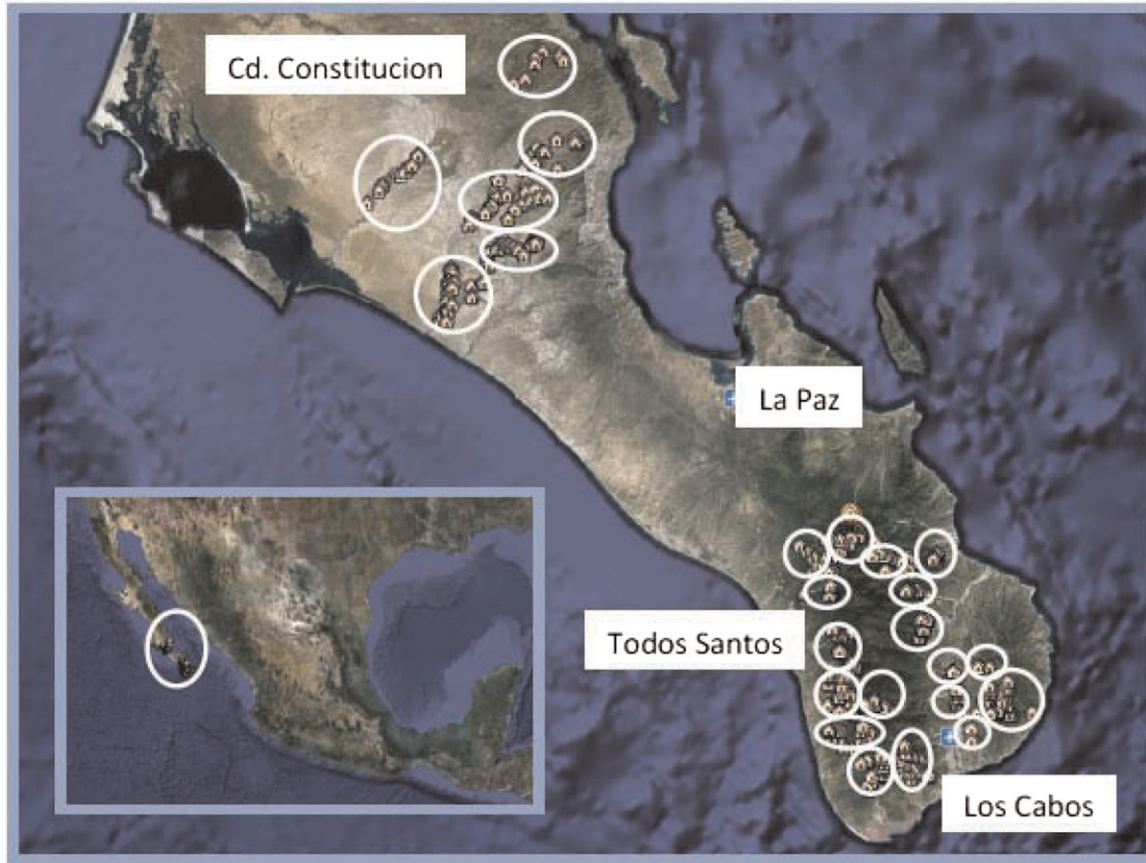**Supplemental Appendix A: Map of Los Cabos and La Pa Study Regions of Baja California Sur, Mexico**

Supplemental Appendix A: Google Map Showing Los Cabos and La Paz *municipios* (counties) of Baja California Sur, Mexico. Circles represent rough demarcations of the 24 study communities. Insert: Map of Mexico.

