

COVID-19 Results Briefing

Global

April 08, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on April 6, 2021 with data through April 5, 2021.

The main areas of the world driving the global figures remain the same as last week. The largest surge is currently in South Asia, with rapidly increasing case numbers reaching the highest levels seen in the pandemic. Daily deaths in South Asia are also increasing. Increases are seen even in places such as Delhi where seroprevalence surveys confirmed that 65% have already been infected. The speed of the surge happening in settings with high levels of past infection strongly suggest the surge is driven by an escape variant; limited sequencing data confirm that escape variants are circulating in the region.

The second major foci of the epidemic is Brazil and surrounding countries where the P.1-driven epidemic continues to unfold. Easter-related lags in reporting have artificially reduced case numbers, but on balance, the evidence suggests the epidemic is continuing to expand in Brazil.

The B.1.1.7-driven epidemic continues in Europe, despite extensive social distancing mandates and increasing immunization rates. Within Europe, the UK has declining transmission, likely due to higher levels of vaccination. Central and Eastern Europe – with lower mask use, higher mobility, and slower vaccination expansion – may have the biggest problem controlling the B.1.1.7 surge in the short term. The B.1.1.7-driven surge is also clear in Turkey and a number of other countries in the Middle East.

The US and Canada are the other area where some states and provinces have increasing transmission, likely driven by B.1.1.7. In the case of the US, higher past levels of infection and higher vaccination rates may limit the spring B.1.1.7 surge. However, the very large increases in daily cases in Michigan demonstrate that European-like surges in the US are possible.

Strategies for tackling the risk over the next few months remain expanding vaccination wherever possible, maintaining high mask use, and maintaining or re-imposing social distancing mandates as needed when transmission intensifies. Given the critical role of vaccination in the next few months, the small but steady declines in vaccine confidence seen in many countries are of particular concern.

Current situation

- Daily reported cases in the last week decreased to 512,000 per day on average compared to 532,800 the week before (Figure 1).
- Daily deaths in the last week increased to 12,200 per day on average compared to 11,100 the week before (Figure 2). 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 34 countries (Figure 3). Most of these countries are in South America and Eastern Europe.
- We estimated that 12% of people globally have been infected as of April 5 (Figure 4).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 115 countries (Figure 5).
- The infection detection rate globally was close to 18% on April 5 (Figure 6).
- Based on the analysis of publicly available sequence data and our variant spread model, we estimate the current prevalence of three variants of concern (Figure 7). B.1.1.7 is the dominant variant in Europe and many parts of the Middle East. It is also becoming the dominant variant in a number of Canadian provinces and US states. B.1.351 is the dominant variant in Southern Africa and parts of Central and East Africa. P.1 is dominant in most of South America and present, but not dominant, in the US and parts of Southeast Asia.

Trends in drivers of transmission

- Mobility last week was 18% lower than the pre-COVID-19 baseline (Figure 9). Mobility was near baseline (within 10%) in 60 countries. Mobility was lower than 30% of baseline in 46 countries.
- This week we estimated that 63% of people always wore a mask when leaving their home (Figure 11). Mask use was lower than 50% in 45 countries.
- There were 126 diagnostic tests per 100,000 people on April 5 (Figure 13).
- Globally, 69.6% of people either have been vaccinated or say they would accept or would probably accept a vaccine for COVID-19. Global vaccine confidence has declined slowly since a peak around the end of February (Figure 16). The fraction of the population who have received a vaccine or are open to receiving a COVID-19 vaccine ranges from 21% in Bhutan to 96% in Extremadura (Figure 17).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 4,734,000 cumulative deaths on August 1. This represents 1,387,000 additional deaths from April 5 to August 1 (Figure 19). Daily deaths will peak at the beginning of May (Figure 20). In this scenario, we also expect that 2.9 billion will have received at least one dose of vaccine by August 1 (Figure 18).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 354,000 fewer cumulative deaths compared to the reference scenario on August 1 (Figure 19).
- Under our **worse scenario**, in which mask use declines faster and mobility increases faster, our model projects 5,189,000 cumulative deaths on August 1, an additional 455,000 deaths compared to our reference scenario (Figure 19). In the worse scenario, daily deaths remain above 13,000 on August 1.

- By August 1, we project that 523,600 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 remain over 4 million through until early July. In the worse scenario, daily infections increase to over 7 million in late June and then decline slightly but remain over 6 million on August 1.

Model updates

There are no major updates in the model this week.

Current situation

Figure 1. Reported daily COVID-19 cases

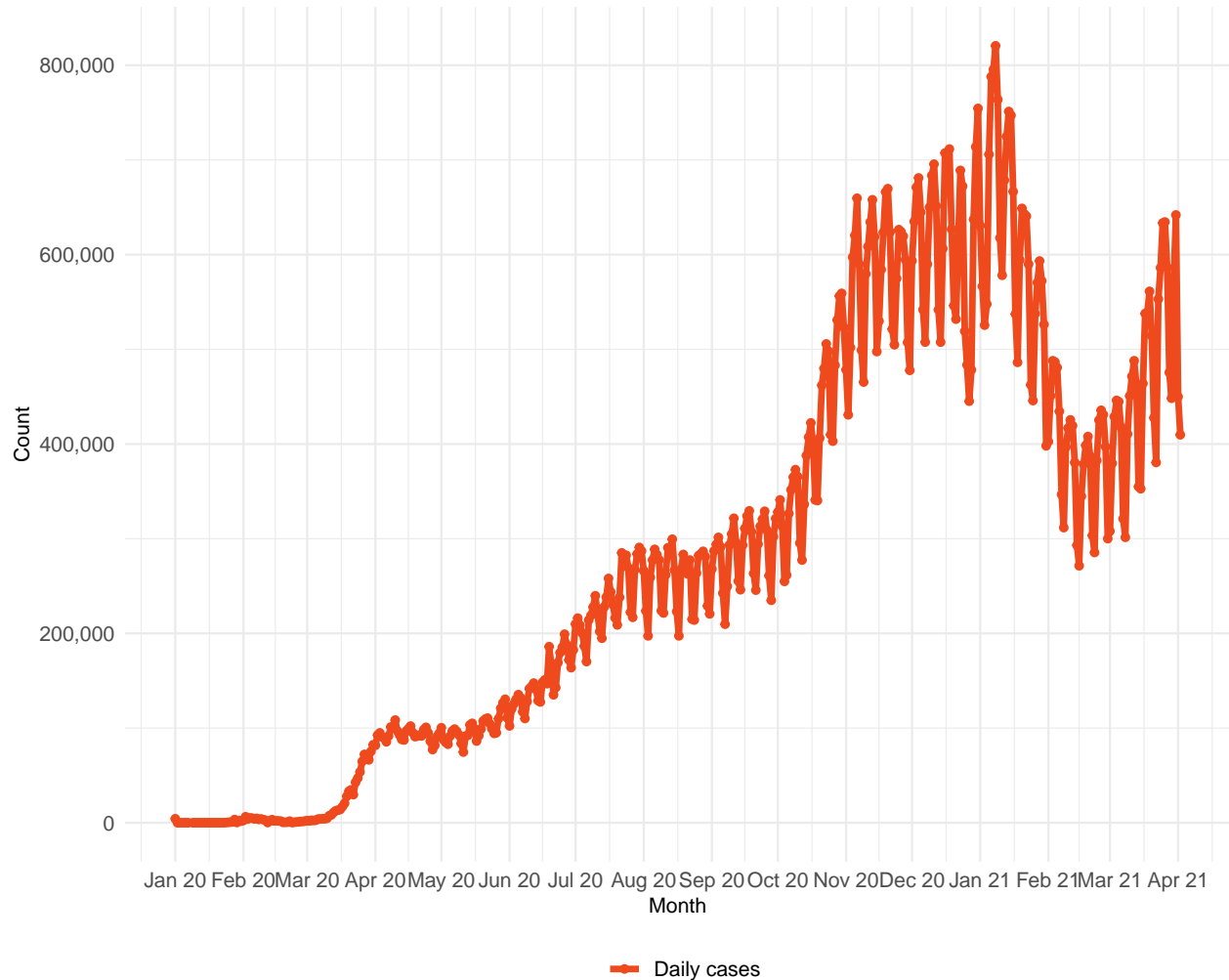


Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	175,727	1
Stroke	126,014	2
COVID-19	85,557	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. Reported daily COVID-19 deaths and smoothed trend estimate.

