“DEMAND” FOR HOUSE IMPROVEMENT IN RURAL GAMBIA: VERY PRELIMINARY RESULTS

Elisa Sicuri & Lesong Conteh
11th Spanish Stata Conference, October 2018
ROOPFS CLUSTERED-RANDOMISED CONTROLLED TRIAL IN THE UPPER RIVER REGION - THE GAMBIA

Primary clinical endpoint:
- Incidence of clinical malaria, which is determined by active case detection (ACD) and defined as a body (axillary) temperature of $\geq 37.5 \, ^\circ C$, together with the presence of P. falciparum parasites detected by microscopy

Sample size:
- A total of 800 households (from 92 villages) enrolled received LLINs, and 400 will receive improved housing before clinical follow-up

Source: Pinder et al, Trials (2016) 17:275
THE GAMBIA
TRIAL LOCATION
RooPfs study design

800 houses traditional mud-walled thatched houses recruited

400 traditional mud-walled thatched houses

400 ventilated metal-roofed houses
RoofPf's house: Ventilated roof
RooPfs house: Ventilated front door
ECONOMIC COMPONENT: EXPLORING DEMAND FOR HOUSE IMPROVEMENT

1. Willingness to pay for the intervention (demand based on stated preferences)
2. Household expenditure for house improvement (demand based on revealed preferences)
3. Satisfaction with housing (demand based on utility)

Specific Aim: analysing the role of seasonality
LONGITUDINAL STUDY “HOUSE SPEND”

- Approx 1 year follow up of a subset of 15 RooPfs villages (out of 92 total villages)

- 15 villages randomly selected stratified by:
  - (i) Village size; (ii) North/South bank; (iii) Ethnic group (Jagajari village purposely selected for being Sarahule)

- Intervention and control houses plus non-RooPfs houses

- 201 households included (67 intervention, 65 control, 69 non-RooPfs), 191 effective

- 4 rounds:
  - Round 1 (9th May 2017– 25th May 2017)
  - Round 3 (November 2017 – January 2018)
  - Round 4 (March 2018– April 2018)
STUDY ROUNDS AND RAIN OVER A "TYPICAL" YEAR

Round 1 (2017): WTP

Round 2 (2017)

Round 3 (2017)

Round 4 (2018): WTP

Source=NOOA
## SAMPLE DESCRIPTION (INTERVIEWEE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>106 (44.5)</td>
</tr>
<tr>
<td>Female</td>
<td>85 (55.5)</td>
</tr>
<tr>
<td>Fula</td>
<td>117 (61.26)</td>
</tr>
<tr>
<td>Mandinka</td>
<td>66 (34.55)</td>
</tr>
<tr>
<td>Sarahule</td>
<td>8 (4.19)</td>
</tr>
<tr>
<td>18–30 years old</td>
<td>(11.52)</td>
</tr>
<tr>
<td>31–40 years old</td>
<td>(30.89)</td>
</tr>
<tr>
<td>41– onwards</td>
<td>(57.59)</td>
</tr>
</tbody>
</table>
WILLINGNESS TO PAY

WTP for a house improvement similar to the one provided through the RooPfs study (including corrugate roofs, metal screened doors and installation)?

Starting bid:
- 10,000 Dalasi (USD 210)
  - Yes
  - No
    - Why?
    - 7,000 Dalasi (USD 145)

Second bid:
- 13,000 Dalasi (USD 270)
  - Yes
  - No
    - 9,000 Dalasi (USD 190)
    - Yes
    - No
      - 5,000 Dalasi (USD 105)

Third bid:
- 17,000 Dalasi (USD 350)
  - Yes
  - No
    - Max WTP
SATISFACTION (UTILITY) AND ACTUAL EXPENDITURE (REVEALED PREFERENCES)

- How satisfied are you with your house overall?
  1. Not at all satisfied
  2. Not satisfied
  3. Neither
  4. Satisfied
  5. Very satisfied

- Have you or someone else carried out work (improvement/repair/renovation) on one of your buildings during the last 3 months?
  0. No
  1. Yes

- Can you estimate how much money was spent on these works:
  $$$$$$$
DEMAND ACCORDING TO WTP

