COVID-19 Wastewater Surveillance Survey Results

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Key Findings

- Based on 33 Public Health Units (PHU) that responded to the survey, wastewater surveillance (WWS) data were generally seen as a complementary tool for COVID-19 surveillance.

- The most common uses cited by PHUs were monitoring viral shedding for trends over time, determining its presence or absence in the community, and as an early indicator of changes in trends such as rises, peaks, or declines.

- One quarter of PHUs reported institutional monitoring at sites such as universities, correctional facilities, and long-term care homes.

- Most PHUs shared WWS data in publicly accessible dashboards and websites.

- The most common gaps identified by PHUs were the frequency of wastewater sample collection, and the length of time taken to report sample results to PHUs.

Objectives and Scope

This survey was designed by Public Health Ontario to respond to the Ministry of Health's need to understand the value, use, and needs related to COVID-19 wastewater surveillance (WWS) specifically for PHUs in Ontario. The intention is to use this information to inform provincial wastewater surveillance planning. All Ontario PHUs were invited to participate in this survey to understand the perspectives of the PHUs and to identify strengths and limitations of the current COVID-19 WWS program in Ontario.

Background

Through a program coordinated by the Ministry of Environment, Conservation and Parks (MECP), wastewater from sampling sites across Ontario is tested, largely by academic laboratories, and results are shared with PHUs participating in the program. In addition to the program coordinated through the MECP, some PHUs receive wastewater testing results from the National Microbiology Laboratory. The reduced availability of COVID-19 clinical testing at the end of 2021 increased PHU interest in WWS data. WWS remains a rapidly evolving area with varied uses and experiences with COVID-19 surveillance reported by PHUs. To better understand the current state of use of WWS for COVID-19 surveillance across Ontario, including strengths and areas requiring improvement, a survey was sent to all PHUs.

Methods

All PHUs were invited to participate in this online survey from April 14, 2022, to May 3, 2022. The survey questions were also emailed to PHUs to help facilitate internal discussions before completing one online survey per PHU. The survey included 11 questions to understand whether the PHU currently uses WWS data for COVID-19 monitoring; and if so, how the data are used by the PHU, the logistics of sampling, strengths and limitations of the data, as well as additional comments. The full survey is provided in Appendix A.

Results

We received responses from 33 PHUs. Detailed results by survey question are provided below.

How is wastewater surveillance data directly used by your PHU?

