

In the last week, the increase in daily cases has become much clearer, and for the first time since early August, daily deaths have begun to rise. We believe that the fall/winter surge has begun, albeit several weeks behind the massive surge in Europe. The fall/winter surge will intensify in November and December, reaching a peak in January. Many states will face enormous pressure on hospital capacity and will likely have to re-impose some social distancing mandates. The best strategy to delay re-imposition of mandates and the associated economic hardship is to expand mask use.

Current situation

- Daily cases have increased to nearly 50,000 a day in the last week up from 45,000 a day last week (Figure 1).
- Daily deaths are up to 710 a day in the last week an increase from 680 a day last week. This is the first increase in daily deaths since early August (Figure 2).
- Effective R – computed on the basis of cases, hospitalizations, and deaths – is over 1 in many Northern states, but also in Nevada, Colorado, New Mexico, Kansas, Oklahoma, Mississippi and Alabama (Figure 3).
- The daily death rate is over 4 per million in eight states spanning from Montana to Florida (Figure 6).

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

- Social distancing mandates remain largely unchanged over the last week with the exception of re-imposition of some gathering restrictions in Pennsylvania (Figure 7). Only one social distancing mandate remains in place in Florida, Idaho, Missouri, Oklahoma, and South Dakota.
- Mobility remains constant at the national level. Only California and Hawaii have levels that are less than 35% of the pre-COVID-19 baseline (Figure 8).
- Approximately two-thirds of Americans are wearing a mask outside the home, and this level has remained constant over the last two weeks (Figure 9). The lowest mask use rates are in Wyoming, North Dakota, and South Dakota.
- Testing rates continue to rise since the first week of September, which is likely due to both increasing numbers of individuals with symptoms seeking testing and mandatory testing in some workplaces and educational facilities (Figure 10).

Projections

- In our reference scenario – the scenario that we think is most likely to happen – we expect daily deaths to reach nearly 2,200 a day in mid-January (Figure 13).
- Cumulative deaths by February 1 in the reference scenario reach 386,000 (Figure 12).
- The reference scenario assumes re-imposition of social distancing mandates when the daily death rate reaches 8 per million in many states beginning with Montana and North Dakota in October, six states in November, 13 states in December, and five states in January (Figure 15).
- Expanding mask use to 95%, the level seen in Singapore, can greatly delay the imposition of mandates and save 63,000 lives (Figure 12).
- Figure 18 compares our forecasts with other publicly archived models. The USC (SIKJalpha) model shows an increase in death reaching a peak in mid-November. The Imperial model has nearly flat daily deaths through to mid-January. MIT (Delphi) and Los Alamos National Labs continue to forecast steady declines in daily deaths to lower levels. Given US cases and deaths have started to increase, we expect many of these other models to revise their forecasts up in the next 1–3 weeks.

Model updates

- There are no major updates the modeling strategy this week. We continue to examine a wide range of data sources including infection-fatality rates calculated from seroprevalence surveys, hospital-fatality rates, and select individual hospital record databases to determine whether the age-specific infection-fatality rate has declined.
- We are elaborating our model to allow for including the impact of vaccination scale-up in the first and second quarters of 2021.

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: United States of America

Institute for Health Metrics and Evaluation (IHME)

October 22, 2020

This briefing contains summary information on the latest projections from the IHME model on COVID-19 in United States of America. The model was run on October 20, 2020.

Model updates

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

Summary of findings

Current situation

Figure 1. Reported daily COVID-19 cases

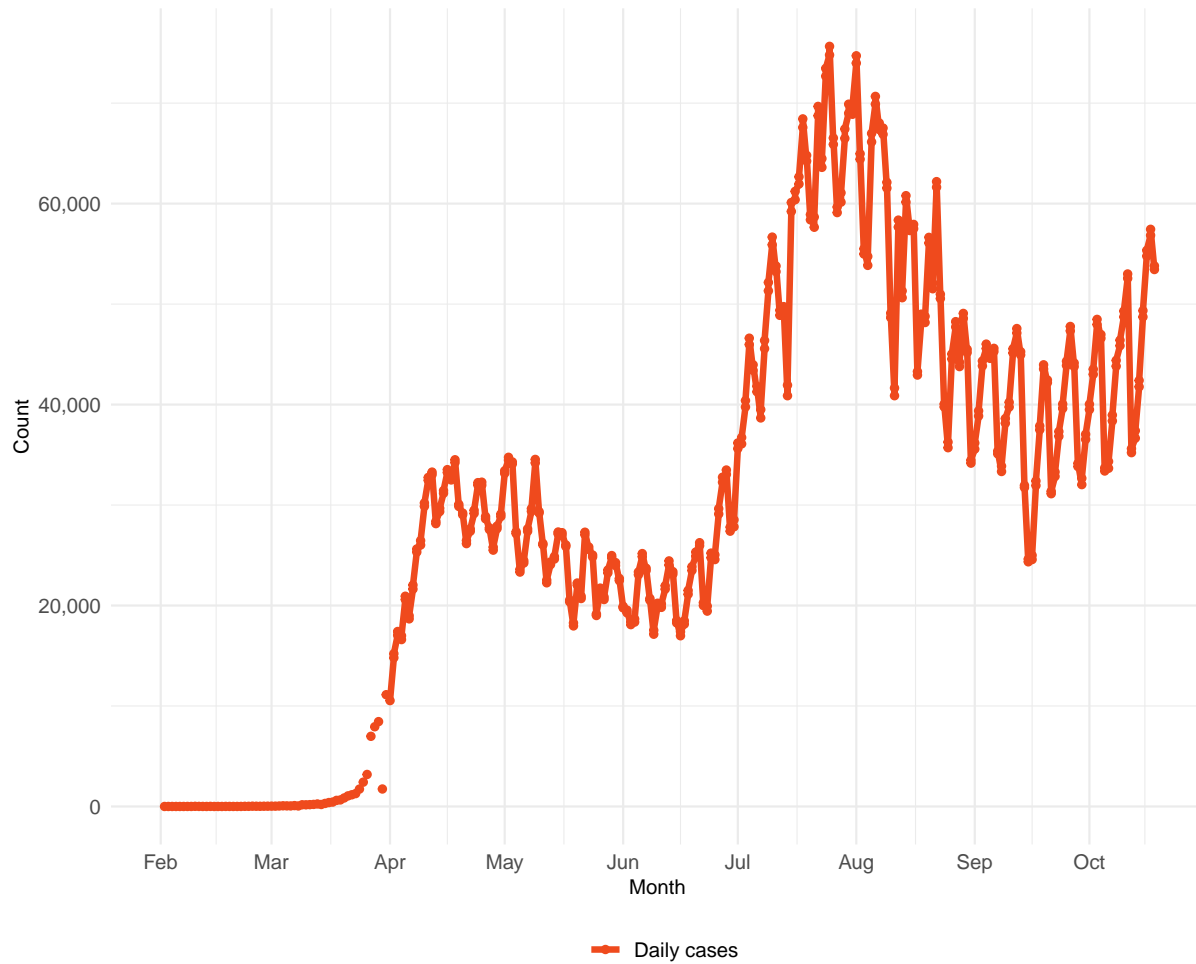


Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	10,724	1
COVID-19	4,962	2
Tracheal, bronchus, and lung cancer	3,965	3
Chronic obstructive pulmonary disease	3,766	4
Stroke	3,643	5
Alzheimer's disease and other dementias	2,768	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 2a. Reported daily COVID-19 deaths.

