did not change. The Oregon program has unique aspects that may limit the generalizability of their findings, but the finding is consistent with research on the effects of increased co-payments and capped benefits for prescription drugs for low-income people (see below). As noted earlier, a study by Tamblyn et al. (123) of the effects of increased cost-sharing for prescription drugs for people on welfare in Quebec in 1996 has similar findings – after the patient cost-sharing was increased, there were significantly higher rates of ED visits and adverse events including a larger number of hospitalizations. Although Tamblyn et al. did not obtain cost information, the higher rates of ED visits and hospitalizations likely increased total spending.

Low-income populations are likely to be disproportionately affected by increased cost-sharing. Cost-sharing is a potential barrier to obtaining care for anyone, especially if the dollar limit on out-of-pocket spending is a high fraction of a person's income. However, the same amount of cost-sharing represents a larger share of income for a poor person than a middle-class or high-income person, creating a financial barrier to care that disproportionately affects low-income people. The HIE strongly suggested that poor people reduced outpatient care more than higher-income people, and had larger reductions than higher-income people in the use of dental care and immunizations for children (80). These findings raised concerns that cost-sharing disproportionately reduces low-income people's access to preventive and clinically beneficial outpatient health care.

These concerns have dominated most states' policies with regard to cost-sharing required of people covered by Medicaid and children covered by the Children's Health Insurance Programs (CHIPs). In the 1980s, states were given options to increase Medicaid income eligibility limits beyond the required increases for children and pregnant women. They were then allowed to obtain waivers to charge nominal premiums and co-payments for use of some services for these optional groups of enrollees. The state CHIPs always allowed cost-sharing for those programs that were not expansions of the Medicaid programs. However, few states have actually used patient cost-sharing for services under Medicaid (with the exception of prescription drugs). Some have tried instituting caps on numbers of hospital inpatient days or mental health provider visits, and prescription drugs. Given that small or "modest" increases in co-payments are not trivial to people who are living from paycheck to paycheck, and the administrative costs of collecting such co-payments are not trivial for providers, there seems to have been little appeal to actually introducing patient cost-sharing under Medicaid or the CHIPs. States have also been reluctant to impose caps on the number of drugs a beneficiary can have each month since

at least two studies (118, 119) found that the cap greatly reduced the use of study drugs (by 35 percent) but also significantly increased the risk of people going into nursing homes or using emergency medical services. The increased expenditures when the caps were in place cost the state a lot more than it achieved in savings from the reduced number of prescriptions. Significantly, the people who were most affected by the cap were vulnerable people, including frail, poor elderly and mentally ill people.

Case studies that have been done on the few states that introduced Medicaid cost-sharing all show that the cost-sharing affected people's decisions to disenroll, but these studies do not examine actual use of medical care by people affected by a co-payment. Wright et al. (132) surveyed a sample of people who were eligible for Medicaid in Oregon under "expanded eligibility" criteria – i.e., they were families and childless adults with incomes up to the poverty level who did not meet the "traditional" categorical criteria for Medicaid. In 2003, Oregon increased cost-sharing for both premiums and co-payments for physician visits, emergency department visits, and inpatient care for this group of Medicaid enrollees. Previously, they did not have a co-payment at all for these services. In response to the increased cost-sharing, enrollment in the Oregon Medicaid plan covering this group fell by 46 percent. Wright et al. found that among the people in their survey who disenrolled, 44 percent identified cost-sharing reasons as the primary reason they left. Moreover, those with the lowest incomes were most likely to report cost-sharing as the major reason for disenrolling. In turn, those who left for cost-sharing reasons had greater unmet need for health care and were more likely to become uninsured.

A recent study (19) examined changes in prescription drug co-payments imposed on privately insured people and how the effects were different for people living in low-income areas compared with high-income areas. The study focused on people with diabetes and people with congestive heart failure, and analyzed their adherence to prescribed medications in response to the co-payment increases. Privately insured people who did not have the increased co-payments were a comparison group. The results indicate that for each medication class examined, individuals living in high-income areas were consistently more likely to continue taking their medications than people in low-income areas.

Responses to cost-sharing may differ by income even among groups that are not low-income. In a study that did not explicitly focus on low-income people, Friedman et al. (35) found suggestive evidence of differences in use of two cancer screening tests by hourly and salaried employees (and dependents) at General Motors. For all enrollees, regardless of health plan type chosen, mammograms and Pap tests were free; the enrollees only paid any out-of-pocket cost-sharing required for the office visit. The hourly employees in the health plan with cost-sharing for outpatient visits had significantly lower use of mammograms and Pap tests than did employees in the plan with free outpatient visits if the visits were within the network of PPO providers. The GM hourly workers in the study earned an average wage of $21 per hour (1997 dollars), placing them above the median family income. Nonetheless, they had a greater response to the cost-sharing than did the salaried enrollees. This is suggestive of income-associated differences in response to cost-sharing. However, because the hourly employees were not low-income, the cost-sharing response differences are more likely associated with unobserved socioeconomic differences in people that are correlated with whether they are hourly or salaried employees. Some of those unobserved differences could, of course, be linked to choice of plan type.

Whether responses to cost-sharing differ by race and ethnicity is unknown. A number of studies have analyzed cross-sectional data to estimate the associations between use of different types of health care (primarily mammography) and cost-sharing as reflected in Medicare supplemental plans, with controls for various demographic characteristics that might be thought

to independently affect health care use (10, 125). Race/ethnicity is frequently thought to be such a characteristic. The rate of use of mammography is lower among Medicare beneficiaries who faced cost-sharing for mammography, and such cost-sharing disproportionately affects minority groups because they are either more likely to enroll in supplemental plans with cost-sharing or not have supplemental coverage at all. However, low income has a stronger association with use of such services than race/ethnicity. Women lacking supplemental insurance and women with Medicaid and Medicare were disproportionately low-income, had limited education, and were minorities. Thus, it is not clear whether cost-sharing itself differentially affects health care use of whites and minority groups (and between different minority groups) after controlling for income and other socioeconomic characteristics that also might affect obtaining Medicare supplemental insurance and health care use.

