

COVID-19 Results Briefing

Global

September 9, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on September 8, 2021, with data through September 7, 2021.

At the global level, transmission has declined to the lowest level since March, with declines in reported cases and reported deaths as well. The global decline is driven in large part by reductions in transmission in most of Southeast Asia, with the exceptions of Vietnam and the Philippines, combined with declining transmission nearly all of South America, Southern states in the US, most of Mexico, southwestern Europe, Central Asia, South Asia, and most of the Middle East, with the exceptions of Egypt, Syria, and Yemen. Some of the declines are related to social distancing mandates, while others appear to be due to the exhaustion of susceptible individuals, due either to past infection or vaccination. The experience in Scotland, where a Delta peak and decline has been followed by a second Delta wave coinciding with school openings, is a stark reminder of the role of human behavior in transmission. Despite rising vaccination rates, where one-third of the world will be fully vaccinated by December 1 and nearly half will be immune to the Delta variant through vaccination or past infection, global transmission should return to over 5 million infections a day by mid-October and stay at that level through to December 1. The trajectory of the epidemic can be greatly influenced by a number of factors: 1) the accelerator effect on transmission of school openings, especially in settings with insufficient mitigation measures in place such as weekly testing, mask use, and spacing of students; 2) the emergence and spread of major new variants that can escape natural or vaccine-derived immunity; 3) efforts to increase vaccination rates in countries with sufficient supply through information, community outreach, or employer/school mandates such as those adopted by the US government this week; 4) the potential for severe hospital stress in the Northern Hemisphere winter due to ongoing COVID-19 transmission and flu epidemics; and 5) the extent to which vaccine-derived immunity wanes and the use of booster vaccines. Given the available evidence on waning immunity and lower efficacy of vaccines preventing infection as compared to hospitalization and death, strategies to reduce COVID-19 transmission to zero are unlikely to succeed. More and more countries are recognizing that a zero COVID-19 strategy is not viable, such as Australia this week. Ongoing COVID-19 transmission and burden on the health system are likely to extend past the forecast period and well into 2022.

Current situation

- Daily infections in the last week decreased to 4.3 million per day on average compared to 4.7 million the week before (Figure 1). This is the lowest level since March 2021.
- Daily hospital census in the last week (through September 7) decreased to 1.0 million per day on average compared to 1.1 million the week before.

- Daily reported cases in the last week decreased to 613,800 per day on average compared to 638,300 the week before (Figure 2).
- Reported deaths due to COVID-19 in the last week decreased to 9,300 per day on average compared to 9,600 the week before (Figure 3).
- Excess deaths due to COVID-19 in the last week decreased to 25,200 per day on average compared to 26,300 the week before (Figure 3). This makes COVID-19 the number 1 cause of death globally this week (Table 1). Estimated excess daily deaths due to COVID-19 in the past week were 2.7 times larger than the reported number of deaths.
- The daily reported COVID-19 death rate is greater than 4 per million in 34 countries (Figure 4). Locations with a death rate over 4 per million included many US states, Mexican states, South Africa, Tunisia, Iran, several countries in Europe, Sri Lanka, and Malaysia.
- The daily rate of excess deaths due to COVID-19 is greater than 4 per million in 61 countries (Figure 4).
- We estimate that 34% of people globally have been infected as of September 7 (Figure 6).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in the northern states of the US, Canada, Central and Eastern Europe, parts of West, Central, and East Africa, Papua New Guinea, and Australia (Figure 7).
- The infection-detection rate globally was close to 13% 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). Delta is the dominant variant in most parts of the world. Delta is spreading in South America, but many parts have not yet seen an invasion of Delta.

Trends in drivers of transmission

- Mobility last week was 7% lower than the pre-COVID-19 baseline (Figure 11). Mobility was near baseline (within 10%) in 124 countries. Mobility was lower than 30% of baseline in 13 countries.
- As of September 7, in the COVID-19 Trends and Impact Survey, 59% of people self-report that they always wore a mask when leaving their home (Figure 13). Mask use remains very high in Latin America, central and southern Africa, South Asia, and Southeast Asia.
- There were 136 diagnostic tests per 100,000 people on September 7 (Figure 15).
- As of September 7, 23 countries have reached 70% or more of the population who have received at least one vaccine dose and 15 countries have reached 70% or more of the population who are fully vaccinated (Figure 17). Comparison of the map of one dose and fully vaccinated suggests that many Latin American countries will achieve over 70% fully vaccinated in the coming weeks.

- Based on various surveys, 70% of the adult population say they would accept or would probably accept a vaccine for COVID-19. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 28% in Kazakhstan to 98% in United Arab Emirates (Figure 19). There are marked differences between adjacent countries such as provinces of Canada and neighboring US states, or Bolivia and Peru, or Turkey and Syria.
- In our current reference scenario, we expect that 3.3 billion people will be vaccinated with at least one dose by December 1 (Figure 20). We expect that by December 1, 34% of the world's population will be fully vaccinated.
- In our current reference scenario, we expect that by December 1, 48% of people will be immune to the Delta variant (Figure 21).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 5,325,000 cumulative reported deaths due to COVID-19 on December 1. This represents 713,000 additional deaths from September 7 to December 1. Daily reported deaths will decline to 7,300 by mid-October and then increase again to near 9,500 by December 1 (Figure 22).
- Under our **reference scenario**, our model projects 11,945,000 cumulative excess deaths due to COVID-19 on December 1. This represents 1,786,000 additional deaths from September 7 to December 1 (Figure 22).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 213,000 fewer cumulative reported deaths compared to the reference scenario on December 1.
- Under our **worse scenario**, our model projects 6,111,000 cumulative reported deaths on December 1, an additional 786,000 deaths compared to our reference scenario. Daily reported deaths in the **worse scenario** rise to nearly 30,000 by mid-November (Figure 22).
- Daily infections in the **reference scenario** will decline to 3.9 million by the third week of September and then increase to over 5 million by late October (Figure 23). Daily infections in the **worse scenario** rise to 13.5 million by late October and then decline (Figure 23).
- Daily cases in the **reference scenario** will stay above 500,000 throughout September and then slowly increase to 750,000 by December 1 (Figure 24). Daily cases in the **worse scenario** will rise to 2.7 million by early November (Figure 24).
- Daily hospital census in the **reference scenario** will decline to 800,000 the second week of October and then increase to 1.0 million by December 1 (Figure 25). Daily hospital census in the **worse scenario** will rise to 2.9 million by mid-November (Figure 25).

Model updates

No model updates

Projections

Figure 1. Daily COVID-19 hospital census and infections

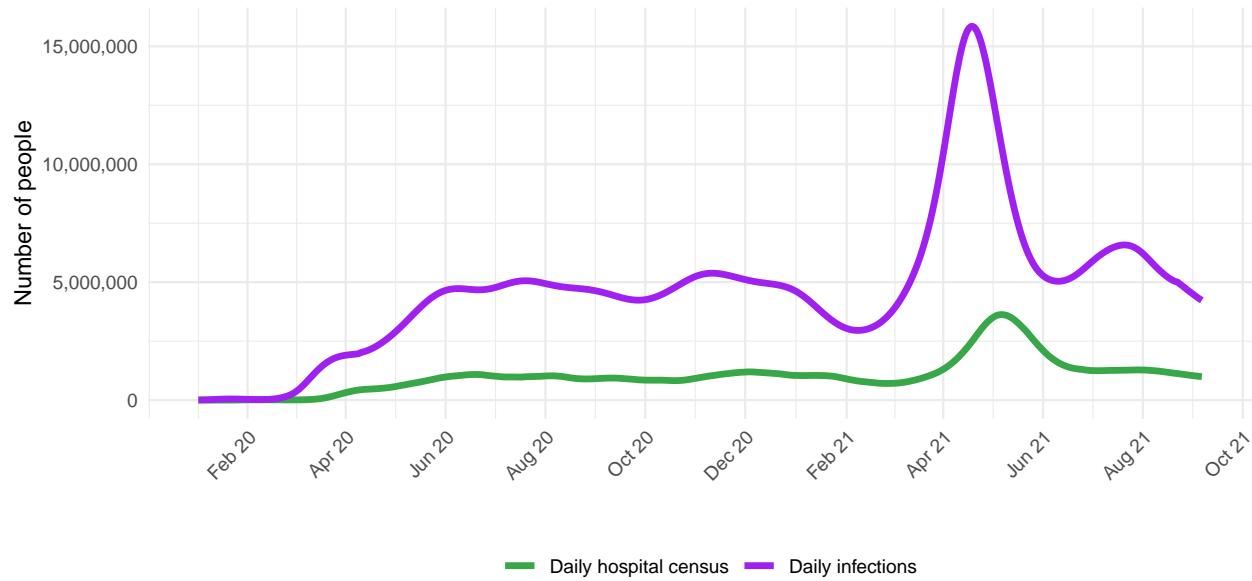


Figure 2. Reported daily COVID-19 cases, moving average

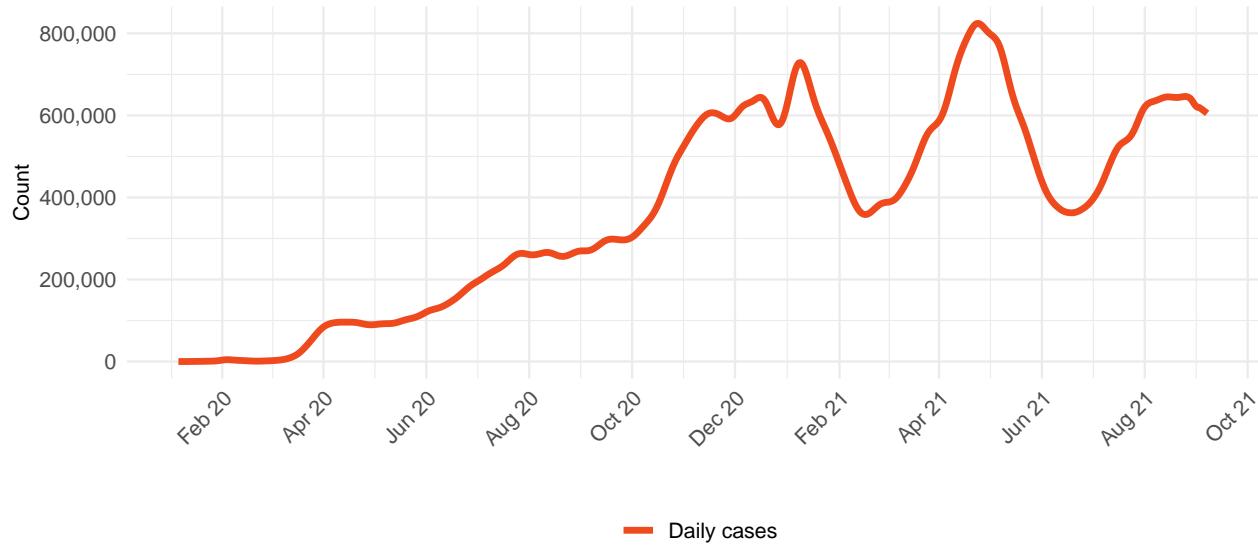


Table 1. Ranking of excess deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

| Cause name | Weekly deaths | Ranking |
|---|---------------|---------|
| COVID-19 | 176,331 | 1 |
| Ischemic heart disease | 175,727 | 2 |
| Stroke | 126,014 | 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. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and excess daily deaths due to COVID-19 (orange)

