

1 EXECUTIVE SUMMARY AND CONTEXT

This is the February 24, 2022 overview of modelling studies conducted and collated by the PHAC Modelling Group. Summaries below are hyperlinked to the related section of the report for full details.

CURRENT SITUATIONAL AWARENESS

Domestic

The effective reproduction number (R_t) for Canada as of February 12, 2022, estimated using date of illness onset, was 0.78. Nationally, R_t has been above 1 since mid-December. On February 12, 2022, R_t was below one in all major provinces. Decline in R_t in late December and early January is likely in part due to changes in testing practices. However, a similar signal from wastewater analysis suggests that the decline may reflect a genuine decline in transmission.

The short-range statistical forecast for Canada up to March 3, 2022 is:

- 36,418 cumulative deaths (range 36,258 to 36,558).

Short-range forecasts for cases were not produced given the recent changes to testing protocols across Canada. The incidence of new deaths is projected to decline throughout the next week in Canada.

The long-range dynamic modelling forecast (Simon Fraser University model) for Canada suggests the Omicron-driven resurgence nationally has peaked and the forecast is for a resurgence of cases with reopening plans. Projections suggest that this wave has peaked in all major provinces. Due to surveillance limitations, the uncertainty of the impact of recent and planned changes in public health measures is large.

The long-range dynamic modelling forecast (PHAC-McMaster University model) suggests that, nationally, infections, hospital occupancy and hospital admissions will continue to decline, but resurge with lifting of restrictions. Hospital admissions and occupancy are forecast to be lower than seen in January, with the possible exception of British Columbia and Alberta. Due to surveillance limitations, there are uncertainties in the forecast.

The Wastewater-based forecasts and effective reproduction number estimates suggest a decreasing trend of infections and that case under-reporting is decreasing from highs in early January 2022. R_t estimates from clinical and wastewater data have been stable at or < 1 since mid-January, and concordant for most of the cities. However, wastewater data are not yet capturing full effects of reopening in some provinces.

International

Importation risk modelling suggests that for the week of February 13 to 19, 2022 the highest expected importation risk by air is from United States of America (USA), and the highest risk by land is from the states of Washington and Michigan. From February 13 to 19, 2022, the estimated percentages of imported cases from air travel that may be variants of concern (VOCs) or variants of interest (VOIs) among all known

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sequenced strains are: 95.58% B.1.1.529 (Omicron), 3.62% BA.2 (Omicron), and 0.56% B.1.617.2 (Delta). Other VOIs/VOCs each represent less than 0.01% of imported cases. The four major airports in order of highest estimated importation risk are Toronto Pearson International, Montréal-Trudeau International, Vancouver International and Calgary International.

Assessment of the impact of interventions on the COVID-19 epidemic in Canada and other countries using the Oxford University stringency index:

- In Canada, due to the large volume of cases driven by the Omicron variant, the stringency index increased in late-December 2021, then decreased as cases declined. The national stringency index is at 76, as of February 18, 2022.
- Most provinces and territories implemented public health restrictions in response to Omicron-driven COVID-19 resurgence. However, in response to decreasing activity, many jurisdictions are now easing or planning to ease public health measures; and targeted measures remain in response to local COVID-19 activity.
- Internationally, many countries are beginning to ease public health measures based on factors such as current COVID-19 trends, health care capacity, and vaccine coverage and booster dose administration.

DYNAMIC MODELLING

There are no dynamic modelling studies this week. The agent-based model and the compartment model are undergoing updates and calibration, taking into consideration the impact of waning immunity, updates on vaccination rates and reopening plans.

SPECIAL REPORT

The study *Projections of transmission of Omicron* used a compartment model to project estimated total cases, including cases unreported due to the new testing strategy, and severe outcomes in the city of Toronto, province of Ontario and Canada, when comparing different levels of lifting restrictions, eligibility for PCR testing and test turnaround time, and promotion of self-testing. Simulations suggested that, after easing restrictive public health measures, a resurgence of transmission that affects healthcare capacity will occur in April. This resurgence can be mitigated by limiting lifting of restrictions, increased detection of cases by self-testing at home, or by PCR testing by public health (both combined with isolation of those testing positive). The model results suggest that promoting testing and keeping some restrictions in place are key factors for an efficient COVID-19 exit strategy.