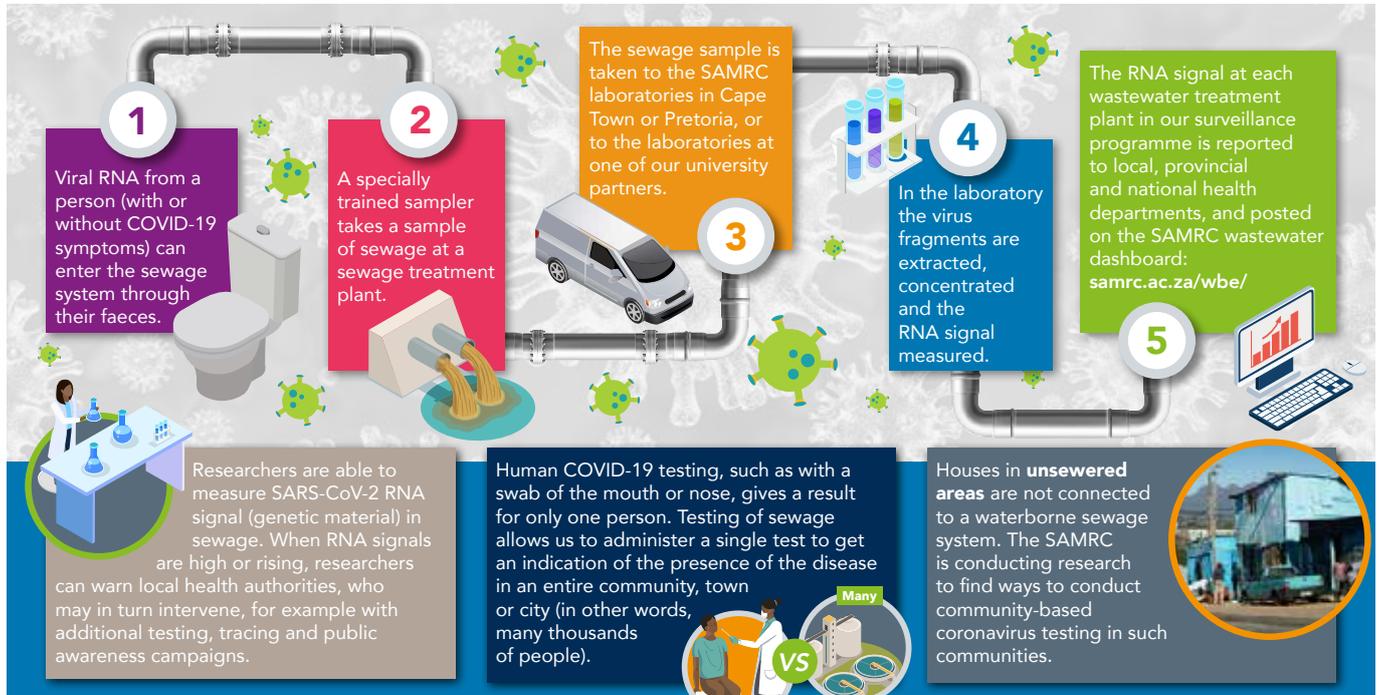


Coronavirus in sewerage

THE ROLE OF THE SAMRC IN THE DETECTION OF CORONAVIRUS RNA IN SEWAGE

(AN EARLY WARNING SYSTEM FOR COVID-19 INFECTIONS)



How does collecting wastewater samples help identify areas where there may be COVID-19 outbreak?

With the outbreak of the coronavirus disease 2019 (COVID-19), many countries around the world started to look for ways to monitor the presence of COVID-19 in their communities. One of the ways to monitor the spread of a virus in communities has been through the testing of wastewater (or sewage). This has historically played a key role in the development of strategies to deal with harmful viruses such as poliovirus, norovirus and hepatitis.

Soon after the start of the COVID-19 pandemic, the South African Medical Research Council (SAMRC) brought together five of its research units, including the Environment and Health Research Unit, the Biomedical Research and Innovation Platform, the Tuberculosis Platform, the Genomics Centre and the Biostatistics Unit, to coordinate the SAMRC Wastewater Surveillance and Research Programme (WSARP). The SAMRC WSARP monitors fragments of SARS-CoV-2, the virus that causes COVID-19, by collecting wastewater samples from wastewater treatment plants across South Africa. SARS-CoV-2 viral fragments from infected persons, with or without

COVID-19 symptoms, enters the sewerage system through their faeces. Testing sewage gives us an indication of the presence of COVID-19 in a particular area or community.

The monitoring of SARS-CoV-2 in wastewater is conducted across selected cities and towns in various provinces in South Africa. It is important to note that when wastewater is tested, the SARS-CoV-2 virus is no longer infectious. To date, there is no evidence that shows that people can become sick with COVID-19 because they came into contact with wastewater.

