

## Sanitation and disease: it's time to cut the crap!

Even if we don't talk about it, most of us will experience diarrhea in our lifetime, suffering little more than temporary discomfort and embarrassment. Except for the approximately 1.5 million people — over 350,000 of whom are children under five — who die each year due to diarrheal disease. Most of these deaths are caused by tiny pathogens that were excreted by an infected person, made their way into water, then were ingested by some unlucky person who got sick. Unlike many problems facing the world, we know how to fix this one — give people toilets or other sanitation technologies and the number of deaths and illnesses declines. Scientists have documented the connection between providing sanitation and reducing disease, and engineers have developed many cost-effective options for the safe collection, treatment, and disposal of human waste. Yet, in the developing world, 85% of sewage is discharged into waterbodies without being treated (see photo). Even in the industrialized world, treatment systems fail without proper management and maintenance. A recent study in the US found higher the density of septic systems in a watershed, the higher the amount of human fecal contamination. Simply put, we are not doing a good job keeping poop out of our water and people are getting sick and dying because of it.



Sewage drains from pit latrines directly into the Motoine River in Kibera, Kenya. Photo: Nicholas Kiulia.

Why haven't we solved this problem? Microbiologists Joan Rose and Walter Jakubowski explore this important question in a recent article published in *The Lancet Infectious Diseases*. The solution is to provide sanitation. In many cases, scientists and engineers don't have the information necessary for local decision-makers to create effective regulations or to select a cost-effective technology from the many options. In addition, there remain critical unanswered questions concerning the microorganisms that make us sick. How many are excreted by sick people? How long do pathogens live in the environment? Other questions concern sanitation. How many microbes do we need to remove to protect human health? What technology is best for a poor, rural household in Kenya and is that same technology appropriate for other places? Finally, there are

questions about management. What standards will ensure effective treatment? What risks are acceptable? Having the answers to these types of questions would allow us to manage waste more effectively.

In 1983 a group of scientists published a book that pulled together all the information about these types of questions. The authors synthesized the scientific knowledge available at the time on the occurrence, persistence, and control of pathogens in the environment. That book, *Sanitation and Disease: Health Aspects of Excreta and Wastewater Management*, became the “bible of sanitation” and is used across the world as a reference for scientists, engineers, and policymakers. But a lot has happened since 1983— new pathogens have emerged, new technologies were developed, and new management approaches created. It’s time for an update.

The Global Water Pathogens Project ([waterpathogens.org](http://waterpathogens.org)) was initiated to fill the knowledge gaps. A group of scientists and engineers from around globe are working to update information and provide new insights to improve the management of human waste. As part of the new project, decision-makers and those tackling the sanitation problem will be provided with one-stop shopping — an easy-to-access online resource with the information necessary to make wise choices about the best way to keep feces out of the water. So go ahead, talk about diarrhea. The more people talking about it and contributing to what we know about pathogens and sanitation, the faster we will make progress toward reducing disease.

***Erin A. Dreelin, Ph.D***

*Department of Fisheries & Wildlife and MSU Water Science Network  
Associate Director, Center for Water Sciences  
Michigan State University*

## **Publication**

[Sanitation and disease-updates are overdue.](#)

Rose JB, Jakubowski W

*Lancet Infect Dis.* 2015 Sep 21