

**Covid
virus**

Science Matters

**Sewage
system**

Infected person

1 Person inhales SARS-CoV-2 virus particles, enclosed in oily envelopes

2 Virus invades the body and explosively clone their genetic material (RNA)

3 Spreading virus may cause breathing, nerve, circulation symptoms

4 Some viral copies are shed inside the intestines and adhere to stool

5 When the person eliminates, viral RNA is flushed into the sewage system

Sewers can reveal Covid cases

Samples taken from sewage treatment plants can carry signs of coronavirus – accurate evidence of the pandemic's progress, no hospital data or Covid test results required.



Wastewater processing plant

Chemical and physical wastewater treatment is highly effective in deactivating viruses

That and viruses' natural decay, meant waste water poses no significant health risk

Testing system, detection of Covid variants

Uses a highly sensitive test commonly used to detect the virus in nasal swabs: **polymerase chain reaction (PCR)**

Test is so sensitive it can detect the virus when just **one person out of 100,000** using the area's sewers is infected

α β γ δ ο
Alpha Beta Gamma Delta Omicron

Genome of the virus is analyzed, indicating which genetic strain (variant) of SARS-CoV-2 it is

After eight days, the amount of virus in wastewater samples decreases – the length of time an infection outbreak starts to slow

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Source: US National Wastewater Surveillance System; US Centers for Disease Control and Prevention; Coronavirus Alert Network; Italian river study in medRxiv journal; TNS Photos
Graphic: Helen Lee McComas, Tribune News Service