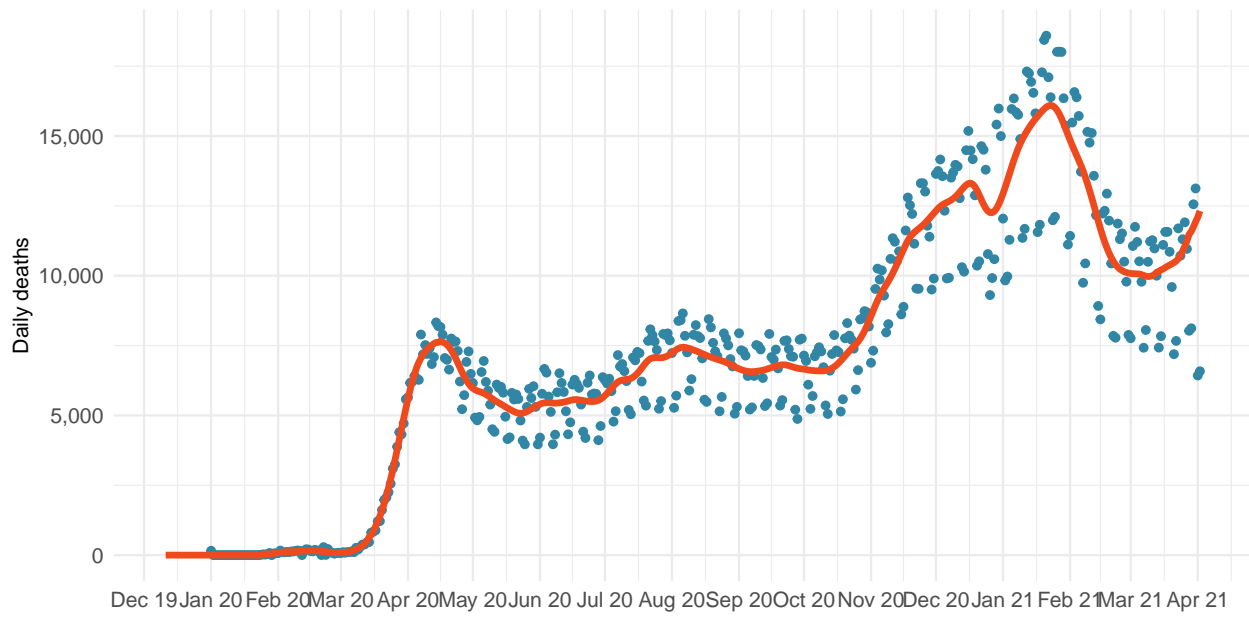


Figure 3. Daily COVID-19 death rate per 1 million on April 05, 2021

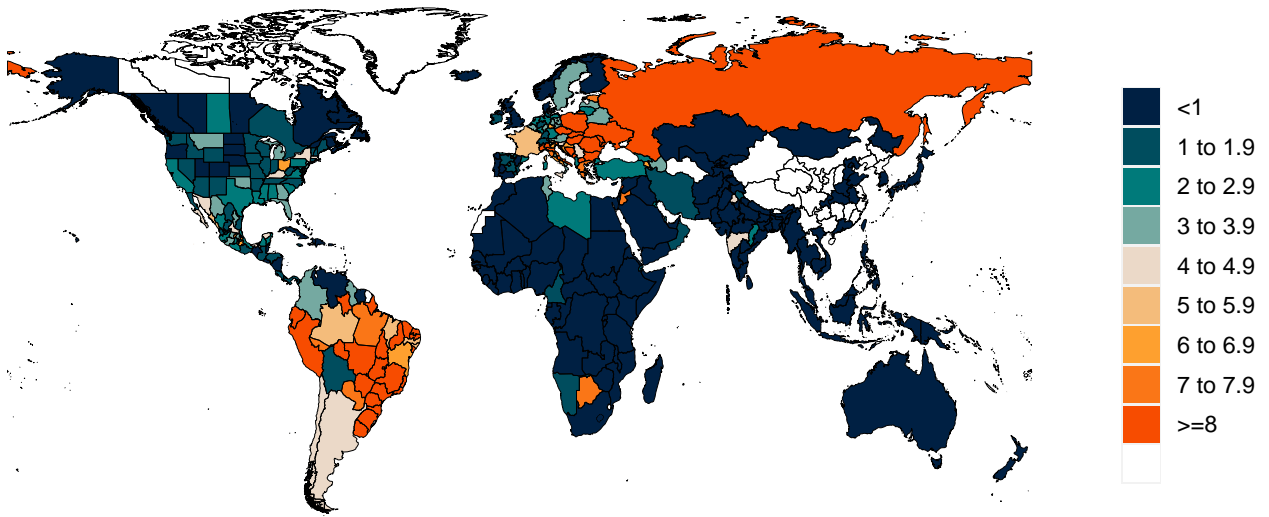


Figure 4. Estimated percent infected with COVID-19 on April 05, 2021

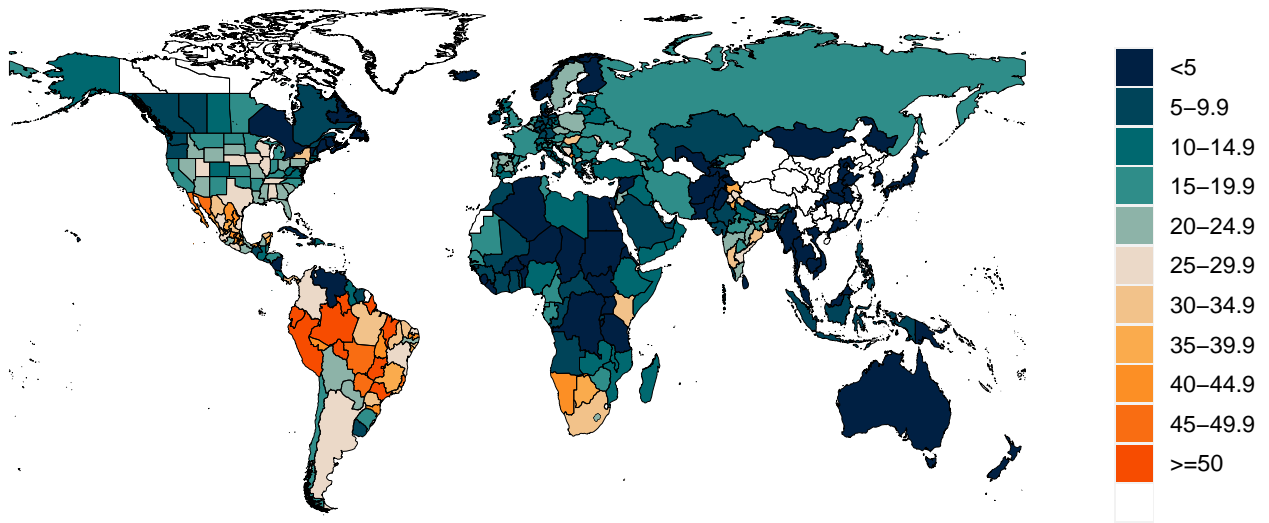


Figure 5. Mean effective R on March 25, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting and hospitalizations where available. Current reported cases reflect infections 11-13 days prior so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline all other things being held the same.

