Clean Water to Liberia Project Results
**Report to Sawyer, Inc**
February 2022

Background
The Last Well and Sawyer, Inc. engaged in a 5-year, border-to-border clean water project in Liberia. Through this work, approximately 100,000 Sawyer PointOne filters were distributed to households in small and/or remote villages. Households that received the filters were surveyed upon receipt of the filters, after approximately 2 weeks, and after 8 weeks. This data was analyzed independently by researchers at Calvin University in Grand Rapids, Michigan.

The results below reflect approximately 30,000 households in Liberia representing 13 counties. The heat map of Liberia villages surveyed (Figure 1) reflects the geographic distribution of the participating villages.

Figure 1: Heat map of Liberia villages surveyed
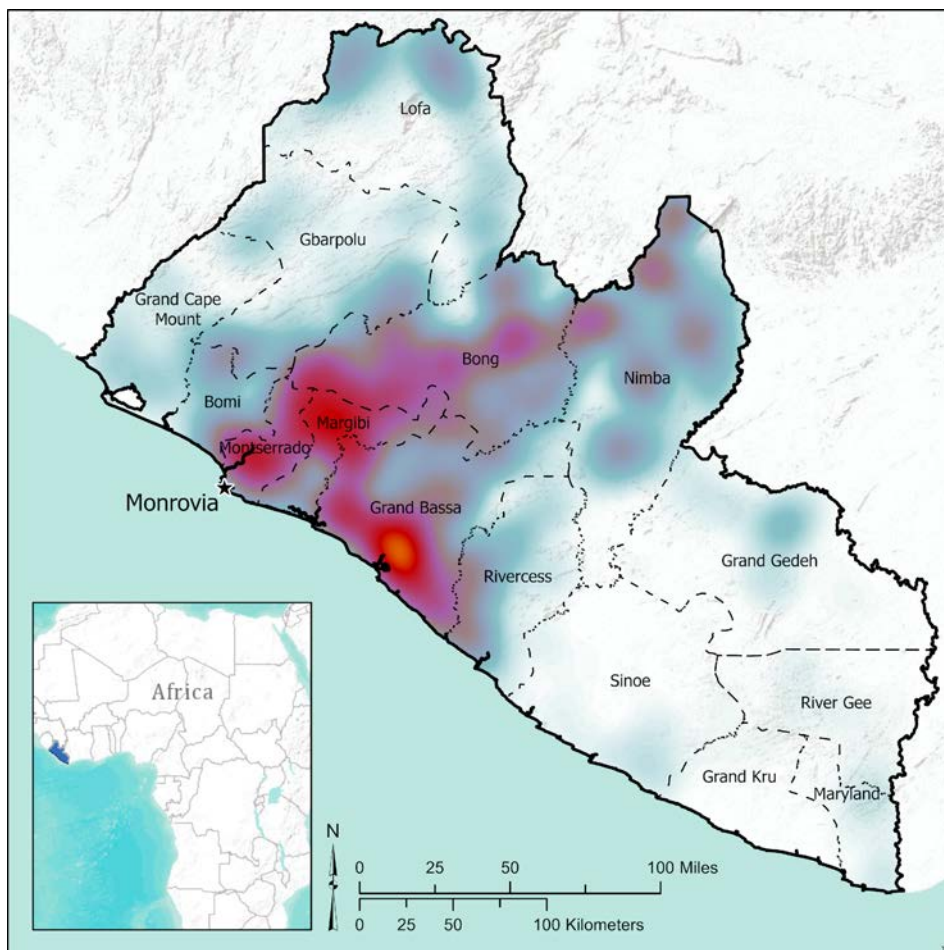
Results