People in poor health or with chronic conditions respond differently to cost-sharing than healthy people. It has long been suspected that people who are sick or chronically ill respond differently to increased cost-sharing than the average, healthy person. The RAND HIE did not find evidence of such differential behavior, but the HIE also excluded elderly people – the very people who are most likely to have chronic conditions and use medical care more frequently. People over age 65 account for more than a third of total health care spending. The issue of whether people who are sick respond differently to cost-sharing than the average, healthy person is important because sick people account for the majority of aggregate health care spending. Estimates of the decline in health care spending or changes in health outcomes based on the average person – who is healthy – will mislead policy-makers and the public if people's responses to cost-sharing depend in part on their health status. Recent studies of interactions between health status and cost-sharing have focused on the elderly and/or Medicare beneficiaries – primarily to obtain large enough samples of the small fraction of people who are very sick each year, most of whom are elderly. Two studies (98, 16) relied on samples of Medicare beneficiaries and conclude that people in poor health respond differently than healthy people to cost-sharing. Raising cost-sharing for outpatient care and prescription drugs for people in poor health can lead to significant overestimates of the reductions in health care spending that might result from increasing cost-sharing.

The study by Chandra et al. (16) provides a clean estimate of how cost-sharing per se could differentially affect healthy versus sick people. Unlike Remler and Atherly (98), they do not have to worry about unobserved differences in people that might explain their choice of Medicare supplemental insurance or whether they had any supplemental coverage. All of the people in their study population are retired California public employees with CalPERS Medicare supplemental insurance, which increased co-payments for physician office visits and prescription drugs in some of its PPO and HMO plans.[8] The effects of the increased cost-sharing were estimated by comparing the changes in health care use of people who faced the co-payment increases with changes in use of people who did not have increased co-payments. Chandra et al. used two different definitions of poor health and both definitions yield the same results: when faced with increased cost-sharing, retirees in poor health had larger reductions in spending on physician visits and prescription drugs than those in relatively good health. With the simple definition of chronically ill, those who were "healthy" reduced the amount they spent on physician office visits by 3 percent and the amount they spent on drugs by 8 percent. In contrast, those who were chronically ill reduced the dollars spent on physician visits and prescription drugs by 15 percent and 27 percent, respectively. Despite the larger reductions in dollars spent by the chronically ill, we cannot simply conclude from this study that people in poor health status are more responsive than healthy people to cost-sharing increases. The larger reduction in spending by the chronically ill reflects at least in part their high initial level of health care spending and does not necessarily correspond to greater price sensitivity. (See the Methodological section above.) Significantly, moreover, the chronically ill used more

8 The people in their sample were continuously enrolled in whichever plan they chose and did not switch plans after the increases in cost-sharing.

inpatient hospital care after the supplemental insurance cost-sharing increased. The effect of the increased cost-sharing imposed by the supplemental insurance was to increase Medicare spending on the chronically ill for Part A hospital services by 122 percent. Results of Chandra et al. are consistent with the fact that healthy older people go to a physician only once or twice a year – the reduction in their use of care is constrained by the fact that it cannot drop much. Chronically ill people, with more visits to physicians and more prescriptions to begin with, can cut back more on visits and use of drugs.[9] In turn, these reductions could lead to increased rates of hospitalizations for people with higher risks of dying because of a chronic condition.

The conclusion from both studies is that sick or chronically ill elderly people respond differently to increased cost-sharing than do healthy people. Moreover, the results of Chandra et al. indicate that even modest reductions in physician visits and prescription drug use among the sick elderly come at a high price for Medicare, with significant increases in Medicare spending on hospital care. This finding is consistent with the findings (noted above) that when cost-sharing for prescription drugs for elderly people and people on welfare was increased in Quebec in 1996, it was quickly followed by a significantly higher rate of emergency department visits and adverse events including a larger number of hospitalizations (123).

What are the effects of cost-sharing on different types of services?

Much attention has been devoted over the past 10 to 15 years to examining the effects of cost-sharing on the use of different types of health care. In particular, concern has focused on whether cost-sharing might reduce the appropriate use of preventive services that have been deemed cost-effective and valuable to one's health (21), as well as emergency department use (24), mental health care services, and prescription drugs. This section discusses what has been learned about the effects of cost-sharing on preventive services, the use of emergency department services, and the use of mental health and substance abuse services. Findings related to the effects of changes in cost-sharing for prescription drugs are discussed separately in the next section because so many studies of changes in cost-sharing for prescription drugs have been conducted in the past 15 years.

Cost-sharing reduces the use of preventive services. The HIE found that people with cost-sharing reduced their use of preventive care such as immunizations for children and Pap tests for cervical cancer. More recent studies focusing on mammograms, Pap tests, and colorectal cancer screening are consistent with the HIE finding that cost-sharing reduces the use of preventive care (14, 125, 131, 116, 35, 10). All the studies involve cross-sectional data, however, and are potentially subject to bias because of unobserved characteristics that could be associated with a person's choice of health plan and with use of preventive care. The results need to be interpreted with caution therefore, but the consistency of the findings is striking.

As more preventive services have been deemed cost-effective (21), concerns have risen that cost-sharing applied to preventive services might be counter-productive in terms of reducing health spending. As a result, some large employers and health plans have reduced or eliminated cost-sharing requirements on some specific preventive services. The newly released rules for health insurance plans created by the PPACA eliminate cost-sharing for four sets of preventive services, and Medicare also will no longer face cost-sharing for most preventive services as of January 2011.

Cost-sharing reduces emergency department utilization. Three well-designed studies consistently found that increases in co-payments for emergency department (ED) use were associated with significant declines in ED use (112, 62, 130). The difference in ED utilization in

9 If the conditions are asymptomatic (e.g., high blood pressure or high cholesterol), people with chronic conditions may be especially likely to reduce physician visits and prescription drugs in response to increased co-payments for each.

groups with higher co-payments compared with control groups ranged from 10% to 15% (130, 112). Further, one study found that for all ED visits subsequent to a first ED visit, there was an almost 25 percent decline in ED visits relative to the control group, and the reduction was greater for visits classified as low or indeterminate severity (130). It should be noted, however, that these studies involved enrollees of two large managed care plans (Kaiser Permanente of Northern California and Harvard Pilgrim Health Care), and many of the enrollees could obtain care from urgent care centers rather than hospital EDs. As DeLia and Cantor (24) point out, people who lack access to alternative urgent care providers may respond differently to cost-sharing and not reduce their use of EDs as much. Moreover, only one of these studies included Medicare beneficiaries; all of the other enrollees were employees and their dependents. Thus, while these studies are well-done in terms of having good control groups for comparison, their results may not be generalizable to vulnerable population groups.