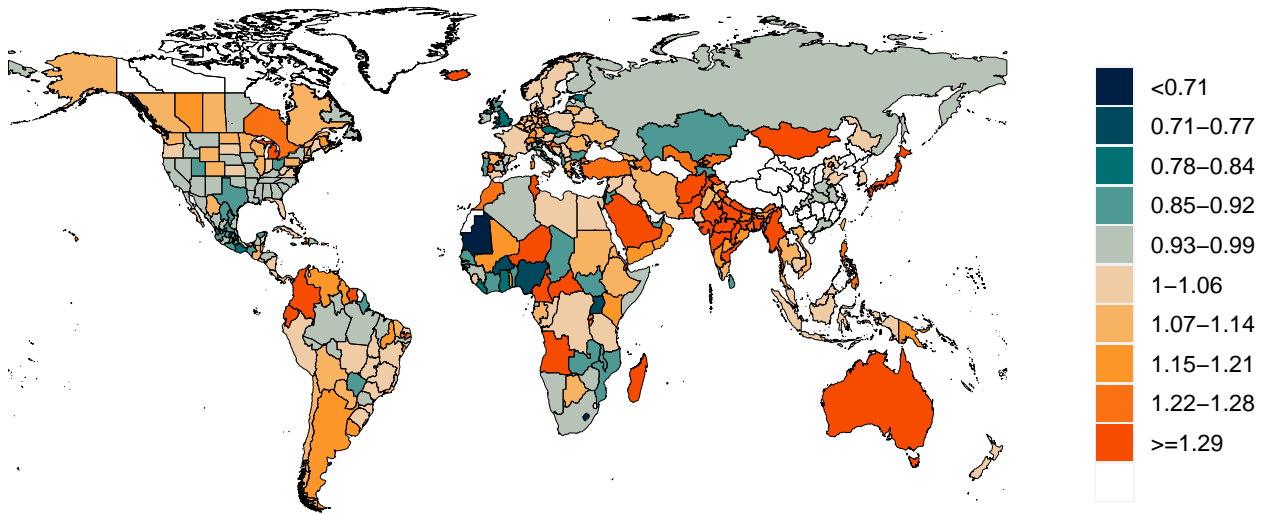
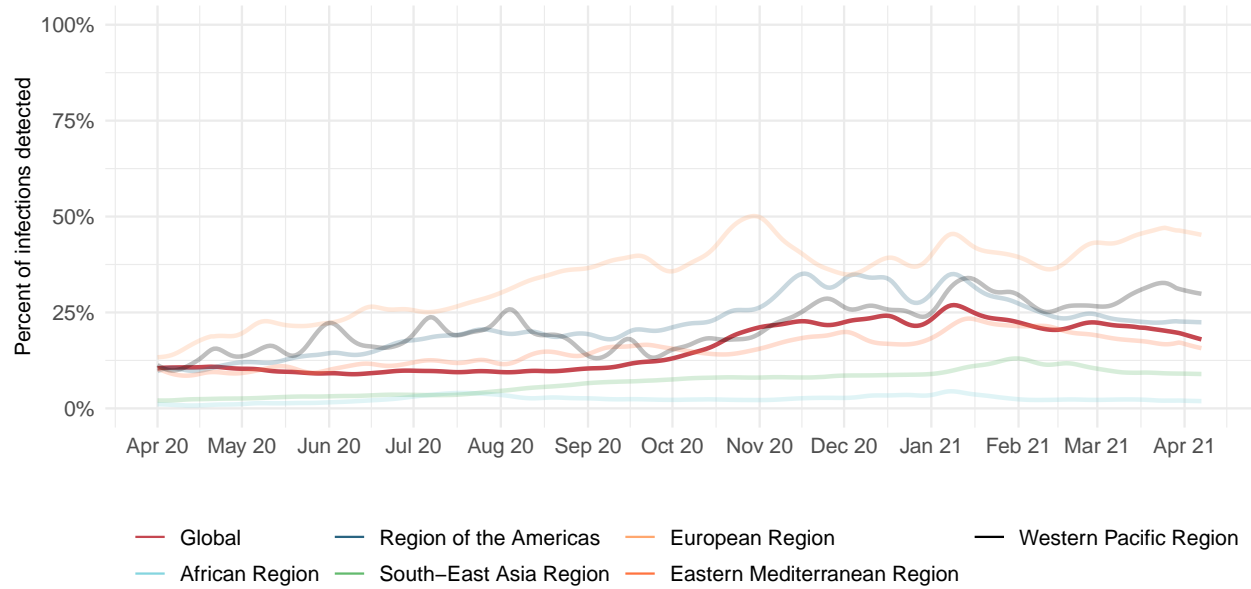


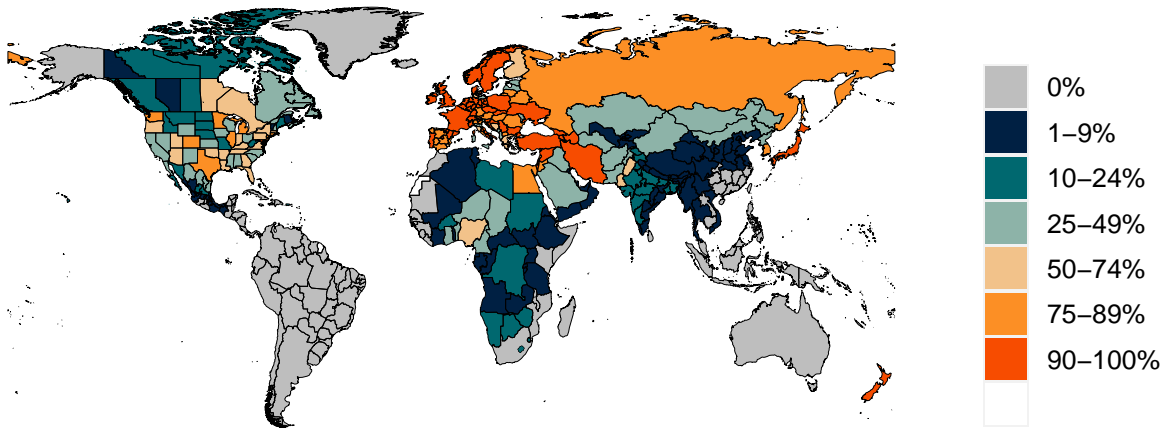
Figure 6. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model.



