Evaluation of Health Plan Member Use of an Online Prescription Drug Price Comparison Tool

Norman V. Carroll, PhD; Matthew P. Mitchell, PharmD, MBA; H. Eric Cannon, PharmD; Bryan W. York, BS, CPA; and Robert S. Oscar, BS Pharm

ABSTRACT

BACKGROUND: Health plans have implemented tiered copayment systems to incentivize members to use less expensive medications. However, members need drug price information to make comparisons among therapeutic alternatives. Many health plans and pharmacy benefit management companies have implemented online prescription drug price comparison tools to provide such information. There has been little published evaluation of these tools.

OBJECTIVE: To evaluate use of an online price comparison tool—MyPharmacyTools (MPT)—by the measures of (a) the extent to which the tool was used, (b) changes in use over the first year after implementation, and (c) the types of members who were most likely to use the tool.

METHODS: Data were provided by a 500,000-member integrated health plan with approximately 156,250 enrolled families. The sample included only families with continuous eligibility for all members from July 1, 2006, through June 30, 2008; use of 1 of 7 common copayment structures; and use of the pharmacy benefit in every quarter of the study period. Data collected on each member, using pharmacy claims for the time period July 1, 2007, through June 30, 2008, included annual drug costs (total, out-of-pocket, plan-paid, and mail order) and number of unique drugs and unique generic drugs taken during the third quarter of 2007. Data collected also included whether the member had each of several selected chronic diseases (as inferred from drug claims for the third quarter of 2007) and demographics. Age, gender, and family size were taken from eligibility files. Other demographic data were imputed to members from the demographics of the ZIP code in which they resided. MPT was made available to members on July 1, 2007. Use of MPT was measured as the number of times members logged into the site for each quarter during the subsequent year. Statistical analyses were conducted at the family rather than at the individual level, and families were defined as users if any family member used MPT at least once during the year. Between-group comparisons were evaluated with t-tests, Pearson chi-square tests, and analyses of variance.

RESULTS: Data were analyzed for 8,909 families composed of 28,537 health plan members, of which 464 (5.2%) families used MPT at least once between July 2007 and June 2008. A total of 141 families used MPT in the first quarter it was available, 170 families used it in the second quarter, 185 families in the third quarter, and 182 families during the fourth quarter. Users had significantly higher mean [SD] total drug costs ($4,477 [9,647] vs. $2,848 [3,473], P<0.001) and used significantly more unique drug products (7.7 [5.7] vs. 5.9 [4.5], P<0.001) and unique generic drug products (5.0 [3.9] vs. 3.9 [3.2], P<0.001) than did nonusers. Users were significantly more likely than nonusers to use drugs for behavioral diseases (47.0% vs. 39.7%, P=0.002), hypercholesterolemia (35.8% vs. 27.0%, P<0.001), gastric disorders (32.8% vs. 23.0%, P<0.001), diabetes (18.3% vs. 12.8%, P<0.001), epilepsy (21.1% vs. 10.6%, P<0.001), cardiovascular problems (48.3% vs. 37.5%, P<0.001), and asthma (14.0% vs. 10.7%, P=0.025). Families that used MPT were less likely to have a female subscriber than were nonusers (39.7% vs. 49.0%, P<0.001). Otherwise, there were no statistically significant demographic differences between users and nonusers. Families using MPT in more quarters of the year had higher out-of-pocket (P<0.001) and mail order drug costs (P<0.001), took a larger number of drugs (P=0.003) and generic drugs (P=0.019), were more likely to use drugs for diabetes (P=0.049) and cardiovascular disease (P=0.013), and used drugs for a greater number of chronic diseases (P=0.049), compared with less frequent MPT users.

CONCLUSIONS: About 5% of families in a sample from a large integrated health plan used an online prescription drug cost comparison tool during the first year it was available. Use increased over the year. Users were more likely to have several chronic diseases, took more prescription drugs, and had higher drug costs than nonusers. Further, users with more chronic diseases and more prescriptions were more likely to use the tool consistently throughout the year. These results indicate that the tool was successful in reaching health plan members who could most benefit from comparative prescription drug price information.

What is already known about this subject

• Spending on prescription drugs in noninstitutional settings in the United States increased from $12 billion in 1980 to $234 billion in 2008.
• Use of generic and therapeutic alternatives rather than more expensive brand or nonpreferred formulary medications generates substantial savings for both health plans and members.
• Health plan members need convenient, benefit-specific comparative drug pricing information in order to make cost-effective prescription drug choices. This information would allow members to determine the therapeutic and generic alternatives to the medicines they are currently taking, see their copayments and the cost to the health plan for both their medicines and alternatives, and compare prices for 30- and 90-day supplies.
• Many health plans attempt to provide such information through online prescription drug price comparison tools.

