

COVID-19 Results Briefing

The United States of America

July 1, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the United States of America. The model was run on July 1, 2021, with data through June 29, 2021.

Daily cases stopped declining in the last week. If CDC guidance to not test vaccinated individuals unless they are hospitalized were not in place, reported cases would likely be increasing. Based on examining hospitalizations, cases, and deaths, we estimate that 14 states now have increasing transmission. These increases are most likely due to the combination of the Delta variant and huge reductions in mask use and increases in mobility. The fastest increase in transmission is in Nevada. While the number of states with increasing transmission highlights the risk of summer resurgence, so far no state has shown the explosive rate of increase seen in Scotland with the Delta variant. The US population has a much higher rate of past infection and has used much more extensively the more effective mRNA vaccines; these are the reasons that our models suggest that cases and deaths will increase slowly over the next three months. Nevertheless, it is quite possible that the Delta variant has more immune escape and more transmissibility than we currently estimate, which could drive summer surges in some states. Our current estimates of transmissibility are based on the Public Health England secondary attack rates based on detailed contact tracing comparing the Delta variant to the alpha variant. As seasonality starts to increase in the fall, we expect that there will be sufficient individuals susceptible to the Delta variant to sustain larger surges later in the year. State and Federal policy responses should focus on continued efforts to reach the hesitant with vaccination, consider delivering a dose of an mRNA vaccine to those who have received the Johnson & Johnson vaccine to increase protection against the Delta variant, and expand efforts to monitor transmission in the vaccinated by encouraging rather than discouraging testing. In states where transmission is increasing, individuals, including those who have been vaccinated, should consider wearing masks in situations where the risk of transmission is high.

Current situation

- Daily reported cases in the last week (through June 25) remained essentially constant at 11,600 per day on average compared to 11,400 the week before (Figure 1).
- Reported deaths due to COVID-19 in the last week decreased to 230 per day on average compared to 280 the week before (Figure 2).
- Excess deaths due to COVID-19 in the last week decreased to 370 per day on average compared to 450 the week before (Figure 2). This makes COVID-19, counting excess deaths, the number 6 cause of death in the US this week (Table 1). Estimated excess daily deaths due to COVID-19 were 1.5 times larger than the reported number of deaths.

- No locations had daily reported COVID-19 death rates or excess death rates greater than 4 per million (Figure 3).
- We estimated that 38% of people in the US have been infected as of June 29 (Figure 5).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 14 states (Figure 6). The number of states with increasing transmission has increased each week over the last two weeks.
- The infection-detection rate in the US was close to 15% on June 29 (Figure 7).
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figure 8). We estimate that B.1.351 is circulating in nine states, that B.1.617 is circulating in 13 states, and that P.1 is circulating in 23 states.

Trends in drivers of transmission

- Social distancing mandates have been largely removed. Hawaii is the only state with a mask mandate. Some form of gathering restriction remains in place in six states, and even these restrictions in many cases are scheduled to be removed in the next days.
- Mobility last week was 7% lower than the pre-COVID-19 baseline (Figure 10). Mobility was near baseline (within 10%) in 42 states.
- As of June 29, in the Global COVID-19 Symptom Surveys and the US COVID-19 Symptom Surveys, 29% of people self-report that they always wore a mask when leaving their home (Figure 12).
- There were 320 diagnostic tests per 100,000 people on June 29 (Figure 14).
- In the US, 71.3% 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 56% in Mississippi to 89% in Hawaii (Figure 18).
- In our current reference scenario, we expect that 180 million people will be vaccinated with at least one dose by October 1 (Figure 19). By August 1, we expect 60% of the adult population will be effectively vaccinated – having received the full set of doses and having immune protection.

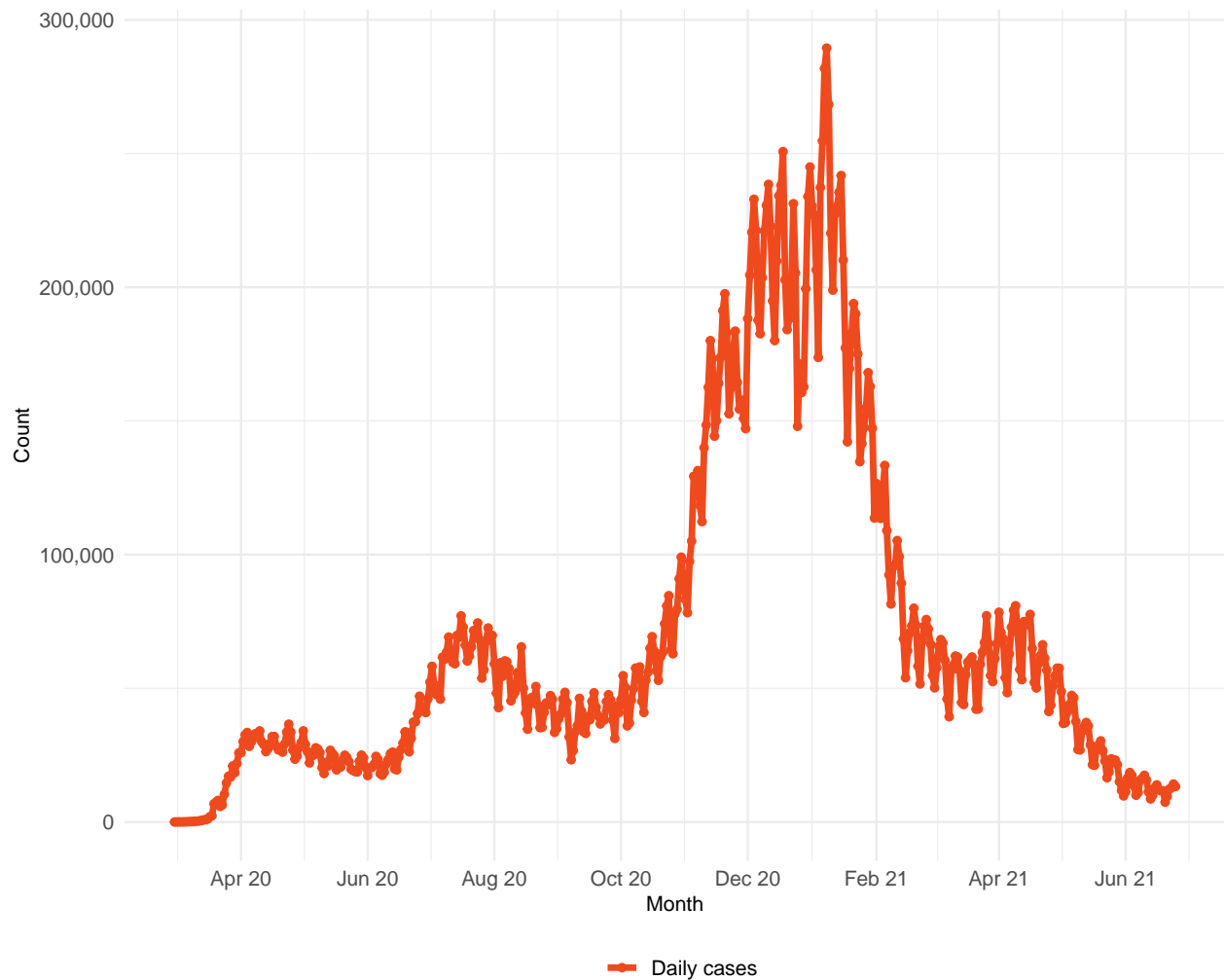
Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 621,000 cumulative reported deaths due to COVID-19 on October 1. This represents 20,000 additional deaths from June 29 to October 1. Daily reported deaths are expected to increase very slowly from mid-July forward until October 1, 2021 (Figure 20).
- Under our **reference scenario**, our model projects 960,000 cumulative excess deaths due to COVID-19 on October 1. This represents 33,000 additional deaths from June 29 to October 1 (Figure 20).

- If **universal mask coverage (95%)** were attained in the next week, our model projects 12,000 fewer cumulative reported deaths compared to the reference scenario on October 1.
- Under our **worse scenario**, our model projects 624,000 cumulative reported deaths on October 1, an additional 3,800 deaths compared to our reference scenario. Daily reported deaths in the worse scenario are expected to decline until October 1, 2021 (Figure 20).
- By October 1, we project that 8,700 lives will be saved by the projected vaccine rollout. This does not include lives saved through vaccination that has already been delivered.
- Daily infections in the reference scenario are expected to increase slowly until October 1, 2021. Under the worse scenario, daily infections are expected to increase more rapidly until October 1, 2021 (Figure 21).
- Figure 22 compares our reference scenario forecasts to other publicly archived models. Most models project steady declines. The CDC ensemble has stagnant death numbers. IHME and Los Alamos National Labs forecast increases from August 1.
- At some point from June through October 1, zero states will have high or extreme stress on hospital beds (Figure 23). At some point from June through October 1, zero states will have high or extreme stress on intensive care unit (ICU) capacity (Figure 24).

Model updates

Our modeling inclusion criteria for current local transmission of a variant were updated to account for locations with relatively few sequences, but for which all sequences were collected in the last few weeks. Specifically, we consider local transmission to have potentially occurred if a location has identified more than 50 sequences of a new variant in the previous six weeks. This rule essentially only applies to P.1 and B.1.617.2.

Figure 1. Reported daily COVID-19 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	10,724	1
Tracheal, bronchus, and lung cancer	3,965	2
Chronic obstructive pulmonary disease	3,766	3
Stroke	3,643	4
Alzheimer's disease and other dementias	2,768	5
COVID-19	2,624	6
Chronic kidney disease	2,057	7
Colon and rectum cancer	1,616	8
Lower respiratory infections	1,575	9
Diabetes mellitus	1,495	10

Figure 2. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily COVID-19 deaths (orange).

