Research Summary:
Roles & Responsibilities Pilot
January-November 2011

A SWASH+ Project report

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June 12, 2012

Executive Summary

Background: While school-based water, sanitation, and hygiene (WASH) programs have been shown to improve health and educational outcomes for school children, there are often sharp declines over time in functionality of water and sanitation infrastructure and the provision of key inputs, such as soap and treated drinking water. Lack of government oversight and limited support from teachers, pupils, and parents have been identified as causes of these declines.

Methods: We engaged 14 schools in a set of interventions expanding and clarifying the roles and responsibilities of parents, pupils, and teachers for monitoring school WASH facilities. Focus group discussions and in-depth interviews were held with school stakeholders over the course of two terms to explore learning from the implementation process.

Findings: Involving parents in monitoring was widely accepted among teachers and had some indication of effectiveness in identifying and resolving problems like repair needs and lack of supplies; however, there was inconsistent participation among parents. Involving pupils in monitoring reduced self-reported teacher workload and both pupils and teachers reported that it improved cleanliness of latrines. Efforts to provide teachers with operational tools to integrate monitoring WASH facilities and activities into their daily duties were well received, but they did not appear to have any noticeable effect on schools' WASH programs.

Conclusion: Greater involvement of parents and students in monitoring school WASH programs was endorsed by both teachers and the parent community, and there were indications that the interventions could produce improvements in cleanliness of latrines and availability of supplies, as well as increased awareness of needed repairs. These interventions should be more rigorously tested at a larger scale and additional research is needed to determine how to ensure consistent participation of parents and pupils over time.

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List of Acronyms

ECD	Early child development
FPE	Free primary education
SMC	School management committee
SWASH+	Sustaining and scaling school water, sanitation and hygiene plus community impact
TOD	Teacher on duty
WASH	Water, sanitation, and hygiene

Background

Providing primary school students with improved water, sanitation, and hygiene (WASH) services has led to measurable improvements in both health and educational outcomes. Studies in developing countries have shown that school-based water treatment and hygiene promotion programs are associated with a significant reduction in absenteeism among primary school students, particularly girls (Bowen *et al.* 2007; Blanton *et al.* 2010; Freeman *et al.* 2011). School-based water treatment, latrine provision, and handwashing programs have also demonstrated decreases in diarrheal disease and helminth reinfection rates among school children (Migele *et al.* 2007; Freeman *et al.* 2012).

Unfortunately, interventions aiming to provide schools with clean drinking water, latrines, and handwashing facilities face serious challenges to sustainability. Evaluations of WASH interventions have revealed sharp declines over time in the functionality of water and sanitation infrastructure and the provision of key inputs, such as soap and treated drinking water (Saboori *et al*. 2011, Hoque 1996). Saboori *et al.* (2011) investigated the barriers to sustaining school WASH programs in Western Kenya and identified a number of potential reasons for these declines, including lack of accountability oversight from the government and limited engagement among pupils, teachers, and parents.

In the absence of governmental oversight, a variety of approaches have been tried to support a bottom-up approach. A growing body of research has looked into how delivery of public services can be improved through community-led accountability systems (Bruns, Filmer, and Patrinos 2011). In healthcare settings, evaluations of community accountability interventions such as report cards and community committees have shown that improved or increased community involvement can have a positive effect on health outcomes and provision of resources (Bjorkman and Svensson 2009, Loeweson, Rusike, and Zulu 2004, Iwami and Petchey 2002).

In educational settings, training parent groups to evaluate school performance has resulted in improved pupil test scores (Duflo, Papas, and Kramer 2009) and providing teachers with operational tools has also improved pupil test scores as well as teacher performance (Nguyen and Lassible 2008). There is a paucity of information on whether accountability interventions at the school level can impact the provision of non-academic services such as school WASH.

