

# COVID-19 tracing of human feces in wastewater could indicate future outbreaks

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Ben-Gurion University of the Negev (BGU) scientists have developed a new methodology to trace the SARS-CoV-2 virus through the sewage and wastewater systems, which could potentially be used to track existing and future outbreaks of the coronavirus.

Environmental monitoring of [sewage](#) can be effective if clinical testing is deficient in ascertaining the infection rate. Sewage surveillance can provide better estimates of how widespread the virus is to determine the extent of those who are infected but have not been tested and are asymptomatic or have only mild symptoms. If the virus is identified in wastewater, using the population size, the researchers can calculate the amount of virus shed in feces and then extrapolate the number of infected people in a population from these samples.

The research team has already determined that SARS-CoV-2 is transferred through feces into the sewage, and is now seeking to determine if the virus remains contagious in sewage. Previous coronaviruses, like SARS, could only survive below

20°C (68°F) for long periods in sewage. The team is planning on testing the samples to see if the virus is still capable of infecting someone or only present and not contagious.

The BGU researchers found SARS-CoV-2 RNA in sewage after conducting sampling at all the [wastewater treatment plants](#) in Israel and several additional spots in the sewage pipeline in the Tel Aviv area before, during and after the coronavirus outbreak. The BGU researchers also found a larger concentration in the Bnei Brak area, which was an outbreak hotspot in Israel. Therefore, they believe screening sewage and wastewater could give a better indication of the spread of the virus than current methods.

In 2013, the same BGU team discovered an outbreak of wild polio in the sewage that only reproduced in humans, so they knew the virus was in the population.

Israel is the world's leader in wastewater reuse for agriculture, so it is critical to determine if the virus is being passed through human excrement or other routes into the sewage while remaining infectious. If it does remain infectious, then sewage maintenance workers could be an additional vector for the [virus](#) spread. This is of great relevance to high-risk communities and regions with inadequate sanitary conditions, where someone is more likely to be exposed to untreated sewage.

The research team includes leader Prof. Ariel Kushmaro of the BGU Avram and Stella Goldstein-Goren Department of Biotechnology Engineering; Dr. Yakir Berchenko of BGU's Department of Industrial Engineering and Management; and Dr. Oded Nir, of the Department of Desalination and Water Treatment at BGU's Zuckerberg Institute for Water Research. Other members include Dr. Itay Bar-Or, a virologist from Sheba Medical Center, and Prof. Eran Freedler at the Technion Israel Institute of Technology.

"Testing water systems is an established practice for municipalities so this process could yield valuable data that could prevent transmission and save lives, especially given the shortage of testing capabilities right now in the U.S. and many countries," explains Doug Seserman, chief executive officer of the New York-based American Associates, Ben-Gurion University of the Negev (AABGU). "This is yet another example of BGU's world renowned researchers devising solutions to address global challenges of COVID-19."

The new approach is just one of some 70 initiatives underway as part of the BGU COVID-19 Response Effort. These each require [financial support](#), and AABGU has announced its commitment to raise emergency funds, enabling BGU to participate fully in the world's efforts at mitigation and containment.

**More information:** Contributions can be made online at: [www.aabgu.org/donate-covid-19](http://www.aabgu.org/donate-covid-19)

Provided by American Associates, Ben-Gurion University of the Negev

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