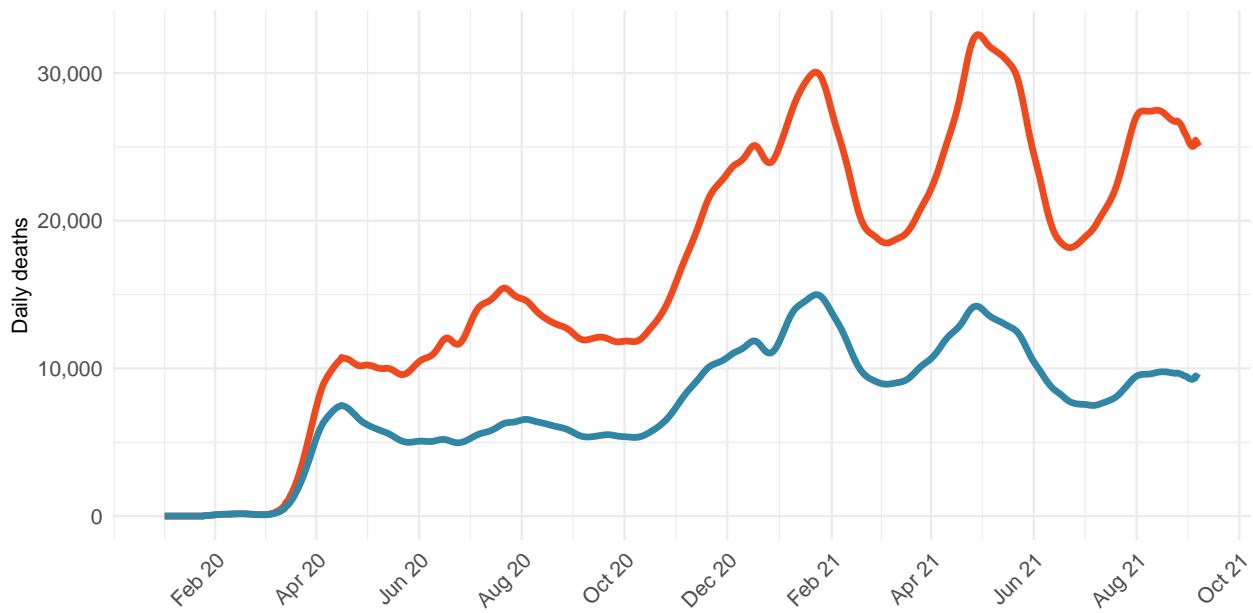


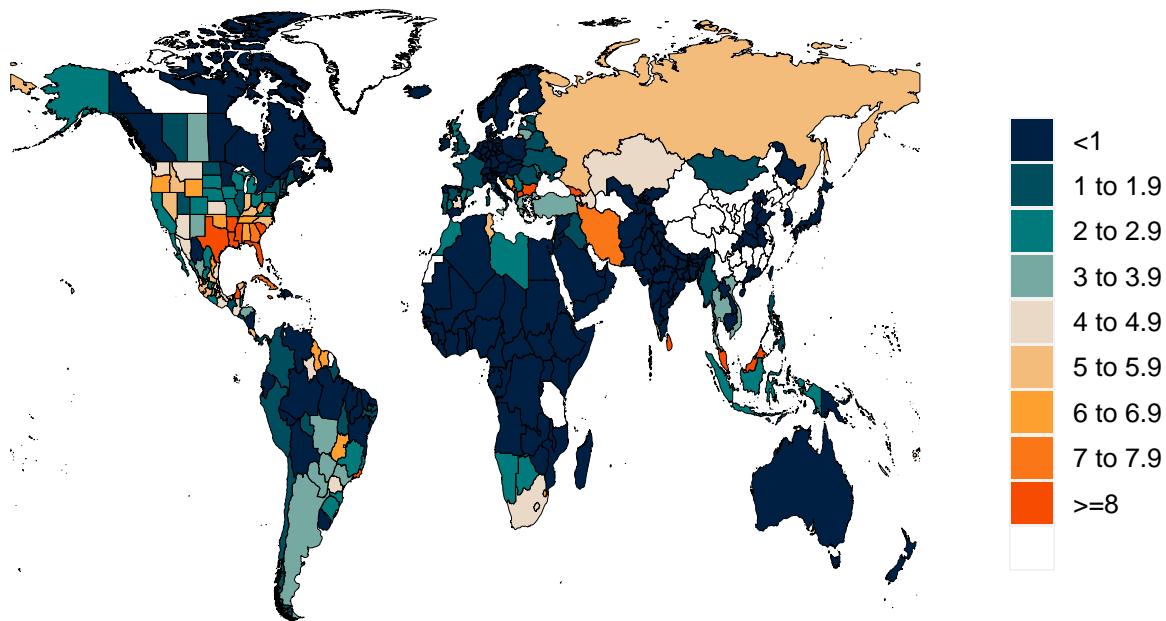
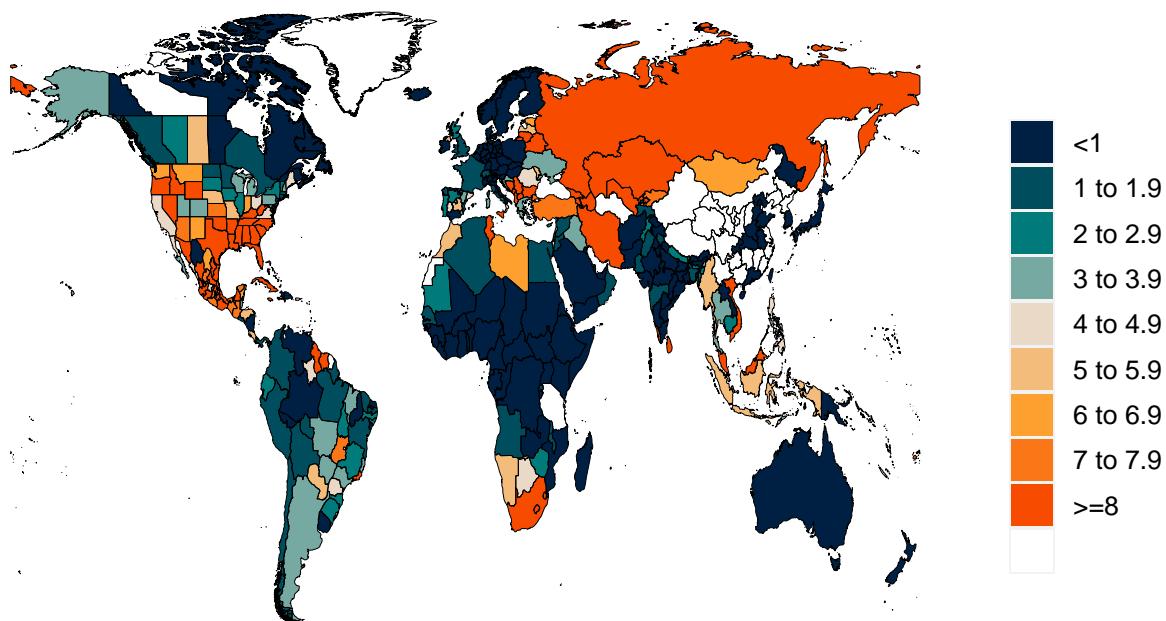
Figure 4. Daily COVID-19 death rate per 1 million on September 7, 2021**A. Daily reported COVID-19 death rate per 1 million****B. Daily excess COVID-19 death rate per 1 million**