Study Goals

The objective for this study was to identify and pilot alternative models of enhanced roles and responsibilities for monitoring school WASH facilities that can improve accountability for maintaining those facilities. This includes a) determining how alternative models for improving roles and responsibilities can be most effectively implemented in schools, and b) identifying barriers to the sustained efficacy of these models. This study was formative in nature and aimed to explore the feasibility, design, and implementation process of the interventions in order to identify the most promising strategies that can be implemented at a broader scale or included in larger efficacy trials.

While gaps in government oversight have been identified as one of the barriers to sustainability of school WASH services (Saboori *at el*. 2011), this study specifically targeted roles and responsibilities at the school and community levels. These roles and responsibilities include activities (such as making repairs or cleaning), monitoring those activities, and communicating information about problems and solutions both up and downstream. Our aim was to enhance these three elements among actors at the school level in order to approach the ideal system as depicted in Figure 1.

Our study is grounded within programs and systems that currently exist in the Kenya public education sector and utilize both intervention strategies and evaluation approaches that are feasible for the Ministry of Education to support at scale. In addition, the design of the interventions incorporated factors that previous research has identified as impacting the efficacy of community-led accountability programs, including democratic and transparent selection of community members, clearly established mandates, decision-making power, integration into existing community structures, and adequate training and supervision (Molyneux *et al*. 2012).
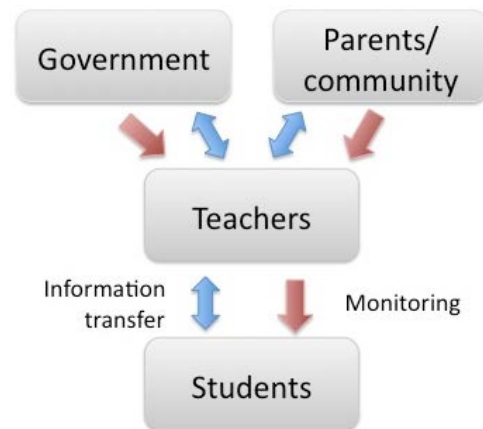

Figure 1: Ideal system of monitoring and communication for school WASH

Methods

Study design

This study was conducted among public primary schools in Nyanza Province, Western Kenya as part of the Sustaining and Scaling School Water, Sanitation and Hygiene Plus Community Impact (SWASH+) applied research project. The study involved two phases: formative research on existing roles and accountability systems in schools from January to March 2011, and a pilot from May to November 2011.

Based on findings from formative interviews as well as information from literature on accountability in health and schools, we identified four potential school- and community-level monitoring interventions that could enhance the maintenance of WASH services in schools. These are described in Table 1.

In May 2011, SWASH+ engaged twelve schools in a participatory learning process to 1) identify the challenges the schools face in maintaining school WASH facilities through taking parents and teachers on a "walkthrough" of facilities, and 2) help the schools select and implement a set of roles & responsibilities interventions to mitigate those challenges.

The research team worked with each school to actively implement and adapt their chosen interventions over the course of Term 2 (May-July 2011). After modifying interventions based on findings from Term 2, schools were left to continue their selected programs without further support or guidance in Term 3 (Sept-Nov 2011).

Participant selection

Fourteen schools were selected to participate in the pilot. These include six schools each from Nyando and Rachuonyo districts[1] that had previously participated in SWASH+ learning initiatives and two schools from Nyando district without prior involvement in SWASH+ that were recruited for participation in the community monitoring intervention. Schools were purposively selected that a) were not involved in recent or concurrent SWASH+ research, b) had not received in-kind financial donations in recent months, c) were physically accessible for data collection teams, and d) had been cooperative with participating in interviews during previous SWASH+ learning activities.

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[1] Since initial SWASH+ implementation, Rachuonyo district has been divided into North and South Rachuonyo, and Nyando district has been divided into Kisumu East, Muhoroni, and Nyando.

