

Practical Implications • p 34
 Author Information • p 38
 Full text and PDF • www.ajpblive.com
 Web exclusive • eAppendix

Setting Prices for Generic Medications: A Survey of Patients' Perceptions

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The greater use of generic prescription medications has been widely advocated as a policy solution to rising healthcare costs.^{1,2} Although generics accounted for 63% of prescriptions dispensed in the United States in 2006 and the rate of generic drug use is increasing,³ there still are substantial opportunities for further improvement. By simply switching prescriptions from branded medications to molecularly identical generics, overall drug spending in the United States could be reduced by 11%.⁴ Moreover, the greater use of generics need not negatively impact quality and in some cases may improve it. For example, prescribing in accordance with established guidelines for the treatment of hypertension could lead to more generic drug use and substantial prescription drug cost savings (approximately 25% of total drug costs for hypertension medications) while providing higher-quality, evidence-based care.⁵ More extensive generic medication use also could reduce patient costs and promote medication adherence.⁶

Tiered formularies, in which patients pay higher copayments for brand-name medications, are widely used to create incentives for patients to use generics; 86% of Medicare beneficiaries who receive drug benefits through the Part D program and 91% of workers with employer-sponsored coverage are enrolled in tiered plans.^{7,8} Although implementing a tiered benefit structure leads to greater generic drug use,^{9,10} as do larger differences between the copayments charged for branded and generic drugs,^{11,12} a better understanding of patients' price sensitivity for choosing a generic over a branded medication could assist with the design of formularies that maximize generic medication use.

One explanation for the underuse of generic medications may be that the current structure of tiered formularies, in which there is an average of a \$13 difference in copayments between brand and generic medications,³ is insufficient to motivate some patients to use generics. Accordingly, we conducted a national mailed survey of a random sample of

ABSTRACT

Objective: To estimate savings needed for patients to choose generics over equivalent brand-name medications.

Study Design: Cross-sectional mailed survey of 2500 commercially insured individuals.

Methods: Survey subjects were given hypothetical scenarios and asked about their willingness to purchase generic medications. We used descriptive statistics to examine characteristics of the respondents and to summarize our overall results, and developed linear regression models to identify independent predictors of the price savings patients would need to receive in order for them to use generic medications.

Results: The usable response rate was 48%. Few respondents would never buy a generic medication, although a greater proportion indicated that they would not buy a generic antidepressant (13.1%) than a generic cholesterol (5.7%) or back pain (5.9%) medication ($P < .001$). Among patients willing to use a generic only if it were less expensive than a brand-name medication, the median cost difference required each month to choose the generic was \$25.50 (interquartile range \$18-\$50). Nonwhite patients needed to save \$15.15 more than white patients in order to choose a generic.

Conclusions: Savings thresholds needed to choose a generic often are significantly more than the \$13 current average copayment difference between brand and generic medications. Efforts to increase generic medication use may be aided by increasing copayments for preferred brand-name drugs or decreasing them for generics.

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PRACTICAL IMPLICATIONS

Patients were presented with hypothetical scenarios and asked about their willingness to purchase generic medications in a cross-sectional survey.

- On average, the difference between copayments for generic and preferred brand-name drugs in tiered formularies is \$13.
- Most patients were willing to choose a generic medication over a comparable brand-name medication if the generic medication cost less; on average, patients needed to save \$25.50 per month for them to choose the generic alternative.
- Efforts to increase the proportion of generic medication used may be aided by increasing the copayments associated with preferred brand-name drugs or decreasing them for generics.

commercially insured adults to estimate how much patients would need to save in order to choose a generic over an equivalent brand-name medication.

METHODS

Study Sample

We surveyed a random sample of 2500 of the approximately 50 million Medicare and private health plan beneficiaries of a large, national pharmacy benefits manager between February and April 2007. Our survey sample included patients in any state or the District of Columbia who were between 18 and 94 years of age, and who had at least 1 pharmacy claim through their pharmacy benefits manager in the previous year. Beneficiaries were excluded if during the same 1-year period they had at least 1 pharmacy claim for a medication to treat cognitive impairment based on Generic Product Identifier (GPI) codes beginning with 6205 (eg, donepezil, rivastigmine, tacrine). We also excluded patients insured by Medicaid and patients with any pharmacy claims for antiretrovirals (GPI codes beginning with 1210) during the prior year because they may have obtained overlapping or additional prescription drug coverage. We selected our sample size to estimate descriptive statistics after conservatively predicting our response rate at 40%, with narrow confidence intervals (95% confidence intervals with a width of fewer than 5 percentage points).