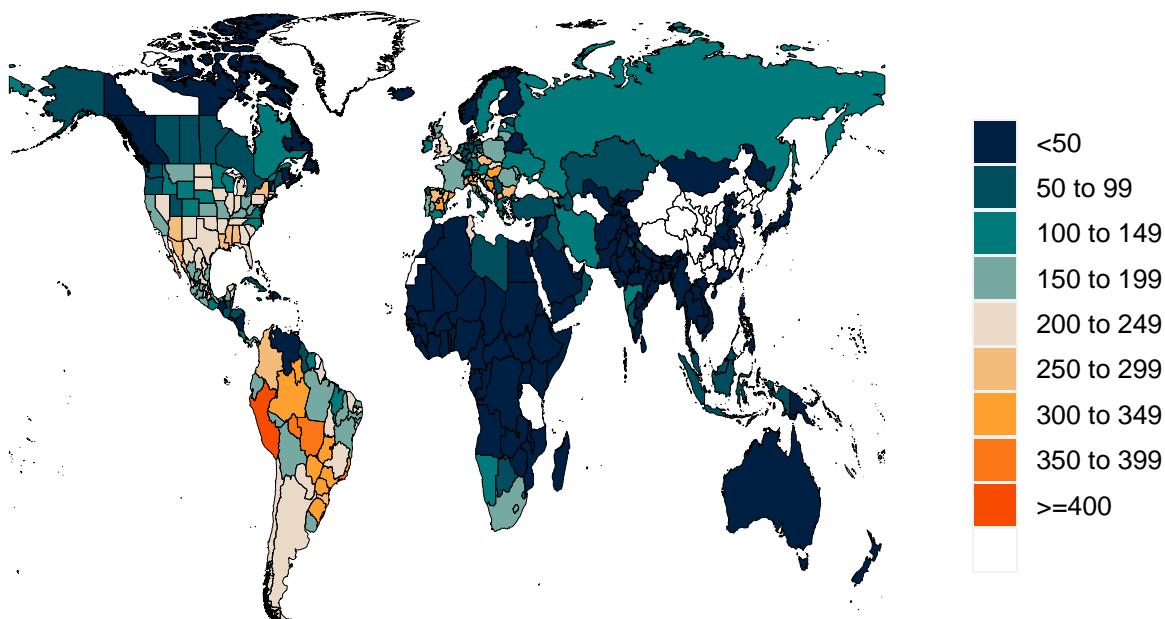
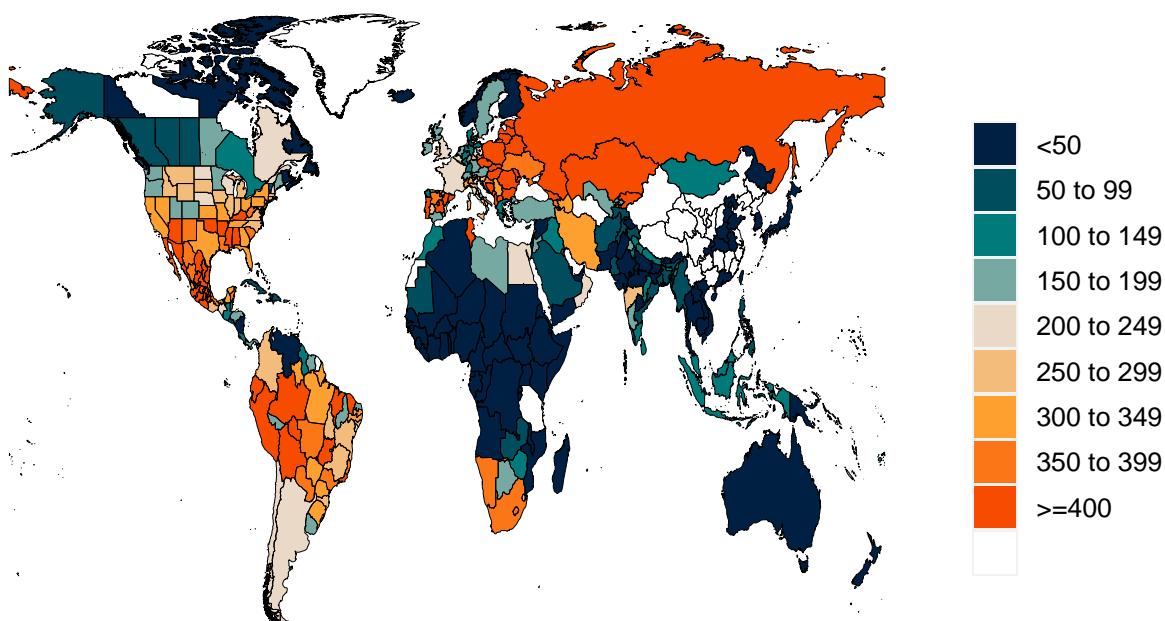
Figure 5. Cumulative COVID-19 deaths per 100,000 on September 7, 2021**A. Reported cumulative COVID-19 deaths per 100,000****B. Excess cumulative COVID-19 deaths per 100,000**

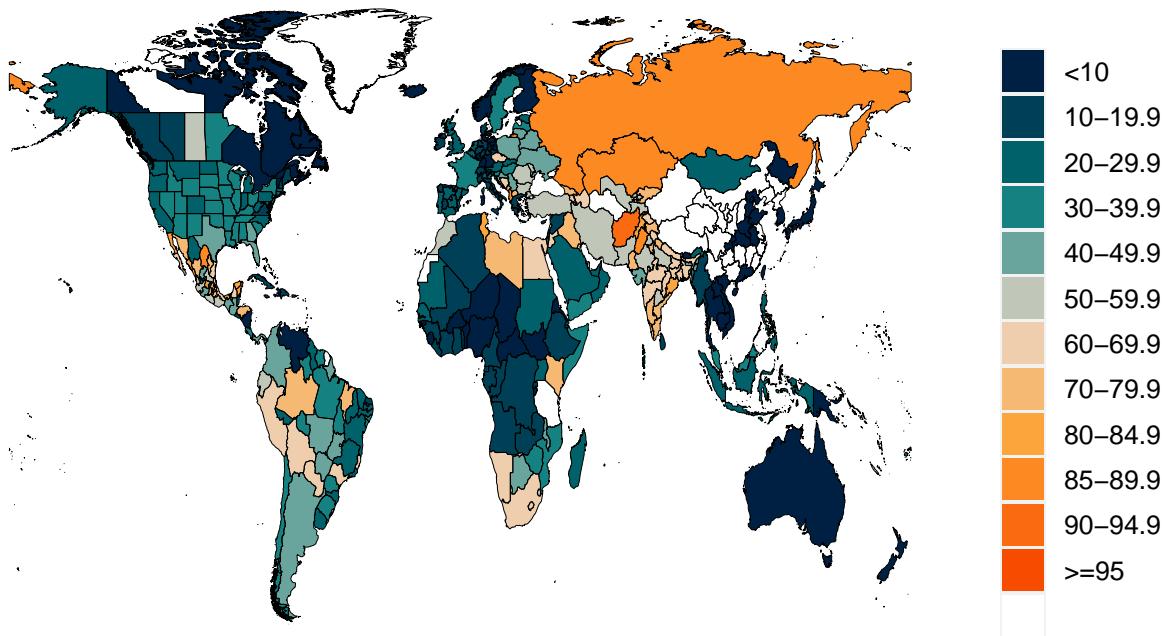
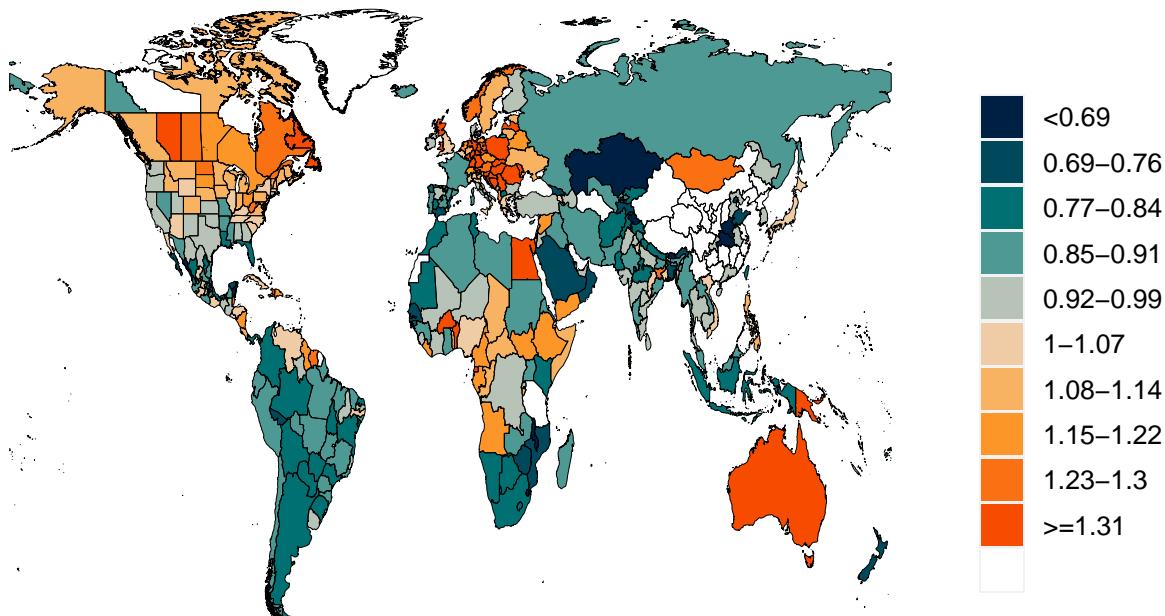
Figure 6. Estimated percent of the population infected with COVID-19 on September 7, 2021**Figure 7.** Mean effective R on August 27, 2021. Effective R less than 1 means that transmission should decline, all other things being held the same. The estimate of effective R is based on the combined analysis 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.

