

COVID-19 Results Briefing

United Kingdom

February 24, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the UK. The model was run on February 24, 2021, with data through February 22, 2021.

Current situation

- Daily reported cases in the last week decreased to 11,600 per day on average compared to 14,600 the week before (Figure 1).
- Daily deaths in the last week decreased to 470 per day on average compared to 700 the week before (Figure 2). This makes COVID-19 the number 1 cause of death in the UK this week (Table 1).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in no countries of the UK (Figure 5).
- We estimated that 16% of people in the UK have been infected as of February 22 (Figure 4).
- The daily death rate is greater than 4 per million in England, Scotland, and Wales (Figure 3).

Trends in drivers of transmission

- Mobility last week was 53% lower than the pre-COVID-19 baseline (Figure 7). Mobility was near baseline (within 10%) in no countries. Mobility was lower than 30% of baseline in England, Northern Ireland, Scotland, and Wales.
- As of February 22, we estimated that 67% of people always wore a mask when leaving their home, the same as last week (Figure 9). Mask use was lower than 50% in no countries in the UK.
- There were 771 diagnostic tests per 100,000 people on February 22 (Figure 11).
- In the UK, 90.5% 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 88% in Northern Ireland to 91% in Wales (Figure 14).
- In our current reference scenario, we expect that 51.86 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 150,000 cumulative deaths on June 1, 2021. This represents 9,000 additional deaths from February 22 to June 1 (Figure 16). Daily deaths peaked at 1,140 on February 1, 2021 (Figure 17).
- By June 1, 2021, we project that 5,300 lives will be saved by the projected vaccine rollout.
- If **universal mask coverage (95%)** were attained in the next week, our model projects 1,000 fewer cumulative deaths compared to the reference scenario on June 1, 2021 (Figure 16).
- Under our **worse scenario**, our model projects 152,000 cumulative deaths on June 1, 2021 (Figure 16).
- Figure 19 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.
- At some point from February through June 1, England, Northern Ireland, and Wales will have high or extreme stress on hospital beds (Figure 20). At some point from February through June 1, all four countries will have high or extreme stress on ICU capacity (Figure 21).

Model updates

In this week's model, we have made five updates. First, new blood bank seroprevalence data from South Africa has strengthened the evidence that the age-standardized infection-fatality ratio (IFR) is much lower in sub-Saharan Africa than previously estimated. Surveys in Kenya and Nigeria had supported this idea, but the more extensive data from South Africa have led us to revise the IFR for all countries in sub-Saharan Africa. This change revised upwards our estimates of the percentage of the population that has been infected in this region. Second, the third round Indian Council of Medical Research serosurvey found a higher level of seroprevalence at the national level than we have been estimating. In this week's analysis of past levels of infection, we have put more emphasis on this new round of survey data in estimating state-specific IFRs, which in turn is leading to higher estimates of cumulative infection. Third, the winter storm and electricity outages in Texas have had a noticeable impact on case, hospitalization, and death reporting. We have excluded data after the storm from the analysis. Fourth, we have continued to revise our variant scale-up estimates for the past and forecasts for future scale-up. For the past, for countries in Southern Africa without sufficient numbers of isolates sequenced, we have revised the likely start data for B.1.351 based on the scale-up of cases observed in these countries. A similar approach has been taken for Ghana. Newly available sequence data have led to revisions of the timing of the introduction of B.1.1.7, B.1.351, and P.1 in select locations. The maps below show our estimates of the prevalence of each variant this week by location. Fifth, we made two changes to the worse scenario. Rather than assuming immediate introduction of new variants B.1.351 or P.1 in all locations, we have assumed that the variant spreads to adjacent locations in 21 days, including across national borders. We have also assumed that mask use in those who have been vaccinated will begin declining one month after completed vaccination (rather than the reference scenario that assumes mask will begin declining three months after completed vaccination).

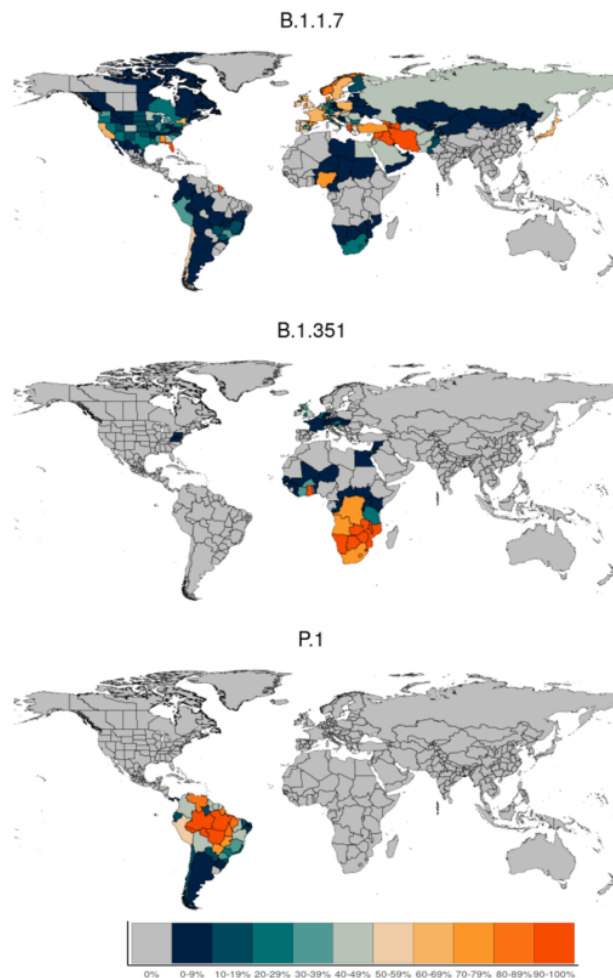
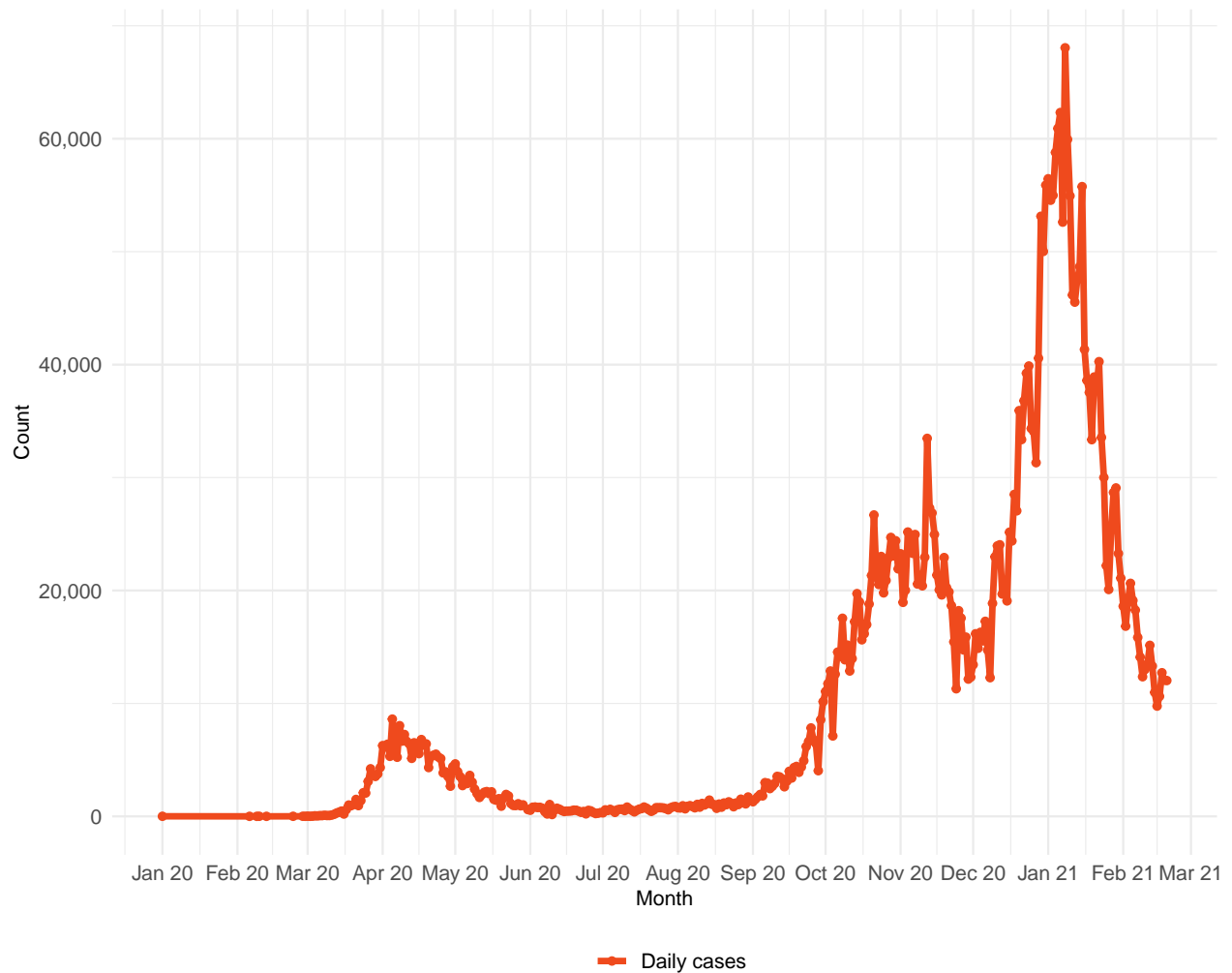