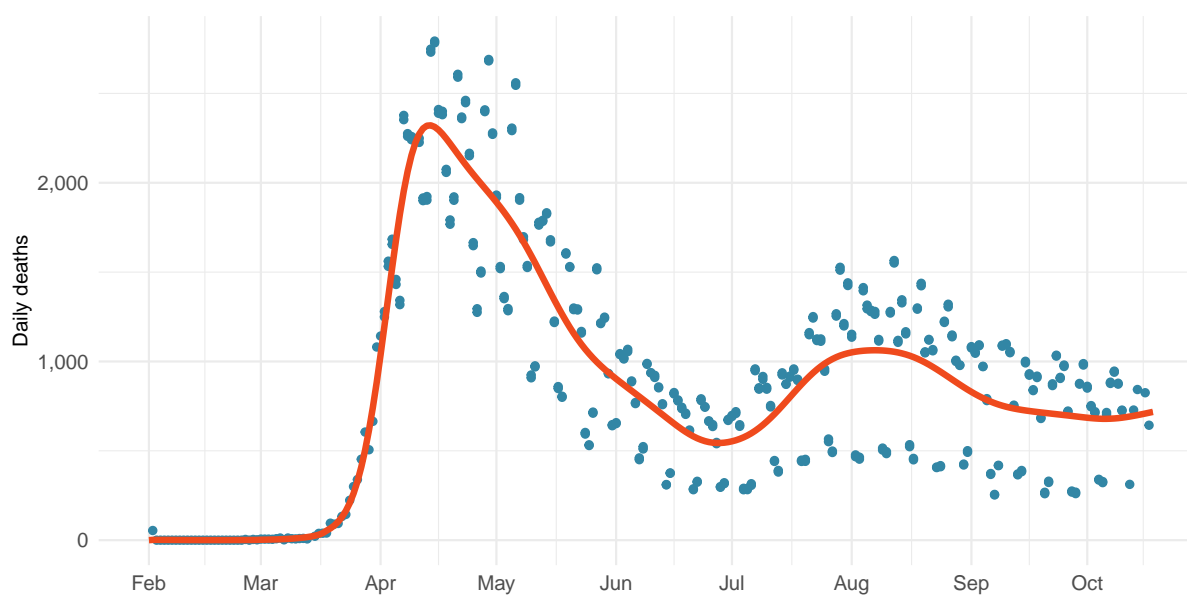


Figure 2b. Estimated cumulative deaths by age group



Figure 3. Mean effective R on October 08, 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.

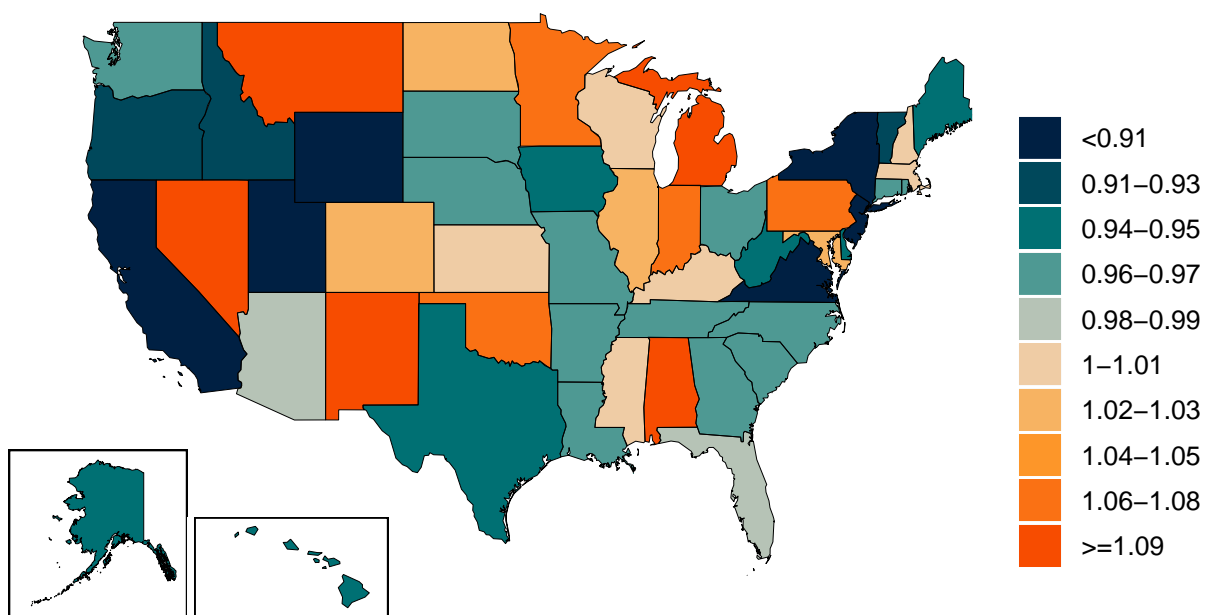


Figure 4. Estimated percent of the population infected with COVID-19 on October 19, 2020

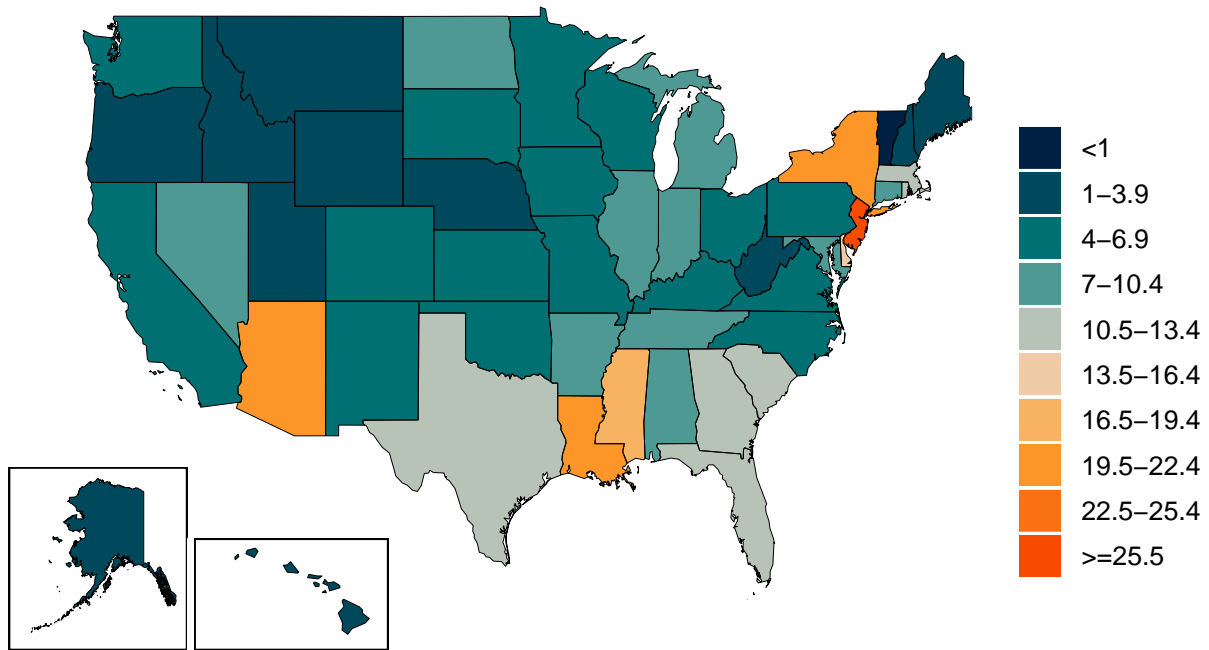


Figure 5. Percent of COVID-19 infections detected. This is estimated as the ratio of reported COVID-19 cases to estimated COVID-19 infections based on the SEIR disease transmission model.

