National Wastewater Surveillance System (NWSS)

A new public health tool to understand COVID-19 spread in a community

The Centers for Disease Control and Prevention (CDC) and the US Department of Health and Human Services (HHS), in collaboration with agencies throughout the federal government, are initiating the National Wastewater Surveillance System (NWSS) in response to the COVID-19 pandemic. The data generated by NWSS will help public health officials to better understand the extent of SARS-CoV-2 (the virus that causes COVID-19) infections in communities.

CDC is currently developing a portal for state, tribal, local, and territorial health departments to submit wastewater testing data into a national database for use in summarizing and interpreting data for public health action. Participation in a national database will ensure data comparability across jurisdictions.

Data from wastewater testing are not meant to replace existing COVID-19 surveillance systems, but are meant to complement them by providing:

- An efficient pooled community sample.
- Data for communities where timely COVID-19 clinical testing is underutilized or unavailable.
- Data at the sub-county level.

What is wastewater surveillance for COVID-19?

- "Wastewater", also referred to as "sewage," includes water from household/building use (i.e., toilets, showers, sinks) that can contain human fecal waste, as well as water from non-household sources (e.g., rainwater and industrial use.)
- Wastewater can be tested for RNA from SARS-CoV-2.
- While SARS-CoV-2 can be shed in the feces of individuals with COVID-19, there is no information to date that anyone has become sick with COVID-19 because of direct exposure to treated or untreated wastewater.

What are the advantages of wastewater infectious disease surveillance?

- Sewage testing has been successfully used as a method for early detection of other diseases, such as polio.
- SARS-CoV-2 can be shed in the feces of individuals with symptomatic or asymptomatic infection; therefore, wastewater surveillance can capture data on both types of infection.
- Nearly 80 percent of United States households are served by municipal sewage collection systems.
- Quantitative SARS-CoV-2 measurements in untreated sewage can provide information on changes in total SARS-CoV-2 infection in the community contributing to that wastewater treatment plant (that area is known as the "sewershed.")
- Depending on the frequency of testing, sewage surveillance can be a leading indicator of changes in COVID-19 burden in a community.
- SARS-CoV-2 RNA detection in sewage serves as a COVID-19 indicator that is independent of healthcare-seeking behaviors and access to clinical testing.

Is wastewater surveillance right for my community?

Wastewater surveillance for RNA from the virus that causes COVID-19 is a developing field. Health departments setting up a sewage-based infectious disease surveillance system should consider the following to generate data that is useful for public health response:

- Sewage testing over time can provide trend data that can complement other surveillance data that informs public health decision making. However, at this time, it is not possible to reliably and accurately predict the number of infected individuals in a community based on sewage testing.

- Community-level wastewater surveillance at a treatment plant will not capture homes on a septic-based system.

- Community-level wastewater surveillance at a wastewater treatment plant also will not capture communities or facilities served by decentralized systems, such as prisons, universities, or hospitals that treat their waste.

- Low levels of infection in a community may not be captured by sewage surveillance. The lower limits of detection (i.e., the smallest number of people shedding the virus in stool that can still be detected by current testing methods) for sewage surveillance are not yet well understood. More data on fecal shedding by infected individuals over the course of disease are needed to better understand the limits of detection.

- All wastewater treatment plants may not be appropriate as sites for surveillance given their operations logistics (e.g., if sewage is pre-treated before it reaches the plant.)

- Information on implementing wastewater surveillance in areas served by low resource waste systems can be found here.

How can I implement wastewater-based disease surveillance?

Wastewater-based disease surveillance is a rapidly developing science, and CDC will provide updated guidance and information as it becomes available. The links below will address specific recommendations for consideration when implementing a wastewater-based disease surveillance system:

- Sampling Strategy: Where, How, and What to Sample
- Testing Methods
- Data Reporting and Analytics
- Public Health Interpretation and Use
- Targeted Wastewater Surveillance at Facilities, Institutions, and Workplaces

How do I become engaged in NWSS?

Using wastewater surveillance for public health action requires a multidisciplinary approach. Communities interested in conducting wastewater surveillance for COVID-19 should identify the necessary local partners for sample collection, testing, and public health action.

Local partners should include:

- State, local, tribal, and territorial health departments – COVID-19 epidemiologists and environmental health specialists.

- Wastewater treatment plants and workers.

- Laboratories – public health, environmental, academic, and/or private (Note: CDC is not currently accepting sewage samples for testing.)

National Wastewater Surveillance System (NWSS) is currently ramping-up efforts through partnerships with state, local, tribal, and territorial health departments. Additional information, including sampling, testing, and interpretation guidance, minimum reporting requirements, and instructions for reporting through the data portal will be updated on this page as they become available.

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