COVID-19 Results Briefing

United Kingdom

July 22, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in United Kingdom. The model was run on July 20, 2021, with data through July 19, 2021.

Current situation

- Daily reported cases in the last week (through July 19) increased to 45,500 per day on average compared to 32,100 the week before (Figure 1).
- Reported deaths due to COVID-19 in the last week increased to 35 per day on average compared to 32 the week before (Figure 2).
- Excess deaths due to COVID-19 in the last week increased to 35 per day on average compared to 32 the week before (Figure 2). This makes COVID-19 the number 10 cause of death in United Kingdom this week (Table 1). Estimated excess daily deaths due to COVID-19 were 1 times larger than the reported number of deaths.
- No locations had daily reported COVID-19 death rates greater than 4 per million (Figure 3).
- No locations had daily excess death rates greater than 4 per million (Figure 3).
- We estimated that 22% of people in United Kingdom have been infected as of July 19 (Figure 5).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 4 countries (Figure 6).
- The infection-detection rate in United Kingdom was close to 75% on July 19 (Figure 7).

## Trends in drivers of transmission

- Mobility last week was 11% lower than the pre-COVID-19 baseline (Figure 9). Mobility was near baseline (within 10%) in no countries. Mobility was lower than 30% of baseline in no locations.
- As of July 19, in the COVID-19 Trends and Impact Survey, 50% of people self-report that they always wore a mask when leaving their home compared to 50% last week (Figure 11).
- There were 1447 diagnostic tests per 100,000 people on July 19 (Figure 13).
- In United Kingdom 88.7% of people say they would accept or would probably accept a vaccine for COVID-19. This is up by 0.2 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 82% in Northern Ireland to 94% in Wales (Figure 17).
- In our current reference scenario, we expect that 45.3 million people will be vaccinated by November 1 (Figure 18).
- In our current reference scenario, we expect that by November 1, 74% of people will be immune to non-escape variants and 68% of people will be immune to escape variants (Figure 19).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 187,000 cumulative reported deaths due to COVID-19 on November 1. This represents 34,000 additional deaths from July 19 to November 1. Daily reported deaths will rise to 760 by September 10, 2021 (Figure 20).

- Under our **reference scenario**, our model projects 188,000 cumulative excess deaths due to COVID-19 on November 1. This represents 34,000 additional deaths from July 19 to November 1. Daily excess deaths due to COVID-19 will rise to 760 by September 10, 2021 (Figure 20).

- If **universal mask coverage (95%)** were attained in the next week, our model projects 20,000 fewer cumulative reported deaths compared to the reference scenario on November 1.

- If **universal mask coverage (95%)** were attained in the next week, our model projects 20,000 fewer cumulative excess deaths due to COVID-19 compared to the reference scenario on November 1.

- Under our **worse scenario**, our model projects 188,000 cumulative reported deaths on November 1, an additional 1,200 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to 860 by September 8, 2021 (Figure 20).

- Under our **worse scenario**, our model projects 189,000 cumulative excess deaths due to COVID-19 on November 1, an additional 1,300 deaths compared to our reference scenario. Daily excess deaths due to COVID-19 in the worse scenario will rise to 870 by September 8, 2021 (Figure 20).

- Daily infections in the reference scenario will rise to 432,840 by August 16, 2021 (Figure 21). Daily infections in the worse scenario will rise to 501,770 by August 14, 2021 (Figure 21).

- By November 1, we project that 2,000 lives will be saved by the projected vaccine rollout. This does not include lives saved through vaccination that has already been delivered.

- Figure 22 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

- At some point from July through November 1, 4 countries will have high or extreme stress on hospital beds (Figure 23). At some point from July through November 1, 4 countries will have high or extreme stress on intensive care unit (ICU) capacity (Figure 24).

Model updates

Our mobility covariate that is used in the projections of COVID infections and deaths was updated to account for observed sustained levels of high mobility. Specifically, the mobility forecasts used in both the *reference* and *universal mask coverage* projection scenarios were adjusted upward according to vaccine uptake. This is equivalent to what was previously used in the *worse* projection scenario. To produce vaccine-adjusted mobility forecasts, we assume that social distancing mandates decline exponentially with respect to increasing vaccine uptake such that all mandates are lifted 30 days after vaccine coverage reaches 75%. In locations where vaccine uptake is already high, projected mandates are ramped down linearly from the current value to the vaccine-adjusted value over a 30-day period. As a final change, for locations whose last day of data indicates mobility levels above baseline (defined as average mobility during the period 1/3/2020 to 2/6/2020), we no longer cap forecasted mobility at zero. The variant spread model was updated to allow for spread to have occurred in the past in locations with some variant surveillance when there was little to no sequence data to confirm or reject the potential invasion.

Figure 1. Reported daily COVID-19 cases

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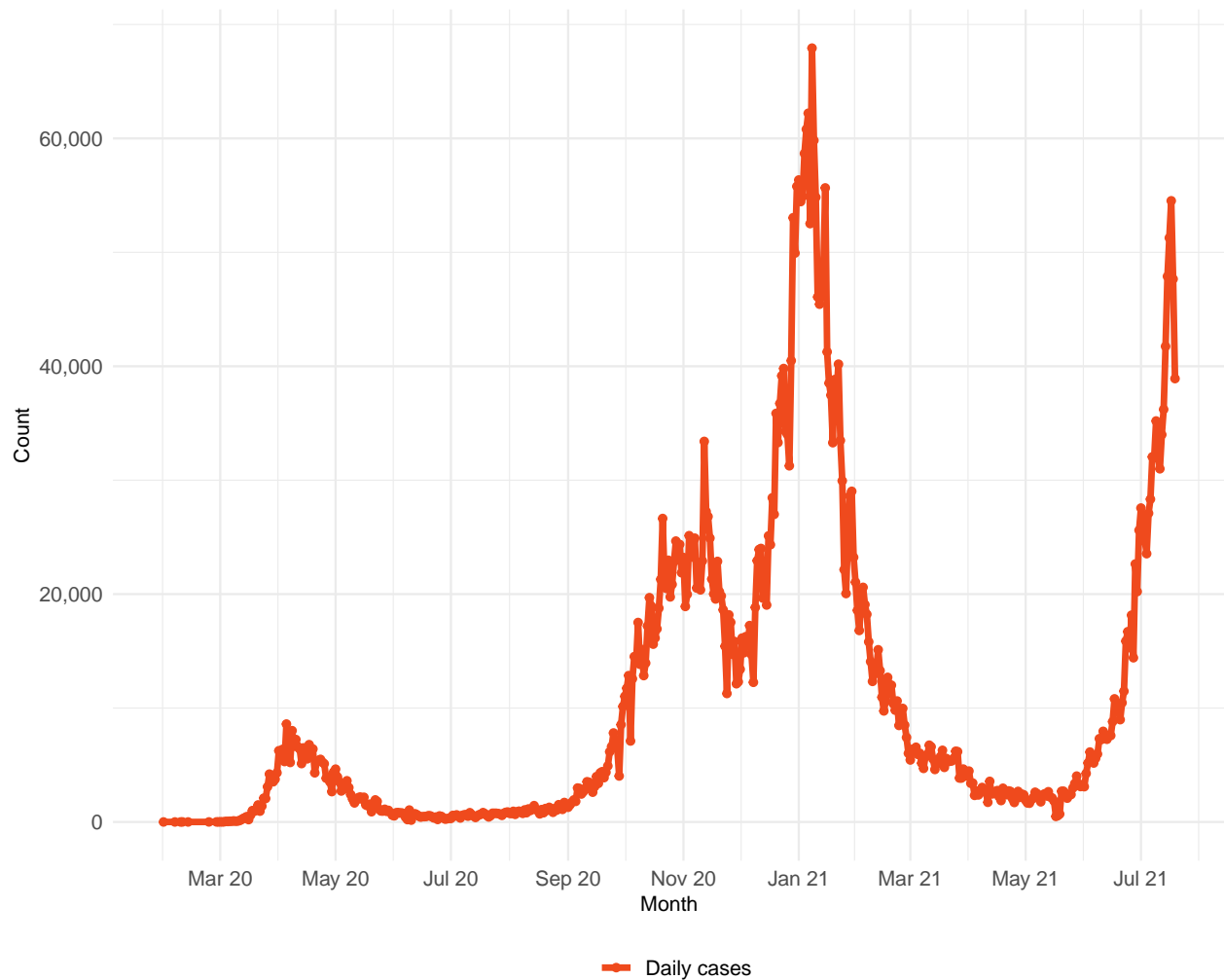
Table 1. Ranking of excess deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	1,796	1
Stroke	974	2
Chronic obstructive pulmonary disease	845	3
Tracheal, bronchus, and lung cancer	824	4
Lower respiratory infections	805	5
Alzheimer's disease and other dementias	624	6
Colon and rectum cancer	466	7
Prostate cancer	307	8
Breast cancer	293	9
COVID-19	244	10

