Does community-based health insurance protect household assets?

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- 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

Livestock produce

CBHI

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

Costs

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

**Selection bias**

**Household assets**

**CBHI**

**Instrumental variable (IV)**

(Exclusion restriction)

(Relevance)

**Household assets**

**CBHI**

Reverse (2-way) causation
Models

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)

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
Per capita HH assets\textsubscript{it+1}: 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

$n\text{CBHI}_{it}$: number of insured people in the household

$u_i$: unobservable time-invariant factors e.g. ability, preference

$\epsilon_{it}$: 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

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

- Drought & locust invasion
- Subsidy for poor
- High prices

N=835 (2004)
N=782 (2005)
N=776 (2006)
N=751 (2007)
## 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>
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<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>
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<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\textsuperscript{st} stage chi$^2$: 17.33 (p=0.0000)

Angrist-Pischke 1\textsuperscript{st} stage F statistic: 16.47 (p=0.0003)

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

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<td>Year_2005</td>
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<td>Year_2007</td>
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<td>0.034</td>
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<tbody>
<tr>
<td>No. of clusters</td>
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<td>890</td>
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</tr>
<tr>
<td>No. of observations</td>
<td></td>
<td>3,144</td>
<td></td>
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</tbody>
</table>

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
Thank you

Any questions, comments ...