

COVID-19 Results Briefing

Brazil

May 5, 2022

This document contains summary information on the latest projections from the IHME model on COVID-19 in Brazil. The model was run on May 5, 2022, with data through May 3, 2022.

Current situation

- Daily infections in the last week increased to 319,000 per day on average compared to 314,000 the week before (Figure 1.1). Daily hospital census in the last week (through May 3) increased to 2,700 per day on average compared to 2,600 the week before.
- Daily reported cases in the last week increased to 15,000 per day on average compared to 14,000 the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week decreased to 95 per day on average compared to 98 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week remained the same at 110 per day on average compared to the week before (Figure 3.1). This makes COVID-19 the number 10 cause of death in Brazil this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 1.2 times larger than the reported number of deaths.
- The daily rate of reported deaths due to COVID-19 is greater than 4 per million in no states (Figure 4.1).
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in no states (Figure 4.2).
- We estimate that 84% of people in Brazil have been infected at least once as of May 2 (Figure 6.1). Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 16 states. (Figure 7.1).
- The infection-detection rate in Brazil was close to 5% on May 2 (Figure 8.1).
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figures 9.1-9.5). We estimate that the Alpha variant is circulating in four states, that the Beta variant is circulating in no states, that the Delta variant is circulating in 27 states, that the Gamma variant is circulating in 27 states, and that the Omicron variant is circulating in 27 states.

Trends in drivers of transmission

- Mobility last week was 2% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was lower than 15% of baseline in one state (Figure 12.1).
- As of April 24, in the COVID-19 Trends and Impact Survey, 31% of people self-reported that they always wore a mask when leaving their home compared to 32% the previous week (Figure 13.1).
- There were 40 diagnostic tests per 100,000 people on May 2 (Figure 15.1).
- As of May 2, 10 states have reached 70% or more of the population who have received at least one vaccine dose, and seven states have reached 70% or more of the population who are fully vaccinated (Figures 17.1 and 17.2). 81% of people in Brazil have received at least one vaccine dose, and 76% are fully vaccinated.
- In Brazil, 88.4% of the population that is 12 years and older say they would accept a vaccine for COVID-19 (Figure 18.1). This is the same as last week. Note that vaccine acceptance is calculated using survey data from the 18+ population. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 69% in Amapá to 99% in São Paulo (Figure 19.1).
- As of April 25, 2022, 1.5 percent of the population in Brazil say they would accept a vaccine for COVID-19 but have not yet been vaccinated.
- In our current reference scenario, we expect that 175.3 million people will be vaccinated with at least one dose by September 1 (Figure 21.1). We expect that 76% of the population will be fully vaccinated by September 1.

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 seven days.
- Mobility increases as vaccine coverage increases.
- Omicron variant spreads according to our flight and local spread model.
- 80% of those who have had two doses of vaccine (or one dose for Johnson & Johnson) receive a third dose at six months after their second dose.

The **80% mask use scenario** makes all the same assumptions as the reference scenario but assumes all locations reach 80% mask use within seven days. If a location currently has higher than 80% use, mask use remains at the current level.

The **third dose scenario** is the same as the reference scenario but assumes that 100% of those who have received two doses of vaccine will get a third dose at six months.

Projections

Infections

- Daily estimated infections in the **reference scenario** will rise to 333,280 by July 18, 2022 (Figure 23.1).
- Daily estimated infections in the **80% mask use scenario** will decline to 79,260 by June 25, 2022 (Figure 23.1).
- Daily estimated infections in the **third dose scenario** will rise to 311,990 by July 18, 2022 (Figure 23.1).

Cases

- Daily estimated cases in the **reference scenario** will rise to 20,620 by July 22, 2022 (Figure 23.2).
- Daily estimated cases in the **80% mask use scenario** will rise to 15,120 by May 12, 2022 (Figure 23.2).
- Daily estimated cases in the **third dose scenario** will rise to 18,970 by July 25, 2022 (Figure 23.2).

Hospitalizations

- Daily hospital census in the **reference scenario** will rise to 6,610 by August 7, 2022 (Figure 23.3).
- Daily hospital census in the **80% mask use scenario** will rise to 3,110 by May 15, 2022 (Figure 23.3).
- Daily hospital census in the **third dose scenario** will rise to 6,350 by August 7, 2022 (Figure 23.3).

Deaths

- In our **reference scenario**, our model projects 681,000 cumulative reported deaths due to COVID-19 on September 1. This represents 17,000 additional deaths from May 2 to September 1. Daily reported COVID-19 deaths in the **reference scenario** will rise to 190 by August 15, 2022 (Figure 23.4).
- Under our **reference scenario**, our model projects 796,000 cumulative total deaths due to COVID-19 on September 1. This represents 19,000 additional deaths from May 2 to September 1 (Figure 23.5).
- In our **80% mask use scenario**, our model projects 671,000 cumulative reported deaths due to COVID-19 on September 1. This represents 7,400 additional deaths from May 2 to September 1. Daily reported COVID-19 deaths in the **80% mask use scenario** will rise to 90 by May 17, 2022 (Figure 23.4).
- In our **third dose scenario**, our model projects 680,000 cumulative reported deaths due to COVID-19 on September 1. This represents 16,000 additional deaths from May 2 to September 1. Daily reported COVID-19 deaths in the **third dose scenario** will rise to 180 by August 16, 2022 (Figure 23.4).

- Figure 24.1 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.
- At some point from May through September 1, no states will have high or extreme stress on hospital beds (Figure 25.1). At some point from May through September 1, eight states will have high or extreme stress on intensive care unit (ICU) capacity (Figure 26.1).

Model updates

No model updates.

Figure 1.1: Daily COVID-19 hospital census and estimated infections

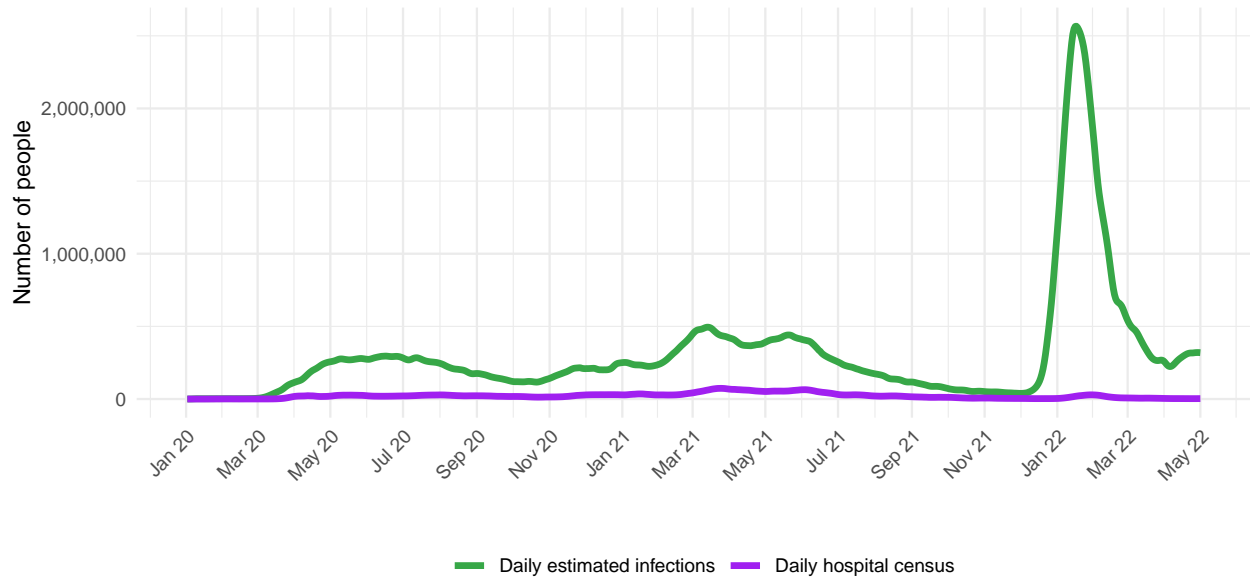


Figure 2.1: Reported daily COVID-19 cases, moving average

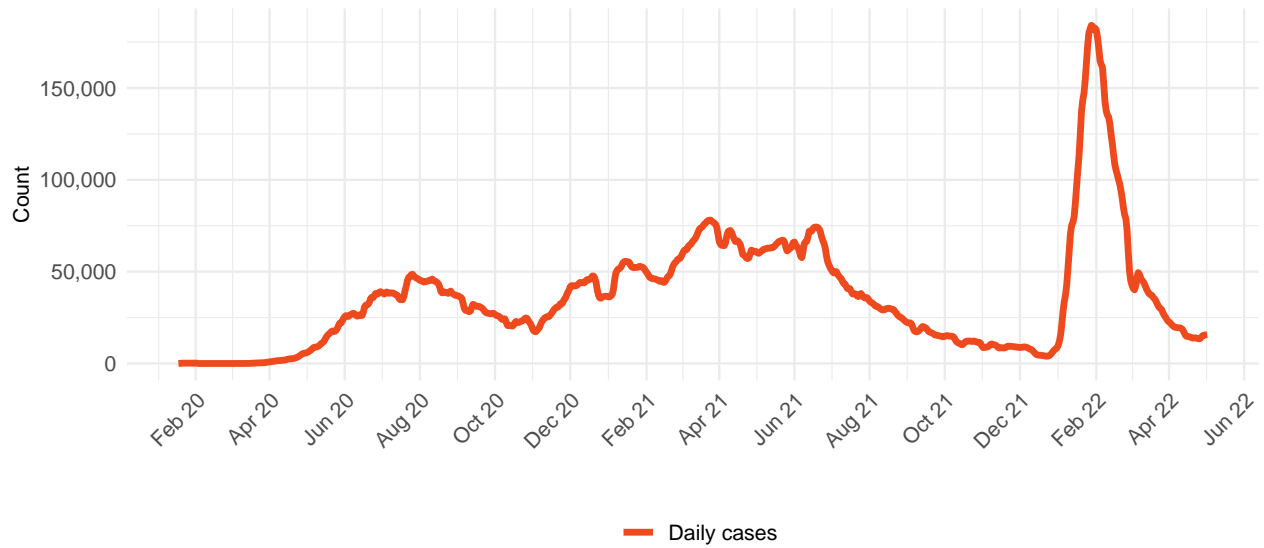
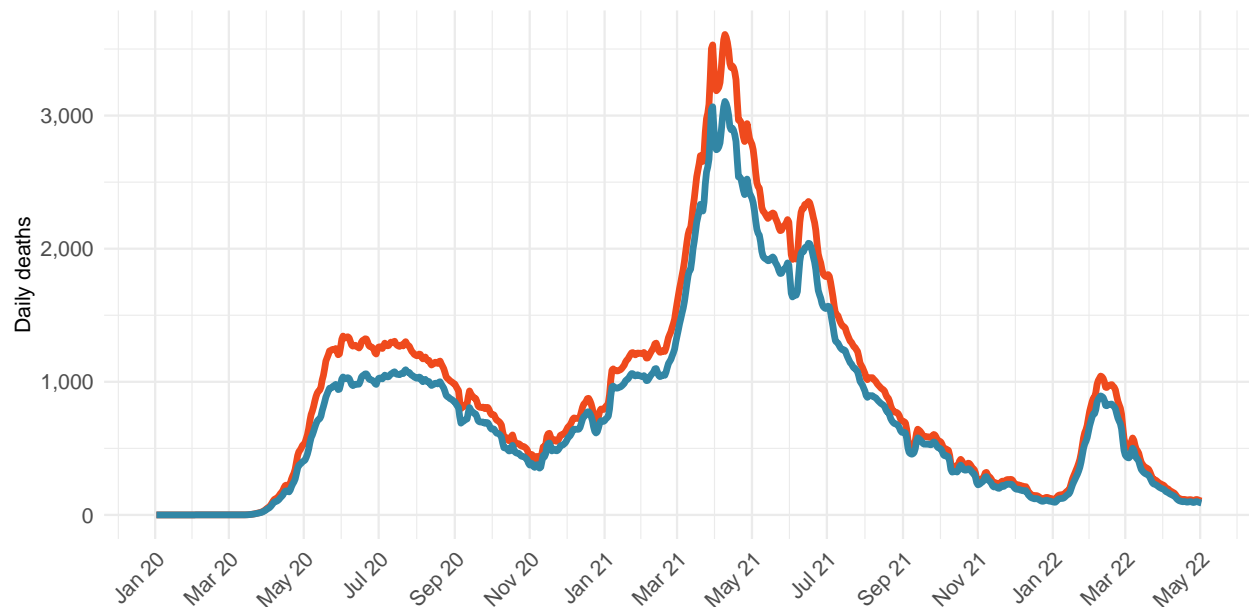


