COVID-19 Results Briefing

Global

November 17, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on November 16, 2021, with data through November 15, 2021.

Global reported cases and estimated infections are increasing, driven by increases in five areas: Northern and Central Europe, the northern United States, Chile, Bolivia and Colombia, Algeria, Egypt, Jordan and Lebanon, and Laos and Vietnam. The most dramatic increases are in Europe, in countries with moderate to high levels of vaccination. These increases, along with increases in the US, appear to be related to three factors coming together at once: winter seasonality, waning vaccine-derived immunity against infection, and decreasing protective behaviors such as mask use. Increases in other clusters of countries are harder to account for, but waning immunity may be a factor in countries such as Chile. Global daily infections are at the lowest level since May of 2020 but are expected to increase modestly to nearly 4 million in January. In our reference scenario, we expect an additional three-quarters of a million reported deaths by March 1. As evidence accumulates that vaccine-derived immunity against infection wanes substantially by 30 weeks after the second dose, the key question is the pace at which immunity from natural infection wanes. There are few studies to inform this critical aspect of transmission. Patterns in Europe, where the winter increases are largest in countries with low levels of past infection and smallest in the reverse, may suggest that immunity from natural infection may wane more slowly than vaccine-derived immunity. Fortunately, vaccine-derived immunity preventing hospitalization and death wanes at a much slower rate than for preventing infection. Our reference forecast does not explicitly take into account waning of vaccine-derived immunity. Our revised model that explicitly models vaccine-specific waning immunity and waning natural immunity is likely to be released in early December. But it is already clear from testing and development of this new model that we may see even larger winter surges in the Northern Hemisphere. Policies to address the winter surge fall into three categories: First, increasing mask use can have an immediate impact on transmission through mandates and mask use promotion, particularly in the vulnerable. Any increase above the current level of mask use will be beneficial. Second, in countries with access to vaccines, increasing vaccination in those who are hesitant through outreach to these groups and/or workplace and other activity requirements will have an impact on transmission, less rapidly, but still in time to prevent some of the winter surge. Progress on reducing hesitancy, however, has been very slow. In contrast, more rapid vaccine donations would have an important effect on reducing transmission in lower-resourced countries. Third, in countries with surges and evidence of waning immunity, delivering a third dose of vaccination to the adult population who have had two doses could interrupt considerable transmission. Third-dose delivery would need to be rapidly accelerated in order to prevent some of the Northern Hemisphere winter surge. Some combination of all three of these strategies may be able to prevent a large fraction of the expected deaths in the next four months.

Current situation

- Estimated daily infections in the last week increased to 2.958 million per day on average compared to 2.916 million the week before (Figure 1.1).
- Estimated daily hospital census in the last week (through November 15) stayed constant at 521,000 per day on average compared to the week before.
- Daily reported cases in the last week increased to 483,100 per day on average compared to 447,300 the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week increased to 7,700 per day on average compared to 7,600 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week decreased to 13,000 per day on average compared to 13,100 the week before (Figure 3.1). This makes COVID-19 the number 3 cause of death globally this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 1.7 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 29 locations (Figure 4.1). All the locations with death rates over 8 per million are in North America and Europe.
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in 47 locations (Figure 4.2).
- We estimate that 42% of people globally have been infected as of November 15 (Figure 6.1).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 212 locations (Figure 7.1). Transmission is notably increasing in the Netherlands, Austria, Germany, Denmark, Norway, Czechia, Poland, Hungary, some northern US states, Chile, Bolivia and Colombia, Algeria, Egypt, Jordan, Lebanon, Laos, and Vietnam.
- The infection-detection rate globally was close to 17% on November 15 (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 (Figure 9.1). the Delta variant is the dominant variant in nearly all countries.

Trends in drivers of transmission

- Mobility last week was 2% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was near baseline (within 10%) in 136 locations. Mobility was lower than 30% of baseline in Laos, Latvia, Myanmar, and Sri Lanka.
- As of November 15, in the COVID-19 Trends and Impact Survey, 55% of people self-report that they always wore a mask (Figure 13.1).
- There were 150 diagnostic tests per 100,000 people on November 15 (Figure 15.1).

- As of November 15, 52 locations have reached 70% or more of the population who have received at least one vaccine dose and 31 locations have reached 70% or more of the population who are fully vaccinated (Figure 17.1).
- In our current reference scenario, we expect that 4.5 billion people will be vaccinated with at least one dose by March 1 (Figure 20.1). We expect that 53% of the population will be fully vaccinated by March 1.
- Based on the estimate of the population that have been infected with COVID-19 and vaccinated to date, combined with assumptions on protection against infection with the Delta variant provided by either natural infection, vaccination, or both, we estimate that 49% of the region is immune to the Delta variant. In our current reference scenario, we expect that by March 1, 55% of people will be immune to the Delta variant (Figure 21.1). These two calculations do not take into account waning of natural or vaccine-derived immunity.

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 6,263,000 cumulative reported deaths due to COVID-19 on March 1. This represents 766,000 additional deaths from November 15 to March 1. Daily reported deaths will rise to 8,080 by November 28, 2021 (Figure 22.1).
- Under our **reference scenario**, our model projects 13,627,000 cumulative total deaths due to COVID-19 on March 1. This represents 1,603,000 additional deaths from November 15 to March 1 (Figure 22.1).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 308,000 fewer cumulative reported deaths compared to the reference scenario on March 1.
- Under our **worse scenario**, our model projects 7,180,000 cumulative reported deaths on March 1, an additional 917,000 deaths compared to our reference scenario. Daily reported deaths in the **worse scenario** will rise to 24,670 by January 27, 2022 (Figure 22.1).
- Daily infections in the **reference scenario** will rise to 3.7 million by mid-January (Figure 22.3). Daily infections in the **worse scenario** will rise to 10.0 million by early January (Figure 22.3).
- Daily cases in the **reference scenario** will rise to 620,000 by the second week of January (Figure 22.4). Daily cases in the **worse scenario** will rise to 2.3 million by mid-January (Figure 22.4).
- Daily hospital census in the **reference scenario** will rise to 580,940 by February 3, 2022 (Figure 22.5). Daily hospital census in the **worse scenario** will rise to 1,998,190 by January 23, 2022 (Figure 22.5).

Model updates

No model updates.

