

COVID-19 Results Briefing

Canada

September 9, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in Canada. The model was run on September 8, 2021, with data through September 3, 2021.

Current situation

- Daily infections in the last week increased to 18,000 per day on average compared to 16,200 the week before. (Figure 1). Daily hospital census in the last week (through September 3) increased to 5,600 per day on average compared to 4,100 the week before.
- Daily reported cases in the last week increased to 4,100 per day on average compared to 3,300 the week before (Figure 2).
- Reported deaths due to COVID-19 in the last week increased to 23 per day on average compared to 14 the week before (Figure 3).
- Excess deaths due to COVID-19 in the last week increased to 38 per day on average compared to 23 the week before (Figure 3). This makes COVID-19 the number 6 cause of death in Canada this week (Table 1). Estimated excess daily deaths due to COVID-19 in the past week were 1.6 times larger than the reported number of deaths.
- No locations had daily reported COVID-19 death rates greater than 4 per million (Figure 4).
- The daily rate of excess deaths due to COVID-19 is greater than 4 per million in Saskatchewan (Figure 4).
- We estimate that 12% of people in Canada have been infected as of September 7 (Figure 6).
- Effective R₀, computed using cases, hospitalizations, and deaths, is greater than 1 in 10 provinces (Figure 7).
- The infection-detection rate in Canada was close to 28% on September 7 (Figure 8).
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figure 9). We estimate that the Beta variant is circulating in 1 province, that the Delta variant is circulating in 12 provinces, and that the Gamma variant is circulating in 9 provinces.

Trends in drivers of transmission

- Mobility last week was 15% lower than the pre-COVID-19 baseline (Figure 11). Mobility was near baseline (within 10%) in New Brunswick, Newfoundland and Labrador, and Nova Scotia. Mobility was lower than 30% of baseline in no locations.
- As of September 7, in the COVID-19 Trends and Impact Survey, 56% of people self-report that they always wore a mask when leaving their home compared to 56% last week (Figure 13).
- There were 148 diagnostic tests per 100,000 people on September 7 (Figure 15).
- As of September 7, 8 provinces have reached 70% or more of the population who have received at least one vaccine dose and 7 provinces have reached 70% or more of the population who are fully vaccinated (Figure 17).
- In Canada, 86.3% of adults say they would accept or would probably accept a vaccine for COVID-19. This is up by 0 percentage points from last week. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 78% in Alberta to 95% in Newfoundland and Labrador (Figure 19).
- In our current reference scenario, we expect that 27.8 million people will be vaccinated with at least one dose by December 1 (Figure 20).
- In our current reference scenario, we expect that by December 1, 67% of people will be immune to non-escape variants and 63% of people will be immune to escape variants (Figure 21).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 36,000 cumulative reported deaths due to COVID-19 on December 1. This represents 9,000 additional deaths from September 7 to December 1. Daily reported deaths will rise to 280 on December 1, 2021 (Figure 22).
- Under our **reference scenario**, our model projects 58,000 cumulative excess deaths due to COVID-19 on December 1. This represents 15,000 additional deaths from September 7 to December 1 (Figure 22).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 4,800 fewer cumulative reported deaths compared to the reference scenario on December 1.
- Under our **worse scenario**, our model projects 62,000 cumulative reported deaths on December 1, an additional 26,000 deaths compared to our reference scenario. Daily reported deaths in the **worse scenario** will rise to 1,070 by November 13, 2021 (Figure 22).
- Daily infections in the **reference scenario** will rise to 69,840 by November 16, 2021 (Figure 23). Daily infections in the **worse scenario** will rise to 220,130 by October 21, 2021 (Figure 23).
- Daily cases in the **reference scenario** will rise to 29,610 by November 27, 2021 (Figure 24). Daily cases in the **worse scenario** will rise to 95,110 by November 1, 2021 (Figure 24).
- Daily hospital census in the **reference scenario** will rise to 36,960 on December 1, 2021 (Figure 25). Daily hospital census in the **worse scenario** will rise to 111,550 by November 5, 2021 (Figure 25).
- Figure 26 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.
- At some point from September through December 1, 24 countries will have high or extreme stress on hospital beds (Figure 27). At some point from September through December 1, 30 countries will have high or extreme stress on ICU capacity (Figure 28).

Model updates

No model updates

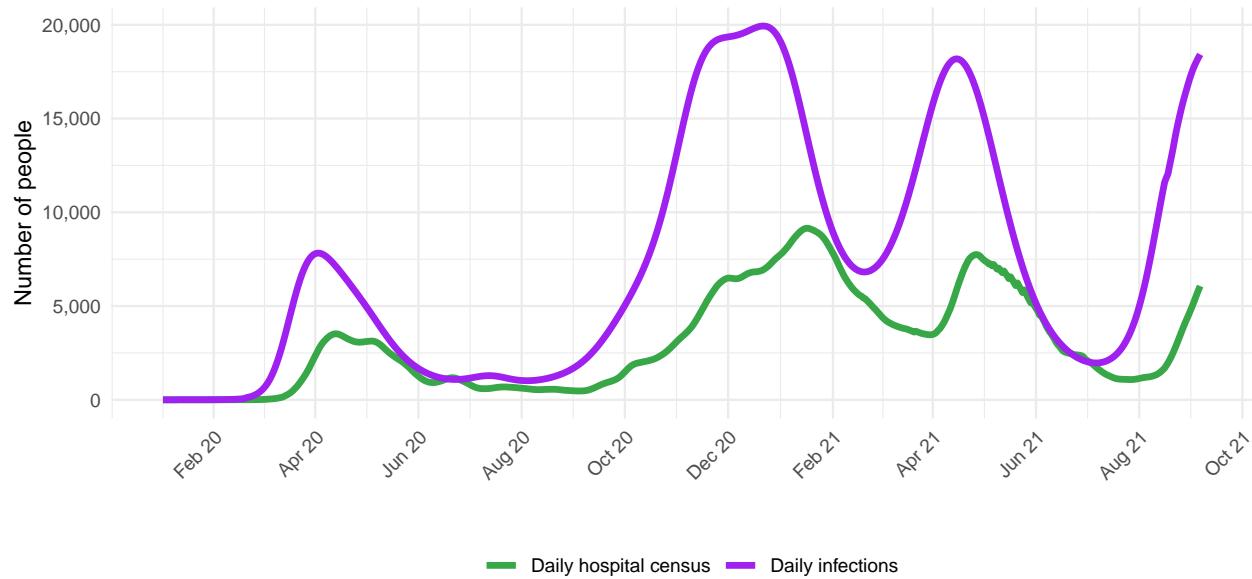
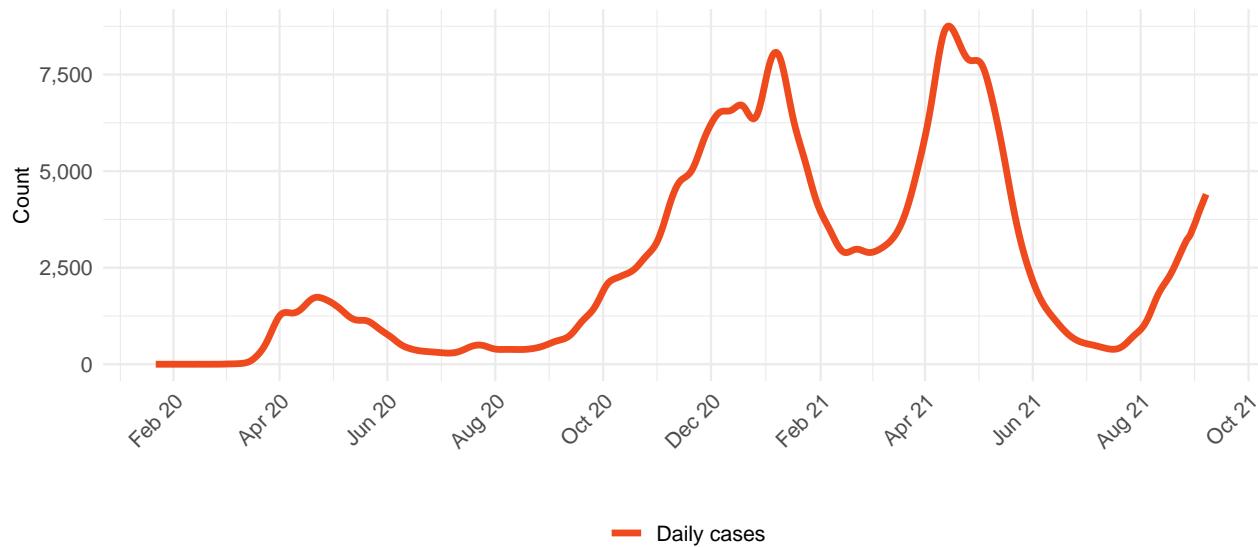
Figure 1. Daily COVID-19 hospital census and infections**Figure 2.** Reported daily COVID-19 cases, moving average

Table 1. Ranking of excess deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	938	1
Tracheal, bronchus, and lung cancer	463	2
Stroke	355	3
Alzheimer's disease and other dementias	328	4
Chronic obstructive pulmonary disease	300	5
COVID-19	265	6
Colon and rectum cancer	223	7
Lower respiratory infections	175	8
Chronic kidney disease	144	9
Diabetes mellitus	143	10

Figure 3. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and excess daily deaths due to COVID-19 (orange)