Sawyer PointONE filters have demonstrated short-term effectiveness both in diarrheal reduction, filter durability, and user friendliness.
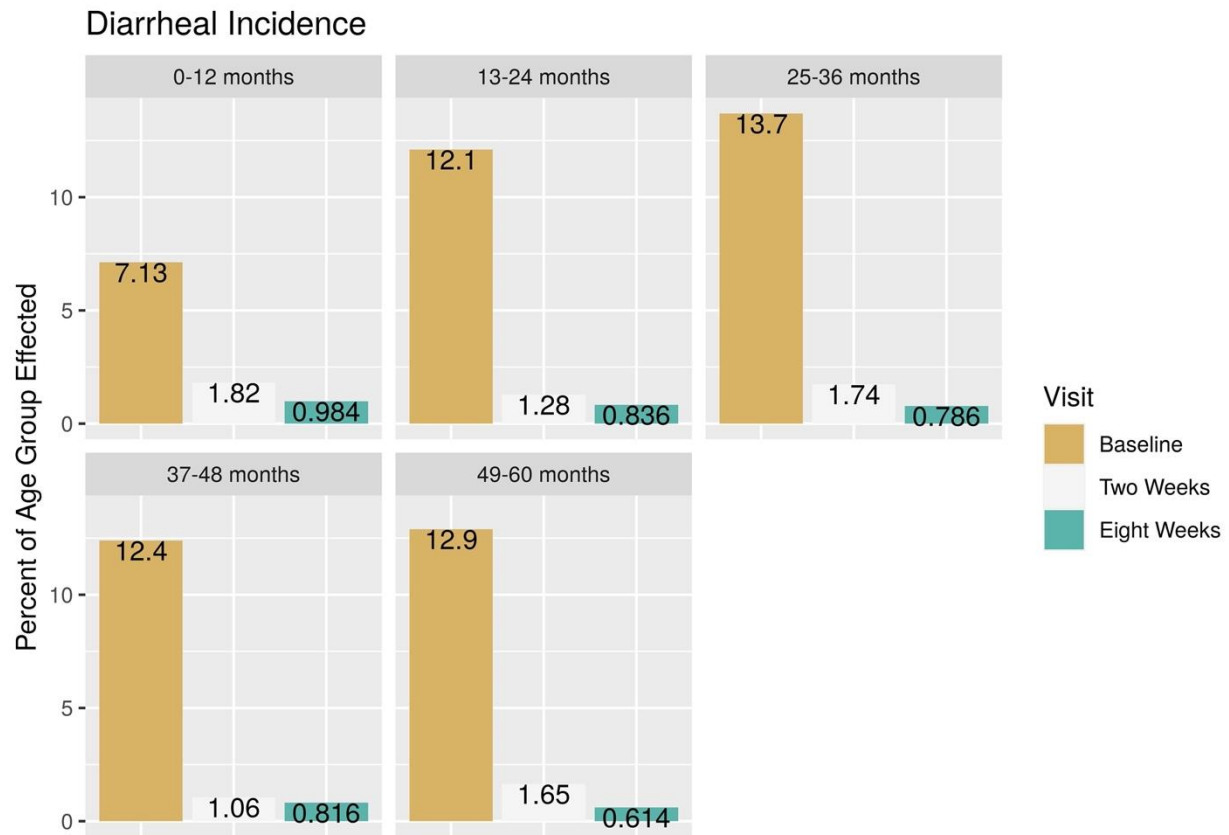
Diarrheal Reduction

A key indicator of filter efficacy on health is measured through changes in diarrheal incidence. Using mixed-effects logistic regression models, we confirmed that reductions in diarrhea incidence after filter distribution were dramatic even accounting for potential effects of other factors like location, season, and water source.The proportion of diarrhea in children under 5, children ages 5 through 17, and adults ages 18 and over, all decreased (Figure 2).

