
COVID-19 Results Briefing

Global

June 24, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on June 23, 2021, with data through June 21, 2021.

Daily reported cases and deaths continue to decline. But this decline is largely driven by continued declines in India and in most of Europe and North America. Transmission is, in fact, increasing in countries and states/provinces within countries in all regions. In sub-Saharan Africa, increases in transmission are quite widespread, with rapid surges in some countries such as Uganda, Zambia, and Zimbabwe continuing. Increases continue in many states of Brazil and countries in Central America and the Caribbean, including substantial increases in a number of states in Mexico. Some countries in Southeast Asia that have managed to keep COVID-19 infection rates very low to date are now seeing substantial surges unfold. In Europe, the increases despite high vaccination rates in the United Kingdom and now Portugal are demonstrating the transmissibility and perhaps immune escape of the delta variant (B.1.617.2). The increase in the Russian Federation, also linked to the delta variant, in a population with more than 75% previously infected, suggests immune escape for natural infection along with increased transmissibility. The global picture appears to be largely driven by seasonal surges in the Southern Hemisphere and the spread of P.1 in Latin America and of B.1.617.2 in many other parts of the world. The widespread increases in transmission should be a stark reminder that we are not entering a post-COVID-19 world; rather, we should expect continued major impacts of COVID-19 in the coming year or two. While our models suggest global numbers may decline from mid-July to October, if the delta variant (B.1.617.2) has more immune escape and/or transmissibility than we currently estimate, many more countries in the Northern Hemisphere may have surges despite seasonality. Despite these uncertainties, the main strategies for countries remain: a) make every effort to expand vaccination particularly with mRNA vaccines proven to work better against B.1.617.2; b) promote mask use when cases begin increasing; c) consider social distancing mandates if hospitalizations and deaths begin to increase; and d) minimize the risk of the spread of new variants, particularly the delta variant (B.1.617.2), if it is not already circulating.

Current situation

- Daily reported cases in the last week (through June 18) decreased to 349,100 per day on average compared to 379,700 the week before (Figure 1). This week-on-week decline was slower than in the six weeks prior.
- Daily deaths, adjusted for under-reporting, in the last week decreased to 16,900 per day on average compared to 19,200 the week before (Figure 2). Estimated total daily COVID-19 deaths were 2.1 times larger than the reported number of deaths. This makes COVID-19 the number 3 cause of death globally this week (Table 1).

- The daily death rate is greater than 4 per million in 35 countries (Figure 3). These countries are in South America, southern Africa, Eastern Europe and Central Asia, along with Oman and Tunisia. Several southern Indian states also have rates over this threshold.
- We estimated that 30% of people globally have been infected as of June 21 (Figure 5).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in groups of countries in all regions: states in the US, states in Mexico, several countries in Central America, multiple states in Brazil, many countries in Western, Central, Eastern, and Southern sub-Saharan Africa, Eastern Europe, parts of Central Asia, and Southeast Asia, along with Portugal and the UK (Figure 6).
- The infection-detection rate globally was close to 7% on June 21 (Figure 7).
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figure 8). We estimate that B.1.351 is circulating in 92 countries, that B.1.617 is circulating in 28 countries – although this estimate is likely low due to lags in sequence reporting, and that P.1 is circulating in 19 countries.

Trends in drivers of transmission

- Mobility last week was 16% lower than the pre-COVID-19 baseline (Figure 10). Mobility was near baseline (within 10%) in 117 countries. Mobility was lower than 30% of baseline in 20 countries.
- As of June 21, in the Global COVID-19 Symptom Surveys and the US COVID-19 Symptom Surveys, 63% of people self-report that they always wore a mask when leaving their home (Figure 12). Mask use was lower than 50% in 64 countries.
- There were 132 diagnostic tests per 100,000 people on June 21 (Figure 14).
- Globally, 72.1% of people say they would accept or would probably accept a vaccine for COVID-19. This is up by 0.7 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 29% in Kazakhstan to 95% in Extremadura, Spain (Figure 18).
- In our current reference scenario, we expect that 2.5 billion people will be vaccinated with at least one dose by October 1 (Figure 19).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 9,578,000 cumulative deaths on October 1. This represents 1,327,000 additional deaths from June 21 to October 1 (Figure 20). Daily deaths are expected to increase until mid-July and then decline, dropping below 10,000 by early September (Figure 21).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 379,000 fewer cumulative deaths compared to the reference scenario on October 1 (Figure 20).

- Under our **worse scenario**, our model projects 10,154,000 cumulative deaths on October 1, an additional 576,000 deaths compared to our reference scenario (Figure 20). Daily deaths in the worse scenario increase until mid-August and then decline in September, but remain above 15,000 by October 1, 2021 (Figure 21).
- By October 1, we project that 241,000 lives will be saved by the projected vaccine rollout. This does not include lives saved through vaccination that has already been delivered.
- Daily infections in the reference scenario are expected to decline steadily until October 1, 2021, reaching 2.5 million at that time. Under the worse scenario, daily infections increase to nearly 6 million by late July and then decline to near 4 million by October 1 (Figure 22).

Model updates

Following on our update last week to model all variant data simultaneously, we augmented our variant spread algorithms to model spread of all variants simultaneously across all locations at once. We have observed simultaneous or near-simultaneous invasion across many locations, and this new approach allows us to more closely capture the data. As before, locations with a variant may spread it to their neighbors or locations connected through large flows (based on a gravity model), but now we have also instituted a hierarchy of variants based on observations of variant-variant interaction. In particular, if B.1.617.2 is already the dominant variant, no other variant is allowed to invade on top of it. From B.1.617.2, the hierarchy is P.1, B.1.617.1, B.1.1.7, and B.1.351. In each case, a variant may not invade if all the current infections in a location are estimated to be of a variant above it in the hierarchy.

Our previous assessment of the total COVID-19 to reported COVID-19 death scalar for Georgia was 3.73. This was based on the estimated infection-detection rate (IDR) for Georgia and information on the scalars from other countries in the GBD region and super-region. We opted to use such estimates for the country because the reported all-cause mortality data, which are needed to estimate excess mortality as described in our online method description, were only available up to the 26th week of 2020, before the epidemic became severe. We have since received all-cause mortality data from our collaborators in Georgia up to week 13 of 2021. This has allowed us to directly estimate the scalar after accounting for the impact of flu, or lack thereof, in the first three months of 2021. Our new scalar is 2.04 for Georgia, which reflects such changes.

