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## Sanitation, Nutrition Better Than Vaccines at Protecting Children From Disease, Study Shows

Using data from India, researchers from the University of California, Irvine (UCI) modestly propose sanitation improvements “may play a role in strengthening [young] children’s immune response” and reducing their disease burden, while vaccine campaigns can’t come close to making the same claims.

By [Children's Health Defense Team](#)



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In the 19th century, improvements in quality-of-life fundamentals such as drinking water, sanitation, housing and nutrition helped launch the public health profession.

The [revolution in sanitation](#) was one of the critical milestones that enabled Victorian-era Britain to dramatically reduce rates of sickness and death.

And in the 20th-century U.S., [rising standards of living](#), including improvements in nutrition and sanitation, deserve the lion's share of the [credit](#) for health improvements — not vaccination or other medical interventions.

The significant decline in mortality from illnesses such as [measles](#), [pertussis](#) and [influenza](#) — today dubbed “vaccine-preventable” despite ample evidence of vaccine failure — occurred well before the development of any vaccines for those diseases.

U.S. data also [reveal](#) comparable declines in mortality for other conditions for which there was never a vaccine program.

Ignoring this unambiguous historical record, officials nonetheless turned vaccination into the [centerpiece](#) of U.S. (and global) public health policy, cementing the formation of a relentless medical-pharmaceutical-government juggernaut that — thanks to compromised legislators, regulators, scientists and private-sector players — brooks no questioning.

Now, in a rare departure from vaccine-centric public health dogma, a [study](#) published in The BMJ reminds us that old-fashioned public health interventions not only matter but can make a difference in a very short time frame.

Using data from India, researchers from the University of California, Irvine (UCI) modestly propose that sanitation improvements “may play a role in strengthening [young] children’s immune response” and reducing their disease burden.

Reading between the lines, the study’s results also suggest vaccination programs, for all their professed benefits, cannot come close to making the same claims.

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### **Putting sanitation back on the map**

Intrigued by the relationship between sanitation and childhood illness, the UCI team looked at the incidence in Indian children of four “vaccine-preventable” diseases (VPDs) — measles, diphtheria, pertussis and tetanus — before and after the government’s implementation of an ambitious program to achieve universal sanitation coverage.

India launched the [Swachh Bharat Mission](#) (SBM) or “Clean India Campaign” in 2014, to tackle the problem of [open defecation](#) (the depositing of human stool in open spaces and waterways).

The “world’s [largest toilet-building initiative](#)” included the construction of more than 100 million toilets.

Although India is the world’s [fifth-largest economy](#) and has achieved impressive reductions in poverty, it accounts for [60%](#) of the global population practicing open defecation. Within the country, this translates to somewhere between [26%](#) and [48%](#) of Indians.

Open defecation is a major cause of [diarrheal disease](#) in children. Even without diarrhea, fecal-oral contamination can also set in motion [environmental enteropathy](#) and a cascade of negative effects, including intestinal inflammation, malnutrition due to “significantly deranged” intestinal absorption, immune dysfunction and altered gut bacteria.

### Standout results for measles

The UCI researchers admitted it would have made sense to evaluate the impact of sanitation improvements on the occurrence of the conditions that account for the majority of diarrheal disease episodes in India: cholera, salmonella, hepatitis A and rotavirus.

Surprisingly, however, there are no “nationally representative, publicly available data sets” that would permit such analyses.

The researchers’ rationale for punting to the four above-listed VPDs has to do with the high incidence of those conditions — relative to other countries — in Indian children under age 5.

For example:

- Average measles incidence in that age group is estimated at 32.8 cases per 100,000, placing India among the top 10 countries worldwide. Global measles incidence as of 2019 was [12 per 100,000](#).
- The estimated incidence of pertussis for India’s children under 5 (31.1 per 100,000) is 10 to 15 times higher than in other large countries such as [Brazil](#), even in the context of [rising incidence](#) globally.
- Similar patterns hold true for [diphtheria](#) and [tetanus](#), with India’s incidence outpacing the global average.

What did the UCI team find when it examined disease incidence pre- and post-SBM?

“Rapid improvements in ambient sanitation through increased toilet availability correspond with a reduction in the annual incidence of measles” in children under 5.

