Cost-Sharing and the Utilization of Clinical Preventive Services

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Background: Little is known about the effect of different forms of patient cost-sharing on the utilization of clinical preventive services or if the effect varies by type of health plan.

Objectives: To assess empirically the relationships between the utilization of recommended preventive services and different forms of patient cost-sharing and how the effect is mediated by type of preventive service (counseling, blood pressure, Pap smear, mammogram), type of cost-sharing (deductibles/coinsurance, copayments), and type of health plan (HMO, PPO/indemnity plan).

Research Design: Sixteen logit models were estimated to assess variation in receiving recommended preventive care as a function of cost-sharing within plan type.

Subjects: A sample of 10,872 employees, aged 18 to 64 years, of seven large companies served by 52 health plans with diverse cost-sharing arrangements who responded to the Pacific Business Group on Health, Health Plan Value Check Survey (response rate, 50.3%).

Measures: Receipt of recommended preventive care was based on the U.S. Preventive Services Task Force Guidelines. The effect of cost-sharing was measured as the percentage change in the probability of receiving recommended preventive care in the cost-sharing group compared to the non cost-sharing group.

Results: The negative effect of patient cost-sharing was greatest on preventive counseling in PPO/indemnity plans (−15%) and on mammograms in all health plan types (−9%−10%). The effect on Pap smears was negative (−8%−10%) for deductibles/coinsurance in PPO/indemnity plans and copayments in HMOs. The effect of cost-sharing on blood pressure was mixed. Deductibles/coinsurance had a greater negative effect than copayments.

Conclusions: Eliminating patient cost-sharing for selected preventive services may be a relatively easy and effective means of increasing utilization of recommended clinical preventive care.


Introduction

In an effort to control health care costs in the United States, public and private health insurers have adopted policies designed to curb demand by increasing cost-sharing for users of medical services. Recent estimates suggest that over 90% of privately insured individuals with employer-sponsored indemnity or PPO insurance are subject to cost-sharing requirements, and 77% of HMO enrollees face copayments averaging $6.00 for primary care visits.1

Prior health services research suggests that when individuals are required to share part of the costs of their services, they use fewer services. This has been found to be the case in public and private fee-for-service systems of medical care, as well as in HMOs.2–8 Less is known about the impact of cost-sharing on the use of individual preventive services, particularly in a managed care context.

Only 2 experiments have examined explicitly the impact of cost-sharing on utilization of preventive services. Both the Rand Health Insurance Experiment and the natural experiment at the Group Health Cooperative of Puget Sound found that cost-sharing resulted in a reduction in the utilization of preventive care.5,6,9 Thus, while cost-sharing strategies may have had the effect of making consumers more cost-conscious and provided the incentives for reduced utilization, they may have inadvertently con-
tributed to the under-utilization of recommended preventive care.10

In recent years, employers, public policy makers, and researchers have focused considerable attention on designing policies to optimize utilization of effective and cost-effective preventive services.10,11 Given the considerable emphasis currently placed on cost-sharing as a policy instrument, knowing what impact cost-sharing arrangements have on the utilization of preventive care is important in planning benefit packages designed to promote the use of preventive services at recommended levels.12

Although prior studies provide valuable insights, the ability to generalize their findings to the current health care system is limited because of their study designs and the time periods in which they were carried out. The health care system, particularly in California, has changed dramatically in the last 20 years in both its organization, financing and health plan benefit designs.

This research aims to assess empirically the relationship between cost-sharing and the utilization of recommended preventive services (Pap smears, mammograms, blood pressure, and preventive counseling) and how that effect is mediated by different forms of cost-sharing (deductibles/coinsurance and copayments) in different types of health plans (HMO and PPO/indemnity plans).

