

COVID-19 Results Briefing

The European Region

April 08, 2021

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

Declines in reported daily cases are likely an artifact of delayed reporting over the Easter holidays. We expect that transmission is still increasing in the majority of countries in the European Region. While transmission is still increasing and deaths are now climbing, we expect that the combination of rising vaccination, declining seasonality, and sustained levels of mask use should be enough to lead to a peak in daily deaths by late April or early May. Faster reductions in mask use or increases in mobility captured in our worse scenario show that daily deaths can easily remain higher through to August 1. There is very limited spread of the escape variants (B.1.351 and P.1), and the dominant variant in nearly all of the region is B.1.1.7. This suggests that escape variants may only become a major issue in the region later in the year. The most important strategies to pursue at this point in the pandemic are accelerated vaccination, maintenance of high levels of mask use as well as expansion of mask use in several locations, and appropriate implementation of social distancing mandates where transmission continues to climb. At the country level, the surge underway in Turkey is particularly concerning, suggesting further measures are needed to control transmission.

Current situation

- Daily reported cases in the last week decreased to 204,700 per day on average compared to 234,000 the week before (Figure 1). This decline, however, is likely an artifact due to delayed reporting over the Easter holidays in many countries.
- Daily deaths in the last week increased to 4,700 per day on average compared to 4,400 the week before (Figure 2). This makes COVID-19 the number 2 cause of death in the European Region this week (Table 1). It is possible that death reporting was less affected by the Easter holidays.
- The daily death rate remains greater than 4 per million in most countries in the region, including France, Italy, and most of Central and Eastern Europe (Figure 3).
- We estimated that 15% of people in the European Region have been infected or re-infected as of April 5 (Figure 4).
- Effective R , computed using cases, hospitalizations, and deaths, is greater than 1 in the majority of the region (Figure 5).
- The infection detection rate in the European Region is close to 46% (Figure 6).

- Based on the analysis of the GISAID Initiative and some national databases on sequencing and likely variant scale-up, we estimate the current prevalence of three variants of concern (Figure 7). B.1.1.7 is the dominant variant in nearly all countries in the region. Low levels of the escape variants (B.1.351 and P1) are present in some countries, which warrants close monitoring.

Trends in drivers of transmission

- In the past week, some mandates have been lifted in Bosnia and Herzegovina and Czechia. Some mandates have been imposed in Denmark, France, Iceland, Slovenia, and Turkey.
- Mobility last week stayed constant, reaching 29% lower than the pre-COVID-19 baseline (Figure 9). Mobility was near baseline (within 10%) in Croatia and the Russian Federation. Mobility was lower than 30% of baseline in 26 countries.
- We estimated that 66% of people always wore a mask when leaving their home, same as last week (Figure 11). Mask use was lower than 50% in 10 countries (Figure 12).
- There were 415 diagnostic tests per 100,000 people on April 5 (Figure 13).
- In the European Region, 71.8% of people say they would accept or would probably accept a vaccine for COVID-19. Vaccine confidence varies widely in the region, with the highest levels reported in Denmark and the United Kingdom and levels below 50% in many countries in the east of the region (Figure 17). The fraction of the population open to receiving a COVID-19 vaccine ranges from 34% in Latvia to 91% in Denmark.
- In our current reference scenario, we expect that 657.48 million people in the region will be vaccinated by August 1 (Figure 18).

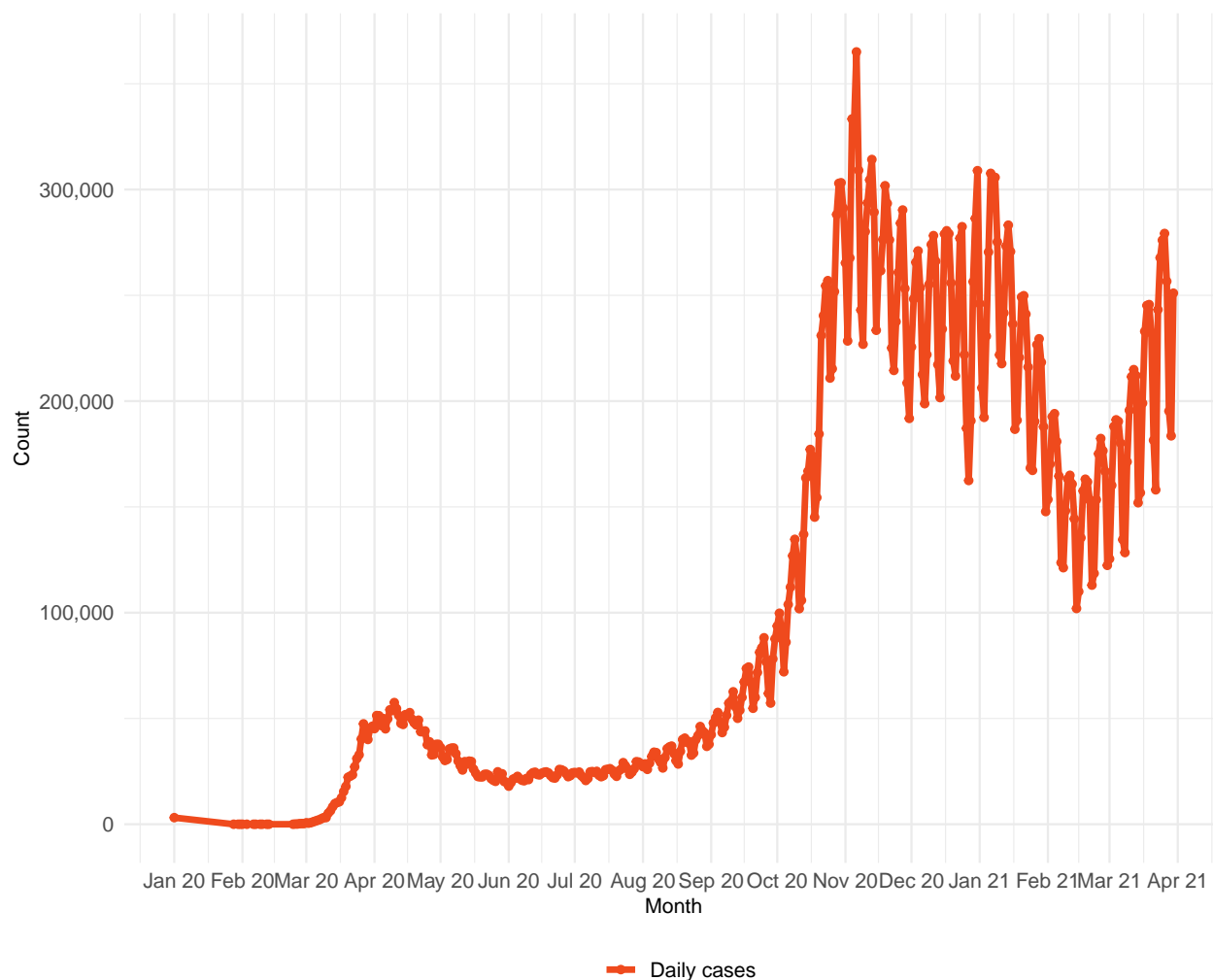
Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 1,566,000 cumulative deaths on August 1, 2021. This represents 303,000 additional deaths from April 5 to August 1 (Figure 19). Daily deaths will peak at about 5,620 in late April, and then start declining (Figure 20).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 55,000 fewer cumulative deaths compared to the reference scenario on August 1, 2021 (Figure 19).
- Under our **worse scenario**, in which mask use declines faster and mobility increases faster, our model projects 1,629,000 cumulative deaths on August 1, 2021, an additional 63,000 deaths compared to our reference scenario (Figure 19). Daily deaths remain above 1,000 on August 1 in this scenario.
- By August 1, we project that 103,500 lives will be saved by the projected vaccine rollout. This does not include lives saved through vaccinations that have already been delivered.
- Daily infections in the reference scenario drop below 100,000 in mid-June but remain above 200,000 through to August 1 in the worse scenario.

- Figure 22 compares our reference scenario forecasts to other publicly archived models. Imperial and IHME forecasts suggest peaks in daily deaths in late or early May. Other forecasts suggest slow or steadier declines from here forward in daily deaths.
- At some point from April through August 1, 19 countries will have high or extreme stress on hospital beds (Figure 23). At some point from April through August 1, 15 countries will have high or extreme stress on ICU capacity (Figure 24).

Model updates

There are no major updates in the model this week.