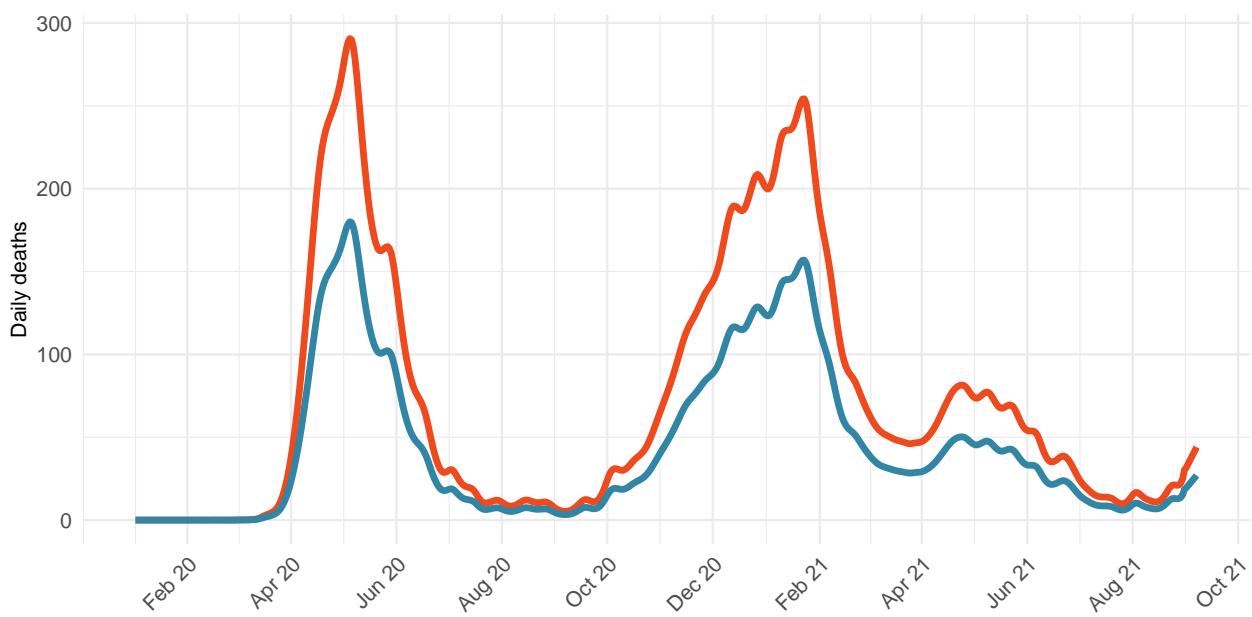
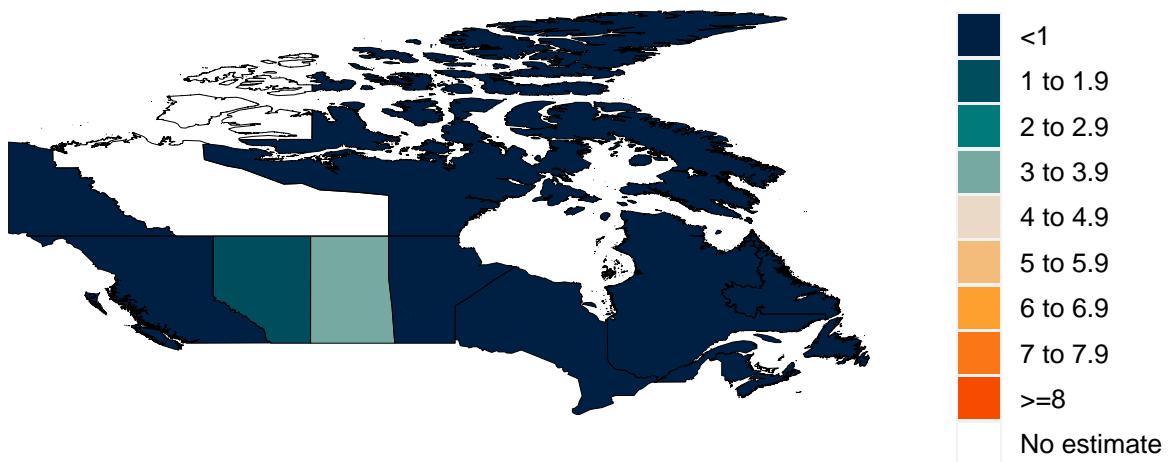


Figure 4. Daily COVID-19 death rate per 1 million on September 7, 2021

A. Daily reported COVID-19 death rate per 1 million



B. Daily excess COVID-19 death rate per 1 million

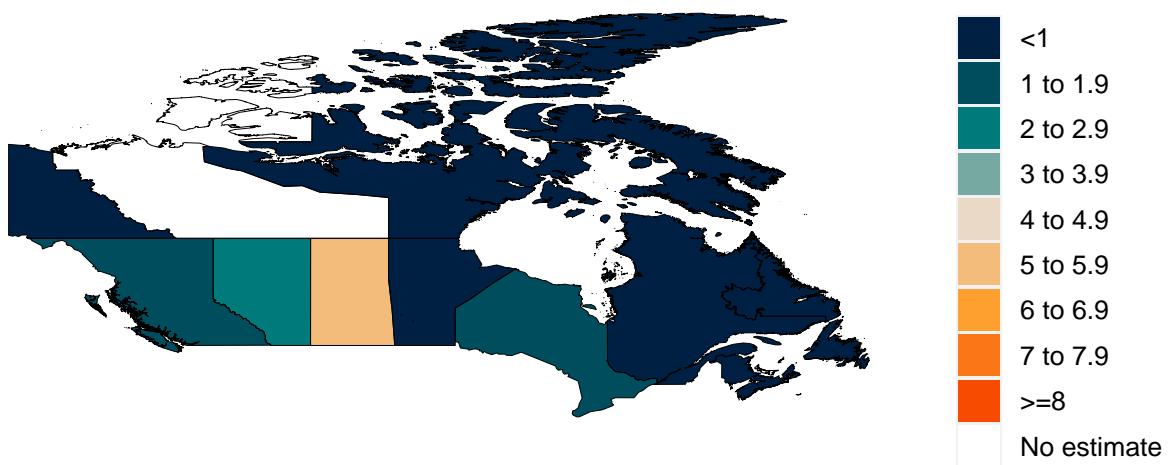
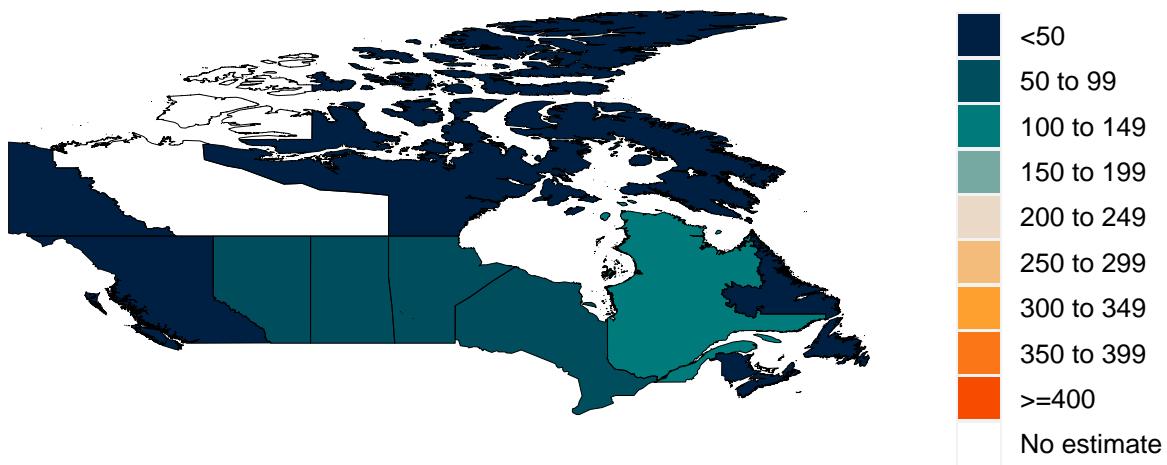


Figure 5. Cumulative COVID-19 deaths per 100,000 on September 7, 2021

A. Reported cumulative COVID-19 deaths per 100,000



B. Excess cumulative COVID-19 deaths per 100,000

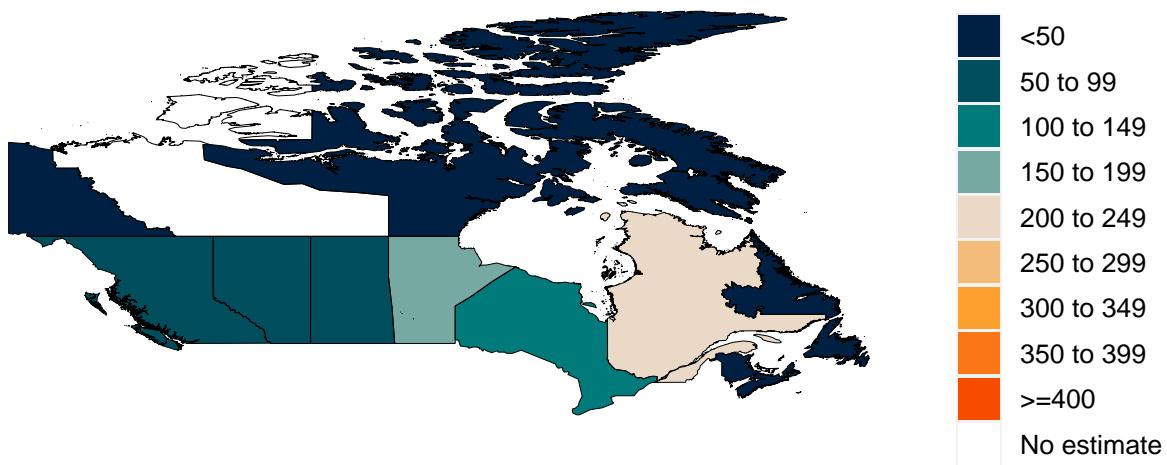


Figure 6. Estimated percent of the population infected with COVID-19 on September 7, 2021

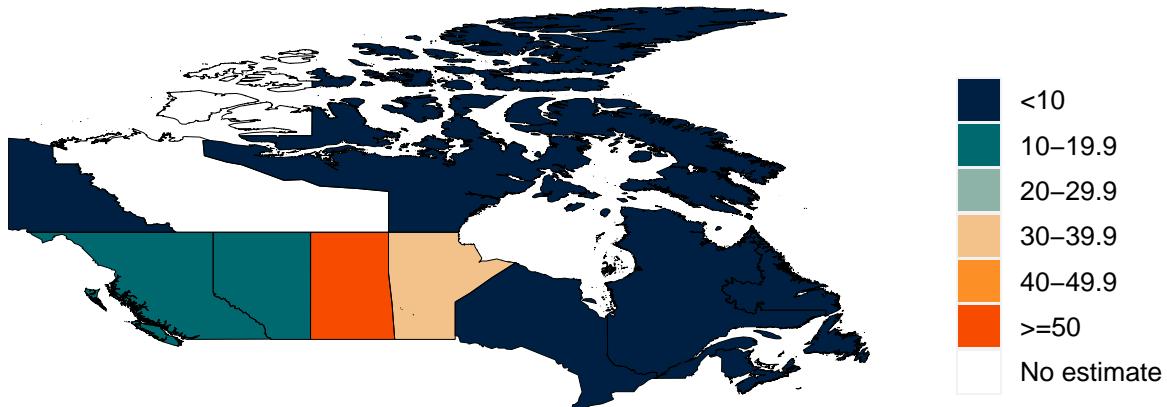


Figure 7. Mean effective R on August 27, 2021. Effective R less than 1 means that transmission should decline, all other things being held the same. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past.

