SUBOPTIMAL DECISION MAKING IN HEALTH PLAN CHOICES

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ABSTRACT

Consumer choice continues to be a key feature of the US health insurance system, yet a growing body of research indicates consumers struggle to choose financially optimal plans. In this paper, we examine plan choices among public employees across four years of benefit elections when the menu of options changed to include financially dominant high deductible health plans (HDHP) with the same provider networks and insurance carriers under both the dominant and dominated plans. Examining choices in this setting is advantageous because the financially optimal plan can be objectively determined without any assumptions about risk preferences or expected health expenditures. Additionally, we examine the effects of two natural experiments: the exit of one insurance carrier which required employees covered under those plans to actively elect benefits, and the introduction of a new interactive plan decision aid. Using two waves of survey data linked to administrative plan choice data, we find less than 20 percent of employees enrolled in a financially dominant plan by the fourth year. Those who were forced to actively elect when their carrier exited were no more likely to enroll in an HDHP plan but they did invest more time and consulted more resources to research plan options. It is possible the expected financial gain associated with switching plans did not outweigh switching costs for employees with moderate to high health expenditures, but we find 70 percent of employees who reported prior year out-of-pocket expenditures consistent with total expenses at or below the employer HSA contribution still chose a non-high deductible plan as did 67% of employees in self-reported "excellent" health. Prior research concludes lack of health plan literacy is the primary explanation for suboptimal choice. Of those who correctly answered all of our literacy test questions, 79 percent considered an HDHP plan and 65 percent enrolled in one, but only 10 percent of employees answered all questions correctly. Only 34 percent of employees used the new decision aid and 78 percent of those still enrolled in a dominated plan. We conclude employees would benefit from default enrollment or removal of dominated options from the choice set when dominant options exist. More broadly, our findings support the conclusion of prior research that market unravelling due to optimal sorting in insurance markets may be less likely than rational agent models predict and the promise of consumer choice as a means to curb rising premiums may be overstated.

JEL Codes: I13.

1. INTRODUCTION

As of 2017, 58 percent of people with employer sponsored health insurance coverage had more than one plan option, 57 percent had a high deductible health plan (HDHP) option, and 94 percent of firms that offered HDHPs offered other plan types, too (Claxton et al. 2017). HDHP premiums can be substantially lower than other plan offerings and employer contributions to Health Savings Accounts (HSAs) can partially offset or even eliminate cost sharing making the total premium and out-of-pocket costs cheaper than other offerings regardless of healthcare consumed. Unlike funds in flexible spending accounts (FSAs) which must be spent down by the end of the plan year or forfeited, remaining funds in HSAs "rollover" from one plan year to the next and constitute an attractive tax exempt savings vehicle. These features combined can lead HDHP plan options to "dominate" other plans available to employees.

To be financially dominant an insurance plan and all cost sharing required under it must cost less than other plans regardless of how sick or healthy the insured person is. In menus with dominant options, the optimal financial choice does not depend on the ability to accurately predict one's chances of becoming ill, but the amount of savings associated with choosing a dominant rather than a dominated plan may vary with health status. If the savings to choosing a dominant plan is too small, it may not offset switching costs or overcome preferences for lower variability in out of pocket expenses. Also, plans may differ in nonfinancial attributes, like provider network, and individuals may choose financially dominated plans because they cover visits to a preferred doctor or health system.

In this study we examine public employees' choices in a menu that included financially dominant and dominated plan choices but access to the same provider network was possible

under all options. The nominal savings from choosing a dominant plan over a dominated plan ranged from approximately $150 to $1400 annually for single coverage, not accounting for the investment value of unused employer HSA contributions or the opportunity to save more income in a tax exempt investment vehicle through own contributions. Our study period encompasses four years of health plan enrollment. The dominant plan was introduced in the second year, but by the fourth year 80 percent of all employees were still enrolled in a dominated plan. Using survey data matched to administrative plan choice data, we explore possible explanations for financially suboptimal choices.

We find employees who understood plan attributes were more likely to switch to the dominant plan. Yet, even among the 10 percent of employees who answered all insurance knowledge questions correctly, 35 percent still enrolled in dominated plans. Employees who had to actively elect coverage did not perform better than those who could passively allow their prior year's choice to carry-over to the next plan year, which indicates inertia cannot explain suboptimal choices. We conclude employees would benefit from default enrollment in dominant plans or removal of dominated options and question the extent to which consumer decision aids can improve choice.

Our finding that the majority of employees fail to enroll in dominant plans is consistent with other field studies of health plan choices and with evidence from choice experiments. Like Bhargava, Loewenstein, and Sydnor (2017) who study plan choices among private employees facing a standardized menu of plans, we find less healthy employees were more likely to enroll in dominated plans. They also conclude choice behavior is regressive because employees who earn less were less likely to select the dominant plan. We do see some (statistically insignificant) evidence that choice may be regressive but differences are practically. We see larger differences

in health literacy by earnings and health literacy is the strongest predictor of HDHP enrollment we examine.

Several prior studies find evidence of consumer inertia, which could explain the persistent enrollment in dominated plans among employees in our study. Neipp and Zeckhauser (1985) found only 3 percent of employees in two firms who were offered several plan choices switched plans, and they propose switching costs likely inhibit plan changes. Although Royalty and Solomon (1999) estimate switching is more common in their sample of Stanford employees, they and Strombom, Buchmueller, and Feldstein (2002) both find older employees and those who are in poor health are less likely to change plans. Handel (2013) examines choices among employees across years where active enrollment was required and years where default enrollment in the prior year's plan was possible without action and finds evidence of consumer inertia as well as persistent choice of higher coverage among higher health risk employees. From this perspective, the apparent mistakes in health plan choice may not be mistakes after all – consumers may willingly accept the added costs of financially dominated plans to avoid the costs of researching, signing up for, and learning to use a new financially dominant plan. We find employees who had to actively enroll were no more likely than others to choose a dominant plan after controlling for observable differences, and 70 percent enrolled in dominated plans after being forced to actively elect despite spending more time than those who had a default option and consulting more resources to research plan options.

A growing body of evidence points to deficiencies in consumer financial literacy as a key explanation for suboptimal plan choices. For example, Bhargava, Loewenstein, and Sydnor (2017) present evidence from survey data that suggests the large shares of consumers cannot define fundamental parts of insurance contracts. Loewenstein et al. (2013) find 28 percent do not

understand copays and 41 percent do not understand maximum out-of-pocket, and the majority cannot identify them in health plans. Indeed, Johnson et al. (2013) conducted choice experiments and found individuals perform no better than random selection when told to identify the most cost-effective plans and they do not realize they are performing poorly.

In experimental settings participants presumably consider all choices presented, but in actual plan elections consumers may exclude plans from the choice set before even considering their financial attributes. For example, if consumers mistakenly assume plans labeled "high deductible" offer only catastrophic coverage they may not examine the actual attributes of the plan. If so, their choices do not reflect poor financial literacy but rather a misguided decision heuristic and the optimal intervention could instead be rebranding of plan choices (Aaron, Healy, and Khitatrakun 2008). By matching survey data containing information about the plans employees said they considered to their actual plan choices, we are able to determine how much of the observed persistence of dominated plan choices is due to employees systematically excluding dominant plans from the set of choices they considered.

2. OVERVIEW OF RESEARCH SETTING AND HEALTH PLAN OFFERINGS

We examine health plan choices among approximately 1,300 employees of a large public employer working in one establishment. In total, the organization employs 38,835 individuals distributed throughout the state. All were offered a financially identical menu of health plan choices but provider networks and insurance carriers varied by region. The establishment we study constitutes approximately 4 percent of total employment within the organization. Relative to the general population, these employees are older, receive higher compensation, and are substantially more educated.

2.1 Plan Offerings and Key Changes Over Study Period

The menu of plan offerings include some desirable features for research purposes. First, all plans must offer uniform benefits, meaning the same health services are covered under all plan offerings. Also, after deductibles are met, coinsurance is provided at the same rate under all plan options. Employees can choose the level of gatekeeping, provider networks, and insurance carriers but identical employee premium costs and deductibles are available, within the same level of gatekeeping, across provider networks and insurance carriers. Table 1 summarizes the financial attributes of plans offering single and family coverage for our study period.

