COVID-19 Results Briefing

The European Union

April 30, 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 April 30, 2021, with data through April 26, 2021.

Daily cases are declining, and deaths are slowly following this trend. Transmission, however, is increasing in a number of countries, including Ireland, Spain, Germany, Slovenia, Croatia, Lithuania, Latvia, and Cyprus. Our reference scenario suggests that increasing vaccination, declining seasonality, and slow lifting of mandates will be enough to keep daily deaths declining at least through to August 1. These strategies should eventually work in the countries and regions with increasing transmission. More rapid declines in mask use and returns to pre-COVID patterns of interaction could endanger this steady decline. Given the unprecedented increase in transmission in India, potentially linked to the variant B.1.617, it would be advisable to restrict travel from countries with this variant. Given the West-East gradient in mask use, mobility, and vaccine confidence, the prospect for continued transmission and a longer period of sustained transmission is greater in countries such as Bulgaria, Romania, or Slovakia. Likewise, the probability of a winter surge this year is greater in these countries for the same reasons.

Current situation

- Daily reported cases in the last week decreased to 122,800 per day on average compared to 141,700 the week before (Figure 1).
- Daily deaths in the last week decreased to 2,300 per day on average compared to 2,600 the week before (Figure 2). COVID-19 remains the number 2 cause of death in the European Union this week (Table 1).
- The daily death rate is greater than 4 per million in 12 countries (Figure 3).
- We estimated that 21% of people in the European Union have been infected as of April 26 (Figure 4).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 39 countries or regions in Spain, Italy, and Germany (Figure 5).
- The infection-detection rate in the European Union was close to 41% on April 26 (Figure 6).
- Based on the GISAID database and various national databases and our variant spread model, we estimate the current prevalence of key variants (Figure 7). B.1.1.7 is the dominant variant in nearly all countries in the EU. Countries continue to sequence B.1.351 and P1 and have reports of community transmission of these variants. But the prevalence of these escape variants has not increased in the presence of B.1.1.7.

Trends in drivers of transmission

- Some schooling mandates were lifted in Belgium and Poland. No new mandates were imposed. In general, the number of mandates in place compared to North America remains very high (Table 2).
- Mobility last week was 32% lower than the pre-COVID-19 baseline, reaching levels last seen in early January (Figure 9). There is a West-East gradient in mobility with higher mobility in the East.
- As of April 26, in Facebook surveys, 70% of people self-report that they always wore a mask when leaving their home (Figure 11). Mask use was lower than 50% in Austria, Croatia, Czechia, Denmark, and Sweden.
- There were 403 diagnostic tests per 100,000 people on April 26 (Figure 13).
- In the European Union, 79.9% of people say they would accept or would probably accept a vaccine for COVID-19. This is up by 1.6 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 27% in Latvia to 91% in Denmark (Figure 17).
- In our current reference scenario, we expect that 437 million will be vaccinated by August 1 (Figure 18). Vaccination should shift to being demand-constrained in late June.

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 765,000 cumulative deaths on August 1, 2021. This represents 79,000 additional deaths from April 26 to August 1 (Figure 19). Daily deaths are expected to decline steadily until August 1 (Figure 20).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 8,400 fewer cumulative deaths compared to the reference scenario on August 1, 2021 (Figure 19).
- Under our **worse scenario**, our model projects 786,000 cumulative deaths on August 1, 2021, an additional 21,000 deaths compared to our reference scenario (Figure 19). Daily deaths would reach 500 a day by August 1.
- By August 1, we project that 43,200 lives will be saved by the projected vaccine rollout.
- Daily infections in the reference scenario decline to below 50,000 by the beginning of June. In the worse scenario, daily infections stay above 50,000 by August 1 (Figure 21).
- Figure 22 compares our reference scenario forecasts to other publicly archived models. The Imperial model suggests daily deaths will increase beginning in mid-May, reaching over 3,000 by July. The other models suggest steady declines.

Model updates

There are no major updates in the model this week.

Figure 1. Reported daily COVID-19 cases

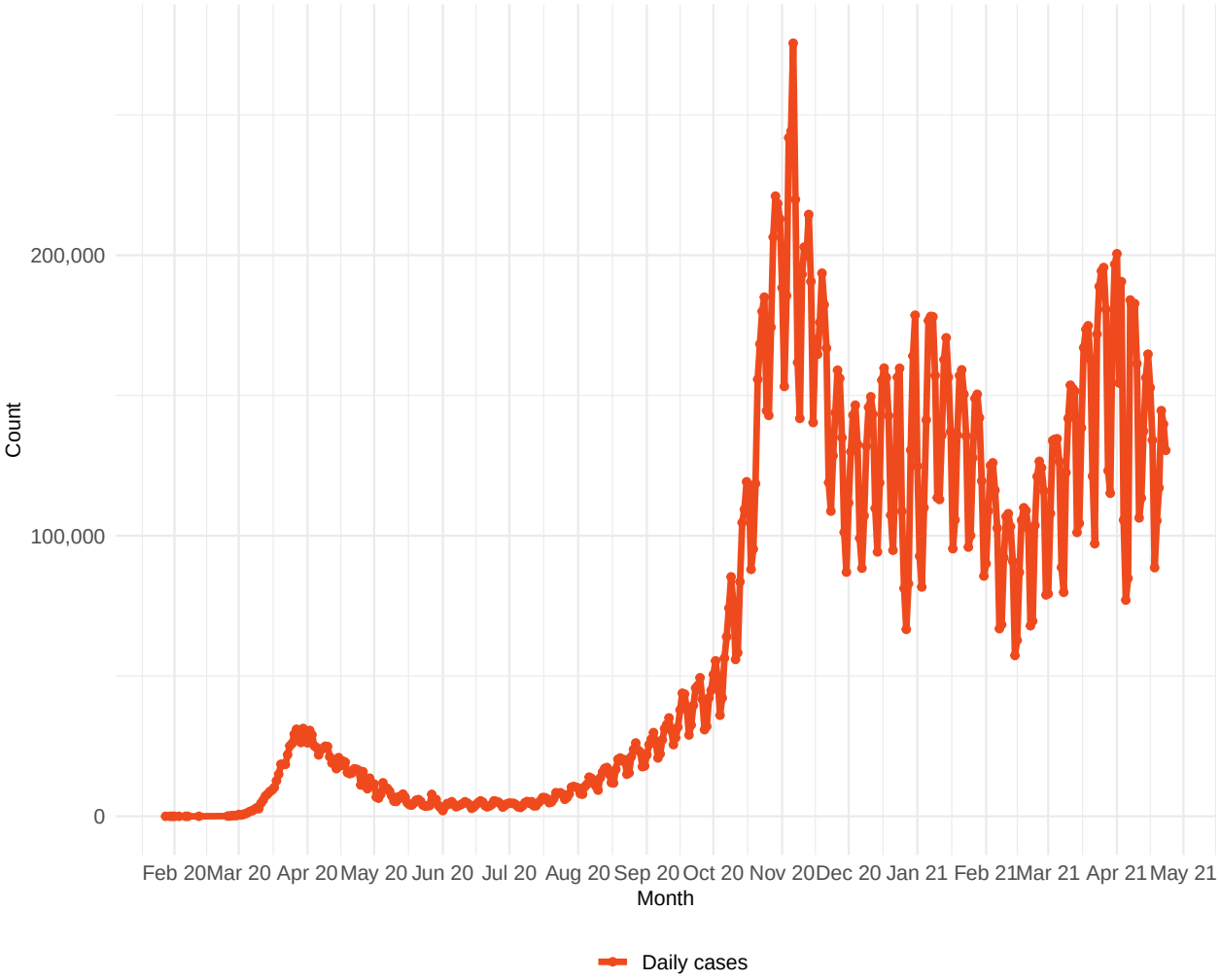


Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	18,714	1
COVID-19	16,191	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 and smoothed trend estimate.

