COVID-19 Results Briefing

The European Union

February 20, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the European Union. The model was run on February 20, 2021, with data through February 16, 2021.

The declines in daily cases that started in late January have continued, and now daily deaths have also started to decline over the last week. Three things are driving this positive trend: continued extensive mandates, which have kept mobility low in most countries in the west of the EU; scaled-up vaccination; and, most importantly, seasonality, which peaked at the end of January and is now declining. Two factors are slowing the decline and could in some countries lead to reversals: the steady spread of variants B.1.1.7 and B.1.351 and the behavioral response of the public to the positive trends. Despite the on balance positive trends, we expect 201,000 additional deaths between now and June 1 in the reference scenario. Reductions in mask wearing and social distancing can, combined with new variant spread, lead to spring surges in a number of EU countries. Our reference scenario does not include these surges, but how behavior changes after mandates start to be more generally lifted will have a critical impact. Looking past June 1, reduced efficacy of vaccines against variants B.1.351 and P1, combined with the possibility that there may not be cross-variant immunity, makes achieving herd immunity unlikely prior to next winter.

Current situation

- Daily reported cases in the last week decreased to 88,700 per day on average compared to 107,700 the week before (Figure 1).
- Daily deaths in the last week decreased to 2,770 per day on average compared to 3,150 the week before (Figure 2). This makes COVID-19 the number 1 cause of death in the European Union this week (Table 1).
- The daily death rate is greater than 4 per million in 17 countries (Figure 3).
- We estimated that 12% of people in the European Union have been infected as of February 16 (Figure 4).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in several regions of Italy, Hungary, Bulgaria, and Greece (Figure 5).
- The infection-detection rate remains just under 50% (Figure 6).

Trends in drivers of transmission

- New mandates were imposed in Belgium, Bulgaria, and Poland.

- Mobility stayed constant at 40% lower than the pre-COVID-19 baseline (Figure 7). Mobility was near baseline (within 10%) in no locations. Mobility was generally higher in countries in the east of the EU.
- As of February 16, we estimated that 73% of people always wore a mask when leaving their home, the same as last week (Figure 9). Mask use was lower than 50% in Denmark, Sweden, and Croatia.
- There were 270 diagnostic tests per 100,000 people on February 16 (Figure 11).
- In the European Union, 77.7% of people say they would accept or would probably accept a vaccine for COVID-19. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 41% in Estonia to 92% in Denmark (Figure 14).
- In our current reference scenario, we expect that 394.68 million will be vaccinated by June 1 (Figure 15).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 725,000 cumulative deaths on June 1, 2021. This represents 195,000 additional deaths from February 16 to June 1 (Figure 16). Daily deaths have peaked and are expected to decline to below 500 by June 1 (Figure 18).
- By June 1, 2021, we project that 69,800 lives will be saved by the projected vaccine rollout.
- If **universal mask coverage (95%)** were attained in the next week, our model projects 30,000 fewer cumulative deaths compared to the reference scenario on June 1, 2021 (Figure 16).
- Under our **worse scenario**, our model projects 755,000 cumulative deaths on June 1, 2021 (Figure 16). This represents 30,000 more deaths than in the reference scenario.
- Daily infections, which have remained constant in the last two weeks, are expected to start declining by the end of February and then drop to below 25,000 by June 1. In the worse scenario, driven by more rapid increases in mobility and new variant spread, daily infections can remain above 200,000 until early April.
- Figure 19 compares our reference scenario forecasts to other publicly archived models. All models except the Los Alamos National Labs model are forecasting steady declines in daily deaths.
- At some point from February through June 1, six countries will have high or extreme stress on hospital beds (Figure 20). At some point from February through June 1, 17 countries will have high or extreme stress on ICU capacity (Figure 21).

Model updates

We have updated our model that predicts the spread of the new variants, which is used in the reference scenario in two ways. First, the speed of scale-up of the new variants is now based on data from more than 15 locations, whereas previously we only had data from London. Second, we now use observed data on the presence of new variants (B.1.1.7, B.1.351, or P1) in all locations with reported community transmission and more than five cases of those variants sequenced.

Figure 1. Reported daily COVID-19 cases

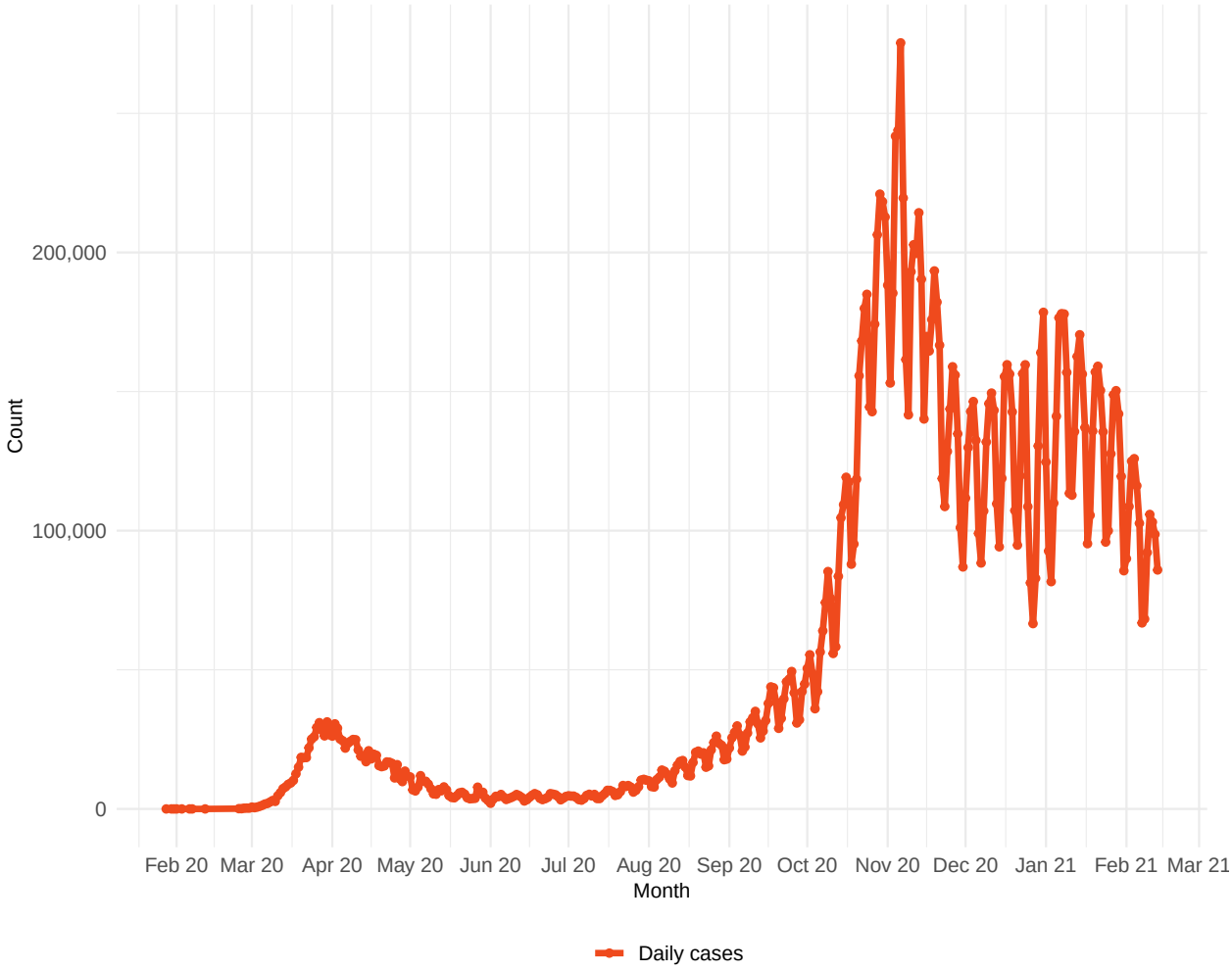


Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
COVID-19	19,388	1
Ischemic heart disease	18,714	2
Stroke	10,303	3
Tracheal, bronchus, and lung cancer	6,216	4
Alzheimer's disease and other dementias	5,827	5
Chronic obstructive pulmonary disease	4,608	6
Colon and rectum cancer	4,100	7
Lower respiratory infections	3,503	8
Hypertensive heart disease	2,797	9
Chronic kidney disease	2,430	10

