Cases and deaths continue to increase exponentially with no evidence of a slowdown. Several countries have re-imposed national mandates, and many have imposed local mandates. Mask use is rising slowly, reaching 60% for the region, and mobility is slowly trending down. Despite these efforts at behavioral change, we expect the daily death toll will increase by nearly four-fold by mid-January. Most countries in the region will experience extreme stress on the hospital system. One of the most attractive policy options is a universal mask mandate with penalties. Achieving universal mask use can save 266,000 lives by February 1.

**Current situation**

- Daily cases have increased to approximately 125,000 a day in the last week, up from 100,000 the week before (Figure 1).
- Daily deaths have increased to 1,825 a day in the last week, a 30% increase from the prior week (Figure 2).
- Effective R, computed based on cases, hospitalizations, and deaths, is over 1 in the vast majority of countries in the region (Figure 3).
- The death rate is over 4 per million in many more countries as compared to last week, including multiple regions of Spain, France, Belgium, Bosnia and Herzegovina, Montenegro, North Macedonia, Czechia, Hungary, Moldova, and Armenia (Figure 6).

**Trends in key drivers of transmission (mobility, mask use, testing, and seasonality)**

- Multiple nations in Europe have put in place local mandates, and national mandates have been imposed in Ireland, Poland, Northern Ireland, Wales, Scotland, France, and Germany (Figure 7).
- Mobility has decreased since the beginning of October. The lowest levels are seen in Ireland, Northern Ireland, Scotland, the Netherlands, and regions of Spain (Figure 8).
- Mask use has steadily increased since early September, now reaching 60% for the region. Despite progress, particularly low levels are seen in Scandinavia, Belarus, many states in the Balkans, Switzerland, Austria, and Czechia (Figure 9).
- Testing rates continue to steadily increase, reaching over 200 per 100,000 (Figure 10).

**Projections**

- In the reference scenario, the scenario that we believe is most likely to occur, daily deaths are expected to reach 8,500 in mid-January (Figure 13).
- Cumulative deaths in the reference scenario are expected to reach 932,000 (Figure 12).
- Expanding mask use to the levels observed in Singapore, 95%, would save 266,000 lives by February 1 (Figure 12).
- Figure 18 compares our forecasts to other publicly archived models. Finally, in this week, we see other models now forecasting a fall/winter surge. The MIT (Delphi) model has forecasts that now are similar to ours. The Imperial forecasts predict a peak of 18,000 deaths a day at the beginning of January. Los Alamos National Labs is the only model still predicting a decline in daily deaths in the US.
- We expect in the reference scenario that most countries in the region will experience in the winter months extreme stress on hospital and ICU capacities. The degree of hospital stress is expected to be much more extensive and severe than the stress seen in March and April in the first wave of the pandemic.

IHME wishes to warmly acknowledge the support of these and others who have made our COVID-19 estimation efforts possible. Thank you.

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.

# COVID-19 Results Briefing: the European Region

**Institute for Health Metrics and Evaluation (IHME)**

**October 29, 2020**

*This briefing contains summary information on the latest projections from the IHME model on COVID-19 in* the European Region. The model was run on October 28, 2020.

For more information on the model, including interactive visualizations, downloadable results, and model details, please visit our site covid19.healthdata.org.

## Model Overview

Updates to the model this week include additional data on deaths, cases, and updates on covariates.

# Current situation

**Figure 1.** Reported daily COVID-19 cases

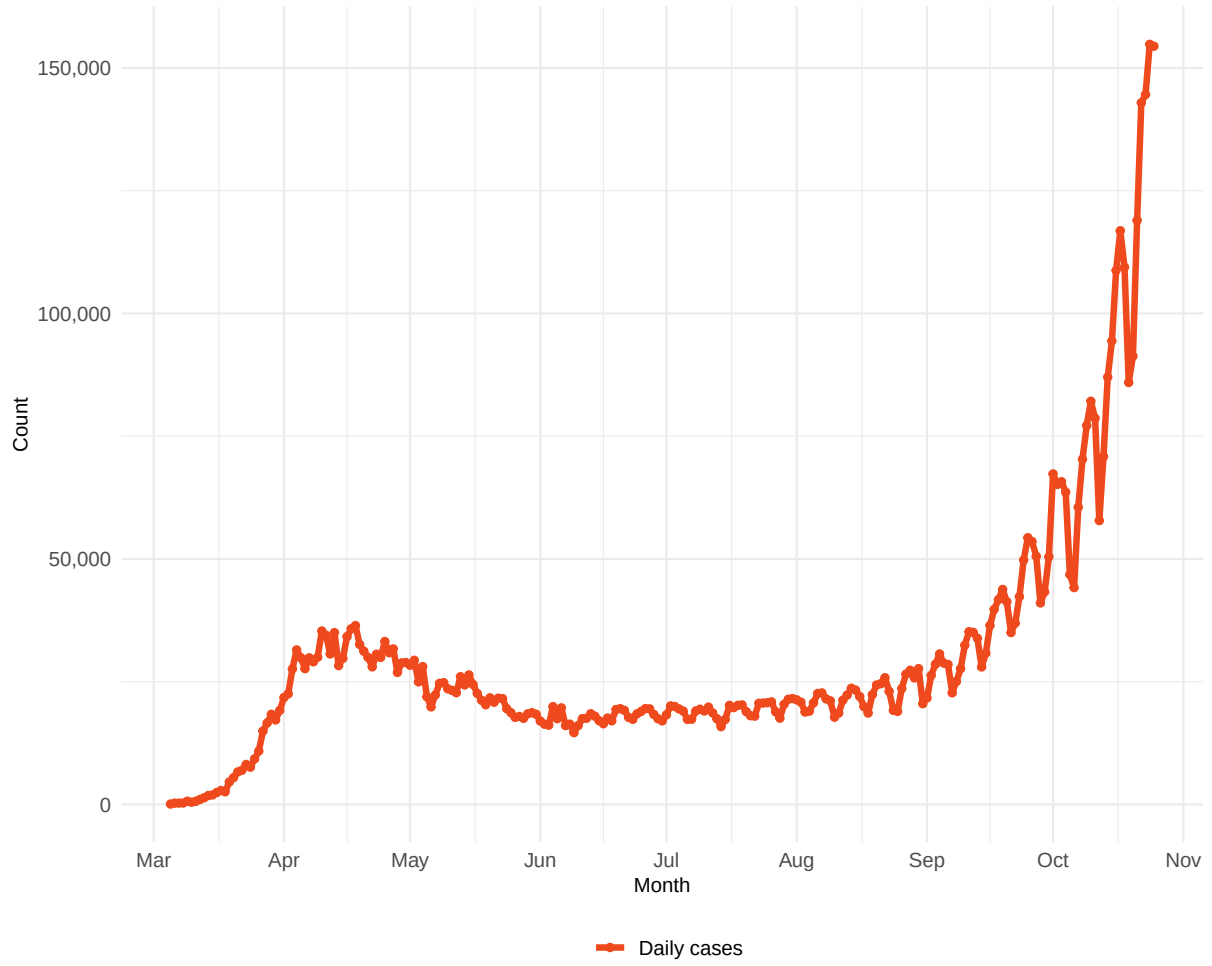


**Table 1.** Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

| Cause name | Weekly deaths | Ranking |
|---|---|---|
| Ischemic heart disease | 44,253 | 1 |
| Stroke | 22,622 | 2 |
| COVID-19 | 12,801 | 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 2a.** Reported daily COVID-19 deaths.

