Risk Selection into Consumer-Directed Health Plans: An Analysis of Family Choices within Large Employers

Roland D. McDevitt, Amelia M. Haviland, Ryan Lore, Laura Laudenberger, Matthew Eisenberg, and Neeraj Sood

Objective. To identify the degree of selection into consumer-directed health plans (CDHPs) versus traditional plans over time, and factors that influence choice and temper risk selection.

Data Sources/Study Setting. Sixteen large employers offering both CDHP and traditional plans during the 2004–2007 period, more than 200,000 families.

Study Design. We model CDHP choice with logistic regression; predictors include risk scores, in addition to family, choice setting, and plan characteristics. Additional models stratify by account type or single enrollee versus family.

Data Collection/Extraction Methods. Risk scores, family characteristics, and enrollment decisions are derived from medical claims and enrollment files. Interviews with human resources executives provide additional data.

Principal Findings. CDHP risk scores were 74 percent of traditional plan scores in the first year, and this difference declined over time. Employer contributions to accounts and employee premium savings fostered CDHP enrollment and reduced risk selection. Having to make an active choice of plan increased CDHP enrollment but also increased risk selection. Risk selection was greater for singles than families and did not differ between HRA and HSA-based CDHPs.

Conclusions. Risk selection was not severe and it was well managed. Employers have effective methods to encourage CDHP enrollment and temper selection against traditional plans.

Key Words. Selection, consumer-directed, account-based plans

Consumer-directed health plans (CDHPs), high-deductible plans combined with a personal savings account, have become increasingly popular over the past decade. This may be because, as shown by several studies, these plans are associated with cost savings, at least in the early years of enrollment (Bundorf 2012). CDHPs accounted for only 4 percent of the employer-sponsored

market in 2006 and now account for nearly 20 percent of the market (The Henry J. Kaiser Family Foundation 2012). A majority of large employers now offer CDHPs, and 14 percent of these firms offer a CDHP as the only option (The National Business Group on Health and Towers Watson 2013).

Prior research documents that CDHPs attract favorable risks or relatively healthy individuals with lower expected health care expenditures. (See Bundorf 2012 for an excellent literature review.) Such favorable selection in CDHPs might have important implications. First, if CDHP enrollment is limited to those who are healthy, then the potential for these plans to significantly lower health care costs as intended might also be limited. Second, with favorable selection into CDHPs, employers might have to increase premiums for more generous traditional plans. In this case, additional premiums in generous plans might not reflect the marginal insurance benefit of the generous plan and thus could distort employee insurance choices. In the extreme case, more generous insurance plans might be eliminated due to adverse selection. For example, Cutler and Zeckhauser (1998) document how Harvard's decision to contribute an equal amount toward subsidizing premiums for all health insurance plans led to the disappearance of the most generous insurance plan within 3 years of the decision (Cutler and Zeckhauser 1998).

In this article, we advance knowledge on favorable selection in CDHPs by analyzing the experience of 16 large employers offering a choice of CDHPs and traditional plans. We contribute to the prior literature in several ways. First, we estimate how the nature of selection into CDHPs evolves over time. Most of the prior studies, with a few exceptions such as Lave et al. (2011) and Lo Sasso, Shah, and Frogner (2010), analyze selection in the first year CDHPs are offered. These first-year effects might be very different than longer term effects, given employers' ability to control premiums and benefit design of health insurance choices for their employees.

Second, we contribute to the literature by estimating how the attributes of plans in employees' choice sets influence the degree of favorable selection in CDHPs. We analyze several plan attributes such as deductibles, premiums,

Address correspondence to Roland D. McDevitt, Ph.D., Former Director of Health Care Research (Retired), Towers Watson, Arlington, VA 22203; e-mail: roland.mcdevitt@gmail.com. Amelia M. Haviland, Ph.D., is with the H. John Heinz III College, School of Public Policy and Management, Carnegie Mellon University, Pittsburgh, PA. Ryan M. Lore, M.P.P., and Laura K. Laudemberger, M.S., are with the Towers Watson, Arlington, VA. Matthew D. Eisenberg, Ph.D. Candidate is with the H. John Heinz III College, School of Public Policy and Management, Carnegie Mellon University, Pittsburgh, PA. Neeraj Sood, Ph.D., is with the Leonard D. Schaeffer Center for Health Policy and Economics, University of Southern California, Los Angeles, CA.

and employer contributions to health care accounts. We also analyze the extent to which other aspects of the choice environment such as the duration of communication about plan offerings or whether employees had a default health insurance plan influence selection into CDHPs.