Supplemental Appendix B: Description of The Mesita Azul Intervention

Supplemental Appendix Figure B-1
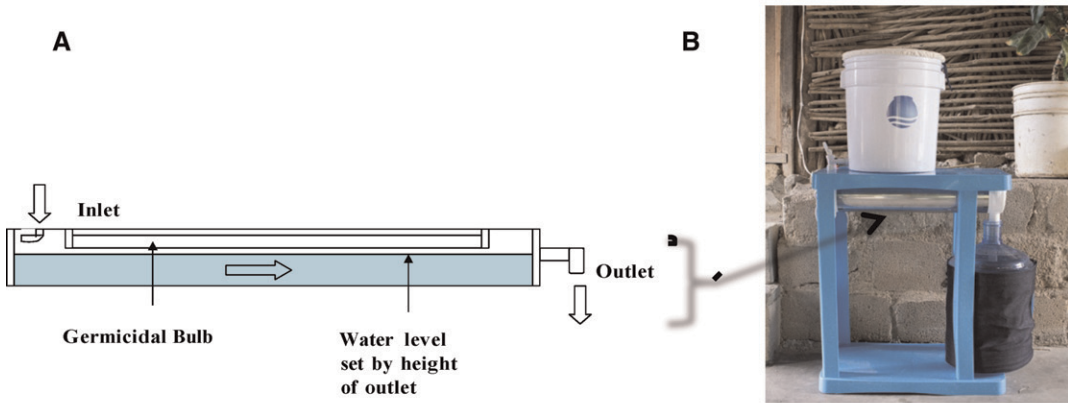
Supplemental Appendix Figure B-1 Description:
Panel A: Schematic of the UV Tube disinfection chamber. The UV Tube is composed of a 15-watt ultraviolet (UV) lamp, a stainless steel cylindrical sheet, and a pair of custom designed polypropylene end-caps. Water flows by gravity under the lamp at a flow rate of up to five liters per minute. The UV Tube has been shown to deliver a germicidal dose of UV light that inactivates bacteria, protozoa and viruses, without changing the taste, temperature or odor of the water.[1] The UV Tube meets the "highly protective" 4-5-4 log criteria of the World Health Organization's household water treatment specifications.[2]

Panel B: Shows the Mesita Azul. Fundacion Cantaro Azul (FCA) developed the final design through an iterative, interactive process that involved extensive piloting and community end-user feedback. Source water is poured into the top bucket in a manner similar to existing regional practices in Baja California Sur. The additional steps (beyond existing practices) are to turn on a switch (that activates the UV lamp), check an indicator that the lamp is functional, and open a valve on the white bucket. The water then flows by gravity through the disinfection chamber (metallic tube underneath the table) and is collected into a *garrafon*; a 20L safe-storage container that is locally associated with commercially purified drinking water. A special fabric is included on the *garrafon*, that when wetted, cools the *garrafon* through evaporation. At the time of the study, the unitary costs of the Mesita Azul technology and program were respectively 900 MPN (72 USD) and 630 MPN (50 USD), respectively. To partially offset program costs, FCA asked for either a onetime contribution of 250 MPN (20 USD) or a 300 MPN (24 USD) total contribution paid in installments over six months. The 250 MPN price point was determined through pilot work to be acceptable to most rural households. Systems were never removed from households for failure to pay installments.

Overview of Regional Safe Water Program:
FCA developed a regional program to promote, install, and encourage the use and maintenance of the Mesita Azul in rural households. All of these program activities were incorporated into this evaluation as part of the randomized intervention. Through the program, FCA and local leaders organized community meetings. During these meetings the FCA implementation team discussed safe water habits and options for household water treatment and safe storage (HWTS), including

Supplemental Appendix B: Description of The Mesita Azul Intervention

the Mesita Azul. The implementation team scheduled a time to return to the community to conduct household installations of Mesita Azul systems (usually within one to three weeks). Households were able to opt-in to the program during the community meeting, or when the implementation team returned for installations. FCA attempted to visit all households in a community to offer an installation, whether or not the household attended the community meeting. In order to decentralize the program, and promote long-term sustainability, FCA conducted training with at least one technician (local resident) in each community in basic repair and parts replacement for the systems. Additionally, spare parts (i.e. replacement valves, switches, ballasts, and lamps) were made available through trained technicians and select local stores.

Randomized Program Variations
Within the intervention, communities were randomized to one of two program variations: "Basic" or "Enhanced". The two variations were created to provide formative information to the implementers regarding barriers to adoption and use of Mesita Azul. The components of the Basic program were: the community meeting; the installation of a Mesita Azul; a six month technical guarantee; one safe-storage container; training of one household member in operation and basic maintenance of the technology; training of at least one local resident in repair and system maintenance; and follow up after four to six months of the installation date. The Enhanced program complemented the Basic version with: a water quality analysis and presentation of results for each household at the community meeting; a six-month money back guarantee; the provision of two safe-storage containers to facilitate access to disinfected water at different locations within the household; training of two household members in operation and basic maintenance of the technology; an additional follow up visit about two weeks after the installation date.

For the purposes of this evaluation we considered both program variations to be a single intervention. However, we explored heterogeneity of diarrhea and water quality results between the different variations of the program. We will report a detailed analysis on adoption and use outcome differences in a separate manuscript.

References:
1) Brownell SA, Chakrabarti AR, Kaser FM, Connelly LG, Peletz RL, Reygadas F, Lang MJ, Kammen DM, Nelson KL. Assessment of a low-cost, point-of-use, ultraviolet water disinfection technology. Journal of Water and Health. 2008;6(1):53-65.
2) WHO. Evaluating Household Water Treatment Options: Health-based targets and microbiological performance specifications: World Health Organization 2011.

