Are studies underestimating the effects of sanitation on child nutrition?

Authors' reply

Should child growth replace diarrhoea as the primary child health outcome for sanitation trials? We appreciate Derek Headey's comment in relation to our trial[1] that the window of opportunity to plausibly affect growth faltering is from in utero up to 24 months, and therefore that sanitation trials should focus growth assessments in children with exposure to the intervention who are younger than 24 months. Ongoing sanitation trials in rural Kenya (NCT01704105), Bangladesh (NCT01590095), and Zimbabwe (NCT01824940) have chosen to enrol target children in utero precisely because of the recognition that child stunting and environmental enteric dysfunction can begin before birth.[2] However, the effect of enteric pathogen exposure—either through reduced acute diarrhoea or asymptomatic infections[3]—is likely to be one of many causes of linear growth faltering. In some settings, competing risks such as poor nutrition and non-enteric infections (eg, malaria) could overshadow improved sanitation's contribution to growth. Child growth is also unable to capture potential health benefits of sanitation interventions for children older than 2 years. For these reasons, it could be premature to rely exclusively on anthropometry measurement before additional sanitation intervention trials successfully show an effect on child growth.

Although we agree with Headey that caregiver-reported diarrhoea can be a biased outcome, we see value in measuring the effect of sanitation interventions on more objective indicators of enteric infections. Notably, recently developed molecular techniques allow for the simultaneous detection of many relevant diarrhoeal pathogens in stool samples, including bacteria, viruses, protozoans, and soil-transmitted helminths.[4] Antibody measures of infection in saliva, blood, and stools provide additional multiplex opportunities to objectively measure enteric pathogens.[5,6] Continued advancements in molecular techniques are reducing costs and increasing the feasibility of their use in low-income settings. Although the high incidence of asymptomatic infections precludes the use of pathogen presence as a direct indicator for clinical diarrhoea,[7] enteric pathogen infection status would be a valuable outcome to understand the ability of sanitation interventions to interrupt transmission of diarrhoeal pathogens.

We propose that enteric pathogen detection be deemed a complementary outcome to child growth for a more comprehensive understanding of the potential benefits of sanitation trials.

We declare no competing interests.

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