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Impact of a High-Deductible Health Plan on Outpatient Visits and Associated Diagnostic Tests

Sheila R. Reddy, PhD, MSc, RPh^{a,b,*}, Dennis Ross-Degnan, ScD^{a,b}, Alan M. Zaslavsky, PhD^{a,c}, Stephen B. Soumerai, ScD^{a,b}, and J. Frank Wharam, MB, BCh, BAO^b

^aHarvard University Ph.D. Program in Health Policy, Cambridge, MA, USA

^bDepartment of Population Medicine, Harvard Medical School and Harvard Pilgrim Healthcare Institute, Boston, MA, USA

^cDepartment of Health Care Policy, Harvard Medical School, Boston, MA, USA

Abstract

Background—By shifting a greater share of out-of-pocket medical costs to consumers, high-deductible health plans (HDHP) might discourage use of essential outpatient services.

Objective—To examine the impact of a HDHP on outpatient visits and associated laboratory and radiology tests.

Research Design/Subjects—We used a pre-post with comparison group study design to examine the differential change in outpatient service utilization among 7953 adults who were switched from a traditional HMO plan to a HDHP compared with 7953 adults remaining in traditional plans. HDHP members had full coverage of preventive laboratory tests and modest copayments for outpatient visits, similar to controls, but faced full cost sharing under the deductible for radiology tests and laboratory tests not classified as preventive.

Results—Compared to controls, the HDHP group experienced moderate relative decreases in overall office visits (ratio of IRRs=0.91, or a 9% relative reduction; 95% confidence interval 0.88, 0.94) and visits for higher (0.91; 0.85, 0.97) and lower-priority (0.89; 0.81, 0.99) chronic conditions. There were no significant differences in changes in visit rates for acute higher or lower-priority conditions (both 0.93; 0.86, 1.01) or preventive laboratory tests (0.97; 0.93, 1.02). HDHP members showed moderate relative reductions in the use of general laboratory tests (0.91; 0.86, 0.97) but not radiology tests (0.97, 0.91, 1.03).

Conclusions—Chronic outpatient visits declined among HDHP members, although preventive labs and acute visits remained unchanged. HDHP patients with chronic illnesses who have more contact with the health care system might be more likely to reduce utilization because of increased exposure to costs associated with ambulatory visits.

*Corresponding author can be contacted at (former affiliation): Harvard Medical School, Department of Population Medicine, 133 Brookline Avenue 6th Floor, Boston, MA, 02215, Fax: (617) 859-8112, Telephone: (617) 509-9987, sheilareddy@post.harvard.edu. Harvard Medical School, Department of Population Medicine, 133 Brookline Avenue 6th Floor, Boston, MA, 02215, Fax: (617) 859-8112, Telephone: (617) 509-9987, sheilareddy@post.harvard.edu

Keywords

High-deductible health plans; out-of-pocket costs; outpatient care

Introduction

The rapid expansion of high-deductible health plans (HDHPs) over the last decade is transforming the U.S. insurance marketplace, yet understanding of their impact on access to care remains limited. From 2006 to 2012, the percentage of covered employees enrolled in a plan with at least a \$1000 deductible more than tripled from 10% to 34%.¹ Among small firms, nearly 50% of workers were enrolled in HDHPs in 2012.¹ The implementation of the Patient Protection and Affordable Care Act (ACA) will likely accelerate HDHP adoption as employers seek to control costs² associated with current provisions³ in the law—such as the expansion of dependent coverage for children up to age 26 and the elimination of annual and lifetime coverage limits—and as millions of uninsured Americans who are mandated to buy coverage by 2014 opt for lower premium HDHPs through an employer or health insurance exchanges.⁴ Indeed, recent surveys confirm many employers expect to pass these costs onto consumers by raising cost sharing levels^{5,6} or offering a different plan⁶ such as a HDHP. Higher patient cost sharing, however, has raised concerns that HDHPs might lead to unintended reductions in routine, effective care.⁷