Projections

Figure 1. Reported daily COVID-19 cases

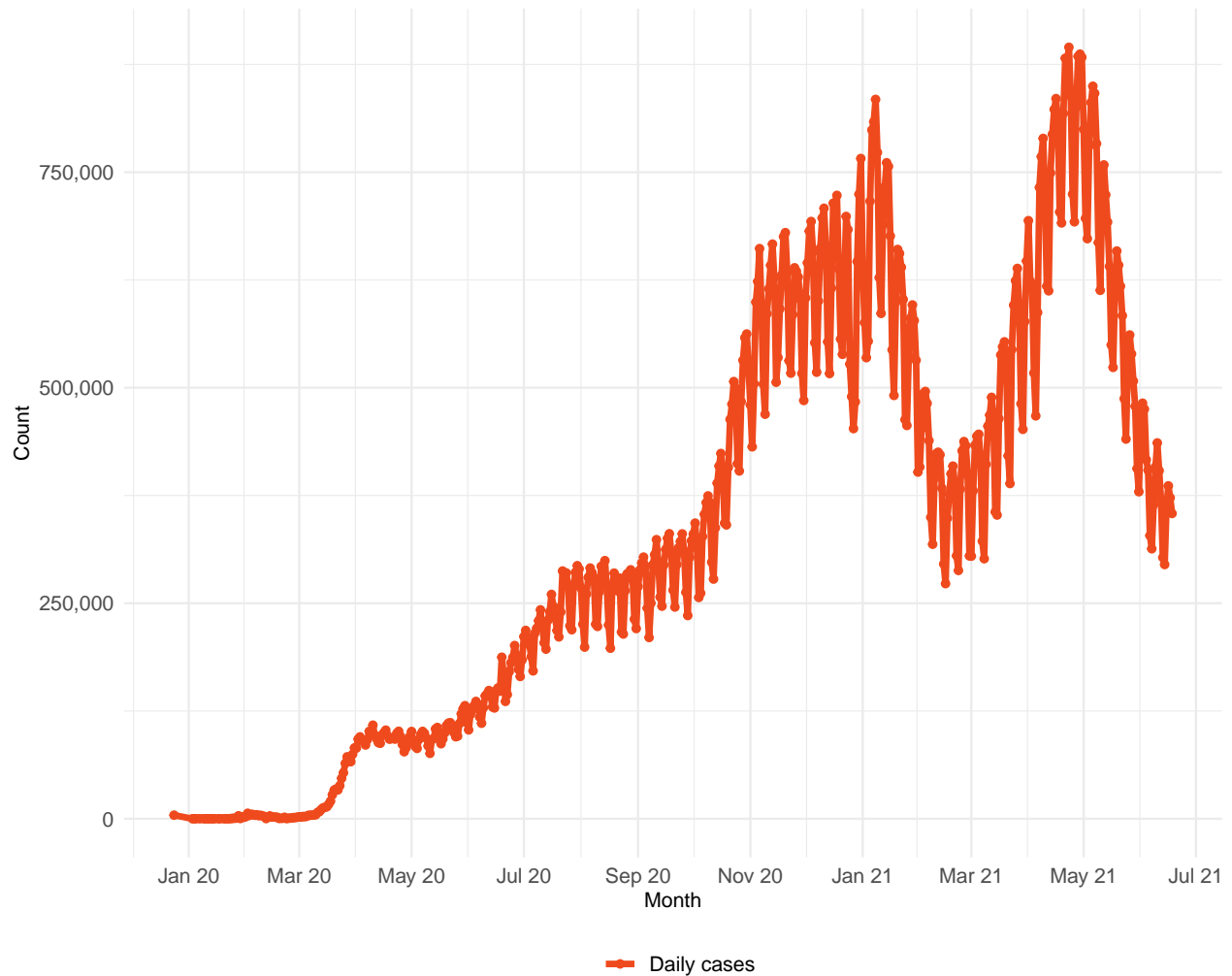


Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	175,727	1
Stroke	126,014	2
COVID-19	118,150	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 2. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily COVID-19 deaths (orange).

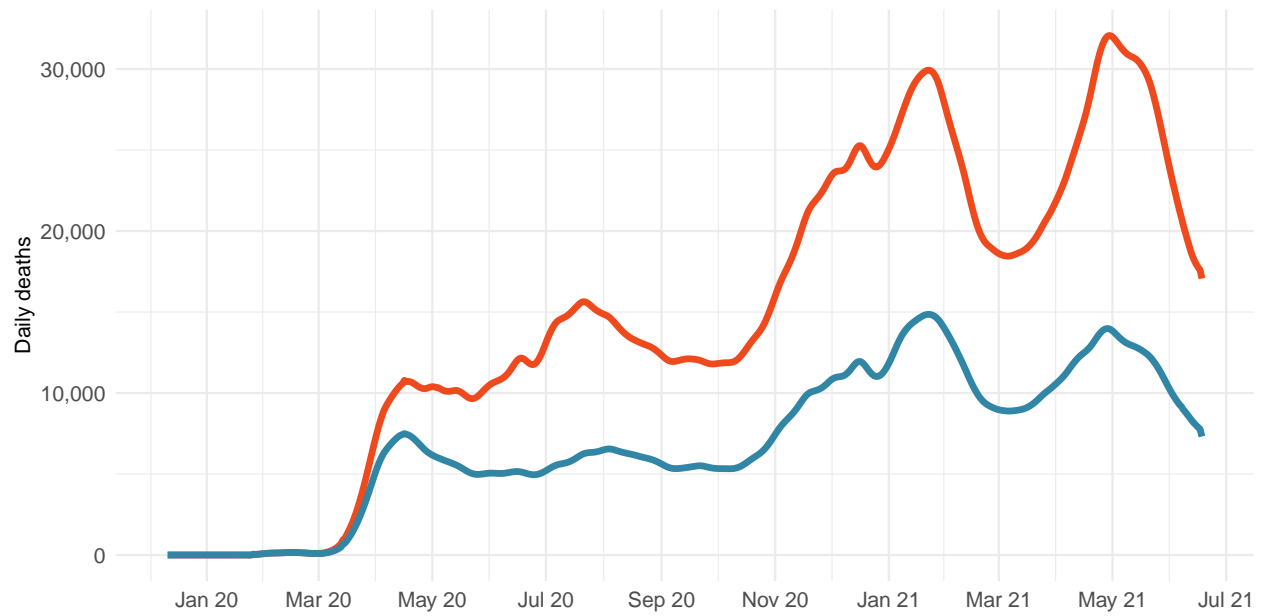


Figure 3. Daily COVID-19 death rate per 1 million on June 21, 2021

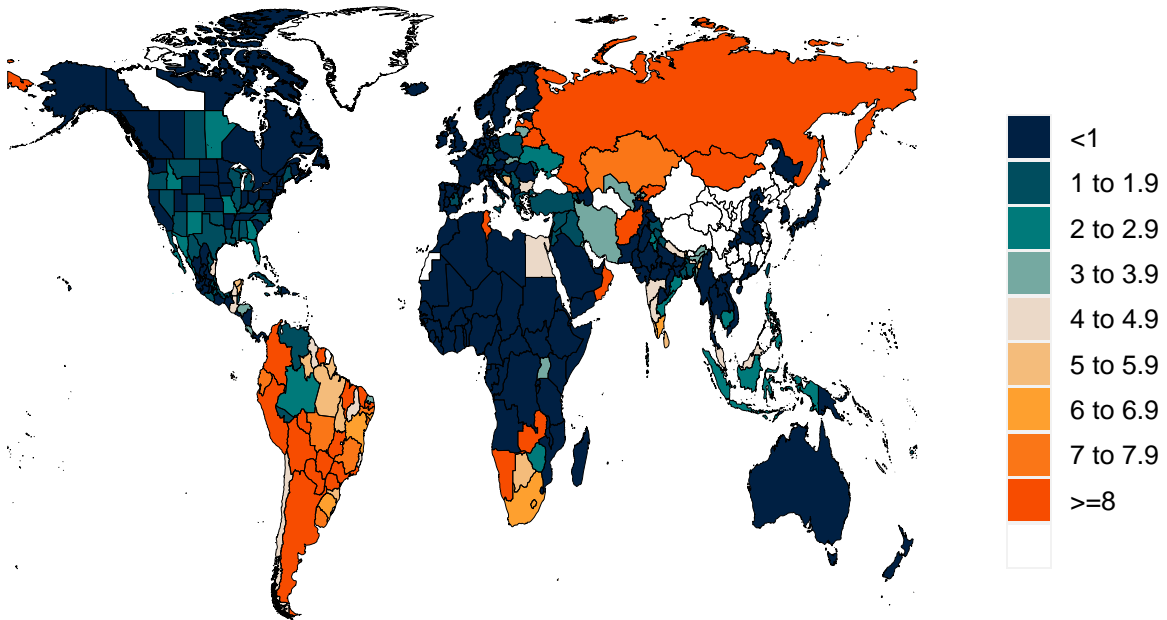


Figure 4. Cumulative COVID-19 deaths per 100,000 on June 21, 2021

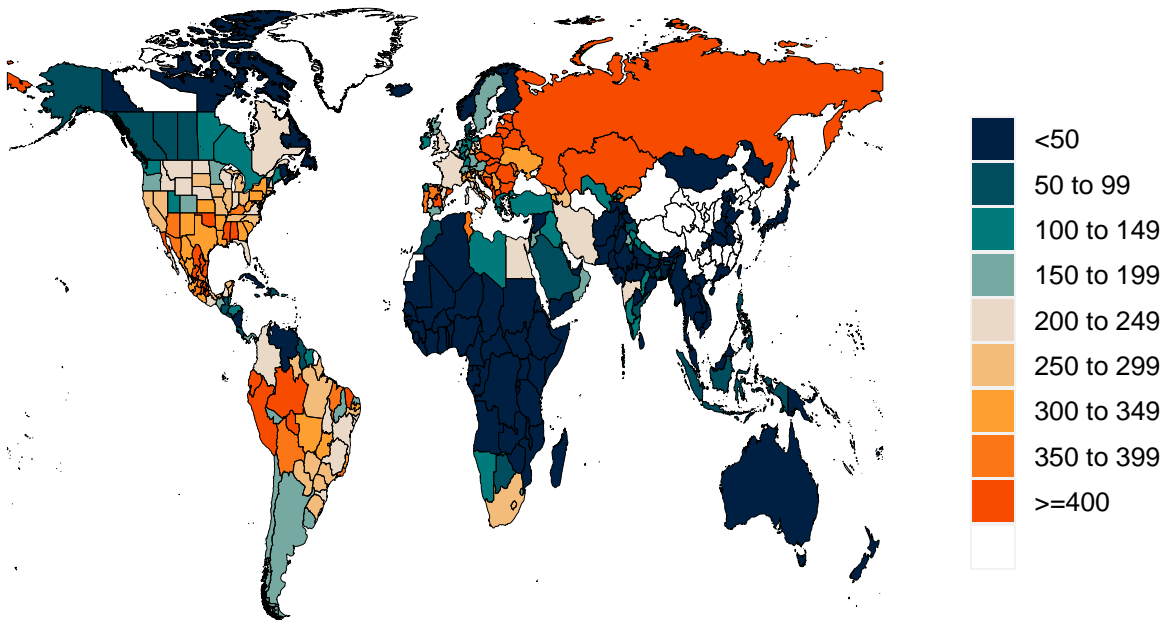


Figure 5. Estimated percent of the population infected with COVID-19 on June 21, 2021

