

The Impact of an HSA-Eligible Health Plan on Health Care Services Use and Spending by Worker Income

By Paul Fronstin, Ph.D., Employee Benefit Research Institute, and M. Christopher Roebuck, Ph.D., RxEconomics

A T A G L A N C E

This study examines whether there is variation by worker income on how an HSA-eligible health plan affects health care services use and spending. Does the typically flat-dollar gap between a health plan's deductible and the employer contribution to a health savings account (HSA) have a bigger impact on the use of health care services among lower-income workers than it does for higher-income workers?

The data for this study come from a large employer that offered an HSA-eligible health plan alongside a preferred provider organization (PPO), includes between 150,000 and 200,000 individuals, and covers health care services use and spending over the six-year period from 2009–2014.

Here are the key findings:

- The HSA-eligible health plan was associated with a decline in (non-preventive) outpatient office visits for workers at all income levels, but the decline was over twice as large for workers and their dependents with incomes less than \$50,000 as compared with those with incomes of at least \$100,000. The decline in specialist visits accounted for most of the decline in outpatient office visits among the group of workers with less than \$50,000 in income.
- There was an across-the-board decline in prescription drug fills regardless of worker income. However, unlike the results for outpatient physician office visits, there was not a clear relationship with income level.
- The HSA-eligible health plan was associated with a reduction in various preventive services by worker income. For example, lower-income workers reduced their use of influenza vaccinations more than higher-income workers. The usage of preventive office visits exhibited the same general pattern as influenza vaccinations.
- In contrast to the other findings, the HSA-eligible health plan was associated with an increase in emergency department visits and inpatient hospital admissions among lower-income individuals.
- The usage levels of certain health care services—inpatient hospital days, avoidable emergency department visits, pneumonia vaccinations, human papillomavirus (HPV) vaccinations, and glycated hemoglobin (HbA1c) testing for individuals with diabetes—were unaffected by enrollment in the HSA-eligible health plan both overall and by worker income.

Paul Fronstin is director of the Health Education and Research Program at the Employee Benefit Research Institute (EBRI). M. Christopher Roebuck is president and CEO of RxEconomics, LLC. This *Issue Brief* was written with assistance from EBRI's research and editorial staffs. Any views expressed in this report are those of the authors and should not be ascribed to the officers, trustees, or other sponsors of EBRI, Employee Benefit Research Institute-Education and Research Fund (EBRI-ERF), or their staffs. Neither EBRI nor EBRI-ERF lobbies or takes positions on specific policy proposals. EBRI invites comment on this research.

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The Impact of an HSA-Eligible Health Plan on Health Care Services Use and Spending by Worker Income

By Paul Fronstin, Ph.D., Employee Benefit Research Institute, and M. Christopher Roebuck, Ph.D., RxEconomics

Introduction

Since 2001, more employers have begun offering “consumer-directed health plans” (CDHPs), which are a combination of health insurance coverage with a deductible, generally in excess of \$1,000 for employee-only coverage, and an individual savings or reimbursement account to pay out-of-pocket costs for health care services. There are two types of accounts: health savings accounts (HSAs) and health reimbursement arrangements (HRAs). Both types may receive tax-favored contributions and make tax-favored reimbursements. In 2015, 29 percent of employers with 10 or more workers and 59 percent of employers with 500 or more workers offered CDHPs based on either HRAs or HSAs.¹ Also, CDHPs covered about 26 million people in 2015, representing about 13 percent of the privately insured market, and most CDHP enrollees were in HSA-eligible versions of such plans (Fronstin and Elmlinger 2015).

Proponents of CDHPs contend that providing participants with a savings or reimbursement account and subjecting claims to high deductibles requiring out-of-pocket payment before they are covered by insurance will induce enrollees to make more cost- and quality-conscious health care decisions (Herzlinger 2002). Skeptics caution that patients lack comprehensible, timely, and trustworthy information that is critical for them to make informed decisions (Davis 2004) and worry that the higher potential cost sharing will lead to less use of preventive care, primary care and other necessary health care services, especially among lower-income individuals (Haviland, et al. 2011) (Newhouse 1993). And while such reduced utilization might save costs in the short term, it might also result in larger long-term costs.

Since 2001, there have been numerous studies examining the impact of CDHPs on use of health care services and overall spending.² The initial studies tended to focus on broad topics like who enrolls in a CDHP, how enrollees differ from non-enrollees, risk selection, and the impact of CDHPs on overall use of services and spending. More recent studies have examined more targeted topics, such as medication adherence for individuals with chronic conditions (Fronstin, Sepulveda and Roebuck 2013), whether individuals with a CDHP are likely to price shop (Brot-Goldberg, et al. 2015), quality of health care received (Fronstin and Roebuck 2014), and the combination of deductible size, presence of an HRA or HSA, and type of CDHP (Haviland, et al. 2011). Recent studies have also examined more current data and plan enrollees’ behaviors over longer time periods.

One issue that warrants more study is the impact of CDHPs on health care services use and spending by worker income level. For example, does a CDHP affect health care services use and spending differently for lower-income workers and higher-income workers? Since the gap between the deductible under an insurance plan and an employer’s contribution to an HSA or HRA is typically a flat dollar amount unrelated to worker income, the CDHP design may impose a higher cost (relative to income) and thus be a bigger impediment to accessing certain health care services for lower-income workers than for higher-income workers. The few studies that have examined this issue to date have certain limitations, described below.

This *EBRI Issue Brief* examines how a particular HSA-eligible health plan affects health care services use and spending by worker income. The data for this study by the Employee Benefit Research Institute (EBRI) come from a large employer that offered an HSA-eligible health plan alongside a preferred provider organization (PPO) and covers health care services use and spending for the six-year period from 2009–2014.

Background on CDHPs

There are two types of CDHPs: HSA-eligible health plans and health plans that include an integrated health reimbursement arrangement (HRA).

HSA-Eligible Health Plans and Health Savings Accounts (HSAs)

HSA-eligible health plans were created under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA). To be an HSA-eligible health plan that satisfies the MMA, the plan must have had an annual deductible of at least \$1,300 for employee-only coverage and \$2,600 for family coverage in 2016, and the plan's out-of-pocket maximum can not exceed \$6,550 for self-only coverage or \$13,100 for family coverage with the deductible counting toward this limit. These minimum allowable deductibles and maximum out-of-pocket limits are indexed to inflation. Certain primary preventive services—typically those deemed to prevent the onset of disease—can be and often are exempted from the deductible and covered in full (Fendrick, et al. 2014). (These preventive services are in addition to those preventive services that the Affordable Care Act (ACA) mandates be covered in full.) Otherwise, all health care services must be subject to the deductible.

An employer may offer an HSA-eligible health plan, but is not required to contribute to an HSA. When an employer does contribute to a worker's HSA, those contributions are excluded from the worker's taxable income. Employer contributions must be the same dollar amount or the same percentage of the deductible for all employees.³

Regardless of whether an employer contributes to an HSA, an individual enrolled in an HSA-eligible health plan is eligible to open and contribute to an HSA on a tax-preferred basis. For 2016, a worker with individual coverage is allowed to make an annual HSA contribution of \$3,350, while a worker with family coverage can contribute as much as \$6,750. Individuals who have reached age 55 and are not yet enrolled in Medicare may make an additional \$1,000 catch-up contribution. Income and gains on HSA funds are tax free.

Distributions from an HSA can be taken at any time. They are treated as taxable income unless they are used to pay for qualified medical expenses as defined under Internal Revenue Code (IRC) Sec. 213(d), in which case they are excluded from an individual's taxable income.⁴ An individual need not be covered by an HSA-eligible health plan to withdraw money from the HSA.

Any HSA amounts unused at the end of the year can be rolled over in the account and used in future years. Also, even if an employer contributes to the HSA, it is individually owned and fully portable if the worker leaves his or her job.

HRA-based Health Plans and Health Reimbursement Arrangements (HRAs)

HRA-based plans have been in existence longer than HSA-eligible health plans. Unlike the HSA-eligible health plan, HRAs are offered, owned, funded, designed and controlled by employers, including the amount of money contributed to and available in the HRA, the extent to which unused amounts can be rolled over from year to year, the portability of the HRA upon job separation, health care services subject to or exempt from the deductible, and the comprehensiveness of the health coverage.

There is no statutory requirement that an HRA be paired with a high-deductible health plan. HRAs can be paired with any type of health plan, although it is common for them to be paired with high-deductible health plans. In such cases, a worker essentially has first-dollar coverage up to a limit (i.e., the employer contribution to the HRA), then faces a deductible that the worker has to pay on an out-of-pocket basis with after-tax dollars,⁵ and then is covered by insurance. This is in contrast to an HSA-eligible health plan, where employers can simply offer the health plan and let the worker decide for him or herself whether to open and fund an HSA.