HDHPs shift costs to members by requiring full out-of-pocket payments for many services until an annual deductible has been met. Certain services, such as primary care visits, preventive screening, and prescription drugs, are often excluded from the deductible in such plans and, similar to traditional health plans, available for moderate or no cost sharing.¹ For preventive services, this arrangement will likely become more prevalent as a result of the ACA, which requires most health plans to offer certain preventive care without deductibles or other cost sharing.¹ In 2012 the average annual deductibles for HMO, PPO, and POS plans with deductible components ranged from \$691 to \$1014 for individuals and \$1329 to \$2163 for families.¹ HDHPs with tax-advantaged health fund accounts, such as Health Reimbursement Accounts (HRAs) or Health Savings Accounts (HSAs), make up about half of the HDHP market and have significantly larger individual and family deductibles (\$2086 and \$3924, respectively).¹

The RAND Health Insurance Experiment established that cost sharing has substantial effects on the use of both essential and nonessential services and, in particular, that deductibles of all sizes can cause reductions in medical spending.⁸ More recent studies focusing on outpatient care have found that enrollment in HDHPs can lead to moderate reductions in the use of services with full cost sharing under the deductible, such as certain medications.^{9–12} However, HDHPs that exempt and fully cover preventive services have been shown to preserve their use.^{13–15} A few studies have examined the impact of HDHPs on outpatient visits and found moderate to significant declines in visits following enrollment in a HDHP plan.^{11,16,17} However, the levels of cost sharing for outpatient visits were not clear in these studies,^{11,16,17} and two of the studies examined members who voluntarily chose HDHPs, possibly leading to selection bias.^{16,17}

No previous research has examined how HDHPs impact outpatient visits and commonly associated diagnostic tests that are both exempt and not exempt from the deductible. We investigated the impact of an employer-mandated switch from traditional HMOs to HDHPs on several types of outpatient services for acute and chronic conditions that had different cost sharing levels: office visits with modest copayments, preventive laboratory tests with first dollar coverage, and general lab tests and radiology tests with full cost sharing under a deductible. We hypothesized that the HDHP would have both intended effects such as preservation of fully covered preventive laboratory tests and reduction of lower priority outpatient visits, as well as unintended effects such as reductions in higher priority outpatient visits.

Methods

Study Setting

On April 1, 2002 Harvard Pilgrim Health Care (HPHC), a nonprofit insurer in New England, began offering an HDHP to Massachusetts employers. The HDHP includes lower premiums¹⁸ and annual deductibles of \$500–2000 for individual coverage and \$1000–4000 for family coverage.¹⁹ Full coverage for services included under the deductible begins for individual members after they reach their individual deductible, or for family members after either they reach their individual deductibles or the family's combined expenses reach the family deductible. The HDHP provider network, referral policies, and copayment obligations for services exempt from the deductible are the same as for HPHC's traditional HMO plans.

Most institutional services (e.g., emergency department visits and hospitalizations) and diagnostic procedures (e.g., radiology tests and general lab tests) are subject to the deductible in the HDHP.¹⁹ However, like traditional HMO plans, only modest copayments are charged for most outpatient visits, including routine exams, urgent care visits, and specialist consultations.¹⁹ These copayments must be paid whether or not the deductible has been met. Preventive services (e.g., immunizations, mammograms, and preventive lab tests) have first dollar coverage similar to traditional plans.¹⁹ The HDHPs also include an annual out-of-pocket maximum equal to twice the deductible amount but not less than \$2000 for individuals and \$4000 for families.¹⁹

Study Design and Sample

We employed a pre-post with comparison group study design to examine utilization rates of several outpatient services. Using previously established methods,^{13,20} we created a study cohort of HPHC members enrolled through Massachusetts employers that offered only a single type of HPHC insurance plan, reducing the influence of self-selection bias. The cohort comprised two groups of interest: an HDHP group and a control group. The HDHP group included members who were enrolled in traditional HMO plans during a one-year baseline period between April 1, 2001 and August 14, 2007 and then experienced an employer-mandated switch to an HDHP. The date of switch defined the index date. Each person in the HDHP group was randomly matched to eight contemporaneous HMO members based on adult/child status and whether the plan was purchased through an

independent broker. We assigned control members the same index date as their matched HDHP member. From this original cohort we selected 8916 HDHP members and 56978 controls aged 18–63 years at baseline who were continuously enrolled for 12 months before and at least 12 months after the index date. To curtail the influence of outliers in our study, we excluded members whose baseline use of office visits, laboratory tests, or radiology tests was above the 99.5th percentile (n=259).

