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Effect of Tiered Prescription Copayments on the Use of Preferred Brand Medications

THOMAS S. RECTOR, PHARMD, PHD,* MICHAEL D. FINCH, PHD,* PATRICIA M. DANZON, PHD,†
MARK V. PAULY, PHD,† AND BHARATI S. MANDA, MS*

BACKGROUND AND OBJECTIVE. Health plans are increasingly using more open drug formularies that offer differential prescription copayments as an incentive to enrollees to use brands that plans prefer. How much this financial incentive affects use of preferred brands has not been widely reported. The aim of this study was to estimate the effect of tiered copayments on the choice between preferred and nonpreferred brand medications.

MATERIALS AND METHODS. Longitudinal logistic regression analyses of pharmacy claims from 1998 and 1999 comparing concurrent groups that were or were not exposed to tiered copayments.

SUBJECTS. Enrollees in four independent physician practice association model health plans who had pharmacy claims for angiotensin converting enzyme inhibitors (ACEI), proton pump inhibitors (PPI), or hydroxymethylglutaryl coenzyme A reductase inhibitors (STATINS).

OUTCOME MEASURE. Change in the percentage of prescription claims that were for preferred brands.

MAIN RESULTS. Regression adjusted estimates of the average net increase in the percentage use of preferred brands of ACEI, PPI and STATIN from first quarter 1998 to third quarter 1999 attributed to tiered prescription copayments were 13.3 ($P = 0.001$), 8.9 ($P = 0.03$), and 6.0 ($P < 0.001$) percentage points, respectively.

CONCLUSIONS. Tiered prescription copayments were associated with a significant shift from nonpreferred to preferred brand medications. This type of financial incentive can help purchasers providing open access drug benefits by steering use of medications toward lower cost brands. The clinical effects of changes in medication use brought about differential copayments warrant further investigation.

Key words: Managed care; drug benefits; formularies; copayments. (Med Care 2003;41:398–406)

Outpatient drug benefits that provide open access to brand pharmaceuticals with different, ie, tiered, copayments for preferred and nonpreferred brands began to become popular in 1997, and are now offered by most managed care organizations. Under this type of drug benefit the managed care organization places some brand medications within a therapeutic class on a preferred drug list. In the plans studied here, a Pharmacy and Therapeutics Committee decided which brands were to be preferred based on review of published literature concerning the safety and efficacy of different brands. Brands judged to offer a significant clinical advantage such as a unique indication, better side

*From the Center for Health Care Policy and Evaluation, UnitedHealth Group, Eden Prairie, Minnesota.

†From the Health Care Systems Department, the Wharton School, the University of Pennsylvania, Philadelphia, Pennsylvania.

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Address correspondence and reprint requests to: Thomas S. Rector, PharmD, PhD, Center for Health Care Policy and Evaluation, UnitedHealth Group, MN002-260, 12125 Technology Dr., Eden Prairie, MN 55344. E-mail: thomas_s_rector@uhc.com

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effect profile or easier to use dosage regimen were included on the preferred drug list. Brands that did not offer a substantial clinical advantage and were more costly from the managed care organization's perspective were not placed on the preferred drug list, thus they were nonpreferred. With tiered copayments, the beneficiary's copayment for a nonpreferred brand is greater than the copayment for a preferred brand, but an open formulary is used. The employer that offers the drug benefit chooses the amounts charged for preferred and nonpreferred copayments with guidance from the managed care organization.

