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Wastewater-based surveillance for SARS-CoV-2 in Alberta

Danielle Southern¹, Casey Hubert², Michael Parkins², and Tyler Williamson¹

¹Centre for Health Informatics, University of Calgary

²University of Calgary

Objective

Alberta's largest research universities collaborated to expand COVID-19 wastewater monitoring throughout the province to regularly provide evidence of SARS-CoV-2 burden in municipalities representing 3.2 million people.

Approach

Sampling was conducted at 26 wastewater treatment plants and facilities across the province. The project quantified SARS-CoV-2 genomic material in wastewater to reveal population-level trends of COVID-19 cases. This inclusive and comprehensive strategy captures everyone who contributes to wastewater, including those not clinically diagnosed. Researchers collected wastewater samples in municipalities three times a week. Additional sentinel monitoring was undertaken in neighbourhoods, hospitals, long-term care facilities, work-sites, shelters, and schools. Results were shared on the public COVID Data Tracker website (<https://covid-tracker.chi-csm.ca/>). Data was additionally linked with hospital outcomes, workforce absenteeism and outbreak information.

Results

Wastewater-based surveillance (WBS) for SARS-CoV-2 genomic RNA associates very strongly with clinically diagnosed cases and health resource utilization, providing a ≥ 6 -day leading indicator. WBS can effectively be performed across a range of geographic scales (from cities to individual facilities), ensuring actionable data that is relevant to end-users. We have published how outbreaks across a range of high-risk facilities can be monitored and predicted with WBS and can also be used to model COVID-19-associated workforce absenteeism. Emails and website interactions suggested widespread citizen engagement using data for evidence-based decisions.

Conclusion

WBS is a valuable tool for identifying potential outbreaks and tailoring response measures at the policy level and by individual citizens. We've created customizable real-time data-sharing tools catering to both the public (enhanced data transparency) and government (actionable insights).