Figure 2. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and excess daily deaths due to COVID-19 (orange)
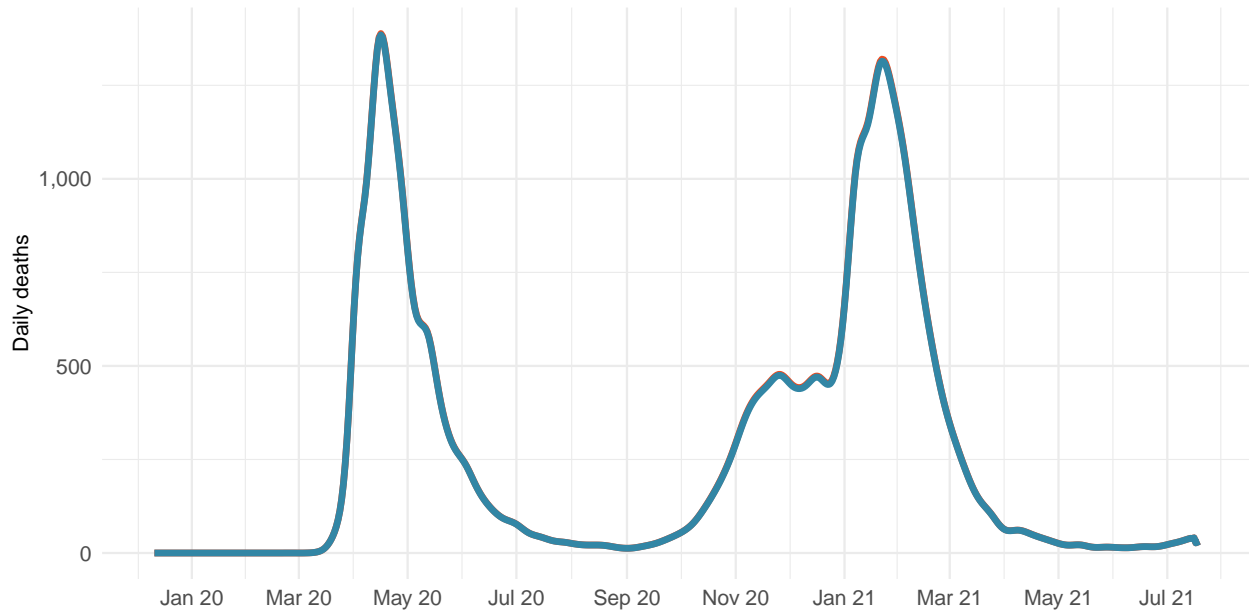
Figure 3. Daily COVID-19 death rate per 1 million on July 19, 2021

A. Daily reported COVID-19 death rate per 1 million
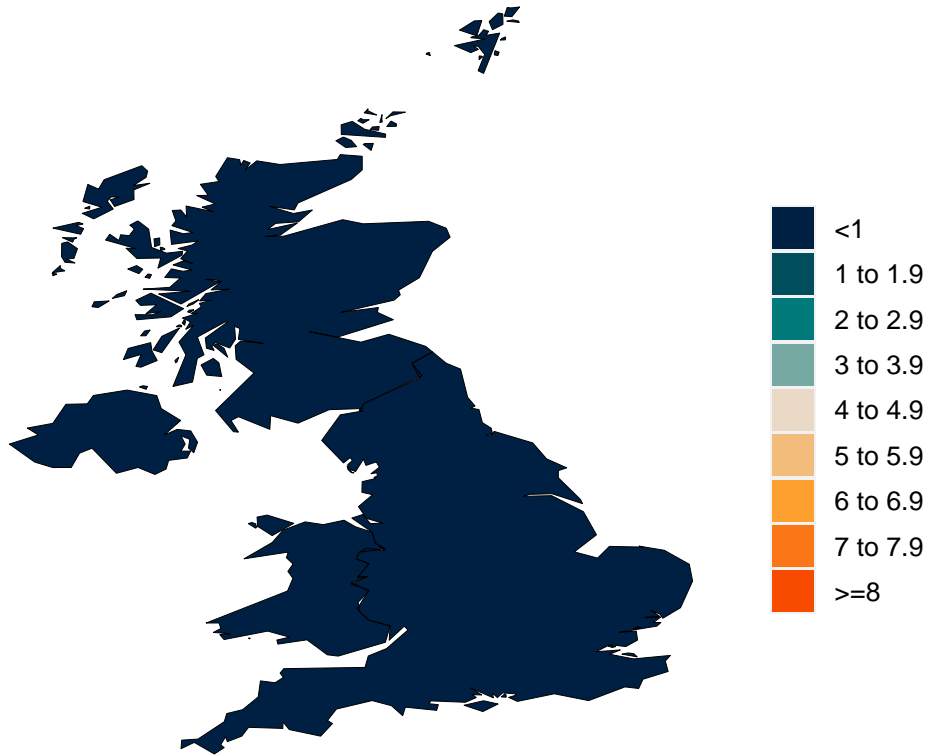
B. Daily excess COVID-19 death rate per 1 million
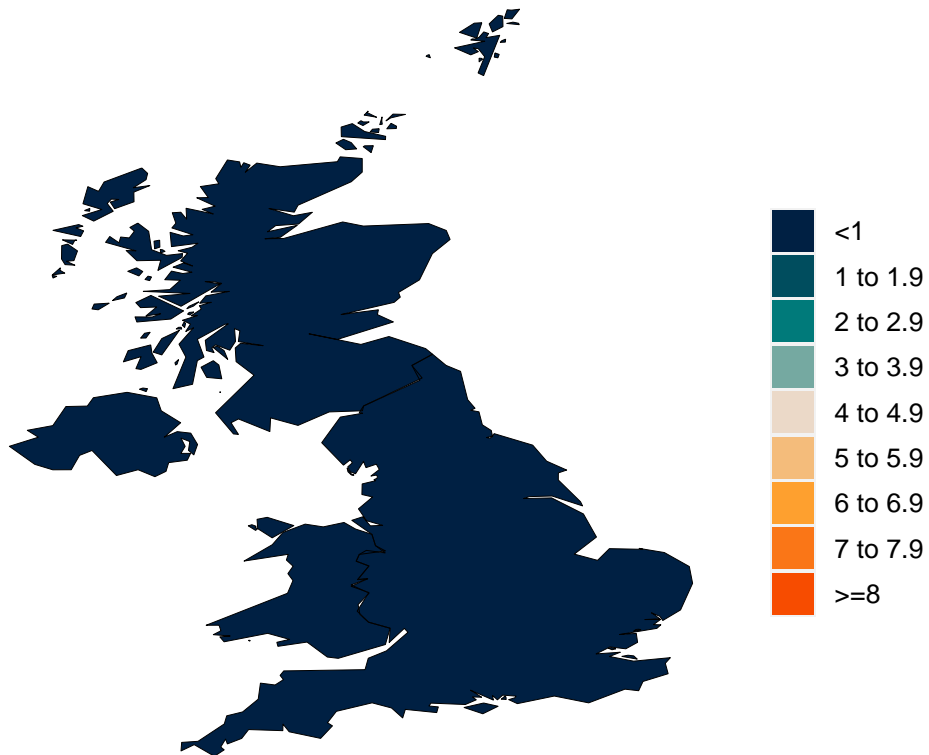
Figure 4. Cumulative COVID-19 deaths per 100,000 on July 19, 2021

A. Reported cumulative COVID-19 deaths per 100,000
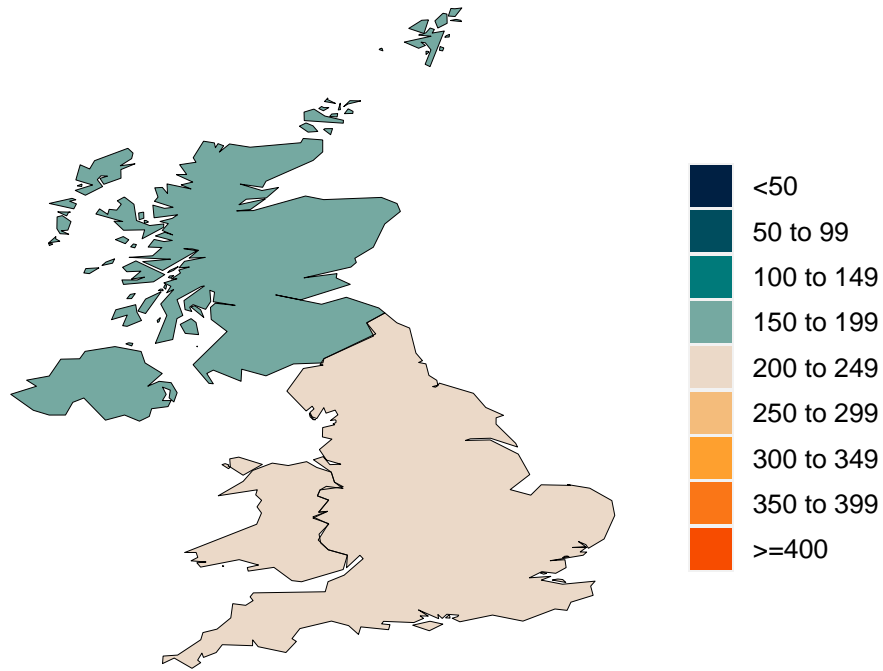
B. Excess cumulative COVID-19 deaths per 100,000
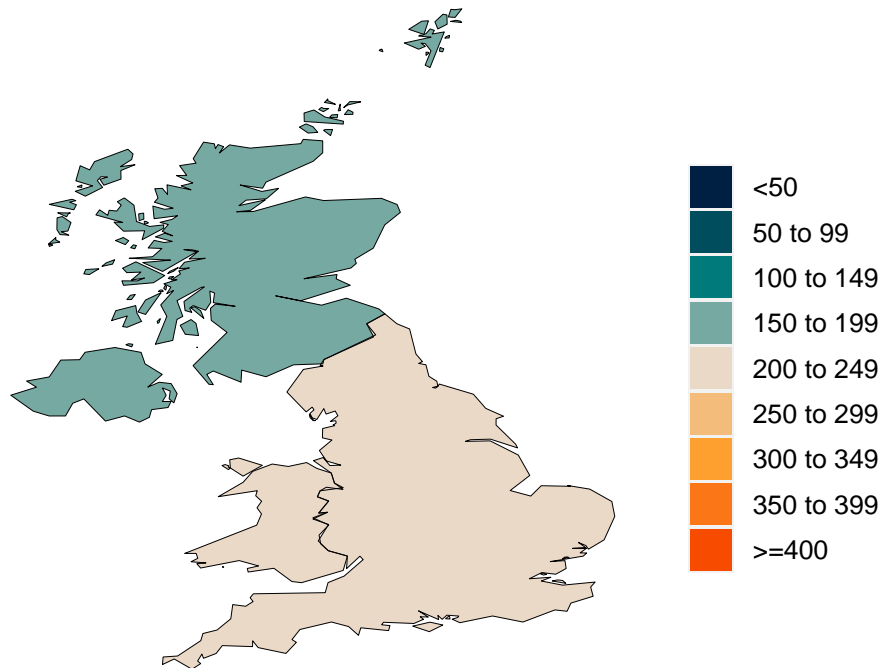
Figure 5. Estimated percent of the population infected with COVID-19 on July 19, 2021