Given the growth of tiered copayments, their effect on drug use is an important question on which there is so far no conclusive evidence. Compared with uniform copayments, differential copayments are expected to lead to increased relative use of preferred brands if beneficiaries are sensitive to out-of-pocket costs. However, beneficiaries' unwillingness or inability to become involved in their physician's prescribing and their perceptions of efficacy and risk associated with less expensive medications may offset the effects of these financial incentives.[1–8] A survey has suggested that many beneficiaries would not be inclined to switch to medications with lower copayments.[9] Differential copayments promoting use of generic rather than brand medications have been associated with increased use of generic medications.[10–12] However unlike generic medications, different brands in a therapeutic class do not necessarily have the same active ingredients or Food and Drug Administration assurances of equivalence, thus patients or their physicians may be reluctant to use plan-preferred brands. Furthermore, most physicians are exposed to several different preferred drug lists promulgated by different managed care organizations, and may not be aware of which medications an organization prefers unless a patient requests a medication with lower cost sharing.

The primary objective of the present study was to estimate the effect of tiered prescription copayments on the relative use of preferred brands in several therapeutic classes of medications covered by an outpatient drug benefit. Secondarily, we sought to identify factors that influence any effect.

Materials and Methods

The study includes four health plans that operated in the same state and used the same list of preferred drugs. Employers that provided an outpatient drug benefit through these health plans began to adopt tiered copayments for brand medications beginning in the later part of 1997, and a majority had chosen this type of drug benefit by the end of 1999. Thus, data from 1998 and 1999 were used for the analysis.

Selection of Therapeutic Classes

The preferred drug list was reviewed to identify commonly used therapeutic classes of medications that had both preferred and nonpreferred brands. Tiered outpatient drug benefits typically offer a third, lowest copayment for generic medications. Because use of a generic, if available, is often mandated unless the prescribing physician requests that a brand prescription be dispensed as written, this study focused on classes of medications that had no or few generic alternatives.

Three classes of medications met the study criteria. Angiotensin converting enzyme inhibitors (ACEI) are used for common chronic conditions including hypertension, treatment and prevention of heart failure in the presence of left ventricular dysfunction, prevention of cardiovascular events in people who have a history of atherosclerotic disease and prevention of diabetic nephropathy. During the period of study, 10 different ACEI were available for outpatient use. Lisinopril and quinapril were preferred during the entire study period, whereas ramipril and fosinopril changed from preferred to nonpreferred status during the period of observation. All other brands of ACEI were nonpreferred. One ACEI, captopril, was available as a generic product, however this medication accounted for only approximately 5% of all ACEI that were dispensed.

Proton pump inhibitors (PPI) reduce secretion of stomach acid (protons) and are commonly used to treat gastric and duodenal ulcers, gastroesophageal reflux disease (heartburn) and hypersecretory conditions. Treatment with PPI can be discontinued after 4 to 8 weeks in many cases. There was only one preferred, lansoprazole, and one nonpreferred, omeprazole, PPI available during most of the study period. Another nonpreferred PPI, rabeprazole, came on the market at the end of the study period and accounted for less than 0.1% of PPI prescription claims.

The third therapeutic class was the hydroxymethylglutaryl coenzyme A reductase inhibitors that are used to reduce cholesterol levels. There were six marketed brands in this class commonly known as

the STATINS. Atorvastatin, cerivastatin and pravastatin were the preferred brands during the study period.

Selection of Pharmacy Claims

Pharmacy claims for prescriptions in the three therapeutic classes dispensed in 1998 or 1999 were electronically extracted from administrative records. Beneficiaries could obtain a 1-month supply for one copayment at retail pharmacies or a 90-day supply for two monthly copayments via a mail order pharmacy. Claims that had more than a 34-day supply (< 2.5%) were deleted from the analytical file because the subgroup that consistently obtained prescriptions by mail was likely to be too small to examine the tiered copayment effect.

Given the health plan's preferred drug list, each employer specifies copayments their employees pay for preferred and nonpreferred medications. To determine copayment levels selected by each employer, we examined copayments on claims for preferred and nonpreferred medications. There were 8420 employer groups represented in the extracted pharmacy claims, however most (84%) had fewer than 10 members who used a study medication during the period of observation. To facilitate the process of characterizing copayments of each employer, only pharmacy claims from the 188 employers with at least 50 members represented in the extracted claims were examined. Prescription claims were identified by employer group to determine the copayments charged for preferred and nonpreferred brands. The date of the first and last prescription dispensed under each drug benefit indicated when the copayments were in effect. Pharmacy claims for employers that did not cover nonpreferred brands were excluded from further analysis.