Table 1: Ranking of total deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	3,293	1
Stroke	2,519	2
Lower respiratory infections	1,705	3
Chronic obstructive pulmonary disease	1,321	4
Interpersonal violence	1,267	5
Diabetes mellitus	1,257	6
Alzheimer's disease and other dementias	1,050	7
Road injuries	856	8
Chronic kidney disease	814	9
COVID-19	774	10

Figure 3.1: Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily deaths due to COVID-19 (orange)



Daily COVID-19 death rate per 1 million on May 2, 2022

Figure 4.1: Daily reported COVID-19 death rate per 1 million

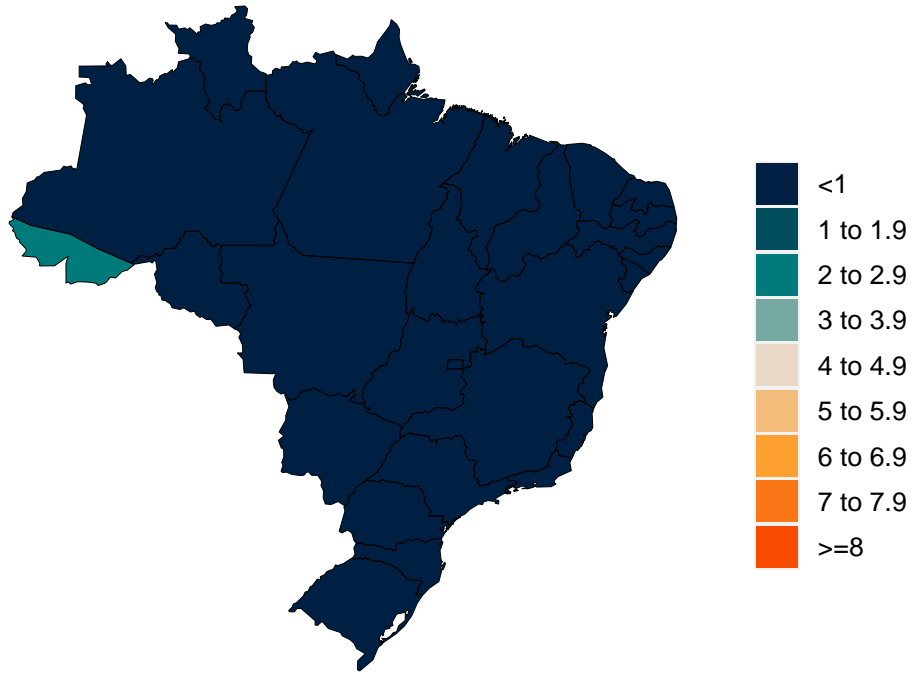
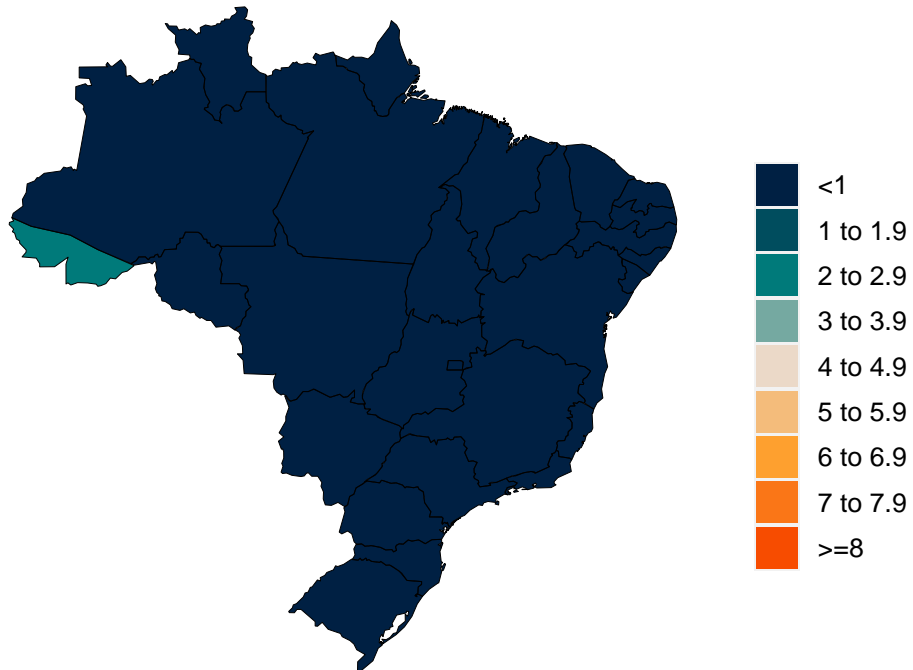


Figure 4.2: Daily total COVID-19 death rate per 1 million



Cumulative COVID-19 deaths per 100,000 on May 2, 2022

Figure 5.1: Reported cumulative COVID-19 deaths per 100,000

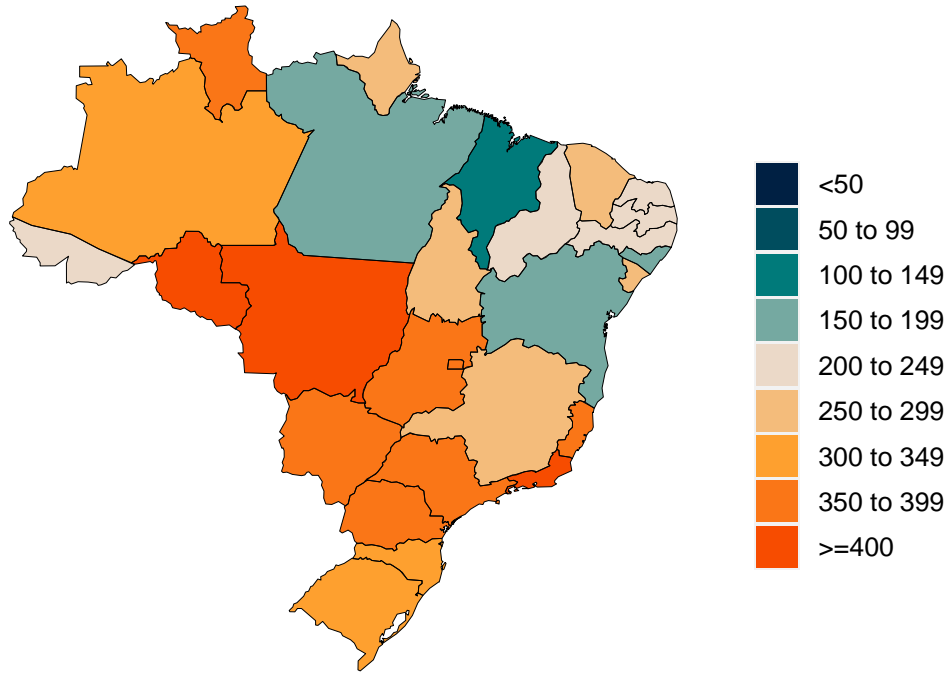


Figure 5.2: Total cumulative COVID-19 deaths per 100,000

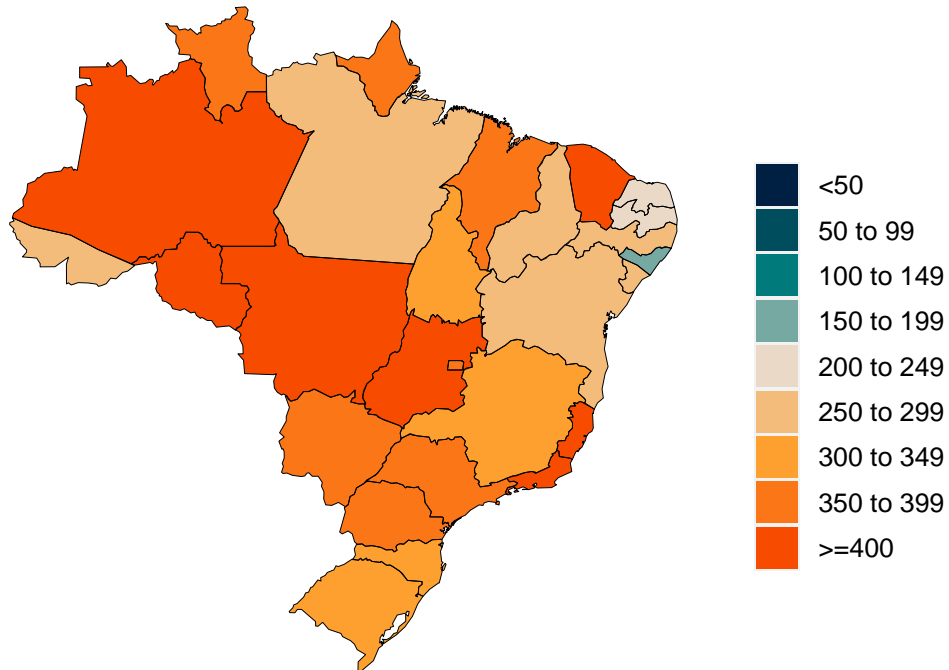


Figure 6.1: Estimated percent of the population infected with COVID-19 on May 2, 2022

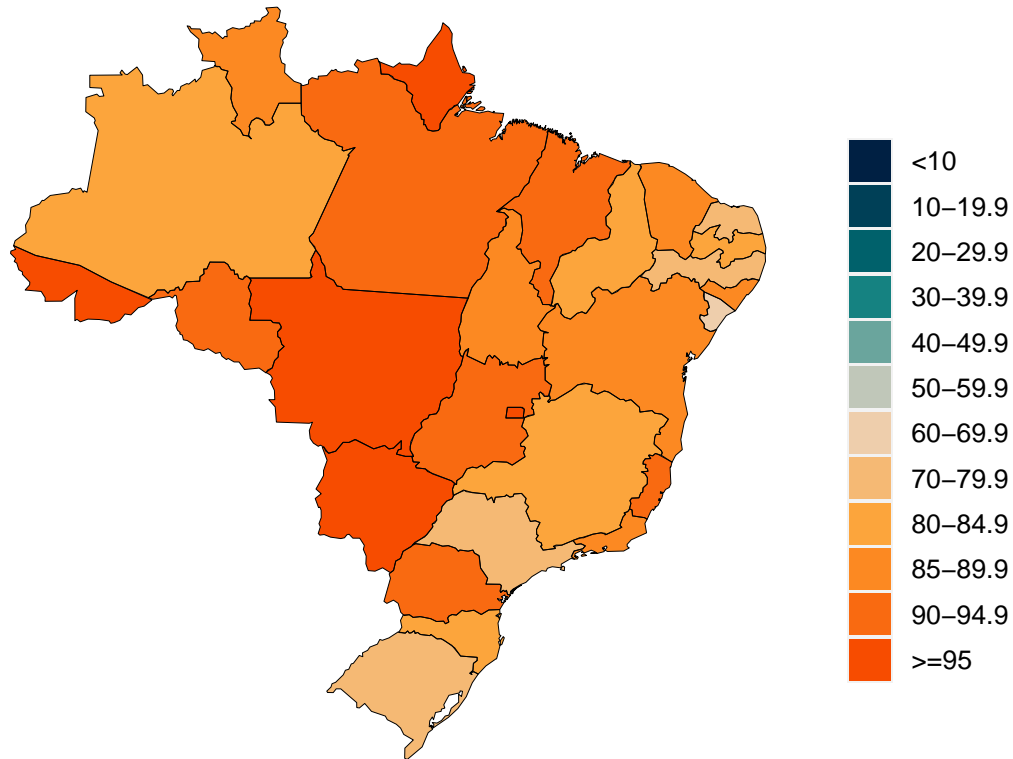


Figure 7.1: Mean effective R on April 21, 2022. Effective R less than 1 means that transmission should decline, all other things being held the same. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past.