Figure 1.1. Daily COVID-19 hospital census and infections

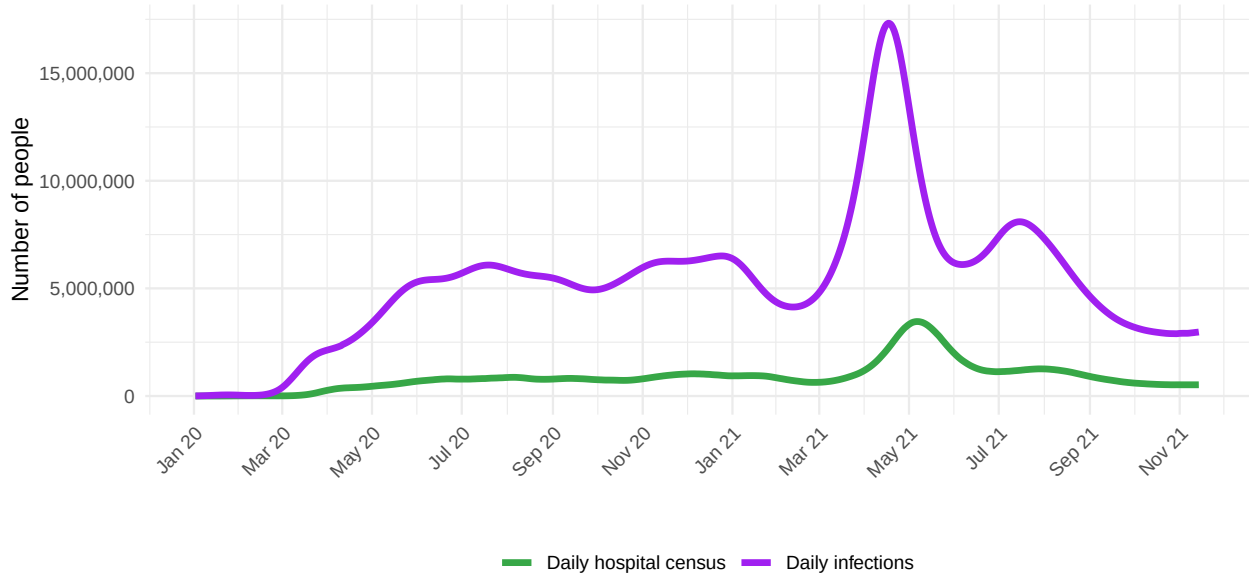


Figure 2.1. Reported daily COVID-19 cases, moving average

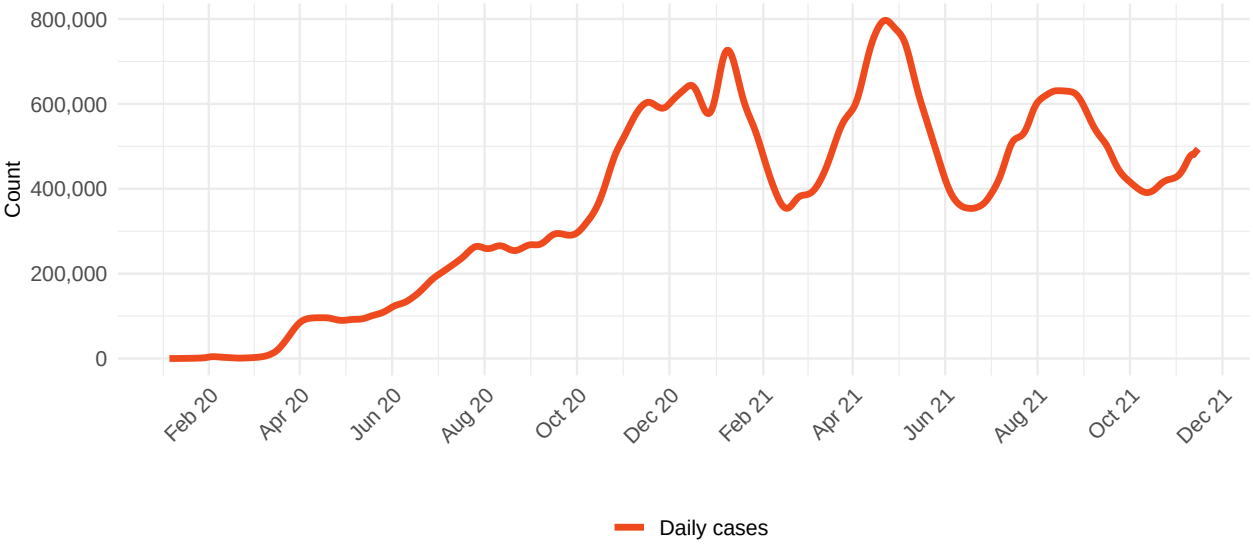
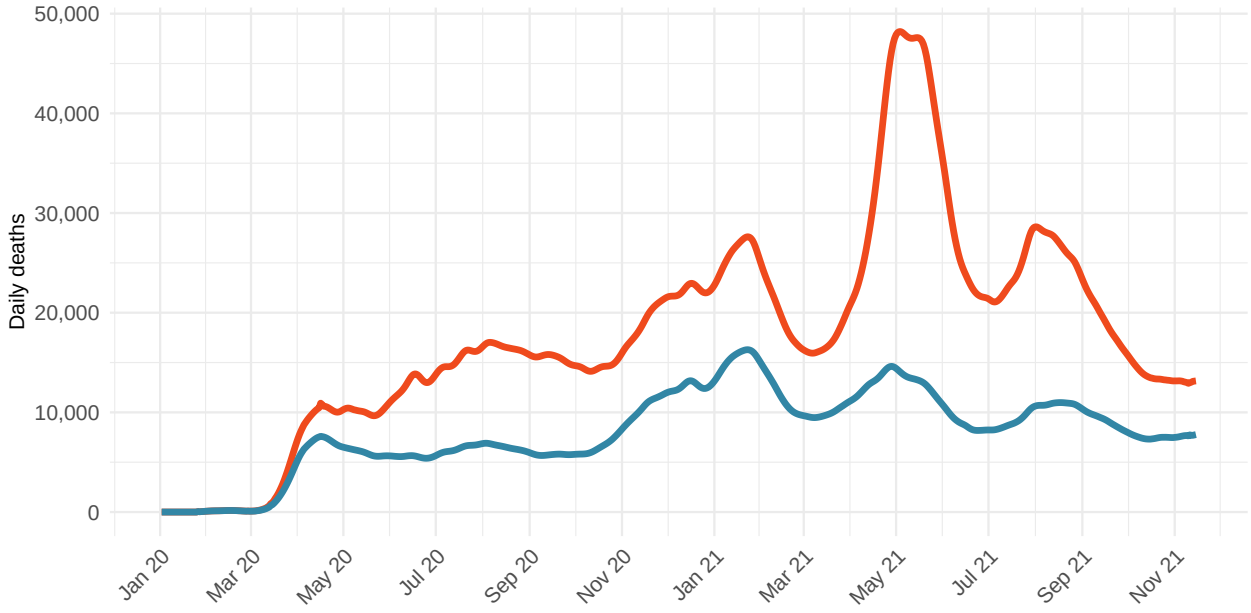


Table 1. Ranking of total deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	175,727	1
Stroke	126,014	2
COVID-19	91,322	3
Chronic obstructive pulmonary disease	63,089	4
Lower respiratory infections	47,946	5
Tracheal, bronchus, and lung cancer	39,282	6
Neonatal disorders	36,201	7
Alzheimer's disease and other dementias	31,217	8
Diabetes mellitus	29,830	9
Diarrheal diseases	29,509	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 November 15, 2021

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

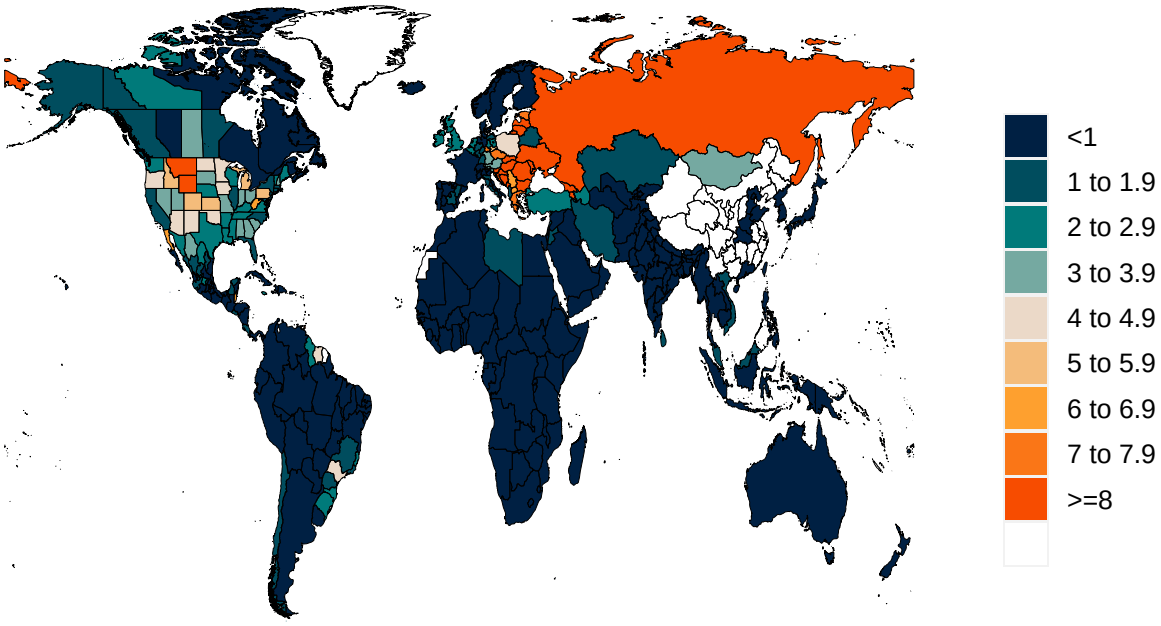
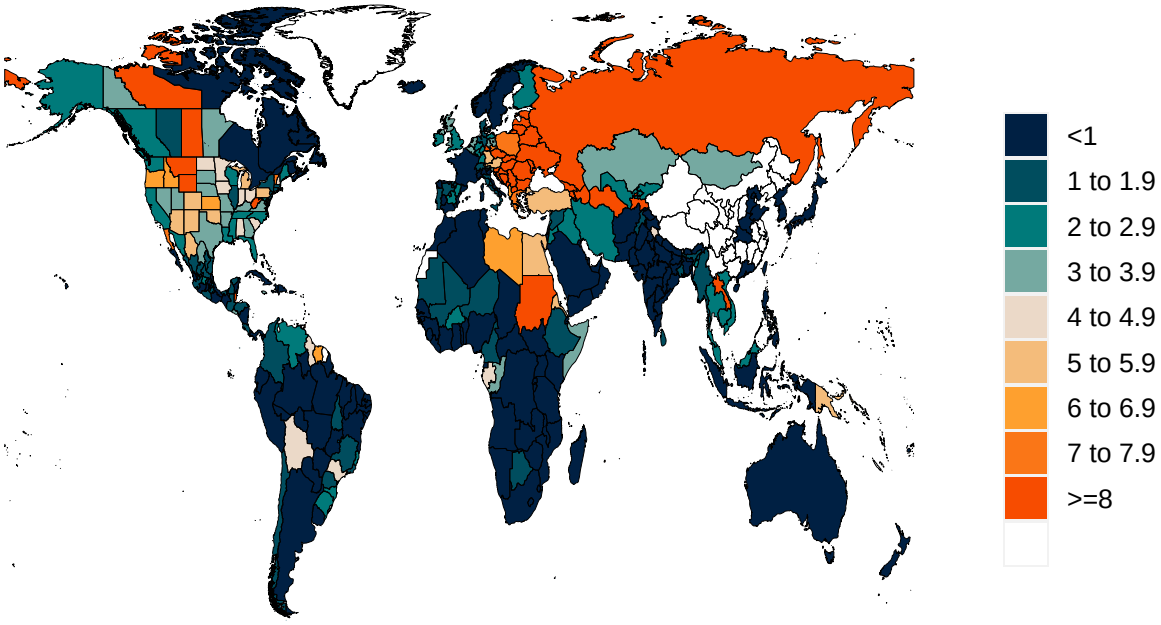