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	44,253	1
COVID-19	32,912	2
Stroke	22,622	3
Tracheal, bronchus, and lung cancer	8,918	4
Alzheimer's disease and other dementias	8,022	5
Chronic obstructive pulmonary disease	6,719	6
Colon and rectum cancer	5,881	7
Lower respiratory infections	5,254	8
Cirrhosis and other chronic liver diseases	4,290	9
Hypertensive heart disease	3,949	10

Figure 2. Reported daily COVID-19 deaths

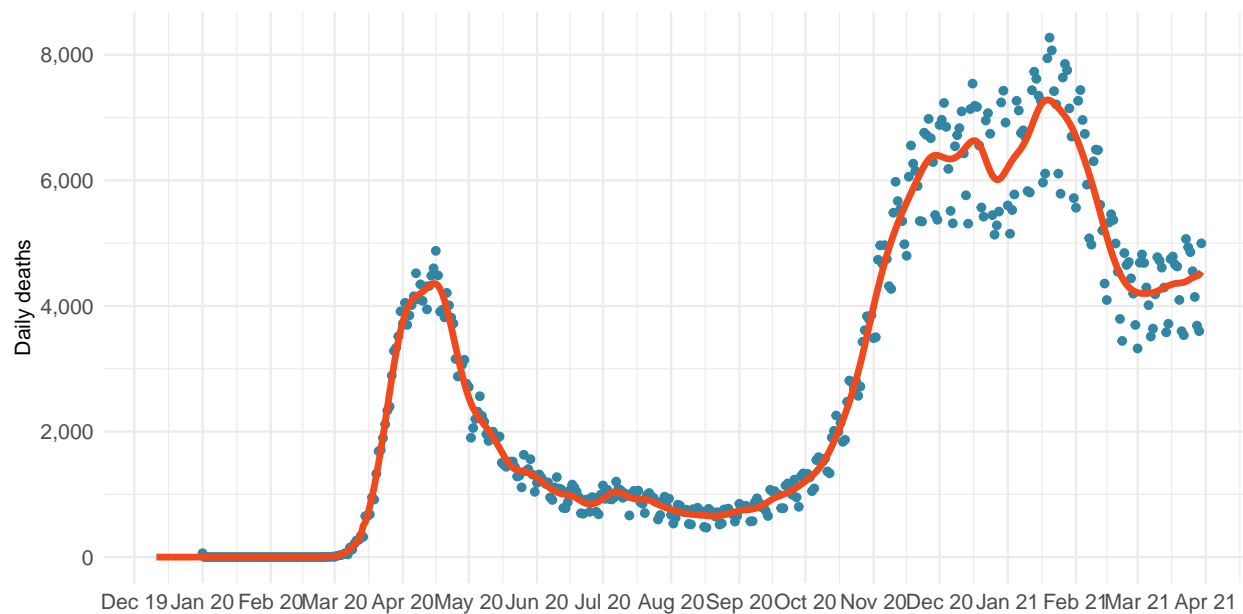


Figure 3. Daily COVID-19 death rate per 1 million on April 05, 2021

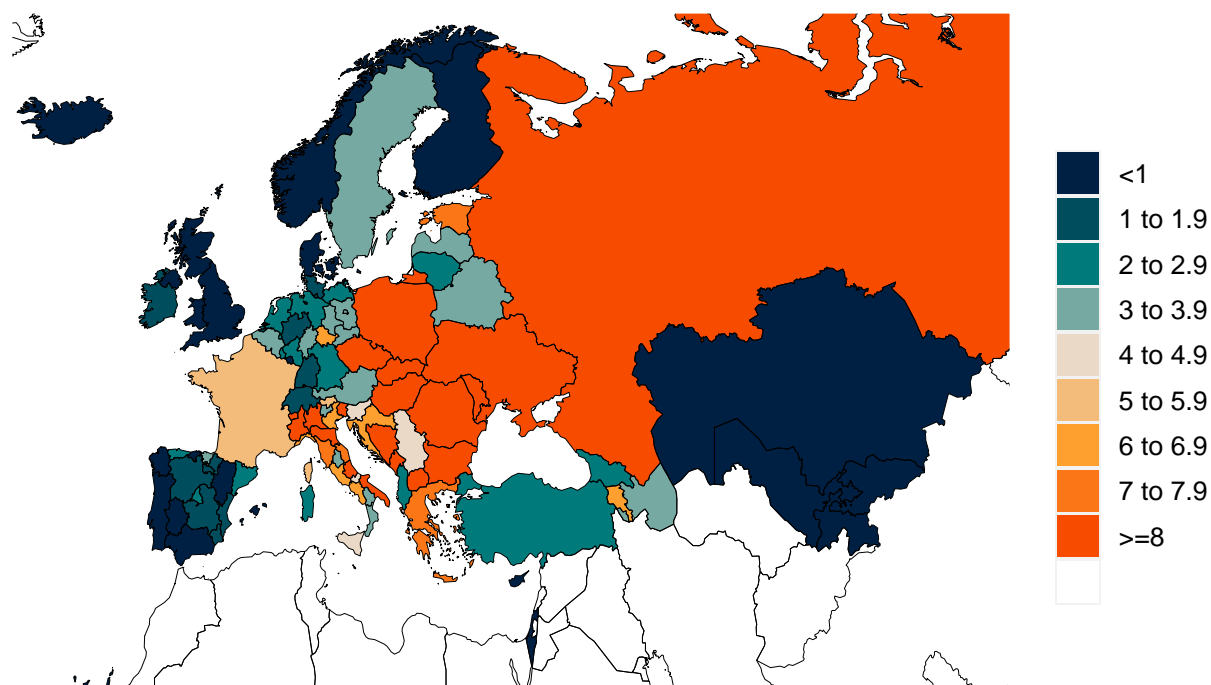


Figure 4. Estimated percent of the population infected with COVID-19 on April 05, 2021

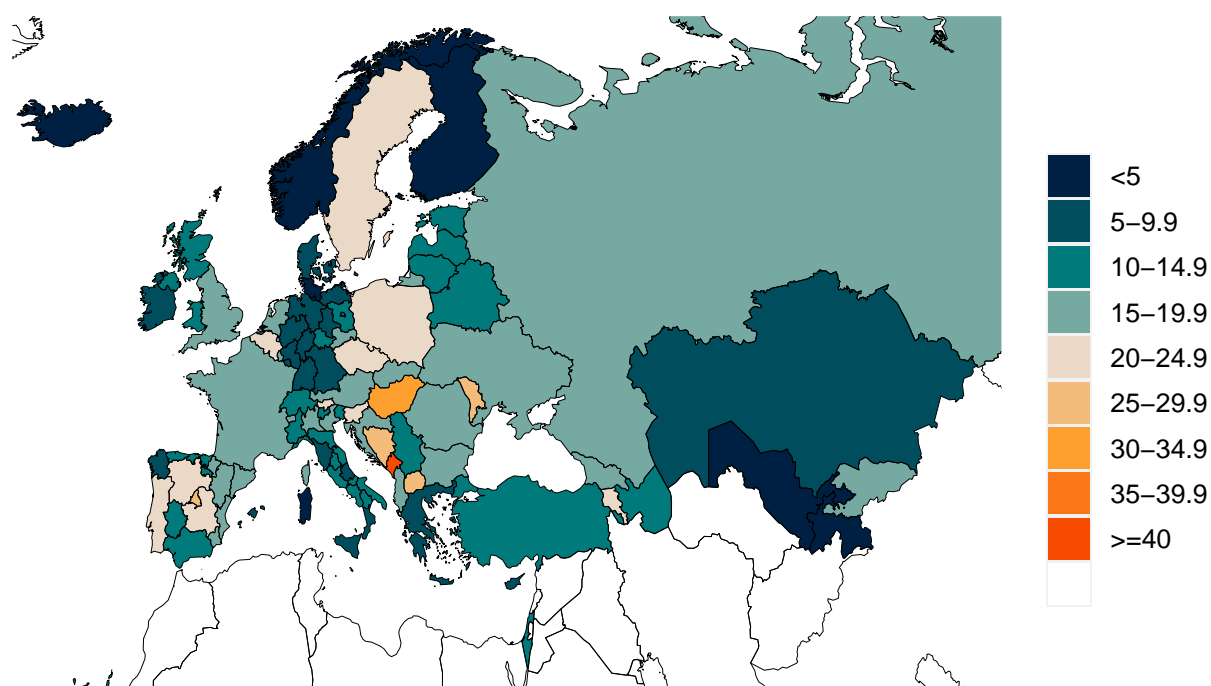


Figure 5. Mean effective R on March 25, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past. Effective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