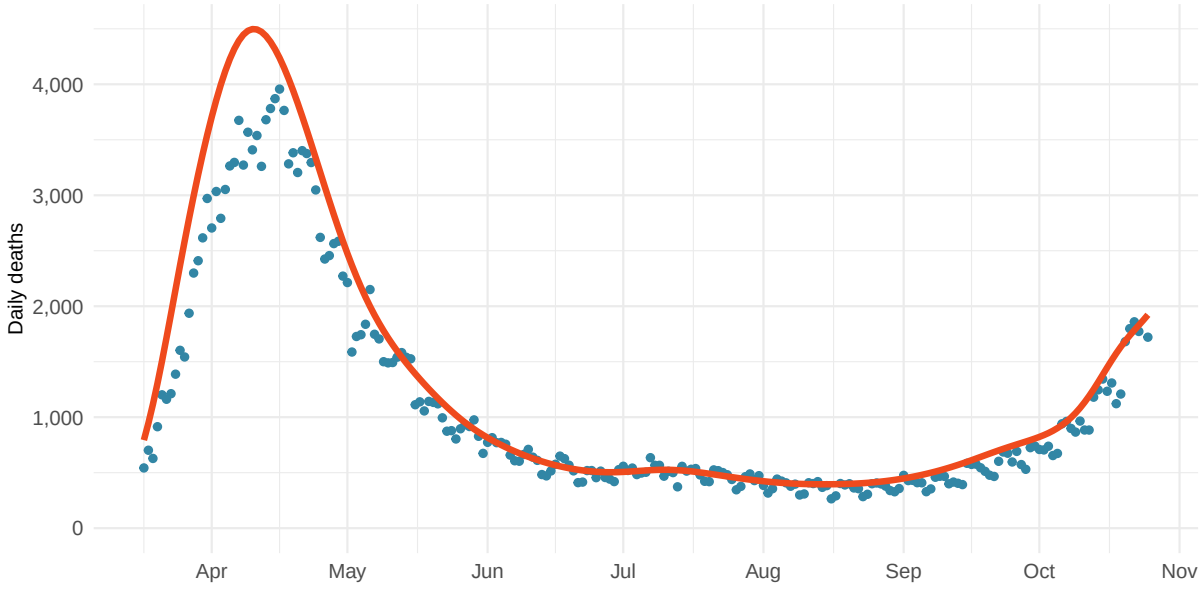


**Figure 2b.** Estimated cumulative deaths by age group

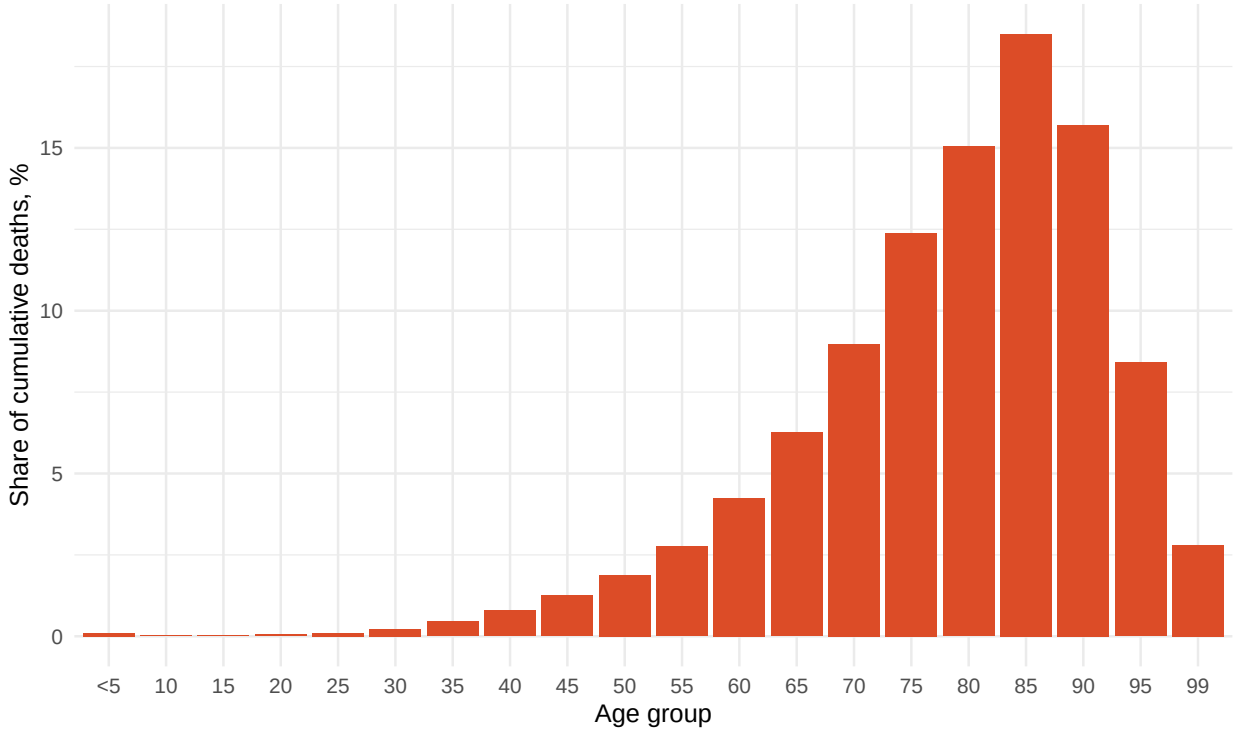



**Figure 3.** Mean effective R on October 15, 2020. The estimate of effective R is based on the combined analysis of deaths, case reporting and hospitalizations where available. Current reported cases reflect infections 11-13 days prior so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline all other things being held the same.

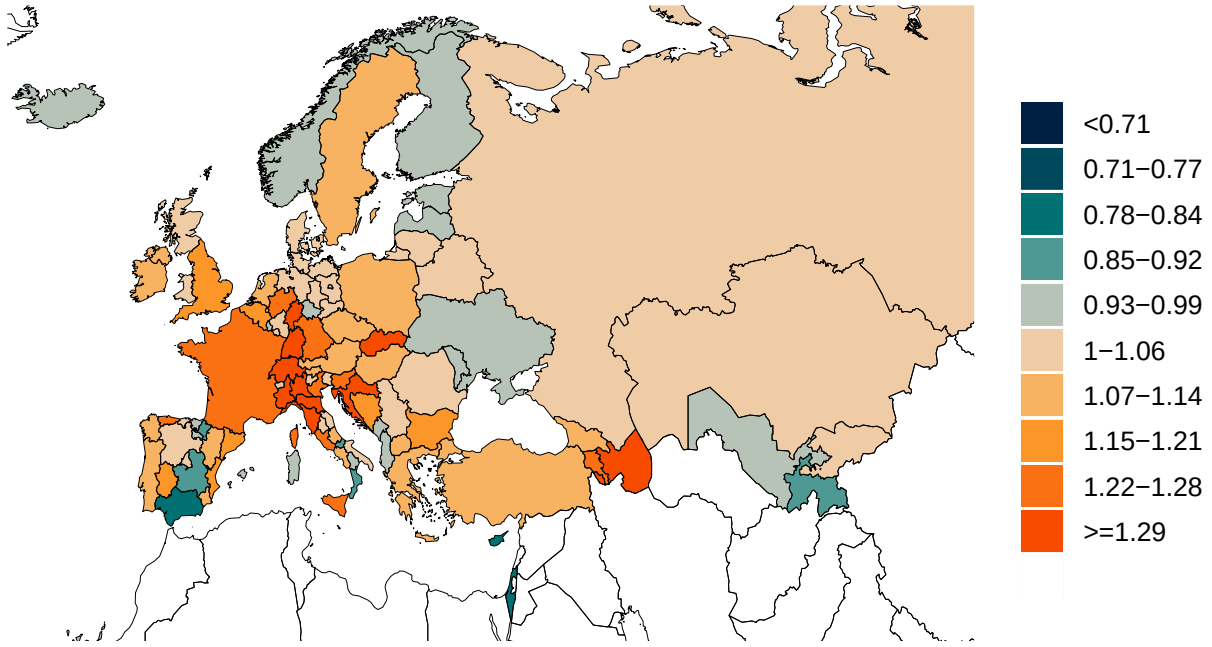


**Figure 4.** Estimated percent of the population infected with COVID-19 on October 26, 2020

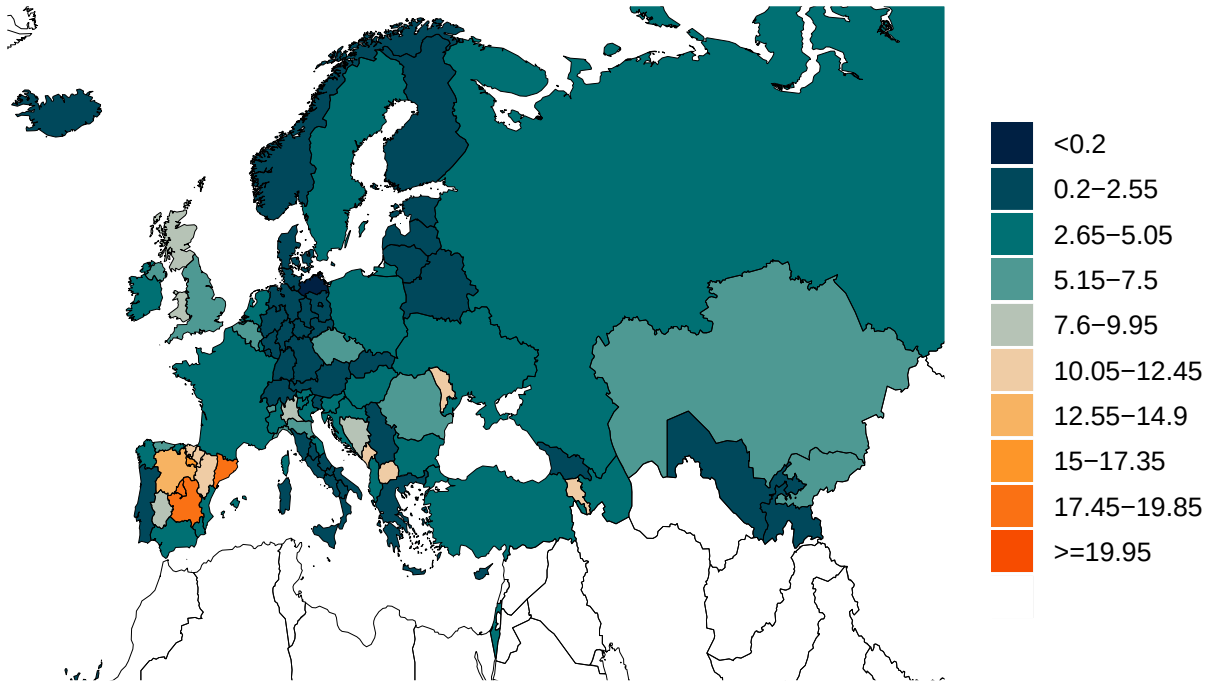



**Figure 5.** Percent of COVID-19 infections detected. This is estimated as the ratio of reported COVID-19 cases to estimated COVID-19 infections based on the SEIR disease transmission model.