Table 1: Roles & responsibilities interventions

Intervention	Description
Parent/Community Engagement	
Health representatives	• One to six parent volunteers are elected to visit schools once a week to monitor WASH facilities, activities, and supply levels using a structured monitoring tool. • Health representatives relay WASH information to the School Management Committee (SMC) and parent body and advocate for prioritizing WASH needs in budgeting.
Community monitoring competition	• Schools in one administrative cluster enter a competition where a committee of parents evaluates how well the schools maintain their WASH facilities. • Committees use a structured monitoring tool that includes evaluation of behavior change education, status of WASH facilities, and systems for monitoring, budgeting for, and repairing WASH facilities. • Schools with the best overall WASH scores and that improve the most over the course of the competition are awarded WASH supplies, equal in value to what schools could provide if every pupil contributed 5 shillings.
Pupil Engagement	
Pupil monitoring	• Using daily structured guides, pupils record latrine cleanliness, provision of water, water treatment, and soap availability. • Once a week pupils record whether any latrines, water storage vessels, or water sources are in need of repairs. • Guides are shared with the teacher on duty (TOD), health patron, and head teacher to raise awareness of needed repairs, supplies, or other recurrent issues.
Teacher Engagement	
Teacher on duty (TOD) checklist and reporting logbook	• TODs are given a checklist of activities to complete each day and a logbook to record any issues they encountered during the week • The checklist lists all required TOD duties, including those related to WASH (i.e. overseeing latrine cleaning and cleaning, treating, and refilling water vessels). Checklists are for personal referral only and do not have to be shared. • The logbooks include space to record any issues encountered, including both general and WASH-specific problems, as well as actions taken to address those issues. Logs are to be shared between TODs and between the TOD and head teacher.

Data collection

Qualitative data was collected at five points throughout the extended learning period. Data included focus group discussions and in-depth interviews held at the schools with teachers, parents, and students. Interview guides were iteratively adapted throughout rounds to explore emerging themes. Interviews were conducted in Dholuo and English by a team of trained qualitative researchers. Interviews were recorded, translated, and transcribed verbatim.

Observational data regarding WASH facilities was collected at baseline and at the end of each school term. This data included latrine quality, water availability, soap availability, and presence of cleaning, handwashing, and water treatment supplies. Drinking water was also tested for presence of residual chlorine using the orthotolidine (OTO) method (www.aquachem.com). Data collection was performed at the beginning of scheduled school visits.

Data analysis

Qualitative transcripts and notes were reviewed and responses organized according to topic. Responses were compared across schools to identify trends, themes, and variations in how programs were implemented, how they were received by different actors, what challenges to sustained implementation emerged, and which practices seemed to be most successful in both enabling implementation and generating improvement in the school's WASH program.

Results from facility observations were used to determine the percentage of schools that met specific school-WASH facility benchmarks at each of three data collection rounds (Baseline, Term 1, and Term 2). Schools were able to select the intervention components they wanted to implement, resulting in a unique combination of activities and inputs at each participation school. Because of this, we are unable to directly attribute outcome measures to any specific intervention component and report only aggregate scores for all schools included in the pilot.

Results

Current roles and monitoring systems

Formative interviews with stakeholders and observation of the School Management Committee (SMC) meetings provided information on the existing system for monitoring and maintaining school WASH, as well as revealing both gaps in the system and opportunities for enhancement.

The existing system for managing WASH facilities in most schools relies on students to conduct day-to-day WASH activities such as cleaning latrines, collecting and treating water, and monitoring whether latrines become dirty or water or soap run out during the day. The teacher on duty (TOD) for the week supervises these activities and monitors facility cleanliness along with the health patron, a teacher specifically tasked with managing school WASH. The head teacher provides more general oversight and reports any financial needs (such as purchasing supplies or making repairs) to the SMC, which is responsible for budgeting government funding. Outside of the SMC, parents typically do not have any roles in school WASH aside from occasionally supplying their children with water or contributing funds for soap, water treatment, or other supplies.

In practice, there are numerous gaps in current monitoring systems that can result in a failure to maintain adequate WASH facilities. Current systems also present opportunities for improvement. Table 2 provides a summary of these gaps and opportunities.

