

SUP 518 – EC1389
ECONOMICS OF GLOBAL HEALTH

Class 8
February 23rd, 2015

Günther Fink
Harvard School of Public Health

Outline

- Overview: Access to Drinking Water
- Devoto et al. paper
- Field et al. paper
- Discussion

Water Targets and Coverage



- According to the latest estimates, about 1 billion people lack access to safe drinking water worldwide
- Safe water is part of the Millenium Development Goals (MDG) targets: to “*halve, by 2015, the share of the population without access to safe drinking water*”.
- 1.70 million people die from diarrheal diseases – diarrheal diseases are the third most common cause of deaths for children under the age of 5 (1.3 bn deaths per year)





Water Access Ladder:

WHO / UNICEF Joint Monitoring Programme (JMP)

- Unimproved water sources: Unprotected dug wells, unprotected springs, carts with small tank/drum, tanker trucks and surface water (river, dam, lake, pond, stream,..)
- “Basic improved” sources: Public taps or standpipes, tube wells or boreholes, protected dug wells and rainwater collection
- Piped household connections in a dwelling, plot or yard

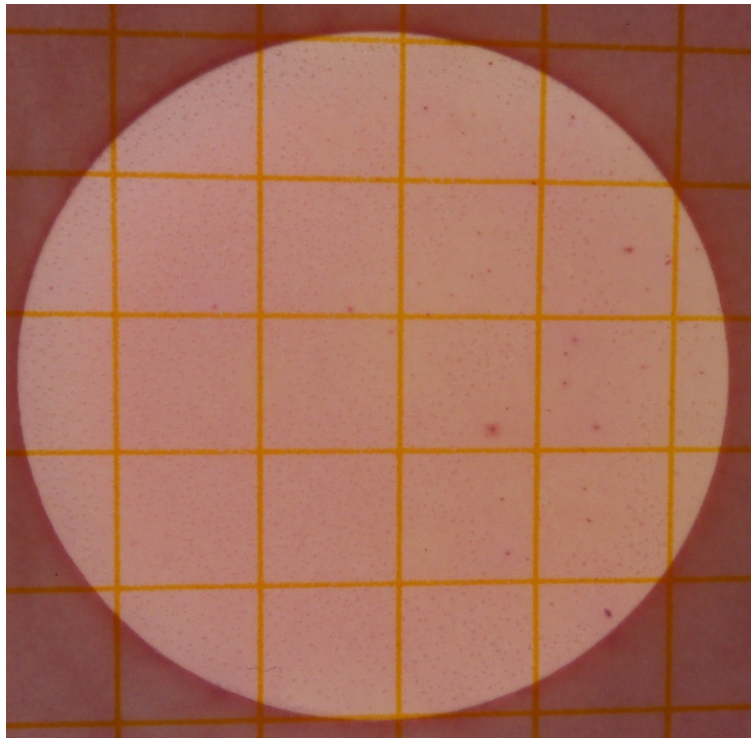


The Water Challenge

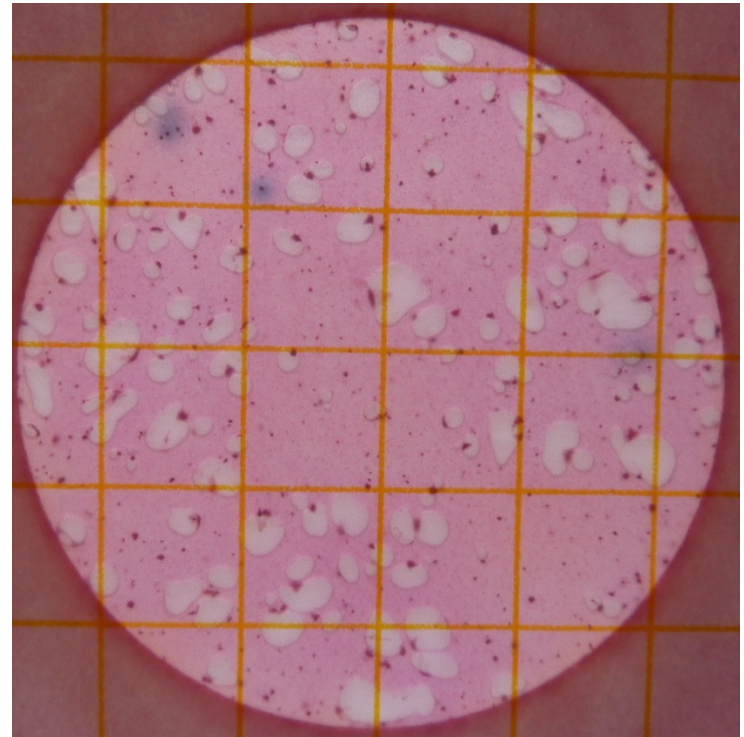
- While lots of efforts have been made to increase the water quality at the source, clean water at the point of source (**POS**) is not the same as clean water at the point of use (**POU**) 
- Clean water is often carried for many kilometers and stored at people's home for several days
