The Impact of Decision Aids on Health Insurance Selection

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Abstract

Consumers frequently make suboptimal health insurance choices despite facing stakes exceeding thousands of dollars annually. We use a randomized field experiment with public university employees during open enrollment to evaluate whether decision aids that clarify these financial consequences affect enrollment patterns. The setting features a high-deductible plan that dominates the alternative for all workers regardless of health spending, with typical annual savings of around $2,000. We find that decision aids improve cost recognition by 22 percentage points. Yet they increase intended enrollment in the high-deductible plan by 6 percentage points and actual enrollment by only 2 percentage points, revealing substantial attenuation from understanding to behavior. Survey responses reveal that concerns about managing a health savings account, aversion to out-of-pocket costs, and reluctance to change from familiar plans limit the translation into enrollment. Treatment effects are largest among workers with limited prior plan engagement and vary substantially by liquidity constraints.

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1 Introduction

Health insurance plan choice can shift household spending by hundreds or thousands of dollars annually, yet consumers frequently select plans that cost them more than necessary. Consumers struggle to translate premiums, deductibles, coinsurance, and out-of-pocket limits into expected costs, and their choices are sensitive to how plan information is presented (Johnson et al., 2013; Loewenstein et al., 2013; Bhargava, Loewenstein and Sydnor, 2017; Handel et al., 2024). Across markets, consumers often select financially dominated plans and fail to minimize total expected costs, leaving substantial savings on the table even with repeated enrollment opportunities (Abaluck and Gruber, 2016; Bhargava, Loewenstein and Sydnor, 2017; Liu and Sydnor, 2022).

One contributor to these patterns may be how plan information is communicated, typically through feature tables that list premiums and cost-sharing rules. Enrollees must then translate these plan details into expected costs on their own, a task that requires projecting future health needs and understanding how plan features interact to determine out-of-pocket spending. Motivated by this mapping problem, a growing literature tests decision aids that present consequence information more directly, such as projected costs under different health scenarios, and finds improvements in choice quality in a controlled laboratory and survey settings (Gutierrez, 2024; Quiroga Gutierrez and Boes, 2024; Samek and Sydnor, 2025). It remains unclear, however, whether these gains carry over to actual enrollment decisions, where attention constraints, inertia, and hassle costs also shape choices (Ericson, 2014; Handel, 2013; Strombom, Buchmueller and Feldstein, 2002).

This study evaluates the impact of decision aids on health insurance choices during actual open enrollment. The setting involves public university employees choosing between two health plan options: a traditional plan (non-HDHP) with lower deductibles and higher premiums, and a high-deductible health plan (HDHP) with higher deductibles but lower premiums. The two plans offer identical provider networks and covered benefits, differing only in their cost-sharing structure. Because of substantial premium savings and a large employer contribution to employees' Health Savings Accounts (HSAs), the HDHP is financially dominant, minimizing total annual spending for all employees regardless of their health care utilization. Given this financial dominance, not selecting the HDHP likely reflects either information barriers and enrollment frictions or strong liquidity constraints (Ericson and Sydnor, forthcoming).

To evaluate these decision aids, we randomly assigned participants to view either standard plan comparison tables or one of two treatments: a video explaining the financial tradeoffs between plans (including the HDHP's cost advantage) and HSA features, and a comprehensive treatment combining the video with personalized cost projections based on individual risk factors. After viewing their assigned treatment, participants answered survey questions measuring their understanding of plan costs and HSA features as well as their intended plan choice. The experiment was conducted a few days before the enrollment period opened, and survey responses were linked with administrative enrollment records, making it possible to examine impacts on actual enrollment decisions as well.

Consistent with information barriers playing a key role, the decision aids substantially improved participants' understanding of the high-deductible plan's financial advantage. Recognition of the HDHP's cost advantage rose from 41% in control to 50% with video and 63% with video plus cost projections. The treatments also significantly improved understanding of HSAs. This was essential because generous employer contributions to these accounts generated the bulk of the HDHP's financial advantage. While these treatment effects on understanding were large, despite a fairly intensive and pointed intervention, our more robust decision-aid treatment still left 37% of subjects misunderstanding the cost comparisons between plans. This speaks to the fundamental challenges of overcoming low insurance literacy and the complexity of health plan selection.

The gains in understanding, however, translated into only modest changes in enrollment behavior. Intended HDHP enrollment increased from 41% in control to 42% with video and 47% with cost projections, a 6 percentage point increase for the most comprehensive treatment. Actual HDHP enrollment, however, rose by just 2 percentage points, one-third the effect on stated intentions. This modest response is striking given that employees who select the traditional plan forgo average expected annual savings exceeding $2,000.

Treatment effects also varied systematically by employee characteristics.[1] Effects on intended enrollment were largest among workers with limited prior plan engagement and lower baseline confidence, those least informed about plan options. At the same time, liquidity-constrained employees showed negative treatment effects, becoming less likely to enroll after learning about upfront deductible costs.

These patterns suggest that modest enrollment effects reflect not simply information failures but preference shaped by liquidity constraints and payment structure. Prior work shows payment timing matters when liquidity constraints bind, even with identical total expected costs (Gross, Layton and Prinz, 2022; Ericson and Sydnor, forthcoming). Consumers also treat actuarially equivalent financial structures differently, responding to rebates and deductibles as distinct instruments (Remmerswaal et al., 2019), and hassle costs can override financial incentives (Handel and Kolstad, 2015). In this light, modest enrollment effects despite improved understanding may reflect not only information failures but rational responses to liquidity constraints and the real costs of managing upfront out-of-pocket spending. These patterns align with prior findings that liquidity-constrained individuals are willing to pay high costs to avoid large out-of-pocket shocks (Ericson and Sydnor, forthcoming) and that higher income and education predict selection of cost-minimizing plans (Handel et al., 2024). Even interventions that standardize plan options to facilitate comparison generate only partial improvements in choice quality (Ericson and Starc, 2016).

Beyond heterogeneity in treatment effects, survey responses reveal which specific frictions constrained enrollment. Analysis of open-ended responses, categorized using generative AI, reveals that while enrollment changed modestly, the nature of participants' stated reasons shifted sub-

[1] Due to privacy limitations in our administrative data match, we can conduct this heterogeneity analysis only using survey data, not administrative enrollment records, and hence focus on intended rather than actual enrollment.

stantially. In the control group, a large share of those selecting the lower-deductible plan cited simply their high expected utilization as the reason, consistent with simple heuristic choice. With cost projections, however, such reasoning fell significantly but was replaced with concerns about managing out-of-pocket costs. This shift reveals strong aversion to upfront out-of-pocket costs as the primary barrier, consistent with evidence that payment timing and structure matter beyond total expected spending. Employees were unwilling to accept high deductibles even when they understood that the HDHP minimized total expected costs. Secondary concerns included managing HSAs and reluctance to switch from familiar plans.

Our study makes three contributions by examining decision aid effectiveness in actual open enrollment with a financially dominant plan option. First, prior work often evaluates decision aids in laboratory or hypothetical-choice settings (Bhargava, Loewenstein and Sydnor, 2017; Samek and Sydnor, 2025). In Medicare Part D, information interventions have provided beneficiaries with personalized cost estimates (Kling et al., 2012). Other work uses algorithmic recommendations to guide plan selection in Medicare markets (Bundorf et al., 2019; Gruber et al., 2020). We provide the first test of decision aids in actual enrollment for employer-sponsored insurance, enabling us to track treatment effects from understanding to realized choices. Additionally, the financial dominance of one plan allows us to isolate information barriers and behavioral frictions. Second, we document a substantial gap between improved understanding and enrollment decisions that reveals preferences beyond simple cost minimization. This stands in contrast to laboratory experiments by Samek and Sydnor (2025), where similar cost-comparison decision aids significantly reduced suboptimal choices. This pattern suggests that real-world enrollment decisions reflect genuine preferences beyond total expected costs rather than simply information failures, consistent with evidence that liquidity constraints, aversion to out-of-pocket exposure, and hassle costs shape insurance demand (Gross, Layton and Prinz, 2022; Remmerswaal et al., 2019; Handel and Kolstad, 2015; Ericson and Sydnor, forthcoming). Third, we find systematic heterogeneity in who responds to decision aids. We show that treatment effectiveness depends critically on baseline information gaps, with effects concentrated among employees with limited prior plan engagement. At the same time, negative effects among liquidity-constrained workers demonstrate that financial constraints cannot be overcome through improved understanding alone (Handel et al., 2024; Ericson and Sydnor, forthcoming).

The remainder of the paper proceeds as follows. Section 2 provides background on the public university employee health insurance program and demonstrates the financial dominance of the HDHP option. Section 3 describes our experimental design. Section 4 presents our main results on baseline plan consideration patterns, understanding improvements, heterogeneity in treatment effects, and enrollment effects. Section 5 explores mechanisms behind the information-enrollment gap and Section 6 concludes.

2 Background

For the 2024 plan year, the Wisconsin State Group Health Insurance Program offered state employees a choice between two plan designs: a traditional lower-deductible option and a high-deductible health plan with employer Health Savings Account contributions. Both plans offered identical covered benefits and provider networks, differing only in their cost-sharing and employer HSA contribution. Figure 1 presents the key features of each plan for single and family coverage. For single coverage, the non-HDHP had a $250 deductible and $115 monthly premium, while the HDHP had a $1,600 deductible and $42 monthly premium. For family coverage, the non-HDHP had a $500 deductible and $286 monthly premium, while the HDHP had a $3,200 deductible and $107 monthly premium. Additionally, for the HDHP, the state contributed $750 annually to employees' HSA for single coverage and $1,500 for family coverage. These contributions were paid monthly.

Figure 1: Plan Details of 2024 Health Plan

Table of Major Differences between non-HDHP and HDHP options 2024 individual coverage

	Traditional Health Plan Design (non-HDHP)	High Deductible Health Plan (HDHP)
Monthly premiums you pay from your paychecks (with dental coverage)	$115	$42
Annual medical deductible	$250	$1,600
Annual medical out-of-pocket limit	$1,250	$2,500
Annual prescription drug deductible	None	Combined with medical ($1,600 for medical + drug)
Annual prescription out of pocket limit	$600 level 1 &2 drugs; $9,100 level 3 & 4 drugs	Combined with medical ($2,500 for medical + drug)
Paired with health savings account (HSA)?	No	Yes
Amount university contributes to your HSA	Not applicable	$750
Links to further information about the plan design:	University website on non-HDHP Plan Design	University website on HDHP Plan design
Link to full plan design comparison:	Full plan comparison details	

(a) Single Coverage

Table of Major Differences between non-HDHP and HDHP options 2024 family coverage

	Traditional Health Plan Design (non-HDHP)	High Deductible Health Plan (HDHP)
Monthly premiums you pay from your paychecks (with dental coverage)	$286	$107
Annual family medical deductible	$500	$3,200
Annual family medical out-of-pocket limit	$2,500	$5,000
Annual family prescription drug deductible	None	Combined with medical ($3,200 for medical + drug)
Annual family prescription out of pocket limit	$1,200 level 1 &2 drugs; $18,200 level 3 & 4 drugs	Combined with medical ($5,000 for medical + drug)
Paired with health savings account (HSA)?	No	Yes
Amount university contributes to your HSA	Not applicable	$1,500
Links to further information about the plan design:	University website on non-HDHP Plan Design	University website on HDHP Plan design
Link to full plan design comparison:	Full plan comparison details	

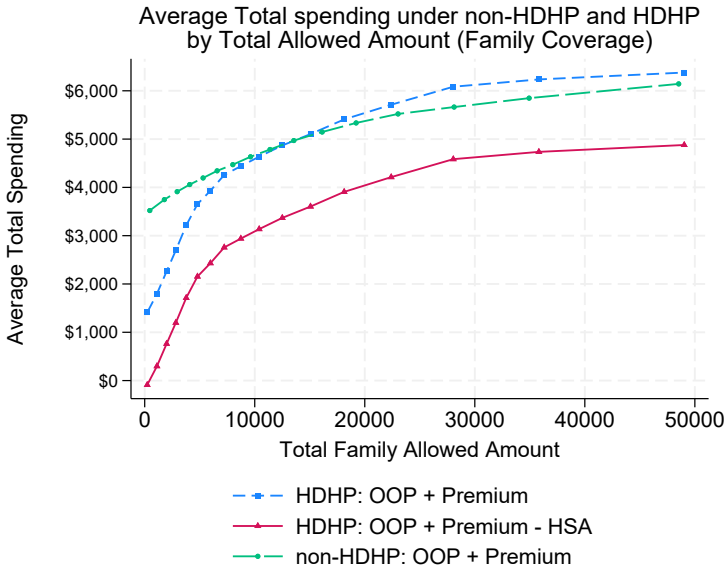
(b) Family Coverage

Note: This figure displays the plan details for the non-HDHP and HDHP options offered by the University System for 2024 enrollment. Panel (a) details the single coverage, and Panel (b) covers the family coverage. Additionally, this information served as the baseline data provided to all participants before introducing the decision aid.