Figure 1. Reported daily COVID-19 cases

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	3,256	1
Ischemic heart disease	1,796	2
Stroke	974	3
Chronic obstructive pulmonary disease	845	4
Tracheal, bronchus, and lung cancer	824	5
Lower respiratory infections	805	6
Alzheimer's disease and other dementias	624	7
Colon and rectum cancer	466	8
Prostate cancer	307	9
Breast cancer	293	10

Figure 2. Reported daily COVID-19 deaths

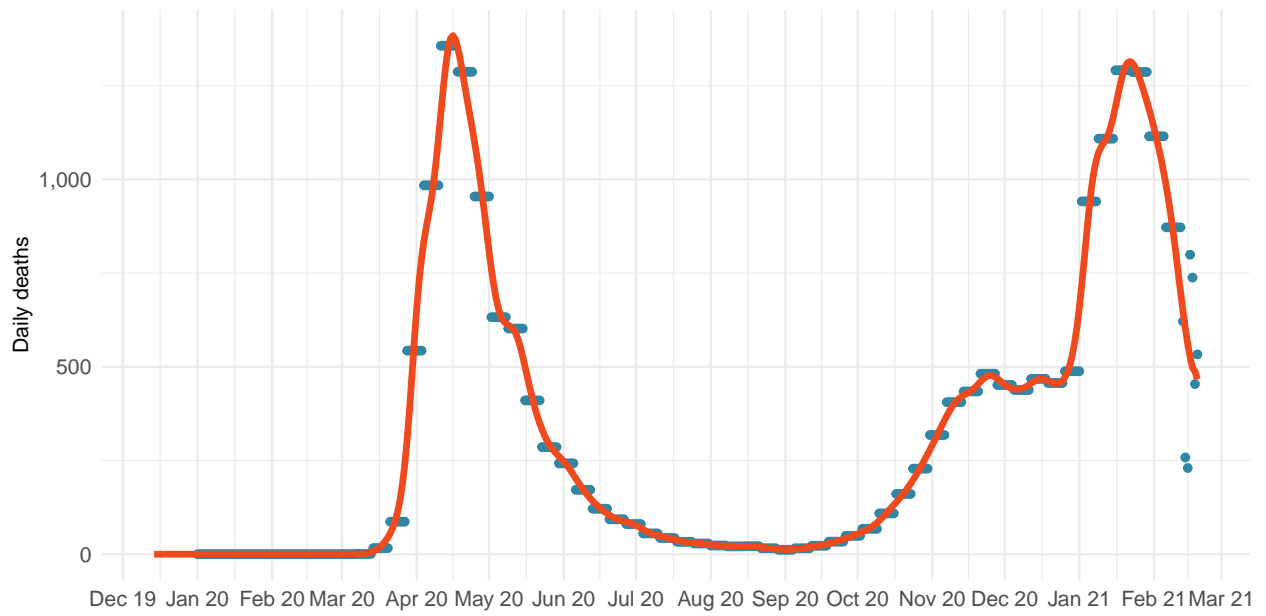


Figure 3. Daily COVID-19 death rate per 1 million on February 22, 2021

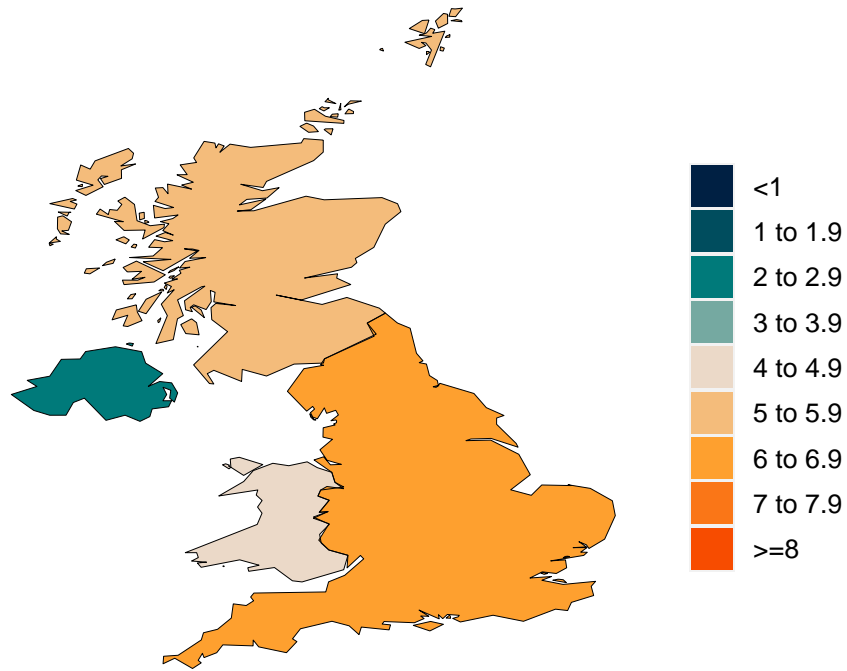


Figure 4. Estimated percent of the population infected with COVID-19 on February 22, 2021