Figure 4.2 Daily total COVID-19 death rate per 1 million



Cumulative COVID-19 deaths per 100,000 on November 15, 2021

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

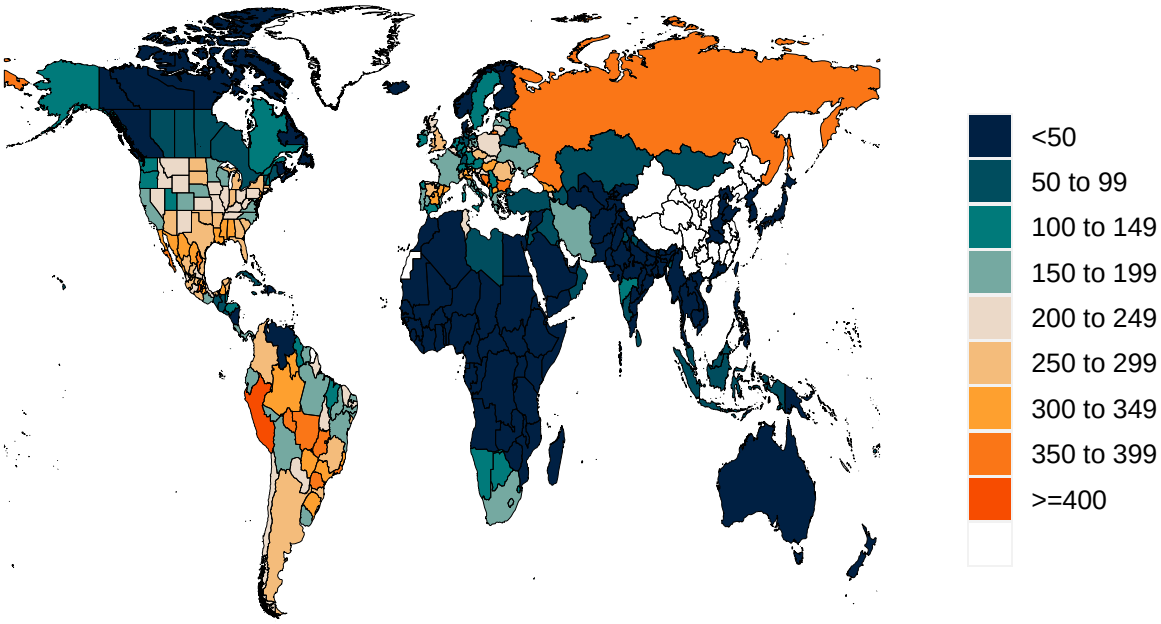


Figure 5.2 Total cumulative COVID-19 deaths per 100,000

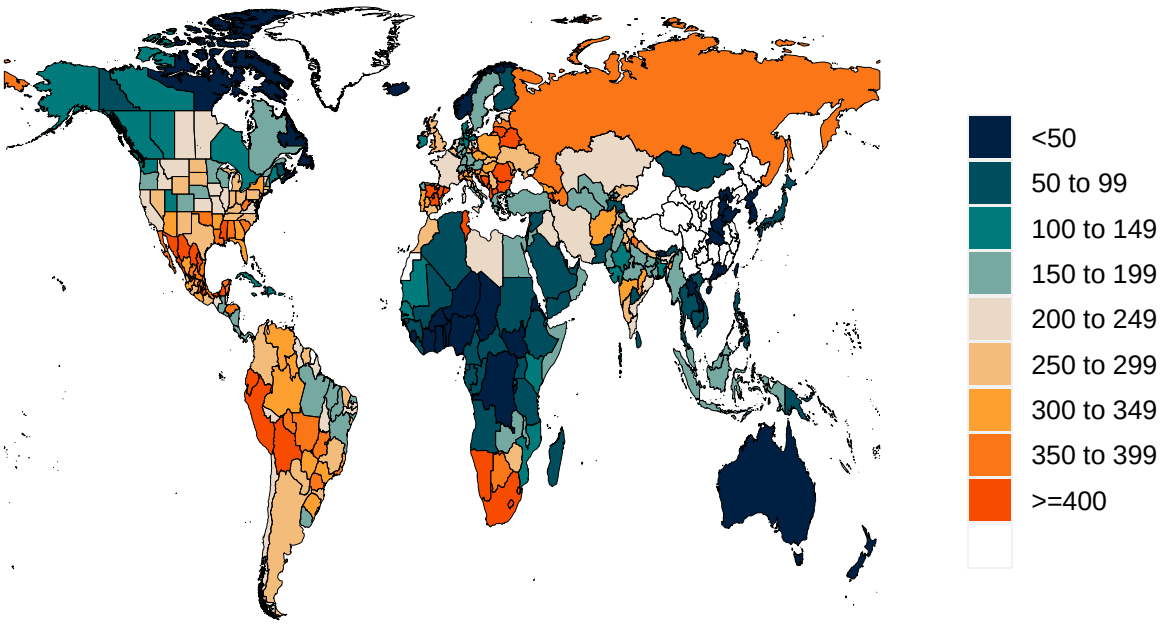


Figure 6.1. Estimated percent of the population infected with COVID-19 on November 15, 2021

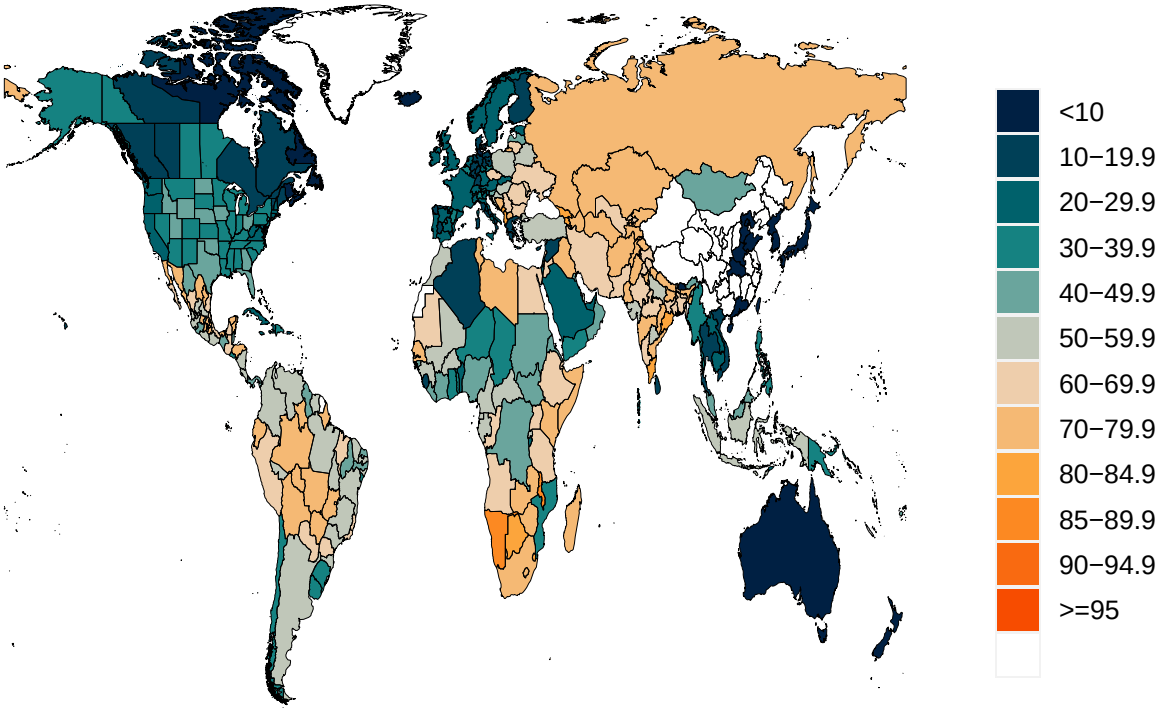


Figure 7.1. Mean effective R on November 4, 2021. Effective R less than 1 means that transmission should decline, all other things being held the same. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past.

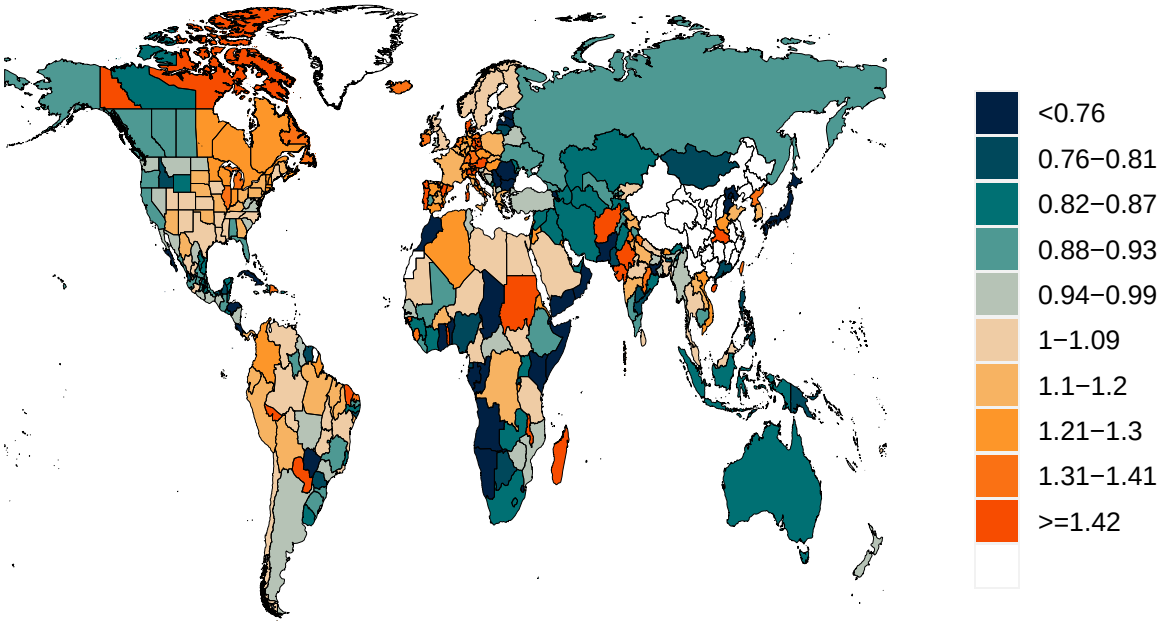
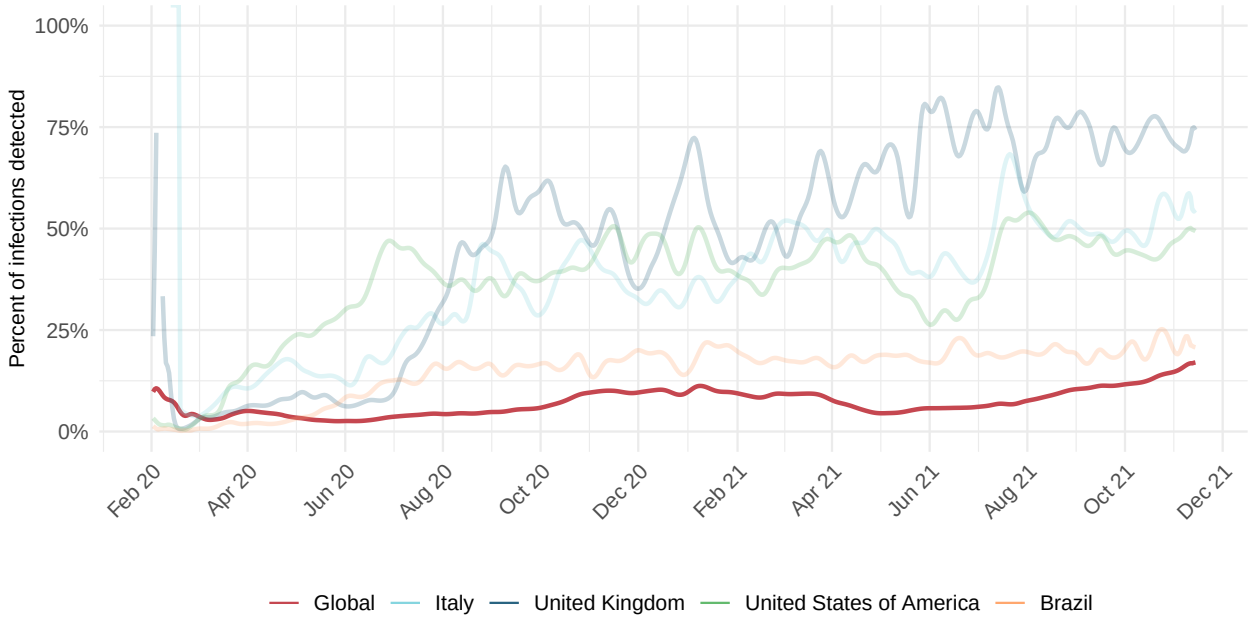