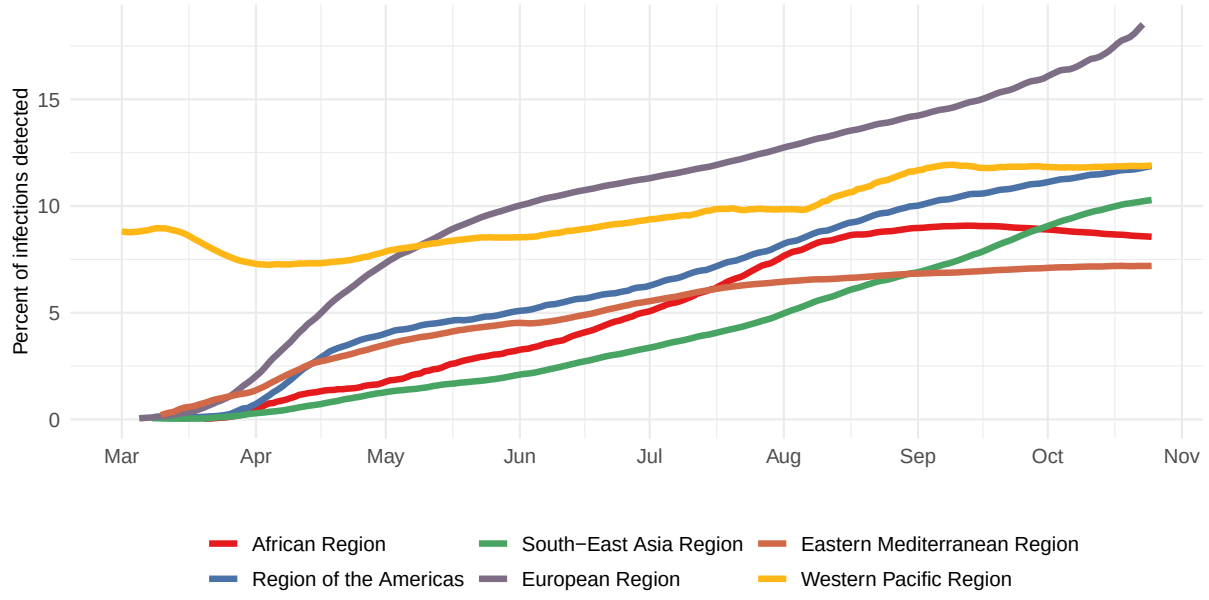
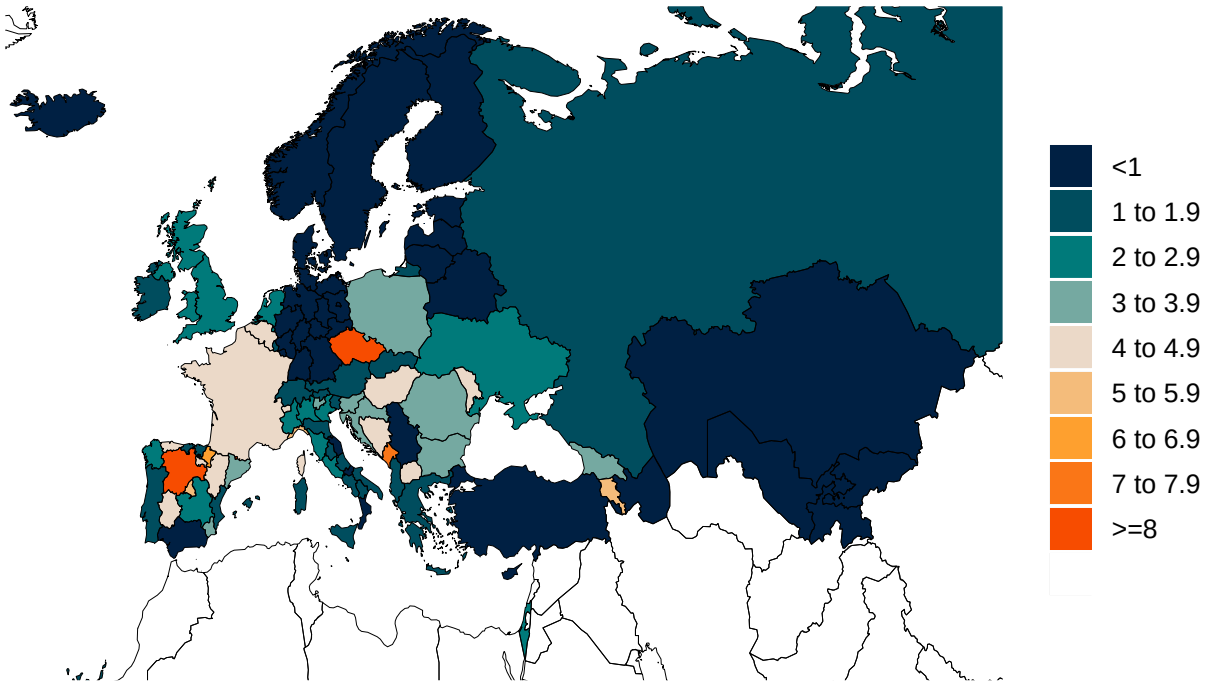