We used propensity score matching with 1:1 caliper matching to minimize employer-level selection effects and further improve the comparability of observed characteristics between the study groups.^{21,22} Variables in the propensity score model and the ensuing match included all variables that predicted being employed in a firm that switched to a HDHP, including age, sex, neighborhood socioeconomic characteristic, health status, individual or family plan status (assessed at index date),²⁰ employer size (based on number of employees),²⁰ baseline copayment level for outpatient, emergency department, and hospital visits, total member health plan costs at baseline, and secular changes. We performed an exact match on the characteristic of having one of four major chronic diseases associated with significant morbidity and mortality to ensure adequate representation in our sample: diabetes, hypertension, hyperlipidemia, and chronic pulmonary disease (asthma or chronic obstructive pulmonary disease). We also accounted for whether a plan was purchased through an independent broker (“association” plan) by doing an exact match on this characteristic given that these very small employers purchase health plans in a different manner (through small business associations rather than directly from Harvard Pilgrim) and we have slightly less information on enrollees (such as whether they had access to Health Reimbursement Arrangements).

To derive neighborhood-based measures of socioeconomic status, we linked members’ residential addresses to their 2000 U.S. Census block group, a subdivision of census tracts containing an average of 1000 individuals.^{20,23} We created previously established categorical variables of neighborhood poverty status and education levels^{20,24} and a composite variable for socioeconomic status.²⁰ We defined a low socioeconomic status neighborhood as a census block group with greater than 10% of households below poverty level or 25% of adult household members with less than a high school education.²⁰ To assess health status we used the Johns Hopkins Adjusted Clinical Groups (ACG) Score, a validated index of morbidity burden based on member age, sex and baseline ICD-9 diagnoses.^{25,26} Relative to larger ACG scores, smaller scores indicate lower risk or greater health. We assumed that employer size, association status, and individual or family plan status were constant throughout the study.

We identified the four major chronic diseases based on the presence of either 2 outpatient or 1 inpatient *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9) diagnoses during the baseline year, similar to previous studies.^{27–32} Our propensity-matched sample comprised 7953 HDHP members and their matched controls, of whom 1010 HDHP members and their matched controls had at least one of the four chronic diseases.

Outcome Measures

We calculated the mean number of services used per member per study year for outpatient office visits, preventive lab tests, general lab tests, and radiology tests using HPHC medical claims data.

Using a taxonomy developed by Fenton et al.,³³ we characterized each office visit into one of the following ICD-9 diagnostic categories: acute condition, chronic condition, symptomatic or ill-defined condition, mental illness, preventive or pregnancy-related care, vision or hearing disorder, and dermatologic condition. We used the Fenton taxonomy to further classify acute and chronic condition visits as *higher-* or *lower-priority*, with higher-priority diseases being considered more likely to benefit from medical care than lower-priority diseases.³³ The classification system was originally derived from the Oregon Prioritized Health Services List, which included an evidence-based ranking of over 700 diagnosis and treatment combinations according to the expected morbidity or mortality benefits of medical care.^{33,34}

We identified preventive lab tests, general lab tests, and radiology tests in the claims data using *Current Procedural Terminology (CPT®) 2008, Standard Edition* codes.³⁵ We included only claims that did not occur on dates of emergency department visits or hospitalizations. We identified preventive lab tests (that have full coverage under the HDHP) based on the HPHC benefit schedule. These included tests for HbA1C, microalbuminuria, cholesterol, lead exposure, routine urinalysis, routine hemoglobin, hepatitis C, prostate-specific antigen, alpha-Fetoprotein, Group B streptococcus, sexually transmitted diseases, and HIV. We excluded fully covered Pap smear and fecal occult blood tests because we examined these in previous studies.¹³ The remaining pathology or laboratory claims were classified as general lab tests. Radiology tests comprised all outpatient radiologic procedures except for pregnancy ultrasound and mammography, which were fully covered by the HDHP.