What this study adds

• This is the first published study to evaluate use of an online prescription drug cost comparison tool.
• In a sample of 8,909 families with similar prescription drug copayment structures, continuous enrollment for 2 years, and use of the pharmacy benefit in every quarter for 2 years, 464 (5.2%) used an online prescription drug price comparison tool during the first year it was available in a 500,000-member, 156,250-family integrated health plan.
Spend on prescription drugs in noninstitutional settings has been rising steadily for many years. Spending in the United States increased from $12 billion in 1980 to $234 billion in 2008. While the rate of growth has declined in recent years, the dollar amounts spent have continued to climb. One reason for the constant and continued increase in prescription spending is that health plan members are shielded from prescription prices by insurance coverage. The prices that insured consumers (i.e., health plan members) pay out-of-pocket for prescription drugs, in the form of copayments and coinsurance, are far less than the actual costs of these products. Given that 90% of prescriptions dispensed in retail and mail order pharmacies are covered by some type of insurance, this is a significant problem.

Tiered copayment benefit designs were implemented, at least in part, to address this problem by providing members with financial incentives to use products that have a lower net cost to the plan. If they choose to use more expensive products, they are required to pay at least part of the increased cost through higher copayments. Of commercial payers, 81% have a 3-tier copayment design. More recently, coinsurance has become a popular benefit for prescription plans. In a recent survey of commercial payers, only 47% used dollar copayments exclusively; the remaining 53% offered a combination of coinsurance and copayments. Coinsurance designs increase the need and demand for information on actual prices allowed by the plan. In order for members to take an active role in prescription selection, or at least have an awareness of prescription drug alternatives, they need convenient access to comparative prescription price information. This need is especially important for members with chronic diseases and high drug costs. These members have the most to gain personally and could have the biggest impact on the health plan’s drug costs by switching to lower-cost alternatives.

Physicians are a potential source of comparative price information for consumers. However, a number of studies have indicated that members cannot rely on physicians to provide accurate drug price information. A 2007 review by Allan et al. indicated that physicians consistently overestimated the costs of inexpensive drugs, underestimated the cost of expensive drugs, estimated drug costs within 20%-25% of actual costs only 31% of the time, and reported needing more drug cost information than was available to them. In a 2007 survey of internists, family practitioners, and general practitioners in Hawaii, Tseng et al. found that despite use of health information technology (HIT) by approximately 80% of respondents, less than 20% reported knowing retail drug prices or copayments most or all of the time. The authors speculated that the generally “modest” association between HIT and knowledge of drug costs was due to lack of cost and price information in the HIT used. Two other studies indicated that when physicians use HIT with well-integrated cost information, they are less likely to prescribe expensive drugs.

A number of states now offer online prescription price posting to provide consumers with better access to prescription price information. Most of these sites base posted prices on the usual and customary prices that pharmacies report on Medicaid claims. As a result, little information is available for pharmacies or drug products with low Medicaid volume. A study of state prescription drug web sites concluded that the posted information was neither timely nor comprehensive. Also, the prices reported provide little assistance to consumers with prescription drug coverage who need information on plan-specific prices.

In order to give members access to cost-effective medication options many health plans, pharmacy benefit management companies (PBMs), and other organizations have implemented online prescription drug price comparison tools. A recent article in the trade press indicates increasing consumer demand for such tools. The available tools represent a range of individualization and precision. The less sophisticated price comparison tools provide “average” retail prices that are based on surveys of pharmacy prices or billed amounts. Tools that are not sponsored by health plans, such as those found on DestinationRx, Rxexaminer, or Consumer Reports, base their prices on surveys of pharmacy prices. Tools posted by health plans are more likely to base their prices on billed or allowed charges across the plan. As examples, RegenceRx (Portland, OR) and SelectHealth (Salt Lake City, UT) offer price comparison tools that are available to both members and nonmembers. A screenshot of SelectHealth’s public price lookup web page is shown in Figure 1.

The more sophisticated tools provide individualized, benefit-specific information. That is, based on the member’s specific plan and benefit design information, these tools indicate what the member would pay out-of-pocket for a given product, identify the product’s therapeutic and generic alternatives, compare pricing for 30-day and 90-day supplies, and indicate the member’s financial responsibility for each of the

What this study adds (continued)

- Families that used the tool had higher mean [SD] total drug costs ($4,477 [89,647] vs. $2,848 [83,473]), used significantly more unique drug products (7.7 [5.7] vs. 5.9 [4.5]), and were more likely to use medications for behavioral health problems, hypercholesterolemia, gastric disorders, diabetes, epilepsy, asthma, and cardiovascular diseases than nonusers of the tool.
- Among users, families that used the tool in more quarters of the year had a greater number of chronic diseases (as defined by the proxy of drug utilization), took a greater number of unique drugs and unique generic drugs, and had higher out-of-pocket and mail order drug costs compared with less frequent users.