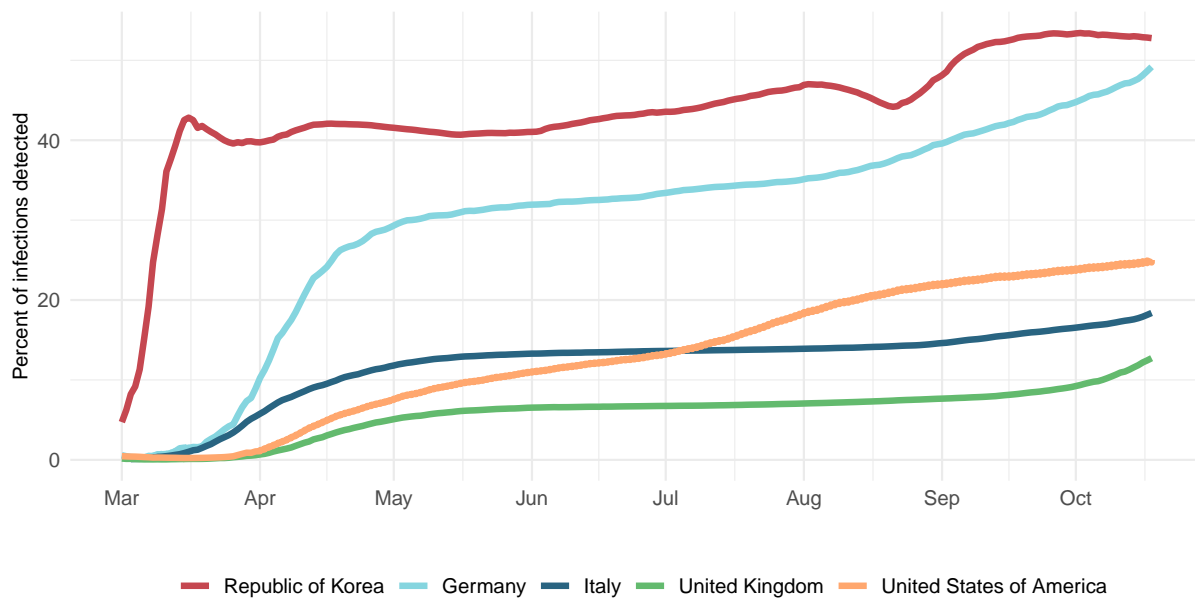
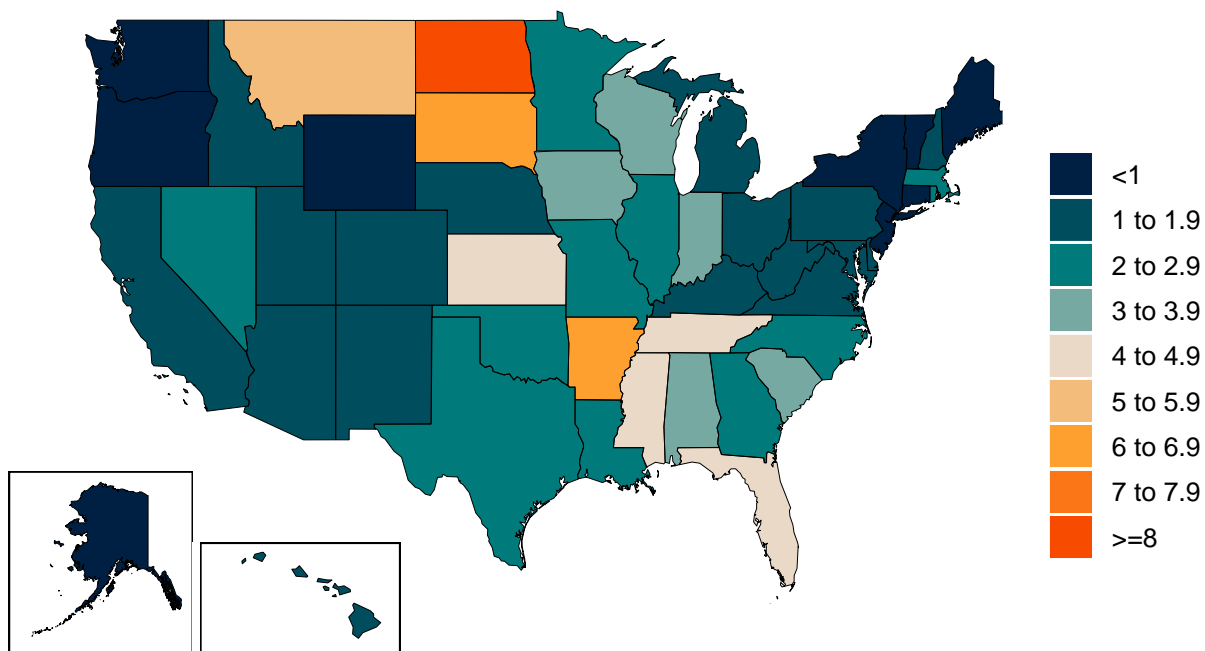


Figure 6. Daily COVID-19 death rate per 1 million on October 19, 2020



Critical drivers

Table 2. Current mandate implementation

	All gatherings restricted	All nonessential businesses closed	Any businesses restricted	Mask use	School closure	Stay home order	Travel limits
Alabama	Mandate in place	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate
Alaska	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	Mandate in place
Arizona	No mandate	No mandate	Mandate in place	No mandate	No mandate	No mandate	No mandate
Arkansas	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate	No mandate
California	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	Mandate in place	No mandate
Colorado	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Connecticut	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Delaware	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
District of Columbia	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Florida	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Georgia	Mandate in place	No mandate	Mandate in place	No mandate	No mandate	Mandate in place	No mandate
Hawaii	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Idaho	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Illinois	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Indiana	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Iowa	No mandate	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Kansas	No mandate	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate
Kentucky	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Louisiana	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Maine	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Maryland	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Massachusetts	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Michigan	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Minnesota	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Mississippi	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Missouri	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Montana	No mandate	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate
Nebraska	Mandate in place	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate
Nevada	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
New Hampshire	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
New Jersey	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
New Mexico	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
New York	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
North Carolina	Mandate in place	No mandate	Mandate in place	No mandate	Mandate in place	No mandate	No mandate
North Dakota	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Ohio	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Oklahoma	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Oregon	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Pennsylvania	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Rhode Island	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
South Carolina	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
South Dakota	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Tennessee	Mandate in place	No mandate	Mandate in place	No mandate	Mandate in place	No mandate	No mandate
Texas	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Utah	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate
Vermont	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Virginia	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Washington	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
West Virginia	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Wisconsin	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Wyoming	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate

 Mandate in place
  No mandate

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

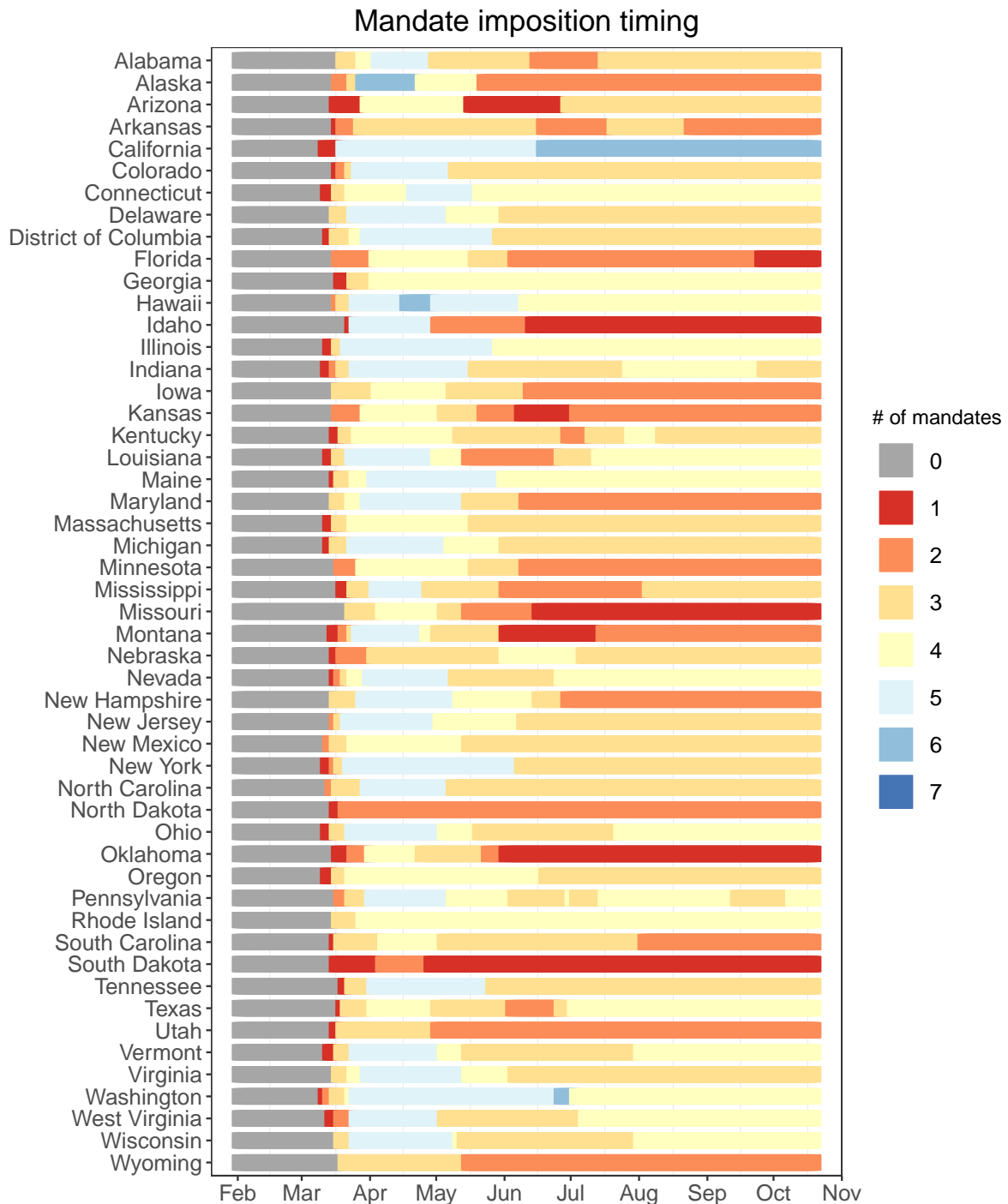


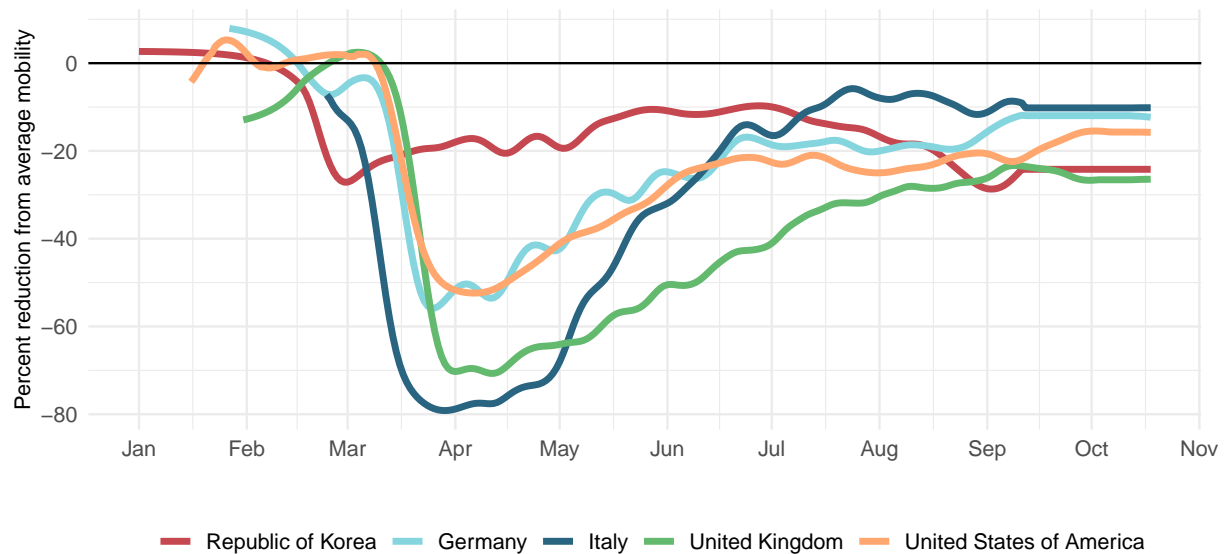
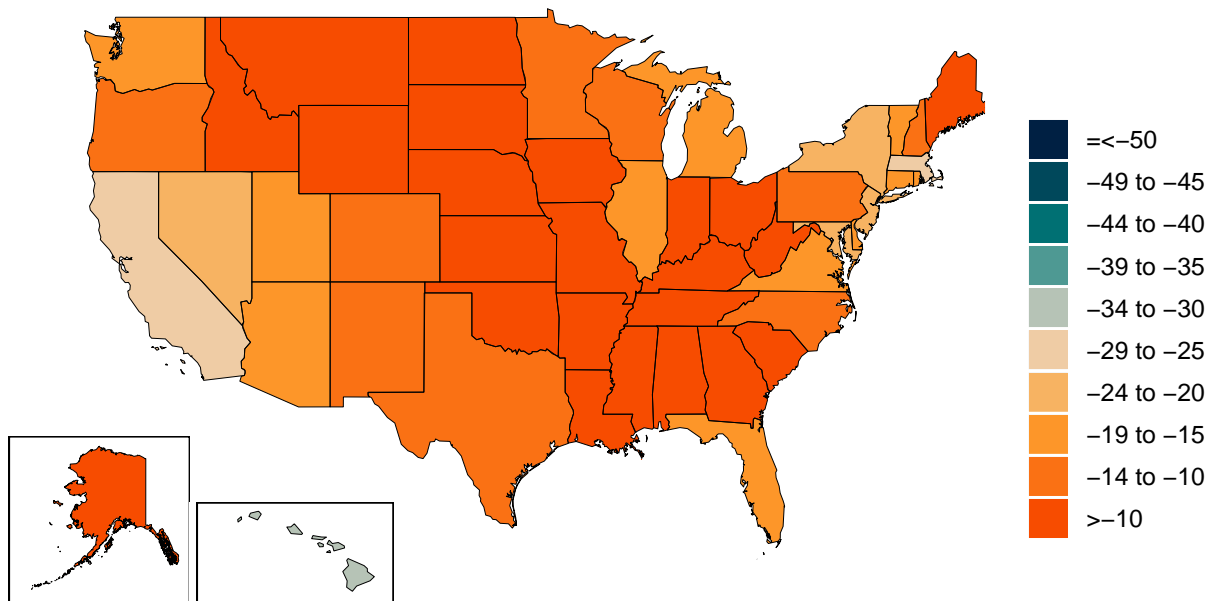
Figure 8a. Trend in mobility as measured through smartphone app use compared to January 2020 baseline**Figure 8b.** Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on October 19, 2020