Different Incentives

Some research combines enrollees in HRA and HSA-eligible health plans into one group for study purposes. However, enrollees and health services utilization patterns should be examined separately because HRAs and HSAs create different incentives relating to the use of health care services. HRAs are health care reimbursement or spending accounts, not savings accounts, and the inability to roll over unused amounts from one year to the next and to take unused amounts to a new job creates the equivalent of a "use-it-or-lose-it" or spend incentive to use an HRA. In addition, since HRAs are funded by employers, workers may tend to view the account as "free" money, which reinforces a spend (rather than save) mentality.⁶

In contrast, HSAs are savings accounts that are fully portable, owned, and frequently funded by the individual, and unused amounts can be rolled over to the next year and even taken from one job to the next. Furthermore, unlike HRA funds, HSA amounts can be used for non-health expenses (albeit on a taxable basis), which further contributes to the save incentive. As a result, a worker has a much stronger incentive not to spend HSA funds (relative to HRA funds), but rather to save them for possible future use.

HSA-eligible health plans should also be examined separately from HRA-related plans because an employer offering the former may be offering only the high-deductible health plan while neither funding nor facilitating worker contributions to an HSA. In many HSA-eligible plans, workers are left on their own to find an HSA provider and open an account.

Because employers have been offering HRA-based plans longer than they have been using HSA-eligible health plans, most of the early research on CDHPs focused on HRA-based plans. Unfortunately, many studies only noted that they were examining “CDHPs,” without specifying whether the CDHP was an HRA-based plan, an HSA-eligible health plan, or both. Also, studies that examined CDHPs may have only examined a health plan with a high deductible; in other words, a health plan that was neither HSA-eligible nor associated with an HRA. Not knowing what type of CDHP the study actually examined makes it difficult to draw conclusions about prior work.

Prior Research

The literature on the impact of CDHPs on health care services use and spending has been summarized at length by Buchmueller (2009), Bundorf (2012), and Buntin, et al. (2011). However, only a few studies have tried to examine the impact of CDHPs on health care services use and spending by worker income. These studies are summarized here.

The RAND Health Insurance Experiment (Newhouse 1993) was the earliest study to examine the impact of plan design on use of health care services by worker income. It was conducted from 1974 through 1982 in six geographic regions of the United States and examined utilization rates for people randomly assigned to different coinsurance plans. While dated, the RAND study continues to be an important study. It is the only study related to plan design and income level that used a randomized controlled trial for its evaluation. Also, in the study, some families were assigned to plans that required them to pay \$1,000 for out-of-pocket expenses, which was a much more significant dollar amount than it would be today, and higher than the minimum deductible levels in CDHPs today once adjusted for inflation. The RAND experiment revealed that higher cost sharing had a greater impact on the poor than on the nonpoor.

More recently, Wharam, et al. (2007) examined use of emergency departments (ED) and subsequent inpatient admissions by enrollees with employers that adopted a health plan with a deductible of at least \$500 for individual coverage and \$1,000 for family coverage for all of its employees sometime between March 2001 and June 2005. Prior to offering only the higher deductible plan, the employer had offered a health maintenance organization (HMO). Individuals were included in the study if they had at least one year of continuous enrollment in an HMO, and six months of continuous enrollment in the higher deductible plan. Employers had the option of pairing the higher deductible plan with an HRA. It is unclear from the study how many individuals were enrolled in a plan with an HRA. Most of the employees (80.2 percent) were in firms with fewer than 50 employees, and most of the remainder (18 percent) were in firms with 51–250 employees. As a result, it is likely that very few employees had access to an HRA, because they tend to be offered by large employers with self-insured arrangements.

The study found that plan members in the two lowest-income groups experienced a 25 percent decline in high-severity ED visits under the high deductible plan compared with the HMO, while there was only a 1.3 percent decline in high-severity visits in the two highest-income categories. Unfortunately, the study did not have actual income data for workers, but instead relied on the distribution of income relative to the poverty level by census block group, a subdivision of census tracts containing an average of 1,000 individuals. Because of this, the results should be interpreted as differences between residents of lower- and higher-income neighborhoods, rather than strictly differences between low- and high-income individuals or families.

Hibbard, Greene and Tusler (2008) examined the impact of CDHPs on office visits for acute and chronic conditions using data from a large, manufacturing employer headquartered in the Midwest that introduced HRAs in 2004. The

study ranked office visits by high- and low-priority, based on the Oregon State Prioritized List of Health Services, which takes into account the effect of a medical intervention on prevention of death, complications, or future costs; effectiveness of medical intervention; and whether a condition is self-limiting. To determine the impact of the CDHP by worker income, the study examined the experience of hourly and salaried employees, as income data was not available. It found that the reductions in both high- and low-priority office visits were greater for hourly employees than for salaried employees. One limitation of the study was that 30 percent of enrollees were in plans with a \$1,000 deductible and a \$750 employer contribution to the HRA, making the deductible gap of \$250 relatively small.

Feldman and Parente (2010) examined data on overall spending on health care services from a single large employer that added an HRA to its array of health plan choices. The HRA option was added in 2001, and medical claims data were examined from 2000–2003. The study included actual income data for employees, but found that income was not a predictor of total spending. A main limitation of the study was the sample size: There were fewer than 3,000 individuals in the sample, and only 429 were enrolled in the HRA.

Haviland, et al. (2011) examined data from 43 employers that offered either an HSA-eligible health plan or HRA-based health plan. The study examined the first-year experience of CDHP enrollees during the period 2004–2007. Because actual worker income data were not available, families were classified as low income if the median income of the families in the employee's five-digit ZIP code area was below 200 percent of the federal poverty level based on the 2000 census. As noted above, because of the use of geo-coded income, the results should be interpreted as differences between residents of lower- and higher-income neighborhoods. The paper concludes that CDHPs affected lower-income and higher-income populations to the same extent. However, one limitation of the study was the use of geo-coded income data. The use of geo-coded income data is not a perfect measure of family income and family characteristics more generally, which may lead to a weak estimate for the effect of family income on use of health care services.

Brot-Goldberg, et al. (2015) used data from a large, self-insured employer that adopted an HSA-eligible health plan for all of its employees. This study was able to combine medical claims data with worker income. The study indicated that the HSA-eligible health plan was introduced sometime after 2009 and that data were available for as many as 200,000 employees and dependents.

The study found that higher-income groups reduced spending more than lower-income groups in the first year of the HSA-eligible health plan. This result seems counter-intuitive, but it was explained by the authors as driven by higher spending by the lower-income groups in the year before the HSA-eligible health plan was introduced, which reflected worse health status, thus making it harder for the lower-income groups to cut back on health care services and thus on spending.

The manner in which the study defined the income groups may have also contributed to this result. The sample was composed in its entirety of a relatively high-income group of individuals. Indeed, only about 6 percent of the sample had incomes under \$100,000. In addition, the study divided the workers into four income tiers, with the two top income groups having annual income of at least \$150,000. The use of a higher-income population may mean that the results are not generalizable to a broader population.

EBRI Study—Data and Methods

The current EBRI study improves on the earlier studies on CDHPs and use of health care services related to income in a number of ways. The prior studies examined early experience with CDHPs. One study (Brot-Goldberg, et al. 2015) used data from as recently as 2010, but most data were from 2000–2007. The EBRI study examines data from 2009–2014.

The prior studies examined mostly HRA-based plans or high-deductible health plans (HDHPs) without a savings account option. Only Haviland, et al. (2011) and Brot-Goldberg, et al. (2015) examined HSA-eligible health plans. With enrollment in HRA plans decreasing and enrollment in HSA-eligible health plans increasing and expected to continue to grow, studies using data from HSA-eligible health plans would contribute to the literature. The EBRI study examines data from an HSA-eligible health plan.

Finally, several of the prior studies suffered from shortcomings in the measurement of worker income. Wharam, et al. (2007) and Haviland, et al. (2011) used geo-coded income data. Hibbard, Greene and Tusler (2008) used a flag for whether a worker was paid hourly or salaried. Feldman and Parente (2010) had actual income data but for a sample of only 429 CDHP enrollees. Brot-Goldberg, et al. (2015) also had actual income data, but only 6 percent of its sample had income below \$100,000. The EBRI study combines actual worker income data with medical claims data and about one-half of the sample has income below \$100,000.

Study Sample

For the EBRI study, data were used from a large manufacturing employer, with employees located throughout the United States. The study used health insurance enrollment information, medical and prescription drug claims, and worker income data for the period 2009–2014. The employer had offered an HSA-eligible health plan since at least 2009 and in 2013 introduced financial incentives to enroll in the plan, which boosted participation.