Demand for house improvement in round 1 and 4

Graphs by round
DEMAND ACCORDING TO WTP: ZOOM IN

Demand for house improvement in round 1 and 4

Graphs by round
### DETERMINANTS OF WTP, RE

xtreg log_MaxWTP i.round i.village i.group, re robust

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Robust SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round</td>
<td>.0106238</td>
<td>.0106238</td>
</tr>
<tr>
<td>Control</td>
<td>−.0079074</td>
<td>.1100982</td>
</tr>
<tr>
<td>Non–RooPfs</td>
<td>−.2302502</td>
<td>.1314717*</td>
</tr>
<tr>
<td>Constant</td>
<td>6.229471</td>
<td>.2083096***</td>
</tr>
</tbody>
</table>

N=382; Controlled by village; *sign at 10%, **sign at 5%, ***sign at 1%
DETERMINANTS OF WTP, FE

xtreg log_MaxWTP i.round, fe vce(cluster village)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Robust SD</th>
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<tbody>
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<td>.0887125</td>
</tr>
<tr>
<td>Constant</td>
<td>5.817821</td>
<td>.0443563***</td>
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</tbody>
</table>

N=382; Controlled by village; *sign at 10%, **sign at 5%, ***sign at 1%
REVEALED PREFERENCES: ANY WORK DONE DURING LAST 3 MONTHS TO ONE OF YOUR BUILDINGS?

![Graph showing proportion of housing intervention over time for different groups.]

- **Intervention**
  - May 2017
  - Aug 2017
  - Nov 2017
  - Apr 2018

- **Control**
  - May 2017
  - Aug 2017
  - Nov 2017
  - Apr 2018

- **Non-RooPfs**
  - May 2017
  - Aug 2017
  - Nov 2017
  - Apr 2018

*Proportion doing housing intervention vs. previous 3 months*
TOTAL COSTS INCURRED BY THOSE THAT DID SOME TYPE OF WORK

Graphs by Household_3
COSTS AMONG EVERYONE

Graphs by Householdr_3
DISTRIBUTION OF COSTS (EVERYONE)
DISTRIBUTION OF COSTS AMONG THOSE THAT DID SOME TYPE OF WORK
TWO TYPE OF ZEROS...BUT "TWO PART MODELS" NOT AVAILABLE FOR PANEL DATA

xtnbreg total_cost_us i.round i.villagenum_5 i.Householdr_3, re

xtreg log_total_cost_us i.round i.village i.group, re robust

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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Robust SD</th>
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</thead>
<tbody>
<tr>
<td>Round 2</td>
<td>-0.8404244</td>
<td>0.1734077 ***</td>
</tr>
<tr>
<td>Round 3</td>
<td>-1.407342</td>
<td>0.1609791 ***</td>
</tr>
<tr>
<td>Round 4</td>
<td>-1.193152</td>
<td>0.1753757 ***</td>
</tr>
<tr>
<td>Control</td>
<td>0.0749423</td>
<td>0.1164061</td>
</tr>
<tr>
<td>Non-RooPfs</td>
<td>0.0069537</td>
<td>0.1181277</td>
</tr>
<tr>
<td>Constant</td>
<td>0.9575255</td>
<td>0.1969352 ***</td>
</tr>
</tbody>
</table>

N=763; Controlled by village; *sign at 10%, **sign at 5%, ***sign at 1%
PREDICTION

Predictive Margins

Graph showing predictive margins against round, with points marked at rounds 1, 2, 3, and 4.
SATISFACTION WITH HOUSE, BY GROUP

1 = not at all satisfied; 2 = not satisfied; 3 = neither; 4 = satisfied; 5 = very satisfied
DETERMINANTS OF SATISFACTION

xtoprobit howsatisfi i.round i.village i.group, vce (cluster village)

<table>
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<tr>
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<th>Coefficient</th>
<th>Robust SD</th>
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<tbody>
<tr>
<td>Round 2</td>
<td>.0469357</td>
<td>.1239696</td>
</tr>
<tr>
<td>Round 3</td>
<td>.1596272</td>
<td>.1986371</td>
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<td>Round 4</td>
<td>-.3106774</td>
<td>.120835***</td>
</tr>
<tr>
<td>Control</td>
<td>-1.709926</td>
<td>.1187732***</td>
</tr>
<tr>
<td>Non-RooPfs</td>
<td>-.9735</td>
<td>.1584928***</td>
</tr>
</tbody>
</table>

N=762; Controlled by village; *sign at 10%, **sign at 5%, ***sign at 1%
CONCLUSIONS

- Seasonality seems to play a significant role in the demand for house improvement
- Trial group also is associated with the demand for house improvement
- This has policy implications in terms of when it is the best timing for intervening
- Any comment is extremely welcome: HELP!
AKNOWLEGEMENTS

Study Participants

Steve W. Lindsay
Margaret Pinder
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Umberto D’Alessandro

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