Implications of WASH Benefits trials for water and sanitation

Two large, well designed, and well executed factorial trials, one in Bangladesh[1] and another in Kenya,[2] published in *The Lancet Global Health*, have reported no effect of drinking water, sanitation, and hygiene (WASH) interventions on linear child growth. In recent years, researchers, policy makers, and practitioners have enthusiastically espoused the biologically plausible idea that reducing environmental contamination through WASH might be key to tackling the persisent challenge of childhood stunting. Should we now conclude that these calls to prioritise WASH as a nutrition intervention were premature or misguided?

First, we congratulate the authors on the quality of these trials. Unlike many previous WASH studies, the trials were registered, data analysis was prespecified, the effects of the interventions on associated behaviours were assessed, objective health outcome measures were used, the trials were adequately powered to detect small effects, geographic buffering reduced the risk of contamination between groups and, at least in the Kenyan study, an active control group was used. The internal validity of these studies is thus likely to be very high.

However, as is often the case in such trials,[3] the external validity of these findings is less clear. In both countries, most trial participants already had access to basic latrines and rates of open defecation were low. Similarly, in both countries, most participants already had an "improved" drinking water source at baseline. The tested WASH interventions might be expected to have a much greater effect on pathogen transmission among populations where open defecation and poor water supply are widespread, which remain significant, especially in sub-Saharan Africa and South Asia.[4]

The choice of interventions raises questions, too. The "water" intervention might have changed the microbial quality of drinking water somewhat, but the quantity of water available at the household, long argued as the driver for water-related health gains,[5] was unchanged. The sanitation intervention was delivered to the compounds of participants and not to the wider community, which, in Bangladesh, was only 10% of the village population. As sanitation facilities arguably benefit the owner's neighbours more than the owners themselves, it is plausible that the sanitation intervention did not achieve sufficient density to significantly improve environmental conditions around the enrolled children. Previous trials reporting an effect of sanitation on linear growth adopted a community-wide approach whereby conditions were improved across whole villages, rather than isolated compounds.[6,7] Also, since both trials were done in rural settings they cannot demonstrate what would happen if sanitation was improved in the dense, informal, and often poorly served urban populations of, for example, Dhaka or Nairobi.

Beyond the usual WASH interventions, recent research[8,9] suggests that food might be a dominant exposure pathway for enteric infection in early childhood but this pathway was unlikely to have been significantly influenced by these interventions. Another reason why children might fail to grow adequately in such settings is exposure to animal waste, with studies showing an association between exposure through animal husbandry and diarrhoeal diseases.[10] In both settings, as acknowledged by the authors, children were likely to be exposed to animal waste and this exposure was not significantly addressed by the interventions. Tackling the environmental contribution to stunting might require more concerted efforts to keep children and animal waste apart.

Setting aside the above caveats, these negative results show that limited WASH interventions—basic latrines, treatment of water, and rudimentary handwashing facilities—did not improve linear growth, or, indeed, many other important health outcomes, in these settings. This is a challenge to all of us in the WASH sector. For researchers and research funders, these results remind us again how little we still know about the transmission of enteric pathogens, the causes of symptomatic infections, and the significance of asymptomatic infections. We hope that forthcoming papers from the WASH-Benefits group will contribute new knowledge with regard to these questions.

At a policy level, these studies suggest that business as usual in the WASH sector will not be enough to significantly improve child growth. At a policy level, these findings lend support to the new, and more ambitious, Sustainable Development Goal (SDG) that calls for progress towards a piped continuous water supply located on premises coupled with a safely managed sanitation service for all.[4] Looking forward, if the prospects of those millions of children still born into poverty, and who too often fail to thrive as they should, are to be improved, then it is clear that this new and ambitious level of service is where we should now be aiming.

We declare no competing interests.

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Lancet Glob Health 2018
Published Online
April 26, 2018
http://dx.doi.org/10.1016/S2214-109X(18)30192-X

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