Supportive Environments for Healthy Communities

Handwashing Determinants and Diarrhea in Sub-Saharan Africa

An Analysis of DHS and MICS Data

Photo: Center on Globalization and Sustainable Development at Columbia University

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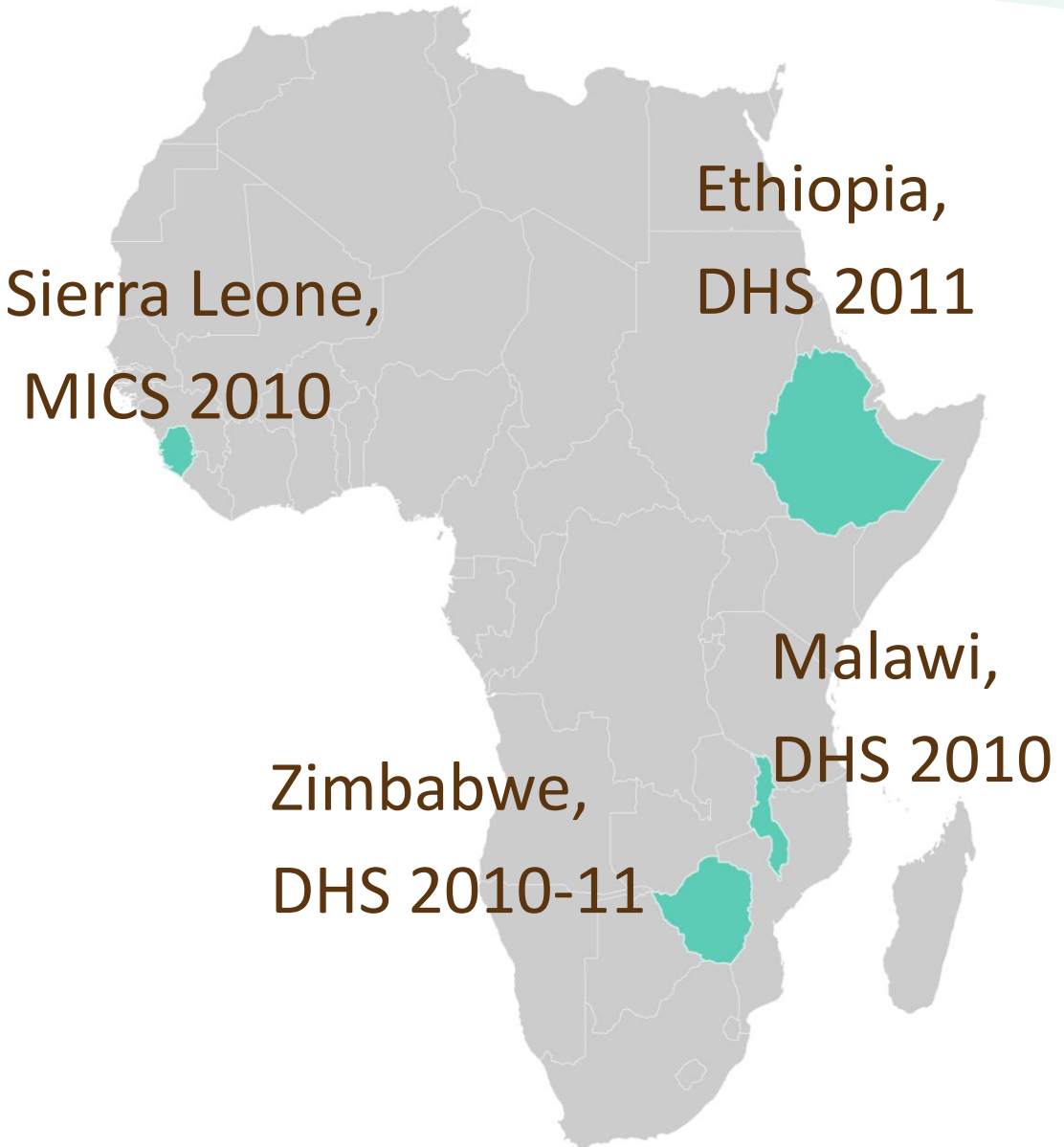
Research Questions

- Are there any cross-country determinants explaining the presence of functional handwashing stations in households?