The combination of lower premiums and employer HSA contributions made the HDHP financially advantageous for all employees. Figure 2 plots total annual costs under each plan against total allowed medical spending for family coverage. The figure shows costs under the non-HDHP (green long-dashed line), the HDHP before HSA contributions (blue dashed line), and the HDHP after the $1,500 state HSA contribution (solid red line). At the lowest spending levels, families saved roughly $2,000 from lower premiums and an additional $1,500 from the HSA contribution,

for total savings of nearly $3,500. Even for families with the highest healthcare spending, the HDHP generated savings exceeding $1,400 annually after accounting for the state HSA contribution. Yet, despite these substantial savings opportunities, only 20% of employees enrolled in the HDHP in 2023.

Figure 2: Total Projected Spending Under non-HDHP and HDHP by Utilization



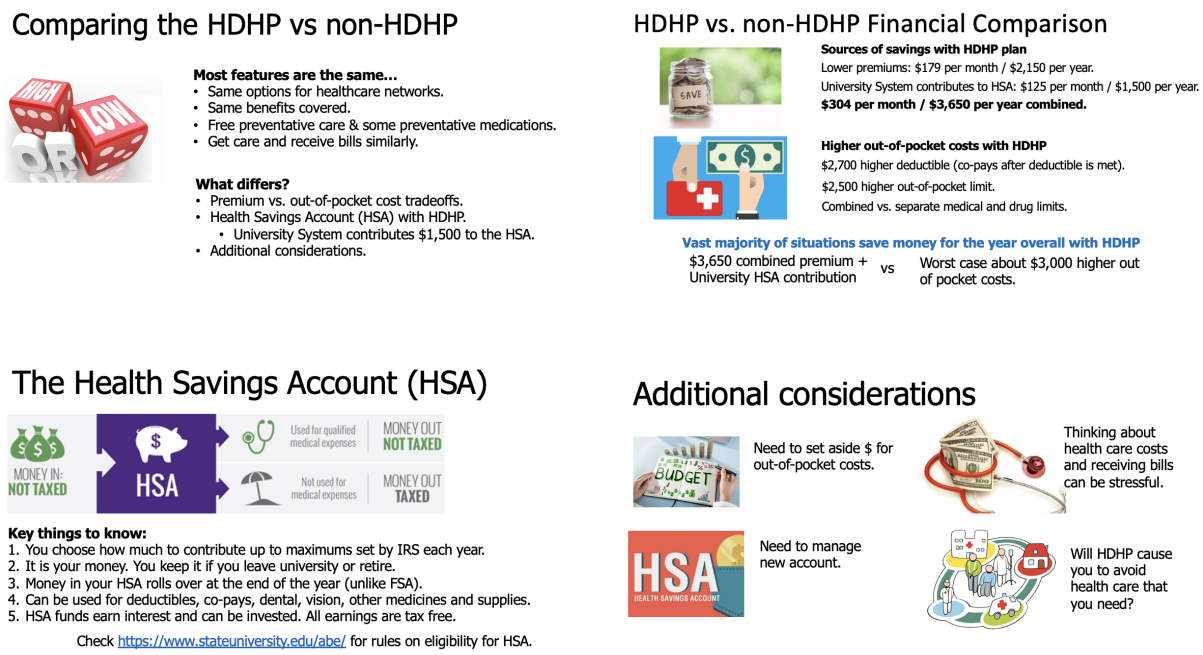
Note: This figure shows the total cost under the non-HDHP and HDHP by total family allowed amount. Total spending under each plan is defined as the sum of out-of-pocket medical and prescription drug costs and annual premiums, minus the State's HSA contribution for HDHP members. To improve readability in the chart, the total allowed amount is capped at $50,000, and the total risk score is capped at the 95th percentile.The sample includes active employees and their dependents (spouses and children) enrolled in the State Group Health Insurance Program who were eligible for the HDHP option. The analysis is based on data from the 2023 plan year.

3 Experimental Design

We conducted a randomized experiment with public university employees during the 2024 open enrollment period, launching five days before enrollment began. A total of 2,852 employees participated, with 2,718 completing randomization into three experimental conditions. Participants received $10 compensation for completing the survey. The three groups received different levels of information: standard plan details (control), an explanatory video on HDHP features and cost savings (video), or comprehensive personalized cost projections (graph). The design was cumulative, with each successive treatment adding information to the previous level.

All participants viewed the plan comparison tables in Figure 1, which detailed premiums, deductibles, coinsurance, out-of-pocket limits, and HSA contributions. The video group additionally watched an explanation video that walked through the plan tradeoffs in simple terms. The video also emphasized that most families would save over $1,000 annually with the HDHP, with many saving

Figure 3: Video Content Shown to the Video and Graph Group - Single Coverage



Note: This is the Presentation Slides used for the Video Aid for Single Coverage. For Family Coverage, the premium and out of pocket cost is $3,650 combined premium + university's HSA contribution and worst case about $3,000 higher out of pocket costs. In this video, we explain the difference between HDHP and non-HDHP as well as the pros and benefits of each plan.

over $2,000. The video further detailed how HSAs function and discussed key considerations such as managing a new account and planning for unexpected healthcare costs. The slides used in the video are presented in Figure 3. Building on the video treatment, the graph group received personalized cost projections that showed expected spending under each plan based on their individual health risk.

Figure 4: Family of 5 with at least one member with a chronic condition and at least one who is 55 or older

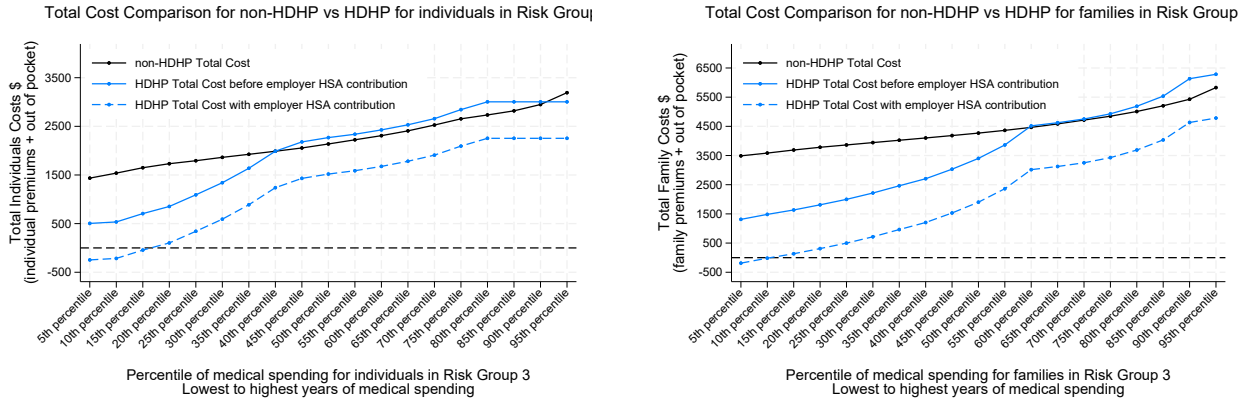
***Family Type*: Family of 5 with at least one member with a chronic condition and at least one who is 55 or older**				
Risk Level	Median Total Family Healthcare Spending	Median Family Spending on Office Visits	Median Family Prescription Drug Spending	Fraction of Your Family Type in Each Risk Level
1	$970	$440	$30	0%
2	$3,160	$1,240	$190	0%
3	$5,510	$2,150	$330	0%
4	$8,830	$2,970	$640	11%
5	$19,530	$4,240	$1,900	88%

Note: This table aids graph groups in identifying participant risk levels based on prior year spending quintiles. The first column indicates the potential risk level for each participant, segmented into five distinct groups. Columns 2 to 4 display the median allowed spending for each risk group, providing insight into typical expenditures within these groups. The fifth column presents the probability of an individual belonging to each risk group, calculated based on the number of enrolled family members, the presence of chronic conditions, and age. These demographic details are gathered through the survey.

To generate these projections, participants first answered three questions about family size, age, and chronic health conditions. Based on their responses, participants were shown probabilities of belonging to each of five groups derived from historical claims data (Figure 4 shows an example). These risk groups ranged from Risk Group 1 (lowest 20% of expected costs) to Risk Group 5 (highest 20%). Once participants selected their risk group, they viewed detailed and simplified cost projection graphs (Figures 5 and 6) comparing expected costs under each plan. The detailed graphs showed the full distribution of potential costs across utilization levels, while the simplified graphs categorized outcomes into "good," "average," and "bad" healthcare years. Figures 5 and 6 present examples for Risk Group 3; Appendix Figures A.1 to A.4 confirm that the HDHP cost advantage holds across all risk groups and coverage tiers. Additionally, these participants were shown a single expected annual savings dollar amount for the HDHP based on their risk group and coverage tier (Table 1 presents these values across all groups).

Following treatment, participants reported their intended plan choice, answered questions measuring cost understanding and HSA knowledge, and provided demographic and financial information. We also obtained consent from 97% of participants to link survey responses to anonymized administrative enrollment and claims data, enabling us to track actual enrollment decisions and analyze healthcare utilization and forgone savings.

Figure 5: Detailed Graph Shown to Participants - Risk Group 3

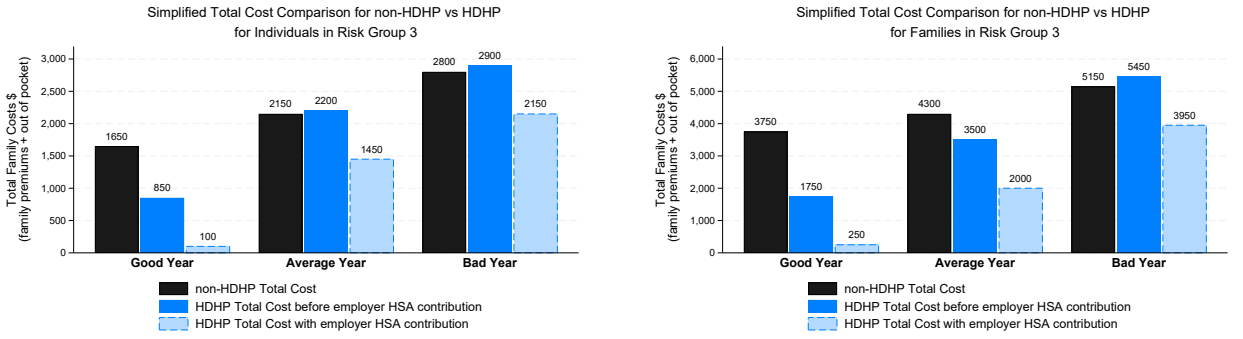


(a) Single Coverage

(b) Family Coverage

Note: This figure shows potential out-of-pocket costs for families under non-HDHP and High Deductible Health Plans (HDHP). The black line illustrates total costs under the non-HDHP, while the blue lines represent HDHP costs, with the solid line showing costs before HSA contributions and the dotted line after. Each point along these lines represents a possible cost outcome, with each family having approximately a 5% chance of incurring costs at that point based on their healthcare utilization. The analysis was created for five risk groups, each for single and family coverage.

