

Study shows effects of toilet facilities on child health in rural Africa

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Roughly one out of four people worldwide has no access to a toilet. A program underway in 50 countries could provide a solution, by motivating communities to build latrines and stop open defecation. The approach increases access to – and use of – sanitation facilities, according to a study co-authored by a Stanford researcher.

Among the promising results of the effort, the researchers found that the practices improved child growth in the communities.

"Historically we have focused on the impact that [sanitation](#) improvements have on rates of acute diarrheal disease among children," says Jenna Davis, an associate professor of civil and environmental engineering and the Higgins-Magid Senior Fellow at the Stanford Woods Institute for the Environment. "Findings from this study suggest that sanitation interventions may have other important health benefits for children, if we measure outcomes such as stunting."

The research, published in *The Lancet Global Health*, is the first scientific trial to show that child growth improved when communities in the Republic of Mali, in West Africa, participated in a community-led sanitation program. Until now, a lack of rigorous evidence on the program's effectiveness had rendered it controversial.

"We're coming out of the period in water and sanitation where we've seen large-scale randomized trials in sanitation that have shown no impact on [child health](#)," says health scientist Robert Dreibelbis, an assistant professor with the Water Technologies for the Emerging Regions Center at the University of Oklahoma, who took no part in the study and who has no affiliation with Stanford. "This study reinvigorates the questions around how and why and under what circumstances can a sanitation intervention have measurable improvements on child health findings."

Although the study found that rates of [diarrheal disease](#) did not change, community-led sanitation efforts such as this promise to improve child health in other ways. The researchers found the greatest improvements in height and weight of children who were less than 1 year of age at the beginning of the study. The window of opportunity to prevent the faltering of long-term growth occurs while a child is under 2 years of age, the authors wrote in the study. Thus, the prevention of exposure to fecal contamination in early life could provide an important element for achieving overall child health.

"It was very exciting to find that an affordable program already being scaled up around the world can improve and sustain access to sanitation in high-need settings," says lead author Amy Pickering, a research associate with Stanford's Department of Civil and Environmental Engineering and the Stanford Woods Institute's Water, Health & Development program. "Poor households were three times more likely to have access to a private latrine in intervention villages."

Community-led sanitation

Pickering and colleagues sought to change defecation behavior by eliciting emotional drivers such as shame, disgust, pride and dignity. They studied 121 villages in Mali, half of which participated in a so-called Community-Led Total Sanitation Program. Researchers engaged with villagers in activities designed to mobilize them to build private latrines.

For instance, in one activity researchers placed human feces on the ground, waited until the feces attracted flies, and then placed a plate of fruit nearby. Villagers watched as flies that had covered the feces landed on the food.

The researchers found that the positive behaviors could be reinforced through activities that encouraged community pride and dignity. For

instance, communities that built latrines and stopped defecating in the open received a certificate, typically awarded by government officials during a ceremony and celebration.

In villages that participated in the community-led total sanitation program, private latrine access almost doubled, compared to non-participating villages, according to the study. For households with a private latrine, 98 percent of adults reported the latrine as the prime defecation location.

The research, as with previous studies, found that improved sanitation had no effect on rates of reported acute diarrhea. However, participating households were 54 percent less likely to experience a death by diarrhea compared to households in the non-participating villages.

Fewer children stunted, underweight

Children in participating villages younger than 2 years old at the beginning of the study were 17 percent less likely to be stunted and 35 percent less likely to be severely underweight. This means that the standard focus on acute diarrhea may be missing important health-related impacts of sanitation, particularly for children.

"Studying sanitation is not always the sexiest topic," Pickering says. "But it certainly is rewarding when we are able to identify strategies to effectively improve quality of life and child health."

More information: "Effect of a community-led sanitation intervention on child diarrhoea and child growth in rural Mali: a cluster-randomised controlled trial." *The Lancet Global Health*. DOI: [dx.doi.org/10.1016/S2214-109X\(15\)00144-8](https://doi.org/10.1016/S2214-109X(15)00144-8)

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