SUPPLEMENTAL TABLES

A stepped wedge, cluster-randomized trial of a household UV-disinfection and safe storage drinking water intervention in rural Baja California Sur, Mexico

Supplemental Table 1: Comparison of Individual Baseline Characteristics Weighted by Time Contributed to Observed Visits and Missing Surveillance [a]

Individual Characteristic	Observed Visits (10258 *person-weeks*) [b]	Missing Surveillance (1859 *person-weeks*) [c]
Age in Years, mean (sd)	38 (23.9)	36 (23.5)
Demographics, *n (%)*		
Female	4686 (46%)	844 (45%)
Under 15 years	1975 (19%)	468 (25%)
Under 5 years	628 (6%)	142 (8%)
Baseline Illness, *n (%)* [d e]		
Diarrhea	466 (5%)	86 (5%)
Upset Stomach	912 (10%)	187 (12%)
Nasal Congestion	418 (4%)	93 (6%)
Cough	715 (8%)	160 (10%)
Tooth Pain	315 (3%)	69 (4%)
Adults (>15 years)	(8283 *person-weeks*)	(1391 *person-weeks*)
Employment, *n (%)* [f]		
Traditional Ranching Activities	6138 (75%)	1002 (73%)
Manual Laborer	920 (11%)	186 (14%)
Service, Government, Tourism	153 (2%)	22 (2%)
Not working	417 (1%)	59 (<1%)
Education, *n (%)* [g]		
Completed Primary School	1644 (20%)	302 (22%)
No Education	1418 (17%)	213 (15%)

[a] See text for description of weighting; [b] 85% of 12,117 possible person-weeks of observation; [c] 15% of 12,117 possible person weeks of observation; [d] 7-day prevalence; Missing Observations at Baseline: [e] *n*=147; [f] *n*=14; [g] *n*=7

Supplemental Table 2: Comparison of Baseline Households Characteristics Weighted by Time Contributed to Observed Visits and Missing Surveillance [a]

Household Characteristic	Observed Visits (*n*=2601) [b]	Missing Surveillance (*n*=507) [c]
Head of HH Education, *n (%)*		
Completed Primary School	585 (23%)	136 (27%)
No Education	668 (26%)	102 (20%)
Water Quality, *n (%)*		
Safe Drinking Water [d]	941 (40%)	165 (39%)
Low Risk Drinking Water [e]	1644 (71%)	253 (60%)
Hygiene and Sanitation, *n (%)*		
Bar Soap at Wash Station	1297 (55%)	215 (50%)
Any Soap at Wash Station	2014 (85%)	352 (82%)
Feces in Yard (Human or Animal)	859 (35%)	142 (32%)
Adequate Sanitation [f]	1273 (49%)	239 (47%)
Self-Reported Open Defecation	237 (9%)	63 (13%)
Reported Diarrhea is Avoidable by…, *n (%)*		
…Environmental Hygiene	434 (17%)	91 (18%)
…Personal Hygiene	917 (35%)	189 (37%)
…Safe Water	415 (16%)	96 (19%)
Reported Washing Hands…, *n (%)*		
…Before Preparing Food	1103 (43%)	206 (41%)
…Before Eating	1754 (68%)	360 (71%)
…After Using Toilet	1840 (71%)	372 (74%)
Health Services, *n (%)*		
Seguro Popular Insurance	1566 (60%)	296 (58%)
Regular Adult Check-ups	972 (37%)	211 (42%)
Regular for Chronic Illness	440 (17%)	78 (15%)
Visit Private Clinics	485 (19%)	82 (16%)
Participate in Oportunidades, *n (%)*	1673 (65%)	315 (62%)
Infrastructure, *n (%)*		
Use Solar Panel	2040 (83%)	368 (82%)
Live on Improved Road	610 (24%)	104 (21%)
Palm Roof	899 (35%)	144 (29%)
Dirt Floor	1908 (74%)	346 (68%)
HH Possessions, *n (%)*		
Functional Radio	1765 (68%)	335 (66%)
Functional TV	1125 (43%)	233 (46%)
Functional Car	2051 (79%)	413 (81%)
Wood Burning Stove Only	963 (37%)	177 (35%)
Functional Refrigerator	433 (17%)	92 (18%)

HH: household
[a] See text for description of weighting; [b] 84% of 3108 possible HH visits; [c] 16% of 3108 possible HH visits; [d] Safe: <1 MPN *E.coli*/100 ml; [e] Low Risk: <10 MPN *E.coli*/100 ml; [f] Sealed Pit Latrine or Flush System