Finally, most prior studies analyze favorable selection into CDHPs that combine high deductibles with a health reimbursement arrangement (HRA) (Fowles et al. 2004; Greene et al. 2006; Barry et al. 2008; Borah, Burns, and Shah 2011; Lave et al. 2011). Although such plans were popular when CDHPs were just introduced, more recently the majority of CDHPs offered combine high deductibles with a health savings account (HSA) (The Henry J. Kaiser Family Foundation 2012; Exhibits 8.1 and 8.4). The nature of selection into CDHPs may be different for the two account types due to differences in key account provisions such as loss of any balance when leaving an employer, ability to use the balance for non-health expenses, and the amount of employer contributions to these plans. In this article, we contribute to the literature by distinguishing between HRA- versus HSA-based CDHPs. To the best of our knowledge, only one paper from the prior literature analyzed selection in HRA and HSA CDHP plans separately (Parente, Feldman, and Christianson 2013). This study, based on data from a single employer, found evidence of favorable selection for HSA-based CDHPs and adverse selection for HRA-based CDHPs.

The rest of the article proceeds as follows. Sections 2 and 3 present the data and methods. Section 4 presents the results and Section 5 discusses the implications of our results.

DATA AND DEFINITIONS

We define a CDHP as a plan with a single deductible of at least \$1,000 together with a HRA or a HSA that can be used to pay out-of-pocket expense not paid by the plan. HRAs require employers to credit an account for each employee to use toward out-of-pocket costs. These credits normally carry over from year to year, but they are usually forfeited if the employee leaves the firm. HSAs allow both the employer and employee to contribute pretax money into an account owned by the employee. The money remains tax free if it is used to pay health care expenses, even in retirement, but can be withdrawn for other purposes—however, with income tax and a penalty.

We obtained medical claims and enrollment files from 30 large employers that offered both a CDHP and a traditional plan during the 2004–2007

period. These employers were selected to represent a range of CDHP plan attributes, employer industries, and geographic presence. Sixteen of these firms met our analysis criteria of supplying at least 1 year of pre-CDHP data and 2 years of post-CDHP data, and providing claims records for all large traditional plans. Eleven companies also provided a third year of post-CDHP data. We present findings for years 1 and 2 for all 16 firms, and year 3 findings are presented for the subset of 11 firms. Year 1 and 2 results for the 11-firm subset are also presented in the Appendix.

In 2005, it is estimated that 21 percent of large employers were offering CDHPs (The National Business Group on Health and Towers Watson 2012). The plan attributes in our sample are similar to those seen nationally for large employers (The Henry J. Kaiser Family Foundation 2012), and we are not aware of any distinguishing features of these 16 employers that would lead them to have unusual health plan selection dynamics. However, due to employer to employer variation, the findings here may not apply directly in any particular employer situation, particularly to an employer first offering a CDHP only recently, as greater awareness of these plans may affect overall enrollment numbers.

Three categories of variables are used to examine plan choice and risk selection: insurance family characteristics, the decision context for choosing a plan, and the financial attributes of the CDHP relative to traditional offerings. (See Table A1.)

Insurance Family Characteristics

We defined insurance families to include both employees with single coverage and employees with family coverage. We limited our study to non-elderly employees and required a minimum 3 months of enrollment. This yielded approximately 200,000 insurance families (500,000 covered lives) in years 1 and 2, and nearly 125,000 insurance families (300,000 covered lives) in the third year (see Table 1 and Table A2).

Family characteristics include indicators of health status, health care use, financial resources, and risk preferences, allowing comparison of families that elected a CDHP and those that elected a traditional plan. Characteristics include employee age, gender, coverage tier (single/family), as well as educational attainment and median income in the five-digit Zip Code of residence based on the 2000 Census. These variables and others used in our analysis are defined in detail in Table A1.

