Wastewater Modelling Report: Forecasting the State of the Pandemic using Wastewater Data

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Public Health Agency of Canada has developed a mathematical model for conducting wastewater based forecasting that describes infections of COVID-19 in the community and also considers how infected people shed the COVID-19 virus into the sewer systems and how that shed virus signal is detected and reported. The clinical case and wastewater surveillance data are used to generate forecasts and help understand what is happening in the community.

The next figures show clinical case and wastewater surveillance data for each city during the Omicron wave. In each figure, the panel shows the traditional reported human clinical case data (solid black line) and model forecasts using only wastewater data (blue shaded area).

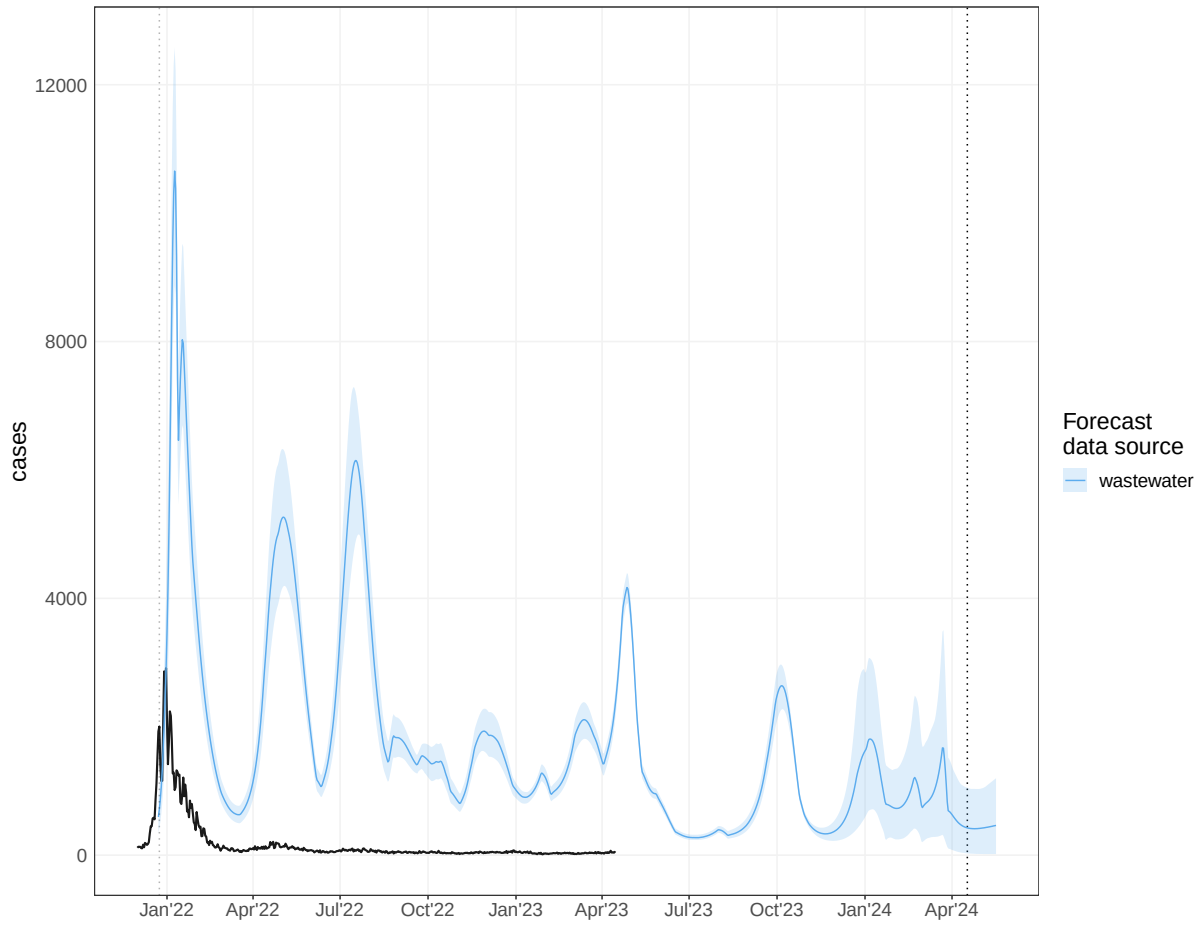
As of November 22, 2022, model forecasts use only wastewater data.