Methods
Data Source

Data were obtained from the 1994 Pacific Business Group on Health (PBGH) annual random sample survey of employees, the Health Plan Value Check. The survey collects information on the satisfaction of the employees of member companies with various aspects of their health plans and their utilization of preventive services. PBGH also collects detailed information on employee out-of-pocket cost-sharing for each plan.13

Sample

A total of 26,536 questionnaires were mailed, of which 13,350 were returned, for an overall response rate of 50.31%. The sample used for the analysis was restricted to employees who had belonged to their current plan for one year or longer, were non-Medicare recipients, and were between the ages of 18 and 64 years. The final sample size was 10,872 employees of seven large companies (>2,000 employees) who were served by 52 health plans with diverse cost-sharing arrangements.

Measures

Two forms of health plan cost-sharing were defined: (1) deductibles/coinsurance in PPO/indemnity plans and (2) copayments in PPO/indemnity plans and HMOs. Three health plan types were defined: (1) PPO/indemnity plans, where the plan pays for or reimburses the costs for individual services on a fee-for-service or discounted fee-for-service basis and enrollees have free choice of any doctor or hospital; (2) Group model HMOs, where the HMO contracts with one physician group and the physicians in that group provide care exclusively to that HMO’s enrollees; and (3) all other HMOs, where the HMOs contract with one or more Independent Practice Associations (IPAs) or medical groups and physicians who provide care for a group of patients who are enrolled in many different plans. IPAs, network model HMOs, mixed model HMOs, and Point-of-Service (POS) plans were combined into one category (IPA/network HMO/POS plan).

Utilization of recommended preventive services was defined as a dichotomous variable for Pap smears, mammograms, blood pressure, and preventive counseling, based on the U.S. Preventive Services Task Force Guidelines.12 Receipt of a recommended Pap smear was defined as at least once in the last 3 years for women 18 years and older. Receipt of a recommended mammogram was defined as at least once in the last 2 years for women 50 years and older. Receipt of blood pressure screening was defined as at least once in the last 2 years for adults 21 years and older. Receipt of preventive counseling is defined as at least once in the last 3 years for adults 18 years and older.

Factors that were controlled for in the individual included functional health status, personal health rating, age, gender, education, income, and smoking status. Factors that were controlled for in the plan include satisfaction with the location and access of providers, and length of time in plan. Table 1 presents descriptive statistics on the study sample.

Analysis

Two forms of cost-sharing (deductibles/coinsurance and copayments), 4 types of preventive services (preventive counseling, blood pressure screening, Pap smears, and mammograms), and 3 types of health plans (PPO/indemnity, group model HMOs, and IPA/network HMO/POS plans) were considered, resulting in 16 unique “combinations” of cost-sharing, type of preventive service, and type of health plan. For each of the

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1In the case of the PPO, there are financial incentives for patients to use the providers in the PPO network, usually through lower cost-sharing than is required if they choose to use providers who are not part of the PPO network.

2IPAs represent a group of physicians who have their own practices or are in small group practices and they negotiate contracts for payment on behalf of all the physicians in the IPA with health plans.
4 preventive services, we examined the effect of each of 4 combinations of type of cost-sharing and type of health plan:

1. Deductible/coinsurance in PPO/indemnity plans
2. Copayment in PPO/indemnity plans
3. Copayment in Group/staff-model HMOs, and

Economic theory suggests that different forms of patient cost-sharing are likely to have different effects on preventive services utilization. Deductibles require patients to spend out-of-pocket a defined amount of money toward the health care costs they incur before their health insurance benefits become effective. Thus, for relatively healthy patients without high utilization or costs, they may never incur costs up to their deductible, leaving preventive care completely uncovered. Coinsurance comes into play once the patient’s deductible has been met. Coinsurance requires the patient to pay a fixed percentage, usually 20% or 25%, of the costs of care above the deductible for covered services that are used. For example, if a patient has a deductible of $500.00 and has paid out-of-pocket at least $500.00 for health care that year and then the patient receives a mammogram that costs $150.00, the patient would be responsible for paying $30.00 out-of-pocket for the mammogram if the coinsurance rate is 20%. Copayments, on the other hand, usually require patients to pay a small fixed fee, usually only $5.00 or $10.00 per visit to the doctor.