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

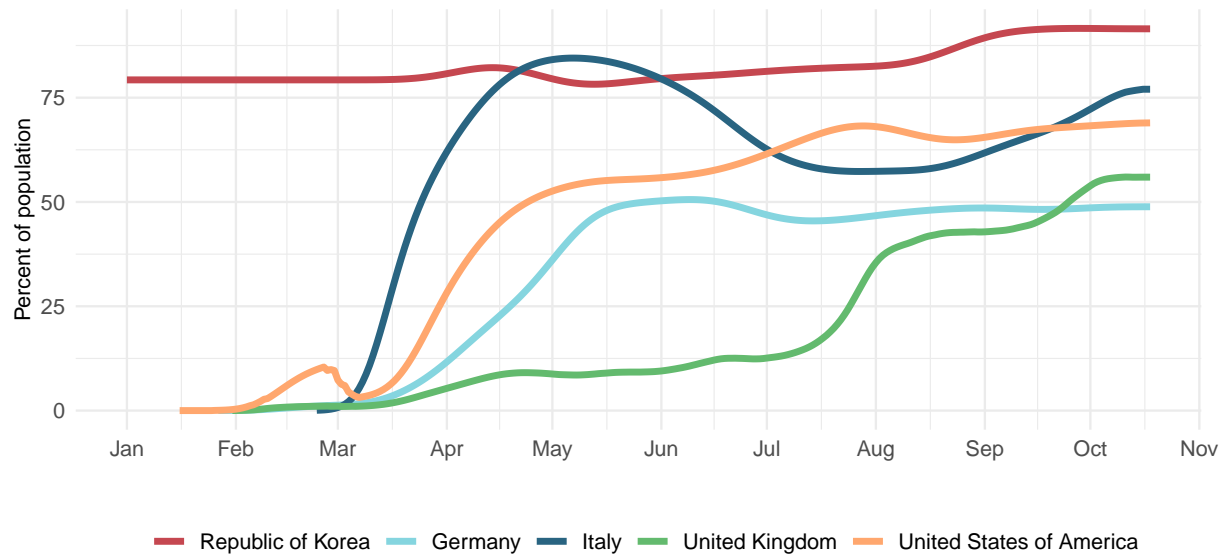


Figure 9b. Proportion of the population reporting always wearing a mask when leaving home on October 19, 2020