In 2015, employees were presented with a HDHP option for the first time. Employees who chose this option were enrolled in HSAs and received a $170 employer contribution for single coverage and $340 contribution for family coverage. The employee's monthly premium cost for single coverage in a Tier 1 (least generous) non-HDHP plan was $81 per month and the comparable HDHP monthly premium cost was $32. Non-HDHP options had no deductible, HDHPs had a $1500 deductible for single coverage, and all plans required 10% coinsurance after the deductible (if any) was met. The out-of-pocket limit (OOPL) for single coverage non-HDHP plans was $500 and for HDHP plans was $2,500. Both plan types offered the same prescription drug coverage but non-HDHP plans had a separate set of OOPLs for prescription drug costs whereas the $2,500 OOPL for the HDHP plan encompassed both medical and drug expenses. If all prescription drug costs were Level 1 (primarily generic) the total of the OOPLs for medical and drug costs in non-HDHP plans was $1100, but if employees had drug costs in all tiers, the combined OOPLs would total $9,150. Together, these features lead the HDHP options to be financially optimal for single employees expecting less than $989 in medical expenses or employees anticipating substantial prescription drug costs relative to total medical expenditures,

especially from specialty drugs.[1] In summary, optimal choices in 2015 did depend on expected health expenditures and risk preferences.

In 2016, the employer contribution to HSAs increased to $750 for single and $1,500 for family coverage. This change was prominently featured in decision guides written for employees, on human resources webpages, in email announcements and reminders leading up to and during open enrollment, and in benefit seminars offered onsite to assist employees in their plan choices. Employee monthly premium contributions increased for non-HDHP plans per month under both single and family coverage, and non-HDHP plans began requiring a deductible. A new opt-out incentive of $2000 was introduced. Plan names changed but the plan descriptions included the old and new names and the HDHP options still included "High Deductible Health Plan" in the plan name. Dental coverage had been included under all plans in 2015 but in 2016 became optional. All employees were enrolled in the 2016 equivalent of their 2015 plan, with dental, by default if they did not actively elect.

Fewer changes occurred in 2017. Employer contributions to HSAs remained at 2016 levels, although the employee contribution limit increased by $50 for singles, and the opt-out incentive was still available. Premiums did increase for all plans but deductibles and out-of-pocket limits remained at 2016 levels.

In 2018, there were major changes to the insurance carriers offered to employees in the establishment we study. One carrier exited the market and all employees had to actively enroll in

[1] This calculation considers only the nominal costs of premiums and coinsurance to employees in 2015 and does not account for the investment value of employer or own HSA contributions over time. It also does not account for the differential tax treatment of premium and out-of-pocket spending, which might lead employees with high marginal tax rates to prefer non-HDHP options. Although, use of an HSA would enable employees to pay for medical and drug costs with pre-tax dollars. In our analysis we directly examine differences in plan choice by marginal tax rate (as well as whether employees know their marginal tax rates) and find this is unlikely to be an important determinant of choice behavior.

a new plan. There was no default. Another carrier underwent a merger that resulted in renaming of the plan but employees would continue to be enrolled in the plan under the new name by default. Premiums, deductibles, employer contribution to HSAs, and the opt-out incentive remained at 2017 levels. This allows us to cleanly identify the impact of inertia because the choice set is identical in financial terms to 2017 but a subset of employees had to actively elect plans.

2.2 Content and Structure of Plan Offering Information Provided to Employees

In all plan years, employees were provided with a Decision Guide. The Decision Guide contained side by side comparisons of plan premiums in a single table, and comparisons of deductibles, out-of-pocket limits and cost sharing for medical expenses in a separate table appearing on a separate page. Tables for 2015 through 2018 are provided in the Appendix. Although the layout and content of tables was similar in all years, the total length of the guide fell from 100 pages in 2015 to 12 pages in 2016 and 2017, and 16 pages in 2018. Employees were referred to the benefits webpages for detailed information that had been included in the 2015 Decision Guide. The 2016 Decision Guide introduced color coding of plans and the colors remained the same for comparable plans in 2017 and 2018. In 2015, cost sharing for prescription drugs was reported in the same table as cost sharing for medical expenses, but in subsequent years it appeared in a separate table on a separate page. The premium comparison table changed in 2018 to include visual summaries of cost-per-visit for each plan which contained two dollar signs for the non-HDHP options and four for the HDHP options whereas prior Decision Guides had contained the language “Lower premium, higher deductible and OOPL” next to HDHP options in the table. In 2016 through 2018, the tables comparing plan benefits and cost sharing

all included a bright yellow arrow pointing towards a non-HDHP option containing the text "Most members are in this plan".

Information about employer contributions to the HSA was more variable both in presentation and accuracy (see Appendix for images of actual content). In all years except 2018, the Decision Guide reported the amount of employer contribution to the HSA. In 2015, employer contributions appeared in a separate table with an entire page explaining HSAs. In 2016, contributions were prominently featured in a summary of changes for the plan year on page 2 of the Decision Guide. In 2017, employer contributions were listed in the text description of the HDHP options but said "your employer may contribute up to $750 individual/$1,500 family. Not everyone is eligible for this plan". It also said "If you decide to enroll in the HDHP, you must open and contribute to the HSA", which was incorrect. Employee contributions to the HSA were never mandatory. In 2018, the table comparing premiums contained a row labeled "Health Savings Account (HSA) Required". Non-HDHP plans had the text "Not allowed with this plan design" in that row and HDHP plans had a large checkmark with text "Employer may contribute $". Actual employer contribution amounts were not reported anywhere in the 2018 guide. Employees had to search for this information in online plan documentation.

The Decision Guides were not the only source of plan information employees had available. In all years, the benefits webpage included extensive information about each insurance carrier and provider networks available, but the side-by-side comparison tables from the Decision Guides were also featured in the webpages.

In 2018, a new interactive decision aid was introduced intended to assist with all benefit choices (e.g. retirement savings options, life insurance etc.). The decision aid was advertised on the organization's main pages as well as local establishment HR webpages and at benefits

seminars. It collects information about income, tax filing status, anticipated health expenditures, preferences for gatekeeping. After collecting this information, the decision aid displays a recommended plan and will explain the recommendation if the employee selects that option. In the explanation, the employee sees the employer contribution to the HSA for HDHP choices, estimated costs in a bar chart given the employee's answers to questions about anticipated health expenditures, and a "worst-case" cost scenario. The decision aid recommended the HDHP options to all employees and those who chose to see the explanation of this recommendation would see a graphical display of the plan's financial dominance (see Appendix for an example).

There was also an HDHP Questionnaire available to employees via a link in the plan design summary. Unlike the decision aid, the HDHP Questionnaire did not default to recommending the HDHP plan. It was structured as a series of yes/no questions that first determine eligibility for the HDHP plan, but then asked about preferences for use of an HSA with cautions against the HDHP option like:

> "Carefully consider whether to enroll in the High Deductible Health Plan (HDHP) plan design. If you are considering enrolling simply because of the low monthly premium cost, you might also want to consider the other health plan designs"

and:

> "… if you incur an expense of $1,500 in January but you have $500 in your HSA, you would need to wait until your account balance is at least $1,500 before submitting a claim using your HSA. Otherwise, you can pay for the expense out-of-pocket and submit a claim when the full amount is available in your HSA. (This is unlike the FSA, where the full amount you elected to contribute for the entire year is available on January 1.)"

Individuals are routed out of the questionnaire any time they decide the HDHP option is not right for them and click “no”. Those who continue to click “yes” see a final message:

> “To maximize the federal tax savings amount, plan participants need to invest time in monitoring contributions and keeping records of eligible expenses for IRS compliance. If you do not have time to invest, then the High Deductible Health Plan (HDHP) plan design that is paired with a Health Savings Account (HSA) may not be the right plan for you.”

The full sequence of questions is provided in the Appendix.

