

Water, sanitation, and child mortality in Tanzania

Woods Institute for the Environment

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The challenge

- Diarrhea kills more children each year than AIDS, measles, and malaria combined
- 1.5 million children under the age of 5 die from diarrheal illness each year
- This is an average of 4,100 children per day--or about 30 children during the course of this presentation



Photo: Amy Pickering

Is this a problem for medicine?



- Medical advances have helped reduce mortality from diarrhea (ORT)
- Improved understanding of etiology has spurred vaccine development (Rotavirus)
- **90% of all child diarrhea can be traced to inadequate water supply, sanitation, and hygiene**

Photo: Amy Pickering



Is this an engineering problem?

- Almost 1 billion people are without improved water supply.
- 2.5 billion do not have basic sanitation.
- **Low-cost water and sanitation infrastructure has mixed results for health.**







Partners



Stanford

Profs. Ali Boehm (CEE) & Jenna Davis (CEE, Woods)

Prof. Gary Schoolnik (MED)

Prof. Abby King (MED)

Dr. Maggie Montgomery (CEE, Woods)

Amy Pickering (IPER)

Rachelle Strickfaden, Annalise Blum, Sarah Walters (CEE)

Helena Horak, Dr. Cynthia Castro (MED)

Kirsten Rogers, Jessie Liu (HumBio)

Tanzania

Charles Makoye, Neli Msuya: (Dar es Salaam Water & Sanitation Authority)

Prof. Larama Rongo (Muhimbili University)

Prof. Simon Mamuya (Muhimbili University)

Health and Environmental Rescue Organisation

Lab and field teams

- DAWASA's Community Water Supply & Sanitation Program targets vulnerable populations



- Deep borewells supply shared public taps



Photos: Amy Pickering

- Intensive training of field and lab teams
- Four visits per household over 3-month period
- In-depth surveys of mother and/or child caretaker





- Water sampling











- Hand rinse sampling



- All water and hand samples processed in team's field lab

MAJIBU YA SAMPULI ZA MAJI
 NAMBA YA KAYA: _____

<p>Maji Yaliyohifadhiwa Katika Kaya</p> 	<p>Majibu ya kaya hii: _____</p> <p>Wastani wa Majibu kwa Maji ya Eneo: _____</p>	<div style="border: 1px dashed black; padding: 5px;"> <input type="checkbox"/> Vijidudu Vingi Sana  <input type="checkbox"/> Vijidudu Vingi  <input type="checkbox"/> Vijidudu Vichache  </div>
<p>Kisima cha Kaya</p> 	<p>Majibu ya kaya hii: _____</p> <p>Wastani wa Majibu kwa Maji ya Eneo: _____</p>	<input type="checkbox"/> Vijidudu Vingi Sana  <input type="checkbox"/> Vijidudu Vingi  <input type="checkbox"/> Vijidudu Vichache 

“Low” ≤ 10 CFU/100ml

“Medium” 11-100 CFU

“High” > 100 CFU (*E. coli*)

Median value for HHs in neighborhood

Respondent's

sample (CFU per

100ml *E. coli*)

Findings: Water contamination happening in the home – Information family receives affects future contamination



- Quality of utility water is generally good relative to stored water
- Hands of mothers and children had high *E. coli* concentrations
- *E. coli* levels declined significantly after families received personal information on their initial poor sanitation results
- However, for families who initially tested at lower *E. coli* levels relative to other families and were told the good news; follow-up testing found that their *E. coli* levels actually increased to approximate same level as other test groups.

Complete results with data will be available once study is published.

Findings: Changes in water management



Shock and awe!

Odds that a participant's family reported water management improvements during post-treatment period as compared to control cohort (all else held constant):

- "High" water contamination test result: 2.3 times higher
- **"Surprisingly high" water test result: 5.6 times higher**



Next steps

- January 2010: Launch of Phase II study, including 1200 households and running for a full year
- Evaluate not only proximal outcomes, but health and mortality effects



Thanks for your interest.



Photo: Amy Pickering

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