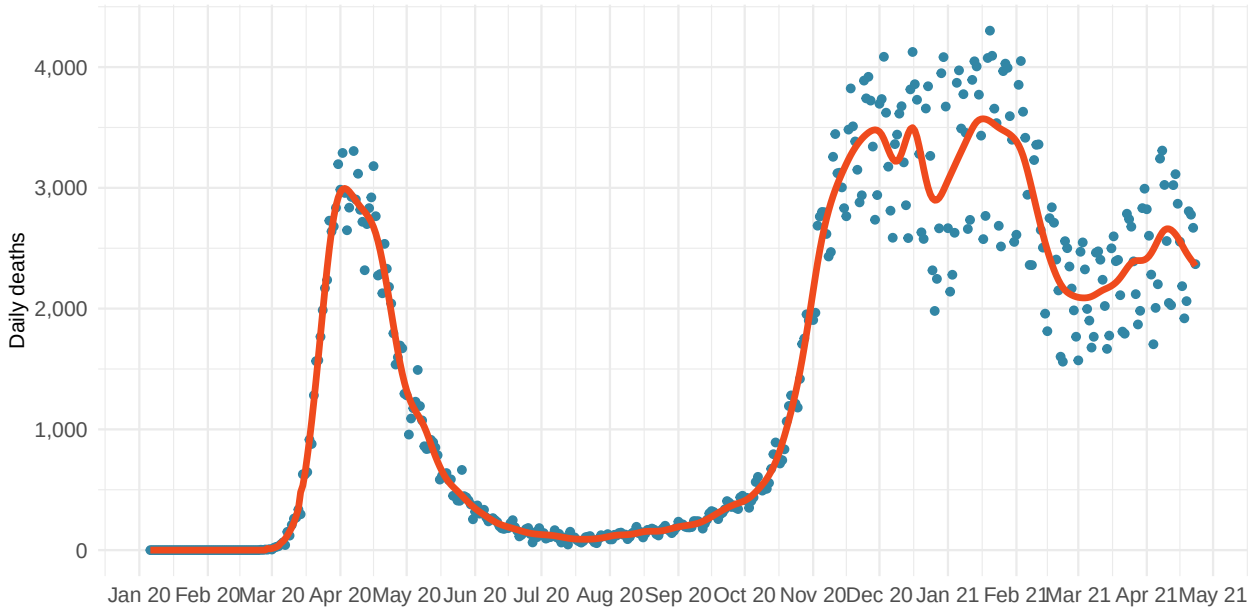


Figure 3. Daily COVID-19 death rate per 1 million on April 26, 2021

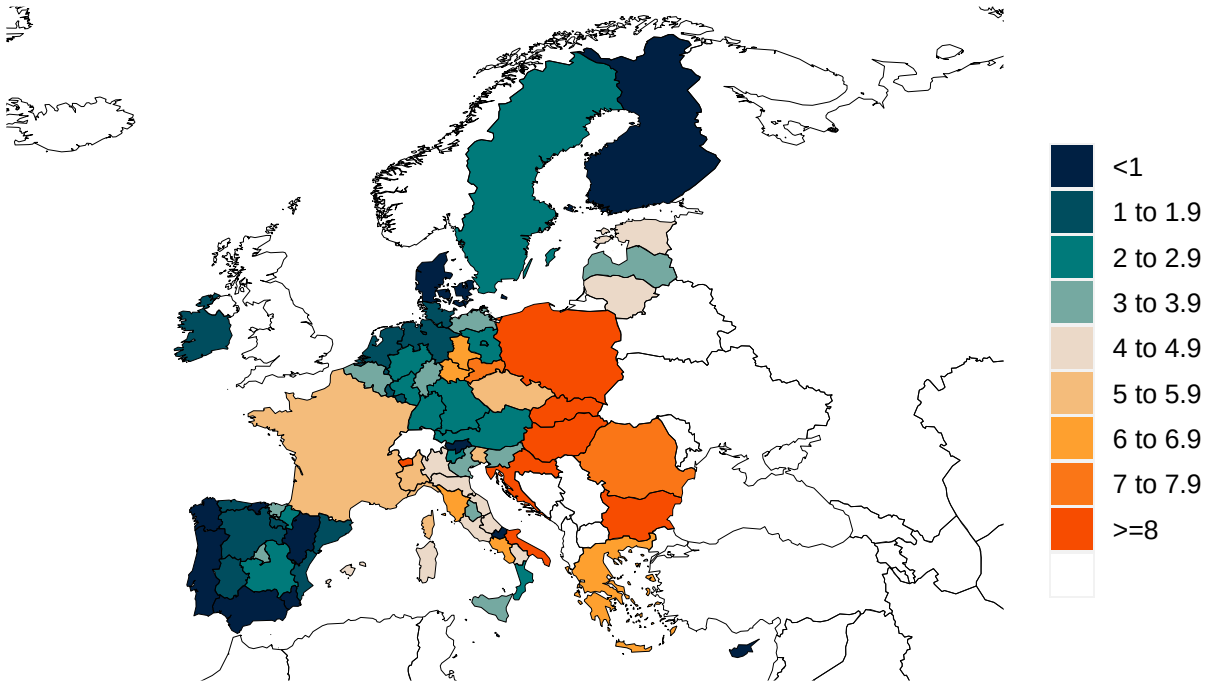


Figure 4. Estimated percent of the population infected with COVID-19 on April 26, 2021

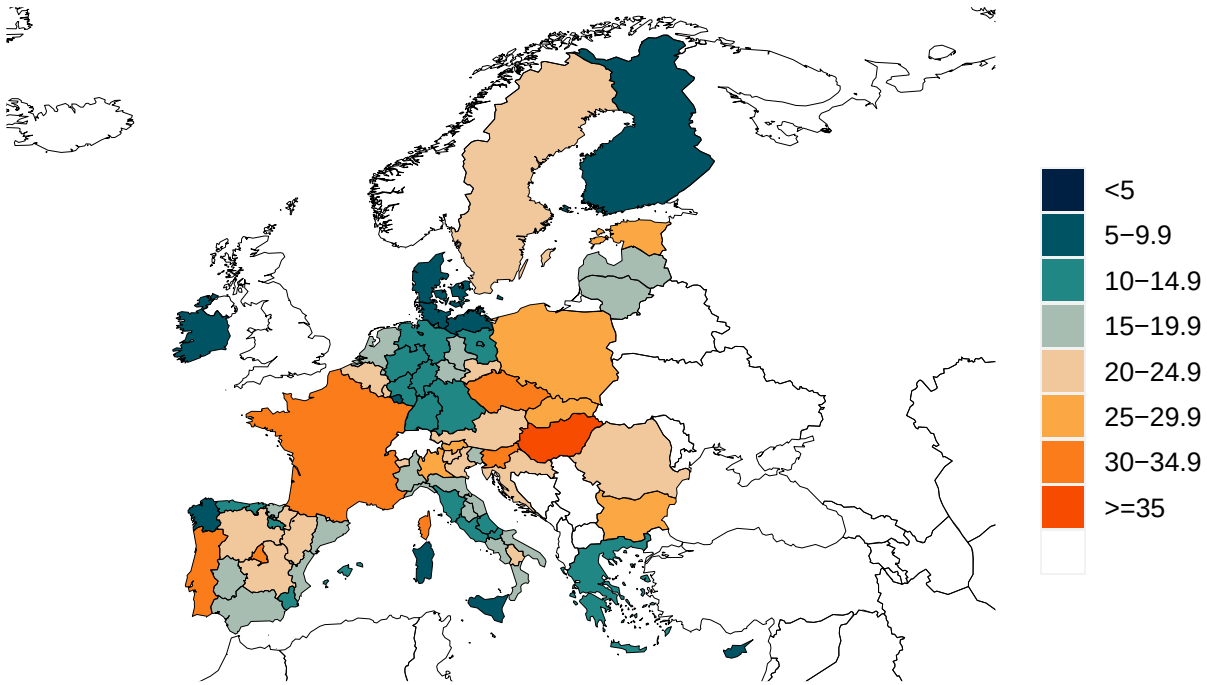


Figure 5. Mean effective R on April 15, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline, all other things being held the same.