**Figure 6.** Daily COVID-19 death rate per 1 million on October 26, 2020



# Critical drivers

**Table 2.** Current mandate implementation

**Figure 7.** Total number of social distancing mandates (including mask use)

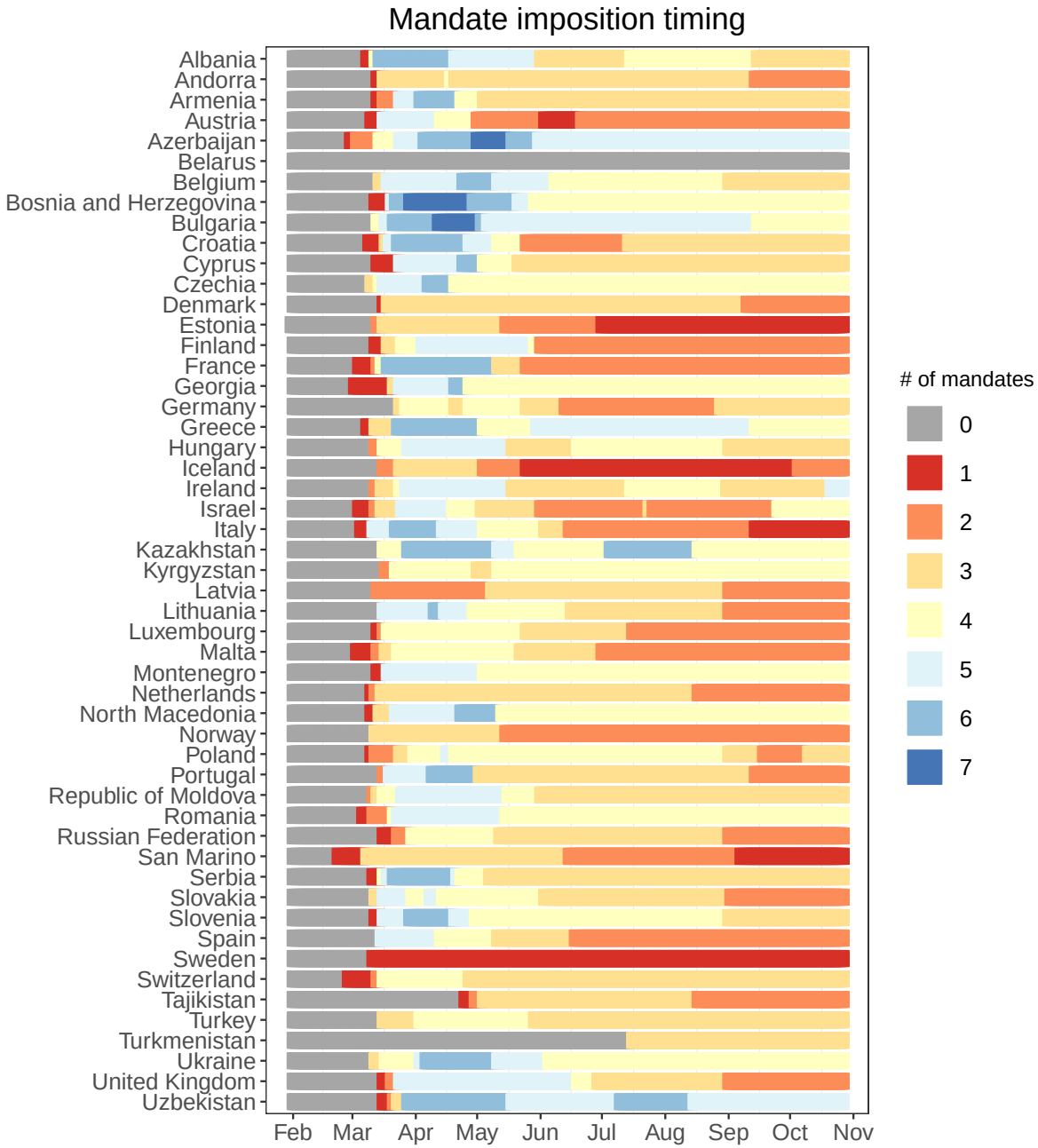


**Figure 8a.** Trend in mobility as measured through smartphone app use compared to January 2020 baseline

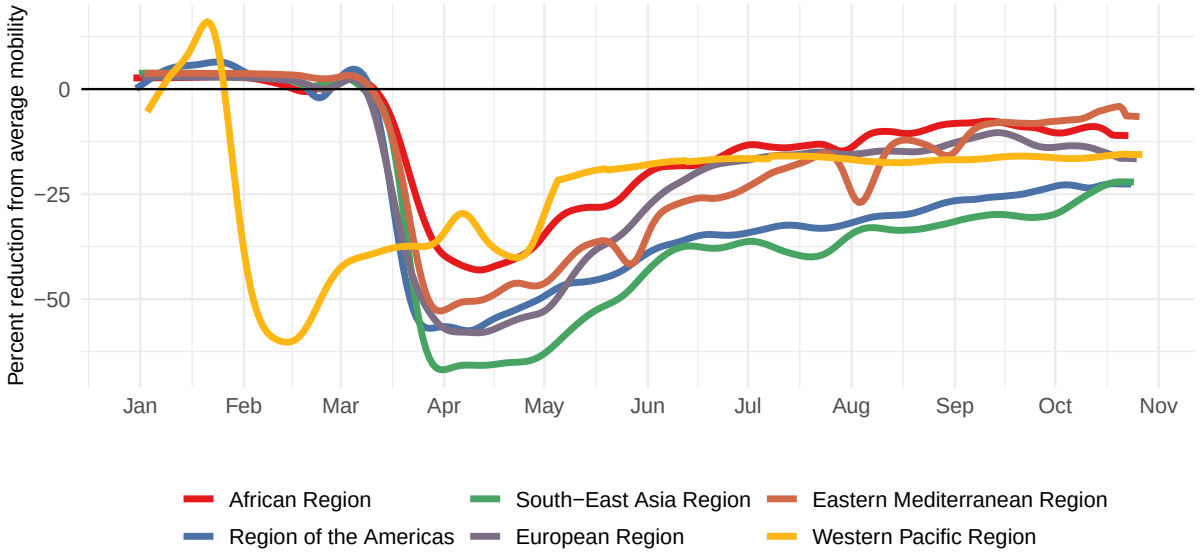



**Figure 8b.** Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on October 26, 2020

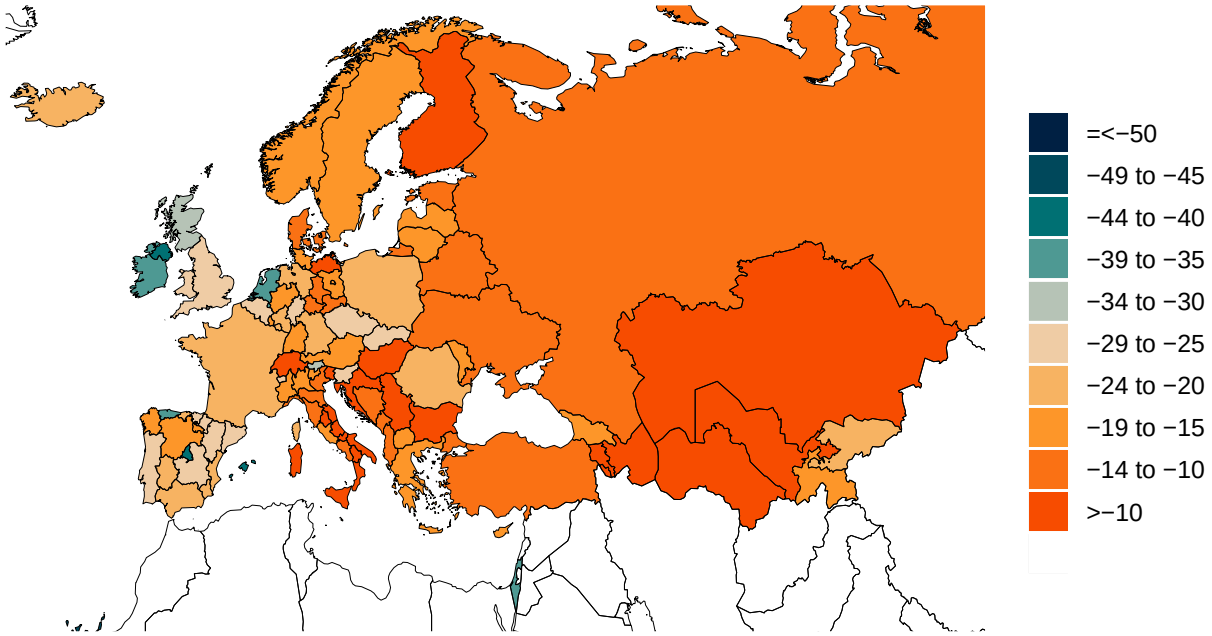


**Figure 9a.** Trend in the proportion of the population reporting always wearing a mask when leaving home

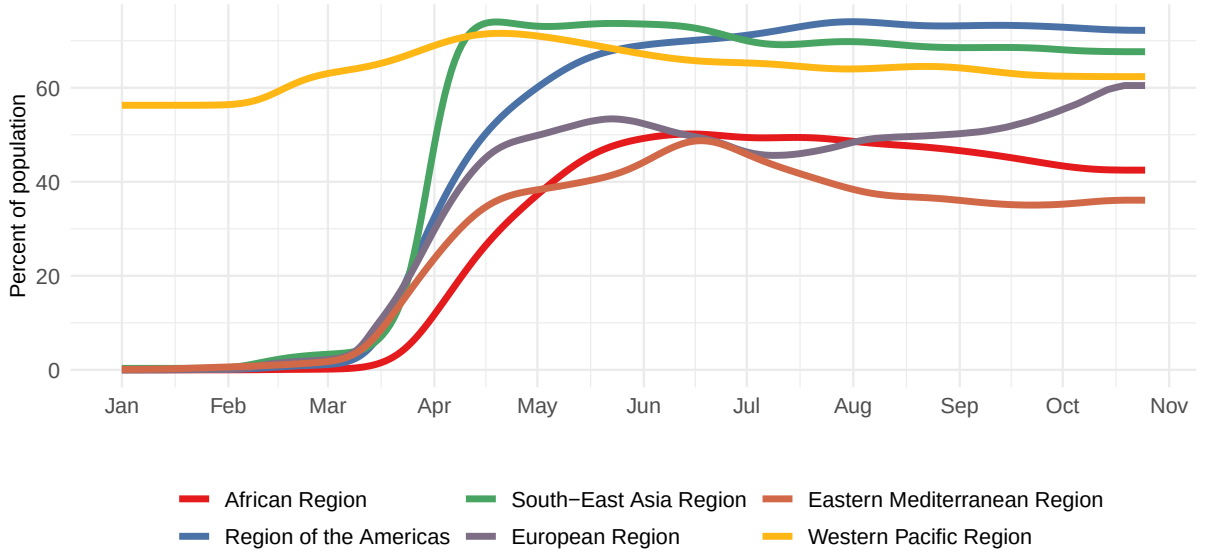



**Figure 9b.** Proportion of the population reporting always wearing a mask when leaving home on October 26, 2020

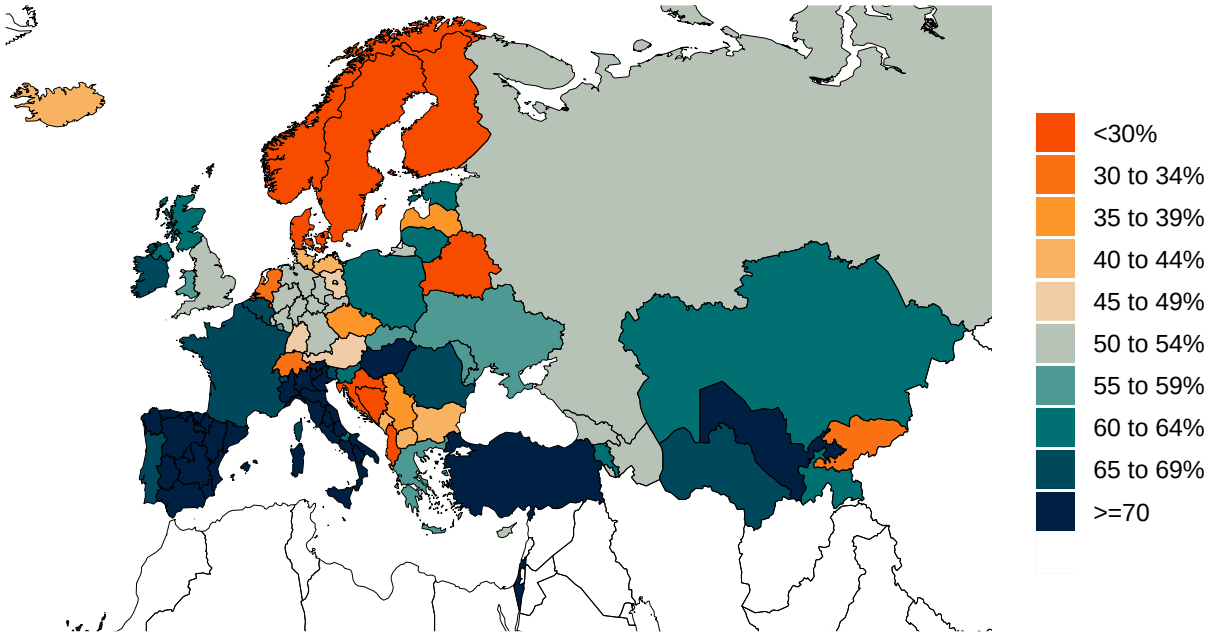