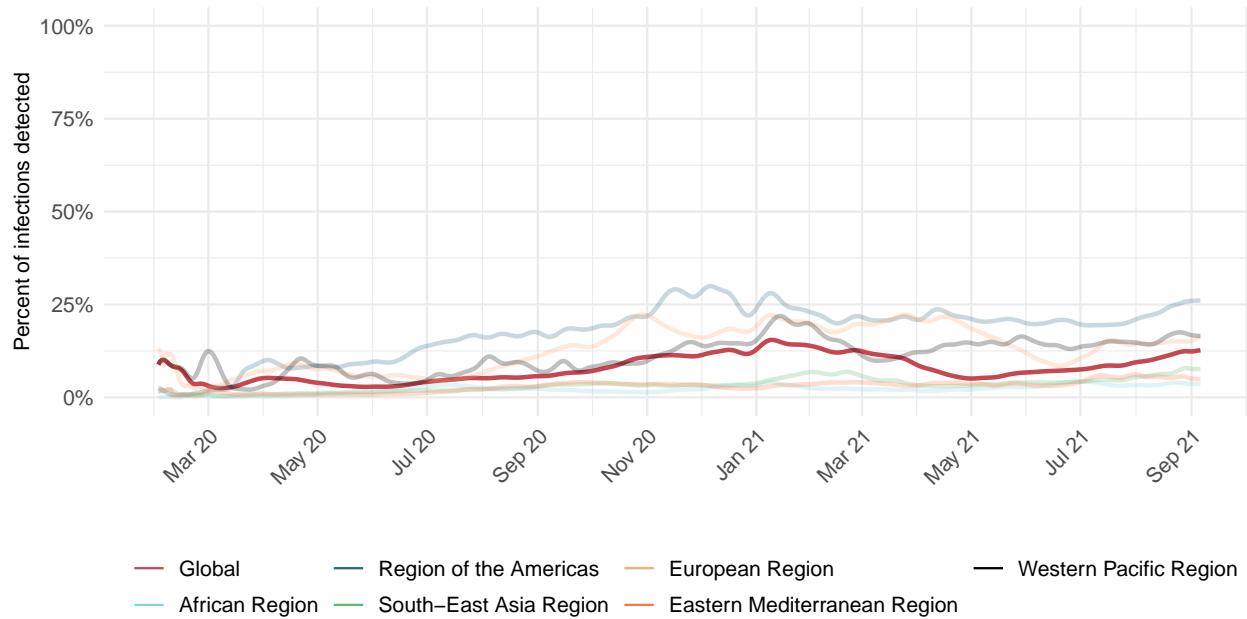
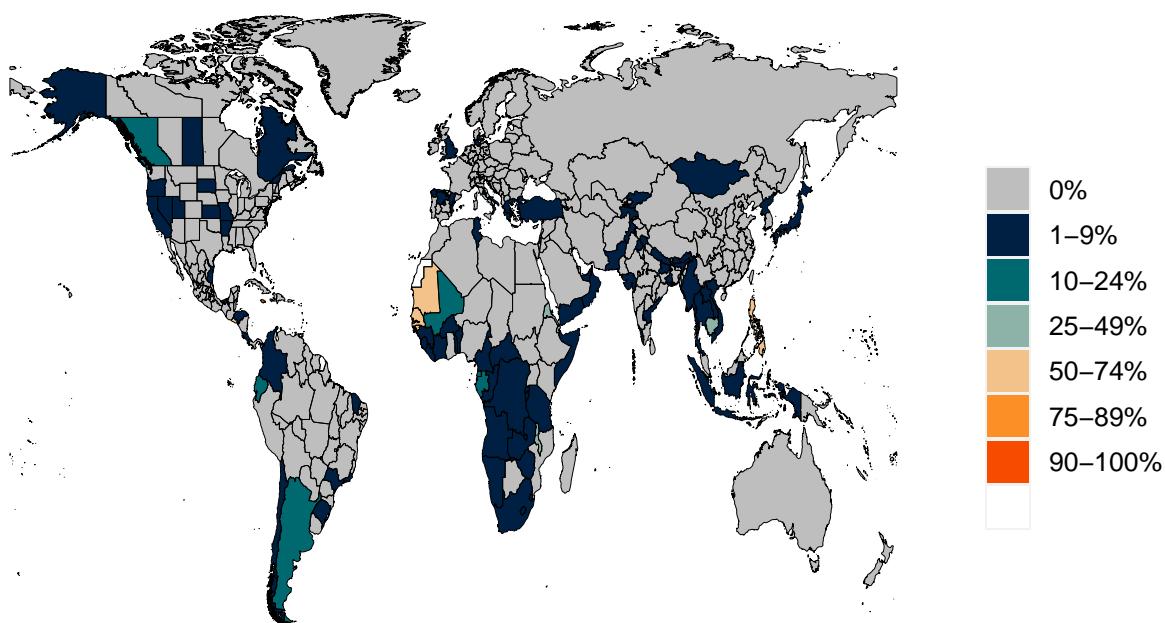
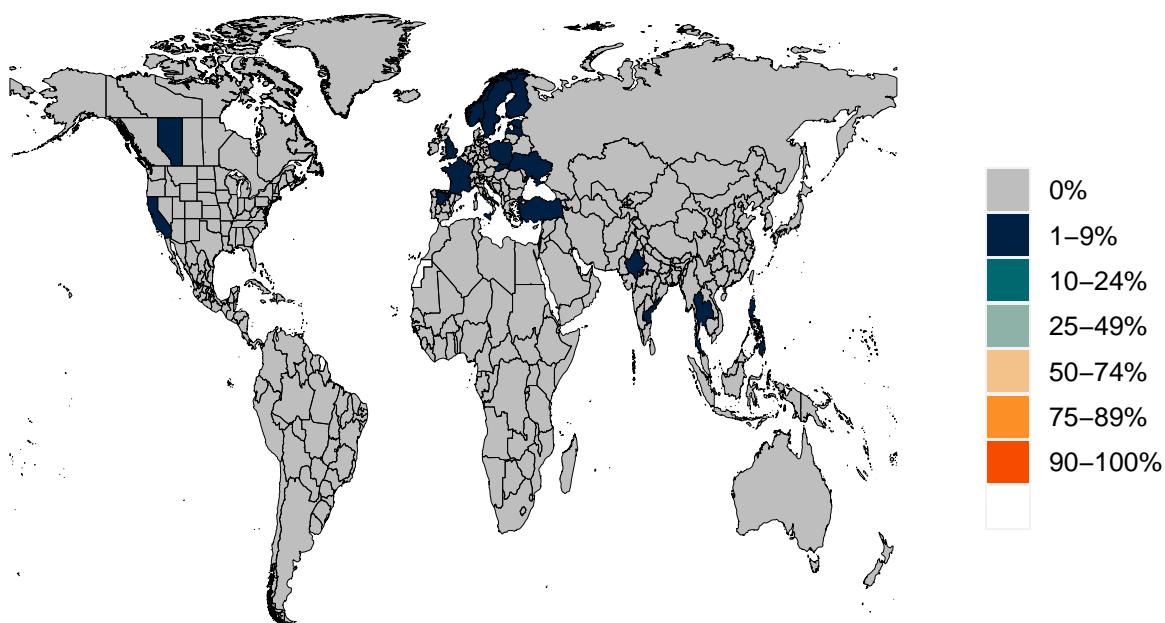


Figure 9. Estimated percent of circulating SARS-CoV-2 for primary variant families on September 7, 2021**A. Estimated percent Alpha variant****B. Estimated percent Beta variant**

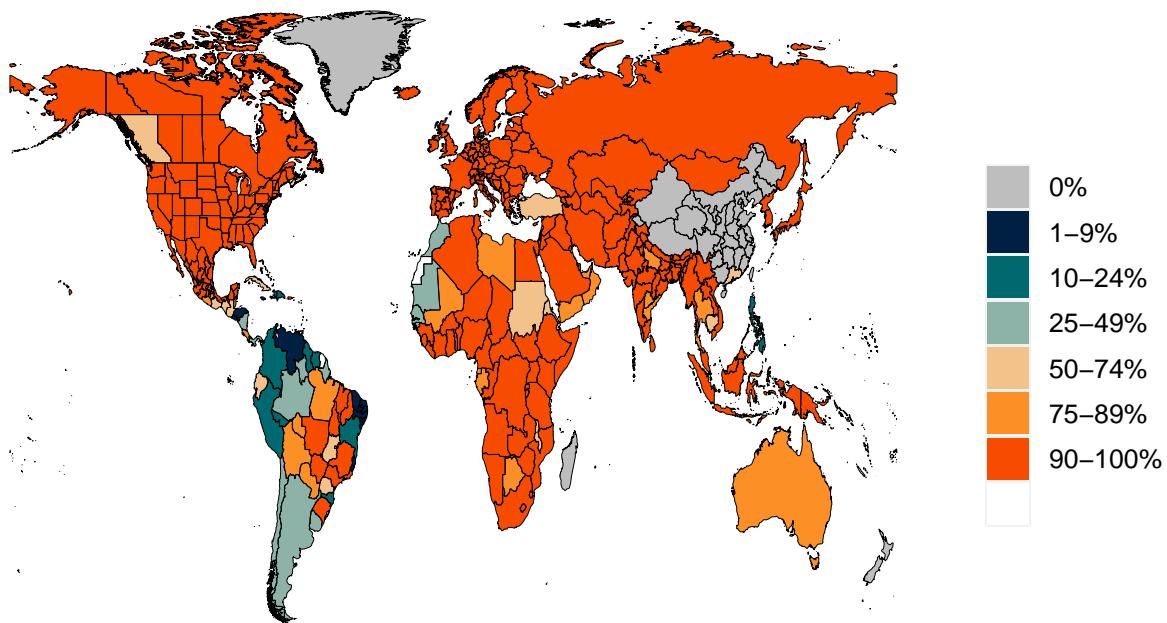
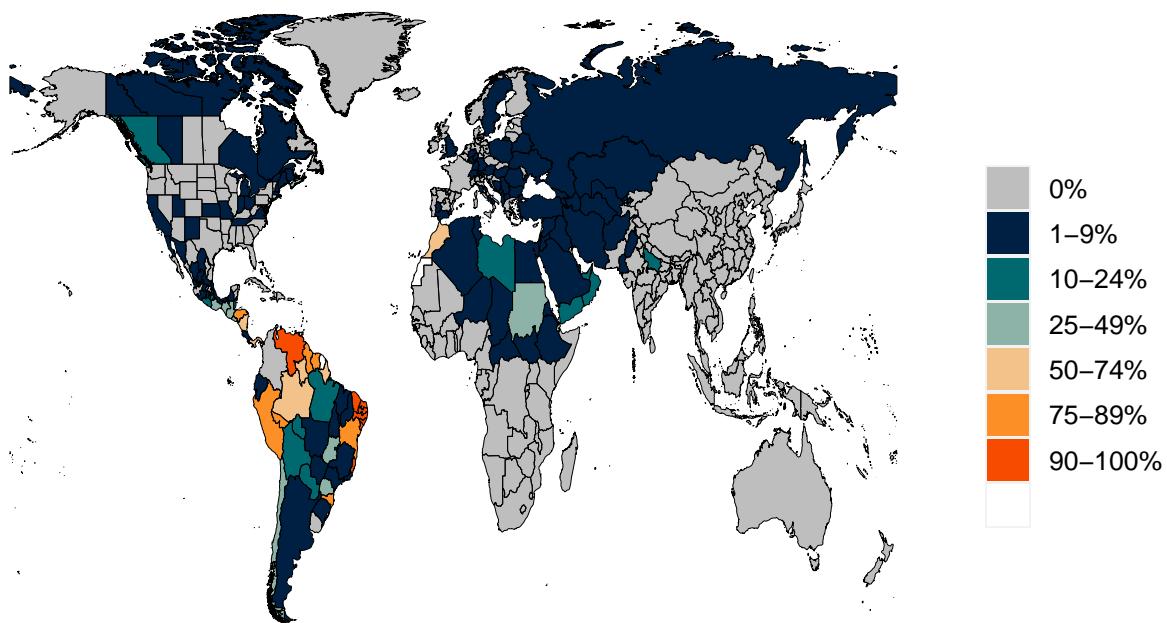
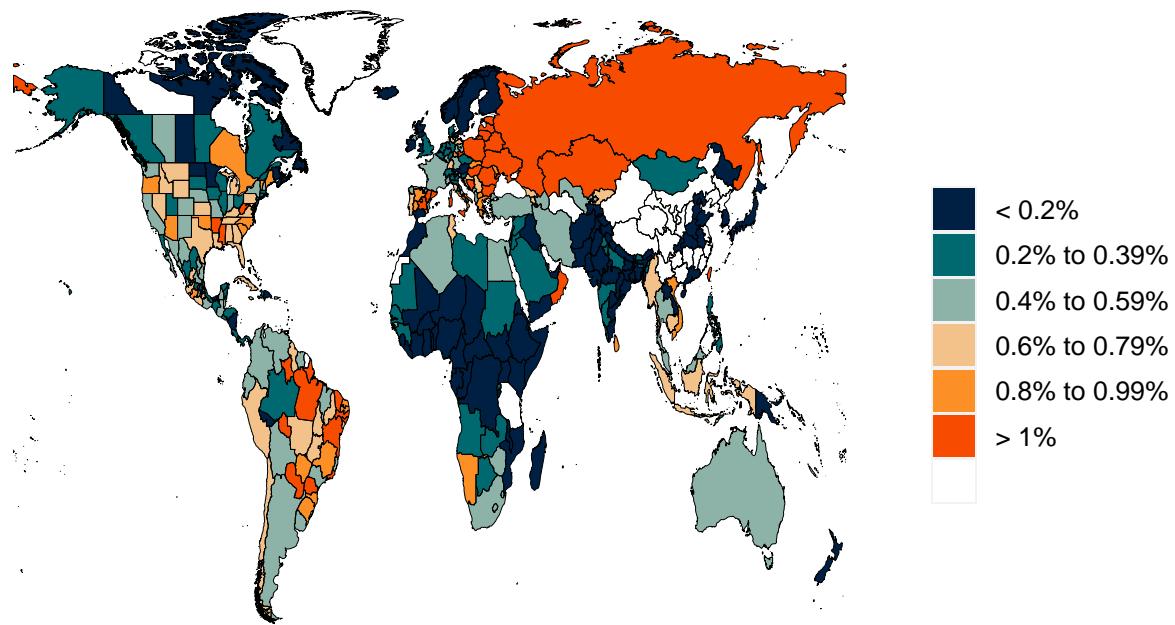
C. Estimated percent Delta variant**D. Estimated percent Gamma variant**

