

COVID-19 Results Briefing

The European Region

November 17, 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 November 16, 2021, with data through November 15, 2021.

The European Region in terms of COVID-19 transmission divides into distinct blocks. In the East, including the Baltic states, Belarus, the Russian Federation, Romania, Bulgaria, and Central Asia, transmission appears to have peaked or is declining. In the rest of the region, transmission is increasing, with more dramatic increases in Germany, Poland, Czechia, Hungary, Denmark, Austria, Ireland, the Netherlands, and Norway. In Israel, however, after a concerted booster vaccination rollout, transmission has been declining since early September. The increases, which are widespread in two-thirds of the region – the Western part – are occurring despite high levels of vaccination in many of these countries. The likely explanation is related to some combination of winter seasonality, waning vaccine-derived immunity, and the extent of prior natural infection. Evidence on waning vaccine-derived immunity against infection suggests very low levels of protection 30 weeks after vaccination. These same studies suggest that vaccine-derived immunity against hospitalizations and deaths wanes at a much slower rate than for preventing infection. Waning immunity is coinciding with rising winter seasonality, driving larger increases in transmission than many expected. Given the West-East divide in terms of transmission, countries with lower rates of prior natural infection may actually be at greater risk of rapid increases this winter. Our reference forecast suggests nearly 450,000 deaths from now until March 1. But this reference forecast does not explicitly take into account the waning of vaccine-derived immunity. Our revised model that explicitly models vaccine-specific waning immunity and waning natural immunity is likely to be released in early December. It is already clear from testing and development of this new model that we may see even larger winter surges in many countries. Policies to address the winter surge fall into three categories: First, increasing mask use, which can have an immediate impact on transmission, through mandates and mask use promotion, particularly in the vulnerable. Any increase above the current 48% level of mask use will be beneficial. Second, increasing vaccination in those who are vaccine-hesitant through outreach to these groups and/or workplace and other activity requirements. Third, delivering a COVID-19 booster shot to the adult population who have been fully vaccinated. Some combination of all three of these strategies may be able to prevent a large fraction of the expected deaths in the next four months.

Current situation

- Estimated daily infections in the last week decreased to 1.25 million per day on average compared to 1.31 million the week before (Figure 1.1).
- Estimated daily hospital census in the last week (through November 15) increased to 308,000 per day on average compared to 299,000 the week before.

- Daily reported cases in the last week increased to 317,200 per day on average compared to 290,500 the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week increased to 5,200 per day on average compared to 4,900 the week before (Figure 3.1).
- **Total deaths due to COVID-19 in the last week increased to 7,200 per day on average compared to 6,900 the week before (Figure 3.1). This makes COVID-19 the number 1 cause of death in the European Region this week (Table 1).** Estimated total daily deaths due to COVID-19 in the past week were 1.4 times larger than the reported number of deaths.
- The daily rate of reported deaths due to COVID-19 is greater than 4 per million in 21 countries (Figure 4.1).
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in 27 countries (Figure 4.2).
- We estimate that 46% of people in European Region have been infected as of November 15 (Figure 6.1).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in nearly all countries in the West of the region, including nearly all regions within Spain, Italy, and Germany (Figure 7.1).
- **The infection-detection rate in European Region was close to 25% on November 15 (Figure 8.1).**
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figure 9.1). The Delta variant is dominant in all countries in the region.

Trends in drivers of transmission

- New mandates were introduced in Croatia and Iceland (Table 2). A variety of restrictions on the unvaccinated have also been introduced in other countries.
- Mobility last week was 8% lower than the pre-COVID-19 baseline, down from baseline levels in the first week of September (Figure 11.1). Mobility was near baseline (within 10%) in 29 countries. **Mobility was lower than 30% of baseline in Latvia, currently in a full nationwide lockdown.**
- As of November 15, in the COVID-19 Trends and Impact Survey, 48% of people self-report that they always wore a mask when leaving their home, up from a low of 42% at the beginning of October (Figure 13.1).
- There were 477 diagnostic tests per 100,000 people on November 15 (Figure 15.1).
- As of November 15, **17 countries have reached 70% or more of the population who have received at least one vaccine dose, and 11 countries have reached 70% or more of the population who are fully vaccinated (Figure 17.1).**

- In the European Region, **69.4% of the population that is 12 years and older say they would accept or would probably accept a vaccine for COVID-19.** Note that vaccine acceptance is calculated using survey data from the 18+ population. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 34% in the Republic of Moldova to 92% in the Netherlands (Figure 19.1).
- In our current reference scenario, we expect that 553.6 million people will be vaccinated with at least one dose by March 1 (Figure 20.1). **We expect that 57% of the region's population will be fully vaccinated by March 1.**
- Based on the estimate of the population that have been infected with COVID-19 and vaccinated to date, combined with assumptions on protection against infection with the Delta variant provided by either natural infection, vaccination, or both, we estimate that 60% of the region is immune to the Delta variant. In our current reference scenario, we expect that by March 1, 71% of people will be immune to the Delta variant (Figure 21.1). These two calculations do not take into account waning of natural or vaccine-derived immunity.

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 2,255,000 cumulative reported deaths due to COVID-19 on March 1. This represents 439,000 additional deaths from November 15 to March 1. Daily reported deaths will rise to 5,400 by late November (Figure 22.1).
- Under our **reference scenario**, our model projects 3,182,000 cumulative total deaths due to COVID-19 on March 1. This represents 640,000 additional deaths from November 15 to March 1 (Figure 22.1).
- If **universal mask coverage (95%)** were attained in the next week, our model projects 164,000 fewer cumulative reported deaths compared to the reference scenario on March 1.
- Under our **worse scenario**, our model projects 2,598,000 cumulative reported deaths on March 1, an additional 343,000 deaths compared to our reference scenario. Daily reported deaths in the **worse scenario** will rise to over 10,500 by January 21, 2022 (Figure 22.1).
- Daily infections in the **reference scenario** will decline slowly to 425,000 on March 1, 2022 (Figure 22.3). Daily infections in the **worse scenario** will rise to 2.7 million by the end of the year (Figure 22.3).
- Daily cases in the **reference scenario** will rise to over 420,000 by the second week of December (Figure 22.4). Daily cases in the **worse scenario** will rise to 1.2 million by the second week of January (Figure 22.4).
- Daily hospital census in the **reference scenario** will decline to 185,000 on March 1, 2022 (Figure 22.5). Daily hospital census in the **worse scenario** will rise to 832,990 by January 17, 2022 (Figure 22.5).

- Figure 23.1 compares our reference scenario forecasts to other publicly archived models. The USC SIKJalpha model suggests steadily rising daily deaths until early January. Other models suggest slow declines after the beginning of December in daily deaths.
- At some point from November through March 1, 25 countries in the region will have high or extreme stress on hospital beds (Figure 24.1). At some point from November through March 1, 49 countries in the region will have high or extreme stress on intensive care unit (ICU) capacity (Figure 25.1).

Model updates

No model updates.

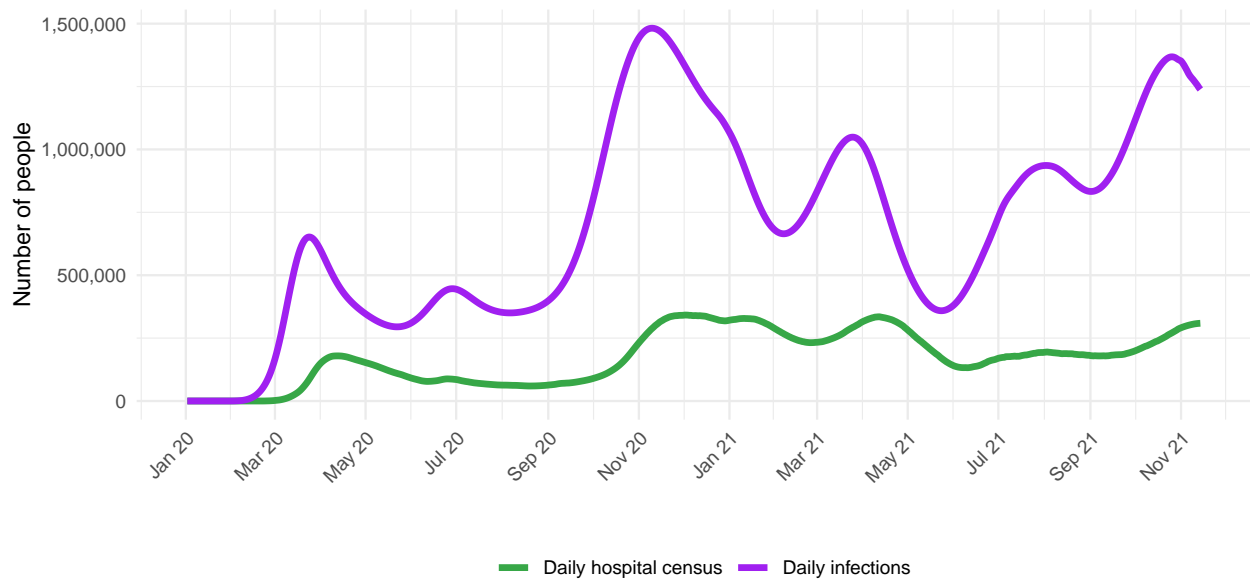
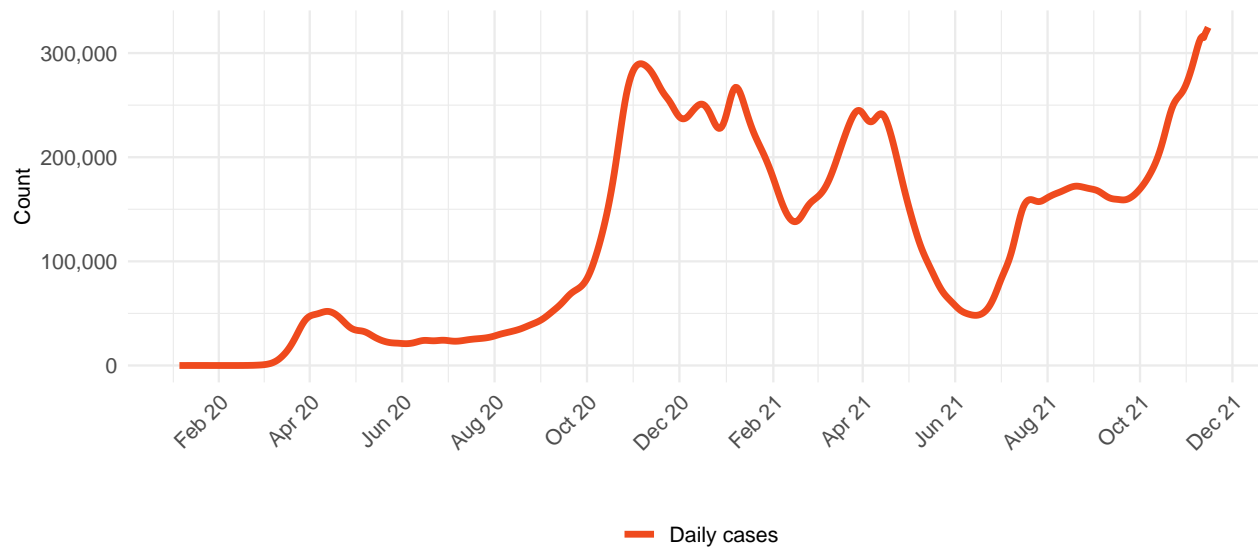
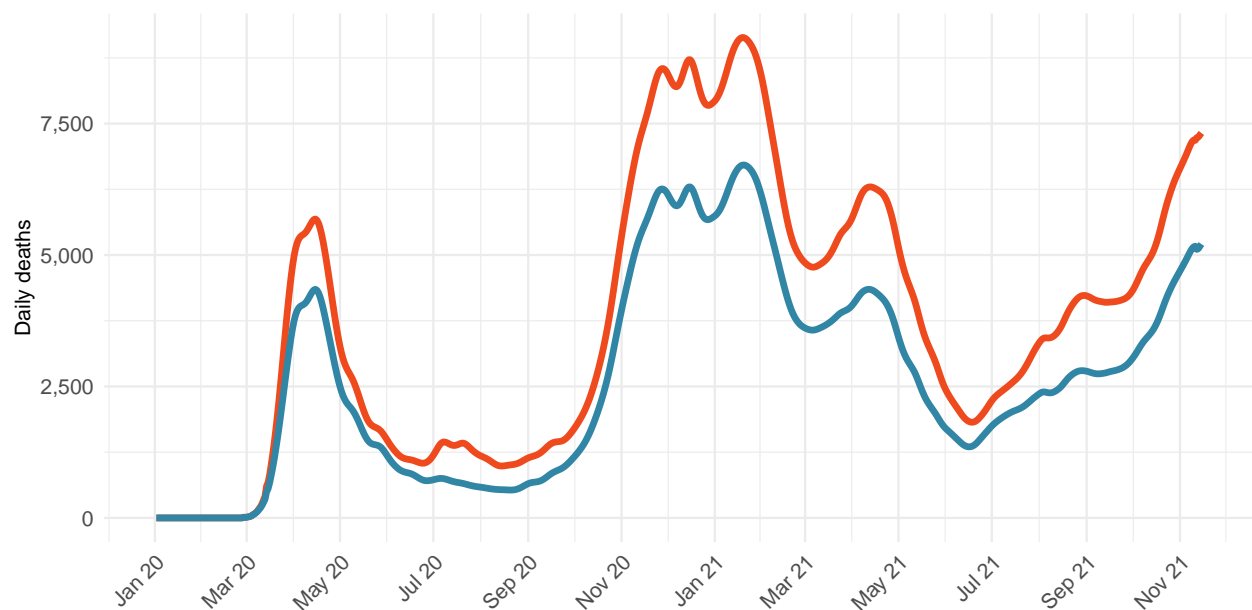
Figure 1.1. Daily COVID-19 hospital census and infections