- ➔ 100% clean water is often heavily contaminated by the time it is consumed; chlorination helps, but effect fades over time 

Escherichia coli (E. coli) in Drinking Water

At the water pipe



In the bucket at home



Devoto, Duflo, Dupas, Pariente, & Pons:

**Happiness on Tap: Piped Water
Adoption in Urban Morocco**

Background and Approach

Background

- Less than 50% of private tap water in the world
- Procuring water is associated with time and money, and may also be associated with home contamination

Approach

- RCT in Tangiers, Morocco
- 845 households eligible for connection to grid
- Encouragement design for 434: information, pre-approval, forms filled at home, payment collected at home



Main Results/Findings

- Encouragement design was highly effective: 69% signed up compared to 10% in the control group
- Access to the grid increases consumption and expenditure (from US\$ 10 to US\$ 21 a month)
- There was no effect on health – presumably because the alternative water source was good
- Welfare improved through less time spent on water fetching and increased “happiness”
- Successful uptake was associated with uptake of neighbors in control group in subsequent 18 months



Strengths & Weaknesses

Strengths

- Interesting design as part of larger private sector operation
- Comprehensive analysis of welfare effects beyond health
- High policy relevance in growing urban areas

Weaknesses

- Setting with high water quality and close taps not representative for many developing countries
- Ex-post rationalization of zero health effects

Field, Glennerster and Reshmaan:

**Throwing the Baby out with the Drinking
Water: Unintended Consequences of
Arsenic Mitigation Efforts in Bangladesh**

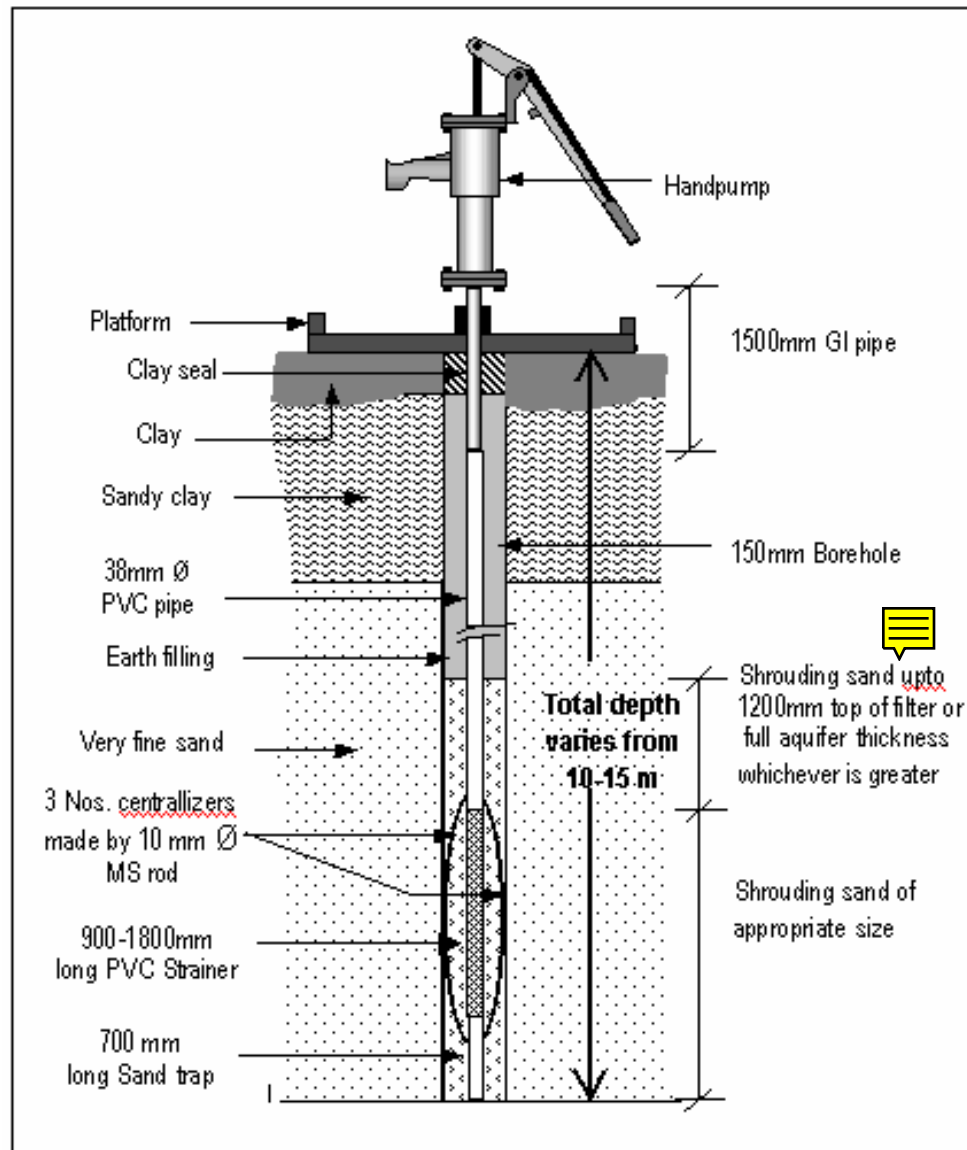
Background and Approach



Background

- Consumption of contaminated water continues to be a primary source of diarrheal disease and child mortality
 - Centrally provided water (public water grids) remains scarce, and wells the most common source of water
 - In Bangladesh, millions of wells were constructed in the 1970s and 1980s with foreign support
 - In the 1990s, many found to be contaminated with arsenic in the late 1990s
- ➔ Massive government effort to test water source and ban contaminated wells