Figure 2: Changes in diarrheal incidence by age group
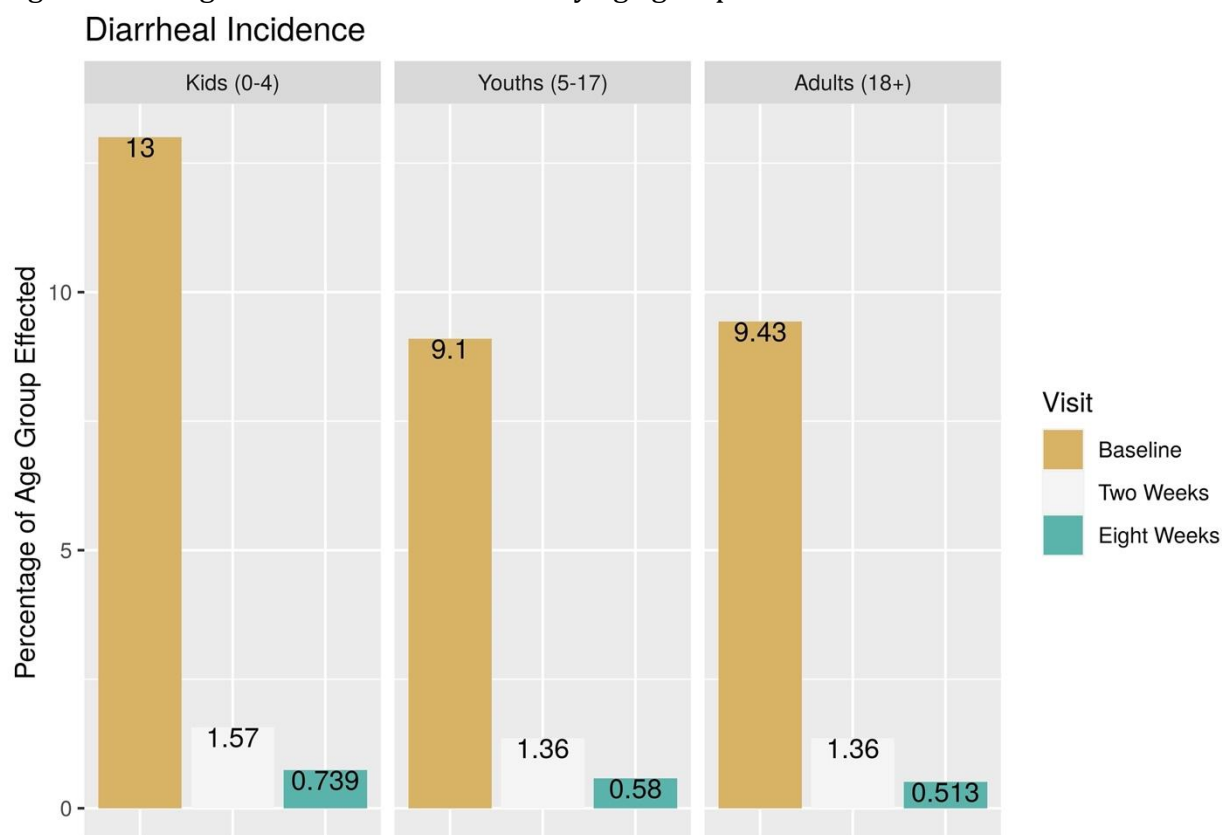
Similarly, as we look at the most vulnerable population, children under 5, we observe decreases in proportions of diarrhea (Figure 3).

Figure 3: Changes in diarrheal incidence by age, children under 5

If we compare the results by county, all counties experienced reductions in diarrhea among households receiving the filter intervention (Figure 4).