31 out of 33 responding PHUs used WWS to monitor viral shedding trends over time. The second and third highest uses of WWS reported by PHUs was to determine the presence or absence of viral shedding in the community (79%), followed by WWS being used as an early indicator of changes in viral shedding trends (70%), shown in Figure 1. Multiple responses could be provided by the PHU.
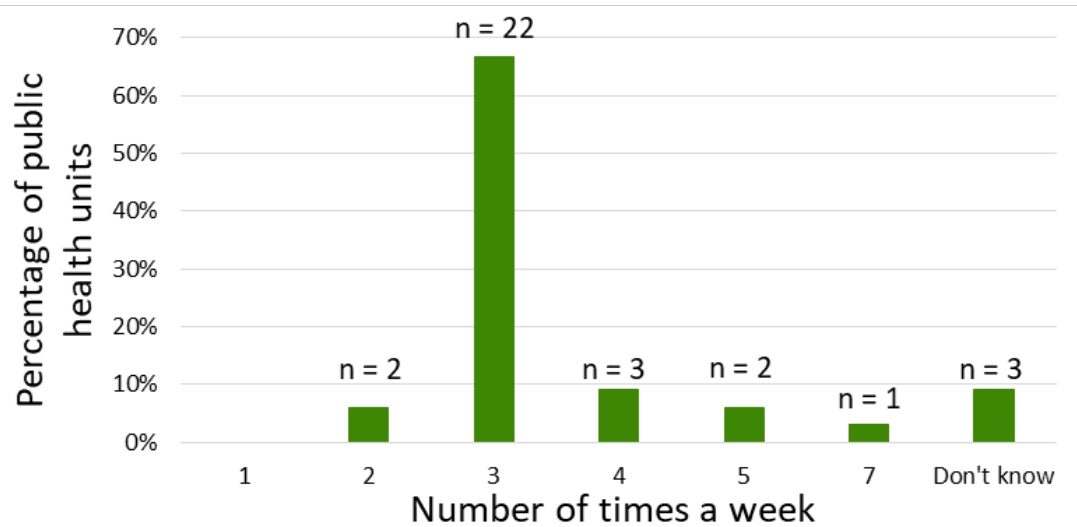
Figure 1: Uses of wastewater surveillance data reported by PHUs (n=33)
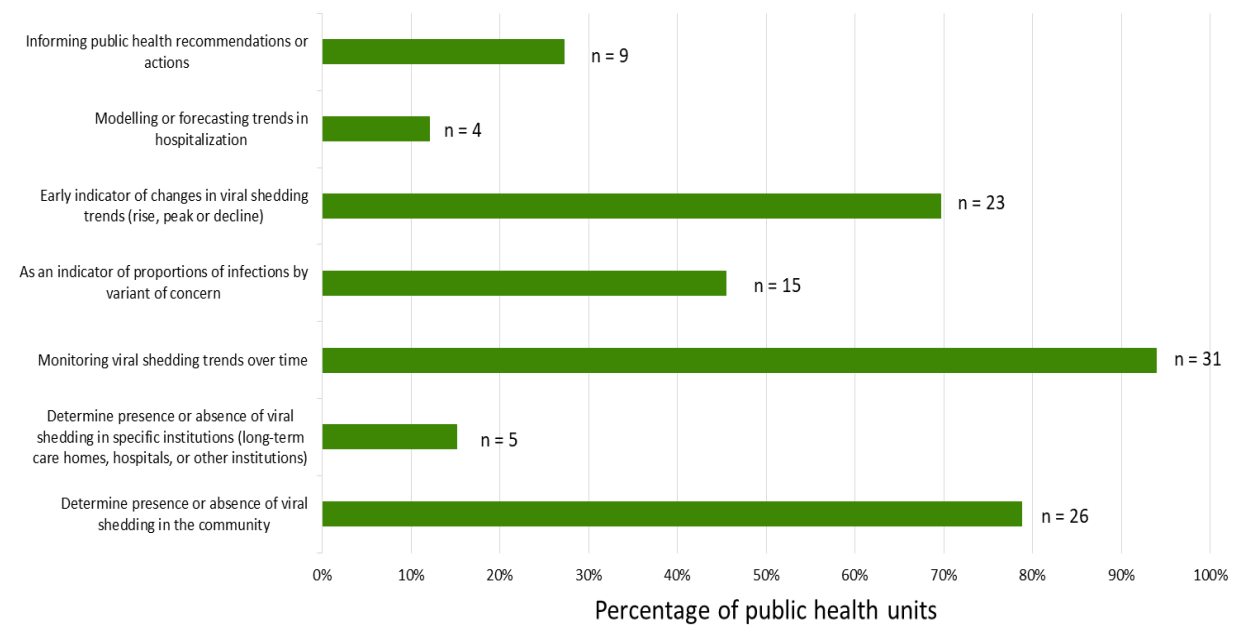
Overall, PHUs found wastewater surveillance data helpful in their efforts to understand local trends in COVID-19 activity.

How many times a week are wastewater samples collected in your region?

Figure 2: Weekly wastewater sampling frequency reported by PHUs (n=33)

The majority of PHUs reported that wastewater samples were collected 3 or more times a week (Figure 2).

What is the time lag between sample collection and reporting of data (not including sequenced results) to your PHU?