It is well established that the higher the level of patient cost-sharing, the greater the negative effect on health services utilization. Thus, we hypothesize that the negative effect of deductibles/coinsurance will be greater than the effect of copayments on preventive services use, with receipt of preventive care being highest for those who face no patient cost-sharing.

Logit models were estimated for each of the 16 combinations to assess the total effect of cost-sharing on the utilization of recommended clinical preventive service as a function of type cost-sharing, plan type, and individual and plan characteristics.

The 4 research questions are: Does cost-sharing affect the utilization of preventive services? Does the impact of cost-sharing vary in health plans by type of cost-sharing? Does the impact of cost-sharing vary for individual preventive services? Does the impact of cost-sharing vary in health plans with different organizational and financial characteristics?

Results

The estimated percentage change (and 95% confidence intervals) in receiving a recommended preventive service in a cost-sharing compared to a non cost-sharing plan based on the results of the 16 logit models is presented in Table 2.

The effect of cost-sharing on the utilization of preventive services was significantly negative for 12 of the 16 combinations examined. The magnitude of the negative effect ranged from −15% (copayments and deductibles/coinsurance on counseling in PPO/indemnity plans) to −0.9% (copayments on preventive counseling in group model HMOs).
The effect of cost-sharing on utilization of recommended clinical preventive services is presented in Table 2. This table includes the mean effect and 95% confidence interval for preventive services in PPO/Indemnity Plans and Group Model HMOs. The effect of cost-sharing on preventive counseling in mixed/IPA/POS plans is presented in Figure 1 and Table 3. The negative effect of cost-sharing on preventive counseling was greatest in PPO/Indemnity Plans (−15.3%), followed by the effect of copayments in IPA/network HMO/POS plans (−6.2%), with the least effect in group-model HMOs (−0.9%).

In HMOs, copayments had a greater effect on preventive counseling in mixed/IPA/POS plans and on blood pressure screening in group-model HMOs.

**Cost-Sharing and Type of Health Plan**

**PPO/Indemnity Plans**

In PPO/indemnity plans, deductibles/coinsurance consistently had a greater negative effect on the use of preventive care compared to copayments, with the exception of their effect on preventive counseling, where both were equally negative (−15%). The effect of cost-sharing in PPO/indemnity plans was −7.8% on Pap smears for deductibles/coinsurance compared to no significant effect for copayments, and was −8.6% on mammograms for deductibles/coinsurance compared to only −2.6% for copayments. Neither form of cost-sharing had any significant effect on blood pressure screening in PPO/indemnity plans.

**HMOs**

In HMOs, copayments had the greatest negative effect on mammograms in both group-model HMOs (−8.8%) and IPA/network HMO/POS plans (−8.8%), however, the effect in group-model HMOs was not statistically significant. The negative effect of copayments on Pap smears was similar in both types of HMOs (−3.4% in group model HMOs; −5.2% in IPA/network HMO/POS plans). The effect of copayments was significantly greater on blood pressure screening in group-model HMOs (−4.8%) than in IPA/network HMO/POS plans (0.9%), and significantly less on preventive counseling in group-model HMOs (−0.9%) compared to its effect in IPA/network HMO/POS plans (−6.2%).

In general, the negative effect of cost-sharing on preventive services utilization, as hypothesized, was greatest with deductibles/coinsurance in PPO/indemnity plans. The effect of copayments in IPA/network HMO/POS plans and group-model HMOs was quite similar for Pap smears and mammograms and significantly less than copayments in PPO/indemnity plans. Within HMOs, copayments had a greater effect on preventive counseling in mixed/IPA/POS plans and on blood pressure screening in group-model HMOs.