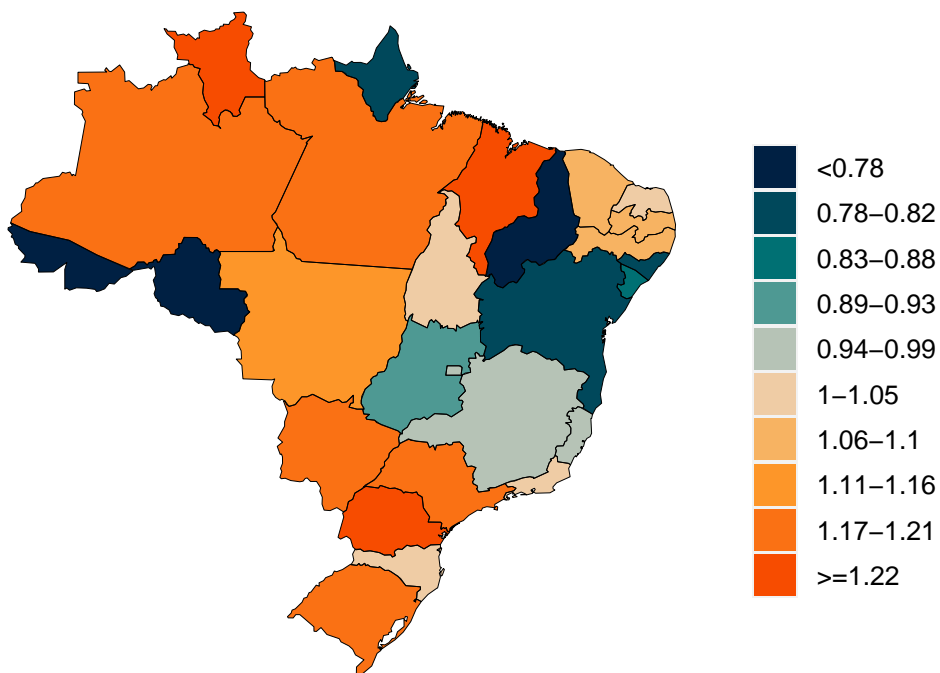
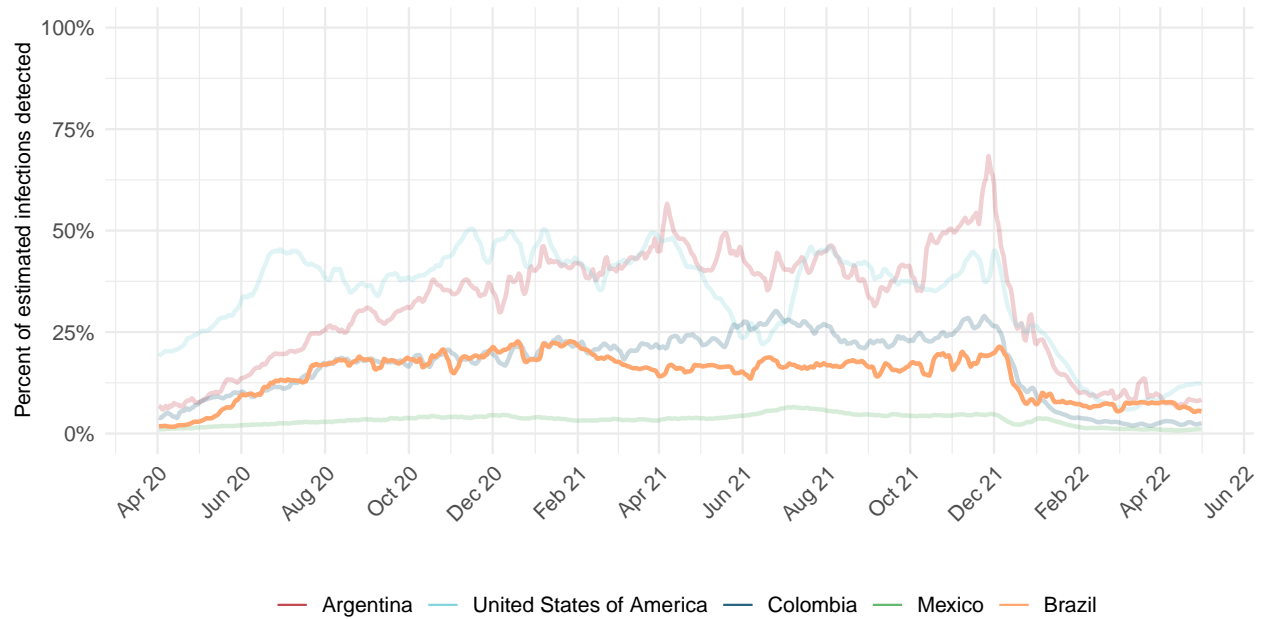


Figure 8.1: Percent of estimated COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.



Estimated percent of circulating SARS-CoV-2 for primary variant families on May 2, 2022