Figure 3: Number of days between wastewater sample collection and reporting of the data to public health units, reported by PHUs (n=33)
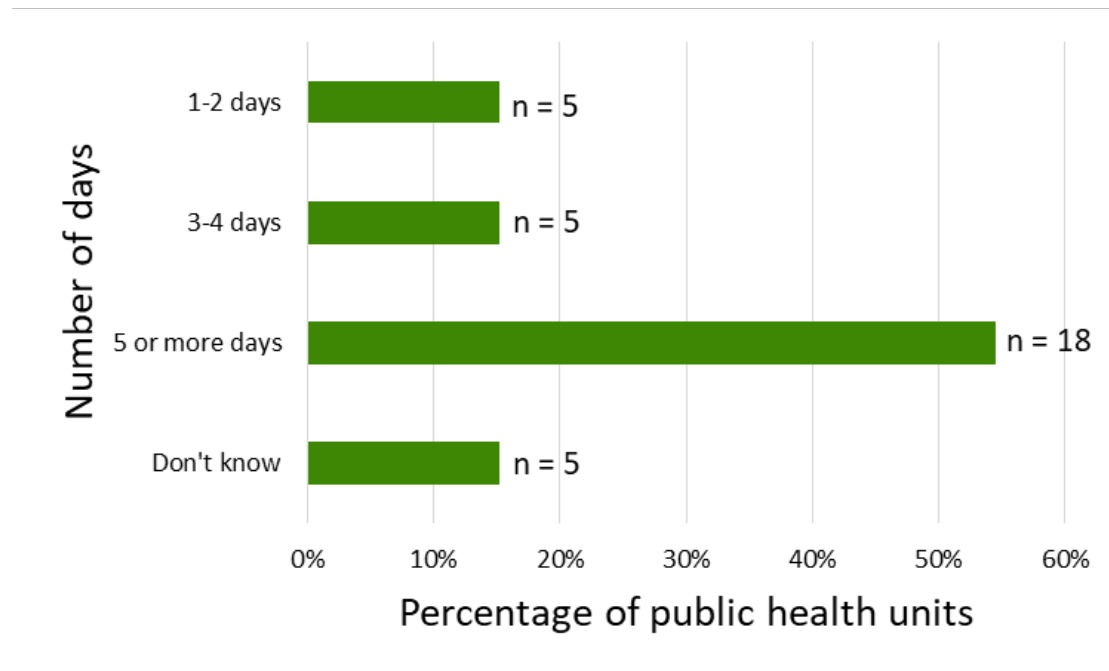

The majority of PHUs reported a lag of 5 or more days between wastewater sampling and reporting of the data (Figure 3).

For each of the uses you have indicated, are the data sufficient?

PHU responses were divided on whether data available from WWS were sufficient for COVID-19 surveillance (Figure 4).

Figure 4: PHUs (n=33) reported sufficiency of wastewater surveillance data
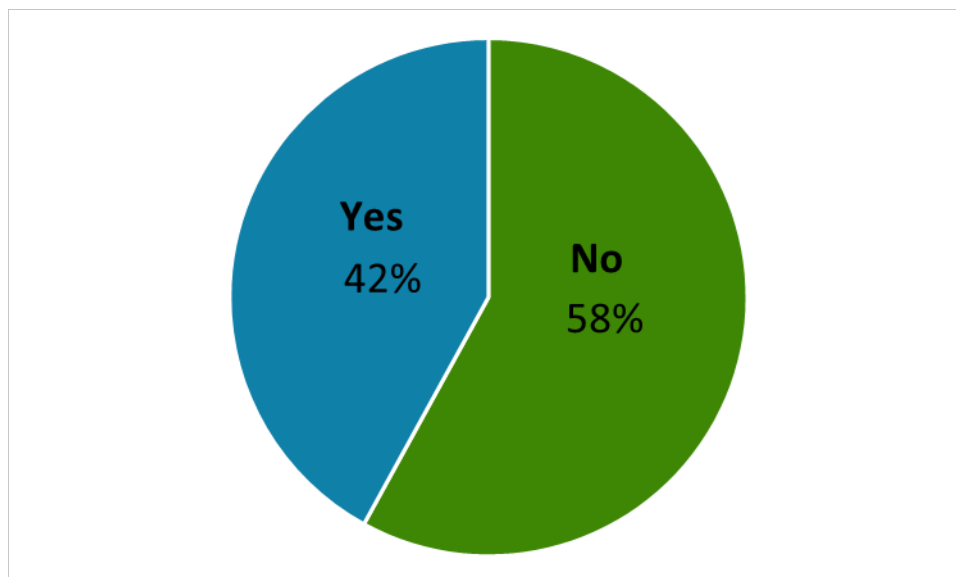
Of PHUs that answered 'yes', WWS sampling occurring multiple times a week was sufficient to monitor changing trends in a timely manner for SARS-CoV-2 viral shedding.

