

# SCHOOL FACILITIES ASSESSMENT: BASELINE TO END OF YEAR 2 COMPARISONS

SWASH+: Sustaining and Scaling School Water, Sanitation, and Hygiene Plus Community Impacts

## Summary

**Background:** Data from a baseline and two follow-up assessments are presented to examine trends in school WASH conditions over time following implementation of the SWASH+ project.

**Findings:** Schools in all intervention groups are continuing to regularly provide drinking water; however, present measurable water chlorination was lower than expected in program schools (around 40%), as was reported provision of soap. School latrine ratios and conditions have improved, although improvements are also seen in control schools.

**Recommendations:** Continued engagement with schools is needed to understand barriers to sustained water treatment and soap provision. Additional research to identify effective latrine maintenance regimes is also necessary.

EMORY UNIVERSITY CENTER FOR GLOBAL SAFE WATER

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## Table of Contents

<b>What Did We Want to Learn – Background .....</b>	<b>2</b>
<b>Approach to Answering the Questions – Methods.....</b>	<b>2</b>
<b>What Did We Learn? – Results.....</b>	<b>2</b>
<i>Are schools providing sustained access to water for drinking and handwashing?.....</i>	<i>3</i>
<i>Are schools providing sustained treatment of water and soap?.....</i>	<i>4</i>
<i>Are schools carrying out the necessary preconditions for sustaining, such as purchasing water treatment products and soap?.....</i>	<i>5</i>
<i>Are sanitation conditions continuing to improve in intervention schools?.....</i>	<i>6</i>
<b>Implications and Next Steps.....</b>	<b>9</b>
<b>Appendix: School WASH Trend Data Tables.....</b>	<b>10</b>
<i>Table 1. Water Sources.....</i>	<i>10</i>
<i>Table 2. Rainwater Tanks .....</i>	<i>11</i>
<i>Table 3. Drinking Water Provision.....</i>	<i>11</i>
<i>Table 4. Drinking Water Treatment.....</i>	<i>12</i>
<i>Table 5. Sustained Water Treatment.....</i>	<i>13</i>
<i>Table 6. Handwashing.....</i>	<i>14</i>
<i>Table 7. Sanitation Access.....</i>	<i>15</i>
<i>Table 8. Sanitation Conditions.....</i>	<i>16</i>

## What Did We Want to Learn – Background

In September to November 2008, Emory University and Great Lakes University of Kisumu conducted a facilities assessment of SWASH+ schools in Nyanza Province, Kenya. The purpose of the assessment was to determine the trends in conditions of WASH (water, sanitation, and hygiene) facilities in intervention and control schools. Preliminary data from this assessment examining regional differences in water treatment and indications of sustainability were presented in November 2008.

The purpose of this report is to examine trends from baseline to the end of year 2 (November 2008). Specifically, it addresses the following questions:

- Are schools providing sustained access to water for drinking and handwashing?
- Are schools providing sustained treatment of water and soap?
- Are schools carrying out the necessary preconditions for sustaining, such as purchasing water treatment products and soap?
- Are sanitation conditions continuing to improve in intervention schools?

## Approach to Answering the Questions – Methods

The data in this report reflect school WASH conditions assessed at baseline from January- March 2007 compared to follow-up assessments in May- August 2008 (announced visit) and again from September- November 2008 (unannounced visit). Trained enumerators completed a detailed facility survey at each school included in the applied research phase of the SWASH+ project. The survey included questions to the head teacher and an observation component. Information was collected regarding school water sources, school water storage and water treatment practices, previous NGO involvement with the school, and school sanitation and handwashing facilities. Data were also collected on school enrollment and school absenteeism.

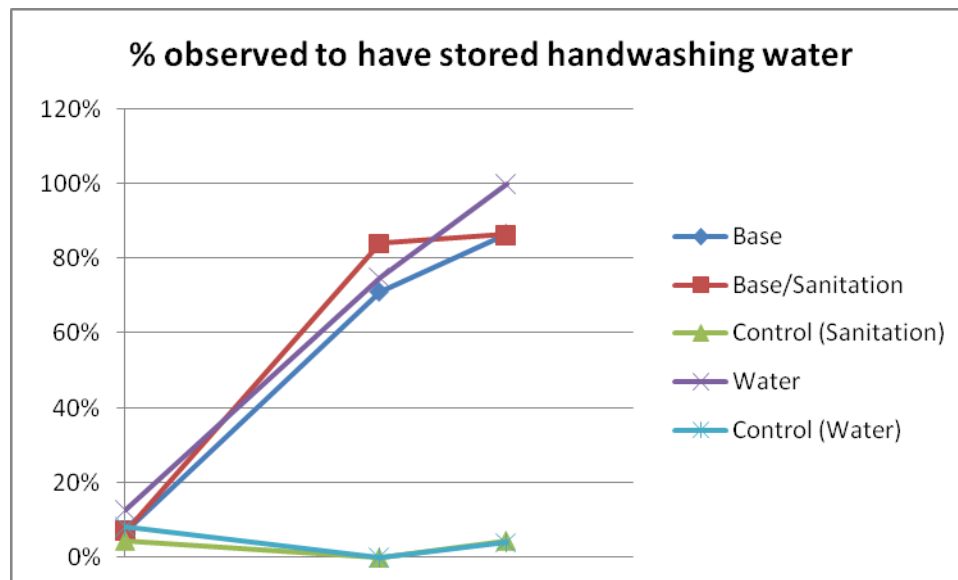
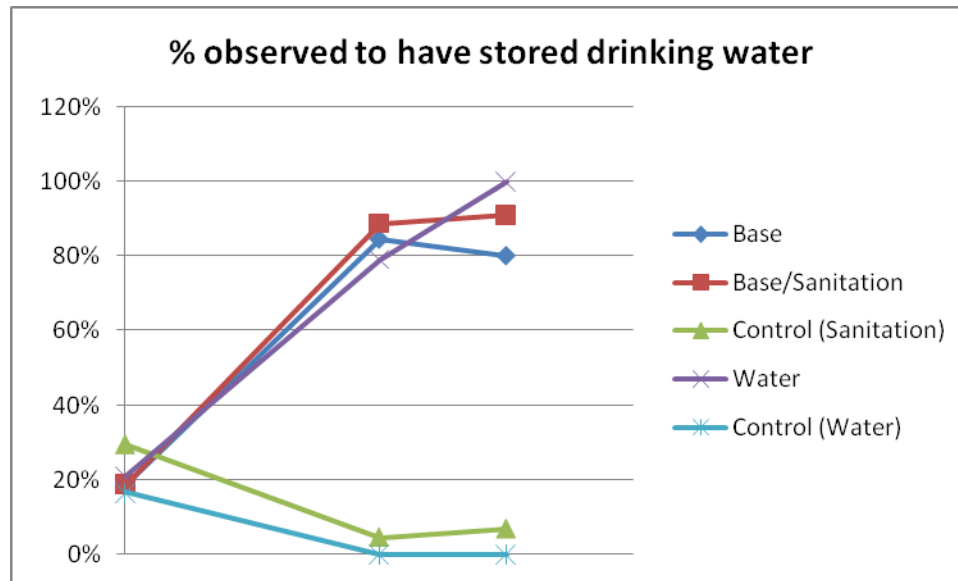
## What Did We Learn? – Results