Figure 2. Reported daily COVID-19 deaths

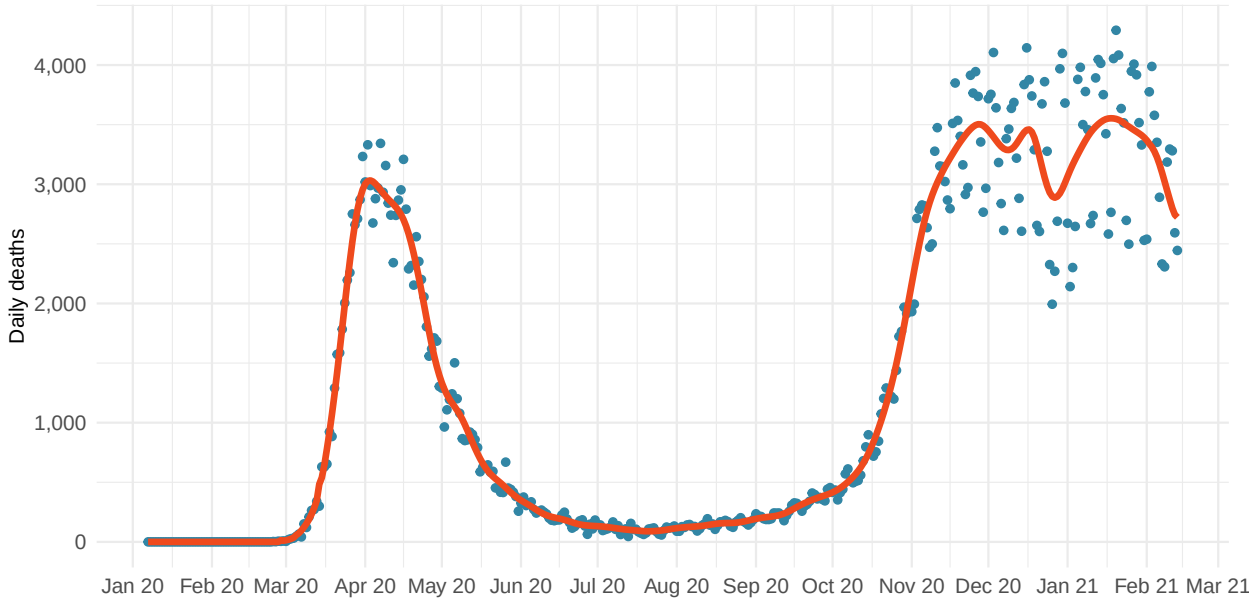


Figure 3. Daily COVID-19 death rate per 1 million on February 16, 2021

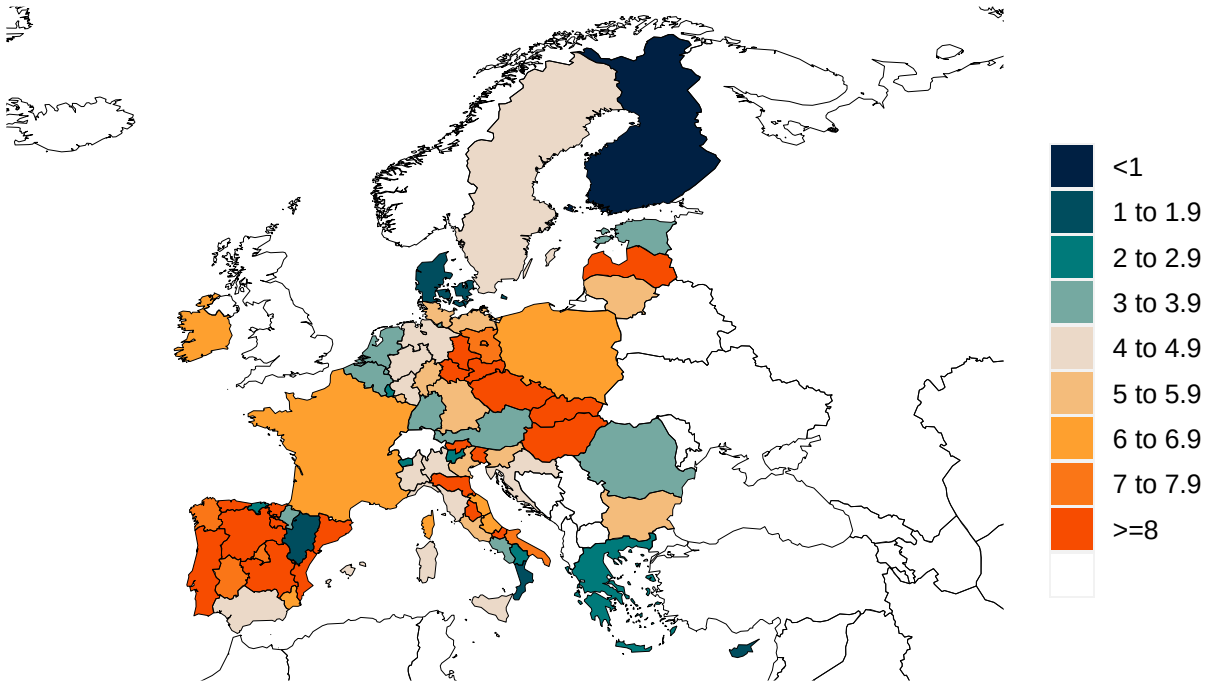


Figure 4. Estimated percent of the population infected with COVID-19 on February 16, 2021

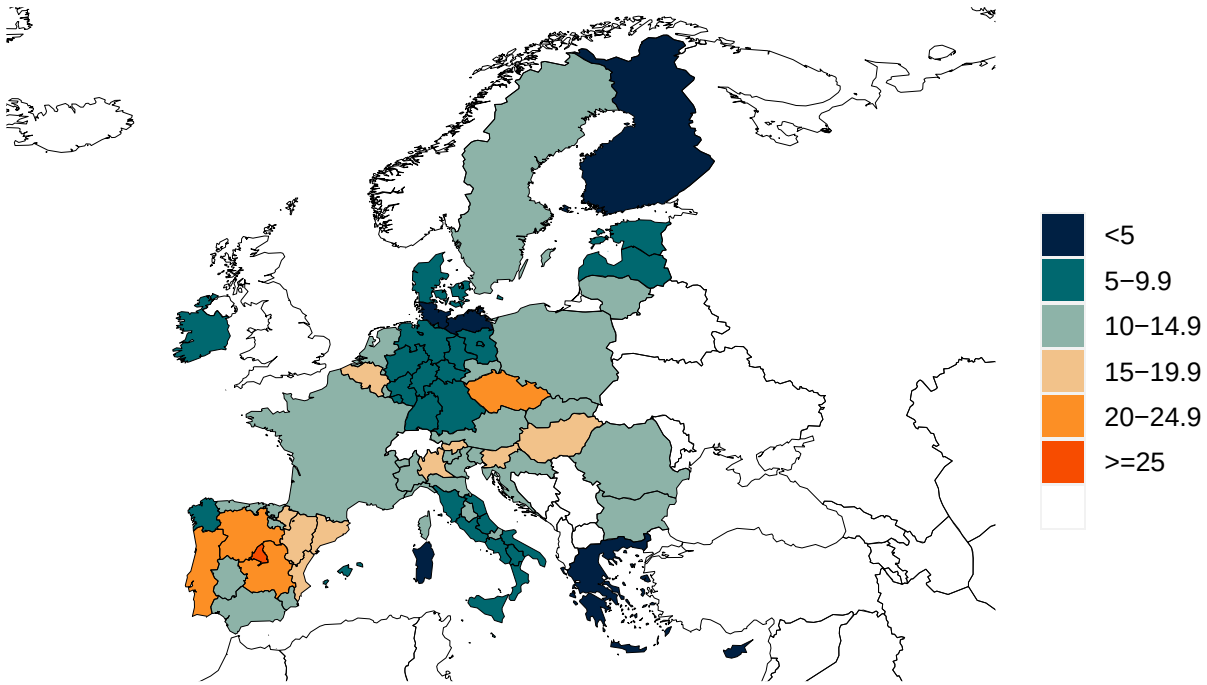


Figure 5. Mean effective R on February 05, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline, all other things being held the same.