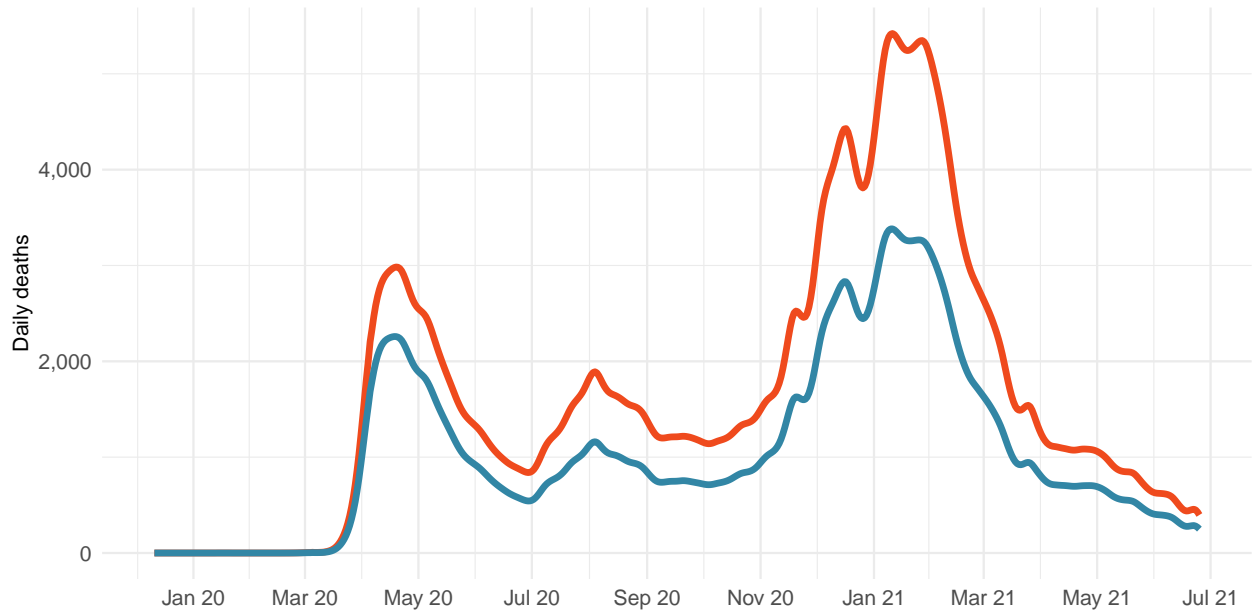
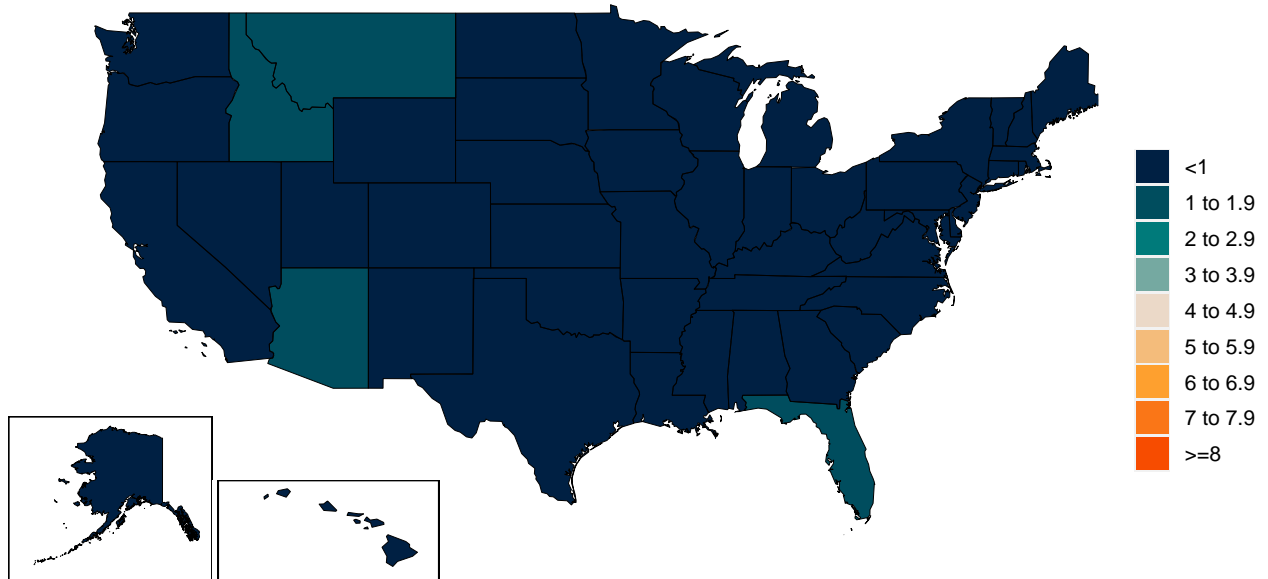


Figure 3. Daily COVID-19 death rate per 1 million on June 29, 2021

A. Daily reported COVID-19 death rate per 1 million



B. Daily excess COVID-19 death rate per 1 million

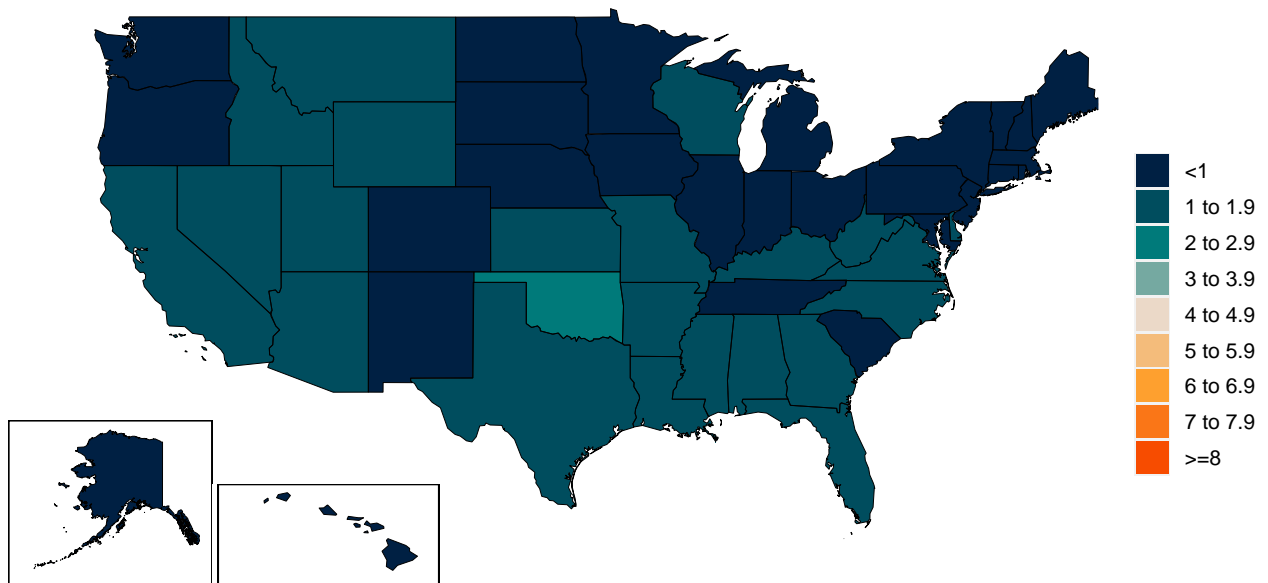
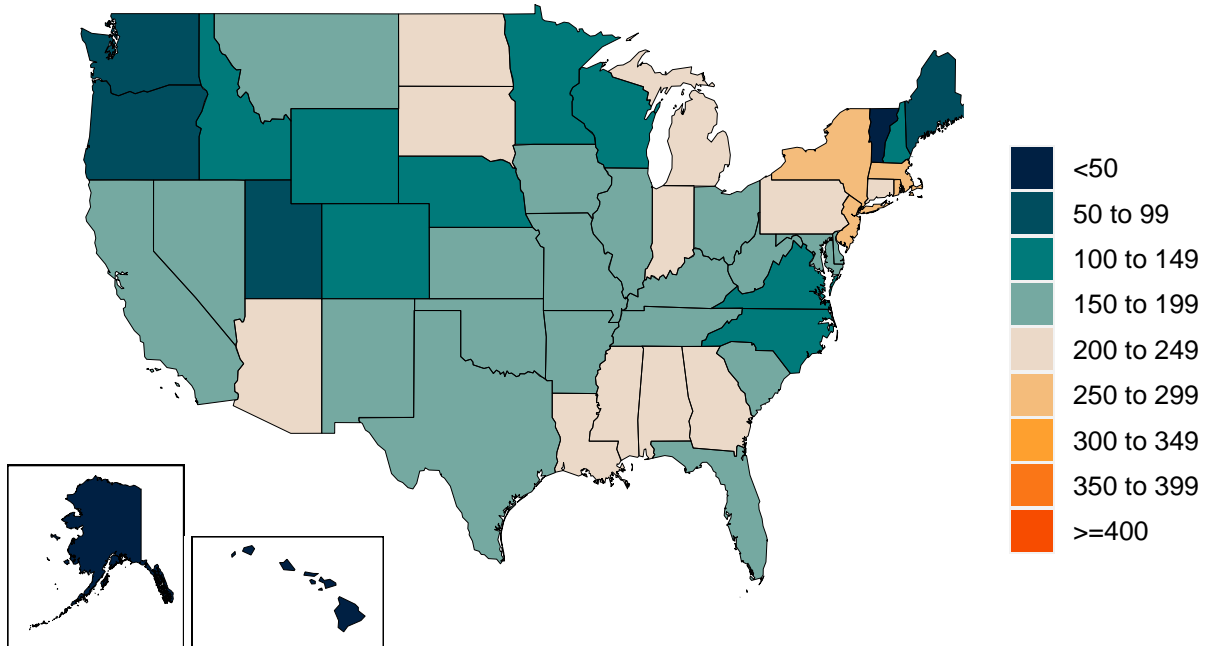