Definition of Comparison Groups

Remaining pharmacy claims were classified into two comparison groups based on copayments. The tiered group included pharmacy claims dispensed when the drug benefit covered both preferred and nonpreferred brands with tiered copayments from the beginning of the observation period in January 1998 to the end in December 1999. The not tiered group included pharmacy claims dispensed when the drug benefit covered both preferred and nonpreferred brands with no difference in copayments during the entire 2-year study period. The hypothesis that tiered copayments shift utilization toward preferred brands predicts a greater increase in the percentage of prescriptions that are for preferred brands in the tiered group compared with the not tiered group.

Data Analysis

Pharmacy claims in the tiered and not tiered groups were categorized according to the date dispensed to plot quarterly trends in the percentage of dispensed prescriptions that were for preferred brands in each therapeutic class. Multivariable logistic regression (STATA software, version 7, College Station, TX) was used to compare changes in the percentage use of preferred brands from first quarter 1998 to third quarter 1999 in the tiered versus the not tiered group. Data from the fourth quarter of 1999 were not used in the regression analysis to avoid any effects of letters that were sent to beneficiaries to announce changes in preferred brands for 2000.

The unit of analysis was prescription claim. The probability that a claim was for a preferred brand (p) was modeled as,

$$\text{Ln}\,(p/(1-p)) = \beta_0 + \beta(\text{tier}) + \beta(\text{time}) + \beta(\text{tier-time}) + \beta(z) + e$$

where Ln (p/(1−p)) is the logarithm of the odds or logit that a claim was for a preferred brand. The tier variable indicated whether the claims represented the tiered (tier = 1) or not tiered (tier = 0) comparison group. The time variable indicated whether the claim was from first quarter of 1998 (time = 0) or third quarter of 1999 (time = 1). The tier-time variable is the interaction between the tier and time variables. The regression coefficient for this interaction measures the difference, between the tiered versus the not tiered groups, in the change from first quarter 1998 to third quarter 1999 in the log of the odds that a claim was for a preferred brand. The 'z' represents a vector of control variables including the beneficiary's gender and age, dummy variables representing the four health plans, a variable indicating whether the prescribing physician or pharmacist requested that the prescription be dispensed as written, and a variable indicating whether the medication dispensed was in some way authorized by the health plan. The last two variables potentially could

counteract the effectiveness of tiered copayments. The total amount of prescription copayments for other medications made by the beneficiary on the same day and the number of prescription claims a beneficiary had during the previous 90 days were included to control for extent of drug use. Finally, whether the member had a claim for a medication in the same therapeutic class during the previous 90 days was included to control for potentially different tier effects on first time versus repeated use of a therapy. Employer group indicators, copayment levels for nonpreferred medications, and the differences between preferred and nonpreferred copayments were not included in the regression equation because the tier variable would be highly collinear with these variables. Variance estimates were corrected for clustering of data within members because of repeated filling of a prescription. Adjustments for clustering within employer groups or prescribing physicians were also examined and found not to substantially alter the reported results. To estimate an adjusted difference between the tiered and not tiered groups in the change in probabilities of using preferred brands, average values of the covariates were entered into the fitted logistic regression equation.

Three-way interactions were added to the logistic regression model to examine how any effect of tiered copayments varied with beneficiary gender, age, number of prescription claims, use of a medication in the same therapeutic class during the previous 90 days or health plan. A separate regression analysis was run for each three-way interaction to determine if the tier effect (represented by the two-way tier-time interaction) varied significantly between subgroups. To summarize the tier effect in each subgroup, regression adjusted estimates were calculated using mean values for the covariates in the equation.