Table 2: Gaps and opportunities for monitoring and maintenance of school WASH facilities

Actor	Gap	Opportunity
Pupils	- Pupils may not report conditions to teachers - Lack of supplies for pupils to treat water, effectively and safely clean latrines	- Pupils are familiar with current state of WASH facilities through daily usage - Health club structure could allow trained students to take a more active role in monitoring facilities and fellow pupils
Teachers	- Limited communication / information transfer of WASH activities between Health Patron and other teachers - Teachers do not always check WASH facilities - Supervisors do not always ensure WASH duties are carried out, and there are often no standard procedures for doing so	- Existing Teacher on Duty (TOD) structure, where one teacher is in charge of school management and monitoring pupil activities each week, provides opportunity for formalizing WASH duties
Parents	- Most parents unaware of school WASH conditions - Parents not comfortable visiting schools without invitation - Parents may have limited WASH information generally	- Despite the Free Primary Education (FPE) system, parents regularly make small financial contributions - Teachers expressed willingness to explore formal parent monitoring system, as long as parents not evaluating teacher performance
School management	- WASH is a low priority for SMC financial decisions - Limited allocation of funds for WASH supplies and repairs	- Parents often trust SMCs to inform them of issues that need attention - One school had a parent on the SMC dedicated to monitoring WASH facilities

Health representatives

Implementation

Nine schools implemented a health representative program. A majority of schools called a parents meeting and nominated and elected one or more health representatives. The elected parents from six of the schools already had other roles, including being SMC members, ECD (informal pre-school) teachers, parents in charge of the school's water point, and parents who had received WASH training from other NGOs. These parents were chosen because they were perceived to be more reliable, better trained, or less likely to demand payment than parents who did not already have a role in the school. Several schools opted to have one male and one female health representative, as they did not want to create a gendered division of responsibilities.

Health representatives were comfortable looking at facilities, reporting problems to the health patron or head teacher, and presenting WASH issues to both the SMC and parent bodies. Many health representatives were also tasked with raising money from parents directly. Some health representatives assumed additional roles as community health educators and many requested additional training on WASH health education.

Effect on school WASH

At six of the schools, participants said that the health representatives were directly responsible for helping the school get supplies such as soap, brooms, and disinfectant, as well as organizing plans for repairs, largely though bringing up issues at SMC and parent meetings. However, participants in the other three schools reported that the health representative created limited change in the status of WASH facilities or supplies.

> *In the past, we would have a [SMC] meeting and fail to discuss issues to do with water…but nowadays there is a change because any meeting that we have [the health representative] comes with her agenda and problems she finds on her side.*
>
> – SMC Member

Opportunities

Many parents and teachers participating in the initial walkthrough were strongly supportive of the idea of implementing a health representative because they felt that would improve the SMC's willingness to budget for WASH needs. Initially there was some concern that no parents would be willing to take up the health representative responsibilities, but all nine schools were able to recruit parents. Concerns for children's health and the cost effectiveness of disease prevention were motivating factors for many parent volunteers, as two parents explained,

> *I preferred leaving my work and coming to school to go around seeing if the latrines were well-cleaned or not than using two hundred shillings for treating the child.*

> *There has been a lot of cholera outbreaks in our community. So we thought that if we help our kids in school then they might not get cholera.*

Parents' motivation for continuing in the role involved the same drivers, as well as a sense of duty and pride in seeing the effect of their work.

Despite some initial reservations that teachers may feel threatened about parents coming to monitor the school, teachers in the interventions schools were almost universally supportive of the health representative program. Teachers called it a "*relief*" that parents were volunteering to monitor and one said "*they are assisting me in doing my work.*"

<u>Challenges</u>
Although many schools envisioned that a health representative could effectively advocate for increased budgets for WASH, few health representatives participated in the FPE budgeting process or even had a clear understanding of how the process worked. This was in part to due to the fact that schools were too busy preparing for annual academic exams during Term 3 to organize FPE budgeting meetings. One health representative pointed to the fact that the head teacher is responsible for calling SMC and parents' meetings, and if the head teacher does not call a meeting the health representative does not have the agency to do so.

