Current situation

- The number of reported cases peaked in the end of July at around 70,000 cases per day and has subsequently declined to around 45,000 cases per day. Given that the current lag between death rates and case rates appears to have lengthened to more than two weeks, deaths have only started to decline after the middle of August and are now averaging around 850 per day.   COVID-19 remains the second-leading cause of death in the nation.
- Effective R is above 1 in 10 states: Idaho, Utah, Kansas, Oklahoma, Arkansas, Alabama, Virginia, West Virginia, Illinois, and Iowa. Increasing transmission in these states, however, is less than the decline in more populous states such as Texas, Florida, and California contributing to the national decline in cases.
- Only eight states have more than 10% of the population that has been infected with COVID-19: Arizona, Louisiana, Mississippi, Georgia, Delaware, New Jersey, New York, and Massachusetts.
- The death rate is over 4 per million per day in Nevada, Arizona, Texas, Louisiana, Arkansas, Mississippi, Georgia, Florida, and South Carolina.

Trends in key drivers

- The only change in mandates since August 27 has been the lifting of any business restrictions in South Carolina.
- National mobility levels continued to increase slowly in the last week, with increases in mobility seen in states such as California, New York, New Jersey, Nevada, and Arizona.
- Mask use continues to decline from a peak in early August. Declines are notable throughout the Midwest, including in some states such as Illinois and Iowa with increasing case numbers.
- Likely reflecting the declining number of individuals presenting with symptoms, national testing rates continued to decline slowly from a peak in early August.

Forecasts

- We extended our forecasts to January 1. We expect the daily death rate in the United States, because of seasonality and declining vigilance of the public, to reach nearly 3,000 a day in December. Cumulative deaths expected by January 1 are 410,000; this is 225,000 deaths from now until the end of the year.
- If a herd immunity strategy is pursued, namely no further government intervention is taken from now to January 1, then the death toll could increase to 620,000 by January 1. Compared to the reference scenario, this would be 210,000 more deaths from now to the end of the year.
- Increasing mask use remains an extraordinary opportunity for the US. Increasing mask use to the levels seen in Singapore would decrease the cumulative death toll to 288,000, or 122,000 lives saved compared to the reference scenario. This would be a 30% reduction in the deaths expected from now until the end of the year.

COVID-19 Results Briefing: United States of America

## Institute for Health Metrics and Evaluation (IHME)

September 03, 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 September 02, 2020.

Model updates

Starting this week, we are reporting our projections up to January 01, 2021. Updates to the model this week include additional data on deaths, cases, and updates on covariates. Since our model two weeks ago, we have been using an updated infection to fatality ratio (IFR) that substantially affects the number of estimated infections, particularly in younger age groups. The Preface Figure shows the age pattern as previously used and the new age pattern. This curve is a global pattern and affects all locations.

Preface Figure.
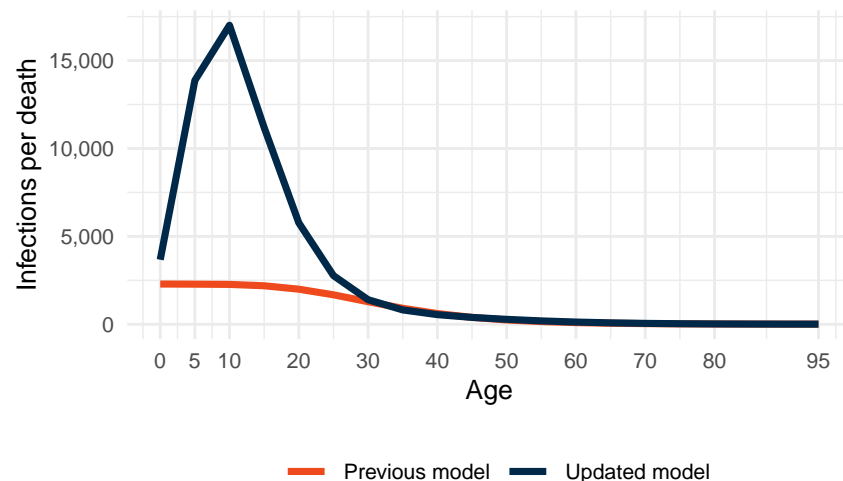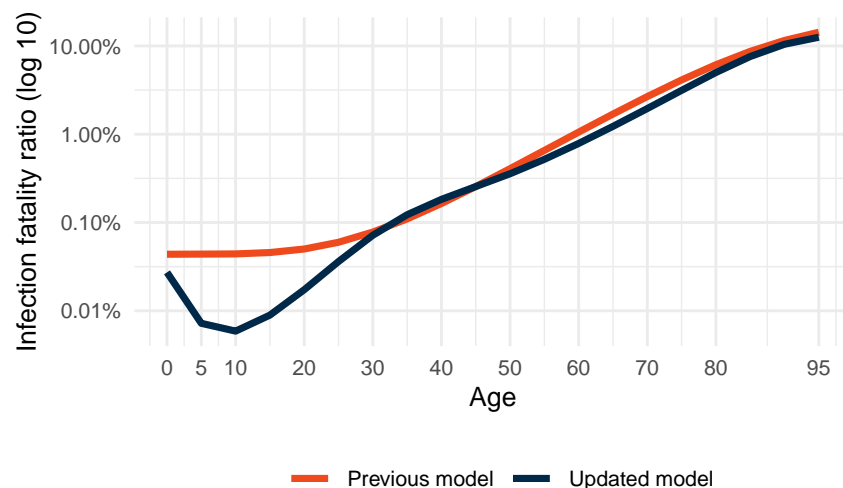
Current situation