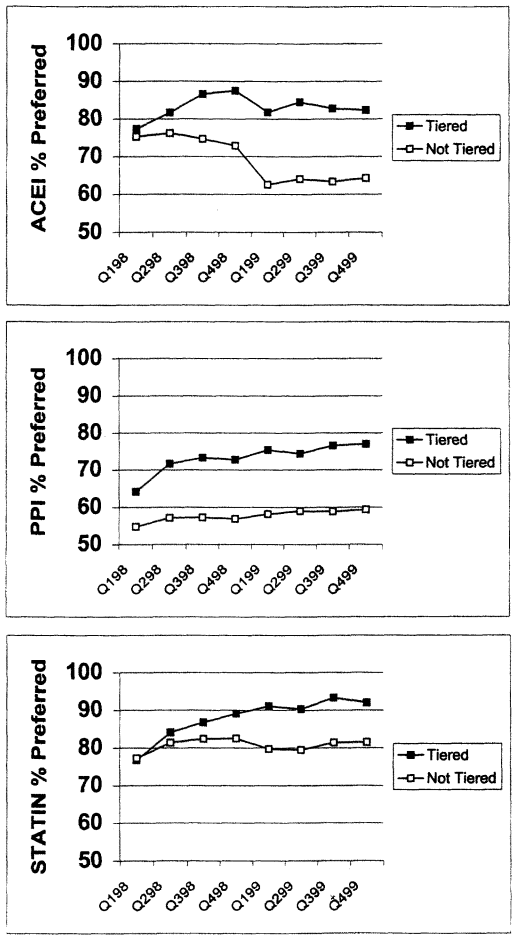

FIG. 1. Observed quarterly trends in the percentage use of preferred brands in three therapeutic classes of medication. The tiered group had different prescription copayments for preferred and nonpreferred medications throughout 1998 and 1999 whereas there was no difference in the copayments for preferred and nonpreferred brands in the not tiered group. ACEI = angiotensin converting enzyme inhibitors. PPI = proton pump inhibitors. STATIN = hydroxymethylglutaryl coenzyme A reductase inhibitors.

Results

Figure 1 shows the observed trends in the percentage use of preferred brands in the tiered and not tiered groups by therapeutic class. In each class, percentage use of preferred brands gradually increased throughout 1998 in the group exposed to tiered prescription copayments and leveled off in 1999. In contrast, use of preferred medications did not increase as much in the not tiered group. The observed differences between the tiered and not tiered groups in the changes in percentage use of preferred brands from first quarter 1998 to third quarter 1999, were 17.3%, 8.4%, and 12.7% points in the ACEI, PPI and STATIN classes, respectively. The abrupt decline in the use of preferred ACEI from fourth quarter 1998 to first quarter 1999 was caused by a change in status from preferred to nonpreferred for two ACEI on January 1, 1999. In the tiered group, 59% of the members who were using either of these two ACEI switched to a preferred ACEI before the end of the first quarter of 1999, whereas only 22% switched in the not tiered group.

TABLE 1. Description of Tiered and Not Tiered Groups by Therapeutic Class

	ACEI*		PPI		STATIN	
	Not Tiered	Tiered	Not Tiered	Tiered	Not Tiered	Tiered
Beneficiaries						
Number	1347	527	2479	347	3936	507
Age (y), mean (SD)	54 (11)	50 (11)	55 (13)	47 (13)	58 (10)	53 (10)
Male/Female (%)	53/47	51/49	41/59	42/58	56/44	58/42
Total prescription use† mean (SD)	9.4 (7.1)	6.5 (5.6)	11.1 (8.6)	7.3 (7.1)	9.9 (7.2)	7.1 (5.1)
Claims						
Number‡	4585	1690	7177	886	13475	1637
Plan A-B-C-D (%)	1-6-28-65	57-10-31-2	1-3-12-84	50-9-39-2	1-2-10-87	51-12-34-3
Preferred brand (%)	69	81	58	72	80	87
Preferred brand copay, mean (SD) $	9.64 (5.00)	8.63 (2.72)	5.78 (5.26)	8.74 (2.71)	5.39 (5.18)	8.64 (2.73)
Non-preferred brand, copay mean (SD) $	11.39 (4.78)	22.27 (3.55)	4.97 (4.88)	22.03 (5.26)	5.26 (5.19)	23.42 (2.75)
Copays for other drugs,§ mean (SD) $	9.50 (12.93)	8.03 (11.50)	5.37 (9.32)	8.28 (13.72)	5.49 (9.21)	8.25 (12.65)
Dispense as written¶ (%)	0.6	0.6	0.3	0	0.1	0
Plan authorized‖ (%)	0.3	0.3	2.3	6.2	0.4	0.4
New use# (%)	10	16	15	24	6	18

