

The Impact of Offering Free Coverage on Enrollment Choice and Risk Selection in an HSA-eligible Health Plan

By Paul Fronstin, Ph.D. & M. Christopher Roebuck, Ph.D.

AT A GLANCE

This study examines whether offering a health savings account (HSA)-eligible health plan for free, alongside other health plan options with a premium, alters employee enrollment choices; and if responders differ by health status. The data for this study come from two large employers and cover the years 2011 to 2014, spanning the 2013 intervention when one of the two employers eliminated employee premiums for the HSA-eligible health plan.

Here are the key insights:

- **Health insurance premiums are a major driver of plan choice.** After eliminating employee premiums for all coverage tiers, HSA-eligible health plan enrollment increased from 4 percent to 25 percent among individuals with employee-only coverage and from 3 percent to 28 percent among individuals with family coverage.
- **Healthier-than-average employees are enticed by \$0 premiums for HSA-eligible health plans.** Offering coverage with no payroll deduction attracted individual enrollees who were marginally healthier than those who would have enrolled without this financial incentive in place, therefore adverse selection was not mitigated as anticipated.

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Recommended Citation: Paul Fronstin and M. Christopher Roebuck, “The Impact of Offering Free Coverage on Enrollment Choice and Risk Selection in an HSA-eligible Health Plan,” *EBRI Issue Brief*, no. 435, (Employee Benefit Research Institute, July 12, 2017).

Report Availability: This report is available on the internet at www.ebri.org

This study was conducted through the EBRI Center for Research on Health Benefits Innovation (EBRI CRHBI), with the funding support of the following organizations: American Express, Aon Hewitt, Blue Cross Blue Shield Association, Boeing, Healthways, IBM, JP Morgan Chase, Kaiser Permanente, Mercer, Pfizer and PhRMA.

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Introduction

Consumer-directed health plans (CDHPs), the combination of health insurance coverage with a high deductible and an individual savings or reimbursement account to pay out-of-pocket costs for health care services, were first introduced by employers in 2001. Today, 29 percent of workers are enrolled in some form of a CDHP.¹ There are two types of CDHPs: HSA-eligible health plans—health plans that can be combined with health savings accounts (HSAs) – and health plans combined with health reimbursement arrangements (HRAs). Both types of accounts may receive tax-favored contributions and make tax-favored distributions.² When CDHPs were first introduced, there was an expectation 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—would induce enrollees to make more cost- and quality-conscious health care decisions (Herzlinger 2002). However, for employers that preferred to offer a CDHP as a choice among several health plan options, there was a fear of “adverse selection” meaning that CDHPs would mainly attract young and healthy workers (Gauthier and Clancy 2004).

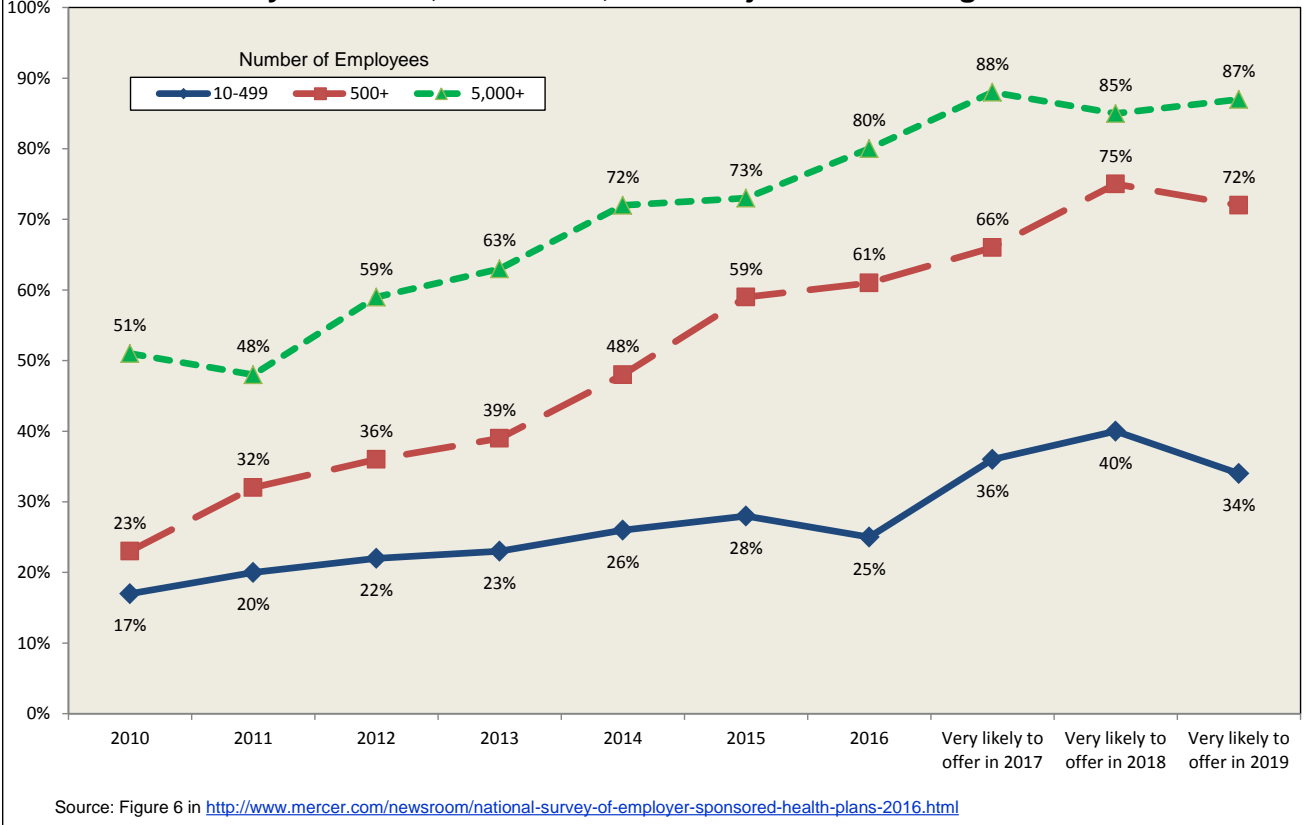
Understanding what drives enrollment in HSA-eligible health plans is important to plan sponsors, since enrollment in these plans is expected to grow. According to Mercer’s survey of employers, 25 percent of employers with 10–499 employees and 61 percent of employers with 500 or more employees offered an HSA-eligible health plan or HRA in 2016 (Figure 1). By 2019, 34 percent of employers with 10–499 employees and 72 percent of employers with 500 or more employees said they were very likely to offer such a health plan. Only 9 percent of employers with 500 or more workers offered an HSA-eligible health plan or an HRA as the only plan option in 2016.³