To assess which specific services might be affected by the plan switch, we identified the top ten most common services in each outcome category at baseline, according to ICD-9 *Clinical Classification Software (CCS)* categories³⁶ (visits) and CPT® codes (lab and radiology tests). The top ten reasons for office visits (routine exam, affective diagnosis, other mental condition, upper respiratory infection, anxiety disorder, hypertension, connective tissue disorder, back problem, skin diagnosis, and joint disorder) accounted for 47.0% of all baseline visits, while the top ten preventive lab tests, general lab tests, and radiology tests accounted for 81.8%, 41.1%, and 48.6% of their respective baseline totals. Due to their clinical importance, we also identified the ten most common chronic high- and lower-priority visit reasons, which accounted for 63.4% and 69.0% of their respective baseline totals.

The average total costs per test for the top ten general lab and radiology tests (i.e., tests with full cost sharing for HDHP members) during baseline were \$11.80 and \$49.07 (maximum: \$261.80 and \$768.36), respectively. Mean outpatient (office visit) copayment levels for the HDHP group were \$15.20 during baseline and \$20.00 in the follow-up year, while the corresponding copayments were \$15.05 and \$15.74 for the control group.

Statistical Analysis

We compared baseline characteristics of the study groups using *t* tests and chi-square tests. We tested whether changes in annual rates after the index date were statistically significant using Poisson regression and generalized estimating equations to control for correlations between the measurements for each sample member before and after the plan switch. The analytic model produced incidence rate ratios (IRRs) by comparing the mean rates in the first year after the index date and the baseline year. We calculated the differential change in the incidence rate between study groups by examining the interaction between study group and year. The exponentiated parameter estimate for the interaction term can be interpreted as the ratio of IRRs. For example, a ratio of IRRs of 0.89 would indicate an 11% relative reduction in use among the HDHP members compared to controls from baseline to follow-up.

As a post-hoc analysis, we calculated the relative change in general lab tests per visit to investigate whether reductions were primarily driven by declines in visits or fewer tests per visit.

All models were left unadjusted because our propensity score match generated study groups that were closely matched at baseline (see Appendix, supplemental digital content 1, which further describes our matching and analytic approach). The analyses were conducted using SAS version 9.3 (SAS Institute, Cary, North Carolina) and we specified an *a priori* statistical significance level of $P < 0.05$.

Results

Baseline Characteristics

Table 1 shows similar demographic, health, and plan characteristics between the HDHP and control groups. Both study groups had a mean age of 44.8 and were balanced by gender. Most members in each group were in family plans and employed by small firms. About half of each group purchased insurance through an association plan. The mean ACG score and the proportion of members with diabetes, hypertension, hyperlipidemia, or chronic pulmonary disease were comparable between study groups. Most members in each group resided in neighborhoods characterized by higher socioeconomic status. About one-third of members in both groups had baseline outpatient (office visit) copayment levels greater than \$15 and inpatient copayment levels greater than \$350.

Annual Changes in Utilization of Outpatient Services

Results from the Poisson regression models are shown in Table 2. HDHP members experienced a 9% relative reduction in the use of all office visits (ratio of IRRs=0.91; 95% CI 0.88, 0.94). The HDHP group showed similar relative reductions in visits for chronic higher-priority conditions (0.91; 0.85, 0.97), chronic lower-priority conditions (0.89; 0.81, 0.99), symptomatic or ill-defined conditions (0.88; 0.82, 0.95), and preventive or reproductive-related care (0.92; 0.87, 0.98) compared to controls. Changes in mean visits for the remaining Fenton categories including acute higher- and lower-priority conditions (0.93;

0.86, 1.01 and 0.93; 0.86, 1.01, respectively) were not statistically different between the study groups.

HDHP members experienced a significant 9% relative decline in the use of all general lab tests (0.91; 0.86, 0.97) but no detectable changes in preventive lab tests (0.97; 0.93, 1.02) or radiology tests (0.97; 0.91, 1.03). The number of general labs per visit did not change for HDHP members relative to controls (data not shown).