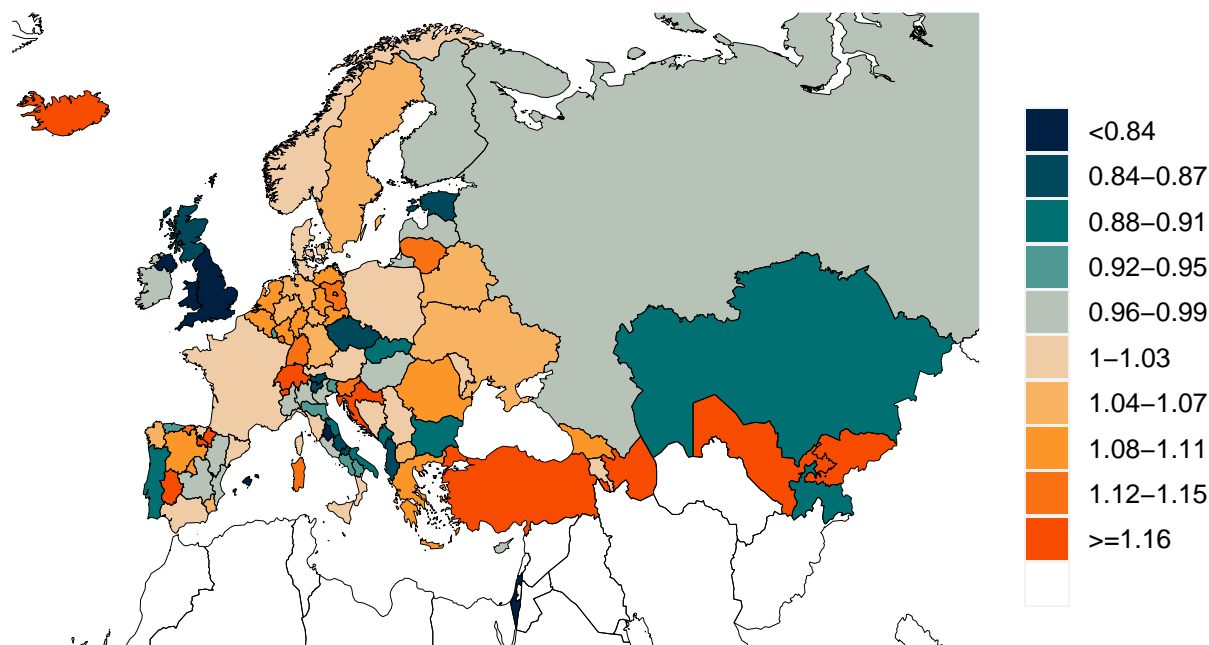
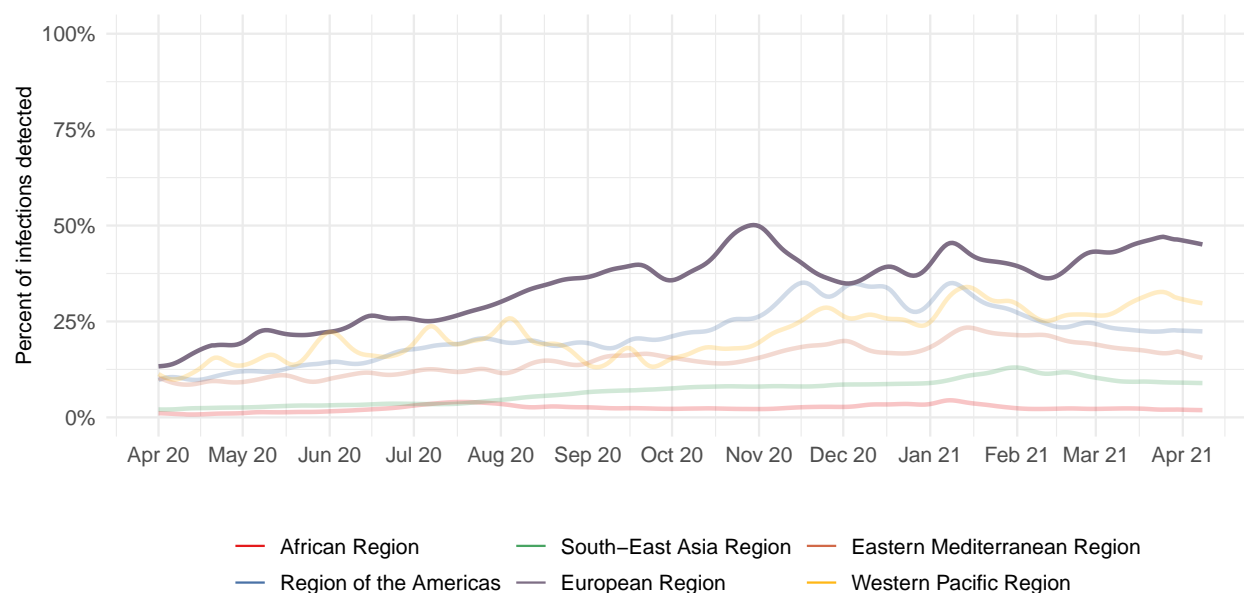


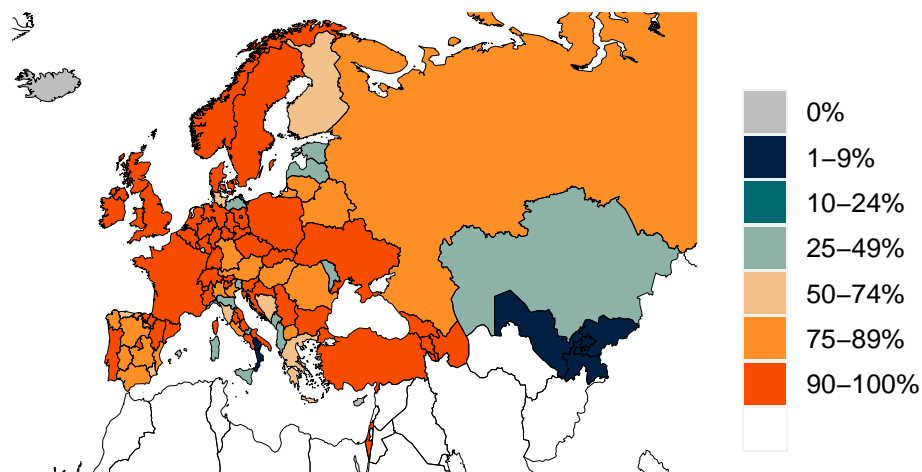
Figure 6. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model.



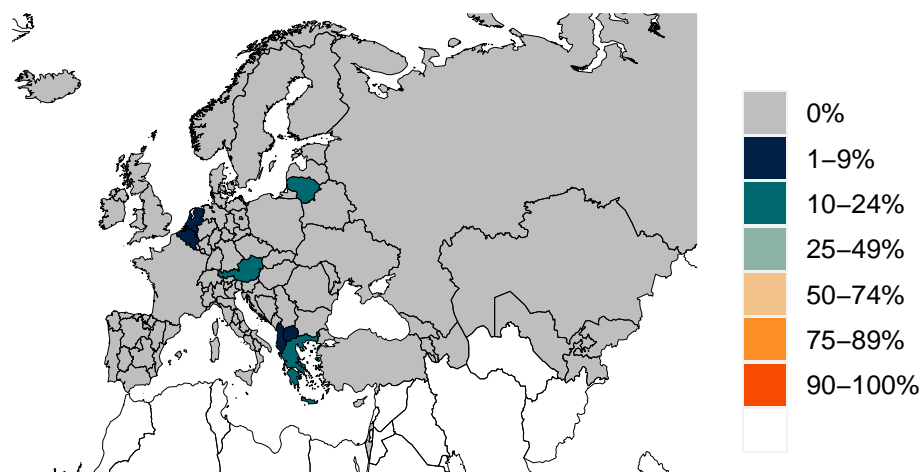
*Due to measurement errors in cases and testing rates, the infection to detection rate (IDR) can exceed 100% at particular points in time.