Table 1: Sample Characteristics in the First Year of CDHP Offer

	Whole Sample		Traditional		CDHP		t-stat
	Mean	SD	Mean	SD	Mean	SD	
Family characteristics							
Current year family max risk score	-0.115	1.179	-0.009	1.205	-0.461	1.016	-80.621
Current year individual risk score*	-0.071	0.957	-0.009	0.934	-0.268	1.030	-75.737
Relative age of employee/10	0.018	1.032	0.079	1.028	-0.176	1.020	-47.450
Single male	0.197	0.398	0.176	0.381	0.262	0.440	38.140
Relative% college	0.030	14.900	-0.275	14.912	0.974	14.830	15.970
Relative income/\$10,000	0.008	1.709	0.005	1.728	0.015	1.648	1.091
Context for choice							
Active choice	0.420	0.494	0.340	0.474	0.673	0.469	134.070
Months of communication	5.112	2.119	4.813	1.919	6.054	2.423	101.910
Relative actuarial value prior year plan/5	-0.002	0.677	0.058	0.580	-0.188	0.894	-56.370
Plan financial attributes							
CDHP premium savings/\$500	1.101	0.556	1.019	0.473	1.361	0.701	99.290
Deductible difference/\$500	2.820	0.992	2.761	0.961	3.003	1.063	44.120
Employer account contribution/\$500	0.890	0.588	0.860	0.565	0.983	0.645	37.180
% in HRA firm	0.464	0.499	0.426	0.495	0.583	0.493	60.520
Single employee	0.376	0.484	0.366	0.482	0.406	0.491	15.490
% of families in HRA	14.05						
% of families in HSA	10.03						
% of families in CDHP	24.08						
Observations	197,204		149,708		47,496		

*There are 363,840 traditional plan and 114,114 CDHP enrollees in year 1.

Risk measures to predict enrollee spending were derived from age, gender, and chronic conditions reported on medical claims (Diagnostic Cost Group software licensed from DxCG, Inc., Boston, MA, USA). It would be ideal to use chronic conditions identified in the previous year to avoid potential influence of current plan design, but the previous year risk measure was not available for new enrollees who comprise about 30 percent of enrollment in each year. Consequently, we developed a prior year risk score for use with those enrolled in both the preperiod and year 1, and a current year risk score for use with all enrollees. Based on 180,400 adults from the preperiod who remained in a traditional plan in year 1, we found a Pearson correlation of .61 between the prior year risk score and the current period risk score. Our rationale for using current year scores is that employees knew the chronic conditions of family members when they selected a plan. We compare the two risk score measures and report all first-year regression results using the prior year risk score (and the subset of employees enrolled for a full year prior to CDHP offer) in the Appendix as a sensitivity analysis.

Average risk scores vary from company to company (see Tables A3a–c). We standardized the scores by dividing each person's score by the mean for his or her employer group, producing a mean of 1.0 for each company and for the entire population. Family risk scores used in the logistic regressions were set to the highest risk score occurring within each family and then renormed to 1.0 within employer (mean family risk score was used in a sensitivity check). The distribution of risk scores was heavily skewed to the right. To address this, we implement a top-code of 5.0. The top-code affects 3.63 percent of families in the sample.

Context of Health Plan Choice

Context can also influence consumer plan choices. For example, employees accustomed to a very rich plan might be reluctant to select a high-deductible plan, and extensive communications to promote a new CDHP might encourage employees to enroll by highlighting the employer's account contributions and other benefits of the new plan. Behavioral economics and interviews with plan administrators suggest that many employees and their families are predisposed to remain in their current plan unless they are forced to make a new choice. Consequently, we determined whether each family was required to make an "active choice," either because their plan from the previous year was eliminated or because they were new to the company. In a similar vein, we examine the extent of plan switching in years 2 and 3 by exploring the extent

to which CDHP enrollees were from a CDHP in addition to whether they were an “active choice” family.

CDHP Financial Attributes

The plan a family selects is highly dependent on the plan options available. Due to limitations on the availability of plan attributes for small enrollment plans, we collapse all CDHPs (when there is more than one offered) and all traditional plans together within each employer using the attributes of the highest enrollment plan to describe the collapsed set. Additional information is given in Table A1 to demonstrate that the differences between CDHP and traditional plan types are much larger than the differences across plans within either plan type category. We use the following variables to compare the value of the most popular CDHP option and the most popular traditional option within each firm: the employer account contribution, if any; the difference in deductible between the most popular CDHP and traditional plan within each company; and the CDHP premium savings that would occur by selecting the CDHP over the traditional plan. In models, we interact employer account contribution with both CDHP premium savings and with the CDHP/traditional deductible difference. This helps to address the way the plan attributes can move in concert. Lastly, we also include an indicator variable signifying that the firm is offering an HRA to allow for different average enrollment rates in HRA- versus HSA-based CDHPs.

METHODS

We use logistic regression models to investigate which factors are most predictive of enrollment in a CDHP with separate models for each of the first 3 years of CDHP offer. The dependent variable in these models is a 0/1 indicator of whether an insurance family enrolled in a CDHP in each year. The predictor variables include the family characteristics, context variables, and CDHP financial attributes discussed above, although some are rescaled to facilitate interpretation in the model as noted in Table A1. We calculate and present marginal effects using recycled replications (STATA command *margins, dydx (*)*).

