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Useful Numbers : Reaching out with pandemic data

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Global Water Futures Next Generation Solutions to Ensure Healthy Water Resources for Future Generations

Illustration by Fred Reibin

Useful Numbers

Reaching out with pandemic data

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In 2020 several streams of research came together unexpectedly to create an opportunity for our science to be of direct service to the broader community. Our Global Water Futures team at the University of Saskatchewan had been using environmental DNA (eDNA) to monitor environmental quality in Canada and China. Collaborating with the provincial government, we had also been monitoring hazardous algal blooms in the province's freshwater and, by looking at the by-products of chlorination, had identified more than 600 novel chemicals in Saskatchewan's drinking water that were not being regulated. Through this work, we were steadily building relationships with provincial and City of Saskatoon's water managers. Then came the Covid pandemic. One after another, many of the active research activities we had begun under GWF were postponed indefinitely as we couldn't move around freely.

But it wasn't long before the public health branch officials and the City of Saskatoon Emergency Preparedness came to me to ask: " Would be possible in a similar way to track the presence of the virus in wastewater?" I was sure it was possible. I contacted our project partner Mark Servos at the University of Waterloo, and he agreed. Together we came up with a plan to pivot our GWF research work to address the pandemic. When I called GWF Director John Pomeroy to pitch our plan, he responded with: "Go for it – this is exactly what our research should be aiming for". We started to work with the municipal departments of public health to monitor wastewater in three of Saskatchewan's largest centres. The results were credible – supporting the findings of epidemiologists -- and our government partners were happy to see the patterns that the monitoring work was uncovering.

Because we had a data sharing agreement with both levels of government, we had frequent discussions. These exchanges brought up a question: why shouldn't we be sharing the data with the people who were experiencing Covid first-hand: the public? A good idea, all agreed. We didn't want to skimp on the science, but we understood that there was a lot of technical detail the public didn't need to see. Our first efforts to publish the data, however, created confusion. We had produced the Covid numbers in the form of percentages, for example: "this past week the amount of virus in Prince Albert's wastewater increased by 10 per cent". People were confused. They didn't understand the difference between absolute and relative values, so they misinterpreted the results. So we regrouped and decided to use trends to show how much virus was in the water and how much that was changing from week to week. Working together with medical doctors, researchers, water managers, and communications specialists we also introduced a simple colour-coded system that gave people another frame of reference that could guide decision-making. All was suddenly made clear, and the regular monitoring reports became a 'go-to' source for a wide range of users. People felt there was a trusted source of information that I believe kept peoples' spirits up during the worst of the pandemic.

When you combine good basic science with relationship-building, you can be prepared for – and reap the benefits of -- the unexpected.

Find out more:

Yuwei Xie, Jonathan K. Challis, Femi F. Oloye, et al. 2022. RNA in Municipal Wastewater Reveals Magnitudes of COVID-19 Outbreaks across Four Waves Driven by SARS-CoV-2 Variants of Concern, ACS EST Water , 2, 11, 1852–1862, https://doi.org/10.1021/acsestwater.1c00349.