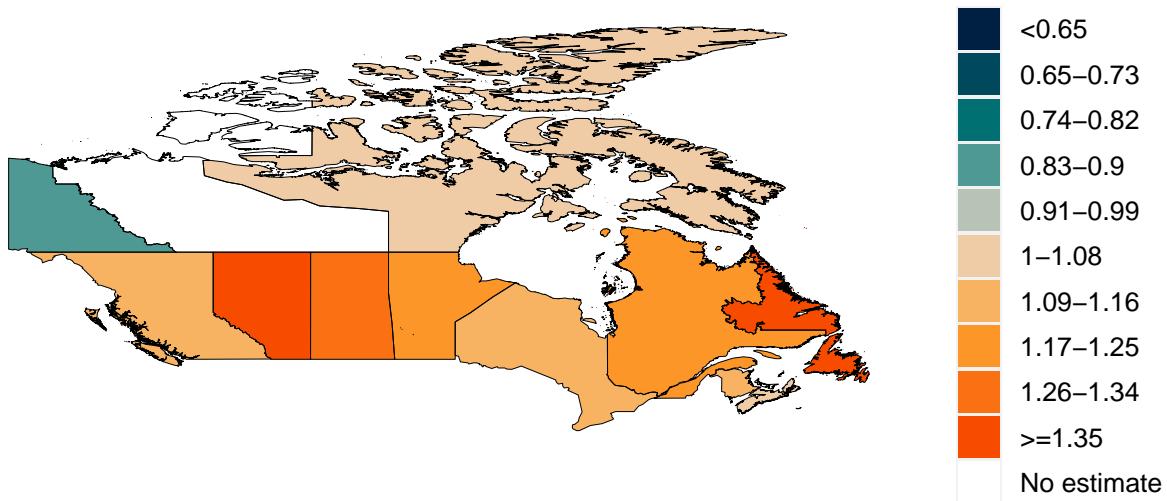


Figure 8. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.

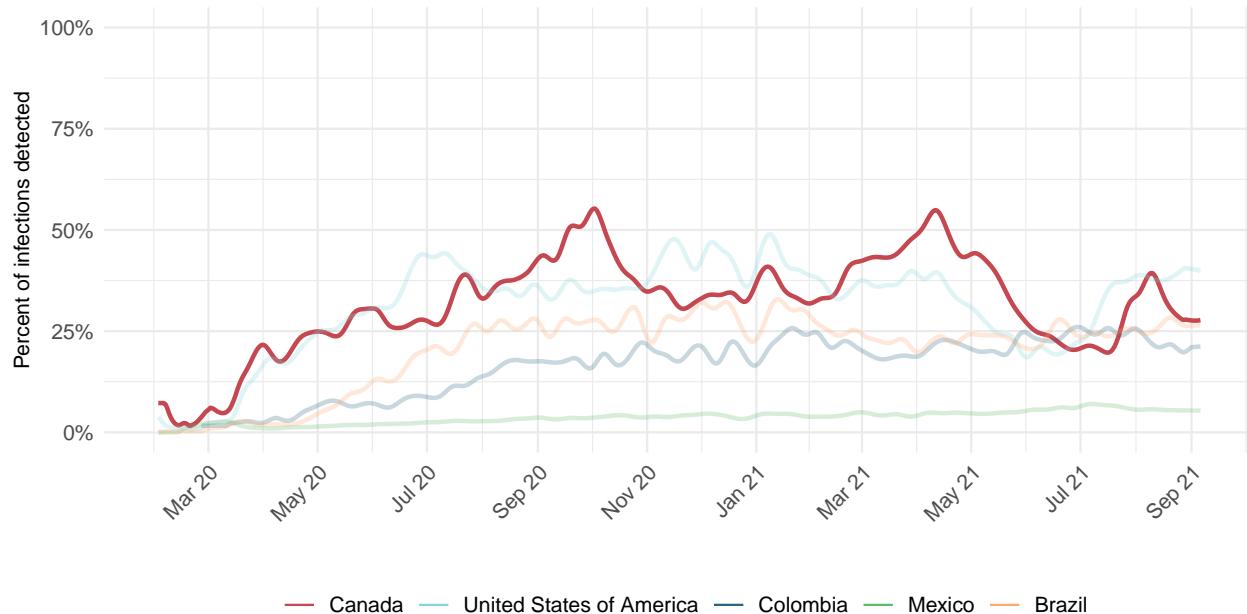
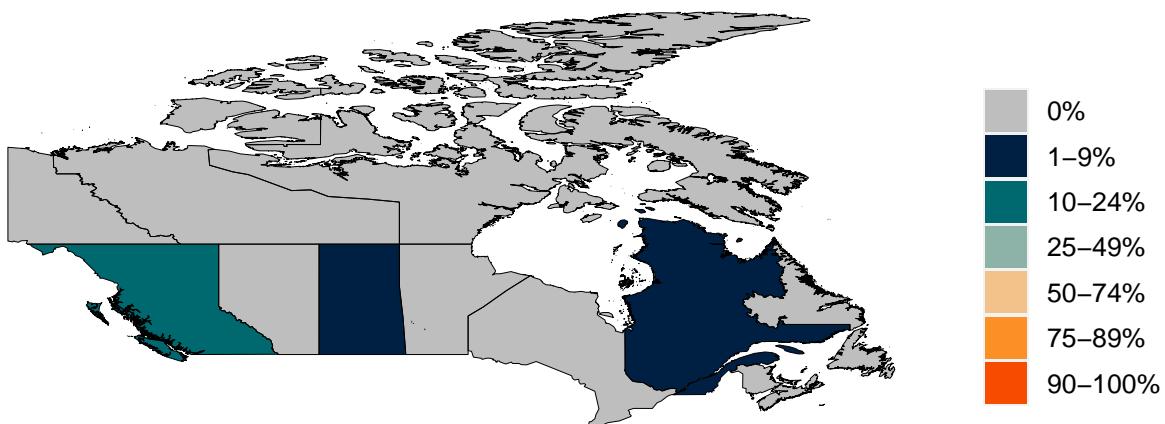
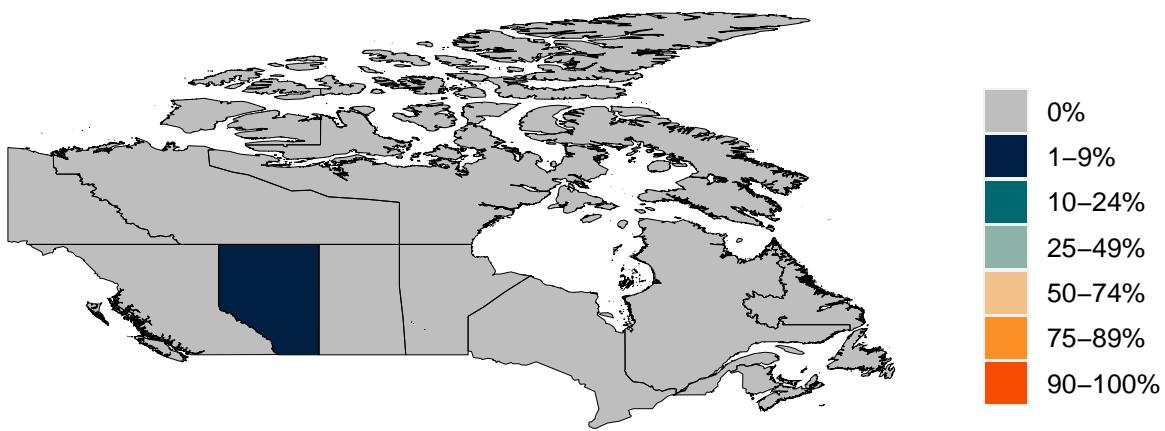


Figure 9. Estimated percent of circulating SARS-CoV-2 for primary variant families on September 7, 2021**A. Estimated percent Alpha variant****B. Estimated percent Beta variant**

