# Do acute health care needs of the poor crowd out their chronic care utilization? Evidence from Rural India

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# Outline

- Context
- Questions
- Methods
- Data
- Results
- Future direction

# Context

- India has seen a rapid rise in the prevalence of non-communicable diseases
  - Brought on by industrialization, urbanization, globalization, higher incomes, lifestyle changes.
- Epidemiological transition (i.e., from infectious to chronic diseases) not complete
- In third phase of demographic transition (i.e., greater life expectancy achieved)

# The Rural Context

- Large rural-urban divide
- Rural economy: poor, agrarian, resource & infrastructure starved
- Rural health:
  - high rates of acute infections, respiratory or gastrointestinal, yet cardio-vascular diseases kill at a higher rate,
  - Increased longevity from higher life expectancy
  - Barely 5% spent by households on health
  - Supply side constraints to treat health

- **Rise in chronic diseases bound to create greater pressures, both on the household as well as the whole system.**

# Specific Questions

- What happens to chronic care management/utilization when there is an acute care episode within the household?
- Is there a crowd-out/rationing?
- Is there an inadvertent age and gender discrimination within the household in making these decisions?
- **These questions have become even more poignant in the recent context of COVID-19 ravaging the whole country?**

# Contributions for Health and Household Economics

- Evidence on simultaneous decision-making within the household on health care seeking and utilization
- Confronts the growing impact of NCDs on poor households and particularly on certain members of the households,
- Evidence for inadvertent age and gender discrimination

