

High Deductible Health Plans Delay Surgical Management of Breast Cancer

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Background

- High deductible health plans (HDHPs) are designed to limit healthcare spending yet may dissuade enrollees from using preventive services.^{1,2}
- HDHPs have been shown to delay timing of screening and chemotherapy for breast cancer patients compared to patients in lower deductible health plans [e.g., intermediate deductible health plans (IDHPs) and low deductible health plans (LDHPs)],^{3,4} although the **relationship between HDHPs and the timing of breast cancer surgery is unknown**.
- Purpose: To characterize the association between HDHPs and the timing of breast cancer surgery for patients undergoing breast cancer operations following routine screening mammograms.

Methods

- Retrospective cohort study of patients within IBM® MarketScan® Commercial Claims Database with continuous enrollment who underwent screening mammogram based on ICD and HCPCS codes.
- From the screening cohort, ICD and CPT codes identified patients who underwent a subsequent breast cancer operation.
- Two proportion z-tests compared the proportion of screening and surgery in quarter 4 (Q4) for LDHP compared to HDHP beneficiaries.
- Calendar quarter of cancer screening and surgery were modeled with ordinal logistic regression.
- The time from screening to surgery (time to surgery, TTS) was evaluated using a Cox proportional hazard function with proportionality depicted with Kaplan Meier curves.

Results

Table 1. Ordinal logistic regression model for likelihood of screening exam in Q1 through Q4 (N=8,208,153)

	Odds Ratio	95% CI	p-value
Health plan [ref: LDHP]			
HDHP	1.146	1.140 – 1.151	<0.001
Year [ref: 2007-2010, pre-ACA]			
2011-2016, post-ACA	1.004	1.001 – 1.007	0.014
Health plan*Year			
HDHP / pre-ACA	1.021	1.015 – 1.027	<0.001
Age, years [ref: 40-44]			
45-49	1.019	1.015 – 1.023	<0.001
50-54	1.053	1.049 – 1.057	<0.001
55-59	1.081	1.077 – 1.089	<0.001
60-64	1.202	1.197 – 1.207	<0.001
Region [ref: Northeast]			
North Central	1.016	1.012 – 1.020	<0.001
South	1.042	1.038 – 1.046	<0.001
West	0.991	0.987 – 0.995	<0.001
Unknown	0.987	0.977 – 0.997	0.011

ACA, Affordable Care Act. *Indicates interaction between variables.

Table 2. Cox proportional hazard model for days from screening mammogram to breast cancer surgery (N=52,897)

	Hazard Ratio	95% CI	p-value
Health plan [ref: LDHP]			
HDHP	0.992	0.957 – 1.029	0.675
Quarter screened [ref: Q1]			
Q2	1.001	0.972 – 1.031	0.948
Q3	1.070	1.039 – 1.102	<0.001
Q4	1.008	0.977 – 1.039	0.620
Health plan*Quarter screened [ref: HDHP/Q1]			
HDHP / Q2	1.073	1.021 – 1.128	0.005
HDHP / Q3	1.072	1.020 – 1.127	0.006
HDHP / Q4	1.041	0.990 – 1.095	0.115
Year	1.009	1.005 – 1.012	<0.001
Age, years [ref: 40-44]			
45-49	1.001	0.973 – 1.029	0.965
50-54	1.063	1.035 – 1.093	<0.001
55-59	1.119	1.088 – 1.150	<0.001
60-64	1.206	1.170 – 1.242	<0.001

Region included in regression model but not shown in table. *Indicates interaction between variables.

