

# A Case Study of Handwashing Behavior & Nudging

## Evaluation Report 2019



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# Introduction

It can be a huge challenge to guarantee access to water, sanitation and hygiene (WaSH) in every school for every child, especially during emergencies. Ensuring schools can reopen with adequate WaSH facilities, namely safe drinking water, hygiene, and improved sanitation facilities, is an essential part of recovery.

In September 2017 two earthquakes struck Mexico. One affected southern Mexico causing severe damages to the states of Chiapas and Oaxaca. The Cántaro Azul Foundation (FCA), in partnership with UNICEF Mexico, in their third phase of post-disaster recovery, focused on providing permanent WaSH improvements in 21 schools in the state of Chiapas. Improving hand washing behaviors among students was one of the focuses of this intervention.

Handwashing with soap at key moments can reduce the risk of diarrhea and enteric infections<sup>1,2,3</sup>. Gastrointestinal infections are a major cause of pupil absence and illness among school-aged children<sup>3,4,5</sup>. School-aged children tend to be particularly susceptible to such infections due to high levels of person-to-person contact, less-developed immune systems, and poor hand hygiene<sup>6</sup>. Improving hand hygiene behaviors in schools has proven to lead to fewer absences and reduction in illness<sup>3,6</sup>.

A range of handwashing behavioral change approaches have demonstrated success in field trials<sup>7,8,9,10,11</sup>. Traditional approaches have relied on educational messages, which typically focus on fecal-oral transmission and health risks associated with germs<sup>7</sup>. Other interventions have shifted to emotional and motivational drivers of handwashing, including disgust and social pressures<sup>7</sup>.

More recently, interventions have focused on “nudges”, or environmental cues that engage unconscious decision-making processes which alter people’s behavior in a predictable way, without forbidding any options or significantly changing their incentives<sup>7,8</sup>.

The Cántaro Azul Foundation (FCA) used a combination of hand hygiene behavior approaches including, nudges, infrastructural improvements, and a single day workshop that focused on educational messaging, to improve handwashing behaviors among school-aged children after toilet use.



Photo credit: Carlos Alberto Cordero Contreras

1 Ejemot, R.; Ehiri, J.; Meremikwu, M.; Critchley, J. Hand washing for preventing diarrhoea. *Cochrane Database Syst. Rev.* 2008  
 2 Walker CL, Black RE. Diarrhoea morbidity and mortality in older children, adolescents, and adults. *Epidemiol Infect* 2010  
 3 Willmott M, Nicholson A, Busse H, MacArthur GJ, Brookes S, Campbell R. Effectiveness of hand hygiene interventions in reducing illness absence among children in educational settings: a systematic review and meta-analysis. *Arch Dis Child* 2016  
 4 Trinius V, Garn JV, Chang HH, Freeman MC. The impact of a school-based water, sanitation, and hygiene program on absenteeism, diarrhea, and respiratory infection: a matched-control trial in Mali. *Am J Trop Med Hyg* 2016  
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 6 Simon AK, Hollander GA, McMichael A. Evolution of the immune system in humans from infancy to old age. *Proc Biol Sci R Soc* 1821: 2015

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 10 Rajaraman D, Varadharajan KS, Greenland K et al. Implementing effective hygiene promotion: lessons from the process evaluation of an intervention to promote handwashing with soap in rural India. *BMC Public Health* 2014  
 11 Contzen N, Meili IH, Mosler HJ. Changing handwashing behaviour in southern Ethiopia: a longitudinal study on infrastructural and commitment interventions. *Soc Sci Med*: 2015

# Approach

**Setting and selection:** Two lists of schools damaged by the 2017 earthquake were compiled independently by UNICEF and Cántaro Azul. The lists were compared and schools located in Chiapas were visited to conduct a needs survey and corroborate damages. Of the schools visited, 21 were chosen to intervene directly. Schools included ranged in size, level (e.g. pre-school, etc.), geographical region, and pre-existing condition of hygiene infrastructure. While a hygiene intervention was conducted, poor hygiene practices or dire hygiene needs were not a part of the selection criteria. Twelve schools (with 2,748 students) were randomly chosen from the 21 schools included in the intervention described in this case study.