	<2.5
	2.5–4.9
	5–7.4
	7.5–9.9
	10–12.4
	12.5–14.9
	15–17.4
	17.5–19.9
	20–22.4
	>=22.5
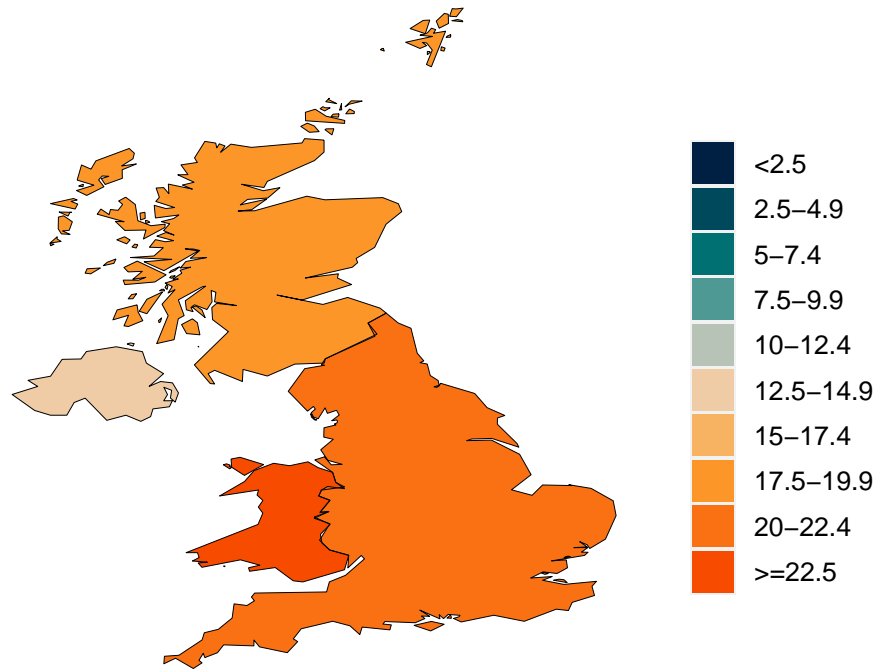
Figure 6. Mean effective R on July 8, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline, all other things being held the same.

	<0.48
	0.48–0.6
	0.61–0.73
	0.74–0.86
	0.87–0.99
	1–1.12
	1.13–1.25
	1.26–1.38
	1.39–1.51
	>=1.52
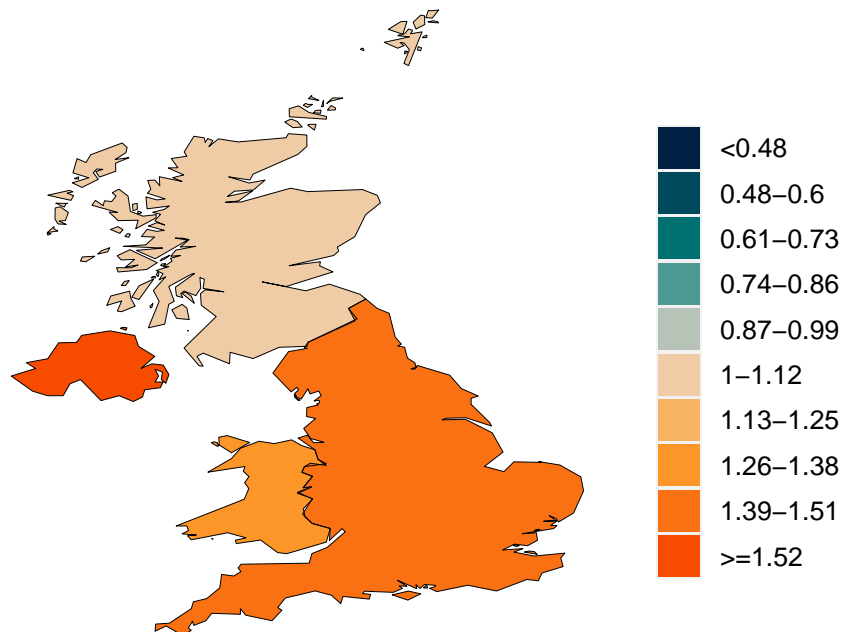
Figure 7. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.
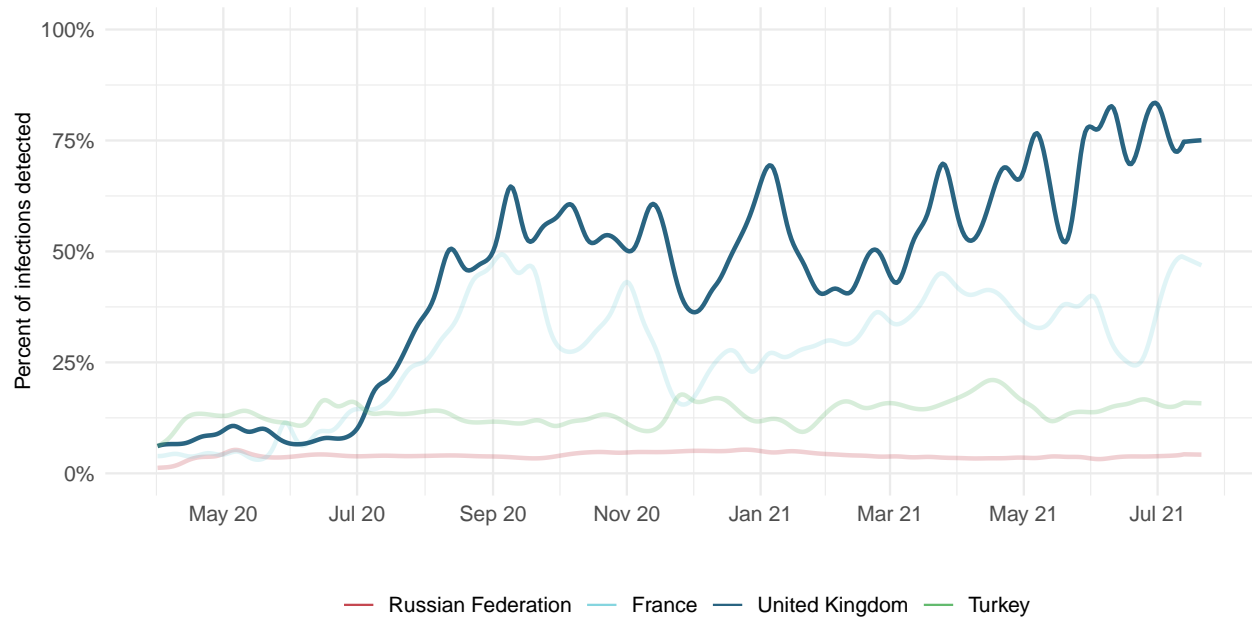
Figure 8. Infection-fatality ratio on July 19, 2021