Consistent participation of parents was also a challenge. Few parents aside from those close to or already working at the school visited with any regularity, even when there were multiple parents sharing the health representative position. According to the parents and teachers interviewed, low participation is linked to financial hardship. Many families in this area rely on subsistence agriculture and cannot afford to miss work to come to the school. One health representative also described a possible cultural disincentive for volunteering:

> *The Luo say, 'tich ber michulie' (work is only good when there is salary) …*
> *There are times I would want to go and weed for someone for their land and*
> *I also have to come to the school to monitor, and I will think that the*
> *monitoring in the school is not helping me let me go to where I am paid.*

Finally, some health representatives may have been discouraged by a lack of recognition for their work. One health representative who was considering leaving the position said, *"What upsets me so much is when I am doing the work and no one is appreciating what I do."*

Community monitoring competition
<u>Implementation</u>
The community monitoring competition took place among three schools and involved two monitoring visits to each of the schools, at the beginning and end of a term. Participating schools appointed two parents each to the community monitoring committee, and these parents elected a chairperson. After the first round of monitoring, committee members found the monitoring form easy to use because it provided clear instructions for what feedback to leave. The chairperson was unable to recruit parents for the second round of visits to schools and completed those assessments alone.

<u>Effect on school WASH</u>
From review of the monitoring tools it appeared that all three schools made some improvements to their WASH programs between the two monitoring visits, including closing unsafe latrines, installing handwashing stations, buying water treatment products, and setting up duty rotations for latrine cleaning and water treatment.

<u>Opportunities</u>
Teachers reported that they were already aware of the problems that were identified through the monitoring process, such as such as poor latrine conditions and lack of drinking water containers, but that the monitoring experience motivated them to act. As a head teacher said, *"…because you came along, it gave us the encouragement to try*." One of the monitoring committee members felt that the dialogue she created with teachers influenced action:

> *We sat with them [teachers] when we got the teachings here … we talked to*
> *them so that they hear what is going on. That is why the work that was done*
> *took place.*

As with the health representative program, teachers were highly supportive of parents' involvement in monitoring the status of WASH facilities. According to one head teacher,

> *…parents learn maybe certain things that they did not know from the program and they can also start practicing this at home. So from school it can spread to the community, and we will say that the school has improved what was not going well in the community."*

Challenges
Unfortunately, teachers and monitoring committee members all found the committee chairperson, a self-described 'community activist,' to be overbearing. Teachers were supportive of the process conceptually, but felt that "*The chairman needs to be educated a bit.*" Lack of parent participation in the final monitoring round was likely also due to personality conflicts as well as the difficulty of visiting multiple schools, although we were not able to reach those parents for comment.

Pupil monitoring

Implementation
Eight schools chose to implement pupil monitoring. In most schools, health patrons only trained health club prefects on how to fill in the monitoring forms. This helped health patrons minimize the time they had to invest in the program and health patrons felt that it was appropriate because prefects "*are the ones in charge.*" Prefects typically worked in a group with other pupils when inspecting latrines, so that the prefect filled the form while other pupils checked on conditions and reported back.

In one school with a large health club, the health patron set up a duty roster for each day of the week; pupils at that school would come to request the forms if the health patron did not hand them out in the morning, in contrast to other schools where pupils would only fill the forms when they were provided by a teacher.

Teachers participated in the program to varying degrees. In most schools health patrons reviewed the monitoring forms either daily or weekly and checked WASH facilities for accuracy of information a few times a week. TODs only reviewed the forms in two schools and head teachers rarely saw the forms, although pupils would often report dirty latrines to TODs or head teachers verbally.

Effect on school WASH
Teachers reported that pupil monitoring increased how often and quickly teachers were informed of dirty latrines. Some teachers said that pupils in charge of monitoring are more likely to give verbal reports when they find dirty latrines because the pupil monitoring program made it clear that it is their responsibility. Teachers also reported that latrines are cleaner than before because the knowledge that they are being monitored each day has motivated pupils to do a better job of cleaning latrines and incentivizes the pupils to be more careful while using them.