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

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

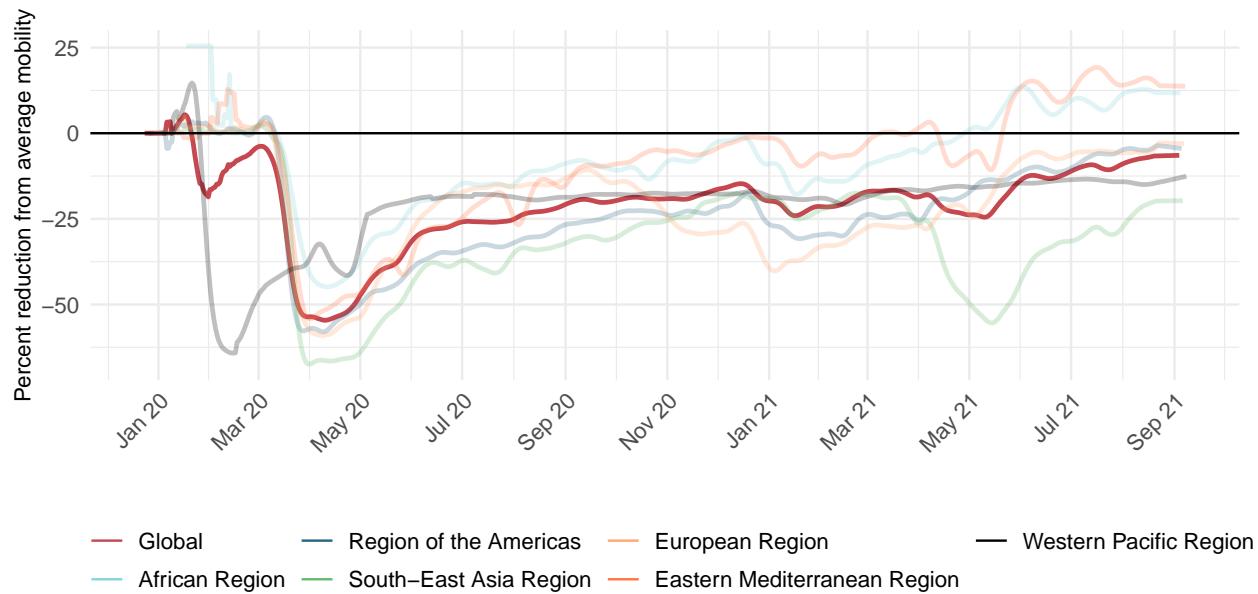


Figure 12. Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on September 7, 2021

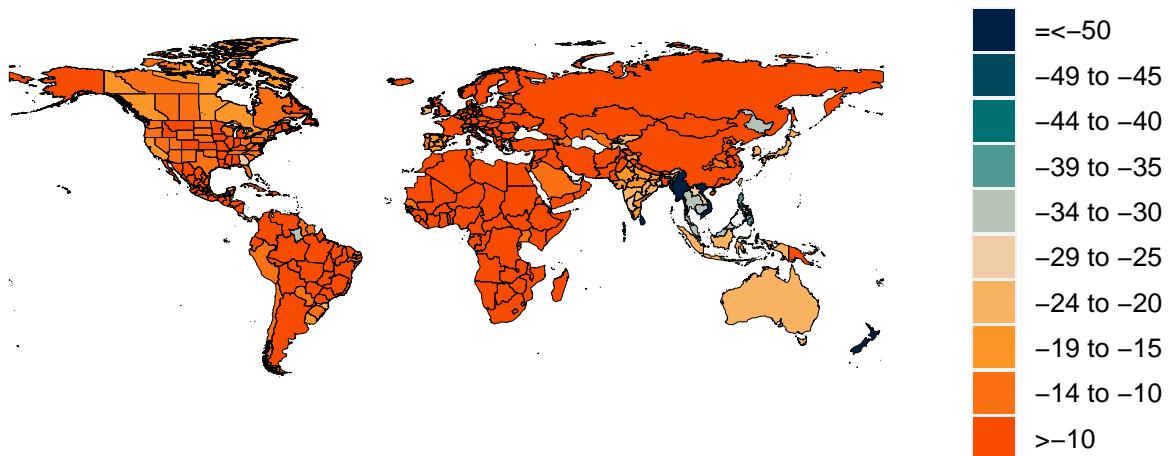


Figure 13. Trend in the proportion of the population reporting always wearing a mask when leaving home

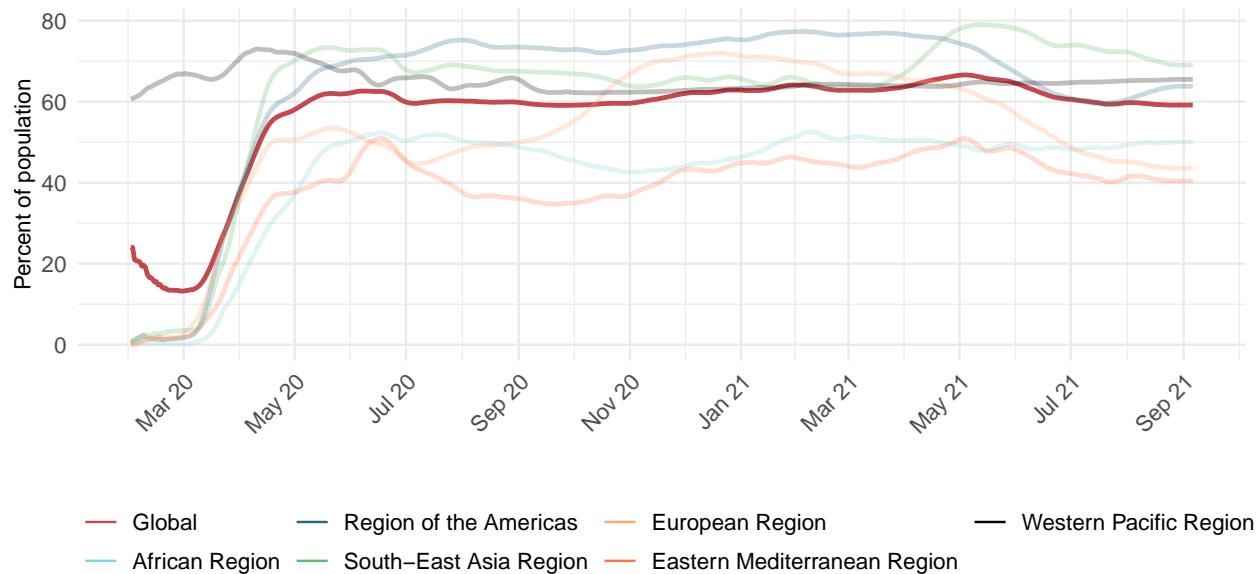


Figure 14. Proportion of the population reporting always wearing a mask when leaving home on September 7, 2021

