Health Events in the Household – Families and Social Insurance

5th IZA Workshop on Gender and Family Economics: "Families as an Insurance Mechanism”
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Torben Heien Nielsen
University of Copenhagen and CEBI
Health events: Severe illness and subsequent deaths

Among the most devastating shocks households face and a major source of financial risk

Understanding responses to health shocks are key inputs in the optimal design of efficient and equitable social insurance programs

More generally, the way families respond to health events are of interest as a social phenomenon, as they affect every family and represent pivotal episodes that make health particularly salient
How do families respond to adverse health events?

Today’s talk centers at two topics

Family labor responses as a self-insurance mechanism

Behavioral responses to health shocks as a social phenomenon
Insurance against adverse health events

• **Social Insurance** – Government intervention in providing insurance against adverse shocks to individuals (Chetty and Finkelstein, 2012)
  • Health, Disability and retirement, work injury

• There is now a wide recognition that most adverse events affect **families** more broadly (this workshop is a proof that)
  • Bereavement, Health shocks, Unemployment

While resources spend on social insurance is positively correlated with GDP, families’ financial circumstances are affected by health shocks—even in richer economies
Who, beyond the individual, bears burden of disease?

<table>
<thead>
<tr>
<th>Health Insurance (against medical bills)</th>
<th>Governments</th>
<th>Families</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>Coverage</td>
<td>(Informal) Care Transfers</td>
<td>Private markets</td>
</tr>
<tr>
<td>- Full: Beveridge or Bismarckian</td>
<td>- Full: Beveridge or Bismarckian</td>
<td></td>
<td>- Employer programs</td>
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<tr>
<td>- Means tested: eg., Medicaid</td>
<td>- Means tested: eg., Medicaid</td>
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<td>- Mandates</td>
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<td>- Partial: eg., Medicare</td>
<td>- Partial: eg., Medicare</td>
<td></td>
<td>Loans</td>
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<td></td>
<td>Medical Bankruptcies</td>
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<td>Hospitals, NGOs…</td>
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<table>
<thead>
<tr>
<th>Income insurance (against lost earnings capacity)</th>
<th>Governments</th>
<th>Families</th>
<th>Others</th>
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<tbody>
<tr>
<td>Survivors Insurance</td>
<td>Survivors Insurance</td>
<td>Self-insurance (Added worker effects)</td>
<td>Private markets</td>
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<tr>
<td>Disability Insurance</td>
<td>Disability Insurance</td>
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<td>- Life insurance</td>
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<tr>
<td>Sickpay (UI-benefits)</td>
<td>Sickpay (UI-benefits)</td>
<td>(Added worker effects)</td>
<td>- Employer schemes</td>
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<tr>
<td>(Retirement schemes)</td>
<td>(Retirement schemes)</td>
<td>Transfers</td>
<td>- Collective schemes</td>
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<td>NGOs</td>
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</table>
How do families respond to adverse health events?

**Empirical Challenges:**
Finding the right data and a proper control group

The anatomy of shocks vary
- Severity and anticipation

The insurance environments vary
- Universal vs. Partial social insurance

Family characteristics vary
- Size and composition, education, peers, within household specialization
How do families respond to adverse health events?

**Family labor responses as a self-insurance mechanism**

Family Labor Supply Responses to Severe Health Shocks: Evidence from Danish Administrative Records*, AEJ:Applied, 2021

**Behavioral responses to health shocks as a social phenomenon**

Family Health Behaviors*, AER 2019


*All work is joint with Itzik Fadlon, UCSD
*The current presentation replicates graphs from these publications
Environment – Denmark 1980 onwards

- Universal health insurance (Beveridge)
  - Almost all health expenditure covered by government
  - Allows us to concentrate on self-insurance related to income and earnings

- Social Income insurance
  - Temporary Sickpay
    - First 4 weeks fully covered, hereafter UI-benefit level
  - Social Disability Insurance
    - Means tested Disability and Social element
    - 25% of all widows receive DI (effectively survivors benefit)
  - Old age pensions (age 65/67) – Early retirement schemes (age 60)
  - (UI benefit scheme)
Environment – Denmark 1980 onwards

• Administrative data
  • Death Registry - Death dates
  • National Patient Registry (hospital admissions)
    • Exact timing and diagnoses
    • Focus on heart attack and strokes - pervasive, sudden and severe (Chandra and Staiger, 2007 and Doyle, 2011)
• Economic Data
  • All sources of income earnings, government transfers (old age pensions, DI, welfare, housing assistance, and UI benefit), pay-outs from retirement savings accounts, capital income
• Spousal linkages
Research design

Main outcome of empirical analysis:
The causal effects of mortality and health shocks on spouse’s labor supply

Ideal experiment:
- Randomly assign shocks to households and track labor supply responses over time
- compare affected households to ex-ante similar unaffected households
- Same expectations, but different realizations