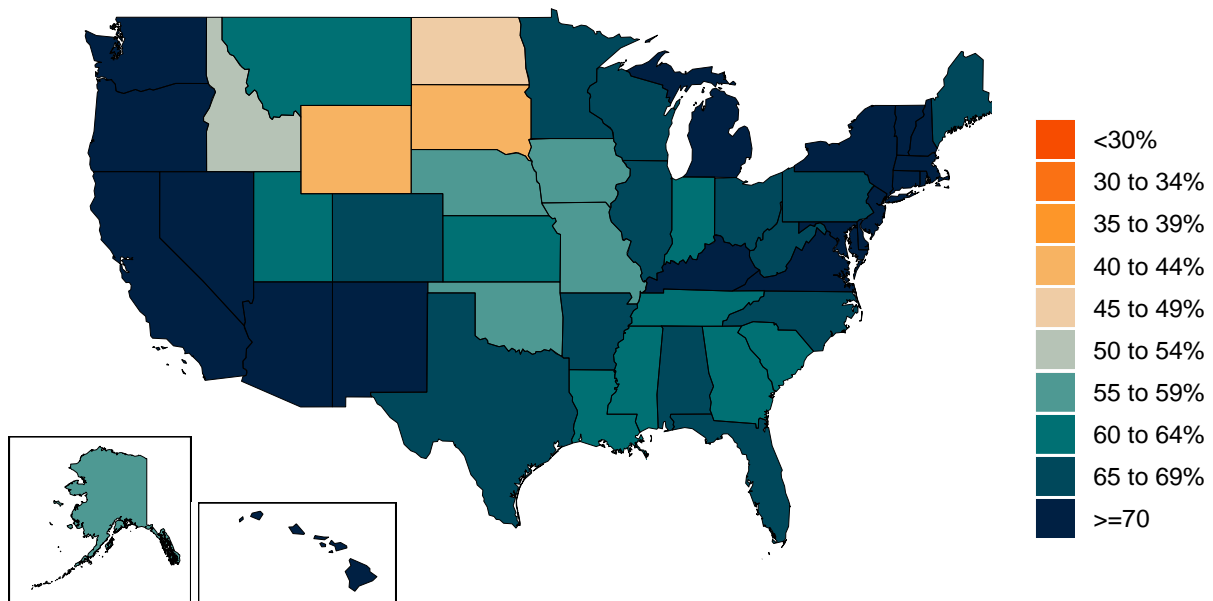


Figure 10a. Trend in COVID-19 diagnostic tests per 100,000 people

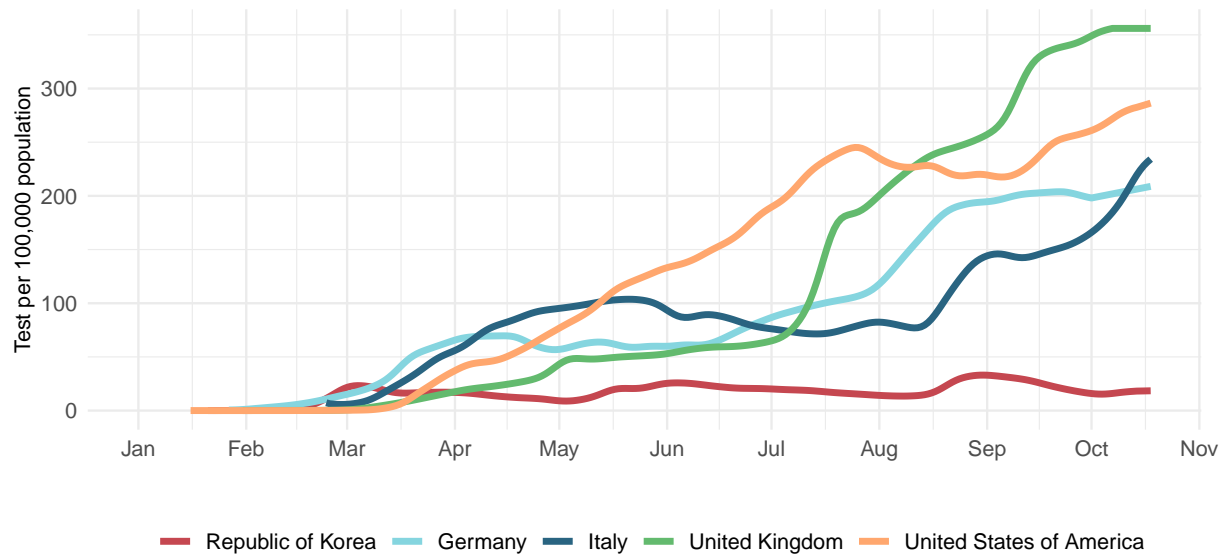


Figure 10b. COVID-19 diagnostic tests per 100,000 people on October 14, 2020

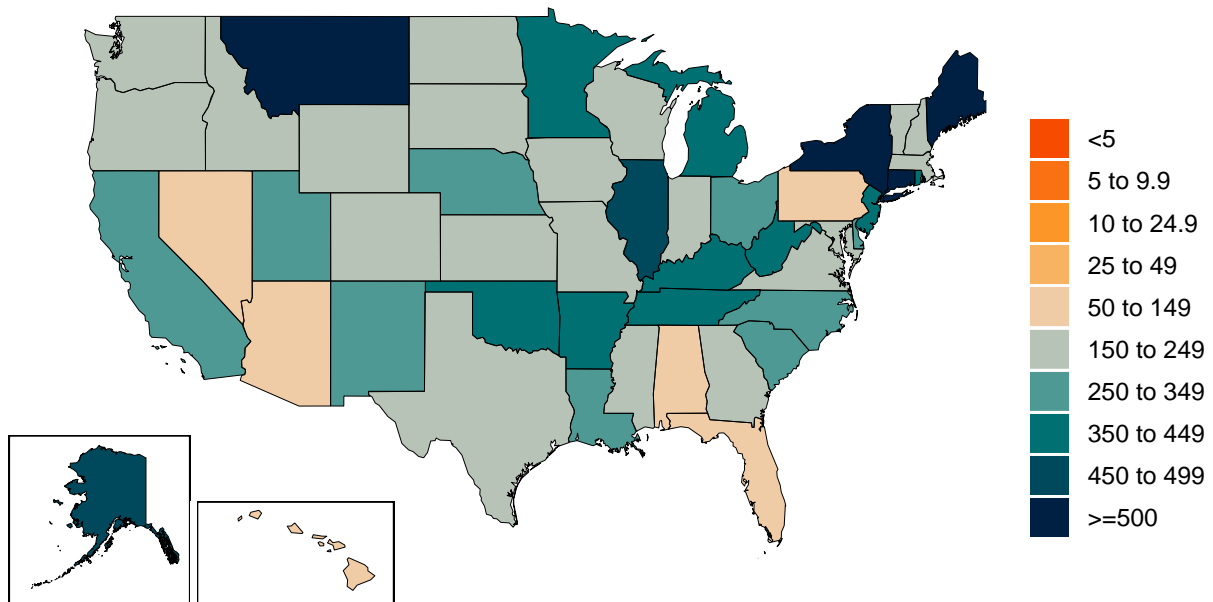
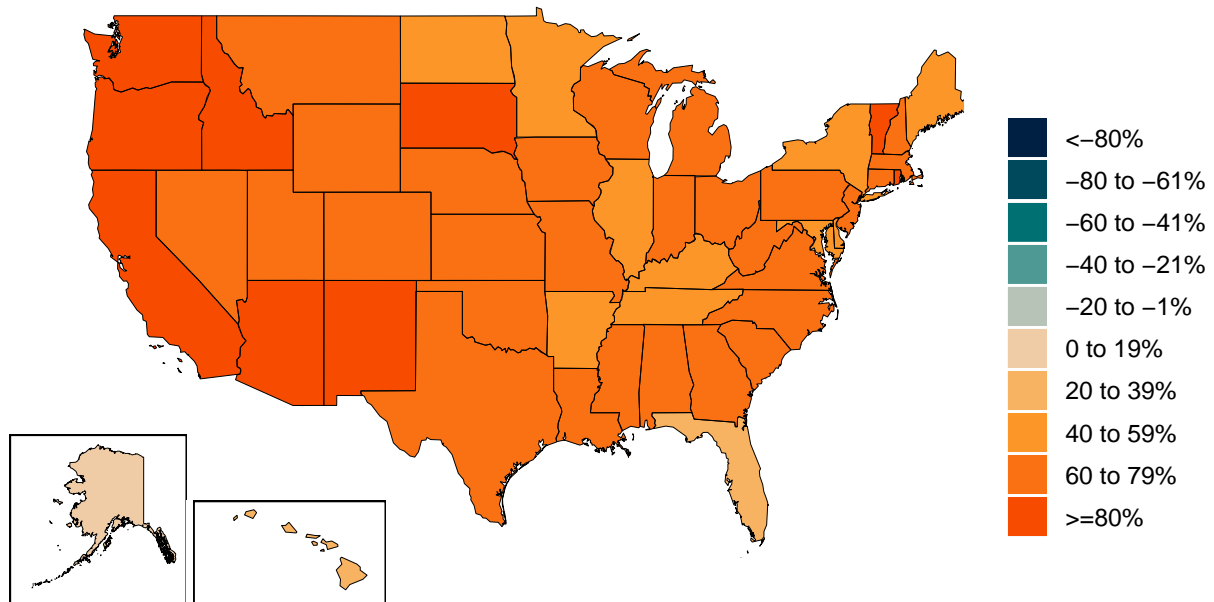


Figure 11. Increase in the risk of death due to pneumonia on February 1 compared to August 1



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.

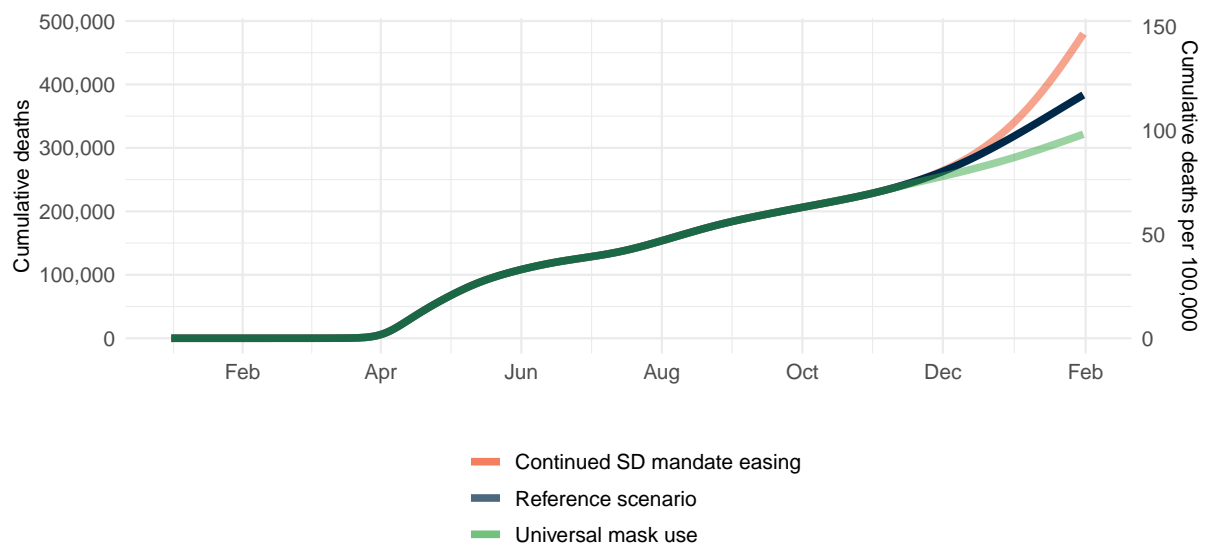


Fig 13. Daily COVID-19 deaths until February 01, 2021 for three scenarios.