We mailed each beneficiary in our random sample an introductory postcard followed by a survey including a \$1 cash incentive. The survey cover page identified the affiliations of the investigators and stated that the survey was to be used for research purposes. Beneficiaries who did not respond to the first survey were mailed up to 2 more surveys, and the second survey also included a \$1 cash

incentive. This study was approved by the Brigham and Women's Institutional Review Board.

Survey Instrument

We provided survey subjects with hypothetical scenarios in which they were prescribed medications to treat high cholesterol, back pain, or depression and asked about their willingness to purchase generic medications. These diagnoses were chosen because perceptions may differ based on the acuity and nature of the conditions being treated (ie, acute symptomatic, mental health, and chronic asymptomatic). For each condition, we asked respondents (1) whether they would only buy the generic medication if it were less expensive for them than the branded drug (true/false); (2) among patients who responded true to the first question, how much they would have to save per month to choose the generic over the branded drug (10 categories, ranging from \$1 to >\$50); (3) whether they would take the generic drug if it were free (true/false); and (4) whether they would never take the generic drug (true/false).

We also collected information about patient socio-demographic characteristics (sex, ethnicity, income, education) and self-reported health to assess factors associated with patients' perceptions about generic drugs. The survey instrument was developed iteratively by the investigators and pilot-tested extensively to improve face validity.

Data Analysis

We used descriptive statistics to examine characteristics of the respondents and to summarize our overall results. Multiple imputation was used to impute missing independent variables,¹³ and no variables were missing more than 10% of the time. Generalized estimating equations with contrasts were used to evaluate whether the proportions of patients willing to purchase generics ever, if they were free, or if they were less expensive than brand-name drugs differed by medication type. The dependent variable for each of these models was the true/false response to each question, and the only independent variable was medication type. This analysis was performed with the GENMOD procedure (SAS 9.1 software; Cary, NC) using a binomial distribution, a logit link function, and an exchangeable variance-covariance structure.

Among patients who reported for all 3 classes of medications that they would only use a generic if it were less expensive than a brand-name drug (ie, among those patients who might use a generic but who were least likely to do so), we calculated each patient's price threshold for each medication based on the midpoint of the range they

selected (see [eAppendix](#) available at www.ajphlive.com). For example, patients who indicated that they would need to save "\$11-\$15" per month in order to use a generic cholesterol medication were considered to have a price threshold of \$13 for that medication. For patients who indicated that they would need to save ">\$50" per month, we defined their threshold as \$50. We calculated an average price threshold for all 3 medication classes and estimated the median of the average price savings that these patients would need to receive for them to use generic medications. We then evaluated

whether a patient's price threshold was influenced by his or her beliefs about generics. Specifically, we assessed the average price threshold for patients who did and did not agree that (1) brand-name drugs are more effective than generic drugs and (2) generic drugs cause more side effects than brand-name drugs. Finally, we developed a linear regression model to identify whether health status, education, race/ethnicity, sex, income, and age independently predicted a patient's price savings threshold.