■	< 0.2%
■	0.2% to 0.39%
■	0.4% to 0.59%
■	0.6% to 0.79%
■	0.8% to 0.99%
■	> 1%
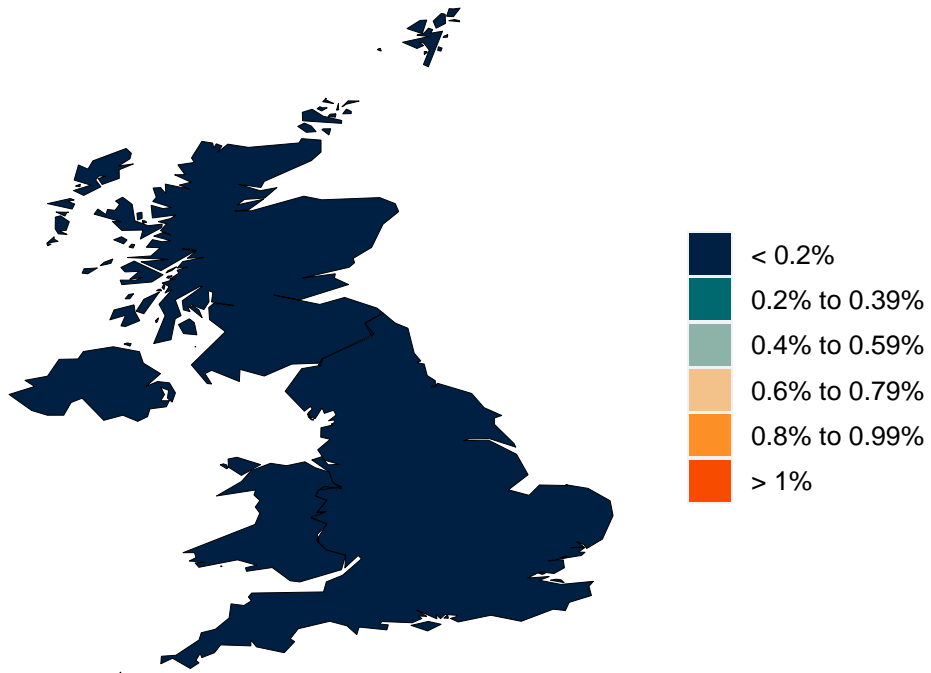
Critical drivers

Table 2. Current mandate implementation

Figure 9. Trend in mobility as measured through smartphone app use compared to January 2020 baseline
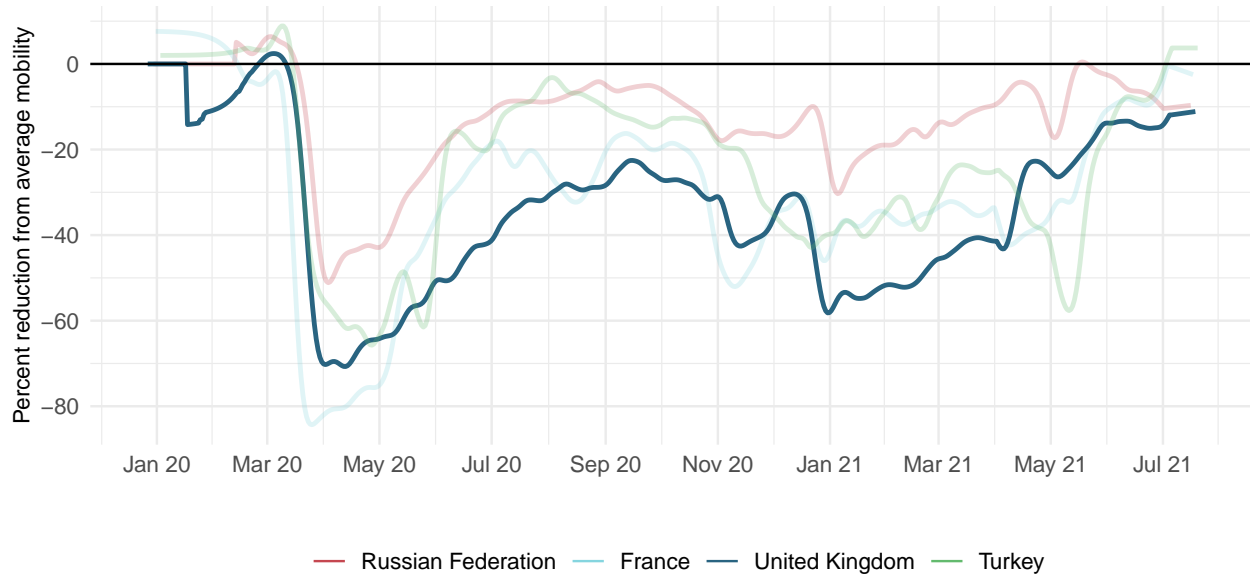

Figure 10. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on July 19, 2021
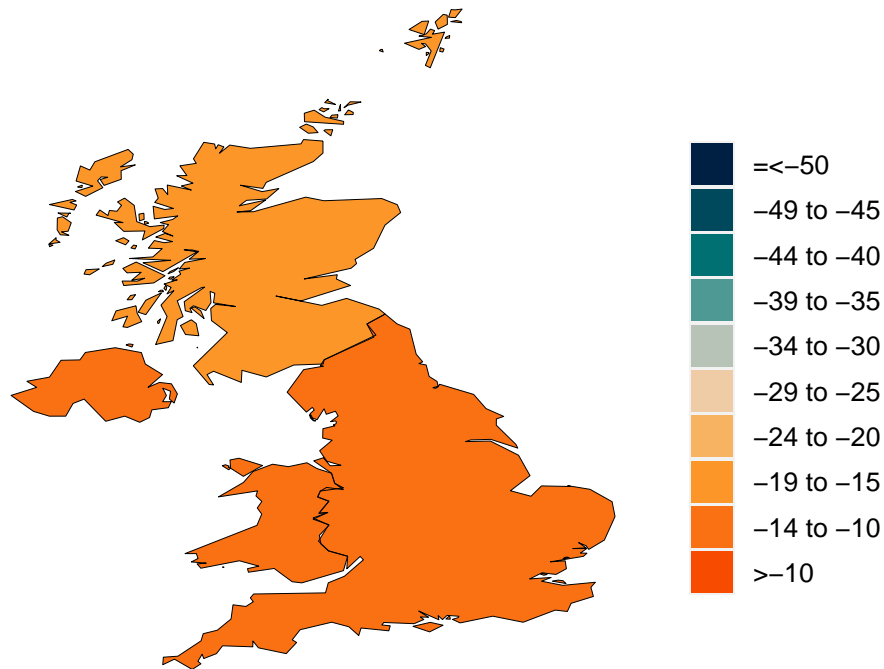
Figure 11. Trend in the proportion of the population reporting always wearing a mask when leaving home
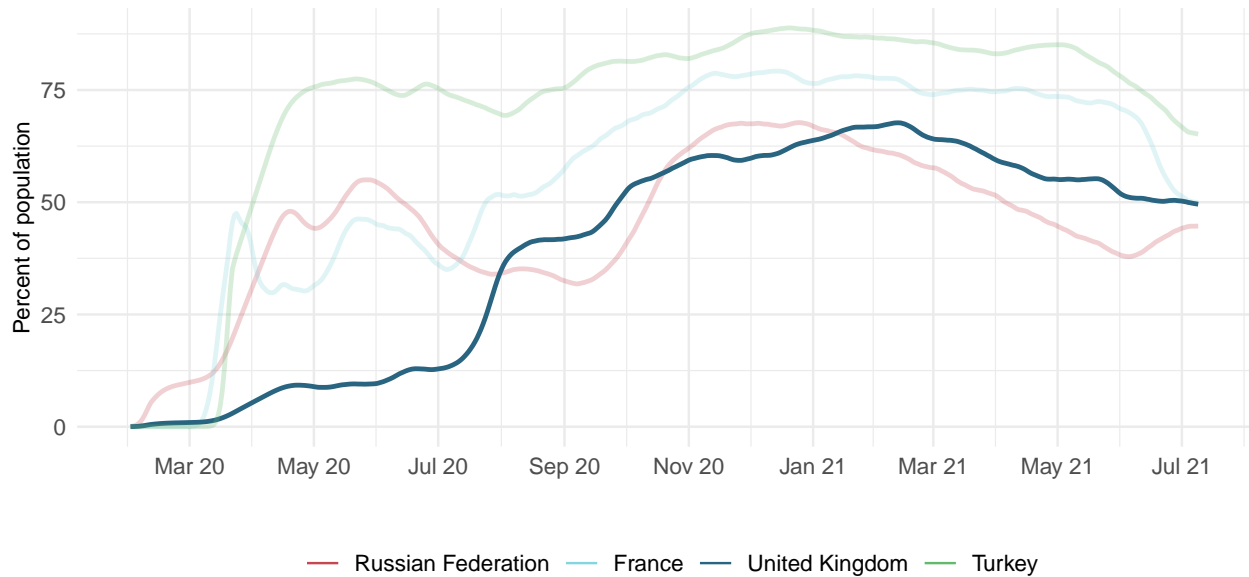