**Intervention:** All schools received infrastructural improvements as part of the intervention. The infrastructural improvements were based on a needs assessment conducted at baseline, and as a result were not uniform. However, the goal was to ensure each school had a sufficient number of hand hygiene stations located within 5 meters of a sanitation facility equipped with running



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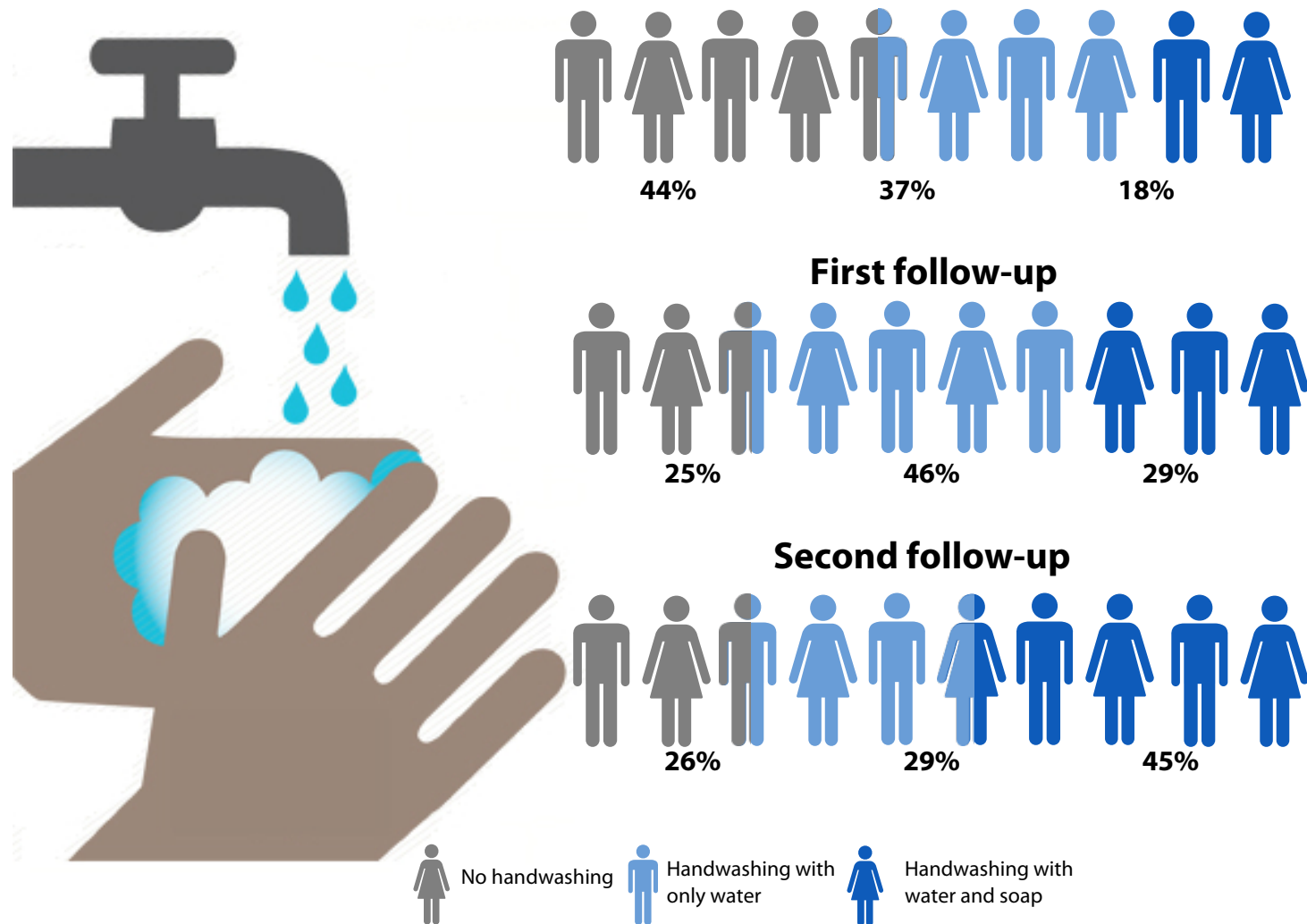
water. In addition to infrastructural improvements, each school received a system of nudges and a one-day workshop focused on health risks associated with germs and proper hand washing techniques. The nudges included painted footprints leading from the sanitation facilities to the hand hygiene stations and painted hand prints above the hand hygiene stations. Soap was provided halfway through each day of observation. FCA recognized that long-term soap provision would not be sustainable and wanted to observe schools under normal operating conditions and how soap provision impacted behaviors.