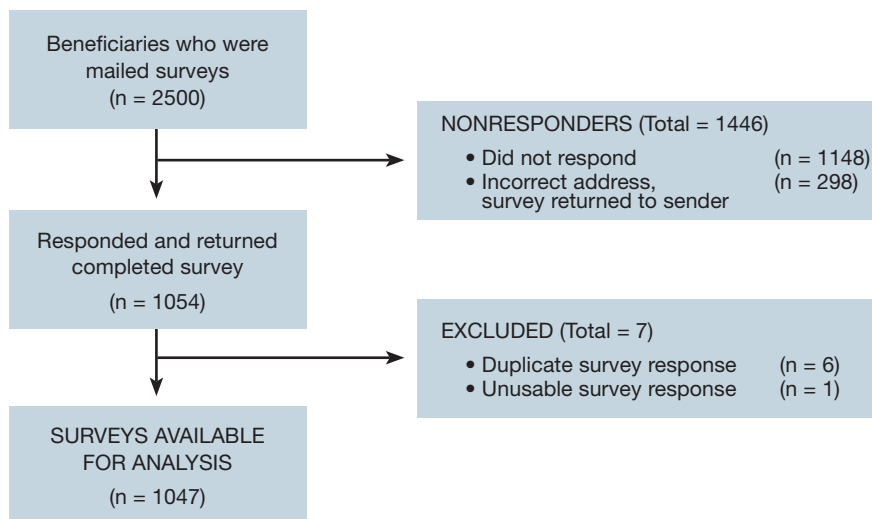
RESULTS

Of the 2500 beneficiaries who were mailed surveys, 1054 responded (see [Figure 1](#)). Six responses were duplicates (patients who had responded, were mailed another survey, and responded to the next survey as well). We only included the first response for each respondent, with an overall response rate of 42%. An additional 298 addresses were identified as incorrect because the mailed surveys were returned to the sender. After removing incorrect addresses from the denominator, our response rate among correct addresses was 48% (1047 respondents from 2202 correct addresses surveyed). The demographic characteristics of our respondents are shown in [Table 1](#).

Willingness to Use a Generic Medication

Few respondents would never buy a generic medication ([Figure 2](#)). Responses varied by the type of medication prescribed; 13.1% of respondents indicated that they would not buy a generic antidepressant at any price, 5.7% would not buy a generic cholesterol medication, and 5.9%

Figure 1. Survey Response Rate



would not buy a generic back pain medication ($P < .001$). Similarly, although the majority of respondents would buy a generic medication if it were less expensive than the branded drug (cholesterol medication 72%, back pain medication 68%, antidepressant 65%) ([Figure 2](#)), the proportion that would do so was smallest for antidepressants ($P < .001$). More than 80% of respondents would take the generic rather than a brand-name drug, regardless of indication, if the generic were free ([Figure 2](#)).

Price Sensitivity for Generics

Among patients who reported that they would be willing to use a generic medication if it were less expensive than a brand-name medication for all 3 medication classes ($n = 235$), the median amount they would have to save each month to choose the generic was \$25.50 (interquartile range \$18-\$50). The distribution of per-patient average price thresholds is shown in [Figure 3](#).

Patients who agree that generics cause more side effects than brand-name medications had a slightly higher price threshold (\$27.22) than patients who did not agree (\$25.50), although this difference was not statistically significant ($P = .32$). Patients' beliefs about the effectiveness of generics did not influence their price threshold.

On regression analysis, race significantly predicted a patient's savings threshold for choosing a generic. White patients needed to save \$15.15 less per month than patients of other races in order to choose a generic ($P < .001$) ([Table 2](#)). In contrast, age, sex, education, income, or health status were not significantly associated with a patient's price threshold.

Table 1. Baseline Characteristics of Survey Respondents (N = 1047)

Characteristic	Value ^a
Age, mean (SD), y	51.6 (±15.4)
Female	706 (67.4)
Education	
High school or less	245 (23.4)
Some college	295 (28.2)
College graduate	317 (30.3)
Graduate school	190 (18.2)
Race	
African American	55 (5.3)
Hispanic	42 (4.0)
Asian/Pacific Islander	31 (3.0)
Caucasian/white	904 (86.3)
Other	15 (1.4)
Total household income	
<\$30,000	186 (17.8)
\$30,000-\$75,000	511 (48.8)
>\$75,000-\$100,000	350 (33.4)
Self-described general health status	
Excellent	106 (10.1)
Very good	410 (39.2)
Good	354 (33.8)
Fair	142 (13.6)
Poor	35 (3.3)

^aValues are number (percentage) unless indicated otherwise.

DISCUSSION

Our survey of randomly selected adults with commercial insurance found that most patients would be willing to choose a generic medication over a comparable brand-name medication if the generic medication cost less and that, on average, the patients most resistant to using generics would need to save \$25.50 per month for them to choose the generic alternative.

Insurers have widely implemented tiered formularies with reduced costs for generic use with the goal of increasing patient demand for generic products. These benefit structures have been shown to effectively stimulate generic use. For example, Huskamp et al found that the introduction of a 3-tier formulary by 2 large employers resulted in 49% of statin users switching to lower-tier drugs.⁹ In addition, the amount of copayment difference between generics and preferred brand-name drugs predicts the proportion of generics that patients use. For example, Mager and Cox showed that plan sponsors with a \$21 and higher

copayment differential had a generic fill rate that was 5.2% higher than those plan sponsors with a \$0 to \$5 copayment differential.¹⁴

Yet at present, the average difference between copayments that US patients pay for generic and preferred brand-name drugs is \$13,³ which is substantially lower than the monthly savings patients in our survey reported as needing to save in order to preferentially choose a generic. Accordingly, our results suggest that efforts to increase the proportion of generic medication used may be aided by increasing the copayments associated with preferred brand-name drugs or decreasing them for generics. Because we found that more than 80% of patients would choose a generic if it were free, eliminating cost-sharing entirely for generics, which currently averages \$11,¹⁵ may be the more effective of these 2 strategies.