The model uses wastewater data with the following last observation dates for each site:

City	wastewater
Halifax	2024-03-27
Montreal	2024-03-30
Edmonton	2024-03-31
Vancouver	2024-03-31
Toronto	2024-04-02

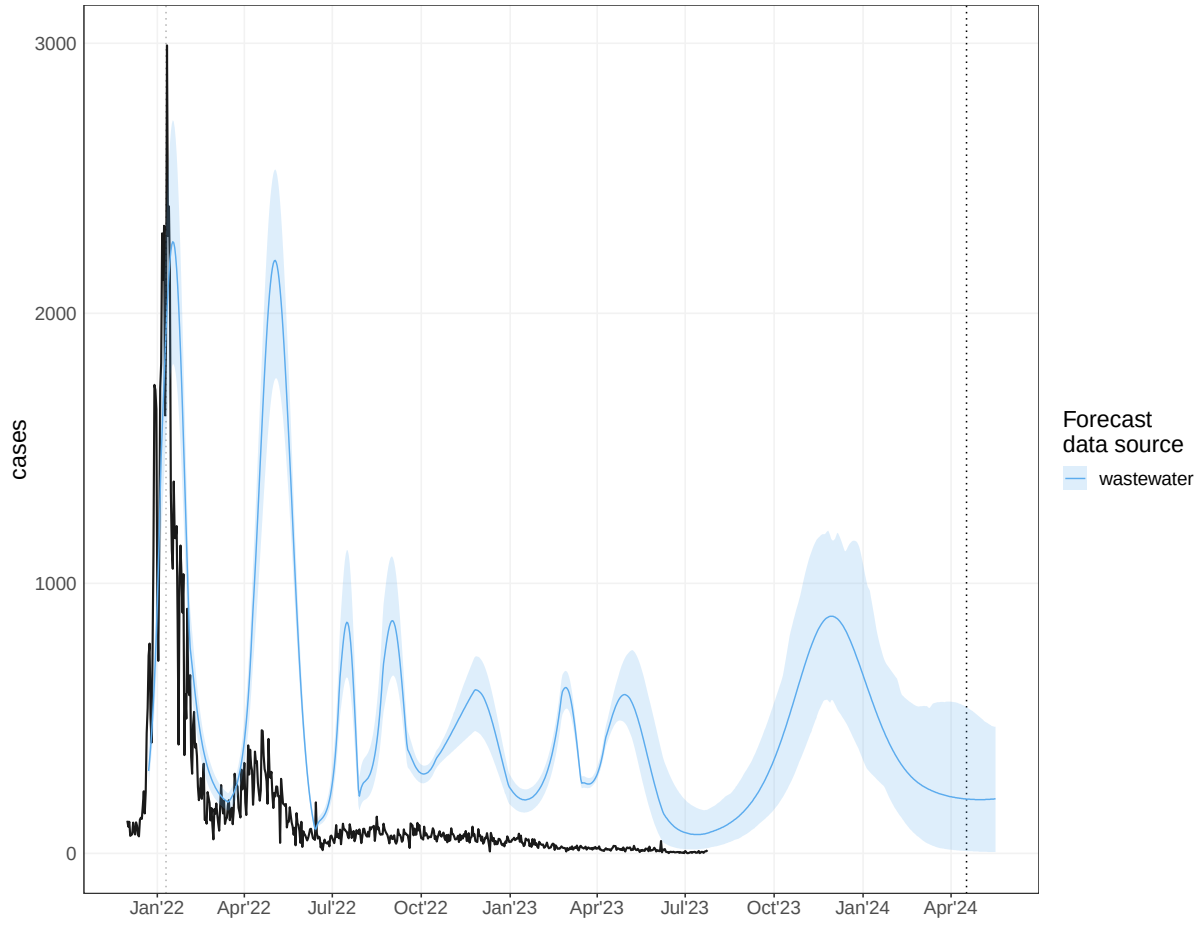
Vancouver

The reported clinical data (black curve) when compared to wastewater-based projections suggests an under-reporting of clinical cases since March 2022. Wastewater-based projections (blue curve) indicate infections will stabilize in the coming weeks.