**Cost-Sharing and Type of Preventive Service**

**Preventive Counseling**

The effect of cost-sharing on preventive counseling was significantly negative for all forms of cost-sharing in both PPO/indemnity and HMO plans. The negative effect of cost-sharing on preventive care was greatest in PPO/indemnity plans (−15%), followed by the effect of copayments in IPA/network HMO/POS plans (−6.2%), with the least effect in group-model HMOs (−0.9%).

**Blood Pressure Screening**

Cost-sharing had a mixed effect on blood pressure screening. Neither deductibles/coinsurance nor copayments in PPO/indemnity plans had a significant effect on blood pressure screening. The effect of copayments in HMOs was small, but significantly negative in group-model HMOs (−4.8%) and a small significant effect (0.9) in mixed/IPA/POS plans.

**Pap Smears**

The effect of cost-sharing on Pap smears was negative for all of the combinations of cost-sharing and plan type, except copayments in PPO/indemnity plans. Deductibles/coinsurance had the greatest impact on Pap smears (−7.8%), followed by the effect of copayments on Pap smears in HMOs (−3.4% in group model HMOs; −5.2% in IPA/network HMO/POS plans).
Mammograms

The effect of cost-sharing on mammograms was negative and statistically significant for all combinations. The effect was largest with copayments in IPA/network HMO/POS plans (−9.9%) and deductibles/coinsurance in PPO/indemnity plans (−8.6%) copayments in group-model HMOs (−8.2%) and smallest for copayments in PPO/indemnity plans (−2.6%).

In general, the negative effect of cost-sharing was greatest on preventive counseling and mammograms, followed by Pap smears, with the least effect on blood pressure screening.

Limitations

The limitations of this research fall into 6 broad areas: potential selection bias, potential response bias, the study design, the generalizability of the findings, the self-report of preventive services utilization, and the inability to control for other potentially important confounders.

Selection bias. The first limitation concerns potential biased selection in consumer choice of health plans. The concern is that individuals who are most likely to use preventive care are more likely to choose one type of plan compared to another. For example, people who value preventive care may be more likely to choose an HMO over a PPO/indemnity plan because HMO benefit packages offer the most comprehensive coverage of preventive care. It is likely that biased selection relates most to the type of plan selected, not to the plans selected within a particular plan type. By analyzing the effects of cost-sharing within plan type, the problem of biased selection is minimized as we are examining the effects of cost-sharing within a plan type, not across them. Second, the most important co-variates for selection effects, as well as the utilization of preventive services, including age, gender, education, income, and health status, were controlled for in the multivariate logit analyses.

Response bias. PBGH analysis of the response bias to their 1993 employee survey indicated that although there were differences in respondents and nonrespondents, the bias was consistent across plans. Those who were more likely to respond were female and were older. The nonrespondents include a higher proportion of younger males (age-gender bias). PBGH also examined ambulatory utilization in each of 5 age-gender cells to estimate actual to expected use ratios for the use rates for respondents and nonrespondents. Responders on average had a 2% higher rate of ambulatory visits compared to nonrespondents. The multiple regression analysis of ambulatory visits found that after controlling for age and gender, the company or employer was a significant predictor of ambulatory visits but response status (respondent/nonrespondent) was not (p = 0.48). Therefore, it is possible, but unlikely, that the observed differences in the patterns of utilization were due to response bias.

Study design. Another potential limitation is related to the potential biases introduced as a result of conducting the survey. Considerable efforts were made in the design and conduct of the study to minimize the effects of these biases and the survey instrument was found to compare favorably in terms of its internal reliability to other similar satisfaction and utilization surveys reported in the literature.

Previous studies examining the impact of cost-sharing on the utilization of preventive services adopted a natural, pseudo-natural, or random experimental study design. While these study designs are stronger in terms of their internal validity, they are much more limited in terms of their external validity. Because this study examined the effects of cost-sharing in a range of health plans with a variety of the financial and organizational structures, its external validity is relatively stronger.

Generalizability. This study was conducted on a population employed by large firms in California. Thus, the ability to generalize beyond this group to a less affluent or educated group of employees, those covered by public insurance (such as Medicaid or Medicare), the uninsured and the unemployed, or to other geographic regions of the country is unknown. The findings however are important for other large employers who contract with a variety of managed care and indemnity plans for their employees' health care coverage.

