



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

Anna N. Chard, Matthew C. Freeman

Emory University Rollins School of Public Health
Atlanta, Georgia, USA



EMORY
UNIVERSITY

WASH
FUTURES



Water, Sanitation & Hygiene Conference 2018

Collaboration for Universal WASH

 #WASHFutures18

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

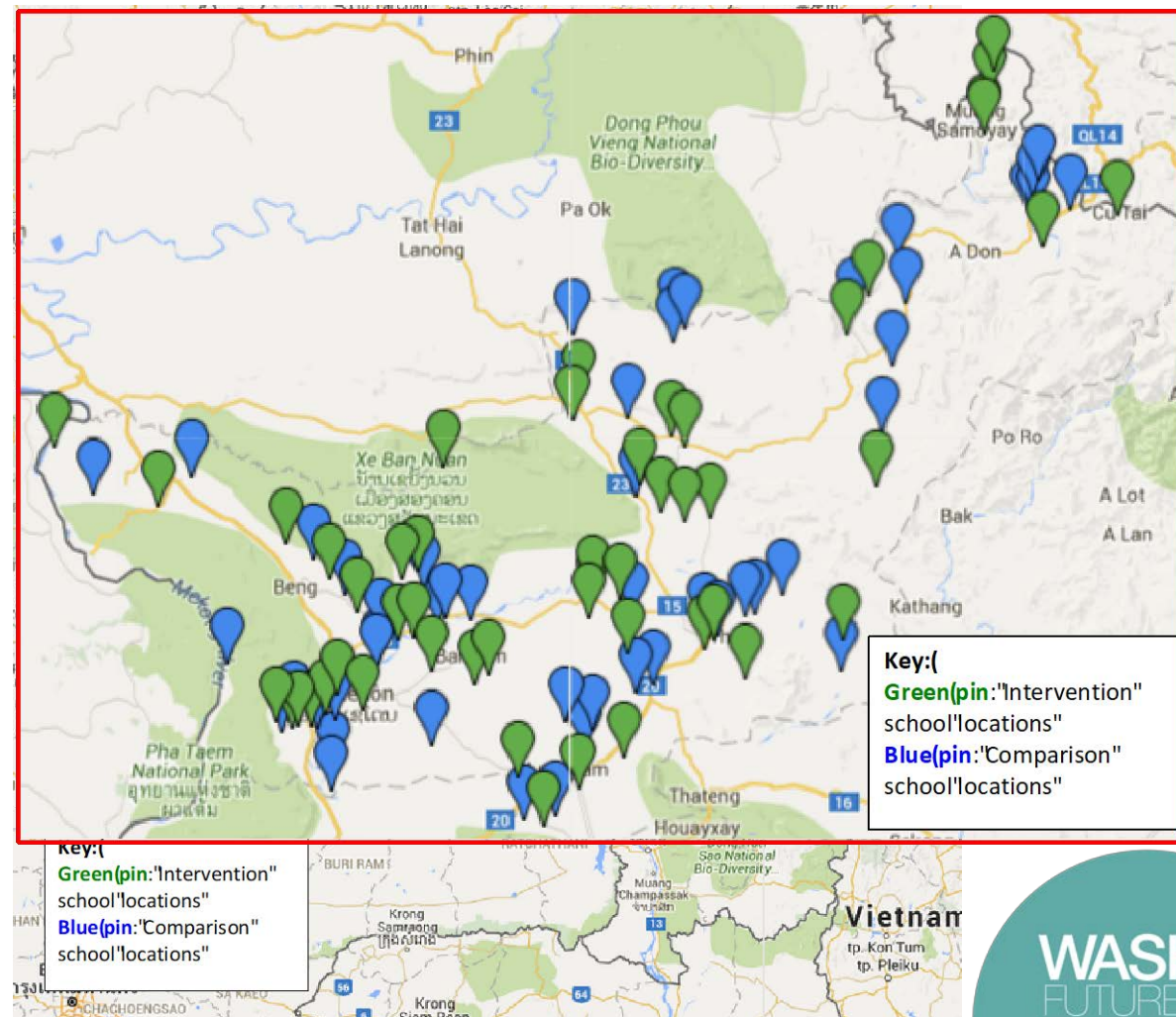
- **Objective:** increase primary school attendance by strengthening WASH services
- **WASH facilities (hardware)**
 - School water supply
 - Water tank to supply toilet block and handwashing facilities
 - Toilet block with 3 compartments
 - Handwashing facilities
- **Hygiene Action led by Pupils in Schools (HAPiS, software)**
 - Water filters for classrooms
 - Group handwashing facilities
 - Promotion of daily group hygiene activities (handwashing, toilet cleaning, compound cleaning)



Water, Sanitation, and Hygiene for Health and Education in Laotian Primary Schools