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**FIGURE 1** SelectHealth’s Publicly Available Price Lookup Page

### Drug Lookup Results

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>FLOMAX 0.4 MG CAPSULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Class</td>
<td>Prostatic Hypertrophy Agent - alpha-1-Adrenoceptor Antagonists</td>
</tr>
<tr>
<td>Selected Quantity</td>
<td>30</td>
</tr>
<tr>
<td>Maximum Days Supply</td>
<td>30 (Retail), 90 (Maintenance)</td>
</tr>
</tbody>
</table>

**Attention:** Prices are calculated based on QUANTITY. You may need to change the quantity in order to display the proper price. You may receive the greatest saving when ordering a 90-day supply using your maintenance benefit.

The information appearing below is intended to be a general guide to prescription drug costs and their alternatives. Due to the fluctuation of prescription drug costs, the estimates shown can vary and do not reflect the exact cost you will pay at the pharmacy. Displayed drugs and their costs do not constitute verification of coverage. Please refer to your Membership Guide and/or the Member Payment Summary specific to your group for more detail.

Please print this page and share the information with your doctor. Please be aware that some of these therapeutic alternatives MAY NOT be appropriate for you. Also, dosages for the alternatives listed below may not be equivalent; varying from one drug to another.

The copays reflected below are after any applicable deductibles have been met. The copays are not reflective of the difference in cost should you choose a brand when a generic is available.

### Please Make Selection

**Retail Pricing**

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Drug Cost</th>
<th>Product Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOMAX 0.4 MG CAPSULE</td>
<td>$124.33</td>
<td>Tier 3</td>
</tr>
<tr>
<td>TAMBULOSIN HCL 0.4 MG CAPSULE</td>
<td>$15.00</td>
<td>Tier 1</td>
</tr>
<tr>
<td>UROVATRAL 10 MG TABLET</td>
<td>$111.18</td>
<td>Tier 3</td>
</tr>
<tr>
<td>RAPPFLO 4 MG CAPSULE</td>
<td>$111.19</td>
<td>Tier 3</td>
</tr>
<tr>
<td>RAPPFLO 8 MG CAPSULE</td>
<td>$111.19</td>
<td>Tier 3</td>
</tr>
</tbody>
</table>

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**Note:** Information based on available data; SelectHealth does not guarantee or warrant its accuracy.
alternatives. Due to the complexities of third-party prescription pricing, members may benefit from the use of more sophisticated tools. For example, what the member pays out-of-pocket for a given drug can vary with the type of drug (generic vs. brand), the formulary tier to which the drug is assigned, and whether the plan requires member copayments or coinsurance. Further, many of these variables change over time: brand drugs go off patent, tier status changes as a result of new clinical data and/or contracts, and copayments/coinsurance may change. As a result, members need sophisticated, benefit-specific tools to determine the prices they will ultimately pay for their medicines.

Although a number of health plans and PBMs have implemented online cost comparison tools, there is little published quantitative research evaluating the use of these price tools. The purpose of this project was to examine use of a more sophisticated price comparison tool in a large health plan. The specific objectives of the study were to determine the extent to which the tool was used in the first year after its implementation, to examine changes in use over the first year, and to identify the
types of members who were most likely to use the tool.

The price comparison tool that we examined is branded as MyPharmacyTools (MPT) by the health plan evaluated in this study. The tool was developed and marketed by RxEOB, a health care technology company based in Richmond, Virginia, under the registered trademark of MyDrugBenefit. MPT includes a number of features. Members can use the tool to access their prescription drug history (Figure 2). This view includes a flashing dollar sign ($) icon that indicates the availability of less expensive alternatives. Clicking on this icon takes the member to a list of all generic and therapeutic alternatives for the product (Figure 3). Information shown on this page includes the member’s copayment or coinsurance amount, the billed amount (the sum of the amount paid by the health plan and the amount paid by the member for the product), and the tier status of the product and each of its alternatives. Further, the page shows this information for both 30-day retail and 90-day maintenance prescriptions. For this health plan, 90-day supplies can be obtained through either the mail order pharmacy or retail pharmacies participating in the 90-day retail program. The page also includes a warning that all products shown may not be appropriate for the member and that he or she should print the page and discuss it with his or her physician.

Members can also use MPT to access drug monographs or to find clinical drug information from First DataBank’s National Drug Data File Plus (First DataBank, Inc., San Francisco, CA).15 The information in MPT is based on prescription claims, eligibility files, and drug benefit design information. As a result, the costs shown are member- and benefit-specific and indicate the amount the member will be responsible to pay at the point of service.

Methods

Data for the study were provided by SelectHealth, a 50,000-member integrated health plan located in intermountain western United States. SelectHealth offers only commercial health plans. The plan does not use an external PBM; these functions are handled internally. SelectHealth therefore has direct responsibility for managing the pharmacy benefit including controlling drug costs.

The selection of members for the study (Figure 4) was undertaken by first searching all pharmacy claims with dates of service from July 1, 2006, through June 30, 2008, and identifying the benefit type for each claim. We then identified the 20 benefit types accounting for the largest number of pharmacy claims. From these, we selected 7 benefit types with similar design; all 7 had a 3-tier benefit. The retail copayments for a 30-day supply ranged from $7/$20/$35 to $10/$30/$45 and the mail order copayments for a 90-day supply ranged from $10/$50/$90 to $10/$50/$90. Examples of excluded benefit types were retail copayments of $10/25%/50% and 20%/20%/30% with 90-day supply copayments of $10/25%/25% and $40/$80/$120, respectively. Because benefit type (e.g., low copayments versus high copayments or copayments versus coinsurance) could affect use of the price comparison tool, we wanted to ensure that all sampled members had similar benefit types.