Figure 12. Proportion of the population reporting always wearing a mask when leaving home on July 19, 2021
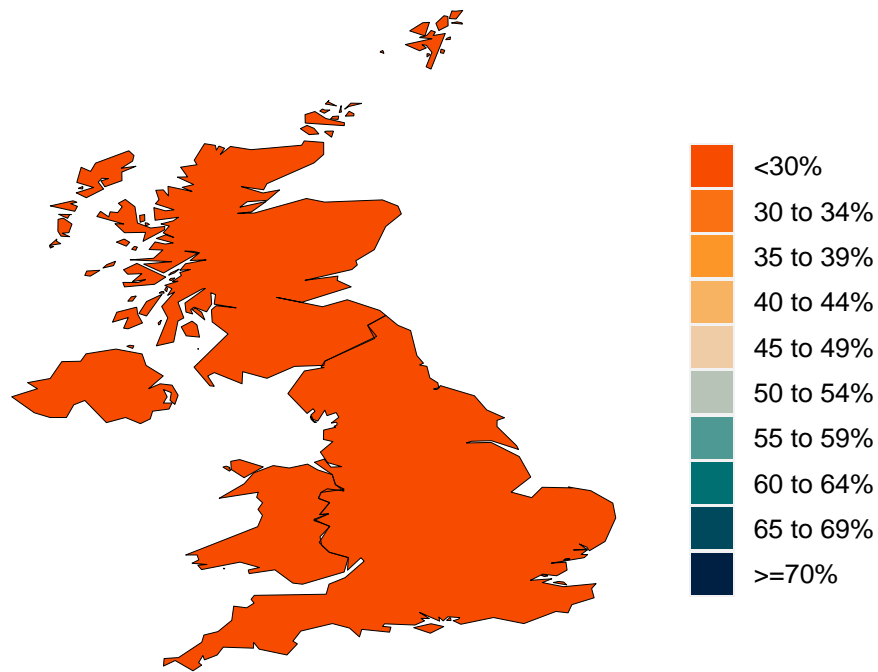
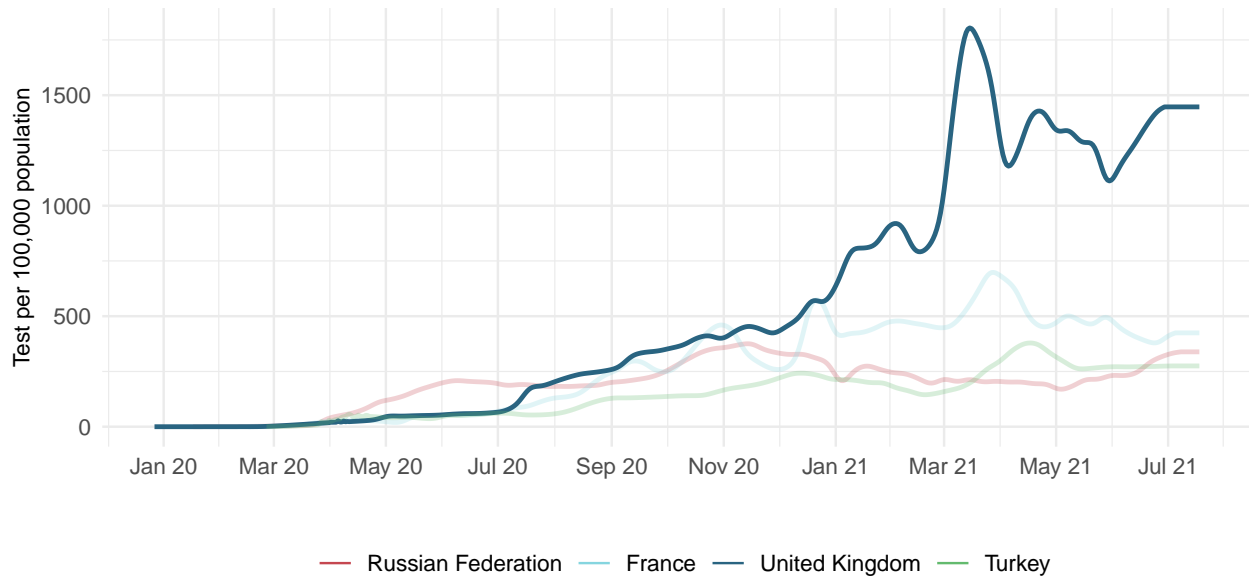**Figure 13.** Trend in COVID-19 diagnostic tests per 100,000 people

Figure 14. COVID-19 diagnostic tests per 100,000 people on July 19, 2021
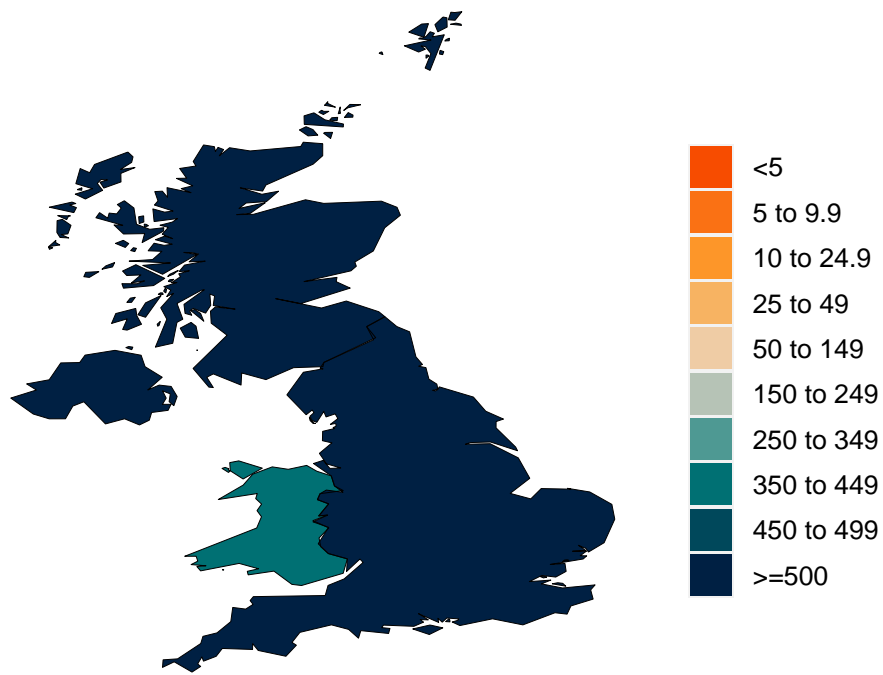
Figure 15. Increase in the risk of death due to pneumonia on February 1 compared to August 1
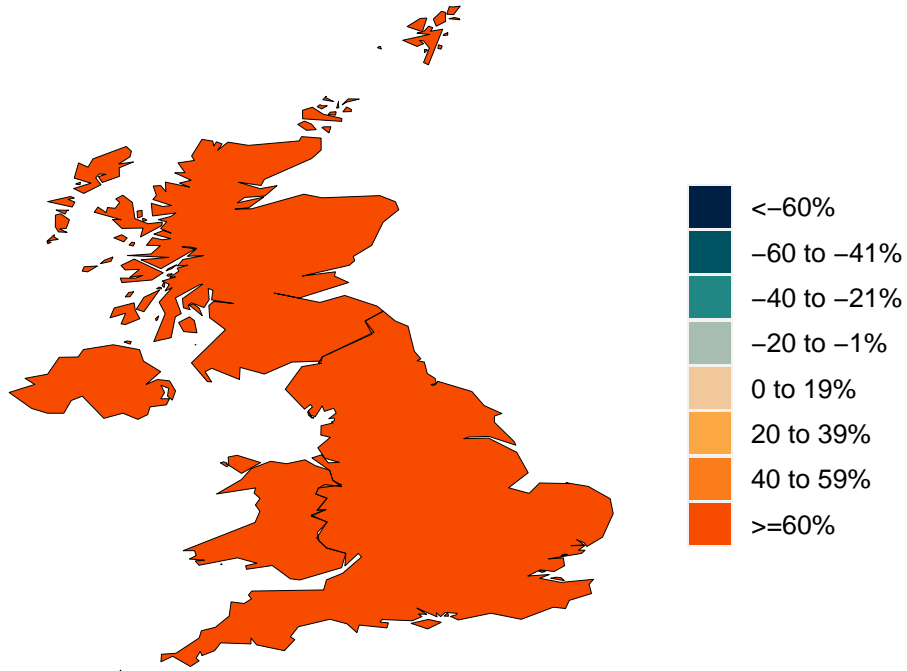
Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our website.