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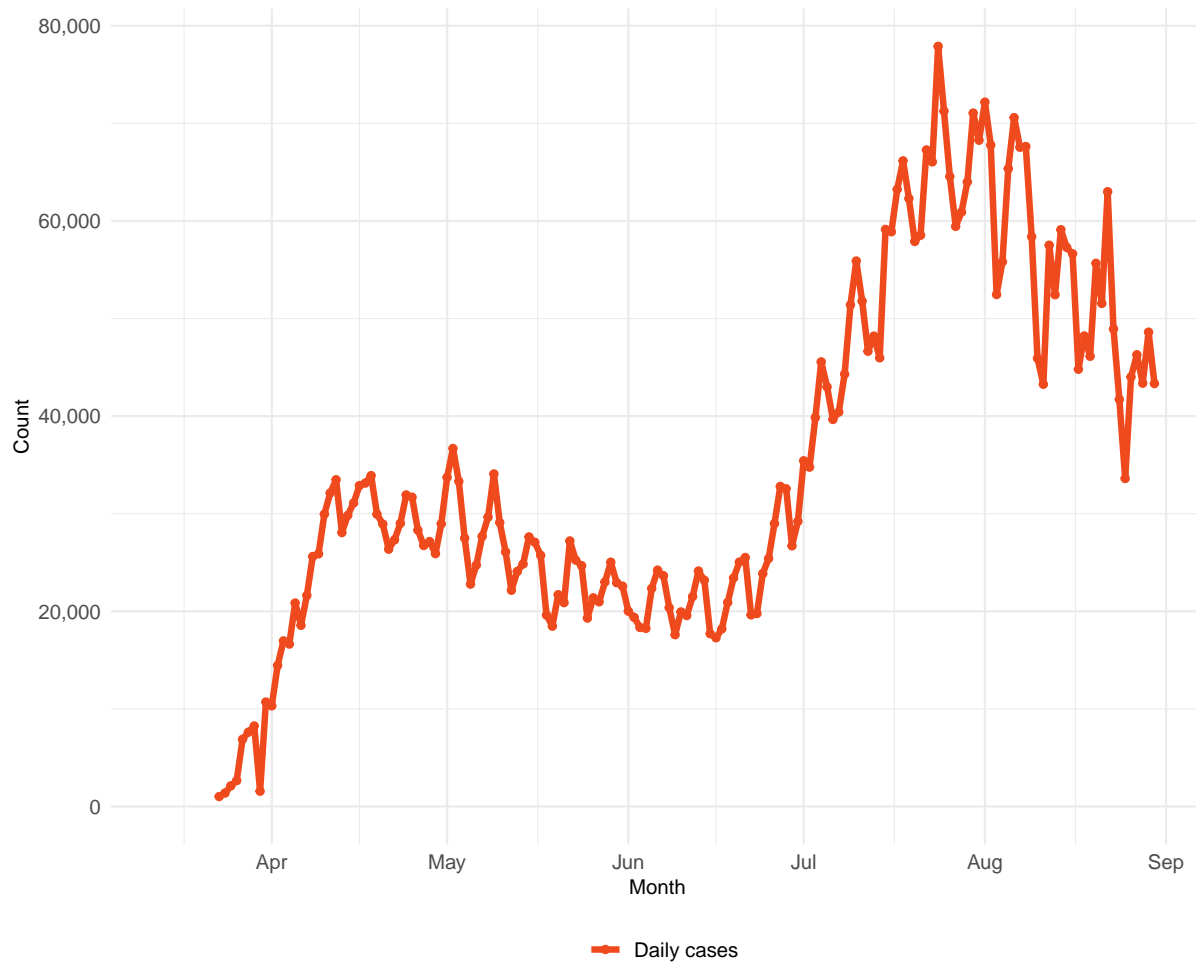
Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	10,724	1
COVID-19	6,014	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 and smoothed trend estimate
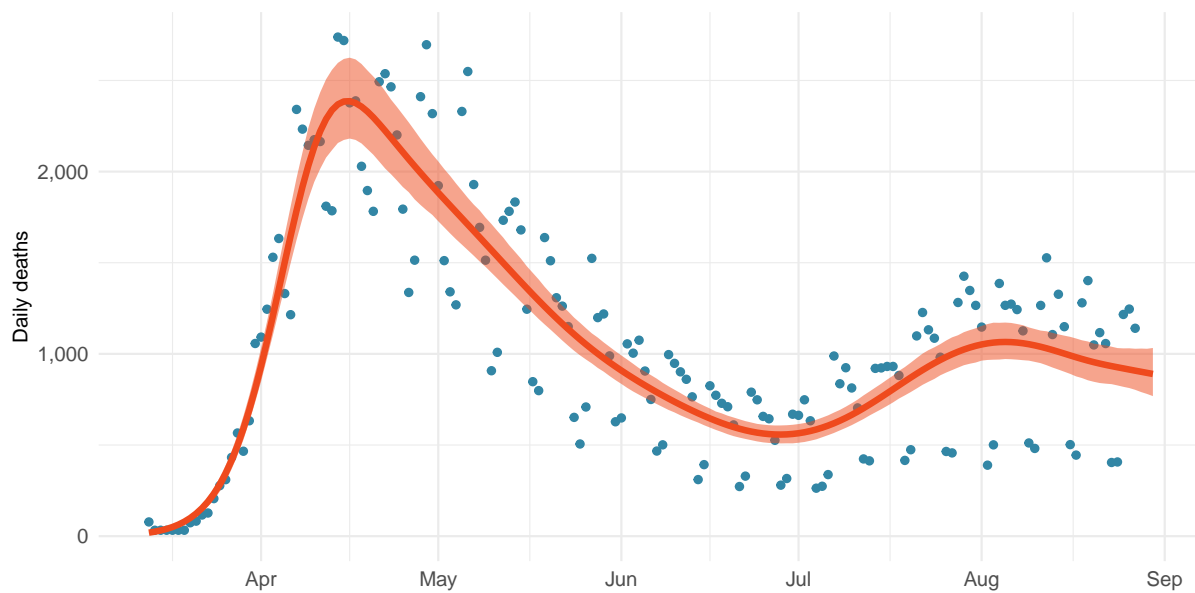
Figure 2b. Estimated cumulative deaths by age group
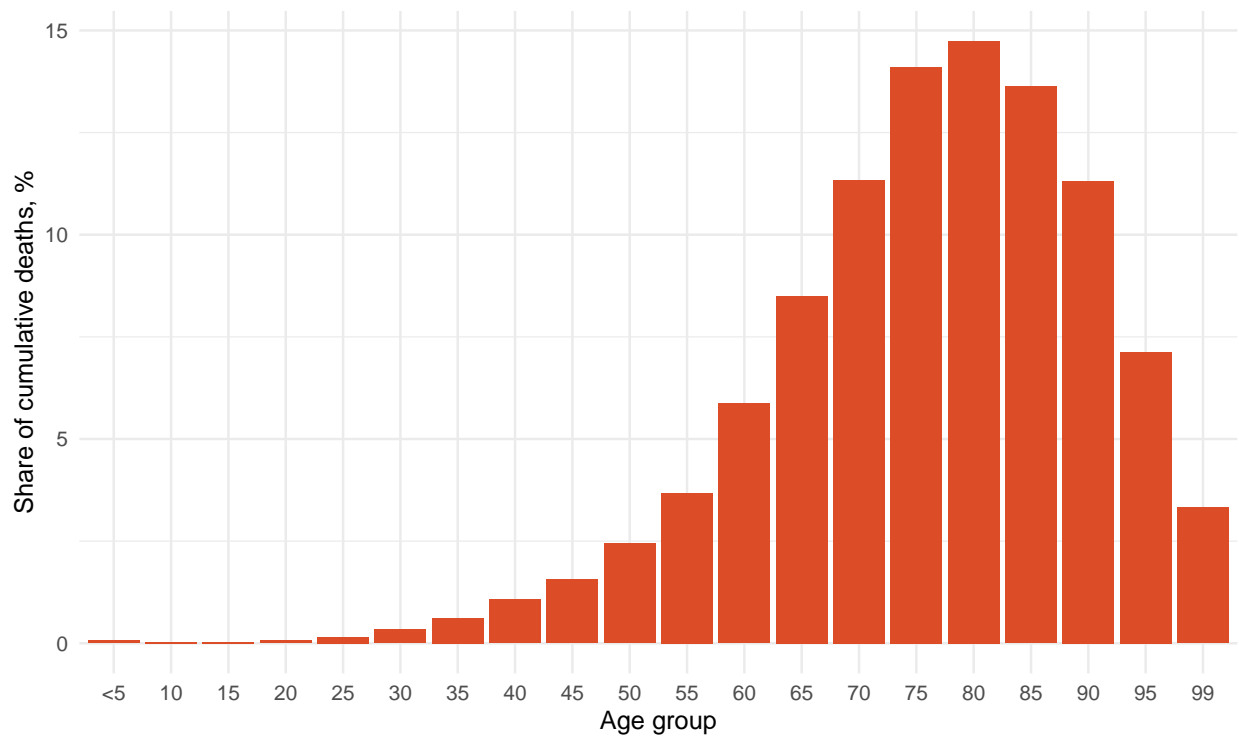