Figure 6: Simplified Graph Shown to Participants - Risk Group 3



(a) Single Coverage

(b) Family Coverage

Note: This figure displays potential out-of-pocket costs for families under non-HDHP and HDHP. Costs are categorized based on "good years" (lowest 30% of medical costs), "average years" (middle 40%), and "bad years" (highest 30%). This percentage was calculated based on the prior year's healthcare costs for each risk group. The analysis was created for five risk groups each for single and family coverage.

Table 1: Total Out of Pocket costs under each Plan and the Savings with HDHP

	Out of Pocket + Premium		With HSA	**Total Saving**
Risk Group	Non-HDHP	HDHP	HDHP	**with HDHP**
Family Coverage				
Risk 1	$4,030	$2,750	$1,250	$2,780
Risk 2	$4,200	$3,190	$1,690	$2,510
Risk 3	$4,410	$3,580	$2,080	$2,330
Risk 4	$4,730	$4,240	$2,740	$1,990
Risk 5	$5,380	$5,150	$3,650	$1,730
Single Coverage				
Risk 1	$1,690	$1,060	$310	$1,380
Risk 2	$1,960	$1,630	$880	$1,080
Risk 3	$2,220	$1,980	$1,230	$990
Risk 4	$2,450	$2,230	$1,480	$970
Risk 5	$2,690	$2,510	$1,760	$930

Note: This table presents average annual savings with High Deductible Health Plans (HDHP) across various coverage tiers and risk groups, based on prior years' out-of-pocket costs. For single coverage, premiums were $115 for non-HDHP and $42 for HDHP. For family coverage, premiums were $286 for non-HDHP and $107 for HDHP. Employer HSA contributions totaled $750 for single and $1,500 for family coverage. The amount of savings was also shown with the decision aids for graph group along with the figures shown above.

Table 2 presents participant characteristics by treatment group.[2] The three groups show similar distributions across demographic characteristics, financial circumstances, and prior plan enrollment, confirming successful randomization. Participants were predominantly female and highly educated, with most enrolled in family coverage. Prior HDHP enrollment was 36% among participants, higher than the 20% baseline enrollment rate across all state employees. Following treatment, participants answered questions measuring cost understanding and HSA knowledge, indicated their intended plan selection, and optionally provided free-text explanations for their choice.

3.1 Survey Engagement and Response Quality

Since the survey concerned participants' own enrollment decision in the coming days, the task carried direct personal relevance, and engagement was correspondingly high. The survey launched five days before open enrollment began with 79 percent of participants starting before enrollment opened, 4 percent on the first of open enrollment, and the remaining 17 percent during the enrollment period before it closed.

Table 3 reports engagement across several dimensions. Survey completion was high, with 94.8 percent of participants answering all survey questions. Most participants also provided written

[2]See Appendix Figure A.5 for the full participant flow. Attrition before outcome questions was 3.8% in control, 5.3% in video, and 5.3% in graph.

Table 2: Combined Respondent's Demographic and Financial Information

	Control	Video	Graph	F-stat	p-value
Demographic Information					
Age Groups					
Under 25	0.02	0.01	0.03	1.47	0.231
25 - 34	0.22	0.23	0.24	0.61	0.543
35 - 44	0.32	0.30	0.32	0.78	0.459
45 - 54	0.26	0.25	0.25	0.19	0.824
55- 64	0.15	0.19	0.14	5.14	0.006
65 and over	0.02	0.02	0.02	0.23	0.798
Gender					
Female	0.71	0.72	0.68	1.56	0.211
Male	0.27	0.26	0.30	1.48	0.228
Other/non-binary	0.01	0.01	0.01	0.28	0.752
Prefer not to state	0.01	0.01	0.01	0.79	0.453
Education Level					
High school graduate	0.03	0.04	0.04	0.27	0.762
Associates degree	0.05	0.04	0.03	1.51	0.221
College degree	0.33	0.32	0.34	0.37	0.692
Graduate degree	0.57	0.60	0.58	0.51	0.601
Prefer not to state	0.01	0.01	0.01	1.03	0.356
Financial Information					
Household Income					
Less than $40,000 annually	0.03	0.04	0.03	0.15	0.859
$40,000 - $80,000 annually	0.29	0.27	0.29	0.28	0.758
More than $160,000 annually	0.19	0.20	0.18	0.36	0.698
Financial Confidence					
I am certain I could not come up with $2,000	0.08	0.09	0.08	0.48	0.619
I could probably not come up with $2,000	0.06	0.06	0.07	0.62	0.537
I could probably come up with $2,000	0.23	0.22	0.21	0.68	0.507
I am certain I could come up with the full $2,000	0.59	0.62	0.61	0.84	0.432
Plan Enrolled - 2023					
Health Plan					
Health Plan (non-HDHP)	0.59	0.60	0.61	0.24	0.788
High Deductible Health Plan (HDHP)	0.36	0.36	0.35	0.10	0.902
Not sure	0.04	0.04	0.04	0.34	0.711
Coverage Tier					
Family Coverage	0.63	0.63	0.62	0.26	0.774
Single coverage	0.34	0.34	0.36	0.59	0.556
Other coverage	0.03	0.03	0.02	0.64	0.525
N	915	895	908		

Note: This table provides a distribution of demographic and financial characteristics for respondents across three treatment groups. F-statistics are from row-level regressions of each characteristic on treatment-group indicators. The null hypothesis is equality of means across Control, Video, and Graph groups.

explanations for their plan choice, with 84.1 percent submitting a response and 69.4 percent writing at least 10 words. Among participants in the Graphs condition, 27 percent selected more than one risk group to view personalized cost projections, indicating meaningful engagement with the tool.

Table 3: Survey Engagement

Measure	Percent
Survey completion ($N = 2{,}718$)	
Completed survey	94.8
Open-ended explanation length ($N = 2{,}718$)	
No open-ended explanation	15.9
Short response (<10 words)	14.7
Medium response (10–49 words)	52.9
Long response (50+ words)	16.5
Risk-group exploration, Graphs only ($N = 908$)	
Selected 1 risk group	73.0
Selected 2 risk groups	14.1
Selected 3 or more risk groups	12.9

Note: Entries are percentages. Survey completion and open-ended explanation measures are calculated among respondents assigned to the Control, Video, or Graphs conditions. Open-ended explanation categories are mutually exclusive and based on respondents' written explanations for their plan choice. Risk-group exploration measures are restricted to respondents in the Graphs condition, where participants could select risk groups to view personalized cost projections.

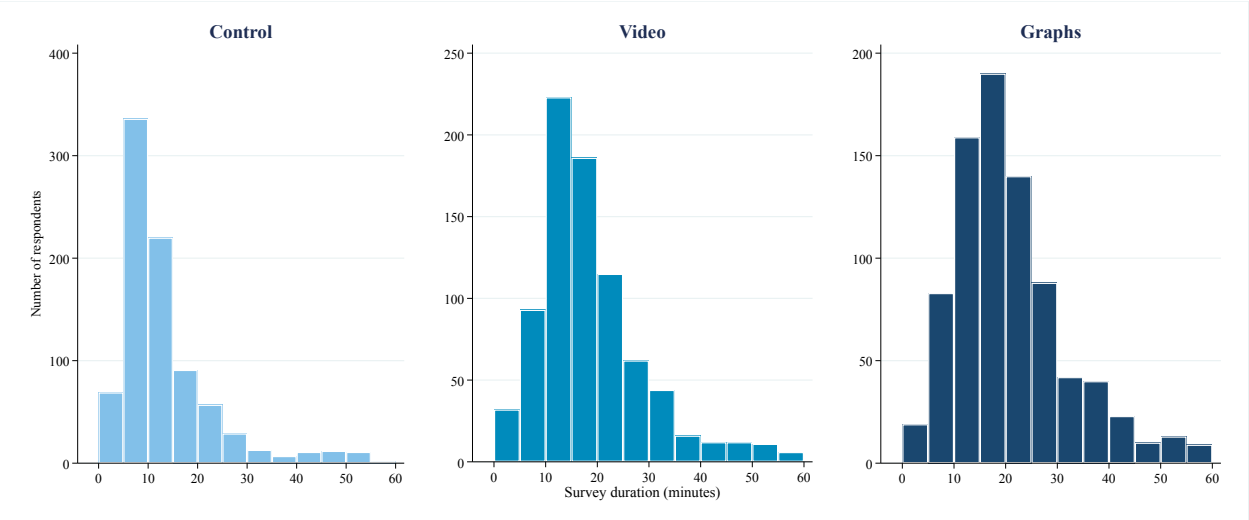
Figure 7 shows the distribution of survey completion time by treatment condition, with median completion times of 10, 16, and 18 minutes for the Control, Video, and Graph groups respectively.[3] Nearly all participants, 95.6 percent, spent at least five minutes completing the survey, suggesting genuine attention to the task. The gradient is also consistent with the cumulative design, where each treatment added content on top of the previous. Overall, these patterns suggest that participants engaged seriously with the survey content regardless of treatment condition.

4 Main Results

We begin by documenting baseline patterns of plan consideration and confidence, then examine treatment effects on understanding, intentions, and enrollment. We measure understanding through multiple cost perception questions, intentions through stated plan choice, and behavior through administrative enrollment records.

[3]These medians exclude the 8.5 percent of respondents who spent more than 60 minutes, as very long durations may reflect leaving the survey window open rather than active engagement.

Figure 7: Survey Duration by Treatment Condition



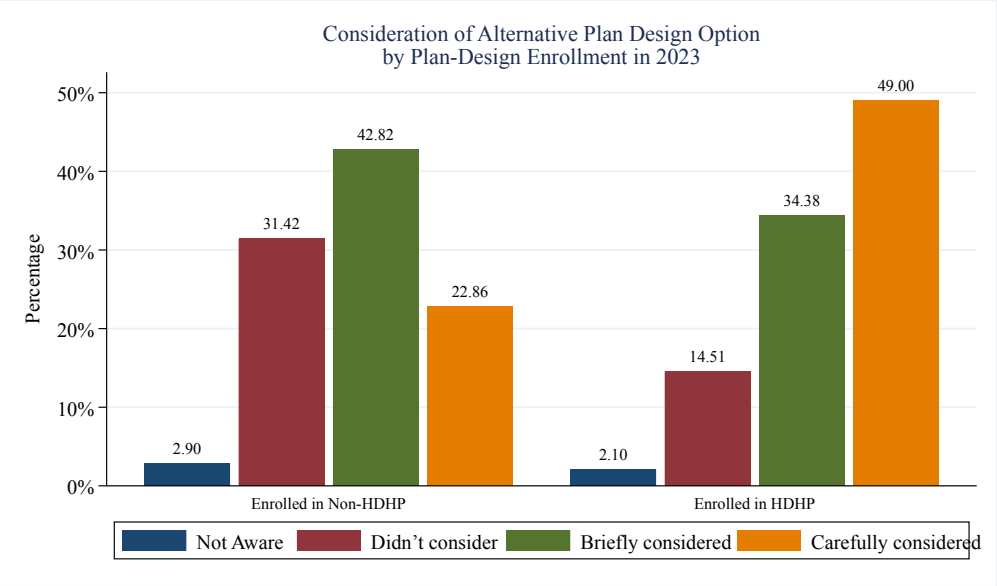
Note: This figure shows the distribution of survey completion time by treatment condition. Respondents who spent more than 60 minutes on the survey are excluded from the histogram, since very long durations may reflect leaving the survey window open. Overall, 8.5 percent of respondents spent more than 60 minutes on the survey. The share above 60 minutes was 6.2 percent in the Control group, 9.3 percent in the Video group, and 10.1 percent in the Graphs group.