Vaccine	Efficacy at preventing disease: D614G & B.1.1.7	Efficacy at preventing infection: D614G & B.1.1.7	Efficacy at preventing disease: B.1.351, B.1.617, & P.1	Efficacy at preventing infection: B.1.351, B.1.617, & P.1
AstraZeneca	74%	52%	53%	47%
CoronaVac	50%	44%	40%	35%
Covaxin	78%	69%	62%	55%
Janssen	72%	72%	64%	56%
Moderna	94%	89%	83%	79%
Novavax	89%	79%	73%	64%
Pfizer/BioNTech	91%	86%	81%	77%
Sinopharm	73%	65%	47%	41%
Sputnik-V	92%	81%	73%	65%
Tianjin CanSino	66%	58%	53%	47%
Other vaccines	75%	66%	60%	53%
Other vaccines (mRNA)	91%	86%	81%	77%

Figure 16. Trend in the estimated proportion of the adult (18+) population that have been vaccinated or would probably or definitely receive the COVID-19 vaccine if available

Figure 17. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available
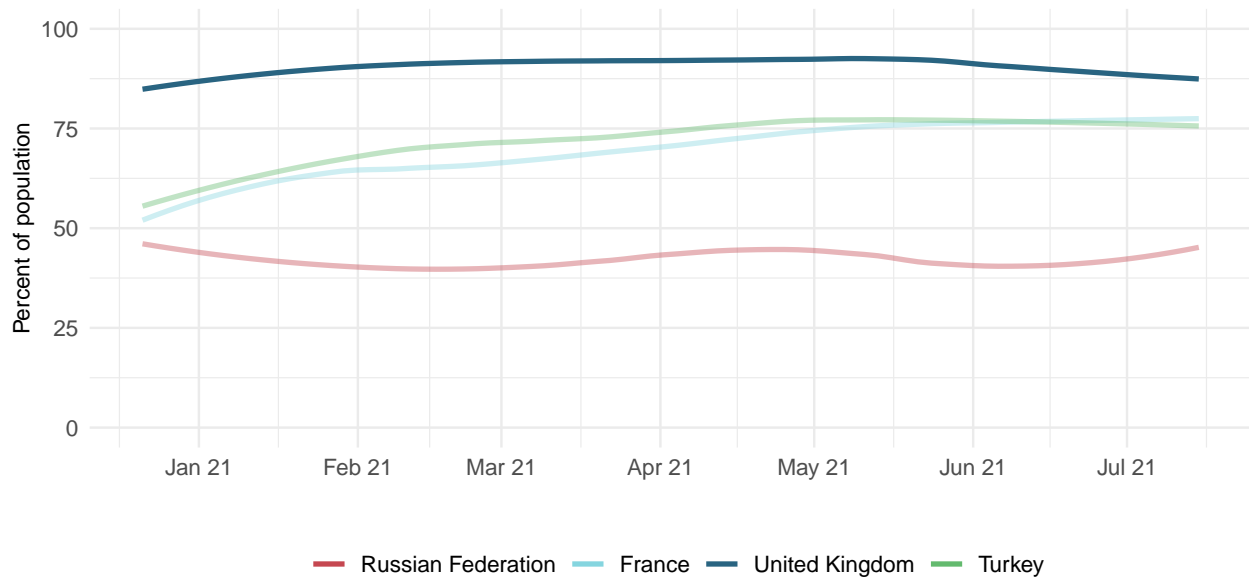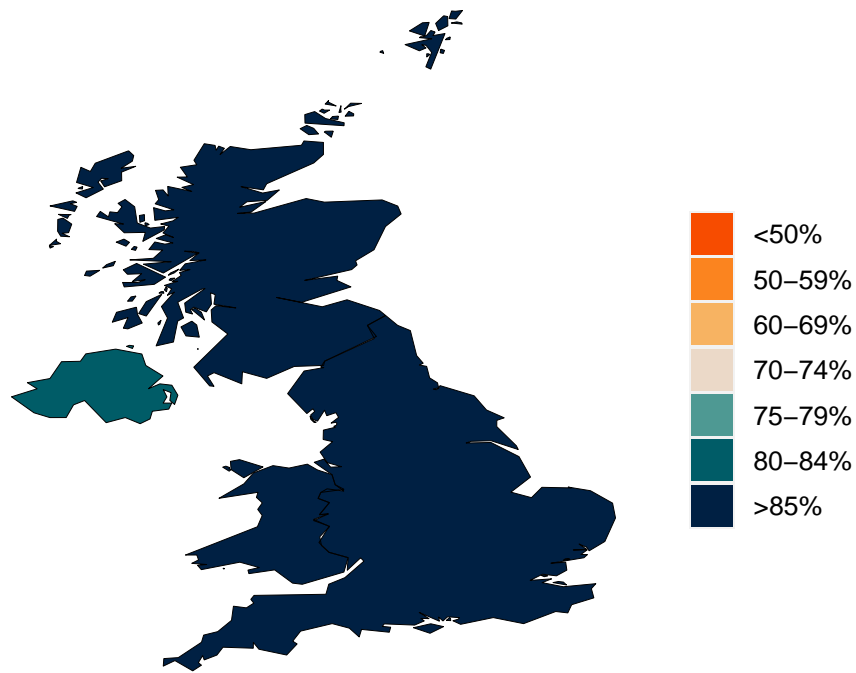
Figure 18. Number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses

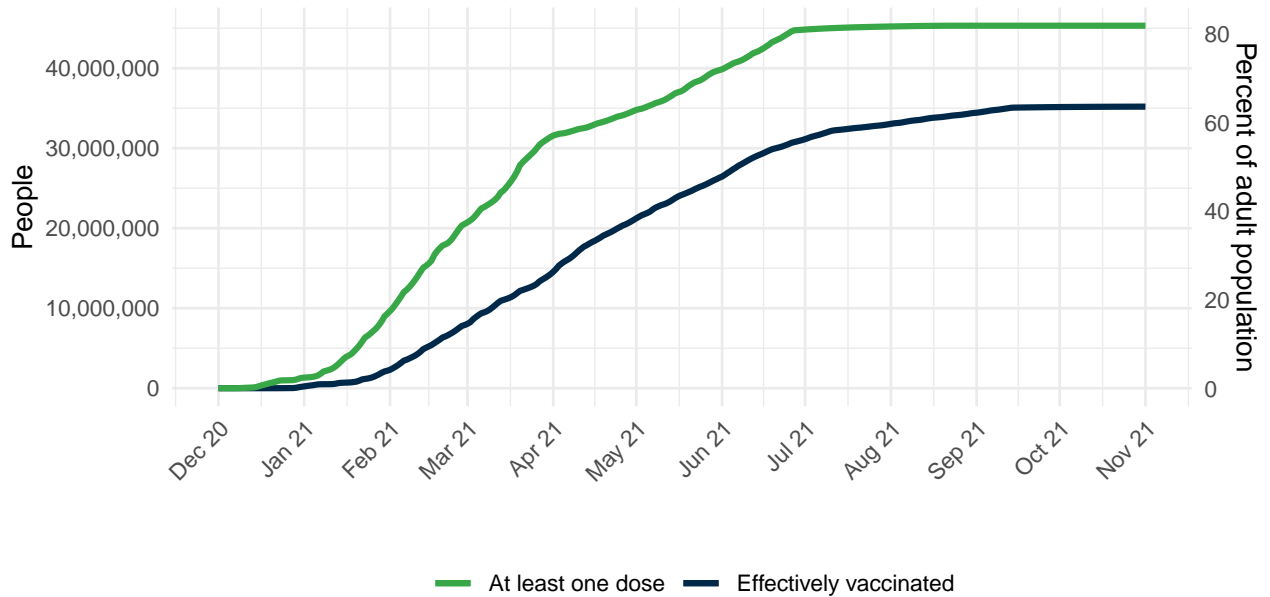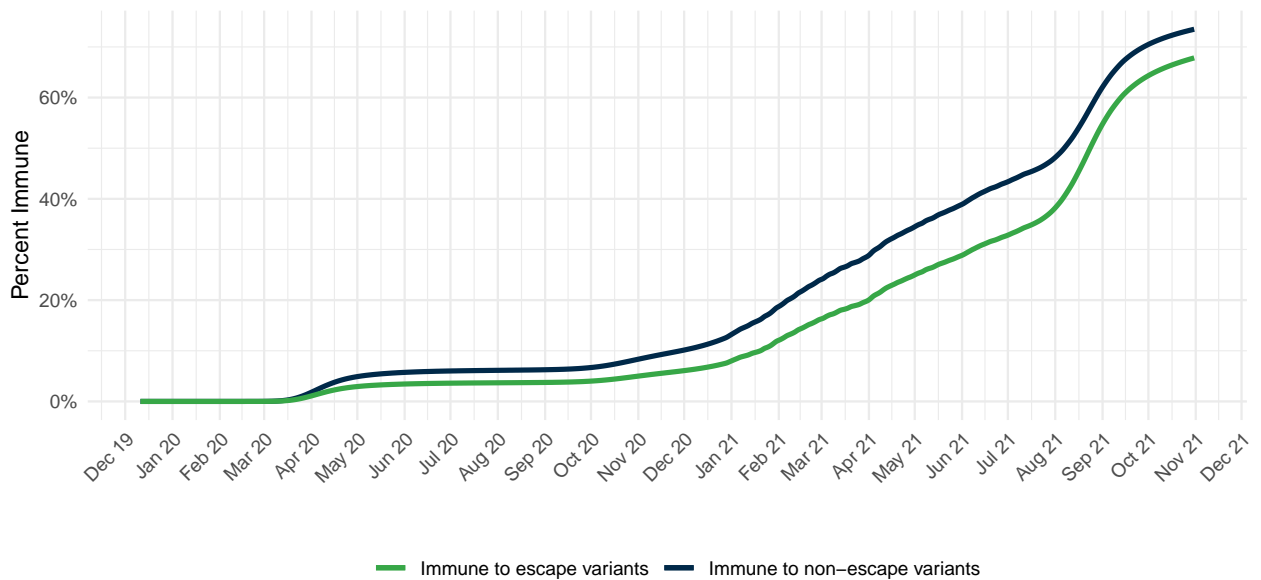—— At least one dose   —— Effectively vaccinated

