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Linking Cost Sharing to Value: An Unrivaled Yet Unrealized Public Health Opportunity

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As the financial burden of cost sharing continues to rise, patients increasingly avoid necessary care, thereby contributing to the high morbidity and mortality of the U.S. population compared with that of other developed countries. The rationale for cost sharing is often based on the moral hazard argument, which states that individuals may overuse care if they do not share in its costs. We evaluate this argument in detail, using it to distinguish between appropriate and inappropriate settings for cost sharing. Cost sharing may be appropriate when health services are of low value (low ratio of benefits to costs), whereas it is inappropriate when health services are of high value (high ratio of benefits to costs). In practice, cost sharing is rarely linked to value, and therefore much of the cost sharing that currently occurs is inappropriate and harmful. Cost-effectiveness analysis is an objective method to estimate the value of health services and may be a way to systematically evaluate whether cost-sharing policies are appropriate. Systematic efforts to discourage inappropriate cost sharing may improve public health.

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Cost sharing is highly prevalent in the U.S. health care system, in which most insured workers pay deductibles and almost all pay copayments (1). In the past 5 years, deductibles have increased between 73% and 140% and copayments have increased between 43% and 105%, and fewer than half of insured persons are "very confident" that they have enough money to pay for the usual medical costs that a family requires (2). The federal endorsement of high-deductible health plans, together with their 4-fold increase in prevalence, suggests that cost sharing will only continue to increase in the coming years.

Because of the ubiquity of cost sharing, viewing it as an immutable fact of our health care system may be tempting. However, complacency with cost sharing in its present form is preventing vulnerable groups from receiving essential care (3–10), thereby decreasing the efficiency of resource allocation. This inefficiency is probably contributing to the low ranking of the United States in public health indices worldwide (25th in life expectancy and 24th in years of life spent in good health), despite its great wealth and unmatched health care expenditures.

The Moral Hazard Argument

The economic justification for cost sharing stems from the moral hazard argument, which posits that individuals with health insurance will overuse health services because they bear no portion of the financial burden (11). In economic terms, overuse implies that the benefits are less than the risks and costs and, therefore, the expenditure would provide greater benefit if it were spent in another way. For example, if someone with a high pretest probability of tension headache were offered the choice of magnetic resonance imaging (MRI) to rule out a structural lesion or an equivalent cash award, she would likely derive far more utility from the cash award. However, because her incentives are distorted by health insurance, she receives the MRI, and resources are expended in a manner that confers less utility than would other possible resources (such as the cash award). When this situation is generalized, resources are used inefficiently and social welfare suffers. Cost sharing can eradicate this moral hazard, and it has been widely advocated by health economists for this reason. If the person with a headache had to pay a substantial copayment for MRI, she would have forgone the test, leaving the money to be allocated in other ways that may confer more benefit.

However, the moral hazard argument does not apply to situations in which a medical expenditure would confer greater benefit than alternative uses (12, 13). If the woman with a headache had a high pretest probability of an aneurysm rather than a tension headache, the MRI would probably confer more benefit than an equivalent cash award because it could avert a potentially fatal condition. Yet a substantial copayment may deter her from choosing it because she may not understand the life-threatening nature of a possible aneurysm or she may be focused on a more immediate and tangible concern (for example, a late car payment). Therefore, her overall welfare would decrease and the moral hazard argument would not hold.

If individuals were always perfectly informed about the costs and benefits of medical care, always aware of long-term as well as short-term consequences of care, and always had sufficient resources to pay for care, the moral hazard argument would hold and cost sharing would indeed be beneficial. However, it is likely that the moral argument is frequently specious, as data suggest that cost sharing is often harmful in practice.

Empirical Data on the Impact of Cost Sharing

Studies from heterogeneous patient populations and settings show that cost sharing is an exceedingly blunt tool that reduces health service utilization substantially, even when those services are of great necessity or benefit.

Experimental Studies

In the RAND Health Insurance Experiment (14), approximately 2000 families (5473 persons) were randomly assigned to varying levels of cost sharing for medical ser-

vices. Subsequent health service utilization and outcomes were tracked. Investigators found that persons in the higher cost-sharing groups decreased their use of low-efficacy services (such as antibiotics for probable viral infections) and high-efficacy services (such as antihypertensives) alike.

Observational Studies

More recent observational studies offer further evidence that cost sharing decreases service use indiscriminately, regardless of effectiveness or value. Ellis and colleagues (3) found that users of 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors (statins) who had copayments greater than $20 were 3 times more likely to refill prescriptions late and 4 times more likely to discontinue treatment altogether than were users who had copayments less than $10. Furthermore, this relationship persisted regardless of whether statins were prescribed for secondary prevention (very high value) or primary prevention (lower value) of cardiovascular disease. Huskamp and coworkers (4) found 24% lower use of statins and angiotensin-converting enzyme inhibitors as copayments increased, and Goldman and associates (5) found that use of antihyperlipidemic and glycemic agents decreased by 35% and 25%, respectively, when copayments doubled. These 2 latter studies provide additional evidence that cost sharing reduces utilization of high-value services.