Figure 2.1. Reported daily COVID-19 cases, moving average


Table 1. Ranking of total deaths due to 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	50,605	1
Ischemic heart disease	44,253	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 3.1. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily deaths due to COVID-19 (orange)



Daily COVID-19 death rate per 1 million on November 15, 2021

Figure 4.1 Daily reported COVID-19 death rate per 1 million

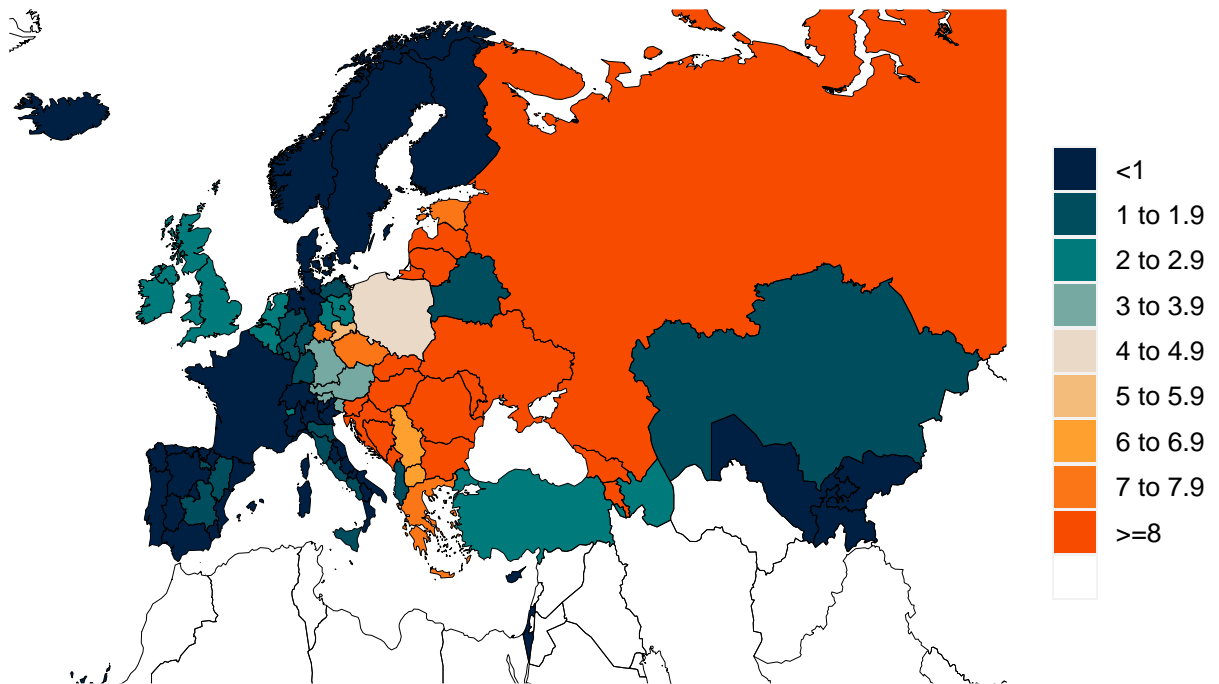
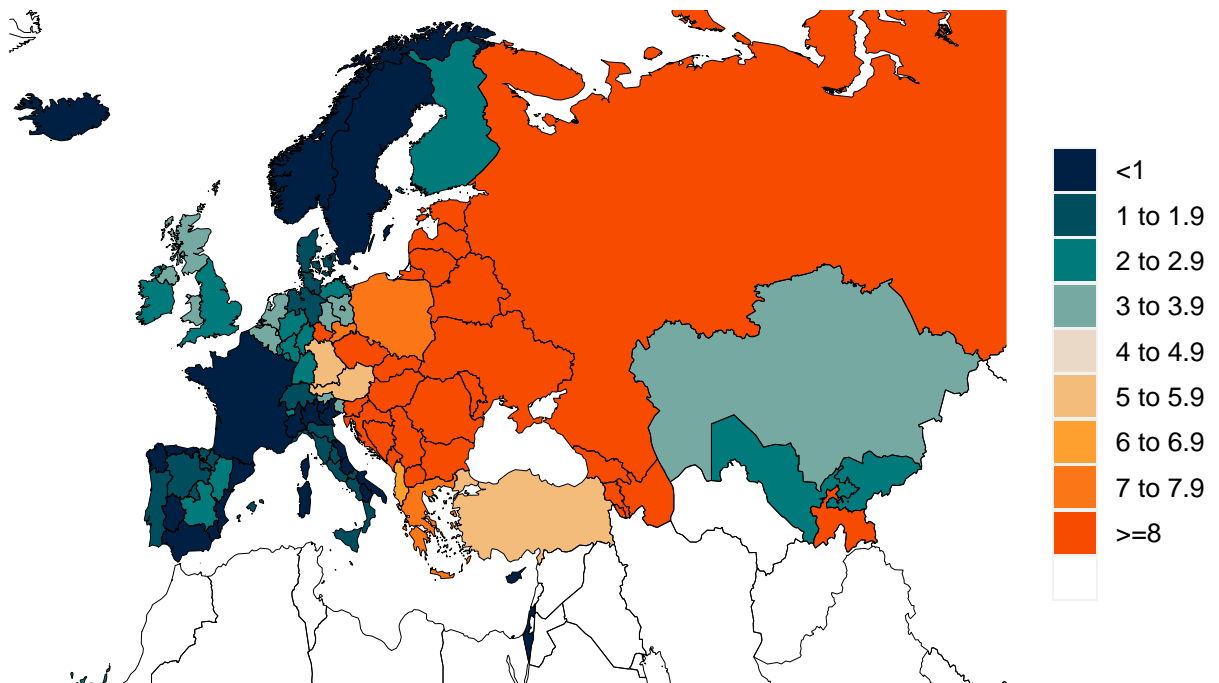


Figure 4.2 Daily total COVID-19 death rate per 1 million



Cumulative COVID-19 deaths per 100,000 on November 15, 2021

Figure 5.1 Reported cumulative COVID-19 deaths per 100,000

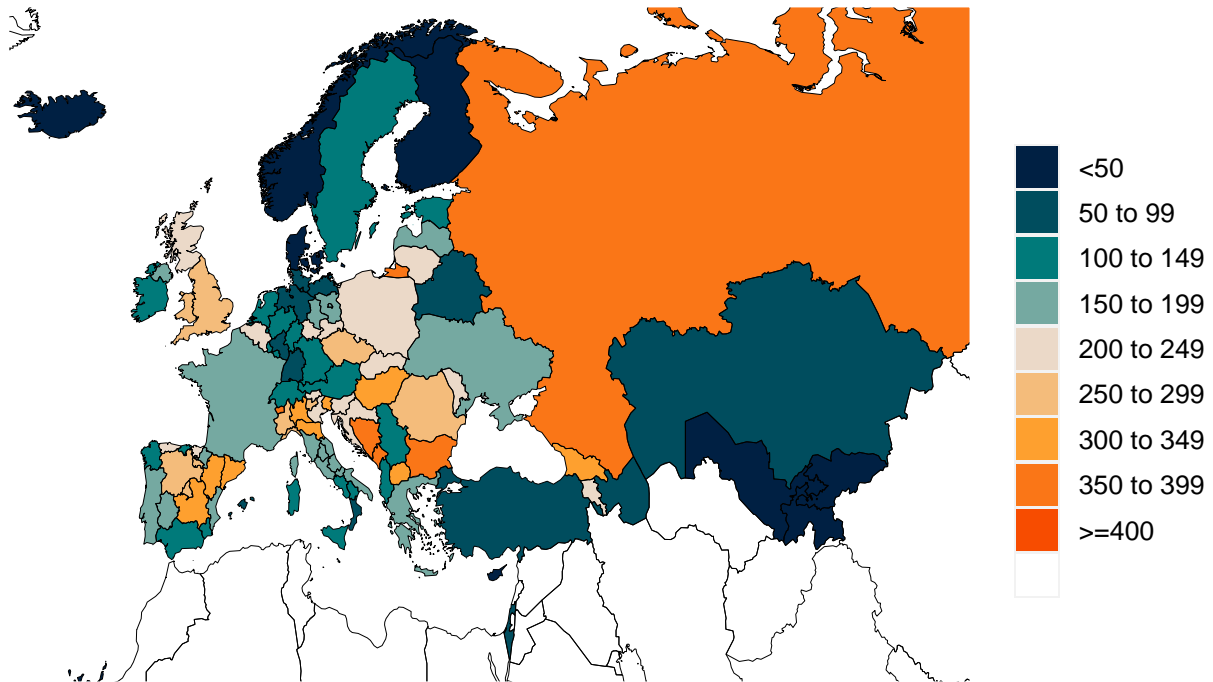


Figure 5.2 Total cumulative COVID-19 deaths per 100,000

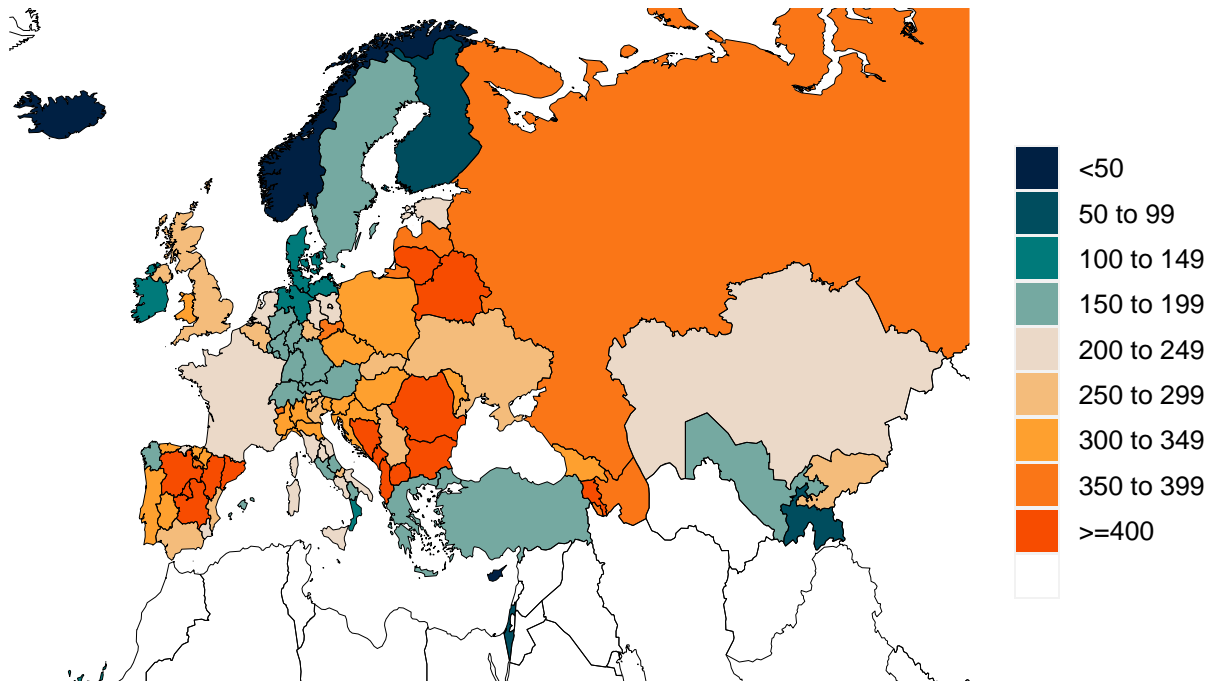


Figure 6.1. Estimated percent of the population infected with COVID-19 on November 15, 2021

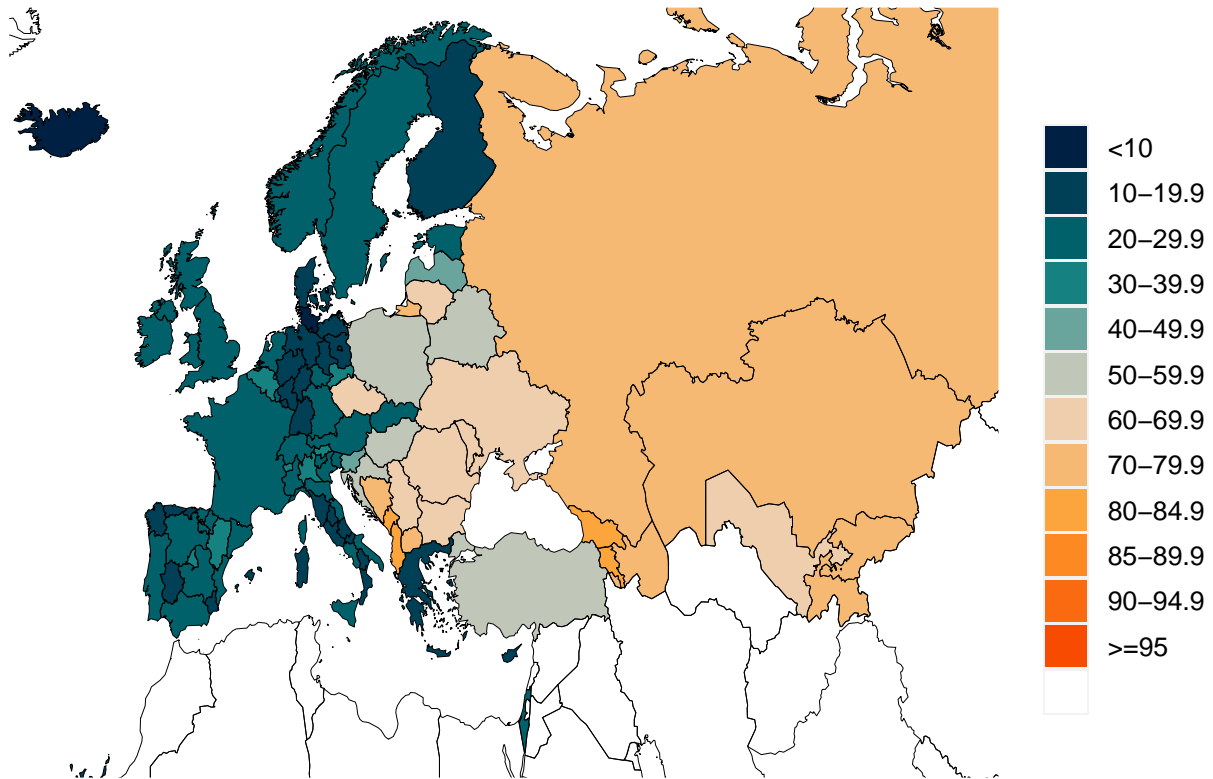


Figure 7.1. Mean effective R on November 4, 2021. Effective R less than 1 means that transmission should decline, all other things being held the same. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past.

