

Sanitation improves health but not stunted growth in Bangladesh trial

January 30 2018, by Rachel Leslie



Study data collectors measure a child's growth in Dhaka, Bangladesh, to assess impact of water, sanitation and hygiene interventions. Credit: GMB Akash

Despite mounting research over the last decade linking poor sanitation to stunted growth in children, a new study found that children born into

housing compounds with improvements in drinking water quality, sanitation and handwashing infrastructure were not measurably taller after two years compared with those born into compounds with more contamination—although children who received the interventions were significantly healthier overall.

The WASH Benefits Bangladesh trial, led by Stanford epidemiologist Stephen Luby, MD, professor of medicine, is one of the first to examine what are known as water, sanitation and hygiene, or WASH, interventions as a way of improving [children's](#) growth in low-income communities. How well a child grows in the first year can indicate overall well-being and is linked to both survival and brain development. These WASH interventions have been proposed as a way of improving child growth and are being implemented in many communities around the world, but haven't been rigorously tested.

"Part of what we learned is that this problem of stunting is not going to be easily fixed by a little bit of attention to water, sanitation and hygiene," Luby said. "Modest efforts to marginally improve environments are not going to be sufficient. If we want children in the lowest-income, most resource-constrained environments to thrive, we're going to need to make their environments radically cleaner."

Children in the Bangladesh trial who received [nutritional supplements](#) in addition to WASH interventions did grow taller and were less likely to die during the study, but WASH interventions alone did not improve growth.

Better nutrition needed

The study, published Jan. 29 in *The Lancet Global Health*, examined the health and growth of children from over 5,000 pregnant women in rural Bangladesh after two years. The mothers were grouped according to

geographic clusters and randomly assigned to one of six interventions or a control group. The six interventions included: integration of chlorinated [drinking water](#); upgraded sanitation facilities; promotion of handwashing; a combination of chlorinated drinking water, upgraded sanitation and WASH promotion efforts; nutritional supplements; or WASH and nutritional supplements.

After two years, nearly all the interventions reduced diarrhea. Although expected, the result is important because it suggests that families did adhere to the interventions. It also creates hope that WASH interventions could beat back one of the greatest killers of children globally—the World Health Organization estimates 361,000 children under age 5 die as a result of diarrhea each year.

Of all the interventions, providing nutritional supplements in addition to combined water, [sanitation](#) and handwashing interventions had the greatest effect on curbing mortality, in addition to improving growth. Children receiving this [intervention](#) were 38 percent less likely to die compared to children in the [control group](#).

The way forward

Past research has shown that WASH strategies are effective at reducing diarrhea and improving child health, Luby said, but evidence of the impact of these strategies on child growth and development has been sparse.

In response to this lack of data, Luby began laying the groundwork for the current study more than a decade ago. One of his concerns was ensuring the group developed a rigorous and transparent trial design that included close community partnerships and innovative ways of encouraging village residents to adopt new behaviors. Unless most people in the community adopted the interventions, he knew the results

would not be conclusive.

With the large number of children in the study, good adoption of the interventions and careful design, the study had the statistical power to detect small effects. Thus, Luby noted the absence of growth improvement with WASH interventions was genuine.

"We developed an intervention that the community really liked and were able to achieve really high uptake," said Luby. "What this tells us is that these interventions, even with high uptake, likely didn't clean the environment enough to impact child growth. This is a disappointment, but it also helps to provide direction as a way forward."

While a great amount of knowledge has been gained from the primary outcomes data, Luby and his team are continuing to analyze the broader range of health benefits that could have resulted from these successfully integrated WASH strategies, such as the impact on bacterial, parasitic and viral infections, anemia and nutritional biomarkers, and child cognitive development.

Provided by Stanford University Medical Center

Citation: Sanitation improves health but not stunted growth in Bangladesh trial (2018, January 30) retrieved 27 April 2024 from <https://medicalxpress.com/news/2018-01-sanitation-health-stunted-growth-bangladesh.html>

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