> PHUs reported that wastewater surveillance data were useful as an indicator of local COVID-19 activity and as a complement to other sources of COVID-19 data like hospitalization numbers and clinical testing results."

Fifty-eight per cent of PHUs answered 'no' and indicated that more frequent and timely testing was needed for WWS data to be considered useful, due to the time lag before results are available.

What do wastewater data provide that other surveillance tools cannot, if anything?

PHUs responded that changes in clinical testing guidelines and population health seeking behaviours resulted in clinical testing not being indicative of COVID-19 trends in the community. PHUs found WWS to be a more reliable estimate of COVID-19 trends in the community, as they are not dependent on symptoms, healthcare seeking behaviours, and the ability or likelihood of getting tested.

Does institutional monitoring take place in your health unit?

Figure 5: Ontario PHUs (n=33) reporting of institutional monitoring in their health unit
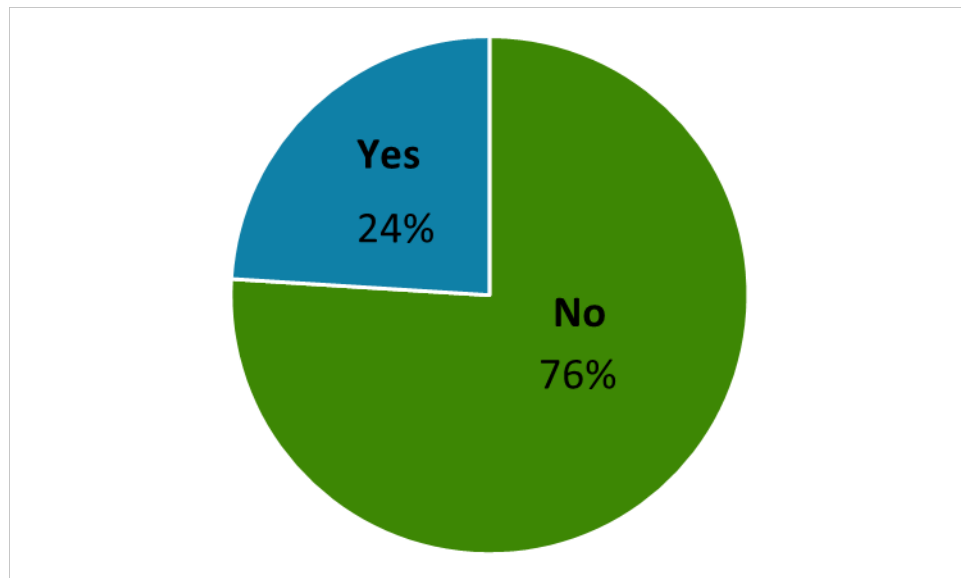

About a quarter of PHUs reported institutional monitoring at sites such as universities, correctional facilities, long-term care homes, or shelters.

Does your PHU publicly display wastewater data? If so, how?

Half the PHUs reported using an online dashboard to share WWS data publicly (51%). Many PHUs update their municipal/regional website with WWS data or share data directly with community, government, and healthcare partners without a public, centralized hub, including one PHU that stated they would comment on trends with media, but did not publically share the data (33%). Some health units reported not sharing the data with the public (27%). See Figure 6. Multiple responses could be provided by the PHU.