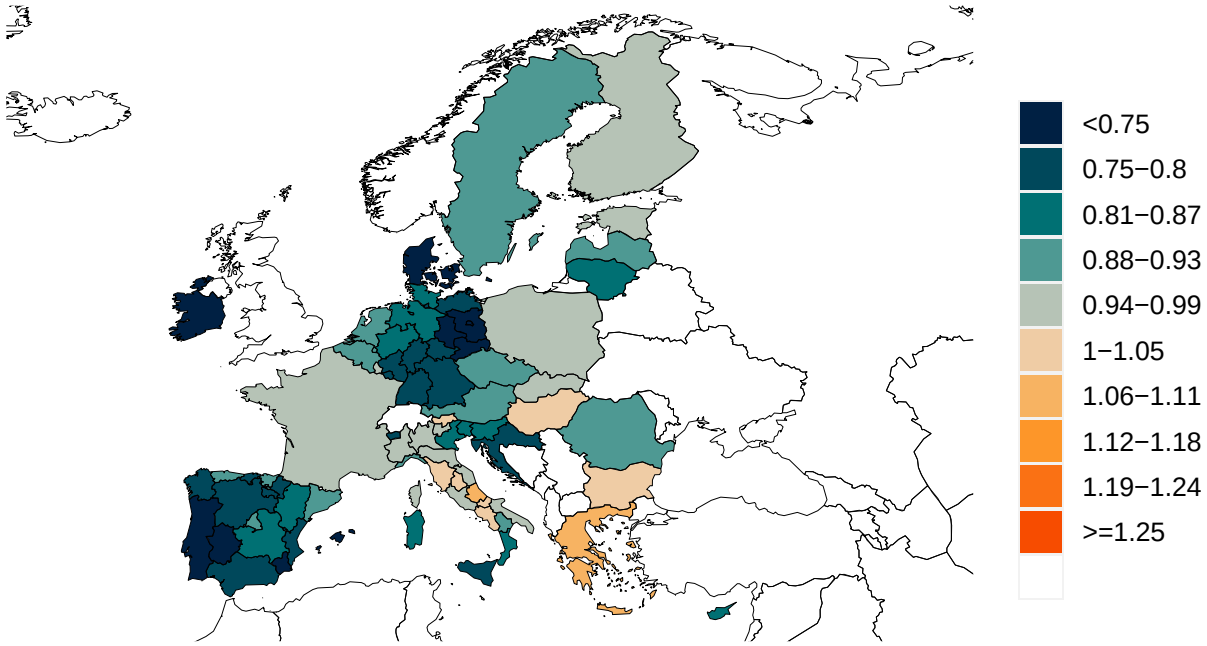
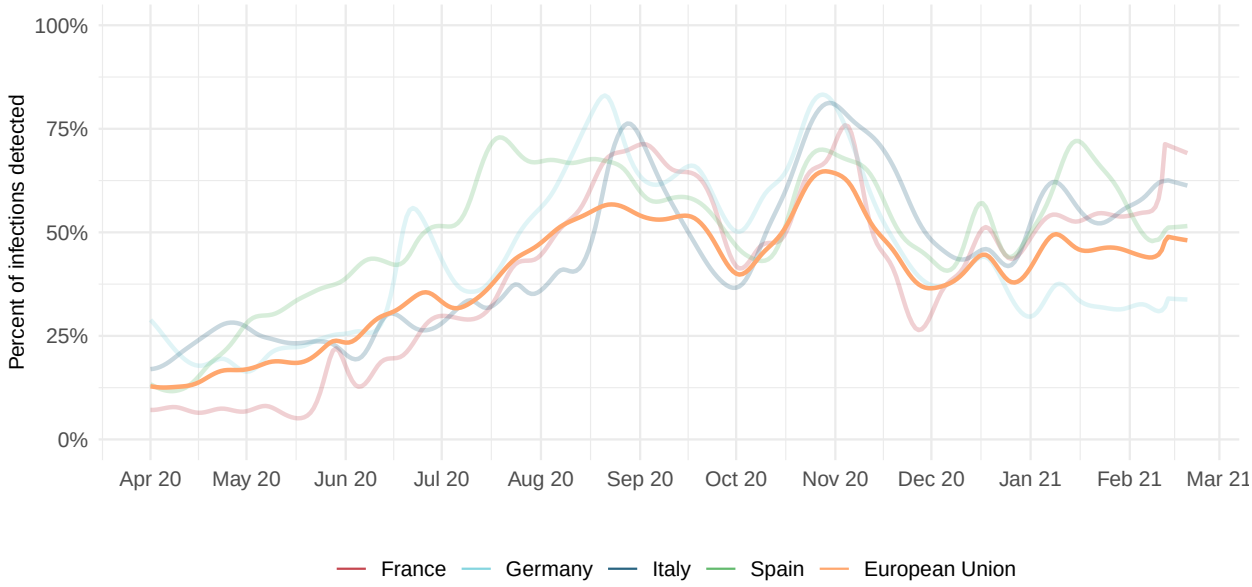


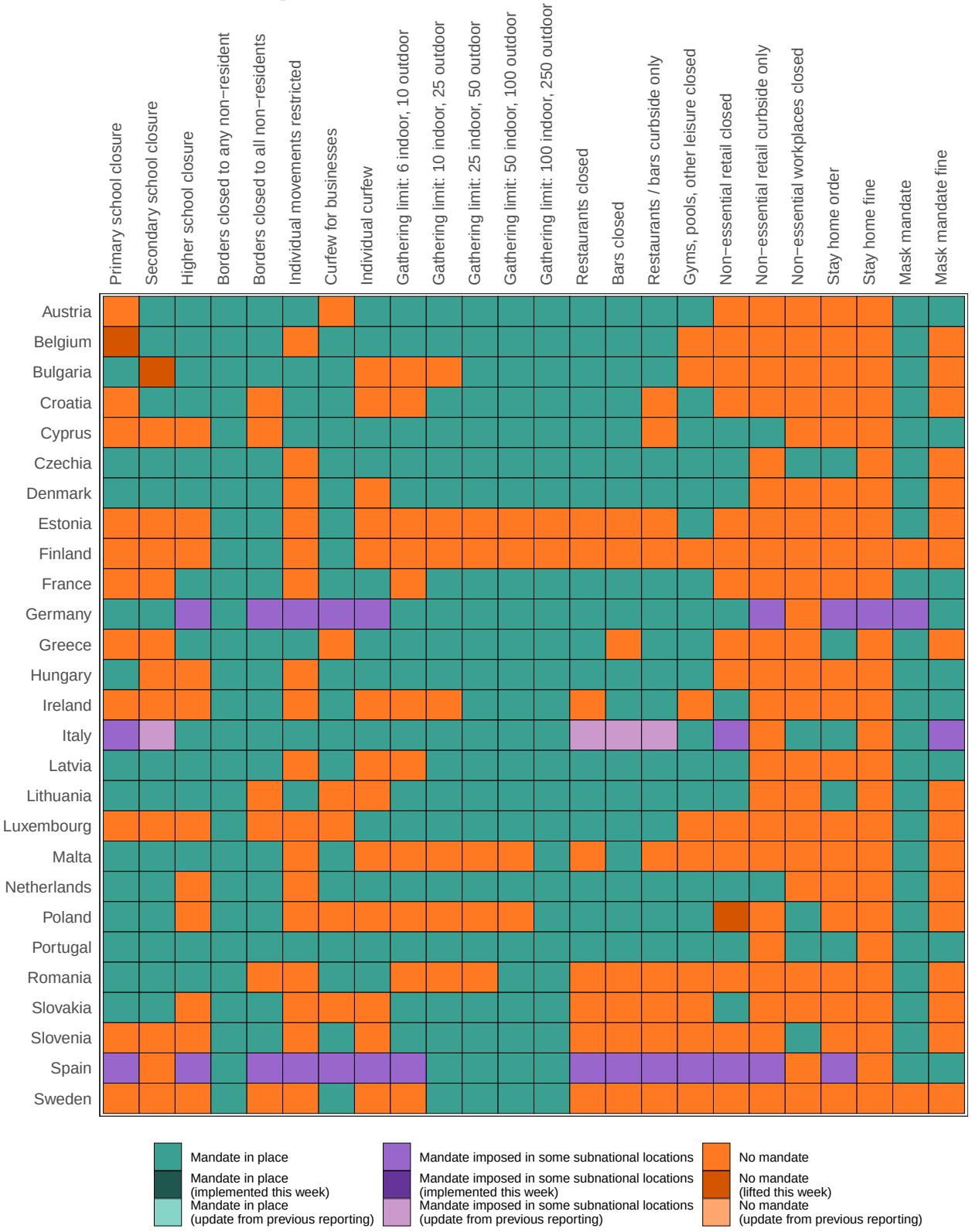
Figure 6. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model.