4.1 Baseline Plan Consideration and Confidence

We first establish baseline patterns in plan evaluation and confidence before examining treatment effects. Figure 8 presents participants' reported consideration of alternative plan options by their 2023 enrollment. The figure reveals substantial differences in evaluation patterns across plan types. Overall, 68% of participants either briefly considered or did not consider the alternative plan option at all, and this limited consideration varied significantly by enrolled plan. Individuals enrolled in non-HDHPs were notably less likely to engage in thorough plan comparison. Only 23% of non-HDHP enrollees carefully considered the alternative plan, compared to 49% of HDHP enrollees.

Despite these marked differences in evaluation effort, self-assessed confidence levels remained remarkably similar across plan types. Approximately 90% of participants across both plans reported being somewhat or very confident that their current plan was best for them. However, among those reporting the highest confidence level, non-HDHP enrollees had slightly higher rates (52% compared to 48%). This pattern is notable given that non-HDHP enrollees spent substantially less time evaluating alternatives yet reported slightly higher confidence, suggesting potential information gaps in plan assessment.

Figure 8: Consideration of Alternative Plan Design Option



Note: This figure shows the distribution of self-reported consideration levels for alternative plan design, disaggregated by participants' current plan enrollment. Participants were asked: "In the past, which best describes how much you have considered the other health insurance plan design option (that is, the non-HDHP vs. HDHP)?"

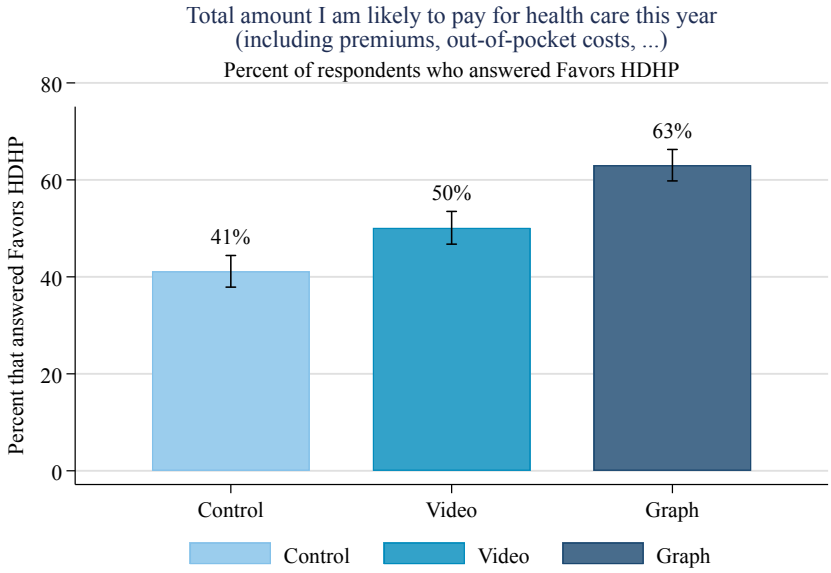
4.2 Effects on Understanding

We now estimate how decision aids affected participants' understanding of plan costs and HSA features. Following treatment, participants answered multiple questions measuring their understanding of plan costs, expected savings, and HSA mechanics. We first examine responses to direct comparative questions where participants identified which plan was more favorable for expected annual costs and worst-case spending scenarios. For expected annual costs, recognition that the HDHP was more favorable increased from 41% in control to 50% with the video and 63% with the graph treatment (Figure 9, Panel A). This represents a 22 percentage point increase for the graph treatment, a substantial shift in cost perceptions. The shift is also evident in participants' savings estimates, with the share expecting to save more than $500 increasing from 26% in control to 34% with the video and 39% with the graph treatment (Figure 9, Panel B). The entire distribution shifts rightward with treatment intensity, indicating improvements in cost understanding.

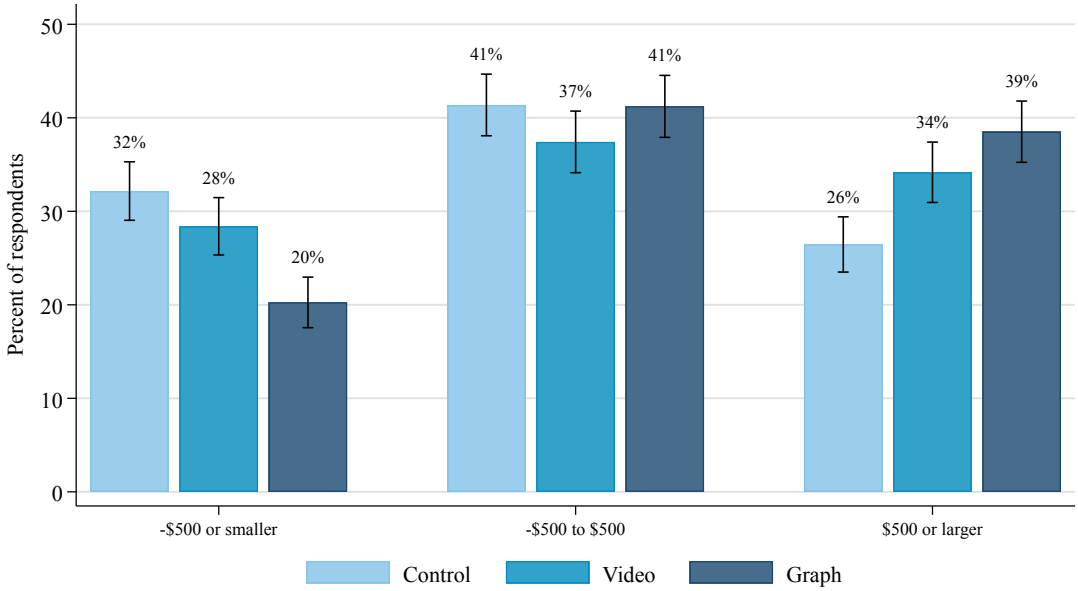
Understanding improvements extended beyond expected costs to worst-case spending scenarios (Figure 10). The percentage recognizing the HDHP as more favorable even for worst-case spending increased from 23% in control to 30% with video and 36% with personalized cost projections. Participants' perceived likelihood of high utilization, however, remained unchanged by treatment, with a median probability of hitting the out-of-pocket maximum at 30% and a mean probability at 41% across treatment groups.[4] Since most participants expected moderate utilization, where the

[4] After controlling for expected level, the estimated mean probability was 41.5% for the graph group and 44% for the video group.

Figure 9: Impact of Decision Aids on Understanding of HDHP Cost Advantages



(a) Recognition of HDHP Cost Advantage for Expected Annual Costs

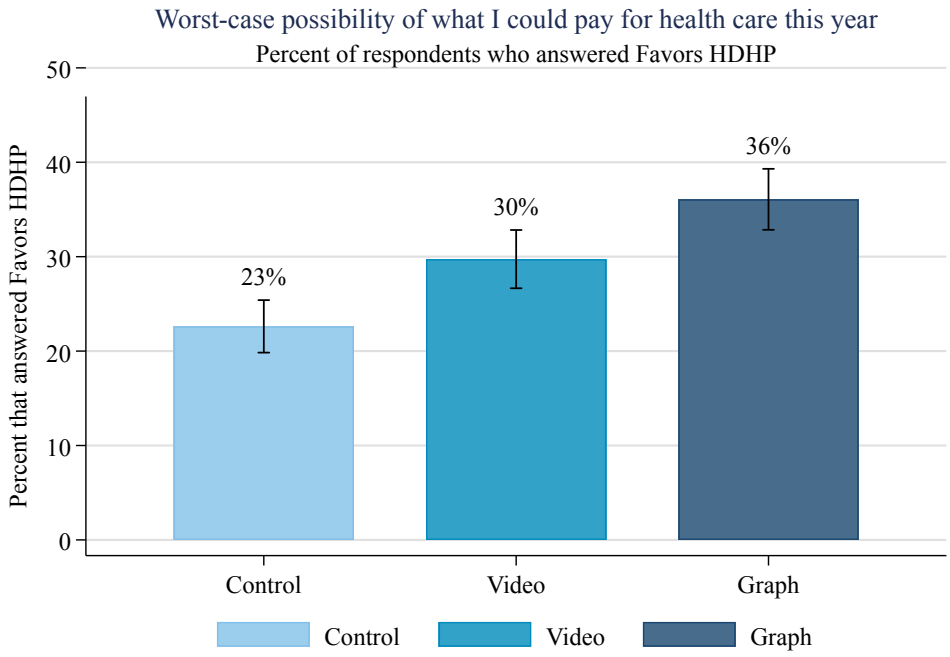


(b) Distribution of Estimated Annual Savings with HDHP

Note: Panel (a) shows the percentage of participants identifying the HDHP as more favorable for "total amount I am likely to pay for health care this year (including premiums, out-of-pocket spending, and HSA funds)" by treatment group. Panel (b) presents the distribution of participants' estimated annual savings (or losses) from selecting the HDHP over the non-HDHP. Negative values indicate participants expected to spend more with the HDHP; positive values indicate expected savings.

HDHP's advantage is largest, their own risk beliefs should have strengthened the financial rationale for HDHP enrollment.

Figure 10: Recognition of HDHP Cost Advantage in Worst-Case Spending Scenarios



Note: This figure shows the percentage of participants identifying the HDHP as more favorable for "worst-case possibility of what I could pay for health care this year" by treatment group. Higher values indicate greater recognition that the HDHP minimizes costs even in high-utilization scenarios.

Regression estimates in Table 4, controlling for demographic and financial characteristics, confirm the treatment effects on cost perceptions and worst-case understanding while also examining self-reported understanding and confidence in plan choice. Self-reported plan understanding increased under both treatments, with the video and graph groups 5.5 and 2.8 percentage points more likely to report high understanding relative to control. Effects on confidence in plan choice were more muted, with the video treatment showing no significant change and the graph treatment reducing the share reporting high confidence by 5.3 percentage points.

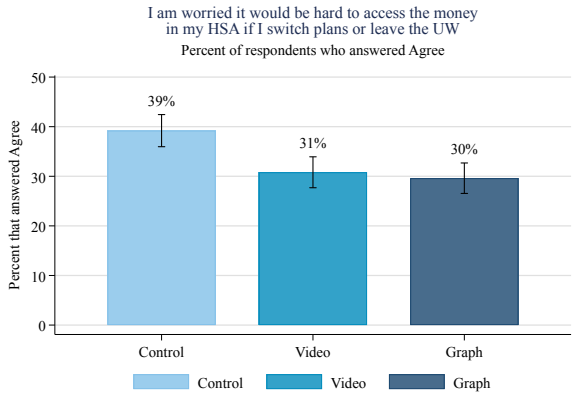
In addition to improving cost understanding, the decision aids clarified practical aspects of HSA management. Figure 11 shows treatment effects on two common HSA concerns about fund accessibility after plan changes and rollover of unspent funds. Concerns about losing access to HSA funds when changing plans decreased from 39% in control to 31% (video) and 30% (graph). Worries about losing unspent year-end HSA balances fell more sharply, from 33% in control to 17% in both the video and graph groups. Given these large improvements in both cost understanding and HSA knowledge, we next examine whether they translated into changed enrollment patterns.

