An Ounce of Prevention or a Pound of Cure? The Value of Health Risk Information

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Abstract

- Individuals **infer their own health risk** after observing health experiences of their family members (e.g., new major diagnoses or hospitalizations)
- When an individual is newly diagnosed with a chronic condition:
  - Unaffected family members increase their healthcare spending **by ↑ 10%**
  - Spillovers include ↑ use of both high- and low-return care
- Responses are consistent with individual updating of their own health risks
- To assess welfare, I estimate a structural model of health choices with learning. I find that:
  - Consumers over-respond to events by **over-weighting *ex-post* risks**
  - This leads to annual welfare losses of **$2,788 per family** on average
  - Limiting responsiveness results in net gains for **86% of households**
  - Revealing information can be optimally targeted to improve social welfare

Introduction

Social networks provide information for consumers' health choices

- Individual expectations of health needs are updated as they observe the experiences of family members, friends, and neighbors[1,2]
- Spillover effects may include updated beliefs about health risk, but also:
  - *Moral hazard:* Changes to the expected price of medical care[3]
  - *Salience:* Preferences for health consumption (e.g., risk aversion)[4]
  - *Health System Information:* Knowledge about the availability of services[5]

Data and Setting

- Nuclear households with employer-sponsored insurance (ESI), 2006-2018
- Setting: new diagnoses of chronic conditions (e.g., diabetes, depression, asthma)

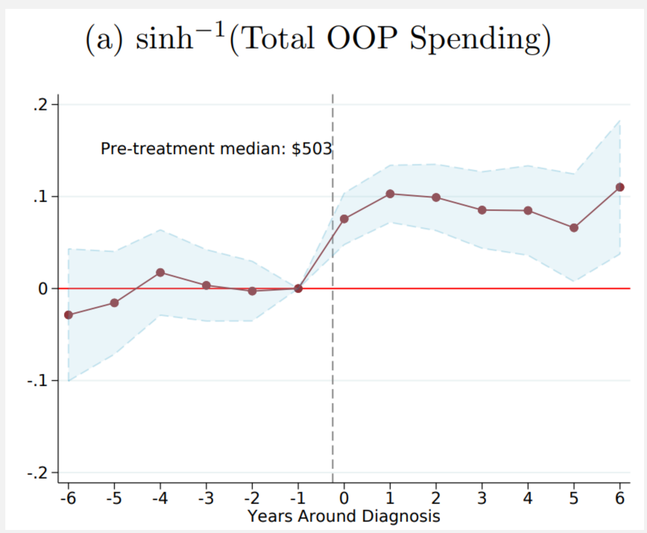

Figure 1. Households increase spending by ~10% in response to intra-household health events

Methods and Contributions

Reduced-Form Evidence: Spillovers and Mechanisms

- I identify **causal** impact of health shocks on choices using TWFE regressions:

$$\sinh^{-1}(y_{ft}) = \alpha_f + \tau_t + \sum_{\{k=-T\}}^{T} \gamma_k \mathbb{I}\{t - E_{ft} = k\} + \varepsilon_{ft}$$

- Results are robust to alternative TWFE estimators
- Explore effects on competing mechanisms based on selection of y_{ft}

Structural Approach: Belief Evolution and Learning

- Model where **households form beliefs** about their health risks over time
- Households choose insurance plan, then select health care in response to fluctuations in individual health states
- Health events ⇒ updated beliefs, but also updated spot prices and risk aversion

Structural Identification:

- Variation in treatment costs identifies spot price changes (moral hazard)
- Plan choice set variation identifies household risk aversion[6]
- Characteristics of diagnostic event **identify belief evolution separately**

Results: Spillover Effects and Mechanisms

1. Diagnoses ⇒ **informational spillovers** for household members (Figure 1)
   a. This includes ↑ in total utilization *and* ↑ in preventive care
   b. Increases are particularly strong for **disease-specific prevention** (e.g., diabetes screenings after a new diabetes diagnosis; Figure 2a)
2. Results are **most consistent** with belief updating *(Competing Mechanisms)*:
   a. *Moral hazard:* Spending ↑ even when spot prices don't change (Figure 2b)
   b. *Salience:* Diagnoses induce stronger preventive responses than acute events
   c. *Health System Learning:* Even those with high health system knowledge are responsive to new household diagnoses (Figure 2c)
3. Responses include ↑ **utilization of "quasi-preventive" low-value care**[7]
   - Cardiac screenings prior to low-risk surgery
   - Imaging services (e.g., for lower back pain)