A growing body of literature suggests that copayments may adversely affect health outcomes as well as utilization. Heisler and colleagues (6) found that among individuals who self-reported cardiovascular disease, those who restricted use of medications because of cost reported higher rates of angina, nonfatal heart attacks, and strokes. Tamblyn and associates (7) found that an increase in cost sharing among elderly and indigent patients in Québec, Montréal, Canada, was associated with increased rates of hospitalization, long-term care admission, or death. In an empirical study of targeted copayment reductions, Schoen and coworkers (8) found that copayment relief for indigent patients with heart disease decreased cholesterol levels, blood pressure, and hospitalization rates. Finally, modeling studies suggest substantial benefit from targeted reductions in copayment reductions (9, 10), including the potential to avert nearly 80 000 cardiac hospitalizations annually (9).

Insights from Empirical Data

Exposing consumers to the costs of their care seems to reduce utilization regardless of value. Cost-related underuse of valuable services may harm health, certainly reduces quality, and may even increase overall costs, perpetuating the cycle of cost shifting to contain health care cost growth. While cost sharing should be limited to situations in which moral hazard may lead to overuse, this is not the standard in health care today, resulting in underuse of high-value therapies in practice. The **Table** shows selected high-value services that are commonly provided in primary care settings. With the exception of some preventive interventions, payers apply cost sharing to nearly all these services. Furthermore, high-deductible health plans, the cornerstone of the Bush administration's proposed health reforms, are likely to exacerbate this problem unless payers are required to waive deductibles for high-value services.

Is There a Solution?

Cost sharing should be linked to value (15) rather than applied as a one-size-fits-all tool. High-value services, such as angiotensin-converting enzyme inhibitors for diabetic nephropathy, should not be subject to cost sharing, whereas low-value services, such as brand-name drug substitutions, could be. In addition to increasing social welfare, this principle would align the conflicting incentives faced by providers and patients in the pay-for-performance era. It seems a logical inconsistency that we pay physicians to prescribe β-blockers after myocardial infarction yet financially penalize patients for taking them.

How to Link Cost Sharing to Value

Linking cost sharing to value requires a quantitative method to compare the value of health services. Fortunately, such a method already exists. Cost-effectiveness analysis (CEA) compares the incremental costs of a health service with its incremental health benefits, yielding an intuitively appealing measure of value. High-value CEA assessments could be linked to a waiver of all cost sharing (that is, no copayments or deductibles), low-value or ambiguous CEA assessments could leave cost sharing unchanged, and very-low-value CEA assessments could be linked to increased cost sharing. The perspective of society rather than particular payers would need to be adopted in these CEAs because costs incurred by particular payers may result in important benefits or cost savings elsewhere in society and payers may be reluctant to invest in high-value interventions when benefits are delayed until after patients may have switched health plans.

Although CEAs are increasingly published in the medical literature and are used in other countries to guide coverage decisions (16), their results have gained little traction in the U.S. policy arena, probably because of concerns that CEAs would be used to deny health services (17). This fear was amplified when health authorities in Oregon invoked the principle of value maximization to deny health services to Medicaid recipients, even though they did not perform CEAs (18). We argue that CEAs should be linked to incentive mechanisms rather than to proscriptions. Indeed, it seems logical that the most widely accepted method of assessing health service value (the CEA) should be linked to the most widely accepted method for controlling health service utilization (cost sharing).

Challenges in Linking Cost Sharing to Value

Linking cost sharing to value will probably pose challenges that are substantial but not insurmountable, especially in light of the large potential health gains. First, data

Table. **Frequency with Which Selected High-Deductible Health Plans Waive Cost Sharing for Common High-Value Interventions***

High-Value Intervention†	Indication	Do Any Selected Plans Waive Cost Sharing?‡§	Does Medicare Waive Cost Sharing?§
Warfarin	Nonvalvular atrial fibrillation	No	No‖
Angiotensin-converting enzyme inhibitor	After myocardial infarction	No	No‖
	Diabetes with microalbuminuria	No	No‖
Proton-pump inhibitor	Symptoms suggestive of mild to severe gastroesophageal reflux disease	No	No‖
β-Blocker	After myocardial infarction	No	No‖
Combination antiretroviral therapy	HIV infection	No	No‖
Low-molecular-weight heparin	Venous thromboembolism	No	Some¶
Statins	Secondary prevention of myocardial infarction	No	No‖
Antihypertensive therapy	Hypertension	No	No‖
Bisphosphonates	Women ≥60 years of age at high risk for hip fracture	No	No‖
Hormonal antagonists	Women with breast cancer	No	No‖
Adjuvant chemotherapy	Women with breast cancer	No	No‖
Nicotine patch	Smokers who want to quit	No	Yes
Buprenorphine	Opiate-dependent persons who want to quit	No	No‖
Combination antiviral therapy	Hepatitis C	No	No‖
Antiviral therapy (e.g., famciclovir, valacyclovir)	Herpes zoster	No	No‖
Selective serotonin reuptake inhibitors	Major depression	No	No‖
Inhaled corticosteroids	Asthma, severity mild or greater	No	No‖
Office visits necessary for selected prevention interventions**	Recommended screening intervals	No	No
Pneumococcal vaccine	Age ≥65 years	Some	Yes
Papanicolaou smear	Sexually active women	Some	Yes
Colonoscopy	Age ≥40 years	Some	No
Mammography	Age 45–69 years	Some	Yes