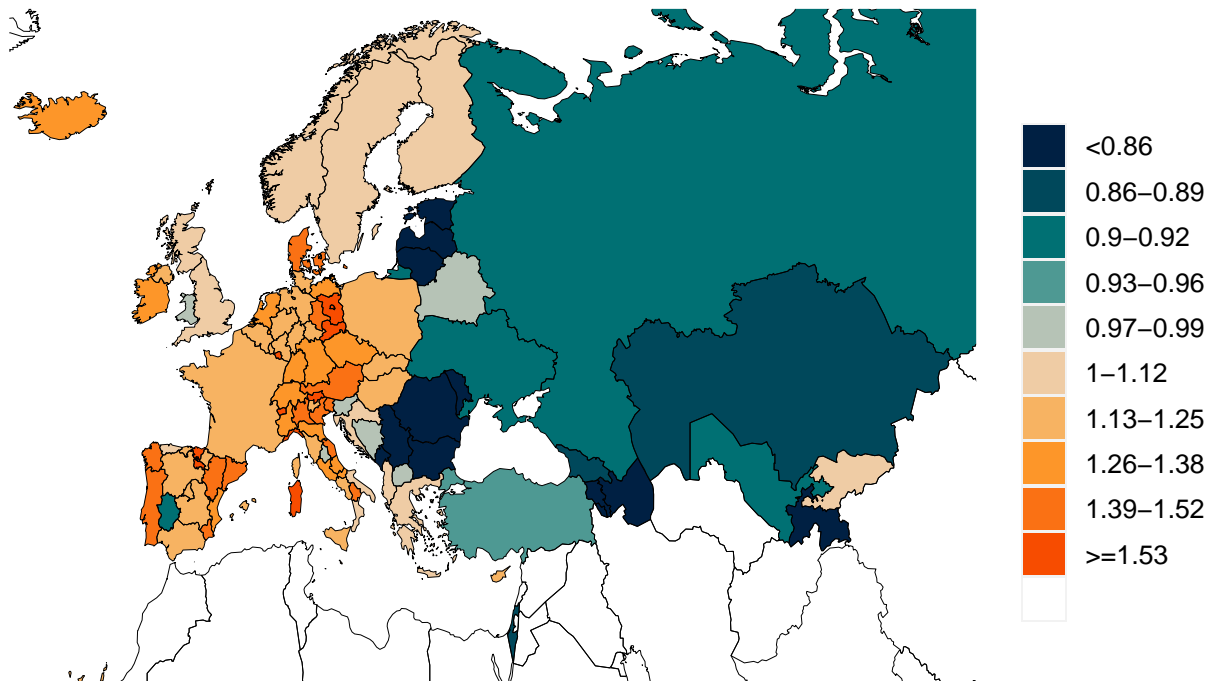
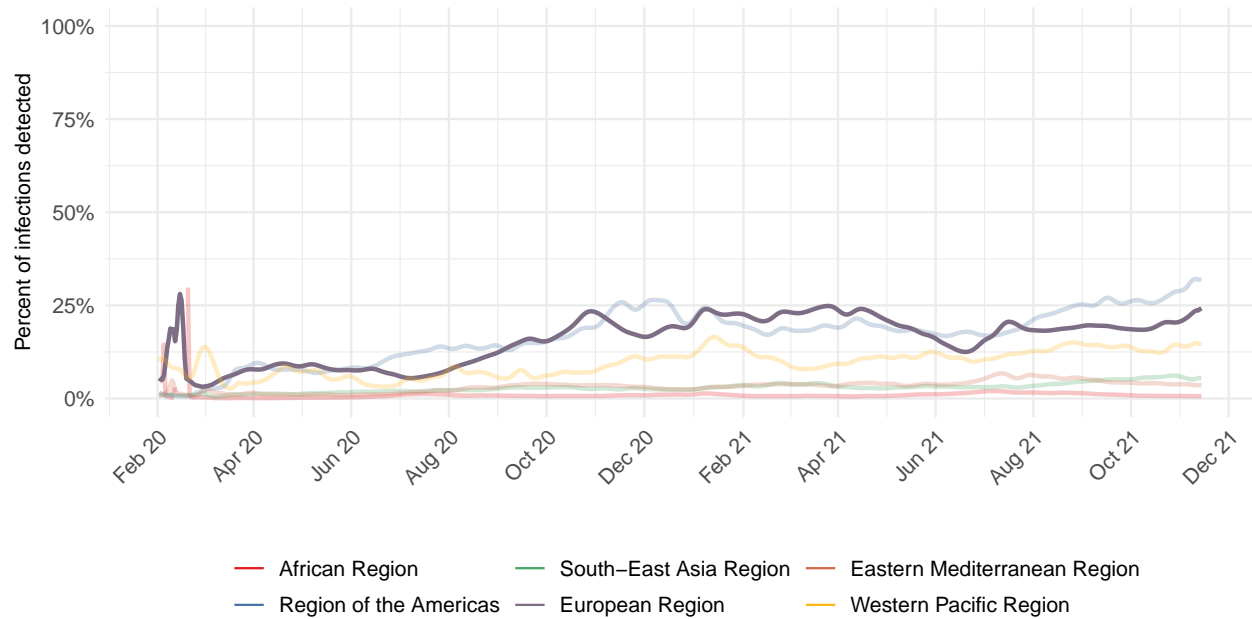


Figure 8.1. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.



Estimated percent of circulating SARS-CoV-2 for primary variant families on November 15, 2021