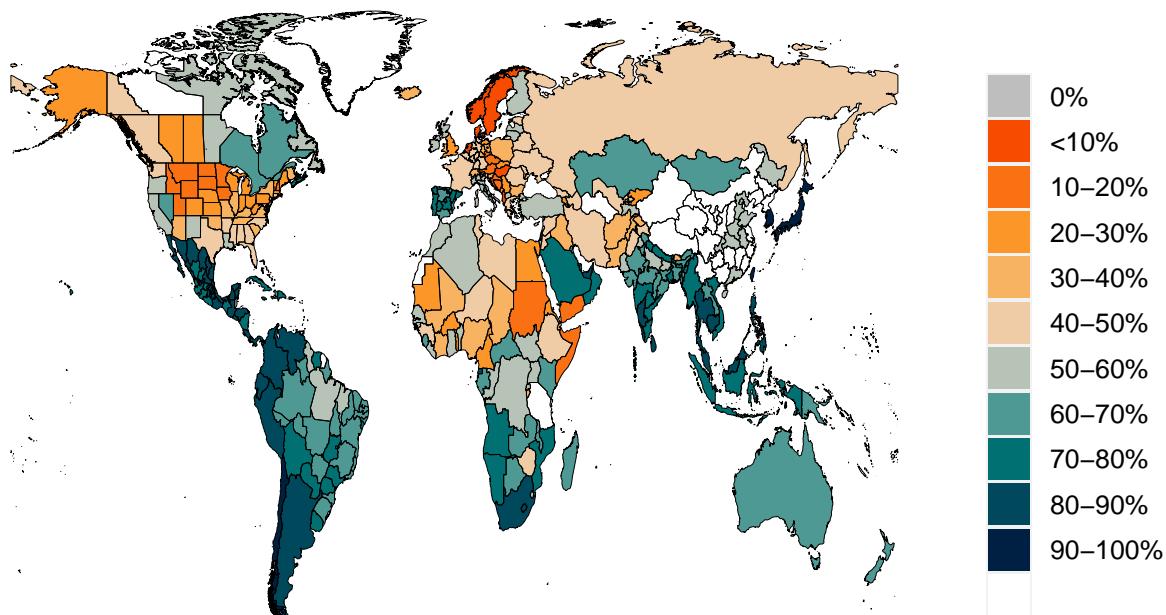


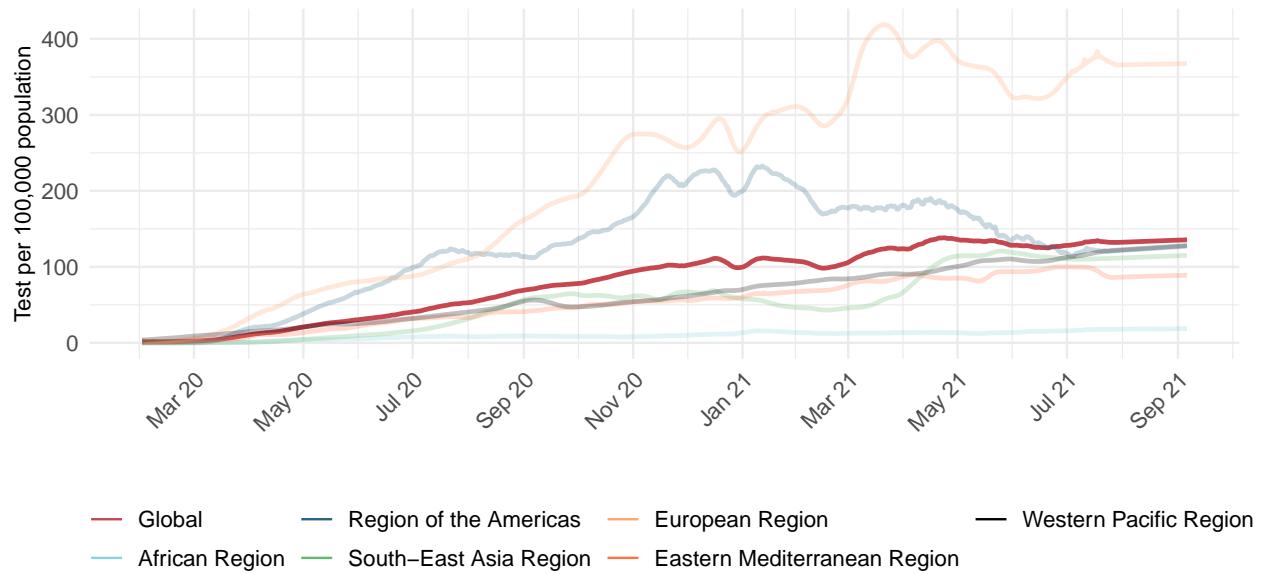
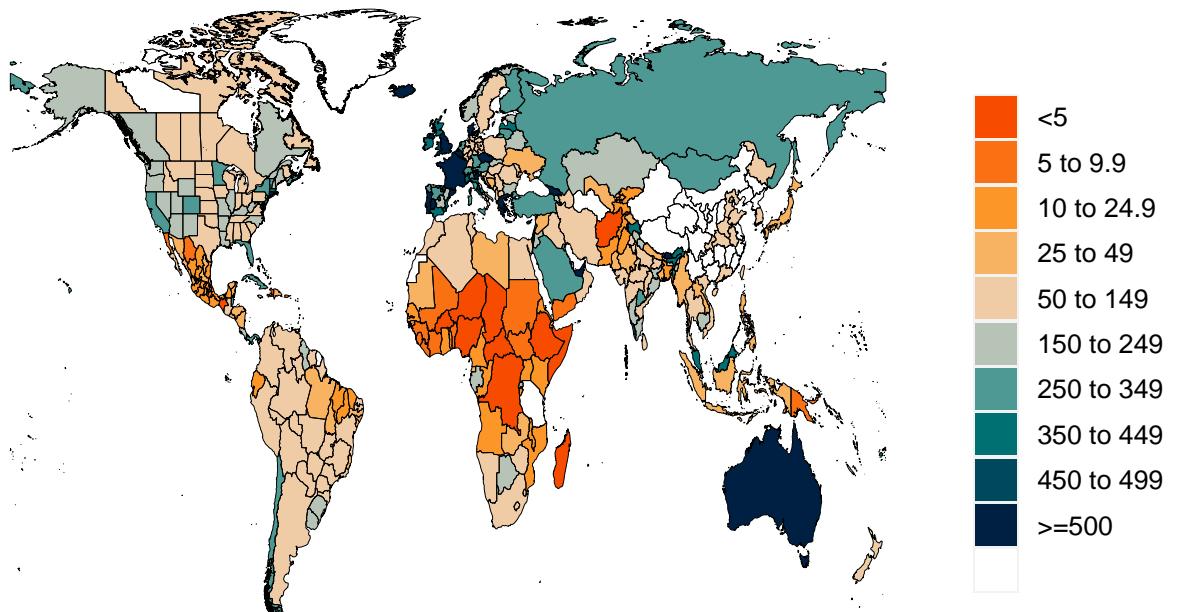
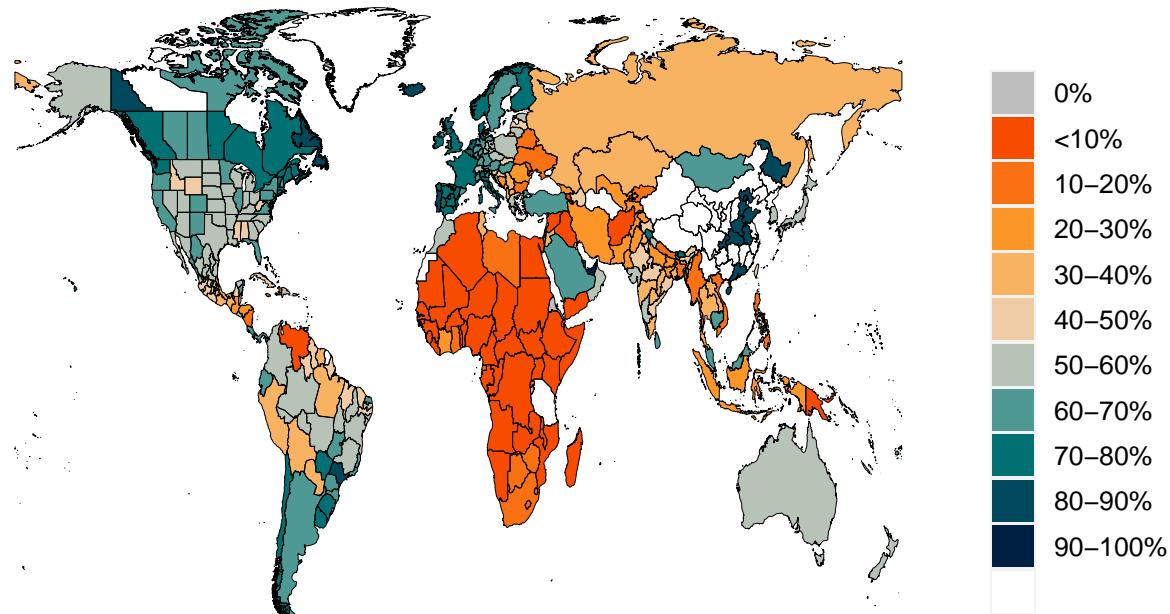
Figure 15. Trend in COVID-19 diagnostic tests per 100,000 people**Figure 16.** COVID-19 diagnostic tests per 100,000 people on September 7, 2021

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

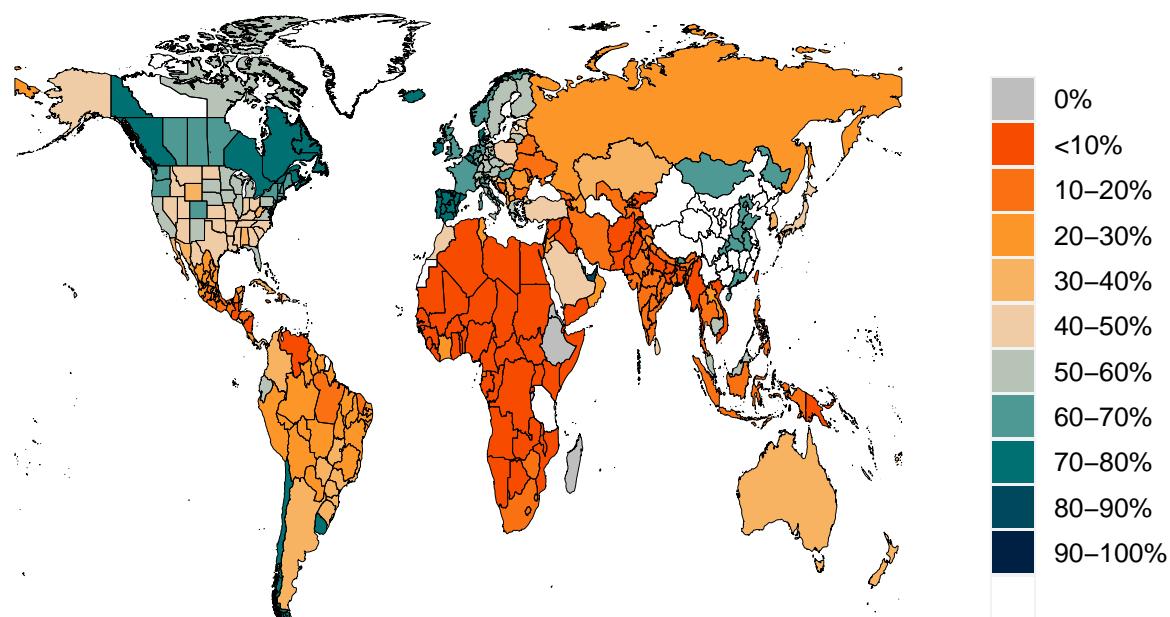


Figure 18. Trend in the estimated proportion of the adult (18+) population that have been vaccinated or would probably or definitely receive the COVID-19 vaccine if available