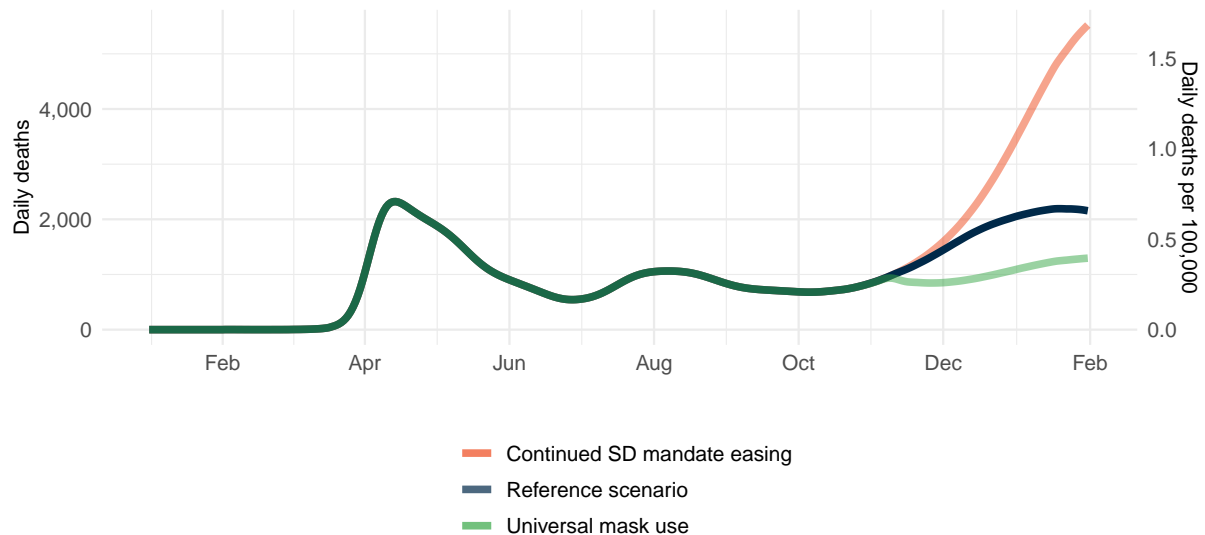


Fig 14. Daily COVID-19 infections until February 01, 2021 for three scenarios.

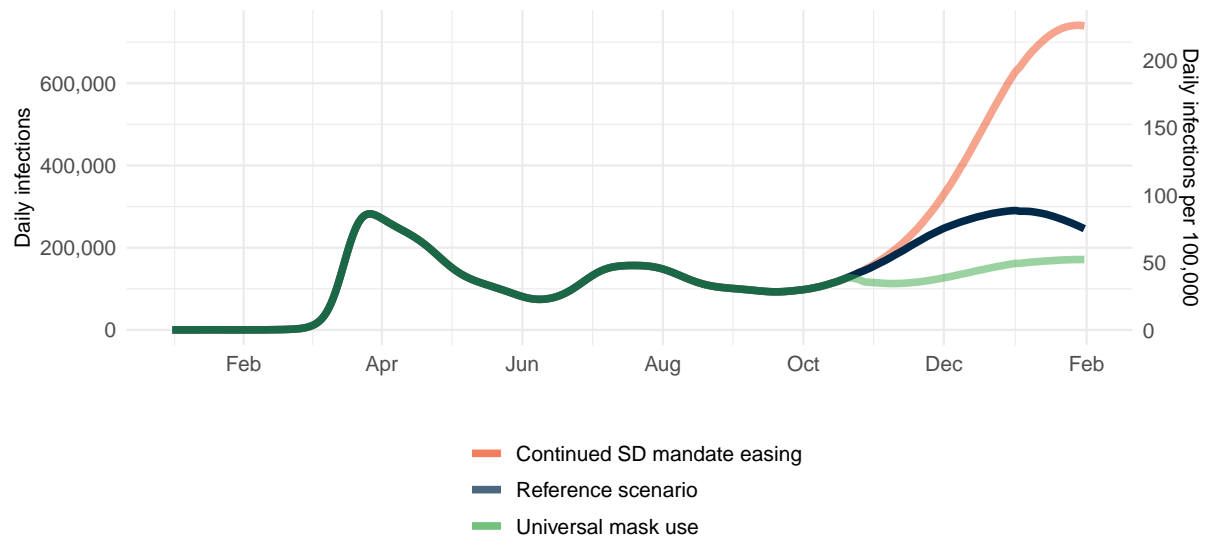


Fig 15. Month of assumed mandate re-implementation. (Month when daily death rate passes 8 per million, when reference scenario model assumes mandates will be re-imposed.)