In summary, employees who sought information using the interactive decision aid were given clear recommendations to choose the HDHP option and shown a graphical display of the financial dominance of that option if they opted to see an explanation of that recommendation. Employees who relied on the Decision Guides saw similar side-by-side comparisons of plan premiums, cost-sharing, and benefits in each year but the location of information about employer contributions to HSAs was variable and language contained the qualifying statement “may contribute”. Also, plan comparison tables highlighted non-HDHP options as most popular. Finally, employees who read the online plan information in 2018 may have followed a link to the HDHP questionnaire which highlighted the risk of liquidity constraint early in the plan year under the HDHP plan option and implied managing an HSA would entail considerable time cost.

3. DATA

Our data come from two sources: the administrative employee benefit records and surveys conducted immediately following the 2016 and 2018 plan year Open Enrollment periods which occurred in October of 2015 and 2017. Surveys were distributed via email to all

employees using Qualtrics. The survey contained an informed consent statement requesting permission to link survey responses to administrative benefit records. Records for employees who did not begin the survey or who did not consent to participate or allow data linkage were not provided to us, but we do have aggregate counts of all employees enrolled in HDHP and non-HDHP plan options.

Figure 1 reports the counts of all employees who participated in our study in each survey wave. In total, we had 784 unique employees participate in the study across the two survey waves. This represents approximately 60 percent of all employees. The response rates in each of the two survey waves were 55 and 45 percent. Numbers of matched survey and administrative records vary by plan year because some respondents were new hires and others retired or resigned before the new plan year. 228 employees participated in the survey in both waves and were matched to plan choice information in all four years. This balanced panel is a point of reference throughout our analysis.

3.1.Contents of Administrative Employee Benefit Records

Our administrative data contain the plan choices employees made, including the insurance carrier and whether coverage was for single or family. This allows us to identify employees who held plans in 2017 with the carrier that was discontinued in 2018. The data also contain employee sex, age, exact salary, and classification which is an (imperfect) proxy for educational attainment and allows us to eliminate employees who are ineligible for the HDHP options due to employment classification. These data do not contain any information about health expenditures, tenure with the organization, qualifying life events that would have led to enrollment outside of the annual open enrollment period, or family structure apart from whether

coverage was chosen for single or family. The data also do not contain information about outside offers of insurance such as through a spouse, parent, Medicare, or Medicaid.

3.2 Summary of Survey Content

The survey collected information across six content areas: details about plan choice including whether employees actively elected or allowed default elections, information gathering activities during the decision process, measures of health insurance literacy, demographic information not captured in the administrative data, anticipated and actual health expenditures, and behavioral proxies for risk preferences and opportunity cost of time. Here we focus on the main measures used in the results presented. Figure 1 summarizes the timing of surveys and key content covered in each wave for each set of respondents.

As noted, the administrative data do not contain any information about spousal offers of insurance, marital status apart from coverage selected, or family composition. In the survey, we ask employees whether they are married or have a partner, whether they have children under the age of 25 and if so how many, and whether that spouse or partner is eligible for insurance coverage through another private source or under public programs. We also ask about the employee's own eligibility for Medicare or the state Medicaid program. In the analysis, we use this information to examine whether low enrollment in HDHP options can be explained by ineligibility for HDHP plan options. In the 2016 plan year survey, we attempted to collect more detailed information about spouse or partner insurance options by requesting the respondent to share partner contact information. This resulted in two few responses for analysis (26) and was not attempted again.

The administrative data contain salary information for employees, but those with spouses or partners may have additional household income. In the 2016 survey we asked respondents to

report their marginal tax rate, if they knew it. Those that did not know their marginal tax rate were asked to select their expected total taxable income for 2016 or their expected gross income if taxable was unknown. In each case respondents were presented with the brackets corresponding to their reported filing status (and expected number of exemptions for those that did not know their taxable income). In the 2018 survey, we simply asked respondents to provide the approximate percentage of employee's total household income attributable to their job. Options include less than 25%, 25% to less than 50%, 50% to less than 75%, 75% to less than 100%, and 100%. Employees who participated in the 2016 survey were asked the simplified question if they participated in the 2018 survey.

The survey also asked employees to provide information about their health expenditures. Employees were asked to provide a subjective rating of their own (or family's in the case of family coverage) health with response options Excellent, Very Good, Good, Fair, Poor, and to report the amount of total out-of-pocket medical expenses incurred so far in the current year not including premiums paid. Because individual and family deductibles are separate under the non-HDHP plan options, we also asked if any one member of the family is in poor health currently or is expected to need costly medical expenses in the coming plan year. Employees were asked to state the number of prescription medications filled in a typical month and the typical monthly cost of those medications. Finally, employees were asked whether they expected medical expenses in the coming plan year to be much lower, slightly lower, about the same, higher, or much higher than in the current year. Employees who participated in the 2016 plan year survey were asked to answer these same questions again for the 2018 plan year.

To assess health insurance literacy, the survey included three key measures. The first was a simple true or false question assessing if employees knew whether HSA funds are forfeited if

unspent. The second was a hypothetical scenario in which they recommended a plan choice for a friend from a simplified menu of two options under three different assumptions about their friend's expected health (Loewenstein et al. 2013). Like the actual menu of options employees faced, this menu included a dominant plan but dominance was not contingent upon an employer contribution to an HSA and the dominant plan was not branded "High Deductible". Employees were asked which plan was cheaper for their hypothetical plan and could also indicate "plans are equal". The third measure asked employees to identify the best value plan from the actual menu of plan options employees faced themselves for a hypothetical family when expecting low and when expecting high health expenditures. Employees who participated in the survey in both years only answered the HSA knowledge and hypothetical plan choice with the simplified menu in the 2016 plan year survey, but they answered the question using their actual plan choice menu in both surveys.

To complement the administrative plan choice information, the survey asked employees to indicate which plans they considered. Also, we asked employees whether they actively enrolled or allowed their choices from the prior year to carry forward by default (when possible). In the 2016 survey, we asked those who did not switch plans to indicate why. Response options included:

- I carefully researched and considered all options and I confirmed my current choice of health plan was the best option for next year as well.
- I was too busy and did not have enough time to research the options.
- There were too many choices and it was too complicated to figure out which option would have been better.
- I like my current plan and I wouldn't want to change.

- I’m certain I couldn’t save enough money for it to be worth my time to consider changing.
- I can’t afford to risk unexpected medical expenses.

Employees also indicated how much time they spent researching plans in hours and relative to the prior year, and which methods they used. In the 2018 plan year survey responses included the new interactive decision aid. Aside from this change, questions were identical across survey waves and employees who participated in both waves answered the questions twice.

3.3 Construction of Analytic Samples and Summary Statistics

Table 2 summarizes the characteristics of the pooled sample by plan year and the panel sample in 2018. All samples exclude employees who are ineligible for HDHP plans based on employment classification, which is reported in the administrative data. Employees who participated in Wave 2 were slightly more likely to be female and were 1 to nearly 2 years younger on average but received similar compensation as those participating in Wave 1. Panel cases were slightly older and better compensated but differences are practically small and statistically insignificant.

4. RESULTS

4.1 Are Choices Actually Suboptimal?

Although the HDHP options are financially dominant there are several reasons why employees may still find non-HDHP plans to be optimal. Only 19.3 percent of all employees were enrolled in a high deductible plan by plan year 2018, as shown in the first row of Table 3, but some enrollment in non-HDHP plans could be due to ineligibility. The IRS considers anyone covered by another non-HDHP health plan to be ineligible for an HSA. This includes persons whose partner has individual coverage through his or her employer with a flexible spending

account (FSA) because the FSA could be used pay for both partners' health expenses. Marital and partnership status is not included in the aggregate or the administrative plan choice data but was collected in the surveys along with whether or not the employee's spouse or partner has an outside offer of insurance. Comparing the rates of HDHP enrollment to enrollment of all married or partnered employees and to married or partnered employees whose partners have an outside offer of insurance across the rows of Table 3 indicates ineligibility does not explain low HDHP enrollment. Married or partnered employees are more likely to enroll in a HDHP than single employees in all plan years, and those with an outside offer of insurance coverage are at least as likely as those without.