Figure 9.1: Estimated percent of new infections that are Alpha variant

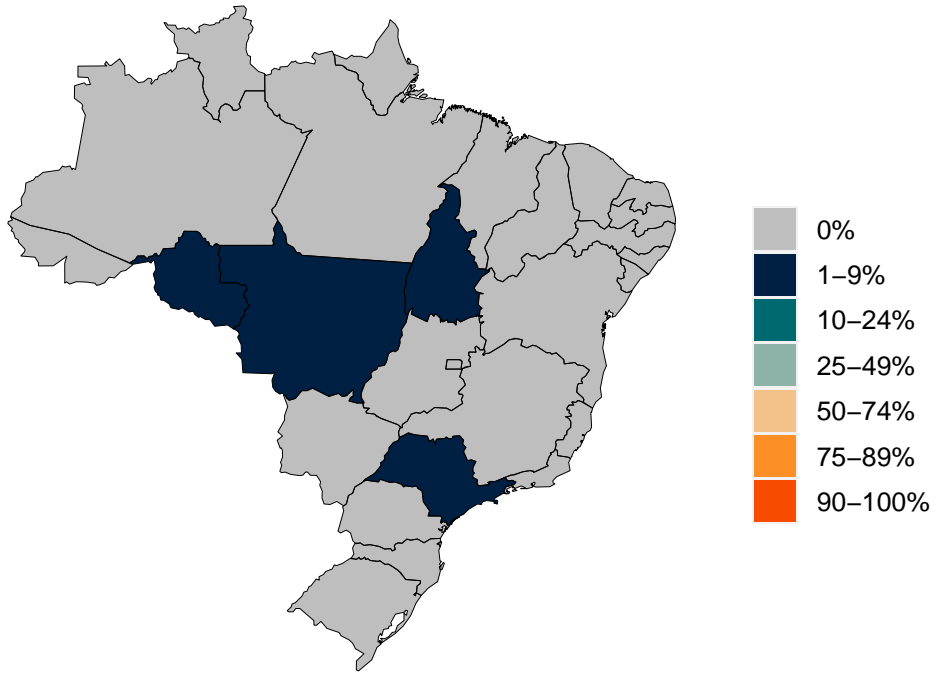


Figure 9.2: Estimated percent of new infections that are Beta variant

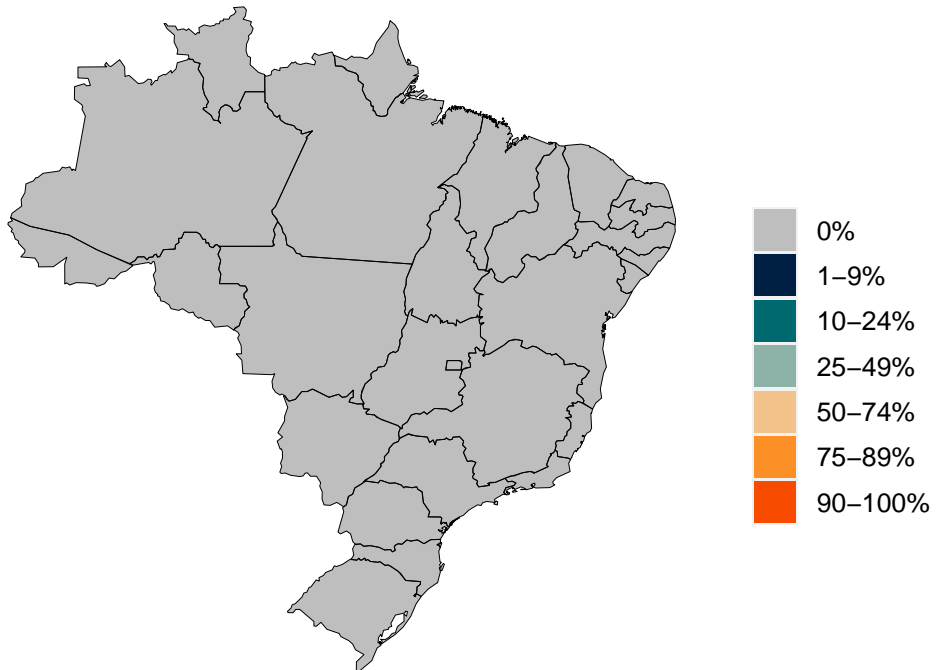


Figure 9.3: Estimated percent of new infections that are Delta variant

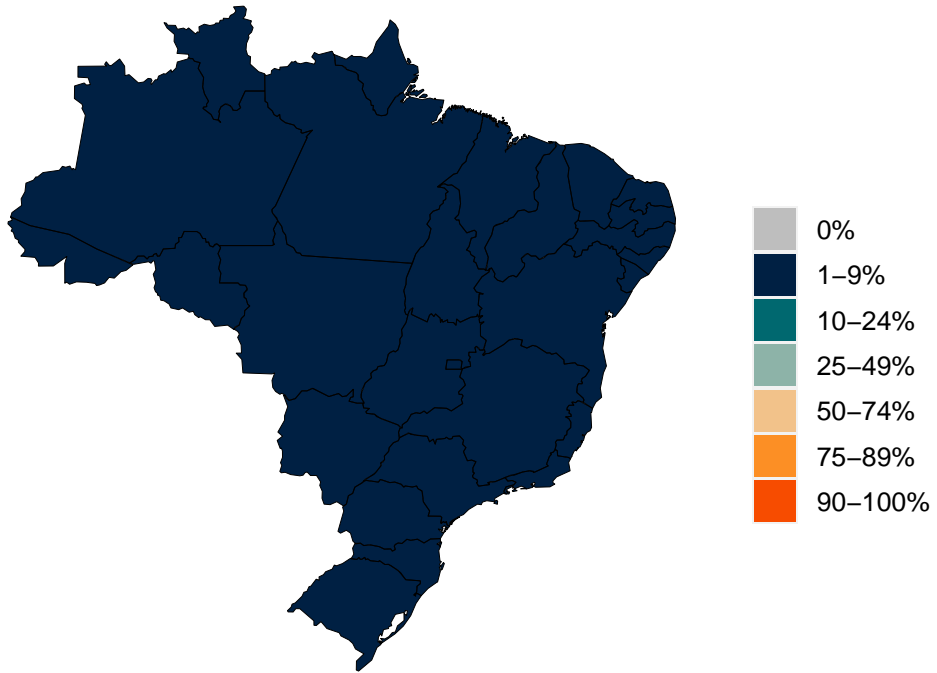


Figure 9.4: Estimated percent of new infections that are Gamma variant

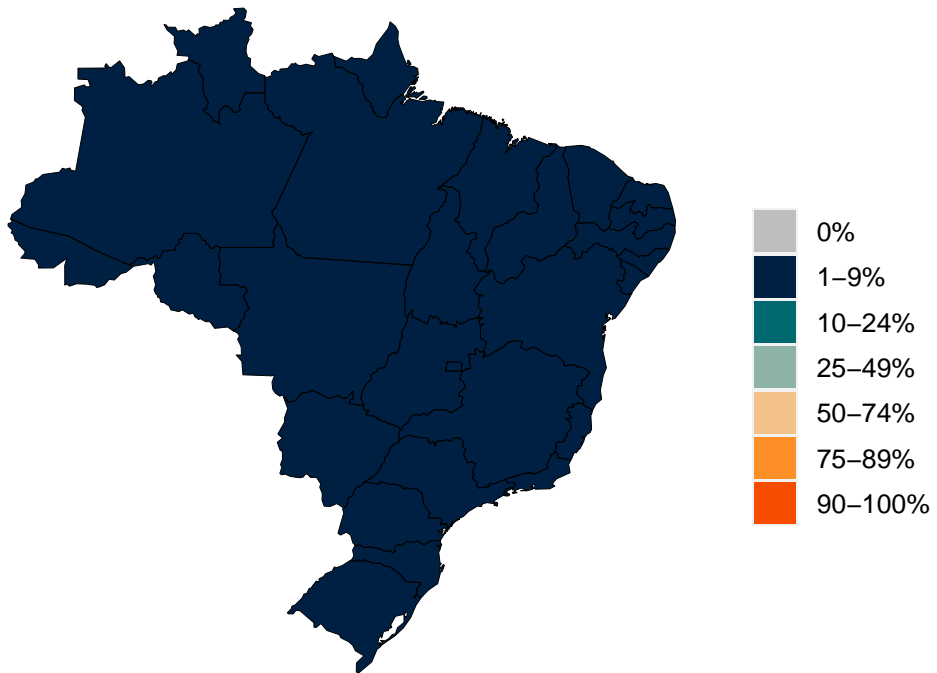


Figure 9.5: Estimated percent of new infections that are Omicron variant

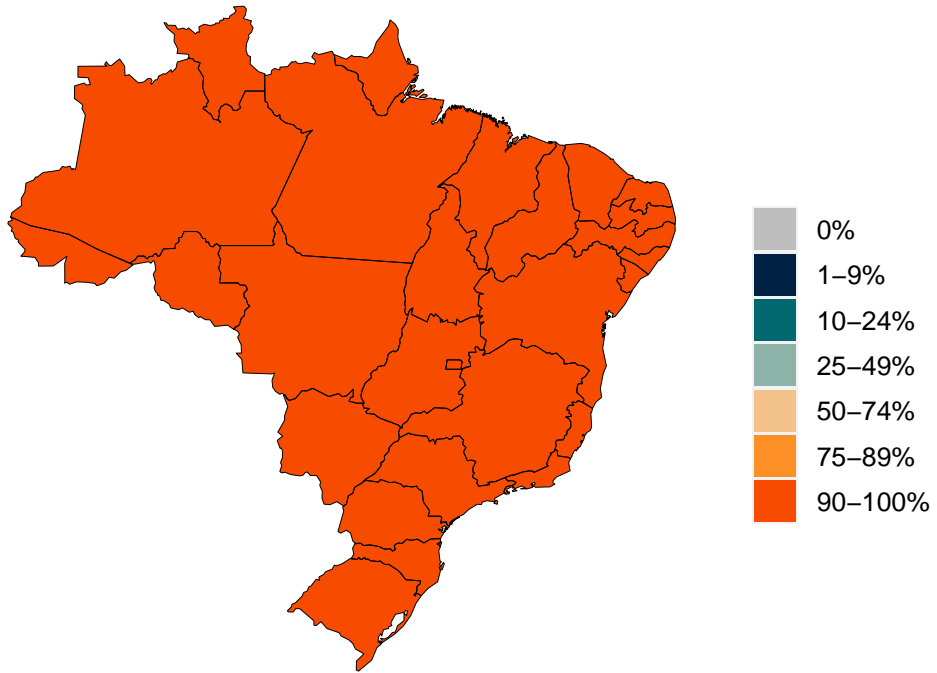
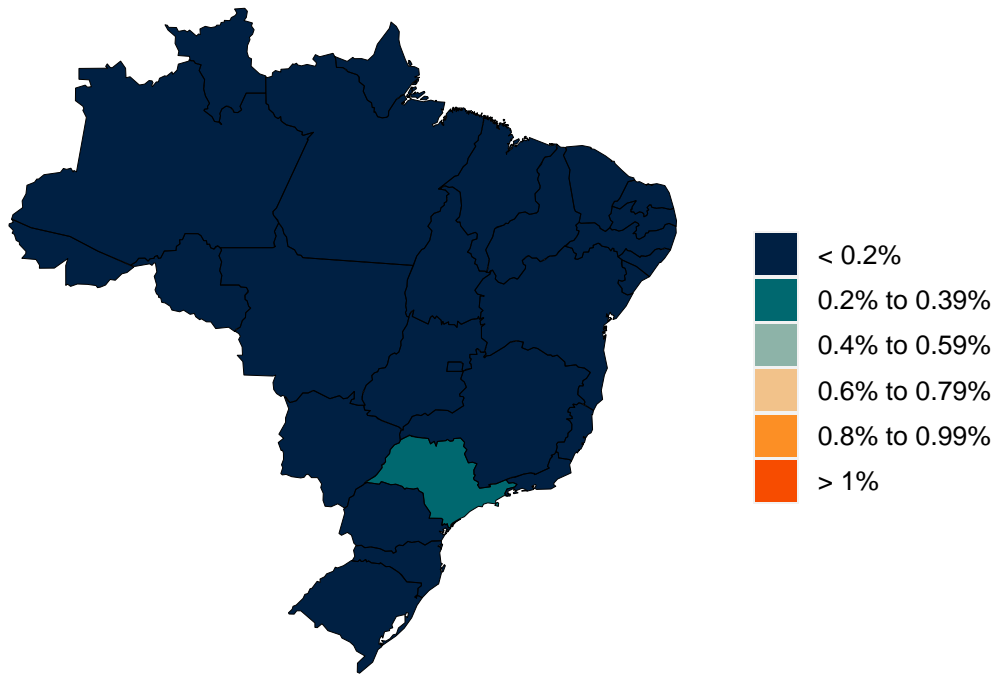


Figure 10.1: Infection-fatality rate on May 2, 2022. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.



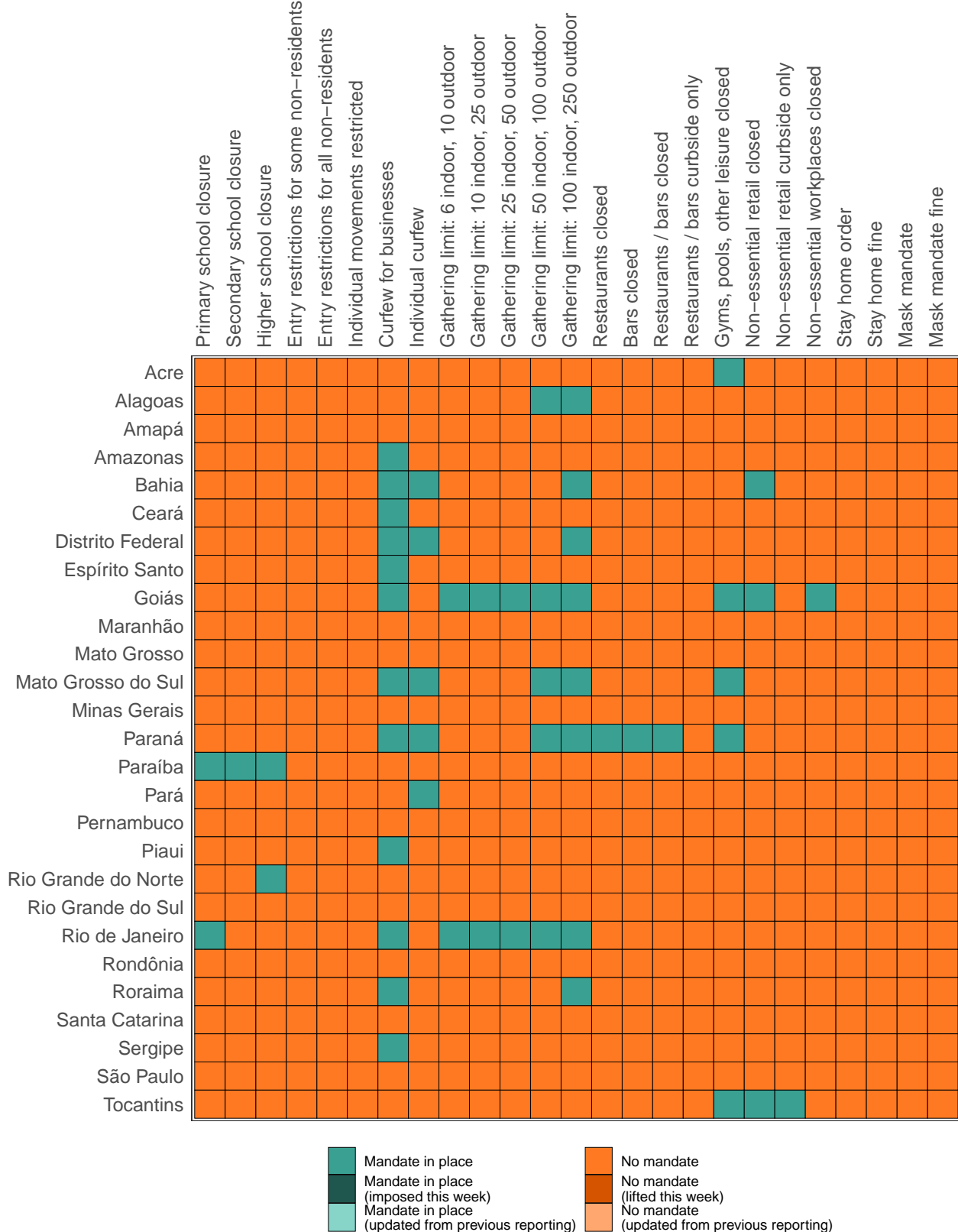
Critical drivers
Table 2: Current mandate implementation


Figure 11.1: Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

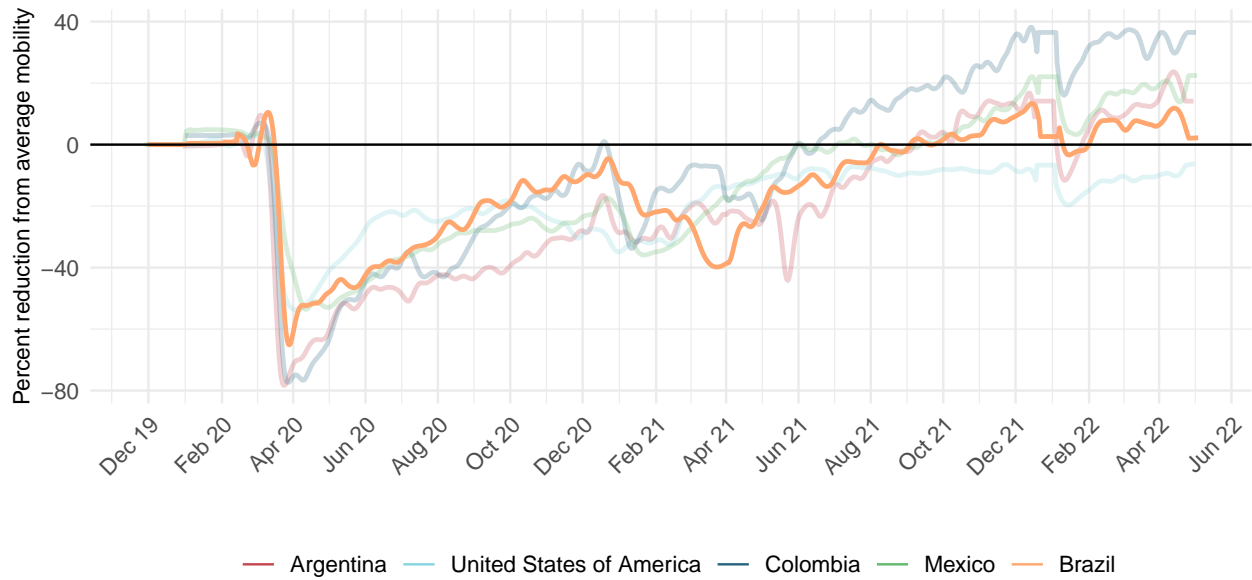


Figure 12.1: Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on May 2, 2022

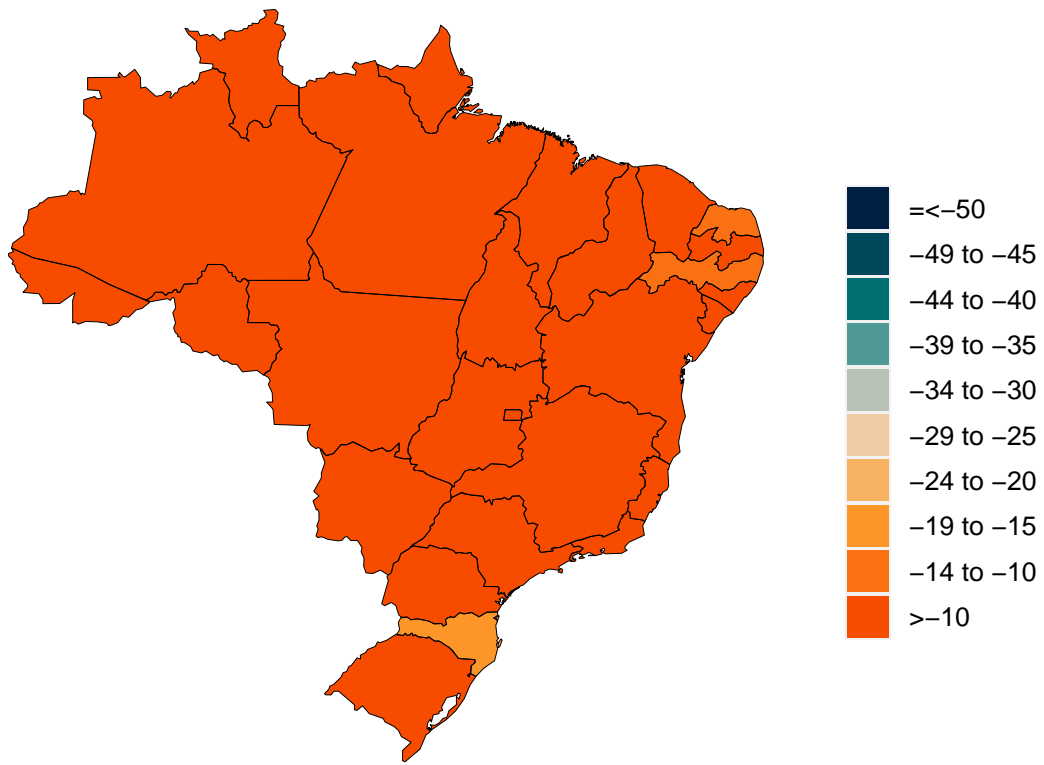


Figure 13.1: Trend in the proportion of the population reporting always wearing a mask when leaving home

