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Assessing the Health Impacts of Drinking Water Quality Evidence from Rural Ethiopia

Muhammed Abdella Usman

Department of Economic and Technological Change

Center for Development Research (ZEF), University of Bonn

mabdella@uni-bonn.de

**Selected Poster prepared for presentation at the
2015 Agricultural & Applied Economics Association and Western Agricultural Economics
Association Joint Annual Meeting, San Francisco, CA, July 26-28**

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Assessing the Health Impacts of Drinking Water Quality: Evidence from Rural Ethiopia

Muhammed Abdella Usman

Center for Development Research, University of Bonn, Germany

Introduction

- Today, more than 700 million people most living in developing countries are without access to improved and adequate water (WHO/UNICEF 2014).
- Every year, more than 1.5 million children –under the age of five, die of diarrheal diseases (WHO/UNICEF, 2009)
- Unsafe drinking water is one of the major causes of diarrheal diseases.
- Increasing the provision of improved drinking water plays an important role in the fight against diarrheal diseases for young children in developing countries.

Objectives

Due to limited availability of safe drinking water, most rural Ethiopian household relies on unimproved water sources, such as rivers, ponds, streams, unprotected springs and wells which are easily polluted by human and animal feces.

Therefore, it is important

- To assess the microbial quality of stored household drinking water, and
- To examine the impact of contaminated drinking water on child health outcomes.

Study Areas

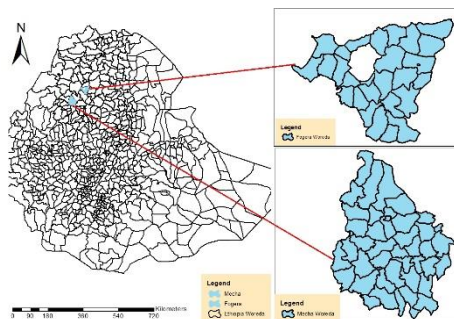


Figure 1. Map of the Study Areas

Data and Methods

A household survey has been conducted from February to June 2014. In addition;

- 62 drinking water samples from community sources, and
- 454 drinking water samples from household drinking water storage has been collected and tested for the presence of *Escherichia coli* (*E.coli*) bacteria (cfu/100 ml).

Child diarrhea:

A self-reported prevalence of diarrheal symptoms by the Primary caretaker of the child in the last 14 days before the survey.

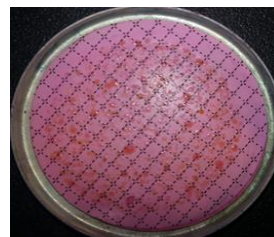


Figure 2. Drinking water sample quality test result

Results and Discussion

- Only 49% of our sample households have access to improved drinking water source
- More than 58% of the water samples from household's drinking water storage is contaminated with *E.coli* (i.e at least one *E.coli* per 100 ml)
- The prevalence of diarrheal disease for under 5 years of children in the last 14 days is 16%.

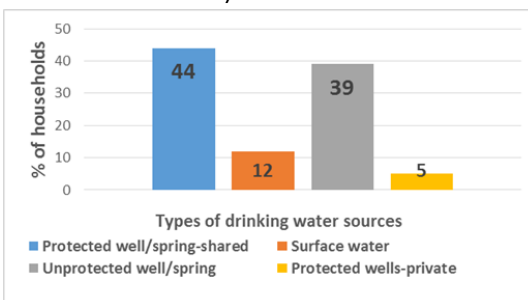


Figure 3: Access to drinking water .

Empirical Strategy

Health effects of drinking water quality

	(1)	(2)	(3)	(4)
	OLS	Probit	IV	BP
diarrhea < 5yrs				
watquality	0.1861*** (0.0225)	3.2101*** (0.4772)	0.3823*** (0.1330)	0.5473*** (0.2535)
(yes=contaminated)				
Child age in months	-0.0039*** (0.0008)	0.9782*** (0.0049)	-0.0039*** (0.0007)	-0.003 (0.0106)
Exclusive breastfeeding	-0.0999*** (0.0287)	0.5977*** (0.0818)	-0.1093*** (0.0266)	-0.0907 (0.1648)
Mother use soap	-0.0290 (0.0310)	0.8846 (0.1466)	-0.0143 (0.0350)	0.0156 (0.2212)
HH have pit latrine	0.0256 (0.0366)	1.1840 (0.2283)	0.0535 (0.0446)	0.0691* (0.1546)
Observations	558	558	558	558
Model F-Test	12.27		137.24	
Model Chi2		163.07		820.58
Model p-value	0.0000	0.0000	0.0000	0.0000
Probit rho chi2				0.4011
Probit rho p-value				0.5265

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Probit and BP in average marginal effect

Source: Authors' compilation based on survey data.

Other controls: gender, mother & HH head age, water collection time, HH size, asset, dependency ratio & medical visits

Conclusions

- Water quality influences the diarrheal diseases especially young children between 6 to 24 months of age
- Household's stored drinking water quality is highly correlated with types of water sources
- Availability of simple pit latrine and hygienic practices does not automatically translate into improved child health outcome

References

WHO/UNICEF. (2014). Progress on drinking water and sanitation: 2014 updates. New York, NY USA and Geneva, Switzerland.
WHO/UNICEF. (2009). Diarrhoea: Why children are still dying and what can be done: World Health Organization (WHO) and United Nations Children's Fund (UNICEF).

Acknowledgment:

Funding was provided by Bill & Melinda Gates Foundation