Figure 4: Changes in diarrheal incidence by county

Diarrheal Incidence
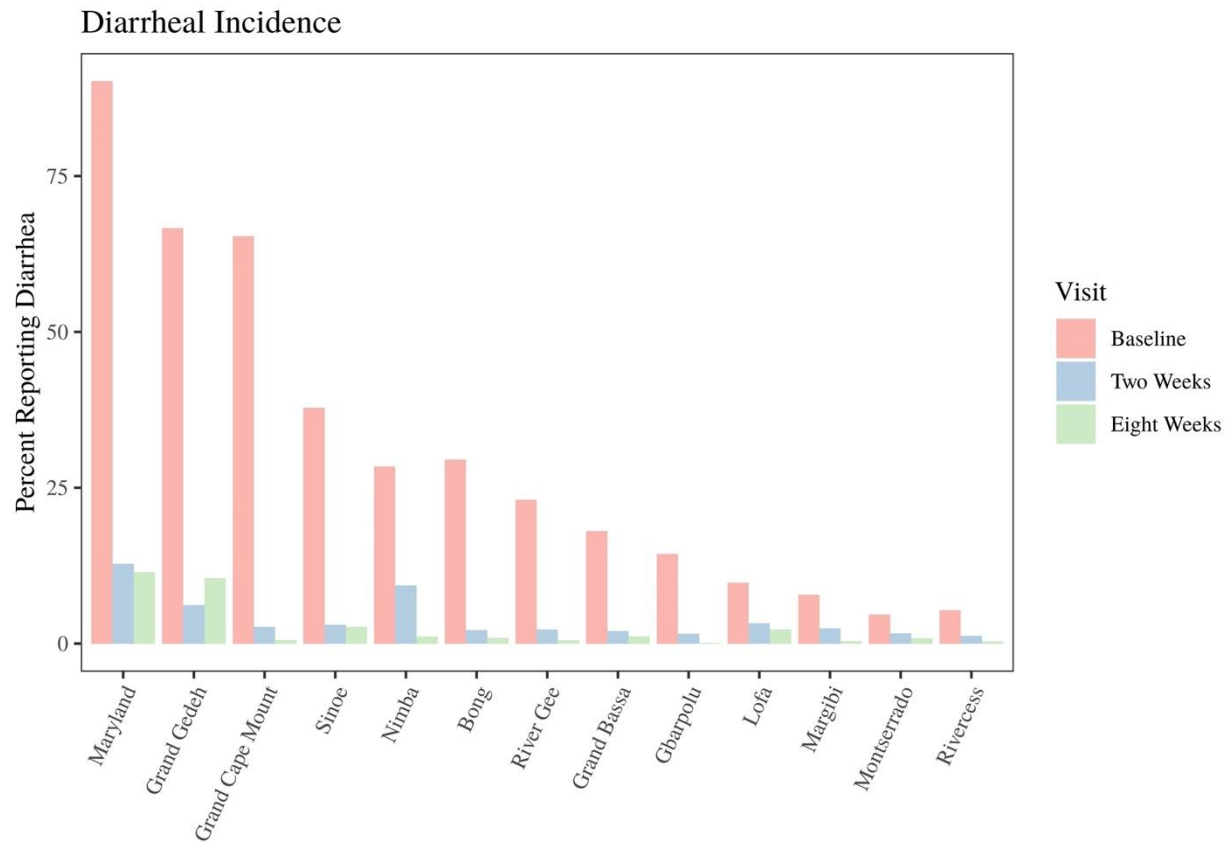
Filter Durability
Figures 5 and 6 show the filter conditions both at the beginning and end of each follow-up. There were relatively few problems with the filter or missing parts at either visit and the majority were resolved by the end of the visit. Alternative ways of displaying this information are shown in Figures 7 and 8.

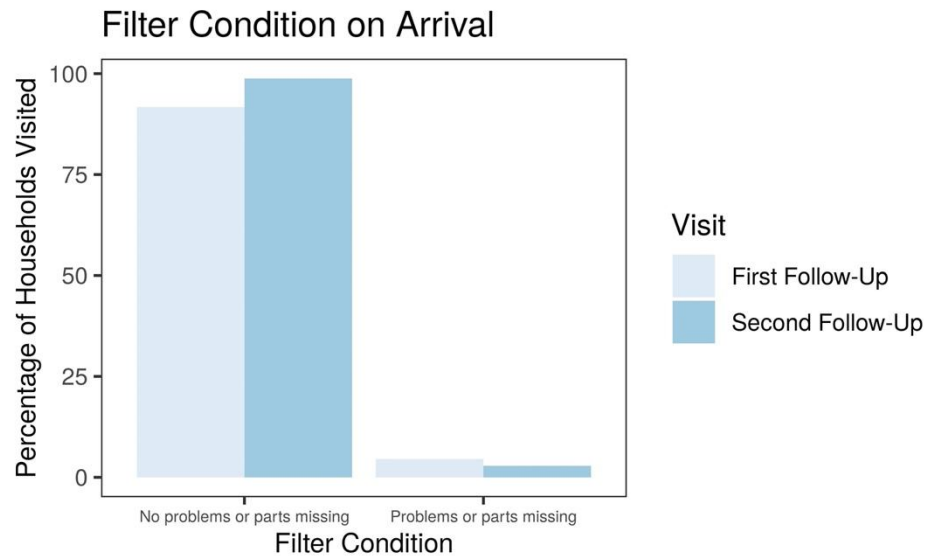Figure 5: Filter condition on arrival at two and eight-week follow-up

