Lives Saved Tool Technical Note
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Updates to sources of effects and coverage of household level water, sanitation and hygiene interventions

In fall of 2020, the Lives Saved Tool Team updated the assumptions used to model the impact of water, sanitation and hygiene (WASH) interventions. Updates to the effects are listed in Tables 1 and 2, and were made as there were new meta-analyses on the effectiveness of these interventions to reduce diarrhea. Updates to the coverage estimates are listed in Table 3, and were needed as JMP expanded the definitions and updated coverage estimates of WASH interventions. These changes were first released in version 5.89 of SPECTRUM.

Table 1. Summary of changes to effect sizes for WASH interventions

Previous intervention name	Previous effect size	New intervention name	New effect size
Improved water source	0.00 (0.00-0.00)	Basic water source	No effect & not included in LiST
-	-	Point-of-use filtered water	0.40 (0.16-0.58
Water connection in the home	0.63 (0.53-0.73)	Piped water	0.23 (0.08-0.36)
Improved sanitation	0.29 (0.19-0.39)	Basic sanitation	0.16 (0.02-0.27)
Hand washing with soap	0.27 (0.17-0.37)	Hand washing with soap	0.07 (0.03-0.11)
Hygienic disposal of stools	0.00 (0.00-0.00)	Hygienic disposal of stools	0.00 (0.00-0.00)

Table 2. Summary of previous and current effectiveness sources for WASH interventions

Previous intervention name	**Previous effect size**	**New intervention name**	**New effect size**
Improved water source	Preliminary analyses by Fischer-Walker *et al.* (publication forthcoming).	Basic water source	No statistically significant effect according to Fischer-Walker *et al.* (publication forthcoming), and Wolf et al.
		Point-of-use filtered water	Wolf J, Hunter PR, Freeman MC, Cummings O, Clasen T, Bartram J, et al. Impact of drinking water, sanitation and handwashing with soap on childhood diarrhoeal disease: updated meta-analysis and meta-regression. Trop Med Int Health. 2018; 23(5): 508-525. doi:10.1111/tmi.13051
Water connection in the home	Cairncross S, Valdmanis V. Water supply, sanitation, and hygiene promotion. In: Jamison DT, Breman JG, Measham AR, et al., editors. Disease control priorities in developing countries. Washington DC: The World Bank, 2006; p. 771-792. http://www.ncbi.nlm.nih.gov/books/NBK11728/	Piped water	Wolf J, Hunter PR, Freeman MC, Cummings O, Clasen T, Bartram J, et al. Impact of drinking water, sanitation and handwashing with soap on childhood diarrhoeal disease: updated meta-analysis and meta-regression. Trop Med Int Health. 2018; 23(5): 508-525. doi:10.1111/tmi.13051
Improved sanitation	Preliminary analyses by Fischer-Walker *et al.* (publication forthcoming).	Basic sanitation	Wolf J, Hunter PR, Freeman MC, Cummings O, Clasen T, Bartram J, et al. Impact of drinking water, sanitation and handwashing with soap on childhood diarrhoeal disease: updated meta-analysis and meta-regression. Trop Med Int Health. 2018; 23(5): 508-525. doi:10.1111/tmi.13051
Hand washing with soap	Darvesh et al. Water, sanitation and hygiene interventions for acute childhood diarrhea: a systematic review to provide estimates for the Lives Saved Tool. BMC Public Health. 2017 Nov 7;17(Suppl 4):776. doi: 10.1186/s12889-017-4746-1.	Hand washing with soap	Fischer Walker *et al.*, publication forthcoming

Hygienic disposal of stools	Clasen TF, Bostoen K, Schmidt W-P, Boisson S, Fung ICH, Jenkins MW, et al. Interventions to improve disposal of human excreta for preventing diarrhoea. Cochrane Database of Systematic Reviews 2010;(5):CD007180. doi:10.1002/14651858.CD007180.pub2	Hygienic disposal of stools	Classen TF, Bostoen K, Schmidt W-P, Boisson S, Fung ICH, Jenkins MW, et al. Interventions to improve disposal of human excreta for preventing diarrhoea. Cochrane Database of Systematic Reviews 2010;(5):CD007180. doi:10.1002/14651858.CD007180.pub2