Complete results for all key indicators are presented in the appendix. Tables show the results for baseline, follow up in May-July 2008 and an additional pre-final follow-up in September-November 2008. The percentage of schools demonstrating each indicator is presented for each of five study groups. These groups represent three different “packages” of interventions that schools were randomized to receive: water treatment, safe storage, hygiene, and education (Base Package); Base Package plus sanitation improvements (Base/Sanitation Package); or water access improvements (Water Package). In the text of this report, Base/Sanitation Package schools will be referred to as simply “Sanitation” Package schools. One control group for Base and Sanitation Package schools and one for Water Package schools are used to adjust for secular trends in facility changes. In the body of the report key findings are highlighted and shown in line graphs, where each line follows the same study group from baseline to the May 2008 follow-up to the September 2008 follow-up.

Are schools providing sustained access to water for drinking and handwashing?

Key findings:

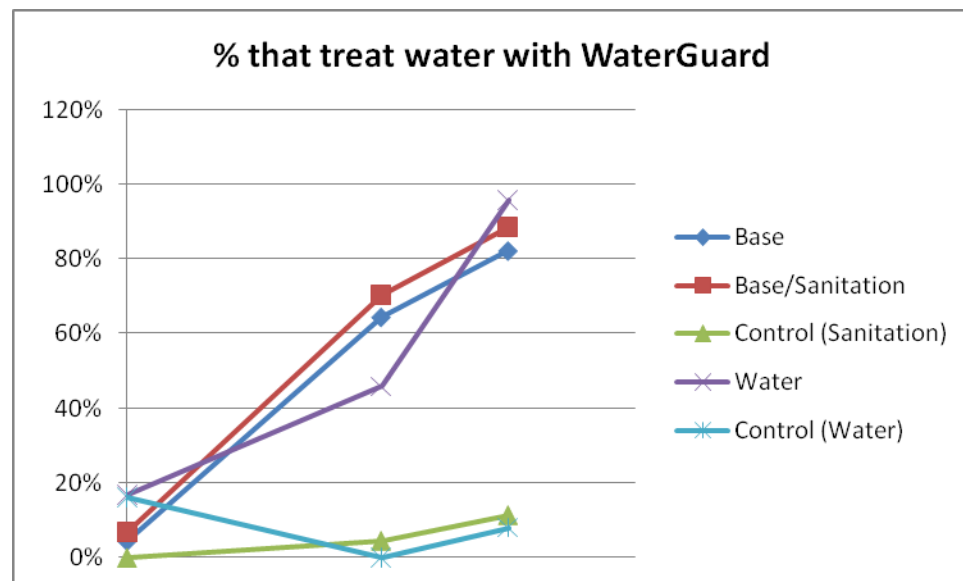
- Schools in all intervention groups are continuing to regularly provide drinking water, with 80% provision at the base package schools and 100% at water package schools.
- A similarly high fraction of schools continue to provide water for handwashing.
- There is high provision of water for drinking and handwashing.