**Figure 10a.** Trend in COVID-19 diagnostic tests per 100,000 people

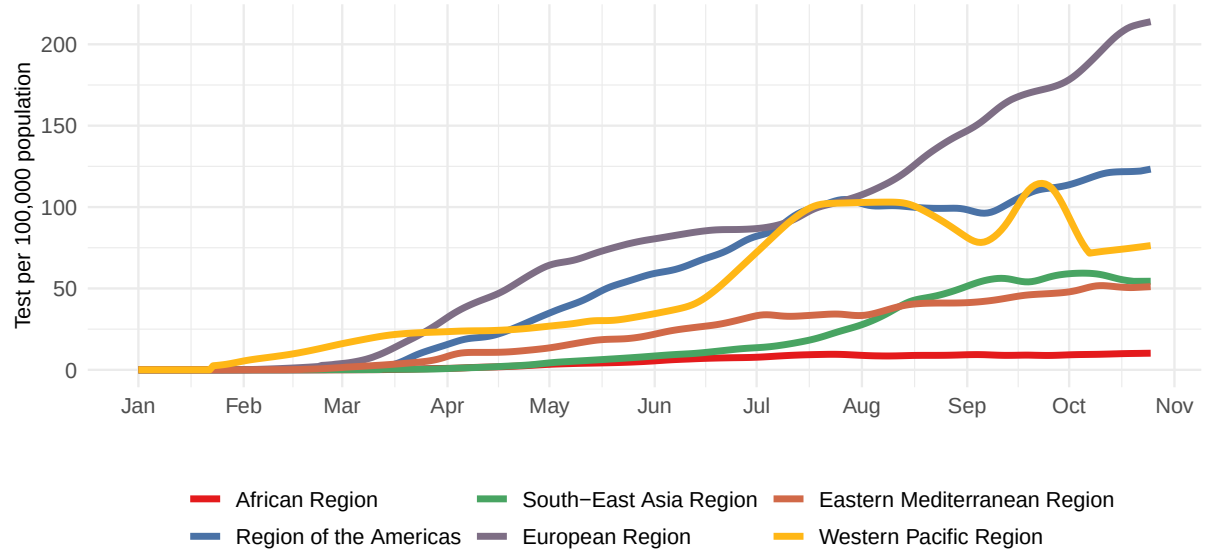



**Figure 10b.** COVID-19 diagnostic tests per 100,000 people on October 26, 2020

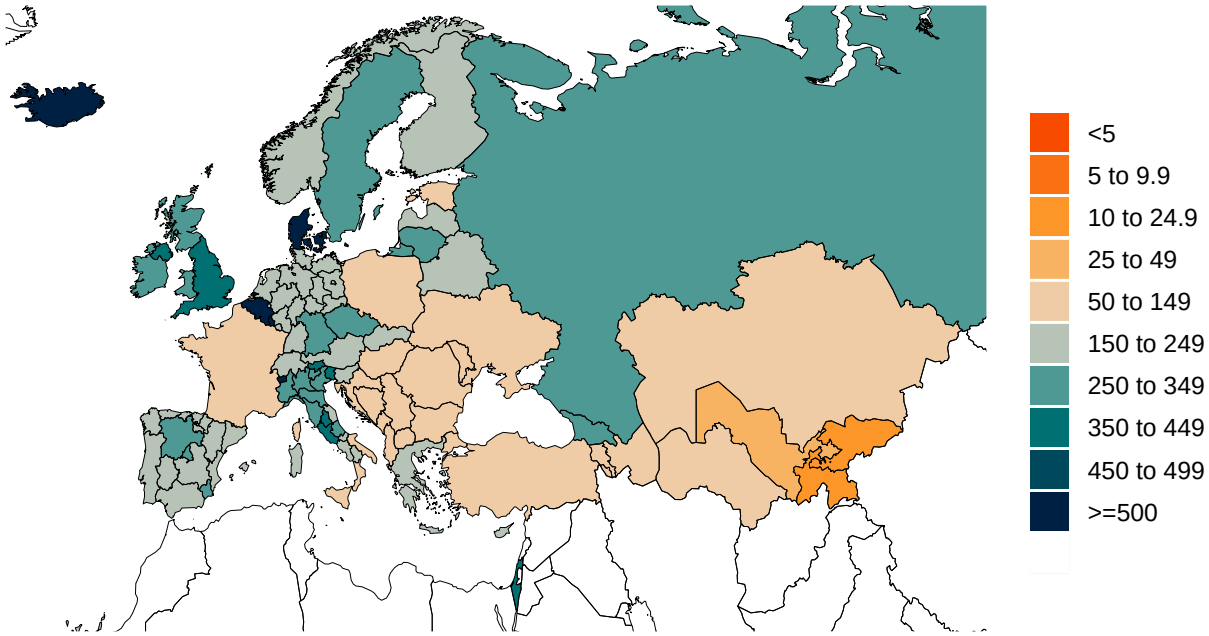
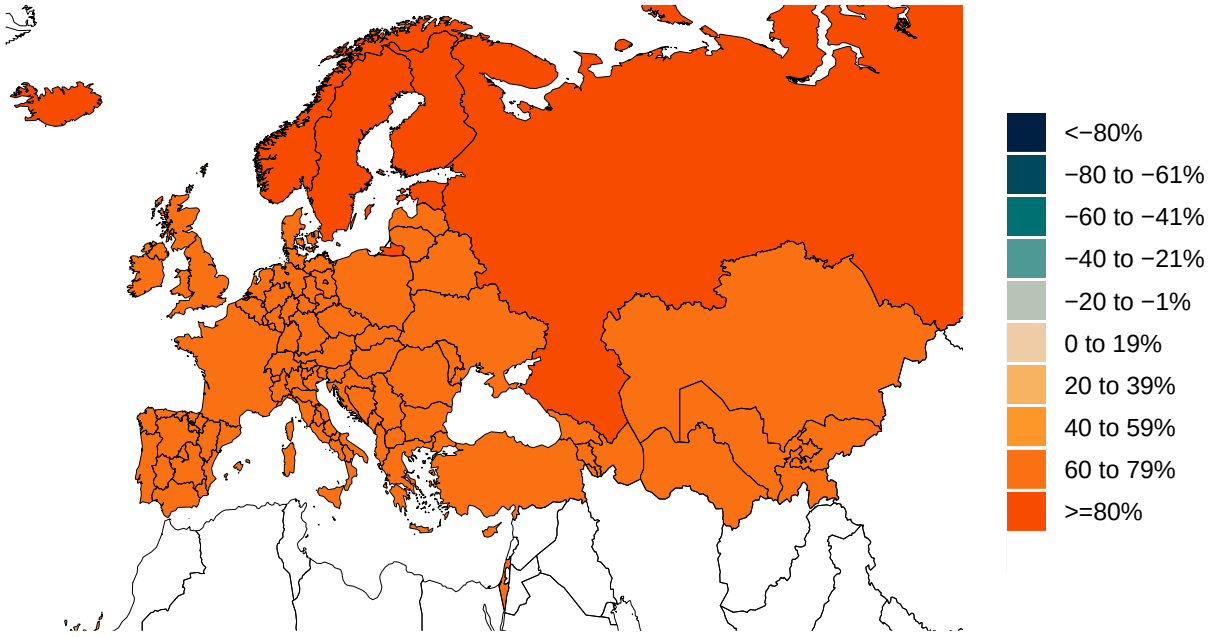


**Figure 11.** Increase in the risk of death due to pneumonia on February 1 compared to August 1



## 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. We assume that if the daily mortality rate from COVID-19 reaches 8 per million, social distancing (SD) mandates will be re-imposed. The mandate easing scenario is what would happen if governments continue to ease social distancing mandates with no re-imposition. The universal mask mandate scenario is what would happen if mask use increased immediately to 95% and social distancing mandates were re-imposed at 8 deaths per million.

