Interdependent Decisions and Demand for Improved Sanitation

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Outline

1. Research Questions
2. Context
3. Interventions
4. Outcomes of Interest
5. Further Analysis
What is interesting about the economics of sanitation?

A very large set of things. We’re focusing on:

- Large externalities relative to private benefits
- Strategic interaction among neighbors
  - Strategic complementarities, either health (O-ring model) or based on social norms (shame)
  - Strategic substitutes (herd immunity)

Our primary research questions:

- How important are all of the above?
  - Dickinson and Pattanayak: +10% neighbors’ adoption $\rightarrow$ +5-7% own probability of adoption $\rightarrow$ social multiplier of 2-3

- What are the implications for policy?
- How do these compare for adoption vs. use?
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Context

- Rural Bangladesh
  - Low sanitation coverage: $\approx 62\%$ open defecation
    - Those with improved sanitation are primarily using rudimentary pit latrines
- Baseline intervention: CLTS-like program
  - Similarities: Village level, use transect walk, village mapping
  - Key differences:
    - Second step on sanitation ladder – improved pour-flush latrine
    - Use of discounts and incentives
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Primary Interventions: Price

- **Group discount**
  - Reduce price as the share of households in a neighborhood (*para*) adopting increases
    - For example: 25% discount if 75% of *para* adopts
  - Could be efficient use of external funds if there are high social returns to high coverage
  - High coverage could reinforce social norms

- **Early adopter discounts**
  - With complementarities, early adopters have low private returns and are taking a risk that others will not adopt
  - Risks:
    - If private returns are initially low, learning could reduce future adoption
Primary Interventions: Incentives for Use

- Use of latrine provides positive externality.
  - Standard PF: should be subsidized

- Incentive could vary on a few dimensions:
  - Material vs. social (+: social recognition; -: mocking, shaming)
  - Based on individual vs. group performance
  - Paid to individuals vs. a community payment (or good)

- Proposed intervention:
  - Surprise inspection of a few households in each *para*
  - Payment to all members of the para based on individuals’ performance
  - Group incentive leverages social pressure

- Alternatives / additions: pay individuals based on their own performance; pay community based on community performance (surprise transect walk); competitions between *paras* in a village
Other potential interventions

- Purchase on credit
  - Sensible: cash constraint, present bias
  - Relate to our primary questions
    - Makes commitment / coordination easier
    - Could combine with incentive for use
  - How to incentivize repayment?

- Institutions: Facilitate coordinated decision-making
  - Nudge: provide common time and place to purchase
  - vs. control of individual, door-to-door sale

- Messaging: vary emphasis on
  - Private benefits
  - Private benefits + public benefits
  - Private benefits + interdependency of benefits
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Outcomes of interest

- Demand
- Use and maintenance over time
- Health impacts
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Structural modeling

- Structural econometric analysis is a useful complement to the RCT methodology.
- The RCT allows one to convincingly identify key inputs to the structural model.
- A structural model allows one to extrapolate from the RCT evidence and analyze policies prospectively.
  - Impact of different magnitudes of treatment variables
  - Changes in variables not randomized
Structural modeling

- Two margins on which households will make decisions.
  - Whether to purchase
  - How intensively to use and maintain the technology
- Extend standard discrete choice to accommodate interdependence
  - Externalities – HH 1’s level of utility may depend on what HH 2 does
  - Complementarities – HH 1’s gains from adopting may depend on what HH 2 does
  - Social Norms – may be dynamic and self-reinforcing.
Externalities

- Health spillovers
- Demand spillovers
  - Staggered introduction – treat control clusters at 2 years
  - How to untangle channels (aspiration / status vs health gains)?