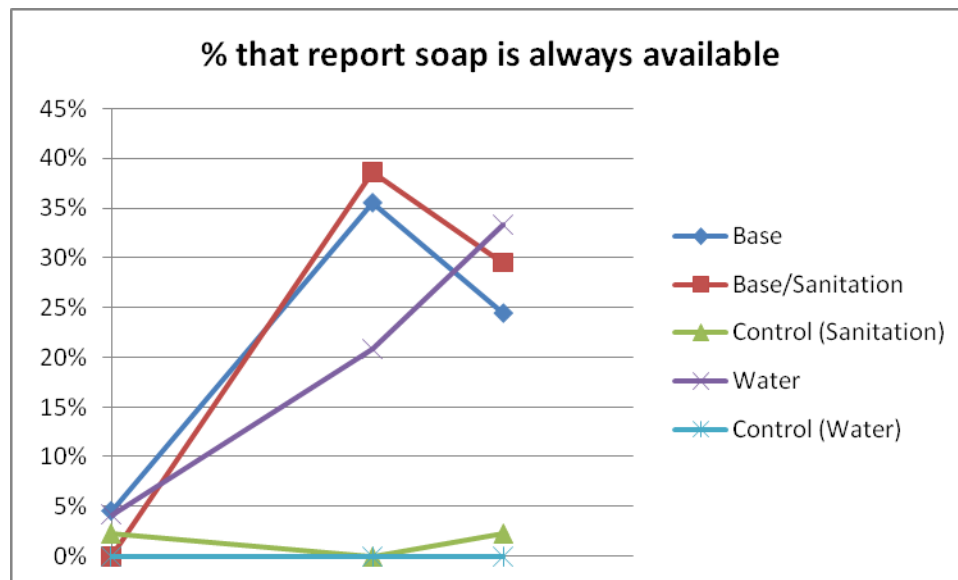
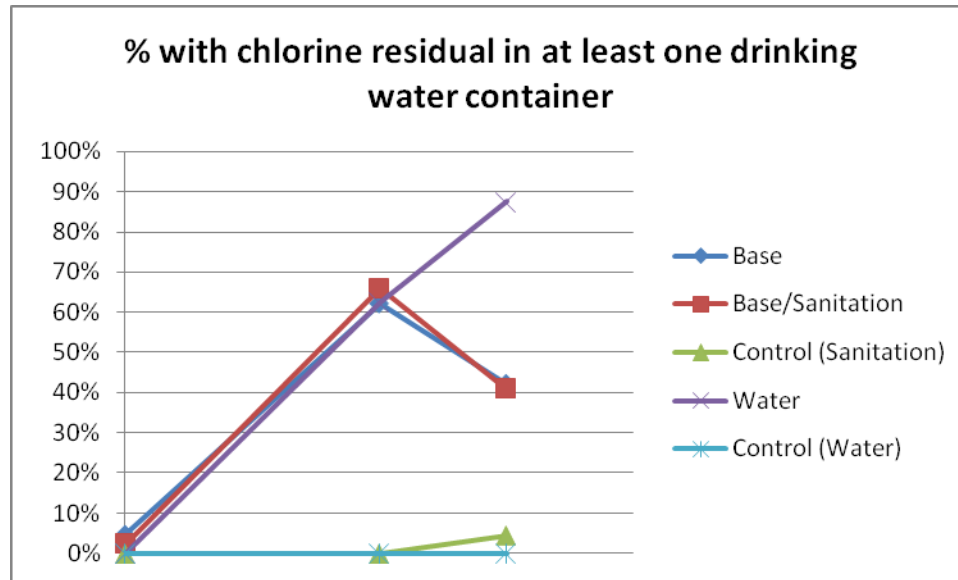


## Are schools providing sustained treatment of water and soap?

### Key findings:

- Between 80% and 95% of schools in the intervention groups report using WaterGuard for treatment, reflecting a continued increase since the first follow-up data collection.
- The percent of both Base and Sanitation schools with residual chlorine in stored drinking water declined in the pre-final evaluation. The higher percentage of schools demonstrating this indicator in the prior survey may be due to the announcement of the visit.
- Similarly, the percent of Base and Sanitation schools with soap for handwashing on the day of the visit declined in the final evaluation.
- Water package schools continued to have high levels of residual chlorine and soap, in part because they have not run out of initial supplies.

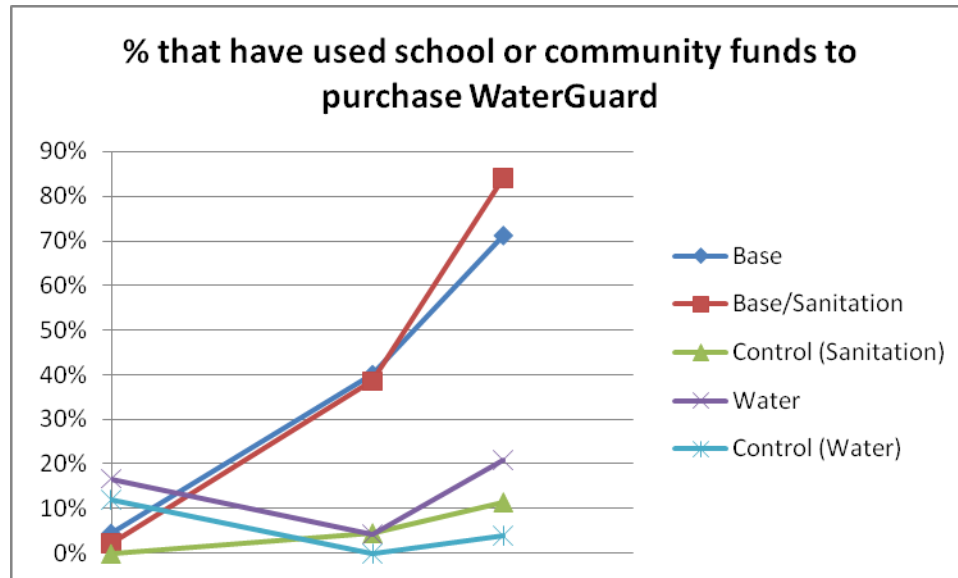




*Are schools meeting the necessary conditions for sustaining program activities, such as purchasing water treatment products and soap?*

Key findings:

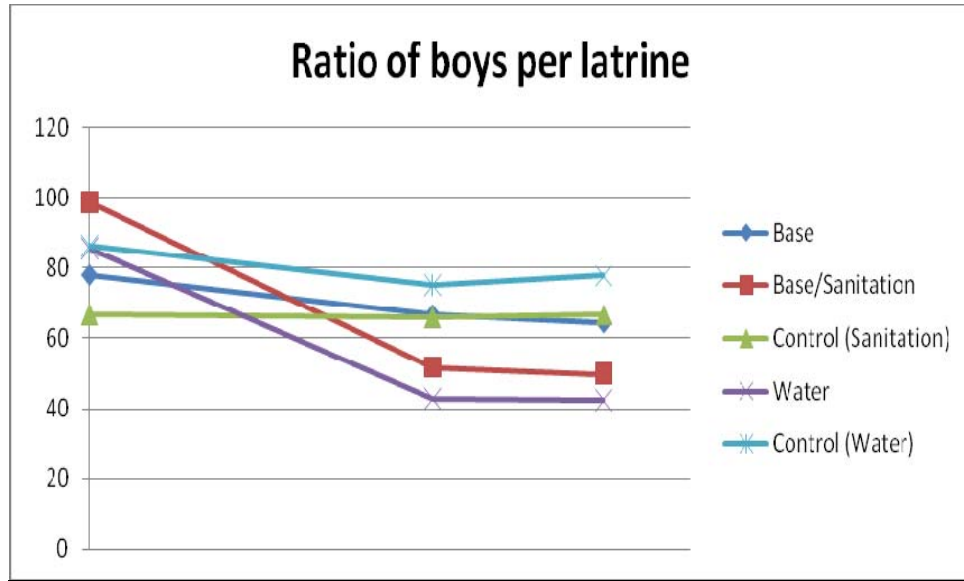
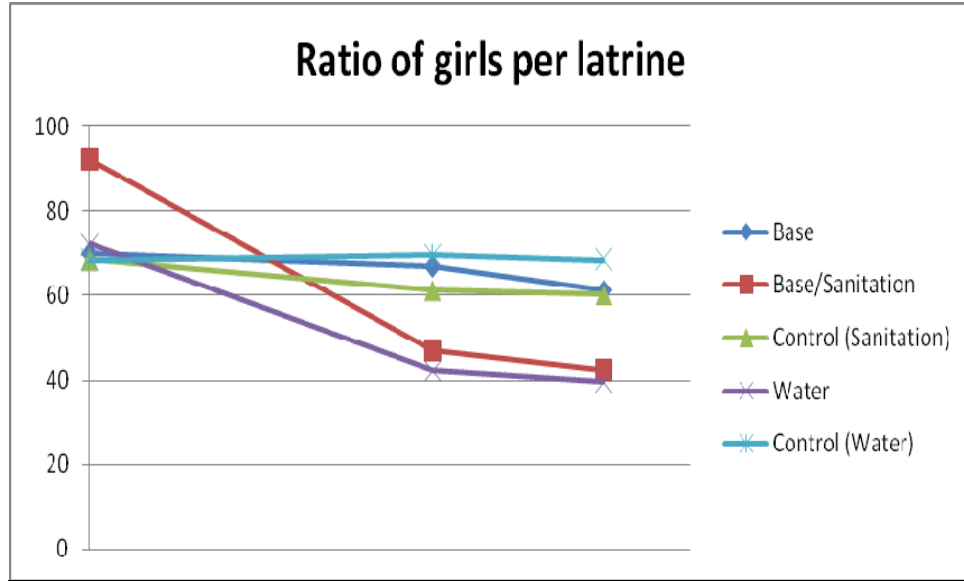
- Base and Sanitation schools which have used up initial supplies of WaterGuard are repurchasing using school or community funds.
- Taking into account results related to both repurchasing and residual chlorine, it appears that schools may be rationing the use of WaterGuard to make it last longer.