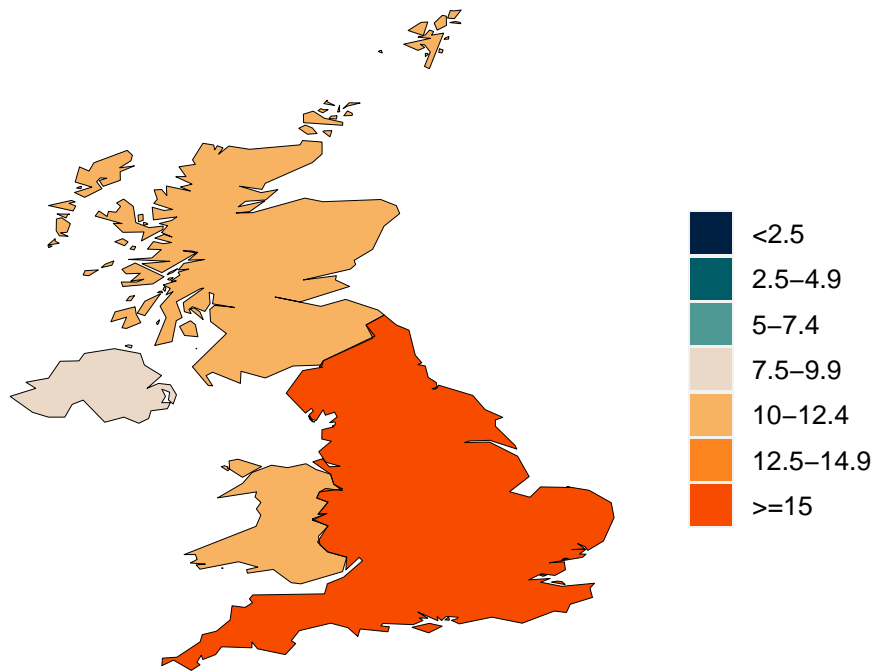


Figure 5. Mean effective R on February 11, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past.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

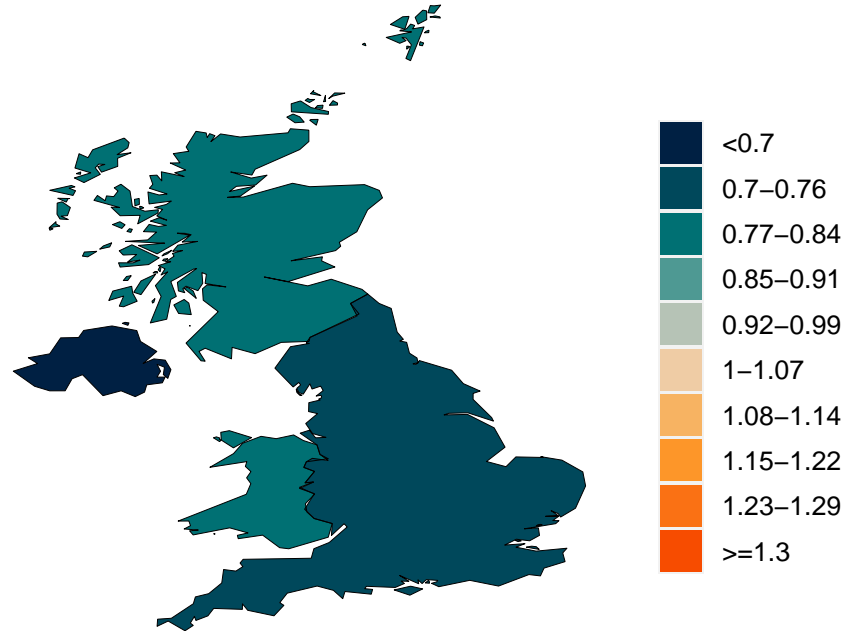
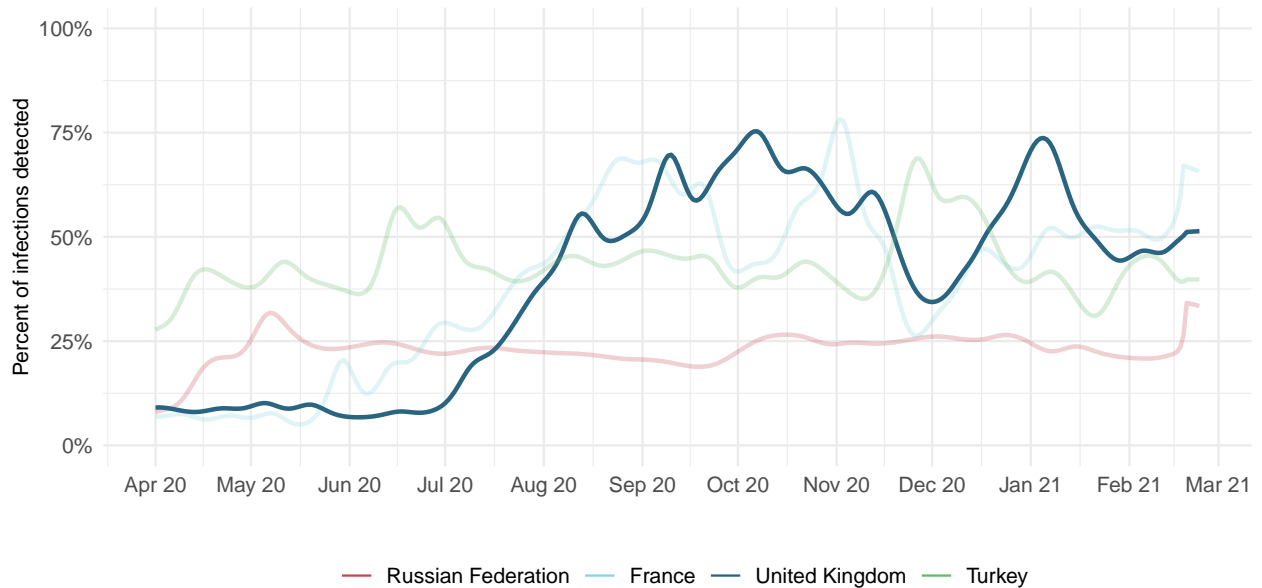


Figure 6. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model.

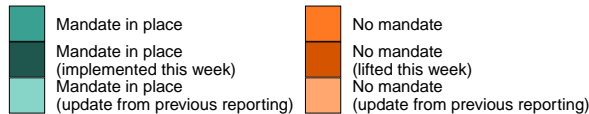


*Due to measurement errors in cases and testing rates, the infection to detection rate (IDR) can exceed 100% at particular points in time.