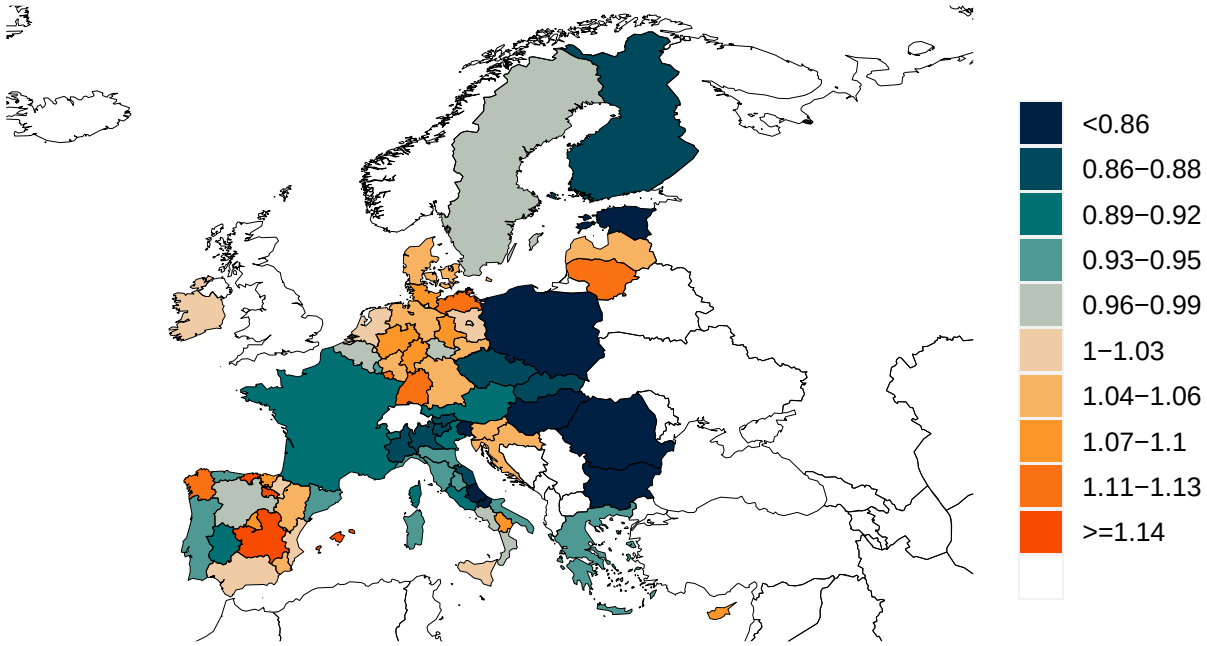
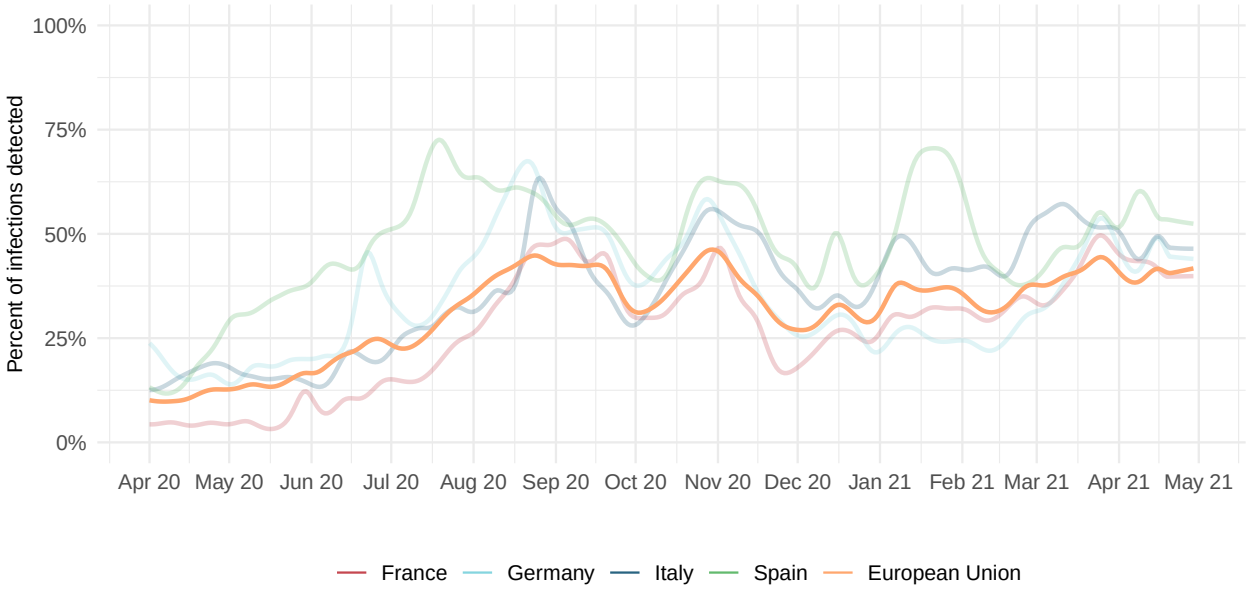


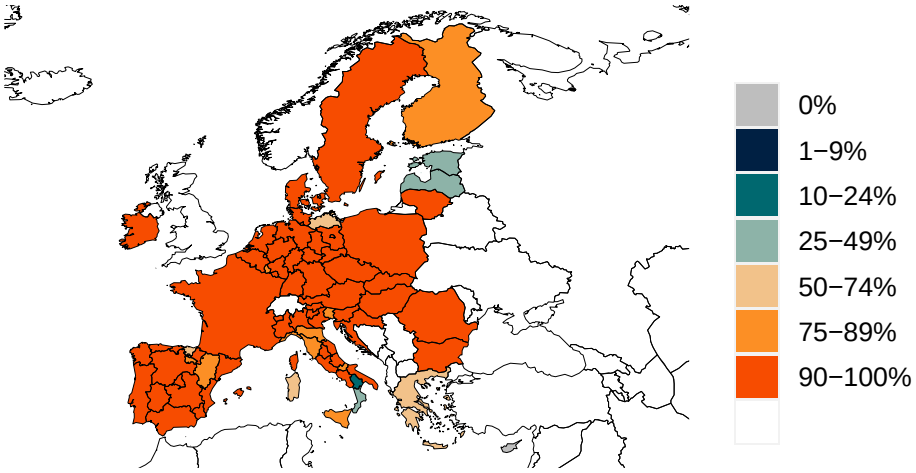
Figure 6. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model.



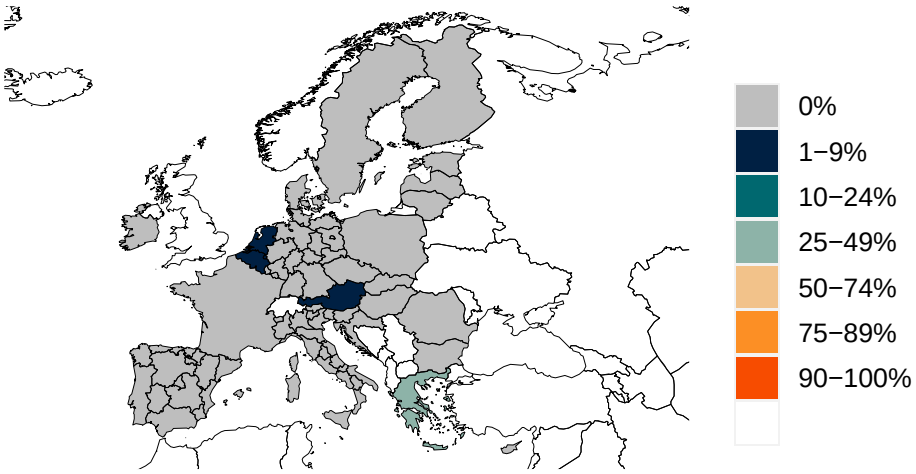
*Due to measurement errors in cases and testing rates, the infection to detection rate (IDR) can exceed 100% at particular points in time.

Figure 7. Percent of circulating SARS-CoV-2 for 3 primary variants on April 26, 2021.