Discussion

The growing prevalence of HDHPs has raised concerns about their impact on essential care. Our study investigated the effect of HDHPs on the use of outpatient visits and associated diagnostic services. Although exempting services from full cost sharing appeared to preserve the use of outpatient visits for acute care and preventive lab tests, relative rates of visits for chronic, symptomatic or ill-defined conditions, and preventive or reproductive-related care declined, driving a 9% relative reduction in outpatient visits. Full cost sharing was associated with reduced use of general labs but not radiology tests.

Our findings suggest that enrollment in an HDHP was associated with both intended and unintended consequences, largely consistent with previous research on the effects of increased cost sharing.⁸ Unchanged rates of high-priority acute visits and preventive labs indicate these services can be preserved under HDHPs that exempt them from the deductible. Relative reduction in lower-priority chronic visits such as upper respiratory or osteoarthritic conditions may indicate potential cost savings without impacts on quality. In contrast, relative reductions in chronic higher-priority visits for conditions such as hypertension and asthma might represent a deferral of essential care that could increase future morbidity and costs. We are unable to conclude whether the observed relative changes in general lab test utilization were appropriate or inappropriate, since this assessment requires detailed clinical information not available in claims data.

Our study provides evidence of indirect reductions in health care services not subject to the deductible. In particular, office visits for HDHP members were selectively excluded from the deductible and available for copays of \$20, yet relative reductions occurred in rates of chronic visits, visits associated with symptomatic or ill-defined conditions, and preventive or reproductive-related care. One hypothesis to be tested in future research is that members with these conditions incurred higher costs from associated services (such as general labs and radiology tests) following transition to HDHPs, which led indirectly to subsequent reductions in future visits. Similarly, it would be useful to examine whether the unexpected decline in visits for preventive or reproductive-related care was due to costs from services associated with reproductive care visits (for example, contraceptive, prenatal, or menopause services).

HDHP members preserved preventive lab tests with first dollar coverage despite reductions in overall outpatient visits, possibly indicating awareness of the "value-based" incentives of the HDHP. Reductions in general lab tests (which were subject to the deductible) could similarly indicate price awareness, but reasons for this reduction deserve scrutiny and raise

the general question of whether patterns we detected were primarily patient- or provider driven. A key policy and research question is whether HDHPs can stimulate "activated consumers" who selectively maintain or increase high-value care at the expense of low value care. Outpatient care is a good setting in which to examine this because patients generally have discretion in undergoing the types of services we examined. Because we detected reductions in care, a preliminary question is whether these were primarily patient or provider driven. Because HDHP members had financial incentives to reduce utilization after the index date whereas their providers did not, any reductions were likely driven by HDHP patients. To further understand the reductions, it is helpful to consider visits and testing as two distinct categories because of differing patient-provider influences on utilization decisions. Reductions in outpatient visits would be patient-driven almost by definition because patients must usually decide independently whether to present (although decision support resources such as telephone triage are sometimes available). Here, we did not find evidence that patients made distinctions in visits by appropriateness given the similar level of reductions in both high- and low-priority care (Table 2). Outpatient testing usually involves joint patient-provider decisions at the point of care, so that the reductions we detected could indicate either that patients made a decision not to undergo testing or experienced reductions only because outpatient visits declined. Our analyses showing that general lab tests per visit did not decline in the HDHP group relative to the control group suggests that reductions were caused by outpatient visit reductions, not point-of-care consumerism (see Appendix, supplemental digital content 2, which includes the test per visit results and a broader discussion about patient decision-making). HDHPs therefore might primarily have a "gatekeeper" effect on certain outpatient services via reducing contact with the system.

Contrary to our hypothesis, HDHP members did not experience significant reductions in the use of radiology tests, relatively expensive services that were subject to full cost sharing. This result might be related to preservation of certain types of outpatient visits (e.g., if such tests occurred predominantly during acute care visits), to patients' perceptions of the relative importance of radiology tests, or to the fact that many physicians order films to be completed and interpreted while patients wait.