**Figure 12.** Cumulative COVID-19 deaths until February 01, 2021 for three scenarios.

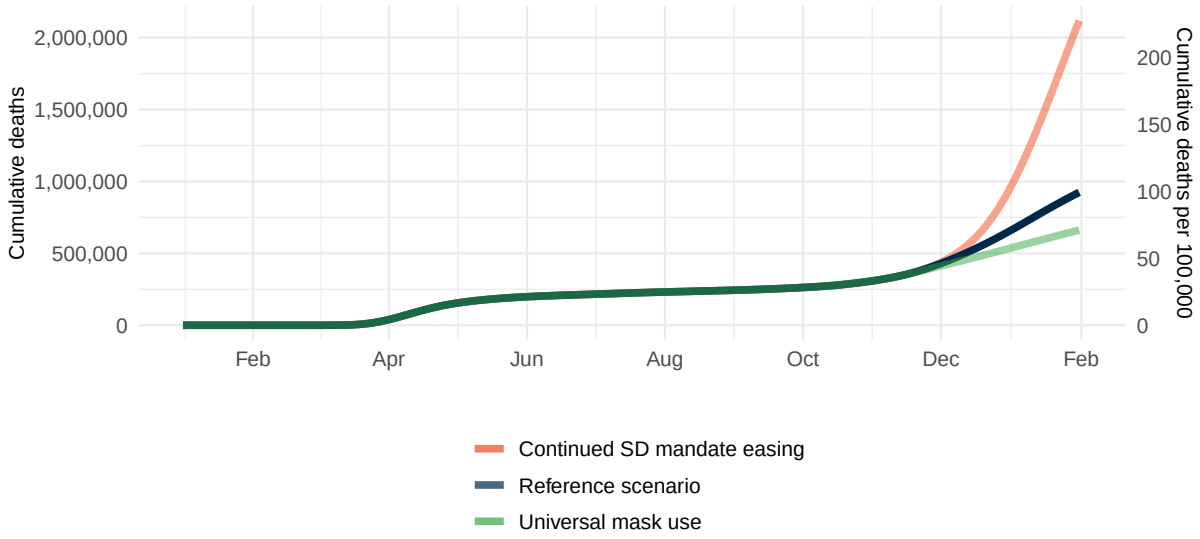



**Fig 13.** Daily COVID-19 deaths until February 01, 2021 for three scenarios.

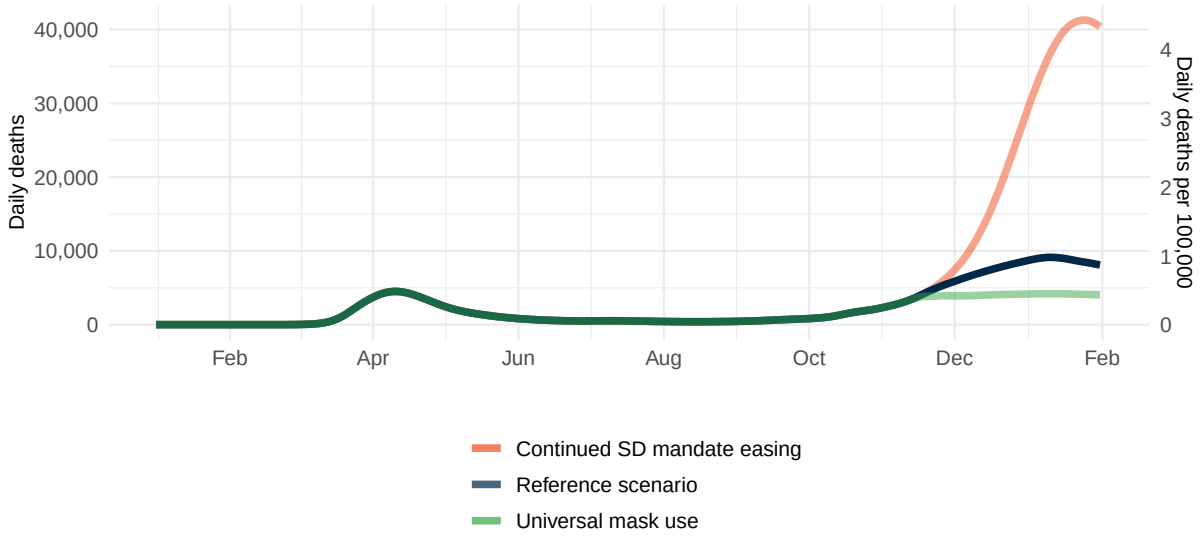


**Fig 14.** Daily COVID-19 infections until February 01, 2021 for three scenarios.

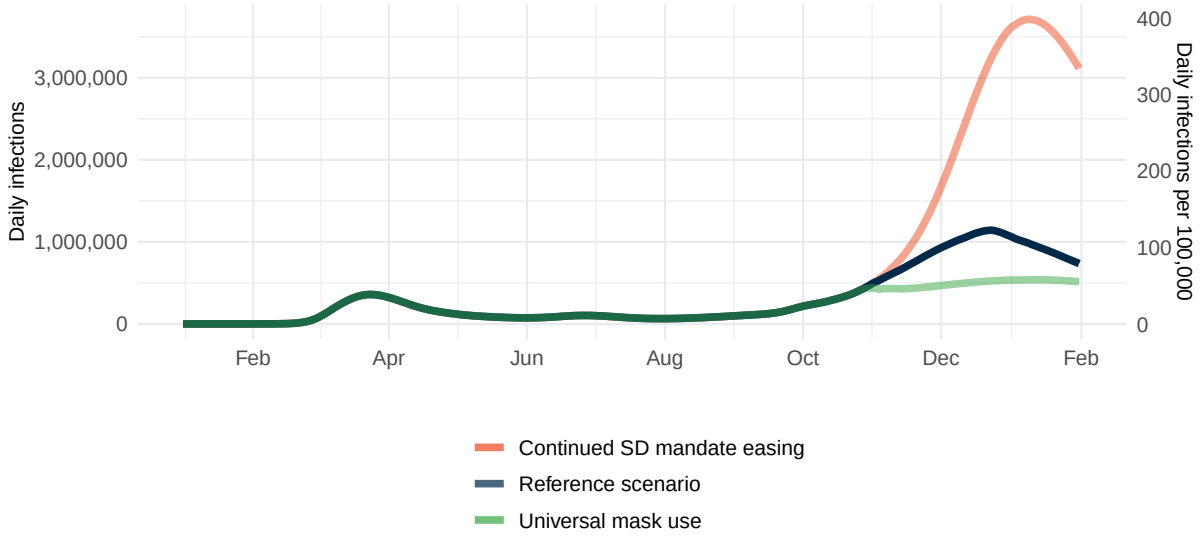


**Fig 15.** Month of assumed mandate re-implementation. (Month when daily death rate passes 8 per million, when reference scenario model assumes mandates will be re-imposed.)