From the 7 similar benefit types, we selected members who either had a claim, or had a family member with a claim, for every quarter in the study period. This was done to ensure that the sample included only continuously enrolled members. Using eligibility files for the most recent quarter, April through June 2008, we then discovered that there were members in the sample who had lost coverage over the study period. For example, a dependent aged 24 years would have been covered by the plan at the beginning of the study period, when he was aged 23 years, but not at the end of the study period. The enrollment files do not automatically drop family members from the file when they become ineligible for coverage. Families with a member who had lost coverage during the study period were then dropped from the sample. This method had the disadvantage of potentially excluding members who were continuously enrolled but did not have, or have a family member with, a pharmacy claim in every quarter. However, the method did ensure that all members in the sample had been continuously enrolled during the study period.

Data collected on each member included annual drug costs (member out-of-pocket, plan-paid, mail order, and total), number of unique drugs and unique generic drugs dispensed during the third quarter of 2007, member demographics, and number and type of certain chronic diseases. Drug cost and utilization data were taken from pharmacy claims for dates of service from July 1, 2007, through June 30, 2008. The number of unique drugs was calculated using First DataBank’s Generic Code Number Sequence Number (GCN_SEQNO).15 The number of unique generic drugs was calculated using Medi-Span’s Multi-Source Code indicator (Wolters Kluwer Health, Indianapolis, IN)16 in combination with the GCN_SEQNO. Age, gender, and family size were taken from eligibility files. Other demographic data were imputed to families as the demographics of the ZIP code in which they resided and included median household income and the proportion of residents having a high school education, a bachelor’s degree from college, married, below the Federal poverty line, and race (Latino, African-American or Caucasian). These data were based on the 2000 U.S Census and were found at http://zipskinny.com.

The diseases included in the study were behavioral problems, hypercholesterolemia, diabetes, gastric disorders, epilepsy, cardiovascular problems, and asthma. We included these diseases because they are common chronic conditions and because drugs are commonly used to treat them.17-19 For example, Druss et al. (2001) reported that 25% of the U.S. community-dwelling population had mood disorders, diabetes, heart disease, asthma, or hypertension.17 We included epilepsy and gastric disorders because of the high rate of use of drugs
FIGURE 3  MyPharmacyTools Drug Lookup Results Page

Drug Lookup Results

Drug Name: FLOMAX 0.4 MG CAPSULE
Drug Class: Prostatic Hypertrophy Agent - alpha-1-Adrenergic Receptor Antagonists
Selected Quantity: 30
Change Quantity Here: 30
Continue

Maximum Days Supply: 30 (Retail), 90 (Maintenance)

Attention: Prices are calculated based on QUANTITY. You may need to change the quantity in order to display the proper price. You may receive the greatest saving when ordering a 90-day supply using your maintenance benefit.

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Friendly

The copays reflected below are after any applicable deductibles have been met. The copays are not reflective of the difference in cost should you choose a brand when a generic is available.

Please Make Selection

Retail Pricing

Maintenance Pricing

The copays reflected below are after any applicable deductibles have been met. The copays are not reflective of the difference in cost should you choose a brand when a generic is available.

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Retail Copay</th>
<th>Billed Amount</th>
<th>Product Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;FLOMAX 0.4 MG CAPSULE&quot;</td>
<td>$62.17</td>
<td>$124.33</td>
<td>Tier 3</td>
</tr>
<tr>
<td>GEN TAMSULOSIN HCL 0.4 MG CAPSULE</td>
<td>$10.00</td>
<td>$15.00</td>
<td>Tier 1</td>
</tr>
<tr>
<td>RAPAFLA 4 MG CAPSULE</td>
<td>$55.59</td>
<td>$111.19</td>
<td>Tier 3</td>
</tr>
<tr>
<td>RAPAFLA 8 MG CAPSULE</td>
<td>$55.59</td>
<td>$111.19</td>
<td>Tier 3</td>
</tr>
<tr>
<td>UROCATAL 10 MG TABLET</td>
<td>$55.59</td>
<td>$111.18</td>
<td>Tier 3</td>
</tr>
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to treat these conditions in our sample. The presence of each disease was imputed based on prescription drugs the member was taking during the third quarter (July through September) of 2007. Drugs were matched to diseases using First DataBank Enhanced Therapeutic Classification Codes (Table 1).