Table 4: Effects of Information Treatments on Additional Outcomes

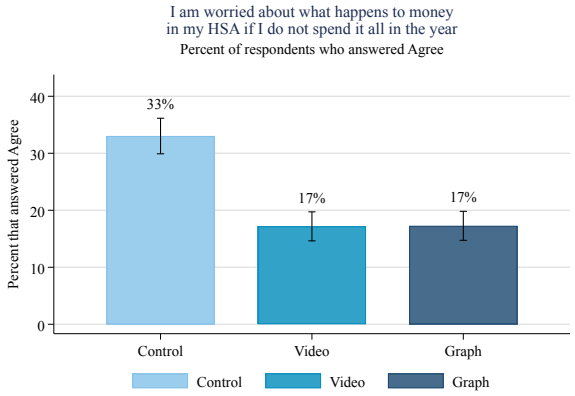
	(1) Believes HDHP Saves Money	(2) Believes HDHP Has Lower Worst-Case Cost	(3) High Understanding of Plan	(4) High Confidence in Choice
Video	0.098***	0.074***	0.055***	-0.014
	(0.020)	(0.020)	(0.012)	(0.015)
Graphs	0.217***	0.139***	0.028**	-0.053***
	(0.020)	(0.020)	(0.013)	(0.016)
Control Mean	0.41	0.22	0.90	0.89
Observations	2,487	2,483	2,499	2,501

Notes: This table reports OLS estimates of each outcome on information treatments, with Control as the omitted category. All columns are indicator outcomes. Column (1) equals one if the respondent reports that the HDHP would save money. Column (2) equals one if the respondent reports that the HDHP has lower worst-case costs. Columns (3) and (4) equal one for respondents reporting high understanding of the plan and high confidence in their choice, respectively. All specifications control for age, education, gender, household income, liquidity constraints, current health plan, and expected health care utilization. The reported Control Mean is the mean of the dependent variable in the control group, computed over the regression estimation sample. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 11: Impact of decision aids on understanding of Health Savings Accounts



(a) Concerns About HSA Access After Plan Changes or Leaving UW



(b) Concerns About HSA Fund Rollover After Year-End

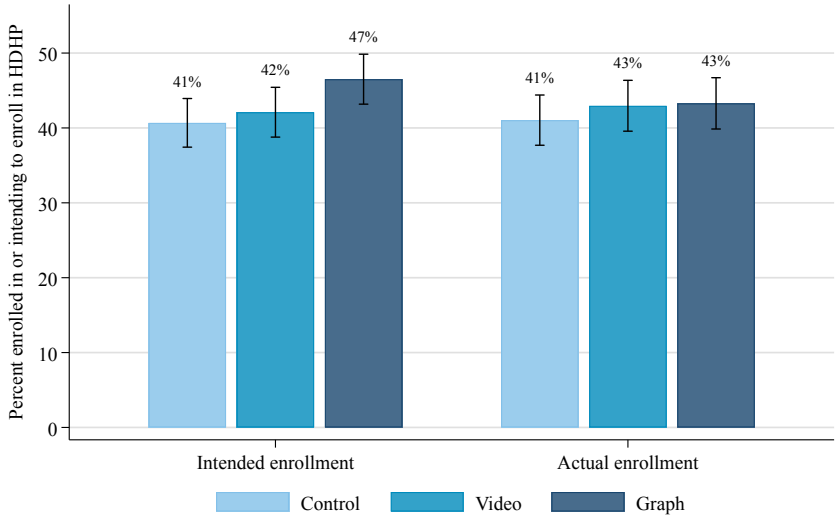
Note: The figure presents responses to questions assessing concerns related to Health Savings Accounts (HSAs). Panel (a) shows concerns about access to HSA funds following plan changes or separation from the employer, while panel (b) shows concerns about rollover of HSA funds after year-end.

4.3 Effects on Enrollment

Wisconsin state employees must make an active enrollment decision each year, logging into the benefits portal to select their plan with no automatic rollover to the prior year's choice. The survey was administered one week before the open enrollment period began, ensuring that stated intentions reflected near-term decisions.

Figure 12 presents both intended enrollment, measured by participants' stated plan choice in the survey, and actual enrollment from administrative records. Among intended enrollment, the graph treatment generated a 6 percentage point increase from 41% in control to 47%, modest relative to the 22 percentage point gain in cost recognition. The transition from stated intentions to actual enrollment reveals further attenuation, with actual HDHP enrollment increasing from 41% in control to 43% with both treatments among the 97% of participants with linked administrative records. Table 5 presents regression estimates confirming these patterns remain robust when controlling for baseline characteristics, with treatment effects significant for stated intentions (Column 1) but not for actual enrollment (Column 2).

Figure 12: High Deductible Take up by Treatment Group



Note: This figure shows the percentage of HDHP take-up during the experiment. This figure shows intended and actual HDHP enrollment by treatment group. Intended enrollment reflects participants' stated plan choice in the survey following treatment. Actual enrollment is from administrative records for the 97% of participants with linked data.

4.4 Heterogeneity in Treatment Effects

Despite modest average effects, treatment impacts may vary substantially across participant types. Following Wager and Athey (2018), we use causal random forests to identify which baseline

Table 5: Effect of Decision Aid Type on HDHP Enrollment

	Intended HDHP Enrollment		Actual HDHP Enrollment	
	(1)	**(2)**	**(3)**	**(4)**
Video	0.014	0.022	0.019	0.027*
	(0.024)	(0.016)	(0.024)	(0.016)
Graphs	0.058**	0.059***	0.022	0.024
	(0.024)	(0.016)	(0.024)	(0.016)
Controls	No	Yes	No	Yes
Control Mean	0.41	0.41	0.41	0.31
Observations	2,588	2,503	2,447	2,397

Notes: This table reports coefficients from linear probability models where the dependent variable is an indicator for HDHP enrollment. Columns (1)–(2) present intended enrollment from survey responses; columns (3)–(4) present actual enrollment from administrative records. The omitted category is the control group. Column (2) controls for age, education, gender, income, liquidity constraints, current plan enrollment, and expected healthcare utilization. Column (4) controls for variables available in the administrative data, including coverage type (single/family), prior HDHP enrollment, age, prior-year spending (allowed amount and out-of-pocket), prior-year utilization, deliveries, and member months. The administrative sample is restricted to primary policyholders.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

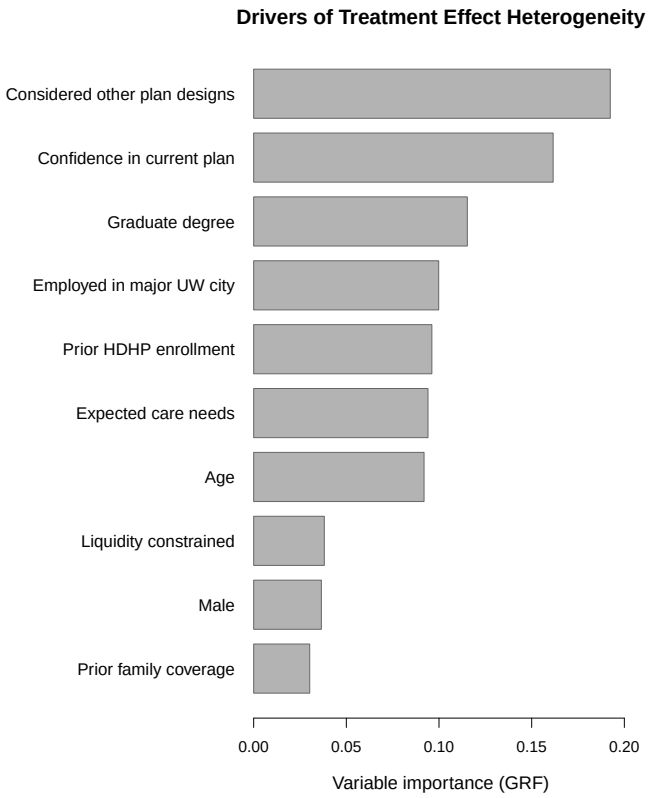
characteristics predict stronger or weaker responses to personalized cost projections. Causal forests use recursive partitioning to estimate conditional average treatment effects (CATEs) for each participant, then rank covariates by their importance in explaining treatment effect variation. We focus on treatment effects for the graph group relative to control, with video comparisons reported in the Appendix. Figure 13 ranks baseline characteristics by their importance in predicting treatment effect heterogeneity. Prior plan consideration emerges as the strongest predictor, followed by baseline confidence in the prior plan choice, household income, and education.[5]

Figures 14a through 14c present treatment effect distributions across these key characteristics. Prior plan consideration emerges as the strongest predictor, with treatment effects modestly larger among those with limited prior engagement than among those who carefully considered alternatives. Similarly, treatment effects decline with baseline confidence in current plan choice, from approximately 6.5 percentage points among those "not confident" to 5 percentage points among those "very confident." Finally, participants with graduate degrees show modestly larger treatment effects, likely reflecting greater ability to interpret graphical cost information.

While liquidity constraints do not emerge as a top predictor in the forest analysis (in part because only 15% of participants report being liquidity constrained), they are theoretically central to understanding barriers to HDHP adoption and warrant closer examination. This is particularly rel-

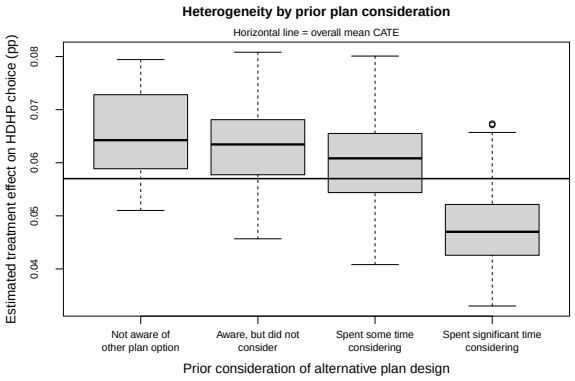
[5]Appendix A.1 presents formal regression analysis interacting treatment groups with prior consideration, confirming the patterns identified through the causal forest approach.

Figure 13: Drivers of Treatment Effect Heterogeneity (Graph vs Control)

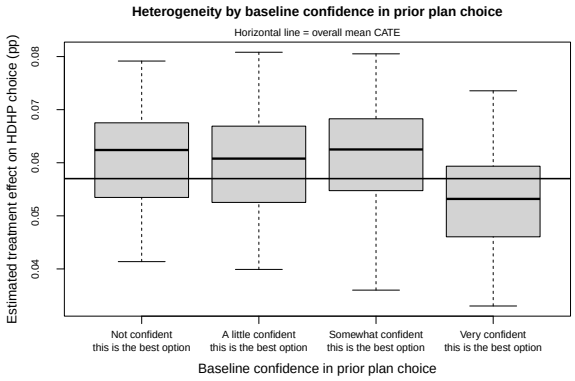


Note: This figure shows the percentage of individuals who reported concerns about the difficulty of setting up and managing an HSA, by treatment group.

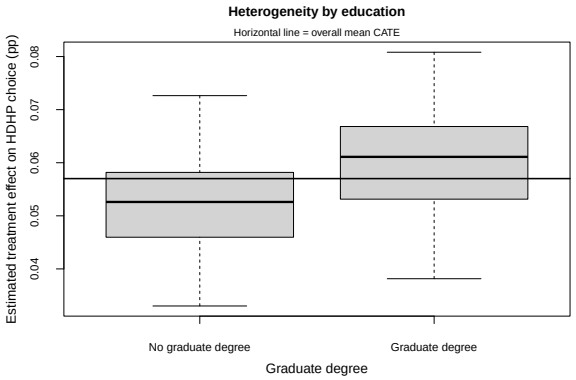
Figure 14: Heterogeneity in estimated treatment effects from the causal forest (Graph vs Control)



(a) Prior plan consideration (*VI rank: 1*)



(b) Baseline confidence in prior plan choice (*VI rank: 2*)



(c) Graduate degree (*VI rank: 3*)