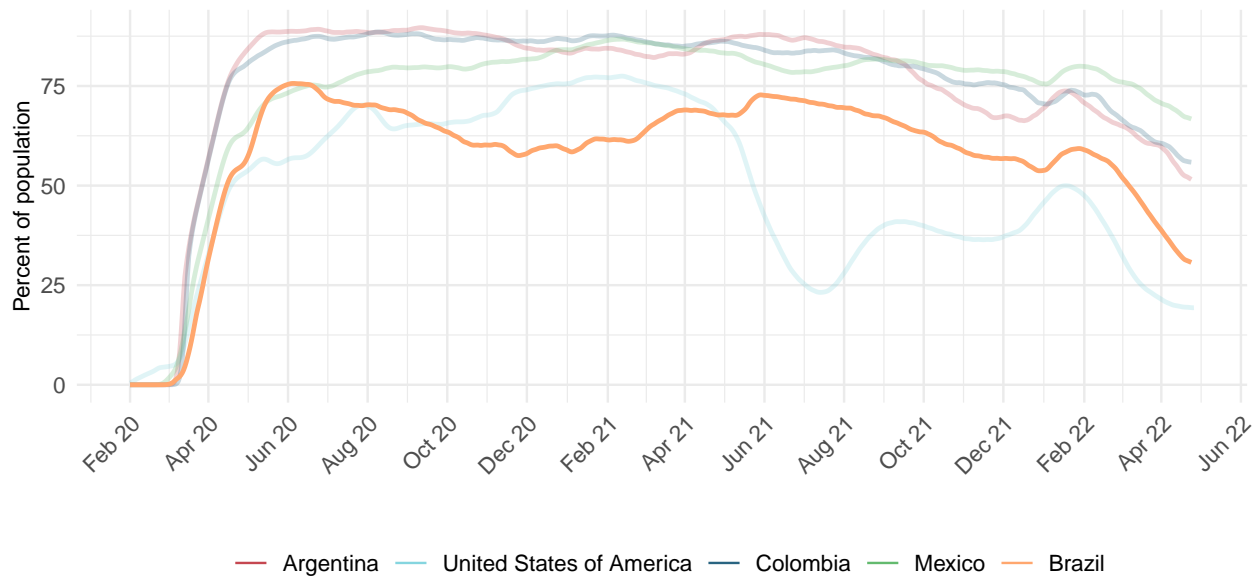


Figure 14.1: Proportion of the population reporting always wearing a mask when leaving home on May 2, 2022

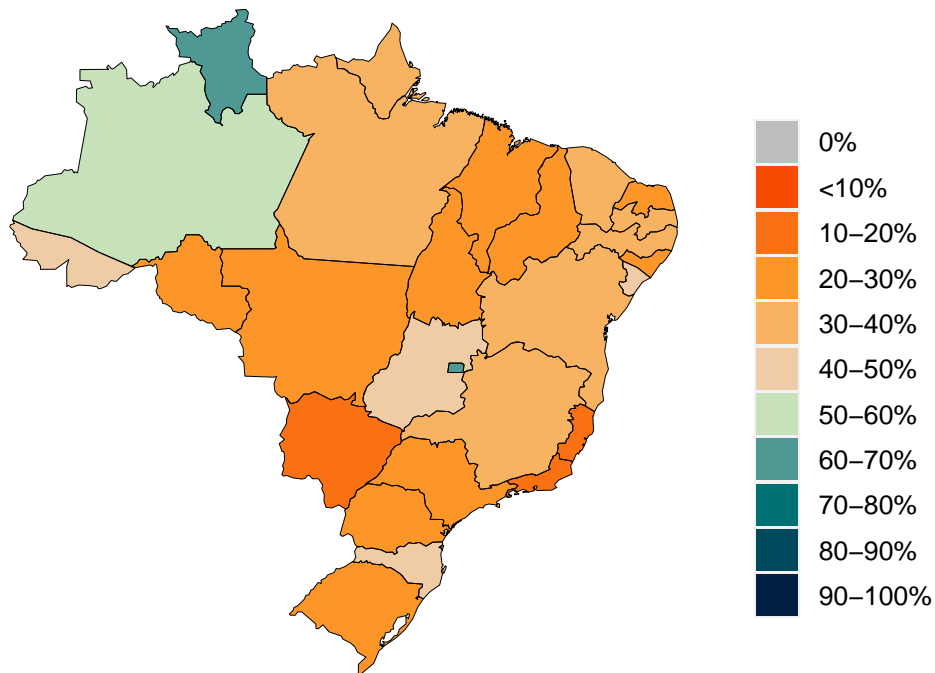


Figure 15.1: Trend in COVID-19 diagnostic tests per 100,000 people

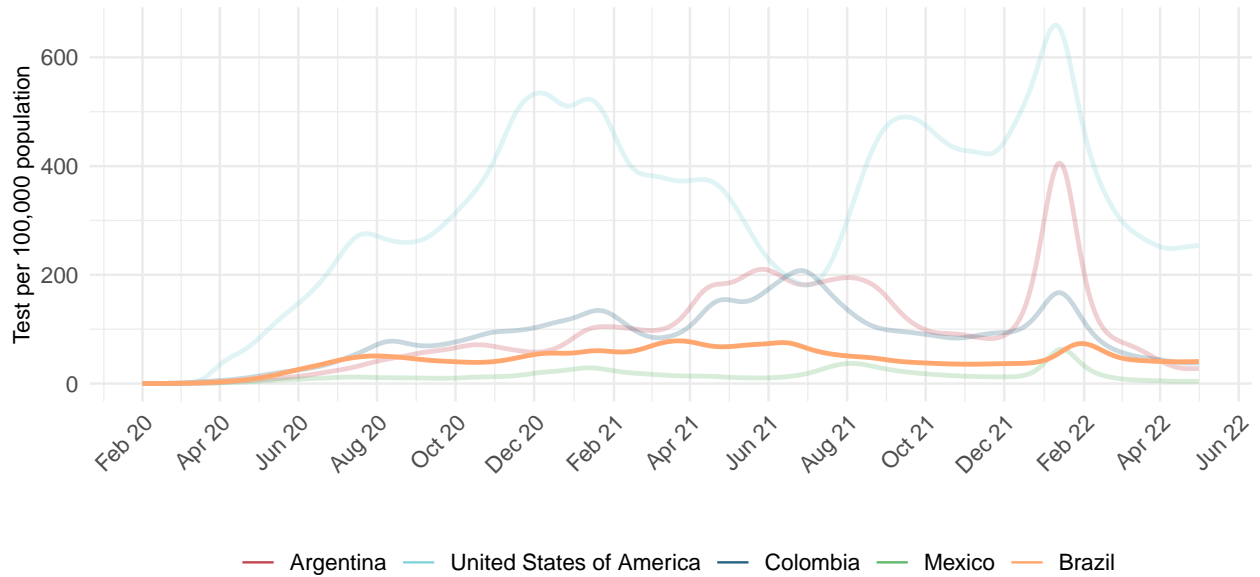


Figure 16.1: COVID-19 diagnostic tests per 100,000 people on May 2, 2022

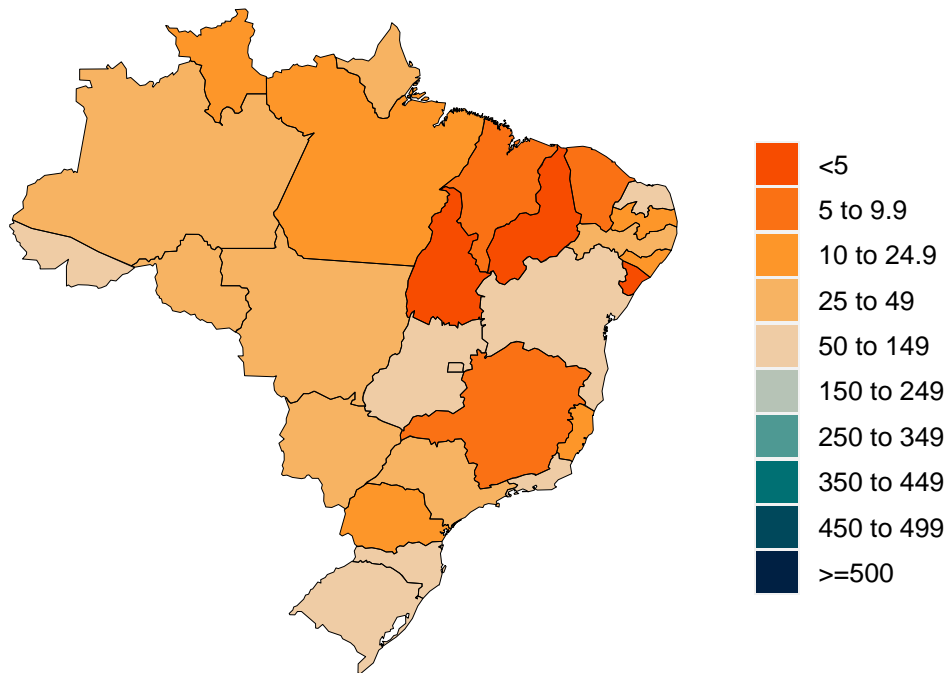


Table 3: Estimates of vaccine effectiveness for specific vaccines used in the model at preventing severe disease and infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our [website](#).

Vaccine	Effectiveness at preventing											
	Ancestral		Alpha		Beta		Gamma		Delta		Omicron	
	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection
AstraZeneca	94%	63%	94%	63%	94%	69%	94%	69%	94%	69%	71%	36%
CanSino	66%	62%	66%	62%	64%	61%	64%	61%	64%	61%	48%	32%
CoronaVac	50%	47%	50%	47%	49%	46%	49%	46%	49%	46%	37%	24%
Covaxin	78%	73%	78%	73%	76%	72%	76%	72%	76%	72%	57%	38%
Johnson & Johnson	86%	72%	86%	72%	76%	64%	76%	64%	76%	64%	57%	33%
Moderna	97%	92%	97%	92%	97%	91%	97%	91%	97%	91%	73%	48%
Novavax	89%	83%	89%	83%	86%	82%	86%	82%	86%	82%	65%	43%
Pfizer/BioNTech	95%	86%	95%	86%	95%	84%	95%	84%	95%	84%	72%	44%
Sinopharm	73%	68%	73%	68%	71%	67%	71%	67%	71%	67%	53%	35%
Sputnik-V	92%	86%	92%	86%	89%	85%	89%	85%	89%	85%	67%	44%
Other vaccines	75%	70%	75%	70%	73%	69%	73%	69%	73%	69%	55%	36%
Other vaccines (mRNA)	91%	86%	91%	86%	88%	85%	88%	85%	88%	85%	67%	45%

Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by May 2, 2022

Figure 17.1: Percent of the population having received one dose of a COVID-19 vaccine