MPT was first made available to plan members on July 1, 2007. Members were informed of its availability through several quarterly newsletters distributed after implementation of the tool. Members from select large employers also received education about the tool from onsite health fairs and brown bag presentations. Members could also have received information about MPT from educational materials placed in physician offices and pharmacies in the form of tear pads. Use of MPT was measured as the number of times members logged onto the site (log-ins) for each quarter during the subsequent year. Each member had his or her own unique log-in identifier. Past research has indicated that the individuals who conduct online searches for health information are frequently doing so for other members of the family. As a result, we conducted statistical analyses at the family rather than the individual level. To do so, we summed the number of times MPT was accessed by any family member for each quarter. We also measured costs, utilization, disease presence, and demographics at the family level. This entailed summing all family members’ drug costs and utilization, defining presence of disease as whether any member of the family had the disease during the third quarter of 2007, and recording age and gender of the health plan subscriber for the family.

Families in the sample were categorized into 2 groups. Users were defined as families that had used MPT at least once during the year. Nonusers were defined as families that had not used the tool during the year. Drug costs and utilization, presence of chronic diseases, and demographics were compared between groups using t-tests and Pearson chi-square tests. T-tests for unequal variances were used for cost and utilization data.

Two analyses were performed. The first analysis used all prescription claims. The second analysis excluded claims for drugs used for acute conditions and for serious, high-cost conditions. Drugs for acute conditions were identified with the First DataBank Maintenance Drug Indicator (MAINT). Drugs for serious, high-cost conditions that were excluded were immunosuppressives, antiretrovirals, herpes agents, Hepatitis B treatments, antineoplastics, antymyasthenic agents, Alzheimer’s Disease treatments, Parkinson’s Disease treatments, and disease-modifying antirheumatic drugs (DMARDs). The second comparison was made because members have less opportunity to use MPT for acute conditions and because they may be less willing to switch drugs, and consequently use MPT, for serious medical conditions. Further, for certain serious conditions, drugs that may be categorized as alternatives because they are in the same class (e.g. antineoplastics, human immunodeficiency virus [HIV] antivirals) may not be reasonable treatment options for the specific patients and conditions being treated.

We used Pearson chi-square and analysis of variance tests to examine the relationship between the consistency of use of MPT over the year—defined as the number of quarters in which MPT was used—and drug costs, drug use, and imputed disease prevalence. These analyses included only users of MPT. This research was approved by the Intermountain Health Care Office of Research and Institutional Review Board. All analyses were conducted using SAS version 9.2 (SAS Institute Inc., Cary, NC) and an a priori alpha of 0.05.

Results

Data were analyzed for 28,537 members from 8,909 families (Figure 4). Of these, 464 (5.2%) families used MPT at some time during the year. Approximately 147,081 of 156,250 families were initially excluded from the sample either because they
had plans with benefit designs unlike those selected for the sample (as explained in the Methods section) or because the family did not have a prescription filled in each quarter of the July 2006 through June 2008 period. An additional 260 families were dropped because they included 1 or more members who became ineligible for coverage during the study period. Usage of MPT grew from 141 families in the first quarter the tool was available (July through September 2007) to 170 families in the second quarter, 185 families in the third quarter, and 182 families during the last quarter of the study period.

The typical subscriber in the study sample had a mean (standard deviation [SD]) age of 50.1 [11.4] years, was married, Caucasian, and lived in a ZIP code that had a median household income of $51,875 (Table 2). There were 3.2 [1.8] covered members in the typical subscriber’s family. The typical family had mean annual total drug costs of $2,933 [4,050], took 6.0 [4.6] unique drugs, and 3.9 [3.2] unique generic drugs.

A total of 314 families (67.7% of users) used the tool during only 1 quarter of the year, 98 (21.1%) used it during 2 quarters, 40 (8.6%) families used it during 3 quarters, and 12 (2.6%) used it in each of the 4 quarters. Among users, the mean [SD] number of uses per family was 29.8 [55.3]. The median was 13 uses during the year. The number of uses ranged from 2 to 617 per family during the year. Families that used MPT in more quarters of the year also had higher mean uses of the tool. Families that used MPT in only 1 quarter had mean [SD] uses of 14.0 [19.0]; the means [SD] for families using the tool in 2, 3, and 4 quarters were 39.2 [42.5], 102.5 [105.3], and 123.4 [162.5], respectively. Families that used MPT were less likely to have a female subscriber than were those who did not use the tool (39.7% for users vs. 49.0% for nonusers, Pearson chi-square = 15.1, P<0.001). Otherwise, there were no statistically significant demographic differences between users and nonusers (Table 2).

There were statistically significant differences in drug costs and use and presence of diseases (Table 2). Users had substantially higher drug costs and received substantially more unique drug products and unique generic drug products than did nonusers. These differences were found in both the analysis using all prescription claims and in the analysis that excluded claims for acute drugs and drugs for serious, high-cost diseases (data not shown). MPT users were significantly more likely to use drugs for each of the chronic diseases.

As shown in Table 3, more consistent users of MPT (i.e., those with use in more quarters of the year) had higher drug costs and drug use than did less consistent users. This trend was statistically significant for out-of-pocket drug costs, mail order drug costs, and total number of unique drugs and unique generic drugs received. Families that used MPT more consistently were more likely to use drugs for cardiovascular disease and diabetes (data not shown) and to use drugs for a higher number of chronic diseases (Table 3). The results shown in Table 3 are based on an analysis of the sample that included all drugs received.