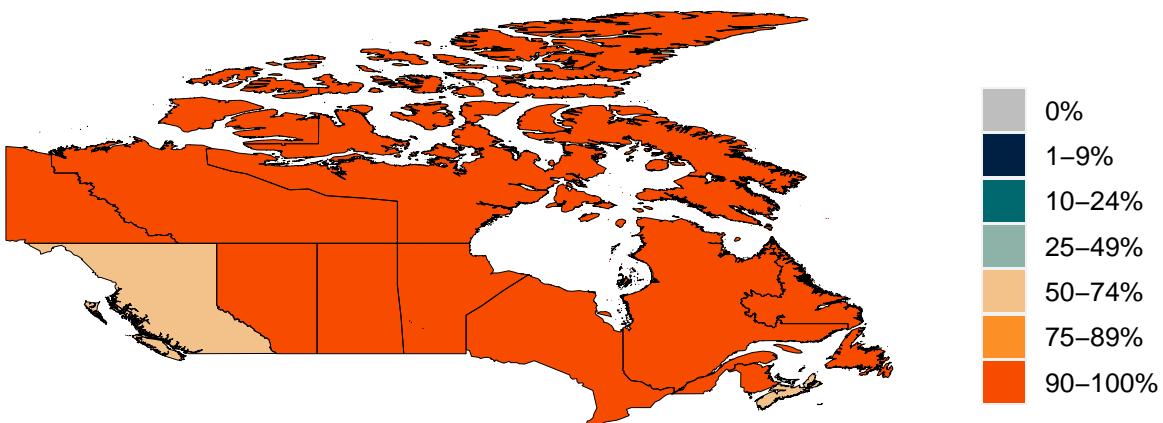
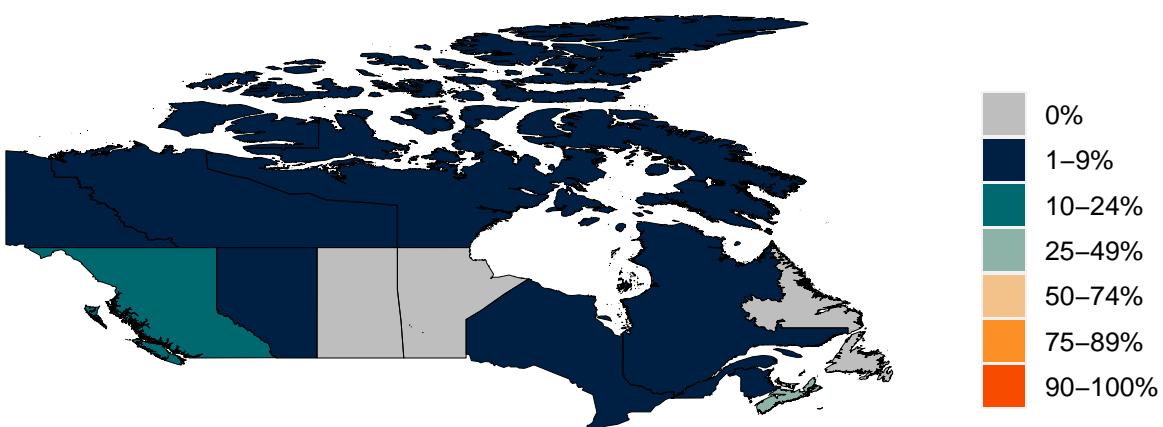
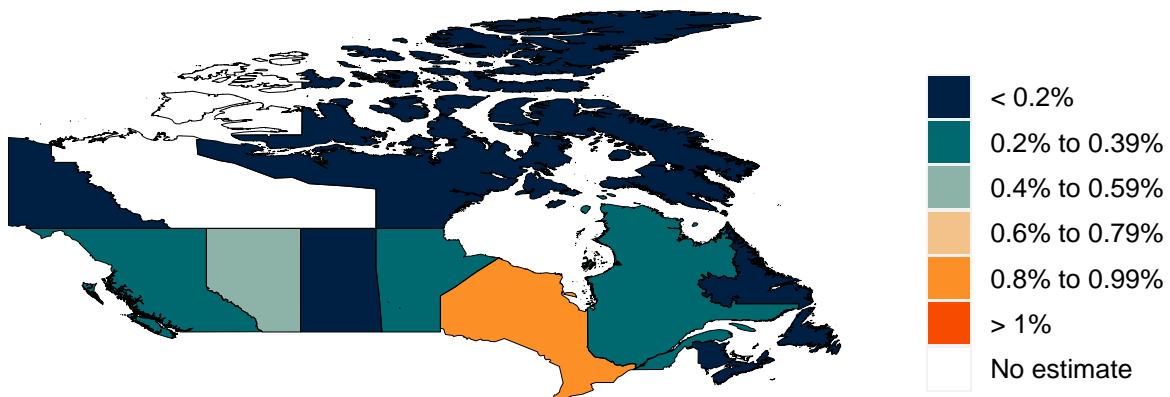
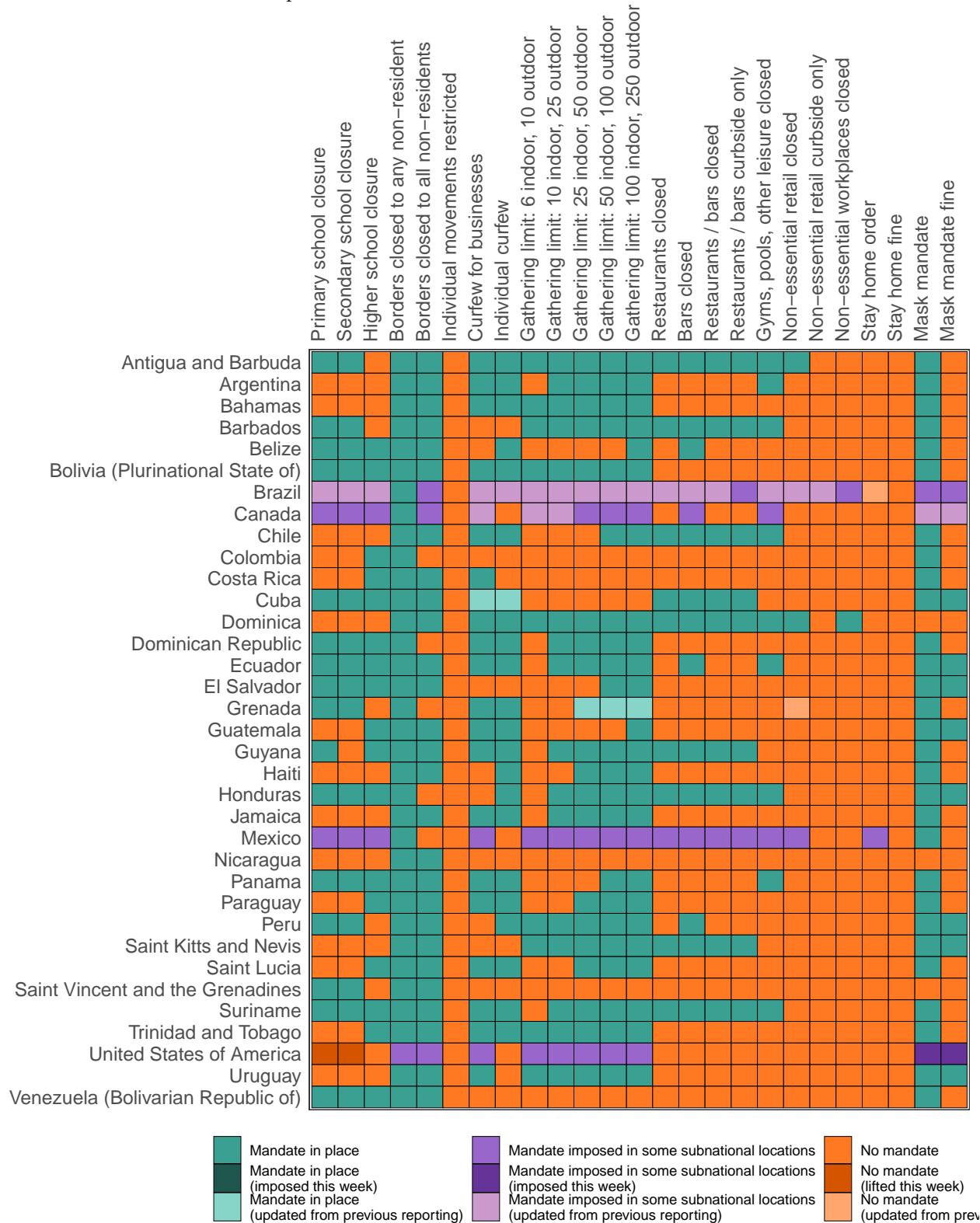
C. Estimated percent Delta variant**D. Estimated percent Gamma variant**

Figure 10. Infection-fatality rate on September 7, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.



Critical drivers

Table 2. Current mandate implementation



*Not all locations are measured at the subnational level.

Figure 11. Trend in mobility as measured through smartphone app use, compared to January 2020 baseline



Figure 12. Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on September 7, 2021

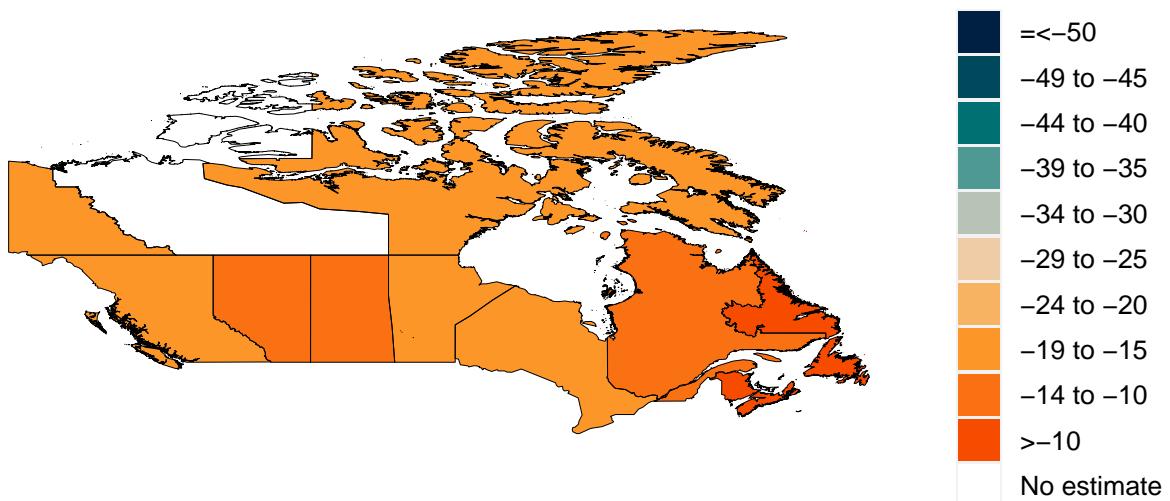


Figure 13. Trend in the proportion of the population reporting always wearing a mask when leaving home