Figure 3. Mean effective R on August 20, 2020. The estimate of effective R is based on the combined analysis of deaths, case reporting and hospitalizations where available. Current reported cases reflect infections 11-13 days prior so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline all other things being held the same.
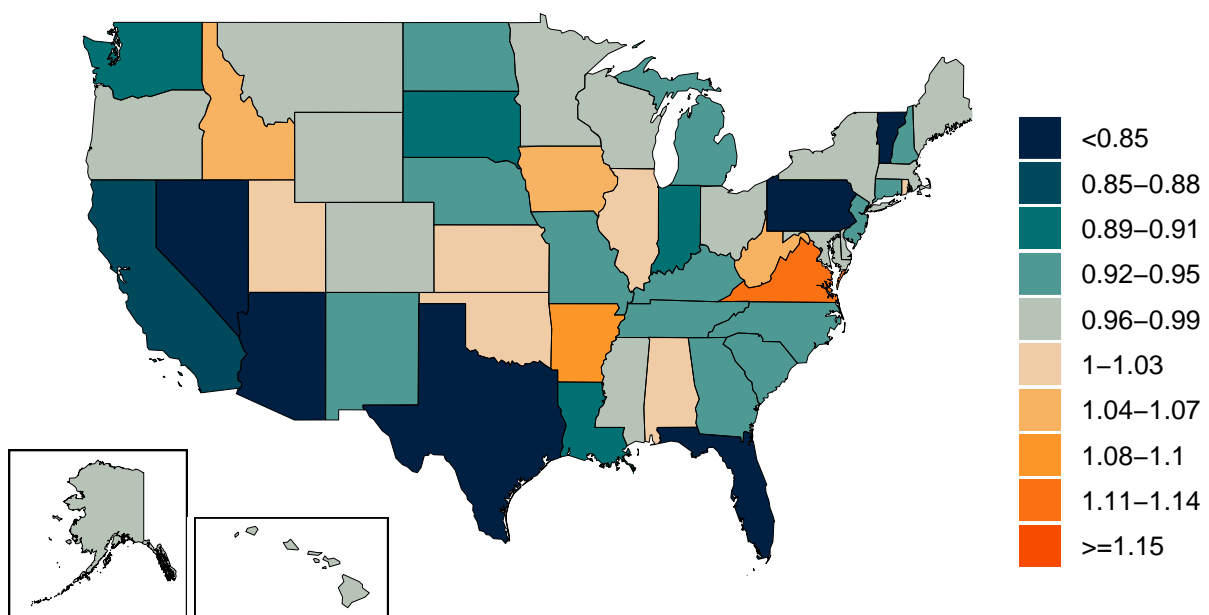
Figure 4. Estimated percent infected with COVID-19 on August 31, 2020