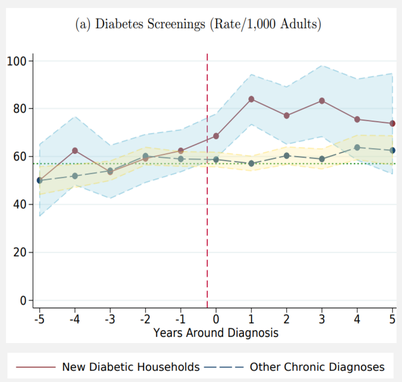

Figure 2a: ↑ in Disease-specific screenings

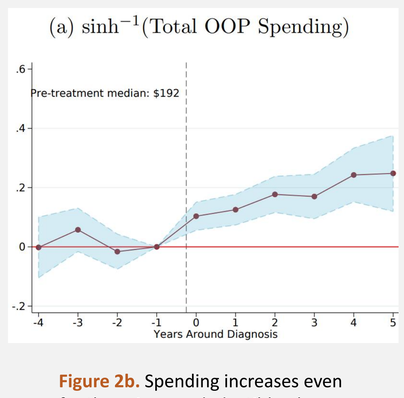

Figure 2b. Spending increases even for those in zero-deductible plans

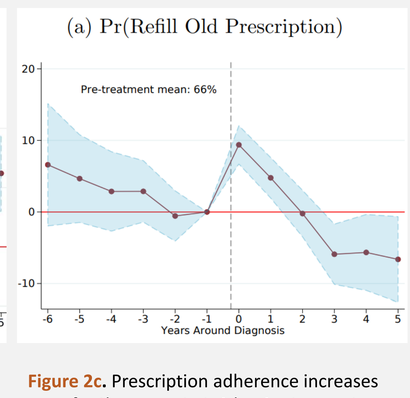

Figure 2c. Prescription adherence increases even for those most at risk prior to event

Results: Belief Evolution

1. New information **is not welfare-improving** for >90% of households
   a. New information lowers expected utility by an average of **$2,788 per year**
2. There is a tension between **an event's seriousness** and **correct updating**:
   a. Diagnoses spur overly large changes in beliefs about risk (Figure 3)

Counterfactual Simulations

1. Bounding changes in risk beliefs would substantially increase consumer welfare
   a. **86% of households** would find information welfare-improving
2. Targeting risk information to *highest-risk* individuals further improves returns

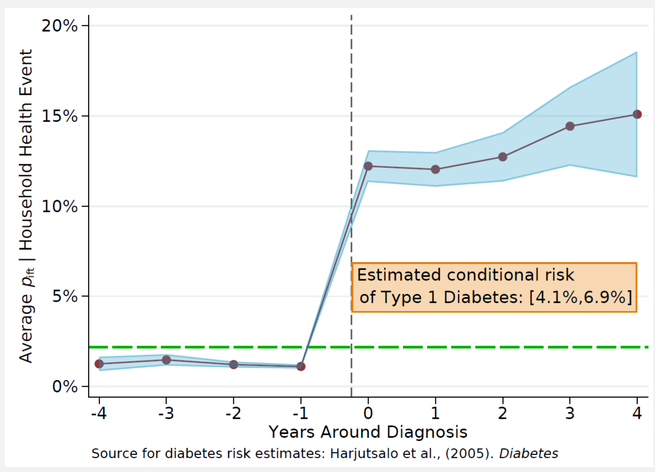

Figure 3. New diagnoses lead to substantial over-updating of household beliefs about risk

Conclusions & Contributions

Health information ⇒ powerful spillover effects in family networks

1. **Novel (strong!) channel** for health spillovers: chronic diagnoses
2. **Mechanisms**: health events affect decisions *most* by how they affect beliefs
3. **Heterogeneous Returns**: diagnoses increase use of both high *and* low-value care, ultimately resulting in welfare losses for the average household

Other Contributions

- Learning and preferences in structural models of health behavior[8]
- Non-Bayesian learning, with an emphasis on salience of recent events
- Suboptimal health decisions made by many health consumers[9]

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