When the Patient Protection and Affordable Care Act (ACA) passed in 2010, it was expected to accelerate the increase in employer adoption of HSA-eligible health plans. Health insurance premiums were expected to increase because of various provisions in the ACA.⁴ These premium increases along with the excise tax on high-cost health plans (the so-called “Cadillac Tax”) were expected to cause more employers to offer HSA-eligible health plans. The outlook for HSA-eligible health plans remains strong, since employers are expected to continue to grapple with efforts to manage the rising cost of providing health benefits. Furthermore, public policy changes may also drive future growth. Both the American Health Care Act, passed by the U.S. House of Representatives in April 2017, and the Better Care Reconciliation Act unveiled in the U.S. Senate in June 2017, would raise the limit on HSA contributions, lower the excise tax on distributions for non-qualified expenses, create a grace period for opening an HSA, and make it easier for spouses to make catch-up contributions. In addition, a draft Executive Order would direct the Commissioner of the Internal Revenue Service (IRS) to allow services and benefits related to the management of chronic diseases to be excluded from the deductible.⁵

Since 2001, there have been numerous studies examining the determinants and effects of CDHPs.⁶ The initial studies tended to focus on broad questions such as 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 questions about individual health engagement, such as medication adherence for individuals with chronic conditions (Fronstin, Sepulveda and Roebuck 2014a), generic drug use (Fronstin and Roebuck 2014), the likelihood of price shopping among individuals with a CDHP (Brot-Goldberg, et al. 2015), quality of health care received (Fronstin and Roebuck 2014b), and the combination of deductible size, presence of an HSA or HRA, and type of CDHP (Haviland, et al. 2011). The most recent studies have examined plan enrollees’ behaviors over longer time periods.

A consistent finding in the research literature (discussed in more detail below) is that CDHPs introduce positive risk selection when workers are given a choice of plans. Namely, healthier individuals are more likely to choose the CDHP,

Figure 1
Percentage of Employers Offering Consumer-directed Health Plan,
by Firm Size, 2010–2016, With Projections Through 2019



which in turn raises the health risk in the other plans. Risk selection is critical in employment-based health plans because it influences who is enrolled in a plan and, therefore, the cost of a health plan. For example, if all healthy employees choose one plan and all sick employees choose a second plan, then the difference in plan costs will be large and these large differences in cost will likely prompt differences in employee contributions, which will cause even further risk selection. This process can lead to the well-known phenomenon of the “death spiral,” where a health plan eventually becomes so costly that it is no longer worth offering. If employees are very sensitive to differences in premiums, then this selection can be problematic in terms of offering more than one type of health plan. On the other hand, if employees are not very sensitive to differences in premiums, then it is more likely that a firm can offer a variety of plans. The upshot is that the responsiveness of employees to changes in premiums is an important determinant of the stability of a firm’s health plan offerings.

There are examples of adverse selection and death spirals when employers have offered a choice of health plans. For instance, Buchmueller and Feldstein (1997) and Buchmueller (1998) looked at the effect of moving to a fixed contribution at the University of California (UC). Before 1994, UC set its contribution equal to the cost of the health plan with the largest membership, but in 1994 UC reduced the employer premium contribution to the amount charged by the least costly plan available statewide. This policy led to a high degree of plan switching by UC employees. Of those employees whose premiums did not increase between 1993 and 1994, roughly 5–6 percent switched plans. The movement to the fixed contribution approach contributed to adverse selection, which drove one plan out of the UC internal market. The high-option plan had to raise premiums 49 percent in 1996 because of adverse selection.

Similarly, Cutler and Reber (1998) examined changes that took place at Harvard University. In 1995, Harvard moved to a fixed contribution for health benefits. Contributions were set at 85 percent of the least-costly policy for employees earning below \$45,000 a year, 80 percent for employees earning between \$45,000 and \$70,000 a year, and 75 percent

for employees earning more than \$70,000 a year. Non-union employees experienced the change in 1995, while union employees were not affected until 1996, which allowed the researchers to look at a treatment group (the 1995 non-union workers) and a control group (the 1996 union workers). The study found evidence of adverse selection: Younger employees were found to be more likely to switch to less costly plans than older employees. This resulted in a 16 percent premium increase in the high-cost plan in 1996. Non-random disenrollment continued. Within three years, the high-cost plan was no longer offered because of adverse selection.