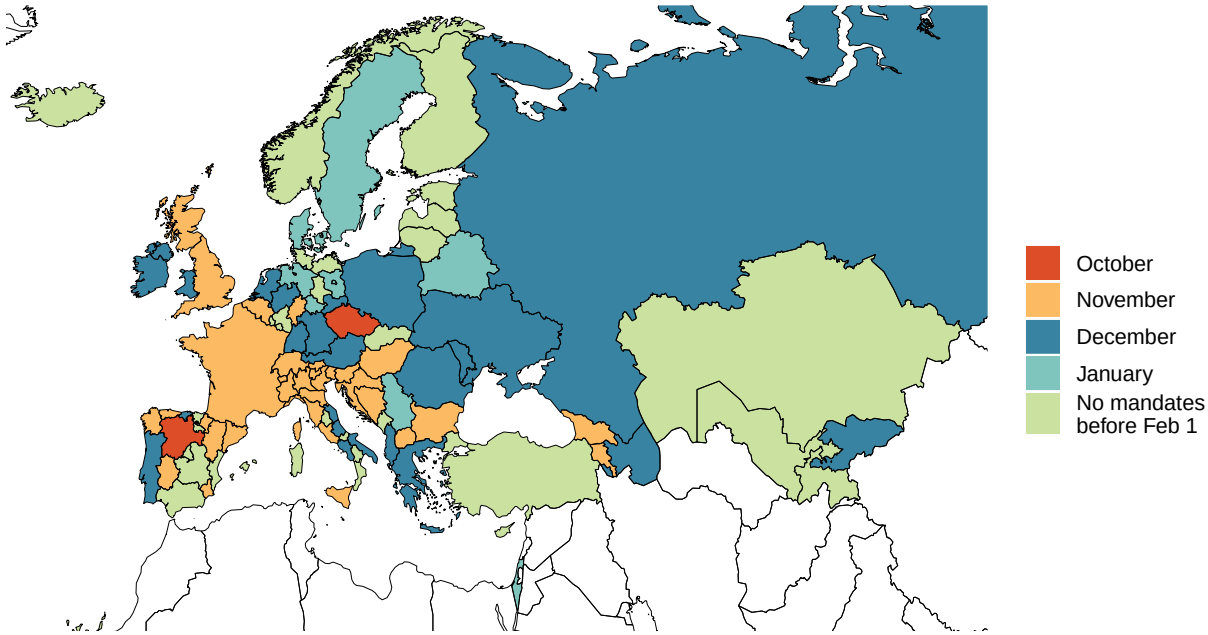


**Figure 16.** Forecasted percent infected with COVID-19 on February 01, 2021

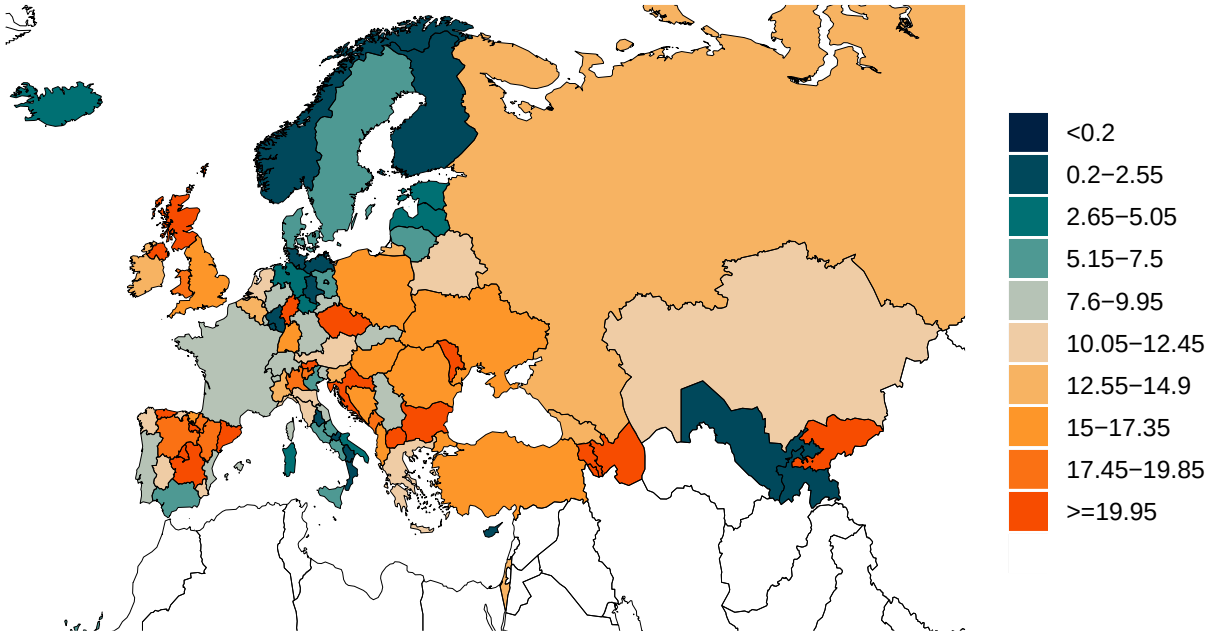



**Figure 17.** Daily COVID-19 deaths per million forecasted on February 01, 2021 in the reference scenario

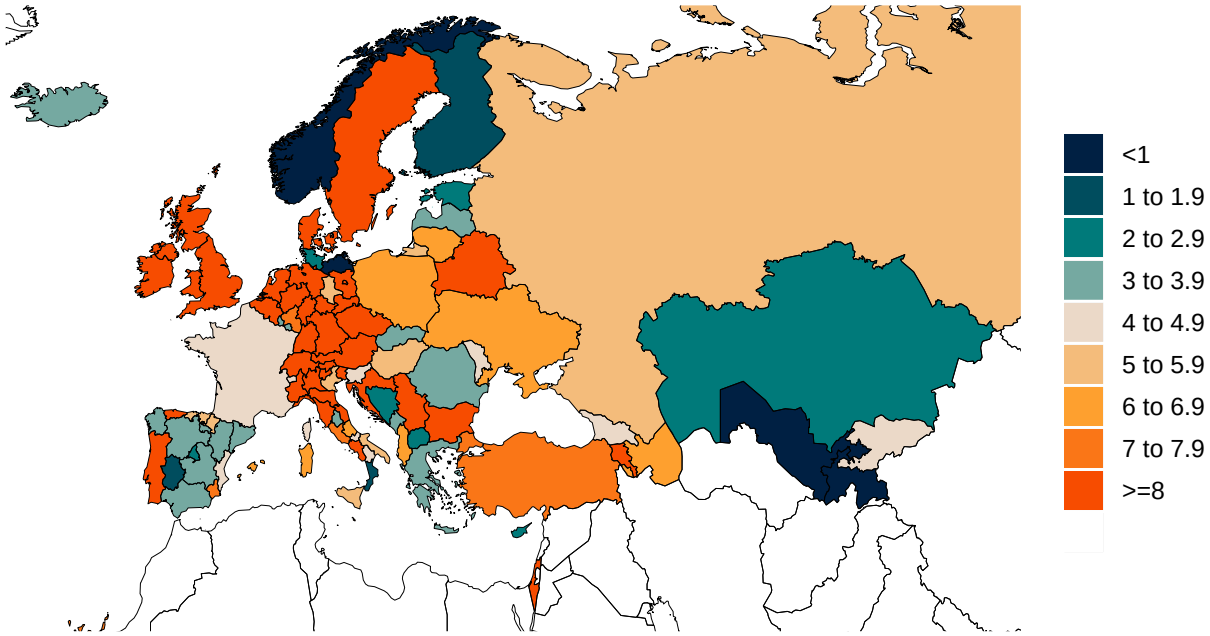


**Figure 18.** Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachussets Institute of Technology (Delphi; https://www.covidanalytics.io/home), Imperial College London (Imperial; https://www.covidsim.org), The Los Alamos National Laboratory (LANL; https://covid-19.bsvgateway.org/), the SI-KJalpha model from the University of Southern California (SIKJalpha; https://github.com/scc-usc/ReCOVER-COVID-19), and Youyang Gu (YYG; https://covid19-projections.com/). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from availble locations in that region.

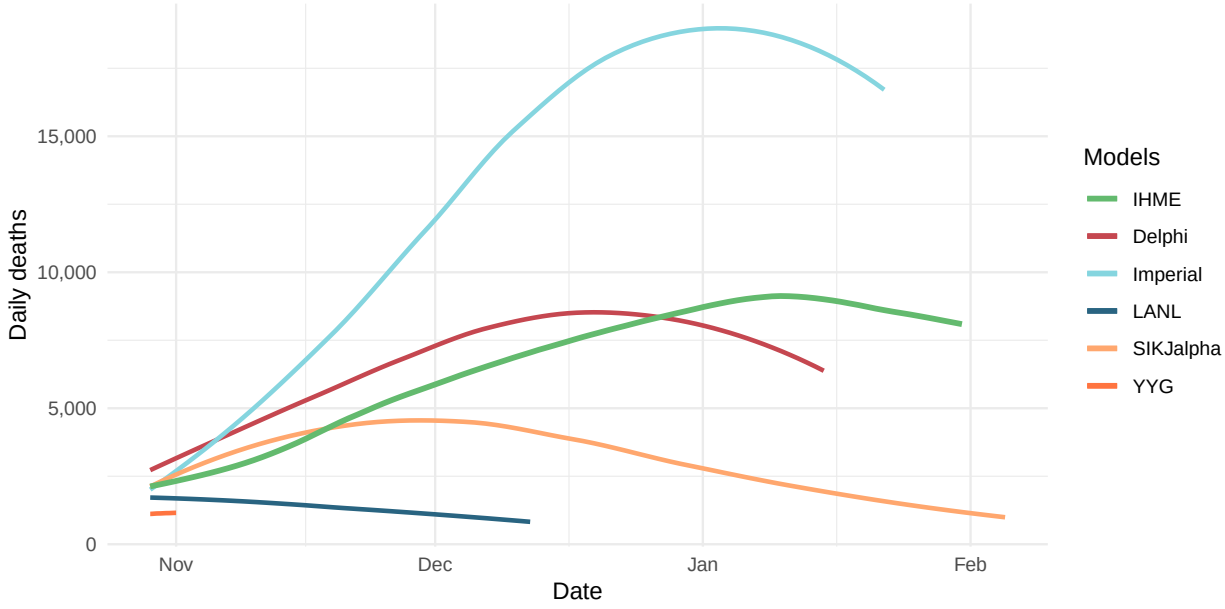


**Figure 19.** The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered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