Cost-sharing for emergency department use does not result in adverse health outcomes, at least in the short term. The effect of patient cost-sharing on ED use is of great interest – both because adverse health effects of a disincentive to use the ED could be more immediately apparent (for example, increased hospitalization rates or deaths per 1,000 people) and because people often use ED services inappropriately for less severe diagnoses. If cost-sharing could reduce the inappropriate use of ED services without causing harm, health care could be delivered more efficiently and at lower overall cost. All three of the studies found that the reduction in ED use was greater for visits of low severity, indicating people were making informed choices about when to seek care in the ED (112, 62, 130). Longer study periods are needed to confirm the stability of this finding over time, however.

Demand for mental health and substance abuse care is sensitive to cost-sharing, according to the limited research available. Studies from the 1980s found people's demand for mental health care was quite sensitive to patient cost-sharing (33, 61, 70). Since then, studies of the effect of patient cost-sharing on use of health care for mental health or substance abuse (MHSA) have focused on the effects of federal and state parity laws that were passed between 1996 and 2008, when the MHPAEA was passed and superceded the earlier laws. The earlier parity laws were intended to equalize patient cost-sharing for MHSA services and acute care services. Cost-sharing for MHSA services has been greater and access to such services has been subject to limits more than acute care services (38, 12, 7). Although advocates for the parity laws hoped they would reduce the cost-sharing for MHSA services, the laws have exemptions that weaken their ability to lower patient cost-sharing for many people. Further, most of the earlier parity laws emphasized parity for mental health care and largely ignored the cost-sharing requirements and limits on coverage for services that alleviate problems of substance abuse. As a result, studies of the effects of the parity laws have had to account for the differences in scope of state parity laws or focus on specific groups of people affected by particular parity laws, such as federal employees covered by the Federal Employees Health Benefits (FEHB) Program or Medicare beneficiaries. The studies have relied on a variety of methods to compare mental health service use before and after the parity laws were implemented, between people in plans that had parity in benefits cost-sharing with those that did not, and between people in states that passed comprehensive parity laws with those that did not (54, 13, 48, 6, 126).

The conclusion that emerges from these studies is that general trends in mental health care treatments explain observed changes in use of mental health care after implementation of the parity laws rather than the parity laws themselves. The general trends include increasing use of contracts between insurers and behavioral health managed care plans, which closely manage the types of mental health providers people can see for outpatient visits, the number of such visits, and the use of prescription drugs. The effects of the early parity laws were not separable from the effects of these

changes occurring at the same time (54, 46). It also appears that the reductions in patient cost-sharing produced by the parity laws did not increase the quality of mental health care obtained (6, 13) although one study suggests that at least for Medicare beneficiaries, quality was improved (126).

Other studies of cost-sharing and demand for MHSA services have focused on the effects of cost-sharing for prescription drugs on people with specific mental illnesses. In their review of the broad literature on the effects of cost-sharing on prescription drug use, Goldman et al. (47) state that for people with schizophrenia (among other chronic conditions) the evidence is "unambiguous" that higher cost-sharing leads to greater use of inpatient and emergency department medical services. Two studies that focused on substance abuse care found cost-sharing sensitivity among people using treatment for substance abuse (114, 121). Stein and colleagues (121) analyzed the effects of cost-sharing within a behavioral health managed care plan that was under contract with a primary insurer to manage all the insurer's enrollees with behavioral health needs. Co-payments reduced the likelihood that patients discharged from inpatient detoxification care would follow through with recommended outpatient treatment, and the higher the co-payment the lower the likelihood that the enrollees would obtain follow-up outpatient care.

A problem complicating the accuracy of estimates of the effects of cost-sharing for MHSA services is that many people (mostly higher-income people) can use flexible health savings accounts to pay for the costs of MHSA care. The flexible health savings accounts can be used to pay for many types of health services but they are generally managed by companies that are independent of employers and the health plans with which the employers contract. To the extent that people do not want their employers to know they are obtaining MHSA care and they are suspicious that the health plan might relay health care records to employers, the flexible health savings accounts offer an alternative, tax-subsidized way of paying for MHSA care. Further, if people do not like the managed care aspects of the mental health or substance abuse services they can obtain through an employer's health plan, they can obtain care on their own and submit claims for reimbursement to the flexible health savings account administrator. Because these claims are not included in health care claims data collected from large employers by researchers, the effects of cost-sharing for MHSA services cannot fully be estimated. A related complication for accurately estimating the effects of cost-sharing for behavioral health services is that higher-income people are more likely than lower-income people to take advantage of the tax code incentives to place up to $5,000 per year of pre-tax income in flexible health savings accounts.[10] As a result, they are more likely than lower-income people to use that money to pay for behavioral health services outside of insurance plans.

What are the effects of increased cost-sharing for prescription drugs?

Increased cost-sharing for prescription drugs is associated with a decline in use of and spending on drugs. As noted by Goldman et al. (47) in their extensive review of studies of the associations between cost-sharing for prescription drugs and use of and spending on drugs, increased cost-sharing is clearly associated with lower pharmaceutical use. Recent research on the effects of pharmaceutical cost-sharing has been dominated by studies of tiering of increasingly higher co-payments or coinsurance for prescription drugs as the drugs move from generic to preferred brand-name to non-preferred brand-name drugs. Over the last decade, most pharmacy benefit managers (PBMs) have increased the cost-sharing for the tiers and/or have increased the number of cost-sharing tiers from two to three or four. According to the Kaiser Family Foundation/Health Research and Educational Trust's latest survey of employer health

10 The PPACA reduced this amount to $2,500 effective 2013, with annual increases limited to the rate of inflation.

benefits (56), 99 percent of workers with employer-sponsored insurance also have prescription drug coverage. The majority of these workers (78 percent) have three or more tiers of cost-sharing for drugs. Between 2000 and 2010, for plans with three or more tiers, the average co-payments increased as follows: for generic drugs (1st tier), from $8 to $11; for preferred drugs (2nd tier), from $15 to $28; for non-preferred drugs (3rd tier), from $29 to $49; and 4th tier drugs had an average co-payment of $89 in 2010. As a result of these changes in numbers of tiers and increases in co-payments, there has been a mini-explosion in studies of the effect of cost-sharing on prescription drug use and prescription drug spending, as well as on secondary outcomes such as adverse health outcomes and total health expenditures.