*ACEI (angiotensin converting enzyme inhibitor), PPI (proton pump inhibitor), and STATIN (hydroxymethylglutaryl coenzyme A reductase inhibitor).

†Average number of prescription claims including refills during the 90-day period before a study prescription was dispensed.

‡From first quarter 1998 and third quarter 1999 combined.

§Additional prescription co-payments the beneficiary made on the same day a study prescription was dispensed.

¶Request to dispense the brand prescribed without substitution.

‖Plan gave some type of authorization, e.g. may have authorized dispensing a non-preferred brand while charging a preferred co-payment.

#A claim for a medication in the same therapeutic class was not made during the previous 90 days.

Table 1 summarizes the combined data from the first quarter of 1998 and third quarter of 1999 that were used in the logistic regression analyses. In all three therapeutic classes, beneficiaries in the group with tiered copayments had, on average, fewer prescription claims than the not tiered group. They were also a few years younger on average. Most pharmacy claims in the tiered groups were from plans A and C, whereas most claims in the not tiered group were from plan D. In the tiered groups, average copayments for nonpreferred brands were clearly higher than the average copayments for preferred brands. The tabulated averages represent a mixture of different copayments set by employers. Throughout the study period, 82% to 84% of the claims in the tiered group of each therapeutic class were dispensed under a drug benefit that had a $15 difference in copayments for preferred versus nonpreferred brands, ie, $5 preferred versus $20 nonpreferred, $10 versus $25, or $15 versus $30. The copayment differential was $18 ($7 preferred vs. $25 nonpreferred) for the remaining 16% to 18% of claims. As an aside, average copayments in the not tiered group were greater for the ACEI than PPI or STATIN classes because claims for several employers that did not cover one of the comarketed brands of an ACEI were excluded from the analysis of ACEI.

As shown in Table 1, a dispense-as-written request affected brand choice for less than 1% of prescription claims. Plan authorizations affected less than 1% of ACE and STATIN prescription claims. However, 6.2% of the PPI prescriptions in the tiered group were influenced by a plan authorization that could have allowed use of nonpreferred brands for preferred copayments. Finally, prescription claims in the tiered groups were more often new use of a medication in the therapeutic class than the not tiered groups.

TABLE 2. Logistic Regression Coefficients (Standard Errors) by Therapeutic Class

Variable	ACEI[§]	PPI	STATIN
Constant	0.33 (0.29)	0.43 (0.20)*	1.96 (0.28)‡
Tier	0.55 (0.20)†	0.28 (0.22)	0.62 (0.20)†
Time	−0.53 (0.09)‡	0.15 (0.06)*	0.24 (0.06)‡
Tier-time interaction	0.67 (0.20)‡	0.44 (0.21)*	1.14 (0.21)‡
Age	0.005 (0.005)	−0.005 (0.003)	−0.01 (0.004)†
Gender	−0.11 (0.11)	0.03 (0.08)	−0.04 (0.08)
Total prescription use[¶]	0.002 (0.008)	−0.01 (0.005)	0.01 (0.01)
Plan A[‖]	−0.29 (0.22)	−0.06 (0.26)	−0.91 (0.24)‡
Plan B	−0.35 (0.21)	−0.03 (0.21)	−0.10 (0.26)
Plan C	−0.22 (0.13)	0.25 (0.13)	−0.76 (0.11)‡
Copays for other drugs[#]	−0.007 (0.003)*	0.005 (0.004)	−0.001 (0.003)
Dispense as written**	−0.59 (0.54)	−0.40 (0.65)	Dropped††
Plan authorized‡‡	−0.64 (0.46)	−0.35 (0.19)	1.98 (0.72)†
Prior use[§§]	0.73 (0.10)	−0.143 (0.07)	0.15 (0.07)*
Pseudo R^2	0.036‡	0.014‡	0.025‡

