

Over four billion people worldwide lack adequate sanitation

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One aspect of the global social crisis was revealed in a recent study published in the journal *Environmental Science & Technology*. Using 2010 sewerage connection data available from 167 countries and sewerage treatment data from 77 of those countries, the study found that 4.1 billion people in the world do not have access to basic sanitation, double the previous estimate. This includes a lack of flush toilets and exposure to untreated sewage.

The research, conducted by scientists at the University of North Carolina at Chapel Hill, was done as an assessment of the United Nations' 1990 Millennium Development Goal, which was supposed to cut in half "the proportion of the population without sustainable access to ... basic sanitation" over 25 years.

Compared to previous studies, it broadened what can be considered "improved sanitation" such that only areas that treat sewerage before discharging excreta into the environment were included.

The new definition raises the percentage of the population without basic sanitation in 1990 from 53 to 64, and estimates that the 2015 goal of the United Nations will not be met. Instead, the study projects that only five percent of the world's population will have gained access to improved sanitation by 2015.

By the UN's definition, basic sanitation is indicated by the percentage of people using facilities such as ventilated pit latrines, composting toilets and toilets connected to a sewer system, septic tank or pit latrine. Those without basic sanitation are those that have access only to basic pit latrines, chamber pots or use the bush or field. In general, basic sanitation "hygienically separates human excreta from human contact." Under this definition, 4.3 billion people have access to basic sanitation.

However, this broad categorization does not make

mention of sewerage treatment. Across the world, common practice is to simply dump untreated sewerage into nearby bodies of water. As a result, more than 50 percent of the world's lakes and rivers are polluted with untreated waste water. Coastal areas are similarly contaminated.

This exposes the populations using these bodies of water to human excreta via drinking water, contamination of fish, pollution of irrigation systems, and direct contact. Viruses and bacteria associated with such exposure include *E. coli* and cholera, among a host of others. Annually, nearly 1.6 million people die from waterborne diseases directly caused by unsanitary water.

A more expanded definition of "improved sanitation" is also required to account for the inter-connectivity of human society. Under the current UN definition, human populations are treated as though they are isolated from one another, so while one area may remain sanitary by dumping waste into a body of water, those downstream face the full dangers.

Access to sewerage treatment in individual countries was found to be affected by the income levels of the countries. For low income countries, generally those whose populations subsist below the world poverty level of \$1.25 per day, less than four percent of the population have access to sewerage at all. There is little to no waste treatment. Only high income countries have both sewerage connections and treatment, averaging at 80 percent of their populations.

Across the world, 1.5 billion people have sewerage systems that do not include treatment, thus affecting nearby populations. Asia accounts for 69 percent of this figure, with Europe and South America accounting for 12 percent and 11 percent respectively. This figure does not include the 2.6 billion people world-wide who are

simply lacking adequate sewerage. Moreover, an investigation into the lack of other sanitation facilities that lead to contamination of the local and wider environment would no doubt reveal that even a larger majority of the world's population is denied the basic social right to a healthy and safe environment.



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