Figure 9.1 Estimated percent Alpha variant

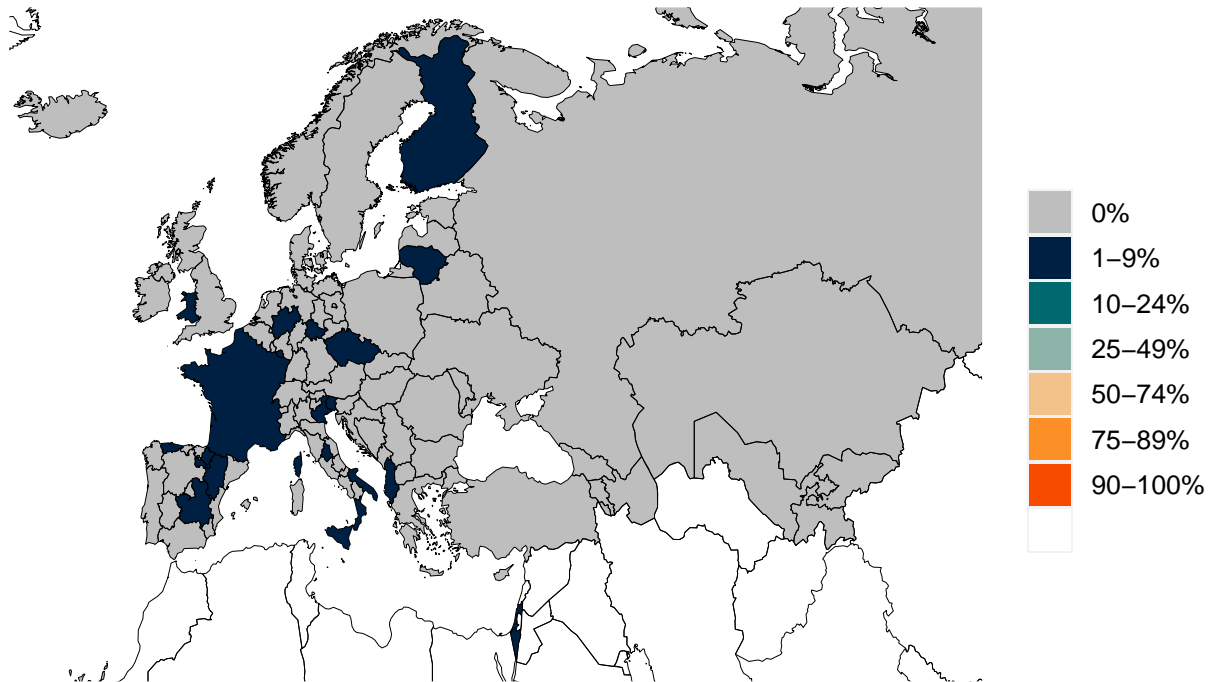


Figure 9.2 Estimated percent Beta variant

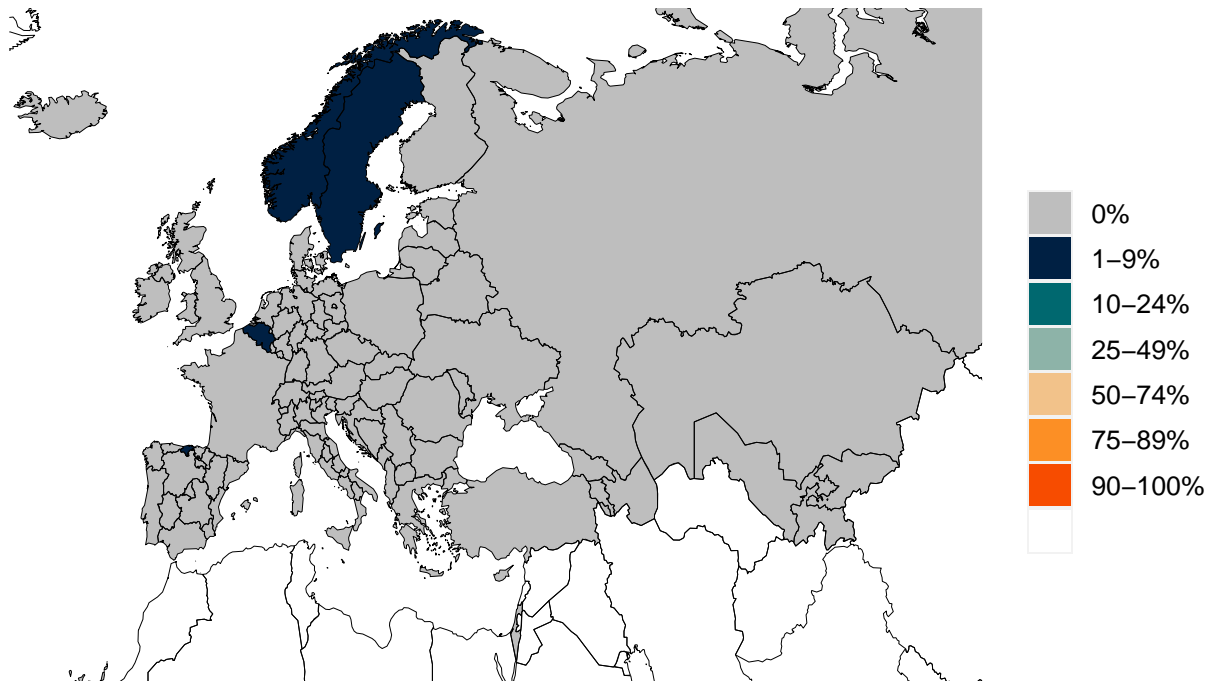


Figure 9.3 Estimated percent Delta variant

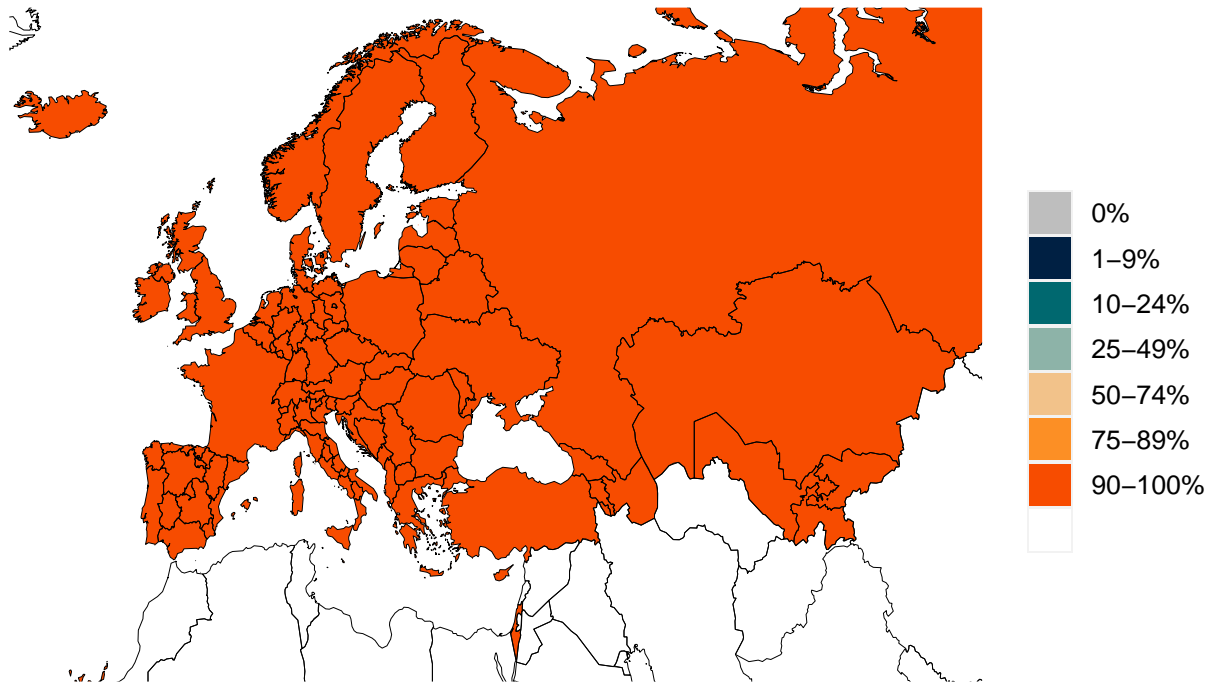


Figure 9.4 Estimated percent Gamma variant

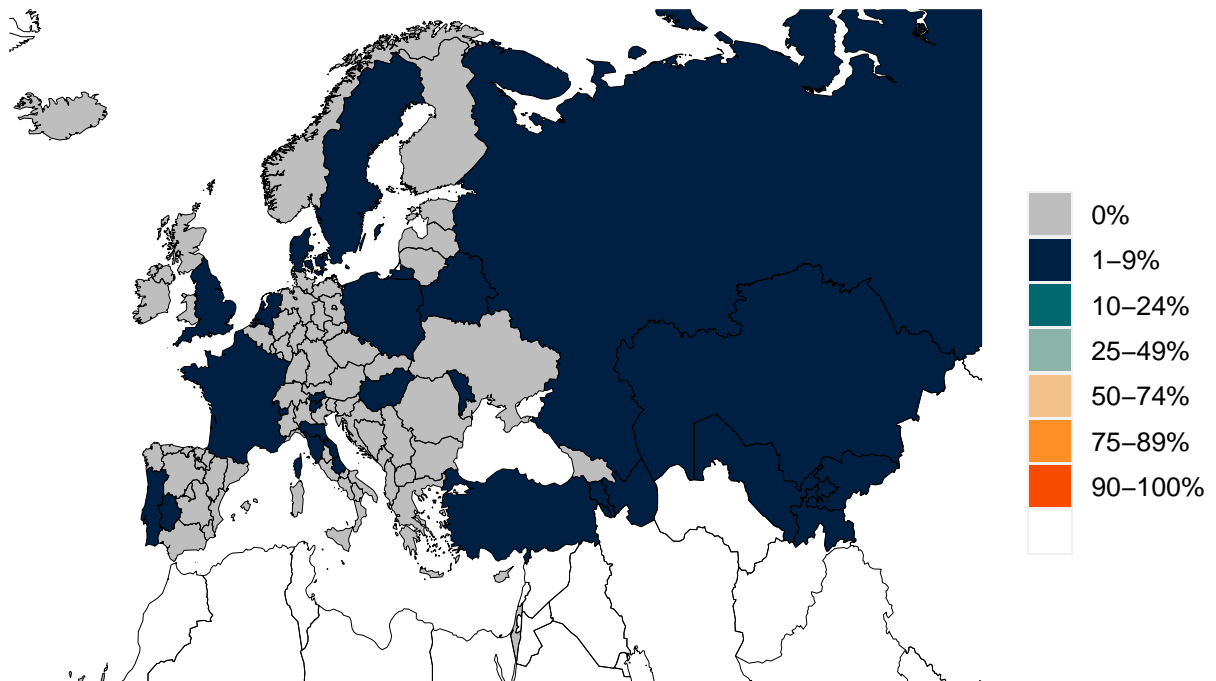
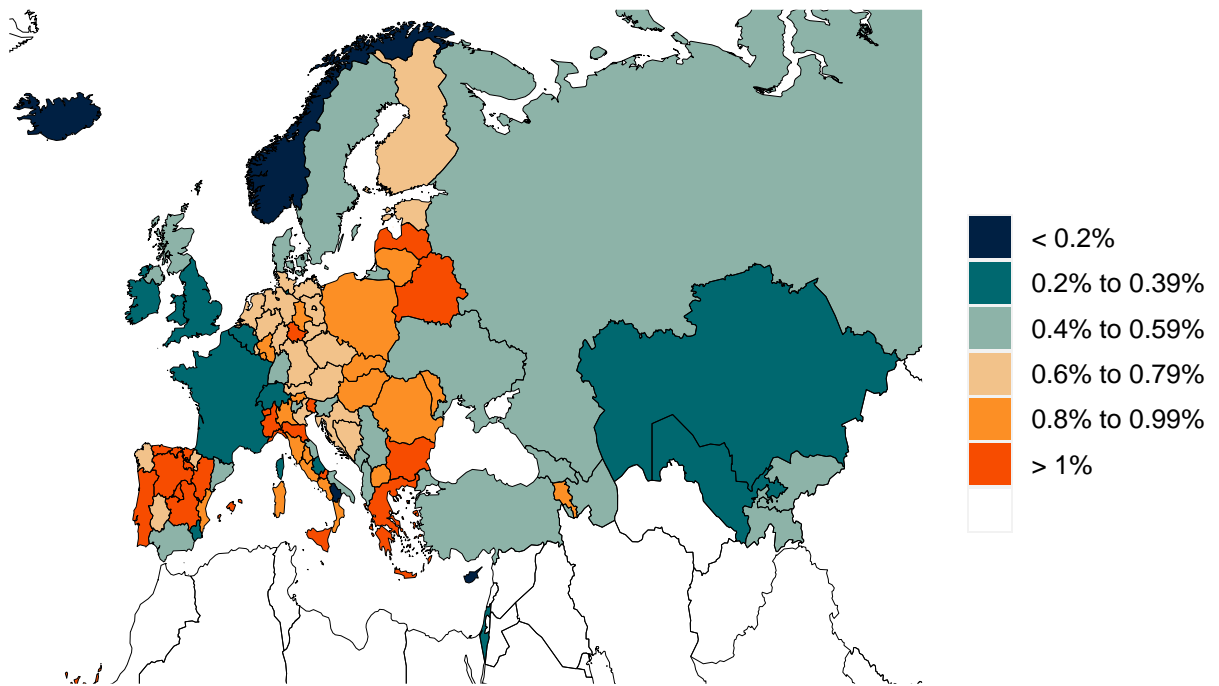
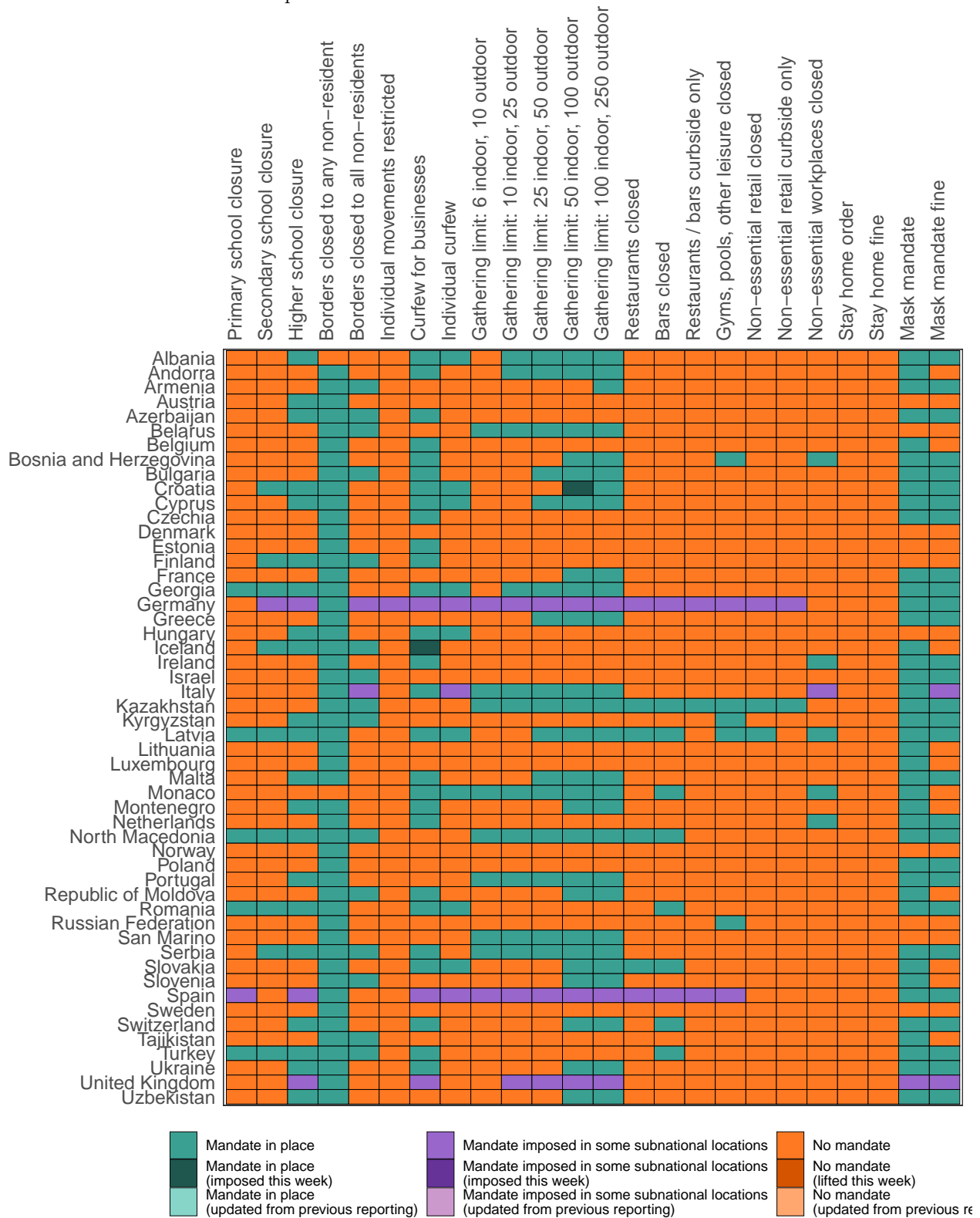


Figure 10.1. Infection-fatality rate on November 15, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.



Critical drivers

Table 2. Current mandate implementation



*Not all locations are measured at the subnational level.

Figure 11.1. Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

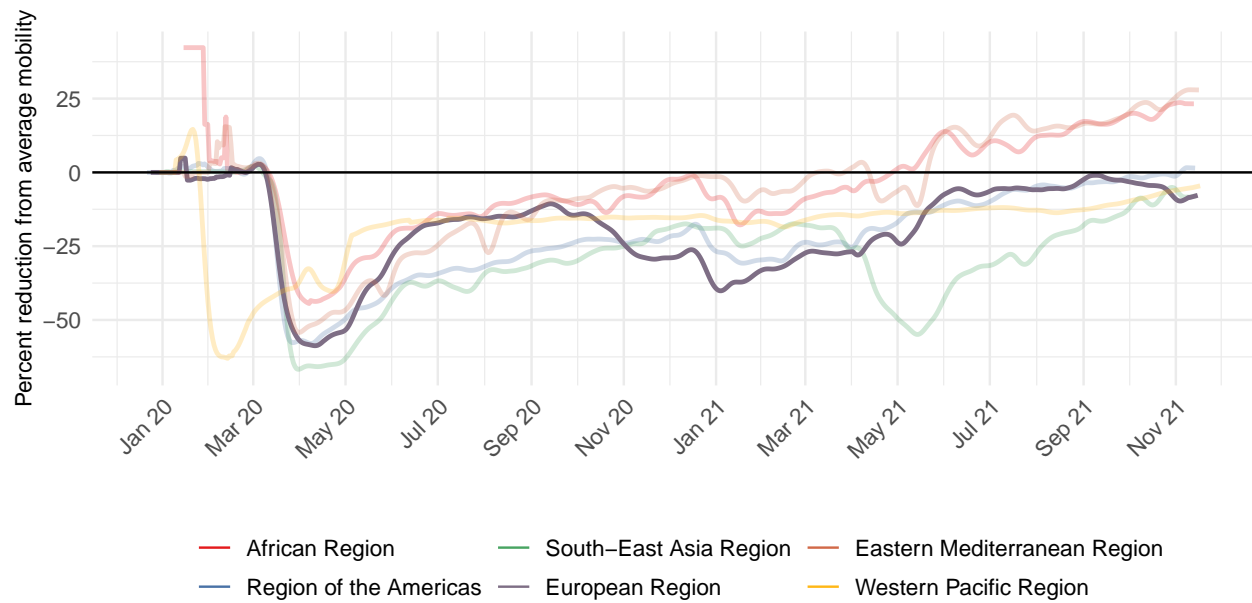


Figure 12.1. Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on November 15, 2021

