Hamilton Board of Health
Report for Information

To:	Chair and Members Board of Health
Date:	July 7, 2025
Report No:	BOH25013
Subject/Title:	Feasibility of Implementing Wastewater Surveillance
Ward(s) Affected:	(City Wide)

Recommendations

1) That Report BOH25013 respecting Feasibility of Implementing Wastewater Surveillance **BE RECEIVED** for information.

Key Facts

- At its meeting on January 12, 2025, the Public Health Sub-Committee meeting, passed a motion directing staff to report back on the feasibility of implementing a local wastewater surveillance program to monitor respiratory viruses, Mpox, and Avian influenza A (H5N1), in response to the discontinuation of the provincial wastewater surveillance program;
- Local wastewater testing is not currently budgeted and would require additional funding to implement;
- Clinical testing remains the primary method for case identification, outbreak detection, and public health management of respiratory virus outbreaks;
- Local respiratory virus transmission status is updated weekly on the City of Hamilton website during respiratory season to help the public assess the local risk and take personal protective measures; and,
- Wastewater surveillance is a feasible tool that has been used alongside traditional clinical testing but is not considered essential to assess local infectious disease transmission at the local or provincial level.

Financial Considerations

Establishing a local wastewater surveillance program would create annual costs. The University of Ottawa, which previously provided wastewater analysis as part of the provincial wastewater surveillance program through the Ministry of Environment, Conservation, and Parks, upon the termination of the provincial program indicated to Hamilton Public Health Services a cost estimate of $55 K to continue this surveillance. Additionally, McMaster University provided Public Health Services with an unsolicited estimate following the January 12, 2025, Public Health Sub-Committee meeting. McMaster University estimated a wastewater surveillance program would cost between $87.5 K and $188 K, depending on the agents being tested for, using existing equipment and expertise. If such a program were to be implemented, the actual costs would need to be ascertained through a competitive procurement process. There is no available funding for wastewater surveillance within Public Health Services' existing budget; any implementation would need to be referred for consideration in the 2026 budget process.

FTE Impacts:
Based on our understanding of the current methodology and processes, implementation of a local wastewater surveillance program could be completed with existing staff resources.

Support from Hamilton Water, within the Public Works Department would be required to provide wastewater samples for testing, amounting to approximately 0.03 FTE.

Epidemiology & Evaluation, within Public Health Services, would be required to support the analysis and reporting of wastewater surveillance, amounting to approximately 0.03 FTE.

Were a program to be implemented with a different methodology requiring additional FTE, this would be brought to the Public Health Sub-Committee in a subsequent report.

Background

At the January 13, 2025 Public Health Sub-Committee, the following motion was passed:

> **9.2 Feasibility of Implementing Wastewater Surveillance**
> That staff **BE DIRECTED** to report back to the Public Health Sub-Committee by Q3 2025 with a report outlining the feasibility of implementing a local wastewater surveillance program, including respiratory viruses (influenza, SARS-CoV-2, RSV), mpox and H5N1.

Analysis

Public health surveillance tracks disease activity and health events by collecting, analyzing, and reporting data to identify and understand health threats with the goal of informing key actions necessary to promote and protect the health of the population. For example, Public Health Services tracks influenza, coronavirus disease (COVID-19), and

respiratory syncytial virus (RSV) by compiling case data and test results from local and external sources. During the respiratory season, Public Health Services collates local data and compares it with information from other geographic areas. Public Health Services creates and shares a summary of respiratory virus activity on the City of Hamilton's public website. This surveillance helps Public Health Services understand local trends in disease activity, support staff inform local institutions and healthcare providers of those trends to support their own disease surveillance and practice, and can inform outbreak management while awaiting test results. It also helps residents understand and assess the level of risk in the community so they can take steps to protect themselves.

Tracking individual cases of illness, known as clinical case surveillance, remains essential in managing outbreaks. It enables identifying and confirming individual cases, helps to understand how the disease is spreading, and provides insight into how serious the illness is and who is most affected. Tailored control measures such as isolation, contact tracing, and targeted testing, depend on the accurate and timely detection of individual cases and exposures. Without this kind of accurate, specific, and timely information, public health lacks the precision required to respond effectively.