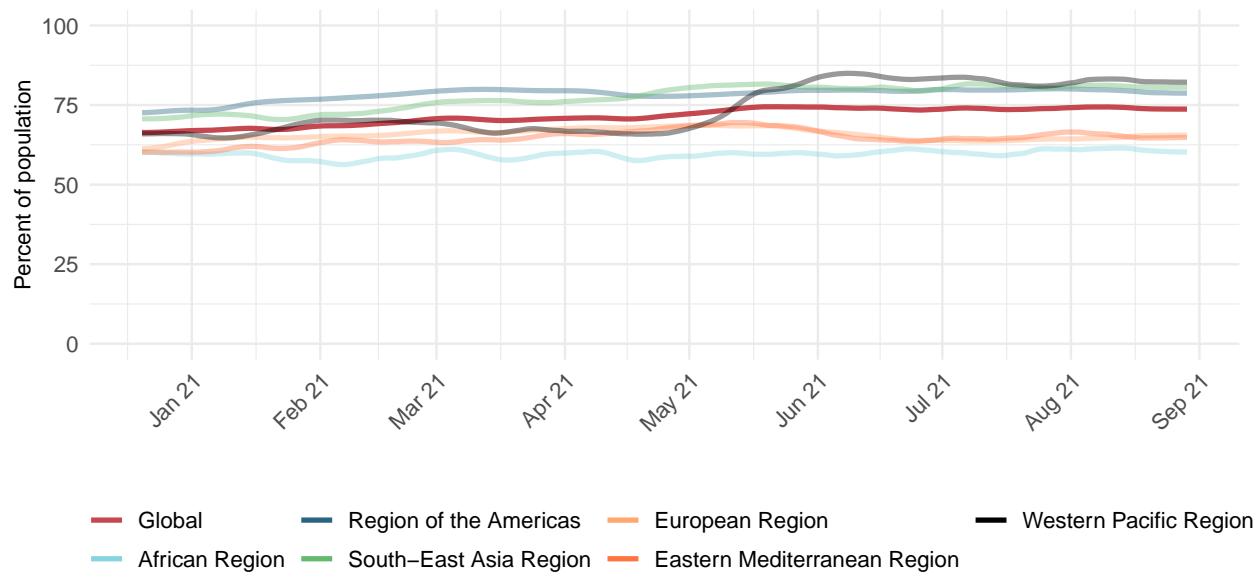


Figure 19. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available

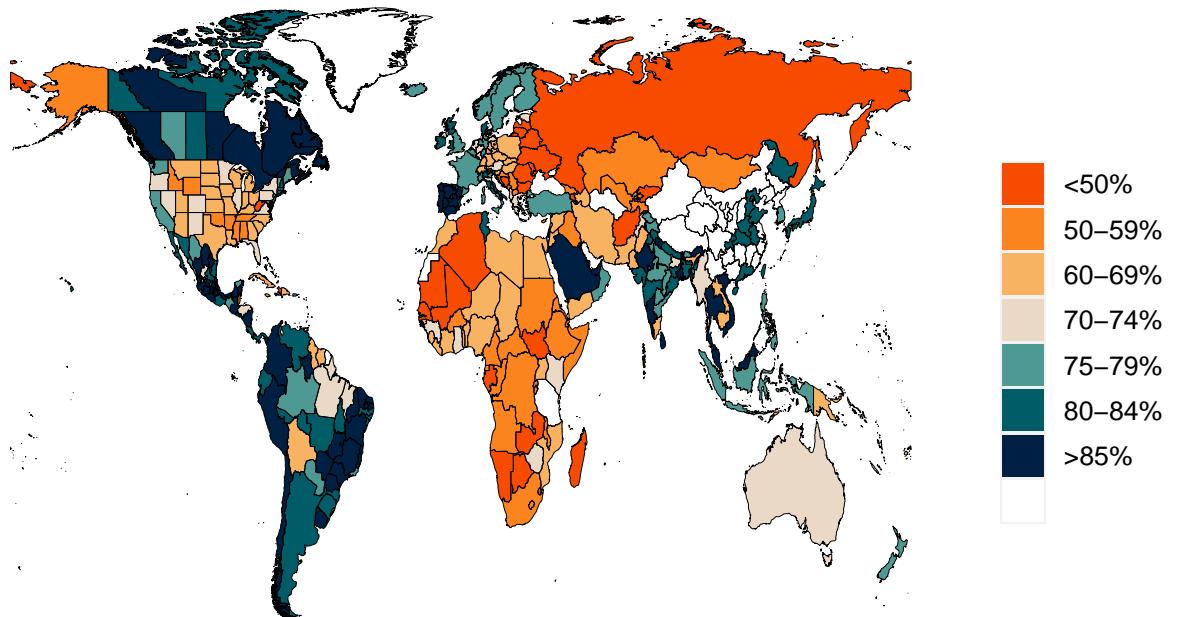


Figure 20. Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

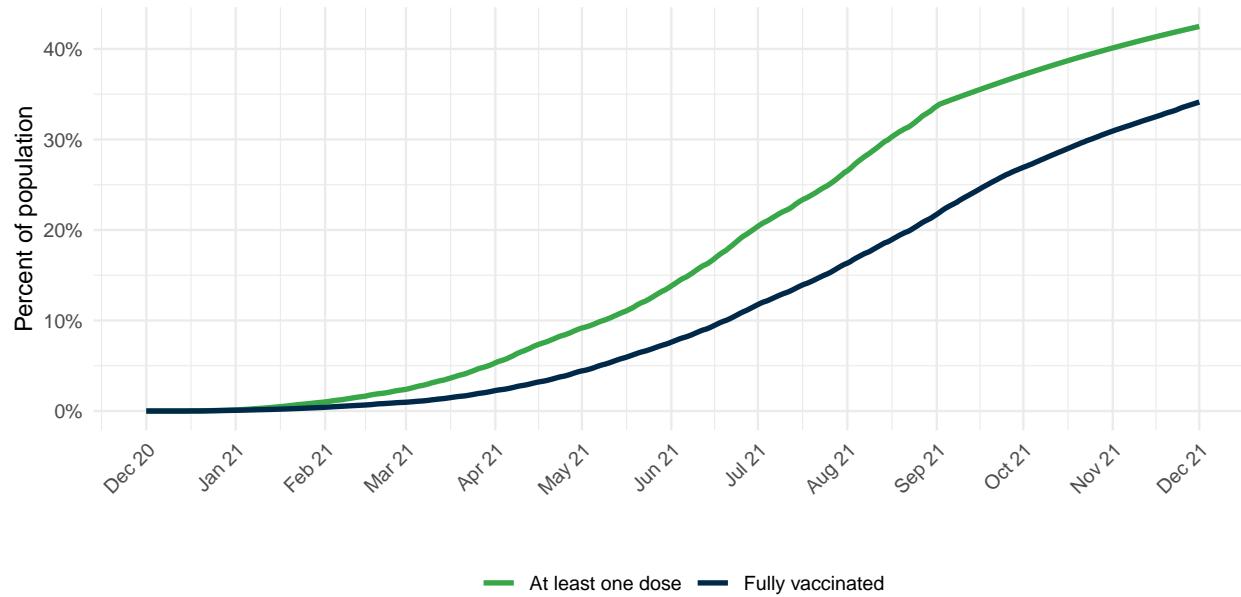
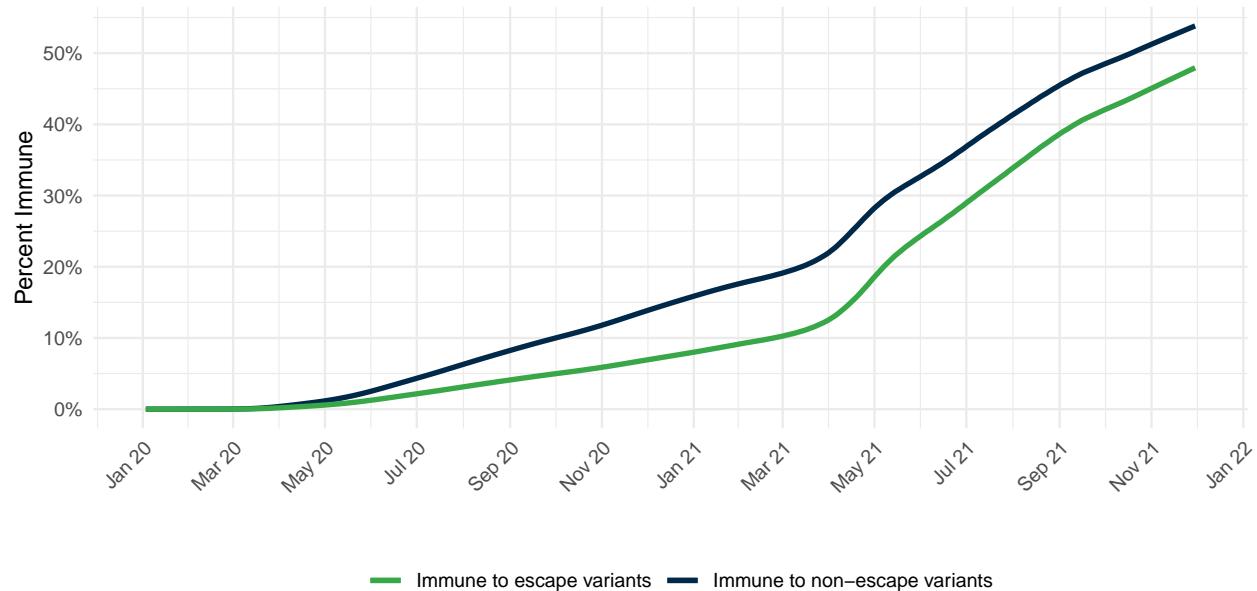


Figure 21. Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants



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.