Researching plans, actively electing during open enrollment, and adapting to any differences in the patient experience under a new plan carry time costs and reduce utility. It is possible employees found the saving associated with switching to an HDHP too small to overcome these switching costs. Figure 2 plots the savings to choosing HDHP for single coverage. The savings is always positive but for those with health expenses above $1,500 it is only $273. Above $11,500 in expenses, the savings falls to $148. These calculations do not incorporate the investment value of funds left in the HSA at the end of the year or the tax savings or investment value and tax savings associated with own contributions to the HSA, so they underestimate the value of the HDHP option. In the survey, employees were asked to report their out-of-pocket medical expenditures to date. Figure 2 contains a histogram of those expenditures for 2015 among single persons, matched for comparison to the estimated savings from electing HDHP coverage. While approximately 30% of single employees reported expenditures in a range consistent with more than $273 in savings, 60% experience expenditures that would drive savings down to $273. If this savings was not sufficient to overcome any disutility from plan

changes then perhaps choice persistence is rational. However, in the 2016 survey 80 percent of employees said they would prefer to receive $40 cash over one hour of free time. Also, only 6 percent of employees who remained in non-HDHP plans said they were certain the savings associated with switching would not be worth their time to consider changing.

In summary, the high rate of non-HDHP elections does appear to reflect sub-optimal choices. Although some employees may have been ineligible to enroll in HDHP plans, the patterns in enrollment across partnered and single employees do not indicate eligibility was a key driver of low HDHP enrollment. Self-reported out-of-pocket expenses suggest most employees had total expenses that would lead to at least a $273 savings if they switched to a HDHP and 80 percent of employees indicated they valued their free time at less than $40 per hour and very few employees reported lack of savings was the primary reason they remained in a non-HDHP plan.

4.2 Why did Employees Remain in Non-HDHP Plans?

In 2016, 66 percent of employees stayed in the same non-HDHP plan they had in 2015. In 2018, 40 percent stayed. Table 3 summarizes the explanations these employees gave when asked the main reason for staying in their plan. As mentioned above, very few employees said the anticipated savings was too small. Only 10 (8.4) percent of employees said they were too busy to research plans in 2016 (2018). Also, the percentages of employees who said they stayed because they couldn't afford to risk unexpected medical expenses were 12.8 percent in 2016 and 9.7 in 2018, which indicates preferences for higher premiums with certainty to reduce uncertainty in out-of-pocket costs are unlikely to explain low enrollment in HDHP options.

Instead, self-reported explanations point to lack of health plan literacy and inertia as the top explanations for remaining in non-HDHP plans. In both years approximately one-third of employees stated they had carefully researched their plans and confirmed their current plan was

best for them. Another 32 percent in 2016 and 43 percent in 2018 choose "I like my current plan and I wouldn't want to change."

Using the discontinuation of one plan in the 2018 plan year, we test whether those who must actively elect new coverage were more likely to choose HDHP options, which would be indicative of inertia. Table 4 contains difference-in-differences (DD) estimates comparing 2017 and 2018 plan choices among employees whose plans were discontinued and employees whose plans were not. All estimates are positive, meaning those whose plans were discontinued had a larger increase in HDHP enrollment from 2017 to 2018 than those whose plans were not, but the estimates are small and too imprecisely measured to rule out no or negative differences. Even at the upper bound, these estimate suggest inertia is unlikely to be a key driver of the low enrollment in HDHP options. However, because there were options still available that offered the same financial structure as their discontinued plan and access to the same provider network with a different carrier, it is possible employees exerted little effort when their plans were discontinued and did not even consider the HDHP options.

Table 5 contains DD estimates of self-reported *consideration* of HDHP options. Estimates here are negative. Fewer employees overall considered HDHP options in 2018 than in 2017 but the reduction was even larger among those whose 2017 plan was no longer offered in 2018. However, this estimate is also small and statistically insignificant. Conditional upon considering the HDHP options, the rate of enrollment was only 60 percent for both groups of employees in 2018. In Table 6, we examine self-reported time spent researching plans and information sources in 2016 and 2018. On average, those whose plans were discontinued reported spending more time researching 2018 choices than those who could default enroll in their 2017 plan for 2018. Also the share of employees in discontinued plans who spent over an

hour researching 2018 plans was larger than the share of all employees who spent over an hour researching plans when the HDHP options first became financially dominant in 2016. Over 90 percent of employees in discontinued plans read websites, which likely included reading the Decision Guides, but this was also the most popular source of information among employees who had a default. Employees in discontinued plans were nearly twice as likely to use the new Interactive Decision Aid as those with a default. However, as shown in Table 7, use of this tool was not associated with an increased probability of enrolling in the HDHP options among those whose plans were discontinued.

In summary, we find little support for inertia as an explanation for persistent enrollment in the non-HDHP when using the discontinuation of a popular plan in 2018. Those in discontinued plans did say they spent more time researching 2018 plan options than employees whose plans were not discontinued, and they were also more likely to use the Interactive Decision Aid which gave a clear recommendation to enroll in the HDHP option. However, employees in the discontinued plan were no more likely to consider the HDHP options for 2018 and use of the Interactive Decision Aid was not associated with an increase in HDHP enrollment for this group.

4.3 Do Employees Understand Their Options?

The foregoing analysis indicates persistent enrollment in the non-HDHP plans is unlikely to be optimal or explained by inertia. Employees who had to actively elect in 2018 did report higher levels of time investment in plan research but this investment did not translate to higher rates of HDHP enrollment. One possible explanation may be employees do not understand the plan features. To investigate this possibility, we display enrollment rates and shares of employees who said they considered HDHP options by performance on our health literacy

questions. As explained, employees first answered a series of three questions about optimal plan choice in a simplified choice with a financially dominant plan but where, unlike their actual choices, neither plan was labeled high deductible, and there was no HSA or employer contribution to consider. To ascertain understanding of HSAs, employees answered one true-false question about whether funds in HSAs expire at the end of the plan year (they do not). And finally employees were asked to recommend a plan from their actual choice set for a family expecting low health expenditures and a family expecting high health expenditures. All questions were asked in both survey waves, but those who participated in Wave 1 answered only the questions about the best choice for a family expecting low and high health in Wave 2.

Figure 3 displays the enrollment rates and shares who considered HDHP options by plan year, number of questions in the simplified choice menu correct, and whether they answered the HSA true-false question correctly. There is little association between number of questions correct in the simplified choice menu and HDHP enrollment or consideration unless the employee also answered the HSA question correctly. However, even among employees who answered all questions correctly, the HDHP enrollment rate in 2018 was only 40 percent, and only 60 percent said they considered the HDHP option.

In Figure 4, we again display enrollment rates and shares who considered HDHP options by number of questions correct in the simplified choice menu, but this time we produce separate series for employees who said their HDHP plan option would never be optimal for a family whether healthy or sick, only optimal if healthy, and optimal regardless of health (i.e. dominant). Here there do not appear to be any systematic patterns in enrollment or consideration of HDHP options by questions answered correctly in the simplified choice menu, but there is a very large difference in both enrollment and consideration in 2016 between employees who said the HDHP

option was best for a family regardless of health expenditures. Among employees who knew the HDHP option in their own choice set was optimal, enrollment rates were about the same whether they recognized the dominant plan in the simplified choice menu or not. This suggests they may have learned the HDHP plan in their choice set was best but not understood why or had the skill set needed to identify dominant plans in other menus. Also, by 2018, the enrollment rates for those who recognized the dominant plan in both settings fell dramatically from 2016 levels. However, as shown in Table 3, actual rates of enrollment in HDHP options did increase. So, this shift reflects an increase in the number of employees who could identify dominance in one or both scenarios but still did not enroll in the HDHP option.

4.4. Are Errors in Choices Regressive?

Figure 4 plots choice rates by employee's marginal tax rates collected in Wave 1 and also displays rates of correct answers on each health literacy measure. Although the share of employees who chose an HDHP plan was highest in the top tax bracket, the differences across brackets are small and statistically insignificant. Interestingly, there do not appear to be systematic patterns in health plan knowledge by income level either. It is possible that, despite the detailed battery of questions used to elicit household marginal tax rates, there is measurement error. Figure 5 takes the administrative salary data for Wave 2 where we asked what percentage of household income the employee's earnings represent and restricts the sample to only earners whose salary comprises 75% of total household income or more. Again, we find little evidence of regressive errors in choices, but some evidence of differences in health plan literacy by earnings. However, these displays are based on very small samples.