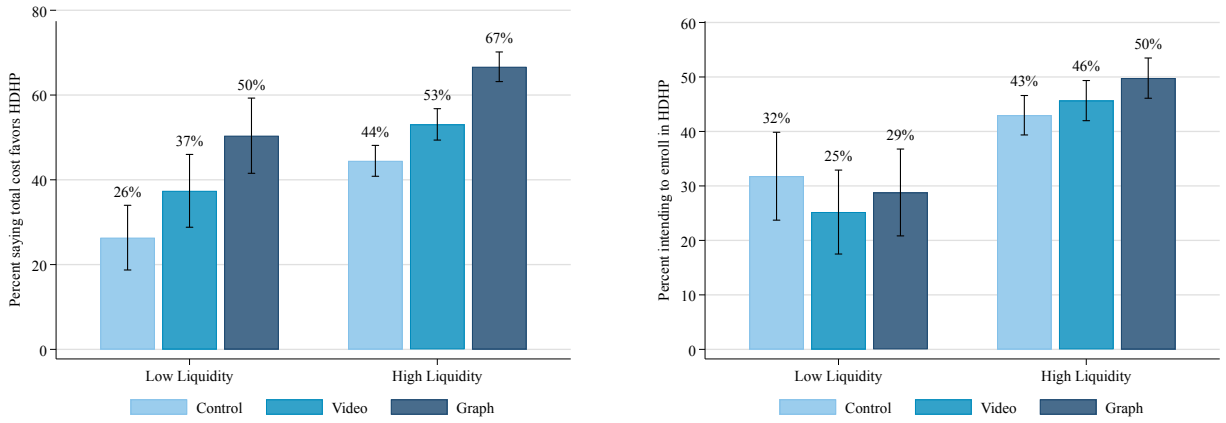
Note: Each panel reports the distribution of causal-forest CATE estimates for the effect of the graphs intervention (vs. control) on the probability of intending to choose the HDHP. Panel (a) groups respondents by prior consideration of alternative plan design; panel (b) by baseline confidence in their prior plan choice; and panel (c) by whether the respondent holds a graduate degree. The horizontal line denotes the overall mean CATE. Within each box, the center line indicates the median, boxes represent the interquartile range, and whiskers extend to 1.5 times the interquartile range.

evant given that HSA contributions accumulate monthly while out-of-pocket costs can occur early in the year, potentially creating cash flow challenges for liquidity-constrained households (Ericson and Sydnor, forthcoming).[6] Figure 15 shows that while understanding improved substantially for both liquidity groups, intended enrollment diverged sharply. Panel (a) shows that the graph treatment raised cost recognition similarly across both groups, from 26% to 50% among low-liquidity participants and from 44% to 67% among high-liquidity participants. Panel (b) shows a different pattern for intended enrollment, with the graph treatment reducing intended HDHP enrollment among low-liquidity participants from 32% to 29% while increasing it among high-liquidity participants from 43% to 50%. This pattern suggests that information about upfront deductible costs

[6]Liquidity is measured by participants' self-reported ability to come up with $2,000 if an unexpected need arose within the next month, following Lusardi, Schneider and Tufano (2011).

may have discouraged liquidity-constrained participants despite the long-run financial advantage of the HDHP. The result also underscores how liquidity constraints can prevent households from accessing financially advantageous options, even when information clearly demonstrates substantial long-run savings.

Figure 15: HDHP Understanding and Intended Take-up by Liquidity



(a) Total cost consideration favors HDHP

(b) Intended HDHP take-up

Note: Panel (a) shows the share of respondents who reported that the total cost consideration favored the HDHP. Panel (b) shows intended HDHP take-up. Both panels report outcomes by treatment group and liquidity subgroup. Liquidity is measured by respondents' self-reported ability to access $2,000 within one month. Error bars represent 95 percent confidence intervals.

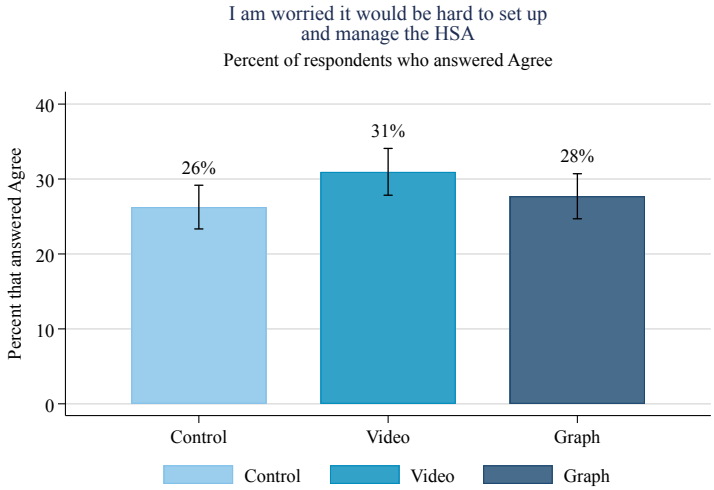
5 The Information-Enrollment Gap

A central finding is the substantial gap between improved understanding and behavioral changes, with decision aids increasing cost recognition by 22 percentage points but actual enrollment by only 2 percentage points. What explains this disconnect between knowledge and action? Participants' responses reveal several persistent frictions, including concerns about HSA management, reluctance to change from familiar plans, and heightened focus on out-of-pocket costs despite long-run savings.

First, concerns about HSA setup and management actually increased with information exposure. Figure 16 shows that 26% of control participants worried about HSA difficulty, rising to 31% in the video group and 28% in the graph group. One interpretation is that while control participants had vague familiarity with HSAs, the treatments explicitly described requirements and features, potentially increasing concern about administrative tasks. Free text-responses support this interpretation, with participants noting concerns such as "I do not want to manage an HSA."

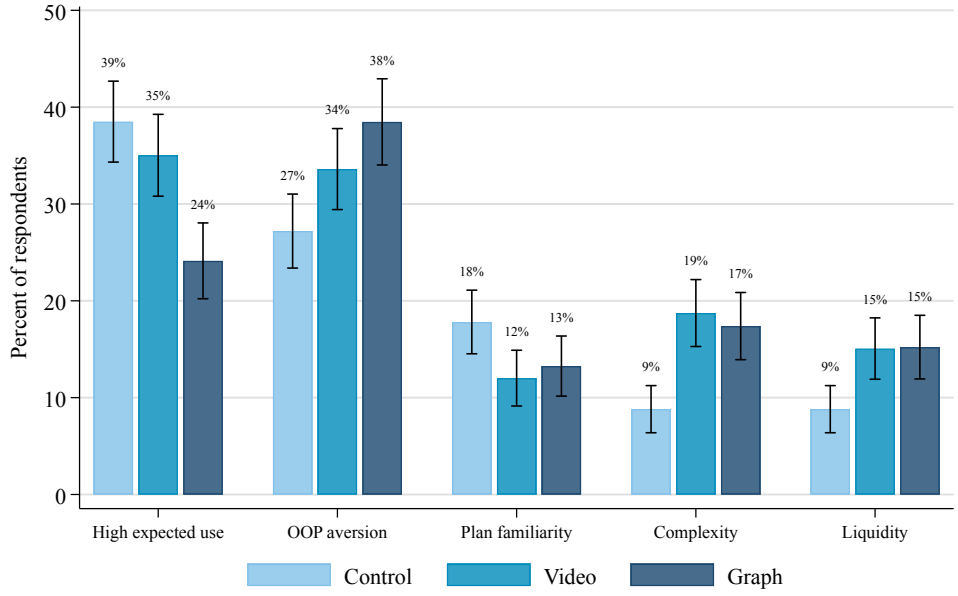
To further understand barriers to enrollment, we analyze open-ended responses from participants who stated they intended to select the non-HDHP. Approximately 87% of the participants

Figure 16: Barriers to HSA Adoption



Note: This figure shows the percentage of individuals who reported concerns about the difficulty of setting up and managing an HSA, by treatment group.

Figure 17: Free Responses Categorized by Generative AI



Note: This figure summarizes coded free-text responses among respondents who reported an intention to enroll in the non-HDHP. GPT-4.1 was used to develop the main response categories and classify responses into those categories. Categories are not mutually exclusive; if a respondent mentioned more than one reason, their response could be coded into multiple categories.

intending to enroll in the non-HDHP provided free-text responses.[7] We use generative AI to identify common concern categories from the responses and classify each response accordingly, with responses coded into one or more categories where applicable. Figure 17 presents the five most common concern types by treatment group.[8]

Stated concerns shifted notably with information exposure, with the share citing high expected utilization falling from 39% in control to 24% in the graph group, while out-of-pocket aversion rose from 27% to 38%. As information addressed concerns about expected utilization, aversion to out-of-pocket cost structure emerged as the primary stated barrier to HDHP enrollment. Participants expressed aversion to out-of-pocket costs independent of total spending, with comments such as "Hitting the deductible limit of the HDHP sounds daunting for an out-of-pocket cost."

Beyond the shift in primary concerns, several secondary barriers persisted across treatment groups. Plan familiarity emerged as a persistent barrier across all groups, with participants expressing they were "nervous to switch" or preferred "what I am used to," declining slightly from 18% in control to 13% in the graph group. Concerns about complexity, including confusion about HSA rules and general insurance hassle, rose from 9% in control to 17% in the graph group, as did liquidity constraints, reflecting explicit inability to cover large upfront medical costs, from 9% to 15%

These patterns reveal several frictions that limited the translation from improved cost understanding to enrollment. Decision aids successfully conveyed the HDHP's financial advantage, yet participants also expressed concerns about HSA management, aversion to out-of-pocket costs, and preference for familiar plans. These findings suggest that when enrollment becomes a real decision rather than an abstract calculation, cost knowledge is only one input among multiple considerations, both financial and non-financial, that shape behavior.

6 Conclusion

This paper tests whether visual decision aids increase enrollment in a financially dominant health insurance plan through a randomized field experiment with Wisconsin state employees. Decision aids largely improved cost understanding but generated only modest enrollment effects. This gap arose from multiple frictions beyond information, including concerns about HSA management, aversion to out-of-pocket costs, and reluctance to change from familiar plans.

Specifically, the treatments increased cost recognition by 22 percentage points. Improved understanding extended across multiple dimensions, including recognition that the HDHP minimized costs even in high-utilization scenarios and clarification of HSA features. However, improved un-

[7] The share providing a free-text response was 89.3% in control, 89.2% in video, and 81.7% in the graph group.

[8] These categories reflect the most common concerns identified across responses; responses that did not match any category are excluded from the figure.

derstanding generated only modest enrollment effects, increasing stated intentions by 6 percentage points for the graph treatment and actual enrollment by 2 percentage points. Effects were largest among participants with limited prior plan engagement and lower baseline confidence, suggesting decision aids successfully reached those with the greatest information needs. Treatment effects also differed substantially by liquidity constraints, revealing how cash flow concerns can prevent enrollment in financially dominant options. Open-ended responses help explain this understanding-enrollment gap, showing that as participants learned about cost advantages, concerns shifted toward HSA complexity, aversion toward out-of-pocket payments, and comfort with existing plans.

Our results contribute to understanding how information affects health insurance decisions and highlight important limits to information-based interventions. Prior research on health insurance decision aids has largely relied on laboratory experiments or hypothetical choices, whereas our study evaluates effectiveness in actual enrollment with real financial consequences. Moving to real enrollment decisions exposes practical frictions absent from laboratory settings, where participants face no administrative burden, no cash flow constraints, and no disruption of established arrangements.

Our results point to institutional design features that could help bridge the understanding-behavior gap. For example, employees could be offered an automatic savings feature that routes the HDHP premium savings directly into their HSA account each paycheck, making the financial benefit concrete and building HSA balances to cover early-year expenses. Importantly, this approach does not depend on employees proactively managing HSA contributions, instead automatically converting abstract premium savings into concrete account balances that address liquidity concerns. Another design feature to consider involves the timing of HSA contributions. Monthly employer contributions mean that HSA balances build gradually, which can create difficulties for liquidity-constrained households facing larger healthcare expenses early in the year. Offering employees the option to receive HSA contributions as a lump sum at the start of the year could better align fund availability with the potential timing of healthcare expenses.

Yet even with improved HSA financing, our findings reveal a strong and persistent aversion to out-of-pocket costs that limits enrollment in high cost-sharing plans even when they are financially dominant. Importantly, this aversion persisted even among financially secure participants who understood the HDHP's cost advantage, reflecting concerns about the structure and timing of payments rather than confusion about total spending. These patterns suggest important limits to the use of high cost-sharing as a policy tool in health insurance design. However, in settings where high-deductible plans are already in place, our results point to the value of helping employees better finance out-of-pocket shocks. Policies that help employees connect predictable savings sources like premium differences and HSA contributions with potential out-of-pocket costs can reframe deductibles as pre-financed expenses rather than financial risks. More broadly, addressing behavioral resistance to out-of-pocket costs may require rethinking both how plans are presented and how their financial implications are communicated.