- Does the presence of functional handwashing stations have any relationship to diarrheal disease when other WASH elements are taken into account?

Methods

- Multi-country comparison
- Analysis in SPSS using sample weights
  - Descriptive statistics
  - Binary logistic regression



Variables

WASH elements

Diarrhea

Socio-demographic

- Wealth Quintile (1-5)
- Household Size
- Sex of the Child
- Age of the Child
- Mother's Age
- Education (mother, head of household)
- Location of household (urban/rural)

Demographic and Health Survey (DHS) Questions on Handwashing Practices

137	Please show me where members of your household most often wash their hands.	OBSERVED . . . . . 1 NOT OBSERVED, NOT IN DWELLING/YARD/PLOT . . . . . 2 NOT OBSERVED, NO PERMISSION TO SEE . . . . . 3 NOT OBSERVED, OTHER REASON . . . . . 4 (SKIP TO 140)
138	OBSERVATION ONLY: OBSERVE PRESENCE OF WATER AT THE PLACE FOR HANDWASHING.	WATER IS AVAILABLE . . . . . 1 WATER IS NOT AVAILABLE 2
139	OBSERVATION ONLY: OBSERVE PRESENCE OF SOAP, DETERGENT, OR OTHER CLEANSING AGENT.	SOAP OR DETERGENT (BAR, LIQUID, POWDER, PASTE) . . . . . A ASH, MUD, SAND . . . . . B NONE . . . . . Y

- No Handwashing Place
- Handwashing Place with No Supplies
- Handwashing Place with Incomplete Supplies
- Fully Functional Handwashing Station (Handwashing Place with Soap and Water)

WASH Elements

WASH Element	Definition	Weighted Percentage			
		Zimbabwe	Ethiopia	Malawi	Sierra Leone
		N=9756	N=16702	N=24825	N=11394
Improved Drinking Water	Source of drinking water is piped water, public tap or standpipe, tubewell or borehole, protected spring, protected dug well, or rainwater collection.	78.6%	53.8%	79.7%	57.0%
Improved Sanitation Facility	Private facility of the following types: flush or pour-flush to piped sewer system, septic tank, pit latrine, ventilated improved pit (VIP) latrine, pit latrine with slab, or composting toilet.	35.5%	8.3%	8.3%	11.2%
Close Water Source	Water source located on premises, or less than 30 minutes needed to retrieve water.	89.2%	64.5%	74.7%	88.0%
Household Treatment of Water	Drinking water treated by bleach/chlorine, cloth strainer, filter; or solar disinfection.	21.6%	9.2%	32.3%	9.1%
Full Handwashing Station	Observed handwashing place with soap and water present.	24.7%	1.0%	2.5%	12.3%
		N=5056	N=10946	N=17887	N=8585
Diarrhea	Self-reported by mothers in the two weeks prior to the interview.	13.6%	13.5%	17.7%	15.5%

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Photo: Uganda Village Project

FUNCTIONAL HANDWASHING STATIONS

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Zimbabwe: Full Handwashing Station in Households

		HOUSEHOLDS (N=9640)	
		p-value	**OR (95% CI)**
WASH	Household Treatment of Water	0.003	1.2 (1.1-1.4)
	Improved Drinking Water	0.027	1.2 (1.0-1.4)
	Sanitation Facility (Unimproved)	< 0.001	0.7 (0.6-0.8)
Socio-Economic	Urban	< 0.001	1.3 (1.1-1.5)
	3rd Wealth Quintile	0.009	1.4 (1.1-1.7)
	4th Wealth Quintile	< 0.001	2.6 (2.1-3.4)
	5th Wealth Quintile	< 0.001	6.0 (4.6-7.8)
	Household Size	0.003	0.9 (0.9-1.0)

- No significant relationships found with improved sanitation facility, distance to water source, head of household's education, and being a member of the 2nd wealth quintile.