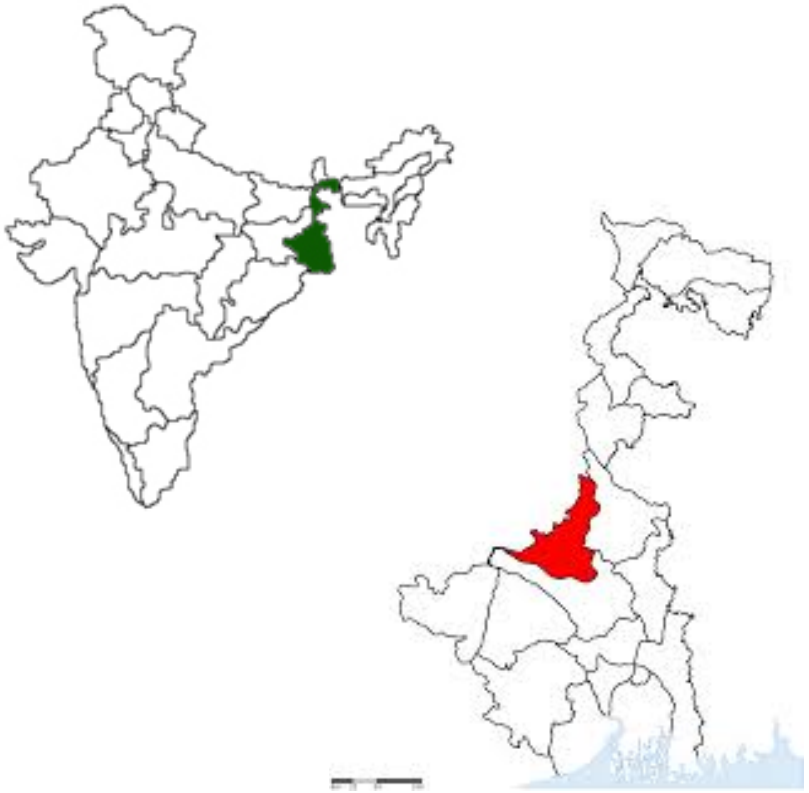
# Model

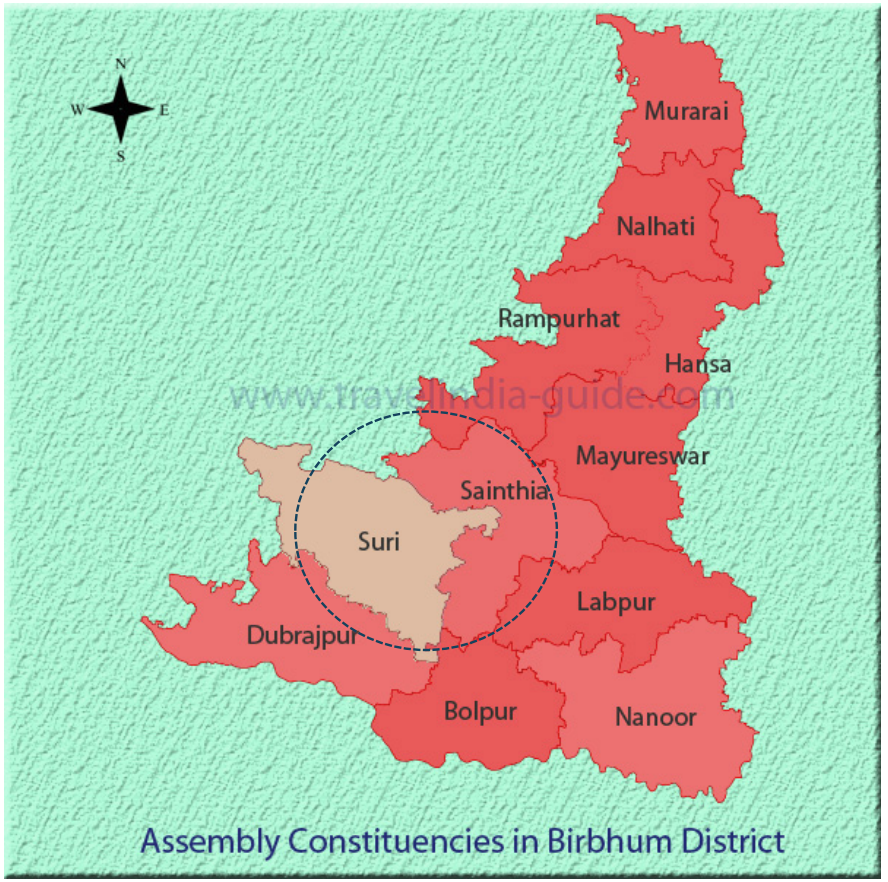
- Household utility maximization model where the two goods are acute health care and chronic health care
- Standard demand model to test whether there is substitution between the two
- Human capital model would predict that the household will invest in the member that yields the highest rate of return/ whose opportunity cost of being sick is the highest.
- Help us predict varying degrees of substitution for each demographic group.

# Data and Sampling procedure

- Birbhum Population Survey 2012 by Society of Health and Demographic Surveillance of West Bengal.
- Predominantly rural and low-income, population growth rate over the decade prior to data collection was 16.15 %, literacy rate of 70.9 %
- Survey on general morbidity, health consumption and health expenditure
- Sampling: 4 blocks selected based on diversity in socio-economic profile. Within the selected blocks villages were selected by stratified random sampling and in selected villages all households were selected.

# Where is Birbhum? Why Birbhum?






http://www.shds.in/


Chinpai Birbhum Nov2011

# Sample description

- The sample size is **54585** individuals and **12557** households.
- Households in this rural sample lie mainly in lower middle to poor section of the income distribution.
- Subsist on rain-fed agriculture, mining and quarrying

# Study population

| Characteristics | 2012 |
|---|---|
| Total population | 54585 |
| Total number of households | 12, 557 |
| Average household size | 4.3 |
| % male population | 50.8 |
| Sex ratio | 970 |
| % Hindu | 70.3 |
| % Muslim | 29.1 |
| % Christian | 0.5 |
| % household head SC | 34.09 |
| % Household head ST | 10.0 |
| % Household head OBC | 6.7 |
| Literacy rates | 68.9 |

# Study population

| Characteristics | 2012 |
|---|---|
| Household access to safe drinking water | 99.6% |
| Household access to sanitation facility | 25.3% |
| Household access to modern cooking fuel | 9.3% |
| Household access to drainage facility | 27.6% |
| Catastrophic health expenditure in episodes of hospitalization* | 50.5% |

*Catastrophic health expenditure includes expenses through borrowing/mortgage, selling assets and charity

# Methods

- Constructed acute and chronic disease classifications
- Constructed economic class groupings using local published poverty line measures
- Descriptive analyses to check for rationing behavior
- Reduced form regressions:
  - Individual level analysis to estimate demand for care conditional on reported episodes, probit, marginal effects
  - $h_{ijt} = \alpha + \beta Sick_{ijt} + Poverty'_{ij}\gamma_{poverty} + Social\ Class'_{ij}\gamma_{class} + Age'_{ij}\gamma_{age} + + Female_{ij}\gamma_{female} + Age'_{ij}\_Sick_{ijt}\gamma_{Int} + Female_{ij}\_Sick_{ijt}\gamma_{Int} + \varepsilon_{it}$
  - Household analysis to estimate demand for care conditional on simultaneously reported acute and chronic episodes, OLS and Village fixed effects
  - $h_{ijt} = \alpha + \beta Sick_{jt} + Poverty'_{j}\gamma_{poverty} + Social\ Class'_{ij}\gamma_{class} + Age'_{ij}\gamma_{age} + + Female_{ij}\gamma_{female} + Age'_{ij}\_Sick_{ijt}\gamma_{Int} + Female_{ij}\_Sick_{ijt}\gamma_{Int} + \upsilon_j + \varepsilon_{it}$

# Disease Classifications

- Acute vs Chronic
  - Chronic: longer lasting, slow to manifest in full-blown symptoms, need lifestyle changes as well as long term and often expensive medical care.