Figure 6: Filter condition at departure at two and eight-week follow-up
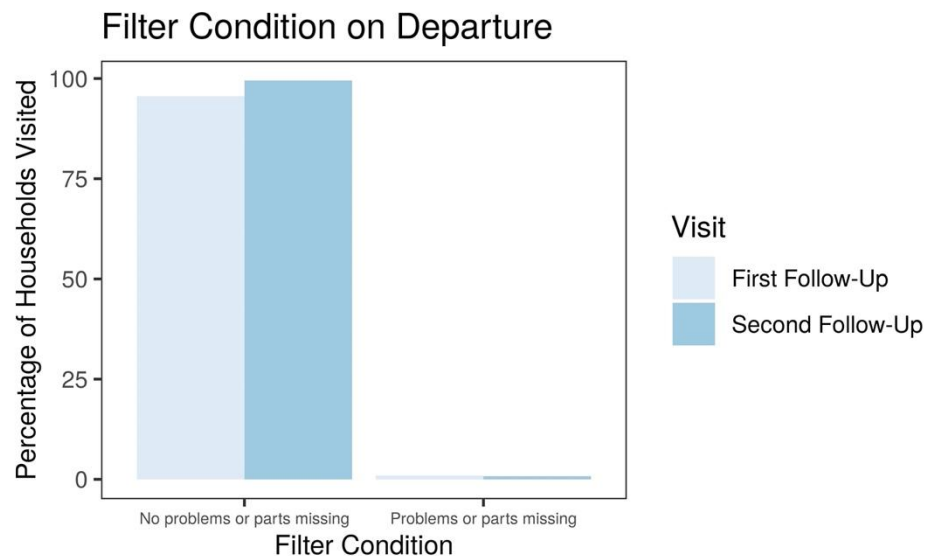
Figure 7: Filter condition on arrival at two and eight-week follow-up (waffle chart)

Filter Efficacy at First Follow-Up

■ No Problems or Parts Missing

■ Problems or Parts Missing

Figure 8: Filter condition at departure at two and eight-week follow-up (waffle chart)

Filter Efficacy at Second Follow-Up

■ No Problems or Parts Missing

■ Problems or Parts Missing

The majority of problems related to dirty filters, clogged filters, and air problems (Table 1).

Table 1: Filter condition at two and eight-week follow-up

	Percent (number) of filters in this condition (n=30897) at beginning of first follow-up	Percent (number) of filters in this condition (n=29463) at end of first follow-up	Percentage change between beginning and end of first follow-up	Percent (number) of filters in this condition (n=30668) at beginning of final follow-up	Percent (number) of filters in this condition (n=29753) at end of final follow-up	Percentage change between beginning and end of second follow-up
Air problem	0.71 % (211)	NA	NA	0.71 % (214)	NA	NA
Bucket connector problem	0.05 % (15)	0.01 % (4)	-80 %	0.05 % (14)	0.02 % (7)	-60 %
Clogged filter	2.1 % (625)	0.04 % (12)	-98.1 %	0.97 % (291)	0.04 % (12)	-95.88 %
Cracked buckets	0.08 % (24)	0.04 % (12)	-50 %	0.03 % (8)	0.02 % (7)	-33.33 %
Cracked casing	0.04 % (12)	0.01 % (4)	-75 %	0.02 % (5)	0 % (1)	-100 %
Damaged hose	0.05 % (15)	0.03 % (10)	-40 %	0.03 % (9)	0.01 % (4)	-66.67 %
Dirty filter	5.01 % (1491)	NA	NA	3.01 % (902)	NA	NA
Missing clear cap	0.04 % (12)	0.03 % (9)	-25 %	0.03 % (8)	0.04 % (12)	33.33 %
Missing syringes	0.2 % (58)	0.18 % (54)	-10 %	0.15 % (46)	0.14 % (42)	-6.67 %
Missing washers	0.04 % (11)	0.03 % (9)	-25 %	0.02 % (5)	0.15 % (44)	650 %
Missing white cap	0.07 % (20)	0.08 % (23)	14.29 %	0.07 % (20)	0.08 % (23)	14.29 %
No problems	95.31 % (28336)	99.01 % (29326)	3.88 %	97.21 % (29103)	99.23 % (29601)	2.08 %

Other problems	0.23 % (67)	NA	NA	0.14 % (43)	NA	NA

User Ability

At both follow-up visits, the majority of household representatives were able to properly demonstrate how to both filter water and backwash the filter. At the second follow-up, a slightly higher percentage of household representatives could properly demonstrate filter use.

Figure 9: User ability at two and eight-week follow-up