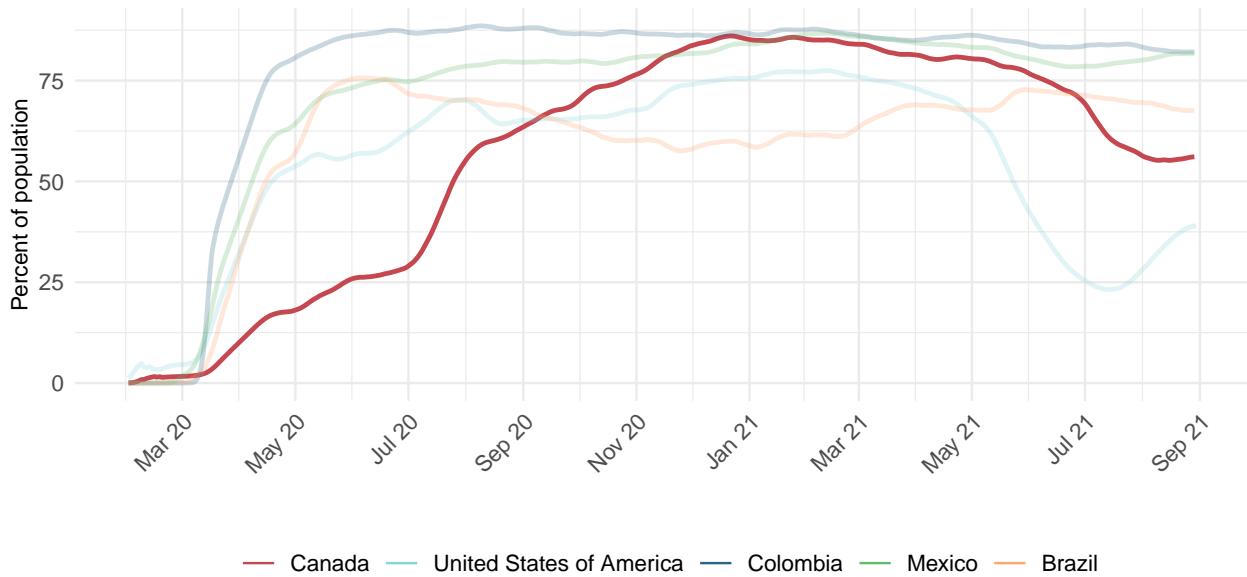


Figure 14. Proportion of the population reporting always wearing a mask when leaving home on September 7, 2021

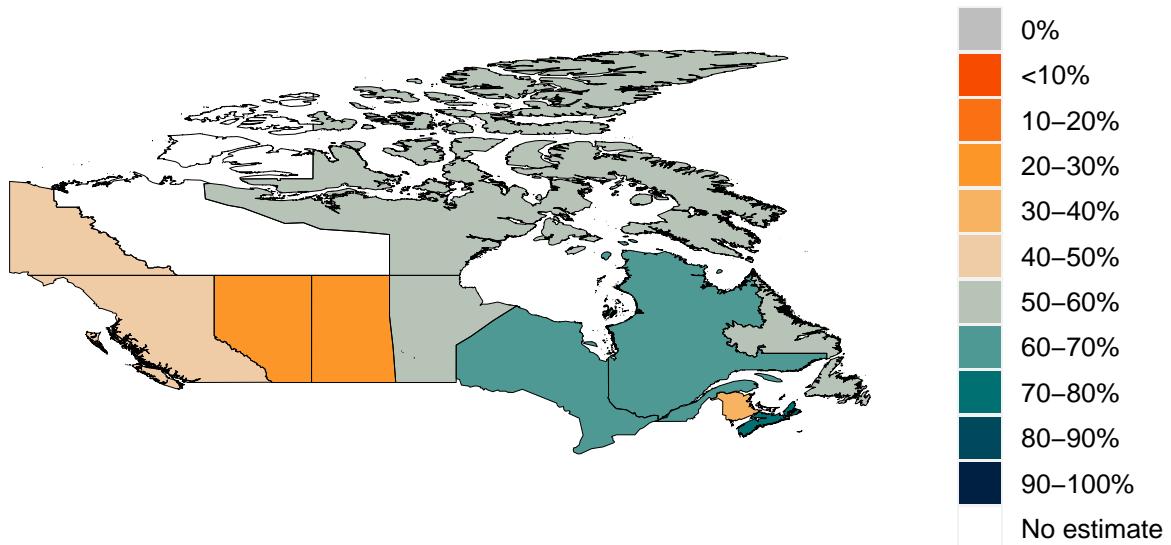


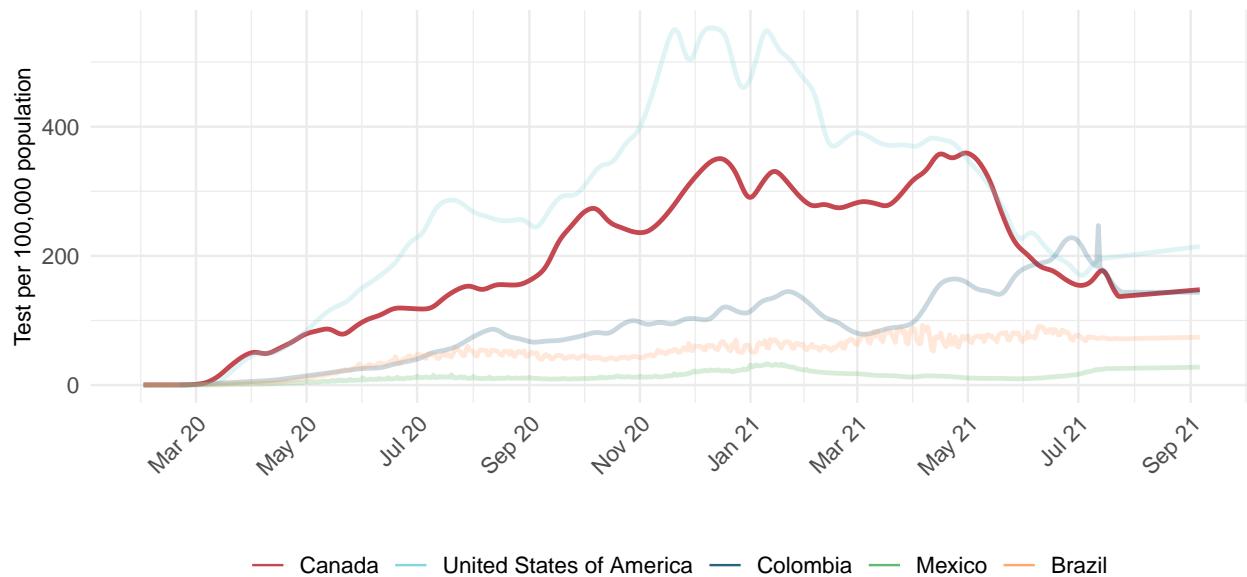
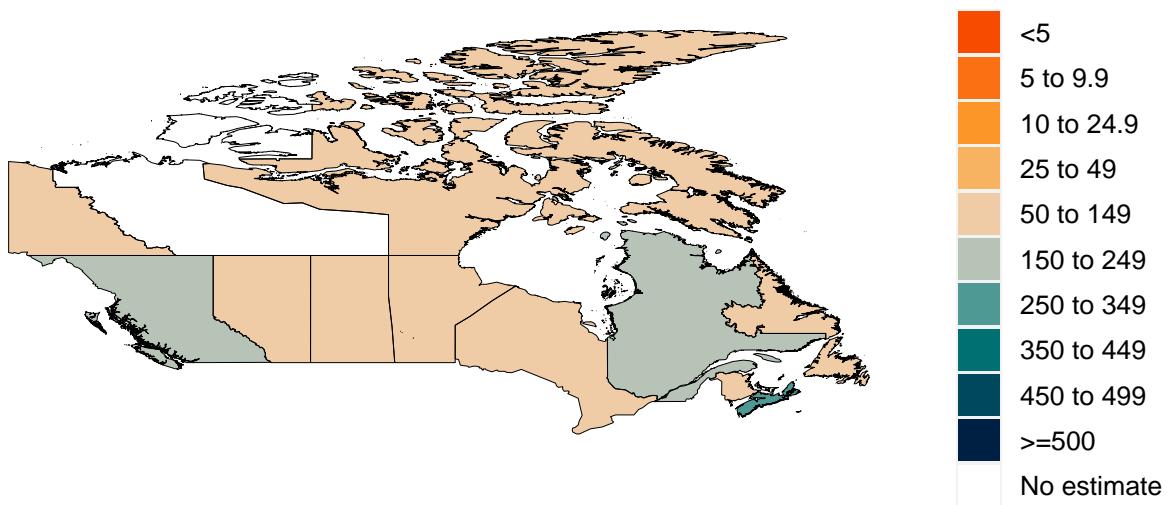
Figure 15. Trend in COVID-19 diagnostic tests per 100,000 people**Figure 16.** COVID-19 diagnostic tests per 100,000 people on September 7, 2021

Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our [website](#).