Figure 4. Cumulative COVID-19 deaths per 100,000 on June 29, 2021

A. Reported cumulative COVID-19 deaths per 100,000



B. Excess cumulative COVID-19 deaths per 100,000

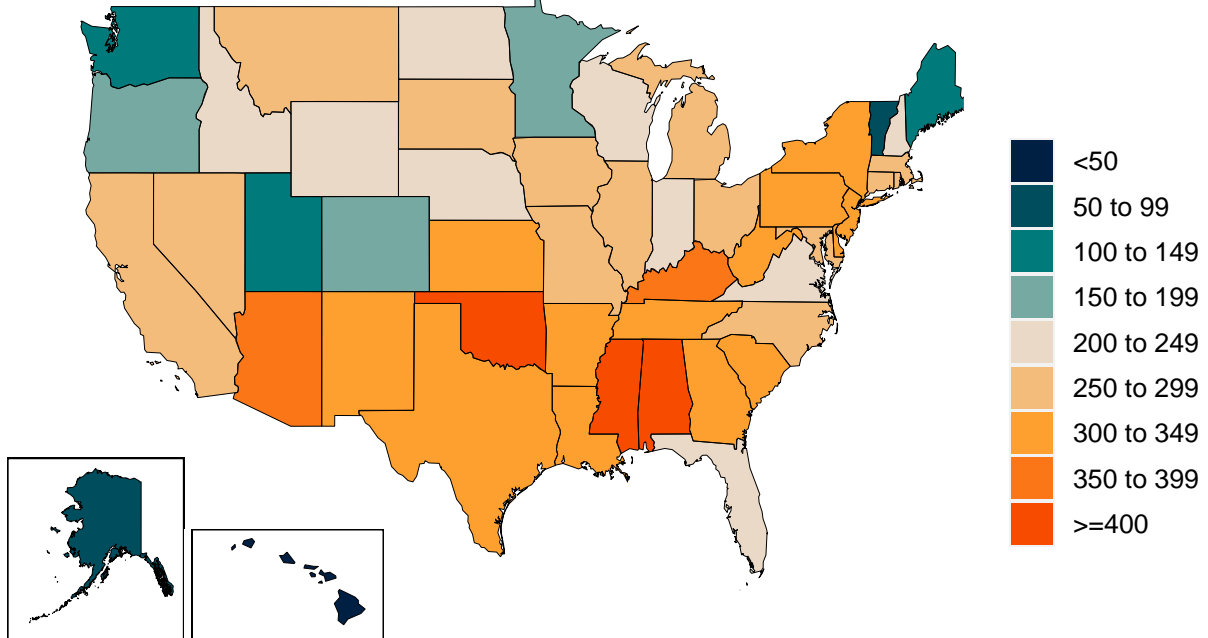


Figure 5. Estimated percent of the population infected with COVID-19 on June 29, 2021

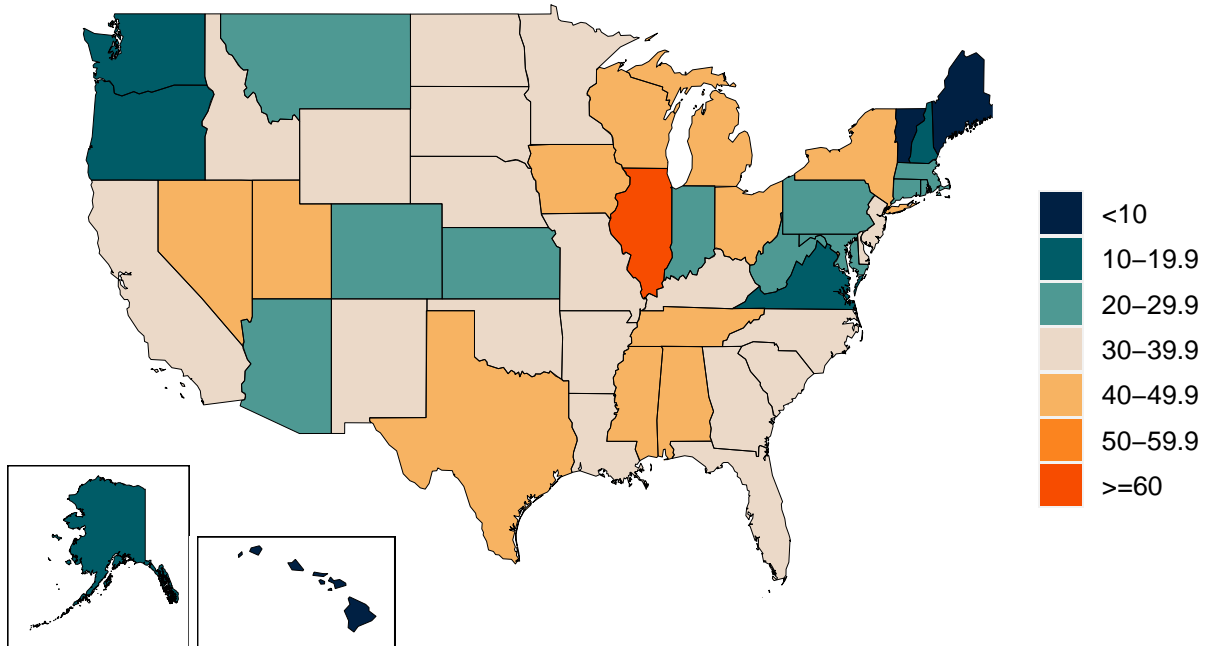


Figure 6. Mean effective R on June 18, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11–13 days prior, so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline, all other things being held the same.

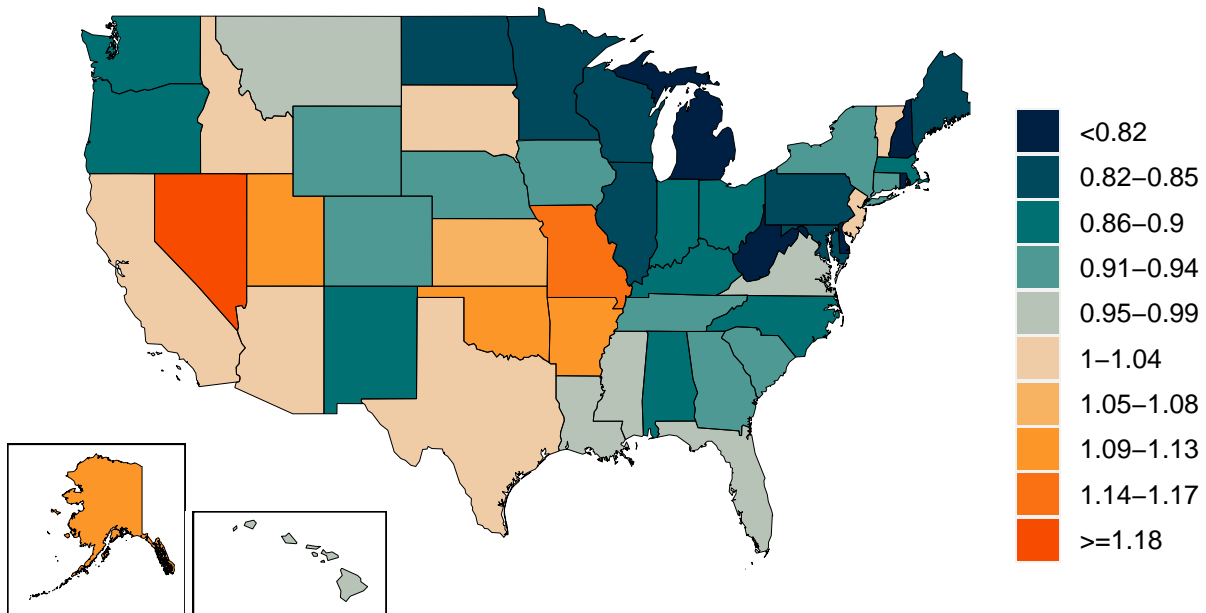


Figure 7. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.

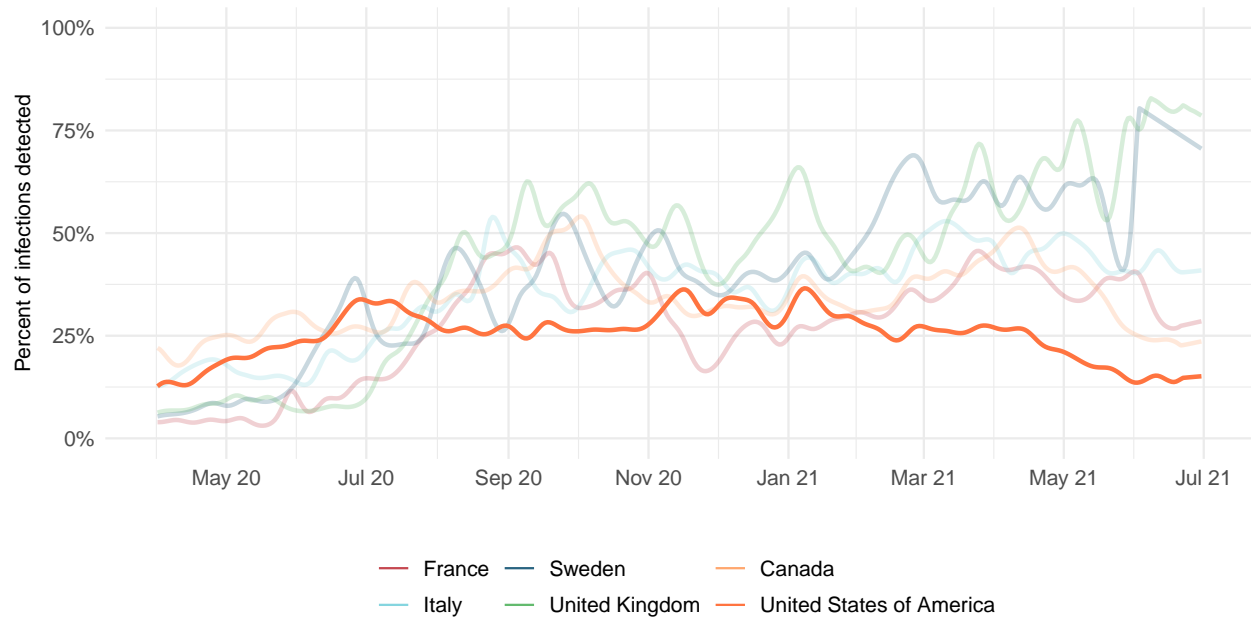
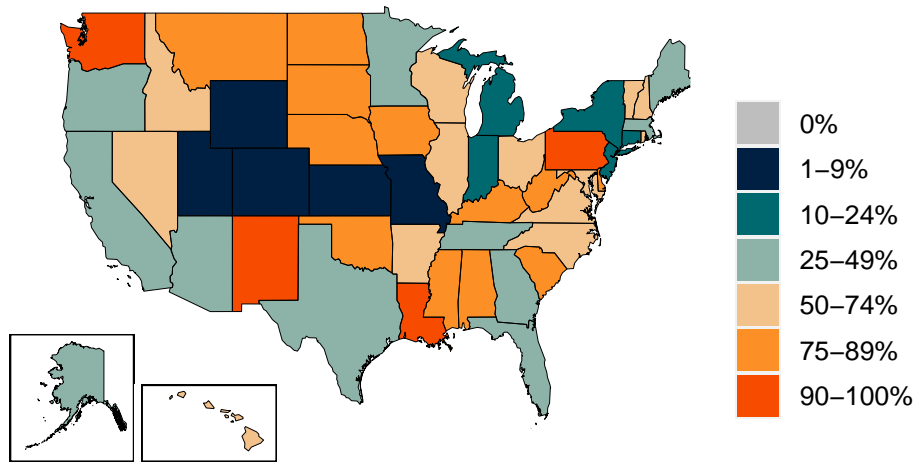
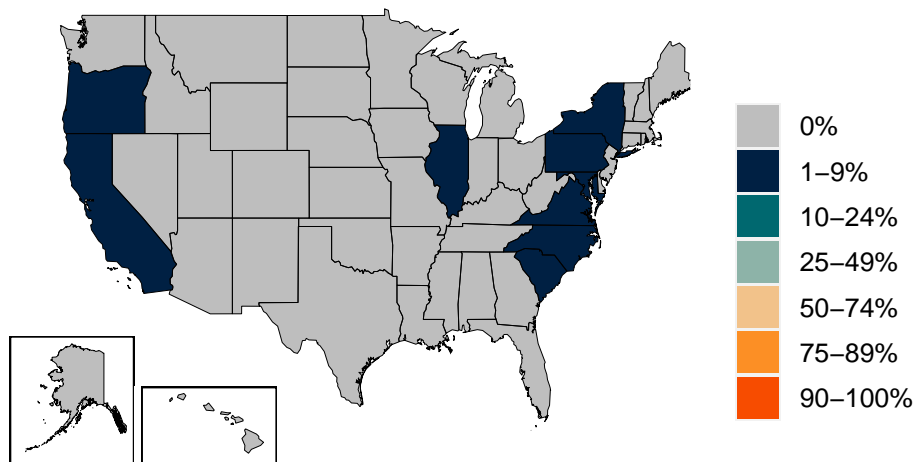


