

# 1333: Evaluating the Efficacy of Point-of-Use Water Filtration Units and Hygiene Training in Fiji

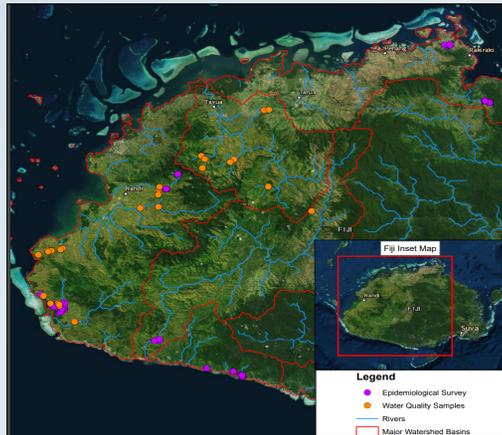
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## Introduction

- In low- and middle-income countries, over a quarter of a million lives lost to diarrhea could be saved by teaching people about hand hygiene
- Half a million lives lost to diarrhea could be saved by providing clean drinking water
- A major source of diarrhea is fecal pathogens via fecal-oral route transmission
- An opportunity for change is possible through preventative means by stopping the transmission of diarrhea pathogens by drinking clean water and using proper hand hygiene
- In Fiji, an estimated 6.4% of deaths of children ages one month to 5 years was a result of diarrhea
- Give Clean Water, Inc., in partnership with the Fiji Ministry of Health has been providing point-of-use water filtration systems (Sawyer® PointONE™) to the people of Fiji along with instructing them on handwashing hygiene
- There have been reports of mixed results about the effectiveness of the filter to remove contaminants as well as health outcomes



GIS map of the main island of Fiji depicting sites where filters have been introduced and survey data has been collected. Colors of points indicate where the epidemiological survey (purple) water quality sampling (orange) have been conducted to date.

## Aims

To provide clarity by evaluating the change in diarrhea risk over time after filter use and training in handwashing hygiene in Fiji by:

1. Analyzing the change in the number of people ill with diarrhea in Fiji after the intervention
2. Exploring how this risk changes for both the number of people with diarrhea as well as the severity of diarrhea, as measured by impact on work/school attendance
3. Reporting on the economic impact of the intervention through savings in medical expenses and water costs

## Sawyer® PointONE™ Filters



- Hollow fiber membranes with micro pores (0.1 microns) to ensure that bacteria and protozoa are filtered out of the water
- Source water filtered via a gravity fed bucket filter system into a clean container, removing bacteria, protozoa and suspended particulates

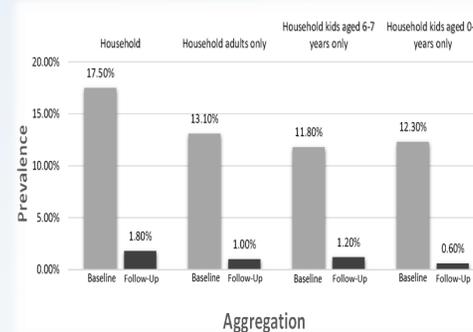
## Methods

- During the initial visit, an adult in each household was taught the proper use and cleaning of the Sawyer® PointONE™ filter, along with basic handwashing instructions.
- At the time of filter installation, the household provided answers to a brief questionnaire about basic health outcomes and other demographic information
- A translator was present to ensure proper understanding of instructions and survey questions.
- Variables of interest: number of people in the household with diarrhea during the two-weeks prior to survey administration, diarrhea severity, economic impact, medical expenses due to diarrhea, money spent on water per month

## Results

### Changes in diarrhea risk over time

- Diarrhea was prevalent in more than 1 out of 6 households in the sample within the two-week period prior to intervention
- Diarrhea prevalence for households with similar distributions across adults, school-aged children and young children



Diarrhea prevalence by age group at baseline and follow-up time points. The mean number of days between baseline and follow-up surveys was 63.8, with a range of 19 to 255 days. AOR at baseline compared to followup for all members of a household was 14.8 (95% CI: 6.9, 32; p<0.001).

### Diarrhea severity

- Measured by being severe enough to cause the affected individual to miss work (adult) or school (school-aged child)
- The AOR of severe diarrhea at baseline compared to follow-up was 29.5 (95% CI: 7.5, 115.2; p<0.001)

## Results (continued)

### Medical expenses and household water expenses

- Estimated savings from baseline to follow-up were approximately Fijian (FJ) \$3.50 in medical costs and FJ \$0.60 in water expenses, per person, per month on average

Aggregation	Timing	Mean (SD)	Unadjusted difference (95% CI)	Adjusted difference (95% CI)
Household medical expenses	Baseline	\$3.84 (\$11.73)	\$3.54 (\$2.47, \$4.61)***	\$4.40 (\$3.29, \$5.51)***
	Follow-up	\$0.30 (\$2.76)		
Household water expenses	Baseline	\$0.78 (\$2.88)	\$0.63 (\$0.35, \$0.92)***	\$0.74 (\$0.46, \$1.03)***
	Follow-up	\$0.15 (\$1.39)		

## Discussion

In this analysis we demonstrated that the combination of providing a Sawyer® PointONE™ filtration system and training on handwashing hygiene (the intervention) provided **substantial health and economic benefits** to individuals in the country of Fiji. The decrease from baseline to follow-up in diarrhea prevalence, severe diarrhea, and economic impact shows the **benefit of the filter and handwashing intervention**. The current minimum wage is FJ \$2.68. With intervention, the **estimated amount of savings from water and medical expenses per Fijian per month totals to be FJ \$4.17**. This is equivalent to approximately 1.56 hours of labor for a Fijian minimum wage worker.

## Acknowledgements

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- The Dordt College IRB approved this project

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