Measuring the Impact of School Water, Sanitation and Hygiene: SWASH+ Experience
Sustaining and Scaling School Water, Sanitation and Hygiene (SWASH+)

- Collaboration between
  - CARE, Water.org, Kenya Water and Health Organization (KWAHO, Great Lakes University of Kisumu. Ministry of Education, Ministry of Public Health and Sanitation, Emory University, University of Florida
- Funded by Bill and Melinda Gates Foundation and Global Water Challenge
- Nyanza Province, Kenya

SWASH+ Impact Assessment Schools
Purpose: Key Questions

• What is the impact of improved school water, sanitation and hygiene on health and educational outcomes?
• What factors affect this impact?
• What is necessary to sustain and scale effective improvements?
Methods: Design

- Cluster randomized trial
- Before and after measurements in intervention and control schools
- Analysis based on difference in difference
  - Did outcomes improve more in intervention schools than in controls?
Background and Methods

• Cluster randomized trial: 2007-2009

• Base package (45 schools):
  – Hygiene promotion + Water Treatment

• Base package + Sanitation (45 schools):
  – HP+ WT + Sanitation

• Water package (25 schools):
  – HP+ WT + Sanitation+ Water

• Control (70 schools) – to receive improvements in third year of project
Methods: Outcomes

• Educational
  – Absenteeism (self-report, roll call, parental recall)
  – Standardized tests
  – Enrollment
• Health
  – Helminthes infections
  – Diarrhea
  – Anemia
• Household
  – Hygiene behaviors
  – Illness in children <5
Results: Reduced Absenteeism in Girls

- Up to 50% reduction in absence among girls, controlling for other factors
- No measured absenteeism reduction in boys
- Effects differed across regions

Source: Freeman et al 2011
Impact on Absenteeism: Gender Differences

- Over 6 days of absence per girl annually
- Cost-effectiveness comparable to other interventions
Results: Helminth Re-infection

- Followed re-infection rates for *Ascaris, Trichuris* and Hookworm
  
  **Ascaris**
  - 45% reduction in odds overall
  - Even greater among poorest girls
  
  **Trichuris**
  - No effects
  
  **Hookworm**
  - Significant reduction in intensity of infection for boys
  - Especially among poorer boys without shoes

Source: Freeman et al 2011
Results: Behavior Change at Home

• School children may serve as change agents

• Focused on changes in household water treatment (presence of chlorine in drinking water)

• Controlled for regional trends in chlorine use
**Note:** Means and 95% CI are for each data collection round separately and account for clustering. Analysis accounting for baseline differences shows a significant increase in intervention school communities.
Diffusion of uptake

Effect of School WASH intervention on Household Water Treatment: Residual Chlorine in Household Drinking Water by Round and Intervention Group

- Fifty percent increase in household water treatment, compared to controls
- Increase especially among poor households
- Limited overall impact – more intensive efforts needed

Source: Rheingans et al 2009
What Determines Impact?

• Reducing exposure is essential for impact

• Sustainability drives impact
Reducing Exposure is Essential for Impact
Reducing Exposure is Essential for Impact

- In schools receiving new latrines, children had *increased* in fecal hand contamination
- Suggests
  - Importance of latrine cleanliness
  - Interdependence of hand-washing and sanitation
  - Need for anal cleansing materials

*Figure 1.* Percentage of pupils with presence of *E. coli* on their hands at schools receiving hygiene promotion and water treatment (HP&WT), additional sanitation (HP&WT + San), and control schools at baseline and follow-up

Source: Greene et al
Sustainability: Sweating the Small Stuff

• Infrastructure alone was less influential
• Impact was determined more by whether schools kept the soap in place and kept water treated

• Why do some schools fail?
Sustainability Drives Impact

Handwashing

<table>
<thead>
<tr>
<th>Year</th>
<th>Proportion of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Has HW containers: 96%</td>
</tr>
<tr>
<td>Year 2</td>
<td>Has HW containers: 97%</td>
</tr>
<tr>
<td>Year 3</td>
<td>Has HW containers: 68%</td>
</tr>
</tbody>
</table>

Year 1: May 08
Year 2: Jun 09
Year 3: Feb 10
Sustaining School WASH: Identifying Barriers

111 Intervention Schools
(Incomplete data on 4 schools)

HW containers: 75 schools
(68% of all schools)

Water available: 61 schools
(55% of all schools)

Soap Available: 9 schools
(8% of all schools)

Potential Barriers:
- Broken containers? Broken taps? No Supply Chain? Not a priority?
- No water source? Water not put in containers? Not a priority?
- Stolen? Never purchased? No Budget? Not a priority?
What Have We Learned?

• School WASH can
  – Reduce absenteeism
  – Reduce helminth infection
  – Change household hygiene behaviors

• Impacts depend:
  – Differences based on who and where you are
  – How well the intervention is executed
  – Intensity of behavior change efforts
  – How well it is sustained