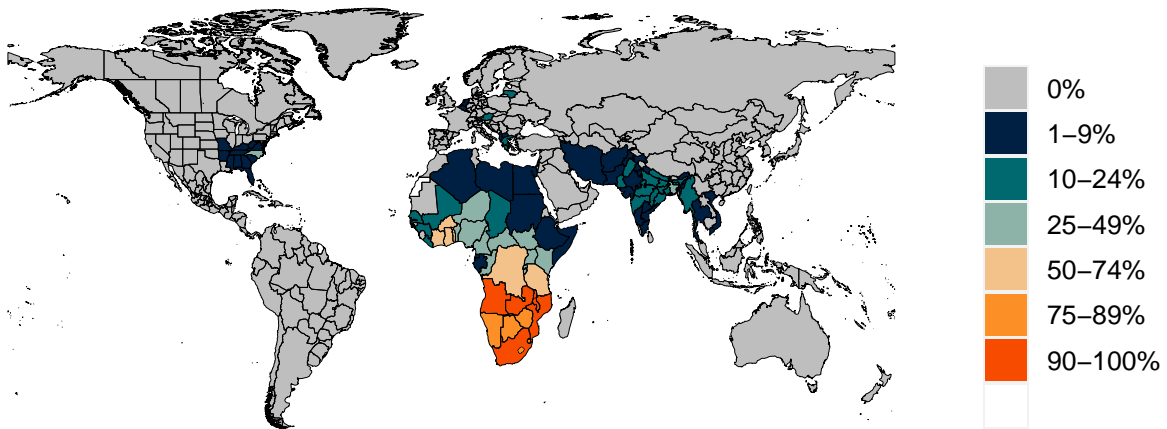
*Due to measurement errors in cases and testing rates, the infection to detection rate (IDR) can exceed 100% at particular points in time.

Figure 7. Percent of circulating SARS-CoV-2 for 3 primary variants on April 5, 2021.

A. Percent B.1.1.7 variant



B. Percent B.1.351 variant



C. Percent P1 variant

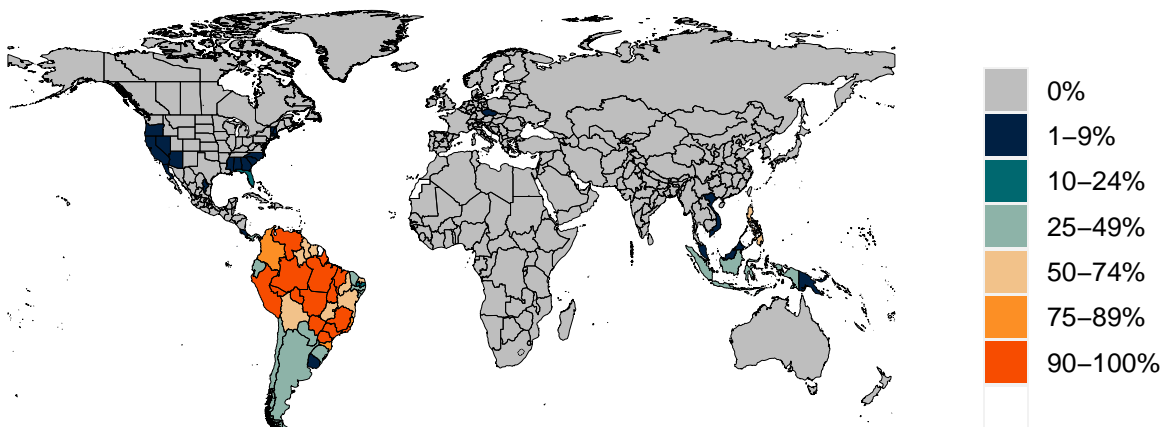
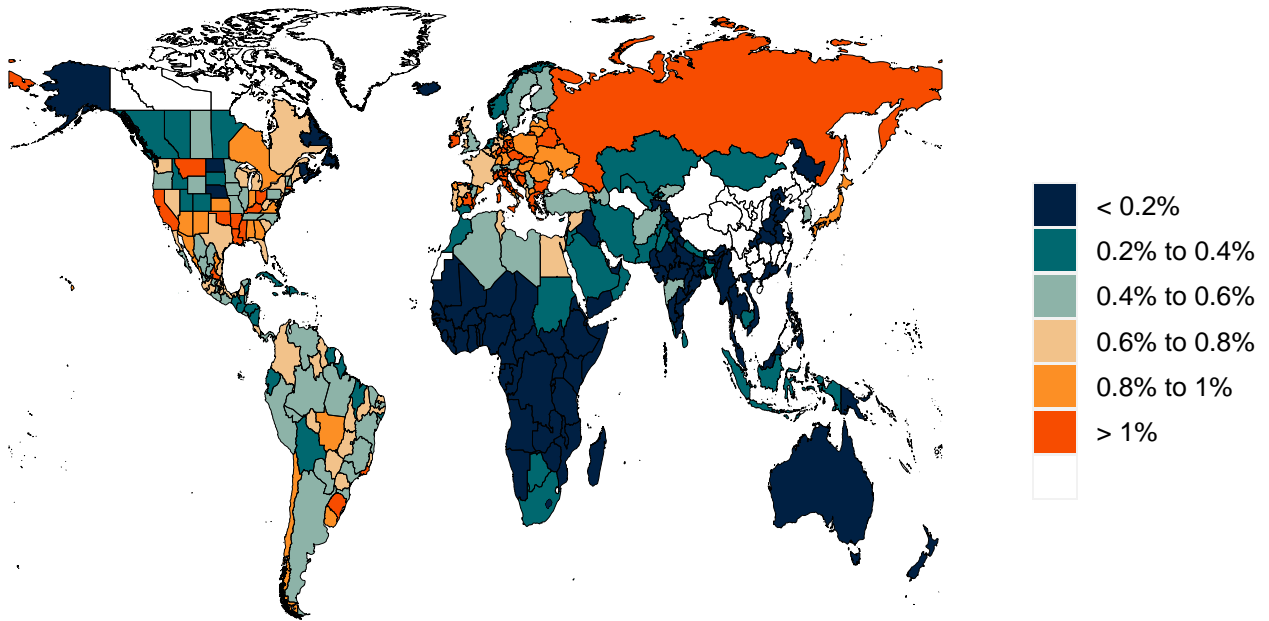


Figure 8. Infection fatality ratio on April 05, 2021. This is estimated as the ratio of COVID-19 deaths to infections based on the SEIR disease transmission model.