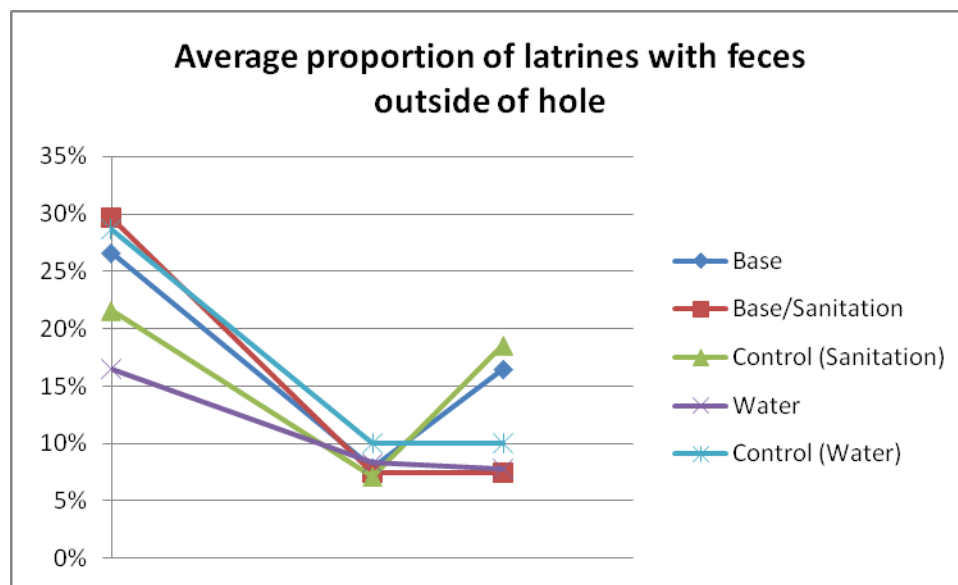
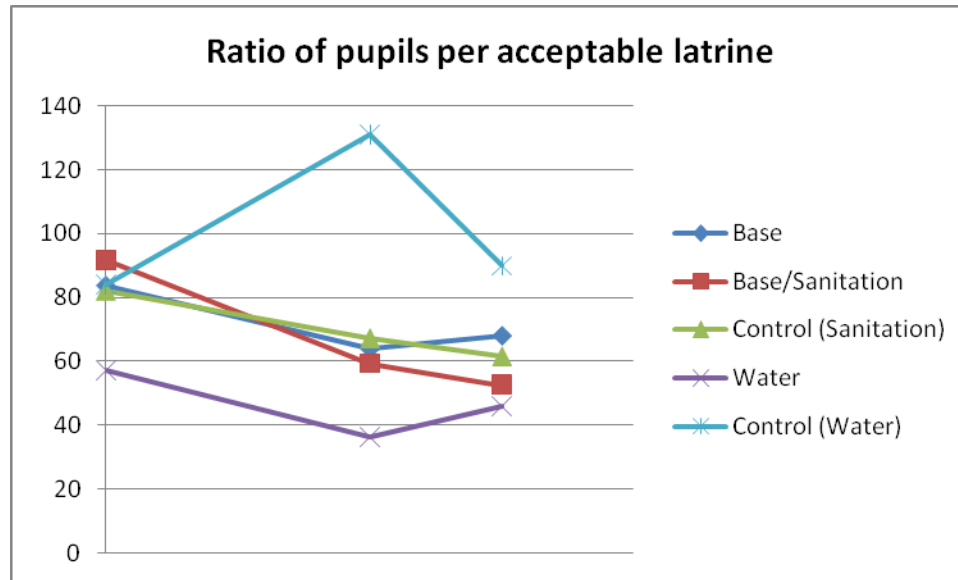
*Are sanitation conditions continuing to improve in intervention schools?*

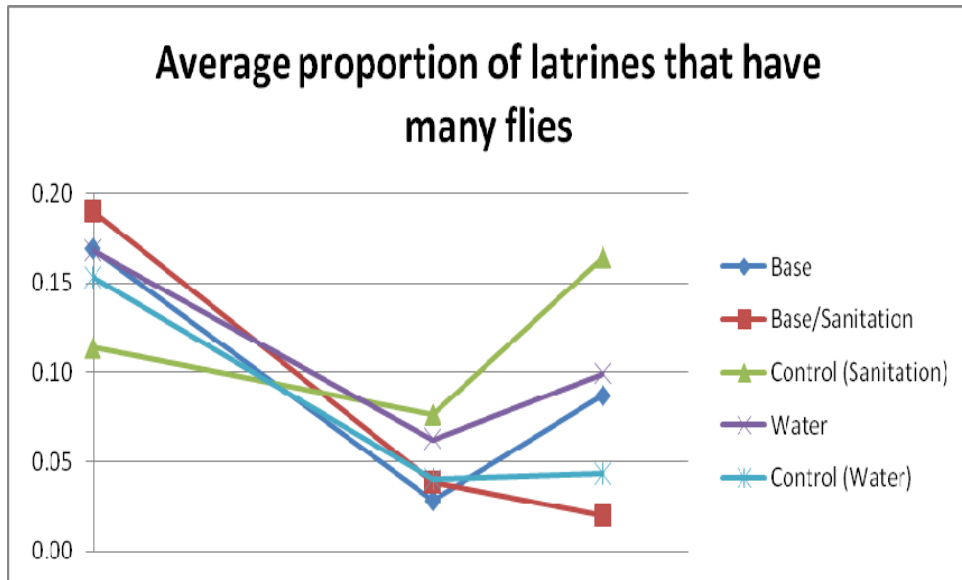
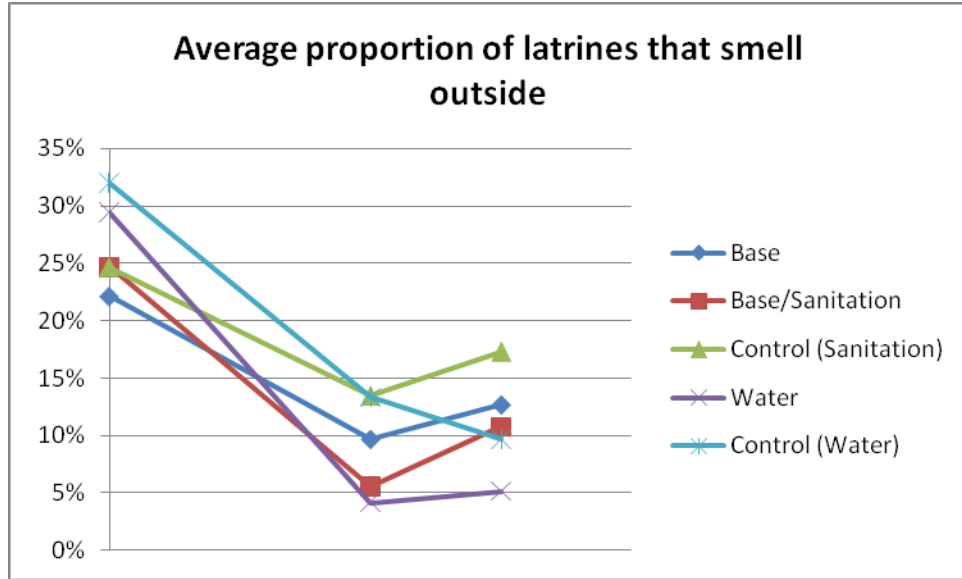
Key findings:

- The ratio of pupils per latrine significantly declined in Sanitation and Water Supply schools. However, potential changes in enrollment must also be considered. The ratios have not reached those recommended by the government (25 girls and 30 boys per latrine).
- There may be a trend toward decreased ratios in the Base package schools, but it is much less marked.
- When considering the ratio of pupils to acceptable latrine, (defined as no major problems with smell, flies or feces outside the hole), the difference between Sanitation and Water Supply schools is less clear. Sanitation schools (and to an extent Water Supply schools) have some of the most favorable changes in latrine cleanliness, but there is a great deal of unexplained variability. In part, this may be due to improvements in latrine conditions carried out by the schools themselves.









## Implications and Next Steps

These data demonstrate the level of improvements in key WASH indicators achieved in program schools and also indicate possible challenges with regard to sustaining improvements in schools over time. In order to sustain WASH improvements after SWASH+ implementation ends, schools must continue to purchase treatment products and soap with their own funds and create a system in which water provision and latrine maintenance are done consistently and adequately. Some issues that require further exploration include:

1. The provision of drinking and handwashing water in program schools has increased markedly over the course of implementation; however, water treatment and soap provision declined after the initial follow-up data collection, suggesting that sustaining these improvements presents a greater challenge. Although more than 80% of program schools reported using WaterGuard to treat drinking water during the most recent evaluation, measured chlorine residual on the day of the most recent school visit was close to 40% in Base and Base/Sanitation package schools. That a large proportion of schools have repurchased WaterGuard after running out of the initial free supply is an encouraging sign of sustainability; however, the small proportion of schools that treated water on the day of the visit indicates barriers to continued use, or at least to adequate dosage. Further assessments should be conducted to determine what leads to non-use or inadequate use of WaterGuard at intervention schools.
2. The measured decline in latrine conditions between the May-August and the September-November data collection periods may be a reflection of the advance notification of the former visit. The most recent evaluation may be a more accurate representation of typical latrine conditions. Results from a recent survey among pupils in program schools have shown that bad odor and uncleanliness are highly associated with a pupil's decision about whether or not to use a latrine (data not shown). Although schools show modest improvements in latrine maintenance over time, further study is needed to examine ways to improve the quality and regularity of latrine maintenance at schools so that conditions will continue to improve.

The final school evaluation to be conducted from May-July 2009 will allow partners to assess continuing trends in school WASH conditions. Additional short-term observational and qualitative assessments will help partners to continue to learn about factors leading to sustained improvements in school WASH.

## Appendix: School WASH Trend Data Tables

Table 1. Water Sources

	Baseline		May-July 08		Sept-Nov 08	
	n*	%	n	%	n	%
<b>% whose current source is protected</b>						
Base	23	87.0%	45	66.7%	45	55.6%
Base/Sanitation	17	76.5%	44	59.1%	44	70.5%
Control (Sanitation)	22	77.3%	43	65.1%	44	61.4%
Water	12	91.7%	24	83.3%	24	87.5%
Control (Water)	14	92.9%	25	84.0%	25	76.0%
<b>% whose current source is surface water</b>						
Base	23	13.0%	45	28.9%	45	35.6%
Base/Sanitation	17	23.5%	44	36.4%	44	22.7%
Control (Sanitation)	22	22.7%	43	27.9%	44	22.7%
Water	12	8.3%	24	16.7%	24	12.5%
Control (Water)	14	0.0%	25	12.0%	25	16.0%
<b>% whose current source is rainwater</b>						
Base	23	60.9%	45	44.4%	45	35.6%
Base/Sanitation	17	47.1%	44	29.5%	44	38.6%
Control (Sanitation)	22	50.0%	43	46.5%	44	36.4%
Water	12	91.7%	24	50.0%	24	54.2%
Control (Water)	14	92.9%	25	80.0%	25	72.0%
<b>% whose current source is improved (protected and &lt;1,001 meters)</b>						
Base	23	87.0%	45	64.4%	45	53.3%
Base/Sanitation	17	76.5%	44	54.5%	44	70.5%
Control (Sanitation)	22	77.3%	43	60.5%	44	59.1%
Water	12	91.7%	24	83.3%	24	87.5%
Control (Water)	14	92.9%	25	84.0%	25	76.0%
<b>Average time to current source (minutes)</b>						
Base	23	avg. 5.0	45	avg. 10.0	45	avg. 10.0
Base/Sanitation	17	10.0	42	10.0	44	9.0
Control (Sanitation)	22	7.5	44	5.0	43	5.0
Water	12	5.0	24	5.0	24	8.0
Control (Water)	14	5.0	24	5.0	24	5.0

\*For all tables, *n* refers to the total number of schools with data for each particular indicator

**Table 2. Rainwater Tanks**

Average capacity of rainwater tank(s)	Baseline		May-July 08		Sept-Nov 08	
	n	avg.	n	avg.	n	avg.
Base	32	2750.0	34	3350.0	31	3500.0
Base/Sanitation	33	3000.0	34	3750.0	35	7600.0
Control (Sanitation)	35	2300.0	37	2500.0	34	3500.0
Water	22	3750.0	22	10150.0	24	11300.0
Control (Water)	24	3350.0	24	3500.0	22	4250.0

