

# Introduction & Background

- Water-borne diseases are a particular concern in developing nations, often a major cause of morbidity and mortality [1]
- Globally as of 2004 approximately **1.1 billion** persons do not have access to improved drinking water [1] In Zambia specifically **36% of the population** do not have access to improved drinking water.
- Given infrastructural and financial hurdles to expand water systems in lower income countries (LICs) **point-of-use disinfectants** are seen as optimal cost-effective interventions [1]
- Informational campaigns and price subsidies are common policy tools to increase the use of household water treatment products in LICs[2]



# Objectives & BWA

- **Bread and Water for Africa (BWA)** “a nonprofit that, among other initiatives, supports programs that provide clean water to rural Sub-Saharan African communities.”
- As a new project manager for BWA programs in Zambia we set out to analyze and evaluate elements of Chlorin use in two municipalities (Lusaka and Mpika) in the Luangwa District.



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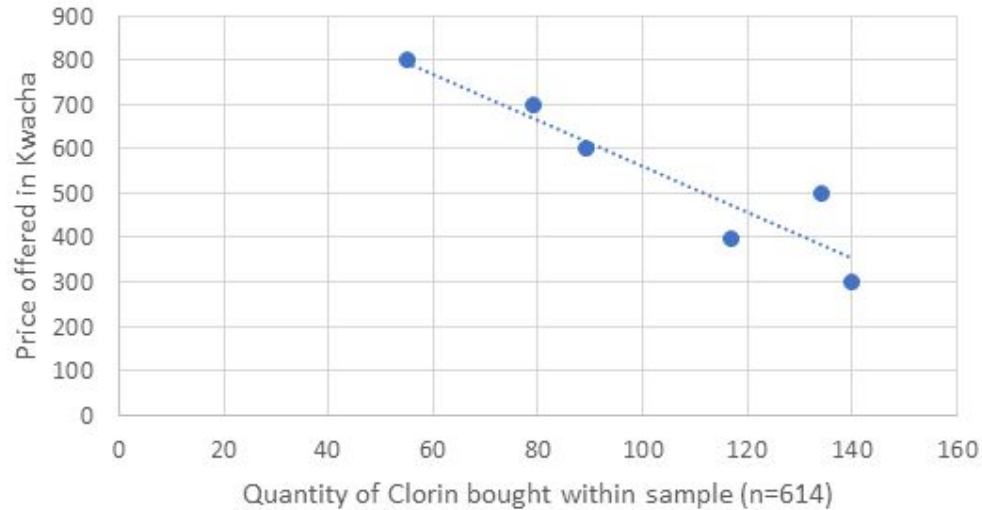


# Findings & Results

## Demand of Clorin at Offer Price in Luangwa

(SE = 0.015)

Figure 1: Demand of Clorin Bought at Offer Price in Kwacha



# Findings & Results Cont.

Larger subsidies **increase** percentage of waste, however total quantity of waste **decreases**.

Market Price	Used	Wasted	Total Number of Used and Wasted	% Wasted
300	51	73	124	0.588709677
400	51	54	105	0.514285714
500	68	54	122	0.442622951
600	45	34	79	0.430379747
700	38	32	70	0.457142857
800	28	18	46	0.391304348

^To calculate waste %, waste divided by total at each interval. For example, at 800 kwacha,  $18/46$ . For 700 kwacha,  $(18+32)/(46+70)$ . For 600 kwacha,  $(18+32+34)/(46+70+79)$ .