The study examined the set of employees who were full-time active workers, under age 65 as of Dec. 31, 2014, as well as their dependents. To allow for cross-sectional time series modeling, the sample focused on individuals who were enrolled in at least two consecutive years covering the period 2009–2014. While the study did not impose a multiyear continuous enrollment requirement, it did use only complete eligibility years. After applying these criteria, the sample contained between 150,000 and 200,000 individuals, depending on the year, and included both union and non-union employees.

Employees were able to choose from among health maintenance organizations (HMOs), exclusive provider organizations (EPOs), preferred provider organizations (PPOs) and HSA-eligible health plans. Approximately two-thirds of employees enrolled in either the PPO or HSA plan. Other than the deductible and maximum out-of-pocket amounts, the PPO and HSA plans were very similar: (a) both plans required the same level of coinsurance after the deductible was met for most types of health care services; (b) both plans covered preventive care without any cost sharing; (c) neither plan required a referral from a primary care physician to see a specialist; and (d) both plans used the same network of providers and the same pharmacy benefit manager (PBM). Based on these similarities, the sample was further limited to individuals enrolled in either the PPO or HSA plan.

Finally, the employer contributed a little less than 50 percent of the deductible into each HSA.

Study Design

Regression models were run to investigate the effects of the HSA-eligible health plan on use of health care services, spending, and medication adherence, by employee income.⁷ Dependent variables included the number of outpatient office visits; primary care and specialist visits; prescription drug fills; inpatient hospital admission and days admitted; and emergency department visits. Flags for use of preventive services were examined, such as physical exam or well-child visit; breast cancer screening (among females, ages 50 and over); cervical cancer screening (among females, ages 21 and over); and colorectal cancer screening (among those 50 years of age and older).

Use of vaccinations and tests were also studied, including indicators for having received tetanus vaccination; pneumonia vaccination (among individuals with congestive heart failure (CHF), asthma/chronic obstructive pulmonary disease, or diabetes); influenza vaccination; human papillomavirus vaccination (HPV) (among females, ages 26 and older); prostate-specific antigen test (among males, ages 55 and older); lipid test (among males with age \geq 35 or females with age \geq 45); and glycated hemoglobin (HbA1c) test (among individuals with diabetes). Medication adherence differences for individuals with high blood pressure; dyslipidemia; diabetes; congestive heart failure; asthma/COPD; and depression were also examined.

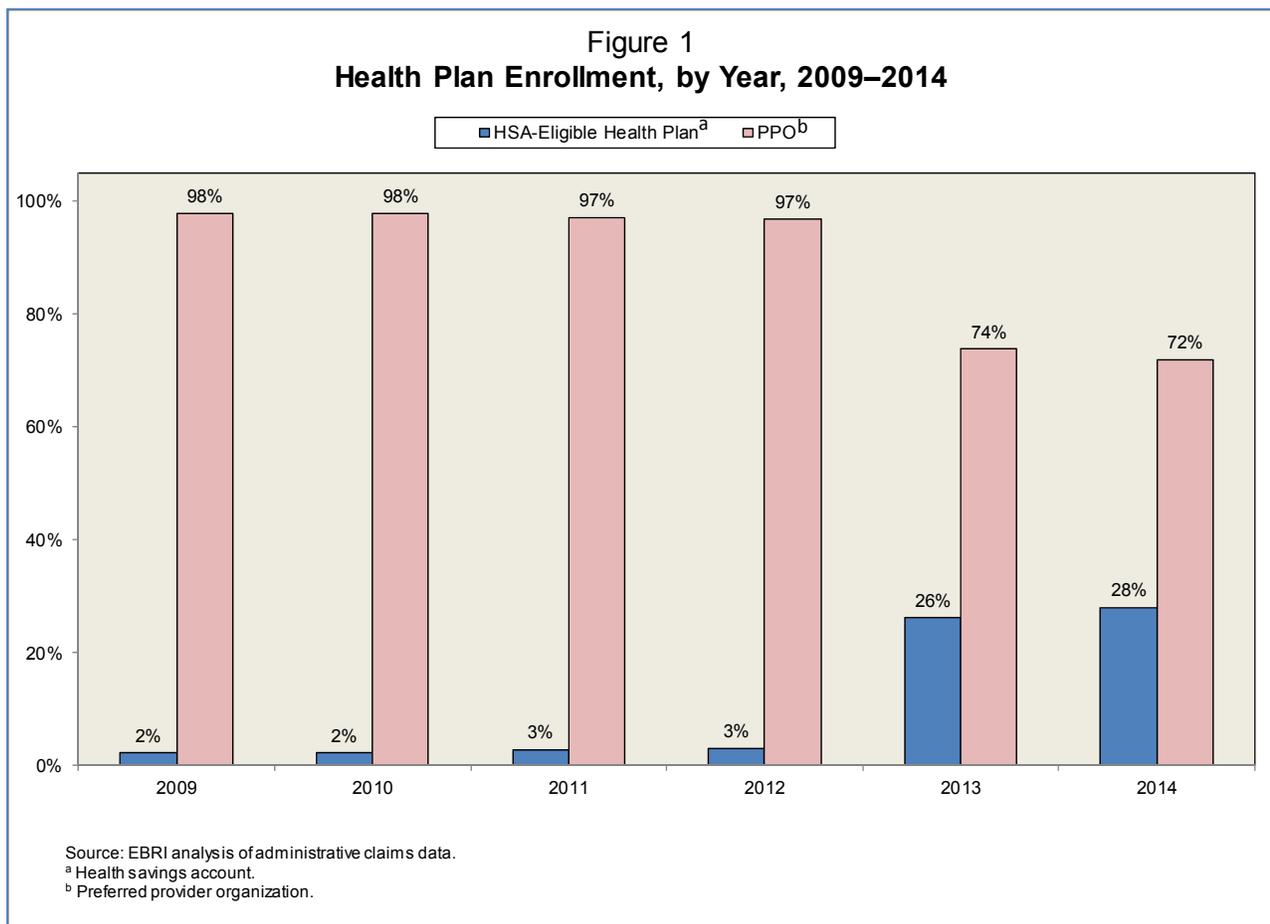
In order to segment the models by income, annual employee income data were converted into 2014 dollars using the consumer price index. Subsequently, employees were separated into five groups based on income: under \$50,000; \$50,000–\$74,999; \$75,000–\$99,999; \$100,000–\$124,999; and \$125,000 or more.

The study also examined the impact of the HSA plan on spending using allowed amounts from claims data, converted into 2014 dollars. This was annual spending on primary care physician visits; specialist visits; other outpatient services; prescription drugs; inpatient hospital services; emergency departments; and total health care spending.

Finally, in addition to the key independent variable indicating plan choice—HSA-eligible health plan versus PPO—all models included the following covariates: age; age-squared; geographic region; household size; union status; indicators for each calendar year; and the Charlson Comorbidity Index (CCI) score, which is a proxy measure of health status derived from diagnosis codes from medical claims data for 19 health conditions (Charlson, et al. 1987) (Deyo, Cherkin and Ciol 1992) (Quan, et al. 2005). Importantly, gender and policyholder status were implicitly included in the models since they did not vary over time and were therefore absorbed in the individual-level fixed effects.

Descriptive Statistics

Figure 1 shows the distribution of individuals by type of plan over the 2009–2014 period. Between 2009 and 2012, most enrollees were in a PPO. Only a few workers had signed up for the HSA-eligible health plan before 2013. However, in 2013, enrollment in the HSA-eligible health plan increased to 26 percent, up from 3 percent in 2012. The increase in enrollment appears to be directly attributable to an increase in financial incentives to join the HSA-eligible health plan, where the employer dropped premiums relative to the PPO. While the earliest data in this study are from 2009, most HSA-eligible health plan enrollees joined in 2013 and had only one or two years of coverage in the plan.



Sample means are shown in Figure 2 by type of health plan for 2013. HSA-eligible health plan enrollees were less likely than PPO enrollees to be male and they were younger than PPO enrollees by about three years. HSA-eligible health plan enrollees were in larger-sized families than PPO enrollees. They were much less likely to be union members. Health status was measured by the CCI. Most individuals in the study were healthy as shown by the CCI, but HSA-eligible health plan enrollees were healthier than PPO enrollees, as the CCI was 0.108 for HSA-eligible health plan

Figure 2
Sample Demographics, by Plan, 2013

| Variable | HSA-Eligible Health Plan ^a | PPO ^b |
|------------------------------|---------------------------------------|------------------|
| Male | 52% | 54% |
| Age | 32.4 | 35.7 |
| Geographic Region | | |
| Northeast | 2% | 2% |
| Midwest | 23% | 6% |
| South | 18% | 15% |
| West | 57% | 76% |
| Unknown region | 0.3% | 0.5% |
| Relationship to Policyholder | | |
| Policyholder | 38% | 44% |
| Spouse | 21% | 21% |
| Child | 41% | 35% |
| Household size | 3.5 | 3.2 |
| Union Status | | |
| Member | 2% | 50% |
| Non-member | 98% | 50% |
| Charlson Comorbidity Index | 0.108 | 0.174 |
| Annual Earnings | \$112,781 | \$98,214 |

Source: EBRI analysis of administrative claims data.
^a Health savings account.
^b Preferred provider organization.

enrollees and 0.174 for PPO enrollees. Annual income was higher among HSA-eligible health plan enrollees (\$112,781) than among PPO enrollees (\$98,214).