**Data collection:** The primary outcomes for this component of the intervention were a) no handwashing, b) handwashing with just water, and c) handwashing with soap and water after a toilet use event. Observations were conducted at baseline, 1 to 2 weeks following the intervention (Follow-up 1), and 8 to 10 weeks post-intervention (Follow-up 2). Trained staff were positioned at discreet locations on school grounds completing structured observations of handwashing practices after leaving the school sanitation facilities (assumed to be a toilet use event). Each observation period consisted of one school day, typically ranging from 9am to 2pm. The first half of the day, staff observed under normal operating conditions. The second half of the day, staff provided soap and placed it directly next to the hand hygiene stations. Considering children were involved, normal ethics procedures were followed including elaborating details of data collection and retrieving permission from the school director and parents.

**Analysis:** Structured direct observations were recorded into a standardized Excel spreadsheet for schools following each data collection period. Handwashing rates immediately following a toilet use event were calculated. In addition, availability of soap and the impact of availability of soap on handwashing rates was calculated to determine if this had any impact on hand hygiene behaviors.

## Impact: Handwashing

Figure 1: Student handwashing rates



Three rounds of data collection from twelve schools yielded 5,462 observations of children leaving school bathrooms. At baseline 18% of students (186 out of 1,031) were observed to wash both hands with soap after leaving the bathroom [see Figure 1]. One to two weeks after the intervention (infrastructural improvements, nudging, and 1-day educational workshop) during the first follow-up visit, handwashing with soap increased to 29% (206 out of 716). Finally, eight to ten weeks after the intervention, including post-winter break, during the second follow-up visit, hand washing with soap increased to 45% (443 out of 984). It should be noted the results presented in Figure 1 represent rates of handwashing under normal operating conditions (e.g. no additional soap was provided and the location of the soap was not altered).

Overall rates of handwashing with soap after toilet use events rose during the intervention, and continued to rise after the intervention had ended [see Figure 1]. The rate of handwashing with soap increased by 27% from baseline to the second follow-up visit. A final rate higher than published handwashing behavior change interventions in Kenya (30 – 35%) and was within range of interventions in Bangladesh (40% - 73%)<sup>7,12</sup>. The rise in rates of handwashing with soap was accompanied by a decline in rates of not washing hands after toileting events, 18% decline from baseline to second follow-up [see Figure 1].

Many children learn some of their most important hygiene skills at school, and for many this is where they are introduced to hygiene practices that may not be promoted or possible at home. However, good hygiene behavior and the effectiveness of hygiene promotion in schools are severely limited where water supply and access to consumables supplies, like soap, are inadequate or nonexistent. Our intervention increased access to functional hygiene stations (e.g. consistently running water) nearly 3.5-fold through rehabilitation and increasing water storage.

7 Dreibelbis et al. *Behavior change without behavior change communication: nudging handwashing among primary school*  
 12 Freeman MC, Clasen T, Dreibelbis R et al. The impact of a school-based water supply and treatment, hygiene, and sanitation programme on pupil diarrhoea: a cluster-randomized trial. *Epidemiol Infect* 2014



## SECTION THREE

Soap placed next to hygiene stations increased student rates of handwashing with soap at each visit from 11% to 37% points.