Figure 8. Estimated percent of circulating SARS-CoV-2 for primary variant families on June 29, 2021.

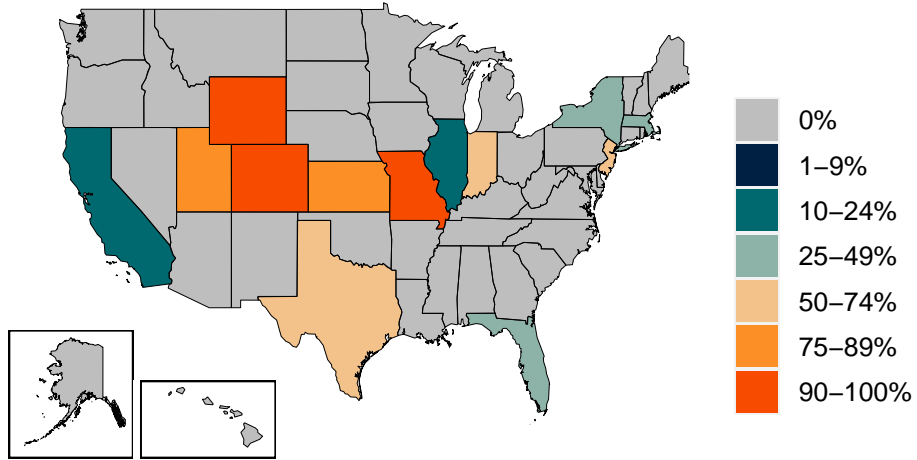
A. Estimated percent B.1.1.7 variant



B. Estimated percent B.1.351 variant



C. Estimated percent B.1.617 variant



D. Estimated percent P.1 variant

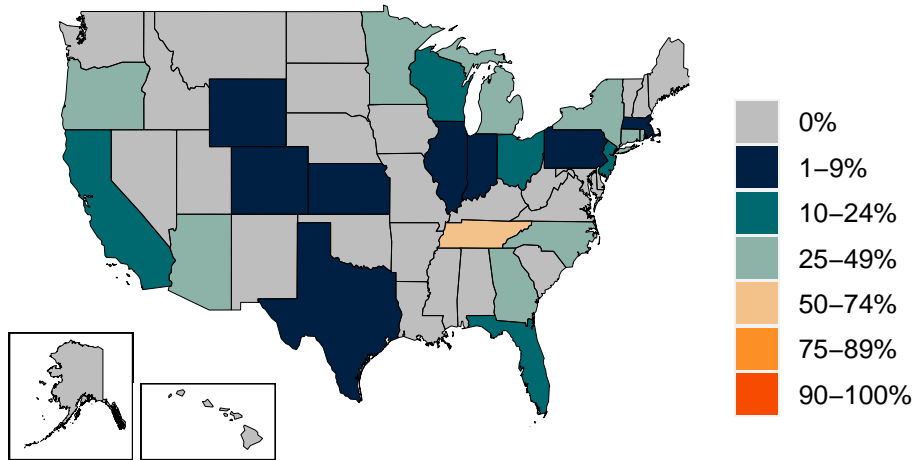
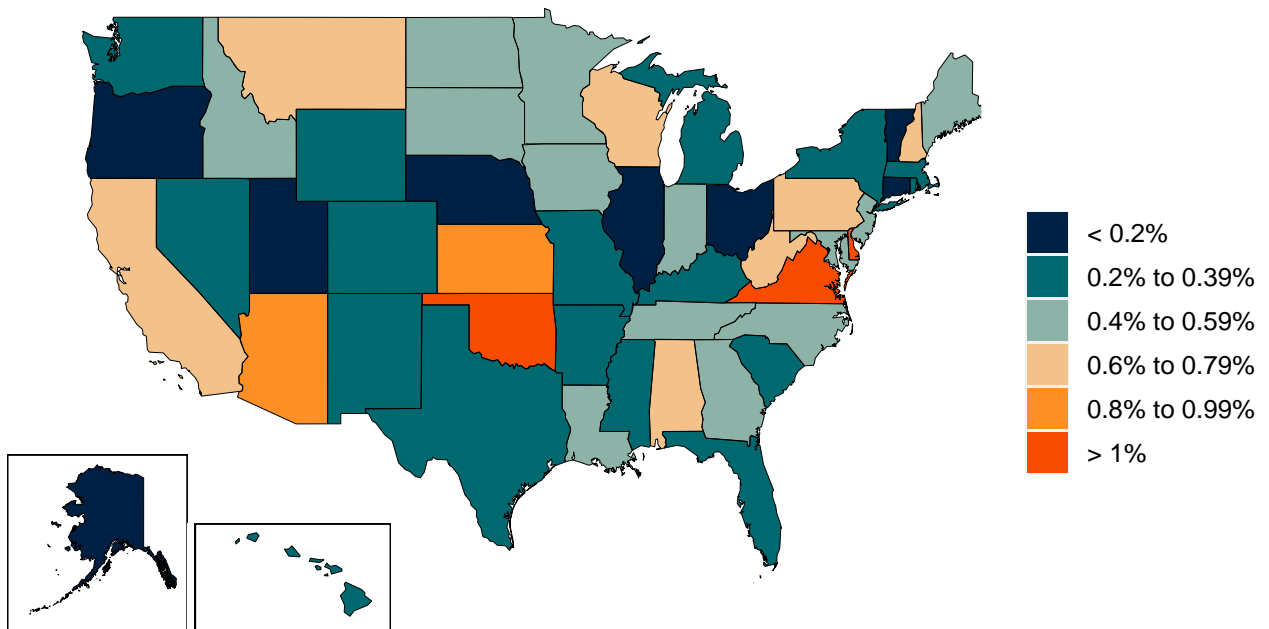