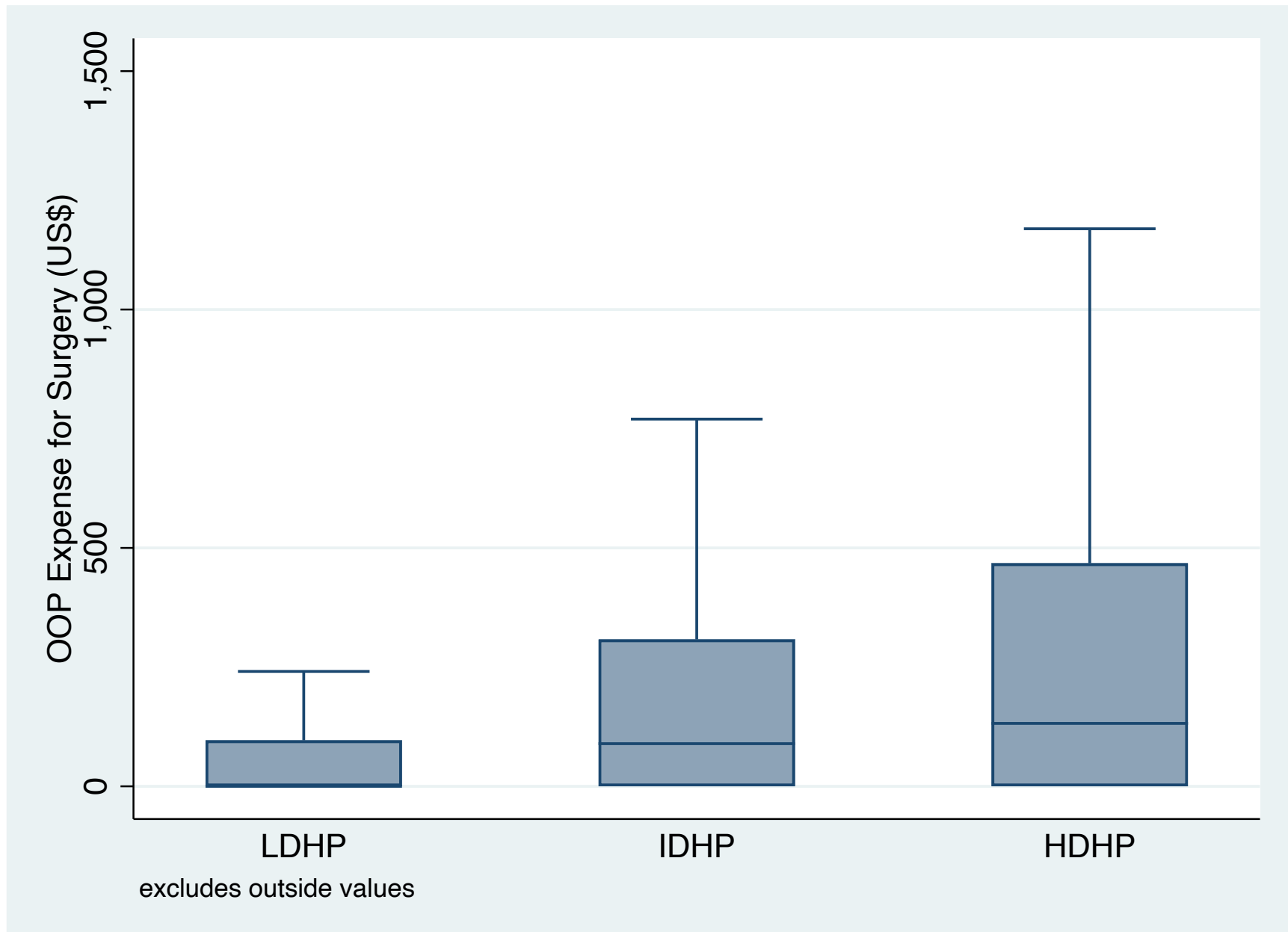
Conclusions

- The current study confirms previous reports that **breast cancer screening is delayed among HDHP beneficiaries and extends these findings by demonstrating the impact of health insurance plan on the downstream definitive surgical treatment**.
- HDHPs were significantly associated with delays in screening mammogram until Q4, with the highest rates of breast cancer surgery in the same period.
- When adjusting for quarter screened, the type of health plan was not a significant predictor of TTS.
- Shorter TTS for HDHP beneficiaries was likely a function of higher Q4 screening rates and the potential rush to have surgery before the fiscal year reset.
- Interventions to improve breast cancer care outcomes in the HDHP population should concentrate on **reducing barriers to timely screening**, rather than on the interval from screening to surgery.