Average approximate # days rainwater can serve school population (at .5 liters/pupil/day)	Baseline		May-July 08		Sept-Nov 08	
	n	avg.	n	avg.	n	avg.
Base	32	14.2	34	16.8	31	18.1
Base/Sanitation	32	17.2	34	20.8	35	26.5
Control (Sanitation)	34	16.5	36	12.2	33	19.8
Water	22	17.2	22	40.5	24	60.4
Control (Water)	24	18.7	24	19.0	22	20.7

**Table 3. Drinking Water Provision**

% that report always providing drinking water	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	17.8%	45	62.2%	45	71.1%
Base/Sanitation	44	18.2%	44	75.0%	44	84.1%
Control (Sanitation)	44	29.5%	44	4.5%	44	9.1%
Water	24	4.2%	24	75.0%	24	87.5%
Control (Water)	25	12.0%	25	4.0%	25	0.0%

% observed to have stored drinking water	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	43	18.6%	45	84.4%	45	80.0%
Base/Sanitation	43	18.6%	44	88.6%	44	90.9%
Control (Sanitation)	44	29.5%	44	4.5%	44	6.8%
Water	24	20.8%	24	79.2%	24	100.0%
Control (Water)	24	16.7%	25	0.0%	25	0.0%

% with drinking water containers	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	37.8%	45	97.8%	45	100.0%
Base/Sanitation	44	29.5%	44	100.0%	44	100.0%
Control (Sanitation)	44	45.5%	44	4.5%	44	6.8%
Water	24	37.5%	24	83.3%	24	100.0%
Control (Water)	25	32.0%	25	0.0%	25	0.0%

Average # months drinking water is provided (among those that provide it)	Baseline		May-July 08		Sept-Nov 08	
	n	avg.	n	avg.	n	avg.
Base	41	4.6	43	4.1	45	3.6
Base/Sanitation	33	3.4	44	4.6	44	3.0
Control (Sanitation)	34	3.3	15	3.9	15	3.7
Water	17	5.0	22	2.9	24	2.6
Control (Water)	21	4.5	12	4.0	13	4.8

**Table 4. Drinking Water Treatment**

	Baseline		May-July 08		Sept-Nov 08	
<b>% that treat water for drinking</b>	n	%	n	%	n	%
Base	45	6.7%	45	64.4%	45	84.4%
Base/Sanitation	44	11.4%	44	70.5%	44	88.6%
Control (Sanitation)	44	4.5%	44	4.5%	44	11.4%
Water	24	20.8%	24	45.8%	24	100.0%
Control (Water)	25	16.0%	25	0.0%	25	8.0%
<b>% that treat water with WaterGuard</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	4.4%	45	64.4%	45	82.2%
Base/Sanitation	44	6.8%	44	70.5%	44	88.6%
Control (Sanitation)	44	0.0%	44	4.5%	44	11.4%
Water	24	16.7%	24	45.8%	24	95.8%
Control (Water)	25	16.0%	25	0.0%	25	8.0%
<b>% that treat water with PUR</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	0.0%	45	2.2%	45	11.1%
Base/Sanitation	44	0.0%	44	0.0%	44	15.9%
Control (Sanitation)	44	0.0%	44	0.0%	44	4.5%
Water	24	0.0%	24	0.0%	24	12.5%
Control (Water)	25	0.0%	25	0.0%	25	0.0%
<b>% that use a method to reduce turbidity</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	0.0%	45	2.2%	45	11.1%
Base/Sanitation	44	0.0%	44	0.0%	44	18.2%
Control (Sanitation)	44	0.0%	44	0.0%	44	4.5%
Water	24	0.0%	24	0.0%	24	12.5%
Control (Water)	25	0.0%	25	0.0%	25	0.0%
<b>% with chlorine residual in at least one drinking water container</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	43	4.7%	45	62.2%	45	42.2%
Base/Sanitation	43	2.3%	44	65.9%	44	40.9%
Control (Sanitation)	44	0.0%	44	0.0%	44	4.5%
Water	24	0.0%	24	62.5%	24	87.5%
Control (Water)	24	0.0%	25	0.0%	25	0.0%

**Table 5. Sustained Water Treatment**

	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
<b>% who have run out of free or subsidized WaterGuard (among those who received a supply)</b>						
Base		n/a	28	64.3%	37	94.6%
Base/Sanitation		n/a	31	64.5%	39	94.9%
Control (Sanitation)		n/a	0		0	
Water		n/a	10	0.0%	23	8.7%
Control (Water)		n/a	0		1	0.0%
<b>% that repurchased WaterGuard after running out</b>						
Base		n/a	18	83.3%	35	88.6%
Base/Sanitation		n/a	20	80.0%	37	100.0%
Control (Sanitation)		n/a	0		0	
Water		n/a	0		2	100.0%
Control (Water)		n/a	0		0	
<b>% that have used school or community funds to purchase WaterGuard</b>						
Base	45	4.4%	45	40.0%	45	71.1%
Base/Sanitation	44	2.3%	44	38.6%	44	84.1%
Control (Sanitation)	44	0.0%	44	4.5%	44	11.4%
Water	24	16.7%	24	4.2%	24	20.8%
Control (Water)	25	12.0%	25	0.0%	25	4.0%

