Effect of Health Shocks on Resource Acquisition for Food Insecure Households

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Wealth-Health Gradient

The difference in incomes of people reporting poor versus excellent health, is similar to the difference in incomes of college dropouts versus college graduates.

1. Low Income causes(?) poor health
   ▶ Safety net health systems has potential to intervene
   ▶ Utilization often sub-optimal

2. Poor health causes(?) lower income & wealth
   ▶ Effects extend beyond the financial burden of healthcare
   ▶ Patchwork of social service programs/agencies that may intervene
Research Question

What is the impact of an unexpected adverse health event on employment, housing mobility, and utilization of social services?

Health Shock = "unexpected adverse health event"
Causal Mechanisms

Poor health *causes (?)* lower income & wealth

- Low SES households are more adversely affected by health shocks....coping is difficult
- Low SES households experience more health shocks
IDENTIFICATION STRATEGY

- Health shock is exogenous (unpreventable and unpredictable).
- Estimate the relationship between health shocks (independent variable) and changes in employment, housing mobility, and utilization of social services (dependent variables).
  - Changes measured over a minimum 180 days
- Health shock occurs in between pre- and post- outcome measures
Largest Non-profit food distributor in the region (>5500 households annually)

Administrative data collected at client intake

Monthly, longitudinal records

Address and household members validated via rental agreements, school records, mortgage

Key Variables

- Household employment
- Household composition
- Crossroads visits
- Address history
- Age, race/ethnicity, gender, marital status
Key Variables

- County safety-net health provider
- Integrated health system (hospital & community clinics)
- Epic electronic health records (~65,000 records annually)
- ER visits
  - Excluded potentially preventable conditions (Parchman & Culler, 1999)
  - Excluded visits for chronic conditions (e.g. prescription refills, administrative visits)
- Insurance status
- Outpatient visits
Real-estate characteristics of all properties in Dallas County (~650,000 parcels)

Crossroads household address history can be geo-coded to DCAD parcel file

Key Variables

- Distance moved
- Type of housing (e.g. apartment, town home, single-family)
- Housing characteristics for single-family
DATA LINKAGE

- Crossroads [Dec. 2013-Nov. 2015]: 10,840 individuals residing in 7,588 households
  - 71,349 household encounters
  - 4471 households with multiple visits spanning at least 180 days

  - 3696 merged household records (82.67%)

- 100% cadastral geocoding of merged records using DCAD parcel file
SAMPLE CHARACTERISTICS

- **Average household:**
  - 14 Crossroads visits
  - 2.5 members
  - 26 household outpatient encounters
  - Monthly income = $1,205 (if any income)

- **Average head of household:**
  - 47 years
  - Female (75%)
  - unmarried (68%)
  - African American (53%) or Hispanic (33%)
**Number of Crossroads Visits**

The bar chart displays the distribution of the number of visits to CCS (Crossroads Community Service) within a study window. The x-axis represents the number of visits, ranging from 0 to 30, while the y-axis shows the percentage of visits, ranging from 0% to 8%. The chart indicates that the majority of visits fall within the range of 0 to 10 visits, with a smaller number of visits occurring at the higher end of the spectrum.
CHANGE IN THE PROPORTION OF ADULTS EMPLOYED FULL-TIME (LAST-FIRST)

90% of sample had no change
CHANGE IN THE PROPORTION OF ADULTS EMPLOYED FULL- OR PART-TIME (LAST-FIRST)

89% of sample had no change
CHANGE IN THE NUMBER OF ADULTS IN THE HOUSEHOLD (LAST-FIRST)

85% of sample had no change
NUMBER OF MOVES

92% of sample did not move
DISTANCE MOVED (MILES)

92% of sample did not move
Econometric Model

\[ y_i = \beta_0 + \beta_1 x_i + \theta HS_i + \epsilon_i \]

- In separate models, \( y_i = \)
  - change in proportion of household adults employed (OLS)
  - change in number of household adults (OLS)
  - number of Crossroads visits (Tobit Model)
  - whether household moved (Logit Model)
  - whether the move was over a longer distance (Logit Model)

- \( x \) is controls for initial household size, initial household employment level, age, age squared, race/ethnicity, head gender, head education, marital status, # of outpatient visits, and health insurance status of head.

- \( HS \) indicates whether the household experienced a health shock
### Estimation Results (OLS and Tobit Models)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Household Shock</th>
<th>Head Shock</th>
<th>Non-head Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>3,235</td>
<td>1,151</td>
<td>1,151</td>
</tr>
<tr>
<td>Change in Proportion Adults Employed Full-time (Last-First)</td>
<td>-0.003 (0.006)</td>
<td>-0.018 (0.011)</td>
<td>-0.016 (0.013)</td>
</tr>
<tr>
<td>Change in Proportion Adults Employed Full/Part-time (Last-First)</td>
<td>-0.009 (0.007)</td>
<td>-0.004 (0.013)</td>
<td>-0.025 (0.015)</td>
</tr>
<tr>
<td>Change in Number of Adults in Household (Last-First)</td>
<td>0.107*** (0.025)</td>
<td>0.091 (0.058)</td>
<td>0.228*** (0.064)</td>
</tr>
<tr>
<td>Number of Crossroads Visits (Tobit Model)</td>
<td>0.716* (0.333)</td>
<td>1.569** (0.570)</td>
<td>1.101+ (0.640)</td>
</tr>
</tbody>
</table>

Covariates: initial household size, initial household employment level, age, age squared, race/ethnicity, head gender, head education, marital status, # of outpatient visits, and health insurance status of head.
Estimation Results, Odds Ratios (Logit Models)

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>3,235</td>
<td>1,151</td>
</tr>
<tr>
<td>Moved</td>
<td></td>
<td>2.046***</td>
<td>1.929**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.303)</td>
<td>(0.483)</td>
</tr>
<tr>
<td>Long-distance Move (&gt; 1 mile)</td>
<td></td>
<td>2.42***</td>
<td>1.945*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.381)</td>
<td>(0.557)</td>
</tr>
</tbody>
</table>

Covariates: initial household size, initial household employment level, age, age squared, race/ethnicity, head gender, head education, marital status, # of outpatient visits, and health insurance status of head.
Discussion & Conclusions

- Health shocks to a household member are associated with
  - Adding adults to the household (doubling up?)
  - More frequent utilization of social services
  - Increased likelihood of moving
  - Moving longer distances

- Health shocks to head versus other adult household members reveal different coping patterns.
  - Non-head shocks associated with adding unemployed adults
  - Head shocks associated with moving
  - Effect size for Crossroads visits larger for a head shock
Next steps—Short Term

- More robust causal analysis (Spatial difference-in-difference model)
  - More data (longer time horizon)
  - Better data (measured BMI, self-reported health status, USDA Food Security Module since July 2015)

- Hazard analysis to better understand risks and time horizon for different coping mechanisms.
  - Better utilize repeat household observations
LONGER TERM: HCL DATABASE IMPROVEMENTS

Crossroads data is archived in the HCL Database. RWJF E4A funding will improve and expand this resource.

Better Data, Better Answers, Better Solutions

The HCLD facilitates a unique understanding of the situations, decisions, and outcomes of a low-income population that is largely under-represented in research. Some areas of inquiry facilitated by the HCLD include:

- How does food insecurity vary across neighborhoods?
- What are the demographic patterns associated with service utilization?
- What health services are lacking for the uninsured?
- How do federal assistance programs impact household health and wellbeing?

Crossroad’s main office is located in downtown Dallas, TX, and other sites are located throughout Dallas County.
Thank You!