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INDIA: How Many Toilets Does it Take to Improve Health?

Access to proper sanitation helps keep children healthy, but millions of people in the developing world still practice open defecation, putting children at risk. Diarrhea, which can result from the spread of fecal material into food or mouths, kills around 800,000 children under the age of five every year and leaves millions more malnourished and stunted. What's the best way to do create lasting change? Previous efforts often focused on encouraging individuals to invest in toilets for their households, but gains are limited if not everyone in the village does the same. One reason may be that sanitation has a communal element because even if only one family in a neighborhood practices open defecation, all families may be at risk of ingesting fecal matter. Sanitation therefore presents a unique challenge: If an individual family invests in a toilet, but their neighbors don't, are there still positive benefits? What proportion of households need to have improved sanitation for benefits to be seen across the whole village? And what's the impact in a village that goes from zero toilet use to full coverage?

The World Bank is committed to helping countries develop the necessary infrastructure and practices to improve sanitation, reducing barriers families may face in raising healthy children. To better understand the impact of a whole village using improved sanitation—such as private toilets or pit latrines—compared with just a few people in the village having access to toilets, World Bank researchers analyzed a national survey database on more than 200,000 children younger than four years old in rural India. More than two-thirds of the people in the rural areas defecate in the open. The study found that diarrhea prevalence halved when sanitation coverage at community level is fully achieved. The study says that these results are mostly due to the positive spillover effects on everyone's health that occurs when all (or the overwhelming majority of) households have toilets. **The findings can help governments and development practitioners understand the importance of taking a communal approach to the problem.**

WATER AND SANITATION

Context

Globally, 2.5 billion people lack access to proper sanitation. In India, the problem is acute: Some 626 million people practice open defecation. This poses a particular health problem for babies and children, because fecal matter is tracked into homes and into food, spreading disease.

There have been many development efforts to encourage families to build sanitation facilities, but progress has been modest in countries where open defecation is widely practiced. In India, open defecation declined from around 60 percent in 2001 to the estimated 50 percent currently. India's Prime Minister Narendra Modi identified the urgency of solving the problem shortly after taking office in 2014, when he said that he wanted to end the practice in India and gave 2019 as the target deadline. His government has since launched Swachh Bharat Abhiyan ("Clean India Mission") to meet this deadline. The campaign, which is supported by the World Bank, is expected to cost nearly $10 billion and includes financial support for poor families to build sanitation facilities and an awareness campaign to change behavior, along with building better waste disposal in rural areas.

Evaluation

Researchers sought to determine the health impact on children in households that use either a basic pit or shared latrine, also known as unimproved sanitation, or switch to a private toilet facility, known as improved sanitation. They also hoped to measure the extent to which the better health outcomes were the result of a "direct benefit"—a child moving to a home with a latrine—or of an "external" benefit—a child moving to a village where most households had access to sanitation facilities.

Researchers analyzed data on 209,762 children under the age of 48 months in households in rural India, using the third round of India's District Level Household Survey in 2007-2008. DLHS-3, as it is known, collected information on maternal and child health and family planning, among other things. Though the survey is nationwide, researchers restricted the sample to rural areas only. Researchers analyzed a household's access to sanitation, as well as the village's overall sanitation coverage. This allowed them to separate the direct benefits to a family that builds a toilet, and the benefits when their neighbors build a toilet.

The household survey includes questions that allowed researchers to measure the health impact of using sanitation facilities. For example, mothers were asked if their child had diarrhea in the previous two weeks, as well as what kind of toilet facility members of their household usually use. Researchers used this information to determine the percentage of homes in a given village that had access to a toilet facility.

Among children in the sample, just 18 percent lived in rural homes with proper toilets, while 72 percent lived in homes that lacked access to any kind of sanitation facility and therefore defecated in the open. The remaining 10 percent had some kind of rudimentary latrines that were not hygienically maintained or that were shared with other families.

Results

Reducing exposure to fecal matter had sweeping effects on a child's health, reducing their likelihood of having diarrhea by almost half.

A child who lived in a village where all the households had access to latrines, toilets, and other improved sanitation facilities had a 47 percent lower rate of diarrhea than a child living in a village where households didn't have sanitation facilities. This lower rate reflects both the impact of sanitation facilities in the child's household and the impact of other households in the village also having sanitation facilities. In terms of incidence of diarrhea, this reflects an almost six percentage point drop from 12.5 percent to 6.8 percent.

While having a toilet is important for improving health, it's even more important that the neighbors have toilets or other sanitation facilities.