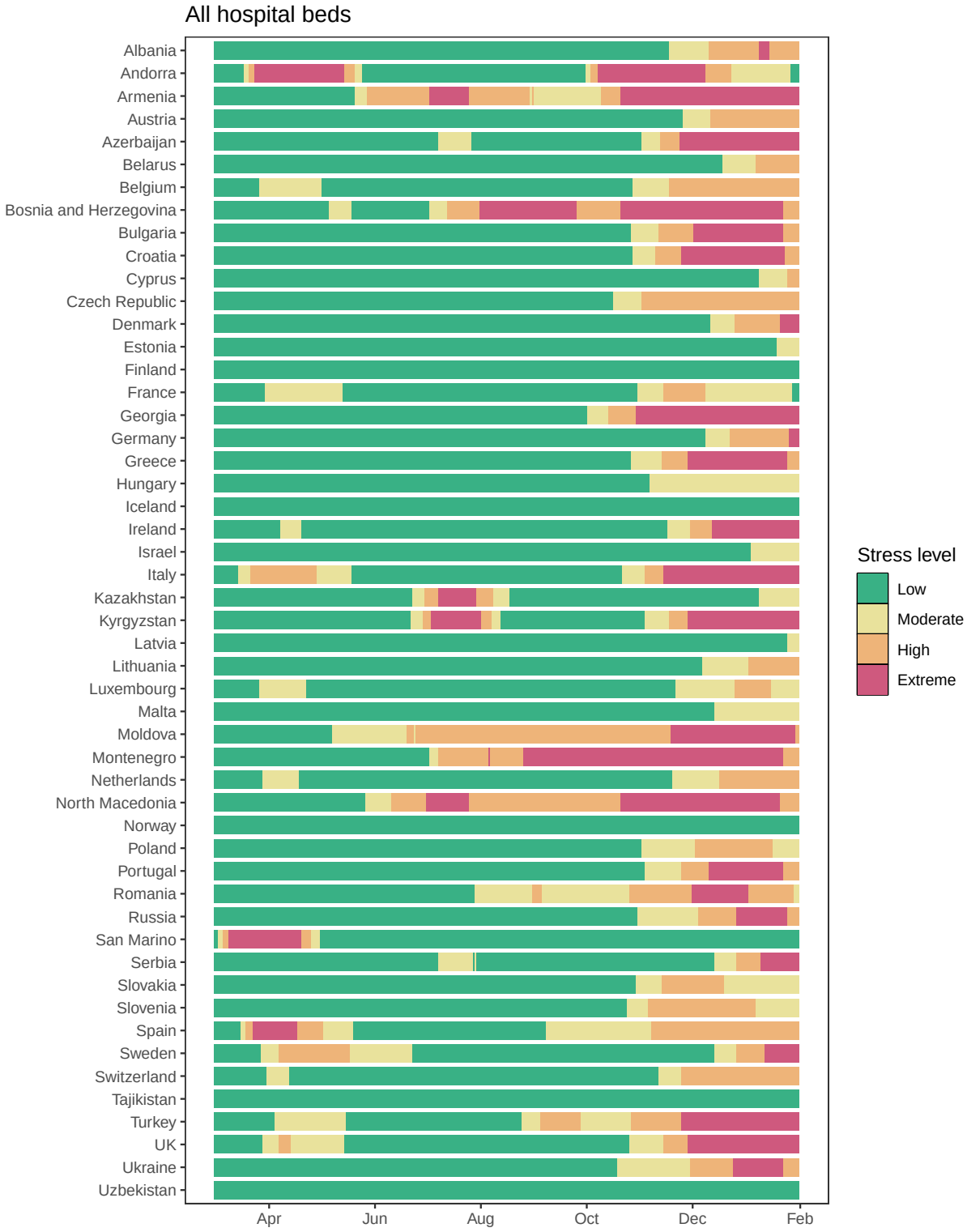


**Figure 20.** The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress* and greater than 60% is considered *extreme stress*.

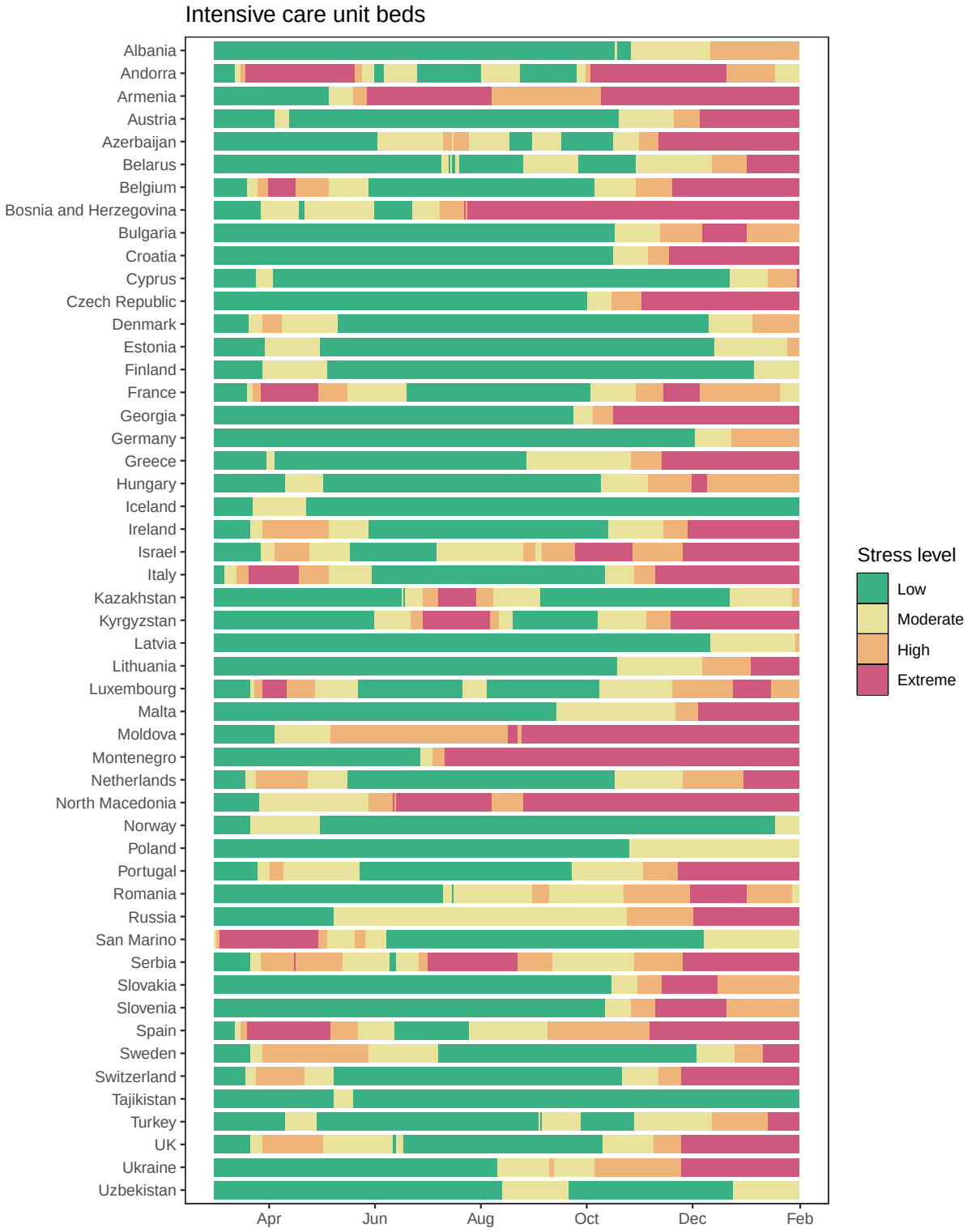


**Table 3.** Ranking of COVID-19 among the leading causes of mortality in the full year 2020. Deaths from COVID-19 are projections of cumulative deaths on Jan 1, 2021 from the reference scenario. Deaths from other causes are from the Global Burden of Disease study 2019 (rounded to the nearest 100).

| Cause name | Annual deaths | Ranking |
|---|---|---|
| Ischemic heart disease | 2,301,100 | 1 |
| Stroke | 1,176,300 | 2 |
| COVID-19 | 661,314 | 3 |
| Tracheal, bronchus, and lung cancer | 463,800 | 4 |
| Alzheimer's disease and other dementias | 417,200 | 5 |
| Chronic obstructive pulmonary disease | 349,400 | 6 |
| Colon and rectum cancer | 305,800 | 7 |
| Lower respiratory infections | 273,200 | 8 |
| Cirrhosis and other chronic liver diseases | 223,100 | 9 |
| Hypertensive heart disease | 205,400 | 10 |

**Mask data source:** 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.

**A note of thanks:**

We would like to extend a special thanks to the Pan American Health Organization (PAHO) for key data sources; our partners and collaborators in Argentina, Brazil, Bolivia, Chile, Colombia, Cuba, the Dominican Republic, Ecuador, Egypt, Honduras, Israel, Japan, Malaysia, Mexico, Moldova, Panama, Peru, the Philippines, Russia, Serbia, South Korea, Turkey, and Ukraine for their support and expert advice; and to the tireless data collection and collation efforts of individuals and institutions throughout the world.

In addition, we wish to express our gratitude for efforts to collect social distancing policy information in Latin America to University of Miami Institute for Advanced Study of the Americas (Felicia Knaul, Michael Touchton), with data published here: http://observcovid.miami.edu/; Fundación Mexicana para la Salud (Héctor Arreola-Ornelas) with support from the GDS Services International: Tómatelo a Pecho A.C.; and Centro de Investigaciones en Ciencias de la Salud, Universidad Anáhuac (Héctor Arreola-Ornelas); Lab on Research, Ethics, Aging and Community-Health at Tufts University (REACH Lab) and the University of Miami Institute for Advanced Study of the Americas (Thalia Porteny).

Further, IHME is grateful to the Microsoft AI for Health program for their support in hosting our COVID-19 data visualizations on the Azure Cloud. We would like to also extend a warm thank you to the many others who have made our COVID-19 estimation efforts possible.