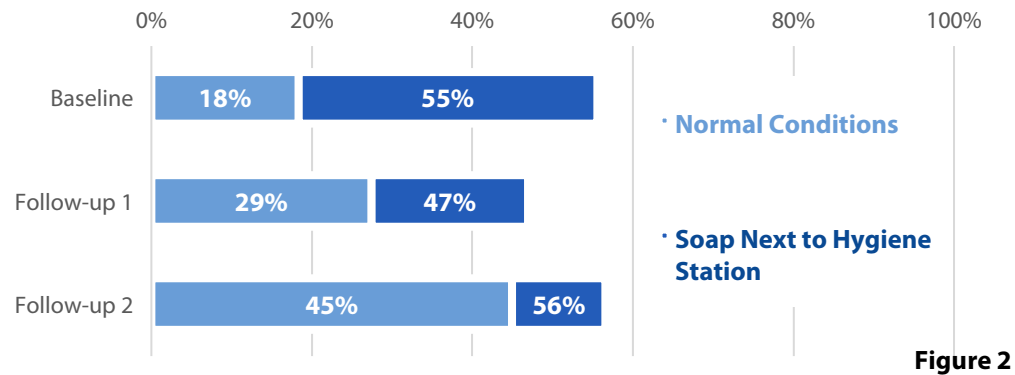


Figure 2

Ensuring that students had access to soap however was a particular challenge. Under normal operating conditions, soap was not consistently available in schools, and in the schools where it was available the location was variable (e.g. the janitor's office or in classrooms) and could discourage students from using soap for handwashing. When FCA provided soap, and placed it next to the hand hygiene stations, an increase in handwashing rates with soap was observed for all visits. At baseline, prior to any intervention, rates of handwashing with soap increased from 18% to 55% - a 37% increase.

Soap availability is correlated with handwashing rates with soap after toilet use events [see Figure 1 and Figure 3]. At baseline, soap was only available in 58% of schools (7 out of 12) and handwashing with soap was observed in 18% of students. Availability of soap steadily increased at each visit [see Figure 3]. During the first follow-up visit soap was available in 67% of schools (8 out of 12), and handwashing with soap was observed in 29% students. Finally, 86% of schools (10 out of 12) provided soap in the second follow-up visit, and handwashing with soap was observed in 45% of students. However, the increased rates of handwashing with soap may also be attributed to the increased awareness of the importance of using soap due to the intervention (i.e. we witnessed more students bringing soap from the classrooms to the bathrooms).

Soap availability in schools increased by 28% points during the project from baseline to the second follow-up.

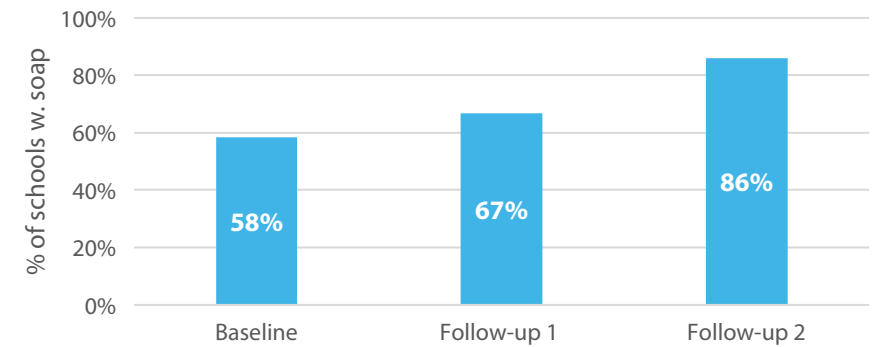


Figure 3

Soap was not available in all schools. After conversations with schools in the final follow-up visit, the FCA diagnostic team discovered that some schools made the conscious decision not to provide soap. When asked why, they reported experiencing theft and vandalism of the soap containers by the students. They stated they were unable to afford consistent replacement. It should be noted this was only reported by secondary schools.

Rates of handwashing with soap and rates of no handwashing after toilet use events under normal operating conditions were stratified by schools located in urban or rural settings and by school level (i.e. pre-school, primary, and secondary) [see Figure 4 and Figure 5]. For the purposes of this case study, "urban" was defined as localities containing more than 15,000 residents and "rural" was defined as localities with less than 15,000 residents (definition used by Mexico's National Institute of Statistics and Geography INEGI)<sup>13</sup>. Additionally, in Mexico, pre-school includes children from ages 4 to 6, primary school comprises grades 1 – 6 and ages 6 – 12 years old, and secondary school comprises grades 7 – 9 and ages 12 to 15<sup>14</sup>.