We examine CDHP enrollment in each of the 3 years post offer and include all families that were enrolled for at least 3 months. We include the current year risk score as a key predictor of interest. Year 1 models that are run

instead with the prior year risk score (and on the subset of the sample who are enrolled for the full 12 months of the prior plan year) are included in the Appendix as a sensitivity check (see Tables A4, A5, A6a, and A6b). To distinguish whether differences seen in Year 3 results are due to time since CDHP offer or to particulars of the subset of firms available for a third year, we present the Year 1 and 2 results on the 11 firm Year 3 subset in the Appendix (see Tables A7 and A8). To check the sensitivity of the family level risk score specification, we compare these results with those obtained with the mean instead of maximum risk score within a family (see Table A9). We next run parallel models that add a vector of interaction terms between the risk score measure and all the context context/plan attributes variables. These models determine whether the health status mix of CDHP enrollees differs based upon the actions employers take in creating and presenting plan options. Key interaction term results are presented in figures and the full model results are in Table A5.

Lastly, we run two sets of stratified models. First, we stratify the sample by account type associated with the CDHP offered to examine whether risk selection or other choice context variables operate differently by account type. All firms offer CDHPs with only one account type per year, and only one firm changes its CDHP offering from HRA to HSA over the sample period. In the third year, only one firm remained in our data offering an HSA and thus these models are not run for the third year. Second, we stratify the sample by single enrollees versus families to examine possible differences in risk selection across these insurance family types due to potentially differing risk preferences. For both stratified models, results are shown in the text for Year 1 (see Tables A6a–b for year 2 results).

Findings

Family Characteristics, CDHP Offerings, and Decision Context. Table 1 presents the sample sizes, family characteristics, context for choice measures, and relative plan financial attributes in the first year of CDHP offer by type of plan selected (see Table A2 for Year 2 and 3 results). CDHP penetration among all families was 24 percent in the first year, 29 percent in the second year, and 40 percent in the third year. Enrollment in HSA plans doubled from 10 to 20 percent in year 2 as these companies offered new HSA options and one company eliminated the HRA option altogether.

Several family characteristics suggest favorable selection for the CDHP plans. Single employee “families” were somewhat more likely to enroll in

CDHPs, as were those who were younger. Geocoded household incomes in study firms averaged from \$44,000 to \$63,700 with an overall mean of \$52,500 across all firms in the first year (Table A3a). Year 1 geocoded incomes were only slightly higher (and not statistically significantly different) for employees in CDHP plans compared with those in traditional plans. Geocoded educational attainment (4-year college degree) was consistently higher for CDHP enrollees than traditional plan enrollees. CDHP offerings with higher account contributions, higher deductible differentials, and greater premium savings all had more enrollees. First-year CDHP enrollees tended to come from those facing an active choice of plans (67 percent of employees who selected a CDHP faced an active choice versus 34 percent of employees who selected traditional plans). CDHP enrollees had selected less generous (and lower premium) plans in the prior year than those enrolling in traditional plans in year 1. The extent of communication about the new CDHP is also associated with enrollment, with an average of 6.1 months communication prior to open enrollment for CDHP enrollees and 4.8 months for traditional plan enrollees. All differences in this paragraph are statistically significant at $p < .001$ except as noted.

Risk Measures. As shown in Table 1 and Figure 1, average individual relative risk scores and thus predicted medical spending were lower in all years for CDHP enrollees compared with traditional plan enrollees with the difference decreasing somewhat over time as CDHP enrollment grew. The average relative risk scores calculated using prior year claims are similar to those calculated using current year claims and show the same moderate converging pattern over time. Using current year risk scores for the full sample (Table 1), predicted spending for years 1, 2, and 3 was 26, 24, and 22 percent lower in the CDHP group. The convergence is due to new enrollees in years 2 and 3 having risk scores generally higher than the CDHP average and lower than the traditional plan average in the prior year.

Choice of Plans and Effects on Risk Selection—Model Results. Table 2 summarizes results from logistic regressions that estimate odds of a family enrolling in a CDHP when it is offered alongside at least one traditional plan. All results presented below are statistically significant at $p < .001$.