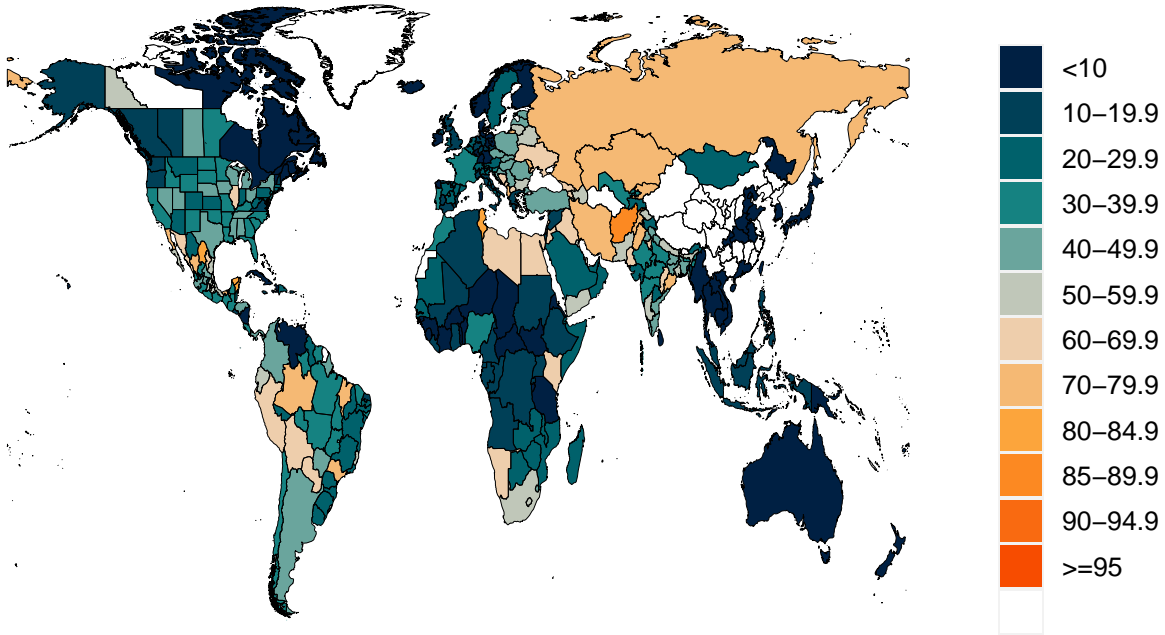


Figure 6. Mean effective R on June 10, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline, all other things being held the same.

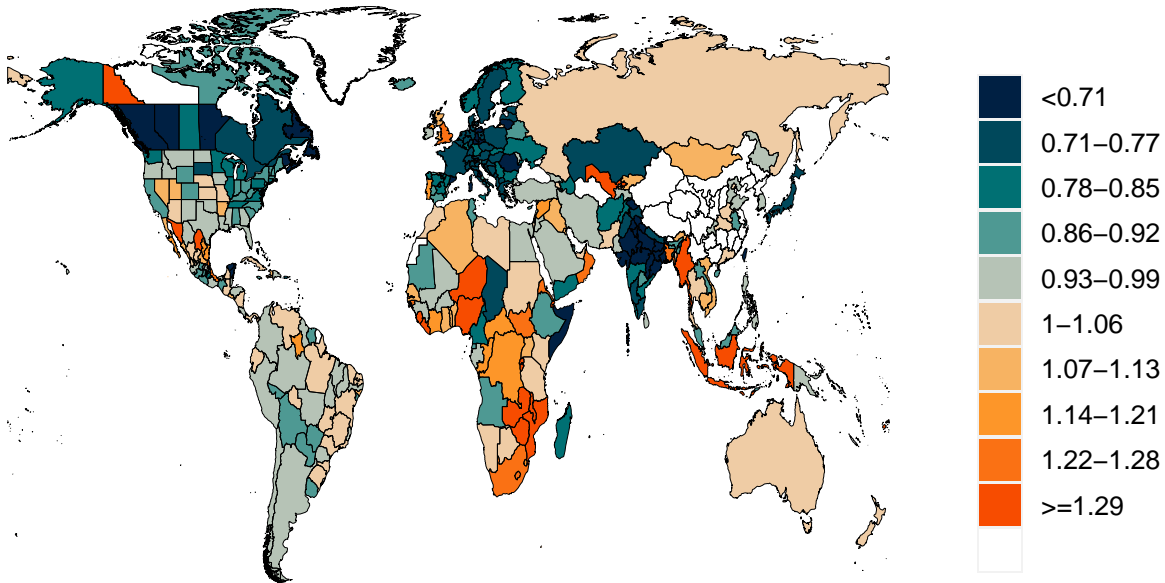


Figure 7. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.

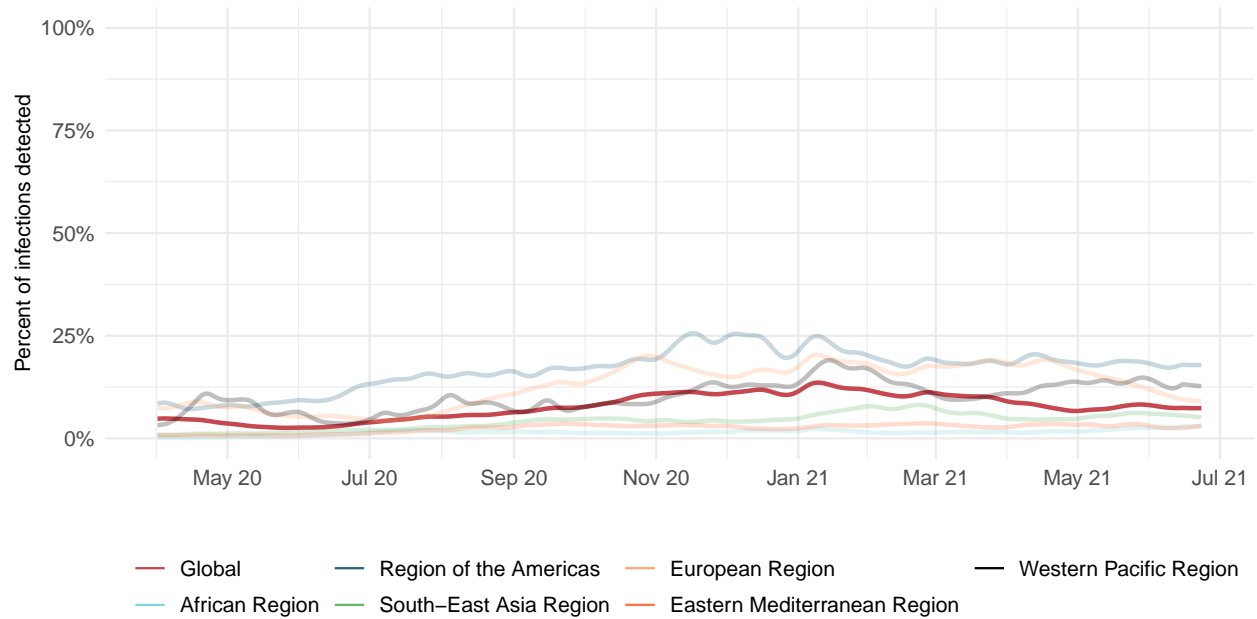
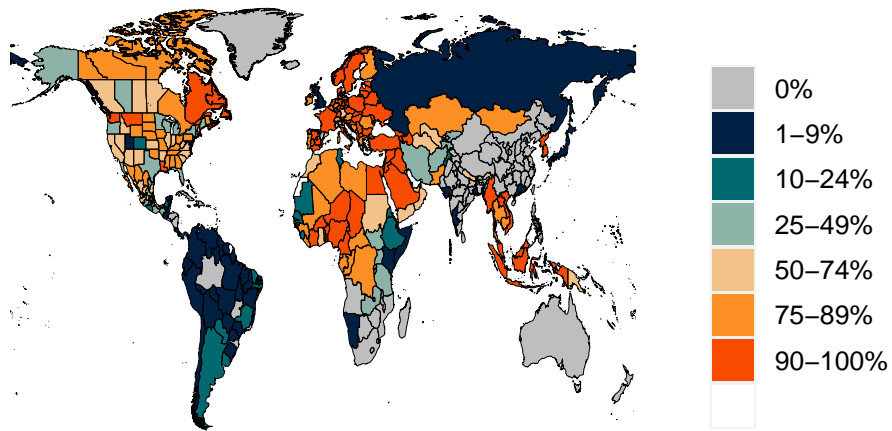
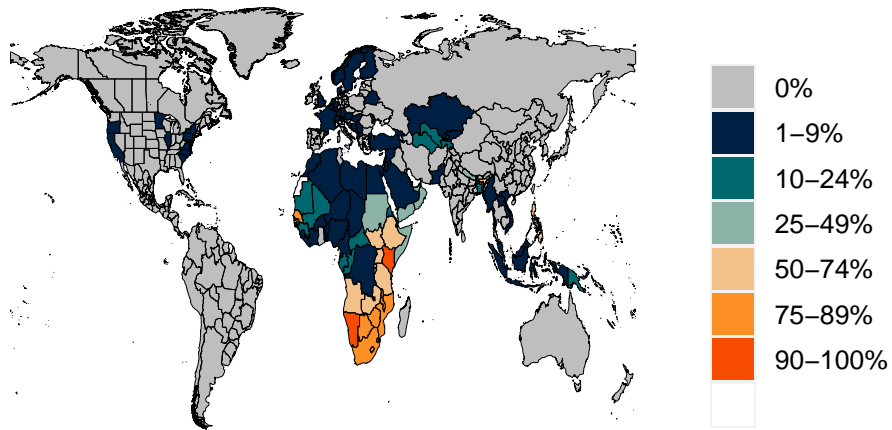