<sup>13</sup> Instituto Nacional de Estadística y Geografía (INEGI) <https://www.inegi.org.mx/eventos/2015/Poblacion/doc/p-WalterRangel.pdf>

<sup>14</sup> Secretaría de Educación Pública "Sitio De Secretaría De Educación Pública." <[gob.mx/SEP](http://gob.mx/SEP), [www.gob.mx/sep](http://www.gob.mx/sep)>

## SECTION THREE

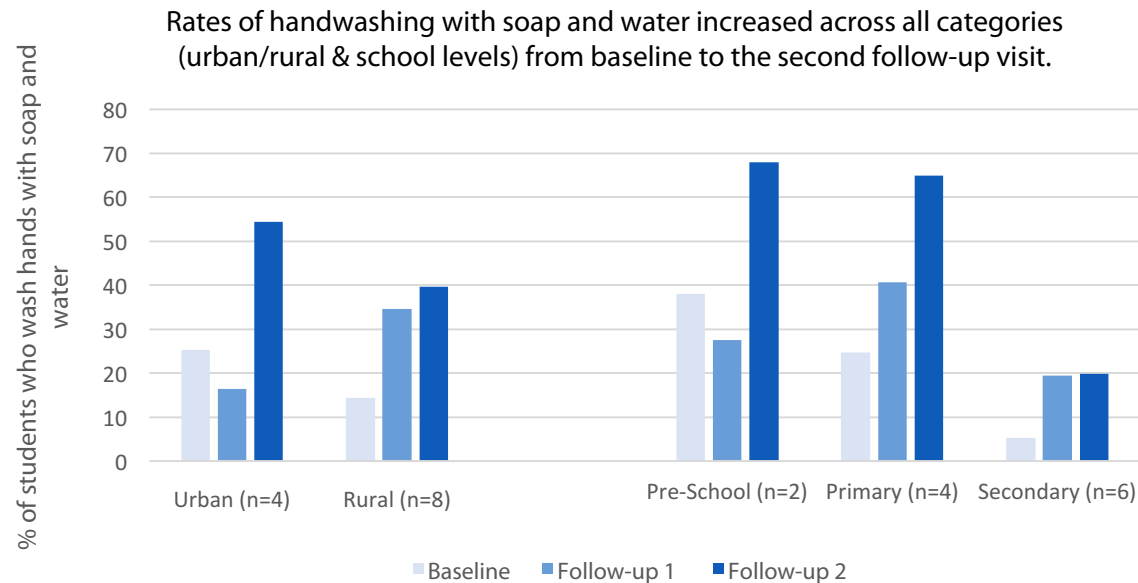


Figure 4

Generally, across all categories, handwashing rates with soap after toilet use events increased from baseline to the second follow-up visit. In urban schools, rates of handwashing with soap were higher at baseline and at the second follow-up visit compared to rural schools [see Figure 4]. However, perhaps of more interest is the low rate of handwashing with soap in secondary schools. We had assumed that we would see the lowest rates of handwashing with soap in pre-school students, but were surprised to find they had the highest rate (baseline = 38%; follow-up 2 = 68%) and secondary students had the lowest rate (baseline = 5%; follow-up 2 = 20%). From interviews with school staff it became apparent that the low rate of handwashing in secondary schools is due likely to low soap availability as mentioned previously. Soap availability may also be a factor the high rates of handwashing with soap in pre-schools, namely soap provision was mandatory in the pre-schools we observed. Additionally, it is worth noting the difference in sample sizes in school levels (pre-school = 2; secondary = 6) and also the overall small sample size of the case study (n = 12) and recognizing further evaluation is needed to make any meaningful conclusions.