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

A. Percent B.1.1.7 variant



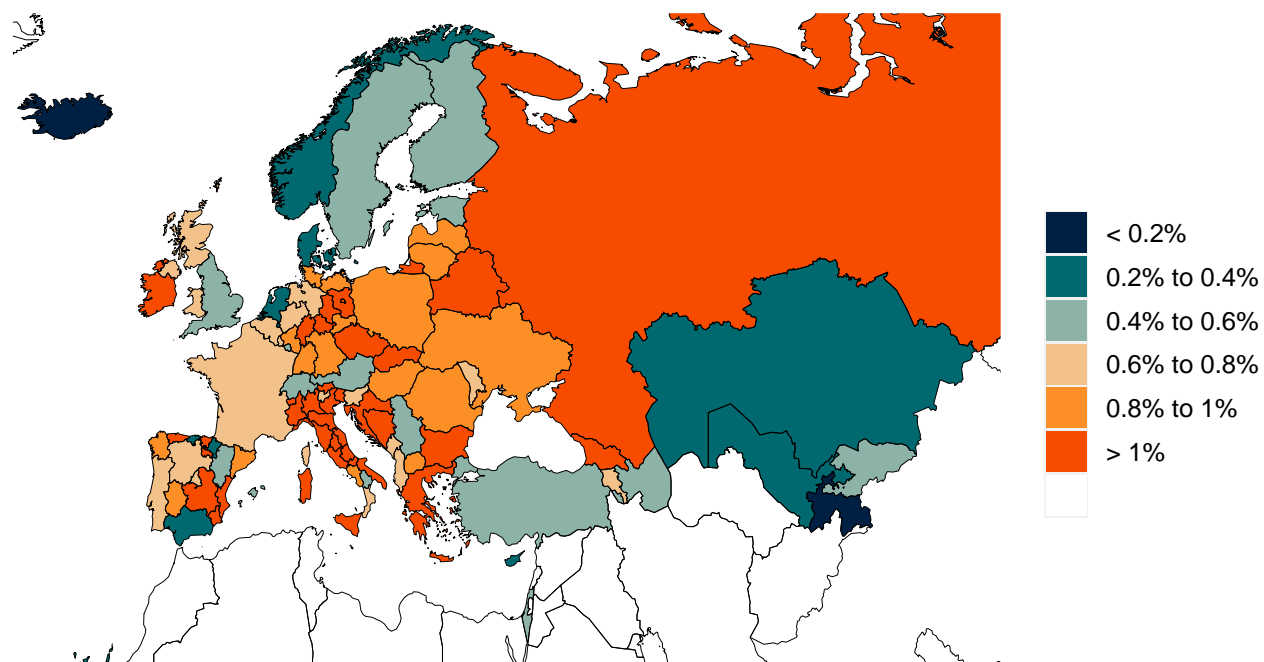
B. Percent B.1.351 variant



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

Table 2. Current mandate implementation

	Primary school closure	Secondary school closure	Higher school closure	Borders closed to any non-resident	Borders closed to all non-residents	Individual movements restricted	Curfew for businesses	Individual curfew	Gathering limit: 6 indoor, 10 outdoor	Gathering limit: 10 indoor, 25 outdoor	Gathering limit: 25 indoor, 50 outdoor	Gathering limit: 50 indoor, 100 outdoor	Gathering limit: 100 indoor, 250 outdoor	Restaurants closed	Bars closed	Restaurants / bars curbside only	Gyms, pools, other leisure closed	Non-essential retail closed	Non-essential retail curbside only	Non-essential workplaces closed	Stay home order	Stay home fine	Mask mandate	Mask mandate fine
Albania																								
Andorra																								
Armenia																								
Austria																								
Azerbaijan																								
Belarus																								
Belgium																								
Bosnia and Herzegovina																								
Bulgaria																								
Croatia																								
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Luxembourg																								
Malta																								
Monaco																								
Montenegro																								
Netherlands																								
North Macedonia																								
Norway																								
Poland																								
Portugal																								
Republic of Moldova																								
Romania																								
Russian Federation																								
San Marino																								
Serbia																								
Slovakia																								
Slovenia																								
Spain																								
Sweden																								
Switzerland																								
Tajikistan																								
Turkey																								
Ukraine																								
United Kingdom																								
Uzbekistan																								

Mandate in place

Mandate in place (imposed this week)

Mandate in place (update from previous reporting)

Mandate imposed in some subnational locations

Mandate imposed in some subnational locations (imposed this week)

Mandate imposed in some subnational locations (update from previous reporting)

No mandate

No mandate (lifted this week)

No mandate (update from previous reporting)

*Not all locations are measured at the subnational level.

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

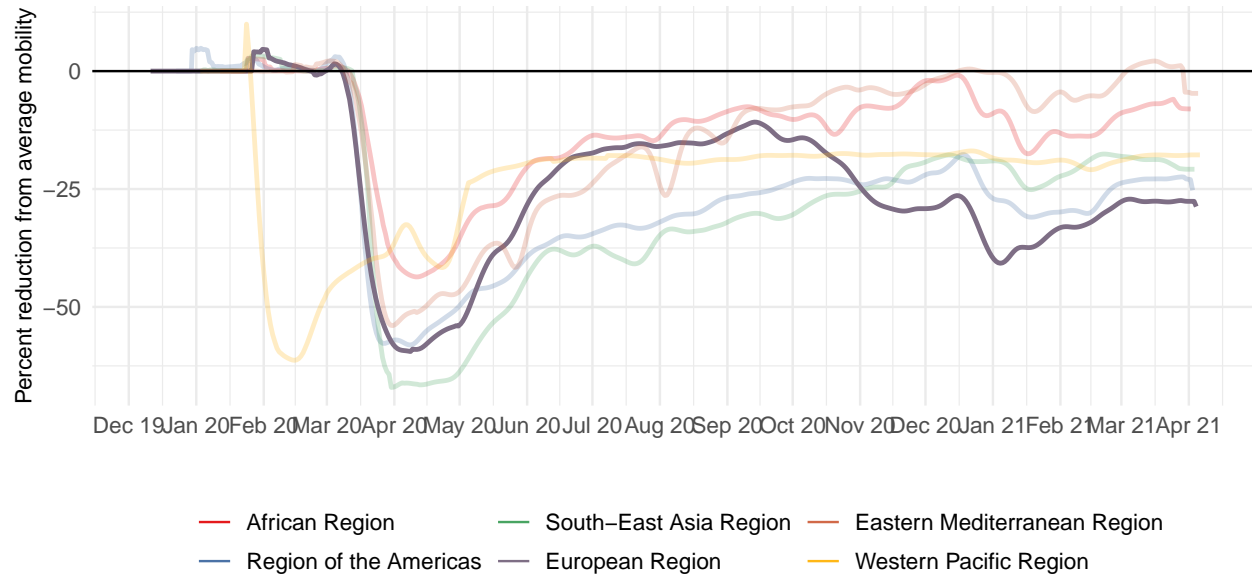


Figure 10. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on April 05, 2021

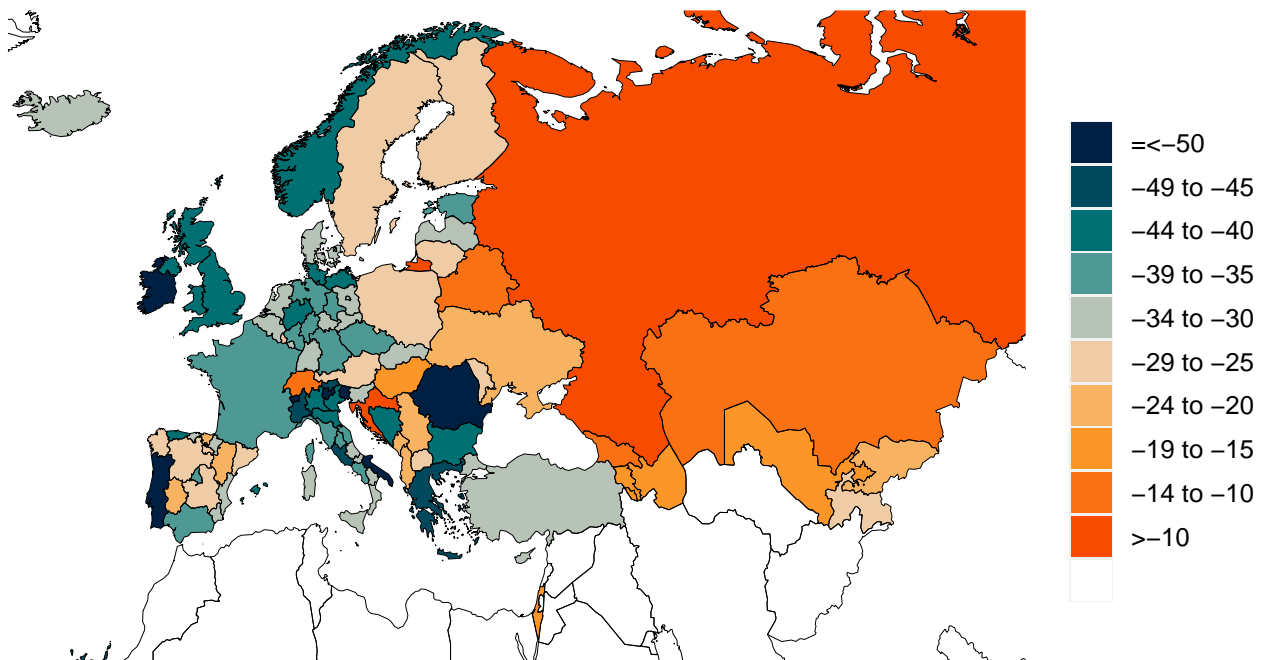


Figure 11. Trend in the proportion of the population reporting always wearing a mask when leaving home

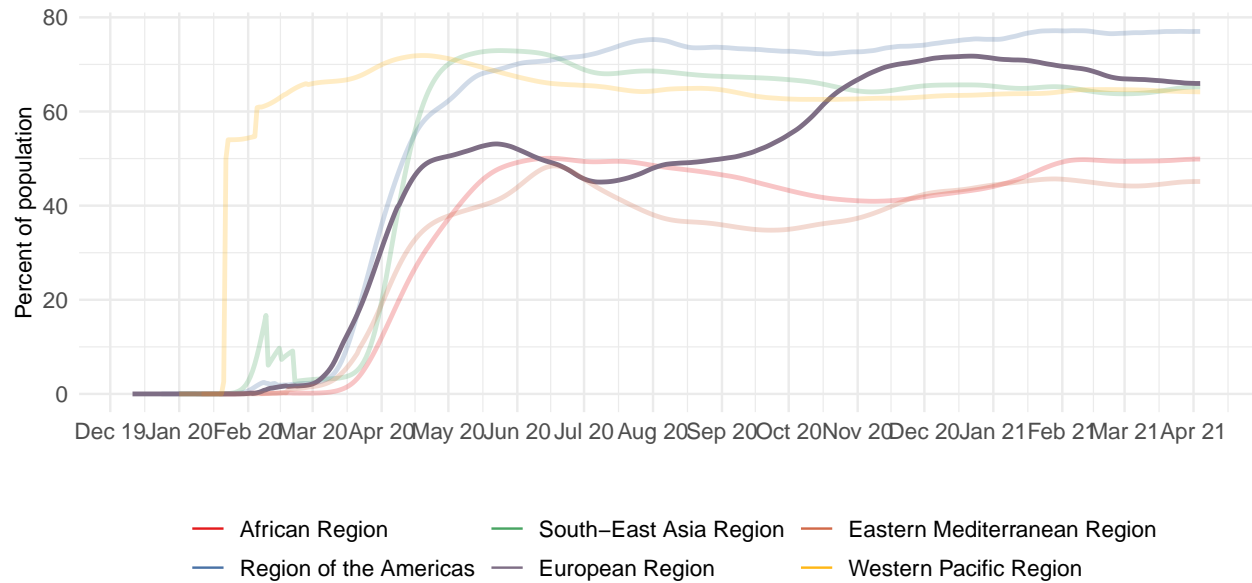


Figure 12. Proportion of the population reporting always wearing a mask when leaving home on April 05, 2021