Figure 8. Estimated percent of circulating SARS-CoV-2 for primary variant families on June 21, 2021.

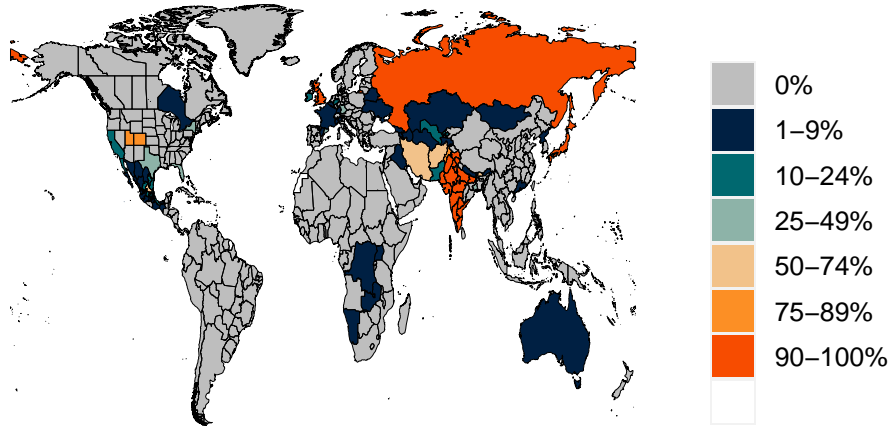
A. Estimated percent B.1.1.7 variant



B. Estimated percent B.1.351 variant



C. Estimated percent B.1.617 variant



D. Estimated percent P.1 variant

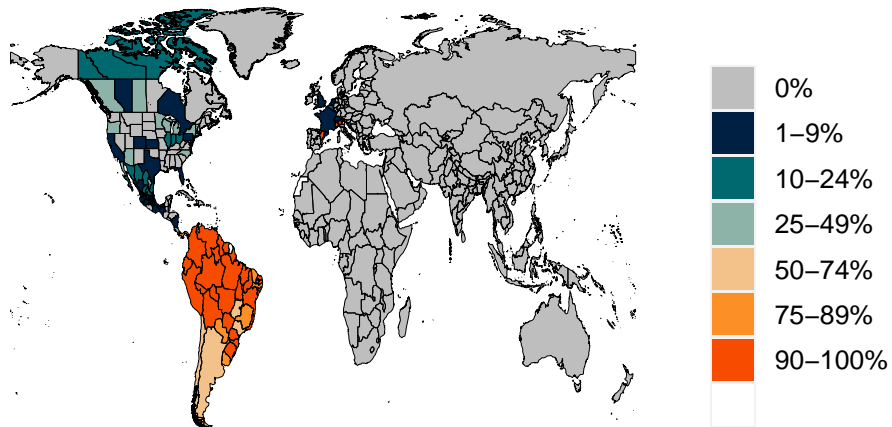
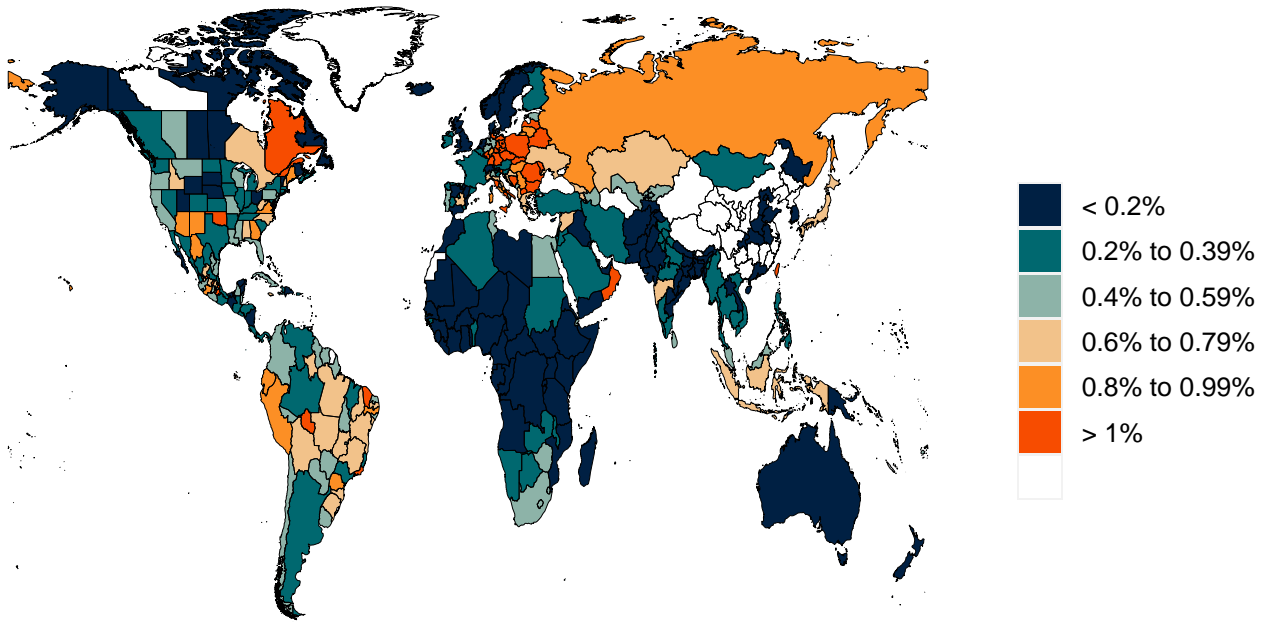