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

Critical drivers

Table 2. Current mandate implementation



*Not all locations are measured at the subnational level.

Figure 7. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

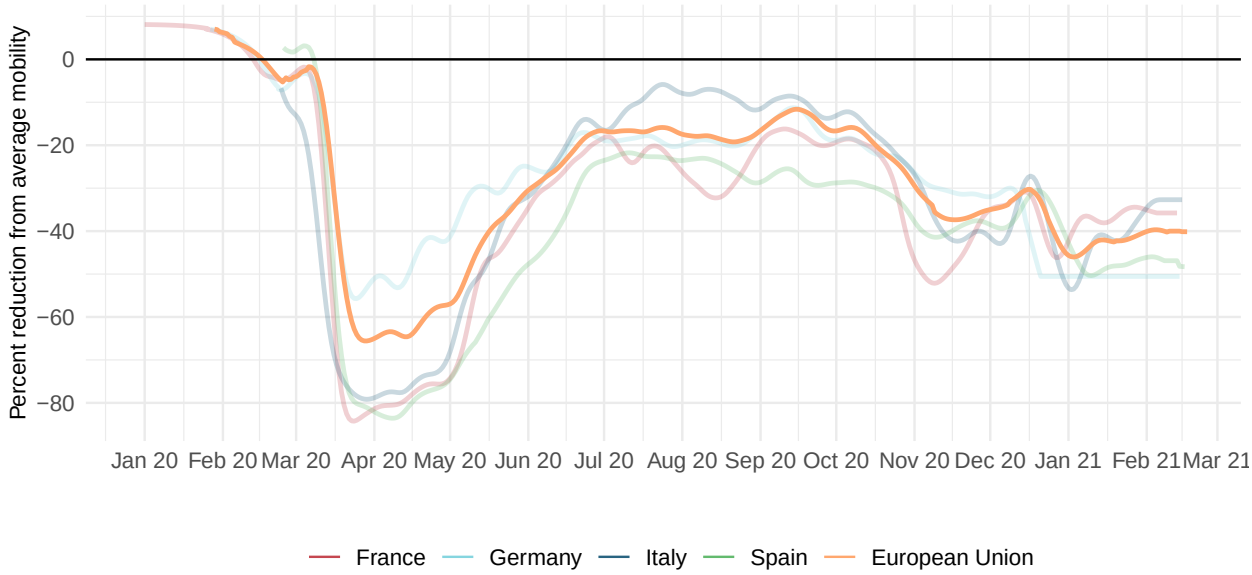


Figure 8. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on February 16, 2021

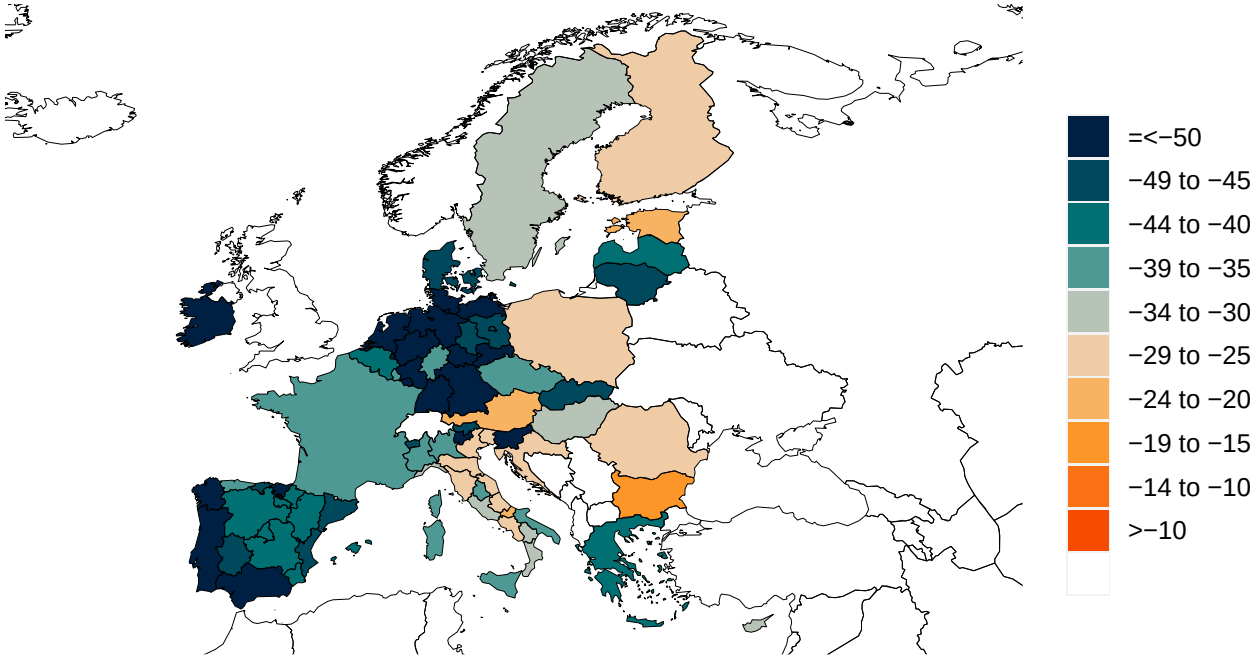


Figure 9. Trend in the proportion of the population reporting always wearing a mask when leaving home

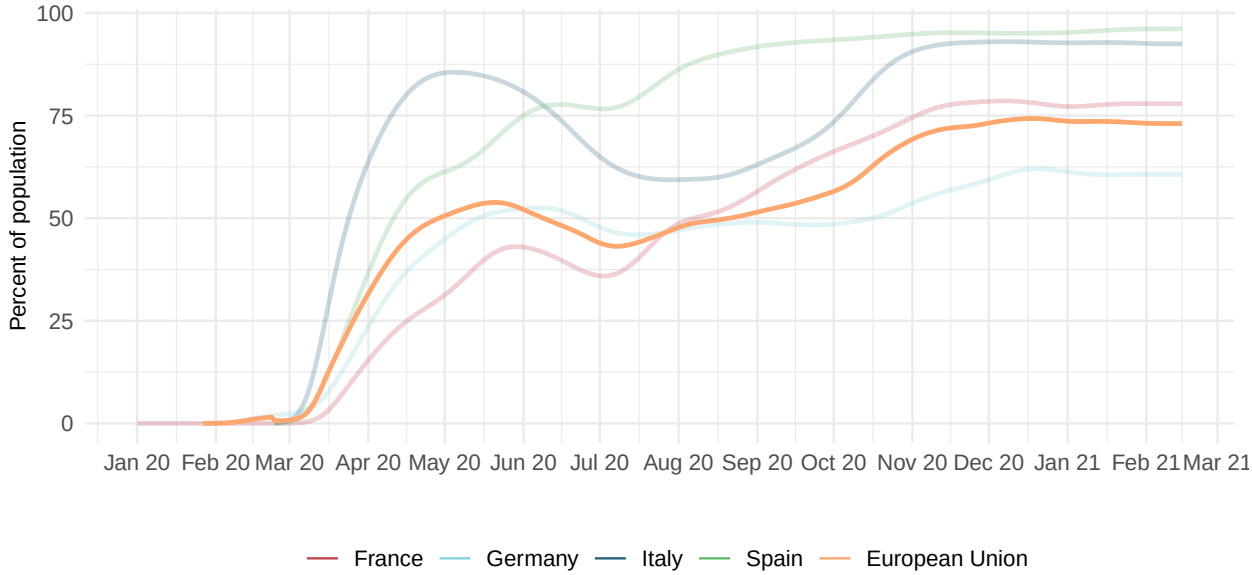


Figure 10. Proportion of the population reporting always wearing a mask when leaving home on February 16, 2021