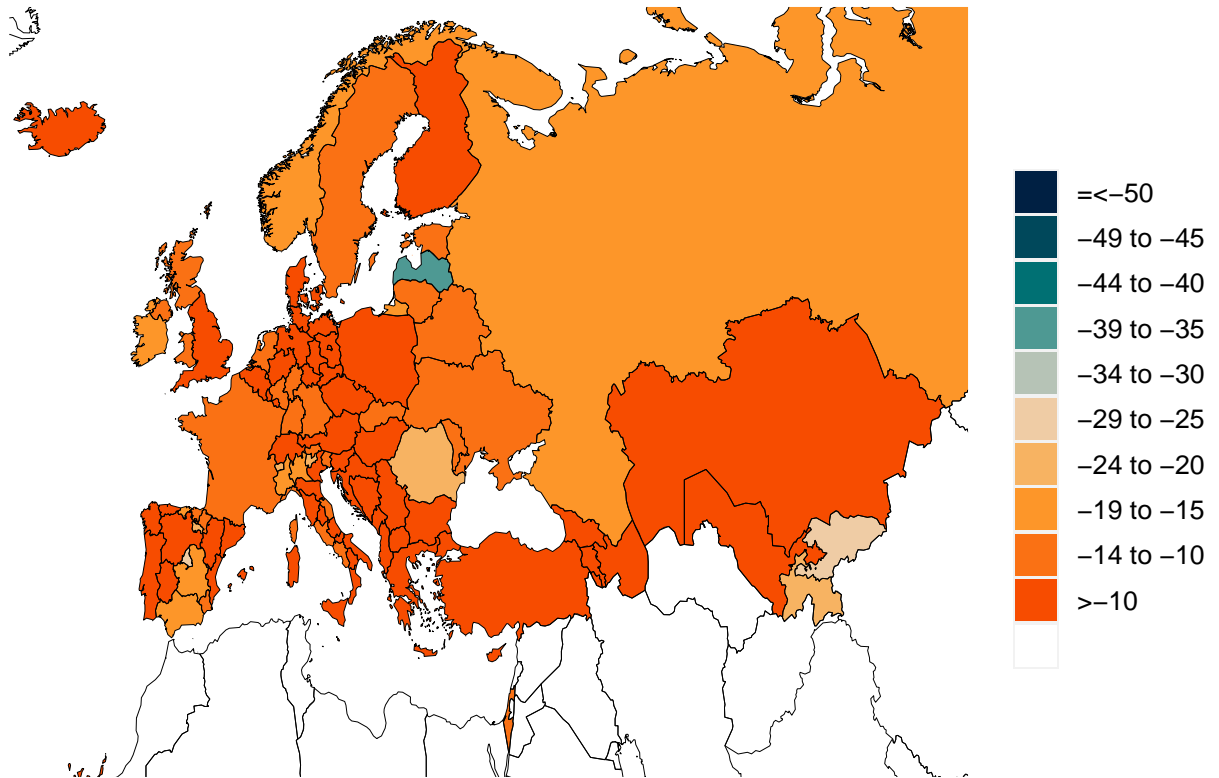


Figure 13.1. Trend in the proportion of the population reporting always wearing a mask when leaving home

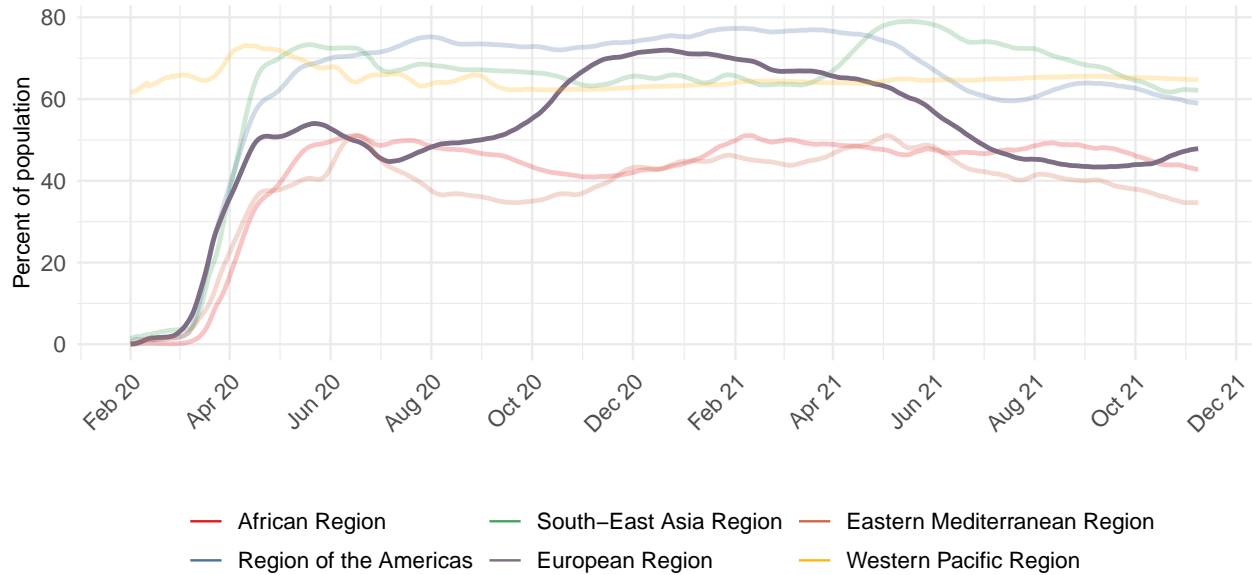


Figure 14.1. Proportion of the population reporting always wearing a mask when leaving home on November 15, 2021

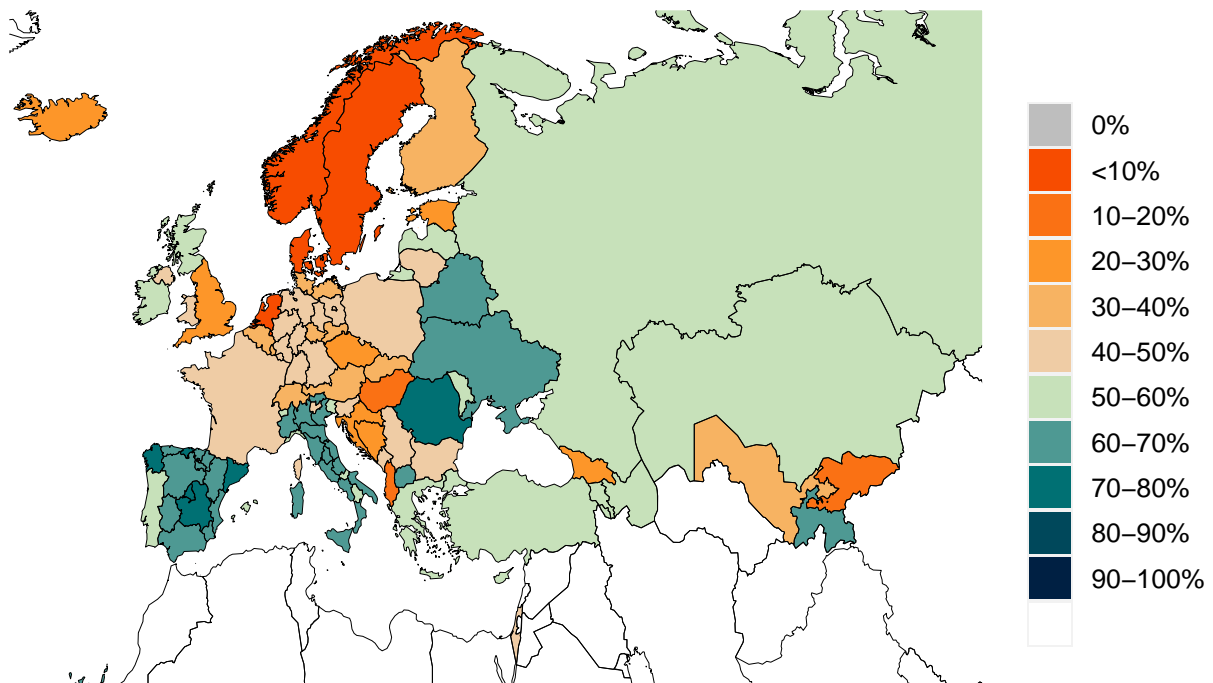


Figure 15.1. Trend in COVID-19 diagnostic tests per 100,000 people

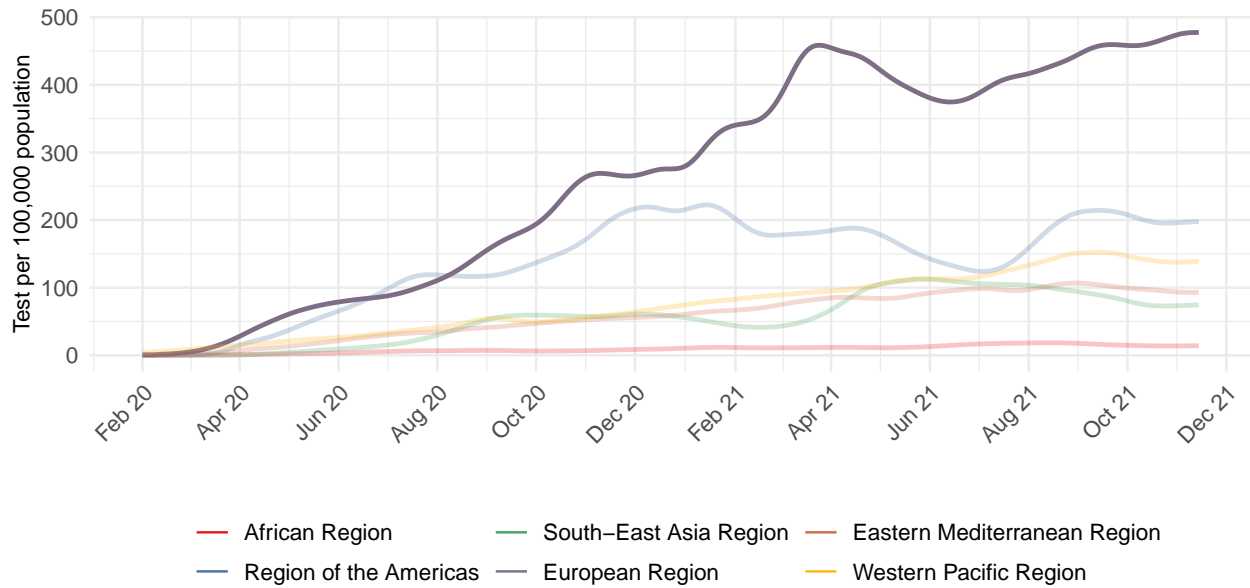


Figure 16.1. COVID-19 diagnostic tests per 100,000 people on November 15, 2021

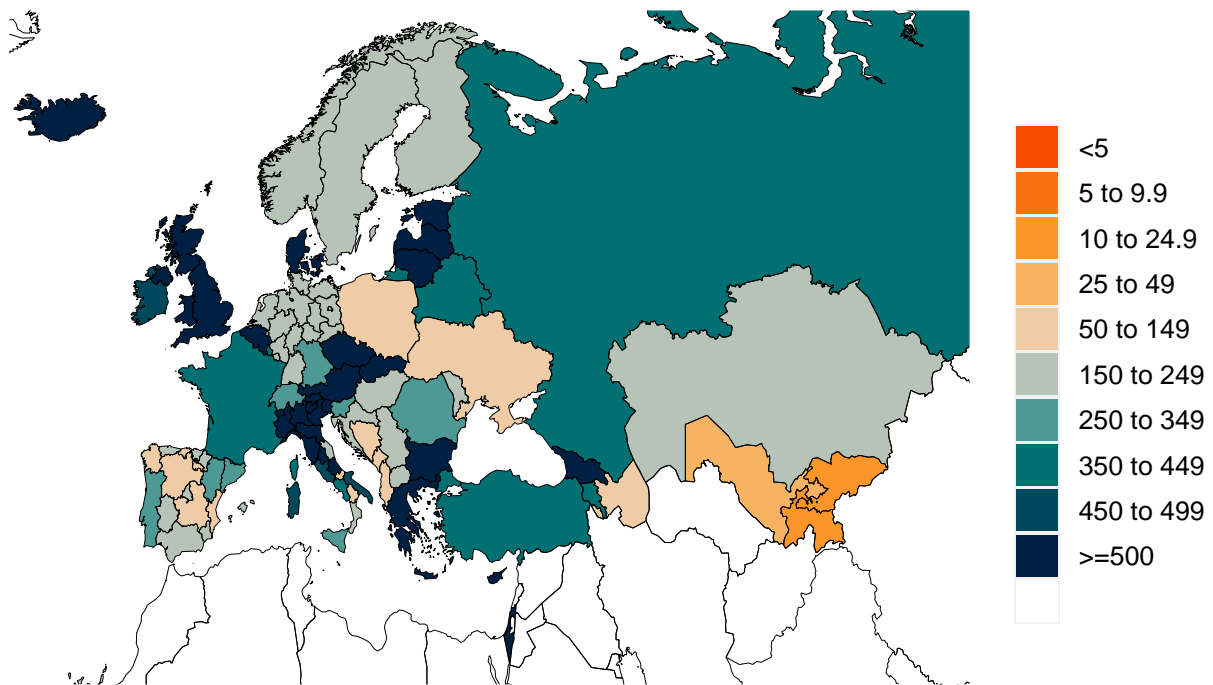


Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our [website](#).

