

# Wastewater Based Epidemiology

How wastewater may provide an effective resource in battling COVID-19.

## What is wastewater-based epidemiology?

Wastewater is a rich source of information about the health of the population from which it comes from. For decades, researchers around the globe have been successfully using wastewater for early detection of polio and other diseases. Now, researchers and public health officials are looking to wastewater as a means to track and combat SARS-CoV-2, the virus that causes COVID-19. Fortunately, COVID-19 has not been shown to remain viable in wastewater but its genetic signal (RNA) can still be detected and serve as an effective diagnostic tool.

**When people infected with COVID-19 use the bathroom, they shed strands of SARS-CoV-2 RNA, the genetic material of the virus, into the sewer system.** By sampling the sewage flowing into our wastewater treatment plants, researchers can spot early warning signs of infection within a community, track trends, and monitor hot spots. There is a lot of research yet to be done. Still, wastewater-based epidemiology offers a promising tool to help our communities respond more effectively to COVID-19.

## How does wastewater sampling work with other COVID-19 testing?

Wastewater sampling can provide a useful complement to the clinical testing of individuals. Some people can be infected with COVID-19 without showing any symptoms; as a result, they may be less likely to get tested. Further, some communities continue to face testing shortages. By providing a snapshot of virus levels within a community as a whole, wastewater analysis can help to fill in the gaps of clinical testing.

At this time, wastewater sampling cannot tell us the number of infected people in a community. **However, it can offer a way to monitor population-level trends that is more efficient and less expensive than repeated, in-person testing.** In this way, wastewater sampling can provide additional information to help health officials determine when it is safe to reopen schools and businesses—or alert them to when the virus may be resurging in their communities.

## Where is wastewater-based epidemiology being used?

Numerous wastewater utilities in California and across the country are already using wastewater-based epidemiology on a limited basis to track COVID-19, in collaboration with local, state, and federal public health officials. Multiple universities and public and private labs are performing the analyses. Together, they are exploring ways to build monitoring programs based on sound science and working hard to develop best practices for generating information that is useful, consistent, and reliable.

## What happens to SARS-CoV-2 in our wastewater?

SARS-CoV-2 Wastewater utilities routinely manage wastewater that may be contaminated with a variety of pathogens (viruses, bacteria, and protozoa). In many ways, responding to SARS-CoV-2 is not that different from what they've always done. Some pathogens, like SARS-CoV-2, aren't able to survive the journey through neighborhood sewer pipes to your community's wastewater treatment plant. For those that do, treatment plants rely on different methods to disinfect the water they clean, including chlorine or ultraviolet light. **Disinfection kills any harmful pathogens that may still be in the water, so that the cleaned water can be safely returned to the environment.**





# Wastewater Based Epidemiology

How wastewater may provide an effective resource in battling COVID-19.

## What is wastewater-based epidemiology?

Wastewater is a rich source of information about the health of the population from which it comes from. For decades, researchers around the globe have been successfully using wastewater for early detection of polio and other diseases. Now, researchers and public health officials are looking to wastewater as a means to track and combat SARS-CoV-2, the virus that causes COVID-19. Fortunately, COVID-19 has not been shown to remain viable in wastewater but its genetic signal (RNA) can still be detected and serve as an effective diagnostic tool.

**When people infected with COVID-19 use the bathroom, they shed strands of SARS-CoV-2 RNA, the genetic material of the virus, into the sewer system.** By sampling the sewage flowing into our wastewater treatment plants, researchers can spot early warning signs of infection within a community, track trends, and monitor hot spots. There is a lot of research yet to be done. Still, wastewater-based epidemiology offers a promising tool to help our communities respond more effectively to COVID-19.

## How does wastewater sampling work with other COVID-19 testing?

Wastewater sampling can provide a useful complement to the clinical testing of individuals. Some people can be infected with COVID-19 without showing any symptoms; as a result, they may be less likely to get tested. Further, some communities continue to face testing shortages. By providing a snapshot of virus levels within a community as a whole, wastewater analysis can help to fill in the gaps of clinical testing.

At this time, wastewater sampling cannot tell us the number of infected people in a community. **However, it can offer a way to monitor population-level trends that is more efficient and less expensive than repeated, in-person testing.** In this way, wastewater sampling can provide additional information to help health officials determine when it is safe to reopen schools and businesses—or alert them to when the virus may be resurging in their communities.

## Where is wastewater-based epidemiology being used?

Numerous wastewater utilities in California and across the country are already using wastewater-based epidemiology on a limited basis to track COVID-19, in collaboration with local, state, and federal public health officials. Multiple universities and public and private labs are performing the analyses. Together, they are exploring ways to build monitoring programs based on sound science and working hard to develop best practices for generating information that is useful, consistent, and reliable.

## What happens to SARS-CoV-2 in our wastewater?

SARS-CoV-2 Wastewater utilities routinely manage wastewater that may be contaminated with a variety of pathogens (viruses, bacteria, and protozoa). In many ways, responding to SARS-CoV-2 is not that different from what they've always done. Some pathogens, like SARS-CoV-2, aren't able to survive the journey through neighborhood sewer pipes to your community's wastewater treatment plant. For those that do, treatment plants rely on different methods to disinfect the water they clean, including chlorine or ultraviolet light. **Disinfection kills any harmful pathogens that may still be in the water, so that the cleaned water can be safely returned to the environment.**