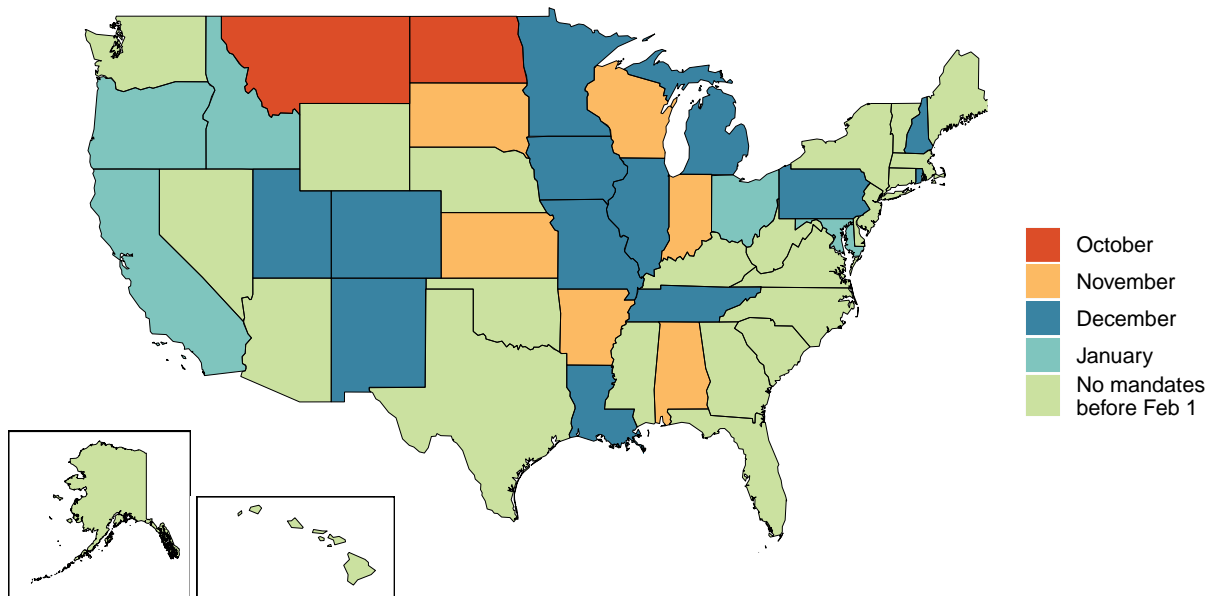


Figure 16. Forecasted percent infected with COVID-19 on February 01, 2021

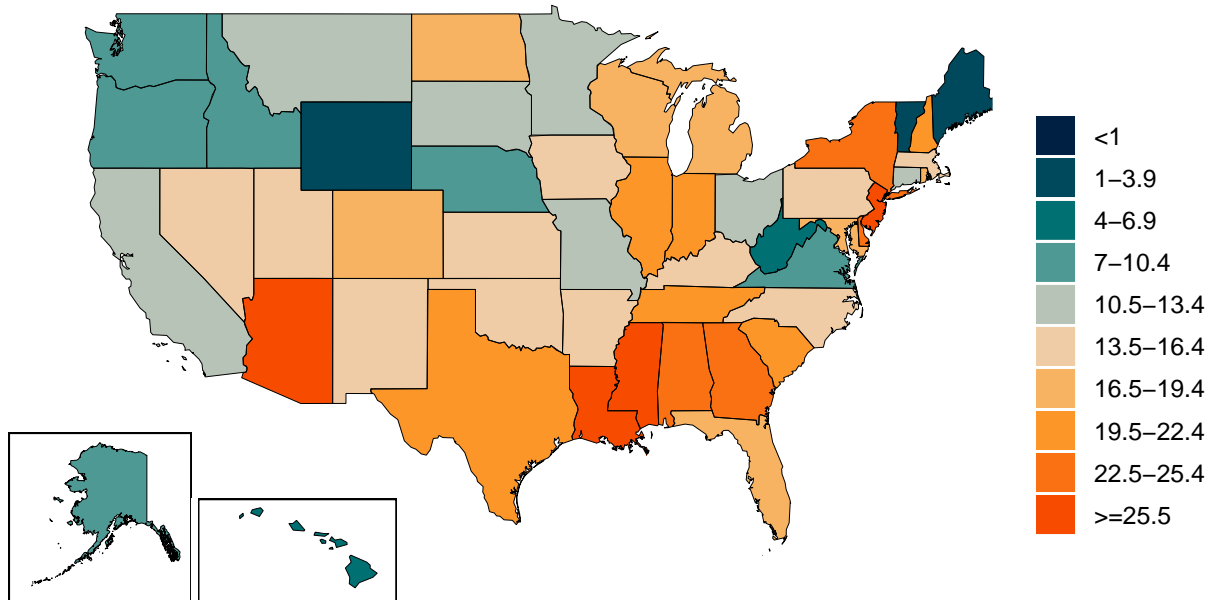


Figure 17. Daily COVID-19 deaths per million forecasted on February 01, 2021 in the reference scenario

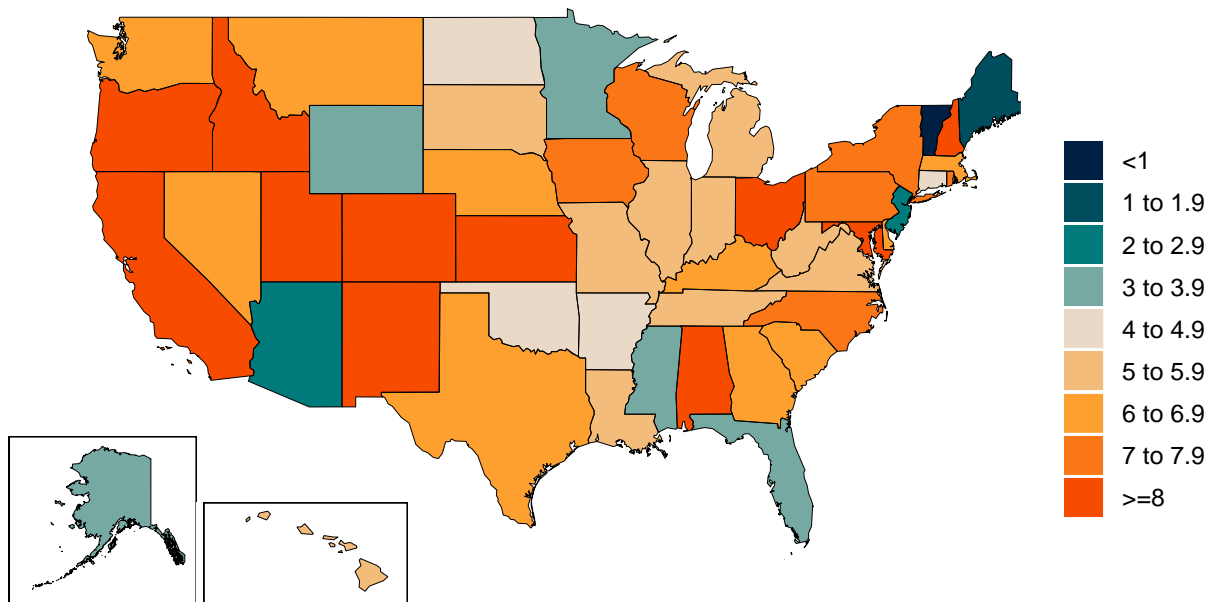


Figure 18. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology (Delphi; <https://www.covidanalytics.io/home>), Imperial College London (Imperial; <https://www.covidsim.org>), The Los Alamos National Laboratory (LANL; <https://covid-19.bsvgateway.org/>), 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 available locations in that region.

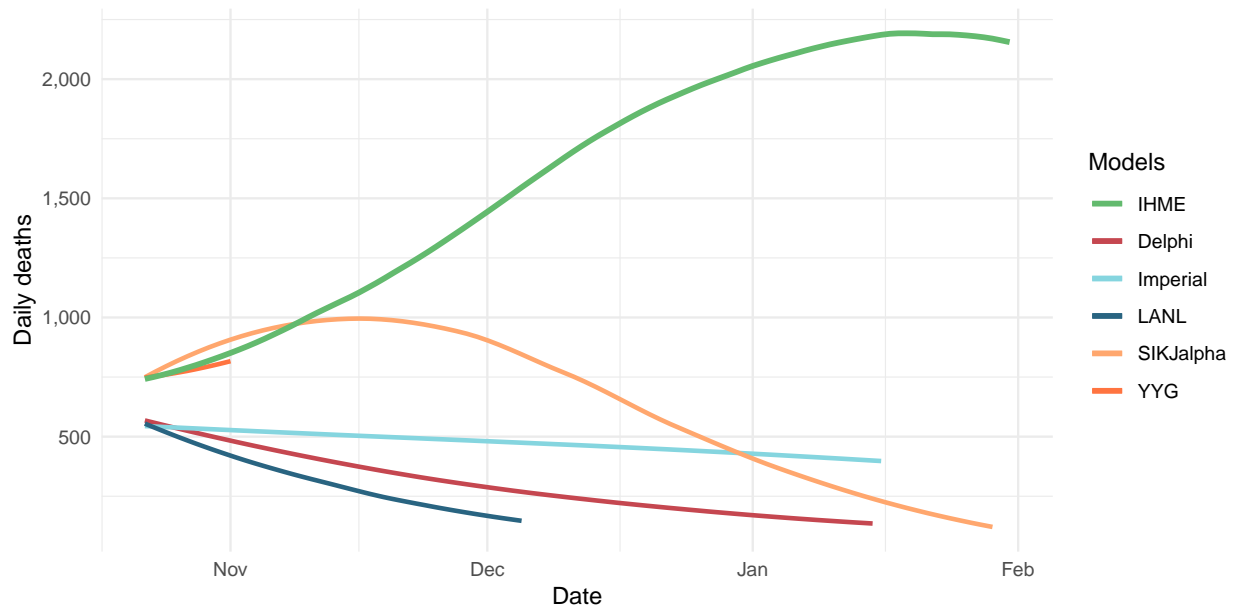


Table 3. Ranking of COVID-19 among the leading causes of mortality in the full year 2020. Deaths from COVID-19 are projections of cumulative deaths on Jan 1, 2021 from the reference scenario. Deaths from other causes are from the Global Burden of Disease study 2019 (rounded to the nearest 100).

Cause name	Annual deaths	Ranking
Ischemic heart disease	557,600	1
COVID-19	318,735	2
Tracheal, bronchus, and lung cancer	206,200	3
Chronic obstructive pulmonary disease	195,800	4
Stroke	189,500	5
Alzheimer's disease and other dementias	143,900	6
Chronic kidney disease	107,000	7
Colon and rectum cancer	84,000	8
Lower respiratory infections	81,900	9
Diabetes mellitus	77,700	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.