Critical drivers

Figure 9. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

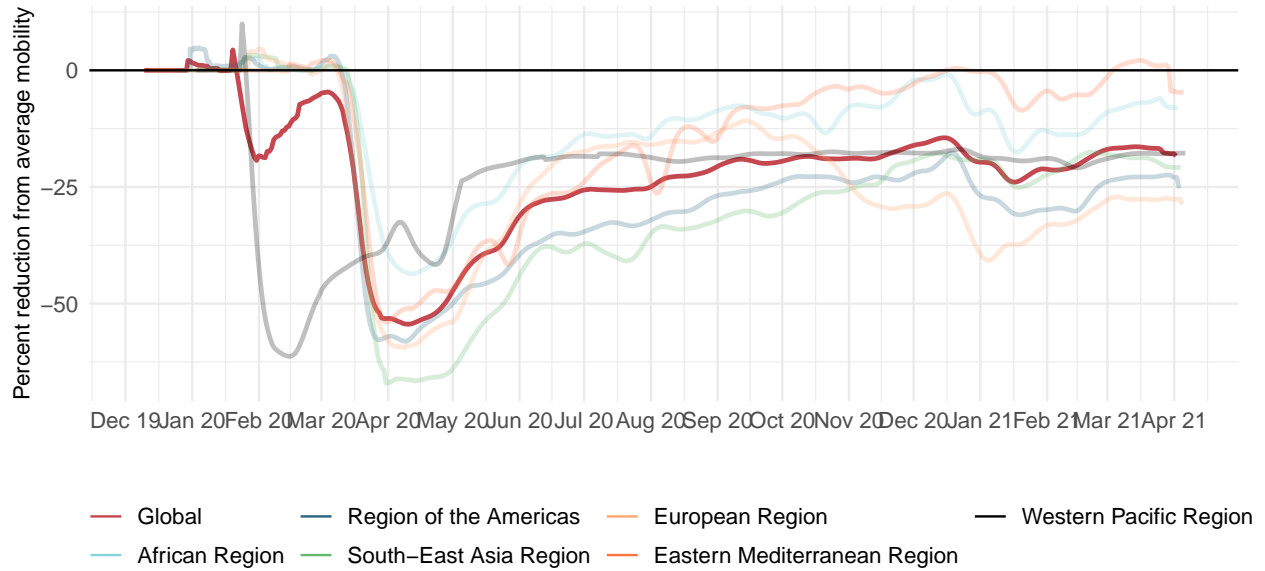


Figure 10. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on April 05, 2021

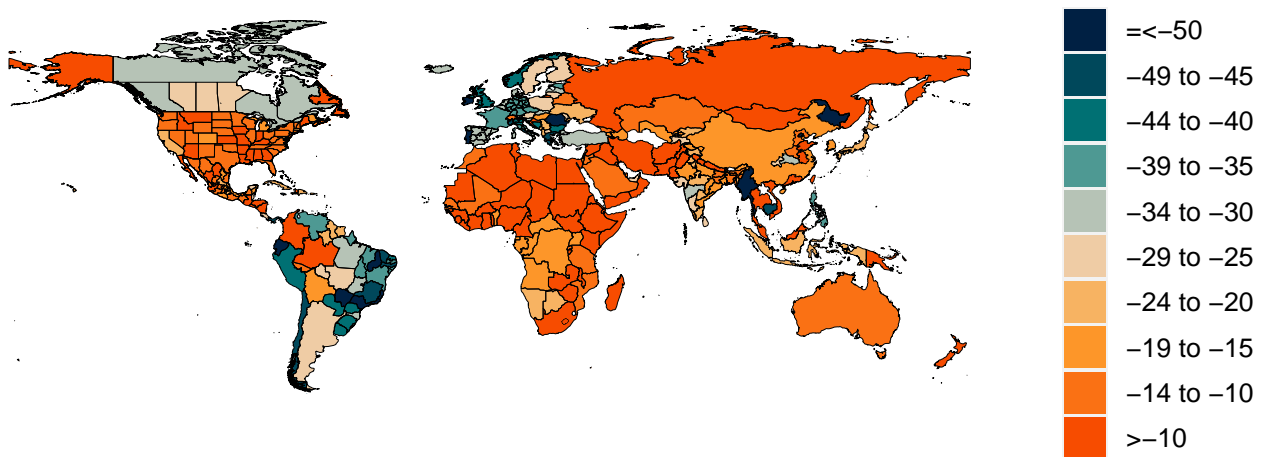


Figure 11. Trend in the proportion of the population reporting always wearing a mask when leaving home

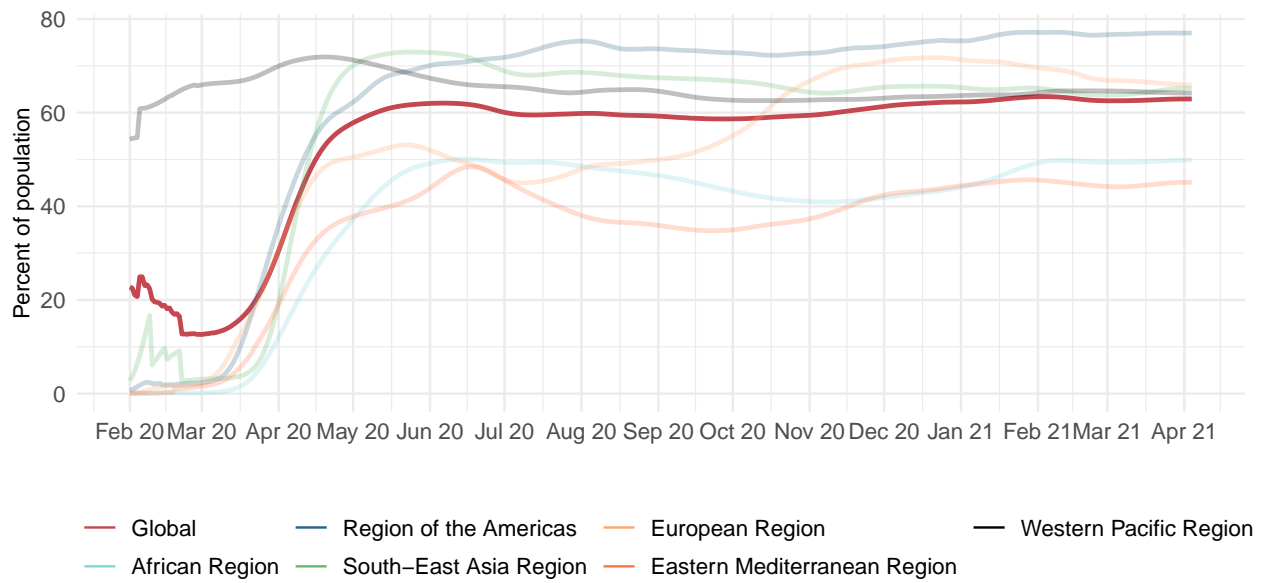


Figure 12. Proportion of the population reporting always wearing a mask when leaving home on April 05, 2021