The evaluation looked at health benefits in terms of incidences of diarrhea in the previous two weeks and then looked at how many households in the village had access to sanitation facilities. Researchers wanted to measure the relationship between a child's health and the so-called private benefit of one household having a toilet, and the relationship between a child's health and what they called the external benefit of other people in the village having access to sanitation facilities.

This policy note summarizes "Sanitation and Externalities: Evidence from Early Childhood Health in Rural India," Luis A. Andres, Bertha Briceno, Claire Chase and Juan A. Echenique, World Bank Policy Research Working Paper 6737, January, 2014. http://go.worldbank.org/FIX0B1R540

Only a quarter of the positive health benefit can be attributed to a child's family having toilet access. More than three quarters of the 47 percent reduction in diarrhea is attributable to external factors, that is to say, the fact that the child lives in a village where other people practice safe sanitation. In other words, whether all your neighbors have a toilet is three times more important in determining your child's health than whether you yourself have one.

The change is less dramatic, but nevertheless noteworthy, for individual families that improve their sanitation services, even if the entire village does not. Researchers found a 10 percent reduction in diarrhea for a child living in a household that installs a toilet and a five percent reduction for a child in a household that installs a basic, but unsanitary, latrine. These relatively small changes account for the "direct" health effects of improved access for the individual.

It's likely that the impact of any one household having a toilet has been underestimated in the past.

Previous studies looking at the relationship between access to sanitation and children's diarrhea may be underestimating the health benefits when a family puts in a toilet. There's the personal gain—which is that children in that household are likely to see a drop in diarrhea—and then there's the communal gain. It's the gain to the whole community that hasn't always been accounted for when looking at the impact of private toilets.

But a critical mass of people needs to build toilets for the external benefits to take effect.

There's limited improvement to children's overall health if only a few households in a given village decide to invest in latrines. Researchers found that at least 30 percent of a village had to have access to proper sanitation for diarrhea rates to start dropping among those without toilets. When coverage reaches 75 percent of a given village, half the potential gains take effect (that is to say. a 25 percent reduction in diarrhea prevalence). Benefits increase steeply with higher levels of village sanitation access, which researchers say bolsters the policy goal of total village coverage.

The health benefits of toilets can't be viewed as a private issue and therefore, private markets can't sufficiently tackle the challenge.

The relationship between a village's overall sanitation and diarrhea underscores the importance of a communal approach to the open defecation issue. Individuals, on their own, can't significantly improve the health of their children if their neighbors don't take similar steps to curb open defecation and reduce the overall probability that a child will come into contact with human feces.

Did You Know…

82% of the one billion people practicing open defecation in the world live in just 10 countries.

India tops the list, followed by Indonesia, Pakistan, and Nigeria.

Diarrhea was responsible for 13% of child deaths in India in 2010

Some 65 million kilos of human feces are said to be dumped in India every day

Statistics from UNICEF

While governments can encourage individuals to invest in toilets, it's the community, rather than the individual household, that reaps most of the benefit. This means that campaigns for ending open defecation need to include a communal approach. Individuals may not be investing in toilets because unless everyone does the same, the direct benefits are so small. Policies, therefore, need to reflect the reality that sanitation is not a "private good"—and that whole villages must have sanitation to be made truly safe for children.

Conclusion

Open defecation remains a challenge to policy makers in India and other developing countries, and as the evidence from this research shows, the solution needs to be communal because the problem is a communal one. Indeed, piecemeal solutions can only make limited impact—because open defecation, by its very nature, affects an entire village: If you want to improve children's health, providing incentives to individuals for using toilets may not be enough. What's critical is ensuring that at least 30 percent of households in a village—and ideally, more than 50 percent—put in toilets. Otherwise, benefits are limited.

Total sanitation approaches like Community-Led Total Sanitation, which mobilize communities to take collective action to eliminate open defecation and ensure everyone in the community uses a toilet, have the potential to radically overhaul the health of millions of children across India and beyond. Ultimately, ensuring that kids stay healthy is critical to making sure they stay in school and have the tools to reach their potential. By tackling sanitation effectively, policy makers around the globe are helping to ensure a generation of healthier kids.

The Strategic Impact Evaluation Fund, part of the World Bank Group, supports and disseminates research evaluating the impact of development projects to help alleviate poverty. **The goal is to collect and build empirical evidence that can help governments and development organizations design and implement the most appropriate and effective policies for better educational, health and job opportunities for people in developing countries.** For more information about who we are and what we do, go to: http://www.worldbank.org/sief.

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THE WORLD BANK, STRATEGIC IMPACT EVALUATION FUND
1818 H STREET, NW WASHINGTON, DC 20433

Produced by the Strategic Impact Evaluation Fund
Series Editor: Aliza Marcus
Writer: Daphna Berman