> *When the pupils are undertaking these duties [e.g. washing latrines, filling water vessels, treating water] they are aware there is somebody who is going to follow up. So when they go to do it they do it thoroughly.*
>
> – Head Teacher

Opportunities
In general, health club members had a positive attitude towards pupil monitoring. When discussing how other pupils perceive them, the pupils in charge of monitoring often spoke of

respect. Some health club members felt that this respect was amplified when pupils could see positive changes in the status of WASH facilities. According to one health club member,

> They respect us because nowadays things are moving on well…vessels are
> filled with water, latrines are cleaned, things move smoothly… They respect
> us because we have made improvement at the school.

Health patrons strongly supported the pupil monitoring program. Many of the health patrons found that pupil monitoring increased their workload overall since they now had to address the problems that pupils identified, but several teachers said that pupil monitoring decreased the amount of time they spent physically checking WASH facilities. One non-patron teacher said that pupil monitoring increased his engagement in solving WASH issues:

> What used to happen, you know at first, the issue of the vessels, we were just
> leaving to the health patron. So when I [review] the monitoring sheet and I
> find that there are some vessels that are leaking, then you know I must
> consult or ask him what should be done.

Challenges
Outside of improved latrine cleanliness, teachers reported few changes brought about by pupil monitoring. The head teacher or health patron only became aware of a repair problem or lack of supplies through pupils in a few instances; teachers were previously aware from personally inspecting the facilities or through reports from other teachers or health representatives.

For those schools that chose to adopt both pupil monitoring and health representatives, we had designed the forms so that pupils were responsible for reporting on structural conditions and health representatives were to review the forms only rather than assessing conditions themselves, in order to decrease their workload. However, most parents did not ever look at the pupil monitoring forms and relied on their own observation of structural conditions.

Health club members said they were discouraged by reporting the same repairs needs every week without seeing any change. In addition, at one of the schools where few improvements had been made to the school's WASH facilities, pupils reported that the monitoring program had been called "*silly work.*"

TOD checklist and reporting logbook
Implementation
The TOD checklist and logbook were implemented in three schools. Health patrons informed teachers about the program in a staff meeting in one school and on a week-by-week basis in the other two schools. Due to initial concerns among teachers that the checklist was a policing tool, these were not designed to be shared with other teachers but were for use as a personal reminder only. The logbooks, however, were intended to increase communication about problems that TODs required help with or wanted to document, such as damage to a facility or disciplinary cases. Most TODs reported that they shared the logbooks with the health patron or incoming TODs, although none shared the logbook directly with the head teacher.

Effect on school WASH
None of the teachers we spoke with could cite a specific instance where the checklist reminded them of an activity that they would have otherwise forgotten to carry out. While the logbooks were used consistently, no WASH-related issues were recorded during the study period.

<u>Opportunities</u>
Teachers reported that the guides were helpful in providing something to refer to when carrying out their duties and one teacher said it was good to have "*a code of ethics following a certain laid down procedure*."

The logbooks also received a positive response; many teachers talked about the benefit of documenting what occurs at the school so that there is proof in case an issue is disputed or so the teachers can be held accountable.

<u>Challenges</u>
Most teachers reported that they had been filling in the checklist at the end of the day or even the end of the week and were not using it as a reminder throughout the day. Reasons for this included that the activities on the checklist were "*routine*," that filling in the checklist was "*tiresome,*" and that TODs are too busy to remember to use the checklist every day. Of the three schools, two had stopped using the TOD guides by the end of the study period.

Facility results

Facility observation data was used to develop six key benchmarks of school WASH conditions:

1. Drinking water available to students upon researchers' arrival at the school.
2. Handwashing water available to students upon researchers' arrival at the school.
3. Soap for handwashing available to students upon researchers' arrival at the school.
4. At least one in-use drinking water container with detectable chlorine residual.
5. Clean latrines, defined as lack of dirt, feces, urine, or debris on floors, lack of dirt or feces on walls, and lack of cobwebs.
6. Any school WASH supplies available, including water treatment products, soap for handwashing, or cleaning materials such as soap, bleach, brooms, or buckets.