	<0.5
	0.5–3.9
	4–6.9
	7–9.9
	10–12.9
	13–15.9
	16–18.9
	19–21.9
	22–24.9
	>=25
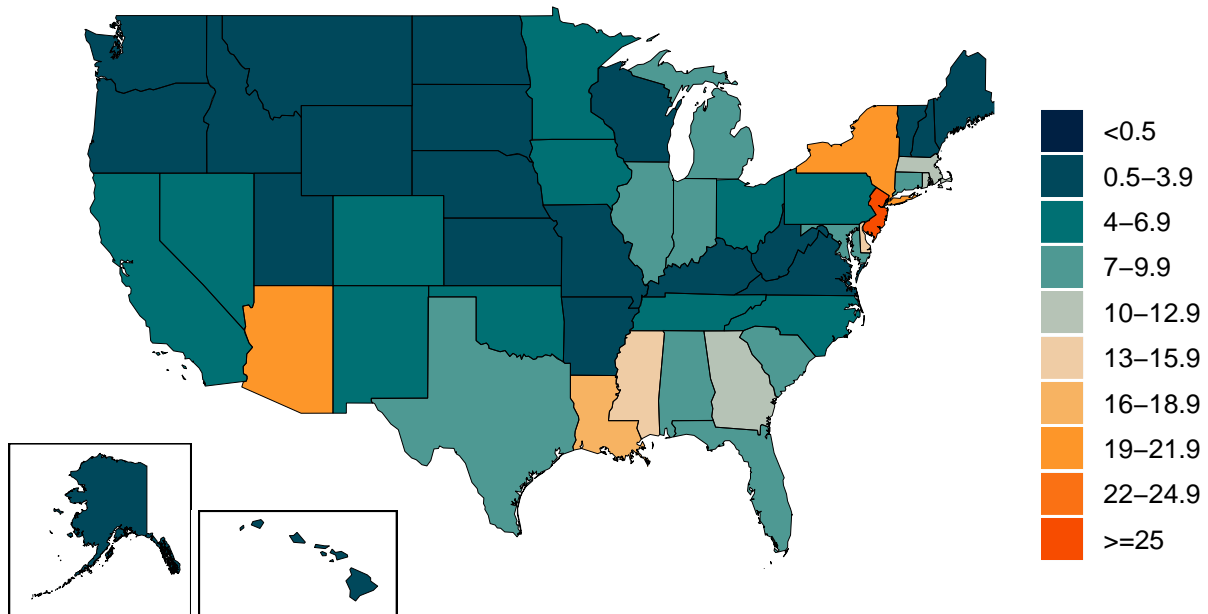
Figure 5. Percent of COVID-19 infections detected. This is estimated as the ratio of reported COVID-19 cases to estimated COVID-19 infections based on the SEIR model.
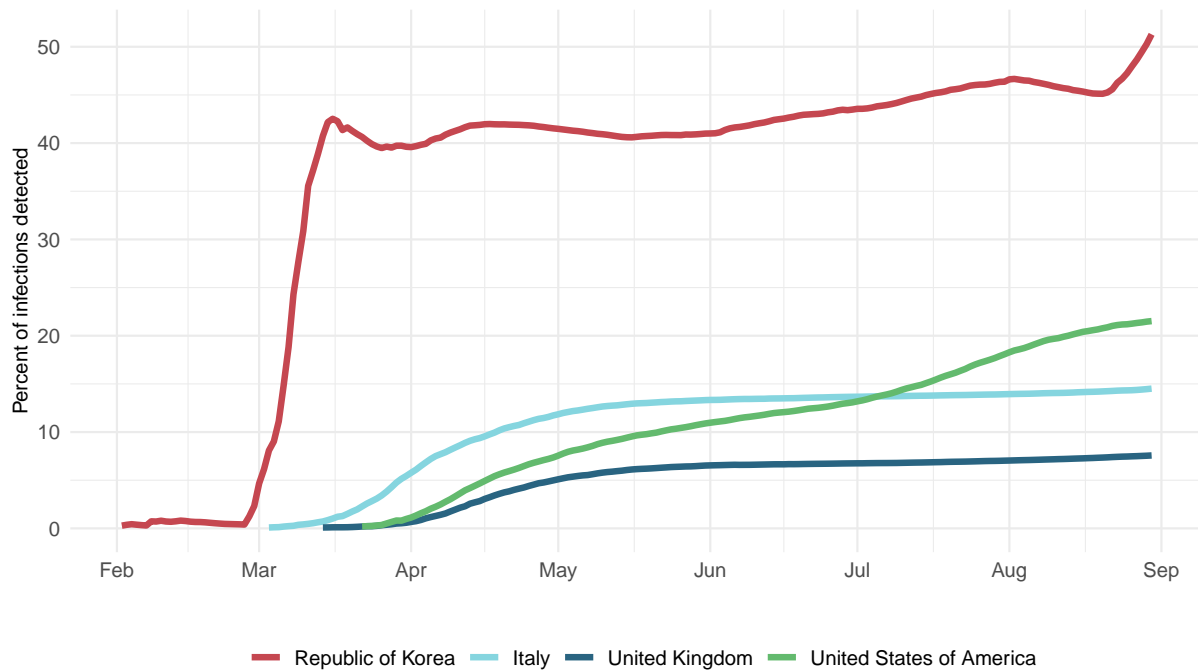
Figure 6. Daily COVID-19 death rate per 1 million on August 31, 2020
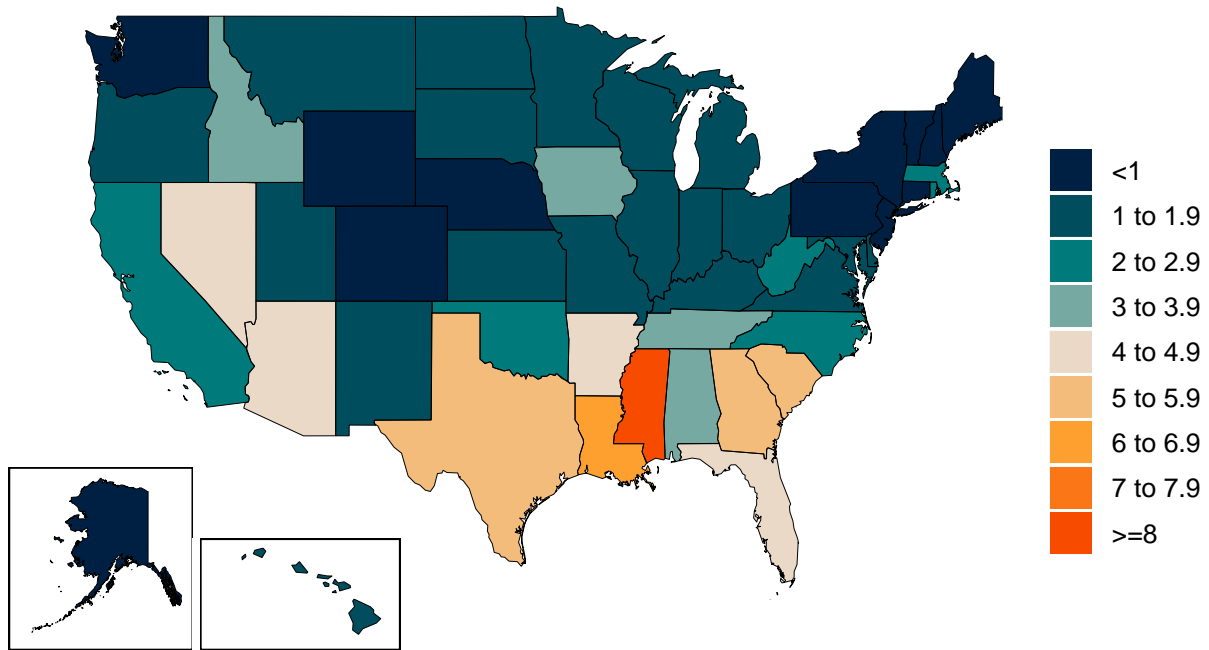
Critical drivers