* Data were obtained from the Harvard Center for Risk Analysis Cost-Effectiveness Registry, a comprehensive Web-based registry of all original cost–utility analyses published in the English-language medical literature from 1976 through 2001. All analyses were conducted from a societal perspective. Additional information is available at www.tufts-nemc.org/cearegistry/.

† Those for which the ratio of incremental costs to incremental benefits is more favorable than $50 000 per quality-adjusted life-year, a common rule of thumb for society's willingness to pay for health care.

‡ Plans were selected on the basis of high market penetration (CIGNA, Aetna, Blue Cross/Blue Shield, Kaiser Permanente, United Health) or anecdotal reports of value-sensitive cost-sharing decisions (Harvard Pilgrim). This is not intended to be a comprehensive list of all plans in the United States.

§ "No" means that the selected plans do not waive cost sharing, "some" means that at least 1 but fewer than all selected plans waive cost sharing, and "yes" means that the selected plans waive cost sharing. "Cost sharing" was defined as mandatory copayments or deductibles for the delivery of care. When the high-value intervention was a class of pharmaceuticals with a similar mechanism of action (for example, angiotensin-converting enzyme inhibitors), we asked whether cost sharing for at least 1 drug was waived.

‖ Medicare Part D does not specify that cost sharing should be waived, and therefore cost-sharing decisions are left to individual contractors.

¶ Cost sharing is waived in the inpatient setting but not in the outpatient setting.

** Visit that facilitates at least 1 of the following screening interventions at appropriate times and intervals: diabetes, hypertension, depression, hyperlipidemia, osteoporosis, or tobacco use.

are currently insufficient to inform many needed CEAs. Therefore, a systematic effort to link cost sharing to value will require increased funding for cost-effectiveness research. Health services that consume the greatest share of resources should be targeted preferentially.

Second, results of CEAs need to be simplified when translated into practice to avoid policy prescriptions that are too cumbersome. Analogous to how formularies now group pharmaceuticals into copayment tiers, different types of health services could be grouped into 3 or 4 cost-sharing tiers that are stratified on the basis of value, with cost sharing waived for the highest value services. By keeping things simple, value-based cost sharing would be no more of a burden on caregivers or administrators than are current systems; tiers would simply be assigned on the basis of value rather than cost.

Third, employers and payers may worry that waiving cost sharing will increase their expenditures. It is important to emphasize that linking cost sharing to value may not necessarily increase expenditures for payers. Cost sharing could be increased for services that are particularly low in value, allowing value-based cost sharing to be implemented in a revenue-neutral manner.

Fourth, health plan decision makers are often unfamiliar with CEA and other methods of quantifying health benefits. In a survey of medical directors of 228 managed care plans nationwide, 90% considered costs when making coverage decisions, whereas fewer than half formally analyzed the ratio of costs to benefits (19). Therefore, education about CEA methods would need to become more widespread, and regulatory authorities may need to introduce incentives to promote their use.

Finally, CEAs themselves have important limitations. Deciding where to draw the line between "high value" and "low value" remains controversial. Therefore, implementing the results of CEAs will probably involve comparison with a "band" within which interpretations are ambiguous (for example, $50 000 to $100 000 per quality-adjusted

life-year) rather than with a single threshold (for example, $50 000 per quality-adjusted life-year). Cost-effectiveness analyses consider only the magnitude of health benefits and not their distributions, and equity considerations may sometimes supersede efficiency. In addition, CEAs remain highly dependent on analysts' underlying assumptions, evidence sources, and methods of sensitivity analysis. Although techniques are being developed to increase the transparency of these assumptions and their consequences (20), basing policy decisions on at least 2 analyses that are conducted independently and are shielded from conflicts of interest will probably remain prudent. However, although CEA methods are imperfect, to "make the perfect the enemy of the good" would be a mistake. Cost-effectiveness analysis is arguably the best way to compare the value of health care services on a level playing field by using an explicit, systematic, and quantitative method, and it is therefore the best candidate to link cost sharing to value.

Cost sharing is not a one-size-fits-all tool. Policymakers and clinicians should demand that cost sharing be used only when it does not decrease the use of high-value services and does not have a deleterious effect on health. Initially, this principle could be applied to the Medicare prescription drug benefit and, if successful, extended to nonpharmaceutical domains of health care as well as nongovernmental payers. Currently, there is no mechanism in place to evaluate the appropriateness of cost-sharing decisions and no effective means of regulating its applications. Complacency with this system is squandering an important opportunity to improve health in the United States.

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