5. CONCLUSIONS AND DISCUSSION

Based on analysis of employee health plan choices in a menu with dominated options matched to self-reported measures of risk preferences, plan consideration, effort exerted to understand plan options, and health literacy, we find substantial evidence of suboptimal decision-making. Persistent enrollment in dominated plan options does not appear to be due to ineligibility, rational preferences to trade off higher premiums for more predictable out-of-pocket expenditures, or switching costs. Examining choices of employees who were required to actively elect coverage when their plan was discontinued, we do not find compelling evidence of inertia despite finding these employees invested more time in researching plan options.

Our analysis of the relationship between choices and employee health literacy and self-education efforts casts doubt on the efficacy of strategies to educate the consumer or offer decision aids to improve choice. Employees who could recognize a dominant plan in a simplified choice set where consideration of HSAs was not necessary were more likely to actually enroll in their own dominant plan but only if they also understood that HSA funds did not expire at the end of the plan year. This suggests HSA knowledge combined with basic understanding of premiums and deductibles both influenced choices in this setting, which is sensible because plan dominance hinged upon an employer HSA contribution. However, even among employees who understood HSA contributions do roll over from year to year and who correctly identified the dominant plan in a simplified choice set, only 40 percent were enrolled in the dominant plan by the end of the study period.

Whereas other studies have suggested decision aids may improve choice, our analysis of the Interactive Decision Aid introduce in 2018 indicates it did not succeed in improving choice despite a clear recommendation with a simple visual comparison of expenses to illustrate plan dominance. Also, only 34 percent of all employees, and 46 percent of those who had to actively

elect coverage for 2018, actually used the decision aid even though 47% percent of employees reported spending over one hour researching plan options and 22% percent spend three hours or more.

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Tables and Figures

Table 1 Summary of Plan Options by Plan Year

	2015	2016	2017	2018
Single: Non HDHP				
Annual Employee Premium Cost	1,104	1,032	1,056	1,056
Deductible	0	250	250	250
Single: HDHP				
Annual Employee Premium Cost	384	384	396	396
Deductible	0	1,500	1,500	1,500
Employer HSA Contribution	170	750	750	750
Family: Non HDHP				
Annual Employee Premium Cost	2,760	2,604	2,628	2,628
Deductible	0	500	500	500
Family: HDHP				
Annual Employee Premium Cost	972	972	984	984
Deductible	0	3,000	3,000	3,000
Employer HSA Contribution	340	1,500	1,500	1,500

Notes: Coinsurance was 90/10 under all plans after the deductible was met. Identical provider networks and insurance carriers were available under both Non-HDHP and HDHP options. All plans include dental.

Figure 1 Overview of Data Sources, Key Measures, Analytic Sample Construction and Sample Sizes

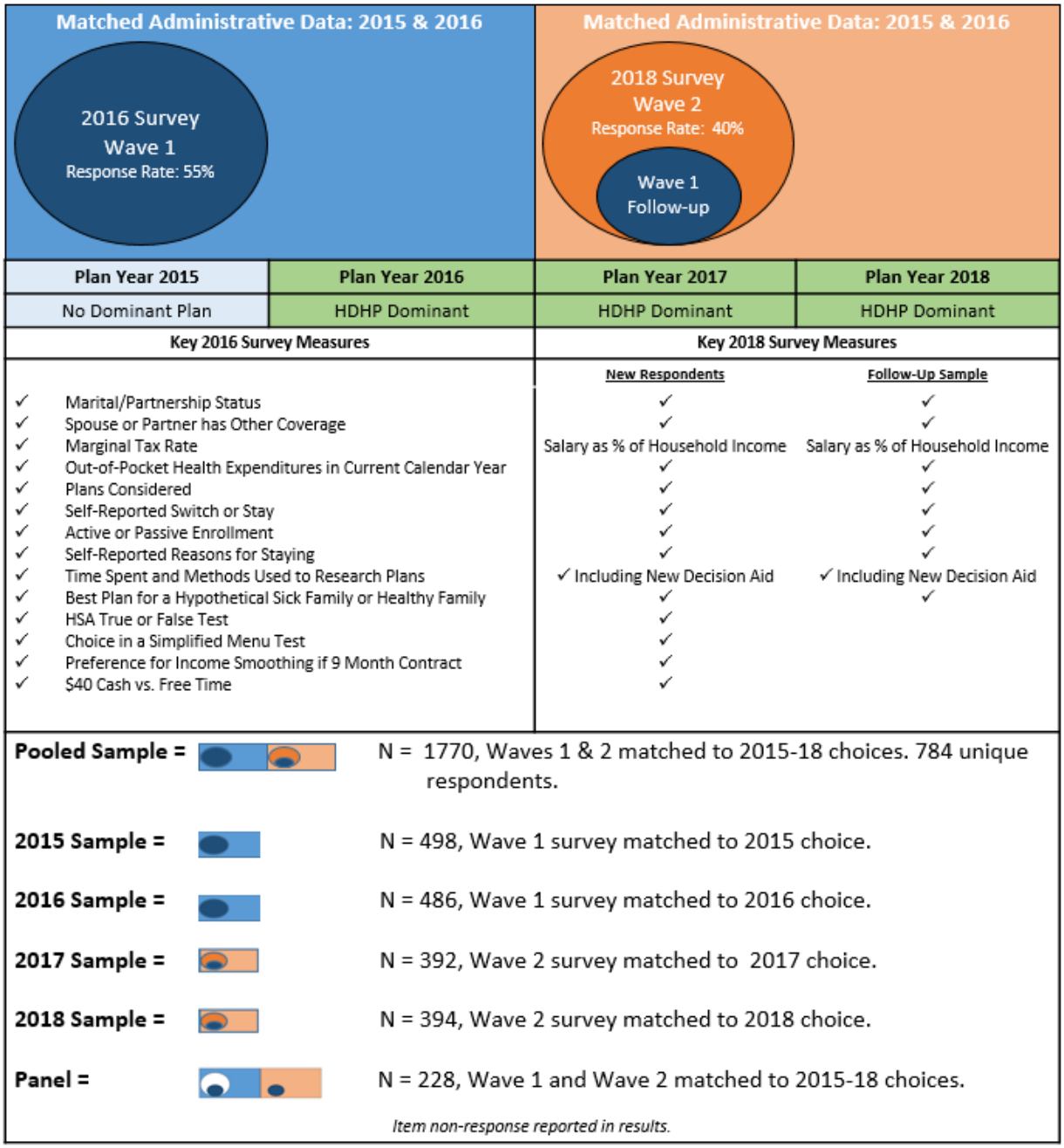


Table 2 Summary of Respondent Characteristics by Analytic Sample

	2015	2016	2017	2018	Panel, in 2018
Male	41.6%	41.8%	38.8%	38.6%	38.9%
Average Age	47.1	46.8	45.5	45.4	47.6
(StDev)	(11.3)	(11.2)	(10.7)	(10.7)	(9.8)
Average Salary*	$55,185	$56,233	$56,305	n/a	$57,620
(StDev)	($23,559)	($23,978)	($20,971)		($20,785)
N	498	486	392	394	228