Figure 9. Infection-fatality ratio on June 29, 2021



Critical drivers

Table 2. Current mandate implementation



Figure 10. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

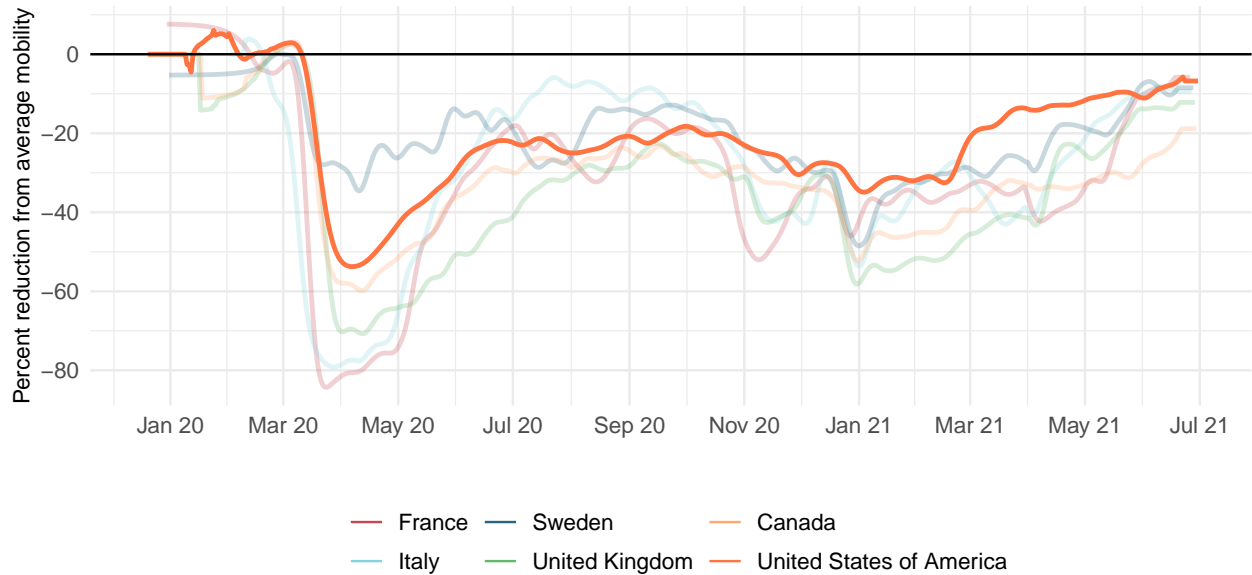


Figure 11. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on June 29, 2021

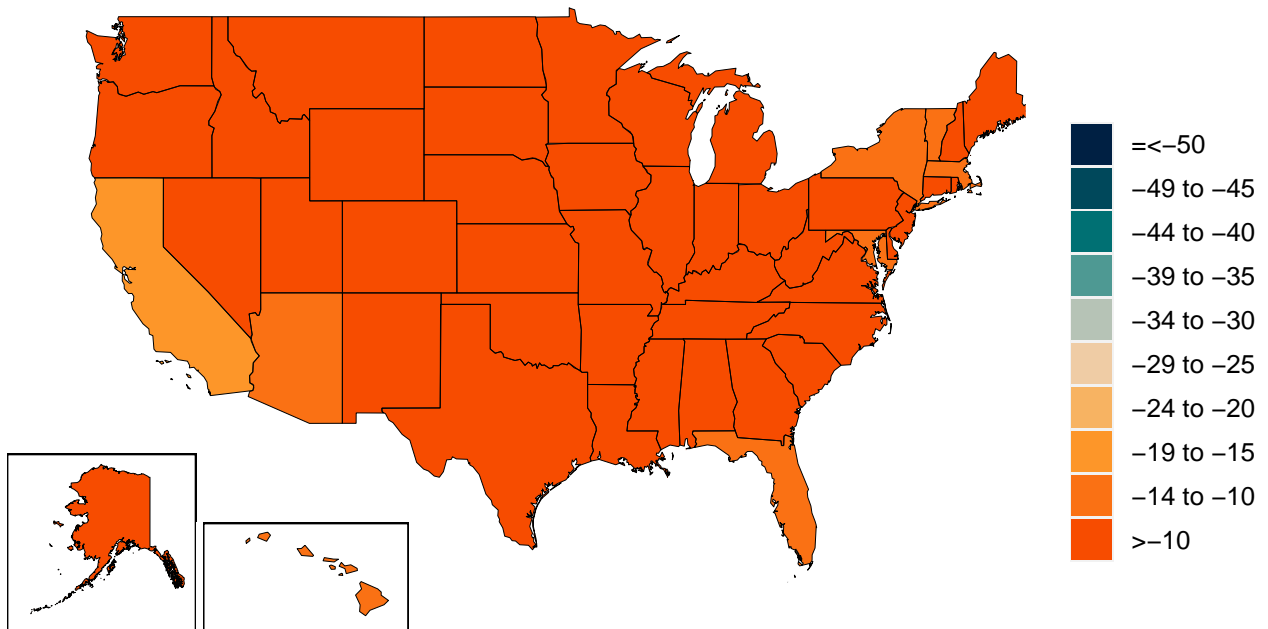


Figure 12. Trend in the proportion of the population reporting always wearing a mask when leaving home

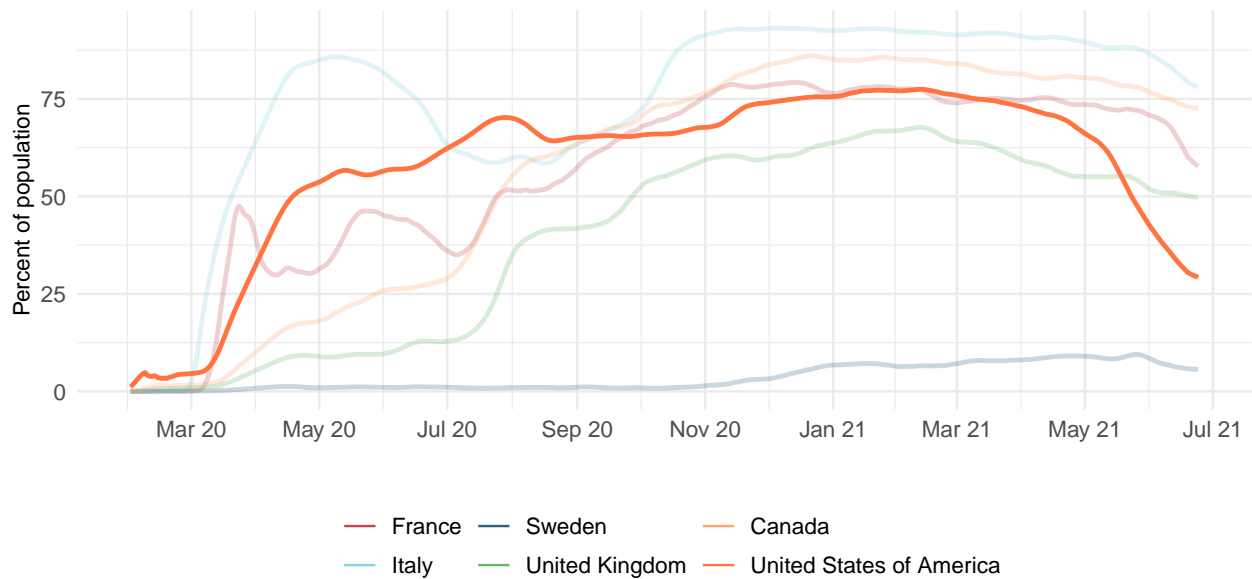


Figure 13. Proportion of the population reporting always wearing a mask when leaving home on June 29, 2021