On Monday mornings, wastewater samples are collected from selected wastewater treatment plants in various parts

SAMRC SARS-CoV-2 WASTEWATER SURVEILLANCE DASHBOARD
AN EARLY WARNING SYSTEM FOR COVID-19 INFECTIONS

of the country by trained individuals. These wastewater samples are collected at the same time each week. As soon as possible after collection, the samples are transported under refrigerated conditions to the SAMRC or partner university-based laboratories. It is necessary to keep the sample cold to delay its degradation.

The SAMRC has established standardised methods for SARS-CoV-2 detection in wastewater and is responsible

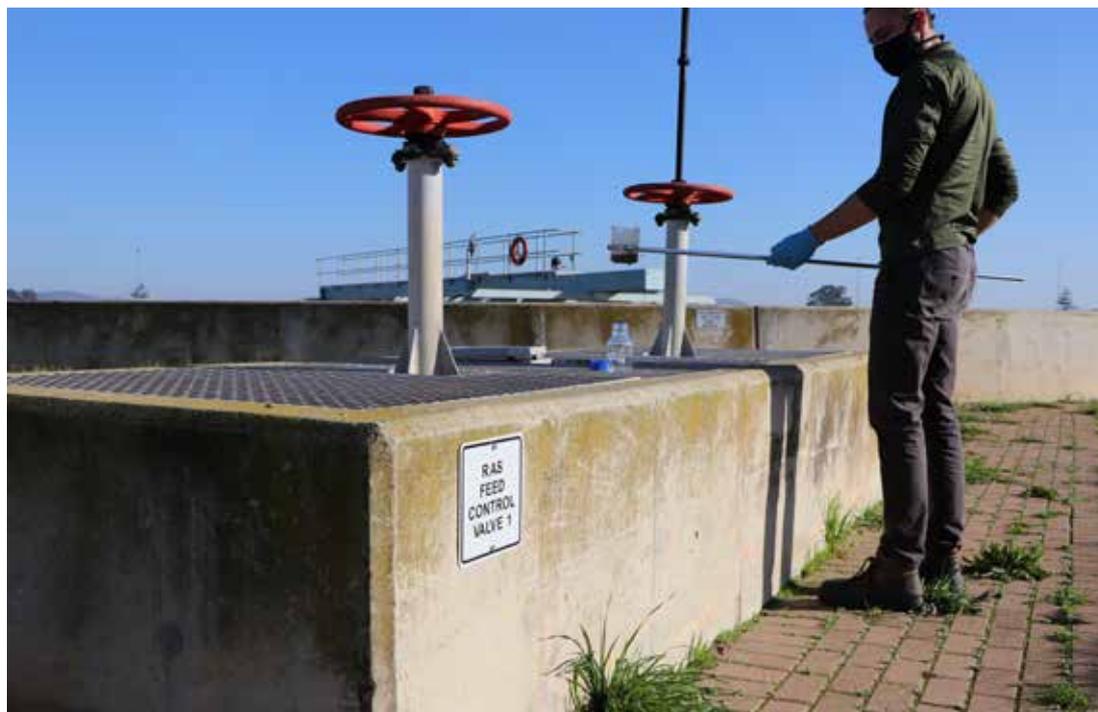
for training partner institutions. In the laboratory, the SARS-CoV-2 fragments are extracted, concentrated and the fragment amounts measured. The laboratories confirm the presence and determine the amount of SARS-CoV-2 viral fragments in each wastewater sample. Since the SARS-CoV-2 virus has been



undergoing changes, additional analysis of some of the samples is done to detect known variations of the virus that are concerning. The programme also has a Genomics Centre to detect new variants of the virus. By testing wastewater weekly, we can measure the SARS-CoV-2 fragment levels and detect the rise of SARS-CoV-2 variants in our communities.

Once the data has been collected and organised, it is important to share the results with the public health and medical communities. The SARS-CoV-2 fragments detected at each wastewater treatment plant in the SAMRC WSARP programme are reported to local, provincial and national health departments, and posted on the SAMRC's public dashboard.

The SAMRC SARS-CoV-2 Wastewater Surveillance Dashboard was launched in November 2020 and presents the



results of the amount of SARS-CoV-2 fragments in wastewater. The dashboard was created so that the public is able to freely check on findings at some of the communities monitored by the programme. The trends observed in the wastewater gives us an indication of COVID-19 trends in a particular area. This becomes very useful to identify areas where there are a lot of people with COVID-19 and can guide action in preparing strategies for the fight against COVID-19. Health authorities have been able to use the wastewater data and other public health information to carry out plans to address COVID-19, such as alerts to health professionals and increased public awareness programmes on the importance of wearing face masks, physical distancing and hand hygiene.

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