Employees in the sample were relatively high income. Average annual salary was \$99,556 in 2009, increasing to \$105,090 in 2014. Median income ranged from \$93,000 in 2009 to \$100,000 in 2014. About one-half of the employees had incomes below \$100,000 in 2014 (Figure 3). Overall, 7 percent had incomes below \$50,000, 15 percent had incomes between \$50,000 and \$74,999, 29 percent had incomes between \$75,000 and \$99,999, 22 percent had incomes between \$100,000 and \$124,999, and 28 percent had incomes of \$125,000 or more.

With respect to the use of health care services, most (87 percent) of the individuals in the sample used some type of service in 2013 (Figure 4). As expected, most of that usage was physician office visits and use of prescription drugs. Over 80 percent of the sample had at least one physician office visit in 2013, with 68 percent having visiting their primary care physician and 57 percent visiting a specialist. Over 70 percent of the sample had at least one prescription drug fill in 2013. Very few individuals (2 percent) had an inpatient admission,

but 11 percent had used an emergency department.

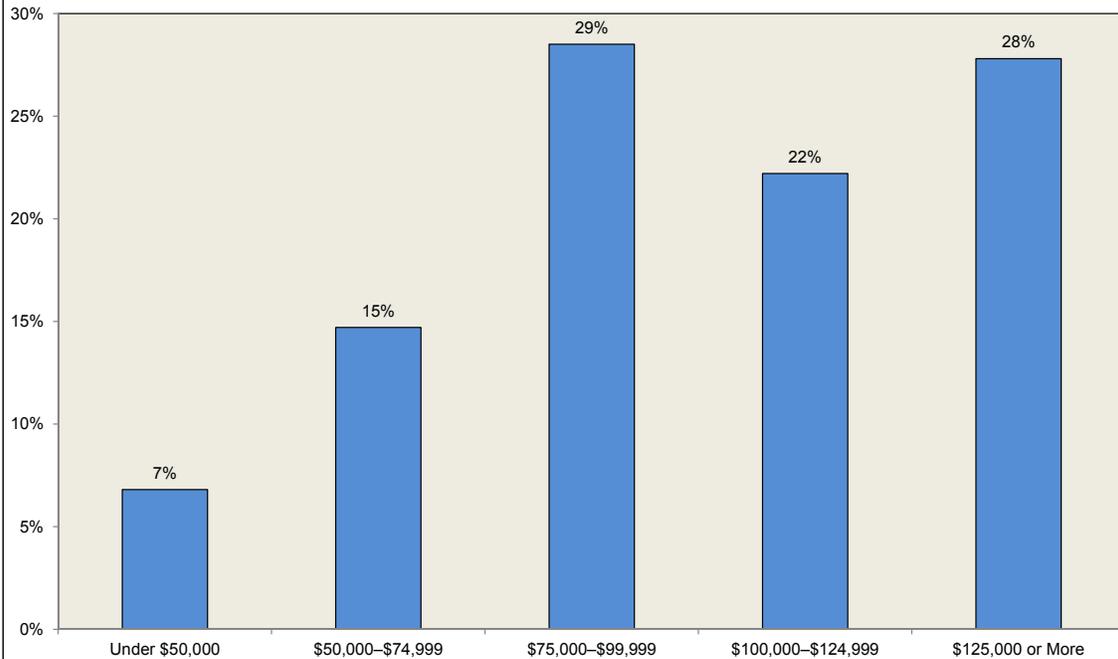
Use of services varies by worker income. In general, lower-income workers used fewer health care services than higher-income workers. Workers with less than \$50,000 in annual income averaged 1.5 visits to specialists, whereas those with \$125,000 or more in income averaged 2.1 visits (Figure 5). Similarly, workers with less than \$50,000 in annual income averaged 8.8 prescription drug fills, whereas those with \$125,000 or more in income averaged 12.5 fills. Preventive services increased with income as did some of the vaccinations and screening tests that were examined. In contrast, however, use of the emergency department was highest for the lowest-income group, and lowest for the highest-income group.

Not surprisingly, total average annual spending increased with worker income as well. Workers with less than \$50,000 in annual income used an average of \$3,338 in health care services, while those with incomes of \$125,000 or more averaged \$4,148 (Figure 6). Spending on specialist visits, other outpatient services, and prescription drugs all increased with income. In contrast, spending on inpatient hospital services and emergency department visits decreased with income.

EBRI Study—Findings

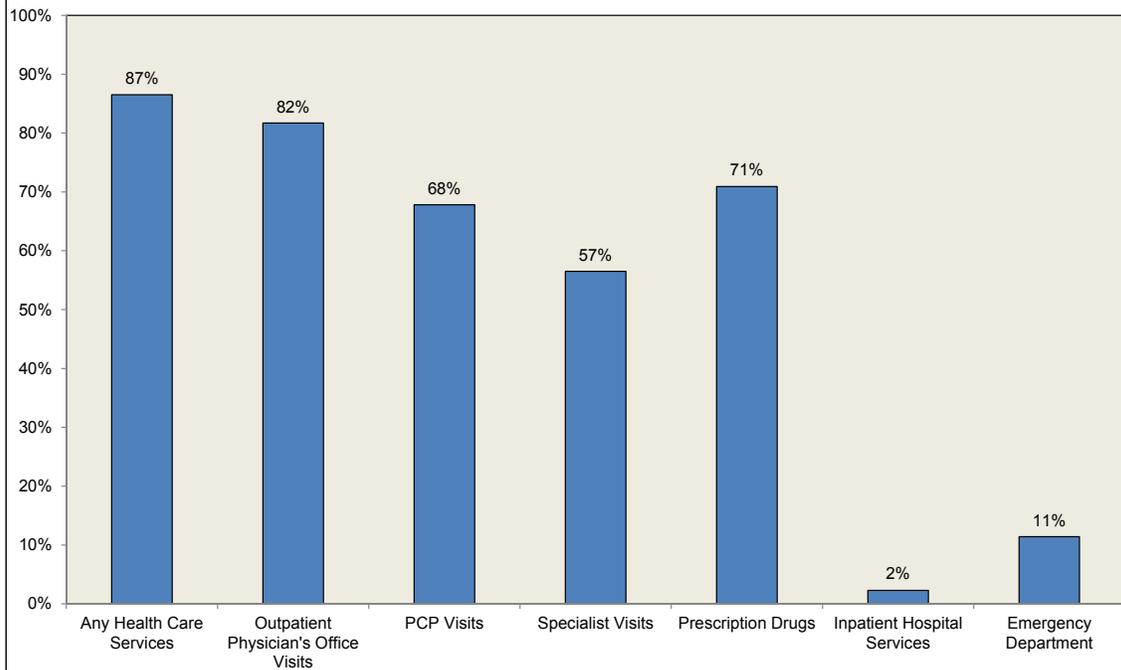
Figure 7 presents the effects of enrollment in the HSA-eligible health plan on use of health care services with respect to all individuals in the sample. The data show that enrollment in the HSA-eligible health plan reduced physician office visits, prescription drug fills and inpatient admissions. Overall, use of physician office visits fell by 0.25 visits per person. Most of the decline in office visits (0.18 of the 0.25 decline) was due to reduced primary care physician office visits, with the remainder (0.07 of the 0.25 decline) due to reduced specialist office visits. Prescription drug fills fell by 0.76 fills per person, and inpatient hospital admissions fell by 2.24 admissions per 1,000 individuals. Moving to the HSA-eligible health plan had no overall impact on the number of days in the hospital or on use of emergency departments.

**Figure 3
Distribution of Annual Earnings, 2014**



Source: EBRI analysis of administrative claims data.

**Figure 4
Percentage of Sample Using Health Care Services, by Type of Service, 2013**



Source: EBRI analysis of administrative claims data.