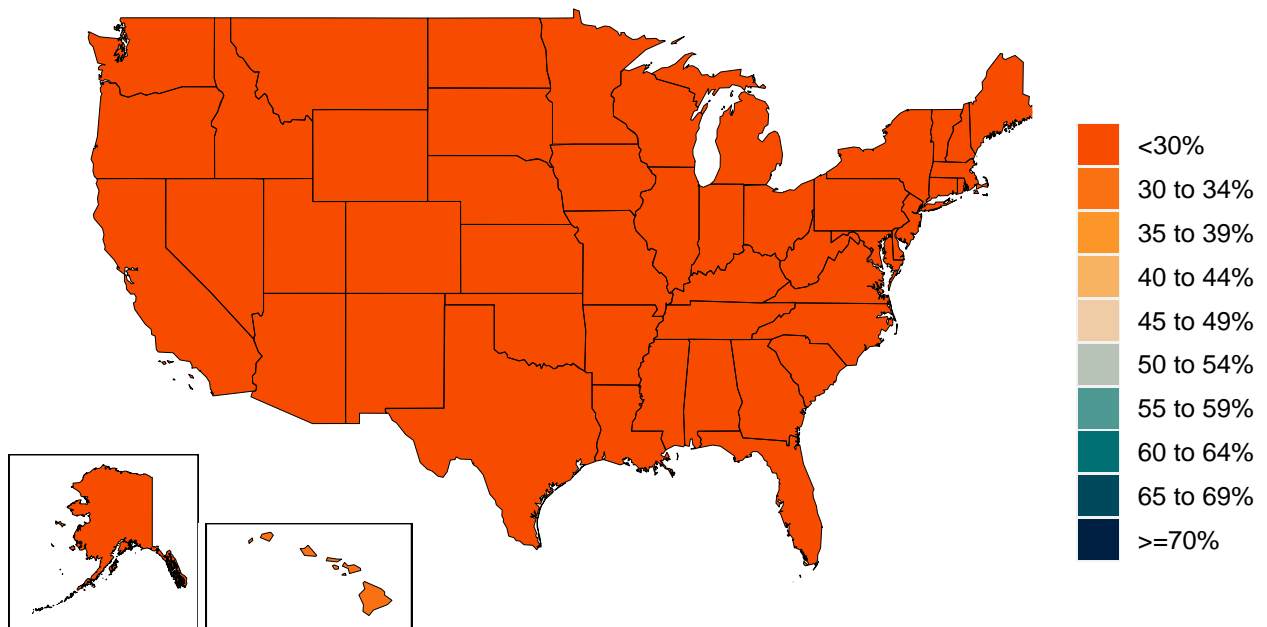


Figure 14. Trend in COVID-19 diagnostic tests per 100,000 people

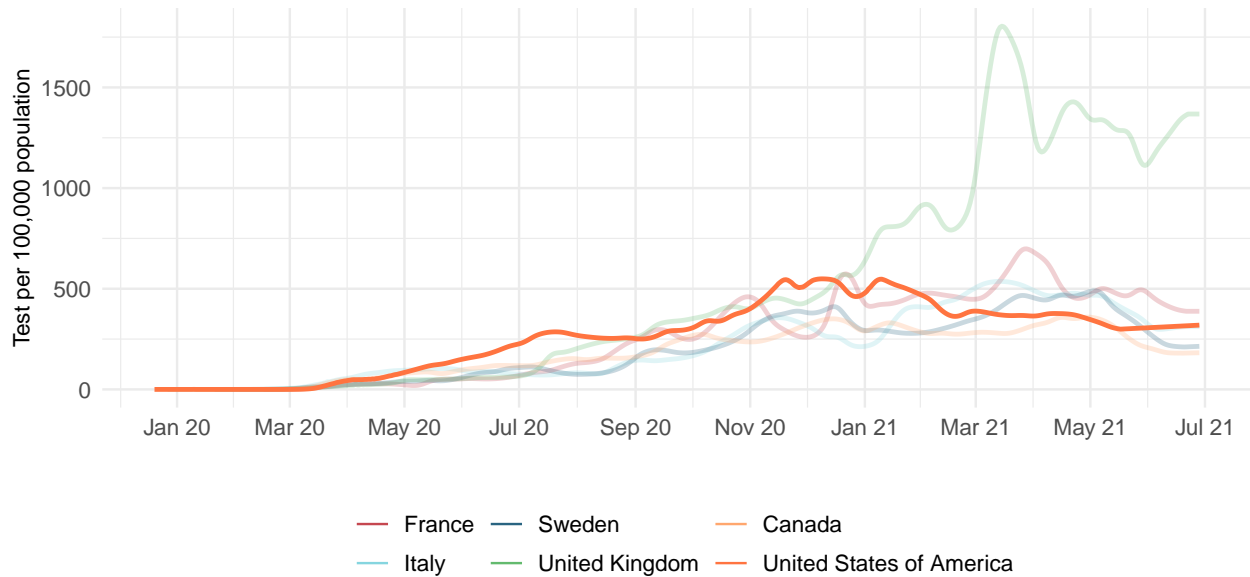


Figure 15. COVID-19 diagnostic tests per 100,000 people on June 29, 2021

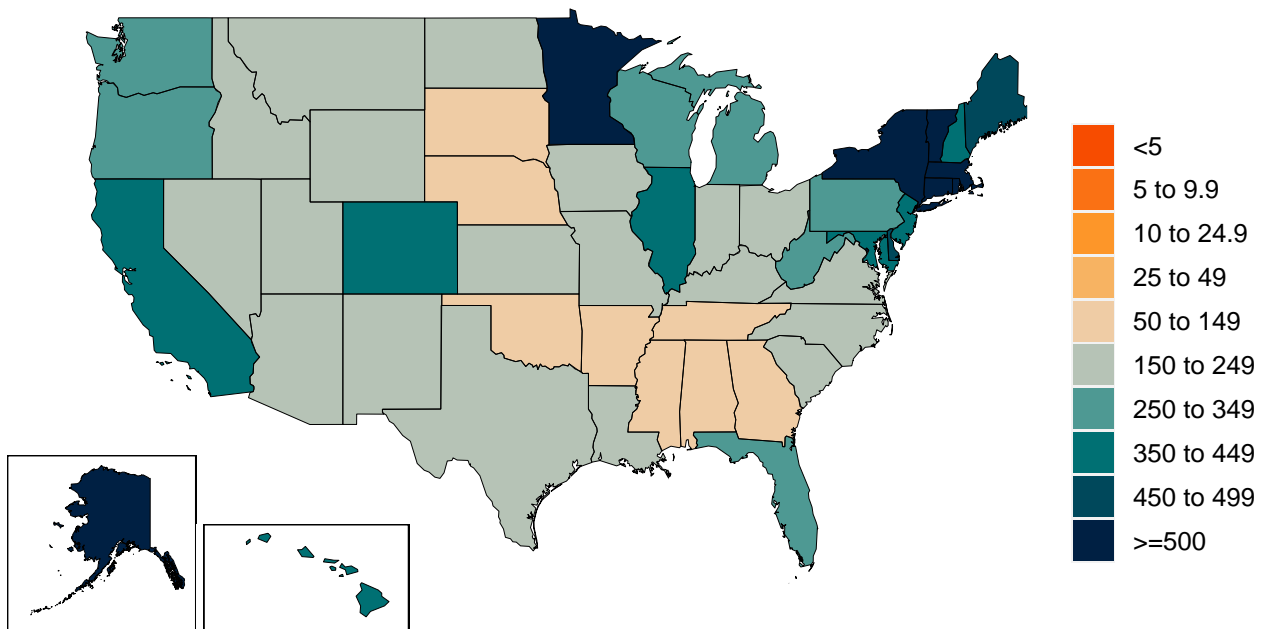


Figure 16. Increase in the risk of death due to pneumonia on February 1 compared to August 1

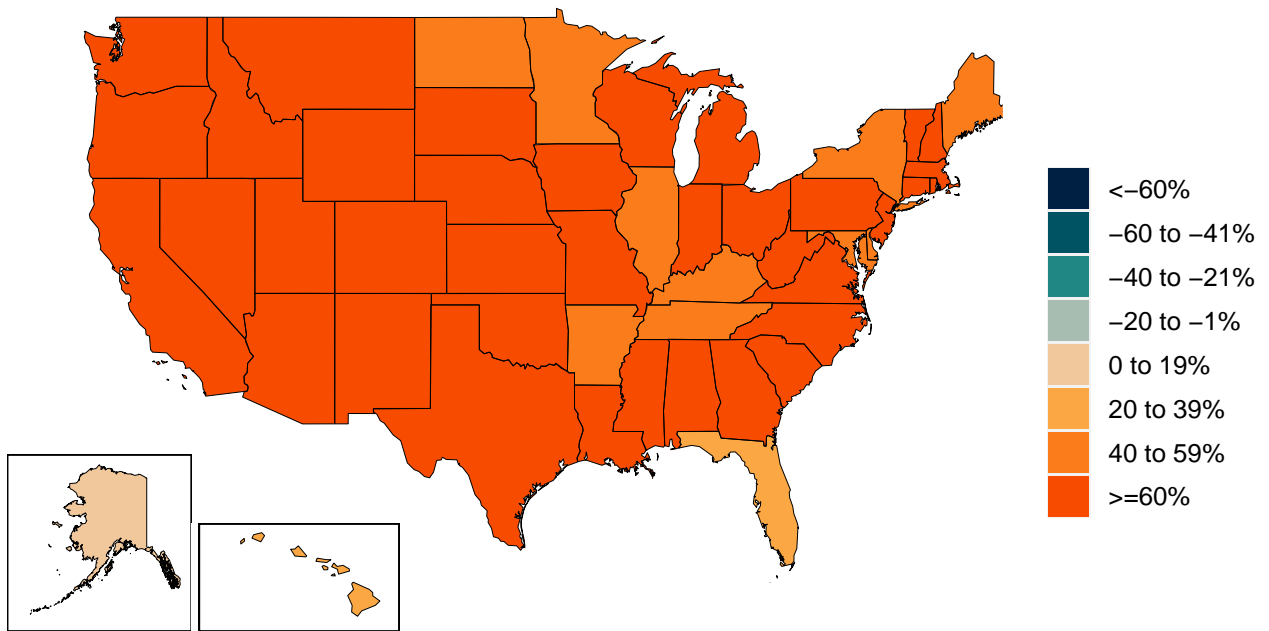


Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, 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	66%	58%	53%	47%
CanSino				
Other vaccines	75%	66%	60%	53%
Other vaccines (mRNA)	91%	86%	81%	77%

Figure 17. 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.

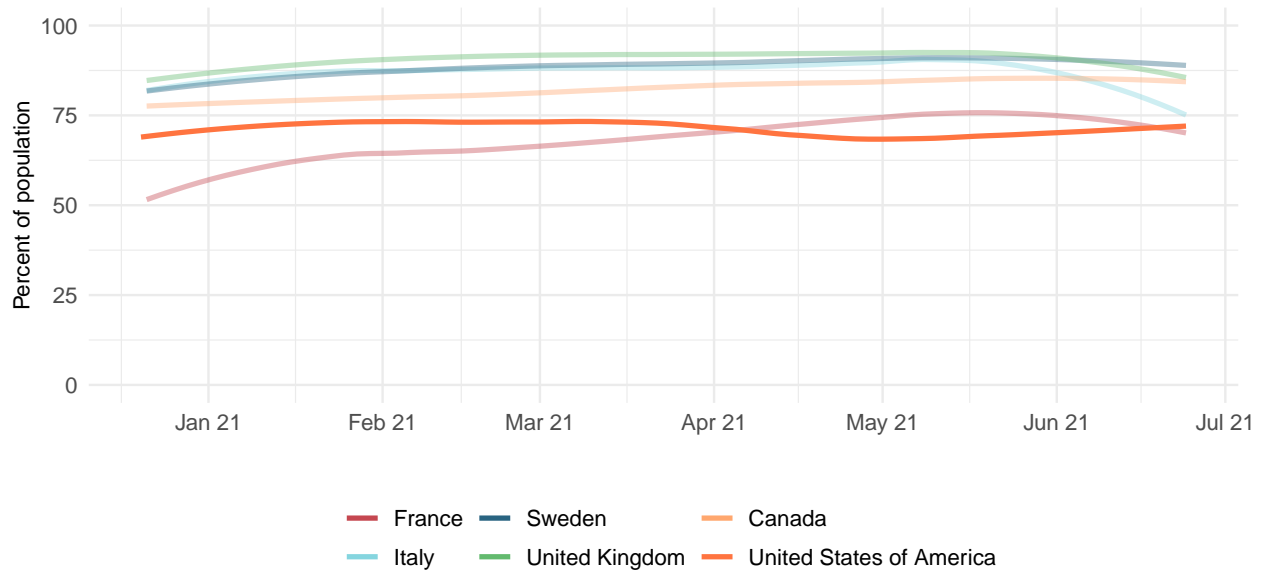


Figure 18. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available.

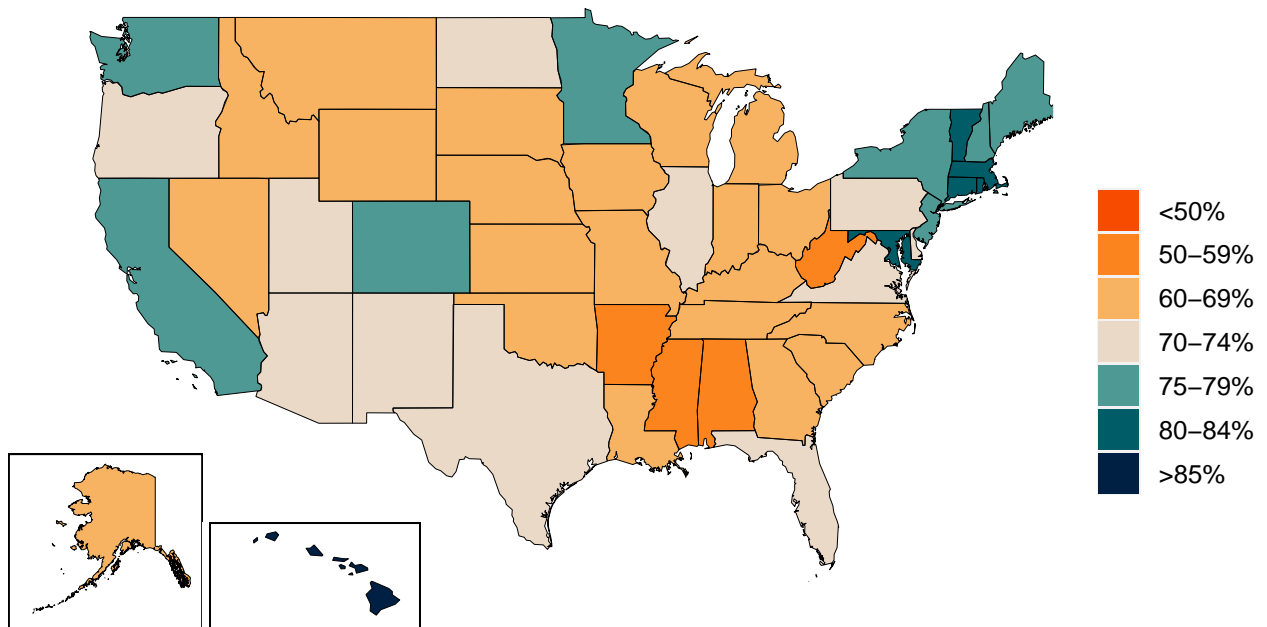
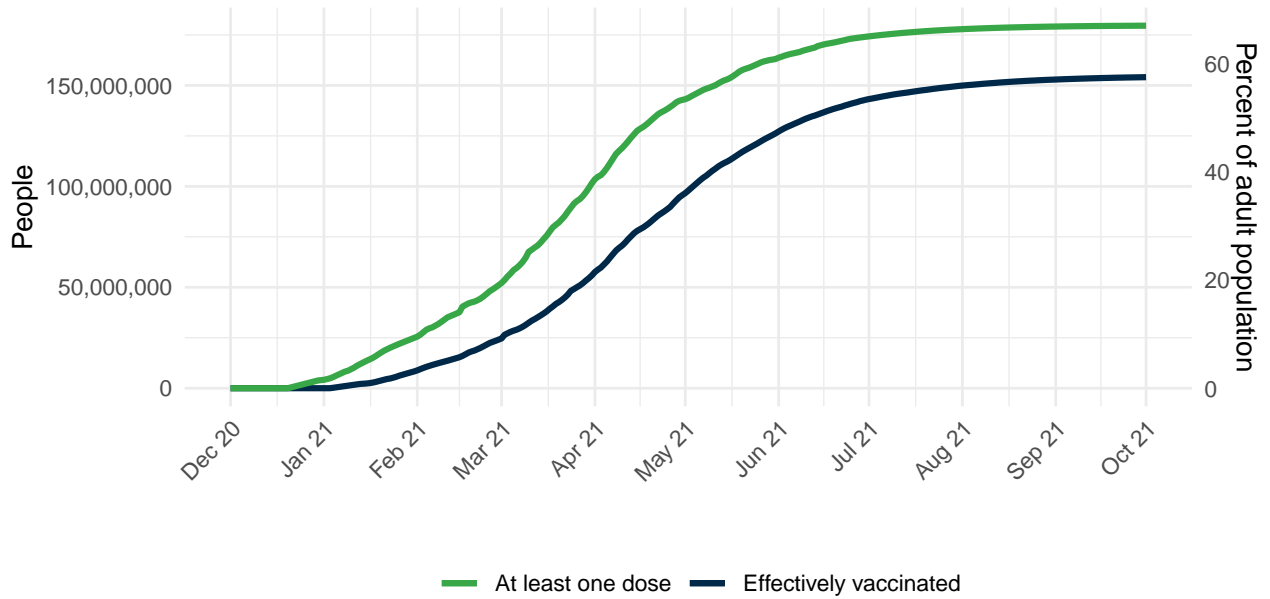