Figure 9. Infection-fatality ratio on June 21, 2021



Critical drivers

Figure 10. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

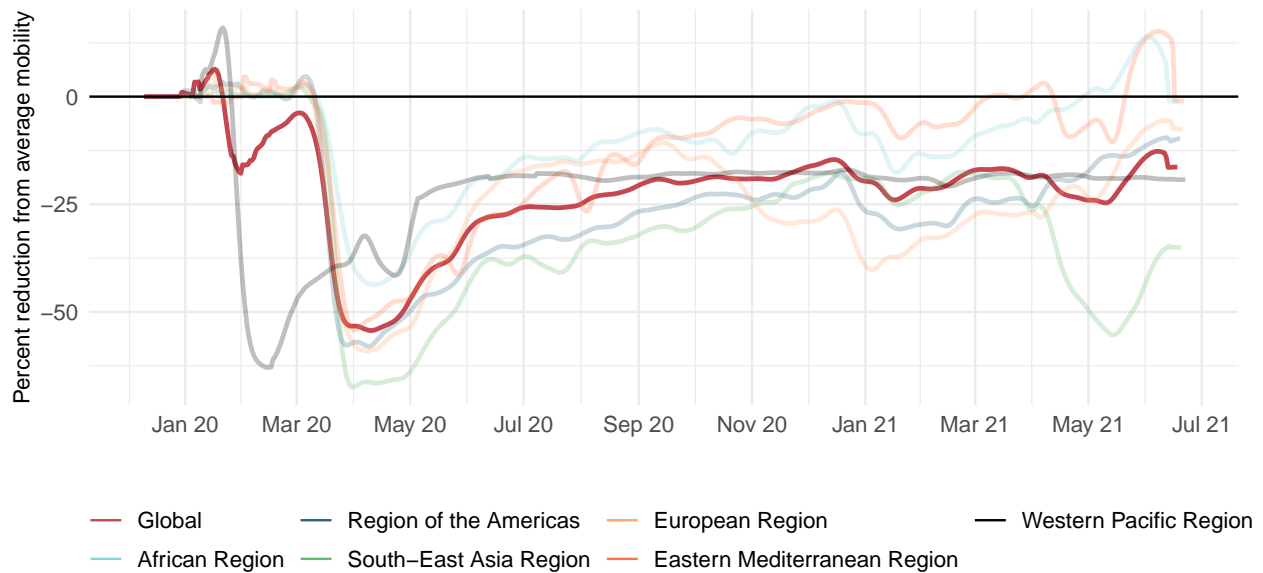


Figure 11. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on June 21, 2021

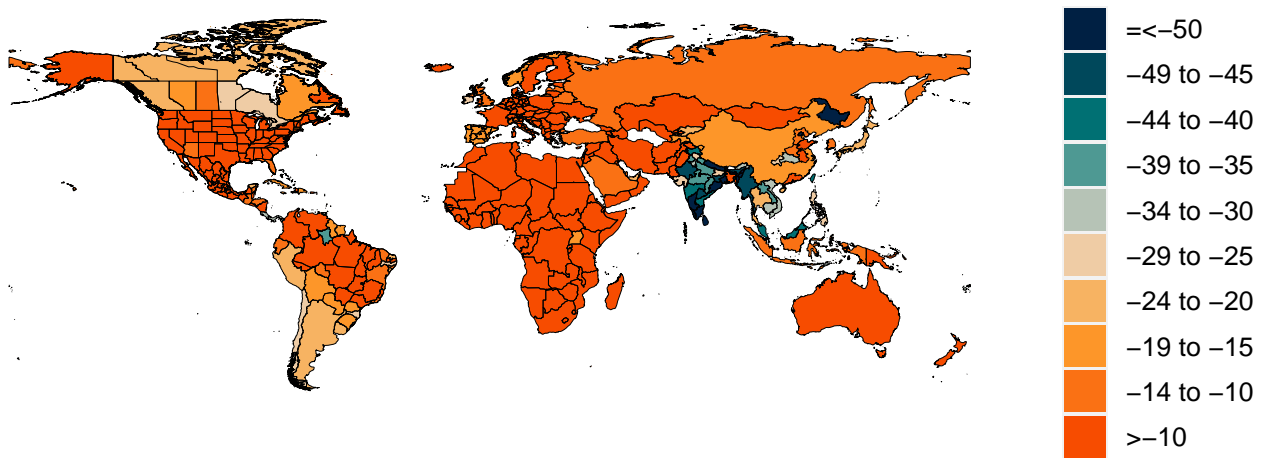


Figure 12. Trend in the proportion of the population reporting always wearing a mask when leaving home

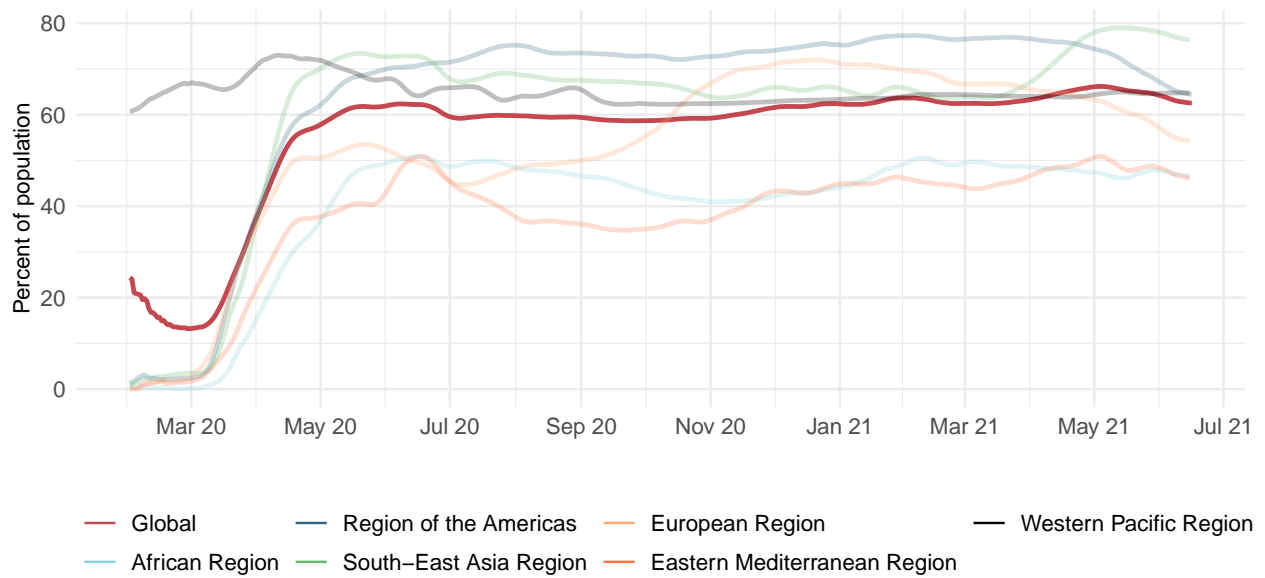


Figure 13. Proportion of the population reporting always wearing a mask when leaving home on June 21, 2021