## Discussion

The sample for the present study consisted of 8,909 families with similar prescription drug copayment structures,
Evaluation of Health Plan Member Use of an Online Prescription Drug Price Comparison Tool

<table>
<thead>
<tr>
<th>Pharmacy Claims Utilization and Cost</th>
<th>Full Sample n = 8,909</th>
<th>Families with No MPT Use n = 8,445</th>
<th>Families with Any MPT Use n = 464</th>
<th>P Value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total drug costs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$2,933 [4,050]</td>
<td>$2,848 [3,473]</td>
<td>$4,477 [5,647]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Out-of-pocket drug costs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$695 [912]</td>
<td>$685 [567]</td>
<td>$876 [869]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Plan paid drug costs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$2,238 [3,635]</td>
<td>$2,163 [3,018]</td>
<td>$3,601 [5,285]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mail order drug costs</td>
<td>$990 [1,886]</td>
<td>$951 [1,839]</td>
<td>$1,698 [2,508]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total number of unique drugs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.0 [4.6]</td>
<td>5.9 [4.5]</td>
<td>7.7 [5.7]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total number of unique generic drugs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.9 [3.2]</td>
<td>3.9 [3.2]</td>
<td>5.0 [3.9]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Health Plan Enrollment Data</td>
<td>Mean [SD] or n (%)</td>
<td>Mean [SD] or n (%)</td>
<td>Mean [SD] or n (%)</td>
<td></td>
</tr>
<tr>
<td>Number of health plan members in household mean [SD]</td>
<td>3.2 [1.8]</td>
<td>3.2 [1.8]</td>
<td>3.3 [1.8]</td>
<td>0.465</td>
</tr>
<tr>
<td>Female subscribers n (%)</td>
<td>4,324 (48.5)</td>
<td>4,140 (49.0)</td>
<td>184 (39.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ZIP Code Information</td>
<td>Mean [SD]</td>
<td>Mean [SD]</td>
<td>Mean [SD]</td>
<td></td>
</tr>
<tr>
<td>Median household income</td>
<td>$51,875 [12,296]</td>
<td>$51,842 [12,287]</td>
<td>$52,425 [12,439]</td>
<td>0.332</td>
</tr>
<tr>
<td>Percentage of high school graduates</td>
<td>89.1 [6.5]</td>
<td>89.1 [6.5]</td>
<td>89.2 [7.7]</td>
<td>0.849</td>
</tr>
<tr>
<td>Percentage married</td>
<td>61.2 [6.3]</td>
<td>61.2 [6.3]</td>
<td>60.9 [6.1]</td>
<td>0.340</td>
</tr>
<tr>
<td>Percentage below federal poverty line</td>
<td>6.9 [4.9]</td>
<td>6.9 [4.9]</td>
<td>6.8 [4.8]</td>
<td>0.589</td>
</tr>
<tr>
<td>Percentage Caucasian</td>
<td>87.1 [8.9]</td>
<td>87.1 [8.9]</td>
<td>87.0 [9.0]</td>
<td>0.777</td>
</tr>
<tr>
<td>Percentage African-American</td>
<td>0.7 [0.9]</td>
<td>0.7 [0.9]</td>
<td>0.7 [0.7]</td>
<td>0.734</td>
</tr>
<tr>
<td>Diseases Imputed from Pharmacy Claims</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Behavioral diseases</td>
<td>3,569 (40.1)</td>
<td>3,351 (39.7)</td>
<td>218 (47.0)</td>
<td>0.002</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>2,450 (27.5)</td>
<td>2,284 (27.0)</td>
<td>166 (35.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gastric disorders</td>
<td>2,094 (23.5)</td>
<td>1,942 (23.0)</td>
<td>152 (32.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1,162 (13.0)</td>
<td>1,077 (12.8)</td>
<td>85 (18.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>990 (11.1)</td>
<td>892 (10.6)</td>
<td>98 (21.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>3,392 (38.1)</td>
<td>3,168 (37.5)</td>
<td>223 (48.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Asthma</td>
<td>967 (10.9)</td>
<td>902 (10.7)</td>
<td>65 (14.0)</td>
<td>0.025</td>
</tr>
</tbody>
</table>

<sup>a</sup>Demographics, with the exception of age and number of health plan members in the household, were measured as the demographics of the ZIP code in which the subscriber resided as taken from the 2000 U.S. Census. All demographic characteristics except median household income were measured as percentages of households in the ZIP code. The figures shown here are the mean [SD] of these percentages. Each family's income was measured as the median household income of the ZIP code in which the family resided. The figure shown here is the mean [SD] of the median household incomes.

<sup>b</sup>Presence of disease was imputed based on drugs taken by family members. Drugs were matched to diseases using First DataBank's Enhanced Therapeutic Classification Codes.

