Why is Diarrhea Still Killing the World’s Children?
A Demand Side Study of the Use of Oral Rehydration Therapy in Rural Burkina Faso

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Background:
- Improvement to early childhood health and nutrition have a positive effect on educational attainment, intellectual functioning and physical work capacity (Alderman et al. 2006, Hoddinott et al. 2008) and a positive impact on income and wealth in adulthood (Strauss and Thomas 1996, Psacharopoulos and Patrinos 2004).
- Diarrhea is a key contributor to economic development (Romero 1986, Ravallion and Chen 1997, Bâltacci et al. 2008).
- Diarrhea accounts for about 2 million deaths each year in children under 5 years (Bryce et al. 2005).
- Long-term effects of chronic diarrhea include malnutrition (Checkley 2008) and impaired cognitive development (Nahhas 2002).
- The use of Oral Rehydration Therapy (ORT) for the treatment of dehydration can prevent death in young children from watery diarrhea in all but the most severe cases.
- Since the early 1980s, the use of ORT for the treatment of dehydration has become standard practice in the medical community throughout the developing world, which has likely played a significant role in the global reduction of deaths from diarrhea (Victoria et al. 2000).
- However, the number of deaths from diarrhea today indicate that ORT is either not widely used, not used early enough in an episode of diarrhea, or not used correctly.
- This paper seeks to understand the gap between the widespread knowledge of the high efficacy of ORT among policymakers and other stakeholders in healthcare, and the actual usage rates of ORT in rural households.

Model:
- A sequential logit model is used to estimate a caregiver’s treatment decision pathway.
- The model estimates the probability of a decision along the path given the occurrence of a prior event and dependent on a set of covariates.
- Analyzing decision making along specified pathways allows modeling of healthcare decisions that are:
  - impacted in a specific order;
  - oriented to each other;
- and impacted by exogenous factors.

Main Conclusions:
- The exogenous variables that impact a caregiver’s health seeking behaviors vary across treatment decision pathways.
- Caregivers who seek informal healthcare for diarrhea (pharmacy, village market, or traditional healer versus formal healthcare, which is a private or public medical facility) typically do not administer ORT to a child with diarrhea; Only 2 of 134 cases of diarrhea were treated with ORT when informal care was sought.
- Severe diarrhea (>5 stools/day) or blood in the stool has a negative impact on the probability that a caregiver—who seeks care outside of the home—will seek immediate care (within 1 or 2 days) or care through a formal channel. This indicates a lack of education at the household level about the danger signs of complicated (dysenteric) diarrhea.
- Severe diarrhea has a positive product on the probability that a child treated through formal channels (with or without delay) will receive ORT, indicating that formal healthcare providers are prescribing ORT when this symptom is present.
- Caregivers from households with fewer wealth constraints have a higher probability of seeking immediate treatment for a child with diarrhea.
- The probability of administering ORT to a child with diarrhea (without seeking other treatment outside of the home) increases with a caregiver’s level of education.
- Male children are favored in a caregiver’s decisions to seek treatment for diarrhea outside of the home and administer ORT when formal and immediate external healthcare is sought.
- Major Policy Implications:
  - More education is needed at the household level about the symptoms and treatment of complicated (dysenteric) diarrhea and the benefits of ORT and the early use of ORT.
  - Reducing financial barriers to the treatment of diarrhea through formal channels may help prevent dehydration and death from diarrhea.

Results:

Data:
- 2010 cross-sectional survey in Southwest Burkina Faso (Orodara health District)
- Detailed data on the characteristics of a child, his mother, his household, his conception (extended family compound), and his community.
- In cases where a mother reported an incident of diarrhea in her young child (< 27 months) in the past two weeks, a questionnaire designed to capture care-seeking behaviors for the treatment of childhood diarrhea was administered.

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Figure 1: Diarrhea treatment pathways decision tree

Results: Table 1: Diarrhea treatment pathways results

Caregiver decision: Seek treatment outside of home

<table>
<thead>
<tr>
<th>Variable</th>
<th>No conditioning</th>
<th>Conditional on formal healthcare facility</th>
<th>Seek immediate ORT</th>
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</table>
| Probability of moving to next node in pathway

\[ P_j = p_j = \frac{1}{1 + \exp(-\beta_j x_j)} \]

where \( p_j \) = probability of moving to next node in pathway