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Conference Item

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Does community-based health insurance protect household assets?

Divya Parmar\textsuperscript{1}, Aurélia Souares\textsuperscript{1}, Germain Savadogo\textsuperscript{2}, Rainer Sauerborn\textsuperscript{1}

\textsuperscript{1}Institute of Public Health
Heidelberg University
Germany

\textsuperscript{2}Nouna Health Research Centre
Burkina Faso
Burkina Faso

- Population: 14.4 million
- GNI per capita (PPP): $1,130 (207/228)
- Occupation: 90% engaged in agriculture
- Spending on health per person: $7
- Life expectancy m/f (years): 46/49 (199/228)
- Infant mortality rate: 85 /1000 live births
- No. of people per doctor: 33,333

Community-based health insurance

- Managed by the community
- Health risk-sharing and pooling of resources at community level
- Aims:
  - Facilitate access to care
  - Provide financial protection against the cost of illness

Affordable - does not cover the cost of providing insurance/health care

- Introduced in 2004
- Unit of enrolment is the household
- Premium: 1500 CFA (2.29€) adult
  500 CFA (0.76€) child
Research Question

Does CBHI protect household assets in the Nouna Health District?

Livestock + household goods

CBIH

Illness in the HH

No treatment
Self-treatment
Traditional Healer
Health facility

Delay in treatment + Costs

Increase severity
Lower productivity
Lower earnings

Delay purchasing

HH assets

Livestock produce

Costs

Sell

Sell

Sell

Sell
Observational data

Unlike randomized trials, in observational studies the intervention (CBHI) is not randomized...

Enrolment for CBHI is voluntary: we cannot assume that the insured (cases) and uninsured (controls) are similar

**Instrumental variable (IV)**

(Exclusion restriction)

(Relevance)

**Selection bias**

Household assets

**Reverse (2-way) causation**

Household assets

CBHI
1. Instrumental Variable (IV) Model

- Study area divided into 31 clusters
- CBHI offered randomly
  - 2004: 11 clusters
  - 2005: +9 clusters (11+9=20)
  - 2006: +11 clusters (20+11=31)

(Exclusion restriction)

Eligibility → CBHI → HH assets

Controls for both self-selection + 2-way causation

2. Fixed Effects (FE) Model

- Does not control for 2-way causality

Controls for self-selection only due to time invariant variables – ethnicity, religion, etc

unobserved variables

CBHI → HH assets

Selection bias
Per capita HH assets<sub>it+1</sub>: Monetary value of livestock and goods/HH size

- \( Z_i \): observable time-invariant factors e.g. religion, education
- \( X_{it} \): observable time varying factors e.g. age, HH size, chronic
- \( nCBHI_{it} \): number of insured people in the household
- \( u_i \): unobservable time-invariant factors e.g. ability, preference
- \( \varepsilon_{it} \): household-specific time shock e.g. death in the household
- \( \delta_t \): sample-specific time shock e.g. drought that effects everyone
Data sources

1. Nouna Health District Household Survey (NHDHS)
   - DSS region: 41 villages & Nouna town
   - 15% of the population (Total population: 67,262)
   - Panel survey (same households interviewed every year)
   - Conducted every year since 2000

(0) Socio-demographic: ethnicity, religion, housing conditions, education...
(1) Socio-economic: ownership of household goods and livestock...
(2) Self-reported morbidity: illness episodes, health-seeking behaviour...
(3) Preventive care
(4) Risk-sharing & perceptions on quality of health care
(5) CBHI: enrolment decisions, reasons for enrolling...
RESULTS
Descriptive statistics

HH assets per capita and insurance variables
2004-2007

Drought & locust invasion
High prices
Subsidy for poor

Mean value of HH assets per capita (CFA)
Mean number of insured individuals in the HH
Mean number of insured HHs
Results: Instrumental Variable (IV) Model for 2004-2005

<table>
<thead>
<tr>
<th>Variables</th>
<th>Co-efficient</th>
<th>Robust SE</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance</td>
<td>0.222</td>
<td>0.121</td>
<td>0.070</td>
</tr>
<tr>
<td>Education</td>
<td>0.273</td>
<td>0.082</td>
<td>0.001</td>
</tr>
<tr>
<td>Male</td>
<td>-0.374</td>
<td>0.106</td>
<td>0.000</td>
</tr>
<tr>
<td>Year_2005</td>
<td>-0.192</td>
<td>0.035</td>
<td>0.000</td>
</tr>
</tbody>
</table>

No. of clusters 31
No. of observations 1,588

Angrist-Pischke 1\(^{st}\) stage chi\(^2\) \(17.33\ (p=0.0000)\)

Notes:
1. Only variables significant at less than 10% significant level are shown here
2. Model controls for
   - Household head characteristics: Ethnicity, Education, Gender, Age, Occupation,
   - Household characteristics: Size, Chronic, Eligible
   - Village characteristics: Town, Literacy, Water source, Distance, Health facility
   - Year dummies

IV is relevant
### Results: Fixed Effects (FE) Model for 2004-2007

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Insurance</td>
<td>0.009</td>
<td>0.005</td>
<td>0.082</td>
</tr>
<tr>
<td>Size</td>
<td>-0.125</td>
<td>0.049</td>
<td>0.010</td>
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<tr>
<td>Year_2005</td>
<td>-0.157</td>
<td>0.027</td>
<td>0.000</td>
</tr>
<tr>
<td>Year_2006</td>
<td>-0.085</td>
<td>0.031</td>
<td>0.006</td>
</tr>
<tr>
<td>Year_2007</td>
<td>0.124</td>
<td>0.034</td>
<td>0.000</td>
</tr>
</tbody>
</table>

No. of clusters: 890  
No. of observations: 3,144

Notes:
1. Only variables significant at less than 10% significant level are shown here
2. Only time varying variables are included
   - Household head characteristics: Age
   - Household characteristics: Size, Chronic
   - Village characteristics: Town, Water source, Distance
   - Year dummies
Conclusion

Both models: CBHI protects household assets

HH assets per capita and insurance variables
2004-2007

Mean value of HH assets per capita (CFA)
Mean number of insured individuals in the HH
Mean number of insured HHs

IV: 24.6%  VS.  FE: 1%

N=835  N=782  N=776  N=751
2004  2005  2006  2007
Thank you

Any questions, comments ...