Their findings also pinpointed the role of nutritional variables, such as vitamin A supplementation (long [recognized](#) as beneficial for reducing measles morbidity and mortality) and improved nutrition measured through the proxy of decreased childhood stunting.

Although they detected no impact of sanitation on the other three VPDs, they suggest this could be accounted for by underdiagnosis and underreporting due to a more ambiguous symptom profile.

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### ‘Low vaccine effectiveness’

India has one of the largest vaccination programs in the world. Even in 2013 — the study’s baseline year — coverage for measles and diphtheria-pertussis-tetanus (DPT) vaccination for children under age 1 was already around 80%.

Fond of big-splash public health campaigns, the government of India [declared](#), one year previously in 2012, a “year of intensification of routine immunization,” [announcing](#) several additions to its childhood vaccine schedule, and its intent to aggressively pursue “full immunization coverage ... particularly in remote, backward and inaccessible areas and urban slums.”

Typically, Indian children [receive](#) one measles shot around 9 to 12 months of age, followed by a second dose at 16 to 24 months, as well as five DPT doses, in the form of [problematic](#) DPT-containing combination vaccines and DPT boosters.

Additionally, the National Immunization Schedule promotes not one but two tetanus shots for women during pregnancy.

Against this backdrop, the UCI authors argue, “India’s abysmal global [VPD] ranking raises questions about low vaccine effectiveness.”

To explain vaccine “underperformance,” the UCI researchers cite [literature](#) suggesting [environmental enteropathy](#) and related gut dysfunction and undernutrition interfere with vaccine effectiveness — even though those findings largely pertain to orally administered rather than injected vaccines.

Other features of India’s childhood vaccination program might also have something to do with the higher-than-average under-5 mortality blamed on VPDs.

Consider the following:

- India has been at the forefront of the global rollout of [five-in-one](#) and [six-in-one](#) combination vaccines, the latter of which contain components for diphtheria, tetanus, pertussis, hepatitis B, Haemophilus influenzae type b and polio. Studies and manufacturer data link these potent concoctions to [infant deaths](#). (Vaxelis, a six-in-one vaccine containing a “double whammy” of untested [aluminum adjuvant](#), is now being given to [American infants](#).)
- India’s children receive [multiple doses](#) of oral polio vaccine (OPV) — so-called “pulse polio” vaccination — and inactivated polio vaccine (IPV), either alone or in combination vaccines. In 2018, Indian researchers [linked](#) OPV pulsing to hundreds of thousands of cases of pediatric paralysis, also noting the paralyzed children died at [twice](#) the rate compared to mortality caused by wild polio.
- India’s national vaccination program requires children in about 25% of the country’s districts to receive two doses of Japanese encephalitis (JE) vaccine in their first two years of life. Case reports and manufacturer inserts associate JE injections with [sudden death](#), [fatal myocarditis](#) and [life-threatening allergic reactions](#) in [children](#) and [young adults](#).

## Public health myopia

For the most part, timeless and unglamorous basics such as sanitation, when mentioned at all, are disparagingly [referred to](#) as “old public health.”

The UCI study shows the memory-holing of such measures is short-sighted.

Other researchers agree that water, sanitation, hygiene and nutrition interventions constitute a public health “[blind spot](#).”

Even [UNICEF](#), hardly a neutral party in pushing vaccines as “the world’s safest method to protect children from life-threatening diseases,” concedes the “[sanitation-nutrition nexus](#)” deserves “far greater attention by policy-makers, practitioners and researchers.”

In 2015, Indian researchers [questioned](#) their country’s rigid JE vaccination policy, calling for an urgent reappraisal and telling policymakers to “tread with caution!”

Noting that JE accounts for a minority of India’s brain-swelling cases, they described enteroviruses — illnesses associated with polio and meningitis and linked to [lax conditions of sanitation](#) — as “coming in a

big way as far as the encephalitis group of illnesses. . . is concerned.”

Their conclusion: “Public health efforts should not focus on vaccination alone.”

These types of observations, together with the UCI results, are reminders that it’s past time to reorient public health toward interventions that, unlike vaccines, not only do no harm but make a lasting difference.

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