A. Percent B.1.1.7 variant



B. Percent B.1.351 variant



C. Percent P1 variant

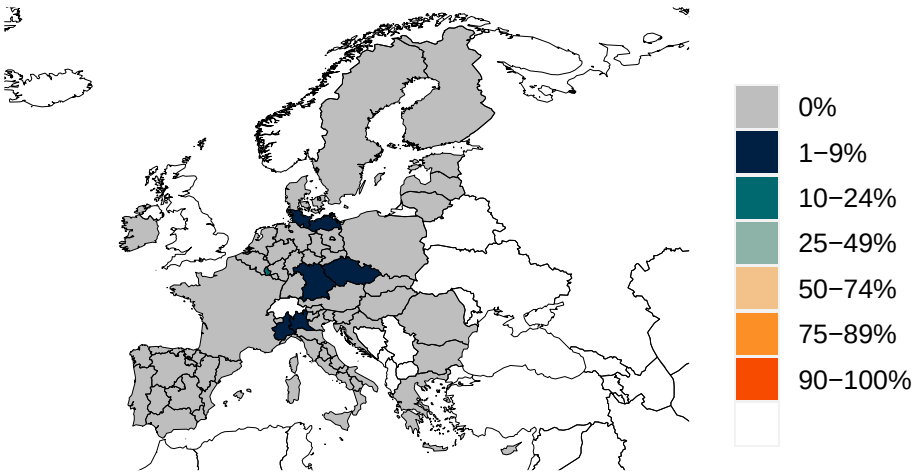
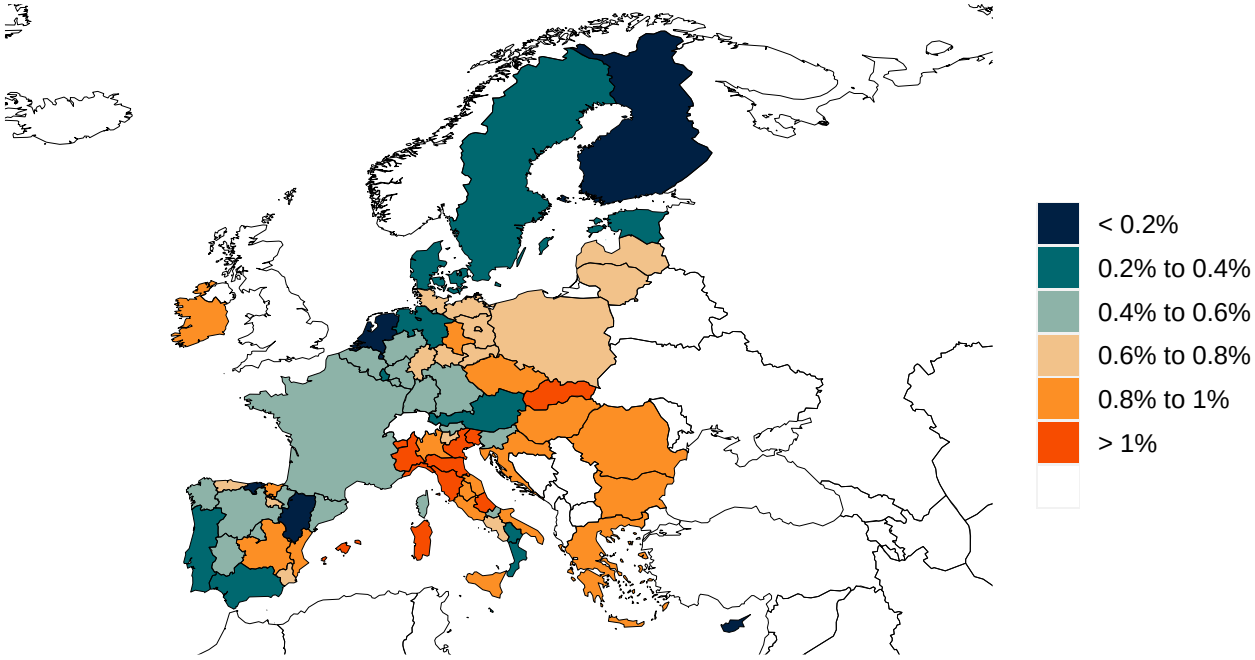
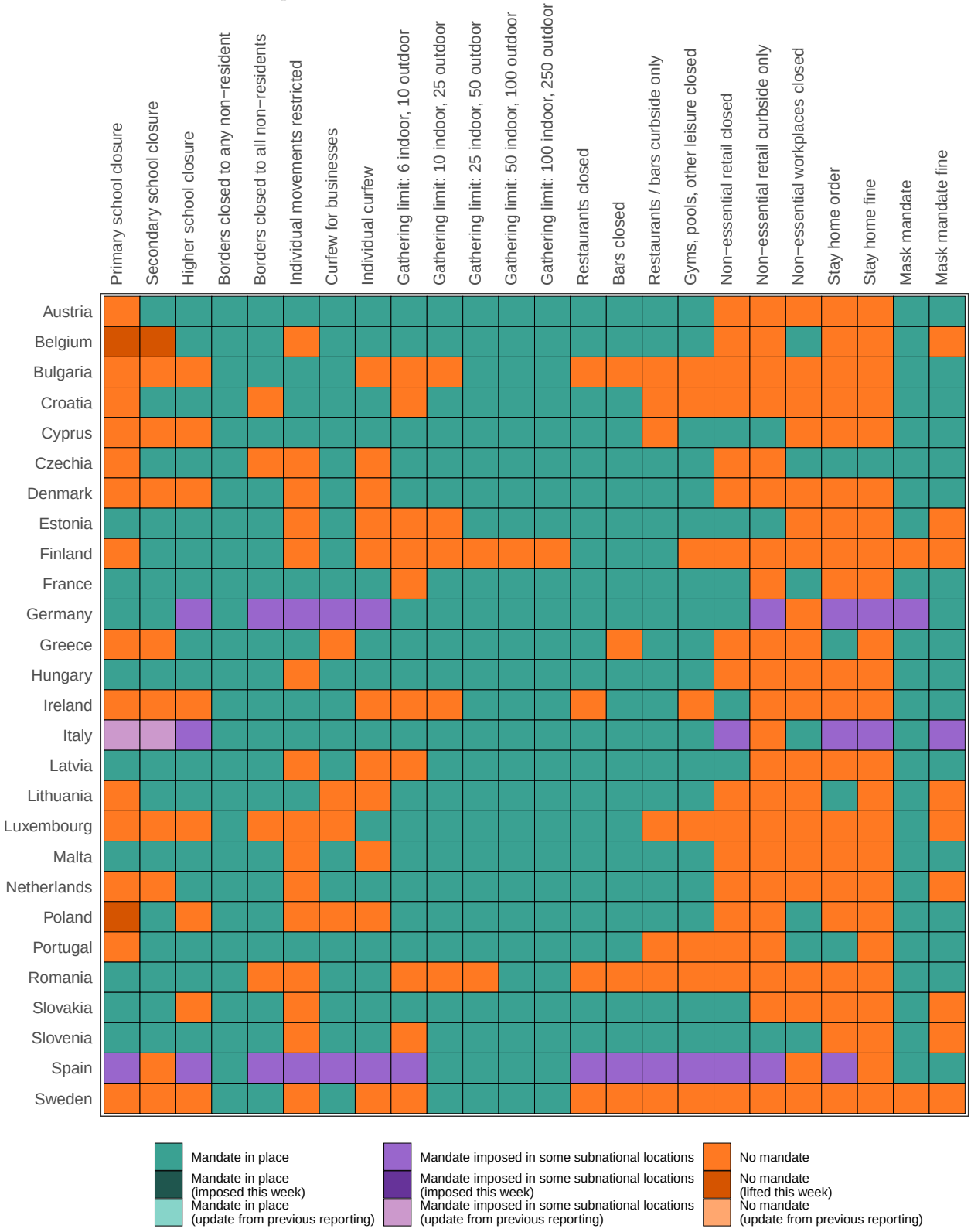


Figure 8. Infection fatality ratio on April 26, 2021. This is estimated as the ratio of COVID-19 deaths to infections based on the SEIR disease transmission model.