Supplemental Table 3: Outcome Frequency, Unadjusted Estimates and ICC

Outcomes	Outcome Frequency Control n (%)	Outcome Frequency Intervention n (%)	Unadjusted Estimates[a] (95% CI) Risk Difference	Unadjusted Estimates[a] (95% CI) Risk Ratio	ICC[c]
Contaminated Drinking Water [b]	698 (59%)	537 (43%)	-15% (-20%,-11%)	0.74 (0.69,0.80)	0.06
Diarrhea	157 (3.1%)	134 (2.3%)	-0.8% (-1.8%,0.2%)	0.66 (0.47,0.93)	0.002
Diarrhea (<5 Years)	9 (2.7%)	5 (1.2%)	-1.5% (-3.5%,0.5%)	0.42 (0.12,1.44)	-

ICC: Intraclass Correlation Coefficient; CI: Confidence Interval
[a] Provided for comparison purposes: outcome is regressed on community intervention with no covariates; control-periods are the reference group; [b] Contaminated Drinking Water: ≥1 MPN *E.coli*/100ml in any sampled drinking water container; [c] ICC reported at the cluster level, ICC for diarrhea at the household level = 0.06

Supplemental Table 4: Effects of the Basic and Enhanced Program Variations

Analysis	N	Risk Difference (95% CI)	Risk Ratio (95% CI)
Water Quality			
Basic [a]	2436	-22% (-33%, -10%)	0.65 (0.54,0.78)
Enhanced [a]	2436	-17% (-24%, -10%)	0.69 (0.60,0.79)
Enhanced vs Basic [b]	-	5% (-6%, 16%)	1.06 (0.93,1.22)
Diarrhea			
Basic [a]	10854	-0.4% (-1.2%,0.4%)	0.74 (0.50,1.09)
Enhanced [a]	10854	0.1% (-1.2%,1.4%)	0.90 (0.51,1.57)
Enhanced vs Basic [b]	-	0.5% (-0.4%,1.5%)	1.22 (0.77,1.92)

CI: confidence interval
[a] Control periods are comparison group; [b] Basic Program clusters are the comparison group;

Supplemental Table 5: Association Between Diarrhea and Alternate Hygiene and Sanitation Pathways

Environmental Pathway	Risk Difference (95% CI)[a]	Risk Ratio (95% CI)[a]
Self-Reported Hand Washing Behaviors [b]		
Before preparing food	-1.1% (-2.2%,0.0%)	0.66 (0.43,1.00)
Before eating	-0.9% (-2.1%,0.3%)	0.73 (0.50,1.09)
After using toilet	-0.3% (-1.2%,0.5%)	0.89 (0.66,1.19)
After returning to the house	0.8% (-0.8%,2.4%)	1.30 (0.78,2.17)
After working with animals	-1.0% (-1.9%,-0.1%)	0.66 (0.44,1.01)
Observable Hygiene [c]		
Any type of soap present	-0.4% (-1.8%,1.1%)	0.88 (0.55,1.42)
Bar soap present	0.4% (-0.4%,1.3%)	1.18 (0.86,1.64)
Flies in kitchen	0.0% (0.0%,0.1%)	1.01 (1.01,1.01)
Garbage in house	1.0% (-0.8%,2.8%)	1.38 (0.83,2.29)
Garbage in yard	1.3% (0.0%,2.5%)	1.51 (1.06,2.15)
Garbage in compound	1.1% (0.0%,2.2%)	1.44 (1.06,1.96)
Feces in house	0.3% (-1.9%,2.5%)	1.11 (0.53,2.31)
Sanitation [b]		
Adequate sanitation [d]	0.0% (-0.8%,0.8%)	0.99 (0.73,1.33)
Practice open defecation	0.1% (-2.0%,2.2%)	1.04 (0.48,2.25)
Household Infrastructure [b]		
Concrete floors	-0.1% (-0.8%,0.7%)	0.98 (0.73,1.31)
Functioning refrigerator	-0.4% (-1.2%,0.4%)	0.82 (0.58,1.17)

CI: Confidence Interval

[a] Un-adjusted analyses, all exposures are binary; [b] Measured at baseline;
[c] Measured longitudinally; [d] Sealed pit-latrine, or flush system

SUPPLEMENTAL FIGURES

A stepped wedge, cluster-randomized trial of a household UV-disinfection and safe storage drinking water intervention in rural Baja California Sur, Mexico

Supplemental Figure 1: Percent of Households with Contaminated Drinking Water by Program Assignment and Step

HHs: Households

Supplemental Figure 2: 7-day of Prevalence of Diarrhea by Program Assignment and Step