The Year 1 model shows that the first-year probability of enrolling in a CDHP fell by almost 5 percentage points when relative risk scores increased

Figure 1: Risk Selection Decreases over Time

Note. Sample restricted to families present for a full 12 months in the prior year ($n = 137,095/156,056/90,615$ in years 1/2/3). The average individual-level CDHP current (prior) risk scores are 24.1 (26.2)/23.0 (24.1)/22.5 (22.3) percent of traditional plan enrollees averages in years 1/2/3. *Prior RS* and *Current RS* refer to the risk scores calculated using prior year versus current year claims.

by 1 point (that is, when predicted spending increased by an amount equal to average spending). Single male employees (relative to single female or families) and more highly educated employees were slightly more likely to enroll in a CDHP and older and higher income employees (holding education fixed) were slightly less likely to enroll in a CDHP. Sensitivity analyses using family average risk score (instead of maximum) yielded slightly higher magnitude and otherwise quite similar results (see Table A9).

In general, the plan financial attributes and the context variables had greater impacts on enrollment in a CDHP than employee and family characteristics. Requiring an active choice (either the employee was new to the company or his or her plan from the previous year was eliminated) increased the probability of first-year CDHP enrollment by almost 10 percentage points. If the employee was previously enrolled in a plan with an actuarial value 5 percent above the company average, the employee was

Table 2: CDHP Enrollment in the First Three Years of CDHP Offer

	(1) Year 1	(2) Year 2	(3) Year 3
Family characteristics			
Current year risk score	−0.0484*** (0.000971)	−0.0312*** (0.000784)	−0.0269*** (0.000920)
Relative age of employee/10	−0.0127*** (0.000945)	−0.0156*** (0.000769)	−0.0159*** (0.000937)
Single male	0.0306*** (0.00222)	0.0142*** (0.00186)	0.00377 (0.00234)
Relative% college	0.00152*** (8.61e−05)	0.000858*** (7.01e−05)	0.00112*** (9.65e−05)
Relative income/\$10,000	−0.00461*** (0.000767)	−0.00108* (0.000622)	−0.000662 (0.000874)
Context for choice			
Active choice	0.0982*** (0.00212)	0.0879*** (0.00167)	0.180*** (0.00179)
From CDHP		0.445*** (0.00152)	0.478*** (0.00119)
Months of communication	0.0230*** (0.000516)		
Relative actuarial value prior year plan/5	−0.0697*** (0.00126)		
Plan financial attributes			
CDHP premium savings/\$500	0.250*** (0.00361)	0.211*** (0.00313)	1.850*** (0.0274)
Account contribution × premium savings	−0.126*** (0.00420)	−0.173*** (0.00344)	−1.436*** (0.0226)
Deductible difference/\$500	−0.0556*** (0.00198)	−0.0337*** (0.00156)	−0.704*** (0.0103)
Account contribution × deductible difference	0.00515** (0.00224)	0.0986*** (0.00196)	0.708*** (0.0123)
Employer account contribution/\$500	0.222*** (0.00695)	0.0179*** (0.00490)	−0.638*** (0.0164)
HRA	0.0524*** (0.00342)	−0.0545*** (0.00183)	−0.0629*** (0.00203)
Number of employers	16	16	11
Observations	182,744	205,825	116,035

Note. Standard errors in parentheses.
*** $p < .01$, ** $p < .05$, * $p < .1$.

almost 7 percentage points less likely to select a CDHP. Conditional on other factors, employees in companies that devoted additional months to communicating about the new CDHP options were slightly more likely to enroll (2 percentage points).

For the plan financial attributes, a \$500 account contribution from the employer increased the probability of first-year CDHP enrollment by 22 percentage points. A \$500 increase in the CDHP deductible *decreased* the probability of CDHP enrollment by 6 percentage points, and a \$500 increase in annual employee premium savings increased the CDHP enrollment probability by 25 percentage points. The premium savings and account contribution measures were less than fully additive such that the impact on enrollment of an extra \$250 in account contribution and \$250 in premium savings is less than \$500 more in premium savings and no greater account contribution or \$500 more in account contribution and no additional premium savings. In the first year of CDHP offer, the probability of enrolling in a CDHP paired with an HRA rather than an HSA was 5 percentage points higher, controlling for all other factors.