Critical drivers

Table 2. Current mandate implementation

	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 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
England	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	
Northern Ireland	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	
Scotland	Mandate in place	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	
Wales	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	



*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

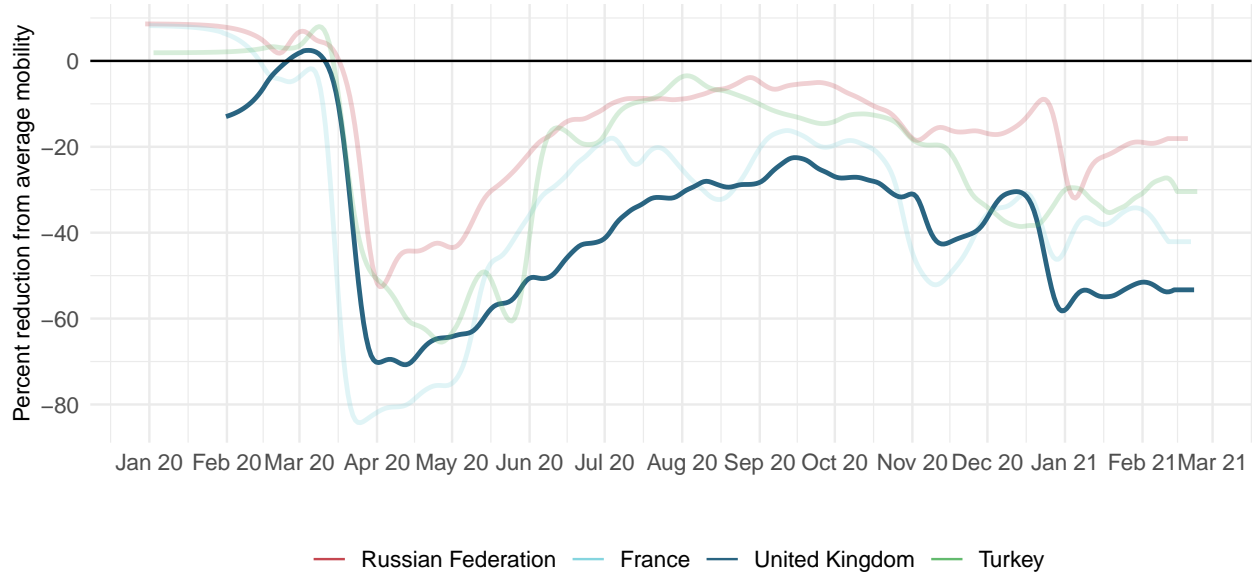


Figure 8. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on February 22, 2021

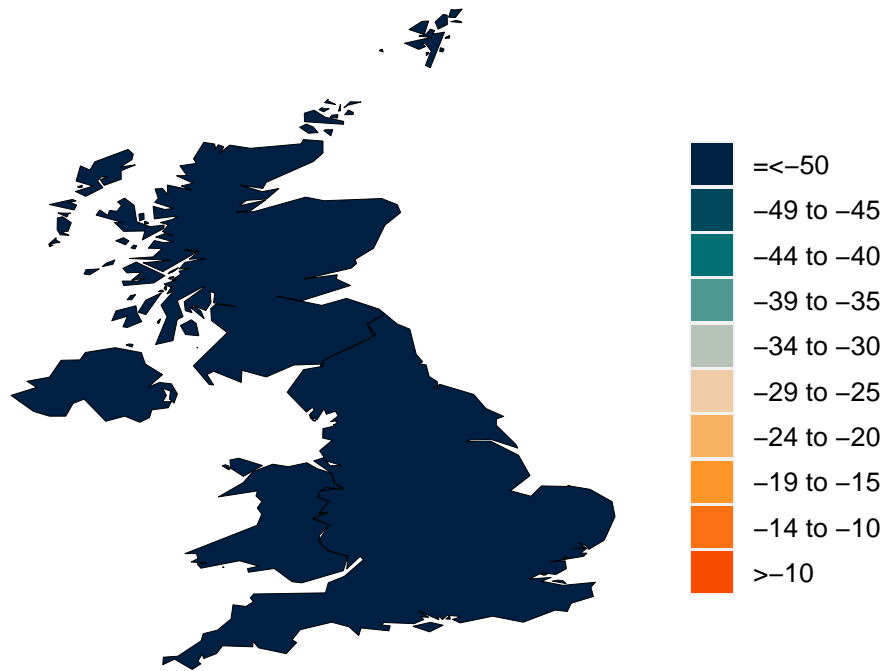


Figure 9. Trend in the proportion of the population reporting always wearing a mask when leaving home

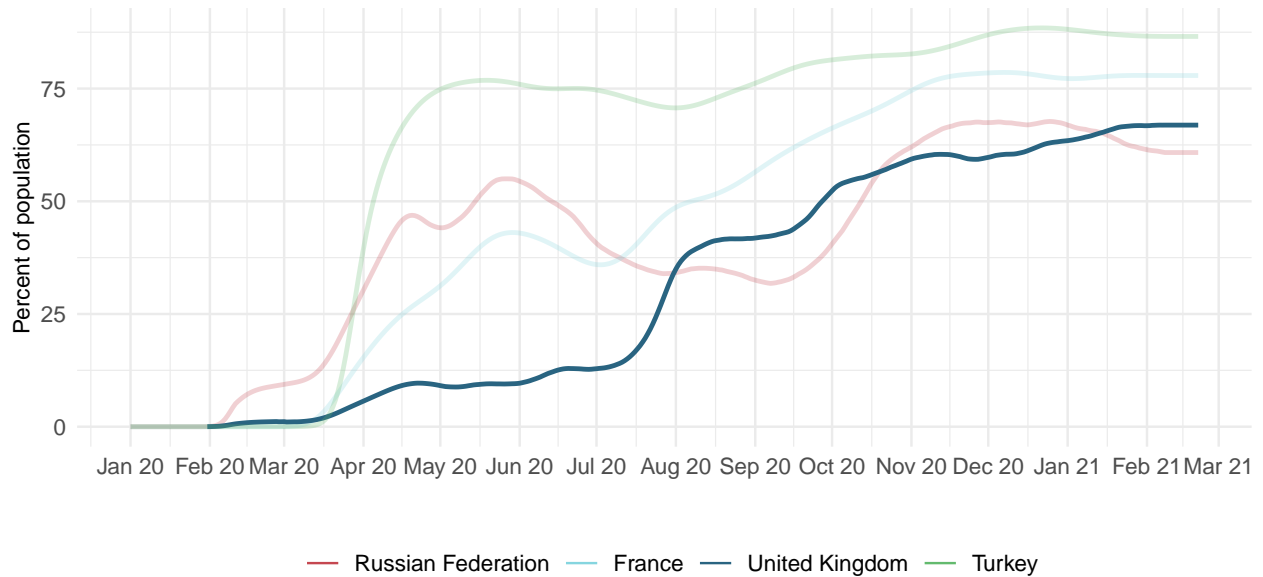


Figure 10. Proportion of the population reporting always wearing a mask when leaving home on February 22, 2021