As mentioned above, there is strong evidence of adverse selection associated with CDHPs. Research has consistently found that when CDHPs are offered alongside other types of health plans, healthier employees were more likely than less healthy employees to enroll in CDHPs. (This literature is presented in more detail in the appendix.)

What is not known from the literature is whether and how adverse selection can be affected. This *Issue Brief* is a significant contribution in this regard. Data were analyzed from a large employer that attempted to encourage enrollment and mitigate adverse selection by eliminating premiums for its HSA-eligible health plan, which was offered alongside other insurance options. In addition to estimating the impact of this financial incentive on enrollment, this analysis investigates whether less-healthy individuals were responsive to the \$0 premium. Data from a second large employer provide the counterfactual for the study—what would have happened in the absence of this financial incentive? The analysis employs a pre-post, treatment-control study design where individuals are matched at baseline, and the effect of the financial incentive is calculated using a difference-in-differences regression framework. This approach is further supported by four years of data—two years before and after the HSA-eligible health plan premium elimination, which is important for ensuring that underlying secular trends were comparable across the two employers. Finally, it is important to point out that while some published studies combined HRA- and HSA-eligible health plan enrollees into one group for analytical purposes, the current *Issue Brief* does not. These two very different plan types should be examined separately because they present dissimilar incentives relating to the use of health care services, which in turn may be related to enrollment.⁷

Data

This study makes use of health insurance enrollment and claims data from a large manufacturer headquartered in the Midwest (Employer A), but with employees residing throughout the United States. For several years, this firm offered a choice of health plans that included preferred provider organizations (PPOs), health maintenance organizations (HMOs), exclusive provider organizations (EPOs), and HSA-eligible health plan options. Beginning in 2013, the employer lowered the employee premium contribution for the HSA-eligible health plan to \$0—for all coverage tiers—to encourage enrollment. There was otherwise no change in the set of plans offered. To study the effect of this financial incentive, this analysis uses data from 2011 to 2014, which provides two years of data pre- and post-intervention. To be included in the study, employees had to be full-time, ages 18–64, continuously eligible throughout the entire four-year study period (2011–2014), and not enrolled in the HSA-eligible health plan in 2011. After applying these criteria, the study cohort consisted of 11,719 workers with employee-only coverage, and 37,129 with family coverage. In all analyses, the sample is stratified by type of coverage: employee-only and family coverage.

To estimate the impact of the financial incentive (i.e., health insurance premium elimination) on HSA-eligible health plan enrollment, we used the experiences of another firm as a comparison group. Briefly, this other large, national company offered health insurance plan options like those of Employer A. This choice set and its associated premiums were not substantially altered over the four-year study period.

To construct the comparison group at Employer B, this analysis used a propensity score matching approach to ensure that the two groups were comparable on a vector of observed characteristics before the elimination of the HSA-eligible health plan premium in the study group. Specifically, the analysis began by applying the inclusion criteria used for Employer A, the treated firm. Next, a probit model of group assignment (i.e., member of treated versus comparison firm) was estimated as a function of the following set of baseline (2011) variables: gender, age, tenure (number of years with the employer), Charlson Comorbidity Index,⁸ as well as dummy variable indicators for the presence of six chronic conditions (congestive heart failure, hypertension (high blood pressure), diabetes, dyslipidemia, asthma/chronic

obstructive pulmonary disease (COPD), and depression), and five measures of health services utilization (the number of inpatient hospital days, emergency department visits, primary care physician visits, specialist physician visits, and prescription drug fills). Separate propensity score models were estimated for employees with employee-only and family coverage; and in the latter case, the health services utilization measures were aggregated additively for all family members. Moreover, the family coverage-specific model also included the number of people in the household, and the Charlson Comorbidity Index was derived as the maximum score in the family.

The predicted probability of being in the study group at Employer A represents the propensity score and is used in the matching process. Since the pool of comparison group candidates at Employer B was somewhat smaller than the study cohort, the analysis matched with replacement within a caliper equal to or less than 1/5 of a standard deviation of the propensity score distribution as recommended by Austin (2011a) and Austin (2011b). The analysis subsequently retained the frequency weights to be used in all subsequent analyses. After this process, the study group was comprised of 11,711 employee-only and 37,129 family subjects, and the comparison group consisted of 4,774 employee-only and 14,555 subjects. Finally, the resulting covariate balance across the two groups at baseline was assessed and is presented in Figure 2, which shows that all variable means were well within the 10 percent bias threshold recommended in the literature, except for one—total number of emergency department visits made by the family (12.8 percent bias).⁹

Methods

In addition to presenting variable means at baseline, multivariate methods were employed to obtain estimates of the effect of the elimination of employee premiums. Specifically, a difference-in-differences (DiD) research design was employed with ordinary least squares regression methods to examine the impact of the financial incentive on HSA-eligible health plan enrollment (Angrist and Pischke 2008). The DiD design relies on the assumption that temporal changes in health plan enrollment were the same between the Employer A (study group) and Employer B (comparison group) before the introduction of the financial incentive. Figure 3 plots the HSA-eligible health plan enrollment rate over time for the two employers including all enrollees (i.e., prior to implementing propensity score matching). It is clear that the pre-period trends (i.e., slopes) in HSA-eligible health plan enrollment were very similar, and this evidence bolsters confidence in the use of the DiD approach to yield unbiased results.