Critical drivers

Table 2. Current mandate implementation



*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

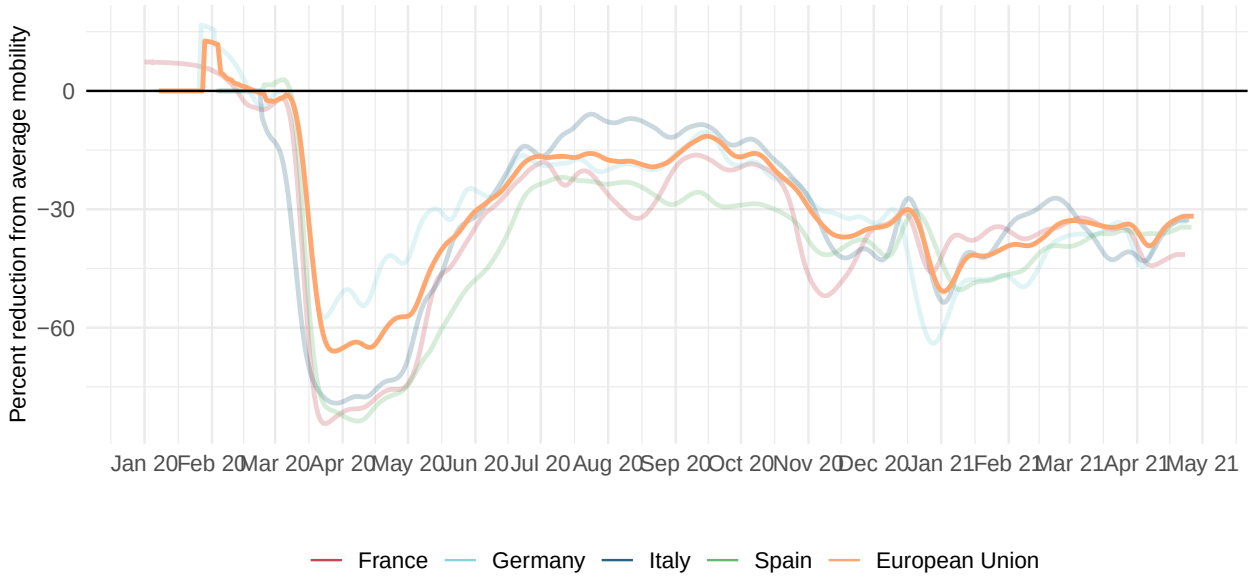


Figure 10. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on April 26, 2021

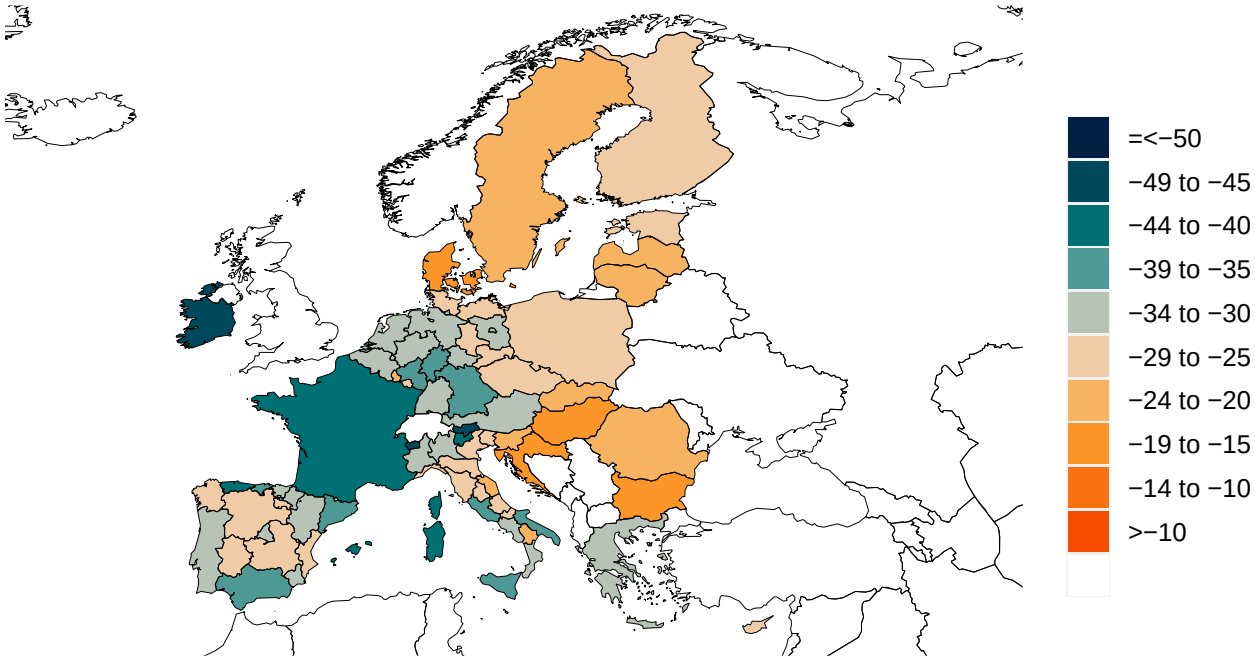


Figure 11. Trend in the proportion of the population reporting always wearing a mask when leaving home

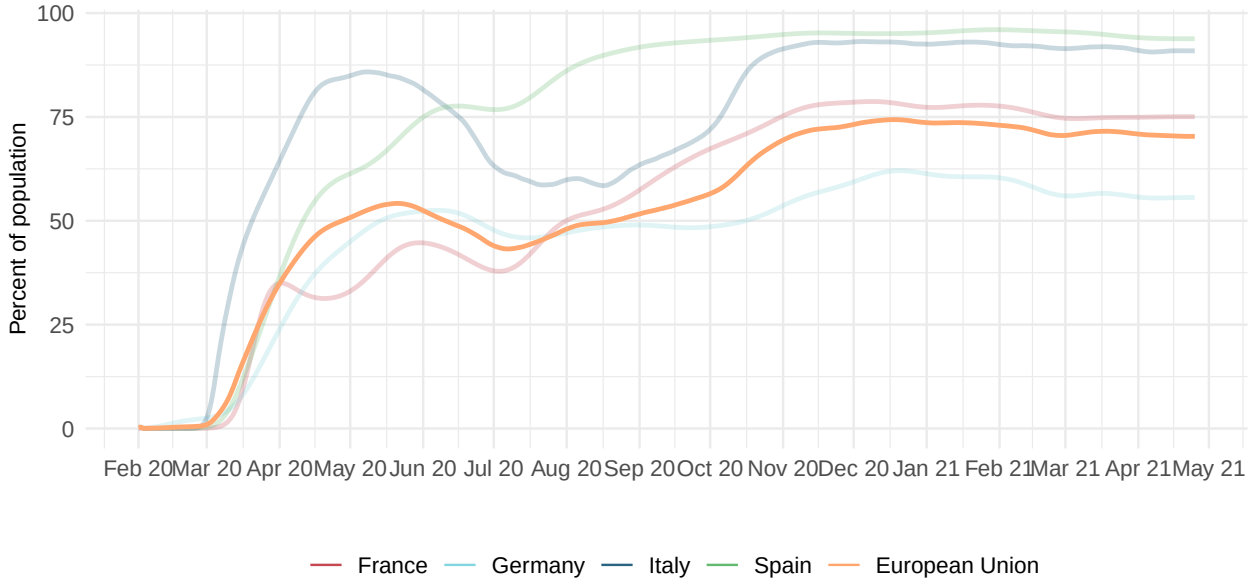


Figure 12. Proportion of the population reporting always wearing a mask when leaving home on April 26, 2021