Table 2. Current mandate implementation

All gatherings restricted
All nonessential businesses closed
Any businesses restricted
School closure
Stay home order
Travel limits

Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming

Mandate in place   No mandate

Figure 7. Total number of mandates
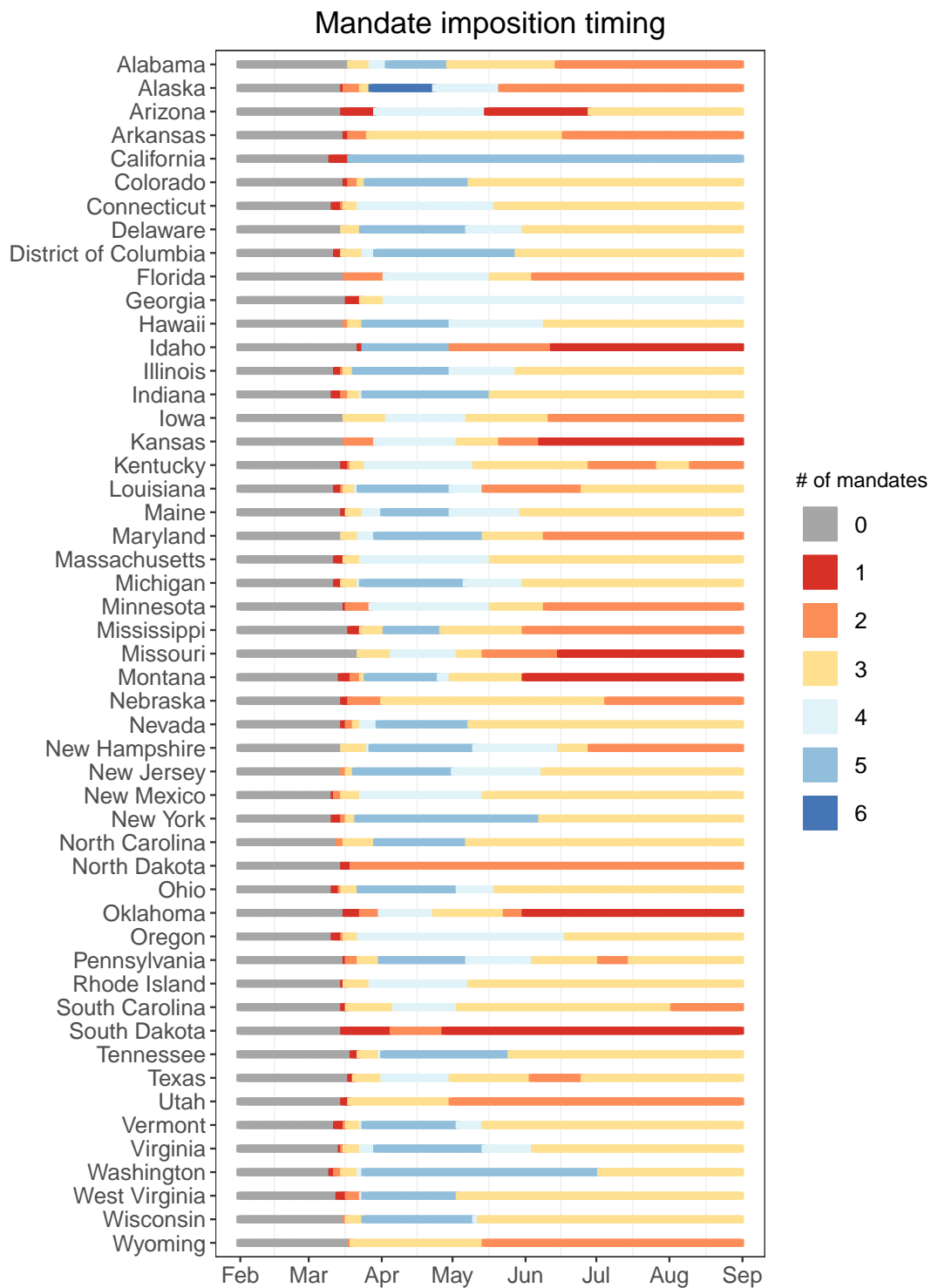
Figure 8a. Trend in mobility as measured through smartphone app use compared to January 2020 baseline
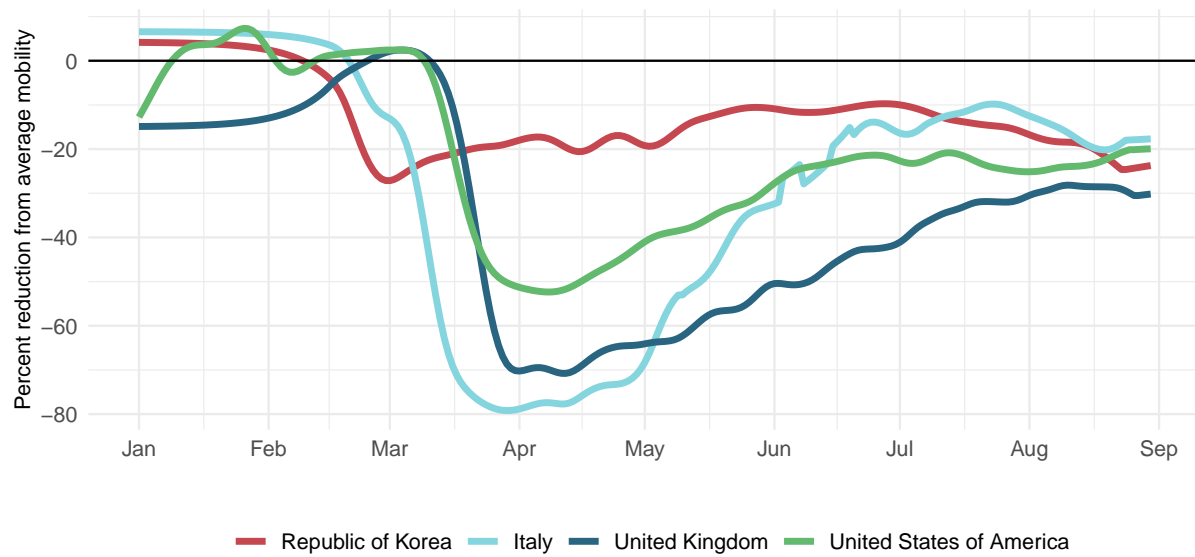
Figure 8b. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent)
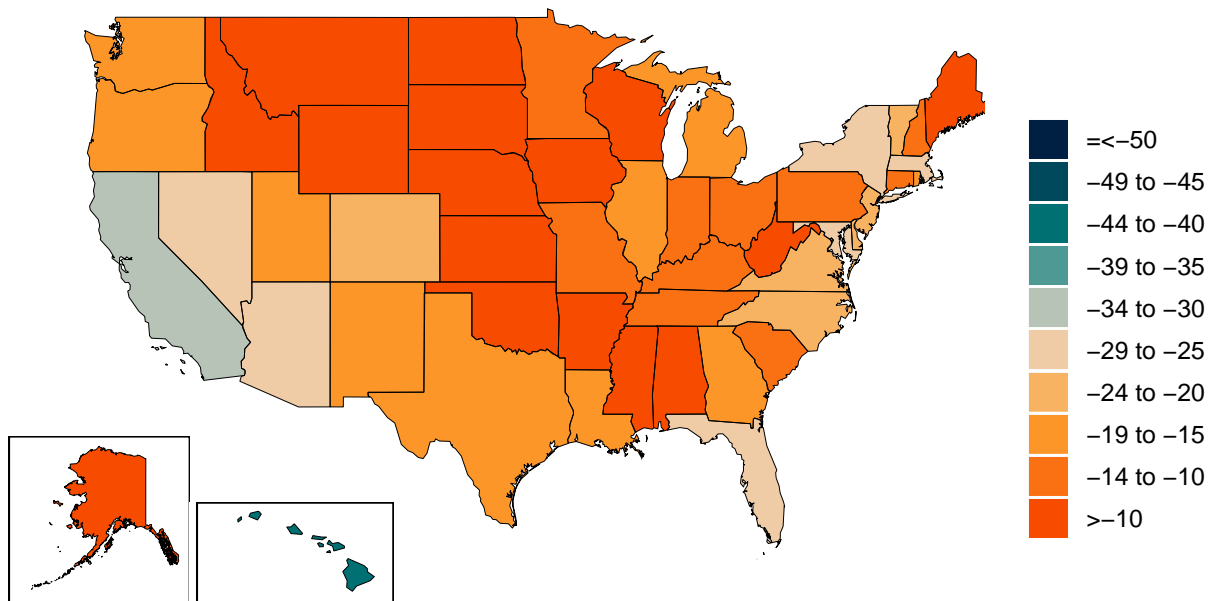
Figure 9a. Trend in the proportion of the population reporting always wearing a mask when leaving home
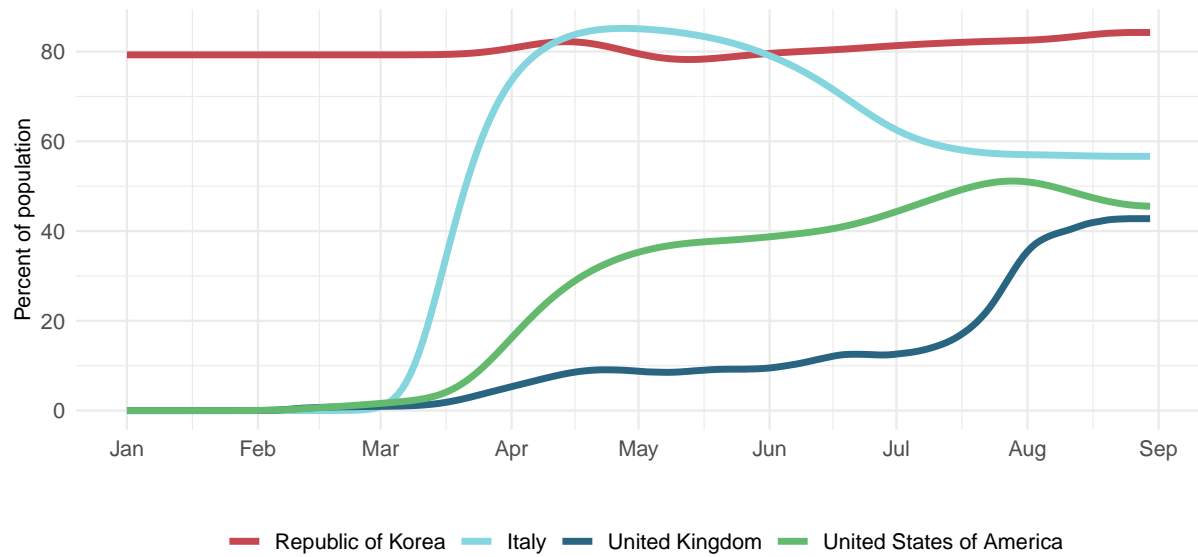
Figure 9b. Proportion of the population reporting always wearing a mask when leaving home on August 31, 2020