References

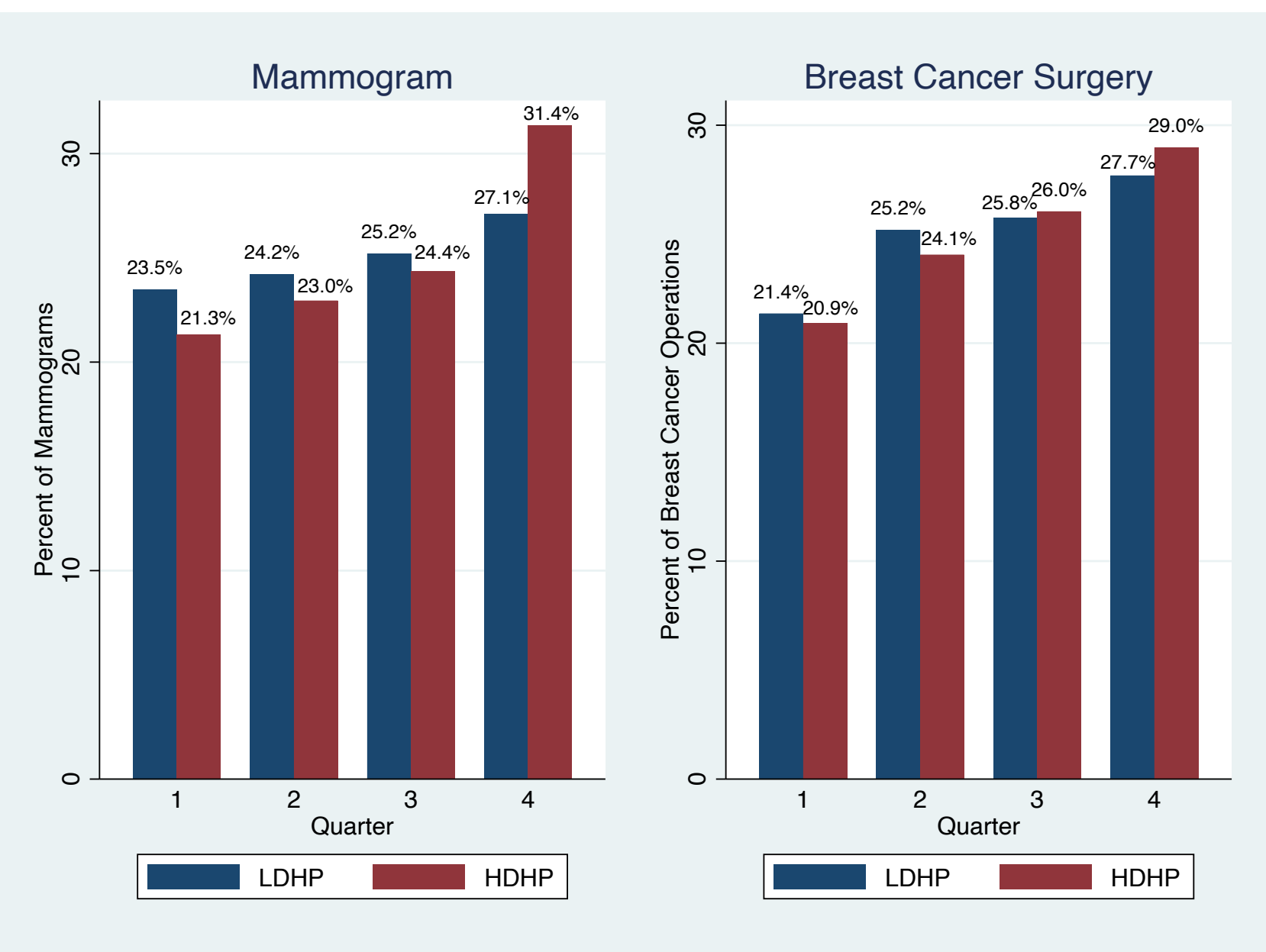
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Figure 1. Out-of-pocket (OOP) expenditures for surgery by health plan type