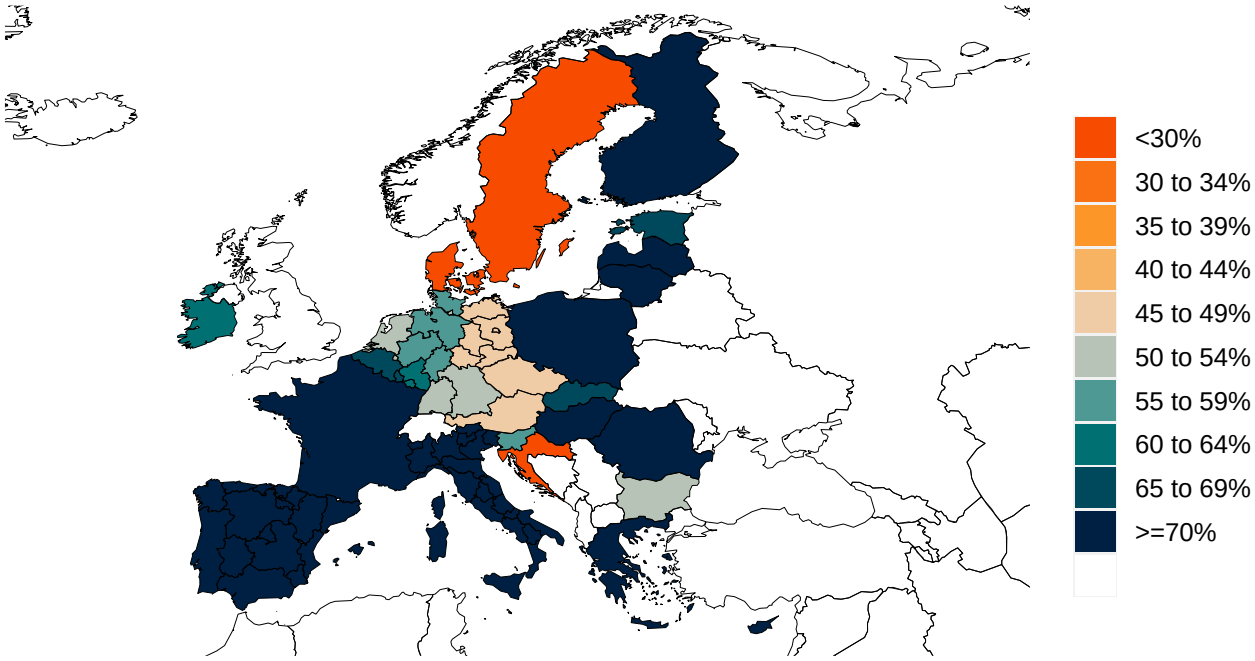


Figure 13. Trend in COVID-19 diagnostic tests per 100,000 people

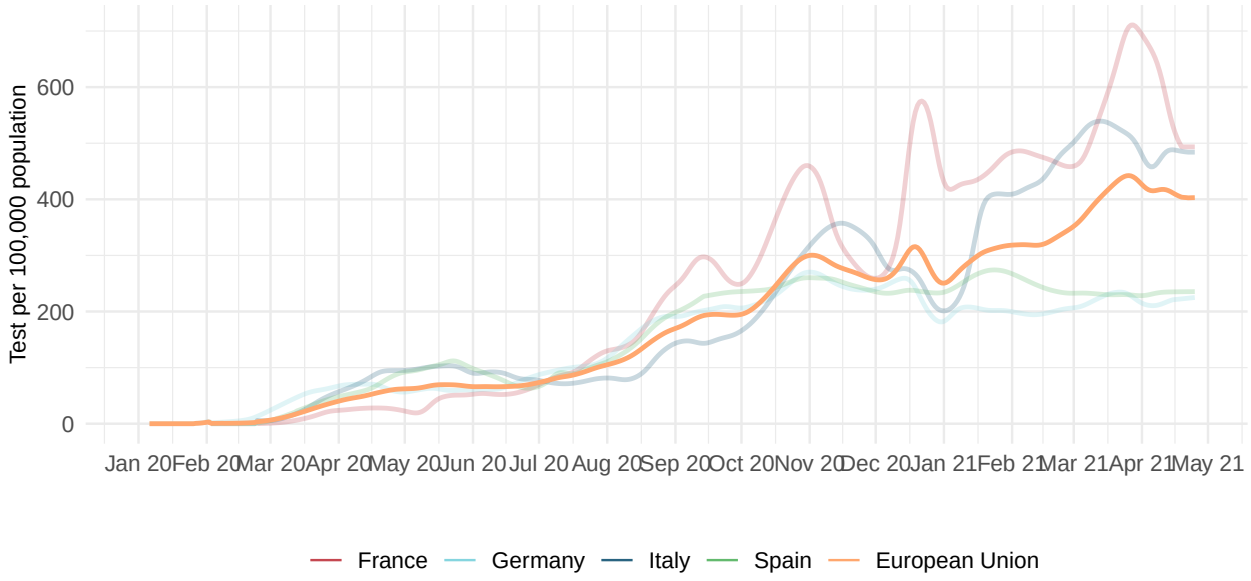


Figure 14. COVID-19 diagnostic tests per 100,000 people on April 22, 2021

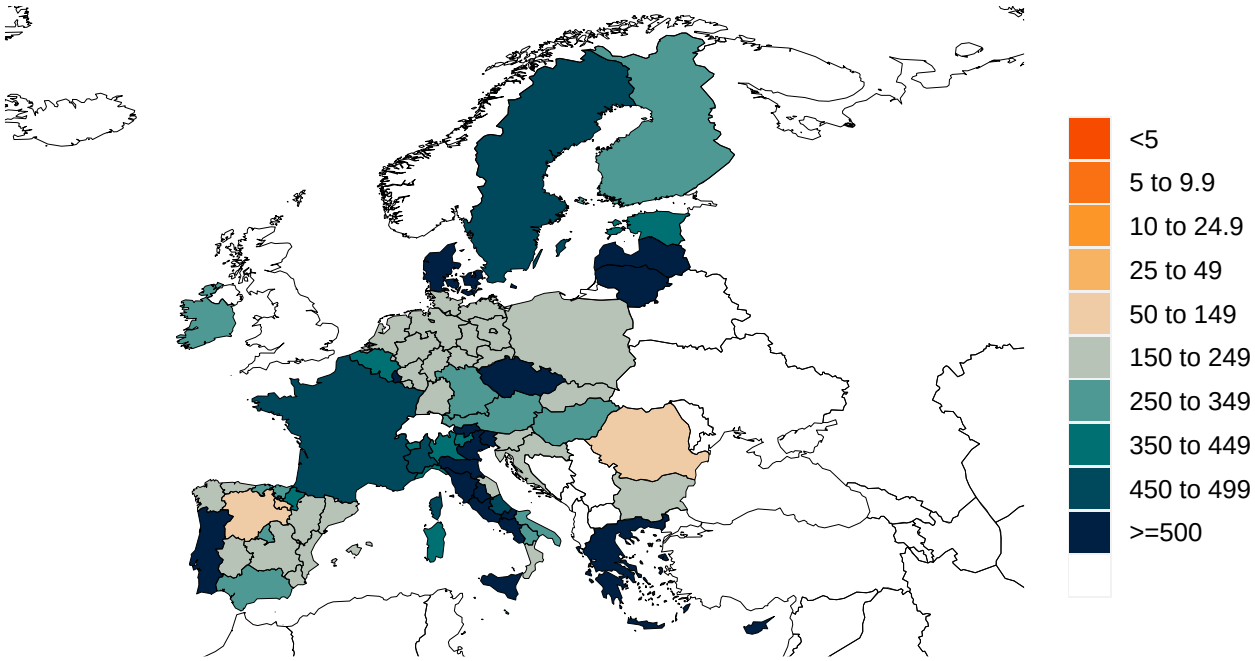


Figure 15. Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020

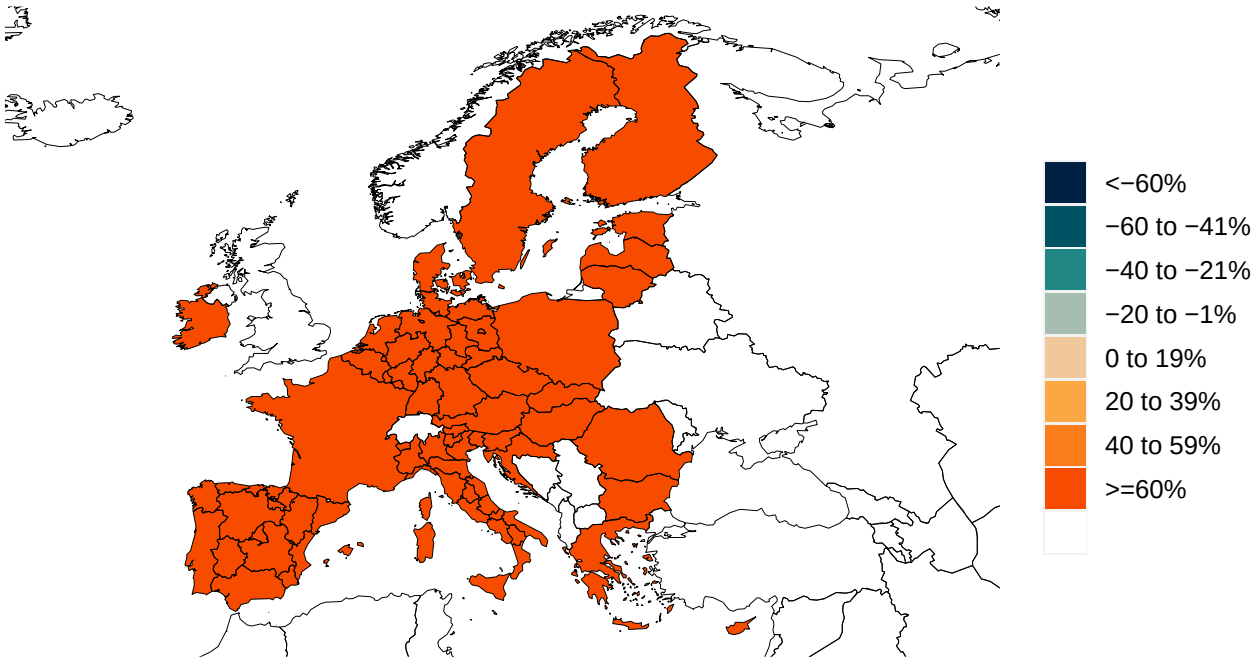


Table 3. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our website (http://www.healthdata.org/node/8584).

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%	6%
CoronaVac	50%	43%	38%	25%
Janssen	72%	72%	64%	42%
Moderna	94%	85%	72%	47%
Novavax	89%	77%	49%	32%
Pfizer/BioNTech	91%	86%	69%	45%
Sinopharm	73%	63%	56%	36%
Sputnik-V	92%	80%	70%	45%
Tianjin CanSino	66%	57%	50%	32%
Other vaccines	75%	65%	57%	37%
Other vaccines (mRNA)	95%	83%	72%	47%

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).