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

Figure 10b. COVID-19 diagnostic tests per 100,000 people on August 30, 2020

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

Projections and scenarios

Figure 12. Cumulative COVID-19 deaths until January 01, 2021 for three scenarios. The reference scenario is our forecast of what we think is most likely to happen. The mandate easing scenario is what would happen if governments continue to ease social distancing mandates. The universal mask mandate scenario is what would happen if mask use increased immediately to 95%.

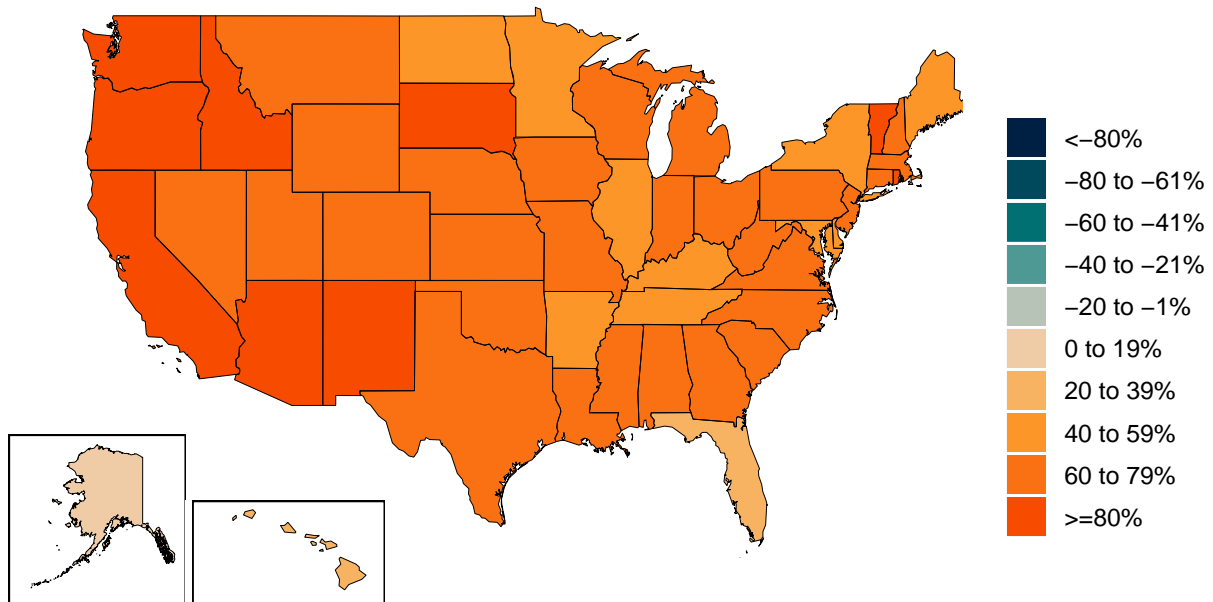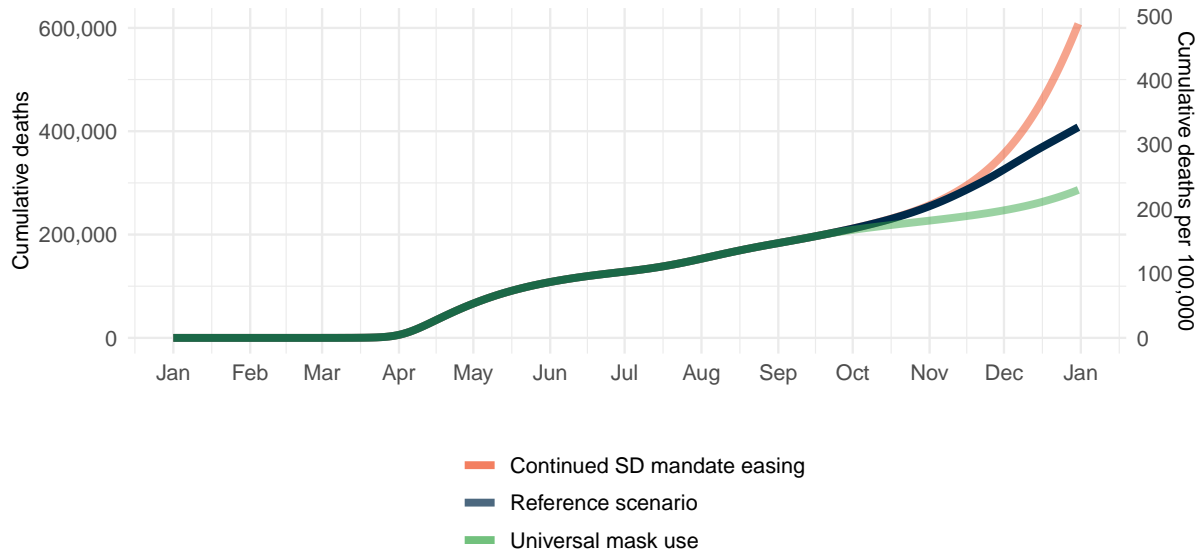**Fig 13.** Daily COVID-19 deaths until January 01, 2021 for three scenarios. The reference scenario is our forecast of what we think is most likely to happen. The mandate easing scenario is what would happen