All schools provided water for both drinking and handwashing at each data collection round. The percentage of schools that met each of the remaining four benchmarks is presented in Figure 2. All indicators showed a positive trend during the pilot period, aside from presence of handwashing soap upon arrival, which increased in Term 2 but returned to baseline levels by Term 3.
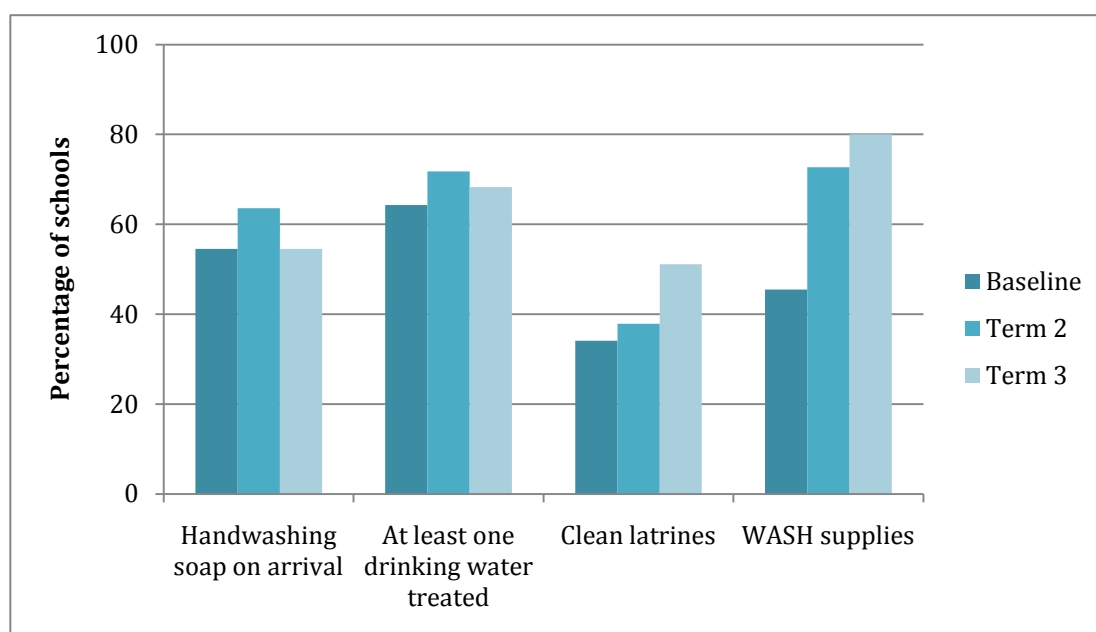
Figure 2: Percentage of schools meeting key WASH benchmarks

Discussion

Involving parents in monitoring through the health representative program was widely accepted among parents and teachers and had some indication of effectiveness in identifying and resolving problems like repair needs and lack of supplies. However, despite our efforts to incorporate lesson learned from the literature on the factors that influence the efficacy of community-based accountability systems, there were several limitations to the success of the intervention. First, there was inconsistent participation among parents. Achieving active participation by parent volunteers seemed linked to choosing parents who are personally motivated and have enough time and income to consistently visit the school, or who have other activities that bring them to the school. Continued parent participation would require sufficient incentives such as training, certificates, acknowledgement, or the reward of seeing improvement as a result of their efforts rather than feeling like they are sacrificing their time for no purpose.

This last point is closely tied with another limitation: there was insufficient funding for schools to address the problems that the health representatives identified. Some schools were able to use FPE funds for WASH, suggesting that allocating money for WASH is possible for schools under current government budgets. However, SWASH+ has demonstrated that schools do lack sufficient funding to maintain clean and well-functioning WASH facilities (Gallo *et al.* 2010). A true test of the impact of parental monitoring would require added financial inputs so that schools have sufficient resources to purchase supplies and make small repairs without having to rely on donations from impoverished parents.