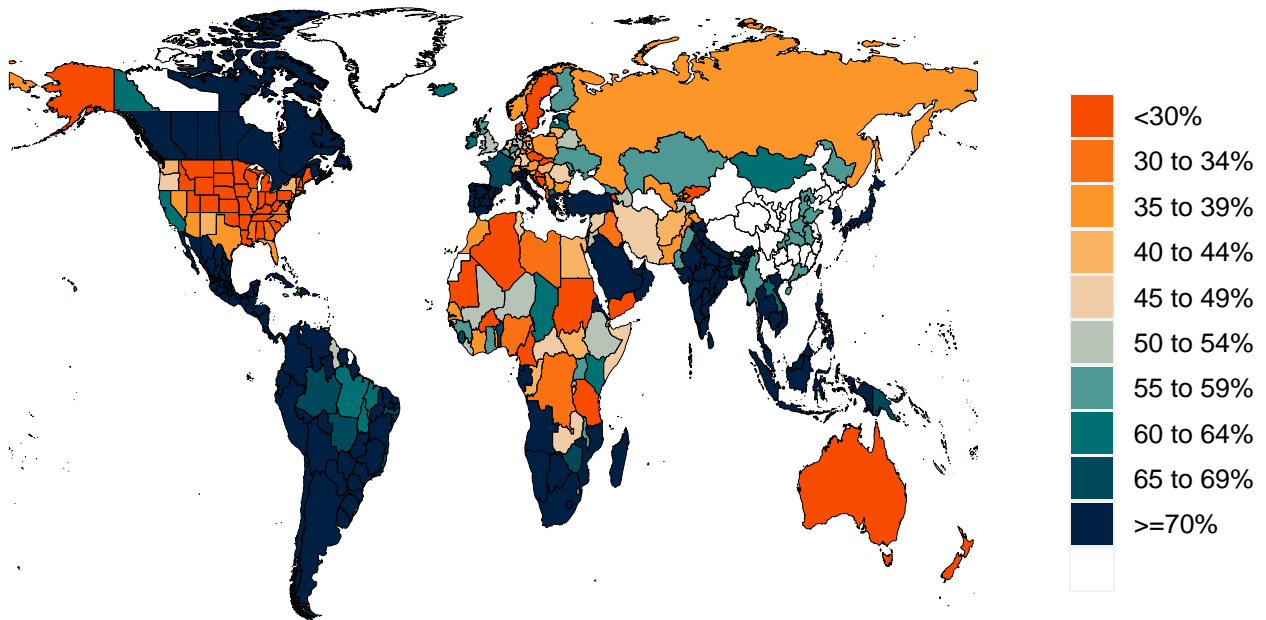


Figure 14. Trend in COVID-19 diagnostic tests per 100,000 people

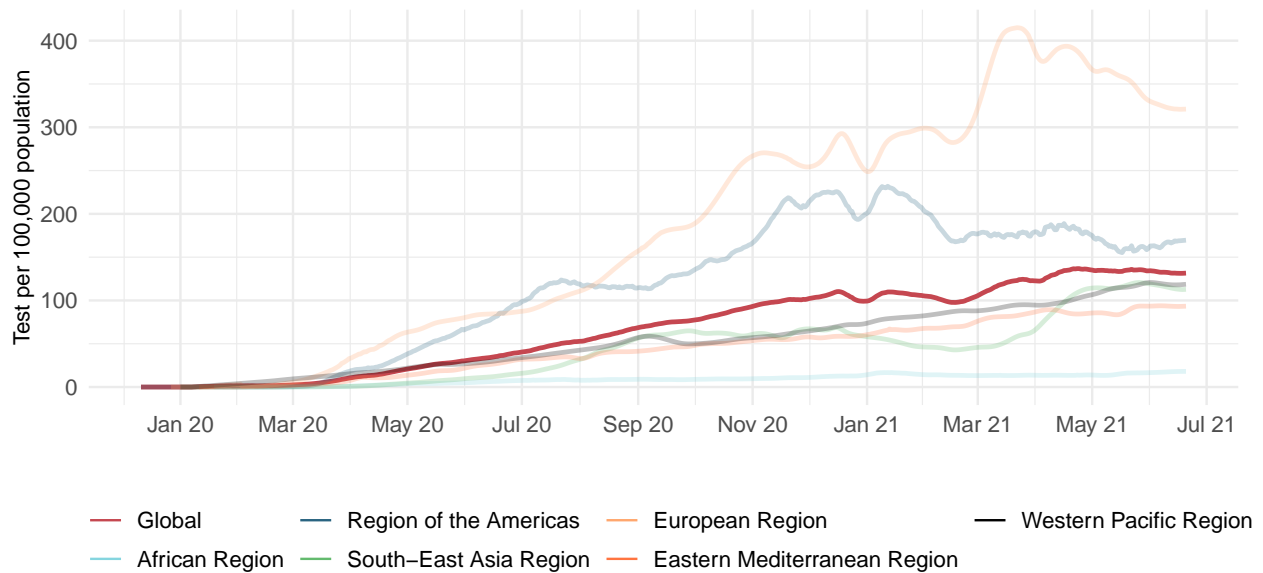


Figure 15. COVID-19 diagnostic tests per 100,000 people on June 21, 2021

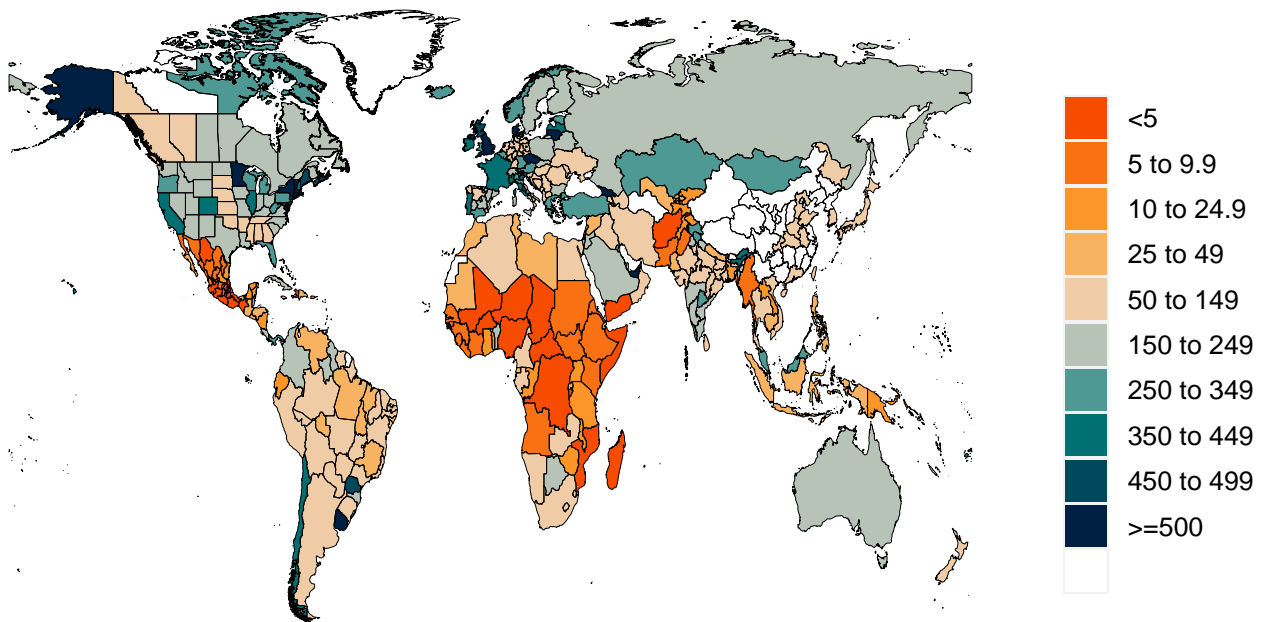


Figure 16. Increase in the risk of death due to pneumonia on February 1 compared to August 1

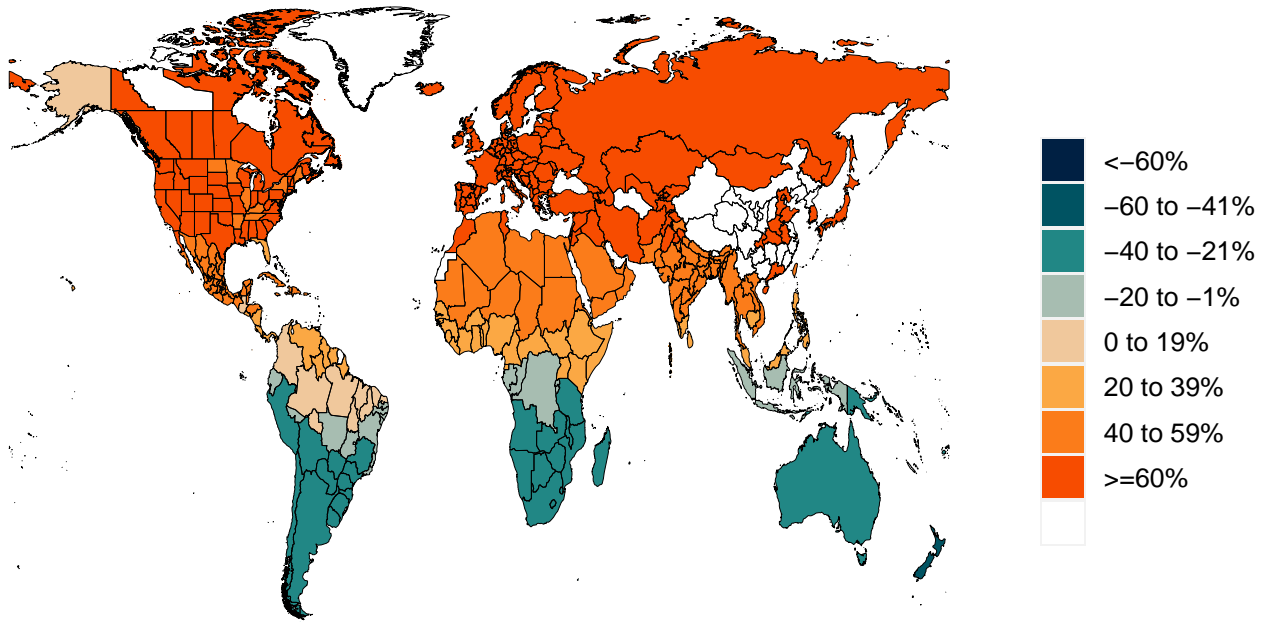


Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available,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

Vaccine	Efficacy at preventing disease: D614G & B.1.1.7	Efficacy at preventing infection: D614G & B.1.1.7	Efficacy at preventing disease: B.1.351, B.1.617, & P.1	Efficacy at preventing infection: B.1.351, B.1.617, & P.1
AstraZeneca	74%	52%	35%	31%
CoronaVac	50%	44%	32%	28%
Covaxin	78%	69%	50%	44%
Janssen	72%	72%	64%	57%
Moderna	94%	89%	89%	85%
Novavax	89%	79%	49%	43%
Pfizer/BioNTech	91%	86%	86%	82%
Sinopharm	73%	65%	47%	41%
Sputnik-V	92%	81%	59%	52%
Tianjin	66%	58%	42%	37%
CanSino				
Other vaccines	75%	66%	57%	50%
Other vaccines (mRNA)	91%	86%	86%	82%

Figure 17. 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.