Figure 19. Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants

—— Immune to escape variants   —— Immune to non–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.
- 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 United Kingdom.
- 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 P.1 begin to spread within three weeks in adjacent locations that do not already have B.1.351 or P.1 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 20. Daily COVID-19 deaths until November 01, 2021 for three scenarios

A. Reported daily COVID-19 death per 100,000

Legend: Reference scenario — Worse — Universal mask use
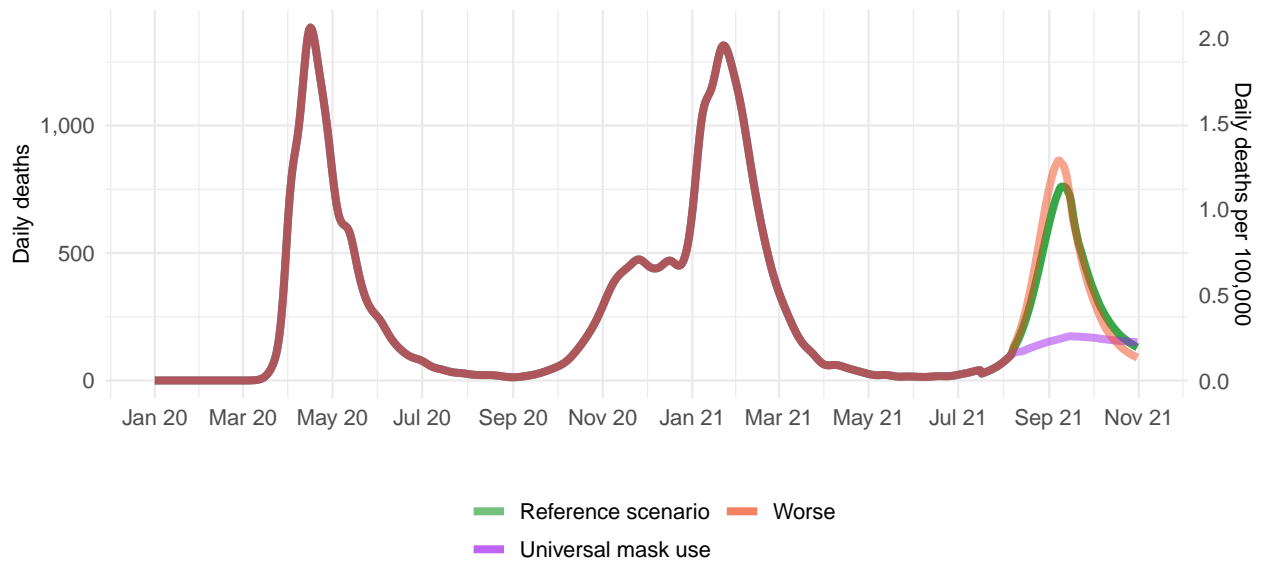
B. Excess daily COVID-19 deaths per 100,000

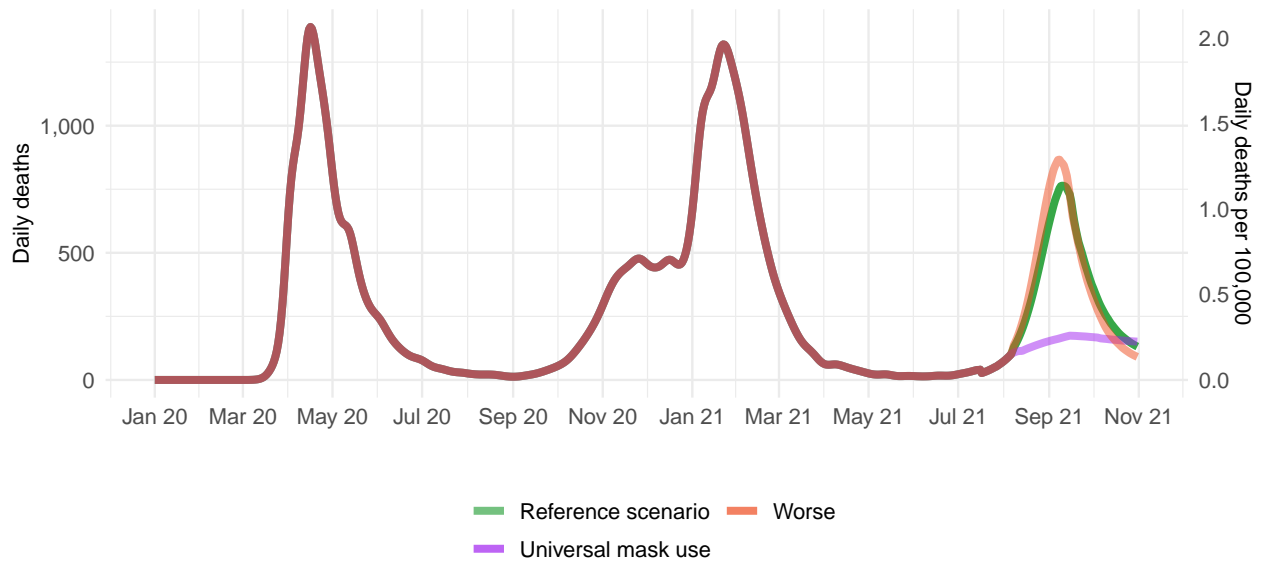Legend: Reference scenario — Worse — Universal mask use