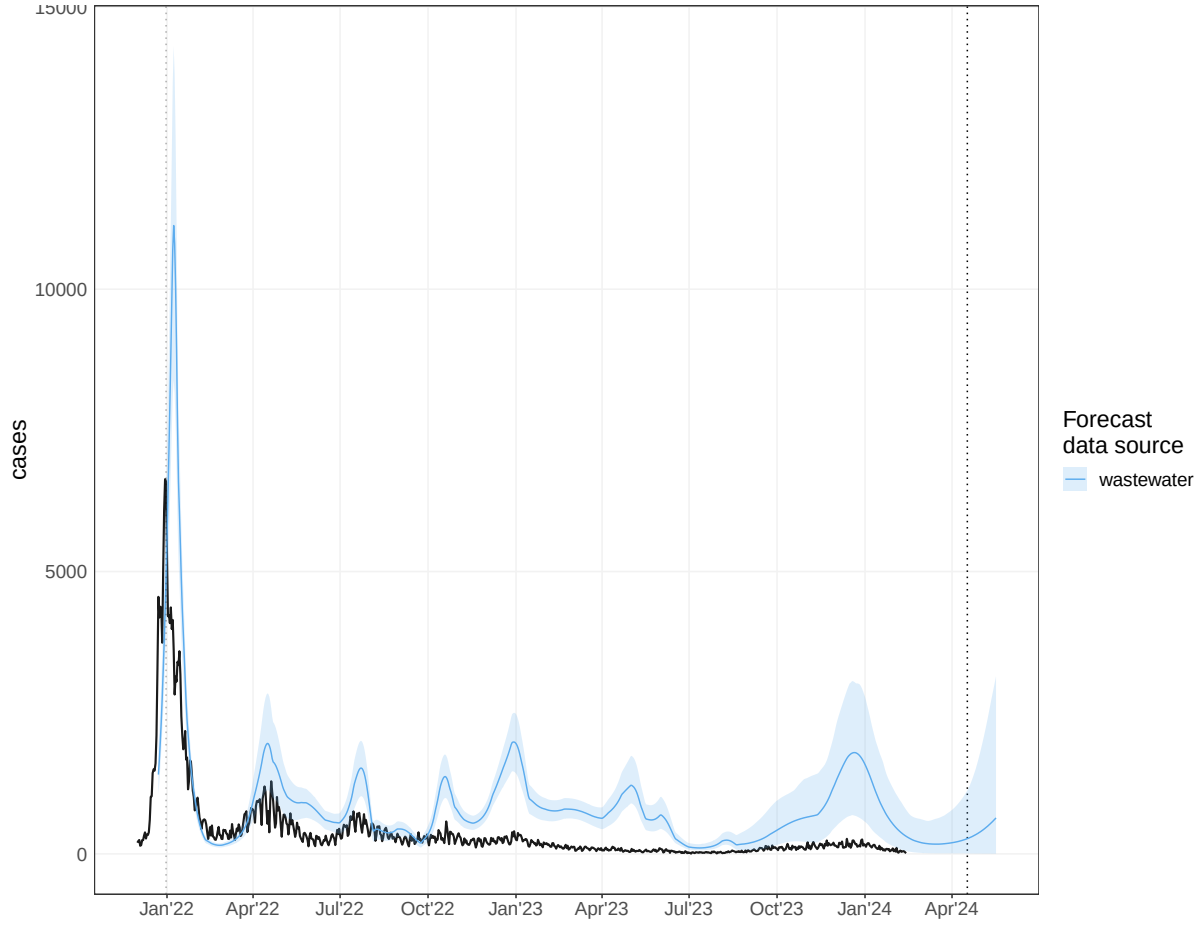
Edmonton

The reported clinical data (black curve) when compared to wastewater-based projections suggests an under-reporting of clinical cases since April 2022. Wastewater-based projections indicate infections will stabilize over the next few weeks.