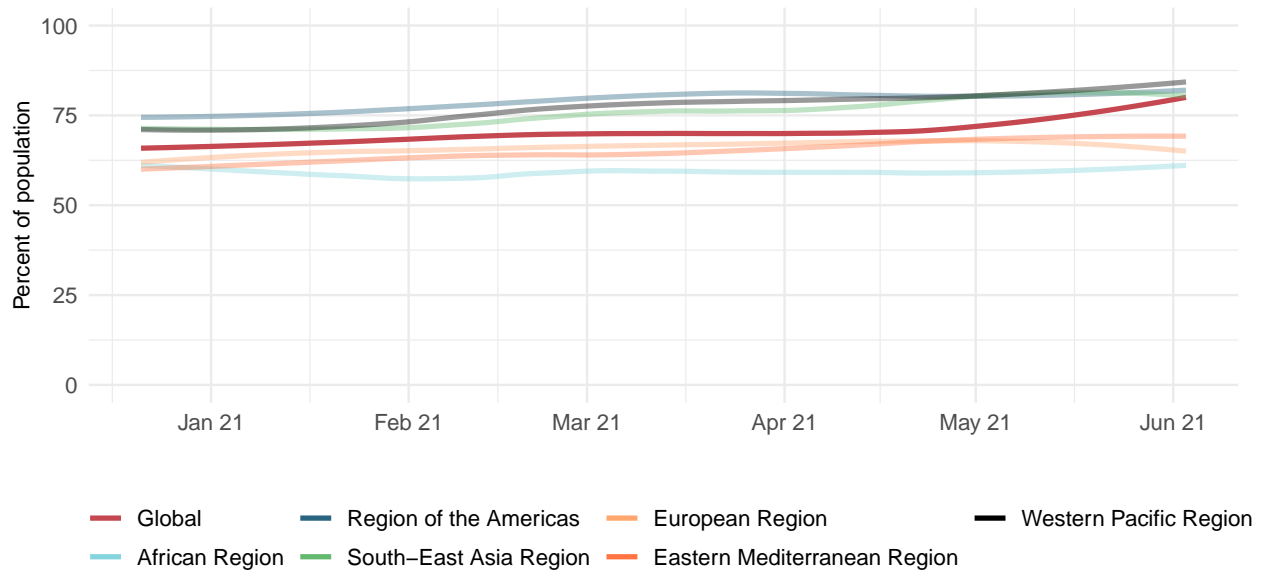


Figure 18. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available.

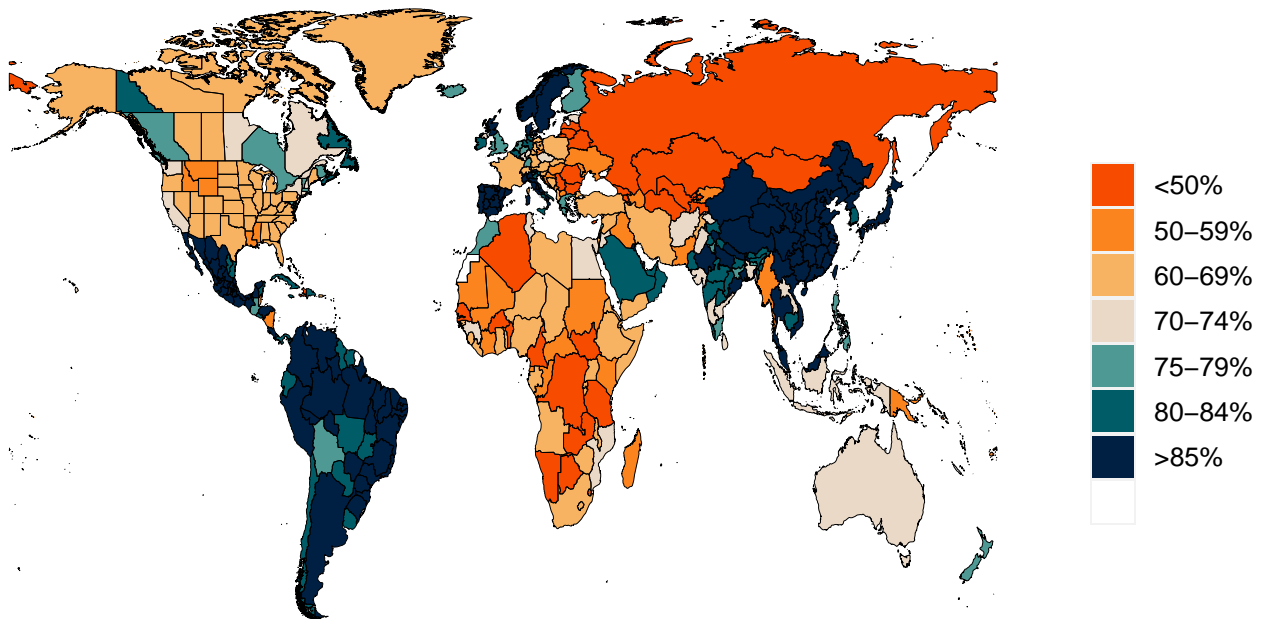
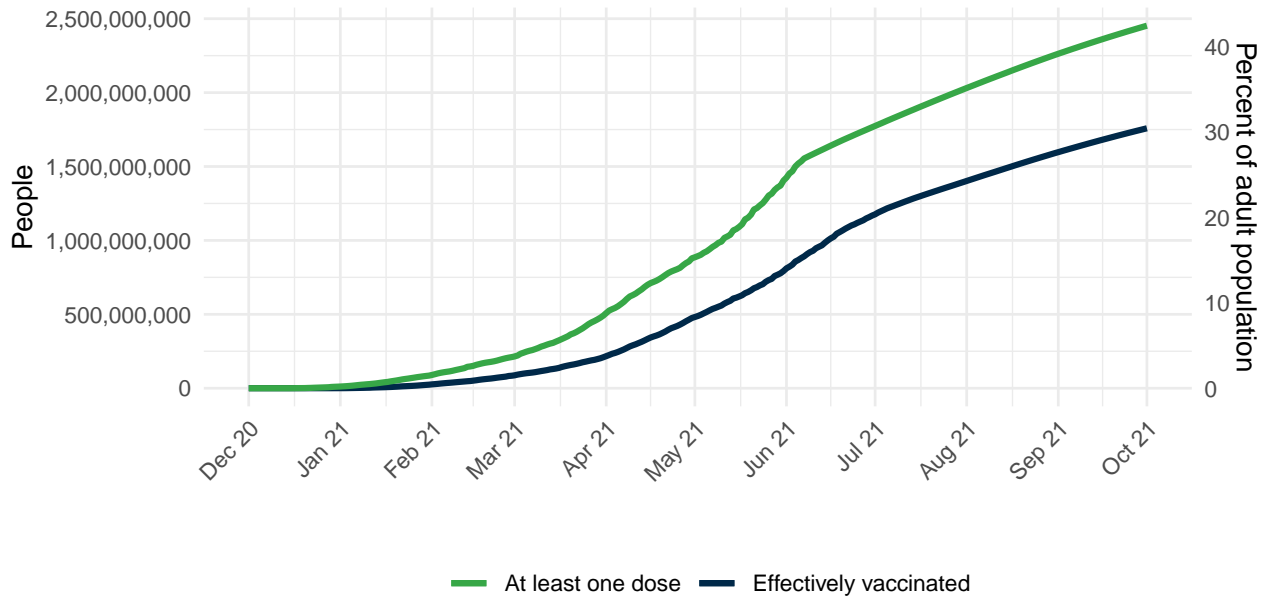


Figure 19. Number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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.
- 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 scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants B.1.1.7 (first identified in the UK), B.1.351 (first identified in South Africa), and P1 (first identified in Brazil) continue to spread from locations with (a) more than 5 sequenced variants, and (b) reports of community transmission, to adjacent locations following the speed of variant scale-up observed in the regions of the United Kingdom.
- In one-quarter of those vaccinated, mobility increases toward pre-COVID-19 levels.