Figure 21. Daily COVID-19 infections until November 01, 2021 for three scenarios
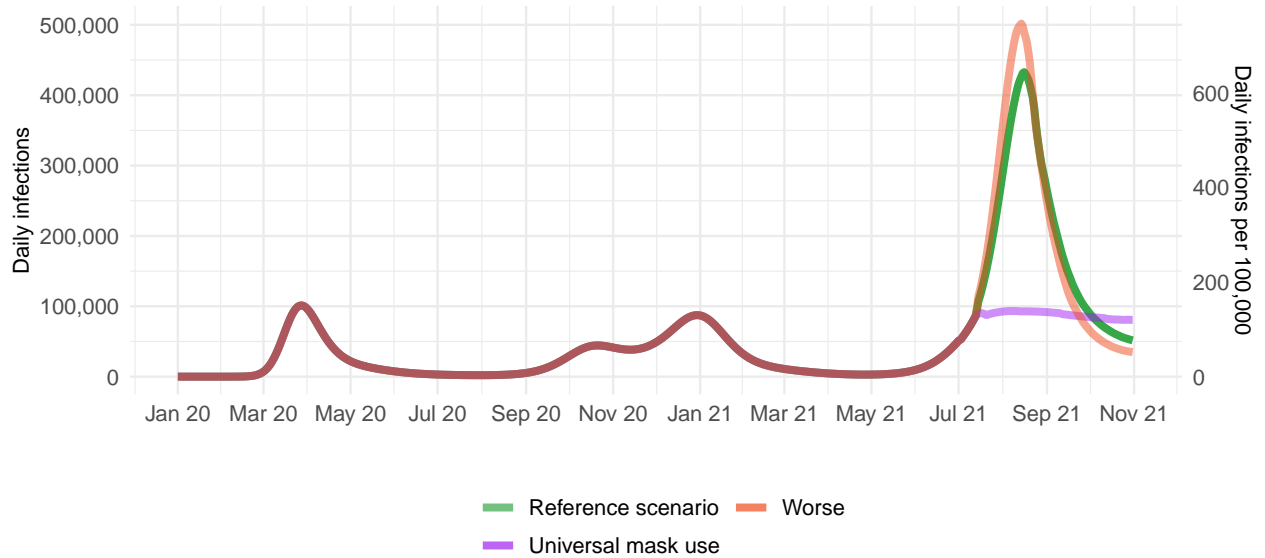
Figure 22. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology (Delphi), Imperial College London (Imperial), The Los Alamos National Laboratory (LANL), and the SI-KJalpha model from the University of Southern California (SIKJalpha). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.
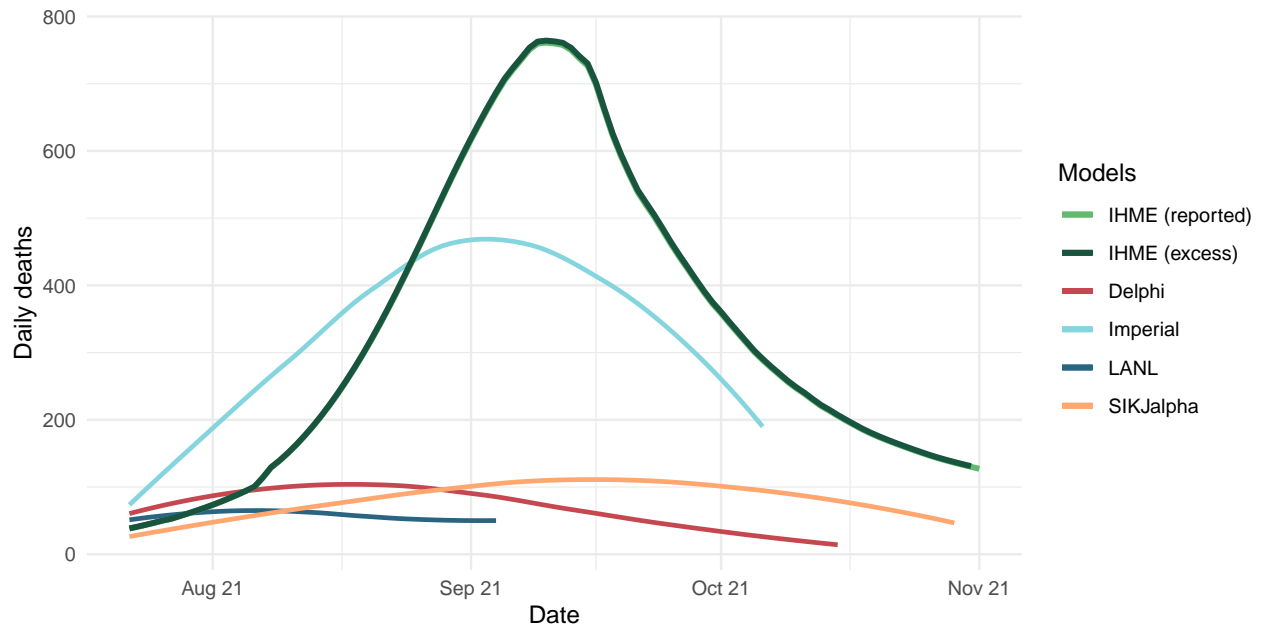
Figure 23. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.
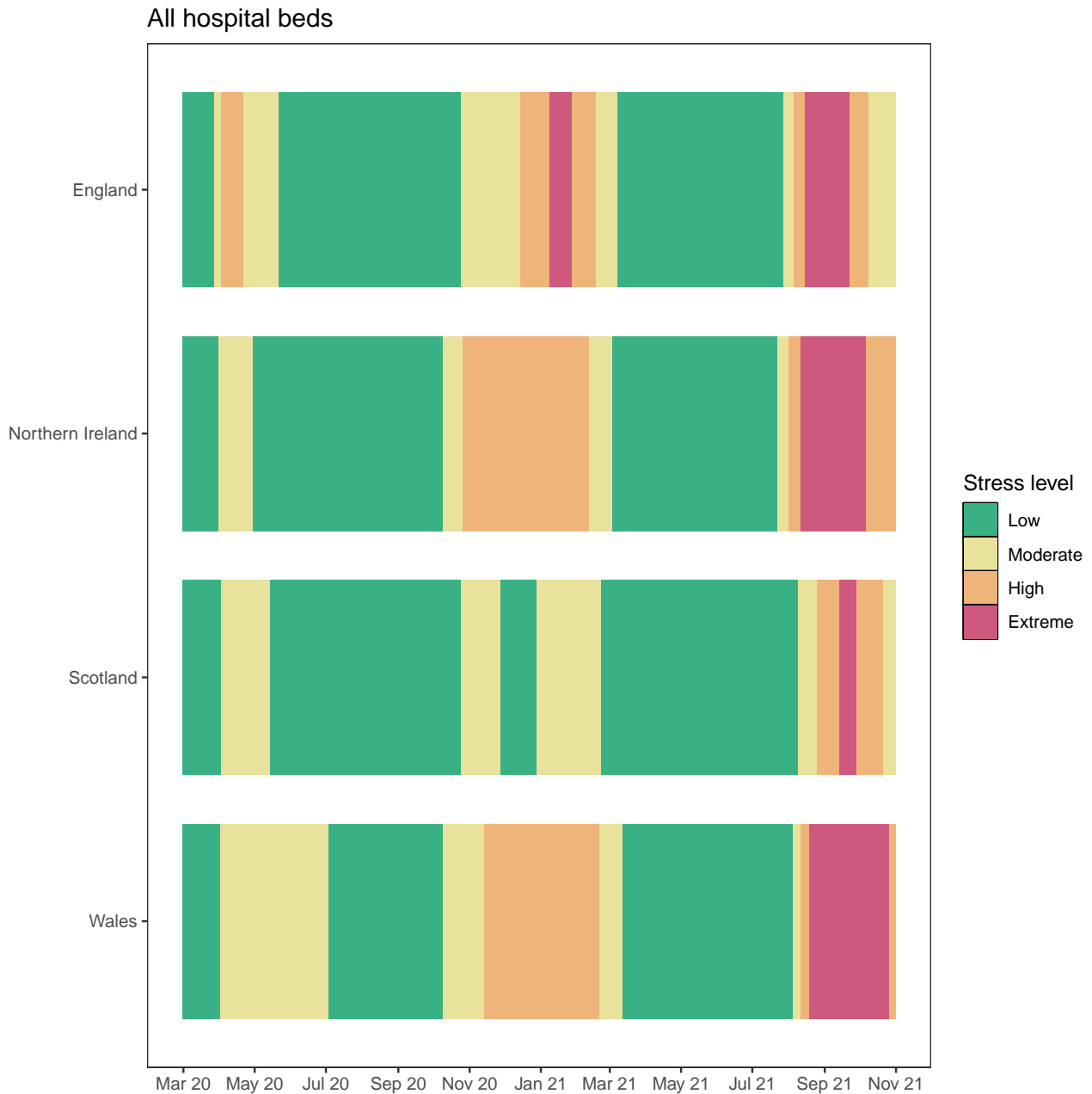
Figure 24. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and 60% or greater is considered *extreme stress*.

Intensive care unit beds
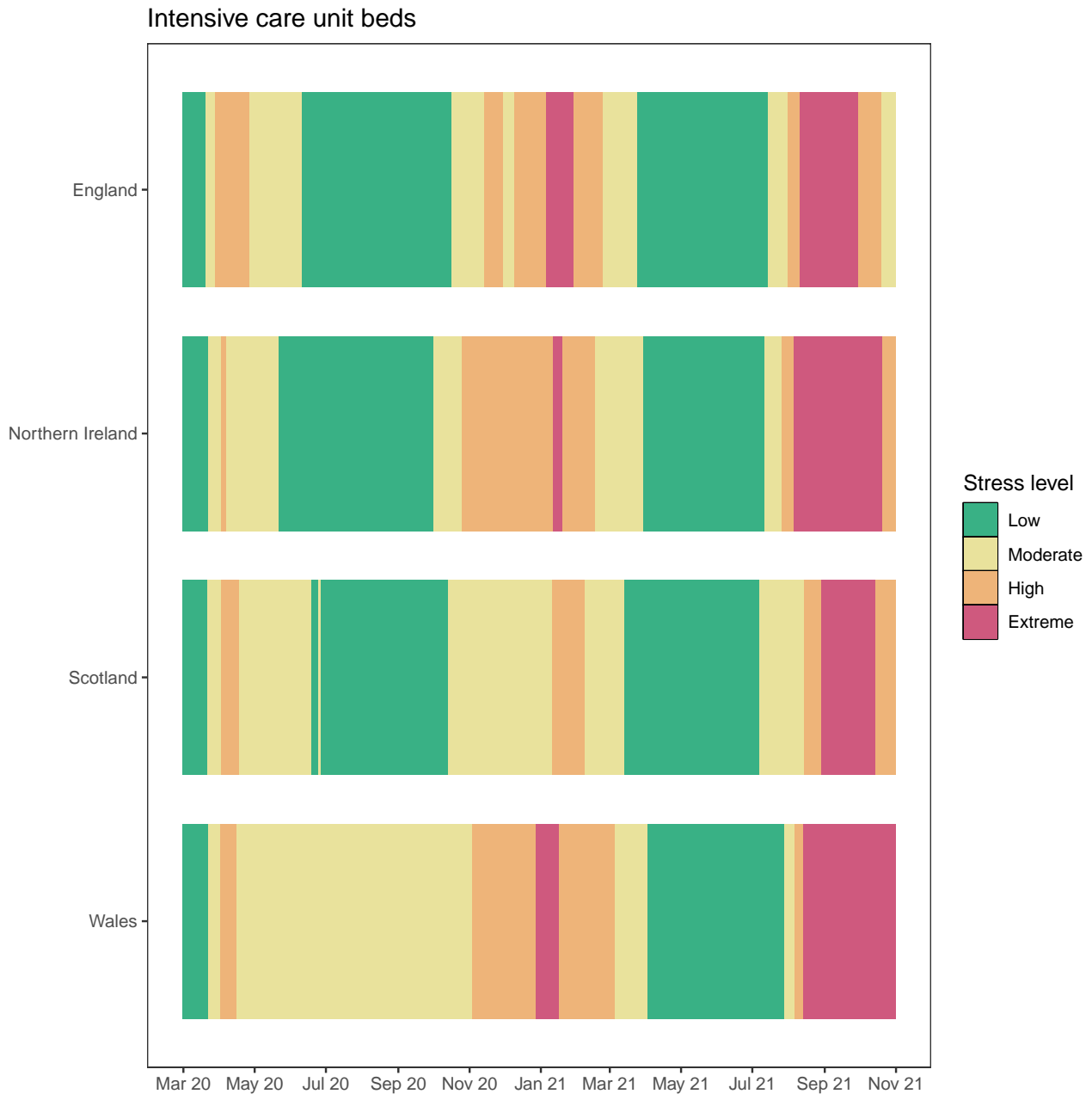
More information

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.

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