Separately for employee-only and family coverage, four models were estimated for the dependent variable, HSA-eligible health plan enrollment. The first of the four models derived the main effect of the financial incentive, and the other three models examined whether the enrollment response to the incentive differed by: the Charlson Comorbidity Index, five chronic disease indicators (hypertension, dyslipidemia, diabetes, Asthma/COPD, and depression), and five measures of prior health services utilization (inpatient hospitalizations, emergency department visits, primary care physician visits, specialist physician visits, and prescription drug fills). All models used robust standard errors and all analyses were conducted using Stata/MP 14.2 (StataCorp. 2015) (White 1980).

Results

Financial Incentives' Effects on HSA-Eligible Health Plan Enrollment

As introduced previously, Figure 3 presents the overall HSA-eligible health plan enrollment rates for the two employers over the entire study period. In Employer A (study group), enrollment in the HSA-eligible health plan increased from 4 percent to 27 percent for employee-only coverage, and from 2 percent to 31 percent for family coverage. In contrast, HSA-eligible health plan enrollment at Employer B (comparison group) continued the slight upward trajectory shared by the study group prior to the premium being made free to employees. These figures provide clear evidence of a large effect of the financial incentive on HSA-eligible health plan enrollment.

Not surprisingly, enrollees with employee-only coverage were younger, less likely to be male, and generally healthier than those with family coverage. Figure 2 reports all variable means at baseline (2011) by group and coverage type for the subjects used in the ensuing regression models. It is worth reiterating that—by design—all of these individuals were not enrolled in the HSA-eligible health plan in 2011. As mentioned earlier, the propensity score matching process yielded study and comparison groups that were very similar in terms of covariate means.

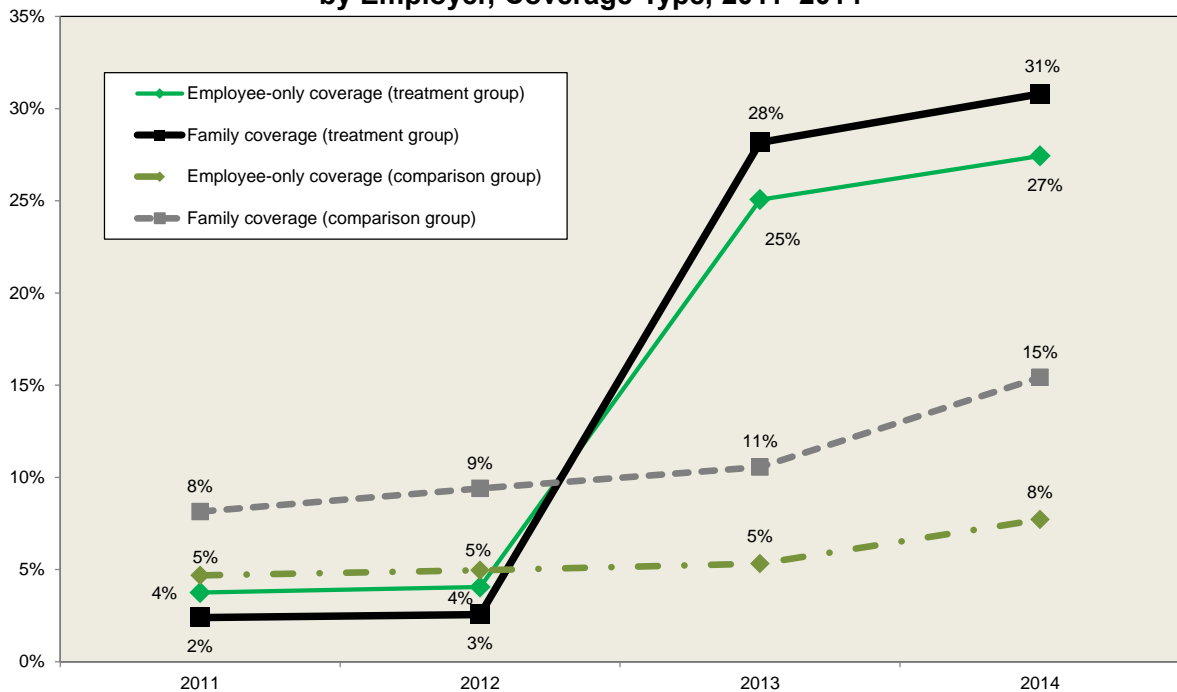
Figure 2
Variable Means at Baseline (2011), by Group, Coverage Type

	Employee-only Coverage			Family Coverage		
	Treatment Group (n=11,711)	Comparison Group (n=4,774)	% Bias	Treatment Group (n=37,129)	Comparison Group (n=14,555)	% Bias
Male	56%	58%	-3.5	79%	80%	-1.9
Age (years)	44.0	43.7	2.7	47.2	47.4	-1.9
Tenure (years)	14.2	14.0	2.0	16.9	17.2	-2.9
Household Size (number)	1.0	1.0	0.0	3.3	3.3	1.2
Charlson Comorbidity Index (score)	0.16	0.16	-0.1	0.35	0.38	-3.0
Chronic Conditions						
Hypertension	12%	11%	3.1	13%	14%	-1.0
Dyslipidemia	14%	13%	1.9	18%	18%	0.2
Diabetes	4%	4%	1.0	5%	6%	-0.9
Asthma/Chronic Obstructive Pulmonary Disease	0.12%	0.05%	2.0	0.12%	0.24%	-2.8
Depression	3%	3%	-0.6	2%	2%	-0.1
Health Services Utilization						
Inpatient Hospital Days (number per 100)	0.04	0.04	0.0	0.4	0.4	-0.7
Emergency Department Visits (number per 100)	0.1	0.1	0.2	0.5	0.7	-12.8
Primary Care Physician Visits	1.6	1.5	2.2	5.2	5.7	-7.5
Specialist Physician Visits	1.6	1.6	3.8	4.9	5.1	-3.8
Prescription Drug Fills (30-day adjusted)	13.1	12.6	2.4	31.8	35.0	-8.5

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Notes: Comparison group subjects may be used multiple times as controls (i.e., means are frequency weighted).