Previous studies of HDHPs and outpatient care have also found that HDHPs protect the use of preventive services that have first dollar coverage, such as breast,^{13,14} cervical,¹³⁻¹⁵ and colorectal cancer screening;^{13,15} child wellness visits;¹⁵ and diabetic monitoring.¹⁴ A recent large study found small but statistically significant reductions in preventive care, including immunizations, cancer screening, and diabetes HbA1c measurement, following HDHP enrollment, but cost sharing levels for these services were uncertain and study members could have selected into HDHPs.³⁷ In addition, while HDHP enrollment has been shown to reduce the use of certain medications that fall under the deductible,⁹⁻¹² utilization is generally preserved for exempted medications that have only modest three-tiered copayments.³⁸ This evidence, along with the findings of our study, may suggest that patients are able to maintain rates of desired services such as preventive tests with modest cost sharing, despite having fewer office visits. Other studies that have examined the impact of HDHPs on outpatient visits show moderate,^{11,16,17} if temporary,¹⁷ reductions in use, although the cost sharing requirements of visits in these studies were not clear.

Three major implications emerge from this research. First, HDHPs that exempt outpatient care from the deductible while requiring modest (\$20) copayments might reduce visits for chronic conditions. Further research should examine how such patterns affect health outcomes and whether chronic visits decline due to more frequent exposure of chronically ill patients to costs associated with outpatient visits. Second, utilization was preserved for services with first-dollar coverage, such as preventive labs. Policymakers could consider selectively extending first-dollar coverage to additional high-value outpatient services, such as chronic higher-priority visits and associated general labs, in order to maintain use. Finally, the relative preservation of radiology tests despite full cost sharing is contrary to the generally accepted view that HDHPs broadly reduce services subject to the deductible. Future studies should examine radiology utilization in detail and attempt to differentiate between appropriate and discretionary use.

Our study has several potential limitations. First, we examined broad categories of services and the results may not be generalizable to specific services in each category. However, by examining the most common services in each category, we shed light on the services that most contributed to our results. Furthermore, the study's comprehensive scope included outcomes absent from previous work, such as general lab and radiology test use. Second, we had a limited ability to understand the reasons for general lab or radiology test use, and thus could not comment about appropriateness of changes in utilization. Third, the findings from our controlled pre-post study could be biased if HDHP members and matched controls experienced different trends in use during the baseline period or if the control group preferentially includes members whose employers chose traditional plans because they anticipated higher utilization. However, we inspected quarterly baseline trends in use for all outcomes and found that the study groups' trajectories were always similar. Finally, our findings may not be generalizable to populations with other demographic or health compositions, or HDHPs with different cost sharing structures. However, because we studied a typical HDHP using a strong study design, our findings should be informative for similar commercially insured and relatively high socioeconomic status populations, in addition to employers newly providing HDHPs under the Affordable Care Act (see Appendix, supplemental digital content 3, which includes further discussion about the issue of generalizability).

Enrollment in an HDHP was associated with both intended and unintended changes in patterns of outpatient health care utilization. In particular, higher-priority chronic outpatient visits declined while no changes were detectable in preventive labs and acute visits. Future studies should examine whether chronic visits decline due to more frequent exposure of chronically ill patients to costs associated with outpatient visits, follow a larger, nationally representative cohort over a longer period, and examine associated changes in important proxy outcomes such as emergency department and hospital visits.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Baseline Characteristics of HDHP and Control Groups

Characteristic	HDHP Group (n=7953)	Control Group (n=7953)	p-value
Mean age on index date, years (SD)	44.8 (11.3)	44.8 (10.9)	0.88
Female, n (%)	4130 (51.9)	4150 (52.2)	0.75
Plan type, n (%)			
In family plan	4775 (60.0)	4806 (60.4)	0.62
In association plan ^b	3888 (48.9)	3888 (48.9)	1.00
Employer size, n (%)			
In small firms (2–50 employees)	5868 (73.8)	5915 (74.4)	0.40
Copayments, n (%)			
Outpatient > \$15	2715 (34.1)	2685 (33.8)	0.615
Emergency department > \$50	752 (9.5)	663 (8.3)	0.01
Inpatient > \$350	2461 (30.9)	2482 (31.2)	0.719
Chronic condition, n (%)			
Diabetes	185 (2.3)	198 (2.5)	0.50
Hypertension	551 (6.9)	537 (6.8)	0.66
Hyperlipidemia ^c	404 (5.1)	434 (5.5)	0.29
Chronic pulmonary disease ^d	183 (2.3)	181 (2.3)	0.92
Morbidity index (ACG Score)			
Mean, (SD)	1.0 (1.5)	1.0 (1.4)	0.79
25th percentile (healthiest)	0.2	0.2	
Median	0.7	0.7	
75th percentile	1.4	1.4	
Neighborhood, n (%)			
High socioeconomic status	6301 (79.2)	6318 (79.4)	0.74

^aHDHP: High-deductible health plan.