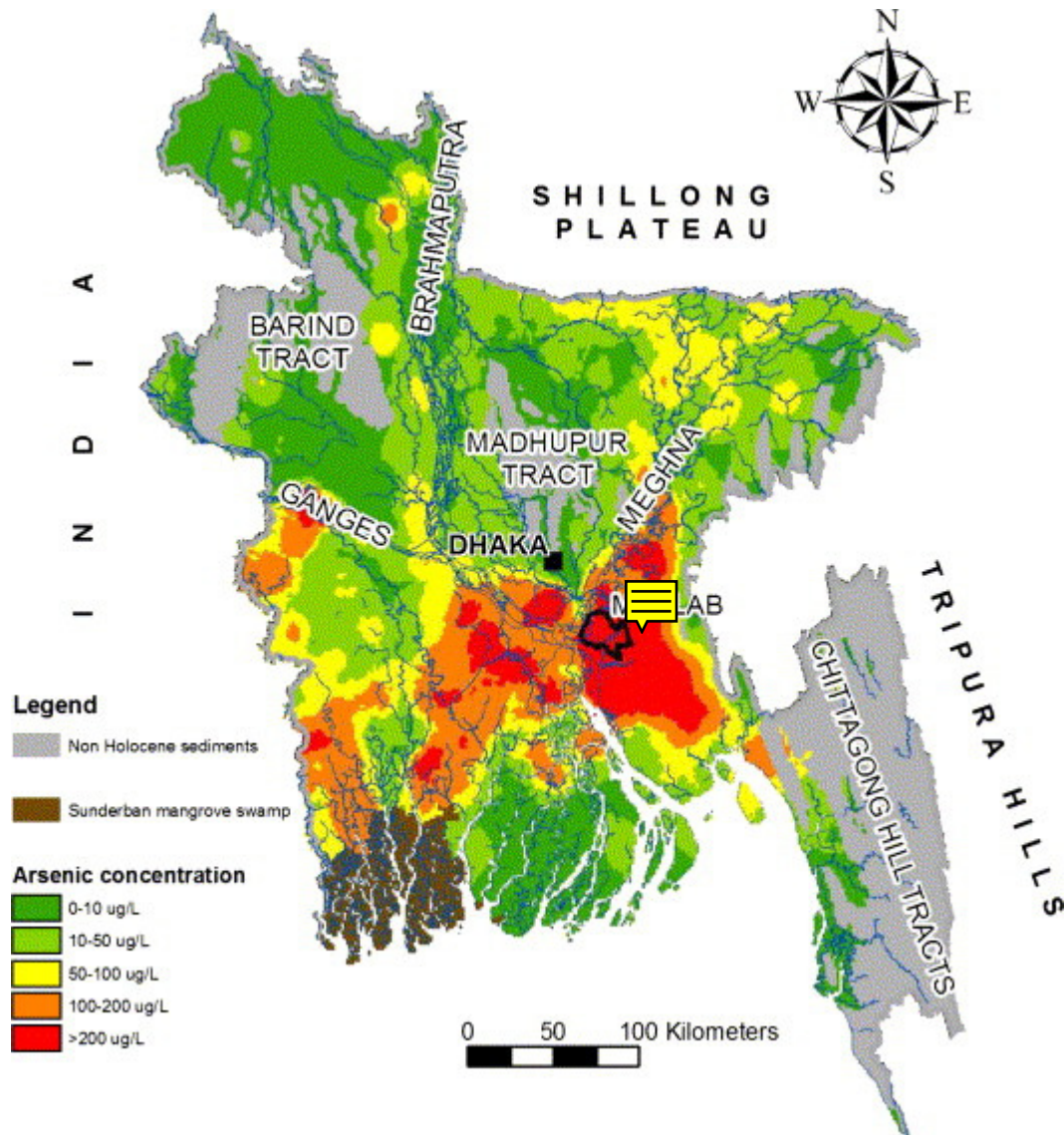
Shallow Tubewells



+ deep enough to avoid surface (fecal) contamination

- Not deep enough to avoid other sources of contamination

Government Efforts



Empirical Approach

Test whether the shift towards less deep (surface) water surfaces had a positive effect on child health

- Difference-in-difference estimation with village fixed effects
- “intensity of treatment” estimation using the household’s distance to contaminated water sources as main predictor of arsenic-induced switching to unsafe water sources
- Compare infant and child mortality rates pre and post 2000



Main Results

- Substantial increase of 27% in infant and child mortality for “switching” households
- Successful adoption of arsenic-free water: only 8% in 2004, and about 1% in 2009
- Effects are larger for non-switchers than for switchers
- Effects persist even when deep wells are the alternative, which suggests imperfect substitution (partial use of surface water) or home contamination



Strengths and Weaknesses

Strengths

- Major effort to collect detailed data on water consumption and child health
- Interesting alternative angle to public arsenic-focused campaign

Weaknesses

- Distance to toxic well measure not obviously random
- Public policy implications not very clear – should the government really tell people to keep drinking (mildly) toxic water?



Discussion Points

- What would you do if you were the government of Bangladesh in the light of the findings of the second paper?
- Why does water get so little international aid in comparison to HIV and malaria?
- Would you invest heavily into urban water infrastructure?