Figure 3
**Enrollment in Consumer-directed Health Plan,
by Employer, Coverage Type, 2011–2014**



Source: EBRI analysis based on administrative claims data.

Figure 4 reports the results from the multivariate regression models of HSA-eligible health plan entry. In 2013, the increase in HSA plan enrollment due to the financial incentive was 21 percentage points for those with employee-only coverage and 25 percentage points for individuals with family coverage. The comparable effect in 2014 was identical (21 percentage points higher) among employee-only enrollees, but was somewhat lower (21 versus 25 percentage points) among those with family coverage (i.e., indicating some disenrollment from 2013 to 2014).

Figure 4 Difference-in-differences Model Estimates of CDHP Entry		
Independent Variable	Employee-only Coverage	Family Coverage
Treatment Group x 2013	0.21 ***	0.25 ***
Treatment Group x 2014	0.21 ***	0.21 ***
Male	-0.001	0.01 ***
Age	-0.003 ***	-0.003 ***
Tenure	0.0004 ***	0.0004 ***
Household Size		0.02 ***
Charlson Comorbidity Index	-0.005 ***	-0.004 ***
Year=2013	0.01 ***	0.02 ***
Year=2014	0.04 ***	0.09 ***
<u>Chronic Conditions</u>		
Hypertension	-0.01 **	-0.01 ***
Dyslipidemia	0.002	0.01 ***
Diabetes	-0.004	-0.02 ***
Asthma/Chronic Obstructive Pulmonary Disease	-0.01 **	-0.01 **
Depression	0.002	0.001
<u>Health Services Utilization</u>		
Inpatient Hospital Days	0.0001	-0.0002 *
Emergency Department Visits	-0.01 ***	-0.004 ***
Primary Care Physician Visits	-0.001 **	-0.0001
Specialist Physician Visits	0.001	0.001 ***
Prescription Drug Fills (30-day adjusted)	-0.001 ***	-0.0003 ***
Test Group	-0.003	-0.03 ***
Constant	0.12 ***	0.08 ***

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: *** p<0.01, ** p<0.05, *p<0.10

Finally, Figure 4 demonstrates that the underlying secular trend in HSA-eligible health plan entry—common to both employers—was positive during the study period independent of the reduction in premiums. New HSA-eligible health plan enrollment increased by 1–2 percentage points in 2013 and by 4–9 percentage points in 2014, compared with 2012. This confirms the upward sloping trends for large employers during the same time frame depicted in Figure 1.

Financial Incentives’ Effects on Risk Selection in HSA-Eligible Health Plan Enrollment

Figure 4 also provides some confirmation of the existing literature that HSA-eligible health plans face positive risk selection. Specifically, older workers were less likely to enroll in the HSA-eligible health plan than younger employees. Moreover, less healthy workers and workers with less healthy families—as measured by the Charlson Comorbidity Index—were less likely than their healthier counterparts to enter the HSA-eligible health plan. Individuals with specific chronic conditions were also less likely to enroll, with one exception—individuals with family coverage with a person diagnosed with dyslipidemia where the effect was opposite in direction. Similarly, individuals and families who used health services in the year prior to the elimination of premiums for the HSA-eligible health plan were generally less likely than those who did not use health care to enroll in the HSA-eligible health plan—again with one contradiction, individuals with family coverage who utilized specialist physician visits. It is worth

noting that the magnitudes of all of these health status effects on HSA-eligible health plan entry were relatively small.

While the results presented in Figure 4 are interesting and were largely expected, understanding whether the financial incentive to enroll in the HSA-eligible health plan moderated positive risk selection into that plan was also a key objective of this study. Figure 5 contains the regression results that address this research question for individuals with employee-only coverage. Figure 6 presents the same for those with family coverage. For brevity, only the main effects of the financial incentive, and its interactive effects with health status, are reported in these tables.

If the financial incentive to enroll in the HSA-eligible health plan reduced positive risk selection, the coefficients on the interactions with the measures of health status presented in Figures 5 and 6 would be positive and statistically significant. The estimates largely reflect the opposite. Among those with employee-only coverage, individuals with higher Charlson Comorbidity Index scores were less likely to respond to the financial incentive by entering the HSA-eligible health plan. Moreover, employees with hypertension, dyslipidemia, diabetes, and asthma/COPD were all between 3 and 11 percentage points less likely to enroll in the HSA-eligible health plan as a result of the financial incentive. And, individuals who had more primary care visits and prescription drug fills during the baseline year were

also less likely to respond to the incentive by enrolling in the HSA-eligible health plan—although similar to the main model, these effects were small in magnitude.

