

# Sanitation scores in India have room for improvement

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Sanitation scores, conferred on each of India's 421 largest cities by the national government, set a useful benchmark, say water-resources experts in Cornell's College of Agriculture and Life Sciences.

Now it's time for individual municipalities to custom-design measures that will save lives and lift their residents to improved health, according to Sridhar Vedachalam and Susan J. Riha. The researchers in the New York State Water Resources Institute report their analyses and recommendations in the journal *Environment & Urbanization* as "Who's the cleanest of them all? Sanitation scores in Indian cities."

"India is struggling to provide adequate water and [sanitation](#) services to its citizens," says Vedachalam, a postdoctoral associate in Earth and Atmospheric Sciences, the department where Riha is the Charles L. Pack Professor. They point to open defecation, insufficient wastewater treatment, and mixing of untreated wastewater with storm water and drinking water supplies as "contributing to a severe health and economic crisis."

Infrastructure improvements in recent years now provide more than 90 percent of India's urban population with access to improved sources of drinking water – but only 30 percent of urban wastewater is treated in centralized facilities. "The rest flows untreated into nearby lakes, rivers or wetlands, or is absorbed below ground, affecting the quality of nearby drinking water sources," Vedachalam and Riha report. Poor access to water and sanitation is partly responsible for as many as 535,000 lives

lost annually to preventable diseases like diarrhea, and for productivity losses to the Indian economy of 73 million working days, the Cornell researchers observe from other studies.

The researchers started with the Ministry of Urban Development sanitation rankings released in 2011, and considered several variables for each of India's largest cities: income per capita, city population and size of each municipal government, percentage of households that own all four "assets" (a television, computer or laptop, landline or mobile phone, and a car or motor scooter), literacy rate, fertility rate, and the percent of households with indoor toilets in each city.

Then they looked for relationships between variables and the sanitation score. For example, higher income per capita usually results in more tax revenues, which allows for better water and wastewater infrastructure. Literacy rates are positively associated with sanitation scores, whereas higher fertility rates are negatively correlated with the sanitation score.

As expected, family ownership of the four assets signified better economic status and was associated with improved sanitation. City population was not so straightforward (see sidebar). And increased presence of toilets – while easy to enumerate – does not influence the city-level sanitation score, the researchers wrote.

If India's national and municipal governments want to improve sanitation scores, the researchers advise "customized policy prescriptions for different classes of cities, preferably designed by municipal governments, that go beyond the targets set by the national government."

National programs, the authors said, "have played a significant role in increasing investment in cities of all sizes, but they need to be complemented by state and local governments, with active participation from the private sector and local communities."

It remains to be seen, Vedachalam and Riha conclude, "if these investments can result in measurably [improved health](#), environmental and social outcomes."

## Keeping score

India's Ministry of Urban Development SANSCORE system ranks cities into four categories: "healthy and clean" (90.5 points or above), "recovering but still diseased" (66.5 to 90.5 points), "need considerable improvement" (33.5 to 66.5 points) and "require immediate remedial action" (below 33.5).

The four best scoring cities achieved the "recovering but still diseased" rating. All the rest fell in the bottom half of the rating ladder.

**More information:** "Who's the cleanest of them all? Sanitation scores in Indian cities." *Environment and Urbanization* 0956247814560978, first published on January 16, 2015 [DOI: 10.1177/0956247814560978](https://doi.org/10.1177/0956247814560978)

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