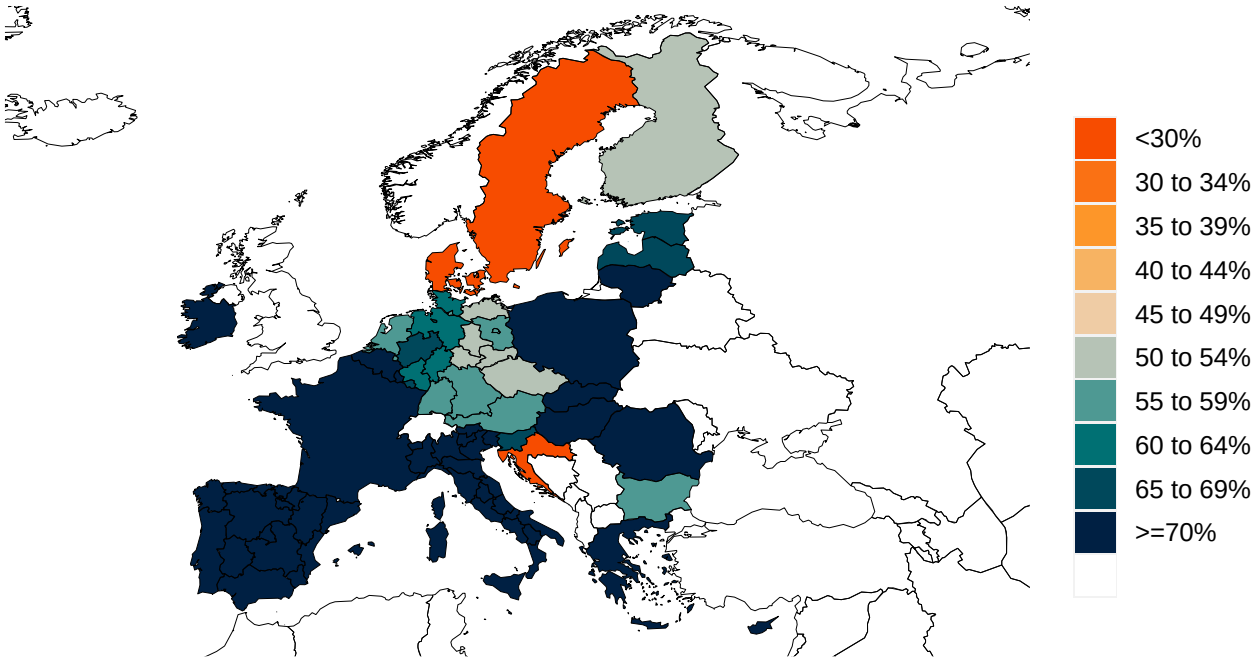


Figure 11. Trend in COVID-19 diagnostic tests per 100,000 people

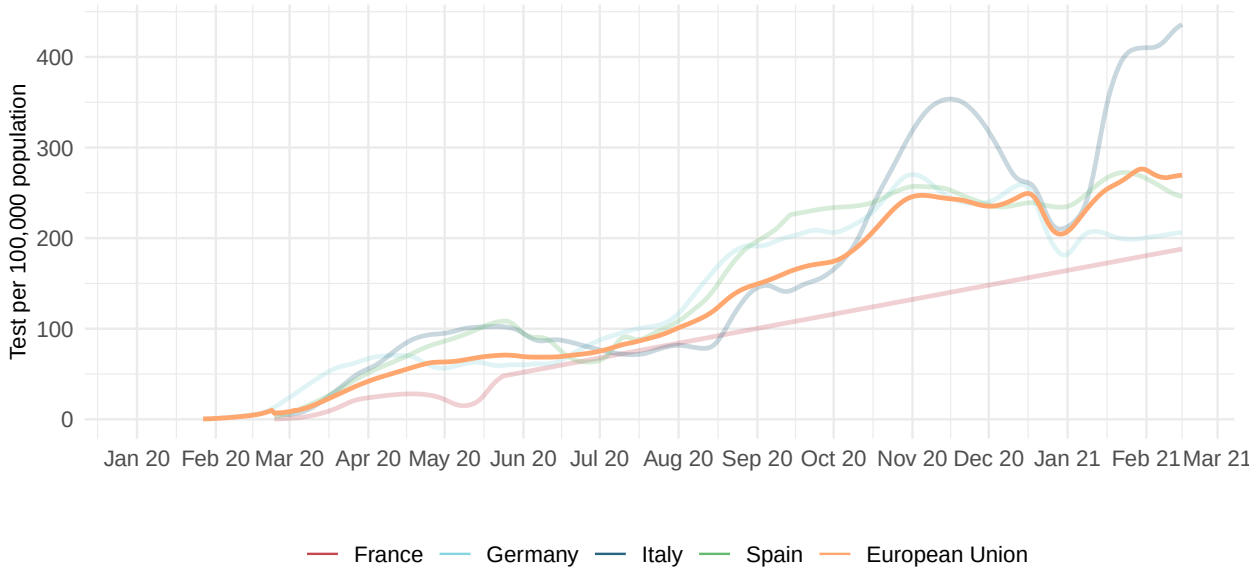


Figure 12. COVID-19 diagnostic tests per 100,000 people on February 16, 2021

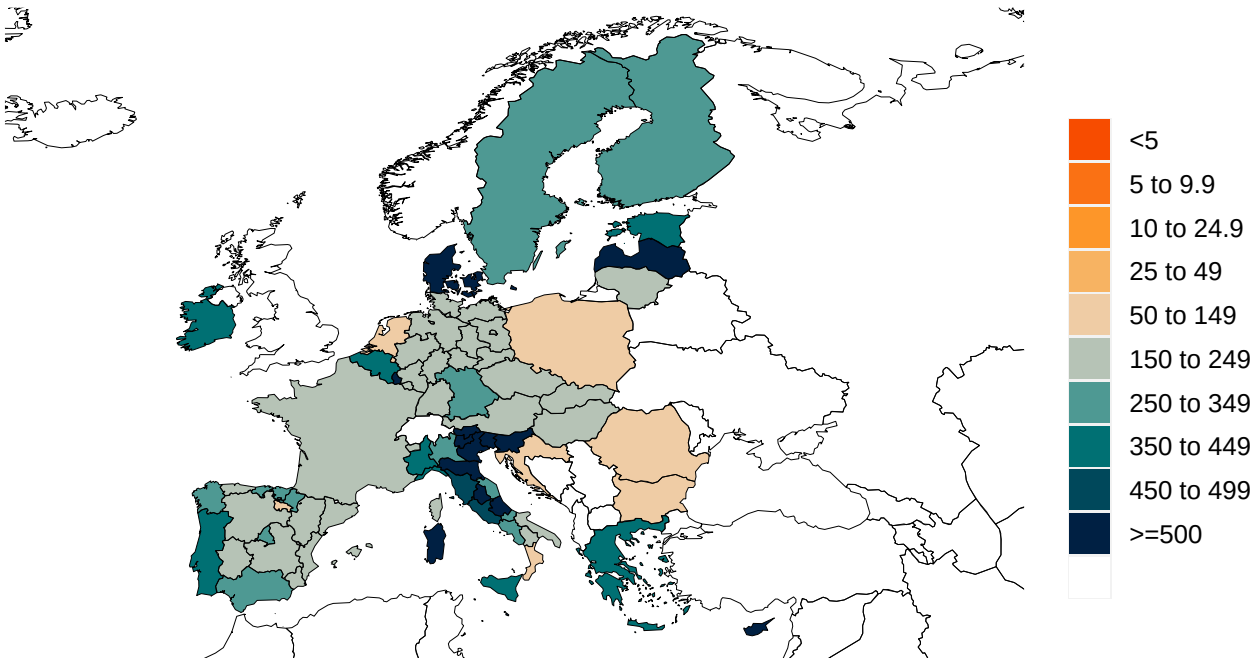


Figure 13. Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020

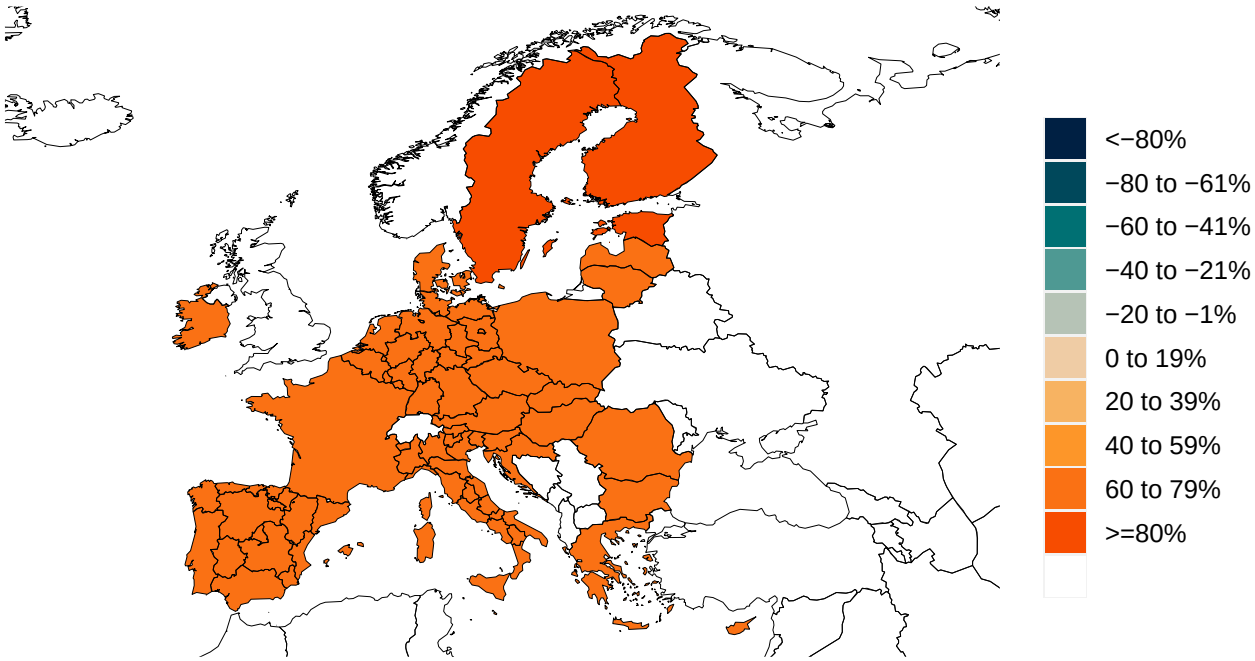


Figure 14. This figure shows the estimated proportion of the adult (18+) population that is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