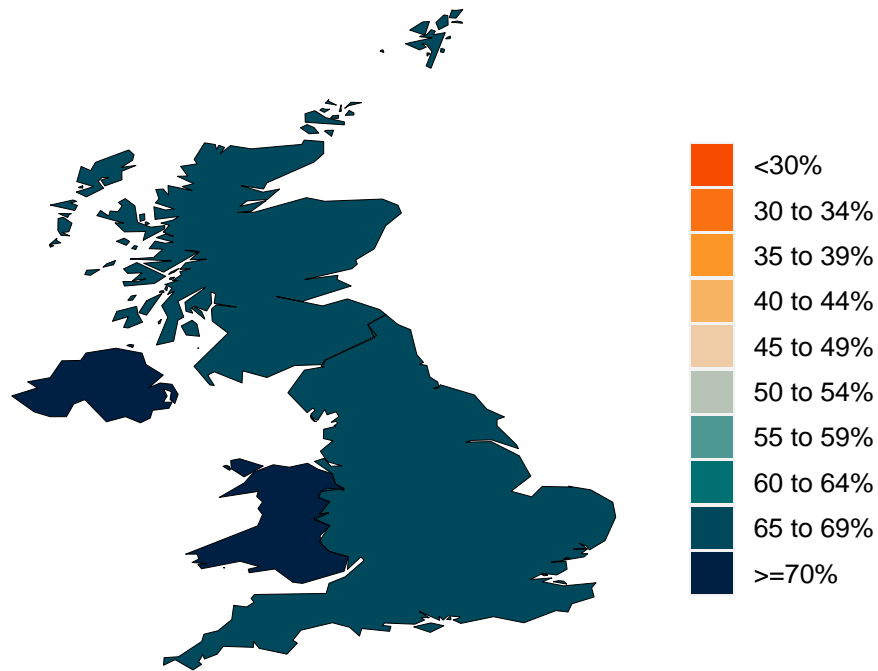


Figure 11. Trend in COVID-19 diagnostic tests per 100,000 people

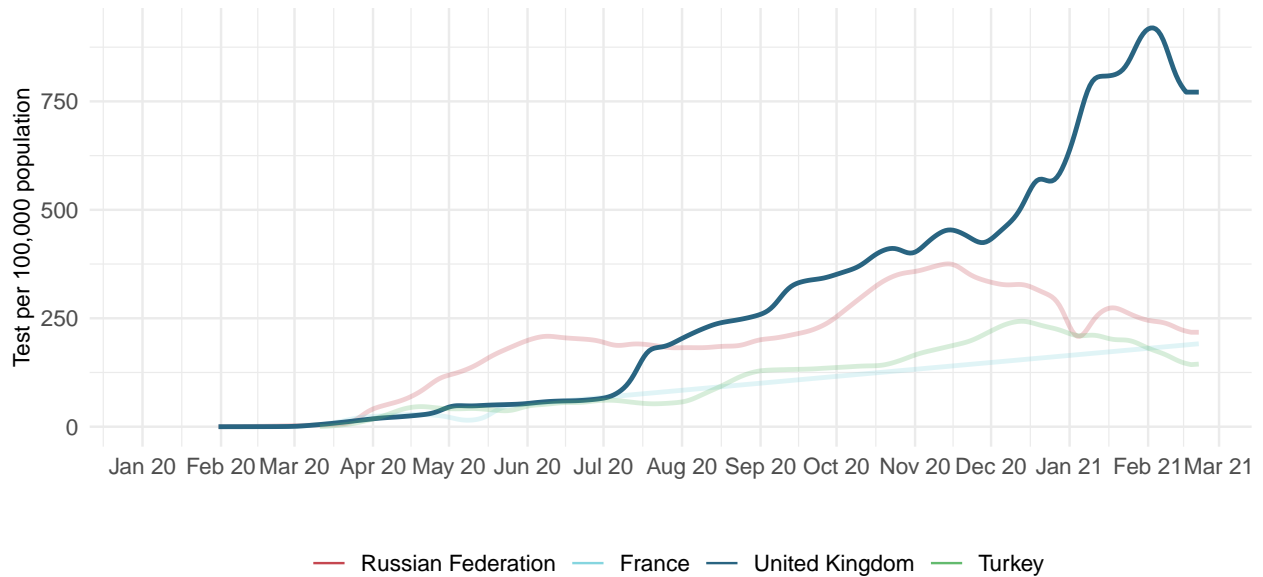


Figure 12. COVID-19 diagnostic tests per 100,000 people on February 16, 2021

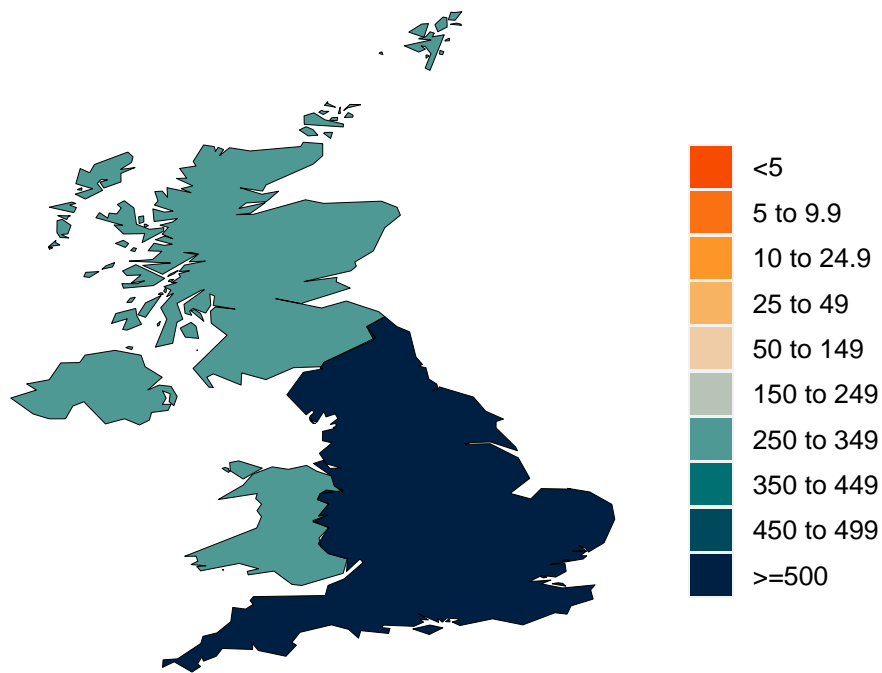


Figure 13. Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020

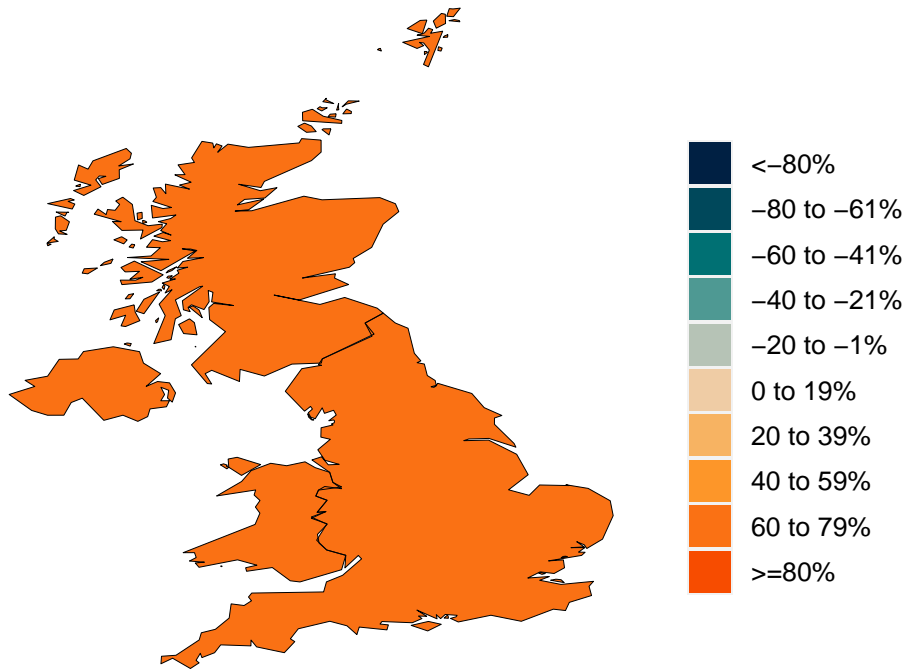


Figure 14. This figure shows the estimated proportion of the adult (18+) population that is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