Increased cost-sharing of about 10 percent is associated with a decline of between 1 percent and 6 percent in spending on prescription drugs. Two recent syntheses reviewed the evidence on prescription drug cost-sharing (Gibson et al. (40), which reviewed 30 studies, and Goldman et al. (47), which reviewed 132 articles). Both reviews focused on how patients responded to higher prescription drug cost-sharing as well as whether there were adverse effects on health outcomes (which were discussed above). Studies that have queried people about how they respond to pharmacy benefit caps or not having prescription drug coverage have found that people (especially the elderly) reduce their spending on prescription drugs in various ways: they stop taking one or more prescriptions, do not fill a prescription, take a prescription every other day rather than as prescribed (all are forms of prescription non-adherence), or they switch to a less expensive version of the drug (a generic or similar drug in the same therapeutic class) (23, 122, 95, 127, 11, 109, 117).

The evidence is mixed as to whether people respond to increased cost-sharing by switching to less expensive, close drug substitutes. Substitution of generic drugs for brand-name drugs seems to depend on the class of medication as well as the absolute out-of-pocket cost increase, whether a person has particular chronic conditions, and how long a person has been diagnosed with the condition (45, 41, 74, 47). In studies of natural experiments where PBMs created a third tier of non-preferred brand-name drugs with substantially higher co-payments or increased the number of tiers in a formulary along with higher co-payments, people were more likely to switch to preferred brand-name drugs with lower co-payments (64, 74). However, in at least one study (41), when co-payments were increased substantially for brand-name but not generic drugs, people reduced their use of both generic and brand-name drugs – suggesting that people may not understand that generics are equivalent to brand-name drugs or that the generic drugs were complements to the brand-name drugs people were taking.

People reduce their use of both essential and nonessential drugs, although the reductions are greater for nonessential drugs than essential drugs. In general it appears that increased cost-sharing for drugs causes people to reduce their use of drugs more when the condition for which the drug has been prescribed is asymptomatic or the drug is used occasionally to treat symptoms. When researchers included the therapeutic class of drugs in studies, there were substantial reductions in spending on all classes of drugs, with the largest reductions occurring for drugs to treat arthritis and allergies (45, 41, 47). Goldman et al. (45) further found that there was much lower responsiveness to price changes for disease-specific drugs[11], and that patients were less likely to reduce their use of essential drugs if they were receiving ongoing care from a physician for the disorder that required the drug.

11 Goldman et al. describe disease-specific drugs as those that a person would take only for a specific condition or disease (often chronic).

Several studies that focused on people with chronic conditions found that cost-sharing reduced the use of essential drugs and was associated with increased use of other medical services, especially hospital care (47). In particular, Tamblyn et al. (123) conducted a study of Quebec's 1996 implementation of a 25 percent coinsurance for prescription drugs and a significant deductible cost-sharing policy for elderly individuals and welfare beneficiaries. The researchers found that elderly beneficiaries decreased their use of essential drugs by 9.1 percent and their use of nonessential drugs by 15.1 percent after the cost-sharing was introduced. Welfare beneficiaries reduced their use of drugs even more, reducing nonessential drug use by more than their use of essential drugs. The study also found a significantly higher rate of emergency department visits and adverse events (defined as hospitalizations, admission to long-term-care facility, or death) related to the decline in use of essential drugs after the cost-sharing was implemented. The study did not have a control group, but "the suddenness of reductions in drug use that occurred immediately after the introduction of the cost-sharing policy strengthens the conclusion that changes in drug use were likely to be related to the cost-sharing policy." (123). A similar study by Kephart et al. (72) analyzed prescription drug use patterns among senior citizens in Nova Scotia after the province switched from providing prescriptions free of charge. Kephart et al. also distinguished between essential and less essential drugs, and obtained results similar to those of Tamblyn et al. Finally, Chandra et al. (16) separated drugs into three categories[12] and found that chronically ill elderly reduced their use of drugs in all three categories after cost-sharing increased.

Effects of the "doughnut hole" coverage gap in Medicare Part D drug plans: the elderly reduce their use of drugs when they have to pay the full price. Researchers and policy-makers have been especially interested in the effects of the gap in coverage (the so-called doughnut hole) that is present in the vast majority of Part D plans.[13] The effects of the cost-sharing mechanisms of Part D plans can be separated into (1) effects due to the gap and (2) overall effects on drug use and adherence to recommended prescriptions.

The standard plan under Medicare Part D has a relatively modest deductible ($310 in 2010), then a coinsurance of 25 percent of the cost of drugs between the deductible and a threshold level at which there is no insurance coverage – the expenditure level at which the gap in drug coverage begins. In 2010, the gap threshold is $2,830 of drug expenditures; the threshold of out-of-pocket drug spending that triggers so-called catastrophic drug coverage (and where the gap closes) is $4,550 (equivalent to $6,440 in total drug costs under the standard benefit). The catastrophic portion of the Part D standard plan has a 5 percent coinsurance rate, without a limit on the coinsurance payments.