Wastewater surveillance is a tool for infectious disease surveillance that became more widely used during the coronavirus disease (COVID-19) pandemic. It tests samples of wastewater for infectious disease targets and indirectly measures the presence of infectious diseases amongst a large population and geography. In 2020, Public Health Services began participating in a wastewater surveillance initiative established by the provincial Ministry of Environment, Conservation, and Parks, which ended in August 2024. Wastewater samples were collected by Hamilton Water and analyzed by a laboratory at the University of Ottawa. The Public Health Agency of Canada has an ongoing national coronavirus disease (COVID-19) wastewater surveillance program, including sampling sites in Ontario, but Hamilton is not currently a site under this program.

Wastewater surveillance provides population-level insights beyond clinical data, as it may detect disease activity from people who do not have symptoms or have not been tested. However, it also has limitations. Wastewater surveillance does not measure the number of cases, identify who is infected or the severity of their illness, or trigger public health actions beyond what is already conducted through existing clinical and outbreak management protocols. For example, in late 2023 and early 2024, increased levels of Mpox were detected in Hamilton's wastewater, but no actual cases were confirmed through clinical testing. Therefore, it shows that more research is needed to understand the correlation between wastewater signals and disease activity before it can be confidently used to trigger public health action.

Wastewater surveillance, particularly during respiratory virus season, may support and confirm trends seen through clinical testing. In Public Health Service's experience, when respiratory wastewater data had been available, it generally aligned well with case data but did not provide new information that led to different public health actions. While wastewater surveillance may provide early local signals of infectious disease case activity, these are unlikely to influence provincial decisions such as the start of

vaccination campaigns. The Ontario Ministry of Health typically bases public health actions, such as the start of respiratory virus vaccination campaigns, on established, standardized clinical surveillance data such as laboratory-confirmed cases or hospitalization rates. Existing infectious disease surveillance in Ontario utilizes standard comparable methodology that allows for assessment of trends and overall morbidity and mortality at the provincial level as well as between jurisdictions. When wastewater surveillance is used inconsistently between jurisdictions and with differing methodology, this limits the utility of this data to be used to compare and interpret trends inter-jurisdictionally.

Infectious disease wastewater surveillance is an area of ongoing research, including the development of new target markers for other infectious diseases where wastewater surveillance has not yet been applied. Research is also being completed to understand the utility of wastewater data to inform public health action. This research will be important to determine the most effective use of wastewater surveillance as part of an overall surveillance system rather than local implementation.

While implementation of a local wastewater surveillance system would be feasible, it would require additional funding and, at this time, does not clearly provide Public Health Services with actionable data beyond that already obtained through existing surveillance methods. Wastewater surveillance is a supplemental tool that complements, but does not replace, clinical testing and traditional surveillance systems, and would be an adjunct to the existing public facing communication that Public Health Services provides for respiratory surveillance.

Given limited financial resources, it would be reasonable to not invest at this time in a local wastewater surveillance program until ongoing research provides clearer guidance on its most effective use, or as a part of participation of a larger overall surveillance system coordinated at a higher level of government. Waiting for evidence-based recommendations will help ensure that any future implementation is both cost-effective and aligned with public health needs at the local level.

Consultations

For Report BOH25013, Hamilton Water provided staffing estimates (0.03 FTE) for collection and preparation of wastewater specimens from Woodward Wastewater Treatment Plant, three times per week, for shipping to local laboratory conducting wastewater sampling.

Finance and Administration reviewed the financial and FTE sections of Report BOH25013.

Alternatives

Not Applicable.

Previous Reports Submitted

Not Applicable.

Consultation

- Rita Armenti, Superintendent, Environmental Laboratory, Hamilton Water, Public Work Department
- David Trevisani, Manager, Finance and Administration, Healthy and Safe Communities Department

Appendices and Schedules Attached

Not Applicable.

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