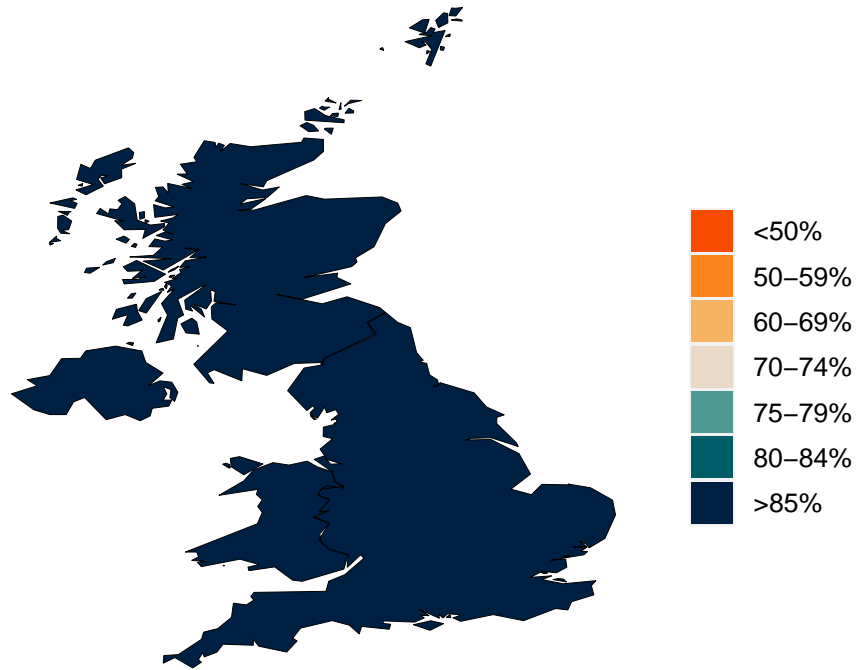
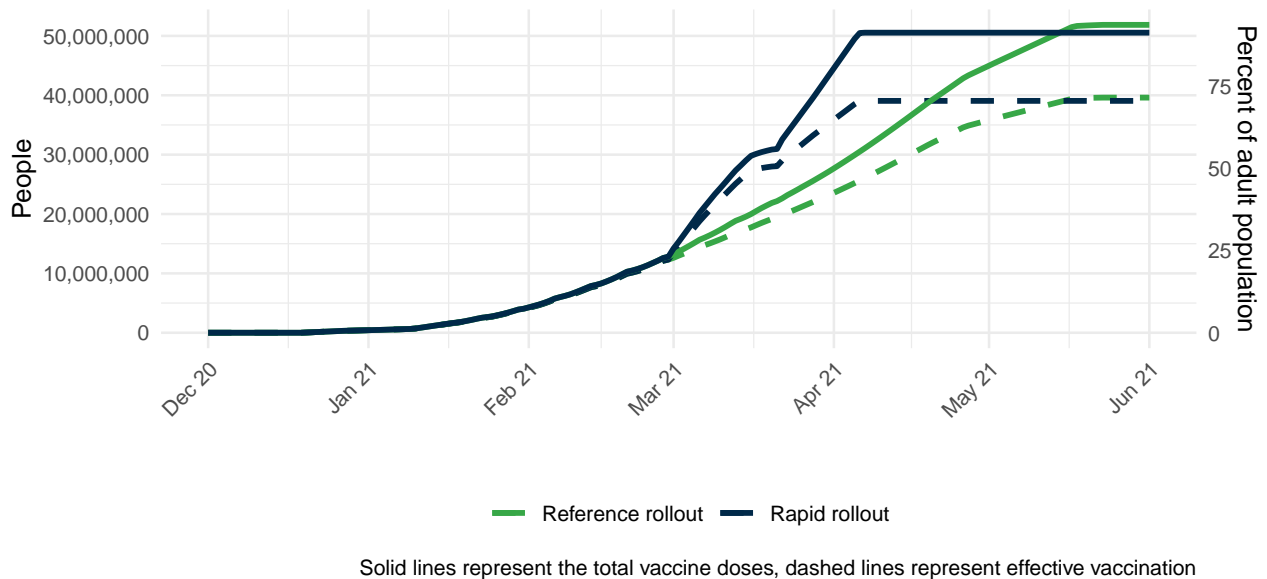


Figure 15. The number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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