The results for individuals with employee-only coverage were mostly mirrored in the models for individuals with family coverage. The financial incentive induced HSA-eligible health plan enrollment by families with lower Charlson Comorbidity Index scores and lower prevalence of hypertension, diabetes, and asthma/COPD. The interactive effects of prior health services utilization were mixed in sign and very small in magnitude—especially given that these measures were constructed as the sums for all family members.

Conclusion

This study examined the extent to which financial incentives encouraged enrollment in an HSA-eligible health plan, and whether the incentive impacted risk selection into the plan. As a result of eliminating premiums for the HSA-eligible health plan, enrollment increased by 21 percentage points among individuals with employee-only coverage and 25 percentage points among individuals with family coverage. Clearly, workers and their families are highly sensitive to health insurance premiums.

Figure 5
Difference-in-differences Model Estimates of CDHP Entry, Employee-only Coverage

Independent Variable	Model 1	Model 2	Model 3
Main Effects			
Treatment Group x 2013	0.22 ***	0.23 ***	0.25 ***
Treatment Group x 2014	0.21 ***	0.23 ***	0.24 ***
Interaction Effects With Charlson Comorbidity Index			
Charlson x 2013	-0.05 ***		
Charlson x 2014	-0.05 ***		
Interaction Effects With Chronic Conditions			
Hypertension x 2013		-0.07 ***	
Hypertension x 2014		-0.07 ***	
Dyslipidemia x 2013		-0.03 ***	
Dyslipidemia x 2014		-0.03 ***	
Diabetes x 2013		-0.10 ***	
Diabetes x 2014		-0.11 ***	
Asthma/COPD x 2013		-0.05 **	
Asthma/COPD x 2014		-0.05 **	
Depression x 2013		-0.0004	
Depression x 2014		-0.02	
Interaction Effects With Health Services Utilization			
Inpatient Hospital Days x 2013			0.0004
Inpatient Hospital Days x 2014			0.001
Emergency Department Visits x 2013			-0.01
Emergency Department Visits x 2014			-0.004
Primary Care Physician Visits x 2013			-0.004 **
Primary Care Physician Visits x 2014			-0.005 **
Specialist Physician Visits x 2013			-0.001
Specialist Physician Visits x 2014			-0.001
Prescription Drug Fills x 2013			-0.002 ***
Prescription Drug Fills x 2014			-0.002 ***

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims
 Notes: *** p<0.01, ** p<0.05, *p<0.10
 Models include all covariates reported in Figure 4, but are suppressed for brevity.

This analysis did not find strong evidence that suggests the positive risk selection routinely reported to affect HSA-eligible health plan enrollment was moderated by eliminating the premium. While there was weak evidence that prior users of health care services were more likely to enroll in the HSA-eligible health plan as a result of the elimination of premiums, for the most part, the findings were to the contrary. In summary, the financial incentive drew new individuals and families into the HSA-eligible health plan who were on average healthier than those who would have entered without the incentive in place.

Plan sponsors are concerned with positive risk selection into HSA-eligible health plans, particularly when the plans are offered alongside other options. Given a fixed pool of employees and their families, as the HSA-eligible health plan draws in more healthy individuals, the other plans are left with a higher average level of risk. This leads to increased costs and higher premiums, which in turn reverberates with more future adverse

selection ultimately resulting in the demise of the riskiest plans. In this study, eliminating premiums for the HSA-eligible health plan did not reduce adverse risk selection.

Employers have other tools they could use to try to reduce or eliminate risk selection. In environments where an employer wants to continue offering their employees a choice of health plans, instead of, or in addition to, reducing employee premiums to encourage HSA-eligible health plan enrollment, they could increase their HSA contribution. Workers with chronic conditions and those who use health care services may find enhanced HSA contributions more attractive than a reduction in premiums, as HSA contributions can be used directly to reduce out-of-pocket costs. Plan sponsors may also consider accelerating their contributions to the HSA. Less healthy enrollees may be more likely to enroll in the HSA-eligible health plan if they are less concerned about not yet having enough money in their HSA to pay for health care before they have had a chance to build up an account balance.

Plan sponsors also may want to explore ways in which they can enhance benefits offered in the HSA-eligible health plan by covering as many preventable services as possible outside of the deductible (Fendrick and Chernew 2017). Other administrative and educational tools that elevate the concept of expected health care expenses may also help. Individuals with chronic conditions that are well managed can confidently estimate their health care use at enrollment, and can be more easily convinced of the financial value provided by an HSA-eligible health plan. Finally, moving to a full-replacement plan (where only an HSA-eligible health plan was offered) would eliminate risk selection, as there would be no other health plan for employees to move to.

Figure 6 Difference-in-differences Model Estimates of CDHP Entry, Family Coverage			
Independent Variable	Model 1	Model 2	Model 3
<u>Main Effects</u>			
Treatment Group x 2013	0.25 ***	0.26 ***	0.24 ***
Treatment Group x 2014	0.22 ***	0.22 ***	0.20 ***
<u>Interaction Effects With Charlson Comorbidity Index</u>			
Charlson x 2013	-0.02 ***		
Charlson x 2014	-0.02 ***		
<u>Interaction Effects With Chronic Conditions</u>			
Hypertension x 2013		-0.04 ***	
Hypertension x 2014		-0.04 ***	
Dyslipidemia x 2013		-0.001	
Dyslipidemia x 2014		0.0002	
Diabetes x 2013		-0.07 ***	
Diabetes x 2014		-0.09 ***	
Asthma/COPD x 2013		-0.04 ***	
Asthma/COPD x 2014		-0.04 ***	
Depression x 2013		0.01	
Depression x 2014		-0.005	
<u>Interaction Effects With Health Services Utilization</u>			
Inpatient Hospital Days x 2013			0.00002
Inpatient Hospital Days x 2014			0.0002
Emergency Department Visits x 2013			-0.01 ***
Emergency Department Visits x 2014			-0.01 ***
Primary Care Physician Visits x 2013			0.01 ***
Primary Care Physician Visits x 2014			0.01 ***
Specialist Physician Visits x 2013			0.004 ***
Specialist Physician Visits x 2014			0.005 ***
Prescription Drug Fills x 2013			-0.001 ***
Prescription Drug Fills x 2014			-0.001 ***
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.			
Notes: *** p<0.01, ** p<0.05, *p<0.10			
Models include all covariates reported in Figure 4, but are suppressed for brevity.			