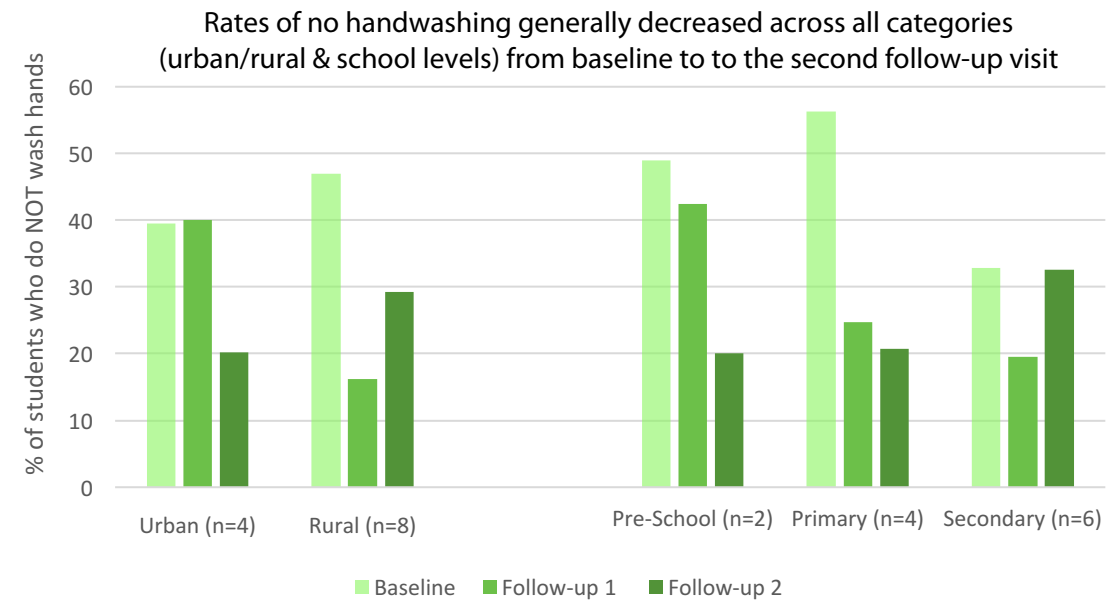


Figure 5

The school environment represents an important setting because many children's hygiene habits and behaviors are learned at school. There was a marked increase in positive hygiene behaviors during the course of the intervention. However, academic research suggests that one to two years after a school hygiene intervention, there is often a decline in positive behaviors<sup>9</sup>. As seen in this case study access to consumable supplies such as soap can have a large impact on positive behaviors. Working with schools on behavior change strategies that emphasize sustained replacement of important hygiene supplies could improve the sustainability of our hygiene intervention.

<sup>9</sup> Garn et al. *The Role of Adherence on the Impact of a School-Based Water, Sanitation, and Hygiene Intervention in Mali*

# Challenges & lessons learned

While the hand hygiene behavior change intervention discussed in this case study saw a successful increase in rates of handwashing with soap after toilet use events (18% to 45%), the intervention encountered some hurdles. Some key challenges and lessons learned include:

- **Nudges did not remain present in schools throughout the follow-up visits.** The diagnostic team found on the second follow-up visit that the nudges had been removed in many of the schools. The schools could not provide the exact date when the nudges were removed. As a result, the impact of the nudges on hand hygiene behaviors cannot be provided. Conversations with school staff revealed that while the purpose of the nudges were disclosed to the school director, they were not communicated to the school janitor and the janitor removed them.
- **Innovative and effective ways to ensure sustained soap provision may be a critical gap in the sustainability of hygiene interventions.** Unlike in many hand hygiene behavior change studies, our case study observed under normal operation conditions and additionally with soap provided. We saw a marked increase when soap was provided.
- **Observing incognito in behavioral change is difficult.** Unlike other studies, we did not construct hand hygiene stations that would make observation more convenient. As a result, sometimes our staff had to sit where students could see us observing them. This could have impacted results.
- **Comprehensive hand hygiene behavior change solutions should also focus on parents and school staff.** School staff and parents are in charge of finances and thus make the decision of whether or not to provide soap and to repair hand hygiene stations. We found some schools actively chose not to provide soap because of limited finances. While we saw an increase in handwashing rates with soap and soap availability, previous studies have

shown a drop off in provision of water and soap for student handwashing 1 to 2 years after an intervention<sup>9</sup>. Improving strategies for promoting soap provision and focusing on external influencing factors such as money may also have a large impact on good hand hygiene behaviors.

- **A limited behavior change intervention can still have impact.** Our behavior change intervention, while more involved than other reported interventions (e.g. in Bangladesh only nudges and infrastructural improvements were provided)<sup>7</sup>, our intervention was still fairly minimal – infrastructural improvements, a one-day educational workshop, and nudges – compared to traditional interventions with much more intensive educational components, and still saw a marked improvement in hand hygiene behaviors.



Photo credit: Carlos Alberto Cordero Contreras

<sup>7</sup> Dreibelbis et al. *Behavior change without behavior change communication: nudging handwashing among primary school*  
<sup>9</sup> Garn et al. *The Role of Adherence on the Impact of a School-Based Water, Sanitation, and Hygiene Intervention in Mali.*

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