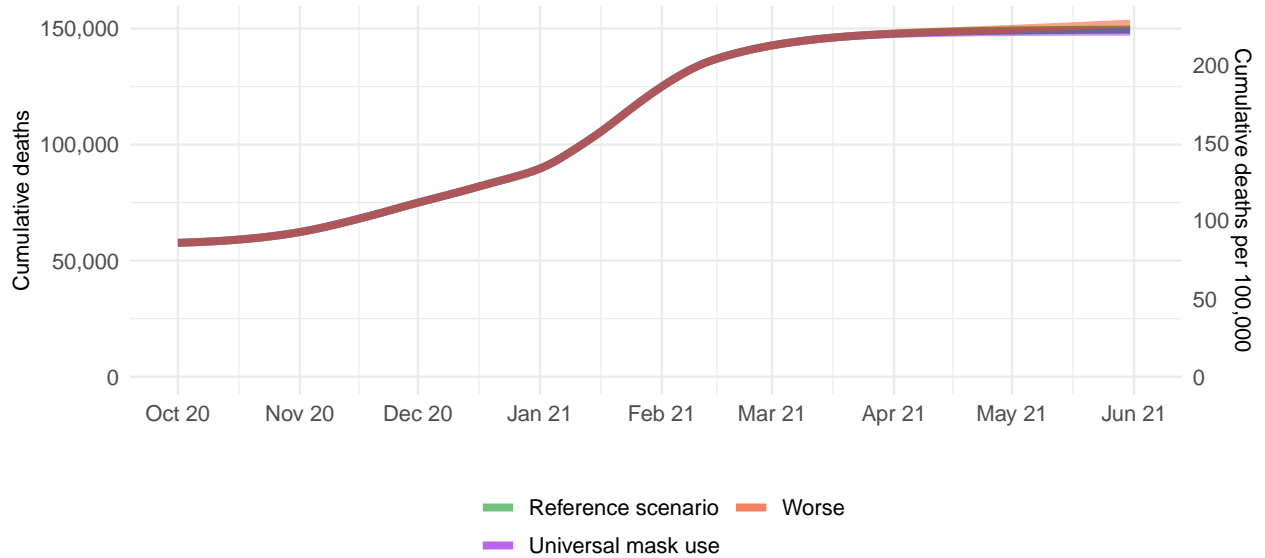


Figure 17. Daily COVID-19 deaths until June 01, 2021 for three scenarios

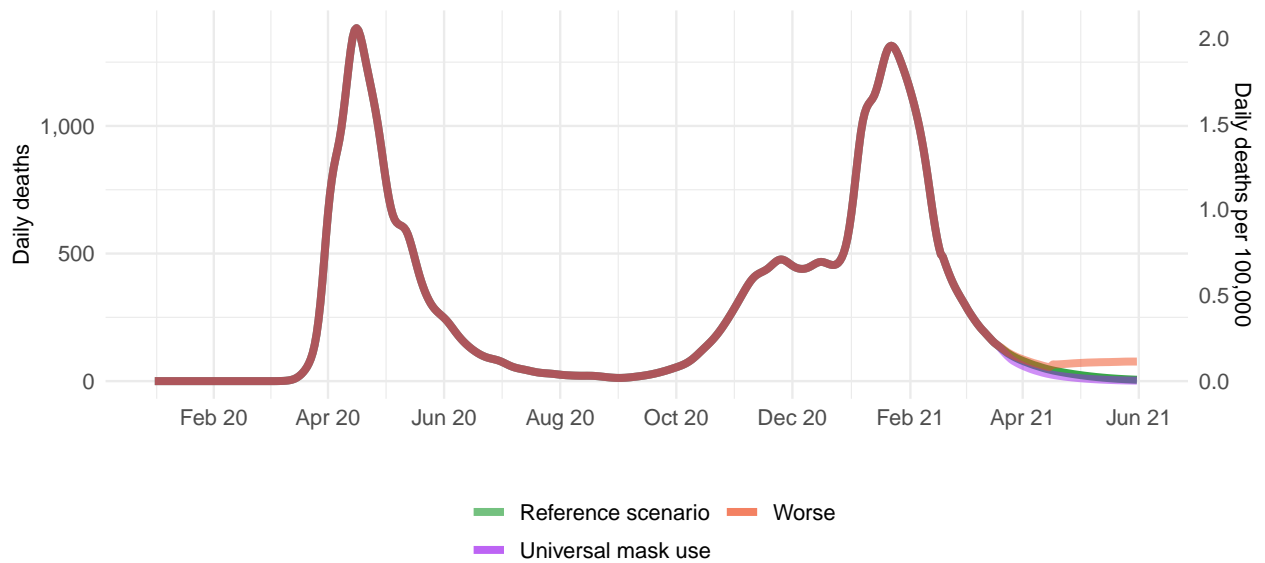


Figure 18. Daily COVID-19 infections until June 01, 2021 for three scenarios

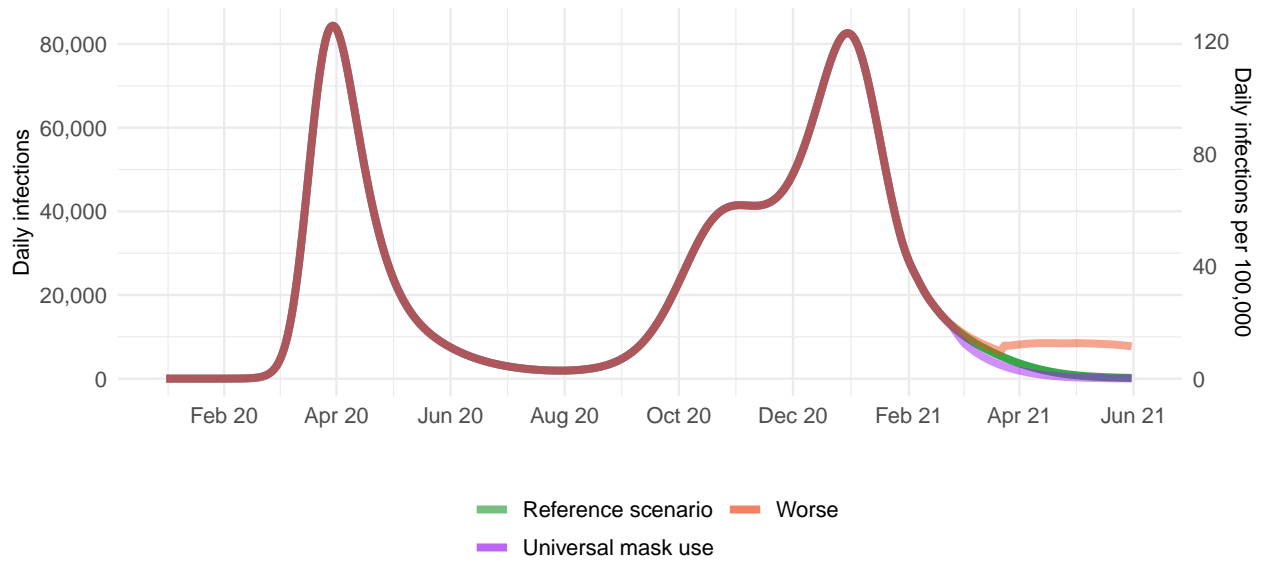


Figure 19. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology (Delphi; <https://www.covidanalytics.io/home>),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

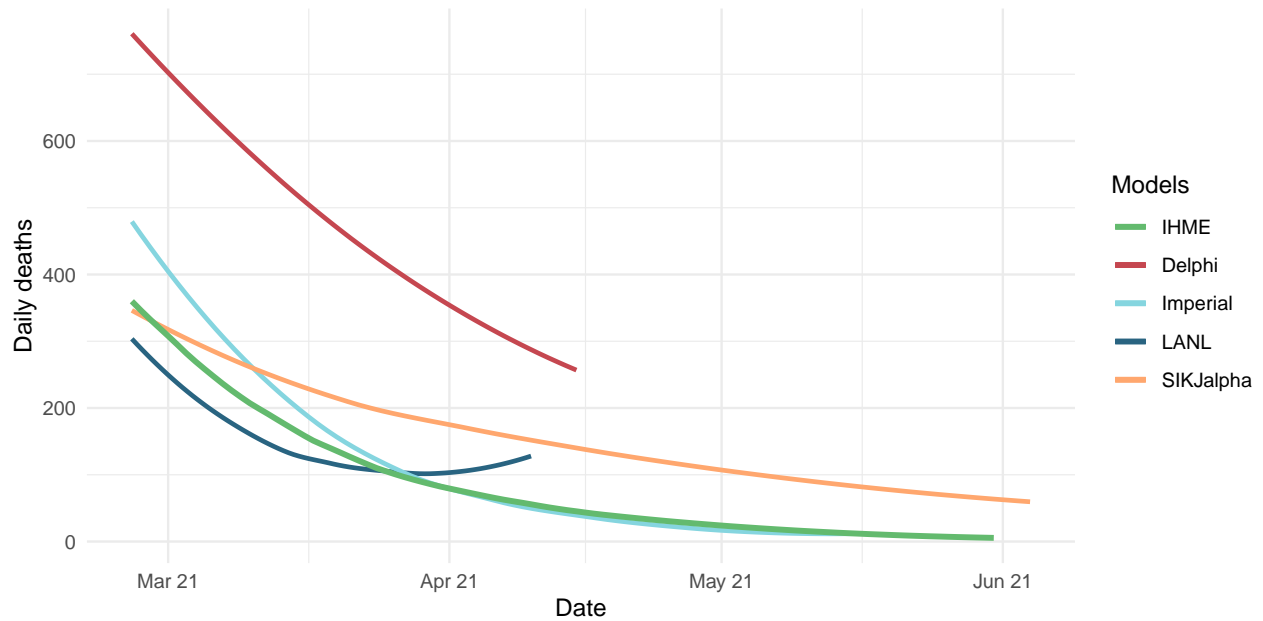


Figure 20. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate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