Self-reported receipt of preventive care. Another limitation of this study is that use of preventive services is self-reported and may not reflect actual use. Prior studies have found that, for example, in the case of mammography, self-reported use is higher than actual receipt of services based on claims and records. It was not possible to validate patient self-report of preventive services use for this survey. However, there is little reason to suspect that persons in different types of health plans or under different cost-sharing arrangements are more or less likely to over or under report their use of preventive services.

Other confounding variables. A final limitation of the study is the inability to control for other variables that may, in part, explain the observed relationships between cost-sharing/health plan and use of preventive care that may lead to either over or under estimates of the effects. These potentially confounding variables include other managed care policies in place in a plan that may influence provider provision of care, patient attitudes toward preventive care or incentives for providers to deliver and patients to receive recommended...
preventive care. In addition, we did not have information on the different dollar levels or rates of cost-sharing that would have enabled us to make more accurate estimates of the effects. For example, we can not distinguish between a copayment rate of $5.00 versus $10.00, or between differences in deductible levels and coinsurance rates.

Conclusions

The hypothesis that patient cost-sharing results in lower utilization of recommended clinical preventive services was strongly supported by the results. When compared to employees in non-cost-sharing health plans, employees in cost-sharing plans were less likely to receive a recommended preventive service in 11 of the 16 combinations of type of cost-sharing, preventive service, and plan type examined. The results of this study are consistent with the findings of other studies in the literature on the negative effects of cost-sharing on the utilization of preventive care.\textsuperscript{5,6,9,10,17}

The hypothesis that the effects of cost-sharing vary across different preventive services was also supported by the results. The results suggest that the impact of cost-sharing is greatest on preventive counseling and mammograms, followed by Pap smears and blood pressure screening. The effect of cost-sharing was also consistently negative for Pap smears, mammograms, and preventive counseling, with mixed effects on blood pressure screening.

The results also support the hypothesis that different organizational and financial characteristics of health plans are important in mediating the effects of cost-sharing. A comparison of the effects in different plan types indicated two patterns—the stronger negative effect of cost-sharing on preventive counseling services in PPO/indemnity plans, and the greater negative effect of copayments on Pap smears and mammograms in HMOs. Within PPO/indemnity plans, deductibles/coinsurance had a stronger negative effect on preventive care compared to copayments.

The findings indicate a need to re-examine cost-sharing policies that have a negative impact on the use of recommended preventive services. Two possible options would be to eliminate all office visit cost-sharing or eliminate cost-sharing for selected preventive services.\textsuperscript{10}

While the elimination of all office visit cost-sharing is attractive from the standpoint of increasing the use of all preventive care and its ease of administration, it could result in the over-utilization of some services. Prior research suggests that cost-sharing is not very discriminating in its ability to influence necessary versus unnecessary care.

However, eliminating cost-sharing could be applied to a defined set of preventive services that have been demonstrated to be effective, relatively cost-effective and under-utilized.\textsuperscript{10} Our findings suggest that eliminating cost-sharing may increase the utilization of individual preventive services by as much as 5%, 10%, or 15%. Since most insured employees belong to health plans with cost-sharing requirements, even a small increase in the use of recommended services through reduced cost-sharing could substantially increase the overall utilization of preventive care in a plan or employed population.

Increasingly, health plans are being asked to compete with respect to their performance in providing Pap smears, mammograms, and advice to quit smoking to their members as part of the National Committee on Quality Assurance (NCQA), Health Plan and Employer Data and Information Set (HEDIS) performance measurement.\textsuperscript{18} Eliminating cost-sharing for targeted preventive services may be a relatively easy and potentially effective means for health plans to increase appropriate utilization of recommended preventive services for their members, to be more competitive in the marketplace, and to meet public health goals for preventive care.

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References