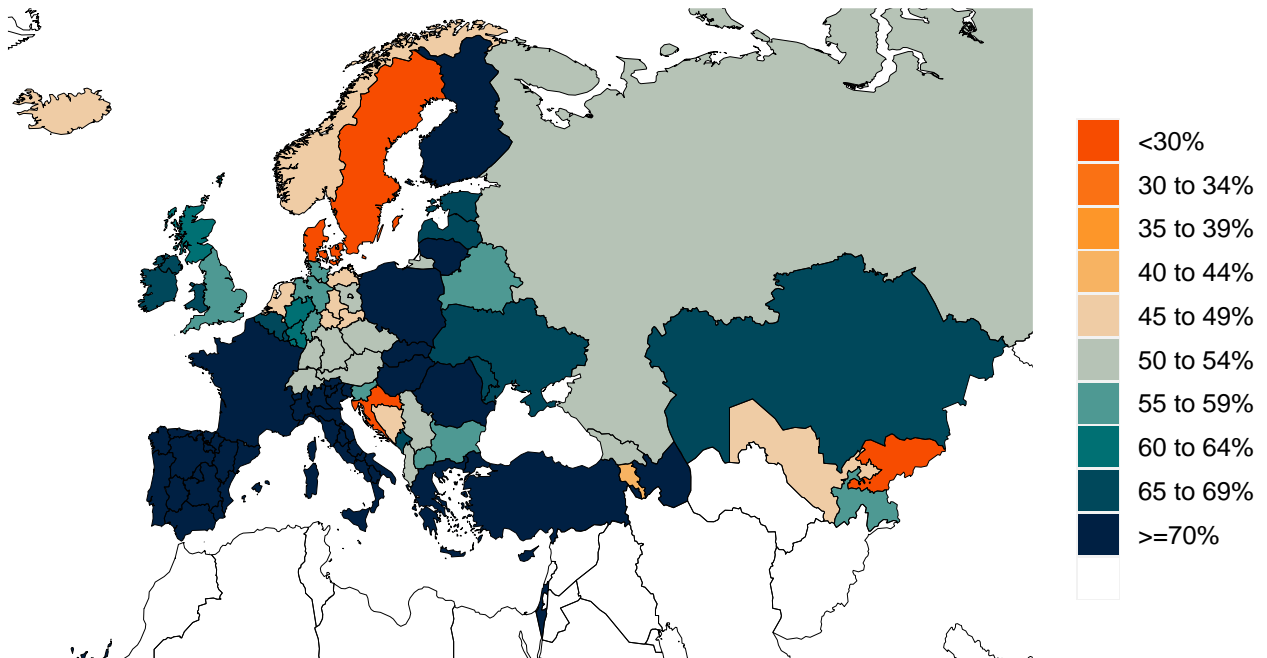


Figure 13. Trend in COVID-19 diagnostic tests per 100,000 people

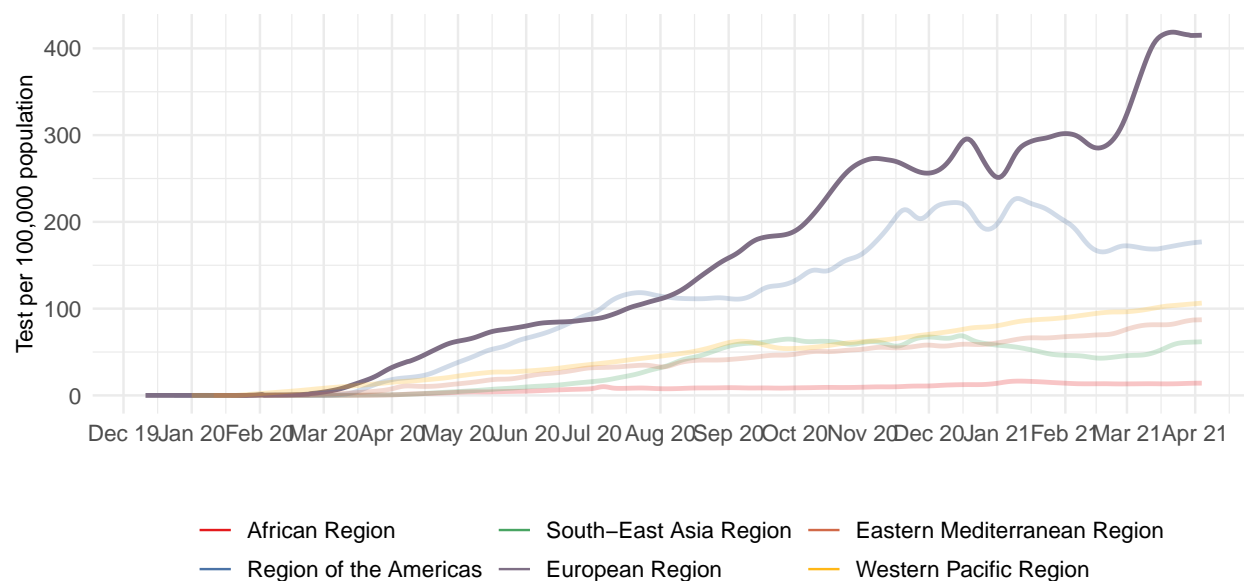


Figure 14. COVID-19 diagnostic tests per 100,000 people on April 01, 2021

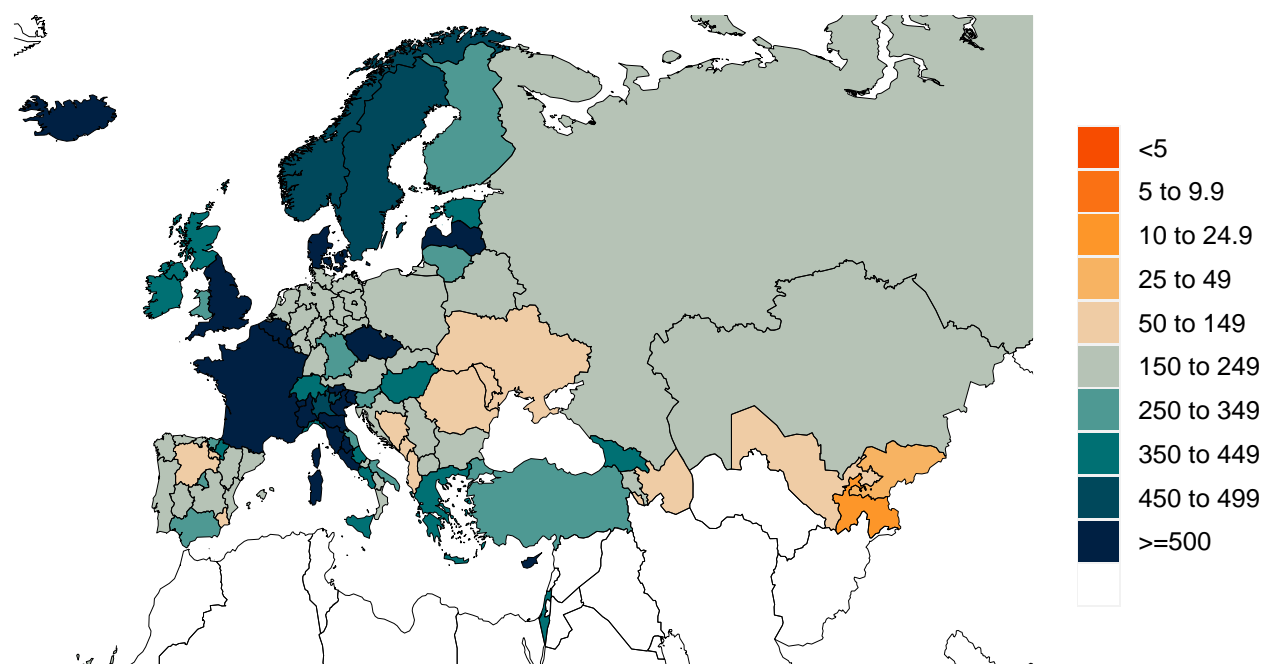
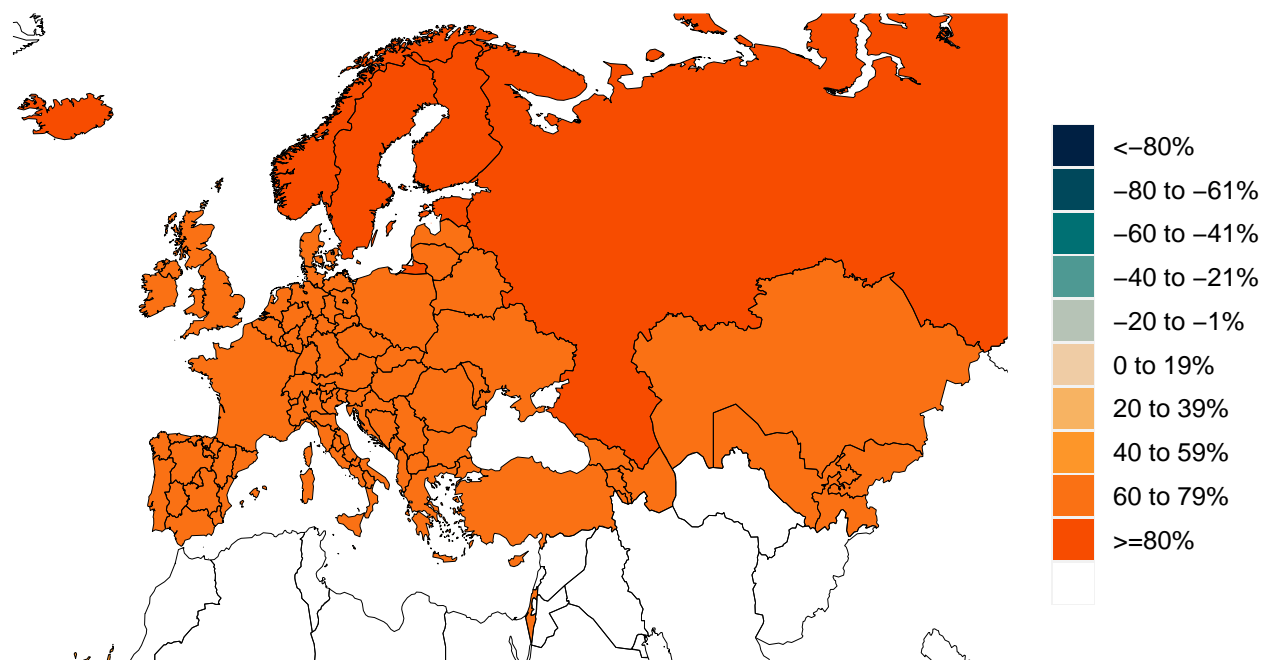