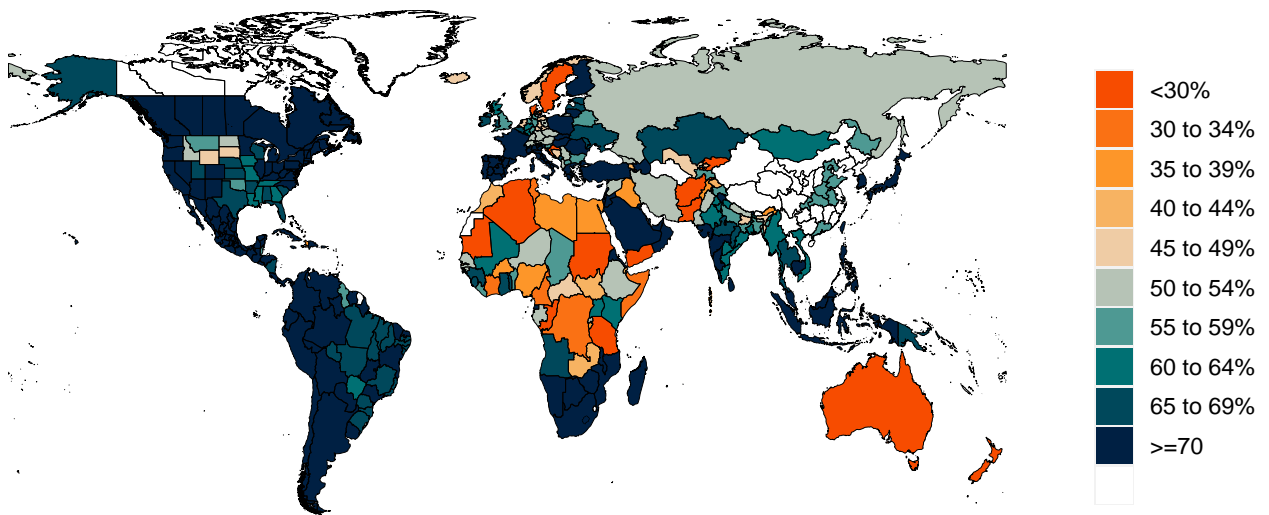


Figure 13. Trend in COVID-19 diagnostic tests per 100,000 people

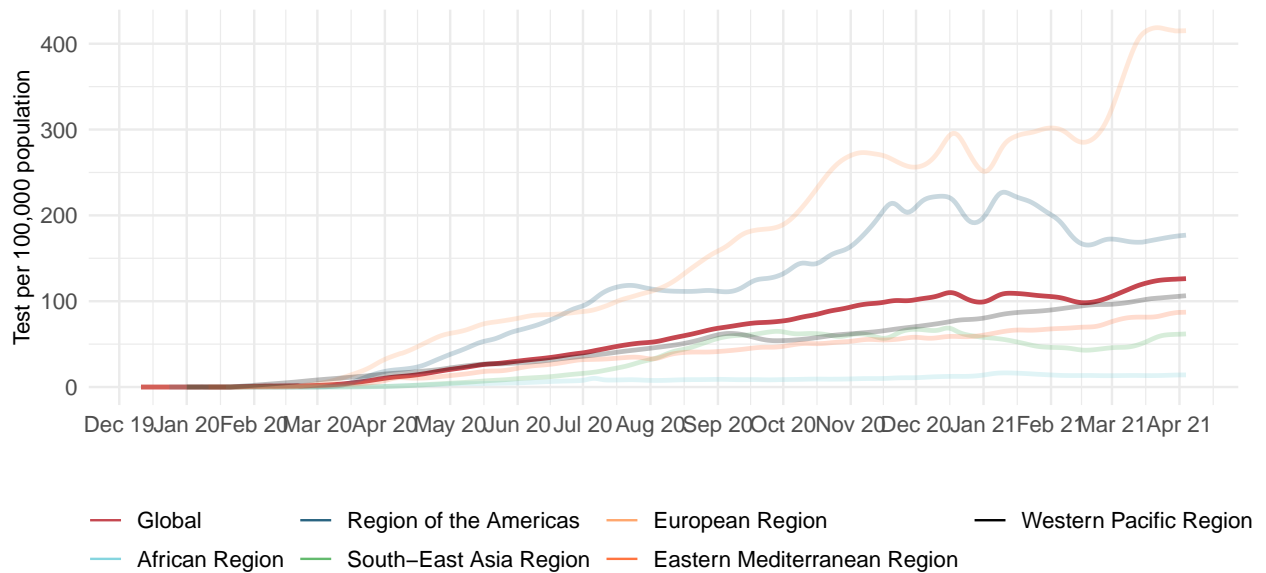


Figure 14. COVID-19 diagnostic tests per 100,000 people on April 02, 2021

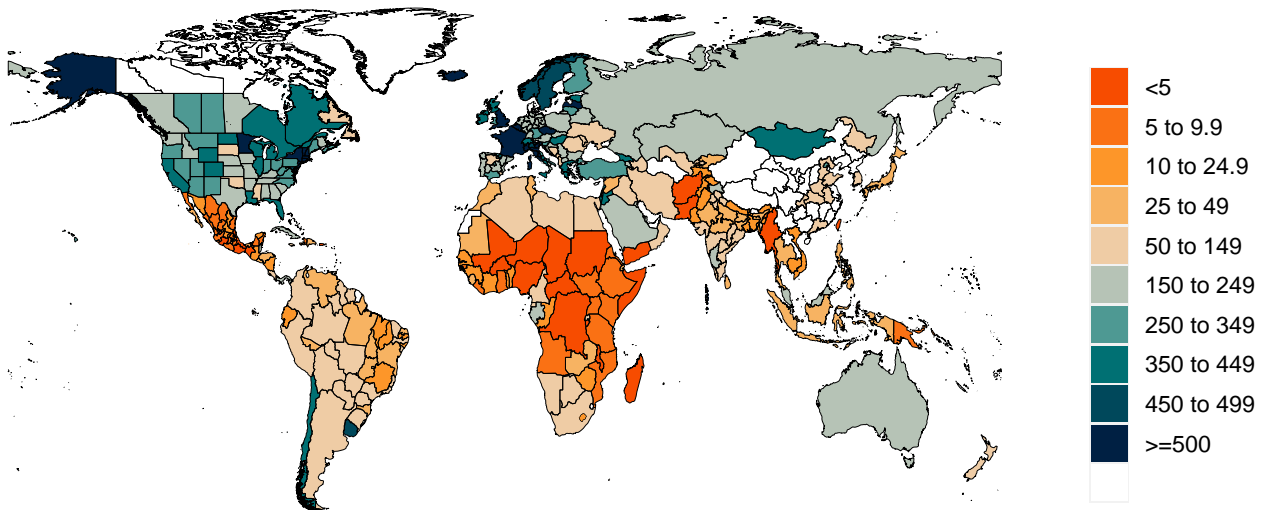


Figure 15. Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020

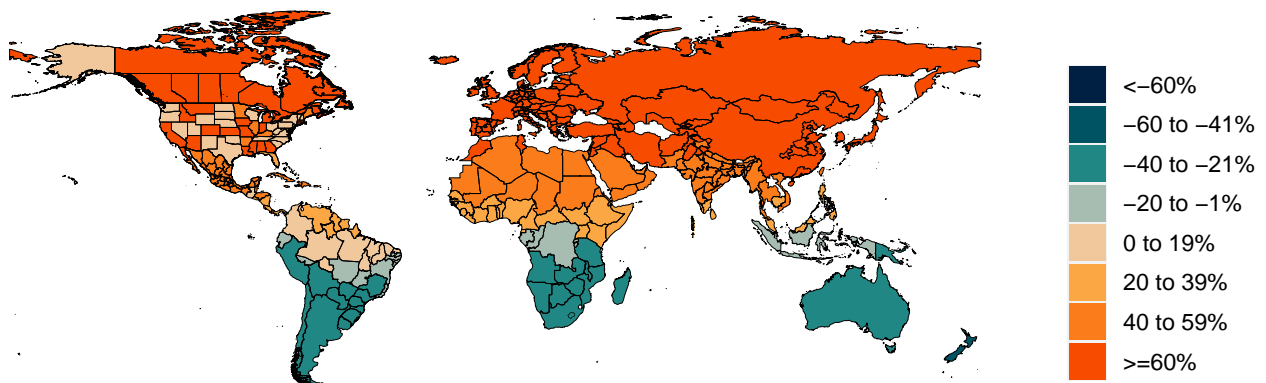


Table 3. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our website (<http://www.healthdata.org/node/8584>).