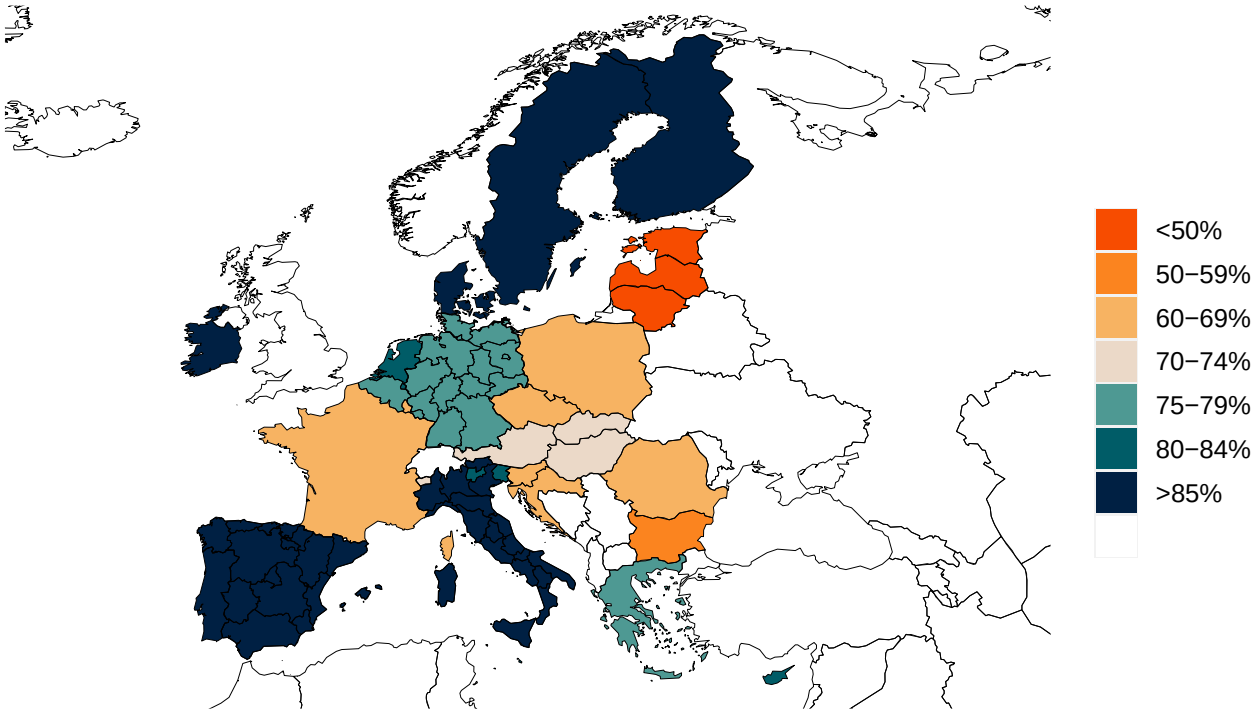
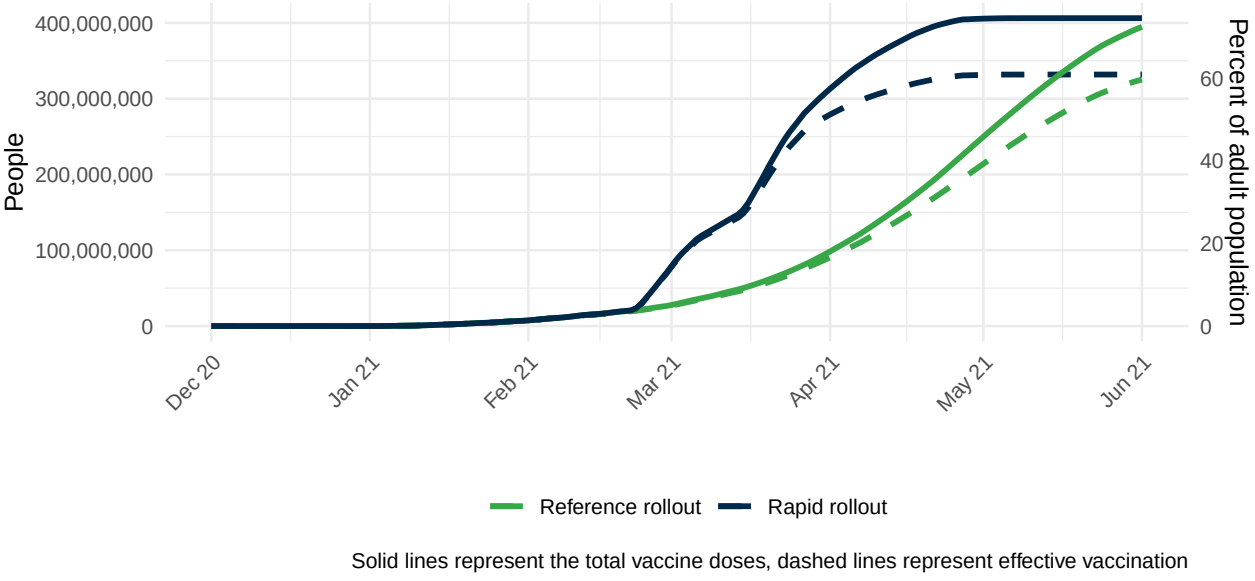


Figure 15. The number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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 two ways:

- First, it assumes that variants B.1.351 or P1 begin to spread within 2 weeks in all locations that do not already have B.1.351 or P1 community transmission.
- Second, it also assumes that all those vaccinated increase their mobility toward pre-COVID-19 levels.