WASH HELPS Study

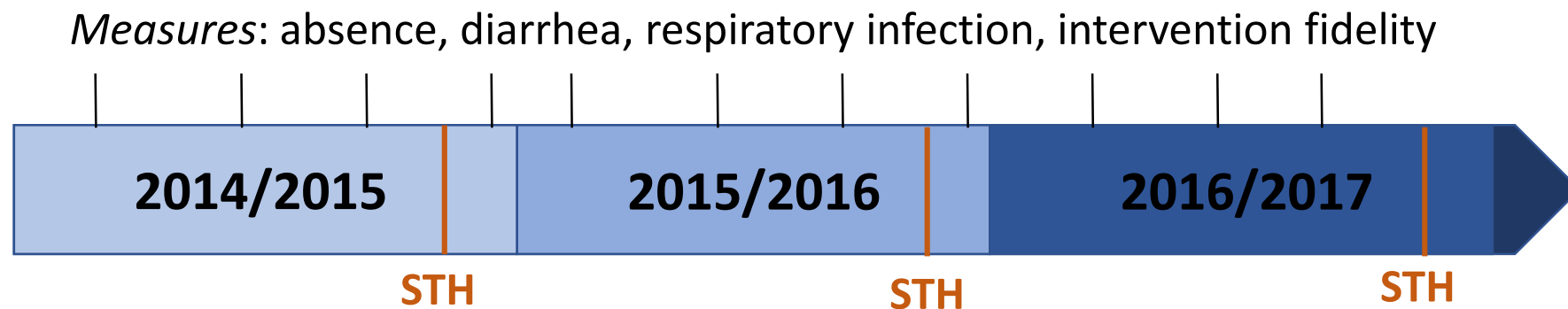
- 100 schools randomly selected & allocated to intervention (n=50) or control (n=50) arm
1. What is the impact of WinS on pupil absence?
 2. What is the impact of WinS on pupil health (diarrhea, respiratory infection, soil-transmitted helminths)?
 3. How does **intervention fidelity** affect program 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