Figure 15. Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020**Table 3.** The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, 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 has been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

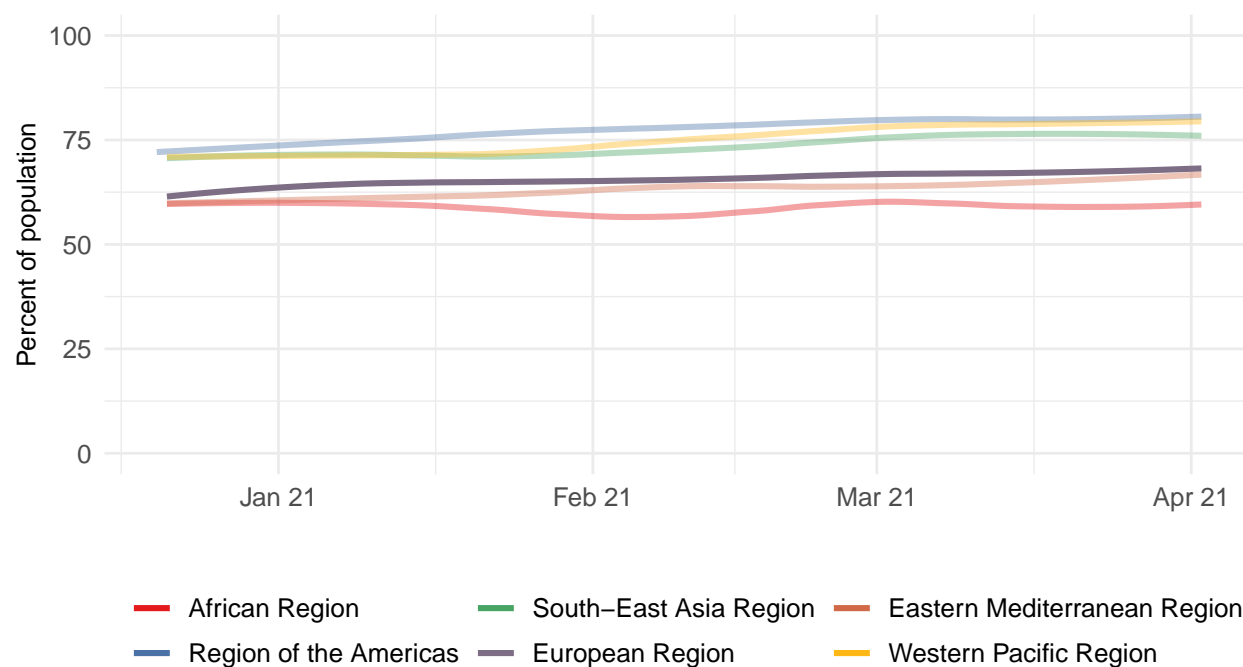


Figure 17. This figure shows the estimated proportion of the adult (18+) population that have been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

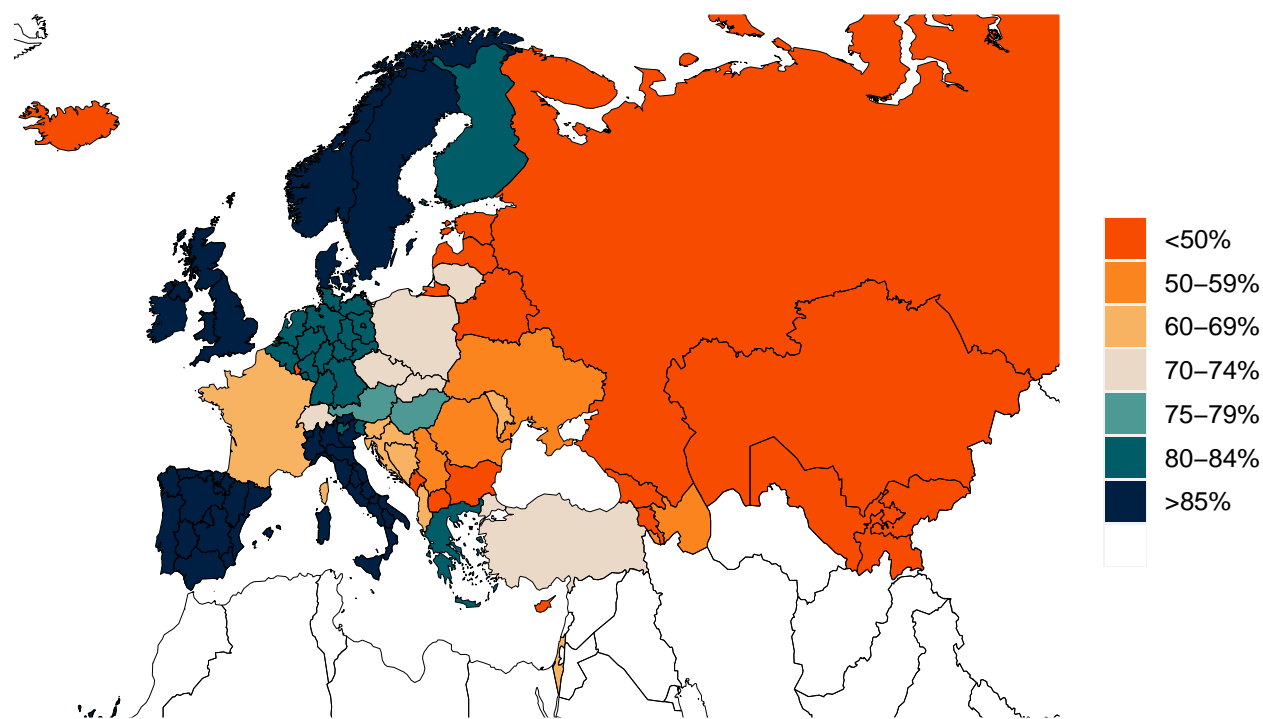
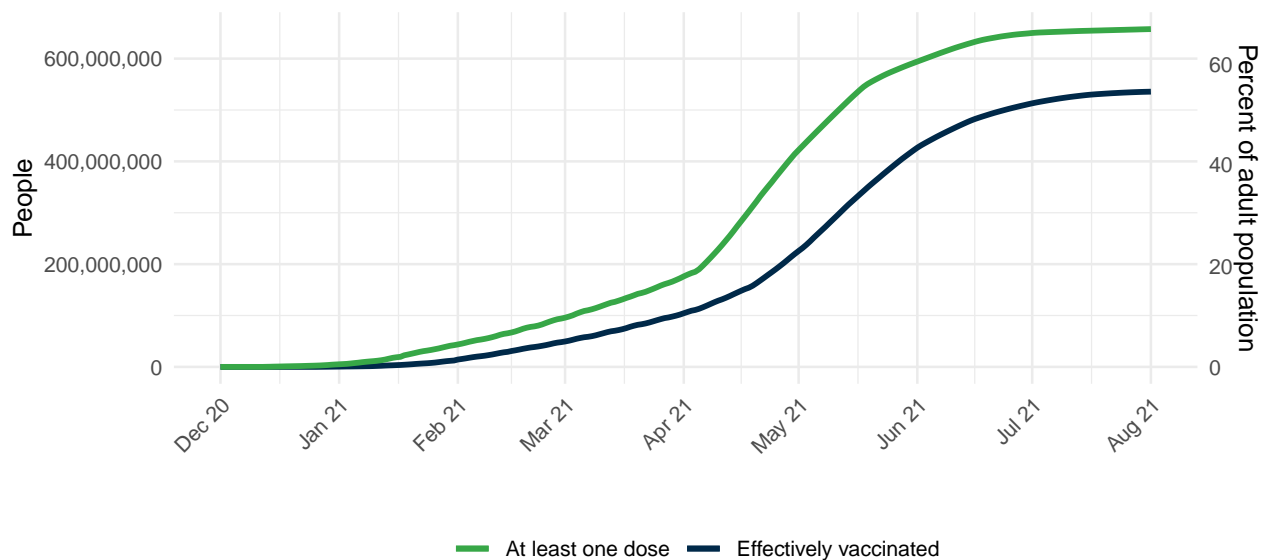