Figure 5
Average Use of Health Care Services, by Worker Income, 2013

| | Total | Less than \$50,000 | \$50,000– \$74,999 | \$75,000– \$99,999 | \$100,000– \$124,999 | \$125,000 or More |
|---|-------|-----------------------|-----------------------|-----------------------|-------------------------|----------------------|
| Outpatient Physician's Office Visits | 3.8 | 3.5 | 3.7 | 3.8 | 3.8 | 3.9 |
| Primary Care Physician Visits | 1.9 | 1.9 | 1.9 | 2.0 | 1.8 | 1.7 |
| Specialist Visits | 1.9 | 1.5 | 1.7 | 1.9 | 2.0 | 2.1 |
| Prescription Drug Fills | 12.1 | 8.8 | 11.3 | 13.1 | 12.4 | 12.5 |
| Inpatient Hospital Admissions | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 |
| Inpatient Hospital Days | 0.11 | 0.12 | 0.10 | 0.13 | 0.10 | 0.10 |
| Emergency Department Visits | 0.15 | 0.20 | 0.17 | 0.16 | 0.14 | 0.13 |
| Preventive Services | | | | | | |
| Physical exam/w ell child visit | 39% | 28% | 34% | 37% | 43% | 44% |
| Breast cancer screening (females, age>=50) | 50% | 40% | 47% | 48% | 52% | 54% |
| Cervical cancer screening (females, age>=21) | 32% | 31% | 32% | 30% | 31% | 33% |
| Colorectal cancer screening (age>=50) | 19% | 15% | 18% | 17% | 20% | 22% |
| Vaccinations & Screenings | | | | | | |
| Tetanus vaccination | 8% | 8% | 8% | 8% | 8% | 7% |
| Pneumonia vaccination (individuals w ith CHF, COPD, or diabetes) | 4% | 3% | 5% | 4% | 4% | 4% |
| Influenza vaccination | 16% | 13% | 13% | 15% | 18% | 17% |
| HPV vaccination (females, age<=26) | 7% | 6% | 6% | 7% | 7% | 9% |
| PSA test (males, age>=55) | 39% | 28% | 32% | 36% | 40% | 44% |
| Lipid test (males, age>=35 or females, age>=45) | 44% | 37% | 42% | 43% | 45% | 47% |
| HbA1c test (individuals w ith diabetes) | 85% | 86% | 87% | 86% | 83% | 85% |

Source: EBRI analysis of administrative claims data.

Figure 6
**Total Average Annual Spending on Health Care Services,
by Type of Service and Worker Income, 2013**

| | Total | Less than \$50,000 | \$50,000– \$74,999 | \$75,000– \$99,999 | \$100,000– \$124,999 | \$125,000 or More |
|-------------------------------|----------------|-----------------------|-----------------------|-----------------------|-------------------------|----------------------|
| Total | \$4,029 | \$3,338 | \$3,672 | \$4,293 | \$4,061 | \$4,148 |
| Primary Care Physician Visits | 232 | 235 | 243 | 252 | 224 | 208 |
| Specialist Visits | 222 | 169 | 200 | 226 | 229 | 243 |
| Other Outpatient Services | 1,941 | 1,567 | 1,704 | 2,034 | 2,001 | 2,052 |
| Prescription Drugs | 929 | 619 | 818 | 990 | 965 | 998 |
| Inpatient Hospital | 570 | 573 | 556 | 644 | 522 | 534 |
| Emergency Department | 135 | 176 | 151 | 147 | 119 | 113 |

Source: EBRI analysis of administrative claims data.

The data also show that moving to an HSA-eligible health plan reduced use of some preventive services, which is consistent with other studies on this subject.⁸ Use of routine office visits for adults (physical exams) and children (well child visits) fell by 0.5 percentage points, while use of cervical cancer and colorectal cancer screenings both fell by 2 percentage points. Use of breast cancer screening was unaffected by the HSA-eligible health plan. All of these preventive services were excluded from deductibles, coinsurance, and copayments for both the PPO and HSA-eligible health plans.

With respect to vaccinations and other screenings, tetanus and influenza vaccinations fell by 0.9 percentage points, and lipid testing for certain men and women fell by 1.1 percentage points. There was no impact on use of the pneumonia vaccination among individuals diagnosed with CHF, chronic obstructive pulmonary disease (COPD) or diabetes; no impact on the use of the HPV vaccination among young women; and no impact on HbA1c testing among individuals

with diabetes. Men over age 54 enrolled in the HSA-eligible health plan were more likely than those in the PPO to have received a prostate-specific antigen (PSA) test for prostate cancer.

Impact of Income on the Use of Health Care Services

Examining the impact of enrollment in an HSA-eligible health plan on use of services masks other important differences among various groups. The study identifies important differences among income groups with respect to the impact of the HSA-eligible health plan. For example, while outpatient office visits fell as a result of enrollment in the HSA-eligible health plan, the decline was more than twice as large for individuals with income less than \$50,000 compared with those with incomes of at least \$100,000. More specifically, there was a 0.48 reduction in office visits per person among individuals with less than \$50,000 in income, a 0.29 reduction among persons with \$50,000–\$74,999 in income, a 0.28 reduction among persons with \$75,000–\$99,999 in income, and a 0.19 reduction among persons with \$100,000 or more in income (Figure 8). Not surprisingly, the impact by income was lower in the higher-income groups.

The decline in specialist visits accounted for most of the decline in outpatient office visits among the group of workers with less than \$50,000 in income. These lower-income workers reduced their use of specialist visits by 0.36 per person, whereas individuals with income of \$50,000 or more reduced their use of specialist visits by 0.11-0.12 per person. Lower-income workers reduced their use of primary care office visits by 0.12 per person, but the effect was not statistically significantly different from zero. In contrast, workers with income between \$50,000 and \$99,000 reduced their use of primary care office visits by 0.17 per person, and those with income of \$100,000 or more reduced their use of primary care office visits by 0.09 per person.

There was an across-the-board decline in prescription drug fills across worker incomes; unlike the results for outpatient physician office visits, there was not a clear relationship to income. Workers with less than \$50,000 in annual income reduced their prescription drug fills by 0.87 per person (Figure 9). And workers with income between \$50,000 and \$99,999 reduced their prescription drug fills less than workers with income below \$50,000: Those with incomes between \$50,000 and \$74,999 reduced their prescription drug fills by 0.29 per person, and those with incomes between \$75,000 and \$99,999 reduced their prescription drug fills by 0.57 per person. But workers with incomes of \$100,000 or more reduced their prescription drug fills by about the same amount as lower-income workers. Those with incomes between \$100,000 and \$124,999 reduced their prescription drug fills by 0.83 per person, and those with incomes of \$125,000 or more reduced their prescription drug fills by 0.88 per person.

As expected, lower-income workers reduced their use of influenza vaccinations more than higher-income workers. Out of 100 individuals with incomes below \$50,000 enrolled in the HSA-eligible health plan, five did not get the flu vaccine (Figure 10). Among individuals with incomes between \$50,000 and \$74,999, one out of 100 people did not get the vaccine, and among individuals with incomes between \$75,000 and \$99,999, two out of 100 did not get the vaccine. The HSA-eligible health plan did not have an impact on flu vaccine use among individuals with \$100,000 or more in income.