Figure 6: PHUs' (n=33) reporting of wastewater data to the public
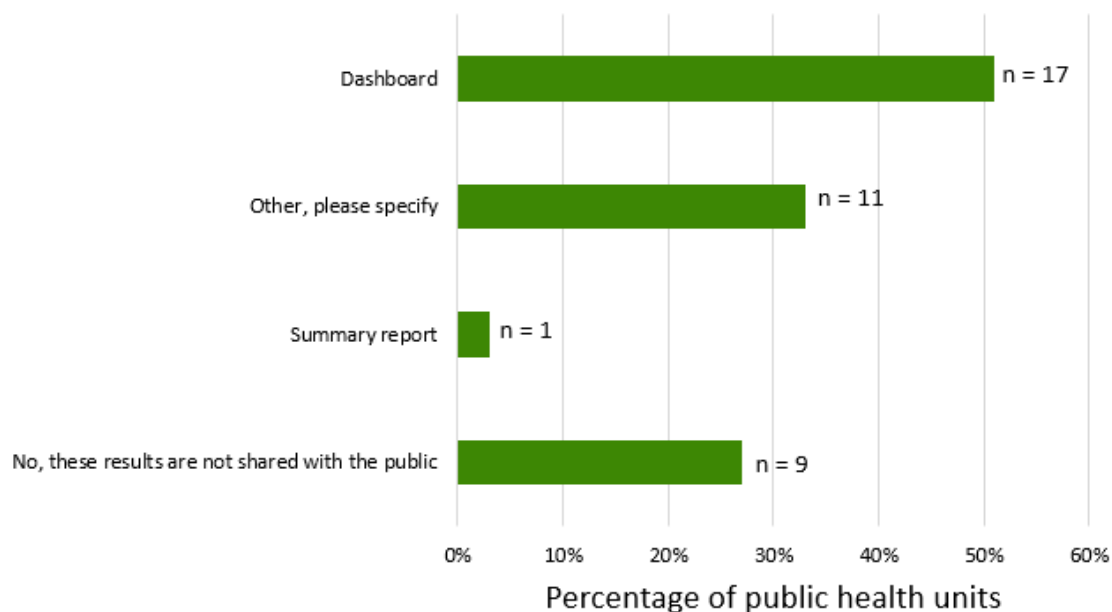
What are some of the desired uses of wastewater data by your health unit that are currently not possible? Are there any gaps or improvements to more effectively use wastewater data?

Many PHUs commented on needing more support to analyze WWS data, guidance on selecting appropriate methods for presenting data and thresholds for public health interventions. There were multiple comments on the need for greater frequency of samples and faster reporting of the data, with reliance on a central hub or dashboard rather than having a direct relationship with a laboratory resulting in different sample reporting times.

PHUs also expressed an interest in seeing a larger number of WWS sampling sites to improve population coverage within the PHU (14 health units indicated that population coverage ranged from 16-95%).

PHUs reported an interest in using wastewater surveillance for projecting case or hospitalization trends in their community. They also see potential for wastewater surveillance as a tool for tracking other diseases (e.g., influenza) along with other substances of public health concern such as opioids and antimicrobial-resistant pathogens.

Do you have any other comments about your PHU's use of wastewater data that you would like to share?

- Responses were generally supportive of WWS being used as a complementary tool to clinical testing.

- Comments suggested that a consistent and coordinated province-wide approach could help and the need for sustainable funding to ensure the success of WWS.

Limitations and Strengths

The majority of PHUs in Ontario participated in the survey (33 of 34 PHUs). This survey does not capture the experience of other partners involved in Ontario's WWS program (e.g., utilities, academic laboratories, government ministries). It also did not ask PHUs for indicators of effectiveness of WWS data for their uses (e.g., early detection of trends). It does provide a recent assessment of the experience of PHUs in Ontario including strengths and future needs related to WWS, as users of these data.

Discussion and Conclusions

The survey found that all responding PHUs (33/34) used WWS data for COVID-19 surveillance. The survey also identified strengths and limitations of using WWS data from the perspective of PHUs in Ontario. Key strengths of the system noted by PHUs was the independence of the data from clinical testing guidelines and individual health seeking behaviours, which PHUs reported makes WWS a more consistent source of population trends.

PHUs reported wanting faster reporting of the data after sample collection to be useful as an early indicator of trends. PHUs also reported wanting more support to analyze WWS data and guidance on selecting appropriate methods for presenting data, data interpretation and public health action.

The information collected in this survey will be shared with the Ministry of Health, the MECP and other system partners to inform broader WWS planning.

Appendix A: PHO Survey for Public Health Units

Online survey administered to all Ontario public health units on April 14, 2022 to understand the value, use, and needs related to COVID-19 wastewater surveillance.

Public Health Unit Wastewater Surveillance for COVID-19

Preamble

Wastewater surveillance has emerged as a tool to monitor the presence of COVID-19 in the community. This is a rapidly developing science and public health units (PHUs) have taken different approaches to wastewater data. The objective of this survey is to gather information from PHUs to understand the **value, use, and needs** related to wastewater surveillance for COVID-19. The results of the survey will be shared with the Ministry of Health and health units.