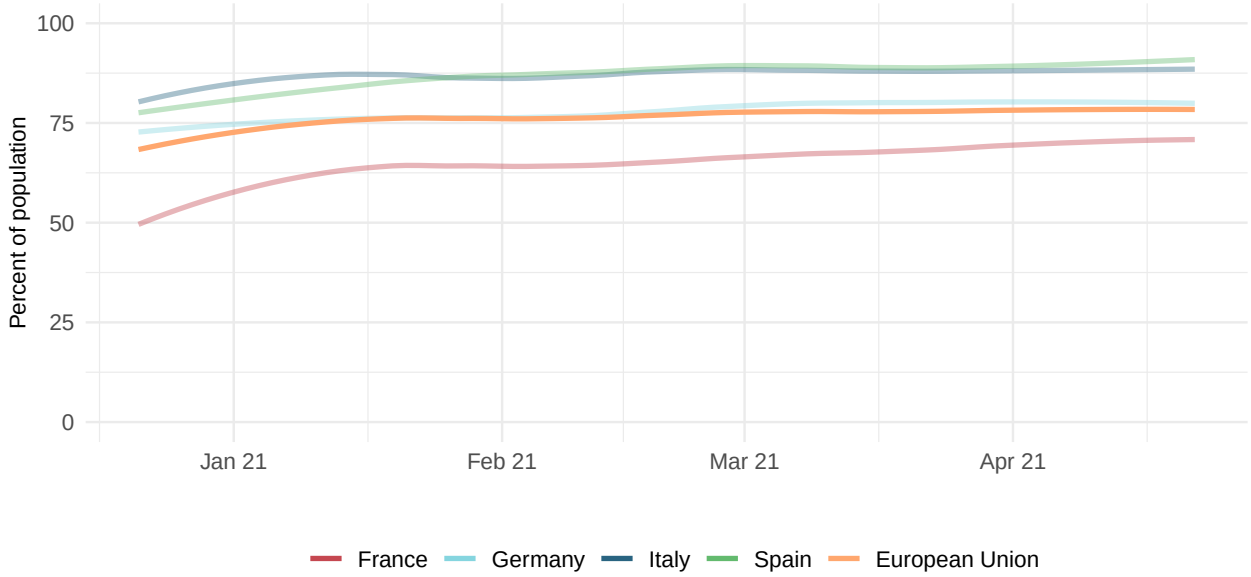


Figure 17. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

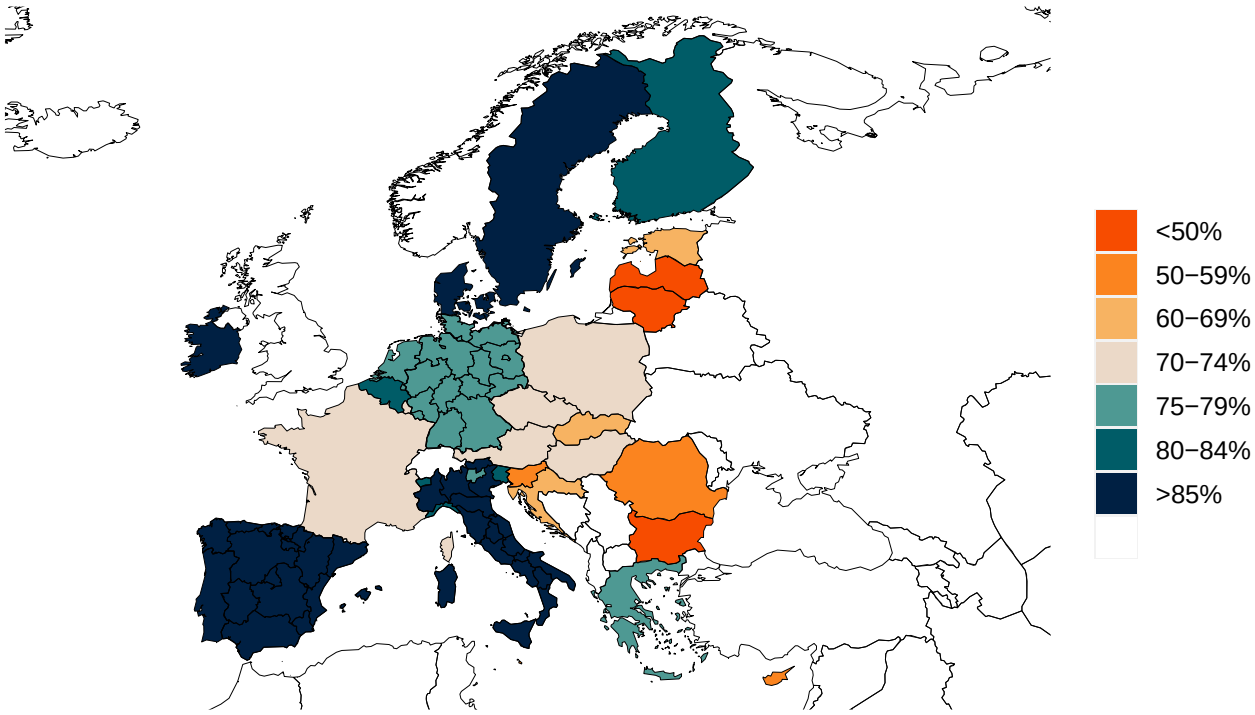
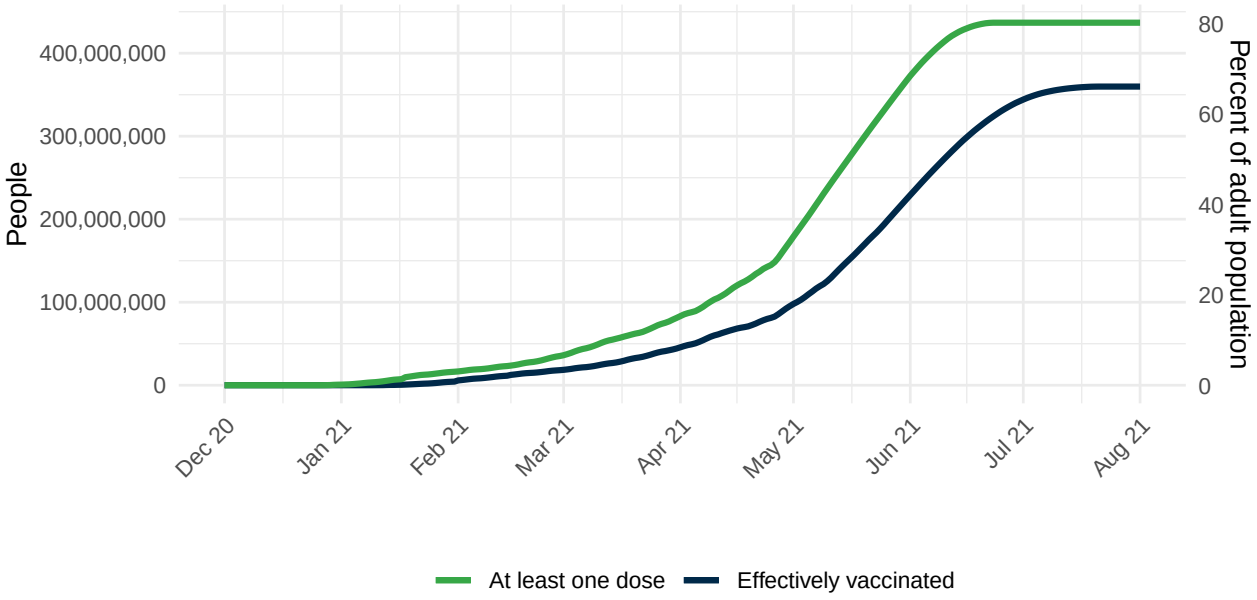


Figure 18. The number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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