The vast majority of Medicare drug plans do not offer coverage for expenses in the gap, and most of those that do provide coverage cover only generic drugs. Moreover, most drug plans (both in the stand-alone prescription drug plans (PDPs) and the Medicare Advantage managed care plans) do not charge the 25 percent coinsurance rate for drug purchases between the deductible and the gap. Instead, they use tiered co-payments with a large fraction of plans including a specialty tier with a high co-payment for high-cost drugs. Hoadley et al. (59) estimated that 26 percent (3.4 million people) of Medicare beneficiaries with Part D coverage through stand-alone PDPs or Medicare Advantage had drug expenditures in 2007 that landed them in the gap. (Fifteen percent of these people had expenses that brought them to the catastrophic portion of the Part D coverage.) Half of the beneficiaries who reached the gap did so by the end of August. Thus, the effects of the gap are important since a large number of people were affected by it and reached the gap well before the end of the calendar year.

12 The three categories are: acute care (drugs that if not taken will increase the probability of an adverse health event within a month or two); chronic care (drugs designed to treat persistent conditions that if not treated will result in a potentially adverse health event within the year); and medications that improve a patient's quality of life but provide relief of symptoms rather than affecting the underlying disease or condition.

13 The PPACA gradually eliminates the Medicare gap in prescription drug coverage.

Schneeweiss et al. (110) and Zhang et al. (134) specifically examined the effect of the Medicare Part D coverage gap on the use and out-of-pocket spending of beneficiaries who reached the coverage gap. Using different datasets, both studies found that people who reached the coverage gap reduced their use of drugs in the months after they were affected by the gap. Zhang et al. estimated such beneficiaries reduced their drug use by 14 percent (0.7 prescriptions per month), and Schneeweiss et al. estimated that their use of drugs in the four drug classes of the study declined at a rate of 4.8 percent to 6.3 percent per month after they reached the gap. Zhang et al. also had data on people who had coverage for generic drugs in the coverage gap; some of these people switched from brand-name to generic drugs but in general these people reduced the number of their prescriptions by only 0.14 prescriptions per month.

The findings of Schneeweiss et al. and Zhang et al. also are consistent with a study by Hsu et al. (63) that analyzed the effects on Medicare beneficiaries who were enrolled in a Medicare+Choice plan and had a cap of $1,000 on their pharmacy benefits. (The study was conducted before the implementation of Medicare Part D and Medicare managed care plans were expanded to Medicare Advantage.) The experiences of the Medicare beneficiaries who faced a cap were compared with the experiences of Medicare beneficiaries who were also enrolled in the same managed care plan but did not face a cap because their former employers did not place a cap on their retiree benefits. Drug spending among those who faced the cap was 31 percent lower than it was among people who did not face a cap. Equally important, the difference in spending between the two groups grew larger in the months after people bumped into the cap than in the months before.

Coverage of prescription drugs under Medicare is associated with increased drug utilization and lower out-of-pocket expenses. Two recent studies of the effects of the Medicare Part D prescription drug benefit conclude that starting six months after Part D was implemented (when presumably enrollees were used to their new plans), average monthly use of drugs increased by between 6 percent and 13 percent, depending on how use was measured, and beneficiary out-of-pocket expenditures declined by between 13 percent and 18 percent (76, 133). The study by Schneeweiss et al. (110) (cited above) analyzed beneficiaries' use of drugs in four essential drug classes: expensive drugs, less expensive drugs, drugs used to treat symptomatic conditions, and drugs used to treat asymptomatic conditions. They found that six months after Part D was implemented, there were increases in use (measured as defined daily doses) of between 11 percent and 37 percent for all the study drugs except warfarin, a blood thinner used to dissolve blood clots and a drug prescribed only when absolutely necessary.

Long-term health effects of reduced use of essential drugs, especially for people with chronic health conditions, are unknown. With one exception (46), none of the studies of the effects of cost-sharing on prescription drug use involved more than two years of data collection after the cost-sharing was initiated. This has created a significant gap in our knowledge about the health effects of increases in cost-sharing for prescription drugs, particularly since many drugs for asymptomatic conditions (e.g., hypertension, high cholesterol) are prescribed to avoid adverse health outcomes at least a decade into the future. Goldman, Joyce and Karaca-Mandic (46) showed that compliance with cholesterol-lowering drugs fell by between 6 percent and 10 percent when co-payments were increased from $10 to $20 for people age 20 and older. Significantly, based on effects of full compliance with cholesterol drugs, they estimate that if co-payments were eliminated for people with medium- or high-risk for coronary heart disease (CHD), up to $1 billion could be saved annually because such people would avoid almost 80,000 hospitalizations and more than 31,000 ED visits. The mechanisms for increasing patient cost-sharing for prescription drugs are changing almost annually, making it important to understand the effects of such financial incentives and yet difficult to study the effects for more than several years.

Conclusions

The large number of research studies analyzing the effects of patient cost-sharing that have been conducted since the RAND HIE confirm the primary conclusion of the HIE – that demand for most health care services is price sensitive. When people have to pay more for health care, they reduce their use of health care. The other primary conclusions that can be drawn from these studies answer the questions that were used to guide this synthesis and include the following:

We do not know if increased patient cost-sharing would reduce the growth in total national health care spending. Half of all Americans account for only 3 percent of all health care spending. While increased cost-sharing may cause them to lower their use of health care, their reductions will not significantly affect total spending or slow the growth in national spending. At the same time, people in the top 5 percent of health care expenditures account for about half of all spending – and they are generally very sick people. Once they begin to seek medical advice and care, their subsequent decisions about their options for medical treatment are generally unaffected by cost-sharing. Even people in the top 10 percent (who account for 65 percent of all spending) have high expenditures (likely above $10,000 in 2010) and almost all are unaffected by cost-sharing once their expenditures exceed $2,000. It is the people in the 50th to 90th percentiles of the health care spending distribution who are the unknowns in terms of responsiveness to increased cost-sharing. Since they account for just over a quarter of all spending, if they reduced their use of care by 10 percent, that could potentially reduce total spending by 2.5 percent. Whether reductions in use by people who are not in the top 10 percent of the spending distribution could offset expected increases in the costs of norms of care for very sick people (those in the top 10 percent) – and thereby also slow the growth in spending – is not clear. Research on the effects of cost-sharing does not address this critically important question.