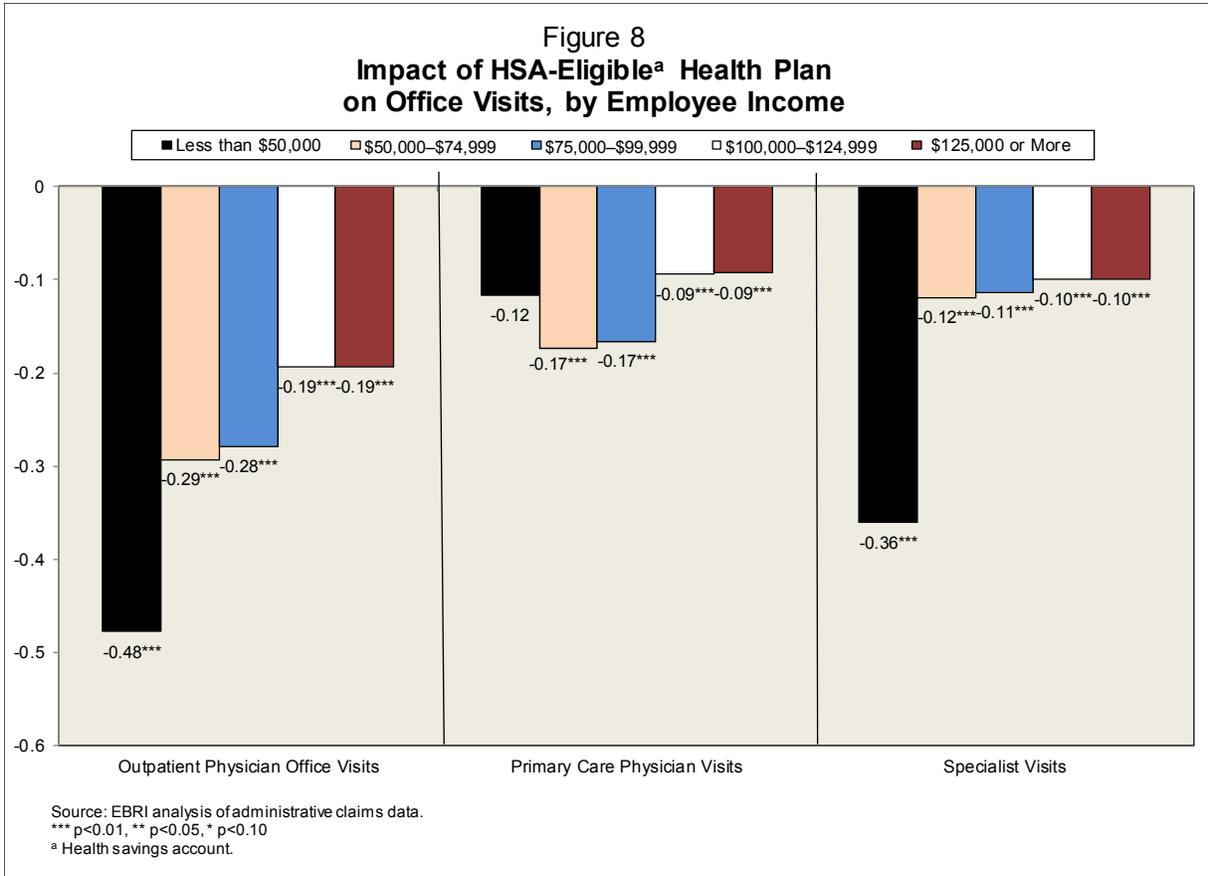
Figure 7

Impact of HSA-Eligible^a Health Plan on Use of Health Care Services

| Health Service Utilization | Use of Services |
|---|-----------------|
| Outpatient physician's office visits | -0.250 *** |
| Primary care physician visits | -0.182 *** |
| Specialist visits | -0.067 *** |
| Prescription drug fills | -0.757 *** |
| Inpatient hospital admissions | -0.002 ** |
| Inpatient hospital days | 0.002 |
| Emergency department visits | -0.002 |
| Preventive Services | |
| Physical exam/w ell child visit | -0.005 * |
| Breast cancer screening (females, age>=50) | 0.001 |
| Cervical cancer screening (females, age>=21) | -0.016 *** |
| Colorectal cancer screening (age>=50) | -0.024 *** |
| Vaccinations & Screenings | |
| Tetanus vaccination | -0.009 *** |
| Pneumonia vaccination (individuals with CHF, COPD, or diabetes) | -0.002 |
| Influenza vaccination | -0.009 *** |
| HPV vaccination (females, age<=26) | -0.004 |
| PSA test (males, age>=55) | 0.024 ** |
| Lipid test (males, age>=35 or females, age>=45) | -0.011 *** |
| HbA1c test (individuals with diabetes) | -0.012 |

Source: EBRI analysis of administrative claims data.
 *** p<0.01, ** p<0.05, * p<0.10
^aHealth savings account.

The decline in preventive office visits (i.e., routine physical exams for adults and well visits for children) exhibited the same general relationship to income as influenza vaccinations. Among individuals with incomes below \$50,000, three of 100 did not have a preventive office visit after moving to the HSA-eligible health plan, though this estimate was not statistically significantly different from zero. One of 100 individuals with incomes between \$50,000 and \$99,999 did not have a preventive office visit. Among individuals with incomes of at least \$100,000, the HSA-eligible health plan had no effect on preventive office visits.

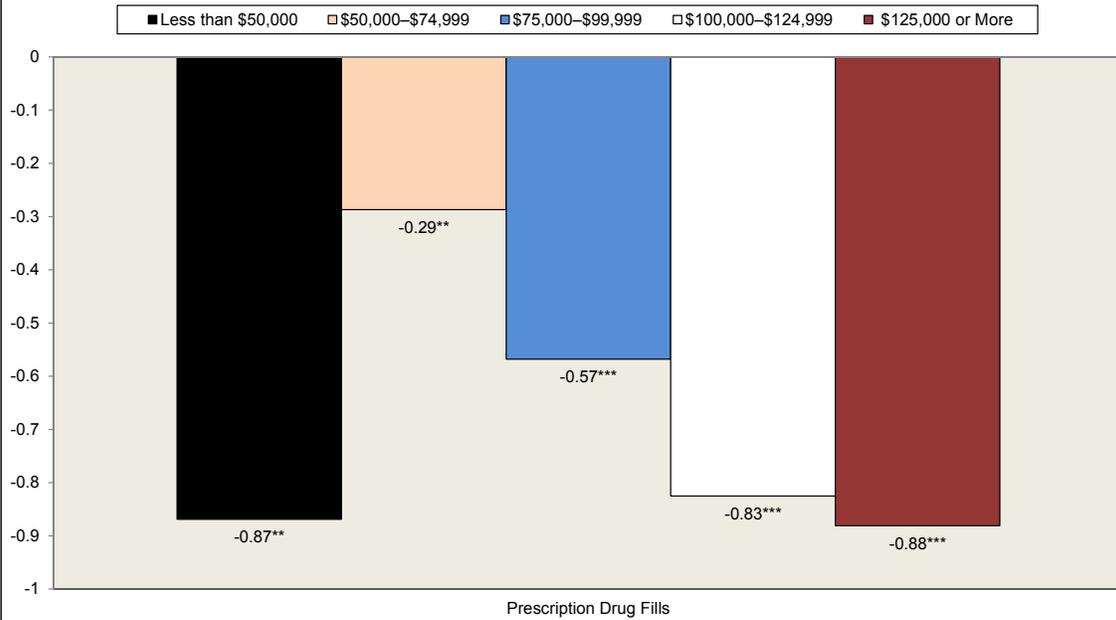


With respect to preventive cancer screenings, the findings by income were mixed. Breast cancer screenings fell by 14 percentage points among HSA-enrolled individuals with incomes below \$50,000, whereas the smaller declines and increases among individuals with income of \$50,000 or more were not statistically significant (Figure 11). Also, while the declines in cervical cancer and colorectal cancer screenings were largest among individuals with incomes below \$50,000, for neither group were the findings statistically significant. Upper-income groups, however, experienced declines of 2–3 percentage points for cervical cancer and colorectal cancer screenings, which were statistically significant.

Perhaps the biggest surprise among the findings is that emergency department visits and inpatient hospital admissions increased among lower-income individuals who enrolled in the HSA-eligible health plan. Individuals with incomes below \$50,000 experienced an increase of four visits per 100 people to the emergency department, and two inpatient admissions per 100 people (Figure 12). In contrast, individuals with incomes of \$50,000 or more did not experience an increase in emergency department visits, and there was no commensurate increase in inpatient hospital admissions among these individuals. Overall, this employer experienced about 162 additional visits to the emergency department in 2013, and about one-half of those visits resulted in an inpatient admission. Examination of the overall findings in Figure 7 would not have revealed this finding.

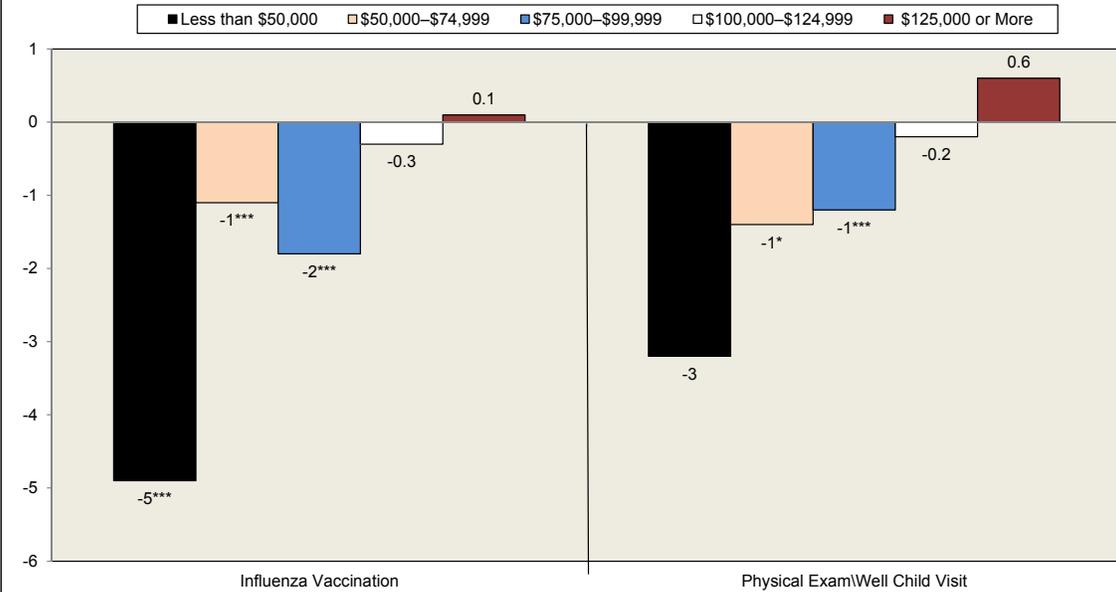
While the implications of the findings related to emergency department visits and inpatient hospital admissions are of concern, the effects are statistically significant only at the p<0.10 level, and they disappear over time. When 2014 claims data were included in the analysis, the positive effects on emergency department use and inpatient admissions