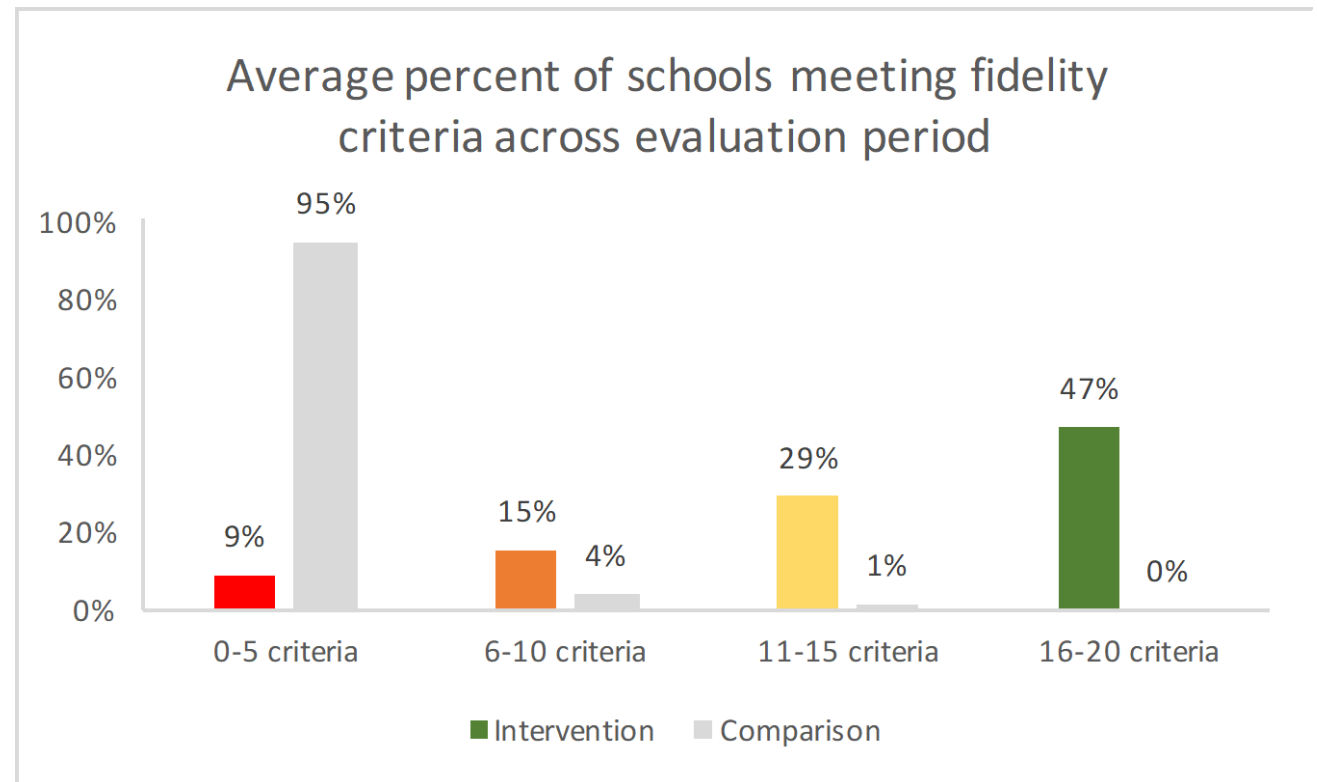
WASH HELPS Study Results

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

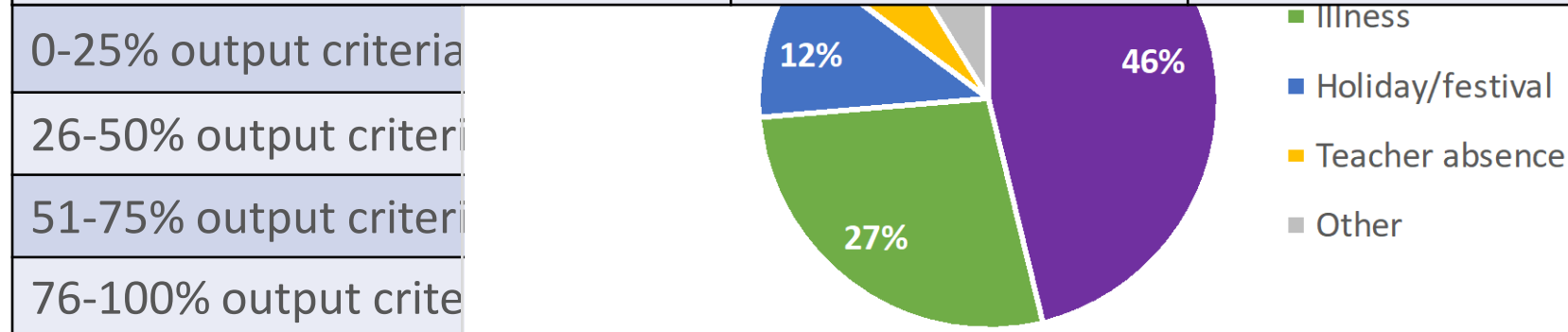


WASH HELPS Study Results

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

	Adjusted Odds Ratios and 95% Confidence Interval		
	Overall	Dry Season	Rainy Season
Intervention group (ref: control)	0.96 (0.81, 1.15)	0.92 (0.77, 1.10)	1.10 (0.91, 1.32)



0-25% output criteria
26-50% output criteria
51-75% output criteria
76-100% output criteria

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.

	Adjusted Odds Ratios and 95% Confidence Interval		
	Overall	Dry Season	Rainy Season
Intervention group (ref: control)	0.73 (0.48, 1.12)	0.56 (0.36, 0.86)	1.41 (0.90, 2.22)
0-25% output criteria met	Referent		
26-50% output criteria met	0.72 (0.63, 0.98)		
51-75% output criteria met	0.79 (0.64, 0.99)		
76-100% output criteria met	1.01 (0.79, 1.29)		

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

	Adjusted Odds Ratios and 95% Confidence Interval		
	Overall	Dry Season	Rainy Season
Intervention group	1.02 (0.82, 1.27)	<i>No effect modification by season</i>	
0-25% output criteria met	Referent		
26-50% output criteria met	0.89 (0.76, 1.05)		
51-75% output criteria met	0.87 (0.74, 1.03)		
76-100% output criteria met	1.00 (0.85, 1.19)		

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

Adjusted Odds Ratios and 95% Confidence Interval

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

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

- Funding from **UNICEF** through the Australia Department of Foreign Affairs and Trade (DFAT) and the European Union
- **Government of Lao PDR**, especially the **Ministry of Education and Sports** and the **Ministry of Health**
- **UNICEF WASH team**, especially Bishnu Timilsina, Carlos Vasquez, Southalack Sisaleumsak, and Pamouane Thongpaseuth
- **Indochina Research Laos team**, especially Vanvilay Phommalath, Sorasin Sivorabout, Amphayvane (Toun) Momkeokhampong, Khamsook Phommavongsa, Chansada Souvanlasy, Noulor Xayleng, and the enumerators Khamkeng Detduduang, Ketsoulin Keopanya, Bounnao Phonboun, and Damlongsack Sengkhamkhoudlavong
- **Center for Malariology, Parasitology, Entomology** laboratory team



Questions?

www.FreemanResearchGroup.org

Anna N. Chard (achard@emory.edu)

Matthew C. Freeman (matthew.freeman@emory.edu)



Photo: Anna Chard

WASH
FUTURES



Water, Sanitation & Hygiene Conference 2018

Collaboration for Universal WASH

#WASHFutures18