We expect that eliminating copayments for generic medications would lead to improvements in adherence. Such observations were made by Pitney Bowes¹⁶ and Chernew and colleagues¹⁷ in conjunction with policies that eliminated or reduced copayments for medications used to treat chronic diseases such as diabetes, hypertension, and coronary artery disease. Further, we suggest that the savings from averted clinical events associated with greater medication adherence may more than offset the increased costs that insurers and employers may face by offering generics for free. Unfortunately, this hypothesis remains inadequately evaluated.

Figure 2. Willingness of Respondents to Use Generic Medications in Hypothetical Scenarios^a

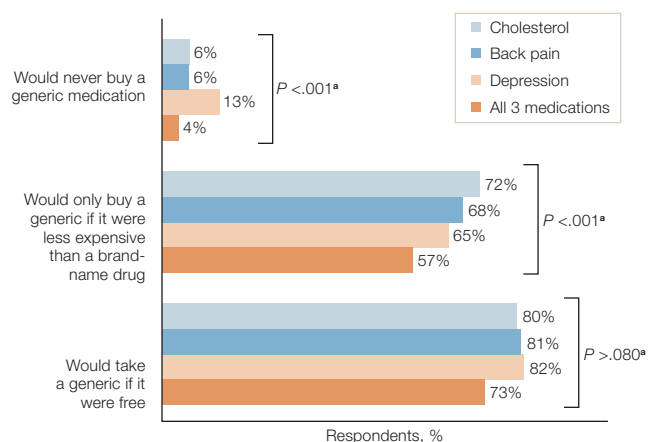
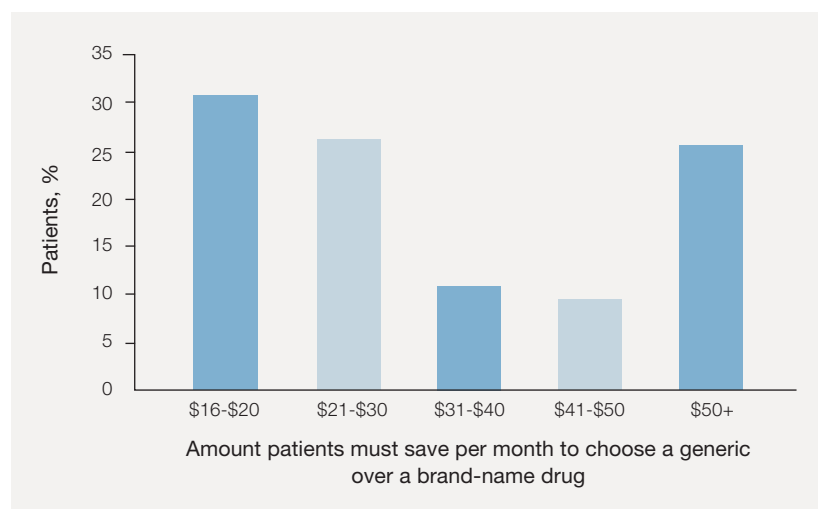


Figure 3. Distribution of Average Monthly Savings Patients Required to Choose a Generic Over a Comparable Brand-Name Medication



In our survey, white patients required a smaller price differential than nonwhites for purchasing generics. Minority patients have been shown to trust the healthcare system less than white patients,¹⁸ and their resistance to choosing a generic may be a reflection of greater distrust of generic medications. Paradoxically, elderly black patients also are more likely to report cost-related drug underuse.^{19,20} These factors combined may contribute to the well-documented disparities in prescription drug use. Of course, our sample was predominantly white, and additional qualitative study of the relationship between patient ethnicity and preferences for generics would be informative.

There are several limitations to our analysis. First, we surveyed only commercially insured patients and cannot generalize our findings to patients who are uninsured or who are covered by Medicaid or the Veterans Affairs healthcare system. Second, fewer than 50% of subjects responded to our survey. Respondents may have differed systematically from nonrespondents, and we did not test for systematic differences between respondents and nonrespondents. Therefore, our results may not be generalizable to all Medicare and private health plan beneficiaries. Third, we assessed patients' willingness to purchase generics on the basis of hypothetical scenarios in which they have been prescribed medications to treat high cholesterol, back pain, and depression. As such, it is possible that their responses may

differ from their actual medication-taking behavior. Additionally, we randomly sampled medication users to increase generalizability and did not enrich our sample with patients using medications to treat the conditions we studied. As a result, a small proportion of respondents were taking medications to treat these conditions, and we could not assess the proportion of patients who responded to each hypothetical scenario who actually used medications for those conditions. Actual use may have altered some patients' perceptions about generics.