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 & P.1	Efficacy at preventing infection: B.1.351 & P.1
AstraZeneca	75%	52%	10%	7%
CanSinoBio	66%	57%	50%	44%
CoronaVac	50%	43%	38%	33%
Johnson & Johnson	72%	72%	64%	56%
Moderna	94%	85%	72%	62%
Novavax	89%	77%	49%	43%
Pfizer/BioNTech	91%	86%	69%	61%
Sinopharm	73%	63%	56%	48%
Sputnik V	92%	80%	70%	61%
Other mRNA vaccines	95%	83%	72%	63%
All other vaccines	75%	65%	57%	50%

Figure 16. Trend in the estimated proportion of the adult (18+) population that have been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

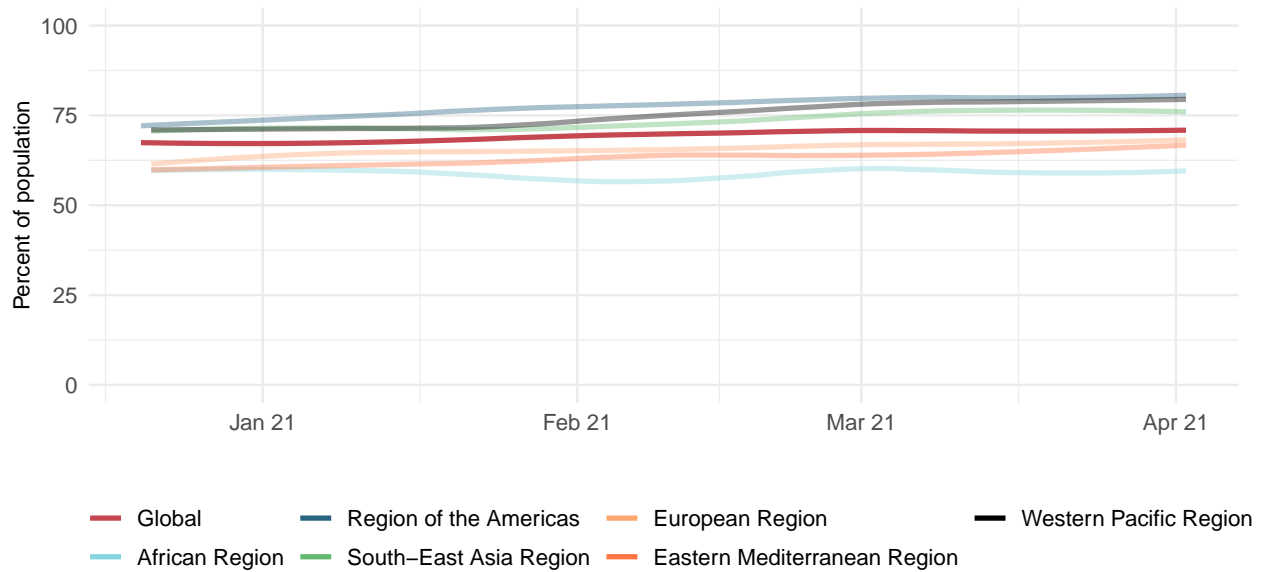


Figure 17. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

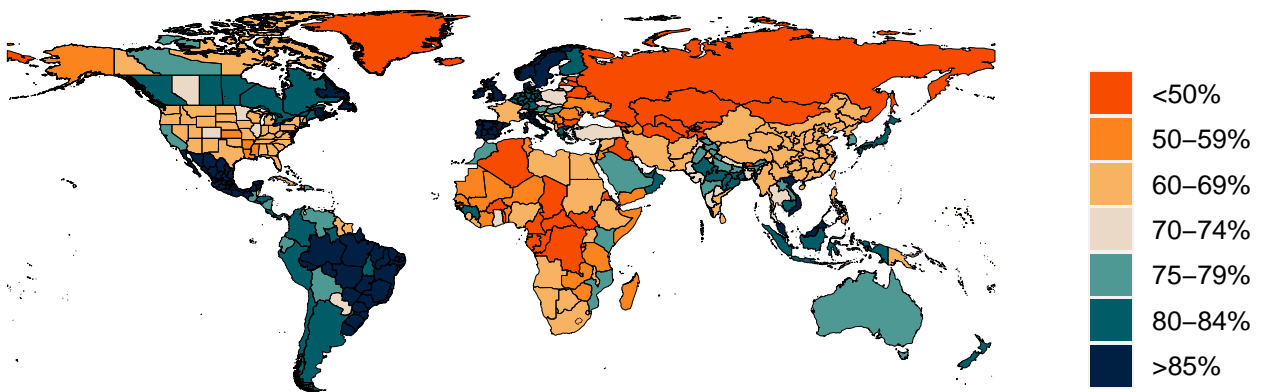
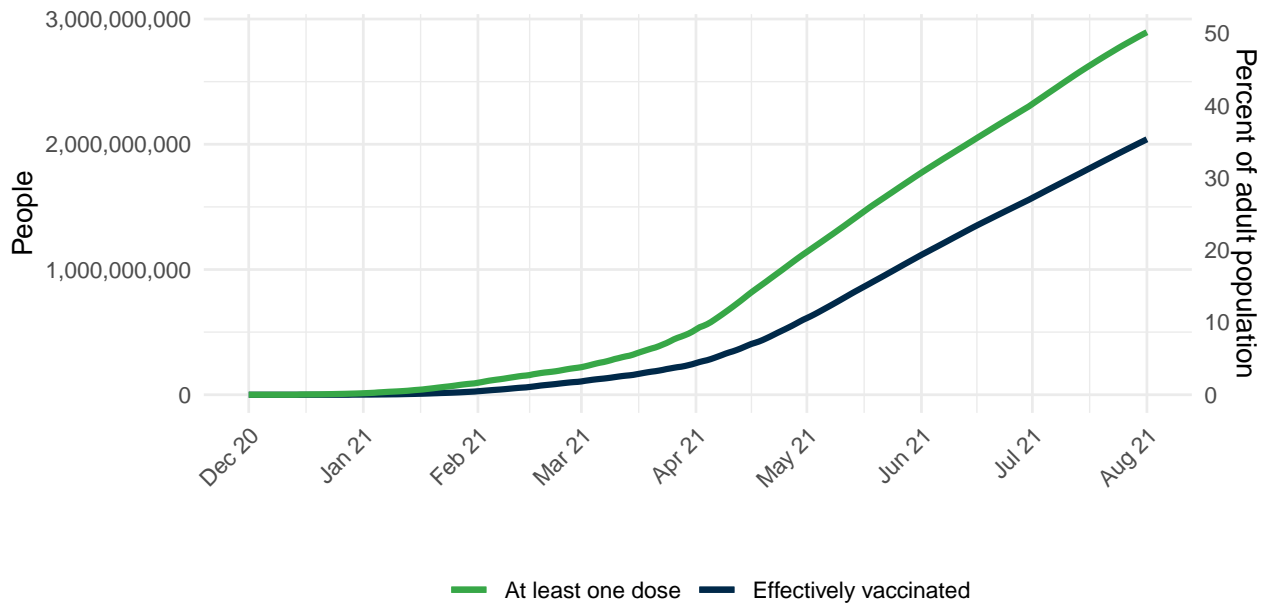


Figure 18. The number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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 UK.
- 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 P1 begin to spread within 3 weeks in adjacent locations that do not already have B.1.351 or P1 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 19. Cumulative COVID-19 deaths until August 01, 2021 for three scenarios