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 16. Cumulative COVID-19 deaths until June 01, 2021 for three scenarios

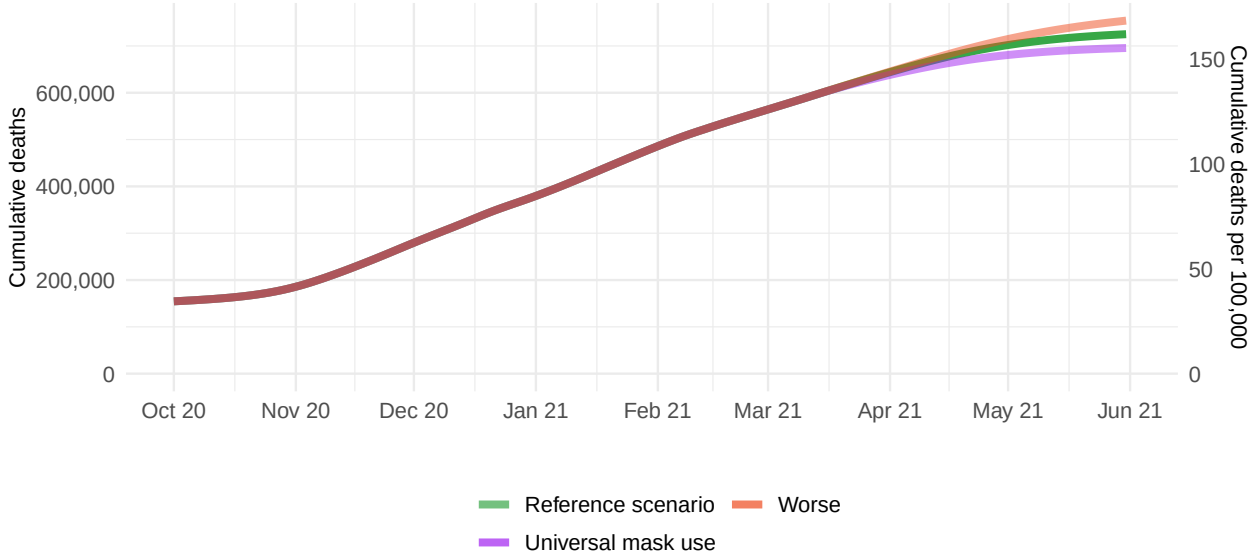


Figure 17. Daily COVID-19 deaths until June 01, 2021 for three scenarios

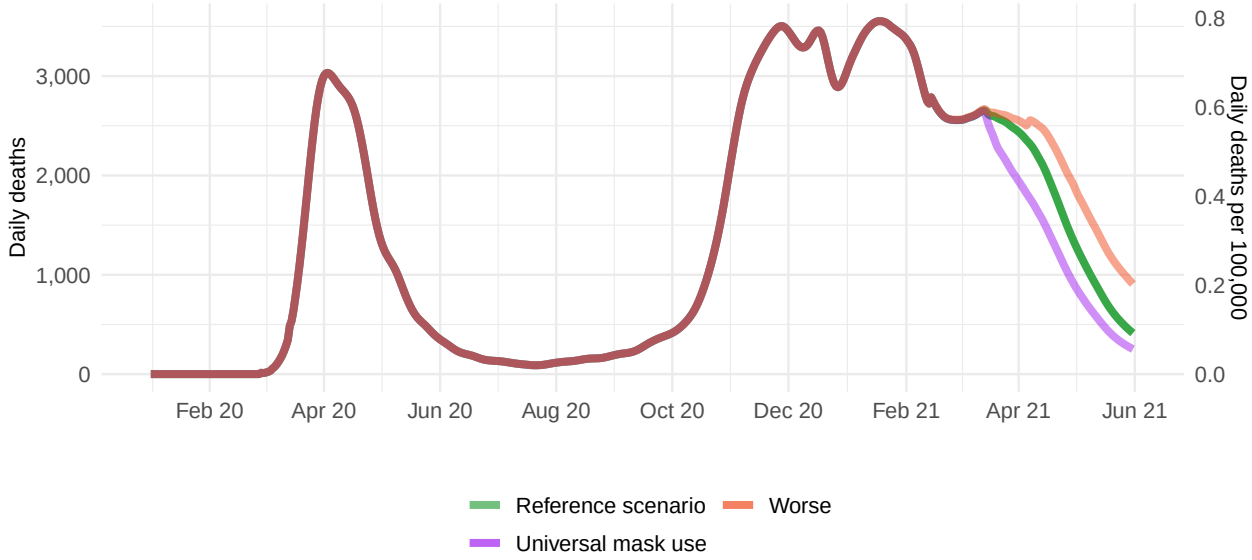


Figure 18. Daily COVID-19 infections until June 01, 2021 for three scenarios

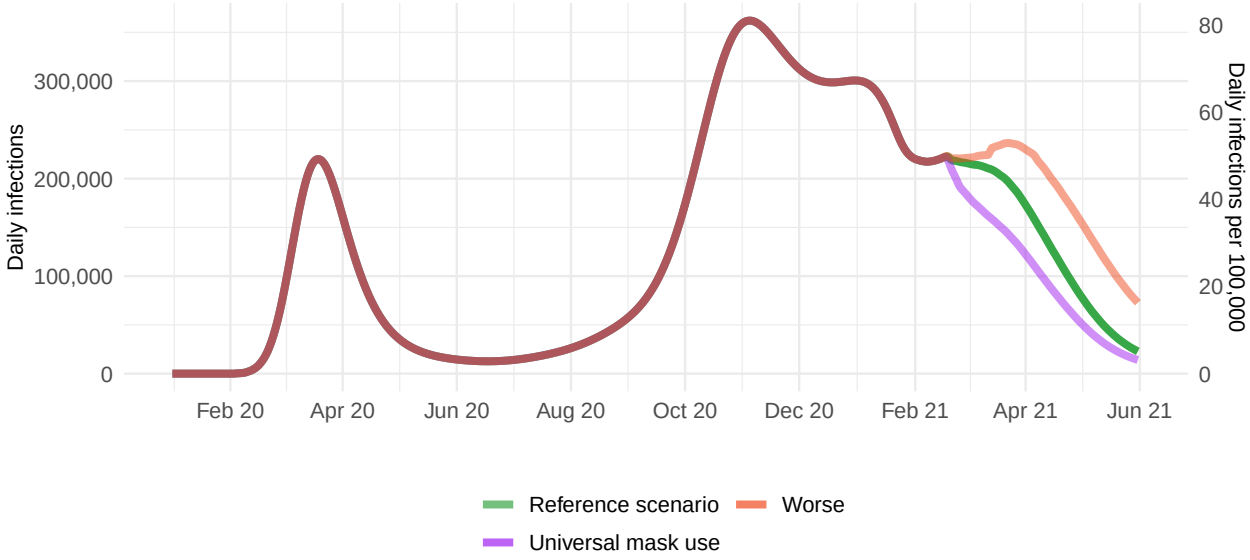


Figure 19. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachussets Institute of Technology (Delphi; https://www.covidanalytics.io/home), 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 availble locations in that region.

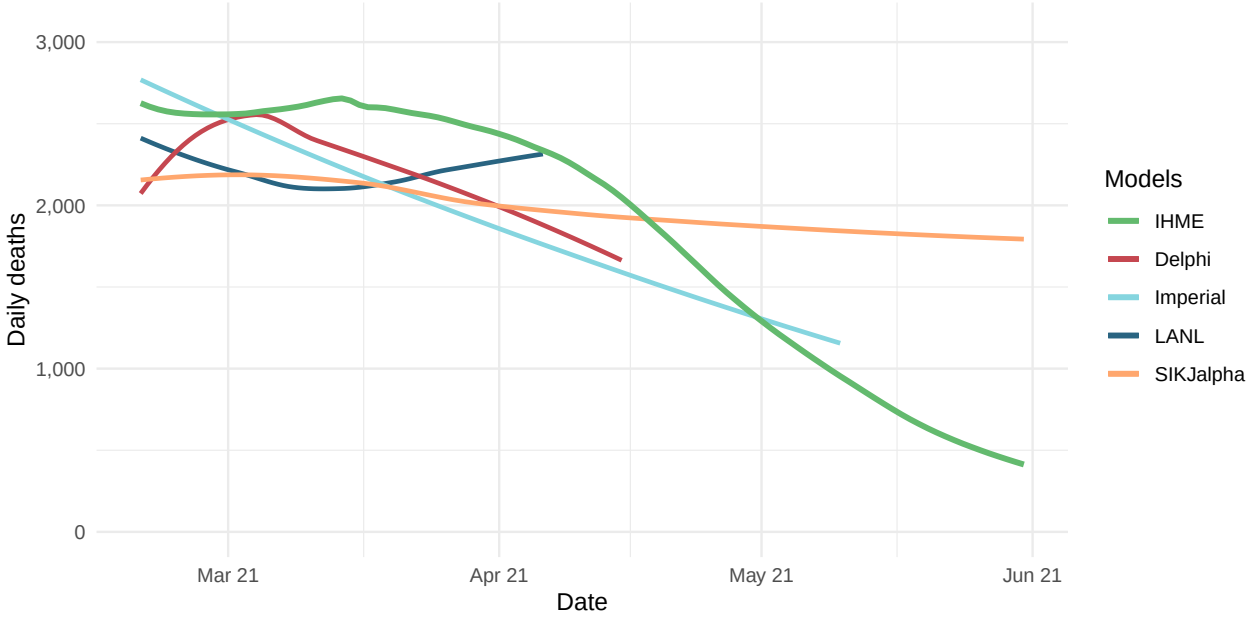


Figure 20. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate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