Figure 9
Impact of HSA-Eligible^a Health Plan on Prescription Drug Fills, by Employee Income



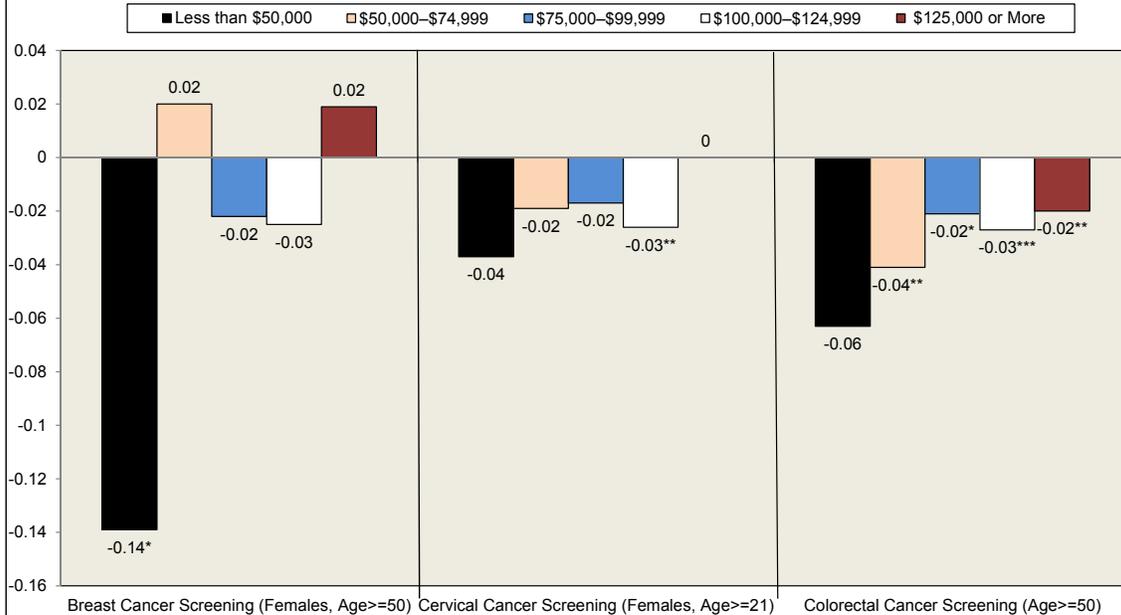
Source: EBRI analysis of administrative claims data.
 *** p<0.01, ** p<0.05, * p<0.10
^a Health savings account.

Figure 10
Impact of HSA-Eligible^a Health Plan on Likelihood of Receiving Preventive Services, by Employee Income (Per 100 Individuals)



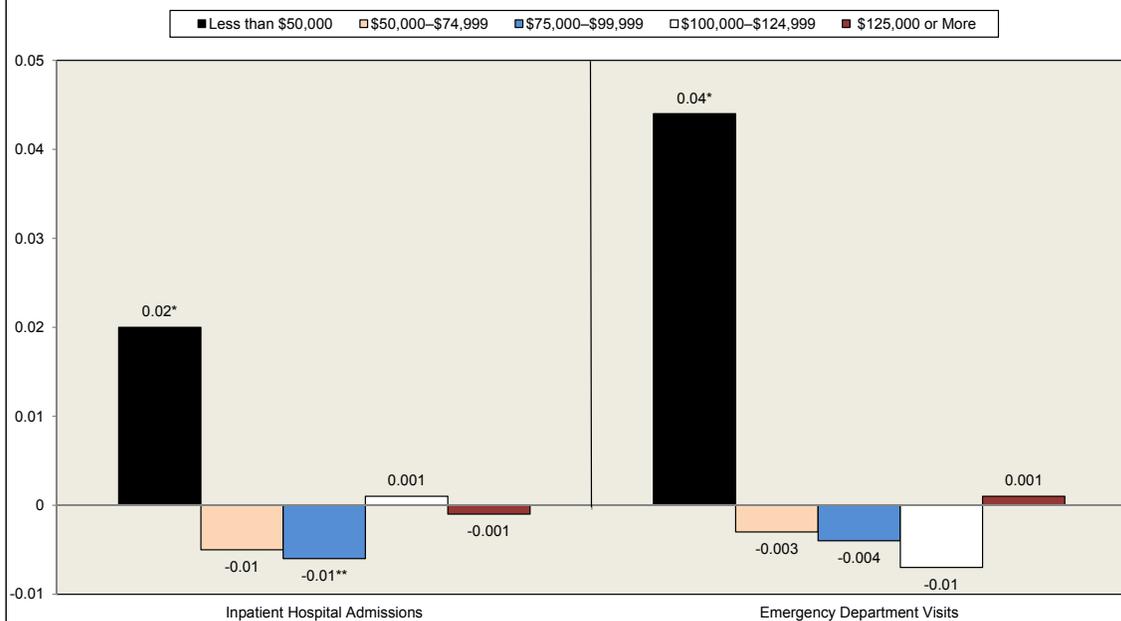
Source: EBRI analysis of administrative claims data.
 *** p<0.01, ** p<0.05, * p<0.10
^a Health savings account.

Figure 11
Impact of HSA-Eligible^a Health Plan on Likelihood of Receiving Preventive Cancer Screenings, by Employee Income



Source: EBRI analysis of administrative claims data.
 *** p<0.01, ** p<0.05, * p<0.10
^a Health savings accounts.

Figure 12
Impact of HSA-Eligible^a Health Plan on Number of Inpatient Admissions and Emergency Department Visits, by Employee Income



Source: EBRI analysis of administrative claims data.
 *** p<0.01, ** p<0.05, * p<0.10
^a Health savings accounts.

for individuals with incomes below \$50,000 were no longer statistically significant.⁹ The study examines data going back to 2009, but most enrollments in the HSA-eligible health plan took place in 2013 when financial incentives to enroll in that plan were introduced; enrollment in the HSA-eligible health plan increased from 3 percent in 2012 to 26 percent in 2013, followed by a slight increase to 28 percent in 2014. Thus, 2013 was the first year of HSA-eligible health plan coverage for most enrollees, and by 2014, enrollees had some experience using the plan. The lack of a statistically significant finding when 2014 data are introduced may indicate that there is an inexperience factor associated with HSA-eligible health plans. Once individuals see the out-of-pocket costs associated with an emergency department visit and an ensuing inpatient admission, they may be less likely to use the emergency department for health care services in the future.

This *Issue Brief* does not present findings related to those variables that were unaffected by enrollment in the HSA-eligible health plan by worker income and overall. A statistically significant effect was not found on inpatient hospital days, avoidable emergency department visits, pneumonia vaccinations, HPV vaccinations, or HbA1c testing for individuals with diabetes.

Findings are mixed with respect to medication adherence for individuals with high blood pressure, dyslipidemia, diabetes, CHF, and depression. For the most part, the HSA plan had no impact on medication adherence, but there were some specifics worth noting. For instance, adherence for depression was negative overall, driven by individuals with incomes between \$100,000 and \$124,999. Note that this effect was present when data for 2009–2013 was used, but not when 2014 was included. Adherence for asthma/COPD was also negative, and appears to be driven primarily by lower-income adults. Interestingly, adherence for high blood pressure was higher in the HSA plan, but does not appear to be related to income.

Impact of Income on Spending

Overall, individuals in the HSA-eligible health plan used \$299 less in annual health care services, relative to individuals not on the HSA plan (Figure 13). Most of that savings came from reductions in prescription drug fills (\$151) and outpatient services other than physician office visits (\$133). While there were reductions in office visits to primary care physicians and specialists, the reductions in spending, which were statistically significant, amounted to only \$20 for physician office visits and \$7 for specialist visits per member per year. There was no statistically significant change in spending on inpatient hospital services or emergency departments.