Finally, because our intention was to assess patients' willingness to accept therapeutically equivalent generic medications, we did not specify whether respondents were to assume that the brand and generic medications they were choosing between were necessarily molecularly identical. This distinction may have influenced the results, as patients may be more likely to accept molecularly identical substitutes. That said, therapeutic interchange is a widely used strategy. Thus our results are, at the least, conservative estimates of patients' willingness to use generics under these circumstances.

Despite these limitations, we believe this is the first study to explicitly survey patient price sensitivity for generic medications. Our findings indicate that current pharmacy benefit designs may not require sufficient cost-sharing differentials between generic and branded medications to stimulate some patients to select generic medications.

Table 2. Predictors of a Patient's Price Sensitivity for Using a Generic Medication

Characteristic	Parameter Estimate ^a	P ^b
Age (<65 vs ≥65 y)	-4.99	.19
Sex (male vs female)	-1.13	.70
Race (white vs other)	-15.15	<.0001
Education (college or graduate school vs high school or less)	-1.09	.71
Income (per income group)	-0.76	.73
Health status (very good or excellent vs fair, poor, or good)	-0.21	.94

^aValues represent the parameter estimates derived from a linear regression model of a patient's average price threshold for choosing a generic medication. These may be interpreted as the adjusted absolute change in price threshold for patients with different characteristics.

^bP value for *t* test of regression coefficient.

If we believe that generics are equally effective and offer greater value than molecularly identical branded medications, increasing that difference may effectively change behavior. Reducing cost-sharing requirements for generic medications may offer the most sensible solution; such a strategy may reduce overall prescription drug costs, improve adherence to essential chronic medications, and improve the management of chronic disease.

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eAppendix. Survey Instrument

1. Here are a few questions about how you would make decisions about **cholesterol medications**. Assume that your doctor has prescribed a medication to treat your high cholesterol. You have to decide whether you want to buy a brand-name or a generic drug to treat your cholesterol. It is likely that you will need to take this medication for years. Which of the following are true:

a. I would buy the generic only if it were less expensive for me than the branded drug.

Check one box

- True False

(If you answered false – skip question 1b and go to 1c)

b. How much would you have to save each month for you to choose the generic over the branded drug?

Check one box

- \$1 less \$16-\$20 less
 \$2-\$3 less \$21-\$30 less
 \$4-\$5 less \$31-\$40 less
 \$6-\$10 less \$41-\$50 less
 \$11-\$15 less >\$50 less

c. I would never buy the generic drug.

- True False

d. I would take the generic drug if it were free.

- True False

2. We would like to ask you questions about how you would choose your medication if you needed a drug to treat **back pain**. Your doctor advises you to take the medication for 2 weeks. You have to decide whether you want to buy a branded pain medication or a generic drug.

a. I would buy the generic only if it were less expensive for me than the branded drug.

Check one box

- True False

(If you answered false – skip question 2b and go to 2c)

b. How much would you have to save each month for you to choose the generic over the branded drug?

Check one box

- \$1 less \$16-\$20 less
 \$2-\$3 less \$21-\$30 less
 \$4-\$5 less \$31-\$40 less
 \$6-\$10 less \$41-\$50 less
 \$11-\$15 less >\$50 less

c. I would never buy the generic drug.

- True False

d. I would take the generic drug if it were free.

- True False

3. Here are some questions about how you would choose your medication if you needed treatment for **depression**. Let's say that there is both a brand-name drug and a generic drug to treat your condition. It is likely that you will need to take this medication for months or even years. Which of the following are true:

a. I would buy the generic only if it were less expensive for me than the branded drug.

Check one box

- True False

(If you answered false – skip question 3b and go to 3c)

b. How much would you have to save each month for you to choose the generic over the branded drug?

Check one box

- \$1 less \$16-\$20 less
 \$2-\$3 less \$21-\$30 less
 \$4-\$5 less \$31-\$40 less
 \$6-\$10 less \$41-\$50 less
 \$11-\$15 less >\$50 less

c. I would never buy the generic drug.

- True False

d. I would take the generic drug if it were free.

- True False