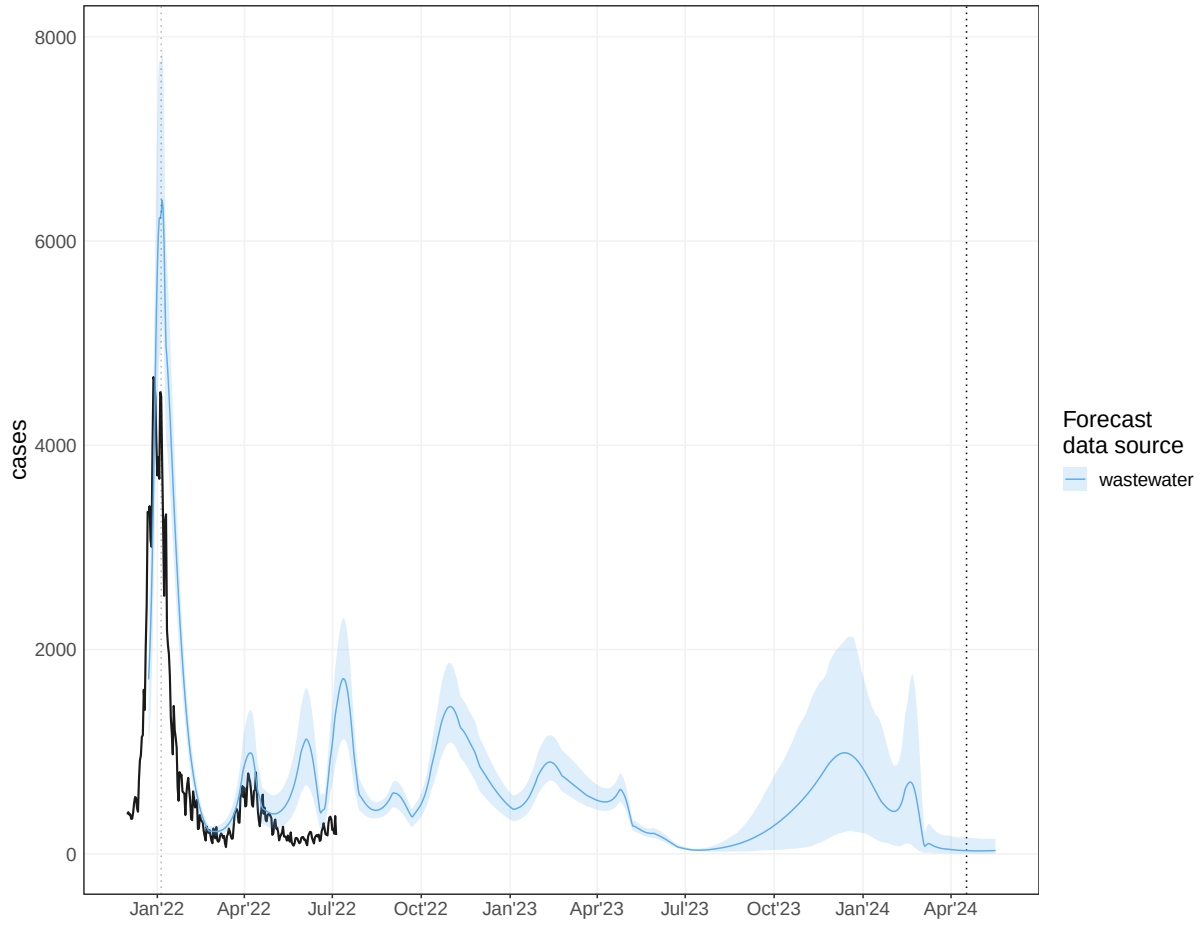
Toronto

Modelling based on wastewater data identifies a wave of infections in Toronto since November 2022 (blue curve). This wave was not noticed in clinical surveillance (black curve), probably due to under-reporting. Wastewater-based forecasts anticipates the number of cases to increase in the coming weeks.



Montreal

Since May 2022, the reported clinical cases (black curve) and the wastewater based case projections (blue curve) do not agree. This is probably caused by under-reporting from clinical surveillance. Wastewater-based forecasts anticipate the number of cases to stabilize in the coming weeks.



Halifax

Since May 2022, the reported clinical cases (black curve) and the wastewater based case projections (blue curve) do not agree. This is likely caused by under-reporting from clinical surveillance. The model forecasts infections will stabilize in the next few weeks.