<sup>c</sup>Total drug costs were defined as the sum of drug costs paid by the member (out-of-pocket drug costs) and paid by the plan (plan-paid drug costs).

<sup>d</sup>Out-of-pocket drug costs were defined as the amount of drug costs paid by the member, including copayments, coinsurance, and deductibles.

<sup>e</sup>Plan-paid drug costs were defined as the amount of drug costs paid by the health plan, derived from the total allowed drug costs less the amount paid by members (out-of-pocket drug costs).

<sup>f</sup>Mail order drug costs were defined as the total cost of mail order drugs including both the plan-paid and member-paid amounts.

<sup>g</sup>The total number of unique drugs and total number of unique generic drugs were measured as of the third quarter of 2007 using First DataBank's Generic Code Number Sequence Number (GCN_SEQNO): Drugs were defined as unique if they had the same chemical ingredients, strength, and route of administration. Drugs were defined as generic if they were coded as multisource (Y) by the Medi-Span Multisource Code generic drug indicator.

MPT = MyPharmacyTools; SD = standard deviation.

Continuous enrollment for 2 years, and use of the pharmacy benefit in every quarter for 2 years, who were selected from a 500,000-member, 156,250-family integrated health plan. About 5% of families in this sample used an online prescription drug price comparison tool during the first year it was available. Use of the tool increased over the course of the year. Users experienced substantially higher drug costs, received more prescription drugs, and were more likely to use drugs for a number of chronic diseases than nonusers. Further, users with higher drug utilization and more diseases used the tool more consistently over the course of the year.

A usage rate of 5% is consistent with documented rates of...
response to similar types of communications. For example, response rates for direct mail (postcards and letters sent directly to consumers to solicit sales, contact information, or donations) average between 1% and 5%. Other web references indicate average “click through” rates of 6% or less for e-mail solicitations sent to large (i.e., more than 1,000-person) groups.

The California Health Care Foundation (2006) commissioned a study of prescription drug, hospital, and physician cost comparison tools. The results indicated that 9% of respondents had compared information about 2 similar prescription drugs online, and 6% had looked for prescription prices online. Consumers with prescription drug insurance were less likely, and more educated and technologically savvy consumers were more likely, to search for prescription price information online.

Ranganathan et al. (2009) sent U.S. mail and e-mail invitations to active and retired employees of General Electric to invite them to use a website providing physician-level quality data. A total of 5.8% of invitees registered to use the site. Fanjiang et al. (2007) sent letters to adult patients seeking a new primary care physician to invite them to view a website providing quality information about available primary care physicians. They sent an initial letter of invitation and a follow-up letter 2 weeks later. Seventeen percent of respondents replied to the letter by accessing the website. This response rate is substantially higher than the rate of use of MPT. An important difference between the studies is that patients in the study reported by Fanjiang et al. were targeted at the time they were making a decision about a primary care physician. Patients in our study were not specifically targeted at the time they were making decisions about prescription drug purchases. Fanjiang et al. commented that the rate of use in their study was higher than typically seen and that this finding was probably due to targeting patients at a time when the physician-specific quality information was particularly relevant to them.

It should also be noted that use of MPT at the health plan we studied, according to plan administrators, was several times greater than use of any other content on the plan’s web page. Also, the rate of use for the tool increased over the first year it was in operation. This finding may suggest that rates of use will continue to increase in later years as plan members become more aware of the availability of the site and of its utility. A recent press release from AISHealth.com notes anecdotal reports of increased use of price comparison tools during the same time period as covered in this study.

The results showed that those most in need of price information were more likely to use the site and that those with greater need used the site more consistently. Families that used drugs to treat more chronic diseases and that had higher drug use and costs were more likely to use the tool, and to use it more consistently, than were families with lower drug expenses.
and fewer chronic diseases. This finding indicates that MPT is an effective vehicle for communicating comparative price information to a health plan’s sickest and highest drug cost members. In general, members with higher drug costs are older. Past research has indicated that older consumers are less likely to use the Internet or to search for health information online than younger consumers. As a result, we had initially suspected that health plan members with higher drug costs would not use MPT as frequently because of their age. However, our analysis indicated no age differences between users and nonusers but significant differences in drug costs and disease prevalence. This finding may be a result of analyzing data at the family level; older members may use younger relatives to do their searches. Or it is possible that high drug expenses provide the motivation that some older members need to induce them to use the Internet. It is also possible that the more Internet-experienced elderly used the site, while less experienced elderly members did not. Two recent studies indicate that consumers who use the Internet to search for health information are more experienced online users than consumers who do not.

Our research suggests several areas for future research. First, how can use of online price comparison tools be increased? Although our research indicated that members with higher costs were more likely to use MPT, there were many members with high drug costs who did not use it. Our research was not able to identify the reasons for these differences in use. Nonusers may differ from users in terms of their willingness to use online tools, their access to the Internet, their general ability to use computers, or their access to friends or relatives who would do online searches for them. Or, despite high drug costs, nonusers may simply have been less involved in and less concerned about prescription drug costs.