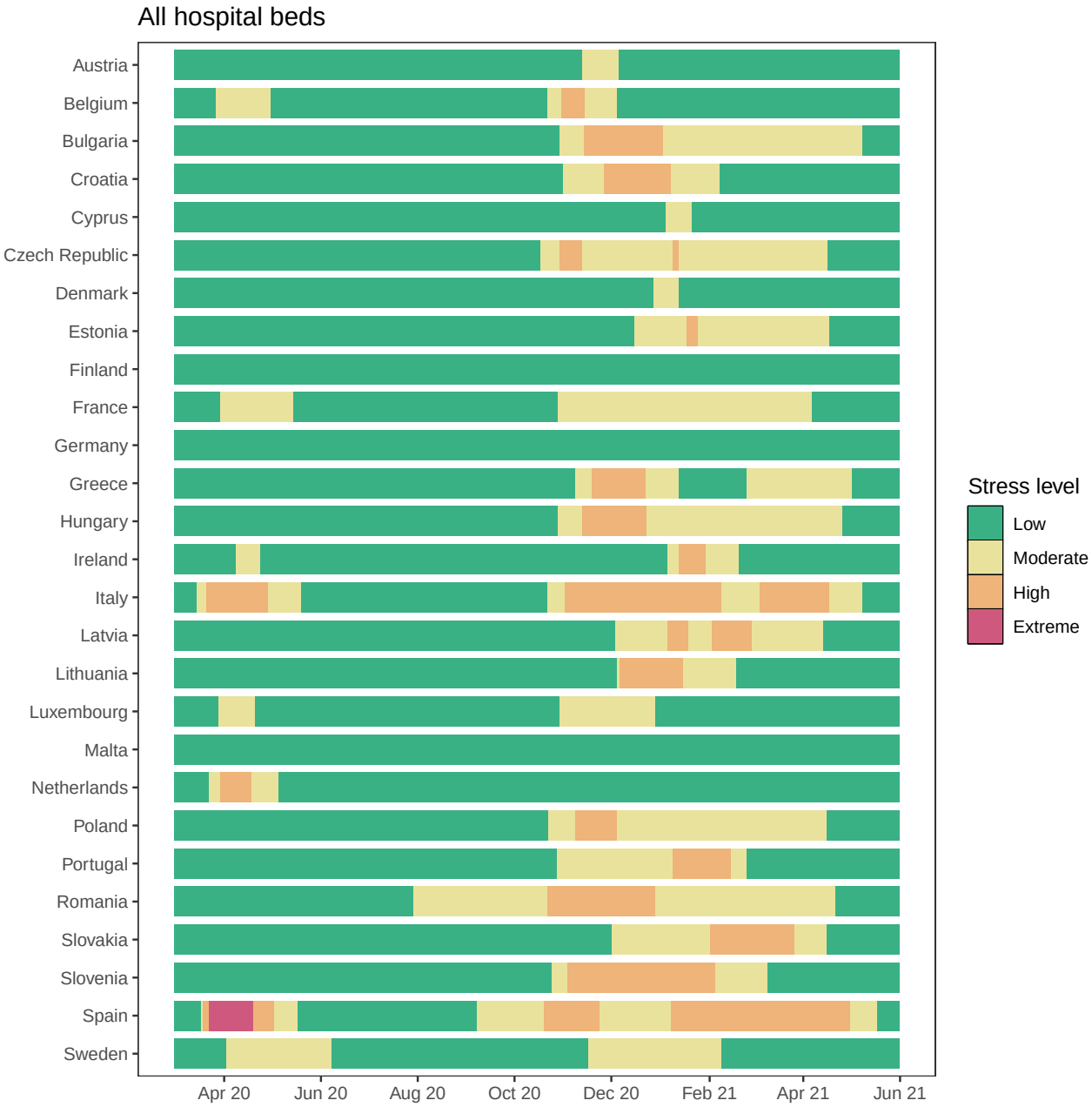
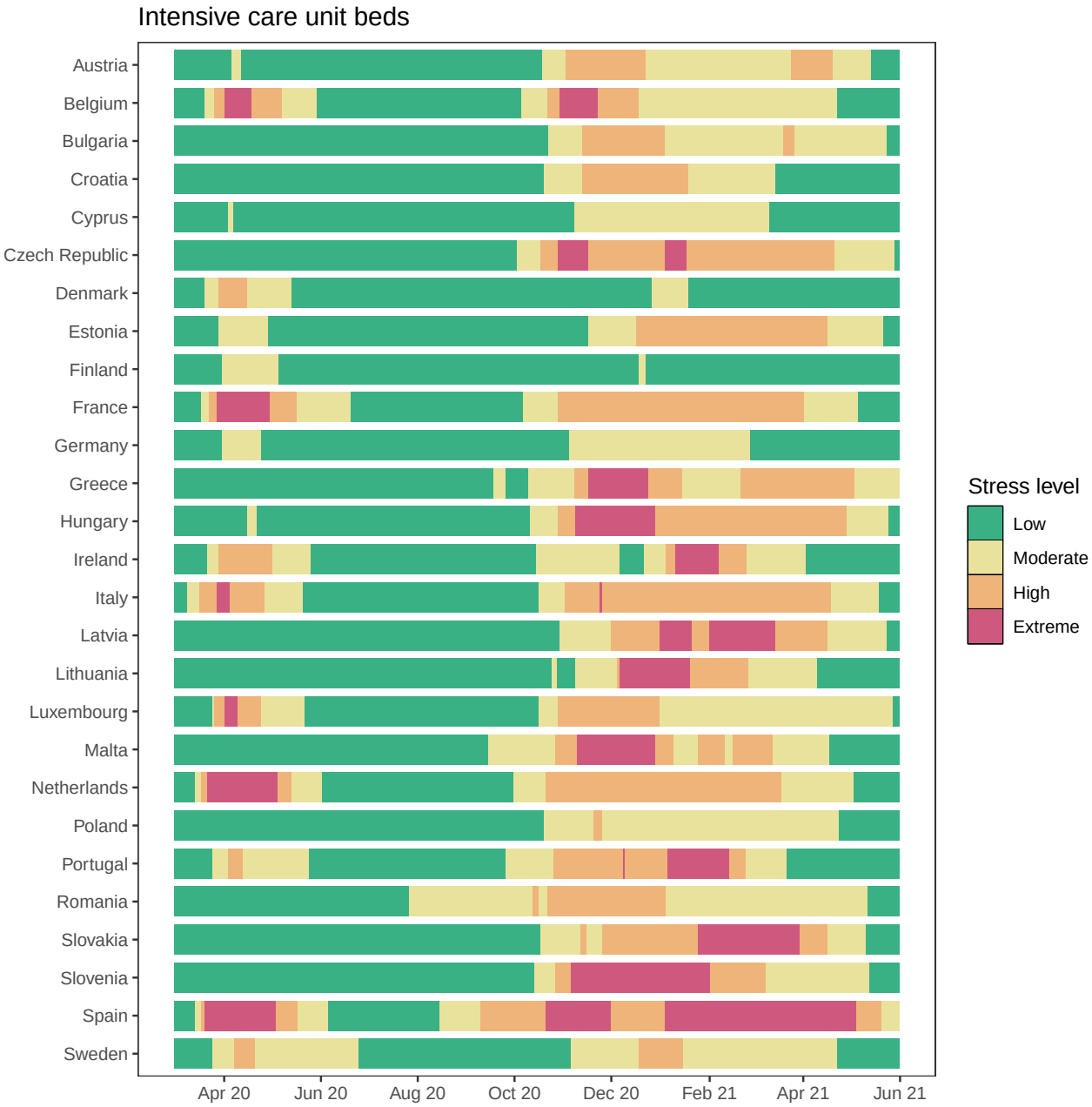


Figure 21. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *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/).

Data on vaccine candidates, stages of development, manufacturing capacity, and pre-purchasing agreements are primarily from Linksbridge and supplemented by Duke University.

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.