Figure 19. Number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.



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 United Kingdom.
- In one-quarter of those vaccinated, mobility increases toward pre-COVID-19 levels.

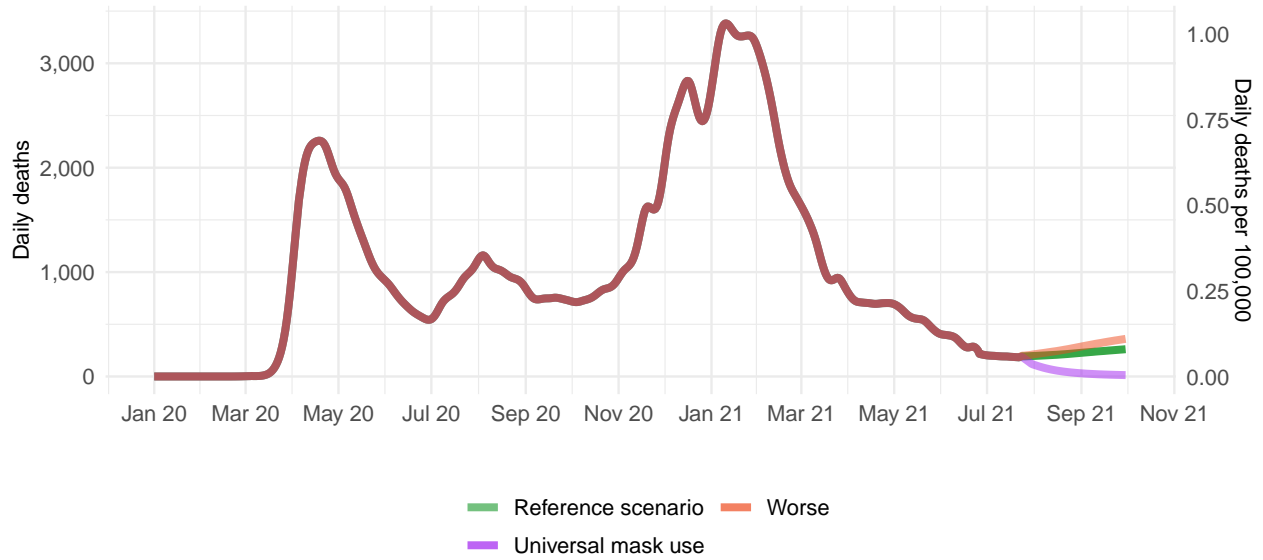
The **worse scenario** modifies the reference scenario assumptions in three ways:

- 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 October 01, 2021 for three scenarios

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



B. Excess daily COVID-19 deaths per 100,000

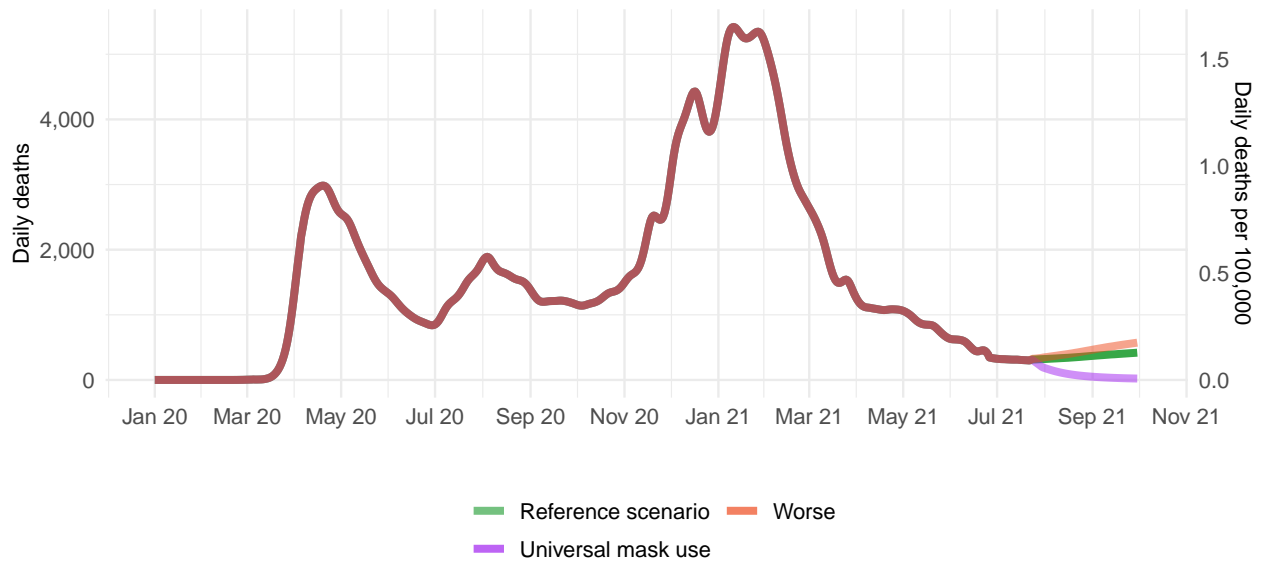


Figure 21. Daily COVID-19 infections until October 01, 2021 for three scenarios

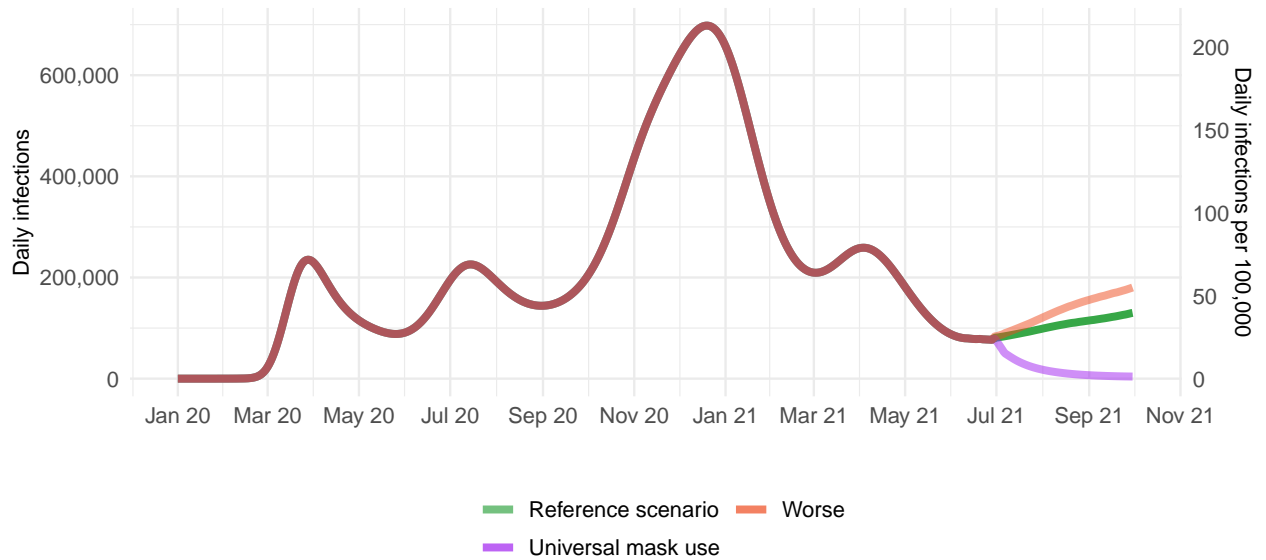


Figure 22. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology ([Delphi](#)), Imperial College London ([Imperial](#)), The Los Alamos National Laboratory ([LANL](#)), the SI-KJalpha model from the University of Southern California ([SIKJalpha](#)), and the CDC Ensemble Model ([CDC](#)) Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.