Vaccine	Efficacy at preventing disease: ancestral and Alpha	Efficacy at preventing infection: ancestral and Alpha	Efficacy at preventing disease: Beta, Delta, & Gamma	Efficacy at preventing infection: Beta, Delta, & Gamma
AstraZeneca	90%	52%	85%	49%
CoronaVac	50%	44%	43%	38%
Covaxin	78%	69%	68%	60%
Johnson & Johnson	86%	72%	60%	56%
Moderna	94%	89%	94%	80%
Novavax	89%	79%	79%	69%
Pfizer/BioNTech	94%	86%	85%	78%
Sinopharm	73%	65%	63%	56%
Sputnik-V	92%	81%	80%	70%
Tianjin	66%	58%	57%	50%
CanSino				
Other vaccines	75%	66%	65%	57%
Other vaccines (mRNA)	91%	86%	85%	78%

Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by November 15, 2021

Figure 17.1 Percent of the population having received one dose of a COVID-19 vaccine

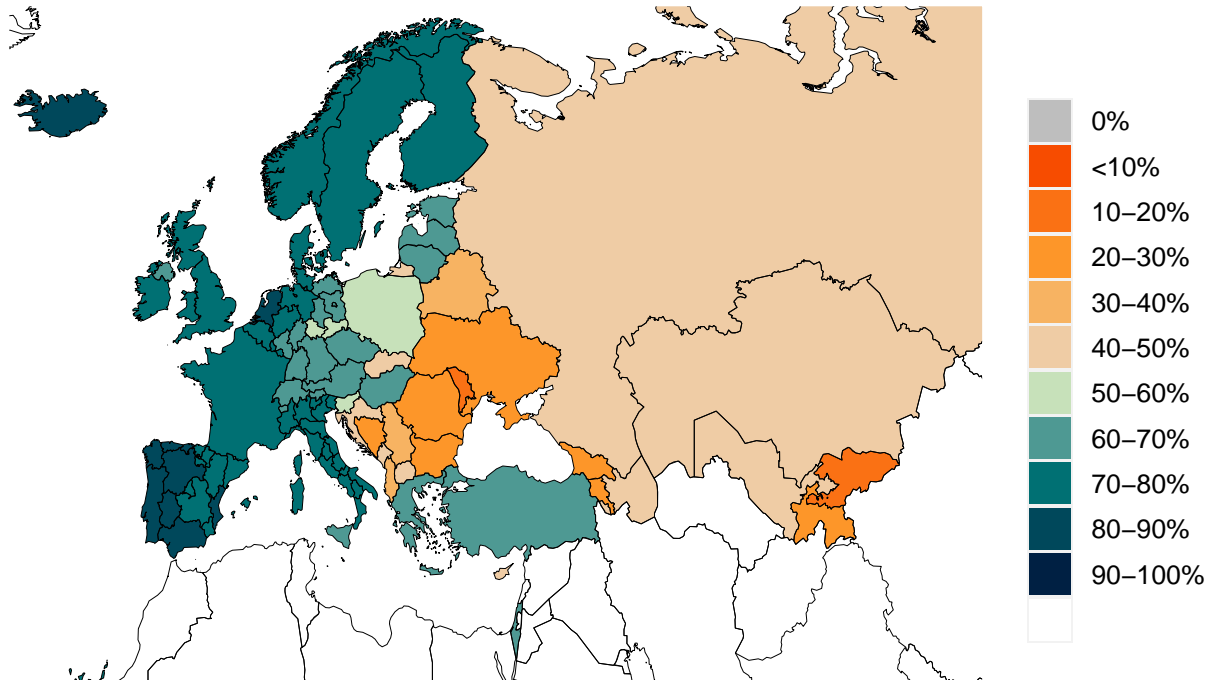


Figure 17.2 Percent of the population fully vaccinated against SARS-CoV-2

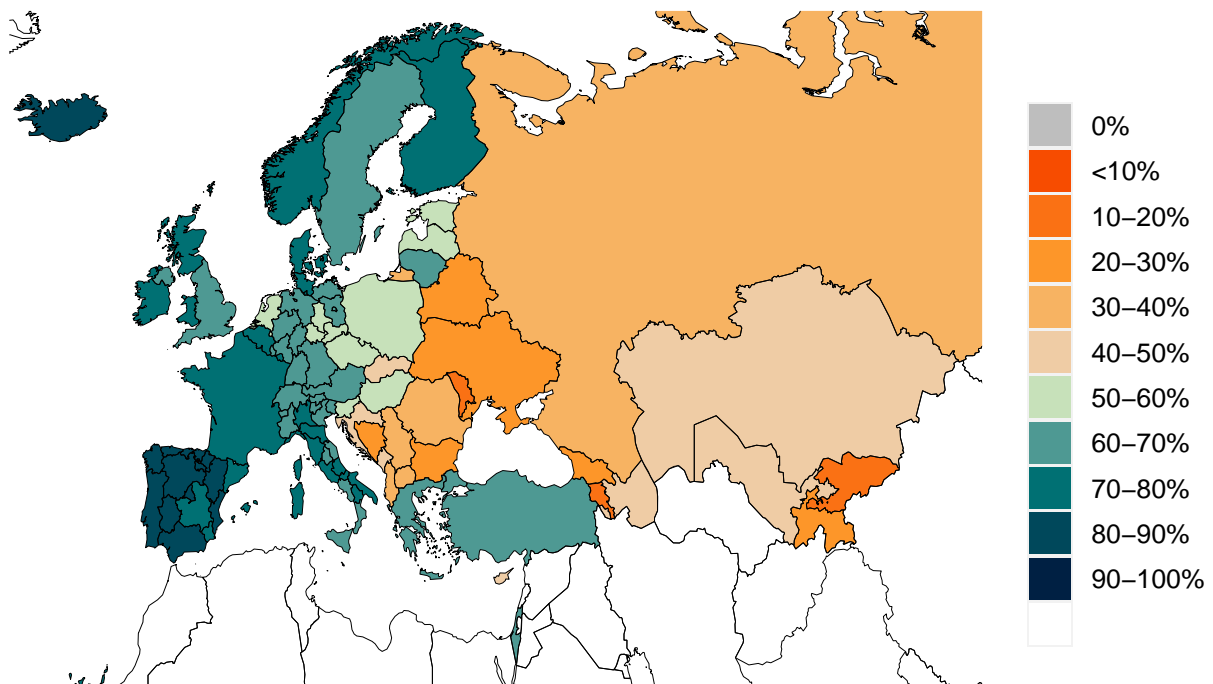


Figure 18.1. Trend in the estimated proportion of the population that is 12 years and older that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

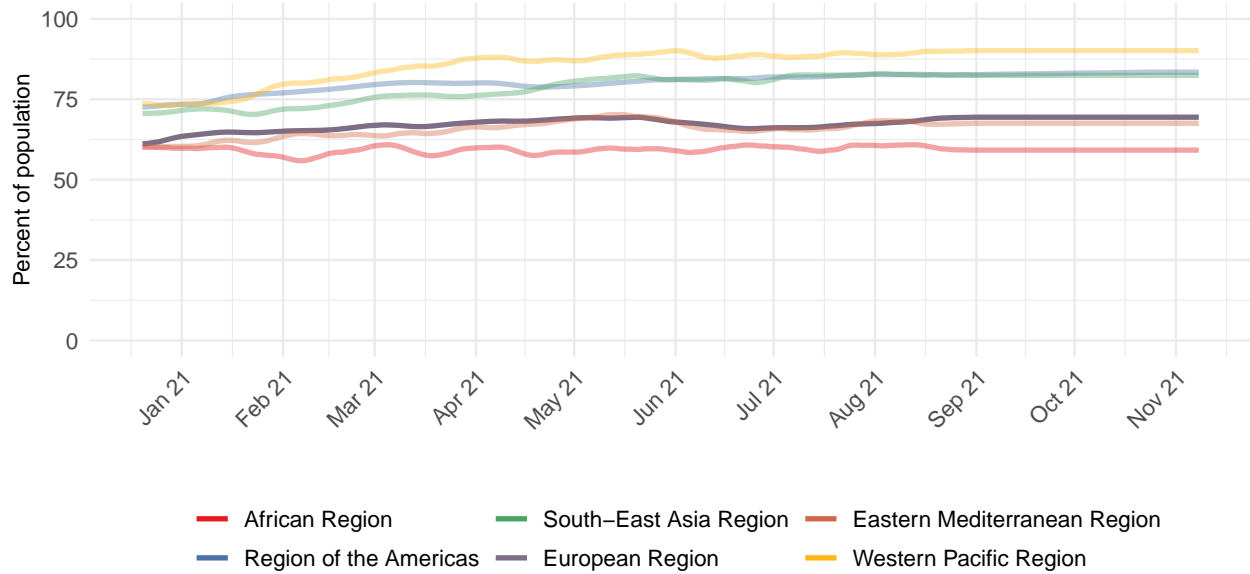


Figure 19.1. Estimated proportion of the population that is 12 years and older that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