*$P \leq 0.05$; †$P \leq 0.01$; ‡$P \leq 0.001$.

[§]ACEI (angiotensin converting enzyme inhibitor), PPI (proton pump inhibitor), and STATIN (hydroxymethylglutaryl coenzyme A reductase inhibitor).

[¶]Number of prescription claims including refills during the 90-day period before a study prescription was dispensed.

[‖]Dummy variables created using Plan D as a reference.

[#]Additional prescription co-payments the beneficiary made on the same day a study prescription was dispensed.

**Request to dispense the brand prescribed without substitution.

††Variable dropped from equation because all claims with dispense as written were for preferred brands, and the perfectly determined regression coefficient would be negative infinity.

‡‡Plan gave some type of authorization, e.g. may have authorized dispensing a non-preferred brand while charging a preferred co-payment.

[§§]Variable indicated whether a claim for a medication in the same therapeutic class was made during the previous 90 days.

Results of the regression analysis used to control for differences between the tiered and not tiered groups are shown in Table 2. The tier-time interaction representing the comparison of changes in the use of preferred brands from first quarter 1998 to third quarter 1999 in the tiered versus not tiered groups was statistically significant in all three therapeutic classes. The small R^2 values shown in Table 2 indicate that the regression model including the tier effect explained only a small fraction of the variation in the use of preferred brands. When mean values of the covariates were entered into the regression model the estimated increases in the probability that a claim was for a preferred brand attributed to having tiered prescription copayments were 13.3%, 8.9%, and 6.0% points.

Subgroup variation in the estimated tiered copayment effect is summarized in Table 3. The tier effect increased significantly with age in the PPI and STATIN groups. There was a consistent pattern in all three therapeutic classes, albeit not statistically significant for the PPI group, for a larger tier effect for chronic medications (a prescription in the same therapeutic class had been dispensed during the previous 90 days) than for new use. The tier effect did not vary significantly with gender, the number of pharmacy claims per beneficiary or health plan.

Discussion

This study demonstrates that differential copayments for preferred and nonpreferred brands were associated with an increase in relative use of preferred brands. The average estimated effect was a 6% to 13% point increase in the share of preferred brands during a 21-month period of observation. Although in our study an $18 copayment differential

TABLE 3. Variation of the Effect of Tiered Prescription Copayments Between Subgroups

	ACEI†		PPI		STATIN	
Subgroup	β (SE)‡	Tier Effect§	β (SE)	Tier Effect	β (SE)	Tier Effect
Male	−0.03 (0.30)	13.2	0.09 (0.36)	8.3	0.06 (0.41)	5.7
Female		13.5		9.8		6.2
Age (y)§						
<50	−0.01 (0.02)	15.5	0.03 (0.015)*	3.6	0.05 (0.02)*	2.9
50–59		12.7		12.0		5.7
≥60		10.1		18.3		8.2
Rx number¶						
<6	−0.02 (0.02)	14.6	−0.01 (0.02)	9.6	−0.005 (0.03)	6.3
7–12		13.2		8.9		6.1
>12		11.0		7.9		5.9
New use‖	0.65 (0.30)*	3.8	0.59 (0.34)	2.0	0.86 (0.44)*	1.9
Repeat use		13.9		10.1		6.2
Plan A#	0.42 (0.34)	17.3	0.26 (0.42)	12.6	0.01 (0.42)	12.2
Plan B	−0.46 (0.49)	7.3	0.59 (0.68)	18.9	0.20 (0.71)	6.4
Plan C	−0.01 (0.35)	13.6	−0.31 (0.40)	4.3	−0.15 (0.42)	9.7

*$P \leq 0.05$ indicating significant variation between the subgroups.