**Table 6. Handwashing**

% that report always providing handwashing water	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	8.9%	45	62.2%	45	55.6%
Base/Sanitation	44	2.3%	44	79.5%	44	75.0%
Control (Sanitation)	44	9.1%	44	0.0%	44	9.1%
Water	24	0.0%	24	62.5%	24	87.5%
Control (Water)	25	8.0%	25	0.0%	25	4.0%
% observed to have stored handwashing water	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	43	7.0%	45	71.1%	45	86.7%
Base/Sanitation	43	7.0%	44	84.1%	44	86.4%
Control (Sanitation)	44	4.5%	44	0.0%	44	4.5%
Water	24	12.5%	24	75.0%	24	100.0%
Control (Water)	24	8.3%	25	0.0%	25	4.0%
Average # months handwashing water is available (among those that provide it)	Baseline		May-July 08		Sept-Nov 08	
	n	avg.	n	avg.	n	avg.
Base	19	4.6	44	7.8	45	7.7
Base/Sanitation	10	3.7	44	8.2	44	7.9
Control (Sanitation)	13	5.3	2	4.5	8	6.1
Water	8	3.8	21	7.3	24	8.0
Control (Water)	9	4.6	0	0.0	7	5.6
% that report soap is always available	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	44	4.5%	45	35.6%	45	24.4%
Base/Sanitation	44	0.0%	44	38.6%	44	29.5%
Control (Sanitation)	44	2.3%	44	0.0%	44	2.3%
Water	24	4.2%	24	20.8%	24	33.3%
Control (Water)	25	0.0%	25	0.0%	25	0.0%



**Table 7. Sanitation Access**

	Baseline		May-July 08		Sept-Nov 08	
	n	# per 1 latrine	n	# per 1 latrine	n	# per 1 latrine
<b>Ratio of pupils per acceptable latrine</b>						
Base	43	83.8	45	64.0	45	68.1
Base/Sanitation	42	91.7	43	59.3	44	52.6
Control (Sanitation)	43	82.0	41	67.3	43	61.7
Water	24	57.2	24	36.4	24	46.1
Control (Water)	25	84.0	25	131.0	25	89.8
<b>% that exceed standard 30 boys per latrine</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	6.7%	45	8.9%	45	4.4%
Base/Sanitation	44	6.8%	44	31.8%	44	29.5%
Control (Sanitation)	44	11.4%	44	6.8%	44	2.3%
Water	24	0.0%	24	25.0%	24	41.7%
Control (Water)	25	8.0%	25	4.0%	25	4.0%
<b>% that exceed 90 boys per latrine</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	28.9%	45	20.0%	45	15.6%
Base/Sanitation	44	43.2%	44	18.2%	44	9.1%
Control (Sanitation)	44	13.6%	44	15.9%	44	20.5%
Water	24	33.3%	24	0.0%	24	4.2%
Control (Water)	25	40.0%	25	36.0%	25	44.0%
<b>% that exceed standard 25 girls per latrine</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	6.7%	45	4.4%	45	0.0%
Base/Sanitation	44	4.5%	44	25.0%	44	15.9%
Control (Sanitation)	44	4.5%	44	6.8%	44	2.3%
Water	24	0.0%	24	20.8%	24	20.8%
Control (Water)	25	8.0%	25	0.0%	25	4.0%
<b>% that exceed 75 girls per latrine</b>	Baseline		May-July 08		Sept-Nov 08	
	n	%	n	%	n	%
Base	45	35.6%	45	31.1%	45	22.2%
Base/Sanitation	44	45.5%	44	15.9%	44	6.8%
Control (Sanitation)	44	22.7%	44	15.9%	44	22.7%
Water	24	29.2%	24	8.3%	24	4.2%
Control (Water)	25	44.0%	25	36.0%	25	32.0%

**Table 8. Sanitation Conditions**

Average % of latrines with feces outside hole	Baseline		May-July 08		Sept-Nov 08	
	n	avg. %	n	avg. %	n	avg. %
Base	43	26.6%	45	7.9%	45	16.4%
Base/Sanitation	43	29.7%	43	7.4%	44	7.4%
Control (Sanitation)	44	21.6%	42	7.1%	44	18.6%
Water	24	16.5%	24	8.3%	24	7.7%
Control (Water)	25	28.7%	25	10.0%	25	10.0%
Average % of latrines that smell outside	Baseline		May-July 08		Sept-Nov 08	
	n	avg. %	n	avg. %	n	avg. %
Base	43	22.1%	45	9.7%	45	12.7%
Base/Sanitation	43	24.7%	43	5.6%	44	10.8%
Control (Sanitation)	44	24.6%	42	13.5%	44	17.3%
Water	24	29.4%	24	4.2%	24	5.1%
Control (Water)	25	32.0%	25	13.3%	25	9.7%
Average % of latrines that have many flies	Baseline		May-July 08		Sept-Nov 08	
	n	avg. %	n	avg. %	n	avg. %
Base	43	16.9%	45	2.9%	45	8.7%
Base/Sanitation	43	19.0%	43	3.9%	44	2.0%
Control (Sanitation)	44	11.4%	42	7.6%	44	16.4%
Water	24	16.8%	24	6.3%	24	9.9%
Control (Water)	25	15.3%	25	4.0%	25	4.3%
Average % of acceptable latrines (clean, with little to no smell or flies)	Baseline		May-July 08		Sept-Nov 08	
	n	avg. %	n	avg. %	n	avg. %
Base	43	33.2%	45	50.1%	45	47.9%
Base/Sanitation	43	32.7%	43	65.2%	44	61.6%
Control (Sanitation)	44	29.6%	42	46.6%	44	38.8%
Water	24	41.7%	24	64.5%	24	61.0%
Control (Water)	25	30.4%	25	49.1%	25	49.0%