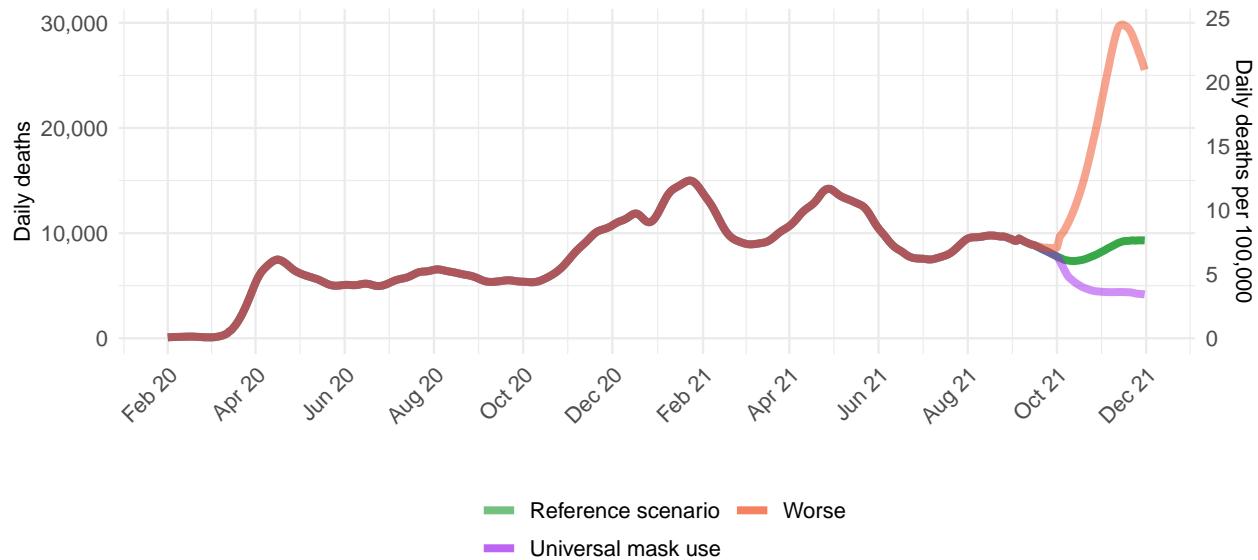
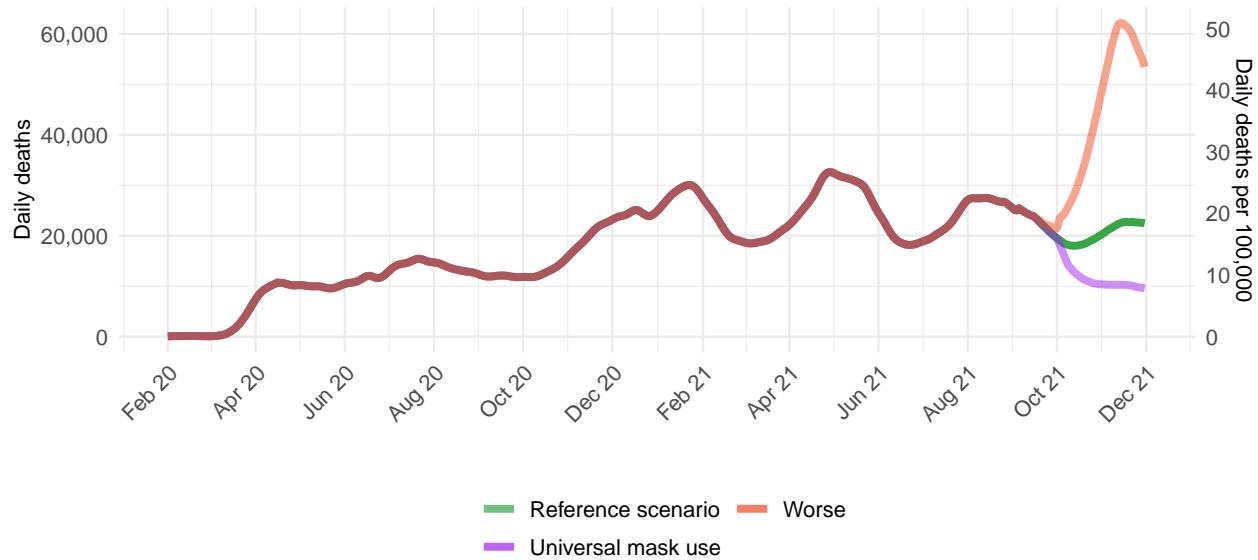
Figure 22. Daily COVID-19 deaths until December 01, 2021 for three scenarios**A. Reported daily COVID-19 deaths per 100,000****B. Excess daily COVID-19 deaths per 100,000**

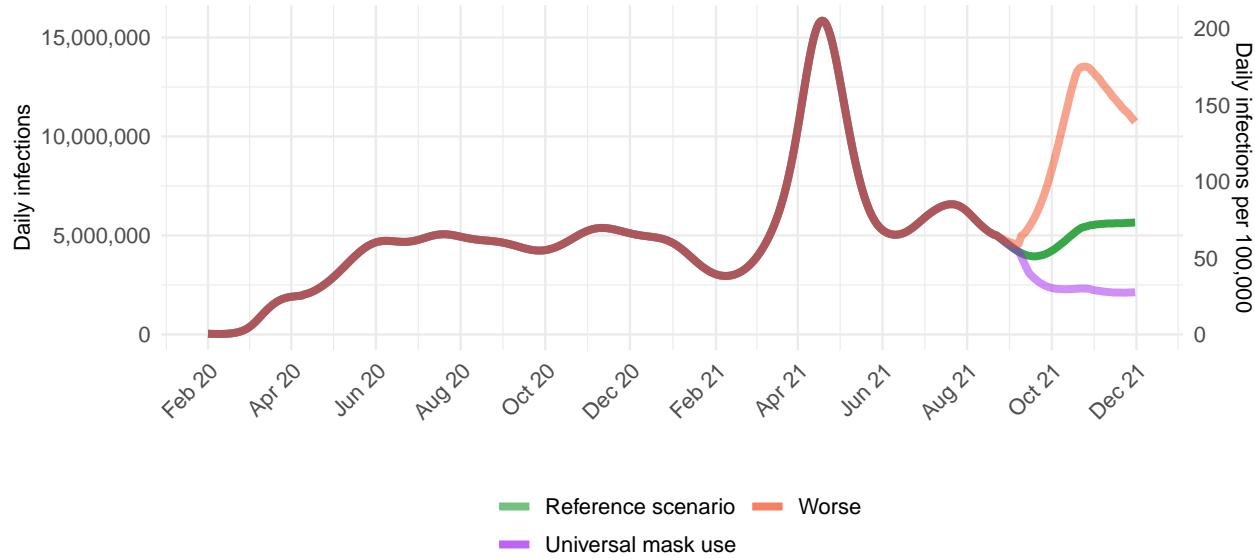
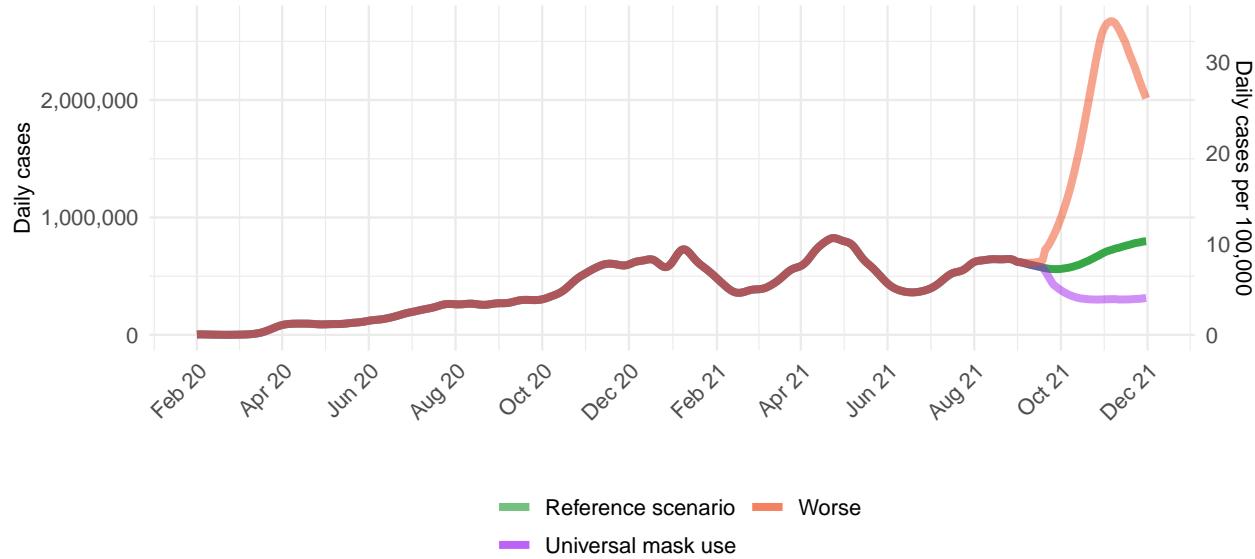
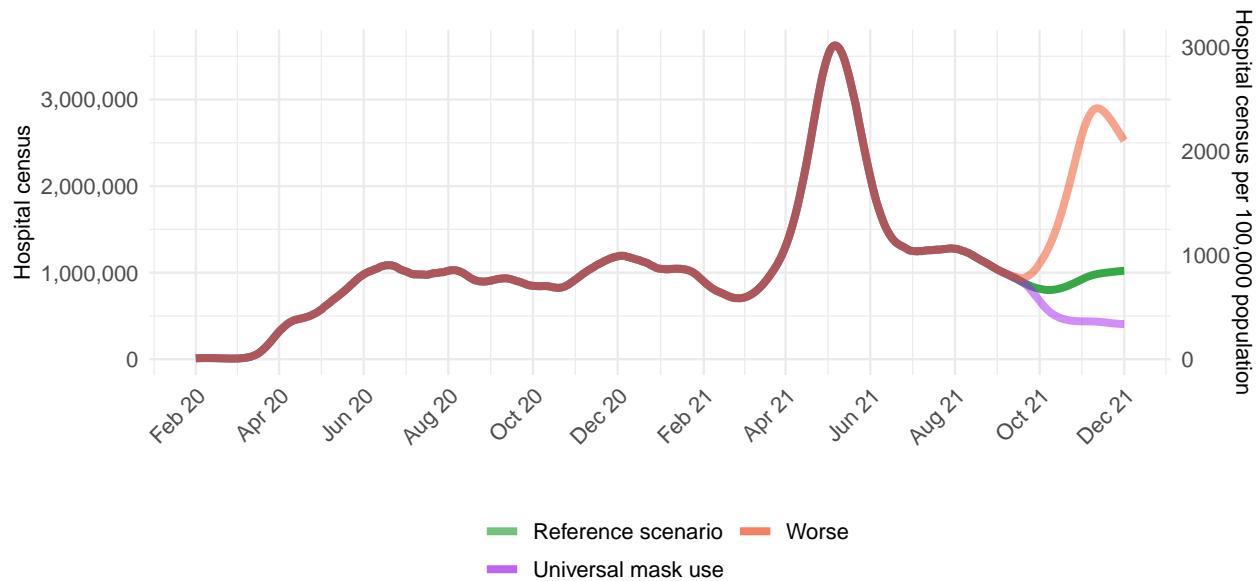
Figure 23. Daily COVID-19 infections until December 01, 2021 for three scenarios**Figure 24.** Daily COVID-19 reported cases until December 01, 2021 for three scenarios

Figure 25. Daily COVID-19 hospital census until December 01, 2021 for three scenarios



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>.