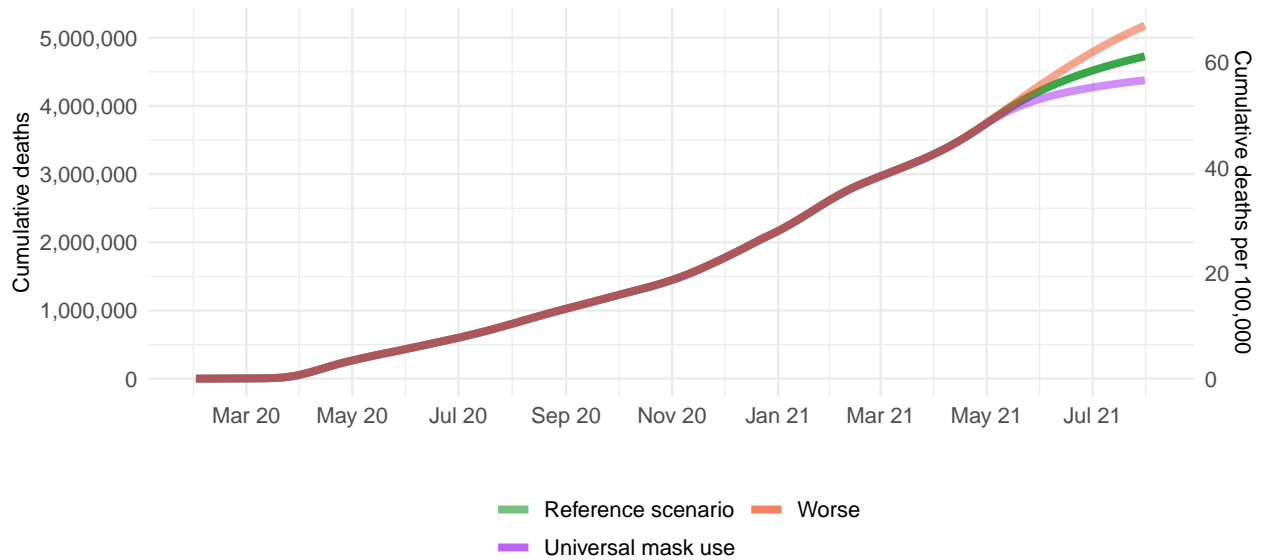


Figure 20. Daily COVID-19 deaths until August 01, 2021 for three scenarios,

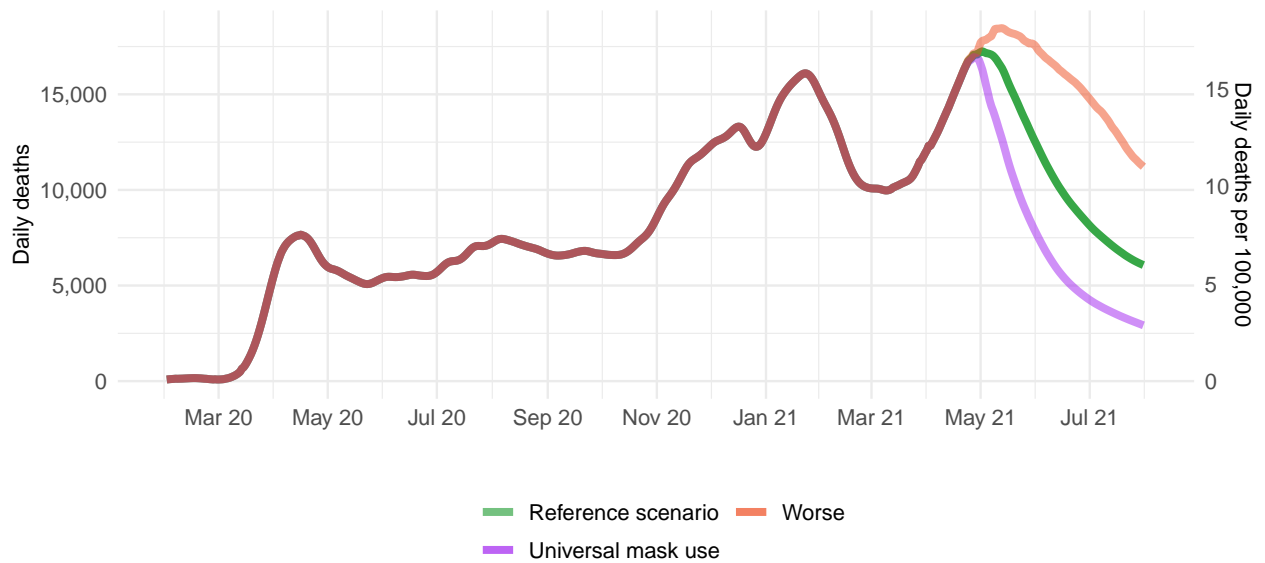
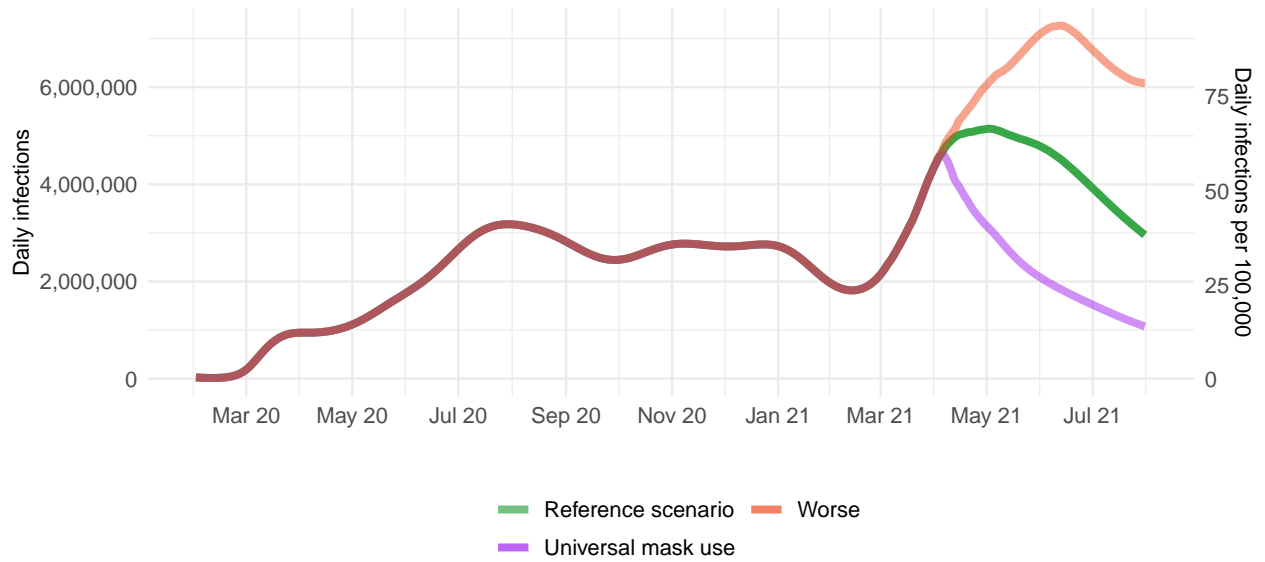


Figure 21. Daily COVID-19 infections until August 01, 2021 for three scenarios.



More information

Data sources:

Mask use data sources include Premise; Facebook Global Symptom Survey (This research is based on survey results from University of Maryland Social Data Science Center) and the Facebook United States Symptom Survey (in collaboration with Carnegie Mellon University); Kaiser Family Foundation; YouGov COVID-19 Behaviour Tracker survey.

Vaccine hesitancy data are from the COVID-19 Beliefs, Behaviors, and Norms Study, a survey conducted on Facebook by the Massachusetts Institute of Technology (<https://covidsurvey.mit.edu/>).

Vaccine hesitancy data are from the Facebook Global Symptom Survey (This research is based on survey results from University of Maryland Social Data Science Center), the Facebook United States Symptom Survey (in collaboration with Carnegie Mellon University), and from the Facebook COVID-19 Beliefs, Behaviors, and Norms Study conducted by the Massachusetts Institute of Technology.

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>.