Our findings should be interpreted within the context of this setting. The sample consists of

state employees with relatively high education levels facing a dominant plan choice. Whether these patterns generalize to settings with genuine cost-sharing tradeoffs or different populations remains an open question for future research.

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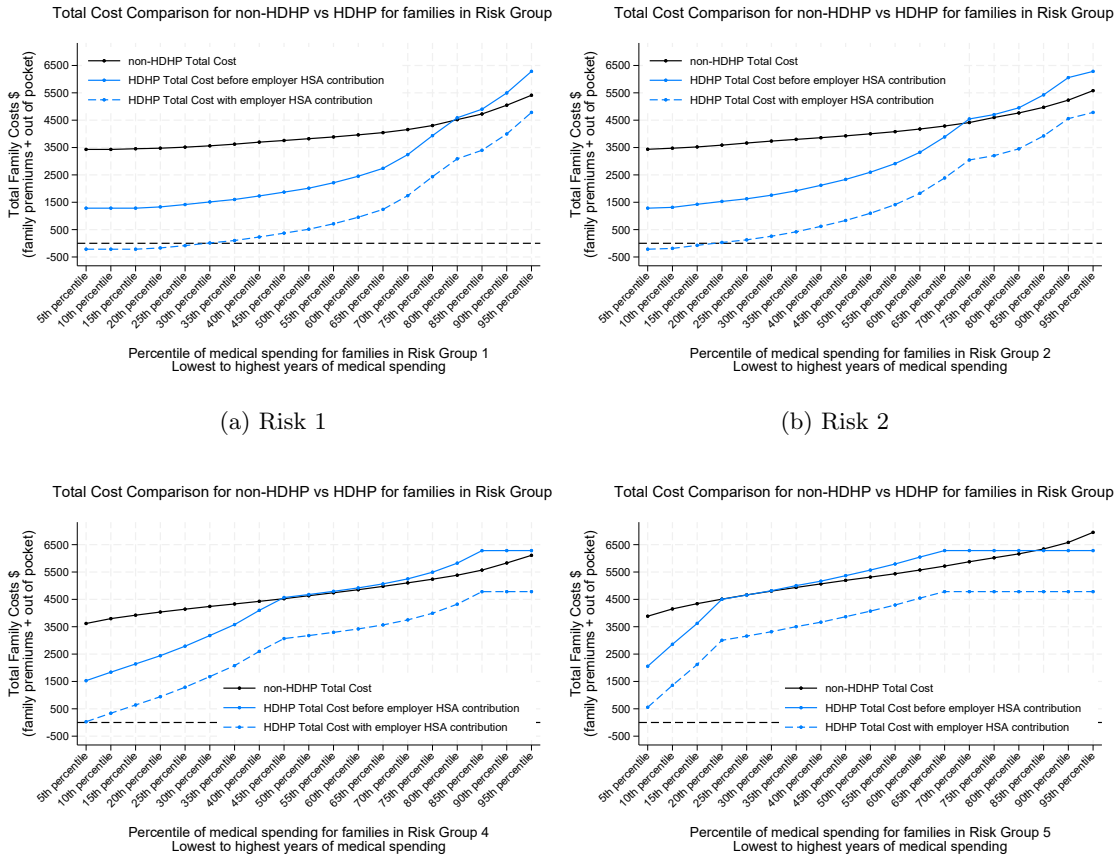
Appendices

Figure A.1: Family Coverage: Detail Cost Projection Graph



(a) Risk 1

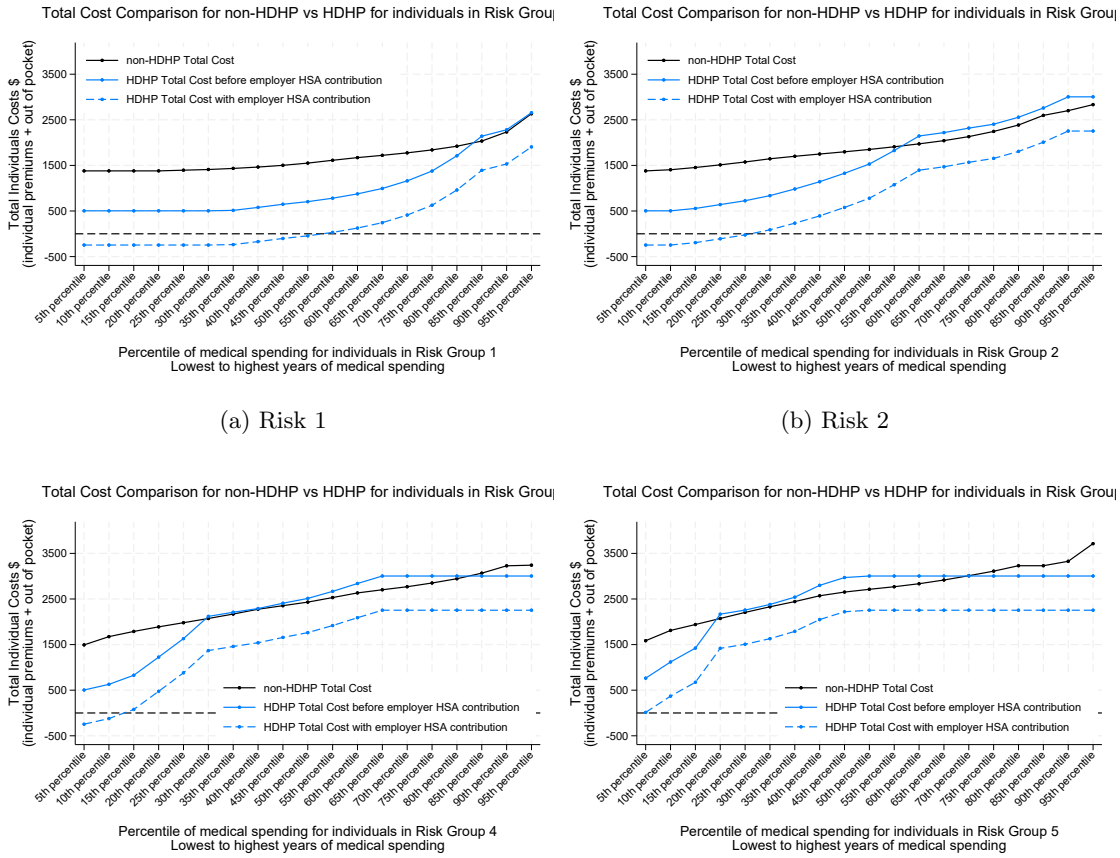
(b) Risk 2

(c) Risk 4

(d) Risk 5

Note: This figure shows potential out-of-pocket costs for families under non-HDHP and HDHP. The black line illustrates total costs under the non-HDHP, while the blue lines represent HDHP costs, with the solid line showing costs before HSA contributions and the dotted line after. Each point along these lines represents a possible cost outcome, with each family having approximately a 5% chance of incurring costs at that point based on their healthcare utilization. The sample includes active employees and their dependents (spouses and children) enrolled in the State Group Health Insurance Program who were eligible to enroll in the HDHP option. The analysis uses the plan detail for 2023 and uses the sample period between 2015-2022.

Figure A.2: Single Coverage: Detail Cost Projection Graph



(a) Risk 1

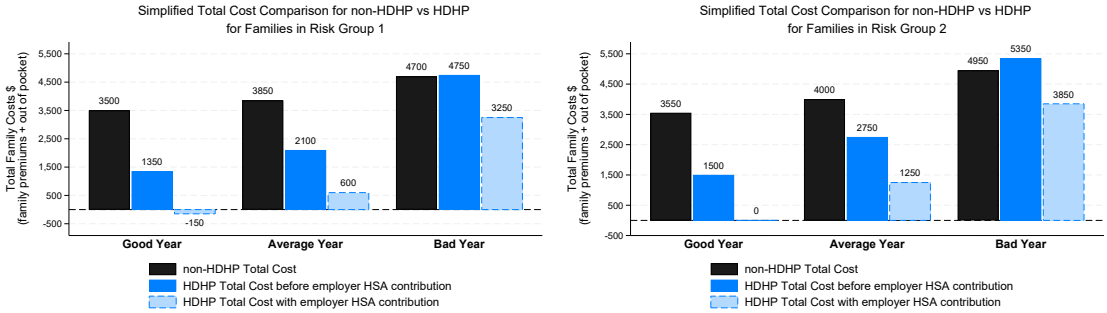
(b) Risk 2

(c) Risk 4

(d) Risk 5

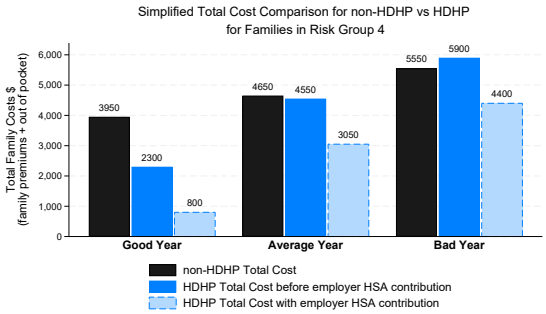
Note: This figure shows potential out-of-pocket costs for singles under non-HDHP and HDHP. The black line illustrates total costs under the non-HDHP, while the blue lines represent HDHP costs, with the solid line showing costs before HSA contributions and the dotted line after. Each point along these lines represents a possible cost outcome, with each individual having approximately a 5% chance of incurring costs at that point based on their healthcare utilization. The sample includes active employees and their dependents (spouses and children) enrolled in the State Group Health Insurance Program who were eligible to enroll in the HDHP option. The analysis uses the plan detail for 2023 and uses the sample period between 2015-2022.

Figure A.3: Family Coverage: Simplified Cost Projection Graph

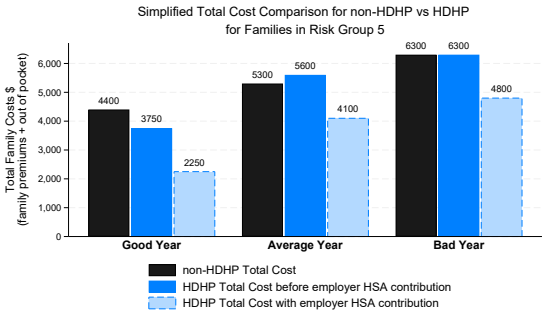


(a) Risk 1

(b) Risk 2



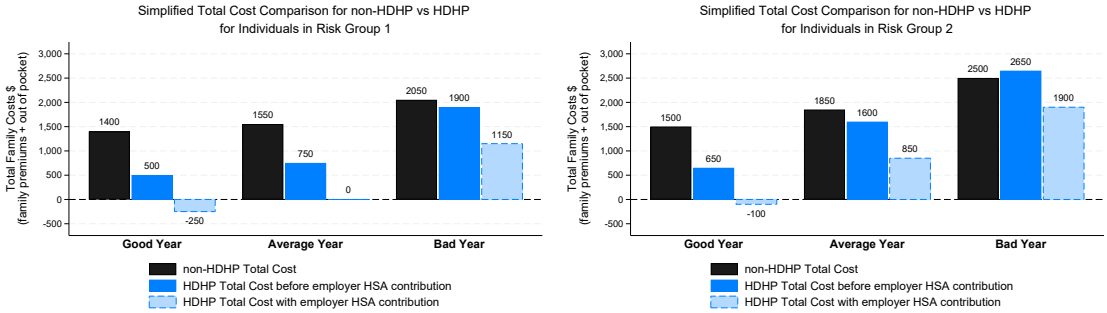
(c) Risk 4



(d) Risk 5

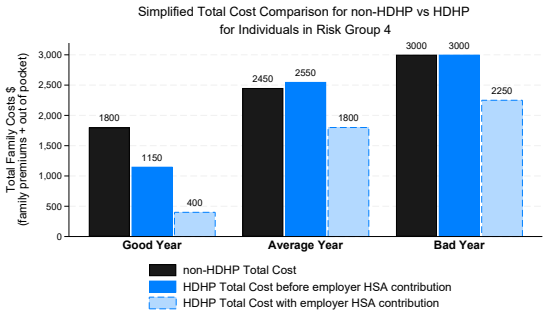
Note: This figure displays potential out-of-pocket costs for families under non-HDHP and HDHP. Costs are categorized based on "good years" (lowest 30% of medical costs), "average years" (middle 40%), and "bad years" (highest 30%). This percentage was calculated based on the prior year's healthcare costs for each risk level. The analysis was created for five risk levels each for family coverage. The sample includes active employees and their dependents (spouses and children) enrolled in the State Group Health Insurance Program who were eligible to enroll in the HDHP option. The analysis uses the plan detail for 2023 and uses the sample period between 2015-2022.