All PHUs, including those that use or don't use wastewater surveillance data, are encouraged to complete this survey. The survey will take approximately 20 minutes to complete. Please attempt to fill the entire survey all at once and submit **one survey on behalf of the PHU**. Since more than one person may be suited to answer the survey, we encourage PHUs to discuss internally first and collate responses into this Word document before entering responses into the online survey. **The survey will be available until 6:00 pm on April 28, 2022.**

This information is collected under the authority of the Ontario Agency for Health Protection and Promotion Act. Your participation in this survey is voluntary and by completing the questionnaire you consent to the collection of information. You can refuse to participate, or withdraw from the survey at any time. Data collected up to the point of your withdrawal will be retained by PHO. Your information will only be disclosed as permitted or required by law.

Please be aware that information in connection with your response to the survey will be stored on PHO servers or secure external servers, located in Canada, throughout the data lifecycle (e.g., collection process, use for analysis, retention), and is governed by PHO Terms of Use. Access to data stored on PHO servers or secure external servers will be limited to only authorized external administrators, survey administrators and PHO staff involved in this initiative. Data will be retained by PHO for two years before they are permanently deleted.

For questions related to this survey please contact eoh@oahpp.ca.

* Required questions

Survey

1.) *Please select your PHU.

2.) *Please provide the full name of a person in your PHU we can contact for more details, if needed:

3.) *Please provide the email of the contact person:

4.) *Does your PHU currently use wastewater surveillance data for COVID-19 monitoring?

☐ Yes → please proceed to question 5

☐ No → please proceed to question 12

5.) *How is wastewater surveillance data directly used by your PHU? Check all that apply.

☐ Determine presence or absence of viral shedding in the community

☐ Determine presence or absence of viral shedding in specific institutions (long-term care homes, hospitals, or other institutions)

☐ Monitoring viral shedding trends over time

☐ As an indicator of proportions of infections by variant of concern

☐ Early indicator of changes in viral shedding trends (rise, peak or decline)

☐ Modelling or forecasting trends in hospitalization

☐ Informing public health recommendations or actions, if so please provide some examples __Click here to enter text._

☐ Other, please specify __Click here to enter text._

6.) *How many times a week are wastewater samples collected in your region (if there are multiple sampling sites, please provide an average of all sites)?

☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ Don't know

7.) *What is the time lag between sample collection and reporting of data (not including sequenced results) to your PHU?

☐ 1-2 days
☐ 3-4 days
☐ 5 or more days
☐ Don't know

8.) *For each of the uses you have indicated in Q5, are the data sufficient (e.g. locations sampled, sampling frequency, timeliness of reported data)? Please elaborate on how it may or may not be sufficient.

☐ Yes, please explain:

☐ No, please explain:

9.) *What do wastewater data provide that other surveillance tools cannot, if anything?

10.) *Does institutional monitoring take place in your health unit?

☐ No

☐ Yes; Please specify where (e.g. university monitoring dormitory sewage). Is the monitoring conducted by the institution, health unit or another group (please specify)? Has it resulted in identifying new outbreaks or helped to limit spread?

11.) *Does your PHU publically display wastewater data? If so, how? Check all that apply.

☐ No, these results are not shared with the public

☐ Dashboard

☐ Summary reports

☐ Other, please specify __Click here to enter text._

→ **Proceed to Q13**

12.) *If your public health unit currently doesn't use wastewater data, what are the reasons for this? Check all that apply.

☐ Do not see the utility of using wastewater data in addition to other surveillance tools

☐ Data quality issues

☐ Lack of resources/expertise (includes lack of funding, time or staff expertise to set-up, analyze and interpret data)

☐ Limitations with population coverage

☐ Inadequate timeliness of reported data

☐ Other, please specify __Click here to enter text._

13.)*What are some of the desired uses of wastewater data by your health unit that are currently not possible? Are there any gaps or improvements you think are needed for your health unit to more effectively use wastewater data?

14.) *Do you have any other comments about your PHU's use of wastewater data that you would like to share?

Citation

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