Consistent with the findings for use of health care services, the impact of the HSA-eligible health plan on total spending on health care varied with worker income. Over the 2009–2013 period, total spending on health care services was \$530 lower under the HSA-eligible health plan among individuals with less than \$50,000 in income. While the effect was relatively large, it was not statistically significant. It was composed of a \$435 decline in spending on prescription drugs and a \$118 increase in spending on emergency departments. In contrast, total spending was \$356 lower among individuals with incomes of \$125,000 or more. The effect was statistically significant and was composed of a \$216 decline in prescription drug spending, an \$11 decline in spending on primary care physician visits, and an \$8 decline in spending on specialist visits.

While the overall spending reductions are similar when 2014 claims data are considered, there are important differences by income. Among individuals with incomes below \$50,000, total spending declined from \$530 to \$309, but was still not statistically significant. The total reduction continued to be composed mostly (\$435) of a decline in prescription drug spending. Despite the fact that use of emergency department services was not statistically significantly higher when 2014 claims data were included, spending on emergency department services were still \$83 higher, though not as large as the \$118 estimate when data from only 2009–2013 were used. Interestingly, spending on primary care office visits was \$18 lower when the 2014 claims data were included, an effect not found when only 2009–2013 data were examined.

Another interesting finding is that overall spending was lower for individuals with incomes of \$75,000 or more when 2014 claims data were included. Among individuals with incomes of \$75,000–\$99,999, average spending was \$253

Figure 13
Impact of HSA-Eligible^a Health Plan on Spending, by Employee Income
2009–2013

| | Total | Less than \$50,000 | \$50,000–\$74,999 | \$75,000–\$99,999 | \$100,000–\$124,999 | \$125,000 or More |
|-------------------------------|------------|--------------------|-------------------|-------------------|---------------------|-------------------|
| Total | -\$299 *** | -\$530 | -\$179 | -\$215 * | -\$225 * | -\$356 *** |
| Inpatient Hospital | 11 | 91 | 73 | 71 | 44 | -61 |
| Emergency Department | 1 | 118 *** | -6 | -2 | -4 | 9 |
| Primary Care Physician Visits | -20 *** | -13 | -18 *** | -18 *** | -11 ** | -11 ** |
| Specialist Visits | -7 *** | -21 | -13 *** | -14 *** | -8 ** | -8 ** |
| Other Outpatient Services | -133 *** | -269 | -136 *** | -133 | -170 ** | -68 |
| Prescription Drugs | -151 *** | -435 ** | -79 *** | -119 *** | -76 | -216 *** |

2009–2014

| | Total | Less than \$50,000 | \$50,000–\$74,999 | \$75,000–\$99,999 | \$100,000–\$124,999 | \$125,000 or More |
|-------------------------------|------------|--------------------|-------------------|-------------------|---------------------|-------------------|
| Total | -\$326 *** | -\$309 | -\$186 | -\$253 ** | -\$248 ** | -\$442 *** |
| Inpatient Hospital | 36 | 121 | 59 | 66 | 8 | -14 |
| Emergency Department | -3 | 83 *** | -7 | -9 | -7 | 1 |
| Primary Care Physician Visits | -19 *** | -18 ** | -16 *** | -19 *** | -10 *** | -8 *** |
| Specialist Visits | -6 *** | -13 | -15 *** | -11 *** | -7 ** | -8 ** |
| Other Outpatient Services | -145 *** | -48 | -108 * | -130 * | -106 * | -170 *** |
| Prescription Drugs | -189 *** | -435 *** | -99 *** | -152 *** | -125 ** | -244 *** |

Source: EBRI analysis of administrative claims data.
 *** p<0.01, ** p<0.05, * p<0.10
^a Health savings accounts.

lower when including 2014 claims data, compared with \$215 when 2014 data were excluded. Among individuals with incomes of \$100,000–\$124,999, average spending was \$248 lower when including 2014 claims data, compared with \$225 when 2014 data were excluded. And among individuals with incomes of \$125,000 or more, average spending was \$442 lower when including 2014 claims data, compared with \$356 when 2014 data were excluded. In the case of the \$75,000–\$99,999 and \$100,000–\$124,999 income groups, statistical significance was stronger when the 2014 claims data were included. Among all three groups, lower spending on prescription drugs appears to be driving the savings, while in the group with \$125,000 or more in income, lower spending on other outpatient services also contributed to the larger spending reductions when 2014 claims data were included.

Study Limitations

While this study improves on the earlier studies on CDHPs and use of health care services by income in several respects, there are certain limitations to this study. First, it draws on the experience of a single manufacturing employer, with socio-demographic and company cultural characteristics potentially influencing behavior under the various health plan options. Consequently, the findings are not necessarily generalizable to broader populations.

Second, while the study used actual income data, there are several income-related limitations: (a) income breaks were chosen arbitrarily; (b) while the average income of the individuals in the sample was lower compared with other studies on worker income and CDHPs, the average income of the sample was still above average compared to the working population; and (c) the study was also not able to control for other sources of income, such as earnings from a working spouse, and non-wage income.

Conclusions

This study by the Employee Benefit Research Institute (EBRI) examined the impact of enrolling in a health savings account (HSA)-eligible health plan on health care services use and spending by worker income. It found that lower-income workers (and their dependents) were more likely than higher-income individuals to reduce their use of physician office visits and certain high-valued services not subject to the deductible, such as influenza vaccinations and breast cancer screenings. Emergency department use and inpatient admissions increased among the lower-income group, but

these increases appear to be short-term effects. The effect of the HSA-eligible health plan did not vary by income for a number of health care services, such as inpatient hospital days, avoidable emergency department visits, pneumonia vaccinations, human papillomavirus (HPV) vaccinations, glyated hemoglobin (HbA1c) testing for individuals with diabetes, cervical cancer screening, and colorectal cancer screening.

Plan sponsors and insurers may or may not be concerned with these findings. Since the increase in emergency department visits and inpatient patient admissions disappear over time, some plan sponsors and insurers may decide not to modify the designs of their plans as a result of these findings. However, if sponsors or insurers are concerned about the impact of HSA-eligible health plans on lower-income workers, they can consider modifications to alleviate any negative impact on this group. For example, employers could provide higher HSA contributions to lower-income workers. This would reduce the typically flat-dollar gap between the health plan deductible and employer contributions to the HSA, so that lower-income workers would have additional funds to pay for health care services. One consideration with this approach involves making sure the lower-income workers use the additional HSA contributions toward health care services that are high value, because once the employer contributes to an HSA a worker can use the account not just to pay for high-valued services, but also for low-valued health services and even non-health services.

In addition, some of the reduced usage relates to services not subject to the deductible, such as influenza vaccinations and breast cancer screenings. Lower-income workers may cut back on these services because they may not realize that these services are covered in full. This is indirectly suggested by the finding that some higher-income workers also cut back on preventive services, such as cervical cancer and colorectal cancer screenings that were not subject to the deductible. All workers may benefit from education and communication campaigns to promote the use of high valued services not subject to the deductible.

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Endnotes

¹ See <http://www.mercer.com/newsroom/national-survey-of-employer-sponsored-health-plans-2015.html>

² Literature reviews can be found in Buchmueller (2009), Bundorf (2012), and Buntin, et al. (2011).

³ There are exceptions to the comparability rule. For instance, employers may make matching contributions that are conditional on a contribution by the employee if done through a cafeteria plan. Furthermore, employers may contribute more to the HSAs of non-highly compensated employees.

⁴ When an HSA is used to pay for non-health expenses, the distribution is subject to regular income tax and a 20 percent excise tax for individuals under age 65. Individuals who have reached age 65 are exempt from paying the excise tax.

⁵ Pre-tax dollars can be used to pay for these out-of-pocket expenses if the employee has funds in either a flexible spending account or HSA.

⁶ Depending on how workers view the HRA, there may not be much difference between a high-deductible health plan with an HRA and a lower-deductible health plan without an HRA. Similarly, depending on how workers view HSAs, there may not be much difference between a high-deductible health plan with an HSA and a lower-deductible health plan without an HSA.

⁷ Linear fixed effects regression models were estimated to examine the effects of the HSA-eligible health plan on use of health care services, spending, and medication adherence. These models control for time-invariant personal characteristics—whether observed or unobserved—that may confound the analysis. It is worth noting, however, that biased estimates of the causal effect of the HSA plan are still possible if there remain unmeasured variables that change over time, and are also correlated with both health plan choice and the outcomes under study. Of course, this is an issue that plagues most observational studies.

⁸ See Fronstin and Roebuck (2014) and the corresponding literature review within the paper.

⁹ These results are available from the authors upon request.

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