Figure A.4: Single Coverage: Simplified Cost Projection Graph

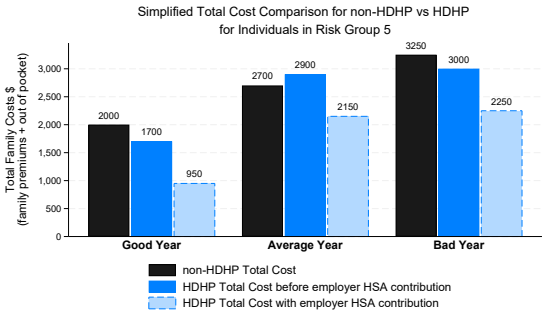


(a) Single Image 1

(b) Single Image 2



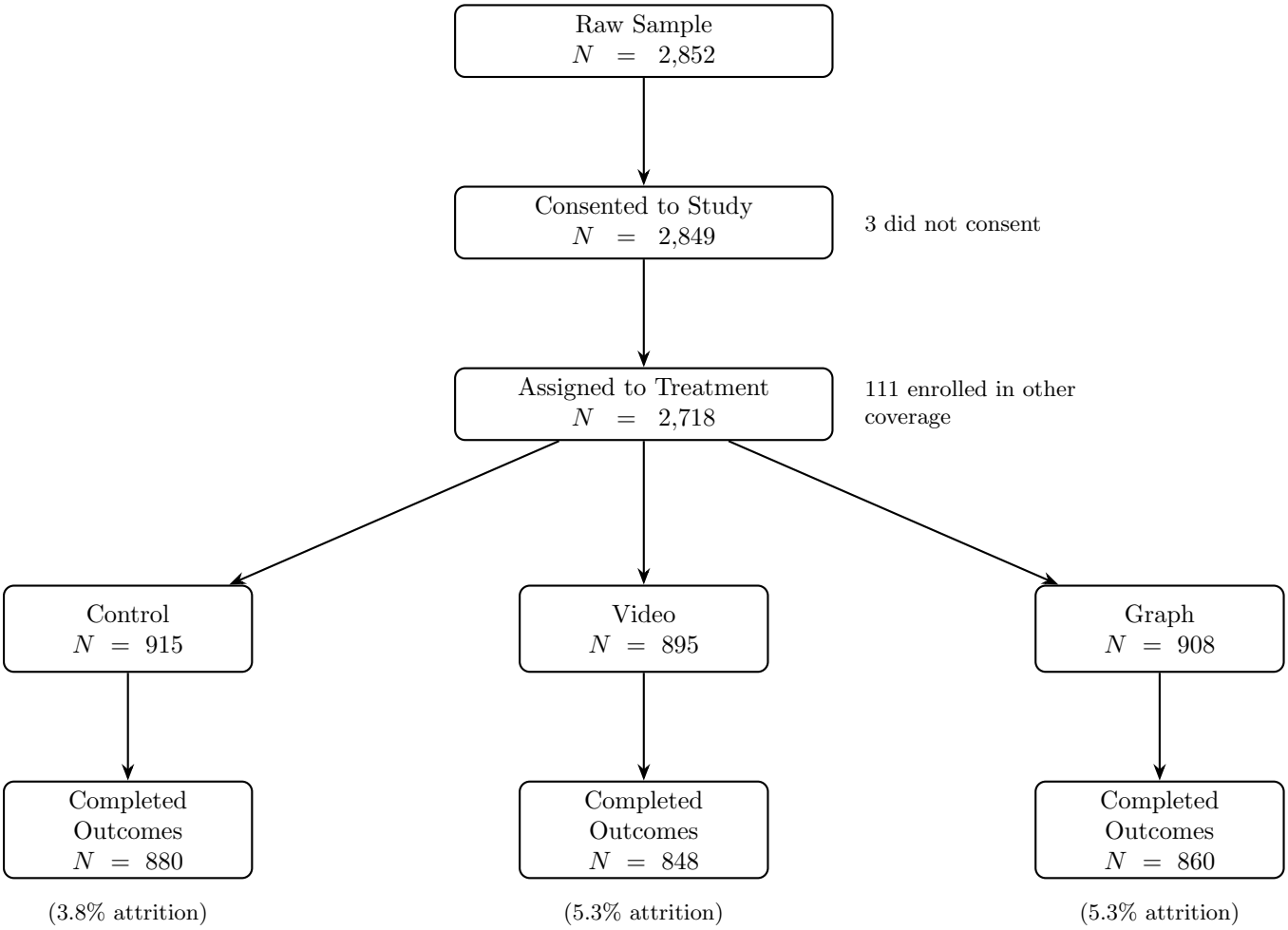
(c) Single Image 3



(d) Single Image 4

Note: This figure displays potential out-of-pocket costs for individuals under non-HDHP and HDHP. Costs are categorized based on "good years" (lowest 30% of medical costs), "average years" (middle 40%), and "bad years" (highest 30%). This percentage was calculated based on the prior year's healthcare costs for each risk level. The analysis was created for five risk levels each for single coverage. The sample includes active employees and their dependents (spouses and children) enrolled in the State Group Health Insurance Program who were eligible to enroll in the HDHP option. The analysis uses the plan detail for 2023 and uses the sample period between 2015-2022.

Figure A.5: Participant Flow



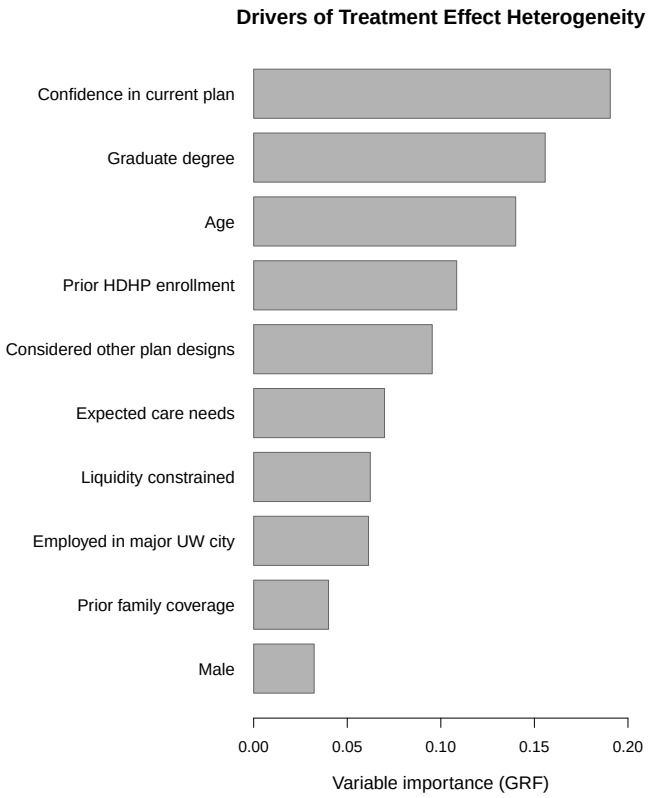
Note: This figure shows the flow of participants through the study. Participants enrolled in coverage other than single or family were not assigned to treatment groups. Attrition refers to dropout before outcome questions.

Table A.1: Heterogeneous Effects by Plan-Choice Deliberation

	HDHP Intended Enrollment	
	(1)	**(2)**
Decision aid (ref: Control)		
Video	0.021	0.041*
	(0.038)	(0.024)
Graphs	0.089**	0.071***
	(0.038)	(0.024)
Deliberation (ref: Spent a little time considering the other option)		
Significant consideration	0.212***	0.043*
	(0.040)	(0.024)
Aware, but did not consider	-0.114***	-0.041
	(0.040)	(0.025)
Not aware of other plan	0.025	0.007
	(0.092)	(0.087)
Decision aid × deliberation		
Video × not aware of other plan	-0.186	-0.091
	(0.125)	(0.115)
Video × aware, but did not consider	0.018	0.007
	(0.057)	(0.038)
Video × significant consideration	-0.003	-0.055
	(0.057)	(0.036)
Graphs × not aware of other plan	-0.130	-0.034
	(0.134)	(0.115)
Graphs × aware, but did not consider	-0.007	0.042
	(0.058)	(0.040)
Graphs × significant consideration	-0.081	-0.065*
	(0.057)	(0.036)
Controls	No	Yes
Control Mean	0.407	0.407
Observations	2,519	2,503

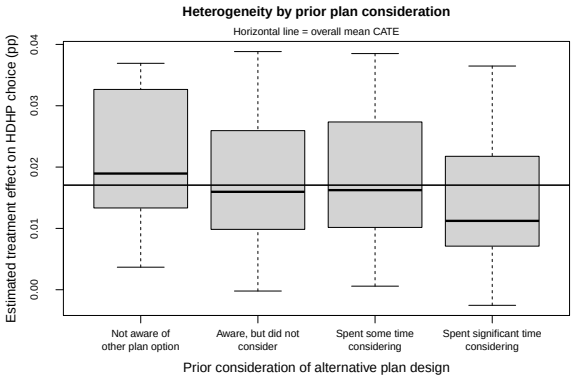
Notes: This table reports coefficients from linear probability models of HDHP enrollment, allowing treatment effects to vary by respondents' plan-choice deliberation. The omitted categories are the control group and the deliberation category "spent a little time considering the other plan design option." Column (2) includes demographic, income, liquidity, current plan enrollment, and expected healthcare utilization controls. Standard errors are in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A.6: Drivers of Treatment Effect Heterogeneity (Video vs Control)

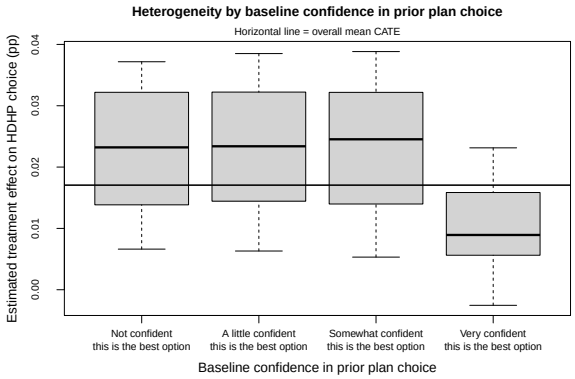


Note: This figure shows the percentage of individuals who reported concerns about the difficulty of setting up and managing an HSA, by treatment group.

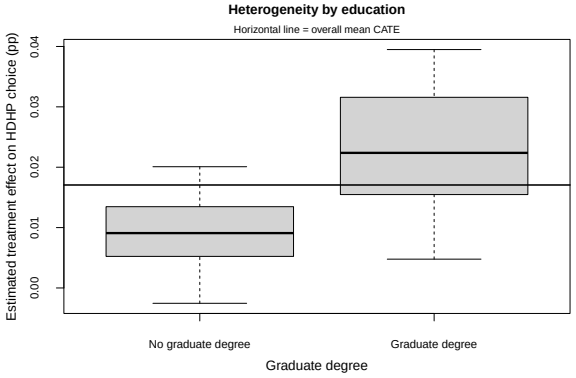
Figure A.8: Heterogeneity in estimated treatment effects from the causal forest (Video vs Control)



(a) Prior plan consideration (*VI rank: 1*)



(b) Baseline confidence in prior plan choice (*VI rank: 2*)



(c) Graduate degree (*VI rank: 3*)