

# 1 EXECUTIVE SUMMARY AND CONTEXT

This is the June 3, 2021 overview of findings 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 on May 22, 2021, estimated using date of illness onset, was 0.83. There has been an increasing trend in  $R_t$  in most provinces from early February to early April. Nationally,  $R_t$  began to decrease in early April and on May 22,  $R_t$  was  $<1$  in most provinces ( $\sim 1$  in New Brunswick).

*The short-range statistical forecast* for Canada up to May 27, 2021 is for:

- 1,401,787 cumulative cases (range: 1,395,965 to 1,408,106); and
- 25,919 cumulative deaths (range 25,781 to 26,033) by that date.

Overall, case incidence is projected to decrease by 26% over the next week in Canada. Mean case incidence is projected to decrease throughout the projection period in all modelled provinces. The incidence of new deaths is projected to remain constant in Canada.

*The Nowcast of the force of infection* suggests that the epidemic is decreasing in British Columbia, Ontario, Quebec, New Brunswick and Nova Scotia. The force of infection is forecast to plateau in Alberta, Saskatchewan and Manitoba.

*The long-range dynamic modelling forecast (Simon Fraser University model)* for Canada, suggests the trajectory is towards a decline in the epidemic over the coming two months, with 1,000 to 1,200 daily cases by the end of June. The epidemic is forecast to decline in all provinces without lifting of recent restrictions.

*The long-range dynamic modelling forecast (PHAC-McMaster University model)* suggests that nationally, the trajectory of the epidemic in Canada is declining with approximately 1,000 per day by end of June with initial stages of re-opening plans. In all provinces, the epidemic is forecast to decline, although for Manitoba the epidemic is forecast to decline more slowly.

*The long range ensemble forecast of reported cases in Canada using dynamic modelling including variants of concern* suggests that the trajectory is towards a decline in the epidemic over the coming 2 months, with approximately 1,000 daily cases by the end of June, even with some lifting of restrictions.

### International

*Importation risk modelling* for the week of May 23 to May 29, 2021, showed that an estimated 1,273 people with COVID-19 came to Canada (204 air travellers and 1,069 land travellers), primarily from the United States of America, Colombia and Iran. From May 23 to May 29, 2021, the estimated percentages of cases that may be variants of concern or interest are 12.3% B.1.1.7 (UK variant), 3.5% B.1.617 (Indian variant), 2.7% B.1.427 and B.1.429 (Californian variants), 2.1% P.1 (Brazilian variant), 2% B.1.351 (South African variant), 1.5% B.1.526 and each of the following at less than 1%: B.1.525 (Nigerian variant), B.1.526.1 VOI and P2 (Brazilian variant).

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

- Canada's stringency index was at 75 for almost two months and recently fell to the current value of 74. The weekly rolling average of daily cases reached a high of 8,730 on April 17, 2021 and has dropped by 69% since that time.
- Recent decreases in the stringency index have occurred in many provinces and territories. It will be important to monitor case trends in light of these changes to ensure trends continue in the desired direction.

## DYNAMIC MODELLING

*The PHAC agent-based model (ABM)* explored the impact of re-opening the Canadian border with and without travel-related testing requirements while vaccines are rolled out to the Canadian population. Previous analysis suggests lifting of restrictive public health measures can occur safely when at least 75% of the eligible population has received their first dose and 20% has received their second dose. This analysis suggests that in addition, concurrent lifting of border measures (pre-arrival and post-arrival testing) may also be lifted without overwhelming healthcare capacity.

*The PHAC SEIR compartment model* explored the effect of vaccination in the 12 to 15 year old age group on the risk of lifting public health measures and the impact of different vaccine uptake levels in all age groups, particularly reduced uptake for the second dose. Results suggest that extending vaccination to the 12-15 year old age group reduced hospitalisations and deaths following lifting of public health measures. However, even when vaccination is extended to the 12-15 year old age group, simulations showed that reaching high levels of vaccine acceptance in all age groups remains important in minimizing risk to healthcare capacity when lifting public health measures.