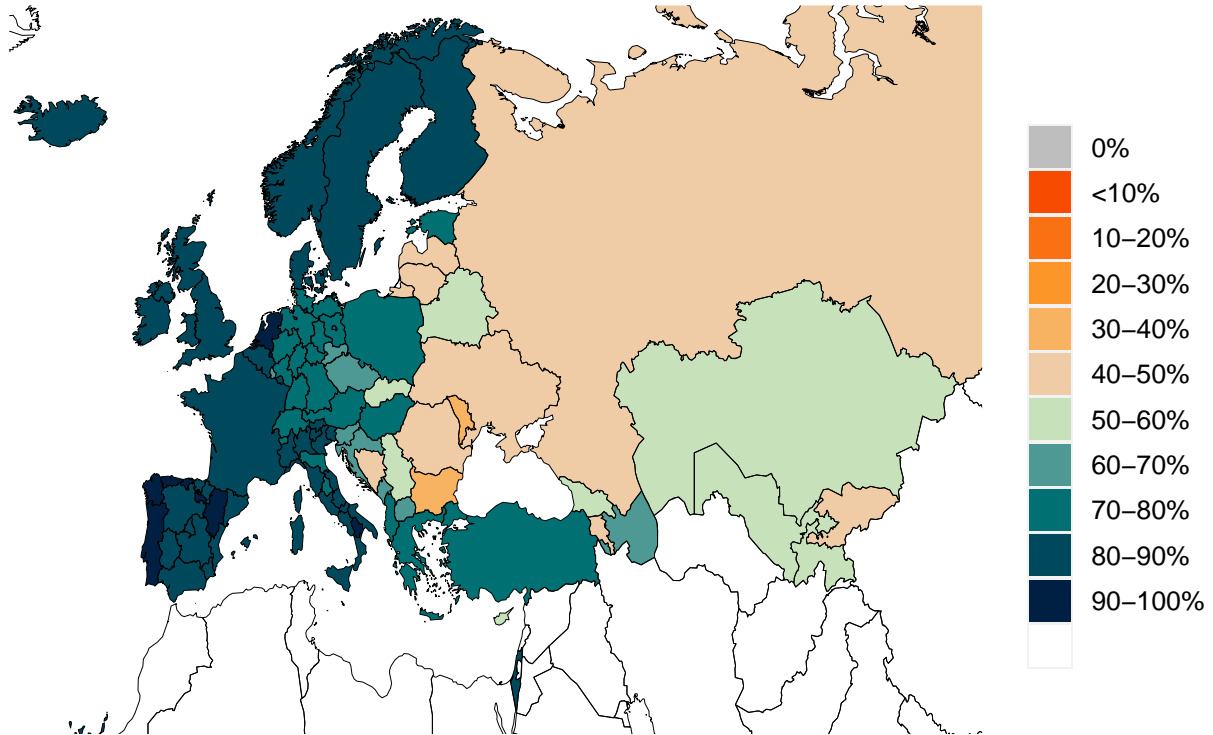


Figure 20.1. Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

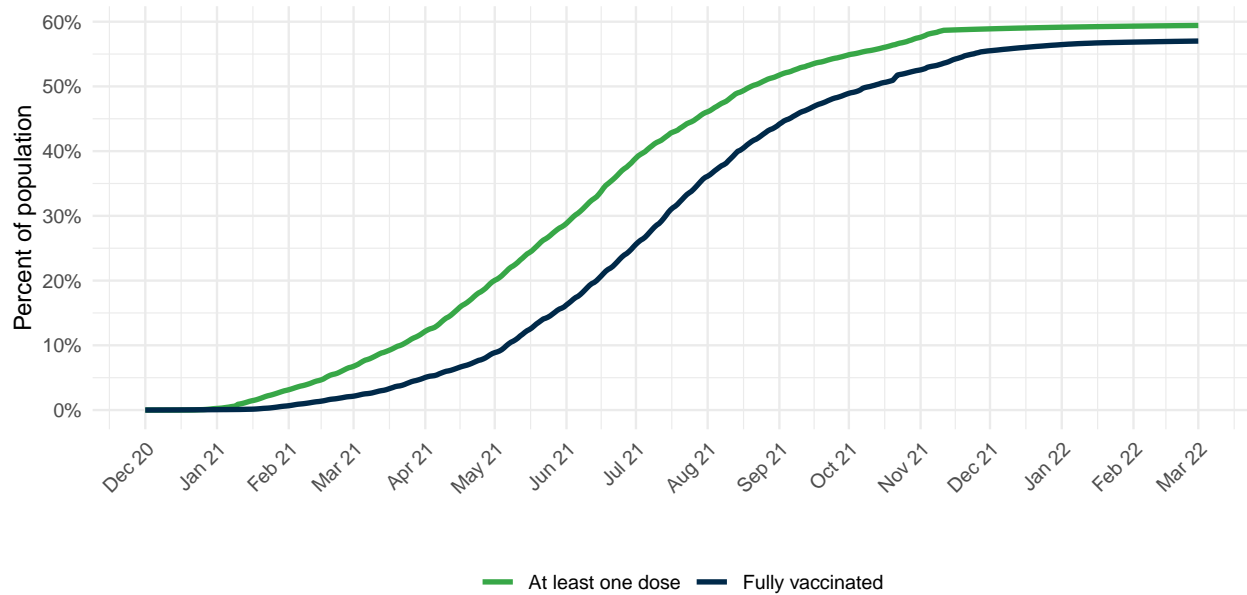
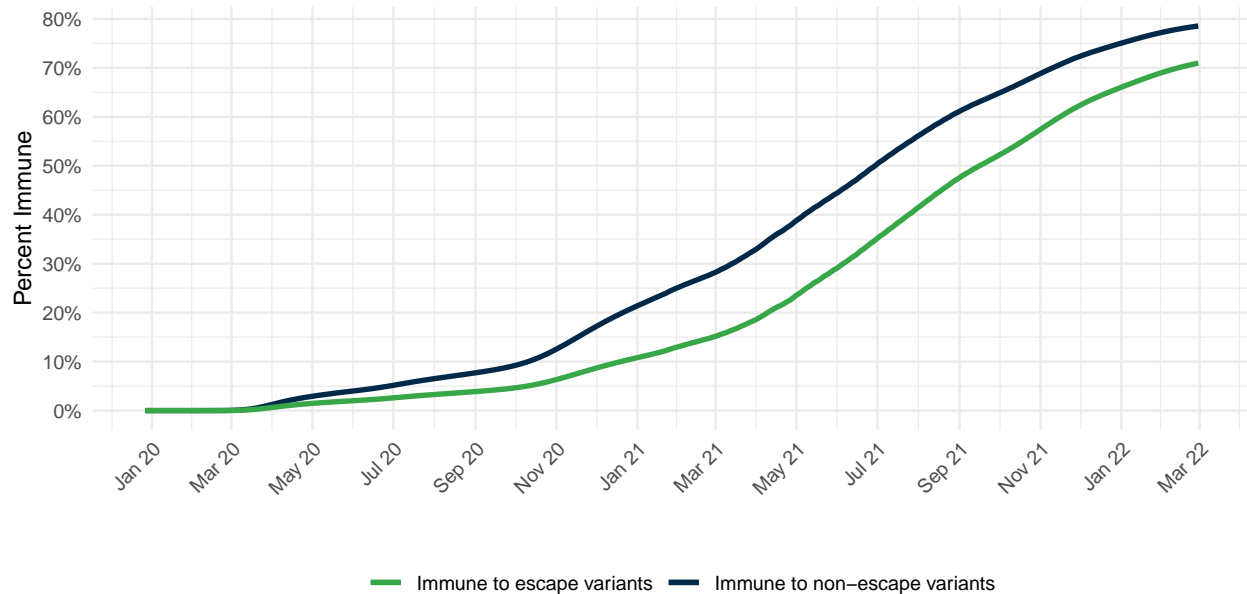


Figure 21.1. Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants



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. Brand- and variant-specific vaccine efficacy is updated using the latest available information from peer-reviewed publications and other reports.
- Future mask use is the mean of mask use over the last 7 days.
- Mobility increases as vaccine coverage increases.
- 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 reference scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants Alpha, Beta, Gamma, and Delta continue to spread regionally and globally from locations with sufficient transmission.

The **worse scenario** modifies the reference scenario assumption in four ways:

- 100% of vaccinated individuals stop using masks.
- Mobility increases in all locations to 25% above the pre-pandemic winter baseline, irrespective of vaccine coverage.
- Governments are more reluctant to re-impose social distancing mandates, waiting until the daily death rate reaches 15 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 reference scenario assumes that mandates are re-imposed when daily deaths reach 38 per million. In either case, we assume social distancing mandates remain in effect for 6 weeks.
- Variants Alpha, Beta, Gamma, and Delta spread between locations twice as fast when compared with our reference scenario.

The **universal masks scenario** makes all the same assumptions as the reference scenario but assumes all locations reach 95% mask use within 7 days.

Daily COVID-19 deaths until March 01, 2022 for three scenarios

Figure 22.1 Reported daily COVID-19 deaths per 100,000

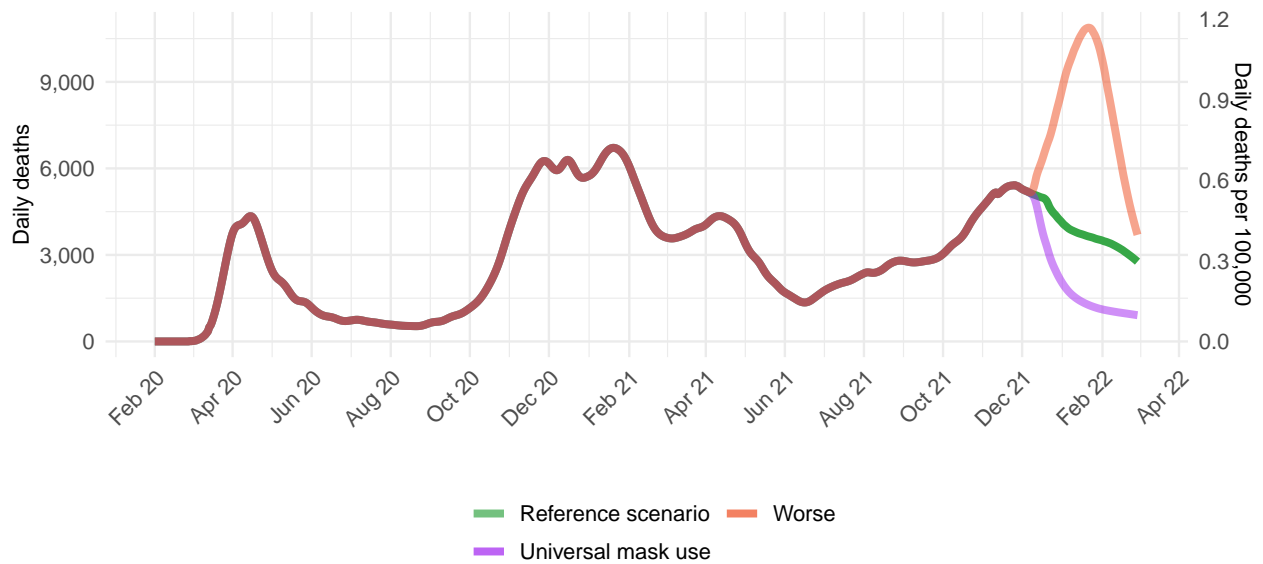


Figure 22.2 Total daily COVID-19 deaths per 100,000

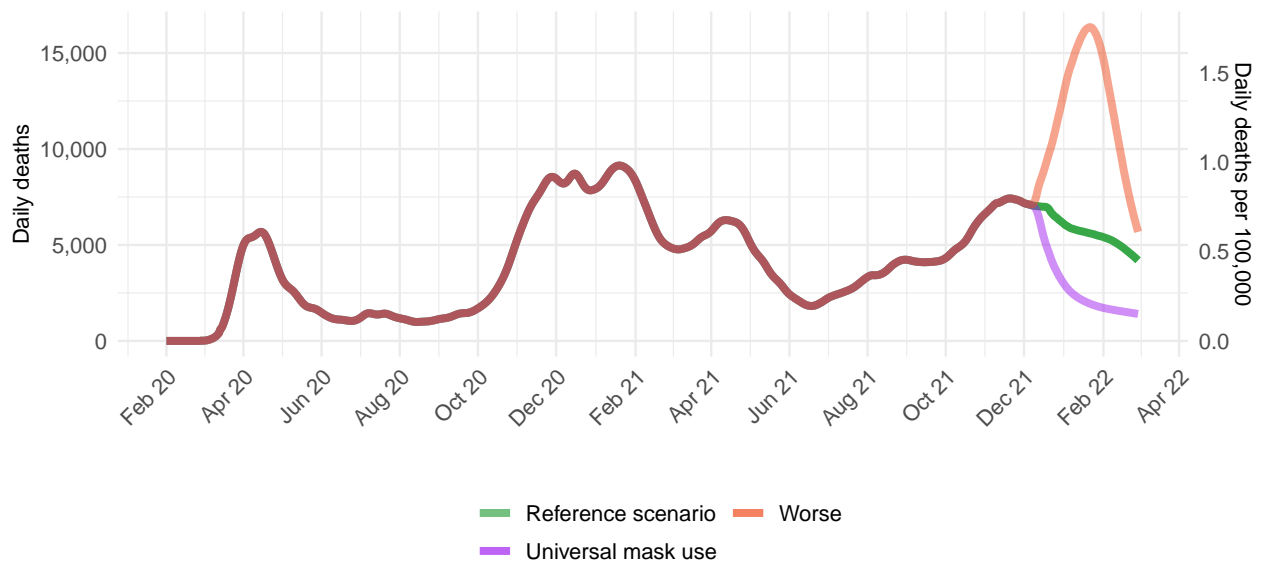


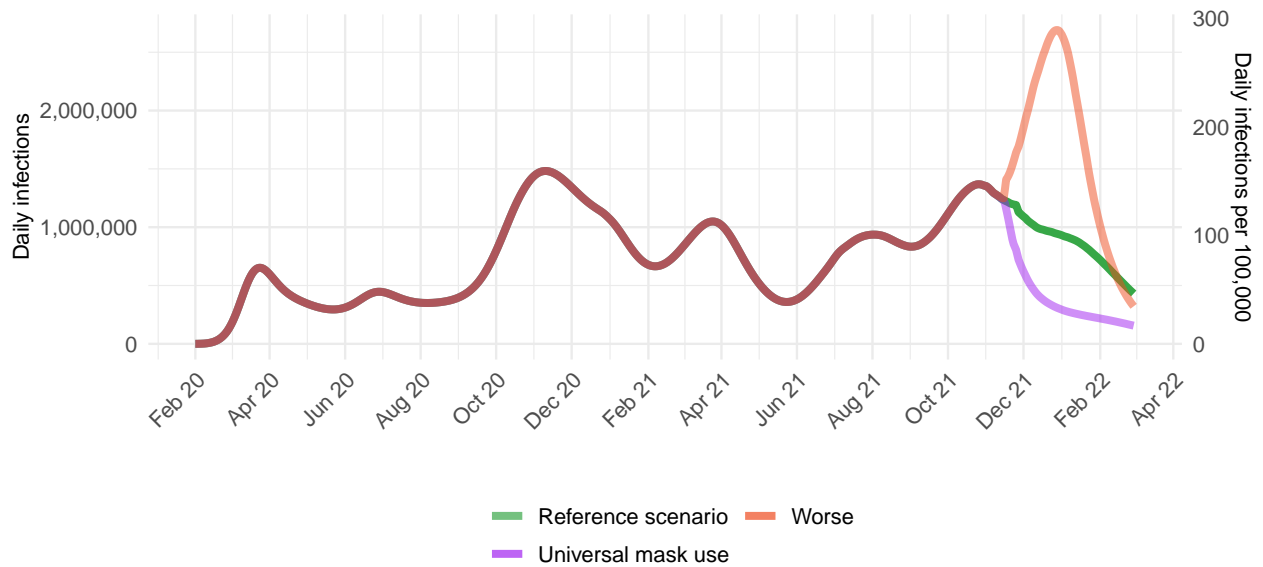
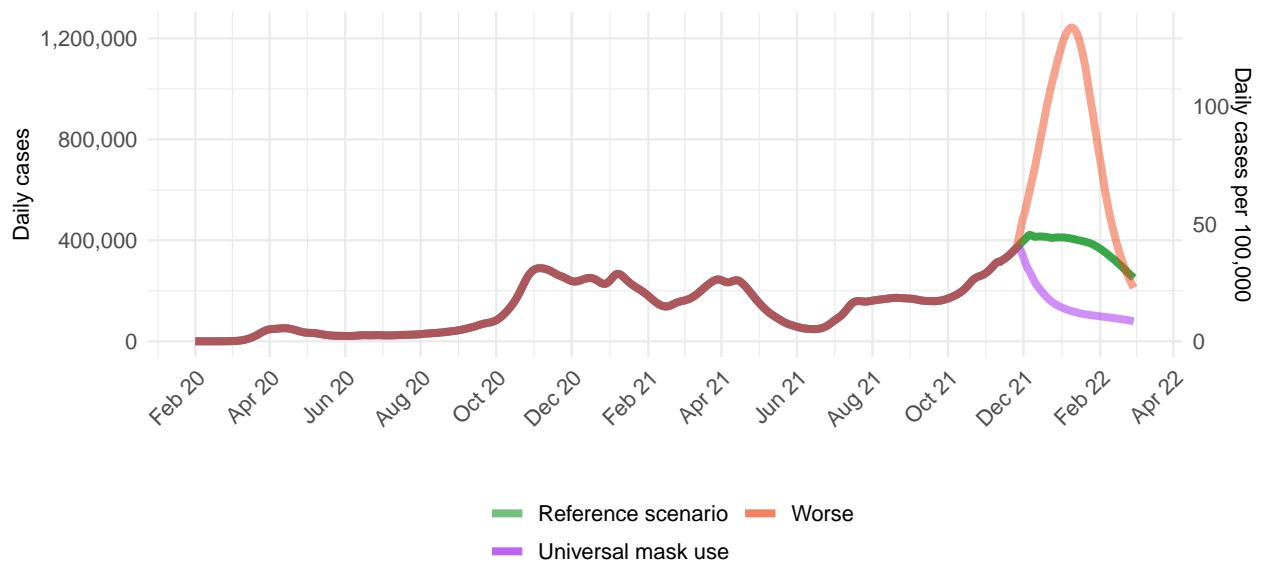
Figure 22.3. Daily COVID-19 infections until March 01, 2022 for three scenarios

Figure 22.4. Daily COVID-19 reported cases until March 01, 2022 for three scenarios