Figure 8.1. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100%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



Estimated percent of circulating SARS-CoV-2 for primary variant families on November 15, 2021

Figure 9.1 Estimated percent Alpha variant

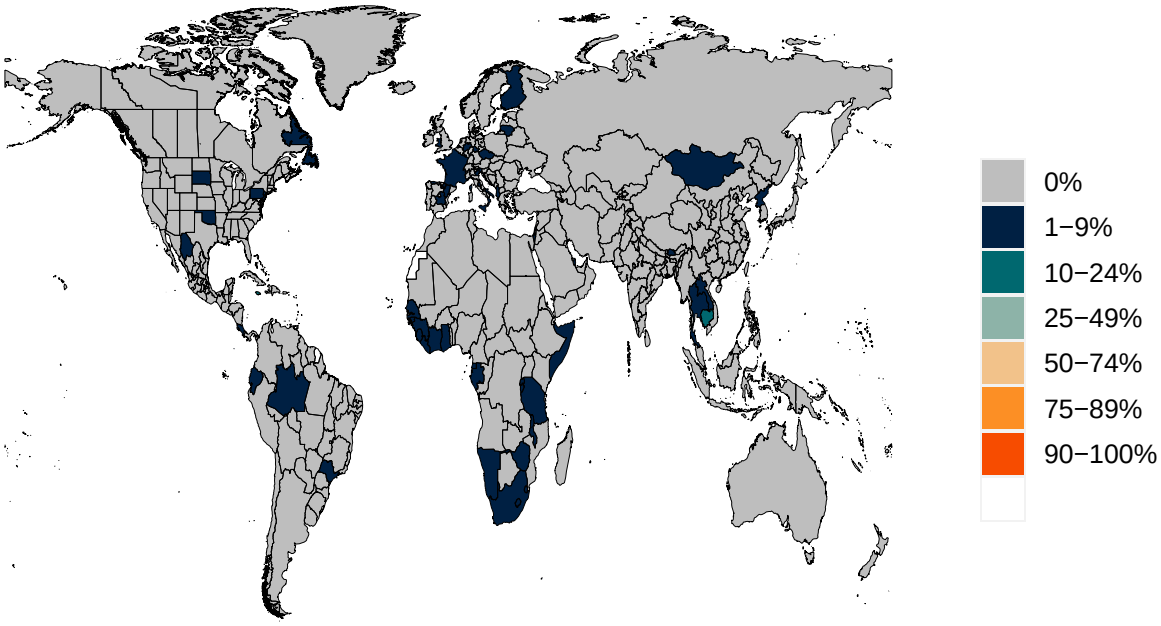


Figure 9.2 Estimated percent Beta variant

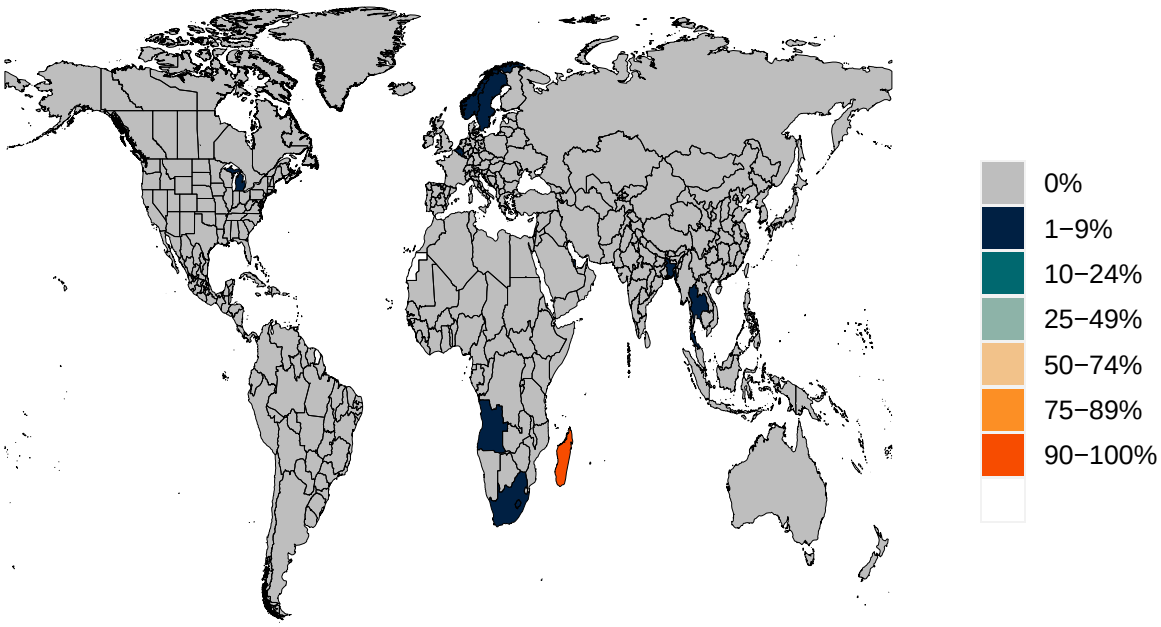


Figure 9.3 Estimated percent Delta variant

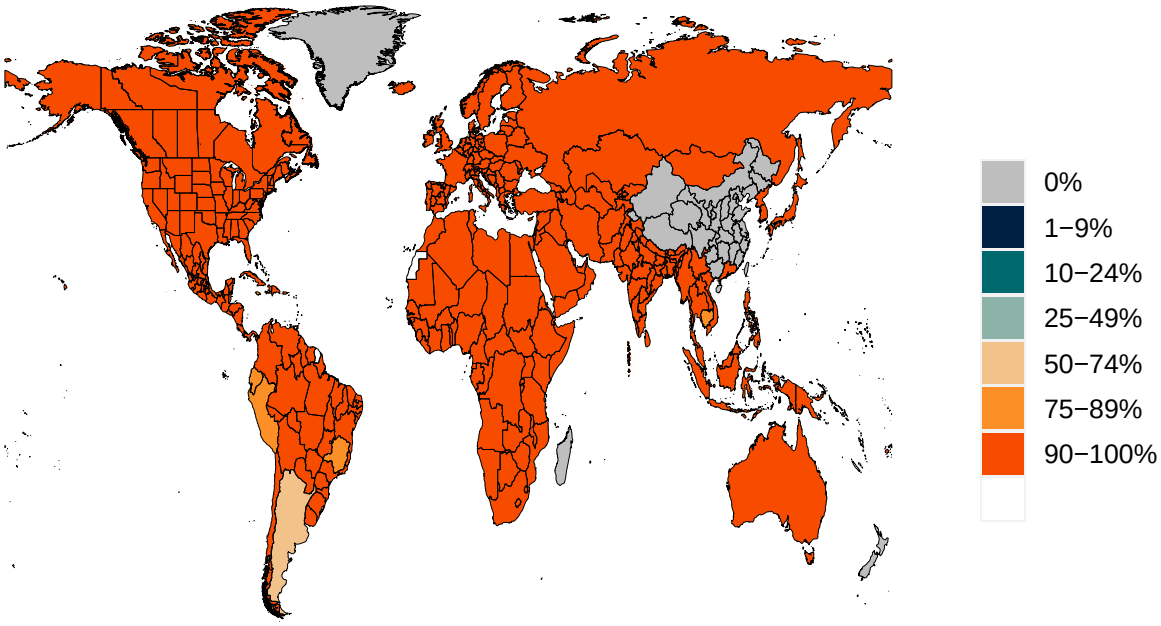


Figure 9.4 Estimated percent Gamma variant

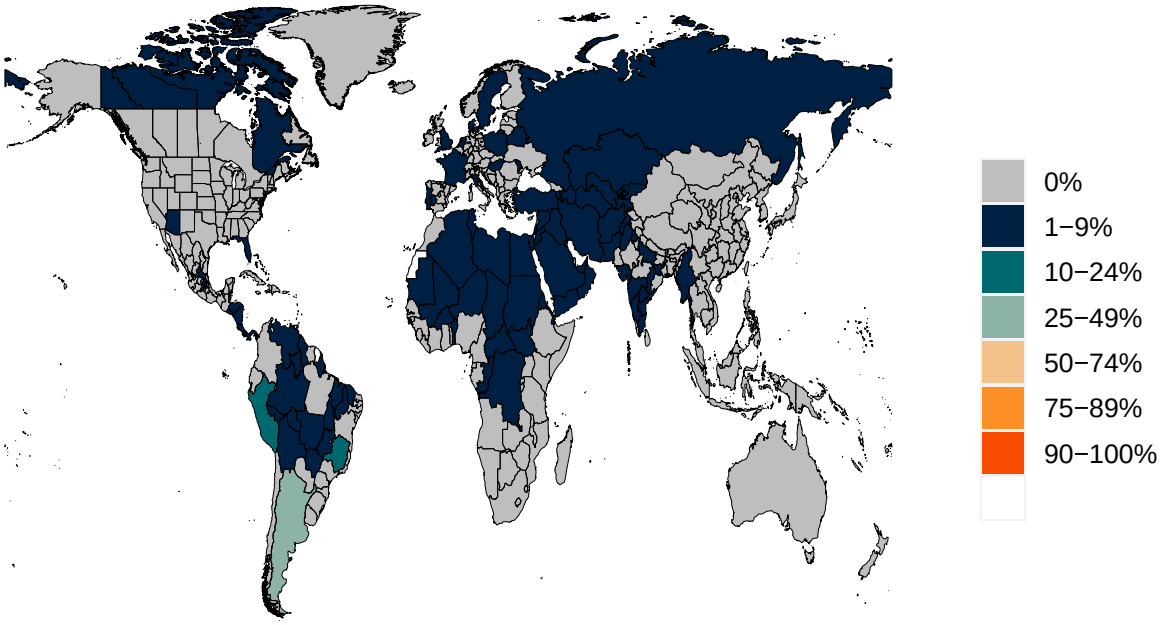


Figure 10.1. Infection-fatality rate on November 15, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.

