Ontario Wastewater Surveillance Initiative

Background and Context

As part of Ontario's COVID-19 Fall Preparedness Plan to quickly identify, manage and prevent outbreaks, the province is investing over $12 million in a COVID-19 wastewater surveillance initiative to test wastewater samples in communities across the province to determine how wastewater surveillance can be used in conjunction with clinical data as a tool to inform a public health response.

Ontario is in "wave 2" of COVID-19, with cases increasing daily. Many people that are infected may not show any symptoms, so other ways of testing for the presence of COVID-19 in a community is needed. For those individuals that are tested, obtaining results takes time, which does not provide Public Health Units with a close to real-time reflection of COVID-19 activity in the community. Other means of determining the degree of COVID-19 presence are needed, hence the investment in wastewater surveillance.

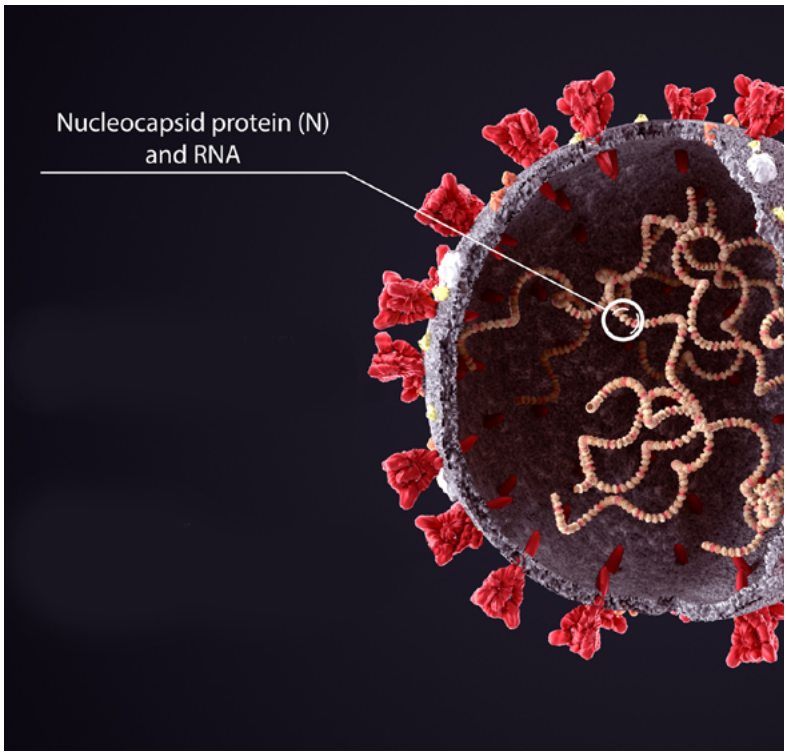
State of the Science

Studies have shown that a significant proportion of people with active COVID-19 infections shed the virus in their stool, sometimes even before their symptoms start.

Wastewater-Based Epidemiology (WBE) surveillance for COVID-19 is underway in a number of jurisdictions globally. For example, the Netherlands is sampling over 300 sewer-sheds across the country and is using the data with other public health screening tools to identify early community spread of COVID-19.

Ontario

Wastewater surveillance tests for the presence of genetic material (known as RNA) in wastewater effluent. It offers the ability to test the whole sub-population including people with and without COVID-19 to identify community trends at a relatively low cost. The testing is not limited by personal behaviour (e.g. choosing to not get tested) and captures both asymptomatic and symptomatic people. While WBE is not able to offer information on the number of cases, it can indicate the presence and trends of COVID-19 in the community generally a few days earlier than when individuals present symptoms.



Benefits of Wastewater Based Epidemiology Surveillance

Along with other clinical and public health data, wastewater sampling can help local Public Health Units identify “hot spots” for the virus, which can inform decisions on where and how to mobilize resources in response. WBE can also benefit municipalities and Public Health Units by:

- Targeting areas with defined, higher-risk or vulnerable populations within the sewershed where early action may be most beneficial (neighbourhood, facility-level, northern and First Nation communities).
- Helping to optimize application and allocation of resources for clinical testing.
- Protecting capacity of Public Health Ontario, hospital and private laboratories.
- Identifying transmission trends and informing predictive modelling.
- Helping evaluate response effectiveness.
- Informing decision on future surveillance expansion or relocation.