Appendix—Background on CDHPs

As mentioned above, 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 satisfy the HSA-eligible health plan requirements of the MMA, the plan must have an annual deductible of at least \$1,300 for employee-only coverage and \$2,600 for family coverage in 2017, and the plan's out-of-pocket maximum may 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, Cliff, et al. 2014).¹⁰ 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.¹¹ 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 2017, a worker with individual coverage can make an annual HSA contribution of \$3,400, 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 generally treated as taxable income, but they are excluded from an individual's taxable income if they are used to pay for qualified medical expenses as defined under Internal Revenue Code (IRC) Sec. 213(d). 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 has contributed to the HSA, it is individually owned and fully portable if the worker leaves his or her job.

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

HRA-related health plans have been in existence longer than HSA-eligible health plans. Unlike the HSA-eligible health plan, the employer can customize the key elements of the HRA-related health plan including the deductible, copayments, health care services subject to or exempt from the deductible, and the comprehensiveness of coverage. Also, in contrast to HSAs, HRAs are offered, owned, funded, designed and controlled by employers. Moreover, the plan sponsors dictate the amount of money contributed to and available in the HRA, the extent to which unused amounts can be rolled over into subsequent years, and the portability of the HRA upon job separation.

Finally, 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. When an HRA is paired with a high-deductible plan, a worker essentially has first-dollar coverage up to a limit (i.e., the employer contribution to the HRA), after which a deductible must be satisfied out-of-pocket with after-tax dollars,¹² and then insurance coverage takes over. This contrasts with HSA-eligible health plans, where employers can simply offer the health plan and let the worker decide for himself or herself whether to open and fund an HSA.

Appendix—Prior Literature

Engaging consumers in their health care has long been viewed by plan sponsors as a way of dampening health care costs (Fronstin 2002). Despite the fact that CDHPs were introduced about 15 years ago, there are only about one dozen studies that have tried to understand who chooses such plans, the first step in becoming a more engaged consumer. The seminal work was presented at a conference on consumer-driven health care in September 2003, and those

manuscripts were subsequently published in a special issue of *Health Services Research* in August 2004. CDHPs were relatively new at the time, and there was not a lot known about them. In September 2003, the MMA had not yet been passed authorizing the use of HSAs, thus there were no HSA-eligible health plans in existence at the time.

The five studies from August 2004 were based on samples of convenience and only one had prior year claims data. All of these papers examined settings where HRAs were offered alongside more traditional health plans, such as health maintenance organizations (HMOs) and preferred provider organizations (PPOs). Lo Sasso, Rice, et al. (2004) reported on site visits that were conducted in 2003. Four companies were interviewed for the study, which found that higher income workers were more likely to choose the HRA plan. Fowles, et al. (2004) examined data from a mail survey sent to employees at Humana Inc. in June 2001, which had introduced an HRA-like health plan. About 200 people enrolled in the CDHP returned the survey, and their answers were compared to about 2,600 individuals enrolled in more traditional coverage. The study found that self-reported health status predicted plan choice. Specifically, employees in excellent or very good health were significantly more likely than those in worse health to choose a CDHP, and those reporting greater health services utilization were significantly less likely to choose a CDHP. Parente, Feldman and Christianson (2004a) examined data on plan choice from the first year that the University of Minnesota offered an HRA plan. They found no association between age or self-reported health and the likelihood of choosing the HRA plan. However, they did find that higher-income employees were more likely to choose the HRA. In a separate study, Parente, Feldman and Christianson (2004b) found that HRA enrollees had a lower average burden of illness than PPO and POS enrollees in the year before the HRA was introduced.

Tollen, Ross and Poor (2004) was the only one of the five studies to use prior-year claims data as a predictor of plan choice. It also examined the experience that Humana Inc., had with its internal rollout of the HRA-like product. The study found that there did not appear to be a difference in risk profiles between employees choosing the HRA and those with more traditional coverage based on demographic data alone, but it appeared that those in the HRA were healthier than those electing to remain in traditional coverage when based on prior claims and prior use of health care services.

Greene, et al. (2006) combined survey information with claims data from a manufacturing company that added two HRA options to its array of plan options in 2004. Data on 2,104 plan enrollees were used: 1,243 HRA enrollees and 861 PPO enrollees. The study found that while self-reported health status was not predictive of plan choice, enrollees in HRA-based plans were healthier than PPO enrollees when examining prior claims data. The study found that HRA enrollees were healthier and had higher education levels than PPO enrollees. The health status effects were based on the finding that pharmacy costs were 56 percent lower among higher-deductible HRA enrollees than PPO enrollees in the year before the HRA was adopted. Similarly, pharmacy costs were 42 percent lower among lower-deductible HRA enrollees than PPO enrollees in the year before the HRA was adopted. The study uncovered no age or income effects, but did find that there was less favorable selection into the more popular lower-deductible HRA plan.