Increased cost-sharing disproportionately shifts financial risk to the very sick. One of the primary purposes of health insurance is to reduce people's financial risk in the case of illness, particularly catastrophic or high-cost illnesses. Broadly raising cost-sharing will shift the financial burden to those least likely to be in a position to reduce their utilization without adverse health outcomes – the very sick.

Cost-sharing affects people differently depending on their income and health status. But controlling for income and health status, we do not know whether race/ethnicity is another significant factor that affects how people respond to cost-sharing. Additional research conducted with more detailed information about individuals' chronic conditions, income, and race/ethnicity would provide more insights into the differing responses. But the general conclusion that responses to cost-sharing depend on people's income and health status has been established.

In general, most people do not distinguish between health care services or prescription drugs that are essential and those that are not essential. The HIE first uncovered this surprising finding and the studies since then (particularly those that focused on cost-sharing effects on prescription drug use) continue to confirm this. Of particular concern recently is the well-documented finding that the use of all preventive diagnostic services and immunizations is lower when cost-sharing is higher. The elimination of cost-sharing requirements for certain preventive services under the PPACA is an attempt to inform people that some preventive services are highly effective at improving health outcomes and should be used. While there are some indications that people with chronic conditions (primarily elderly) are better able to distinguish between essential and nonessential drugs and health care services,

the findings are not consistent. Moreover, the best evidence that people can distinguish between types of conditions that should cause someone to seek care in an emergency department and those that can wait comes from managed care settings. It is not clear that people without alternative urgent care clinics or vulnerable population groups can make the same distinctions and would not be harmed by higher cost-sharing for ED services.

Low-income people are at greater risk than higher-income people in terms of poor health outcomes due to increased cost-sharing. This conclusion appears to be especially pertinent for low-income elderly with chronic conditions and low- to middle-income people with mental health diagnoses that are treatable with prescription drugs.

Policy Implications

Patient cost-sharing is not necessarily an effective policy mechanism for significantly slowing health care spending. Patient cost-sharing is not the panacea many hope it could be for slowing health care spending in the United States. Most people are healthy, and cost-sharing would only modestly affect their health care spending. People who are very sick or who have serious chronic health conditions are typically not making choices about medical care options on the basis of cost-sharing; they are deferring to their physicians. For cost-sharing to slow national health spending without causing adverse health outcomes, it would have to be well-targeted at low-value and expensive health services. Moreover, by itself, cost-sharing is unlikely to slow the growth in spending unless the expected increases in the costs of appropriate care for the very sick also slow. The importance of targeting cost-sharing carefully and well cannot be over-emphasized. Research evidence points to the unintended consequences of raising cost-sharing uniformly for people regardless of their health status. When low-income and chronically ill people faced higher cost-sharing for prescription drugs and physician visits, the higher cost-sharing was quickly followed by increased expenditures for hospital inpatient and emergency department services.

Caution should be used when increasing cost-sharing for low-income populations. Not only are low-income populations disproportionately affected by increased cost-sharing, but they are more price sensitive than higher-income groups. Unless the cost-sharing increases are concentrated on services that are ineffective or unnecessary, low-income people may avoid necessary medical care and that in turn could lead to greater spending on hospital care. In addition, as others have noted, higher cost-sharing may lead to worse health outcomes for low-income people and could increase disparities in health by income (18).

An annual maximum amount of out-of-pocket cost-sharing tied to family income could be part of health insurance. To limit the financial risk that people may be exposed to with increases in patient cost-sharing, insurance benefit packages could contain a cap on the percentage of income that an individual or family has to pay out-of-pocket for medical care.

Increased cost-sharing for people with chronic conditions may result in higher expenditures for costly hospitalizations and greater use of emergency department services. Increased cost-sharing for some services appears to cause people with chronic conditions to reduce their use of such services, but then they use more care in more expensive settings. Increasing cost-sharing for some services may increase overall health care spending rather than yielding cost savings.

Cost-sharing is currently not well-targeted at less beneficial or nonessential services. Patient cost-sharing to date generally has been set up in broad categories – for example, outpatient care, inpatient care, emergency department care, and diagnostic services, or three or four types of drugs. While these broad categorizations may provide wide discretion for physicians in terms of options for caring for heterogeneous patients, they do not help people figure out if some medical service or drug is more or less essential to their health. Many health plans already have zero co-payments or waive deductibles for some preventive services deemed cost-effective in order to encourage people to use them. Similarly, some insurers and employers that self-insure have moved to implement forms of value-based insurance designs even though their effectiveness has not yet been evaluated extensively. The Value-Based Insurance Design (VBID) plans vary the cost-sharing and create incentives for people to reduce their use of low-value care and continue their use of high-value care. It would be helpful, however, to have an objective process for determining what is cost-effective – in much the same way that the Food and Drug Administration determines which new drugs can be brought to market. Results from cost-effectiveness studies and evidence-based medicine could be used to help distinguish between essential and nonessential health care services.

The Need for Additional Information

In spite of the research conducted since the HIE, a number of questions about the effects of patient cost-sharing remain unanswered.

What are the long-term effects on health? Probably the most important unknown effect of patient cost-sharing is its effect on people's health over many years. Health outcomes over many years, however, are affected by a wide variety of factors that are independent of cost-sharing. The only way to know how cost-sharing may affect long-run health outcomes is by following a large number of people who randomly faced different levels of cost-sharing for many years. This type of study would be expensive to conduct (and no doubt would raise ethical concerns) and is not likely to occur.

The HIE results indicated that cost-sharing had no short-term ill effects on the health of the average person. Since the HIE, researchers therefore focused on determining if there might be significant negative health effects on people thought to be more vulnerable to the effects of cost-sharing. More studies are needed that involve populations that are not just in managed care plans or group model HMOs in order to learn more about possible negative effects on people who might be especially sensitive to cost-sharing.