Quasi-experiment:
- use 30 years of administrative panel data to mimic ideal experiment
- Within a short period of time the timing of a severe health shock or death is as good as random
- Identify treatment effects from timing
Research design

Event studies of two experimental groups

- Treatment group: households that experience a shock in year t
- Control group: households that experience the same shock in year t + Δ

- Estimator: simple differences-in-differences

\[ y_{it} = \alpha_i + \beta_{treat_i} + \gamma_{treat_i} \times post_{i,t} + \delta X_{i,t} + \varepsilon_{i,t} \]

Identifying assumption: Parallel Trends

Track the two groups back to five years before the shock to validate the design
The red graph represents labor force participation for persons who had a heart attack or a stroke in 1995.
The red graph represents labor force participation for persons who had a heart attack or a stroke in 1995.
Illustration of quasi experimental design
Illustration of quasi experimental design
Illustration of quasi experimental design
Illustration of quasi experimental design
Illustration of quasi experimental design

Trade-off in choosing $\Delta$:
Comparability vs. Evaluation Horizon
Trade-off in choosing $\Delta$:
Comparability vs. Evaluation Horizon
We choose $\Delta=5$
Spousal Labor Supply Responses

Anatomy: Fatal vs. Non-Fatal events
Spousal Labor Supply Responses

Fatal events
Spousal responses to Fatal health events

Labor force participation

Annual Earnings
Spousal responses to Fatal health events

Labor force participation

Widowers (wife dies)
Widows (husband dies)

Annual Earnings

Widowers (wife dies)
Widows (husband dies)
Spousal Labor Supply Responses

Fatal events:
Do these effects reflect a response to an income drop?
Spousal responses to Fatal health events

Overall Potential Household Income

Widowers (wife dies)

Widows (husband dies)

Potential Household Income:

All household income
– keeping fixed the surviving spouses
Earnings and Social disability insurance (t-1)

• Given OECD equivalence scaling
  • An income drop of 29-33pp would not require self-insurance

• Males drop: 32pp
• Females drop: 40pp
Spousal responses to Fatal health events

Overall Actual Household Income

Widowers (wife dies)

Widows (husband dies)

Actual Household Income:

All household income
– Allowing surviving spouses to respond in Earnings and Social Insurance

• Actual drop in HH Income

• Males drop: 31pp (potential 32pp)
• Females drop: 35pp (potential 40pp)
Spousal responses to Fatal health events

Overall Actual Household Income

Widowers (wife dies)  
Widows (husband dies)

Actual Household Income:

All household income  
– Allowing surviving spouses to respond in Earnings and Social Insurance

• Actual drop in HH Income

  • Males drop: 31pp (potential 32pp)
  • Females drop: 35pp (potential 40pp)

Labor supply works as a self-insurance mechanism for widows
Spousal Labor Supply Responses

Fatal events:
Are labor supply and social insurance substitutes?
Interaction with Social Disability Insurance

- 25% increase in survivors benefits for widows

Take up of Social DI for Widows

Rate vs Time to Event

- Treatment
- Control
- Counterfactual
Interaction with Social Disability Insurance

Take up of Social DI for Widows

Cross Municipality variation in benefits
Interaction with Social Disability Insurance

2SLS estimates suggest a Labor Force Participation elasticity of -.26 with respect to social benefits.

Formal social insurance provided to survivors benefit substitutes for labor supply increases.

JPubE paper shows how labor supply responses can be translated into a sufficient statistics for welfare improvements by government offering of survivors benefits.
Spousal Labor Supply Responses

Non-Fatal events
Non-fatal health events – own earnings

Labor force participation

Annual Earnings
Non-fatal health events – Spousal earnings

Labor force participation

Annual Earnings
Sickpay and DI: Labor market protections for non-fatal shocks

Individual protected against earnings losses following health events

- Temporary: Sickpay
- Permanent: Disability Insurance

No scope for spousal responses
Sickpay and DI: Labor market protections for non-fatal shocks

Individual protected against earnings losses following health events

• Temporary: Sickpay
• Permanent: Disability Insurance

No scope for spousal responses

Main difference to US:
eg. Dobkin et al. (2018)

Sickpay mandates lacking in many states to protect against earnings losses

Consequently, increased credit limitations and borrowing opportunities (consistent with lower earnings) even for people with health insurance
Behavioral response to health shocks as a social phenomenon
Family Health Behaviors
Economic importance

• **Health behaviors**, broadly defined as any action, investment, or consumption choice that can affect health and mortality risk, are a key input in the production of individuals’ health

• These behaviors take a variety of forms including both adverse habits, such as smoking and drinking, and positive actions, such as the consumption of risk-reducing preventive care

• The importance of identifying what determines health-related behaviors, which are notorious for being hard to change, has led to an active literature on a range of potential factors, with some particular focus on financial incentives and health education

• Still, we lack a clear understanding of the channels through which health behaviors and habits evolve over the life cycle
Family Health Behaviors

Every family will eventually experience severe health events. They represent pivotal episodes that make health particularly salient.