if governments continue to ease social distancing mandates. The universal mask mandate scenario is what would happen if mask use increased immediately to 95%.
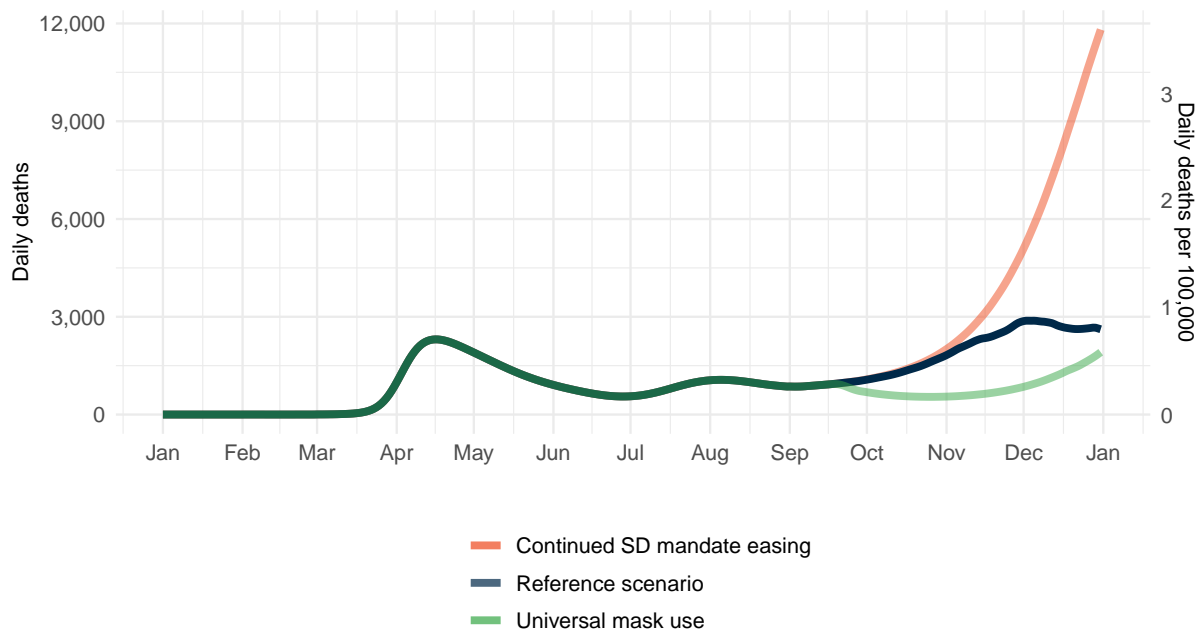
Fig 14. Daily COVID-19 infections until January 01, 2021 for three scenarios. The reference scenario is our forecast of what we think is most likely to happen. The mandate easing scenario is what would happen if governments continue to ease social distancing mandates. The universal mask mandate scenario is what would happen if mask use increased immediately to 95%.
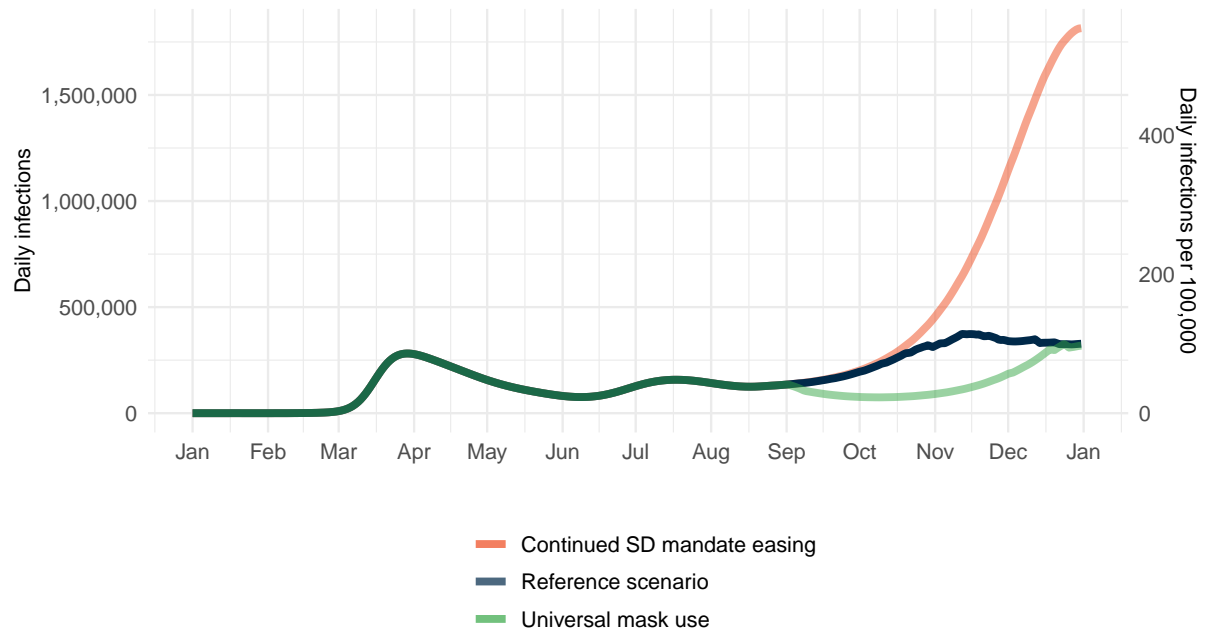
Fig 15. Month of assumed mandate re-implementation. (Month when daily death rate passes 8 per million, when model assumes mandates will be re-imposed.)
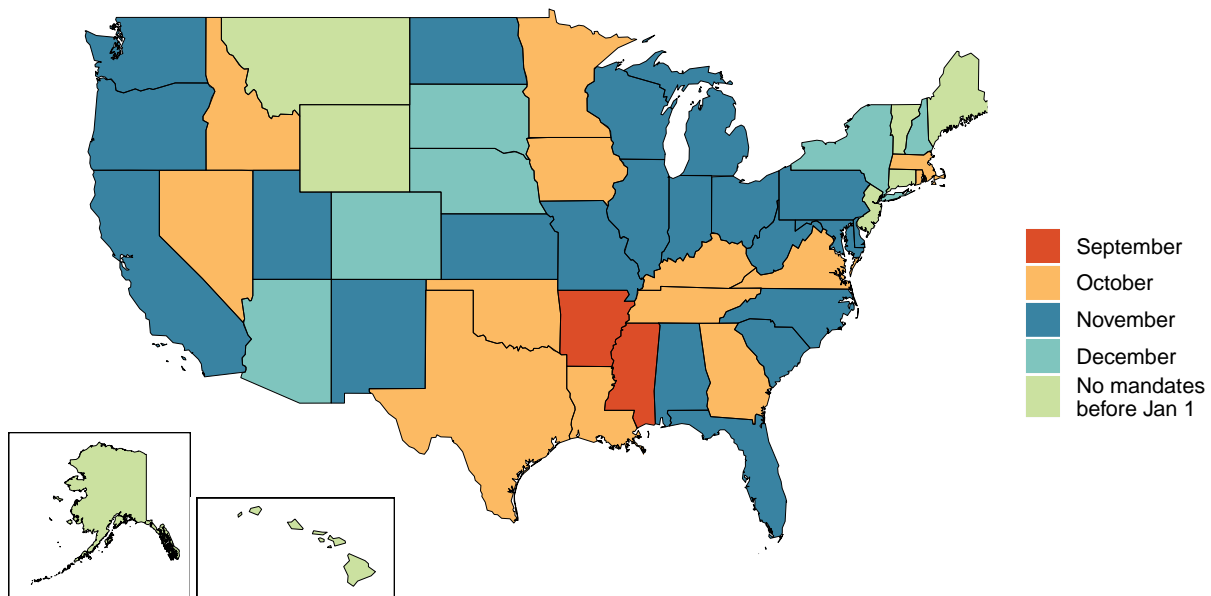
Figure 16. Forecasted percent infected with COVID-19 on January 01, 2021