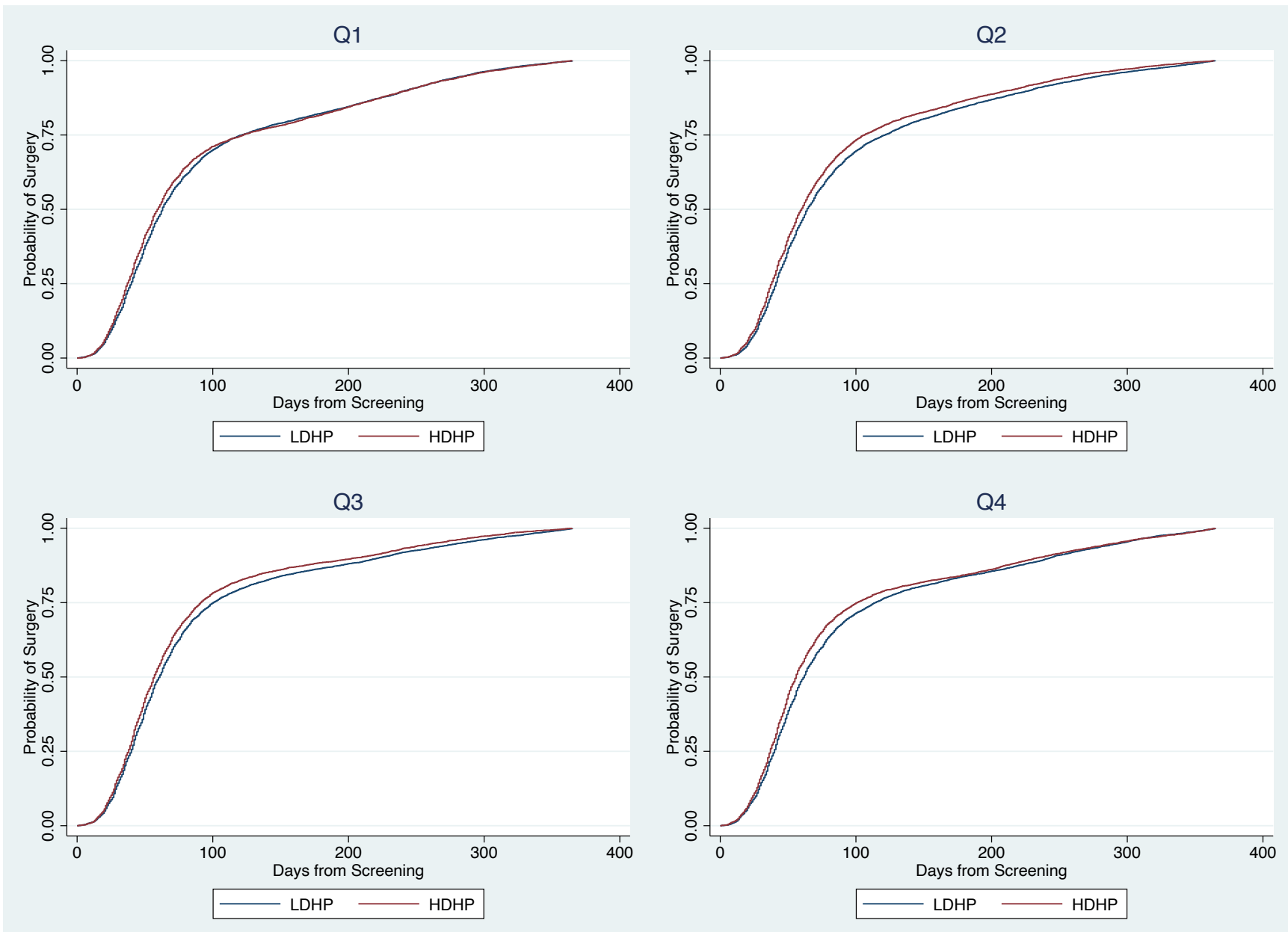
Median (interquartile range; IQR) OOP expenditures for breast cancer surgery were \$0 (0, 96.4) for LDHPs, \$89.4 (0, 308.1) for IDHPs, and \$131.9 (0, 467.7) for HDHPs.

Figure 2. Mammogram and breast cancer surgery rates per quarter



Mammogram and breast cancer surgery rates reversed trend in Q4, with a greater proportion of HDHP compared to LDHP beneficiary utilization (p<0.001).

Figure 3. Kaplan-Meier estimations of time from screen to surgery by quarter



HDHPs were not significantly associated with TTS compared to LDHPs in any quarter.