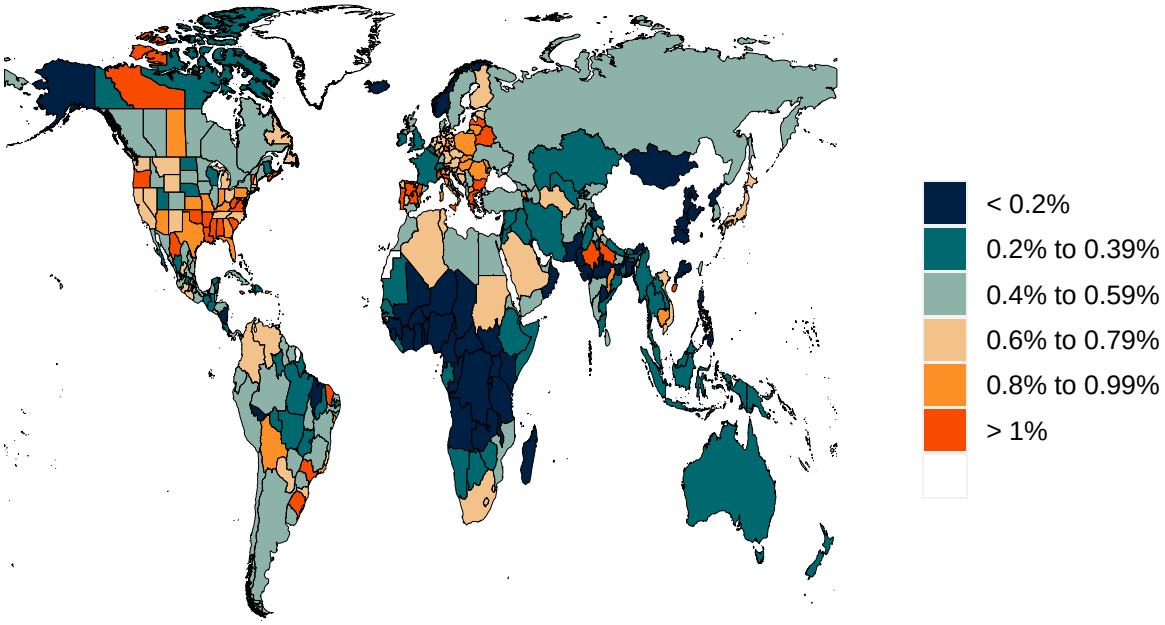


Figure 11.1. Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

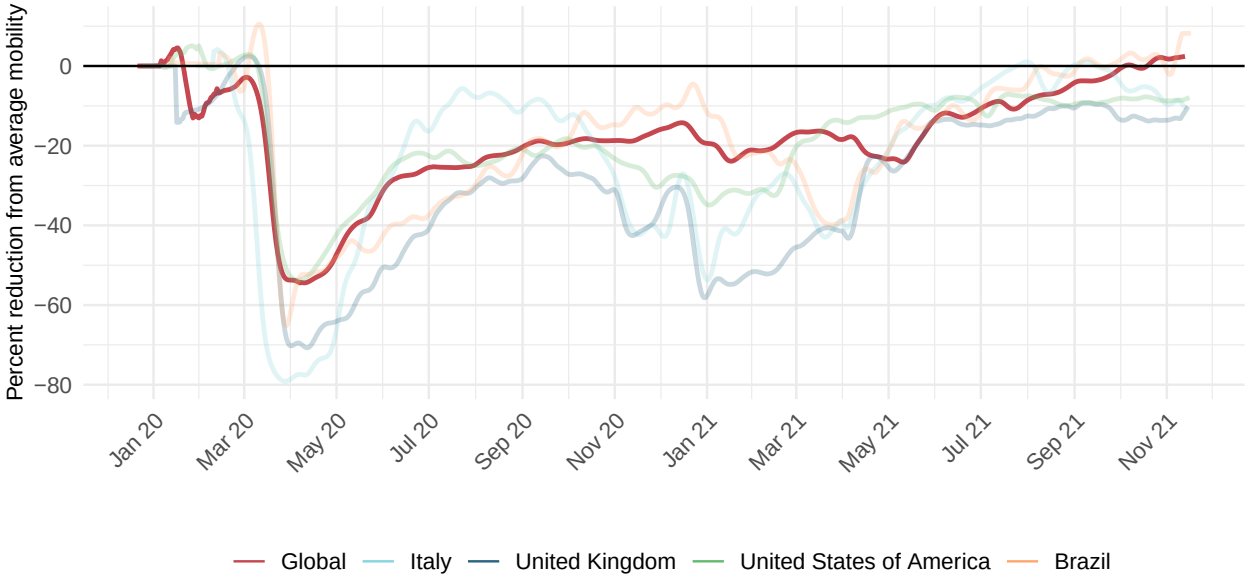


Figure 12.1. Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on November 15, 2021

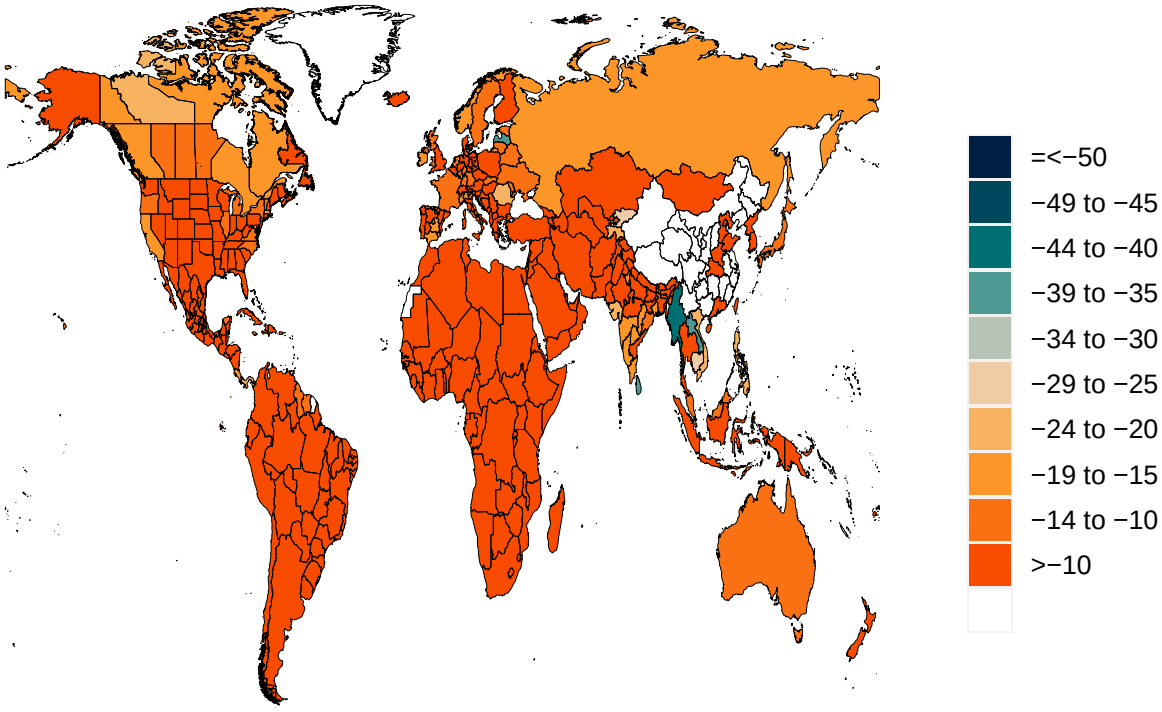


Figure 13.1. Trend in the proportion of the population reporting always wearing a mask when leaving home

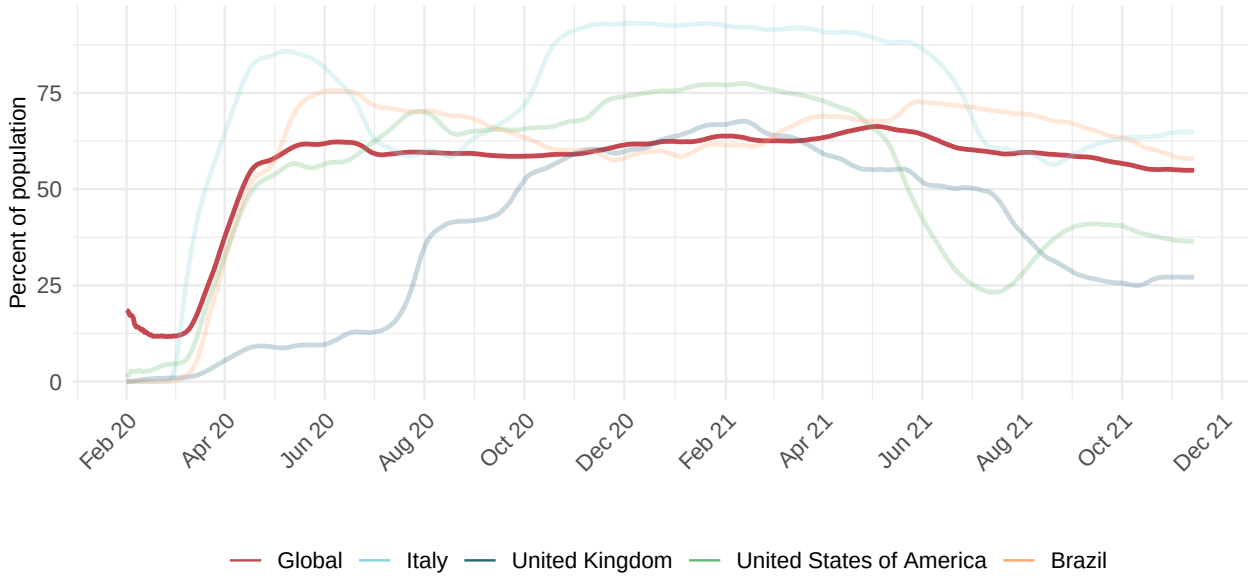


Figure 14.1. Proportion of the population reporting always wearing a mask when leaving home on November 15, 2021