# Findings & Results Cont.

## Supply and Demand in Luangwa.

### Line of best fit/Regression:

$$\text{Quantity} = 0.1214 * \text{Price} + 1.4117$$

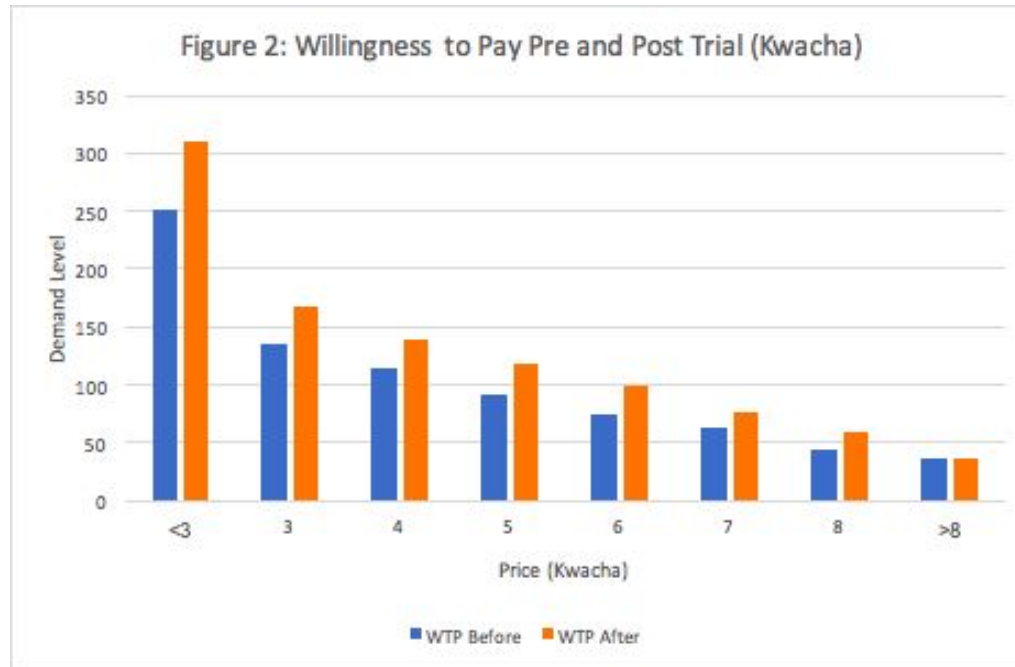
\*Price at each 100kw price interval (i.e. 8, 7, 6)

Market Price in Kw	Demand based on regression	Demand with 25k households	QS	Difference
700	0.5619	14,047.50	80,000.00	(65,952.50)
600	0.6833	17,082.00	40,000.00	(22,918.00)
500	0.8047	20,117.50	26,667.00	(6,549.50)
400	0.9261	23,152.50	20,000.00	3,152.50
300	1.0475	26,000.00	16,000.00	10,000.00



# Findings & Results Cont.

## Mpika Willingness to Pay Pre- and Post- Trial

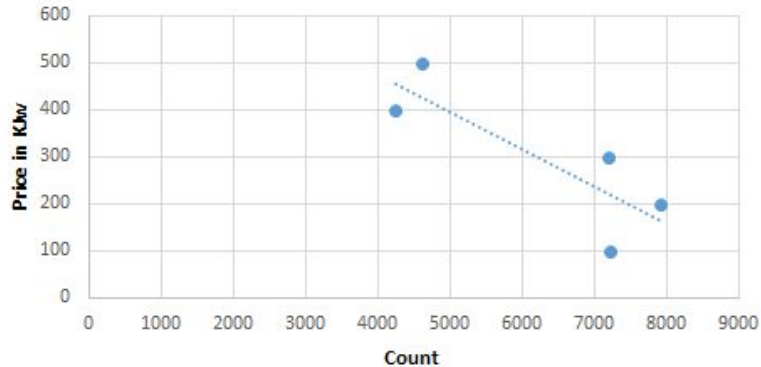


# Findings & Results Cont.

Optimal short run subsidy to maximize long run users.

WTP Price	WTP Pre- Trial	WTP 800kw Post	Percent Change	Absolute N of LRU*
700	18	8	44%	7207
600	13	5	38%	7904
500	17	5	29%	7191
400	23	4	17%	4250
300	21	5	23%	4600

Long run users of Clorin at 800 Kw post trial at each subsidy level



# Discussion

- Our analysis looks only at the nature of Clorin use considering subsidy, usage and wastage. However, our results provide no insight to the effectiveness or efficacy of Clorin use on improvement of health outcomes such as diarrheal diseases for children younger than 5 years old. In fact, other studies looking at Clorin use in Lusaka found that Clorin use does not lead to improved health outcomes for children. [1]
- Other studies have also found that information increased the effectiveness of price subsidies by 60 percent, which suggests that programs aimed at increasing the demand for products or services can be improved by considering how complementary interventions interact to influence demand. [2]

# Limitations

- Secondary self-reported data
- Sample size and generalizability
- No control group, or potential to assess confounding variables

# References

[1] Olembo, L. et al. 2004. Safe Water Systems. An evaluation of the Zambia Clorin Program. Final Report. Johns Hopkins Bloomberg School of Public Health.

[2] IPA Innovations for Poverty Action. 2007. ([Link](#)) Accessed July 5th 2017.