Following the first year, risk score and other employee or family characteristics continued to have a small impact with an increase of 1 point in risk score associated with a 3.1 and 2.7 percentage point decrease in enrollment in years 2 and 3, respectively. In contrast, the strongest predictor of whether a family will enroll in a CDHP is whether that family previously enrolled in a CDHP. In years 2 and 3 the probability of CDHP enrollment was 45 and 48 percentage points higher for those previously enrolled in a CDHP. The requirement of an active choice continued to have a strong influence on CDHP enrollment after the first year, as did the financial attributes of these CDHP offerings relative to traditional offerings. When employees were forced to make a new choice, the probability of CDHP enrollment rose by 9 and 18 percentage points in years 2 and 3, respectively. Relatedly, five companies dropped popular traditional plans between years 2 and 3, forcing an active choice for a high number of enrollees. Plan financial attributes have similar effects in the second year of CDHP offer except that now CDHPs paired with an HRA had somewhat lower enrollment than CDHPs paired with an HSA, conditional on all factors. In the third year of CDHP offer, the magnitude of the effects is larger, but qualitatively the results are largely similar; for example, greater premium savings were associated with higher enrollment, and higher deductibles were associated with lower enrollment. Due to the different mix of plan designs in the third year (with five fewer firms and fewer HRA based CDHPs), the main effect of employer account

Figure 2: Factors Impacting Degree of Risk Selection

Note. These results are derived from the model results presented in Table A5. The differences in risk selection based on active choice and employer contribution level are statistically significant in all years at $p < .01$ and $p < .05$, respectively. For (b), high relative risk score is set to 0 and low relative risk score is set to -1 .

contribution was negative prior to accounting for the interactions with premium savings and deductible difference.

In additional models (see Table A5) interacting risk scores with choice context and plan financial attributes, two interactions in particular stand out as statistically significant and sizeable. Figure 2a illustrates how the degree of risk selection differs for those having to make an active plan choice versus having a prior year “default” plan available; the figure demonstrates substantially more risk selection among those needing to make an active plan choice in all 3 years. Figure 2b illustrates how the degree of risk selection differs for those facing lower (\$500) versus higher (\$750) employer account contributions; the figure demonstrates somewhat less risk selection in the first 2 years of CDHP offer for those whose employer makes a higher account contribution. In addition, having a longer communication period and having already enrolled in a CDHP both are associated with somewhat lower risk selection, as is having a CDHP choice with greater premium savings.

Finally, Table 3 shows the results of models stratified by the account type associated with the CDHP (columns 1 and 2) and single person versus family contracts (columns 3 and 4) in the first year of CDHP offer (see Tables A6a–b for second-year results). In comparing selection effects into CDHPs with HRAs versus HSAs, there are no differences in selection on employee and family characteristics, in particular, the risk score effect is nearly identical. Active choice was a much stronger incentive to enroll in an HSA than an HRA while additional communication about the CDHP had a positive effect on enrollment in HRA-based CDHPs and a small negative effect on enrollment in HSA-based CDHPs. Plan financial characteristics are more difficult to compare (as HRAs require an employer contribution while HSAs do not) but we observe a larger negative effect on CDHP enrollment of higher deductibles when CDHPs are paired with HRAs versus HSAs. In the single versus family contract comparison, there is greater risk selection among singles, and active choice is a greater on CDHP enrollment incentive for singles. Plan financial attributes, in particular premium savings, and employer account contribution, have a stronger impact on CDHP enrollment for families than singles.

DISCUSSION

Our study provides much new information about the dynamics of CDHP enrollment. Consistent with prior research, we found evidence of favorable

Table 3: CDHP Enrollment by Medical Account Type and Single versus Family Insurance Unit

Variables	(1) Year 1 HRA	(2) Year 1 HSA	(3) Year 1 Single	(4) Year 1 Family
Family characteristics				
Current year risk score	-0.0525*** (0.00140)	-0.0535*** (0.00137)	-0.0710*** (0.00214)	-0.0419*** (0.00108)
Relative age of employee/10	-0.0160*** (0.00143)	-0.0143*** (0.00122)	-0.0131*** (0.00148)	-0.00953*** (0.00128)
Single male	0.0162*** (0.00341)	-0.00168 (0.00284)		
Male			0.0343*** (0.00317)	0.0210*** (0.00257)
Relative % college	0.00262*** (0.000149)	0.000856*** (0.000101)	0.00105*** (0.000131)	0.00202*** (0.000116)
Relative income/\$10,000	-0.00182 (0.00138)	-0.00604*** (0.000875)	-0.00182 (0.00124)	-0.00853*** (0.000998)
Context for choice				
Active choice	0.0171*** (0.00354)	0.0776*** (0.00285)	0.1119*** (0.00346)	0.0853*** (0.00270)
From CDHP				
Months of communication	0.0707*** (0.000655)	-0.0233*** (0.00114)	0.0245*** (0.000909)	0.0235*** (0.000627)
Relative actuarial value prior year plan/5	-0.0665*** (0.00211)	-0.0538*** (0.00134)	-0.0740*** (0.00210)	-0.0671*** (0.00159)
Plan financial attributes				
CDHP premium savings/\$500			0.186*** (0.00615)	0.294*** (0.00515)
Account contribution × premium savings			-0.0849*** (0.00687)	-0.151*** (0.00588)
Deductible difference/\$500	-0.126*** (0.00299)	-0.00781*** (0.00173)	-0.0489*** (0.00298)	-0.0716*** (0.00291)
Account contribution × deductible difference			0.00353 (0.00373)	0.0188*** (0.00297)
Employer account contribution/\$500	0.328*** (0.00711)		0.124*** (0.0118)	0.272*** (0.00892)
Indicator for 0 account contribution		-0.121*** (0.00691)		
Deductible difference × 0 account		0.0693*** (0.00199)		
HRA			0.0949*** (0.00523)	-0.00105 (0.00479)
Observations	81,426	101,318	68,982	113,762