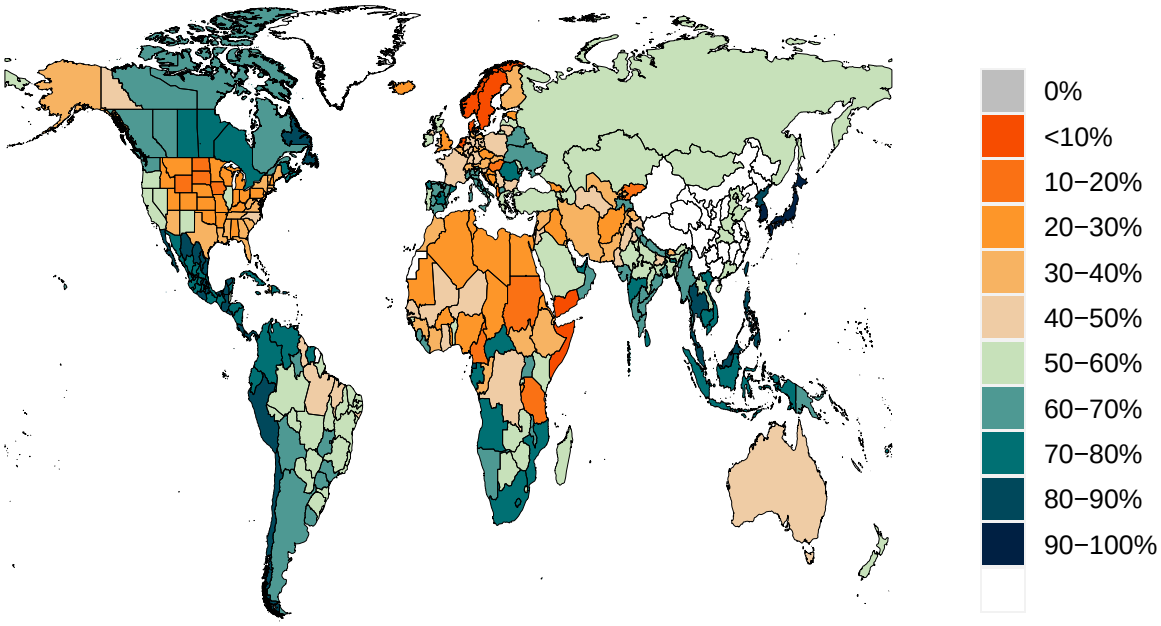


Figure 15.1. Trend in COVID-19 diagnostic tests per 100,000 people

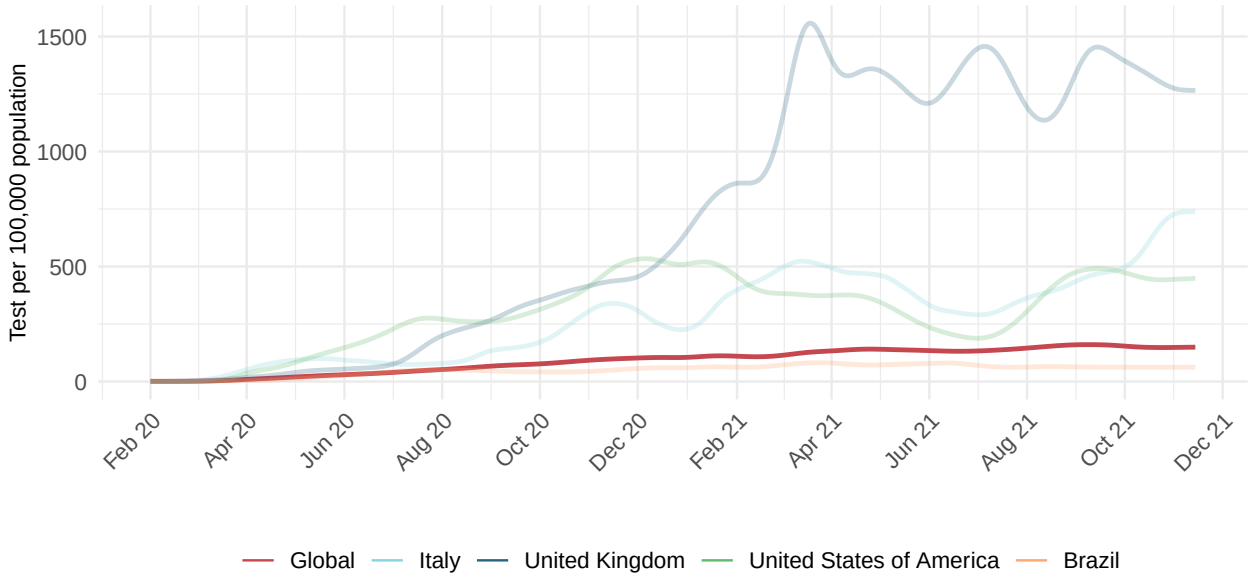


Figure 16.1. COVID-19 diagnostic tests per 100,000 people on November 15, 2021

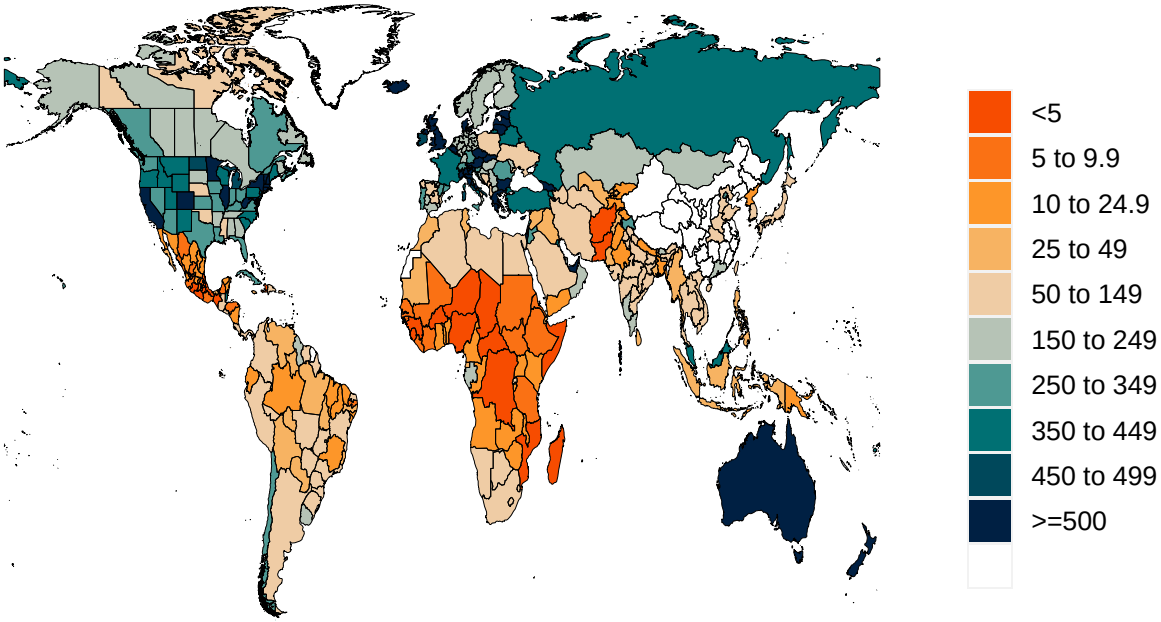


Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, 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	90%	52%	85%	49%
CoronaVac	50%	44%	43%	38%
Covaxin	78%	69%	68%	60%
Johnson & Johnson	86%	72%	60%	56%
Moderna	94%	89%	94%	80%
Novavax	89%	79%	79%	69%
Pfizer/BioNTech	94%	86%	85%	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%	85%	78%

Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by November 15, 2021

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

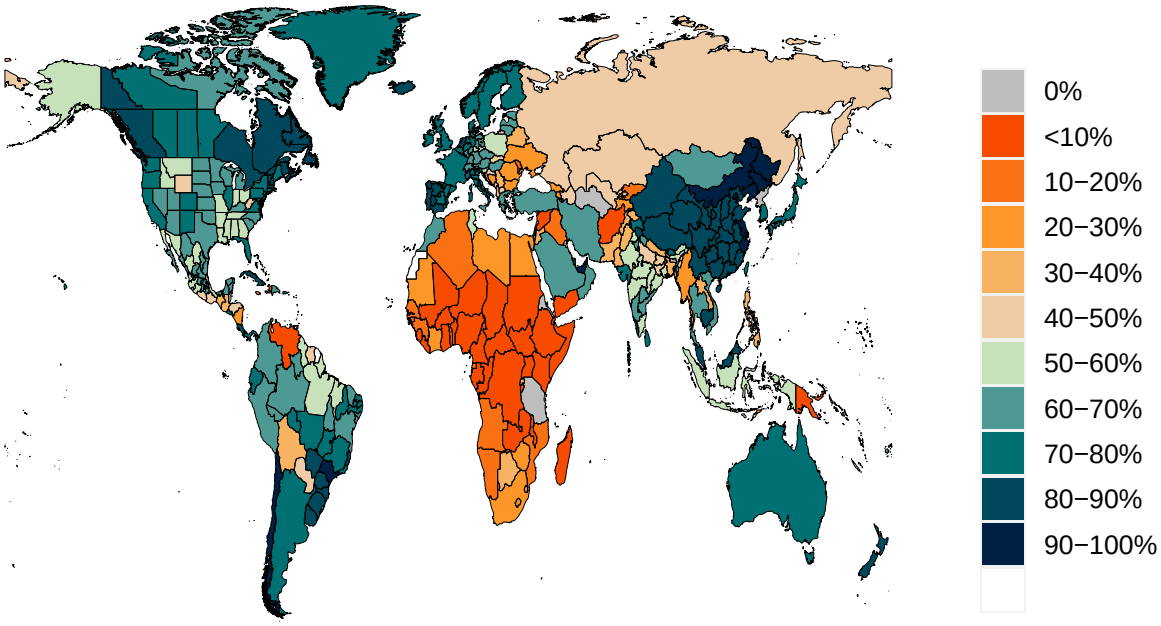


Figure 17.2 Percent of the population fully vaccinated against SARS-CoV-2

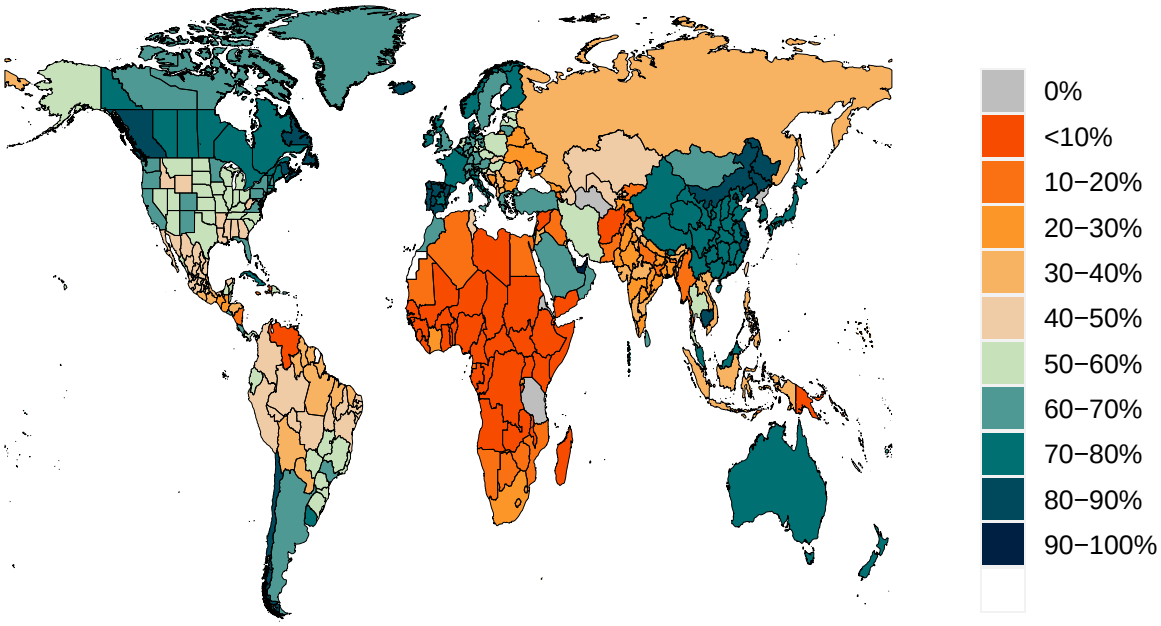


Figure 20.1. Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

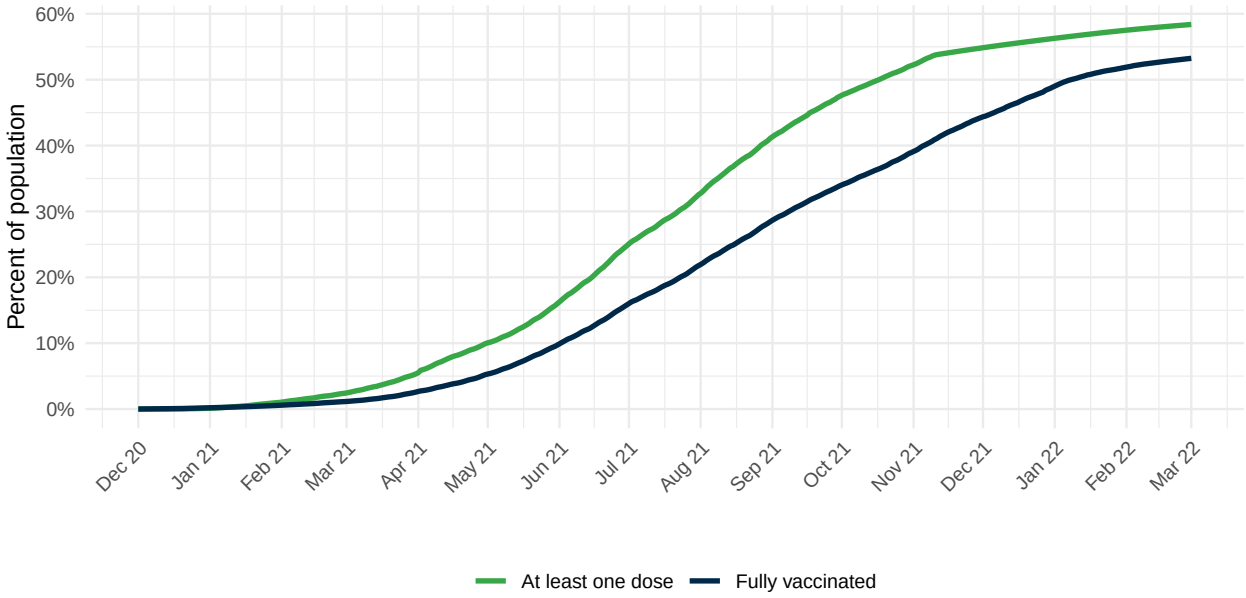
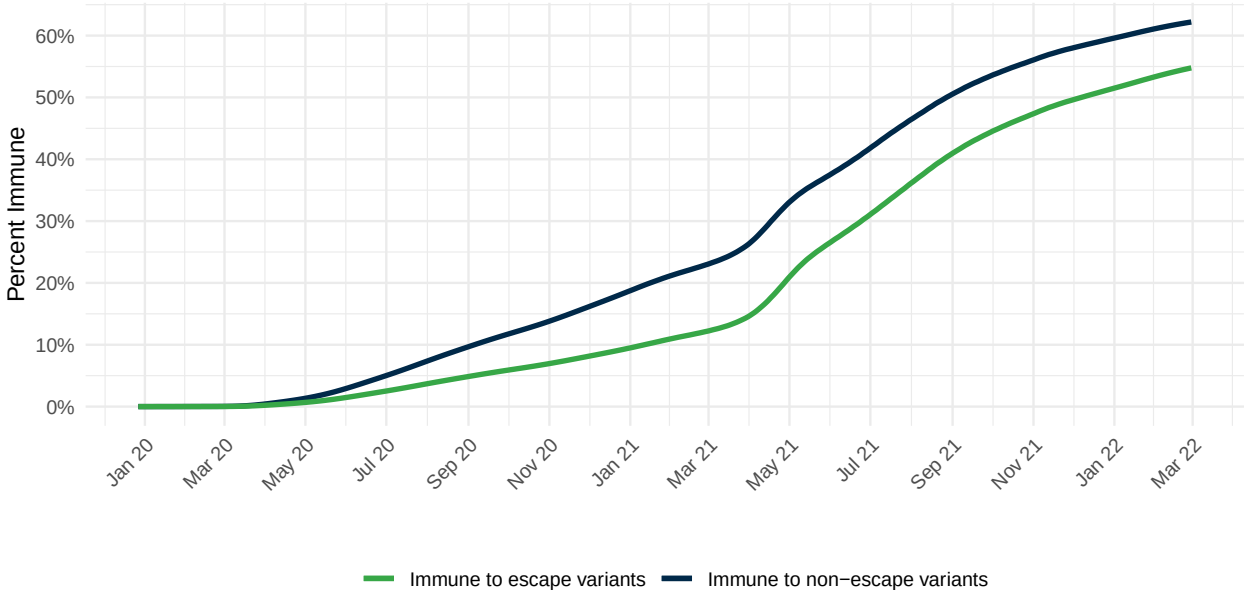


Figure 21.1. Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants



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.