†ACEI (angiotensin converting enzyme inhibitor), PPI (proton pump inhibitor), and STATIN (hydroxymethylglutaryl coenzyme A reductase inhibitor).

‡Regression coefficient (standard error) for the 3-way interaction between the subgroup, tier and time variables. See description of the regression equation in Methods.

§Regression model estimate of the tiered minus not tiered group difference in the change in percentage use of preferred brands for each subgroup. Individual values of the covariates in the regression equation were used to calculate the estimate. Age and the number of prescriptions were continuous variables in the regression analysis.

¶Number of prescription claims including refills during the 90-day period before the study prescription was dispensed.

‖Indicates whether a claim for a medication in the same therapeutic class was made during the previous 90 days.

#Dummy variables for Plans A, B and C were defined using Plan D as the reference.

did not have a significantly greater effect than a $15 differential (data not shown), other evidence suggests that the effect of tiered copayments may depend on the size of the copayment differential.[13] The absolute copayment for nonpreferred medications may also be important if it produces 'sticker shock' that prompts beneficiaries to seek out lower cost alternatives. Copayments for nonpreferred brands ranged from $20 to $30 in this study. Information about the beneficiaries' income was not available for this analysis, although all had health insurance and an outpatient drug benefit via employment.

This analysis may have underestimated the magnitude of the effect if tiered copayments were adopted before the period of observation. Brand switching may occur soon after a copayment differential is introduced as seen in this study when two ACEI were changed from preferred to nonpreferred status. Information about prior outpatient drug benefits for a number of employer groups who enrolled in the study health plans at the beginning of the study period was not available. Use of preferred brands was not near maximal at the beginning of the observation period in either the tiered or not tiered groups, thus there was room for tiered copayments to further increase use of preferred brands during the period of observation.

The preferred drug list sent to health plan enrollees and physicians each year did not include actual copayments for preferred and nonpreferred brands because they vary across employers. The preferred drug list merely informed beneficiaries they could save an unspecified amount by using medications on the preferred drug list. Beneficiaries needed to review their statement of benefits provided at the time of enrollment to determine their prescription copayments in advance of experiencing them when they actually made a purchase. In general, prescribing physicians would not be aware of the actual copayments unless a patient or dispensing pharmacist tells them. If beneficiaries or prescribing physicians responded to the preferred drug list when their drug benefit did not have tiered copayments, estimates of the tiered copayment

effect could be biased downward unless the preferred drug list alone had a similar effect on the study group with tiered copayments.

Subgroup analyses suggested that the effect of tiered copayments on use of preferred PPI and STATIN brands increased with the patient's age. This may reflect more repeat use of medications by older people or more experience with drug benefits, but a definitive explanation is beyond the scope of this study. A relationship between age and the tier effect was not observed in the ACEI class. However, as explained previously, the analysis of ACEI claims included a subset of employers that had different levels of copayments than those represented in the analysis of PPI and STATIN claims. In addition, trends in the use of preferred ACEI were influenced by changes in the preferred status of two brands during the study period. If other studies confirm that tiered prescription copayments are particularly effective in older age groups, this approach to managing drug benefits may be useful should an outpatient Medicare drug benefit be established.