Figure 18. The number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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

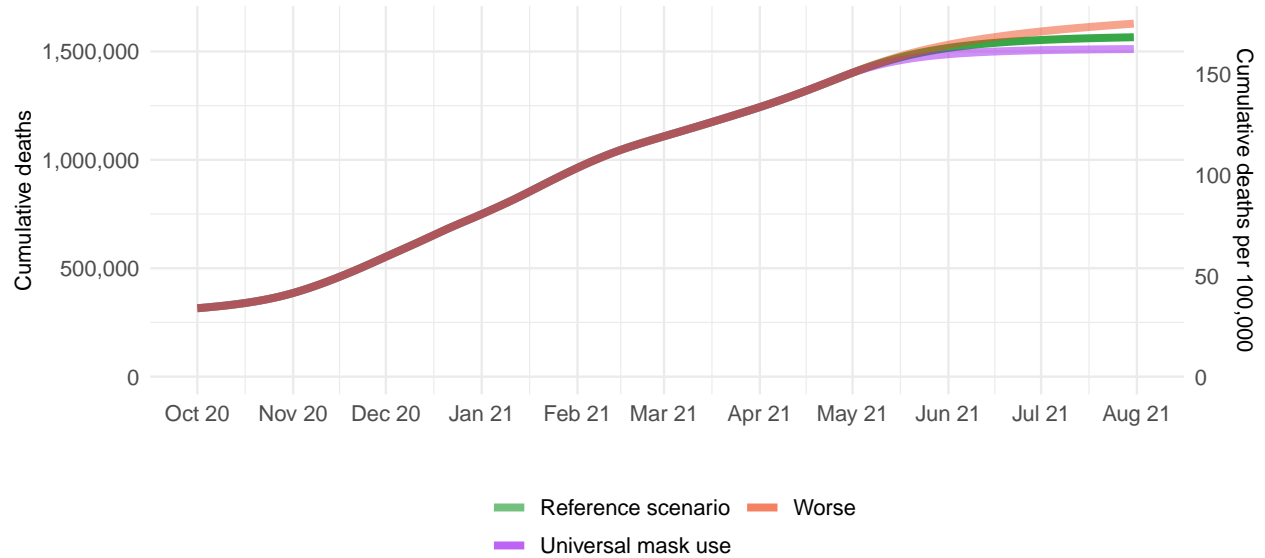


Figure 20. Daily COVID-19 deaths until August 01, 2021 for three scenarios,

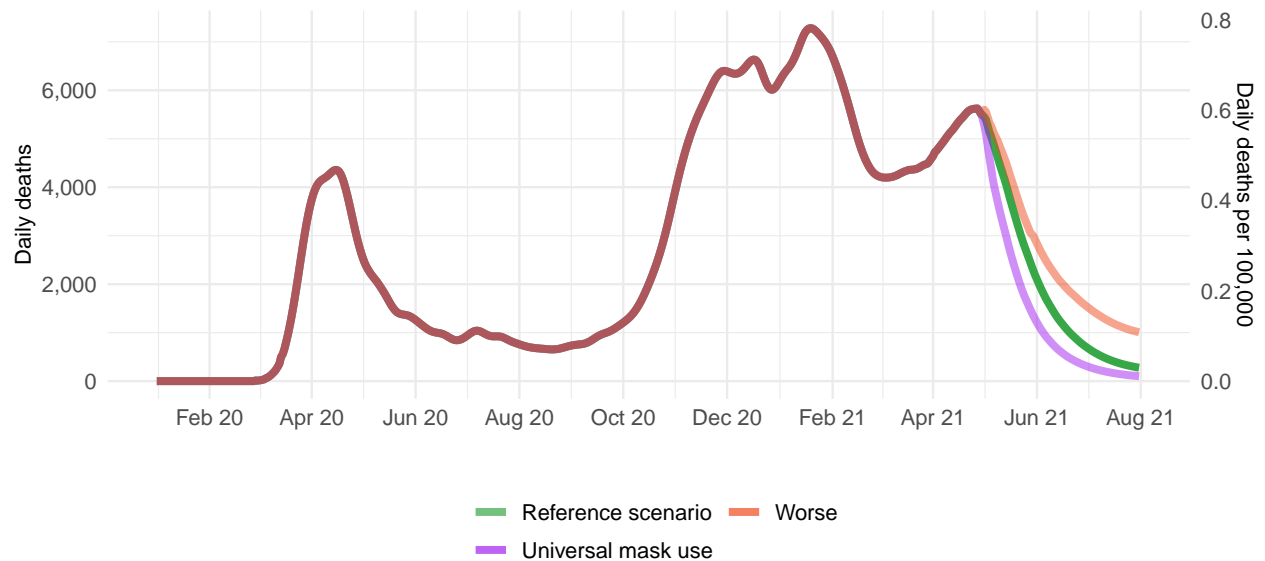


Figure 21. Daily COVID-19 infections until August 01, 2021 for three scenarios.

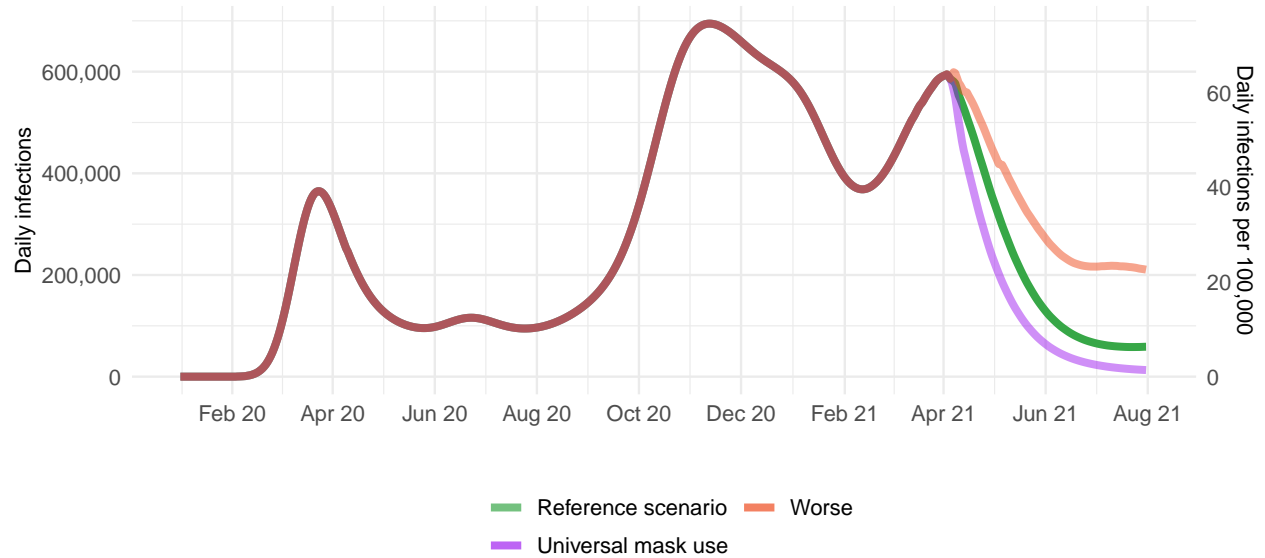


Figure 22. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology (Delphi; <https://www.covidanalytics.io/home>), Imperial College London (Imperial; <https://www.covidsim.org>), The Los Alamos National Laboratory (LANL; <https://covid-19.bsvgateway.org/>), and the SI-KJalpha model from the University of Southern California (SIKJalpha; <https://github.com/scc-usc/ReCOVER-COVID-19>). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.