Teachers were more critical of the community monitoring intervention than they were of the health representative program. This appeared to be largely due to the overzealous nature of the monitoring committee chair. The shorter timeframe and lack of familiarity between the parent "monitor" and teachers likely also played a factor, as there was less of a chance for parents and teachers to develop a dialogue about how to overcome challenges. Parental participation was also not sustained throughout the pilot. While we were not able to reach parents for interviews to determine why, the barriers are likely similar to those reported by health representatives.

Feedback on the pupil monitoring intervention indicated that having a structured form to follow helps keep pupils on task and reduces workload of health patrons and TODs to spot-checking. Pupils were most effective at monitoring daily latrine conditions and provision of soap and water; repair problems took longer to address since they required external inputs, and length of time before problems were resolved led to reporting fatigue. In addition, parents and teachers did not seem to trust pupil reports and instead checked for repair needs themselves.

Efforts to provide teachers with operational tools to integrate monitoring WASH facilities and activities into their daily duties were well received, but they did not have any noticeable effect on schools' WASH programs. In fact, two out of three schools discontinued the daily checklists over the course of the study period. Teachers in schools are already over-burdened and providing them with operational tools may have resulted in additional responsibilities with little obvious benefit. Logbooks for teachers to record issues were used more consistently and did appear to increase communication between teachers around school issues. This increased communication would likely include WASH-related issues, although none were reported during the study period.

While this pilot study was not sufficiently powered to detect significance, facility data collected at baseline and at the end of each school term showed positive trends in provision of key WASH services. This corroborates participant observations and suggests that increased parent, pupil, and teacher engagement can enhance the delivery of a school-based WASH program.

Recommendations

This study was intended to identify and explore models for increasing accountability in maintenance of school WASH programs through clarifying and expanding the responsibilities of parents, pupils, and teachers. We identified several programs that could be tested in future trials to improve WASH programs at a national scale.

1. **Parental engagement through health representatives.** Enlisting parent volunteers to monitor school WASH conditions and serve as a liaison between the school and parents was widely endorsed by both parents and teachers, and there were indications that the program increased school and parent responsiveness to WASH needs. Successful implementation of the program requires a participatory selection process with community involvement, clear mandates and tools, and support from school management. Selecting volunteers with sufficient motivation is critical; findings suggest that selection criteria should include parents who already have a role at school, live nearby, or have a minimal degree of leisure time. Health representatives may be more effective in their roles if they received training on the FPE process and budgeting. Without sufficient increases in budgets for WASH, however, this program will likely show little long-term improvement in WASH services and fail to retain motivated parent volunteers.

2. **Student engagement through pupil monitoring.** Our study suggests that training pupils to fill in daily monitoring sheets of latrine conditions and the provision of treated drinking water and soap and water for handwashing can improve awareness of WASH condition among teachers, lead to greater cleanliness of latrine facilities, and reduce teacher workloads. Training a small group of pupils on overseeing the process and enlisting other pupils to help seemed to be the most effective strategy. Findings suggests that pupil participation can be sustained through enabling a sense of pride by ensuring their efforts are met with improvements in the school's WASH program, although additional research could help determine whether pupils would need additional incentives to continue monitoring in the long term.

3. **Operational tools for teachers.** Implementation of a formalized reporting system through logbooks showed promise for increasing communication between teachers to solve school problems, although there was no opportunity to see an effect on WASH in this study. Although daily checklists for teachers were not well received, the underlying concept of formalizing TOD responsibilities and providing a reference did resonate with some teachers. Further research could show whether formally establishing TOD procedures (without requiring a checklist) could increase the degree to which teachers carried out tasks related to WASH, as well as whether written reporting systems impact schools' responsiveness to WASH concerns.

4. **Parental engagement through a community monitoring competition.** From this study there did not appear to be any added benefit to parental engagement that incorporated competition between schools. However, the efficacy of report cards in improving healthcare delivery (Bjorkman and Svensson 2009) suggests that some form of community monitoring program linked with public reporting merits further exploration. Any further studies should include more careful selection of parents to ensure they have sufficient motivation and ability to participate in the program over time, as well as thorough training to ensure they maintain a good relationship with teachers.

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