The finding of a larger impact on repeatedly used medications is consistent with predicted effects, because the savings from switching to a preferred drug are greater for chronic medications. In addition, beneficiaries might not have been aware of the copayment for a newly prescribed nonpreferred brand until they went to a pharmacy. If the beneficiary did not ask the pharmacist to call the prescribing physician and request a lower cost medication, then they may not request one until their next physician visit. We are not aware of studies of patient requests for medications with lower copayments during pharmacy or physician office visits and pharmacists' and physicians' responsiveness to these types of requests.[4,14] Studies of this nature are needed to better understand how tiered copayments affect drug use.

There are several reasons for being cautious about generalizing the study estimates. First, the four health plans that were studied may not be a representative sample. These health plans had nonexclusive contracts with numerous independent physician practices that prescribed the medications. Most likely the health plan enrollees and preferred drug list represented only a fraction the physicians' practices. Tiered copayments may be more effective in staff model health plans or group practice plans. The studied plans were subject to a state law that required coverage of nonpreferred drugs at the preferred copayment when a physician felt the nonpreferred drug was medically necessary. This law could reduce the impact of tiered copayments compared with plans operating in other states that do not have a similar law. In the PPI tier group, 6% of the PPI medications dispensed were authorized by the plan. Although the pharmacy claims do not specify the nature of the authorizations, use of a nonpreferred medication for a preferred copayment would be one type of authorization that may have reduced the tier effect in the PPI class.

This study was limited to one preferred drug list and three classes of medications. Brands within each of the three classes had the same pharmacological mechanism of action, thus the preferred brands may be more acceptable alternatives to nonpreferred brands than situations where alternative brands have different mechanisms of action. Effects of differential copayments could also vary depending on whether the preferred brands coincide with physicians' prescribing practices. There is no consensus among managed care organizations as to which brands should be preferred. Indeed, each managed care organization establishes a preferred drug list based in part on their review of the literature, which often lacks adequate cost-effectiveness studies. Variation in physician and pharmacist opinions may also affect committee decisions about preferred drugs. Furthermore, costs of medications to the managed care organization that are based on individual negotiations and complex rebate programs have an important influence on preferred drug lists.

The effects of choices driven by differential copayments on health and total health care utilization and spending need to be considered. Others have reported that a $10 differential in prescription copayments for preferred and nonpreferred brands reduced aggregate drug utilization and expenditure with no effect on physician visits and hospital admissions.[15] This finding is not surprising because differences in copayments appeared to influence only a small fraction of total pharmaceutical utilization. The present study found increases in the percentage use of preferred brands amounting to approximately 6% to 13% of total utilization of the three therapeutic classes. Therefore, preferred medications would have to be much less effective or more risky than nonpreferred medications to have a detectable adverse effect on aggregate utilization of medical care. Differences in clinical effects seem unlikely if, in addition to costs, brand preferences are based on known beneficial and adverse effects. Nevertheless, changes in symptoms and adverse effects have been reported in at least two uncontrolled evaluations of switching coverage from the PPI omeprazole to lansoprazole.[16,17] However, these studies

were susceptible to substantial reporting bias as beneficiaries were surveyed shortly after they were switched from a medication they had been taking successfully. When British Columbia instituted a policy that required a copayment for more expensive ACEI, utilization of the more costly brands declined by 29%, and 18% of the beneficiaries switched to other medications.[18] Those who switched medications had a transitory higher health care utilization than those who continued to use the more costly brand, however self-selection and the possibility that switching occurred in those who had more physician encounters may have biased the comparison. Tiered copayments might also have clinical consequences if people reduce or discontinue use of nonpreferred medications because of the copayment rather than switch to preferred medications. Studies to date have not detected much of this type of response to tiered copayments.[15,18,19]

Conclusion

The present study supports the premise that differential prescription copayments do influence choice among brand medications. Tiered copayments can help purchasers and managers of outpatient drug benefits provide open access by increasing the share of medications that are preferred for financial or clinical reasons. Further research is needed to determine whether the magnitude and types of changes in relative medication use brought about by differential prescription copayments lead to clinically important consequences.

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