Summary of Significant Associations with Full Handwashing Station

		Zimbabwe	Ethiopia	Malawi	Sierra Leone
WASH	Household Treatment of Water	+	+	+	+
	Sanitation Facility (Improved)		+	+	+
	Sanitation Facility (Unimproved)	-		+	-
	Improved Drinking Water	+			+
	Close Water Source		+	+	
Socio-Economic	Urban	+	+	+	
	Household Size	-			-
	Household Head- Secondary Education		+	+	+
	Household Head- Higher Education		+	+	n/a
	3rd Wealth Quintile	+			+
	4th Wealth Quintile	+	-		+
	5th Wealth Quintile	+		+	+

KEY	
+	positive association
-	negative association
	direction of association as expected
	direction of association unexpected

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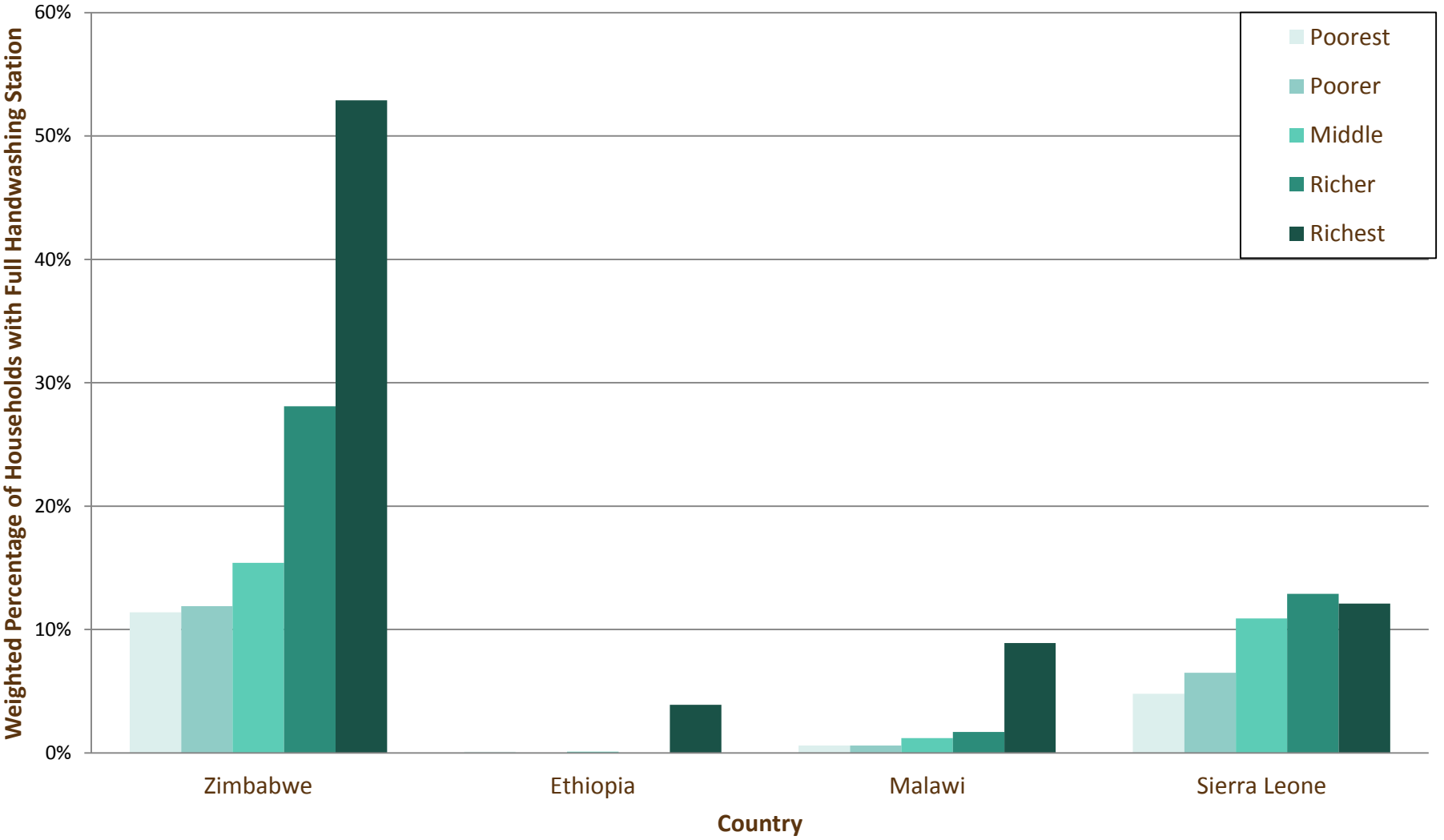
Full Handwashing Station in Households by Wealth Quintile



