Managing Behavioral Hazard: Value-Based Insurance Design and Inertia

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Motivation

Value-based insurance design (VBID) reduces cost-sharing for high-value services to improve adherence and health outcomes, particularly for patients managing chronic conditions. Despite its theoretical appeal, empirical evidence on whether VBID achieves genuine behavioral change versus merely shifting costs remains limited, especially for chronically ill populations where medication adherence has the highest clinical stakes.

Setting and Design

In 2019, the California Public Employees' Retirement System (CalPERS) redesigned one of its PPO plans, PERS Select, reducing primary care copayments from $20 to $10 for enrollees with a designated personal physician while simultaneously increasing specialist copayments from $20 to $35, doubling the individual deductible from $500 to $1,000, and introducing a wellness incentive program allowing members to reduce their effective deductible by up to $500 through completing activities such as biometric screening, influenza vaccination, and chronic disease management program participation. The reform created sharp cross-sectional variation in net cost-sharing incentives across service types, providing a natural experiment for evaluating VBID in a large, administratively rich setting.

Data and Empirical Strategy

We use administrative claims data from 2015–2022. Our primary identification strategy is a difference-in-differences design comparing PERS Select enrollees before and after the 2019 redesign, using another PPO plan as a control group with an identical pre-period benefit structure that was unchanged in 2019. To decompose the benefit design channel from the premium income effect — California state employees received a premium reduction to $0 under all 40 bargaining units — we employ a triple-differences specification exploiting cross-sectional variation in employer-type premium pass-through. We adopt a plan-year intent-to-treat sampling frame to capture compositional responses to the redesign. To assess heterogeneous effects by chronic disease burden, we stratify by baseline (2018) Charlson Comorbidity Index category.

Results

The redesign increased primary care visit probability by 4.4 percentage points and visit counts by 0.49 visits per year. Out-of-pocket spending rose by $99, consistent with the deductible increase. The triple-differences specification reveals heterogeneity in the premium income effect by chronic disease burden: the relative increase in pharmaceutical

spending among state employees receiving the premium reduction was substantially larger for members with mild-to-moderate chronic conditions (Charlson score 1–2) than for healthy members (Charlson score 0), suggesting chronically ill members are more responsive to income relief in their medication decisions. This pattern is consistent with budget-constrained chronically ill patients rationing maintenance medications prior to the premium reduction.

Welfare Implications

Partial equilibrium welfare calculations incorporating downstream hospitalization risk from reductions in maintenance medication use yield positive net welfare estimates across all scenarios, with gains from increased primary care utilization outweighing estimated potential medication utilization costs. However, the concentration of differential pharmaceutical spending responses among Charlson 1–2 members raises concerns about whether deductible-induced cost-sharing increases may offset gains from copay reductions for primary care among chronically ill enrollees.

Contribution

This paper makes three contributions. First, we provide clean identification of the benefit design channel by separating it from the premium income effect via triple-differences. Second, our intent-to-treat sampling frame avoids endogenous sample selection from plan switching, addressing a limitation of prior work on this redesign. Third, we provide new evidence that the premium income effect on pharmaceutical spending is heterogeneous by chronic disease burden, with implications for the design of premium subsidy programs targeting chronically ill populations.