The impact of WASH in Schools on absence and health in Laos: A randomized-controlled trial

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Background: WASH in Schools (WinS)

• WinS is promoted by development agencies to reduce school absence through improvements in health & development of healthy behaviors

• The global evidence base for WASH in schools (WinS) is limited & mixed

• Fidelity to WinS interventions is often sub-optimal
  • Differential impacts of WinS by intervention fidelity is evident
Laos Basic Education, Water, Sanitation, and Hygiene Programme

- **Objective**: increase primary school attendance by strengthening WASH services

- **WASH facilities (hardware)**
  - School water supply
  - Water tank to supply toilet block and handwashing facilities
  - Toilet block with 3 compartments
  - Handwashing facilities

- **Hygiene Action led by Pupils in Schools (HAPiS, software)**
  - Water filters for classrooms
  - Group handwashing facilities
  - Promotion of daily group hygiene activities (handwashing, toilet cleaning, compound cleaning)

Photo: Anna Chard
Water, Sanitation, and Hygiene for Health and Education in Laotian Primary Schools
WASH HELPS Study

• 100 schools randomly selected & allocated to intervention (n=50) or control (n=50) arm

1. What is the impact of WinS on pupil absence?

2. What is the impact of WinS on pupil health (diarrhea, respiratory infection, soil-transmitted helminths)?

3. How does intervention fidelity affect program impacts?
WASH HELPS Study
Methods/measures

• Baseline data collected in September/October 2014 or 2015, followed by intervention implementation
• Follow-up surveys every 6-8 weeks for 3 years (7-11 total visits)
• Stool sample collection every year

Measures: absence, diarrhea, respiratory infection, intervention fidelity
WASH HELPS Study Results
Program fidelity

• Index score of program’s 6 outputs and their evaluation criteria (range 0-20)

Presence and functionality of:
1. Water supply
2. Toilets
3. Handwashing facilities
4. Group handwashing facilities
5. Drinking water filters
6. Group hygiene activities

![Average percent of schools meeting fidelity criteria across evaluation period](chart.png)
WASH HELPS Study Results
Roll-call absence

• **No overall impact** of intervention on absence

• Odds of absence were **higher** among schools with **low fidelity** and **lower** among schools with **high fidelity**

• **Supporting family** was most commonly reported reason for absence

<table>
<thead>
<tr>
<th>Adjusted Odds Ratios and 95% Confidence Interval</th>
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<tbody>
<tr>
<td>Overall</td>
</tr>
<tr>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Intervention group (ref: control)</td>
</tr>
<tr>
<td>0-25% output criteria met</td>
</tr>
<tr>
<td>26-50% output criteria met</td>
</tr>
<tr>
<td>51-75% output criteria met</td>
</tr>
<tr>
<td>76-100% output criteria met</td>
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**WASH HELPS Study Results**

**Pupil-reported diarrhea**

- **No overall impact** of intervention on diarrhea
  - **Lower odds** of diarrhea among intervention group in **dry season**
- Differential impacts by fidelity; no clear dose-response relationship.

<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>Overall</td>
</tr>
<tr>
<td>Intervention group (ref: control)</td>
<td>0.73 (0.48, 1.12)</td>
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<tr>
<td>0-25% output criteria met</td>
<td>Referent</td>
</tr>
<tr>
<td>26-50% output criteria met</td>
<td>0.72 (0.63, 0.98)</td>
</tr>
<tr>
<td>51-75% output criteria met</td>
<td>0.79 (0.64, 0.99)</td>
</tr>
<tr>
<td>76-100% output criteria met</td>
<td>1.01 (0.79, 1.29)</td>
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WASH HELPS Study Results
Pupil-reported symptoms of respiratory infection

- **No overall impact** of intervention on symptoms of respiratory infection
- No differential impacts by program fidelity

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<tr>
<td></td>
<td>Overall</td>
</tr>
<tr>
<td>Intervention group</td>
<td>1.02 (0.82, 1.27)</td>
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<tr>
<td>0-25% output criteria met</td>
<td>Referent</td>
</tr>
<tr>
<td>26-50% output criteria met</td>
<td>0.89 (0.76, 1.05)</td>
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<tr>
<td>51-75% output criteria met</td>
<td>0.87 (0.74, 1.03)</td>
</tr>
<tr>
<td>76-100% output criteria met</td>
<td>1.00 (0.85, 1.19)</td>
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WASH HELPS Study Results

**STH infection**

- **No overall impact** of intervention on STH infection
- Some evidence of a differential impact of program fidelity, no clear relationship

<table>
<thead>
<tr>
<th></th>
<th>Any STH</th>
<th>Hookworm</th>
<th>A. lumbricoides</th>
<th>T. trichiura</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention group (ref: control)</td>
<td>1.00 (0.75, 1.36)</td>
<td>0.98 (0.73, 1.31)</td>
<td>2.46 (0.64, 9.02)</td>
<td>1.59 (0.63, 4.03)</td>
</tr>
<tr>
<td>0-25% output criteria met</td>
<td>Referent</td>
<td></td>
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</tr>
<tr>
<td>26-50% output criteria met</td>
<td>1.05 (0.69, 1.64)</td>
<td>1.08 (0.71, 1.66)</td>
<td><strong>5.50 (1.48, 20.50)</strong></td>
<td>0.89 (0.36, 2.24)</td>
</tr>
<tr>
<td>51-75% output criteria met</td>
<td>0.71 (0.51, 1.01)</td>
<td><strong>0.65 (0.46, 0.92)</strong></td>
<td>1.36 (0.43, 4.26)</td>
<td>0.59 (0.25, 1.40)</td>
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<tr>
<td>76-100% output criteria met</td>
<td>1.09 (0.74, 1.60)</td>
<td>1.01 (0.70, 1.47)</td>
<td>1.38 (0.32, 5.98)</td>
<td>0.61 (0.22, 1.70)</td>
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WASH HELPS Study
Conclusions

1. WinS program as adhered to by schools did not impact absence
   • Primary cause of absence was not illness
   • Reductions in absence in schools with high program fidelity

2. WinS program led to reductions in diarrhea during dry season only. No impacts on respiratory infection symptoms or on STH infection.
   • WinS may be necessary, but not sufficient to overcome pathogen exposure

3. WinS impact will be mediated by context
   • Shift focus to understanding how to improve school-level adherence and sustain behavior change
Acknowledgements

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