The **worse scenario** modifies the reference scenario assumptions in three ways:

- First, it assumes that variants B.1.351 or P.1 begin to spread within three weeks in adjacent locations that do not already have B.1.351 or P.1 community transmission.
- Second, it assumes that all those vaccinated increase their mobility toward pre-COVID-19 levels.
- Third, it assumes that among those vaccinated, mask use starts to decline exponentially one month after completed vaccination.

The **universal masks scenario** makes all the same assumptions as the reference scenario but also assumes 95% of the population wear masks in public in every location.

Figure 20. Cumulative COVID-19 deaths until October 01, 2021 for three scenarios

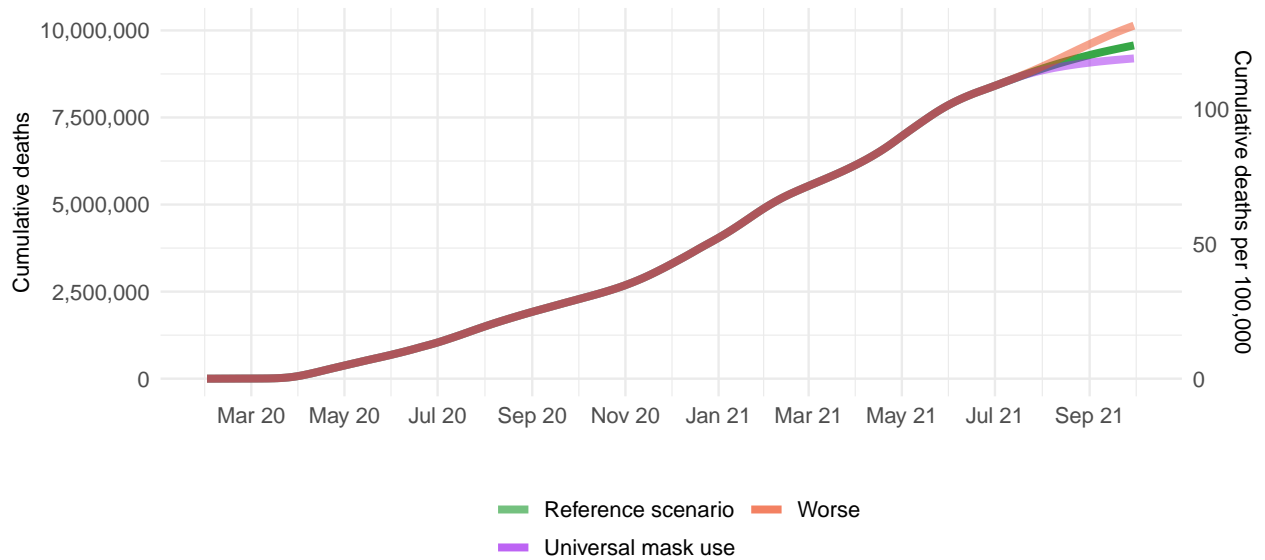


Figure 21. Daily COVID-19 deaths until October 01, 2021 for three scenarios

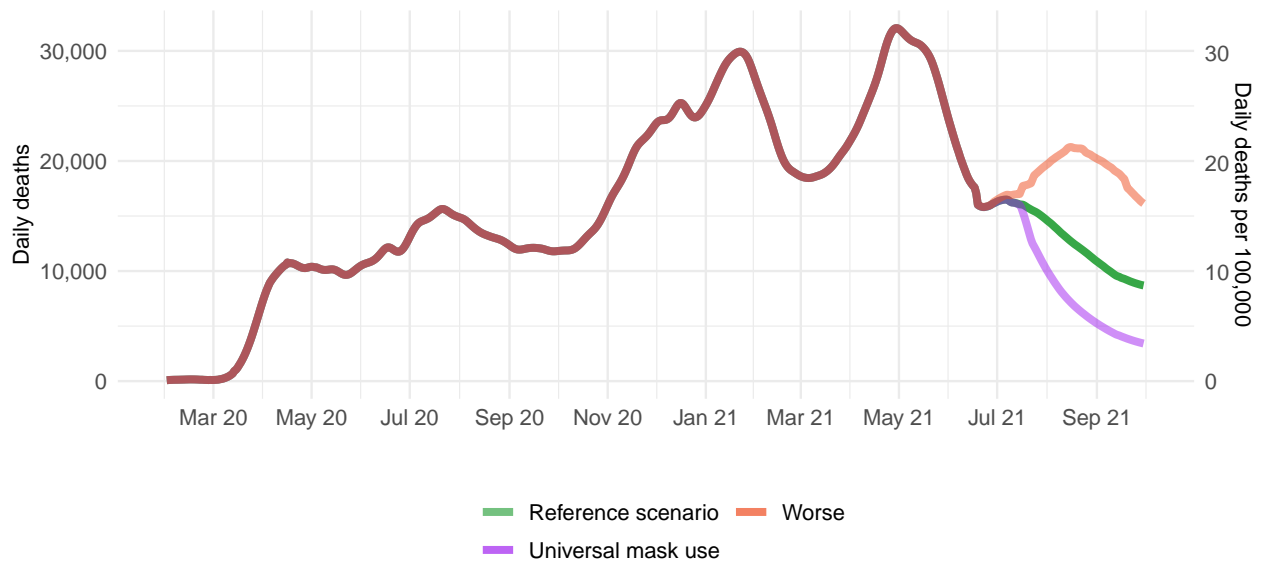
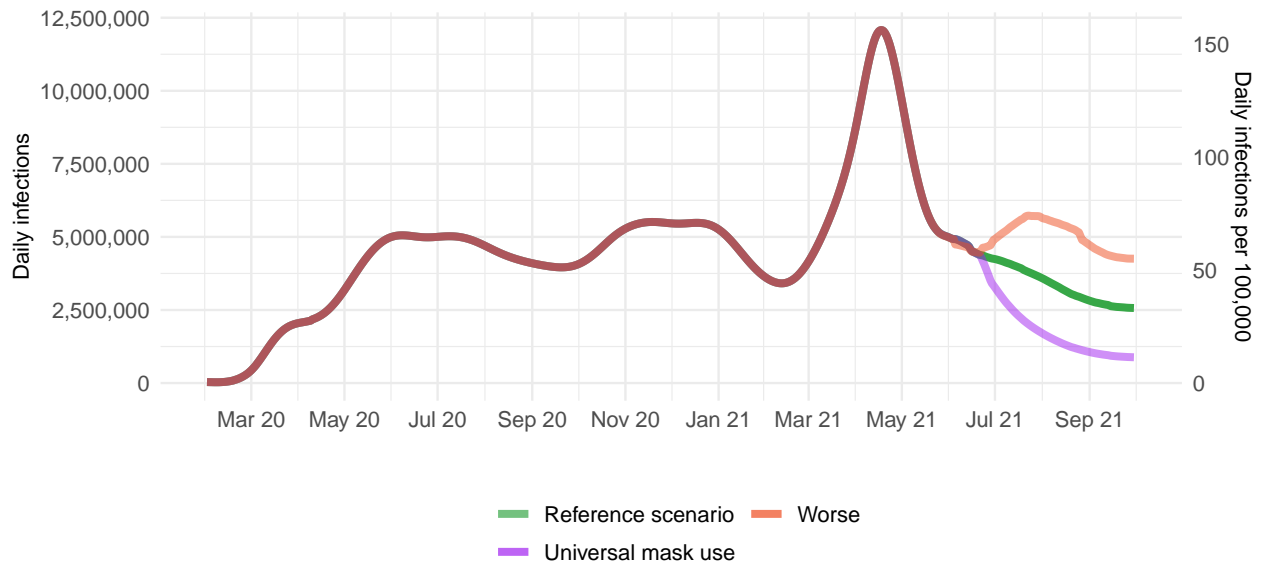


Figure 22. Daily COVID-19 infections until October 01, 2021 for three scenarios



More information

Data sources:

Mask use and vaccine confidence data are from the [Global COVID-19 Symptom Survey](#) (this research is based on survey results from University of Maryland Social Data Science Center with Facebook's support) and the [US COVID-19 Symptom Survey](#) (this research is based on survey results from Carnegie Mellon University's Delphi Research Group with Facebook's support). 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>.

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