Vaccine	Efficacy at preventing disease: ancestral and Alpha	Efficacy at preventing infection: ancestral and Alpha	Efficacy at preventing disease: Beta, Delta, & Gamma	Efficacy at preventing infection: Beta, Delta, & Gamma
AstraZeneca	85%	52%	83%	57%
CoronaVac	50%	44%	43%	38%
Covaxin	78%	69%	68%	60%
Johnson & Johnson	86%	72%	85%	56%
Moderna	94%	89%	93%	80%
Novavax	89%	79%	79%	69%
Pfizer/BioNTech	92%	86%	90%	78%
Sinopharm	73%	65%	63%	56%
Sputnik-V	92%	81%	80%	70%
Tianjin CanSino	66%	58%	57%	50%
Other vaccines	75%	66%	65%	57%
Other vaccines (mRNA)	91%	86%	89%	78%

Figure 17. Percent of the population (A) having received at least one dose and (B) fully vaccinated against SARS-CoV-2 by September 7, 2021

A. Percent of the population having received one dose of a COVID-19 vaccine



B. Percent of the population fully vaccinated against SARS-CoV-2



Figure 18. Trend in the estimated proportion of the adult (18+) population that have been vaccinated or would probably or definitely receive the COVID-19 vaccine if available

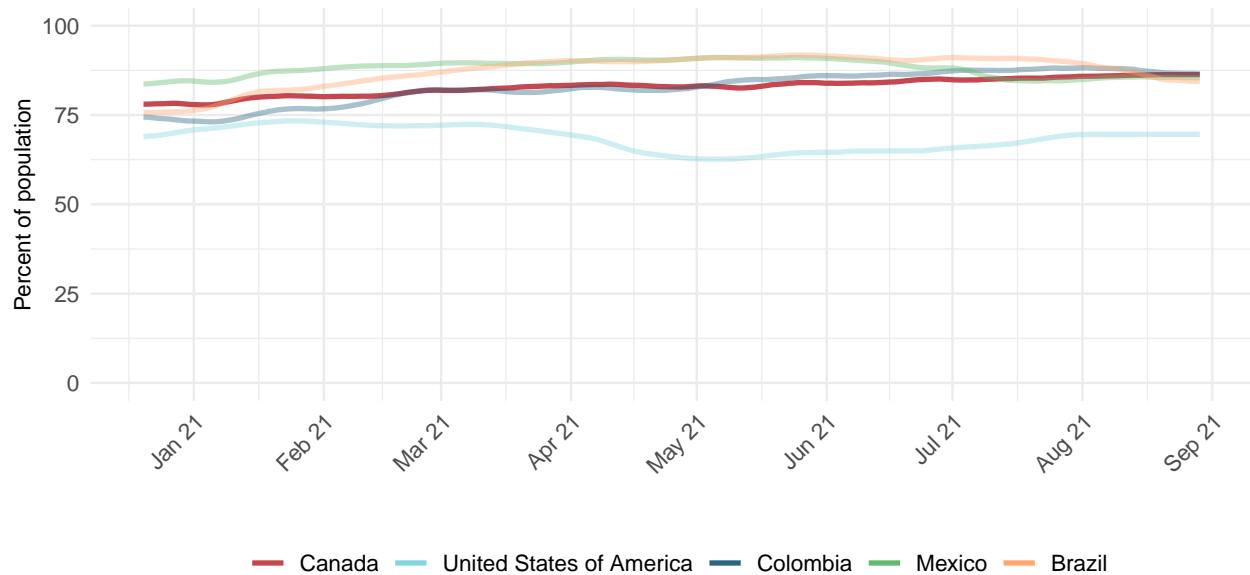


Figure 19. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available

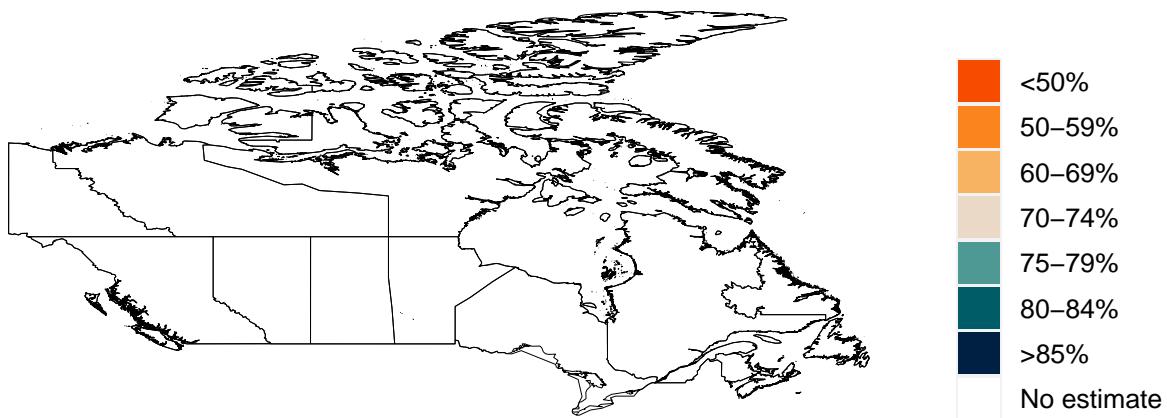


Figure 20. Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

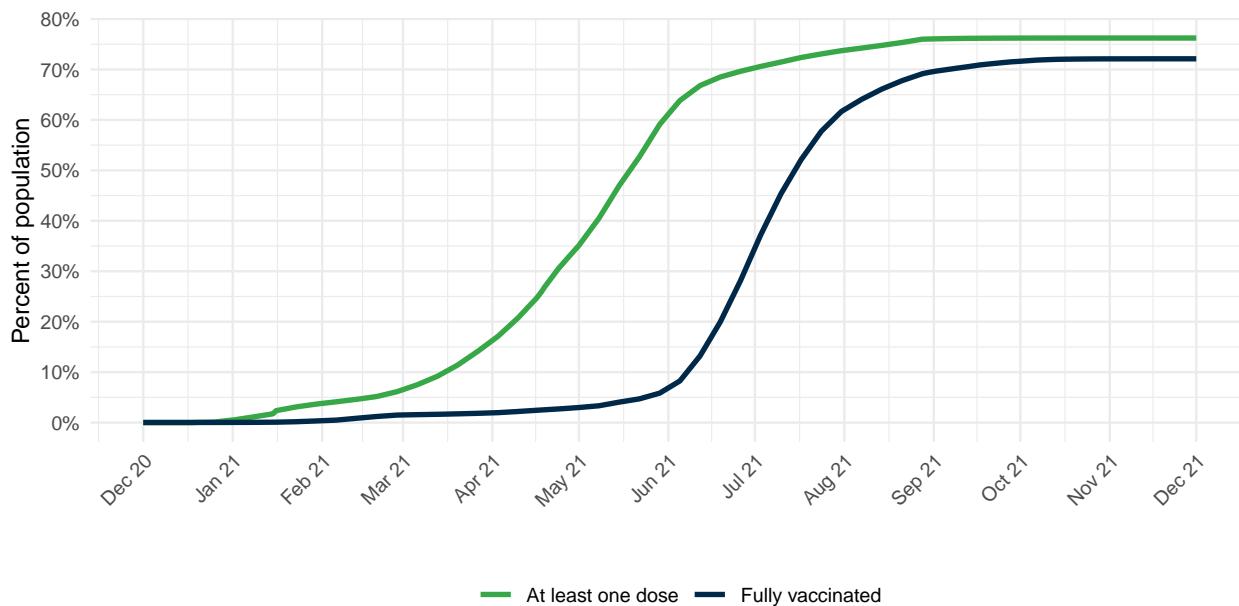
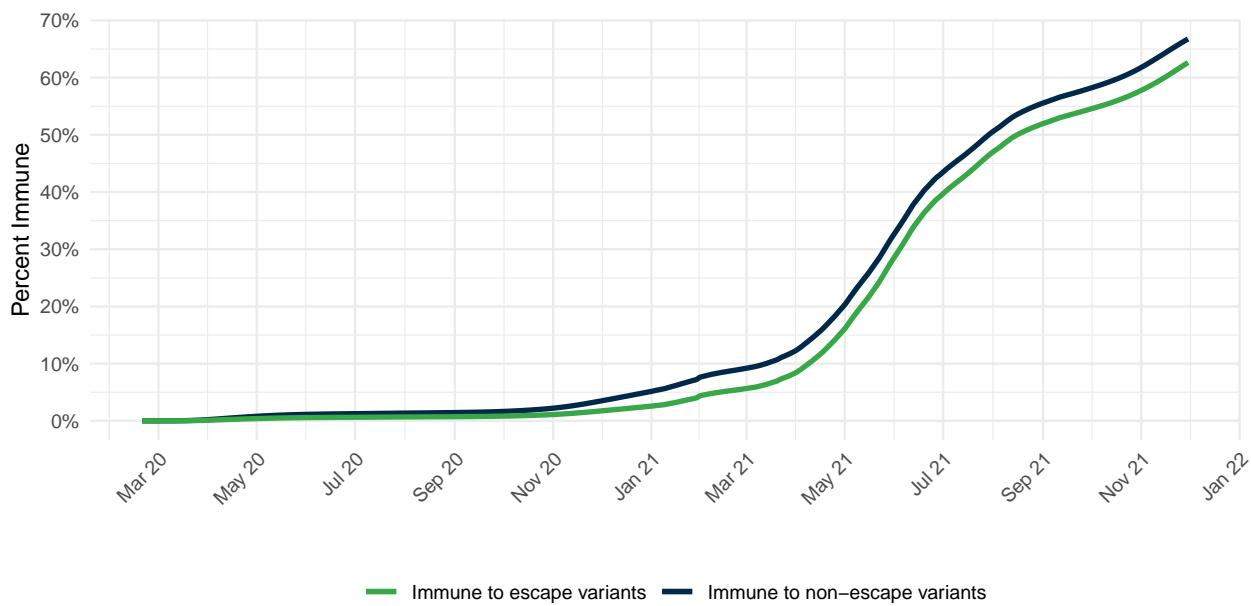


Figure 21. Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants



Projections and scenarios

We produce three scenarios when projecting COVID-19. The **reference scenario** is our forecast of what we think is most likely to happen:

- Vaccines are distributed at the expected pace. Brand- and variant-specific vaccine efficacy is updated using the latest available information from peer-reviewed publications and other reports.
- Future mask use is the mean of mask use over the last 7 days.
- Mobility increases as vaccine coverage increases.
- Governments adapt their response by re-imposing social distancing mandates for 6 weeks whenever daily deaths reach 8 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate, and not yet re-imposed social distancing mandates. In this case, the reference scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants Alpha, Beta, Gamma, and Delta continue to spread regionally and globally from locations with sufficient transmission.

The **worse scenario** modifies the reference scenario assumption in four ways:

- 100% of vaccinated individuals stop using masks.
- Mobility increases in all locations to 25% above the pre-pandemic winter baseline, irrespective of vaccine coverage.
- Governments are more reluctant to re-impose social distancing mandates, waiting until the daily death rate reaches 15 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate, and not yet re-imposed social distancing mandates. In this case, the reference scenario assumes that mandates are re-imposed when daily deaths reach 38 per million. In either case, we assume social distancing mandates remain in effect for 6 weeks.
- Variants Alpha, Beta, Gamma, and Delta spread between locations twice as fast when compared with our reference scenario.