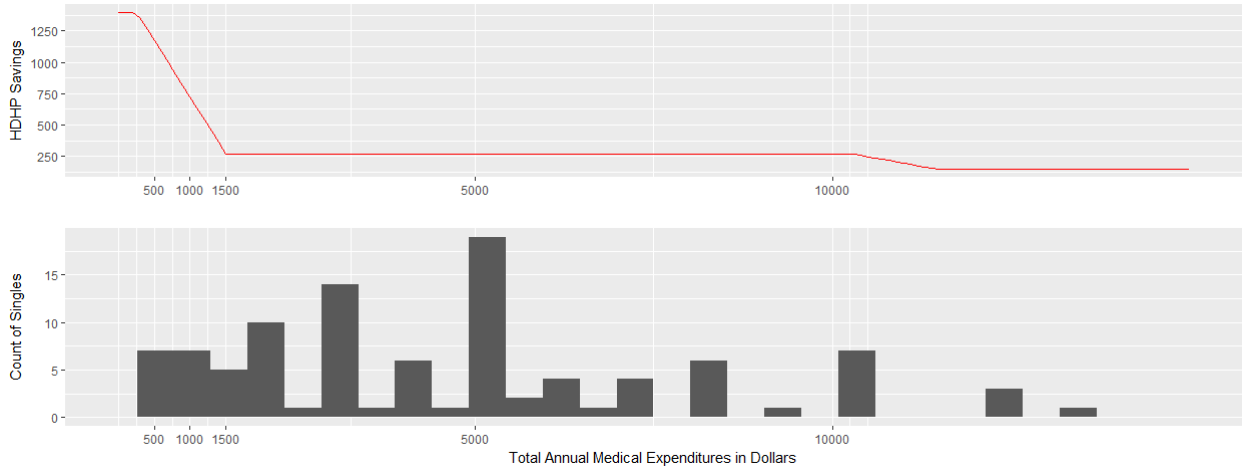
*****Salary information is missing for 4 employees in 2015 and 24 in 2016. 2018 salaries were not included in the administrative data because data were collected in 2017. 2017 salaries are reported for panel cases.

Table 3 Distribution of Plan Choices by Year, Sample, and Proxies for Eligibility

	2015	2016	2017	2018
All Employees, Aggregate Data				
Non-HDHP	1,023	911	834	811
HDHP	18 (1.7%)	114 (11.1%)	156 (18.7%)	194 (19.3%)
N	1,041	1,025	990	1,005
Pooled Sample				
Non-HDHP	489	403	296	277
HDHP	9 (1.8%)	83 (17.1%)	96 (24.5%)	117 (29.7%)
N	498	486	392	394
Single				
Non-HDHP	192	158	119	111
HDHP	3 (1.5%)	26 (14.1%)	25 (17.4%)	32 (22.4%)
N	195	184	144	143
Married/Partnered				
Non-HDHP	297	245	169	166
HDHP	6 (2.0%)	57 (18.9%)	71 (31.9%)	85 (33.9%)
N	303	302	248	251
Partner Has Other Offer				
Non-HDHP	164	137	103	95
HDHP	5 (3.0%)	33 (19.4%)	40 (38.8%)	48 (33.6%)
N	169	170	143	143
Panel				
Non-HDHP	223	173	162	152
HDHP	5 (2.2%)	54 (23.7%)	64 (28.1%)	74 (32.5%)
Opt Out	n/a	1	2	2
N	228	228	228	228

Note: Marital status in 2015 and 2017 are imputed from 2016 and 2018 survey data. Counts exclude employees who opted out in all but the Panel Sample but in the Pooled Administrative sample only 4 opted out in 2016, 9 in 2017, and 10 in 2018. Partner's other offers include private insurance through an employer or parent. If these other offers include a flexible spending account (FSA) the employee would be ineligible for HDHP options.

Figure 2 Distribution of Imputed Health Expenditures in Relation to HDHP Savings



Note: The top graph plots the dollar savings for singles from enrollment in the HDHP versus the non HDHP at different levels of Total Annual Medical Expenditures (non-pharma). The bottom graph is a histogram of the actual out of pocket expenses of singles in 2015 as reported in the survey. In 2015 there was no deductible, and the coinsurance was 90/10. The survey was completed on average in the middle of November so 4% was added to the respondents' estimates.

Table 3 Self-Reported Reasons for Remaining in Non-HDHP, 2016 and 2018

Main Reason for Staying in Plan:	2016	2018	2018 Panel
"I carefully researched and considered all options and I confirmed my current choice of health plan was the best option for next year as well."	35.3%	28.4%	23.8%
"I was too busy and did not have enough time to research the options."	10.0%	8.4%	11.1%
"There were too many choices and it was too complicated to figure out which option would have been better."	4.4%	5.2%	9.5%
"I like my current plan and I wouldn't want to change."	31.9%	42.6%	38.1%
"I'm certain I couldn't save enough money for it to be worth my time to consider changing."	5.6%	5.8%	7.9%
"I can't afford to risk unexpected medical expenses."	12.8%	9.7%	9.5%
Total Stayed in Non-HDHP & Responded	320	155	63
Newly Enrolled Non-HDHP or Switched Non-HDHP Plans (Valid Non Response)	6.7%	23.8%	21.6%
Non Response	13.7%	20.2%	24.1%
Total in Stayed Non-HDHP	403	277	116

Table 4 Difference-in-Differences (DD) Estimate of Inertia in Plan Choices

	2017	2018	Column Difference
Plan Discontinued N = 155	20.6%	29.0%	8.4
Control N = 248	25.0%	28.6%	3.6
Row Difference	-4.4	0.4	DD: 4.8 (6.4) DD Probit: 4.8 (6.3) DD Probit, Adjusted: 5.2 (6.3)
			N = 776

Note: Analytic sample includes all employees in both the 2017 and 2018 Samples. Cells contain the percentage of each group selecting an HDHP plan option and differences reported in the perimeter of the table are in percentage points. Probit estimates are reported as marginal effects. The adjusted estimate controls for gender second order polynomials in salary and age. The average of the dependent variable is 26.1%. Standard errors for each DD estimate are reported in parentheses. None of the DD estimates are statistically significantly different from 0 at conventional confidence levels.

Table 5 Difference-in-Differences (DD) Estimate of Inertia in Plan Consideration, Panel

	Wave 1 2016 Plan Choice	Wave 2 2018 Plan Choice	Column Difference
Plan Discontinued N = 188	63.7%	56.1%	-7.6
Control N = 238	55.7%	45.9%	-9.8
Row Difference	8.0	10.2	DD: 2.2 (9.8) DD Probit: 2.2 (9.8) DD Probit, Adjusted: 1.4 (9.6) N = 426

Note: Analytic sample is the balanced panel. Cells contain the percentage of each group considering any HDHP plan option in the Wave 1 survey and Wave 2 Survey and differences reported in the perimeter of the table are in percentage points. Probit estimates are reported as marginal effects. The adjusted estimate controls for gender second order polynomials in salary and age. The average of the dependent variable is 54.2%. Standard errors for each DD estimate are reported in parentheses. None of the DD estimates are statistically significantly different from 0 at conventional confidence levels.

Table 6 Changes in Time Allocated to Plan Research and Methods Used

	Wave 1	Wave 2 Had a Default Option	Wave 2 Plan Discontinued
Pooled			
Time Spent < 1 Hour	23.4%	37.3%	15.7%
Time Spent 1-2 Hours	42.5%	41.5%	59.3%
Time Spent 3+ Hours	34.1%	21.2%	25%
More Time than Prior Year	61.3%	20.8%	52.1%
Read Websites	74.6%	74.6%	91.4%
Attended Seminars or Webinars	86.2%	43.9%	54.2%
Talked to Colleagues	55.0%	43.6%	56.4%
Used Interactive Decision Aid	n/a	25.4%	45.7%
N, Complete Responses	496	236	140
% Non Response 1 or more items	14.0%	16.0%	9.7%
Panel			
Time Spent < 1 Hour	18.0%	35.5%	17.7%
Time Spent 1-2 Hours	40.8%	49.1%	60.0%
Time Spent 3+ Hours	41.3%	15.5%	22.4%
More Time than Prior Year	71.8%	21.8%	50.6%
Read Websites	81.6%	74.5%	94.1%
Attended Seminars or Webinars	97.5%	36.2%	55.2%
Talked to Colleagues	58.3%	42.7%	58.8%
Used Interactive Decision Aid	n/a	29.1%	47.1%
N, Complete Responses	206	110	85
%, Non Response 1 or more items	9.6%	20.3%	5.6%