Note. Standard errors in parentheses.
*** $p < .01$, ** $p < .05$, * $p < .1$.

selection into CDHPs as these plans tend to attract younger and healthier enrollees. There is greater risk selection among singles compared with family contracts, perhaps reflecting differences in risk preferences between singles and families or within-family pooling of risks. However, we found that the degree of favorable selection is similar in CDHPs with HRAs versus the now more popular CDHPs with HSAs.

Consistent with economic theory, we found that CDHP enrollment was higher in firms that offered more generous CDHPs: CDHPs with higher employer contributions and lower deductibles attracted more enrollees. Similarly, larger premium savings from CDHP enrollment also increased enrollment in CDHPs. These same plan features also influenced the degree of favorable selection into CDHPs as CDHPs with greater premium savings or more generous account contributions produced milder favorable selection. Thus, employers face a trade-off: while offering CDHPs with higher deductibles will likely result in larger health care cost savings per enrollee, such generous CDHPs will attract fewer enrollees and will more likely lead to adverse selection into traditional health insurance plans.

Consistent with predictions from behavioral economics, we found that nonfinancial variables such as whether employees had a default plan option and the extent of communication about plan offerings also exert an important influence on employee decisions to enroll in a CDHP. For example, new employees or employees whose prior year traditional plan was eliminated were more likely to choose a CDHP because they did not have a default traditional plan option. Similarly, employees who enrolled in a CDHP in the prior year were much more likely to continue remaining enrolled in a CDHP in subsequent years. These nonfinancial variables also influenced the degree of favorable selection into CDHPs. We found more favorable selection when employees had to make an active choice to enroll in a health plan. This is consistent with the hypothesis that young and relatively healthy employees exhibit substantial inertia in their health plan choices and continue to stay in their prior year traditional plans even when they might receive substantial financial gains from switching to CDHPs.

From a large employer perspective, these findings suggest that employers have an array of tools that exert a great deal of influence over the employees' health plan choices and that these tools can be used to limit favorable selection into CDHPs when choice is offered. Indeed, we find that the degree of favorable selection into CDHPs (and hence adverse selection into traditional plans) diminished over time, suggesting

that employers have been largely successful in using these tools to offer their employees a choice of health insurance plans including CDHPs and traditional plans. The only exception from this orderly transition to including CDHPs in plan offerings is that several study employers eliminated the most popular traditional plan in the third year after CDHP introduction. However, it seems these employer decisions were not necessitated by an adverse selection “death spiral” as there is no evidence of adverse selection into traditional plans increasing over time. These decisions more likely reflect the desire of employers to achieve higher cost savings through greater enrollment in CDHPs.

The consequences of favorable selection into CDHPs in the individual insurance market or in the newly founded health insurance exchanges might be quite different where a broad choice menu will be offered together with premium subsidies and risk adjustment mechanisms. The extent of adverse selection and its consequences on health insurance choices and social welfare will also depend on the extent to which premiums can be risk rated and the extent to which the healthy uninsured enter the individual insurance market. Moving forward, it is important to analyze policy options for limiting adverse selection so that CDHPs can coexist with traditional plans in health insurance exchanges.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: This research was supported with funding originally from the California HealthCare Foundation and the Robert Wood Johnson Foundation, and currently from the National Institute of Health (Grant no.: 1R01AG04385001). M. Susan Marquis and Melinda Beeukes Buntin were instrumental in earlier phases of the larger research project and we would like to acknowledge their substantial contributions. Jon Conklin, Kate Sredl, and Kay Miller of Truven Health Analytics played key roles in collecting and organizing the medical claims data. We also thank Antonia Feldam for data collection and administrative support throughout this project, and Giancarlo Roach Rivas for producing tables and figures.