Ontario Perspective

Ontario is partnering with academic institutions, in cooperation with Public Health Units and municipalities, to create an integrated project that expands wastewater sampling and analysis provincewide, including some vulnerable populations, such as First Nation communities, long-term care homes and correctional facilities.

Several universities across Ontario are already supporting local Public Health Units by sampling wastewater to help identify COVID-19 trends in their community. For example, the University of Ottawa and the Children's Hospital of Eastern Ontario Research Institute are working with the Robert O. Pickard Environmental Centre (ROPEC), which collects and treats wastewater from over 90 per cent of Ottawa's population. Wastewater samples are collected five days a week from ROPEC and transported to the laboratory where viral RNA levels are immediately tested, and results reported the next morning.

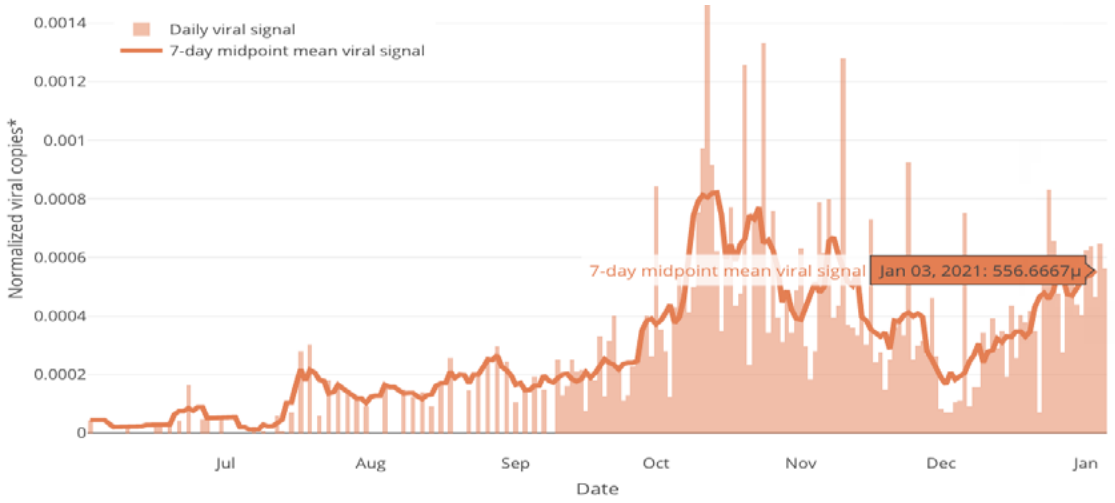
This Ottawa-based partnership has noticed that WBE surveillance may be able to detect the early presence of COVID-19 in the community, where there is a low level of COVID-19 infection noticed in clinical testing (See Figure 1 for how COVID-19 wastewater viral signal is being tracked in Ottawa). The University of Waterloo is noticing similar trends for the Region of Peel and York Region, so has the University of Windsor for London, Windsor and Essex County.

There is currently no epidemiological evidence that wastewater is a route of transmission of COVID-19. Wastewater workers should continue to follow routine practices to prevent exposure to wastewater.

This initiative is one of many tools the province is using to help stop the spread of COVID-19. Everyone should continue to follow public health advice, such as washing hands, wearing a mask, maintaining physical distancing and getting tested if you have symptoms of COVID-19.

The Ontario Clean Water Agency, Ministry of the Environment, Conservation and Parks, and Ministry of Health are committed to working with local Public Health Units, municipalities, vulnerable community partners, and building additional capacity at university laboratories to help inform and plan for additional wastewater surveillance targets.

Figure 1: Ottawa COVID-19 Wastewater Viral Signal



Should you have any questions about this initiative please contact:
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