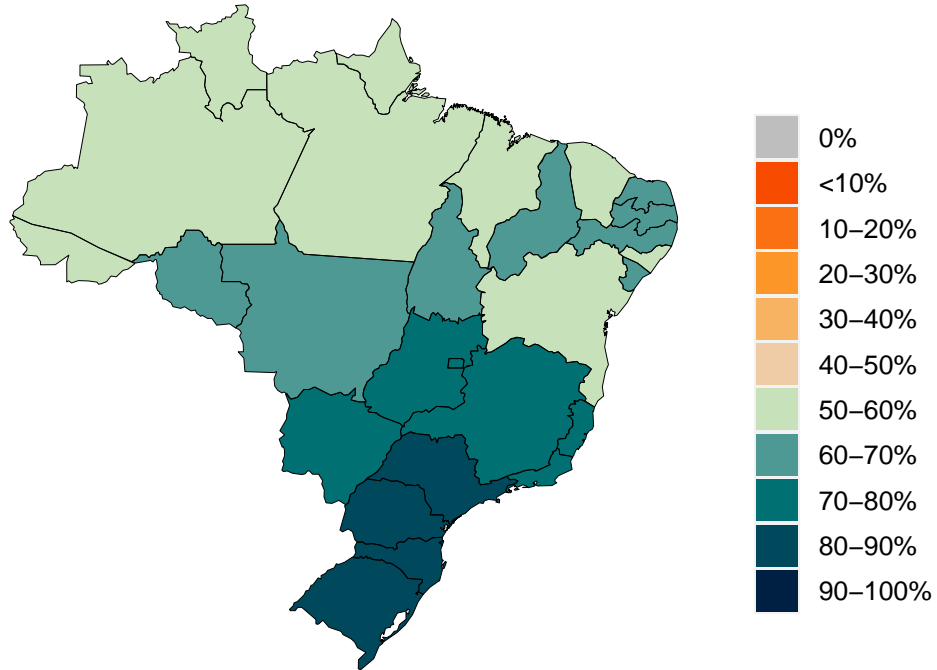


Figure 17.2: Percent of the population fully vaccinated against SARS-CoV-2

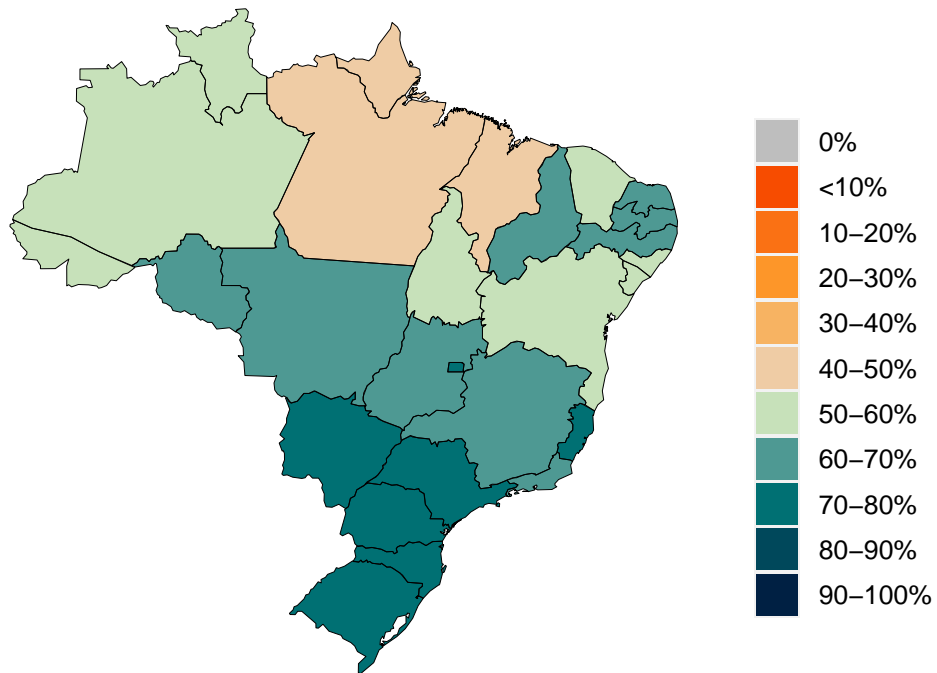


Figure 18.1: Trend in the estimated proportion of the population that is 12 years and older that has been vaccinated or would definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

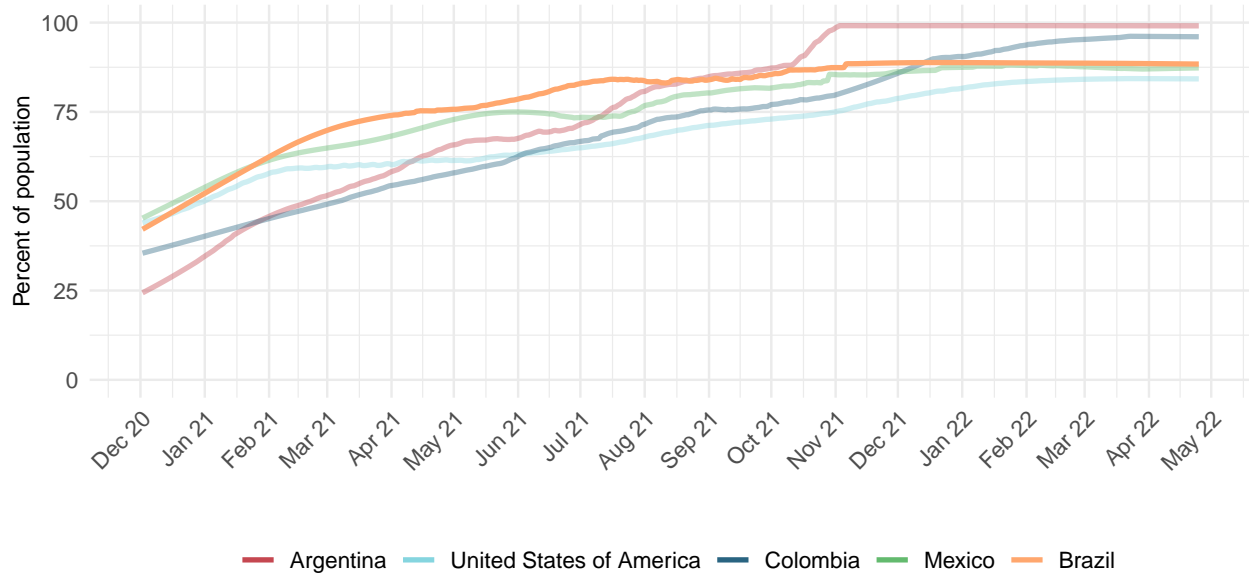


Figure 19.1: Estimated proportion of the population that is 12 years and older that has been vaccinated or would definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

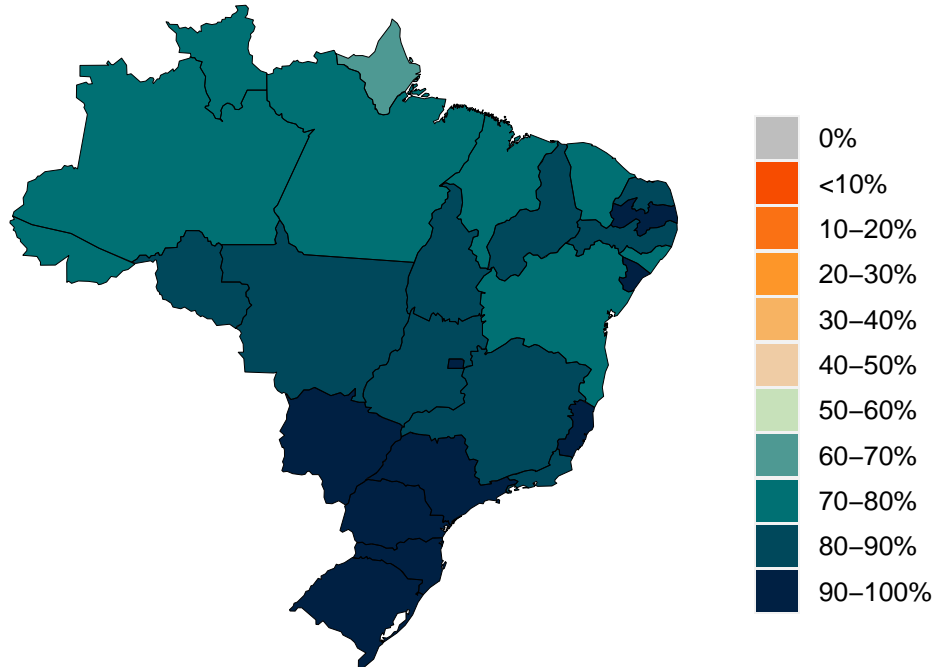


Figure 20.1: Estimated proportion of the total population that is not vaccinated but willing to be vaccinated as of April 25, 2022

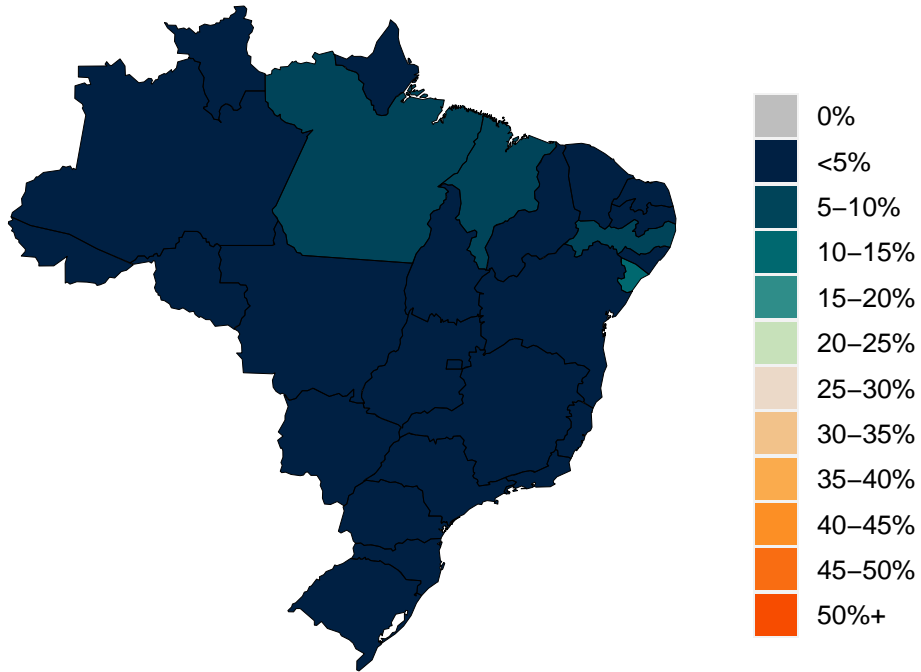


Figure 21.1: Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

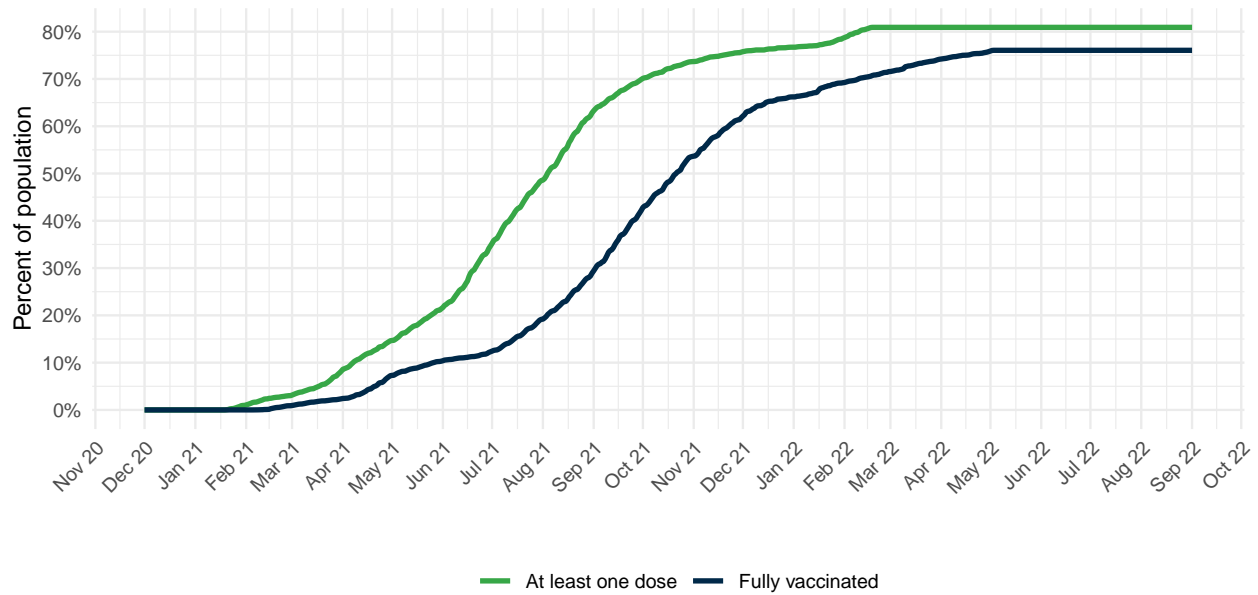
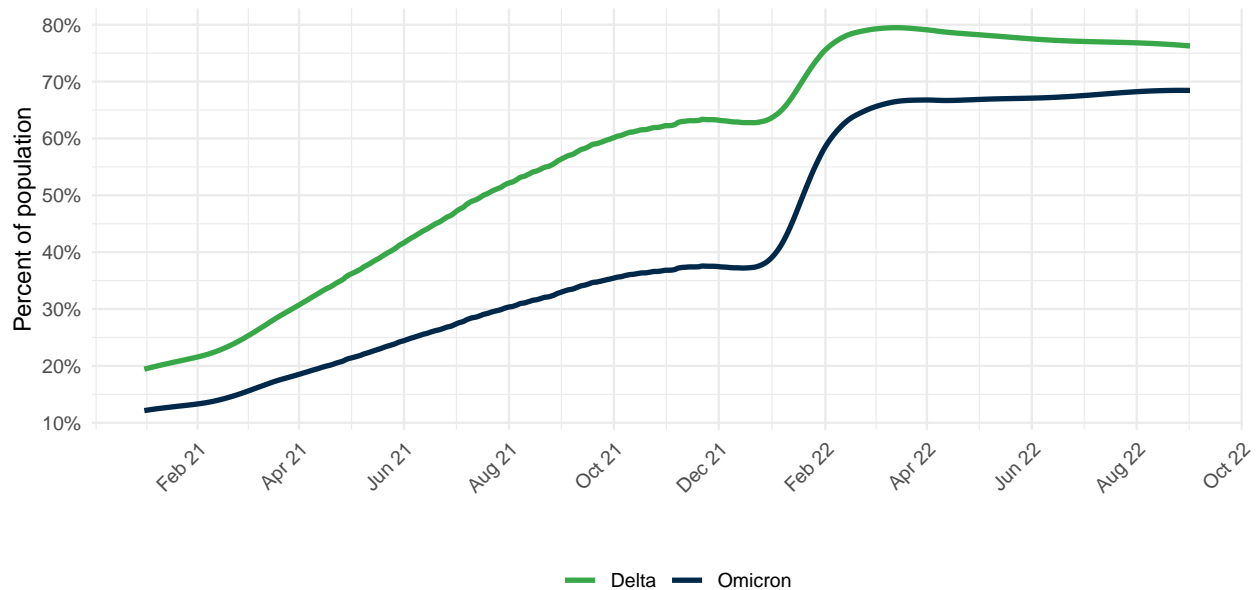