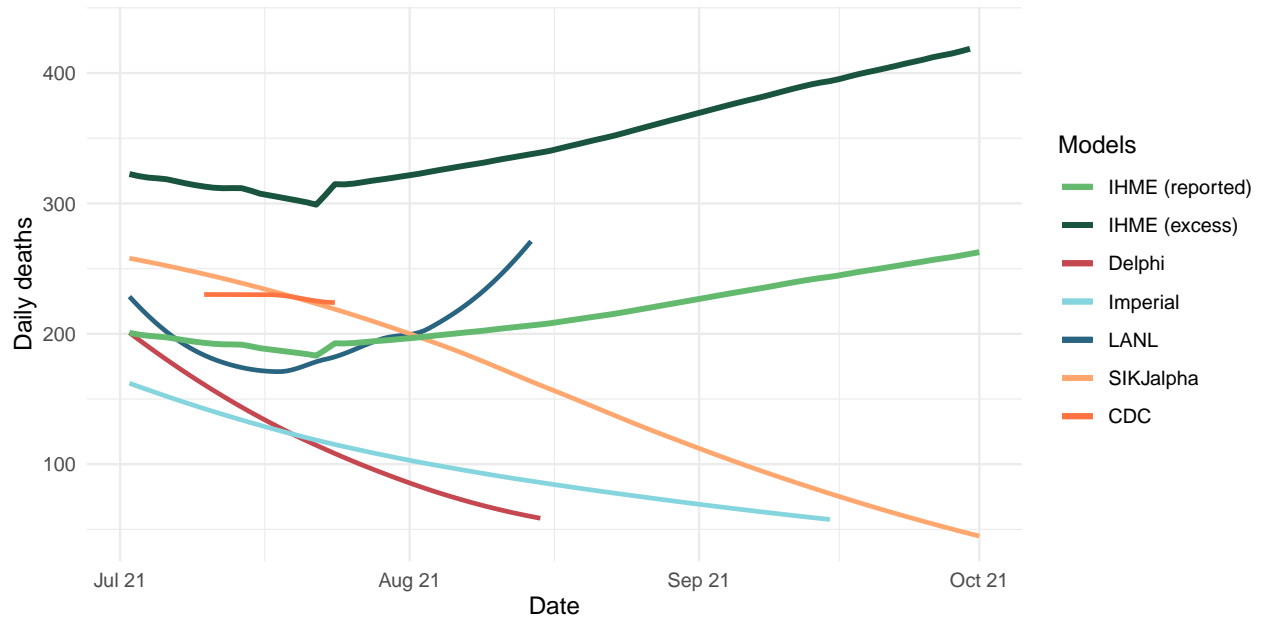


Figure 23. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.

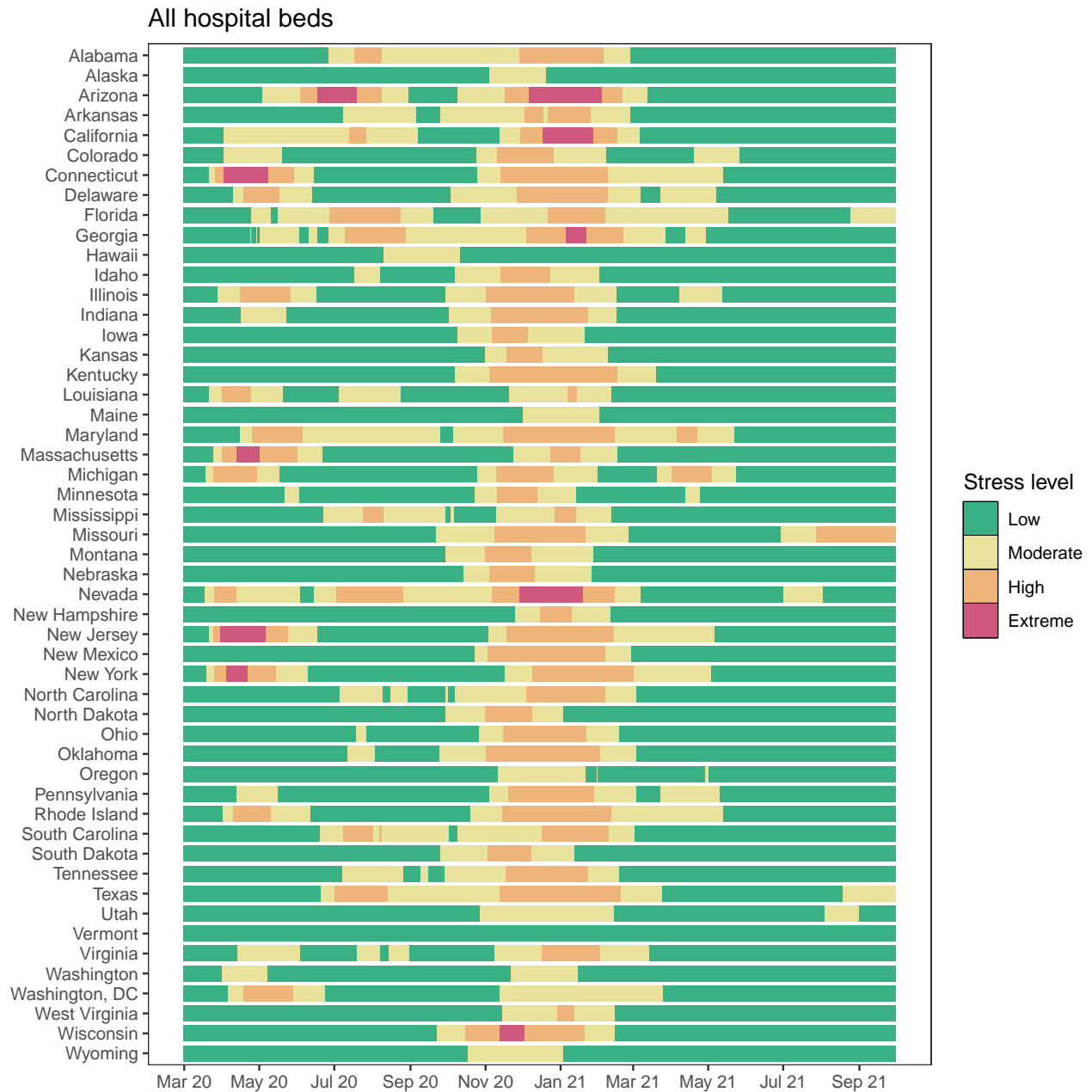
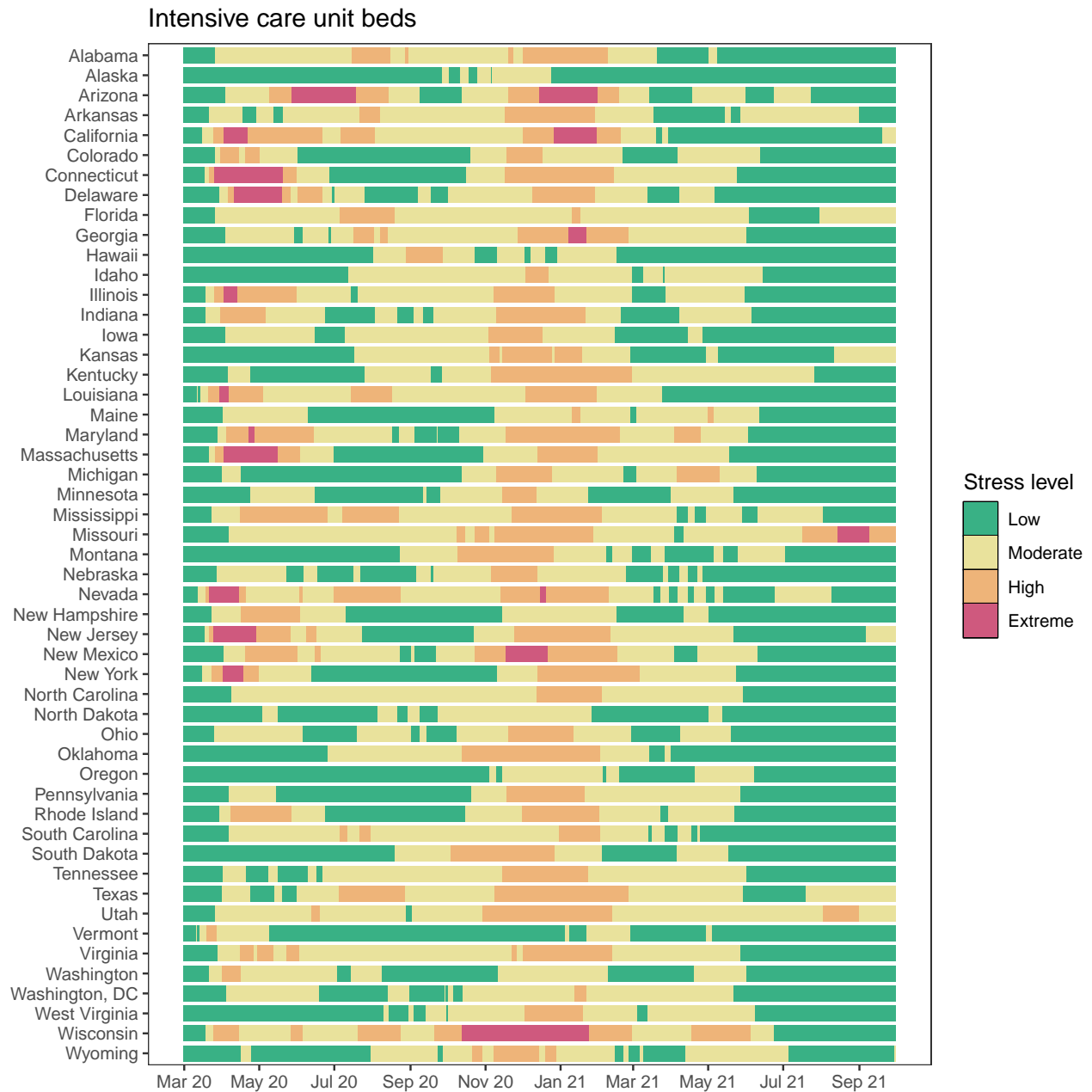


Figure 24. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and 60% or greater is considered *extreme stress*.



More information

Data sources:

Mask use and vaccine confidence data are from the [Global COVID-19 Symptom Survey](#) (this research is based on survey results from University of Maryland Social Data Science Center with Facebook's support) and the [US COVID-19 Symptom Survey](#) (this research is based on survey results from Carnegie Mellon University's Delphi Research Group with Facebook's support). 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>.