The **universal masks scenario** makes all the same assumptions as the reference scenario but assumes all locations reach 95% mask use within 7 days.

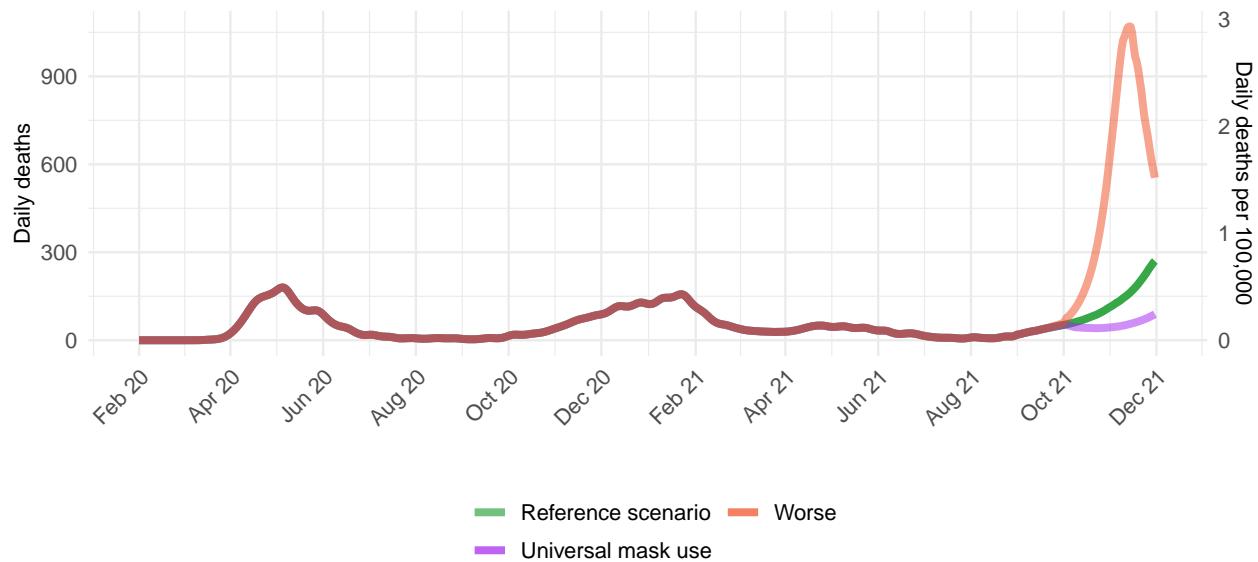
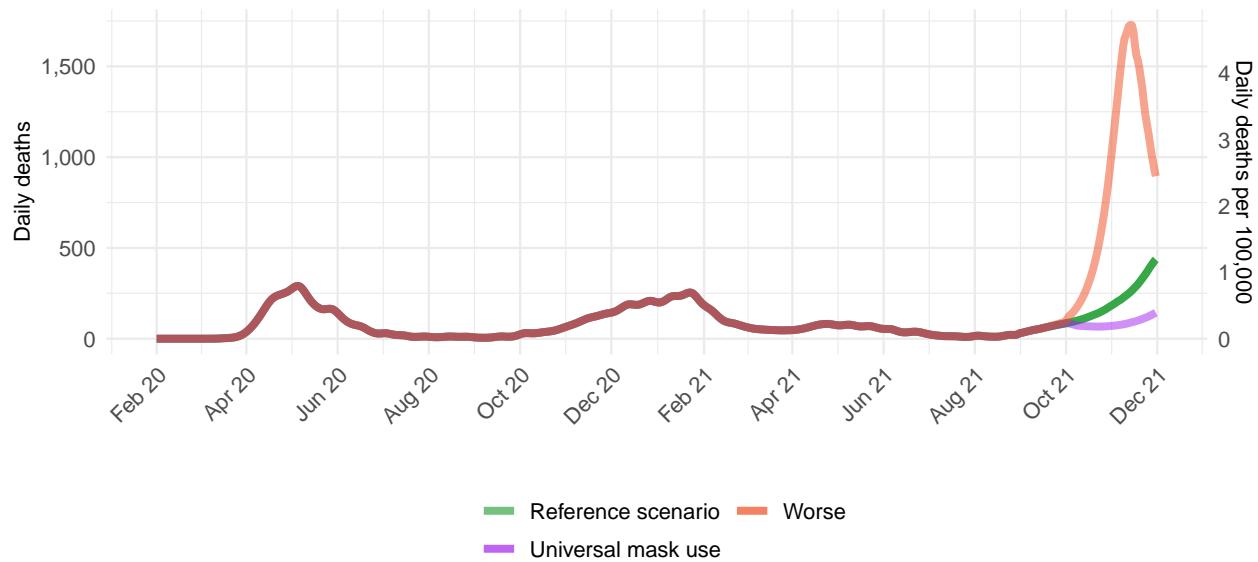
Figure 22. Daily COVID-19 deaths until December 01, 2021 for three scenarios**A. Reported daily COVID-19 deaths per 100,000****B. Excess daily COVID-19 deaths per 100,000**

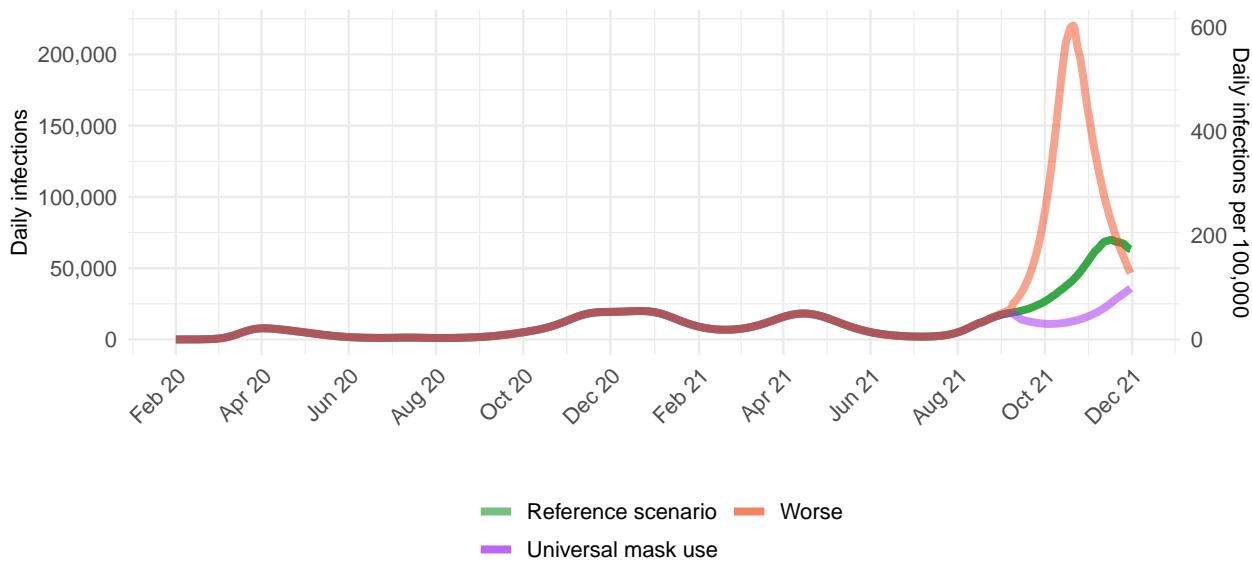
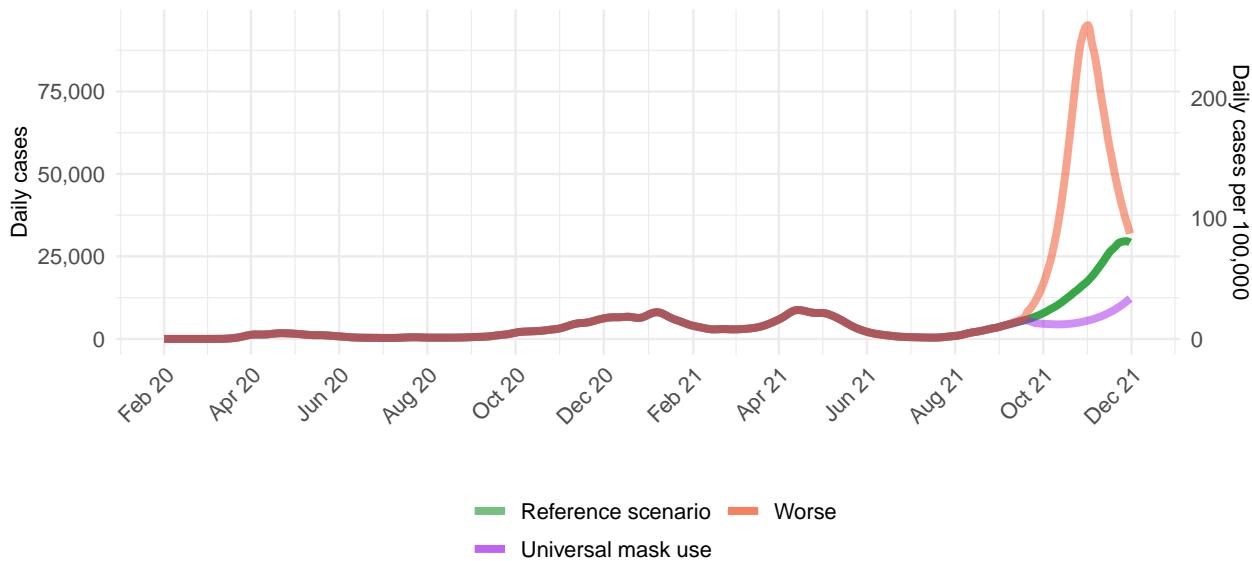
Figure 23. Daily COVID-19 infections until December 01, 2021 for three scenarios**Figure 24.** Daily COVID-19 reported cases until December 01, 2021 for three scenarios