^b Association plans are sold through independent brokers rather than Harvard Pilgrim Health Care.

^c Hyperlipidemia defined as having a diagnosis of hyperlipidemia, coronary artery disease, or peripheral vascular disease.

Chronic pulmonary disease defined as having a diagnosis of asthma or chronic obstructive pulmonary disease.

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Table 2

Effect of HDHP Switch on Use of Outpatient Services

Service	HDHP Group		Control Group		Ratio of annual rate change after switch vs. control group (Ns=7953)
	IRR ^a	P-value	IRR ^a	P-value	
<i>Outside of deductible^c</i>					
All office visits	1.00	0.72	1.10	<0.001	0.91 (0.88, 0.94)
Top 10 office visits ^d	1.03	0.08	1.10	<0.001	0.94 (0.89, 0.99)
Visits by major diagnostic group					
Acute higher-priority condition	0.97	0.29	1.04	0.12	0.93 (0.86, 1.01)
Acute lower-priority condition	0.98	0.58	1.06	0.05	0.93 (0.86, 1.01)
Chronic higher-priority condition	1.07	0.00	1.18	<0.001	0.91 (0.85, 0.97)
Chronic lower-priority condition	0.95	0.15	1.06	0.09	0.89 (0.81, 0.99)
Symptomatic or ill-defined condition	0.96	0.13	1.09	0.00	0.88 (0.82, 0.95)
Mental illness	1.09	0.04	1.19	<0.001	0.92 (0.82, 1.03)
Preventive or reproductive-related care	0.95	0.01	1.03	0.23	0.92 (0.87, 0.98)
Vision or hearing condition	1.07	0.34	1.12	0.11	0.95 (0.78, 1.16)
Dermatologic condition	0.93	0.14	1.06	0.18	0.88 (0.77, 1.00)
Preventive lab tests	1.16	<0.001	1.20	<0.001	0.97 (0.93, 1.02)
Top 10 preventive lab tests	1.15	<0.001	1.18	<0.001	0.97 (0.93, 1.02)
<i>Under deductible^c</i>					
General lab tests	1.13	<0.001	1.24	<0.001	0.91 (0.86, 0.97)
Top 10 general lab tests ^d	1.11	<0.001	1.23	<0.001	0.90 (0.85, 0.95)
Radiology tests	1.20	<0.001	1.24	<0.001	0.97 (0.91, 1.03)
Top 10 radiology tests ^d	1.17	<0.001	1.16	<0.001	1.01 (0.95, 1.09)

^aIRR: Unadjusted incidence rate ratio.

^bThe ratio of IRRs indicates the differential change in rates of services between the study groups.

^cCost sharing for services outside of deductible structure consists of \$20 copays (visits) or first dollar coverage (preventive lab tests); all services falling under the deductible are subject to full cost sharing.

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Top 10 office visits during baseline: routine exam, affective diagnosis, other mental condition, upper respiratory infection, anxiety disorder, hypertension, connective tissue disorder, back problem, skin diagnosis, joint disorder; top 10 preventive lab tests: lipid panel, urinalysis (4 types), Hemoglobin A1C, prostate specific antigen, cholesterol, low density lipids, high density lipids; top 10 general lab tests: thyroid (thyroid stimulating hormone), complete blood count (2 types), metabolic panel (2 types), glucose, hepatic enzyme (ALT/SGPT), prothrombin time, creatinine, hepatic function panel; top 10 radiology tests: diagnostic exam (5 types, unspecified), chest X-ray, transvaginal ultrasound, pelvic ultrasound, breast ultrasound, abdominal ultrasound.