Disclosures: None.

Disclaimers: None.

REFERENCES

- Barry, C. L., M. R. Cullen, D. Galusha, M. D. Slade, and S. H. Busch. 2008. "Who Chooses a Consumer-Directed Health Plan?" *Health Affairs* 6 (27): 1671–9.
- Borah, B. J., M. E. Burns, and N. D. Shah. 2011. "Assessing the Impact of High Deductible Health Plans on Health-Care Utilization and Cost: A Changes-in-Changes Approach." *Health Economics* 20 (9): 1025–42.
- Bundorf, M. K. 2012. "The Synthesis Project. Consumer-Directed Health Plans: Do They Deliver? Research Synthesis Report No. 24." The Robert Wood Johnson Foundation. [accessed on October 17, 2013]. Available at <http://www.rwjf.org/content/dam/farm/reports/reports/2012/rwjf402405>
- Cutler, D. M., Zeckhauser, R. J. 1998. "Adverse Selection in Health Insurance." In *Frontiers in Health Policy Research, Vol. 1*, edited by A. Garber, pp. 1–31. Cambridge, MA: MIT Press.
- DxCg RiskSmart™ Stand Alone V2.2 User Guide. 2007. Boston, MA: DxCg, Inc.
- Fowles, J. B., E. A. Kind, B. L. Braun, and J. Bertko. 2004. "Early Experience with Employee Choice of Consumer-Directed Health Plans and Satisfaction with Enrollment." *Health Services Research* 39 (4): 1141–58.
- Greene, J., J. Hibbard, A. Dixon, and M. Tusler. 2006. "Which Consumers Are Ready for Consumer-Directed Health Plans." *Journal of Consumer Policy* 29 (3): 247–62.
- The Henry J. Kaiser Family Foundation. 2012. "2012 Employer Health Benefits Survey" [accessed on October 17, 2013]. Available at <http://kff.org/private-insurance/report/employer-health-benefits-2012-annual-survey/>
- Lave, J. R., A. Men, B. T. Day, W. Wang, and Y. Zhang. 2011. "Employee Choice of High-Deductible Health Plan across Multiple Employers." *Health Services Research* 46 (1): 138–54.
- Lo Sasso, A. T., M. Shah, and B. Frogner. 2010. "Health Savings Accounts and Health Care Spending." *Health Services Research* 45 (4): 1041–60.
- The National Business Group on Health and Towers Watson. 2012. "Performance in an Era of Uncertainty. 17th Annual Towers Watson/National Business Group on Health Employer Survey on Purchasing Value in Health Care" [accessed on October 17, 2013]. Available at <http://www.changehealthcare.com/downloads/industry/Towers-Watson-NBGH-2012.pdf>
- The National Business Group on Health and Towers Watson. 2013. "Reshaping Healthcare. 18th Annual Towers Watson/National Business Group on Health Employer Survey on Purchasing Value in Health Care" [accessed on October 17, 2013]. Available at <http://www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2013/03/Towers-Watson-NBGH-Employer-Survey-on-Value-in-Purchasing-Health-Care>
- Parente, S. T., R. Feldman, and J. B. Christianson. 2013. *The Impact of Health Status and Price on Plan Selection in Multiple-Choice Health Benefit Program Including HRA and HSA Options*. Unpublished manuscript. University of Minnesota.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Table A1: Variable Definitions.

Table A2: Main Text Table 1 for Years 2 and 3.

Table A3: (a) Distribution of Firm Means, CDHP, and Traditional Plan Enrollees Combined; (b) Distribution of Firm Means, Traditional Plan Enrollees; (c) Distribution of Firm Means, CDHP Enrollees.

Table A4: Main Text Table 2 Alternate Risk Score Measure Sensitivity Analysis.

Table A5: Figures 2a and 2b Model Results and Alternative Risk Score Sensitivity Analysis.

Table A6: (a) Main Text Table 3 Alternate Risk Score Sensitivity Analysis and Year 2 Results—Account Type Stratification; (b) Main Text Table 3 Alternate Risk Score Sensitivity Analysis and Year 2 Results—Family Type Stratification.

Table A7: Main Text Table 2, 11 Firms Subset Results.

Table A8: Main Text Figures 2a and 2b, 11 Firms' Subset Results.

Table A9: Main Text Table 2, Alternate Family Risk Score Specification.

Appendix SA1: Author Matrix.