Second, does use of price comparison tools increase members’ use of less expensive generic and therapeutic alternatives? One goal of the health plan is to provide prescription price information to members so they can make more informed decisions. An additional health plan goal is to reduce drug costs. Research is needed to measure the extent to which MPT, and similar price comparison tools, result in members lowering health plan drug costs through more cost-effective drug choices.

Third, is usage of a price comparison tool affected by the level of specificity of price information provided? As mentioned earlier, tools available to the general public provide only average retail prices, while those offered by health plans are more likely to offer member- and benefit-specific information. It would be useful to determine if the additional specificity of price information was associated with greater use by members.

Finally, are there ways to enhance price comparison tools so that they are more useful and accessible to health plan members? A number of enhancements are currently being made to MPT to increase its utility and accessibility. These include automated alerts to inform members of savings opportunities (e.g., new generic drugs or therapeutic alternatives) when they log on to the website, outbound communication capabilities that would send such alerts and other messages (e.g., compliance reminders) directly to consumers’ e-mail accounts or telephones, and smartphone applications that would allow members to access comparative price information at the point of prescribing. Research will be needed to measure the effectiveness of such enhancements on members’ use and choice of prescription drugs. It would also be interesting to study whether the prescription drug choices of members who use comparative price information at the point of prescribing affect physicians’ prescribing practices and whether any such influence spills over to prescribing for nonmembers.

Limitations
First, only 1 tool was examined in 1 health plan. Rates of use and types of members who use price comparison tools could differ for different kinds of tools (e.g., those that provide only average retail price information rather than benefit- and patient-specific price information), by the extent to which plans promote use of price comparison tools, and by the types of members enrolled in the plans.

Second, we were unable to capture online prescription tool use for individuals who did not log into MPT. The health plan offers a public site where an individual can look up a drug’s copayment tier, therapeutic alternatives, and approximate cash prices. The public site does not provide member-specific information such as copayment or coinsurance amounts for the drug or its alternatives. Specific member use of this public website cannot be captured because members can access information from the public site without logging into either MPT or the public site. The availability of the public site may be another reason that measured use of MPT was low during the study period.

Third, much of the demographic data used in the study was imputed from the demographics of the ZIP code in which the family resided. These data were taken from the 2000 U.S. Census so they are relatively old. In addition, ZIP codes may not be demographically homogeneous and the geographic boundaries of a given ZIP code may change over time. A number of the ZIP codes in which members resided in 2008 did not exist at the time of the 2000 Census. These factors limited the accuracy of the demographic data used in the study. As a result, there may have been demographic differences between users and nonusers that this study was not able to detect.

Fourth, presence of disease was inferred from members’ drug history. As a result, members who had a disease, but did not receive drug treatment for it, would not have been identified. This problem could occur, for example, for members with elevated lipids who were controlled with diet and exercise or...
for depressed members treated by counseling without drug therapy. However, prescription drugs are first-line therapy for most of the diseases we examined. Consequently, it seems likely that this limitation had little effect on our results. Imputing the presence of disease from drug data may have also led to overestimating the prevalence of the chronic diseases in our study. For example, a patient taking a beta-blocker for migraine prophylaxis would have been classified as having cardiovascular disease. Similarly, a patient taking an anticonvulsant for pain relief would have been classified as having epilepsy.

Finally, some use of MPT could have been for persons other than members of the health plan. For example, adult plan members may have used the site to search for lower cost alternatives for elderly parents experiencing the Medicare Part D coverage gap. Although MPT would not provide specific costs that nonmembers would pay, it would provide information on generic and therapeutic alternatives and relative costs for nonmembers. As a result, the usage that was measured in this study could overstate the number of uses of MPT that directly benefited the health plan.

Conclusions
This study examined the use of an online prescription drug cost comparison tool for the first year after it was made available. The results indicated that about 5% of families in our sample used the tool at some time during the year and that usage increased over the year. Users were significantly more likely to use drugs to treat several chronic diseases, took significantly more prescription drugs, and had significantly higher drug expenses than nonusers. Further, users who purchased more prescriptions and had more chronic diseases were more likely to use the tool consistently throughout the year. These results indicate that the tool was successful in reaching health plan members who could most benefit from comparative prescription drug price information.

DISCLOSURES
Carroll's work on this project was part of a sabbatical at RxEOB that was jointly funded by RxEOB and Virginia Commonwealth University. Oscar is Chief Executive Officer and York is Chief Operating Officer at RxEOB, the company that developed and markets the online price comparison tool. Cannon and Mitchell are employees of the health plan at which the online prescription price comparison tool was evaluated.

Concept and design were performed primarily by Carroll, with the assistance of Mitchell and York. Data were collected by Cannon, Mitchell, Oscar, and York and interpreted primarily by Carroll with the assistance of York, Mitchell, and Oscar. The manuscript was written by Carroll, with the assistance of Cannon, Mitchell and York, and revised by Carroll, with the assistance of Mitchell and York.

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REFERENCES