What types of health services are being reduced by people facing higher cost-sharing? This point relates to the previous point about unknown effects on long-term health outcomes due to cost-sharing. We do not know much more than the finding from the HIE that most people reduce both essential and nonessential health care when faced with higher cost-sharing. Some of the recent studies that have examined how cost-sharing affects prescription drug use have analyzed drug use among people with chronic conditions such as hypertension, high cholesterol, arthritis or diabetes. These types of chronic conditions are good to study because large shares of the population have them. But hypertension and high cholesterol, for example, are "silent" diseases – most people with these diagnoses do not notice a difference in their health if they do not take drugs prescribed for them. People with untreated diabetes, on the other hand, can often see health impacts relatively quickly. And people with chronic conditions that involve muscular or neurological conditions such as multiple sclerosis or Parkinson's disease can immediately see a difference if they cut back on their prescription drugs. Thus, more studies are needed that could investigate what types of people with what types of health care needs may be cutting back on their use of essential drugs and other essential medical services if they face higher cost-sharing for the drugs. If chronically ill or otherwise vulnerable people are reducing their use of essential care along with nonessential care, increasing cost-sharing for them could well be leading to increased health expenditures for hospitalizations and worse health outcomes for many people.[14]

What is the effect of large cost-sharing? Most of the last two decades of research on the effects of patient cost-sharing involved relatively small changes in cost-sharing. Moreover, almost all of the studies of the effects of increased cost-sharing for prescription drugs or for emergency department use have involved increases in co-payments rather than coinsurance. The findings from these studies may not be generalizable to cost-sharing that could involve large deductibles, for example.

In addition, it is often proposed that health insurance should move away from the managed care, "first dollar" coverage model that a majority of Americans have had since the late 1980s and should move toward a high deductible, catastrophic model. Although such proposals typically

14 Studies by Rosen et al. (105) and Goldman, Joyce and Karaca-Mandic (46) are examples of research indicating how lower cost-sharing for prescription drugs for people with diabetes and high cholesterol could yield savings from reduced total spending on their health care.

include exemptions for cost-effective preventive care (for example, children's immunizations, colonoscopies, mammograms), they still set the deductible in dollars rather than as a percentage of a person's income. We do not know how people's use of health care would be affected by having to pay a high percentage of income for medical care before insurance would take effect. We also do not know how people's use of medical care might differ if the high deductible were prorated over quarters of the year.

Do people respond differently to increases framed as dollar increases and increases framed as changes in coinsurance rates? A question not addressed by any of the studies examined is whether people react differently to a change in cost-sharing that is announced as a change in the percentage of charges a person is responsible for (coinsurance rate) as compared with a change in the dollar amount of cost-sharing required (co-payment) at the time of seeking care. It may be that people react to an increase of a co-payment that raises the cost-sharing from $10 to $20 as being more of an out-of-pocket increase than an increase in a coinsurance rate from 20 percent to 25 percent that also has a $10 out-of-pocket increase in cost.

What types of interactions occur between cost-sharing and types of health insurance? A number of the well-done studies of the effects of co-payments involved enrollees of managed care plans. If the plans themselves have embedded selection effects in terms of the types of physicians who contract with the plans or management attitudes or controls of the hospital EDs that contract with the plans, then the findings of cost-sharing effects will not be generalizable to the broader population. Further, there are well-known concerns about selection effects due to unobserved differences among people that are correlated with their preferences for styles of medical practice and types of health insurance plans. Thus, we know very little about the interactions between cost-sharing per se and the types of health insurance that people have.

Changes in cost-sharing for prescription drugs offer important opportunities to understand how people respond to different forms of cost-sharing as well as increases in cost-sharing. Perhaps because the changes in pharmacy benefits are occurring so rapidly and are continuing to evolve, much is still unknown about how people respond to changes in prescription drug cost-sharing, particularly for drugs that are prescribed for asymptomatic chronic conditions.

How could care for people with mental health conditions and substance abuse problems be improved with different cost-sharing? We know that demand for mental health and substance abuse care is sensitive to cost-sharing, putting lower-income people at greater risk for problems with mental health or substance abuse. The recent requirements to implement parity in health policies for how mental health and acute health problems are treated will be better implemented if analyses can be conducted of new quasi-experiments with cost-sharing for care of mental health and substance abuse conditions.

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Appendix II The RAND Health Insurance Experiment

The Experiment's Design

The RAND Health Insurance Experiment (HIE) is frequently labeled the "gold standard" for the thoroughness with which the experiment was designed and implemented, and for the way in which the data were analyzed (51). The experiment involved about 5,800 people (in some 2,000 families) who lived in Dayton, Ohio; Seattle, Washington; Fitchburg and Leominster, Massachusetts; Franklin County, Massachusetts; Charleston, South Carolina; and Georgetown County, South Carolina (69, 79, 85). While they were in the experiment, the people used only the insurance plan to which they were randomly assigned; they did not have additional coverage.

The plans to which people were assigned varied by cost-sharing arrangement and a maximum out-of-pocket dollar expenditure (MDE), and some families were recruited from a staff model HMO plan in Seattle (Group Health Cooperative (GHC) of Puget Sound). There were five cost-sharing arrangements: four that involved only coinsurance rates: zero (free care), 25%, 50%, and 95%; and one arrangement that consisted of only a deductible of $150 per person or $450 per family (almost $600 and $1,800 in 2009 dollars) that applied only to outpatient care. In addition, any family in the plans with 25%, 50% or 95% coinsurance rates had a MDE that was 5%, 10% or 15% of the family's income, with a cap on out-of-pocket expenses set at $1,000. Thus, no matter what the coinsurance rate or MDE, a family would never be at risk for more than $1,000 in out-of-pocket expenses per year. People were followed for three years in most cases; some were followed for five years.

The people recruited from the HMO consisted of two groups: a random sample of people who had not previously been in GHC but agreed to enroll in it for the experiment (the experimental), and a random sample of people who had previously been enrolled in GHC and met the eligibility requirements that applied (the controls). The HMO experimentals faced no cost-sharing while the controls remained on whatever plan they had and in general did not face cost-sharing for office visits or hospitalizations.

Almost all medical services that were available in the early 1970s were covered – such services as hospital, physician, dental (which was not a widely covered service), pharmaceuticals, vision and hearing services, services supplied by allied health personnel (including psychologists, psychiatric social workers, optometrists, podiatrists, physical therapists, and chiropractors), and skilled nursing facilities and home health care services.