    Examples are diabetes, arthritis, hypertension, heart disease, asthma, cancer,
  - Acute: periodic episodes, short term in nature, requires immediate attention, can lead to absences from work and loss of income, can be treated and cured relatively quickly

    E.g., malaria, dysentery, diarrhea, eye and ear infections, abdominal pain

# Description of disease prevalence

- Descriptive results indicate that prevalence of chronic illness is much less compared to acute illnesses, reporting bias?
- Rich report higher prevalence of illness compared to the poor.
- While at almost all age groups, prevalence of acute illness is greater, this gets reversed in the 60+ age group where chronic disease prevalence is greater than acute symptoms.
- Women report higher prevalence of illness (both acute and chronic) compared to men.
- Chronic illnesses get treated less than acute illnesses all across income categories but in proportion much less in poor households.

# Results on the crowd-out behavior

| Question | | Estimation | Summary Result |
|---|---|---|---|
| 1. Likelihood of treatment | For acute illness | Probit | 0.0472*** |
| 2. Likelihood of treatment | For chronic illness | Probit | -0.0425*** |
| 3. Likelihood of treatment for chronic illness | When there are simultaneous acute illness (number) within household | Probit | -0.0118*** |
| 4. Expenditure on chronic treatment | When there are simultaneous acute illness (number) within household | OLS<br>FE | 0.6291***<br>0.6543*** |
| 5. Expenditure on chronic treatment | When there are simultaneous acute expenditures in household | OLS<br>FE | -0.0735***<br>-0.0820*** |
| 6. Likelihood of private provider for chronic treatment | When there are simultaneous acute illness in household | Probit | -0.0122 |
| 7. Likelihood of private provider for chronic treatment | When there are simultaneous acute expenditures in household | Probit | 0.0092** |

**All models are controlled for age, sex, income class, socio-religious codes; *** p<0.001, ** p<0.01**

| | (1) | (2) |
|---|---|---|
| | treatchron | lhhchrcost |
| **Non-elderly male has acute** | **-0.0117*** ** | **0.6303*** ** |
| **Illness in the household** | **(0.0030)** | **(0.0341)** |
| **Youth** | 0.0782*** | 0.2112** |
| | (0.0162) | (0.0762) |
| **Midage** | 0.2243*** | 0.8188*** |
| | (0.0192) | (0.0884) |
| **Seniors** | 0.4393*** | 1.5305*** |
| | (0.0252) | (0.1275) |
| **Female** | **-0.0795*** ** | **-0.1590* ** |
| | **(0.0208)** | **(0.0742)** |
| **Youth*Female** | 0.1464*** | 0.3383*** |
| | (0.0286) | (0.0985) |
| **Midage*Female** | 0.1556*** | 0.3875*** |
| | (0.0310) | (0.1154) |
| **Senior*Female** | 0.0553 | -0.1456 |
| | (0.0307) | (0.1713) |
| **Income** | Yes | Yes |
| **Social Class** | Yes | Yes |
| **Religion** | yes | Yes |
| **Observations** | 13,204 | 13,204 |
| **R-squared** | | 0.1240 |
| **Robust standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05** | | |

## Results

- Likelihood to treat a chronic illness is lower when there is acute illness
- Female & Seniors crowded-out
- Spending on acute illness may induce chronic illness discovery hence expenses
- Causal inference not established as most of these happen simultaneously
  - If hh already know about chronic condition, likely wont treat
  - If they spend on acute, they will spend on chronic due to discovery

# Conclusion

- Strong evidence that there is crowding out of chronic treatment
- Strong evidence of expenditure on chronic and acute care being complementary
- Expenditures are endogenous, but village fixed effects results confirm a lower bound
- There are age and gender variations

# Discussion

**Complementarities of care**

- Implications for the supply side

**Why are these choices made?**

- Is it a lack of awareness and reporting?
- Is it a lack of ability to pay?
- Is it lack of infrastructure?
- Is it systemic?

# Reporting and treatment of chronic diseases

| Episode | Reported last year | Treated | Medication |
|---|---|---|---|
| Arthritis | 20.97% | 11.35% | 5.00% |
| Chest pain | 3.37% | 2.40% | 1.45% |
| Asthma | 4.70% | 3.42% | 2.13% |
| Diabetes | 2.48% | 2.18% | 1.52% |
| Cancer | 0.06% | 0.06% | 0.05% |

# Reason for not seeking chronic care

| Reasons for not seeking care | Frequency | Percent |
|---|---|---|
| Absence of health facility | 3 | 0.99 |
| Health facility present but no doctor and medicine | 4 | 1.32 |
| Wait for long time | 1 | 0.33 |
| **Don't have money** | **139** | **46.03** |
| **Illness not critical** | **75** | **24.83** |
| Others | 22 | 7.28 |
| No doctor for illness | 2 | 0.66 |
| Treatment may cost more | 25 | 8.28 |
| Government health facility far | 2 | 0.66 |
| Don't want to visit govt hospital | 9 | 2.98 |
| Missing | 20 | 6.62 |
| Total | 302 | 100 |

Thank you!

Comments and Questions?

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