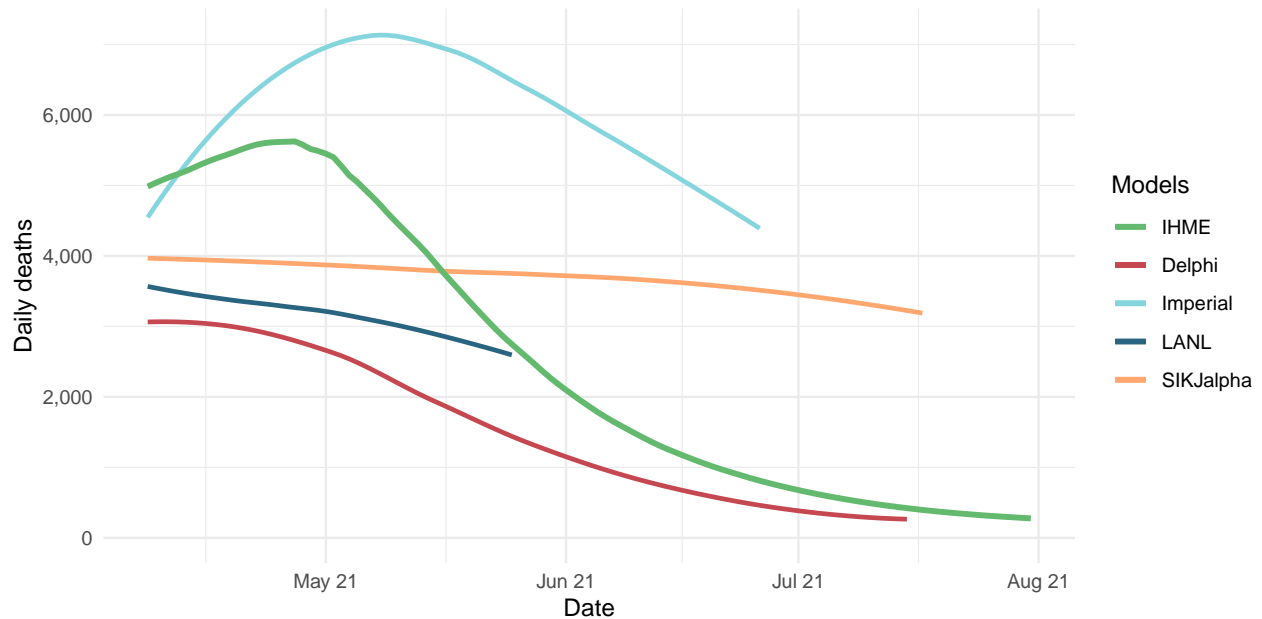


Figure 23. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and greater than 20% is considered *extreme stress*.

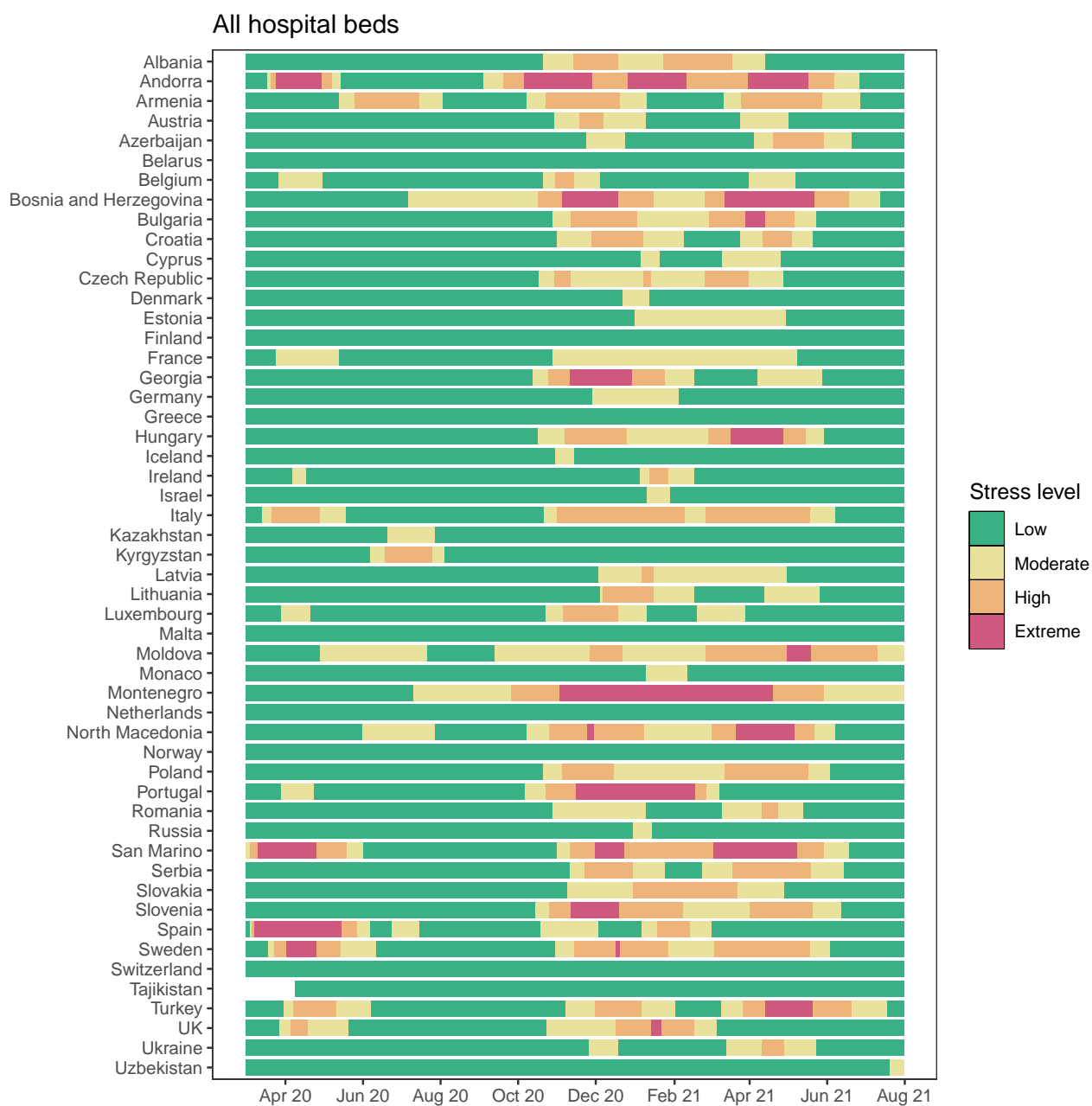
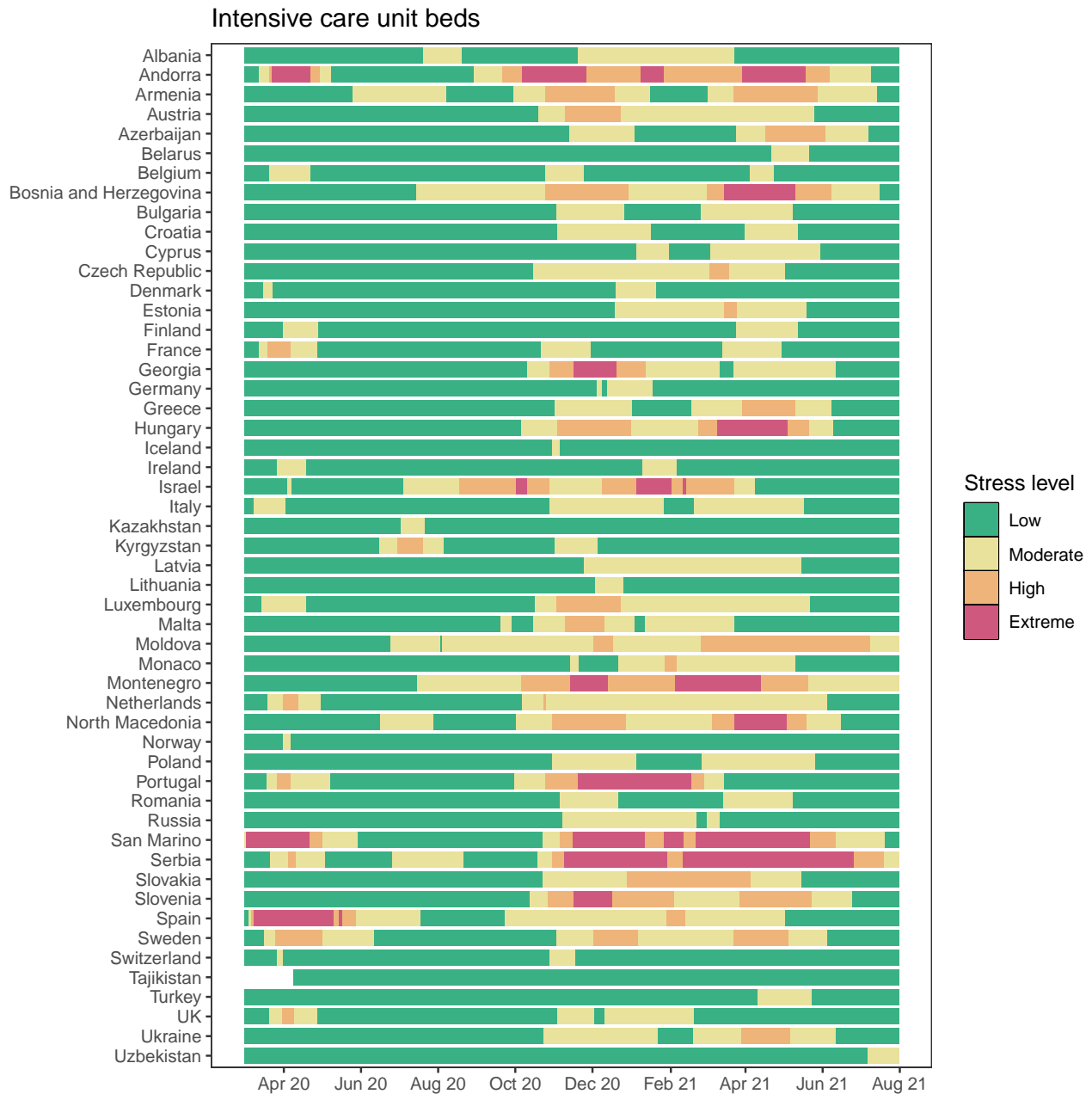


Figure 24. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and greater than 60% is considered *extreme stress*.



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>.