Findings from the RAND Health Insurance Experiment

Four main findings emerged from the HIE:

As coinsurance rates increased, the number of outpatient visits and total spending declined (see Table 1). Because the HIE was an experiment, with people randomly assigned to plans with different levels of cost-sharing, the lesson was clear that higher coinsurance rates led to declines in medical care use and spending by individuals (68, 69, 80, 85, 89). This finding was not universally expected before the HIE was conducted.

Appendix II The RAND Health Insurance Experiment

Table 1: Summary of RAND HIE findings: Sample means for annual use of medical services per capita, by plan

	Levels of cost-sharing: Coinsurance rates			
Outcomes	**Free care**	**25%**	**50%**	**95%**
Probability of any medical (%)	86.8	78.8	77.2	67.7
Face-to-face visits (#)	4.55	3.33	3.03	2.73
Outpatient expenditures (1984 $)	340	260	224	203
Probability of any inpatient admission (%)	10.3	8.4	7.2	7.9
Total admissions (#)	0.128	0.105	0.092	0.099
Inpatient expenditures (1984 $)	409	373	450	315
Total expenditures (1984 $)	749	634	674	518

Source: Adapted from Gruber, 2006 (51) based on data from Manning et al., 1987.

Cost-sharing affected the number of medical contacts initiated by people, but not the intensity of services provided (85). This finding implies that the largest effects of cost-sharing are on patient-initiated medical visits rather than what happens once a physician is treating a patient (68, 69, 71, 80).

People reduced their use of ineffective care about as much as their use of effective care – suggesting that people often are unable to judge when it is appropriate to seek care. People also reduced their use of preventive care, including immunizations for children and diagnostic tests that have been known to be effective such as Pap smears (18, 69, 71, 85). Thus, the indiscriminate reductions in use of effective care raised concerns about the health consequences of the cost-sharing.[15]

Higher cost-sharing did not have an adverse effect on health outcomes for the average person (80, 85). Many measures of health were collected during the experiment, and with the exceptions of reductions in blood pressure and improvements in vision care, people in the free care plan did not have significantly better health outcomes than the people who were in cost-sharing plans (85). Similarly, for the general population of poor people the analyses showed that the reductions in use of medical care did not lead to poorer health outcomes. Poor people did have fewer visits to dentists and poor children were less likely to get what was termed effective care, however. In addition, when people were categorized by whether they were in poor health (defined as being in the at-risk quartile on each of the measures of poor health – for example, being in the top quartile of blood pressure), people in poor health were more likely to have adverse health outcomes if they were in the cost-sharing plans than if they were in the free plan. Thus, although the HIE provided evidence that cost-sharing could reduce health care use without adversely impacting the health of most people, it also raised concerns about how poor people and people who have chronic conditions would be affected by cost-sharing (85). This finding is of great concern because chronic conditions are much more prevalent today than they were 40 years ago. As Chernew and Newhouse recently pointed out, it is likely that "the negative effects of higher cost-sharing are most significant for treating chronic disease and certain preventive services." (18)

15 It is not clear that we would see the same decline in use of preventive care services today because many employers have been emphasizing the importance of preventive care in recent years. Nonetheless, it is noteworthy that the Obama administration released requirements in July stipulating that four sets of preventive services will have zero consumer cost-sharing for people who are covered by health insurance plans sold through the Exchanges and plans that are not grandfathered by the PPACA.

Appendix II The RAND Health Insurance Experiment

Significance of the HIE's Findings

The HIE put to rest any doubts that people respond to prices when seeking medical care. As Newhouse et al. (80, 85) wrote (p. 40), "Use of medical services responds unequivocally to changes in the amount paid out-of-pocket." As coinsurance rates increased, the number of outpatient visits and total spending declined. Because the HIE was an experiment, with people randomly assigned to plans with different levels of cost-sharing, the lesson was clear that higher coinsurance rates led to declines in medical care use and spending.

Perhaps just as important, the HIE also showed that although cost-sharing affects the number of medical contacts initiated by people, it does not affect the intensity of services provided (85). This finding implies that the largest effects of cost-sharing are on patient-initiated medical visits rather than what happens once a physician is treating a patient (68, 71). However, people reduced their use of ineffective care about as much as their use of effective care – suggesting that people often are unable to judge when it is appropriate to seek care. People also reduced their use of preventive care, including immunizations for children and diagnostic tests that have been known to be effective such as Pap smears. Thus, the indiscriminate reductions in use of effective care raised concerns about the health consequences of the cost-sharing.

To the surprise of many, the HIE data showed that for the average person, the higher co-insurance rates and higher maximum out-of-pocket dollar expenditures (MDEs) did not have an adverse effect on health outcomes. Many measures of health were collected during the experiment, and with the exceptions of reductions in blood pressure and improvements in vision care, people in the free care plan did not have significantly better health outcomes than the people who were in cost-sharing plans. The HIE over-sampled people who were considered to be poor to learn if poor people might be different from the "average" person in the Experiment in terms of responses to the cost-sharing and health outcomes due to the cost-sharing (85). However, the HIE design may have been less successful in its ability to detect different effects for poor people. The MDE limit on a family's financial risk from out-of-pocket expenditures was income-related so lower-income people were more likely than higher-income people to reach their MDE. And once a family hit its MDE, it did not face further cost-sharing and was essentially on the free plan. Thus, the effects of cost-sharing on poor people's use of medical care and health outcomes likely are underestimated. Nonetheless, two effects stand out as worrisome: poor people had fewer visits to dentists and poor children were less likely to get what was termed effective care. When the poor people did see a dentist, their expenditures were similar to higher-income people – suggesting that the poor people had greater need for dental care. In spite of these worrisome effects, for the general population of poor people the analyses showed that the reductions in use of medical care did not lead to poorer health outcomes.

Thus, although the HIE provided evidence that cost-sharing could reduce health care use without adversely impacting the health of most people, it also raised concerns about how poor people and people who have chronic conditions would be affected by cost-sharing. Moreover, since the HIE deliberately excluded people age 62 and older from the sample at the start of the Experiment, the HIE does not shed light on the effects of cost-sharing on people who may be particularly likely to have multiple medical conditions and not have full cognitive abilities when it comes to responding to cost-sharing.

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