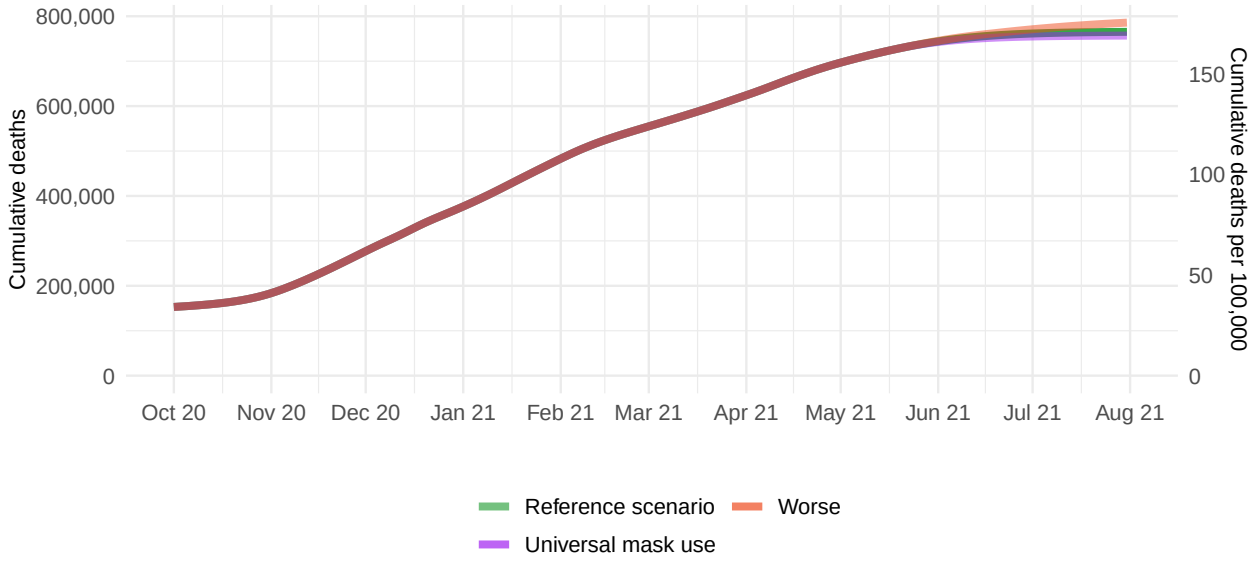


Figure 20. Daily COVID-19 deaths until August 01, 2021 for three scenarios,

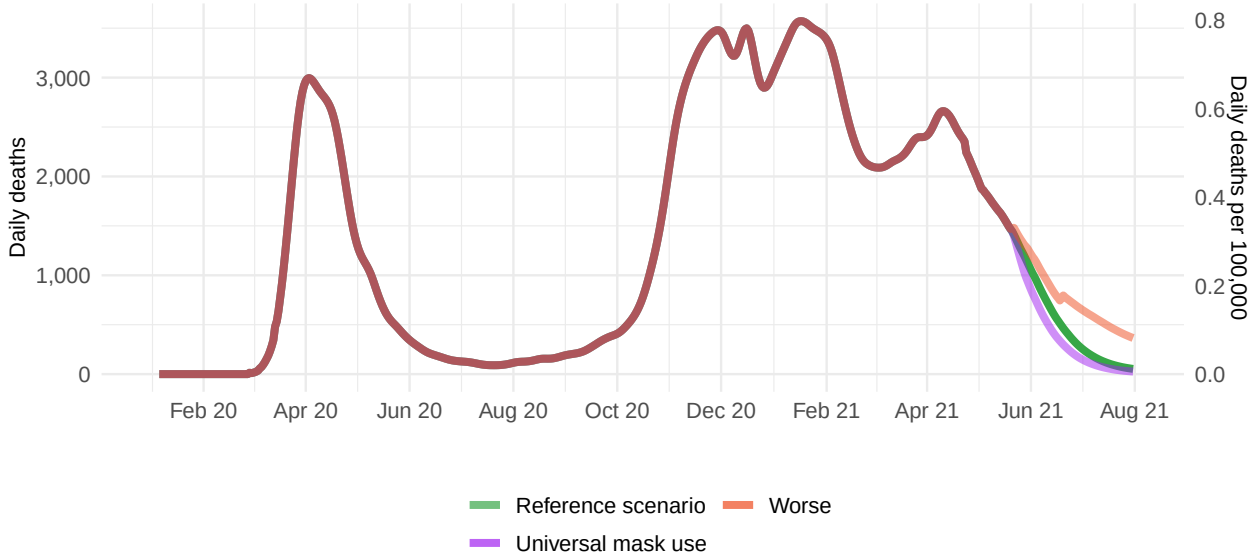


Figure 21. Daily COVID-19 infections until August 01, 2021 for three scenarios.

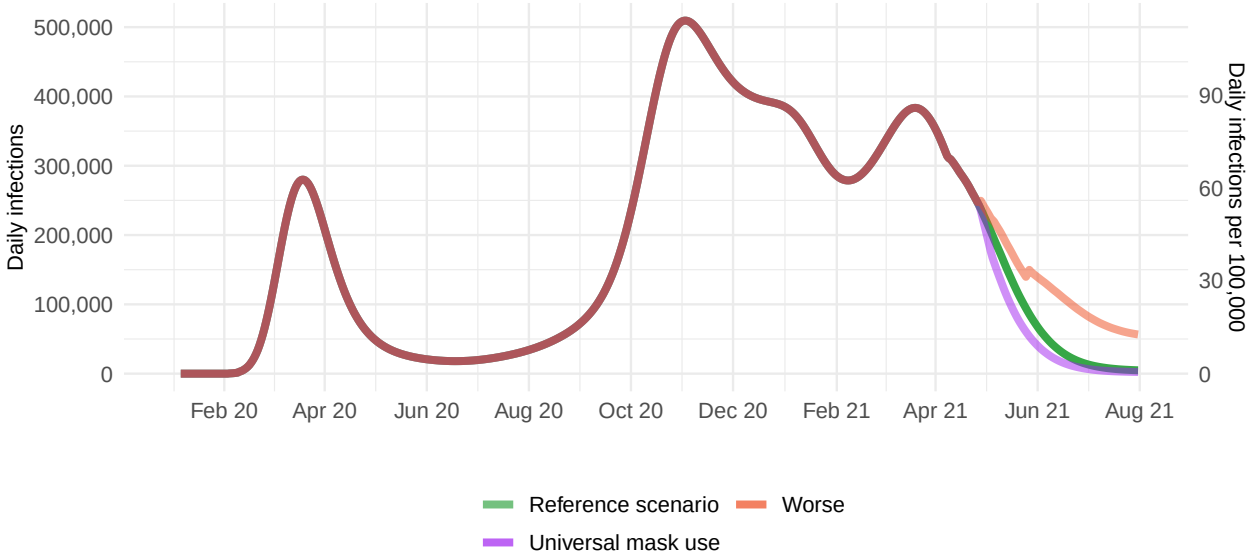
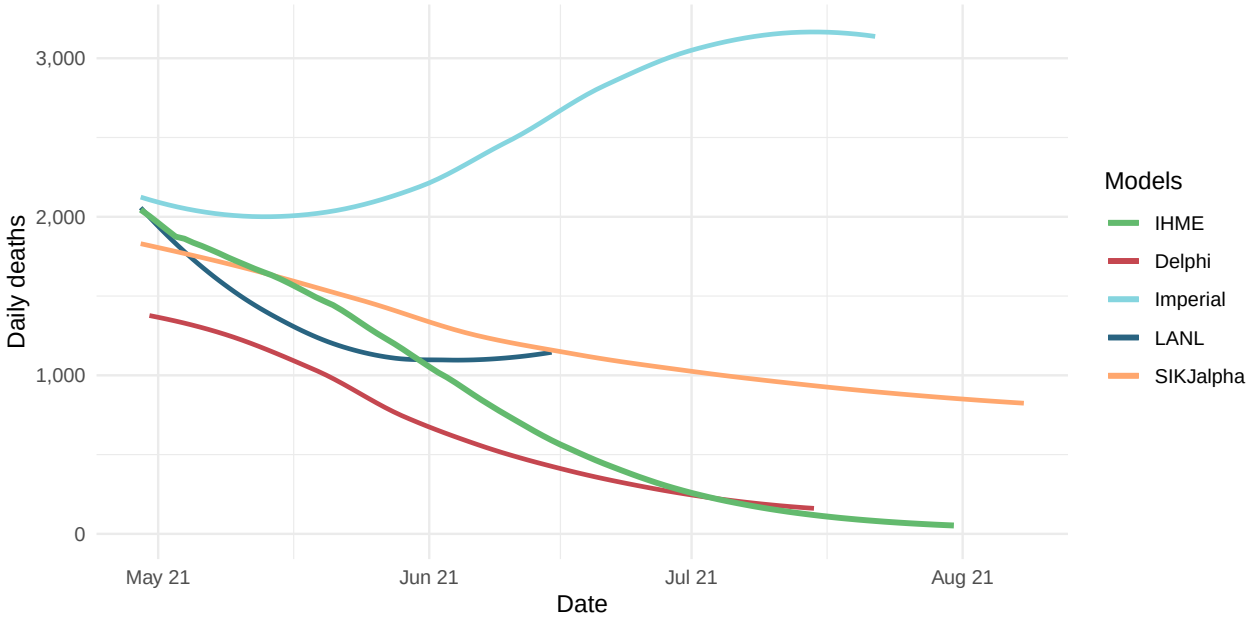


Figure 22. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachussets Institute of Technology (Delphi; https://www.covidanalytics.io/home), 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 available locations in that region.



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.