Figure 22.1: Percent of people who are immune to Delta or Omicron. Immunity is based on protection due to prior vaccination and infection(s). Moreover, variant-specific immunity is also based on variant-variant specific protection.



Projections and scenarios

Figure 23.1: Daily COVID-19 infections until September 01, 2022 for three scenarios

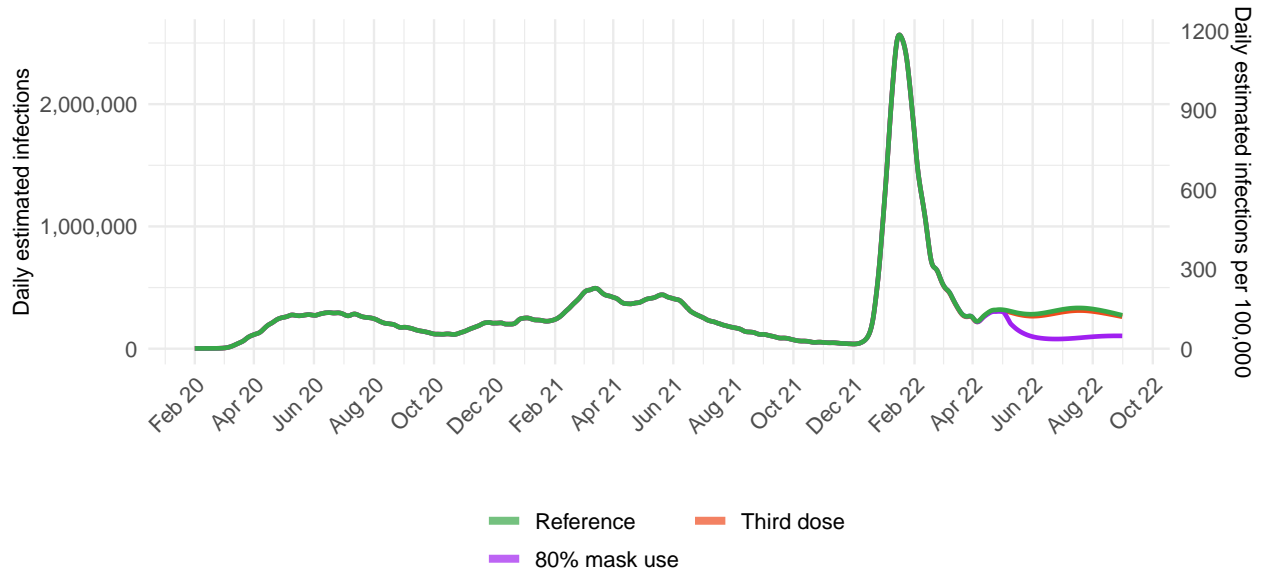


Figure 23.2: Daily COVID-19 reported cases until September 01, 2022 for three scenarios

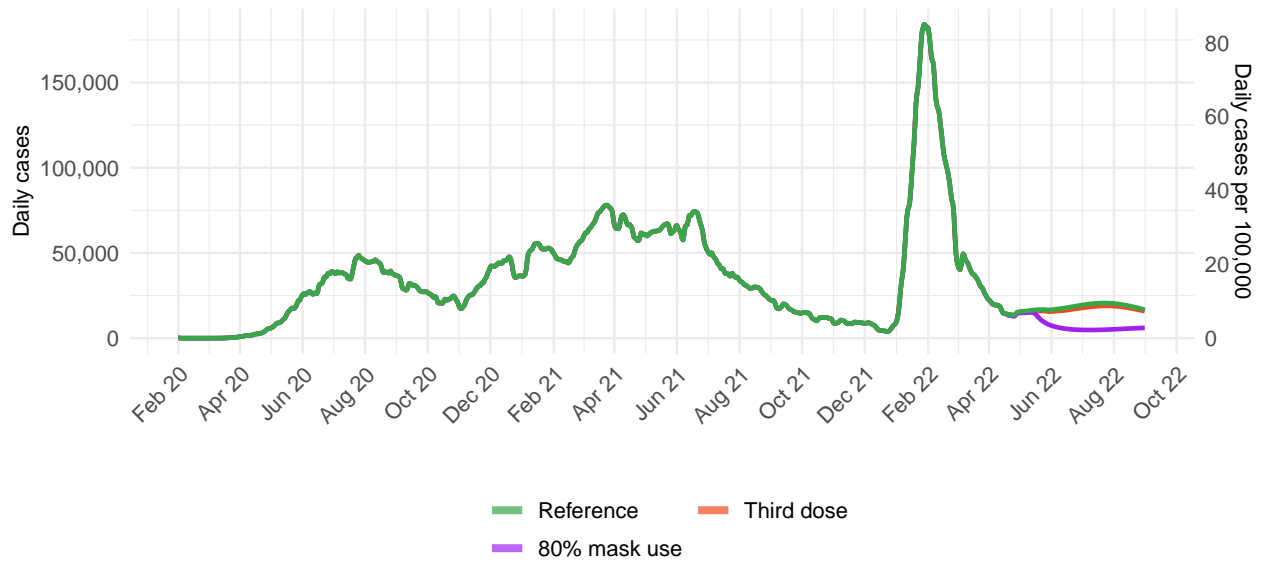


Figure 23.3: Daily COVID-19 hospital census until September 01, 2022 for three scenarios