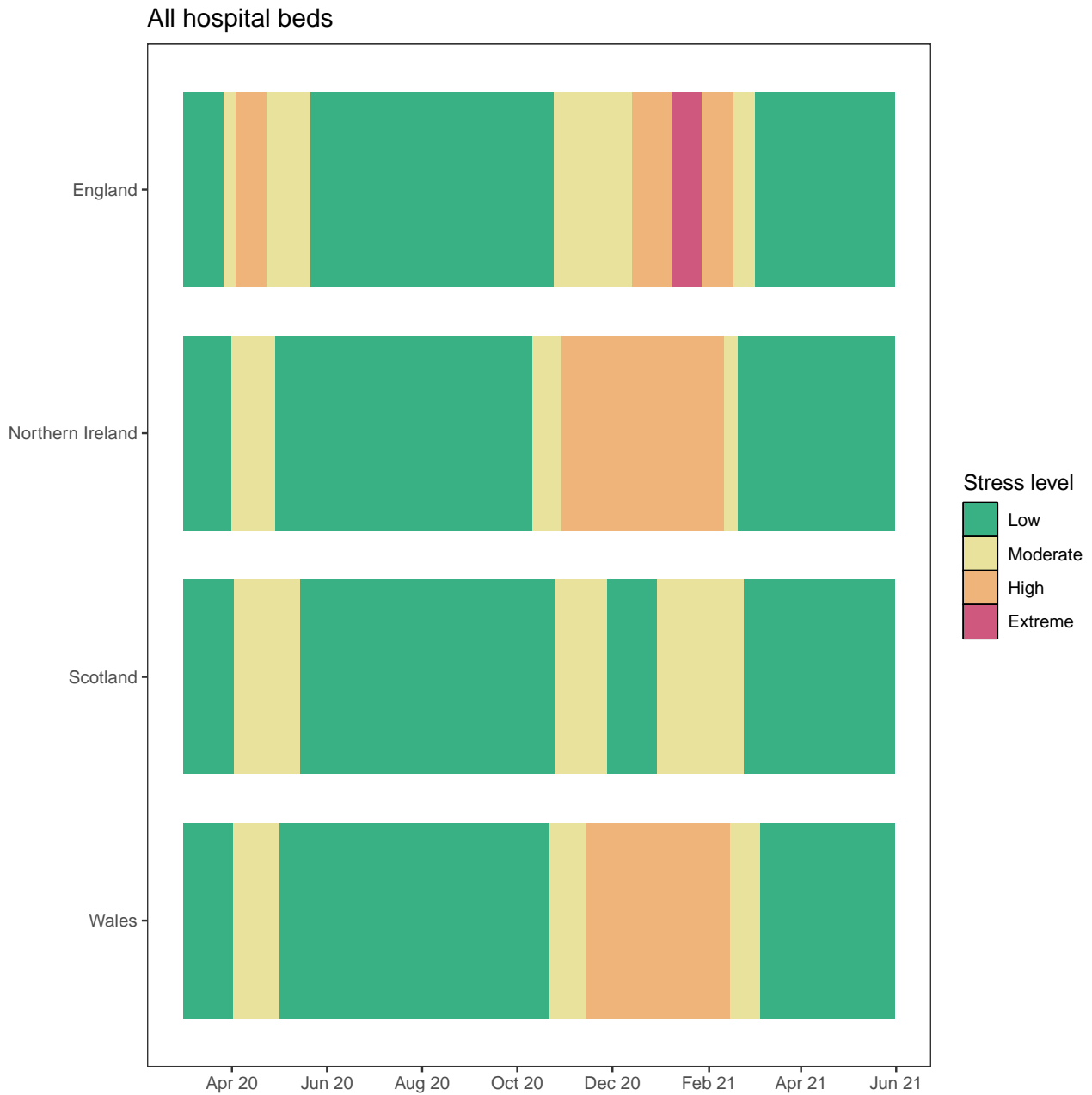
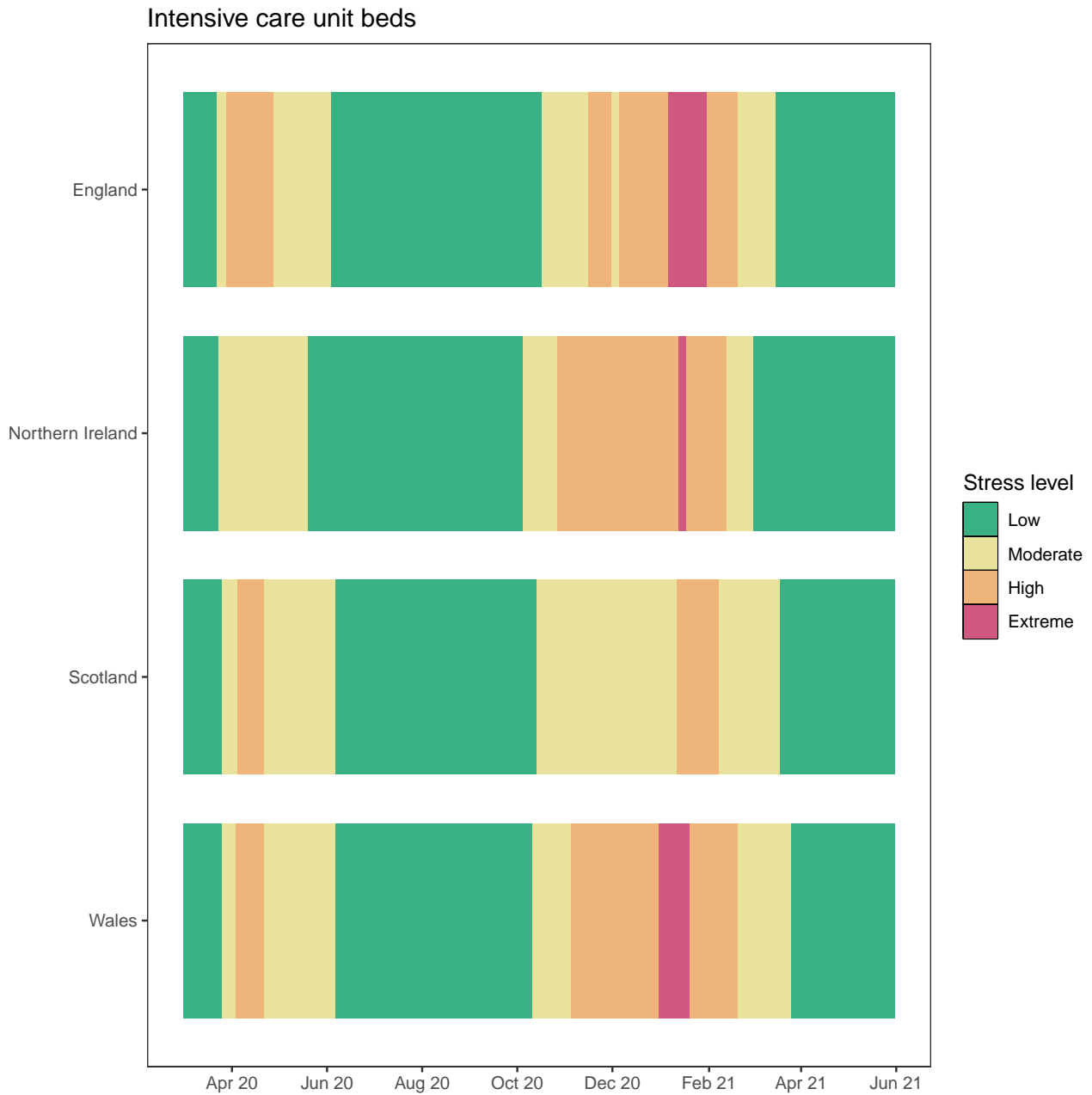


Figure 21. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered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