	<0.5
	0.5–3.9
	4–6.9
	7–9.9
	10–12.9
	13–15.9
	16–18.9
	19–21.9
	22–24.9
	>=25
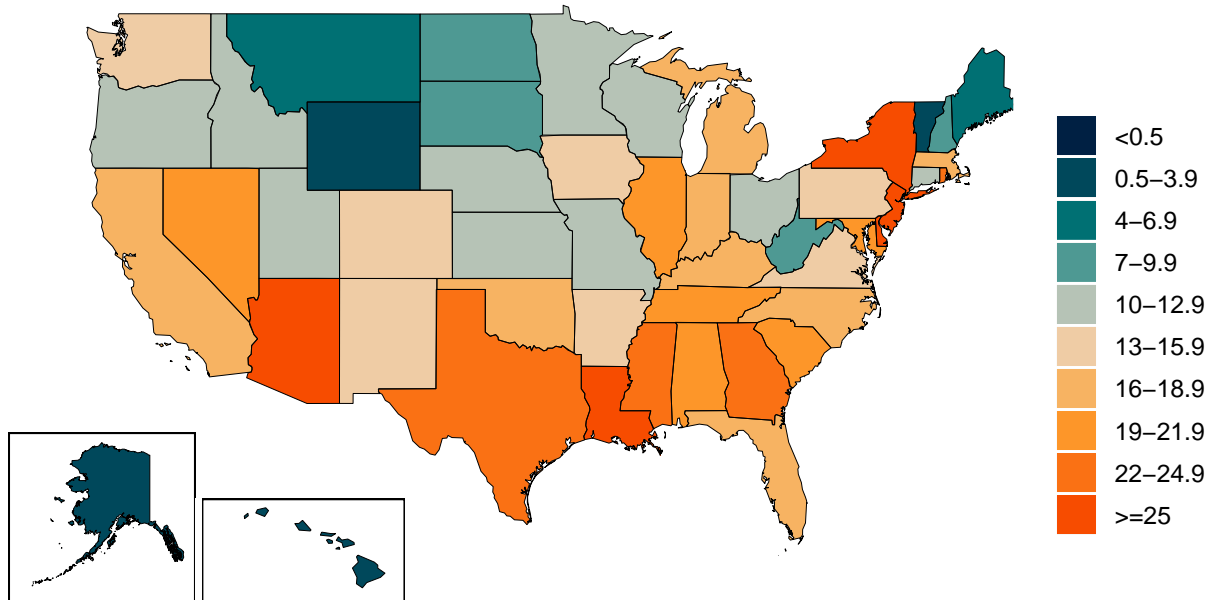
Figure 17. Daily COVID-19 deaths per million forecasted on January 01, 2021 in the reference scenario

	<1
	1 to 1.9
	2 to 2.9
	3 to 3.9
	4 to 4.9
	5 to 5.9
	6 to 6.9
	7 to 7.9
	>=8
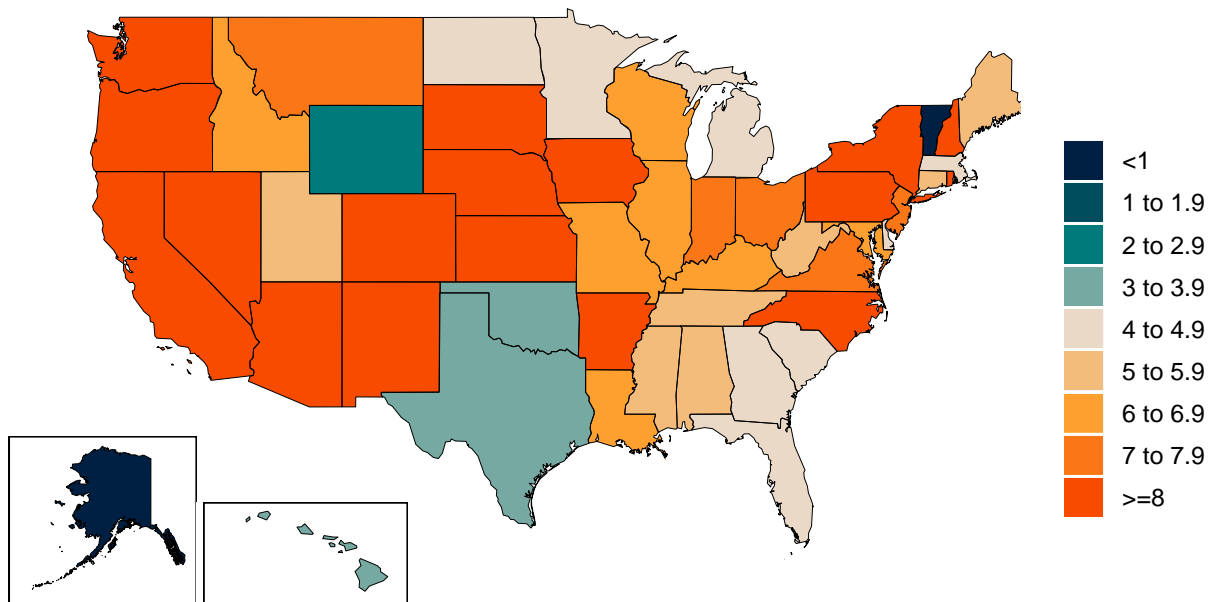
Table 3. Ranking of COVID-19 among the leading causes of mortality in the full year 2020. Deaths from COVID-19 are projections of cumulative deaths on Jan 1, 2021 from the reference scenario. Deaths from other causes are from the Global Burden of Disease study 2019 (rounded to the nearest 100).

Cause name	Annual deaths	Ranking
Ischemic heart disease	557,600	1
COVID-19	410,451	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); 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.