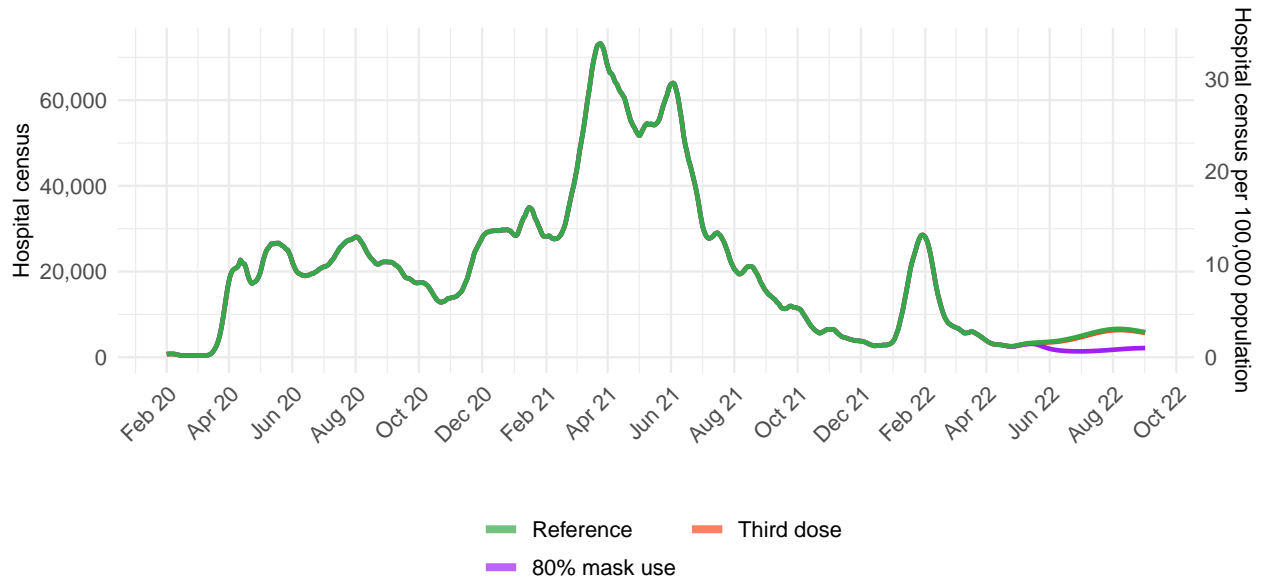


Figure 23.4: Reported daily COVID-19 deaths per 100,000

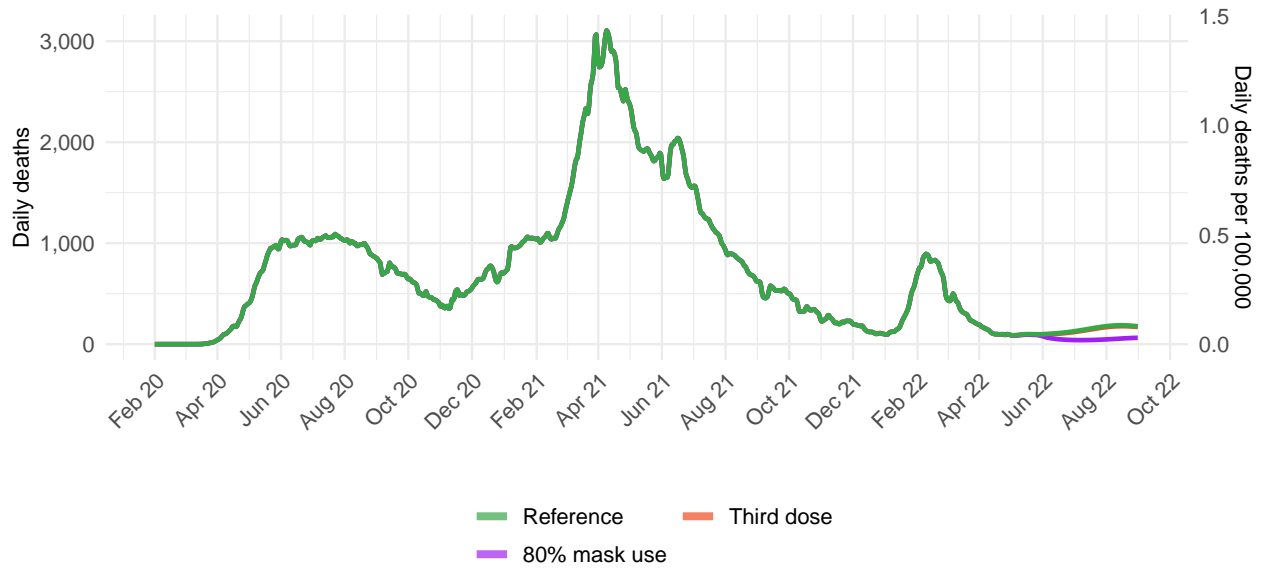


Figure 23.5: Total daily COVID-19 deaths per 100,000

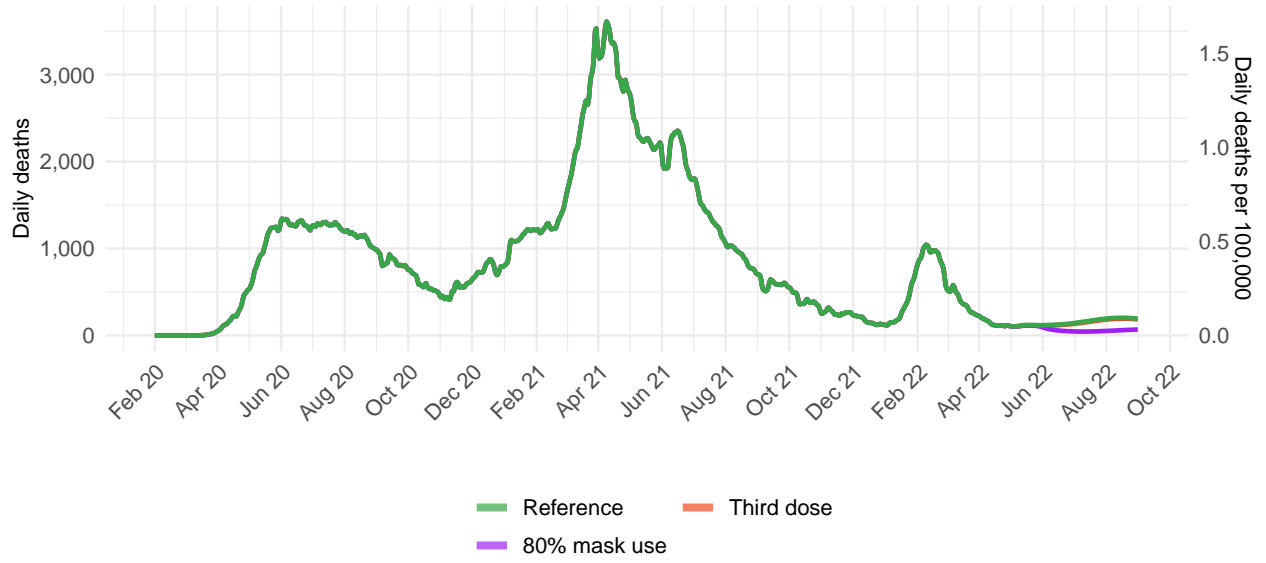


Figure 24.1: Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available, last model update in brackets: the SI-KJalpha model from the University of Southern California (SIKJalpha) [May 2, 2022]. Regional values are aggregates from available locations in that region.

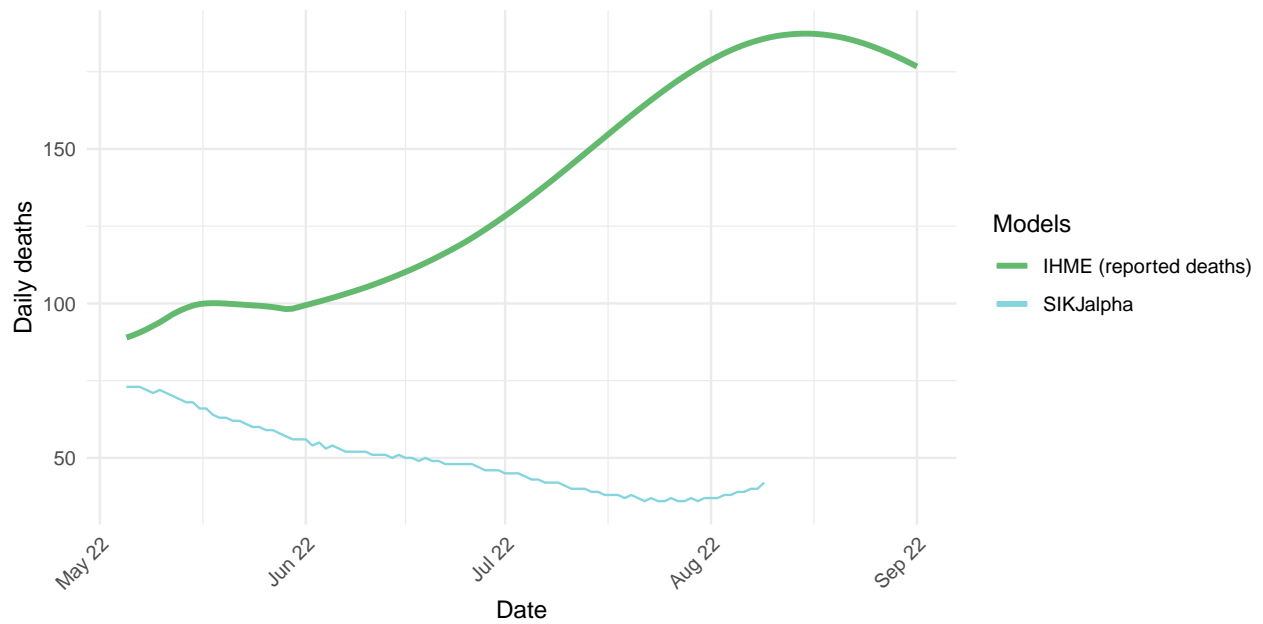


Figure 25.1: The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.

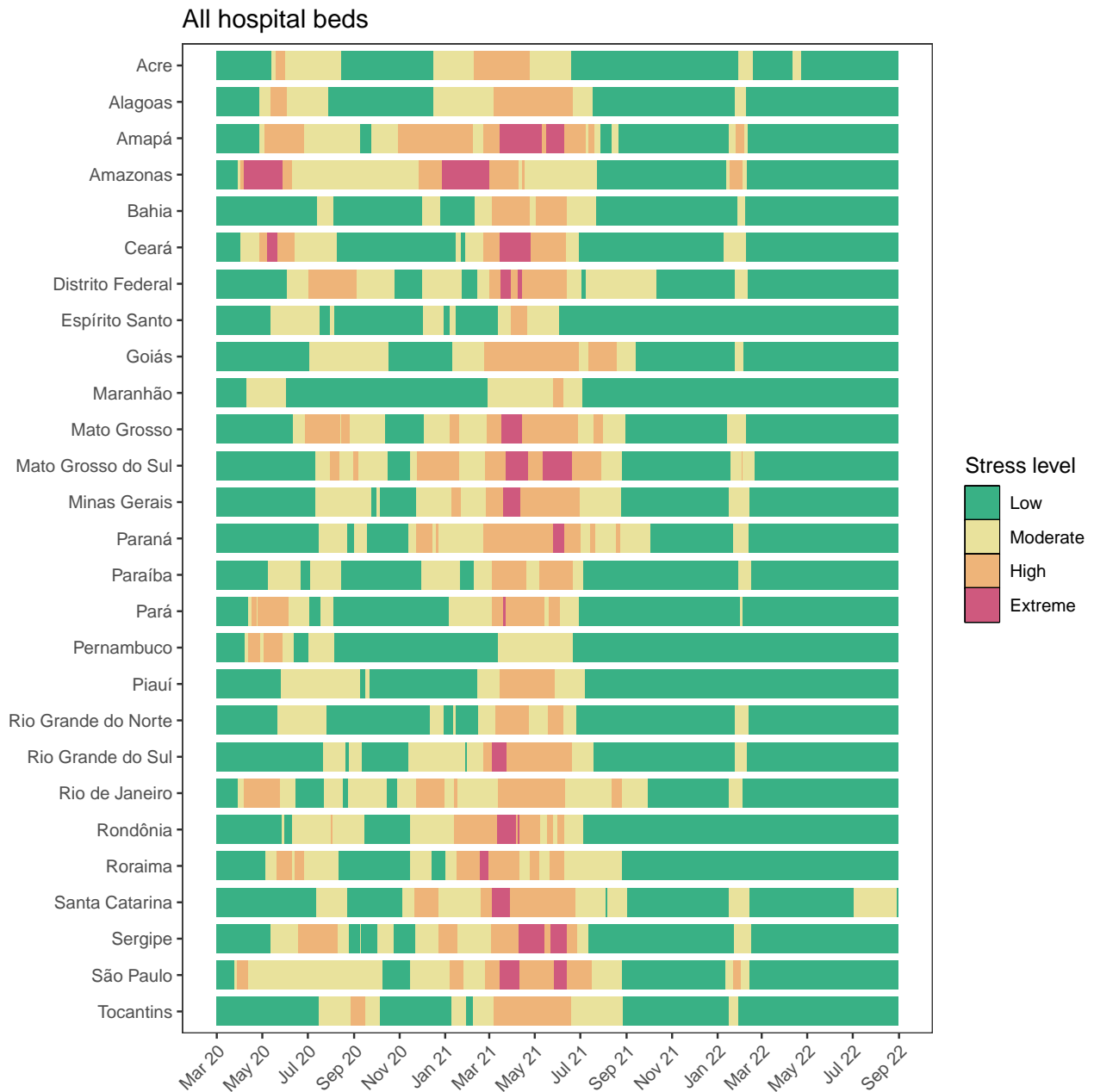
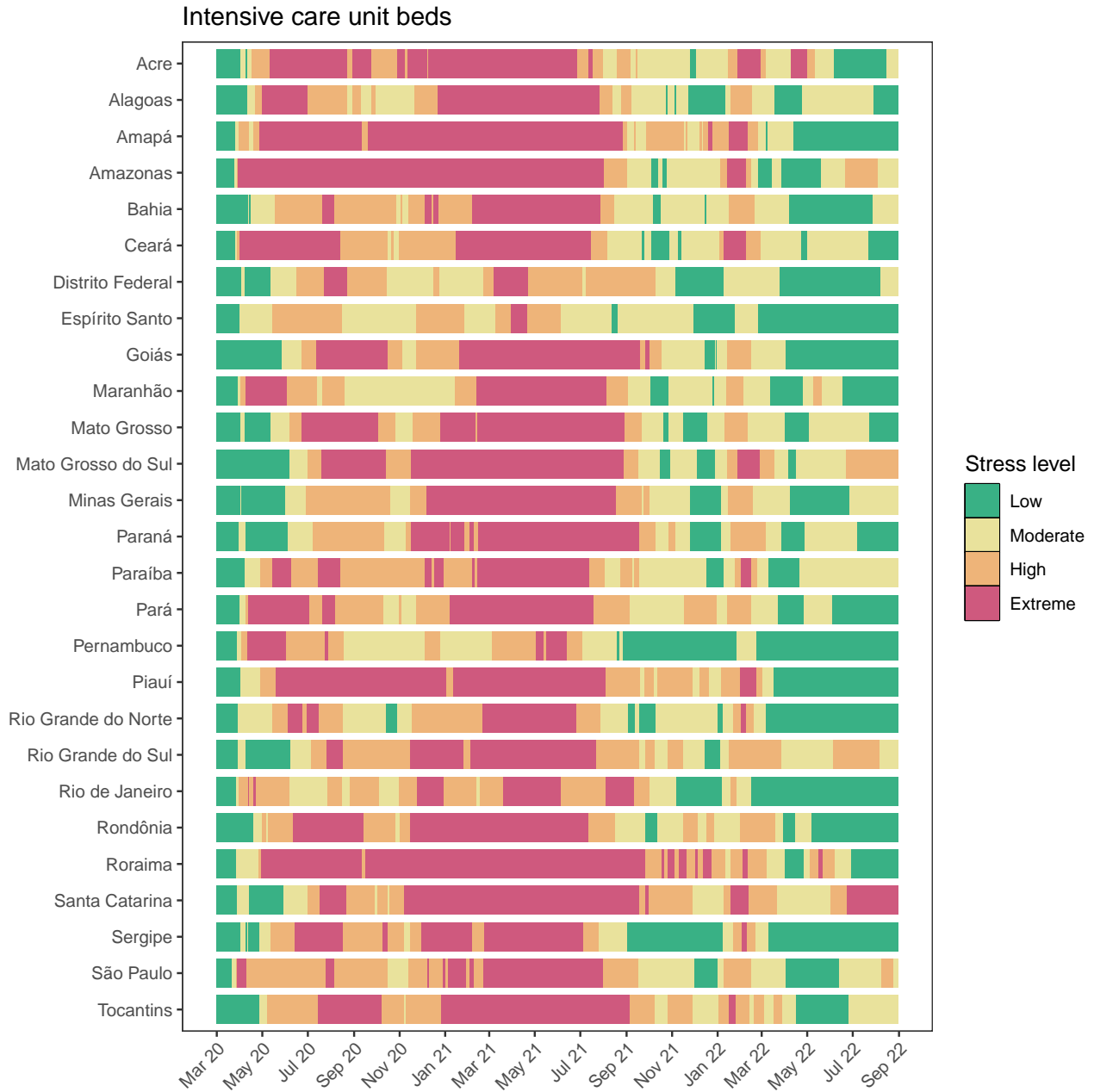


Figure 26.1: The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *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>.