Hence, there could be a role for the family in forming health behaviors, via the flow of information, awareness, and the creation of habits and norms.

This leaves a potential for families, and networks more generally, to learn from the events and perhaps improve their health behaviors.
Family Health Behaviors

Do severe family health events alter preventive behavior?
Data

Now we augment our data source:

- Medical prescriptions for preventive medications (eg. statins)

To understand the anatomy of the responses, we focus not only on spousal responses, but also preventive behaviors of broader circles of peers:

- Adult children, mothers & fathers inlaw and coworkers
- Investigating the responses by these peers in various health behavior margins allows us to better understand the mechanisms driving health choices
Family Health Behaviors

Main effects - Spouses
Prime-age spouses

Statin consumption

Cholesterol tests
Family Health Behaviors

Main effects - Children
Children

Younger Adult Children (Ages 25-40)

Older Adult Children (Ages 40-65)
# Magnitudes

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**Countertual at t=4**

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<tr>
<th>Percent Change</th>
<th>0.07863</th>
<th>0.22842</th>
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**Percent Change**

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<tr>
<th>Counterfactual at t=0</th>
<th>14.83</th>
<th>5.38</th>
<th>36.69</th>
<th>16.20</th>
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</table>

**Percent Change**

<table>
<thead>
<tr>
<th>Number of Observations</th>
<th>441,720</th>
<th>667,980</th>
<th>214,793</th>
<th>1,179,387</th>
<th>647,667</th>
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</thead>
<tbody>
<tr>
<td>Number of Clusters</td>
<td>44,302</td>
<td>65,661</td>
<td>20,997</td>
<td>67,460</td>
<td>40,690</td>
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</table>
Coworkers

- No biological link
- Salience of the shock

<table>
<thead>
<tr>
<th>Close Coworkers</th>
<th>Distant Coworkers</th>
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<tbody>
<tr>
<td>Treat x Post</td>
<td>Larger Workplaces</td>
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<tr>
<td>(1)</td>
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<td>0.01349</td>
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<tr>
<td>Percent Change</td>
<td>15.98</td>
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<td>Number of Obs.</td>
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<tr>
<td>Number of Clusters</td>
<td>3,498</td>
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</table>
Family Health Behaviors

Where are these effects coming from?
Mechanisms

Learning new information

Salience and attention
Mechanisms

**Learning new information**
Stronger response for people at higher risk

Stronger response if there is a biological link

Stronger response if the shock contains more information (age of patient)

**Salience and attention**
Mechanisms

**Learning new information**
Stronger response for people at higher risk

Stronger response if there is a biological link

Stronger response if the shock contains more information (age of patient)

**Salience and attention**
Increased awareness of health
Fatal events – treatment effects

Hospital medical observation for conditions that are ruled out

Non-hospital urgent contacts
Mechanisms

**Learning new information**
Stranger response for people at higher risk

**Salience and attention**
Increased awareness of health

Stronger response if there is a biological link

Stronger response if the shock contains more information (age of patient)
Mechanisms

**Learning new information**

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**Salience and attention**

 Increased awareness of health

 Response with limited scope for learning
  - Response by already tested people
  - Males use more radiology if wife had a female-cancer
Mechanisms

**Learning new information**

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Stronger response if the shock contains more information (age of patient)

**Salience and attention**

Increased awareness of health

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Response for fathers and mothers in-law events
Mechanisms

**Learning new information**

Stronger response for people at higher risk

Stronger response if there is a biological link

Stronger response if the shock contains more information (age of patient)

**Salience and attention**

Increased awareness of health

Response with limited scope for learning

- Response by already tested people
- Males use more radiology if wife had a female-cancer

Response for fathers and mothers in-law events — *IF THEY LIVE CLOSE*
Family Health Behaviors

Policy Remarks
Policy remarks

• An effective “Nudge”: Closing under-utilization gaps in Statins
  • Family health events can close 16% of gap for spouses
  • Family health events can close 42% of gap for children
Policy remarks

• An effective “Nudge”: Closing under-utilization gaps in Statins
  • Family health events can close 16% of gap for spouses
  • Family health events can close 42% of gap for children

• Be careful!!!: We find evidence that family events divert attention towards the specific diagnosis experienced, eg.,
  • Cancer in the family makes family members focus on own cancer
  • But decreased attention towards cardiovascular disease (following cancer events)
  • Bad if individual risk is higher in this domain
Conclusion
Family health events

• Reveal how families self-insure against adverse events
• Crowd-out between self-insurance and social insurance

Health events in the family represent pivotal episodes that make health particularly salient
- large scope for behavioral change towards improved health behaviors

Mechanism both consistent with both
  “learning new information” and “salience and attention”