Barry, et al. (2008) examined the experience at Alcoa after it introduced an HRA in 2004 to over 17,000 employees. Using a combination of employee files and claims data, it found that HRA enrollees were more likely than PPO enrollees to be younger, of higher-wage, and white. They also found that prior health care spending and the presence of a chronic condition affected choice of health plan. Those without a chronic condition were more likely to choose the HRA than those with one.

The first study to examine enrollment in an HSA-eligible health plan was conducted by Parente, Feldman and Christianson (2008). They examined data from an employer with over 130,000 covered lives in all 50 states. In 2006, the employer offered eight different options, including an HSA and two HRA-based plans. The investigators concluded that when both an HRA and an HSA were offered in addition to other choices—such as an HMO, PPO, and point-of-service (POS) plan—the HSA attracted a population of relatively healthy workers, while a more generous HRA attracted relatively unhealthy workers. The study also found that income was positively associated with enrollment in the HSA and HRA plans.

Lo Sasso, Shah and Frogner (2010) examined over 700 (mostly smaller) employers that offered an HSA-eligible health plan either as the only plan option or as a choice among other plans. Using data from 2005, the year before any of the HSA-eligible health plans were offered, they found that when using measures of health risk, full-replacement enrollees were less healthy than voluntary enrollees.

Lave, et al. (2011) examined data from nine employers in western Pennsylvania that started offering high-deductible health plans (HDHPs) in 2006. The paper did not specifically mention whether the plans were HSA-eligible, but instead used terms such as "tax advantaged HDHP" and "qualified HDHPs," both of which implied that the health plans were HSA-eligible. The paper found that healthier individuals were more likely to choose the HDHP in both the first and second years. This was the first paper to try to determine if such adverse selection dissipated over time, and determined that while the results were statistically significant in both years, the magnitude of the effect of health status on enrollment was lower in the second year versus the first for workers with employee-only coverage. The opposite was true for individuals with family coverage—healthy families were more likely to select the HDHP in 2007, which was not observed in 2006. This paper also found that the distribution of the healthy across the two health plans became more balanced over the two years.

McDevit, et al. (2014) built on the work conducted by Lave, et al. (2011) and examined risk selection two years after the adoption of an HSA-eligible health plan. The authors also examined risk selection into HRA plans over time. Using data from 16 large employers during the 2004–2007 period, the researchers analyzed risk selection for the two years post-CDHP adoption (three years for 11 of the 16 employers). While evidence of risk selection emerged, employer contributions were used to reduce it.

Finally, Jordan and Cotter (2016) examined data from the introduction of both an HRA and HSA-eligible health plan in 2006 from a single employer with about 20,000 employees. Less healthy households were reportedly more likely to choose the HSA, but were also less likely to choose the HRA.

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Endnotes

¹ See Figure 3 in <http://www.mercer.com/newsroom/national-survey-of-employer-sponsored-health-plans-2016.html>

² More detailed background information about HSA-eligible health plans and health reimbursement arrangements can be found in the appendix.

³ See Figure 6 in <http://www.mercer.com/newsroom/national-survey-of-employer-sponsored-health-plans-2016.html>

⁴ See http://www.realclearhealth.com/articles/2016/11/16/the_acas_impact_on_employer-provided_health_benefits_110255.html

⁵ See https://gallery.mailchimp.com/e399eff155a589b9a9a45b37d/files/6abc9872-f0a6-4944-a1a5-9021b025e485/updated_EO_draft_3_.pdf

⁶ For example, see Buchmueller (2009), Bundorf (2012), Buntin, et al. (2011), Fronstin and Roebuck (2013), Fronstin, Sepulveda and Roebuck (2013a), and Fronstin, Sepulveda and Roebuck (2013b).

⁷ 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. The inability to roll over unused amounts from one year to the next, or to take unused amounts to a new job, creates the equivalent of a “use-it-or-lose-it” incentive. In addition, because HRAs are always funded by employers, workers may tend to view the accounts as “free” money, which reinforces a spending—rather than saving—mentality. In contrast, HSAs are savings accounts, funded by employees and/or employers, but are fully portable and owned 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. Consequently, a worker has a much more compelling reason not to spend HSA funds (relative to HRA funds), but rather to retain them for the future.

HSA-eligible health plans should also be examined separately from HRA-related health plans because an employer that offers the former might also be offering only the high-deductible health plan while neither funding nor facilitating worker contributions to an HSA. In many HSA-eligible health 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 offering HSA-eligible health plans, most of the early research on CDHPs focused on HRA-based plans. Unfortunately, many studies only note that they are examining “CDHPs,” without specifying whether the CDHP is an HRA-based plan, an HSA-eligible health plan, or both. Also, CDHP studies may have only been examining 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 the type of CDHP under study makes it difficult to draw conclusions from prior work.

⁸ See Charlson, et al. (1987), Deyo, Cherkin and Ciol (1992), and Quan, et al. (2005).

⁹ See Austin (2011) and Austin (2011).

¹⁰ These preventive services are in addition to those that the Patient Protection and Affordable Care Act (ACA) mandates be covered in full.

¹¹ 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.

¹² 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 (FSA) or HSA.

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