Table 7 Efficacy of Time Spent and Methods Used to Research Plans

	(1)	(2)	(3)	(4)	(5)
Time Spent 1-2 Hours	0.056	0.035	0.080	0.041	0.051
	[0.040]	[0.051]	[0.063]	[0.063]	[0.064]
Time Spent 3+ Hours	0.191***	0.260***	0.064	-0.001	0.000
	[0.047]	[0.059]	[0.077]	[0.079]	[0.079]
Attendance at Seminar	-0.020	0.002	-0.069	-0.077	-0.072
	[0.032]	[0.039]	[0.054]	[0.053]	[0.053]
Viewing Web Seminar	0.046	0.040	0.032	-0.002	0.001
	[0..038]	[0.040]	[0.077]	[0.077]	[0.077]
Reading Websites	0.049	0.020	0.074	0.091	0.119*
	[0.40]	[0.046]	[0.069]	[0.068]	[0.069]
Talking to Colleagues	0.041	0.041	0.062	0.056	0.063
	[0.032]	[0.038]	[0.053]	[0.052]	[0.053]
Emails from HR	-0.044	-0.021	-0.083	-0.076	-0.072
	[0.031]	[0.038]	[0.052]	[0.052]	[0.052]
Interactive Tool				0.178***	0.247***
				[0.056]	[0.077]
Plan Discontinued					-0.069
					[0.068]
Interactive Tool * Plan Dis.					-0.105
					[0.110]
2018	0.166***				
	[0.032]				
Constant	0.053	0.038	0.242***	0.207***	0.196***
	[0.045]	[0.049	[0.071]	[0.071]	[0.072]
Observations	770	427	343	343	343
R-squared	0.071	0.107	0.025	0.054	0.068

(1) Pooled sample.
(2) Wave 1 only.
(3) Wave 2 only.
(4) Wave 2 only, adding use of Interactive Tool.
(5) Wave 2 only, comparing effect of Interactive Tool by forced active enrollment because plan was discontinued and available default to prior year's plan.