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Conclusions

- Predictors of functional handwashing stations
  - Access to water and sanitation
  - Urban settings
  - Wealth
- Next step: Examine relationships between WASH elements in households
- Universal access to WASH infrastructure in rural areas and among poorer households remains a challenge, and does not guarantee that households will set up and maintain functional handwashing stations.
- Promotional efforts will need to continue stressing the need to set up these handwashing stations.

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Photo: Anna Kari

WASH AND DIARRHEAL DISEASE IN CHILDREN UNDER 5

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Zimbabwe: WASH and Diarrheal Disease in Children under 5

		CHILDREN UNDER 5 (N=4833)	
		p-value	OR (95% CI)
WASH	No Handwashing Place	. < 0.001	1.7 (1.3-2.2)
	Handwashing Place with Incomplete Supplies	.003	1.5 (1.1-2.0)
	Unimproved Drinking Water	.003	1.4 (1.1-1.6)
	Far Water Source	.007	1.4 (1.1-1.8)
Socio-Economic	Child's Age	< 0.001	0.8 (0.8-0.9)
	Mother's Age	.049	0.9 (0.9-1.0)
	Male Child	.021	1.2 (1.0-1.4)
	Household Size	.040	1.0 (1.0-1.1)
	Urban	< 0.001	1.7 (1.3-2.2)

- No significant relationships found with type of sanitation facility, household treatment of water, wealth, and mother's education.

Summary of Significant Associations with Diarrhea

		Zimbabwe	Ethiopia	Malawi	Sierra Leone
WASH	No Handwashing Place	+		+	
	Handwashing Place with No Supplies		+	+	+
	Handwashing Place with Incomplete Supplies	+		+	
	Unimproved Drinking Water	+	+	-	
	Far Water Source	+	-		
	Open Defecation		+		
	Unimproved Sanitation				-
	Untreated Water in the Household			+	
Socio-Economic	Child Age	-	-	-	-
	Mother's Age	-	-	-	n/a
	Male Child	+	+	+	
	Household Size	+			+
	Urban	+		+	

- No significant relationships found with wealth and mother's education.

KEY	
+	positive association
-	negative association
	direction of association as expected
	direction of association unexpected

Conclusions

- DHS and MICS data at the country level for children under 5 reflect RCT data that relate handwashing with soap to a reduction in diarrheal disease.
- Questions on handwashing station and the availability of supplies is a good proxy for handwashing.
- The importance of a handwashing station in the household may have a higher predictive value than other WASH elements.
- Investments in WASH infrastructure must be accompanied by behavior change efforts to ensure households have functional handwashing stations. Investing in hardware alone may not be enough to reduce diarrheal disease.

WE KNOW:

- DHS and MICS questions on handwashing stations and supplies are a good proxy for handwashing.
- Handwashing is one of the best interventions for reducing diarrheal disease.
- The percentage of households with a fully functional handwashing station is very low across countries.

WHAT NOW?

HOW CAN THIS DATA BE USED?

Thank you!

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