Daily COVID-19 deaths until March 01, 2022 for three scenarios

Figure 22.1 Reported daily COVID-19 deaths per 100,000

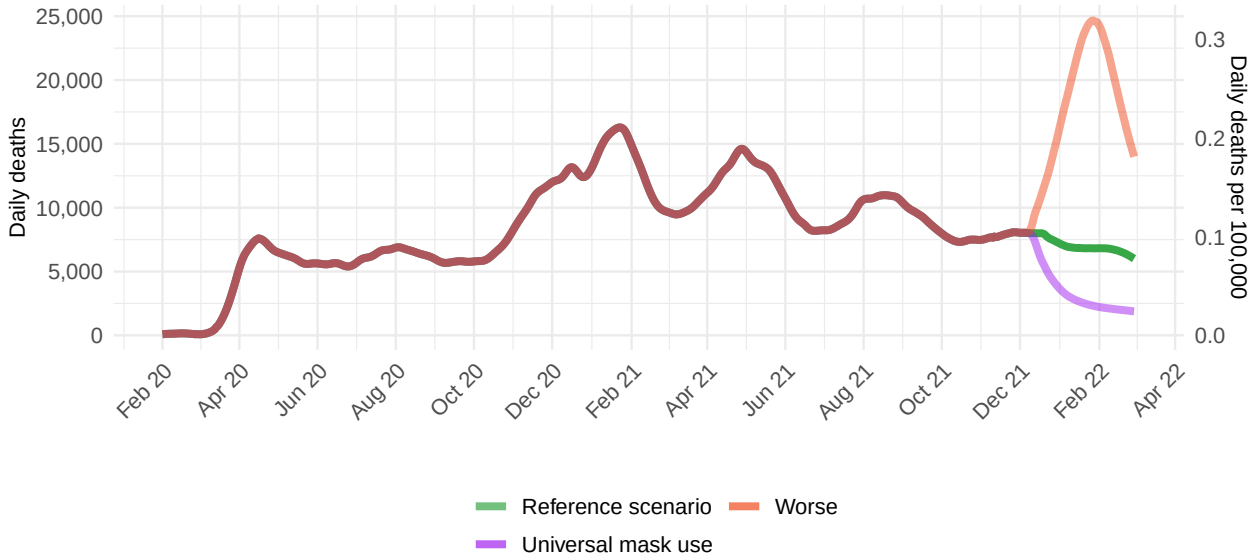


Figure 22.2 Total daily COVID-19 deaths per 100,000

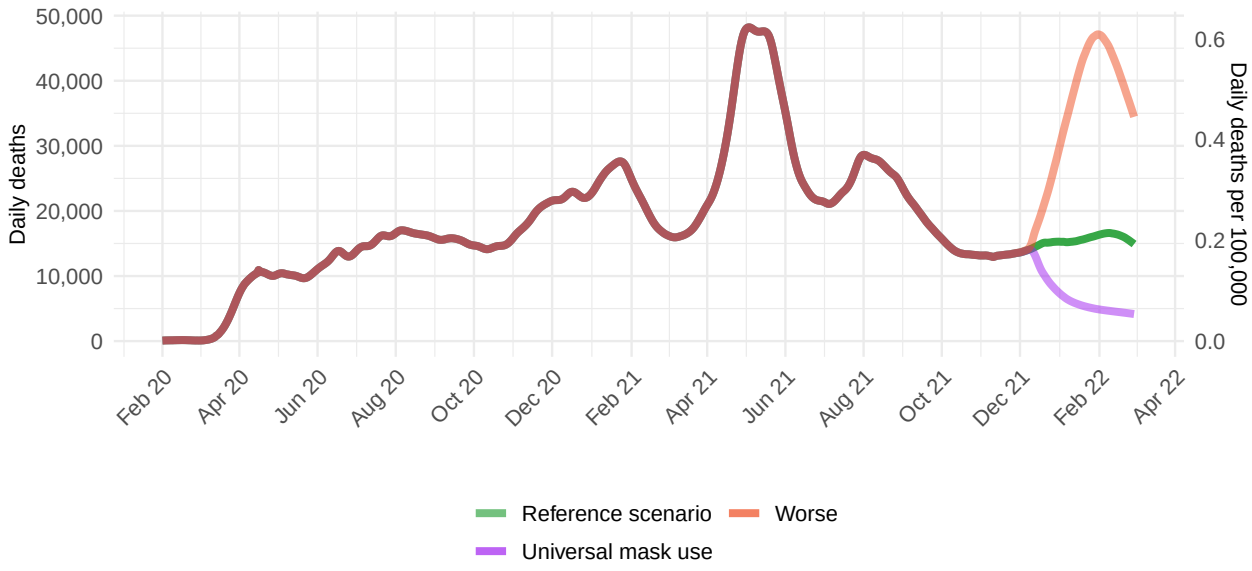


Figure 22.3. Daily COVID-19 infections until March 01, 2022 for three scenarios

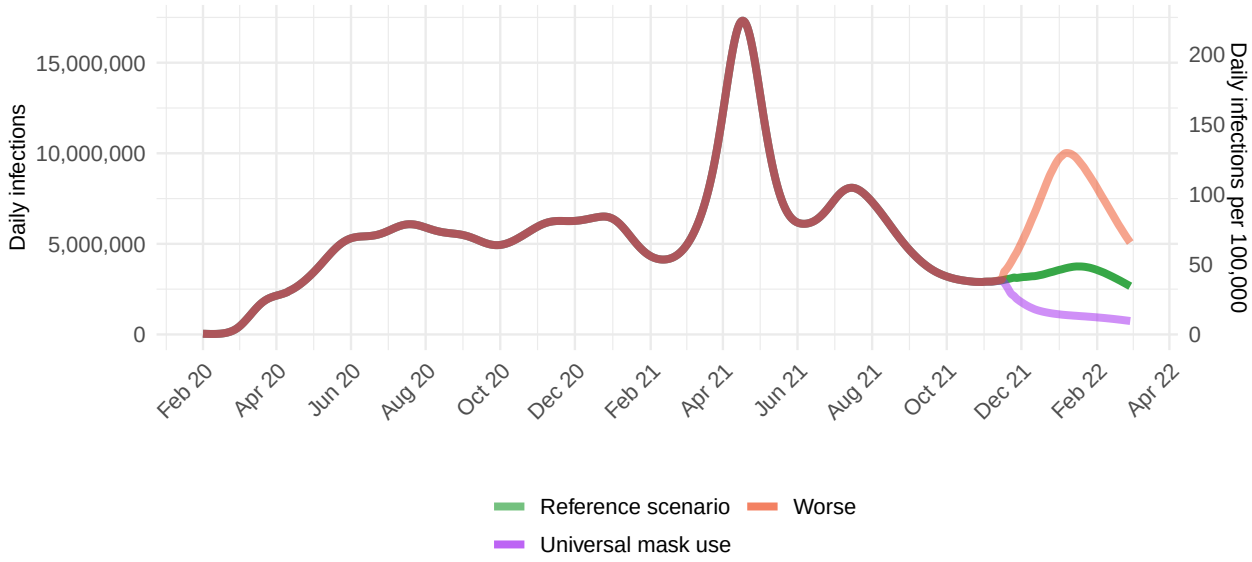


Figure 22.4. Daily COVID-19 reported cases until March 01, 2022 for three scenarios

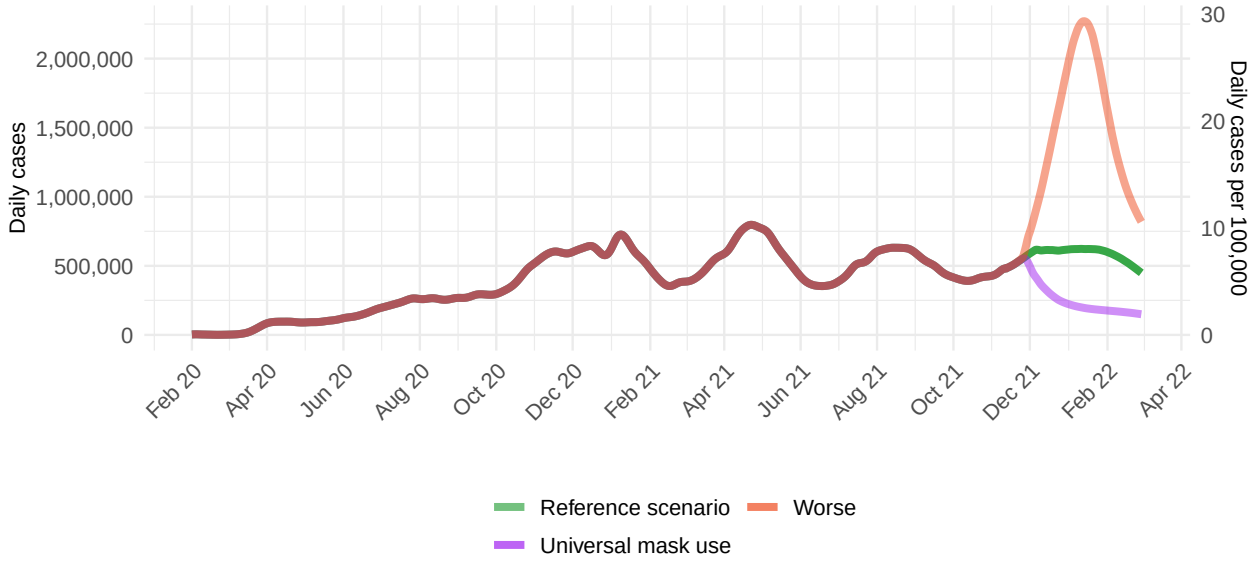
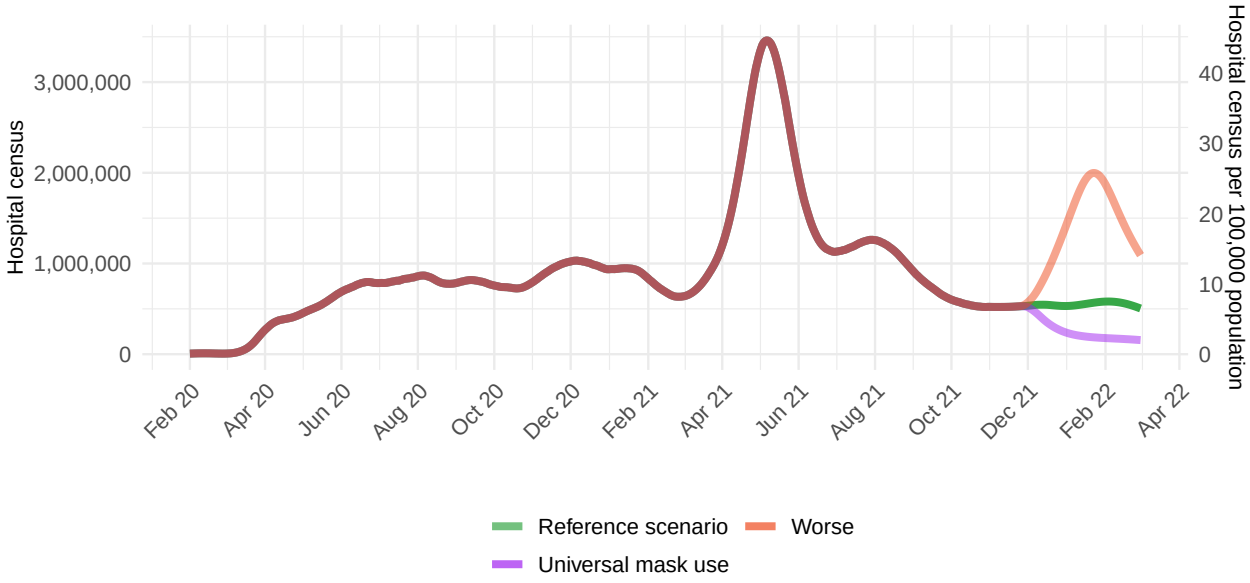


Figure 22.5. Daily COVID-19 hospital census until March 01, 2022 for three scenarios



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.