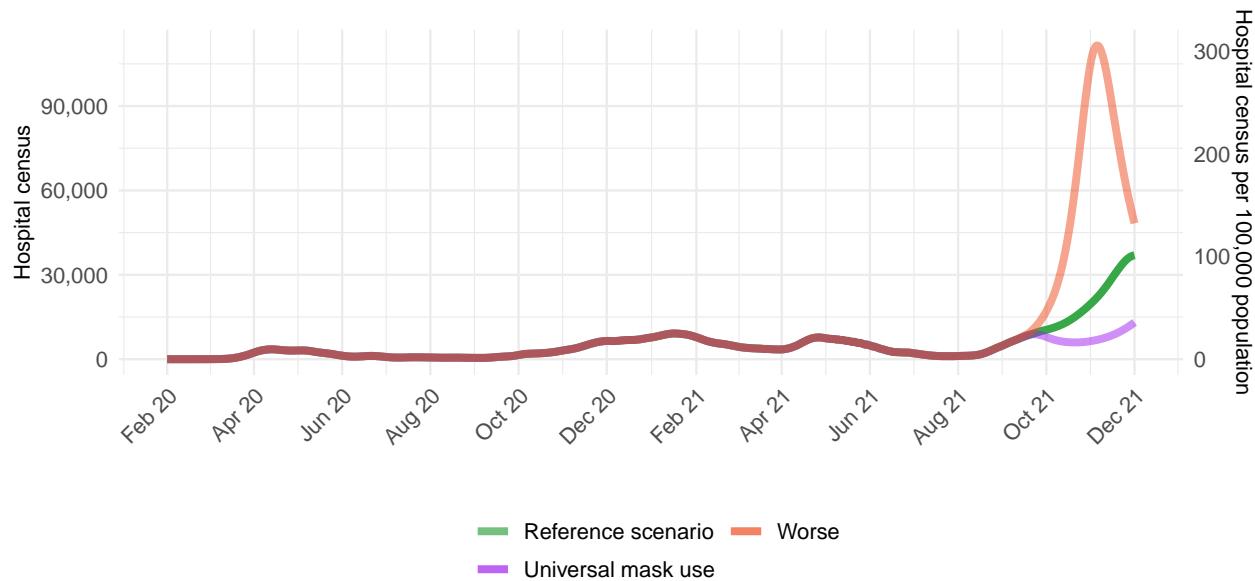
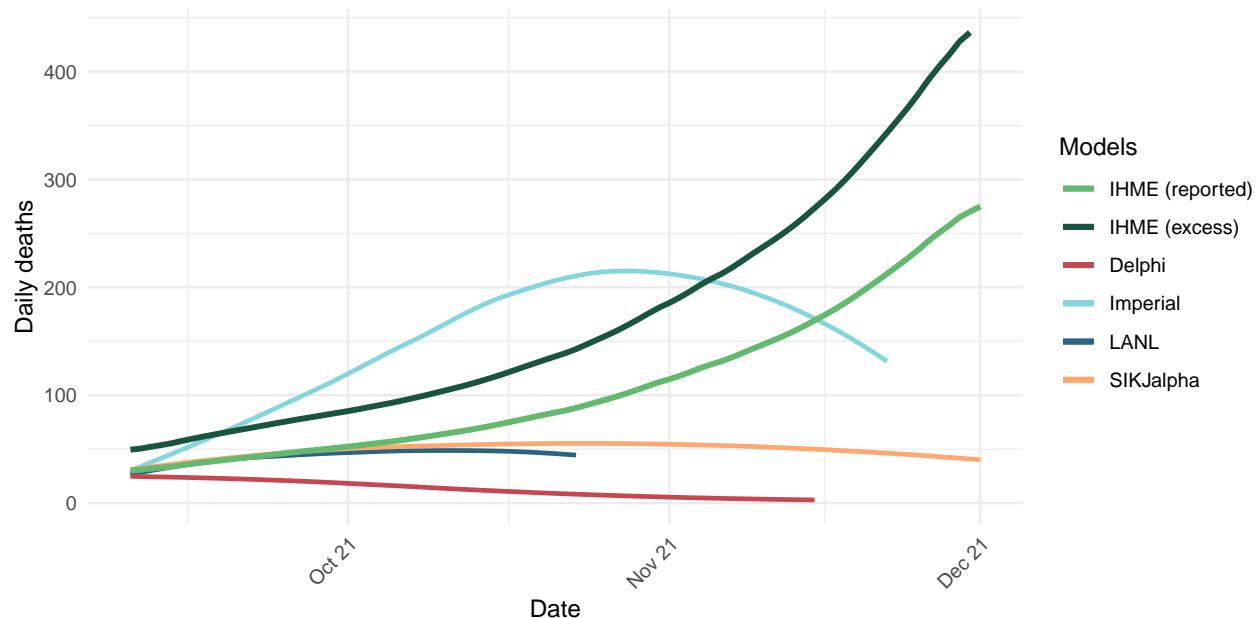
Figure 25. Daily COVID-19 hospital census until December 01, 2021 for three scenarios**Figure 26.** Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology ([Delphi](#)), Imperial College London ([Imperial](#)), The Los Alamos National Laboratory ([LANL](#)), and the SI-KJalpha model from the University of Southern California ([SIKJalpha](#)). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.

Figure 27. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.

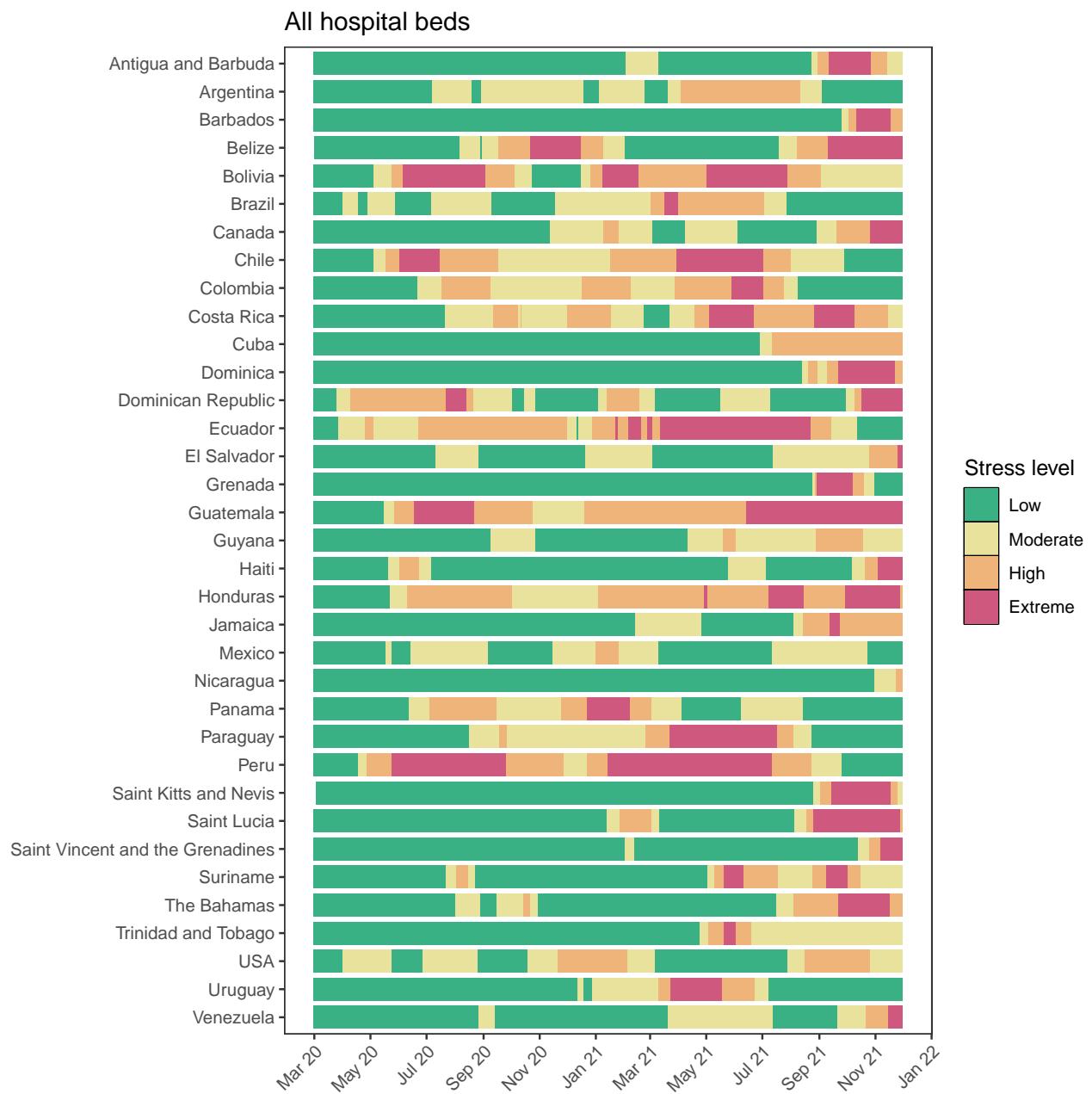


Figure 28. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and 60% or greater is considered *extreme stress*.



More information

Data sources:

Mask use and vaccine confidence data are from the [The Delphi Group at Carnegie Mellon University and University of Maryland COVID-19 Trends and Impact Surveys](#), in partnership with Facebook. Mask use data are also from [Premise](#), the Kaiser Family Foundation, and the [YouGov COVID-19 Behaviour Tracker survey](#).

Genetic sequence and metadata are primarily from the GISAID Initiative. Further details available on the COVID-19 model [FAQ page](#).

A note of thanks:

We wish to warmly acknowledge the support of [these](#) and others who have made our COVID-19 estimation efforts possible.

More information:

For all COVID-19 resources at IHME, visit <http://www.healthdata.org/covid>.

To download our most recent results, visit our [Data downloads page](#).

Questions? Requests? Feedback? Please contact us at <https://www.healthdata.org/covid/contact-us>.