Table 3. Summary of changes to sources of coverage estimates for WASH interventions

Previous intervention name	Previous coverage	New intervention name	New coverage
Improved water source	JMP	Basic water source	No effect & not included in LiST
-	-	Point-of-use filtered water	DHS / MICS
Water connection in the home	JMP	Piped water	JMP
Improved sanitation	JMP	Basic sanitation	JMP
Hand washing with soap	DHS / MICS	Hand washing with soap	JMP
Hygienic disposal of stools	DHS / MICS	Hygienic disposal of stools	DHS / MICS

Improved water source and improved sanitation

From April 2018-June 2020, "Improved water source" and "Improved sanitation" were modeled as linked interventions which only have an effect when delivered in combination. These were based on preliminary results from Fischer-Walker *et al*. (publication forthcoming)[1] that implied that these interventions were not effective in isolation, but needed to be implemented in combination for an effect to be demonstrable. Based on Wolf *et al.* 2018, we are now modeling these as separate interventions.

Improved water source and water connection in the home

We previously modeled "water connection in the home" as a subset of "improved water source". We now model "point-of-use filtered water" and "piped water" as separate interventions and use the effectiveness estimates from Wolf *et al.*[2] The previous effectiveness estimate of "water connection in the home" was drawn from "Disease Control Priorities in Developing Countries, 2nd Edition"[3].

Point-of-use filtered water

We are now using the effectiveness estimate from Wolf *et al.*[2] for point-of-use filtered water. The impacts of other improved water sources, besides piped water, are no longer modeled, as Wolf *et al.* and Fischer-Walker *et al.* did not find significant effects of those interventions on diarrhea incidence or mortality[1,2]. Fischer-Walker *et al.* did not investigate the effect of point-of-use filtered water, specifically. Default sources of coverage estimates of point-of-use filtered water comes from household surveys. Point-of-use filters include ceramic, sand, or other filters.

Piped water

The intervention name has been changed to 'piped water' to reflect the terminology used by WHO/UNICEF Joint Monitoring Programme (JMP). The current effect of piped water is from Wolf *et al.*[2] Default source of coverage estimate comes from JMP.

Basic sanitation

The intervention name has been changed to "basic sanitation" to reflect the terminology used JMP. This intervention is defined by JMP as "improved sanitation facilities, which are not shared." Default source of coverage estimate comes from JMP.

Hand washing with soap

The effect size of the "hand washing with soap" intervention has been changed based on the result of a forthcoming publication by Fischer-Walker *et al*.[1] This intervention is defined by JMP as the "availability of a handwashing facility on premises with soap and water". Default source of coverage estimate comes from JMP. The previous estimate was based on a systematic review by Darvesh *et al.*[4]

Hygienic disposal of stools

We are continuing to assume no effect of "hygienic disposal of stools" on any of the outcomes modeled in LiST, based on the results of a systematic review by Clasen et al.[5]

References

1 Fischer-Walker C. (publication forthcoming).

2 Wolf J, Hunter PR, Freeman MC, *et al.* Impact of drinking water, sanitation and handwashing with soap on childhood diarrhoeal disease: updated meta-analysis and meta-regression. *Trop Med Int Heal* 2018; **23**: 508–25.

3 Disease Control Priorities Project. Disease Control Priorities in Developing Countries - NCBI Bookshelf, 2nd edn. Washington, DC: Oxford University Press, 2006 https://www.ncbi.nlm.nih.gov/books/NBK11728/ (accessed May 11, 2020).

4 Darvesh N, Das JK, Vaivada T, Gaffey MF, Rasanathan K, Bhutta ZA. Water, sanitation and hygiene interventions for acute childhood diarrhea: A systematic review to provide estimates for the Lives Saved Tool. *BMC Public Health* 2017; **17**. DOI:10.1186/s12889-017-4746-1.

5 Clasen TF, Bostoen K, Schmidt W-P, *et al.* Interventions to improve disposal of human excreta for preventing diarrhoea. *Cochrane Database Syst Rev* 2010; : CD007180–CD007180.