Figure 22.5. Daily COVID-19 hospital census until March 01, 2022 for three scenarios

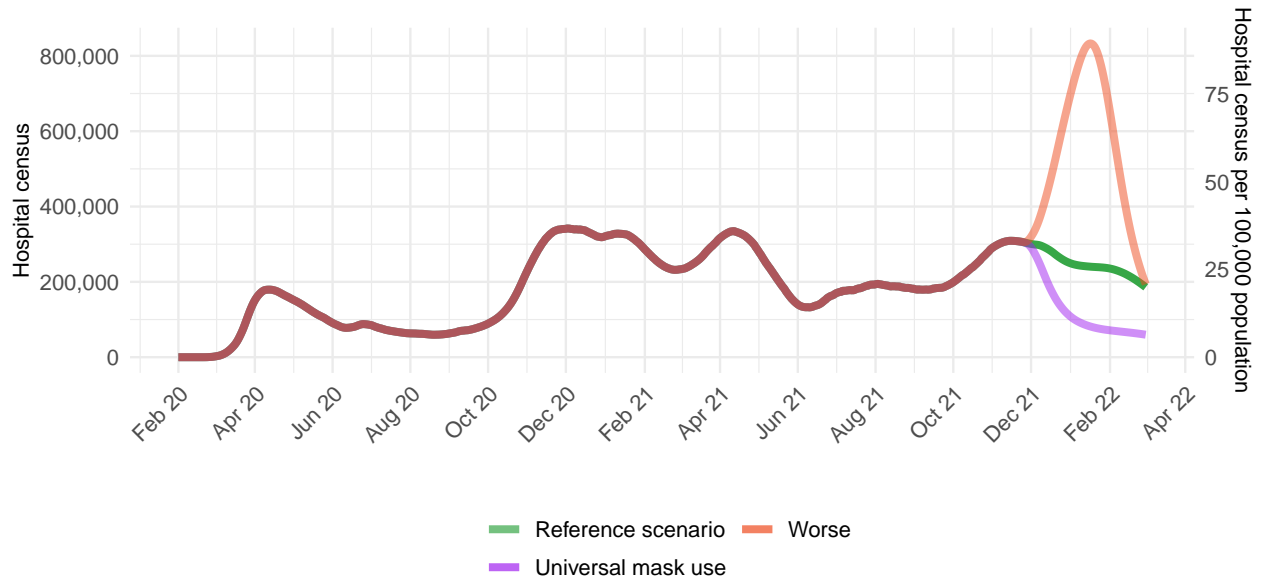


Figure 23.1. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available, last model update in brackets: Delphi from the Massachusetts Institute of Technology ([Delphi](#)) [November 17, 2021], Imperial College London ([Imperial](#)) [November 3, 2021], the SI-KJalpha model from the University of Southern California ([SIKJalpha](#)) [November 17, 2021]. Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.

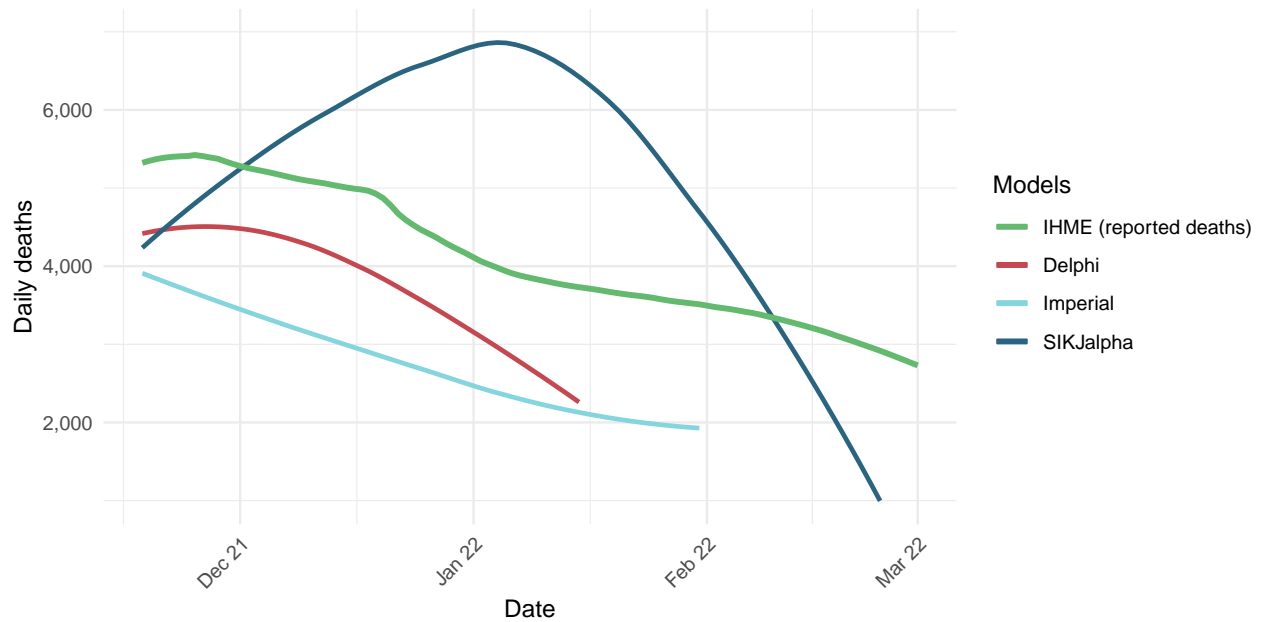


Figure 24.1. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.

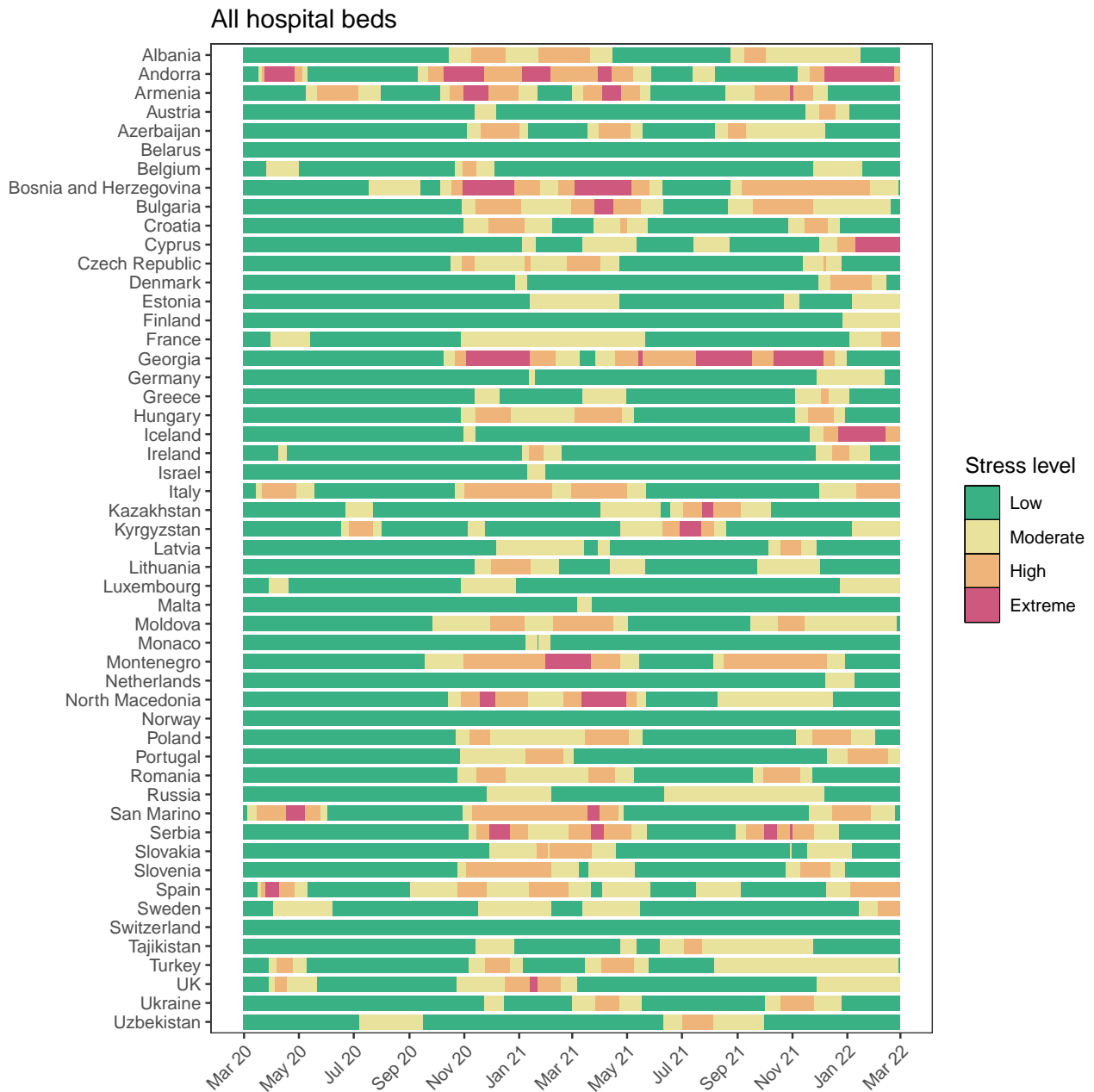
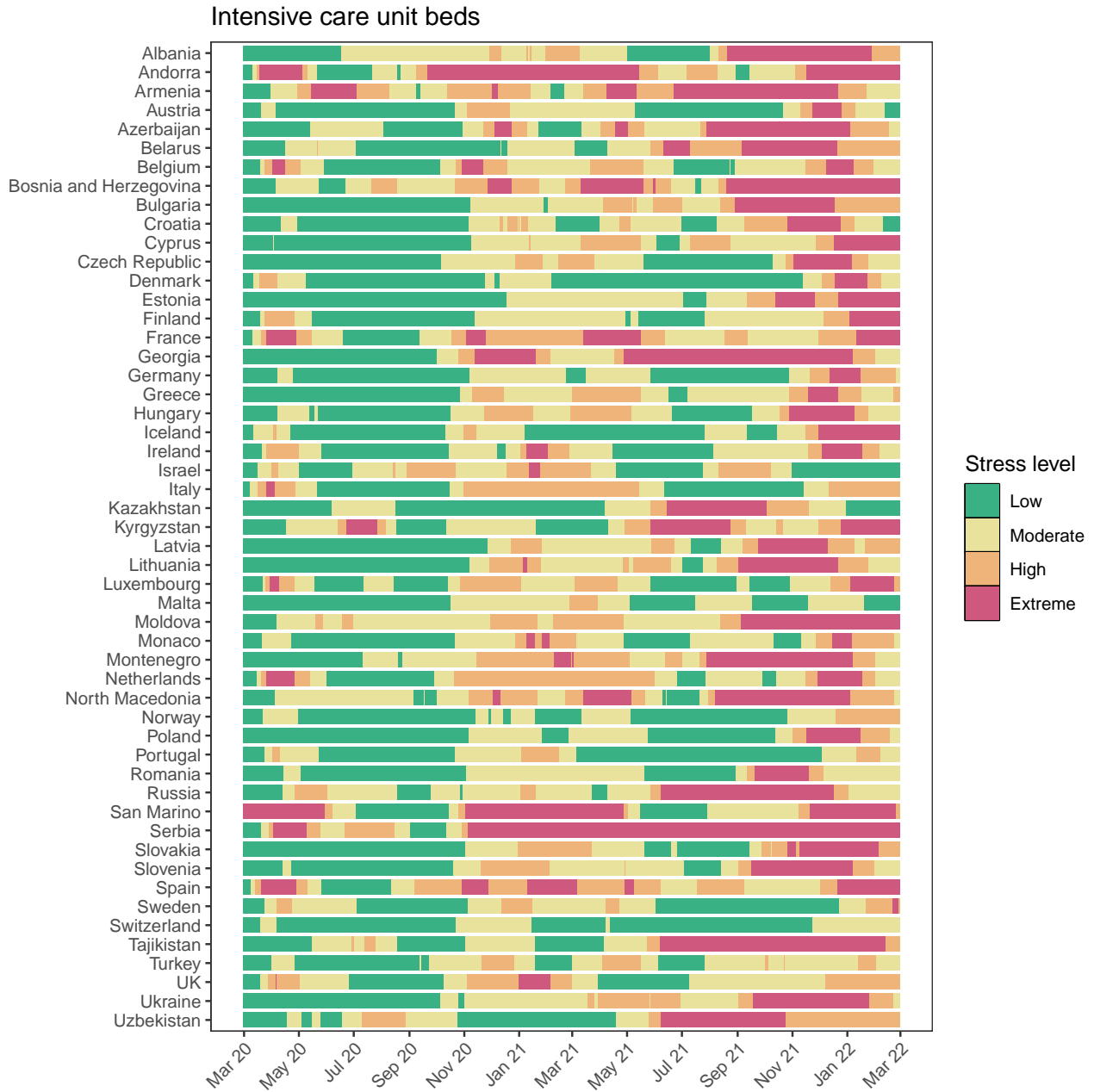


Figure 25.1. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and 60% or greater is considered *extreme stress*.



More information

Data sources:

Mask use and vaccine confidence data are from the [The Delphi Group at Carnegie Mellon University and University of Maryland COVID-19 Trends and Impact Surveys](#), in partnership with Facebook. Mask use data are also from [Premise](#), the Kaiser Family Foundation, and the [YouGov COVID-19 Behaviour Tracker](#) survey.

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>.

To download our most recent results, visit our [Data downloads page](#).

Questions? Requests? Feedback? Please contact us at <https://www.healthdata.org/covid/contact-us>.