Figure 3a Relationship between Choices and Health Literacy

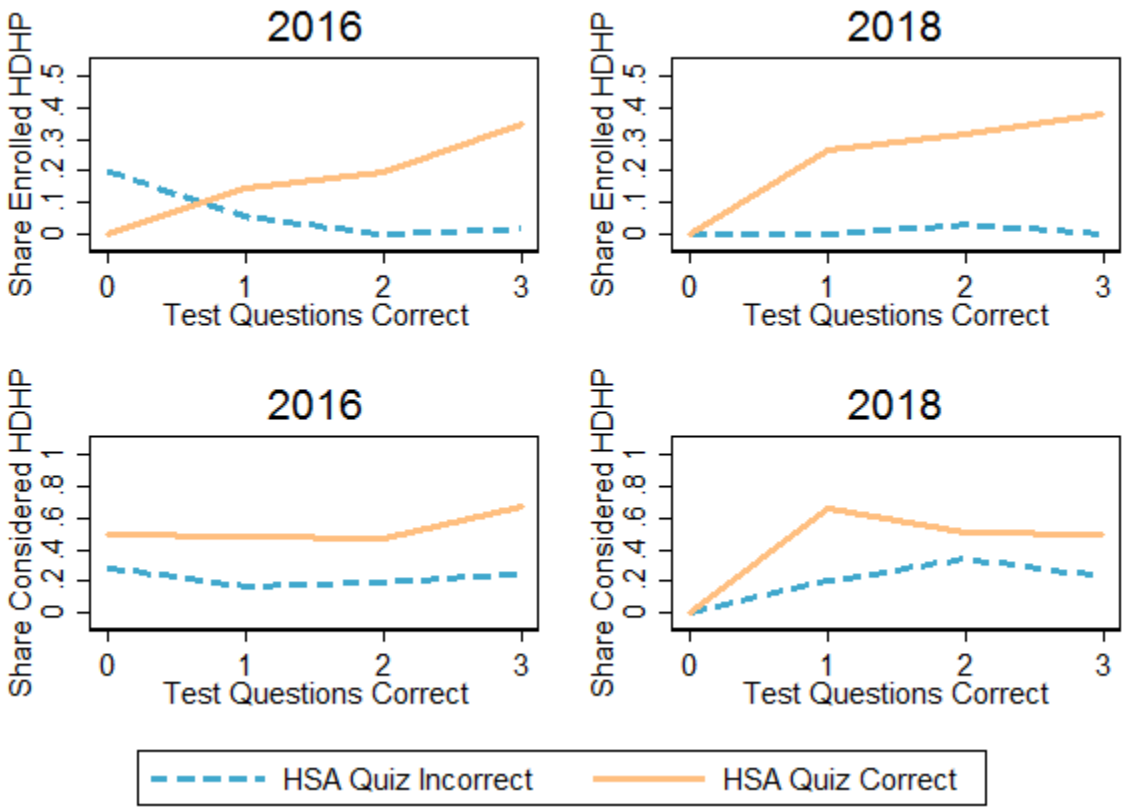


Figure 3b Relationship between Choices and Health Literacy

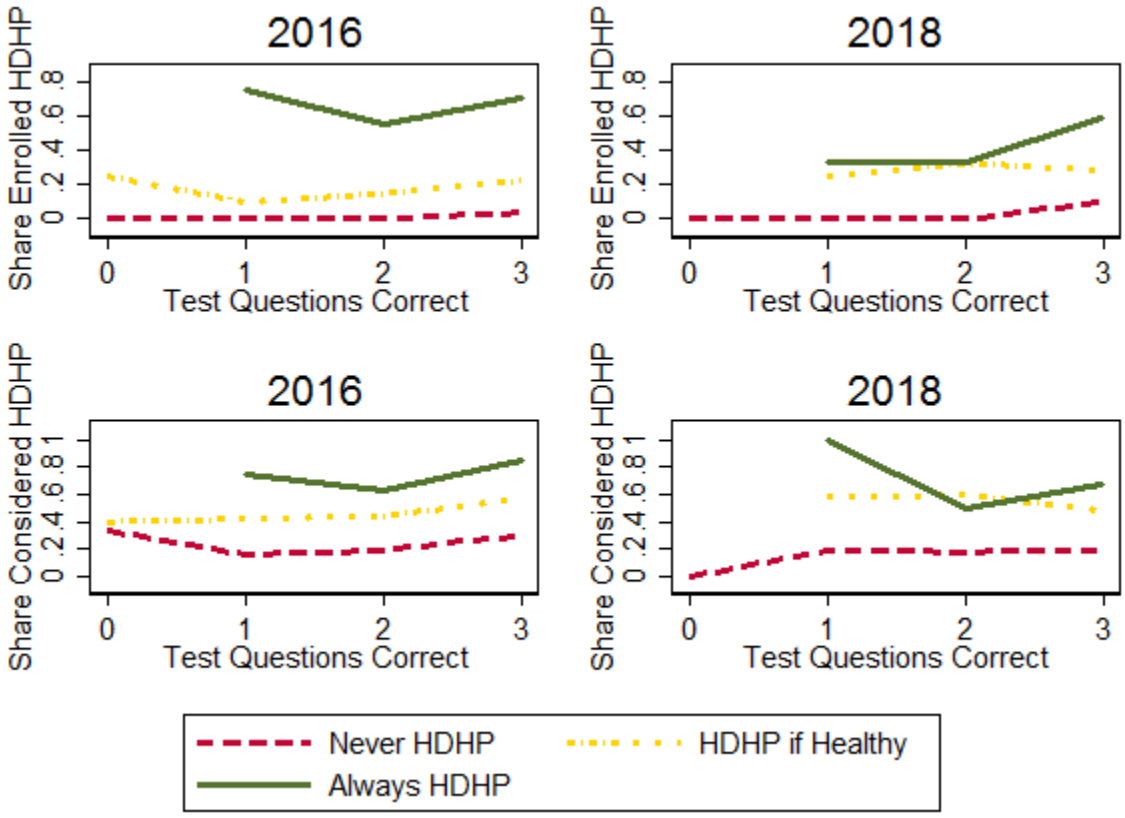


Figure 4 Relationship between Earnings Level, HDHP Choice, and Literacy

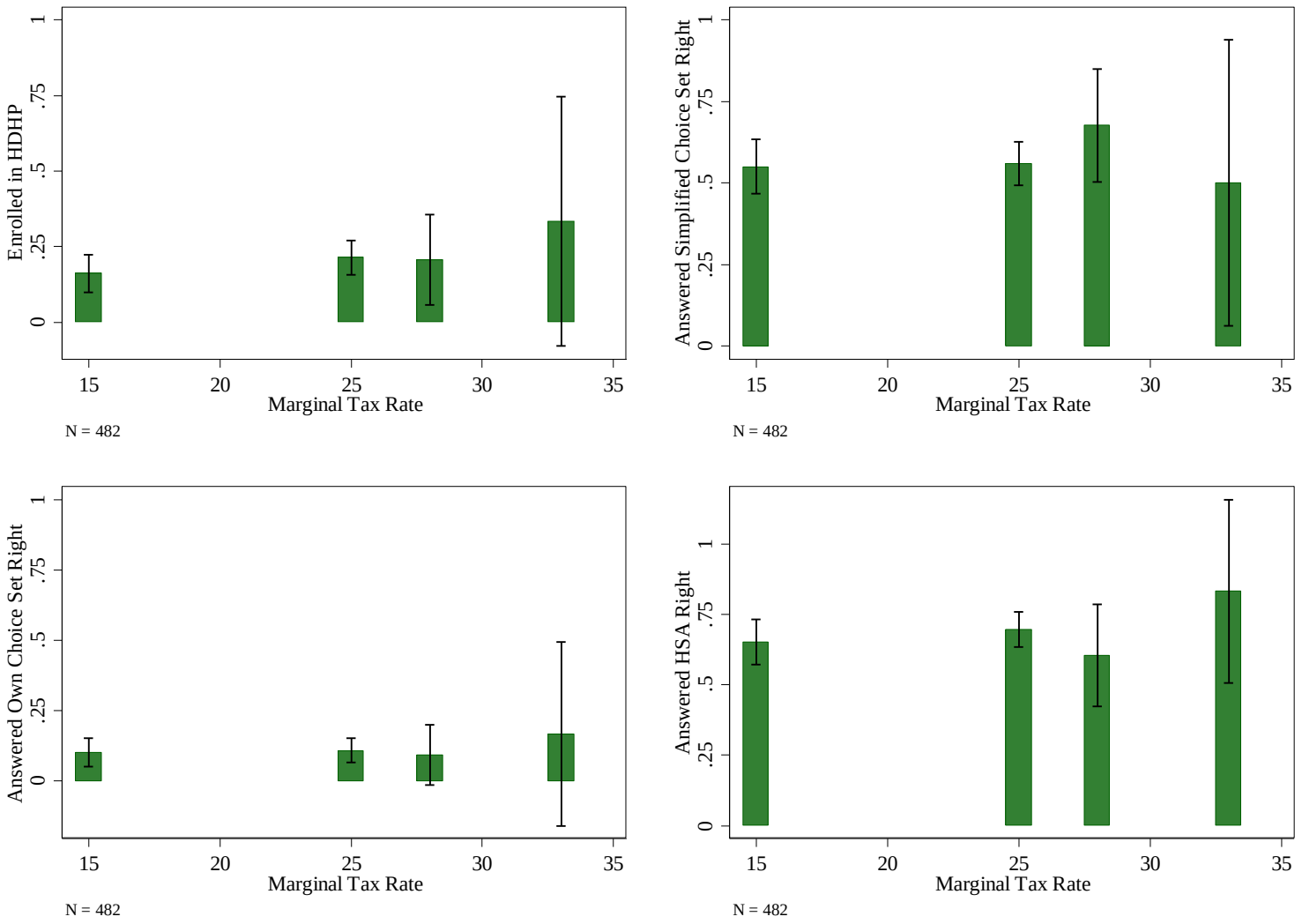
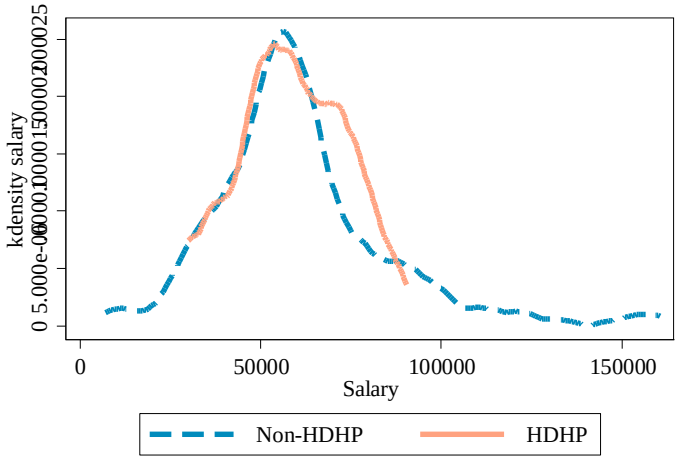
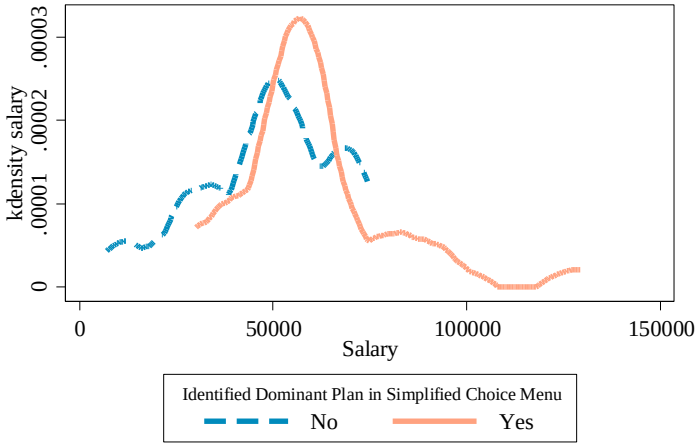


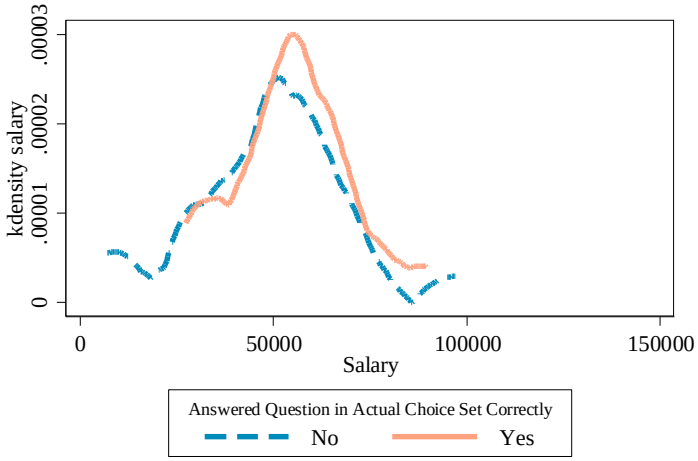
Figure 5 Relationship between Salary, HDHP Choice, and Literacy for Primary Earners



Primary Earners Only, N = 161



Primary Earners Only, N = 63



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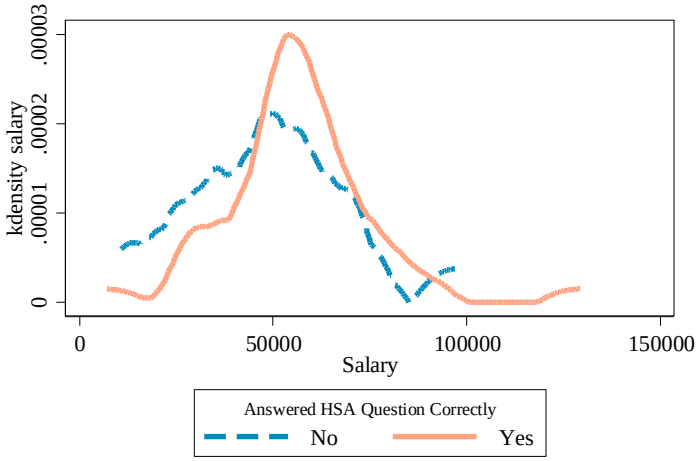

Primary Earners Only, N = 63