COVID-19 Mortality Rate Trends in Countries and US States

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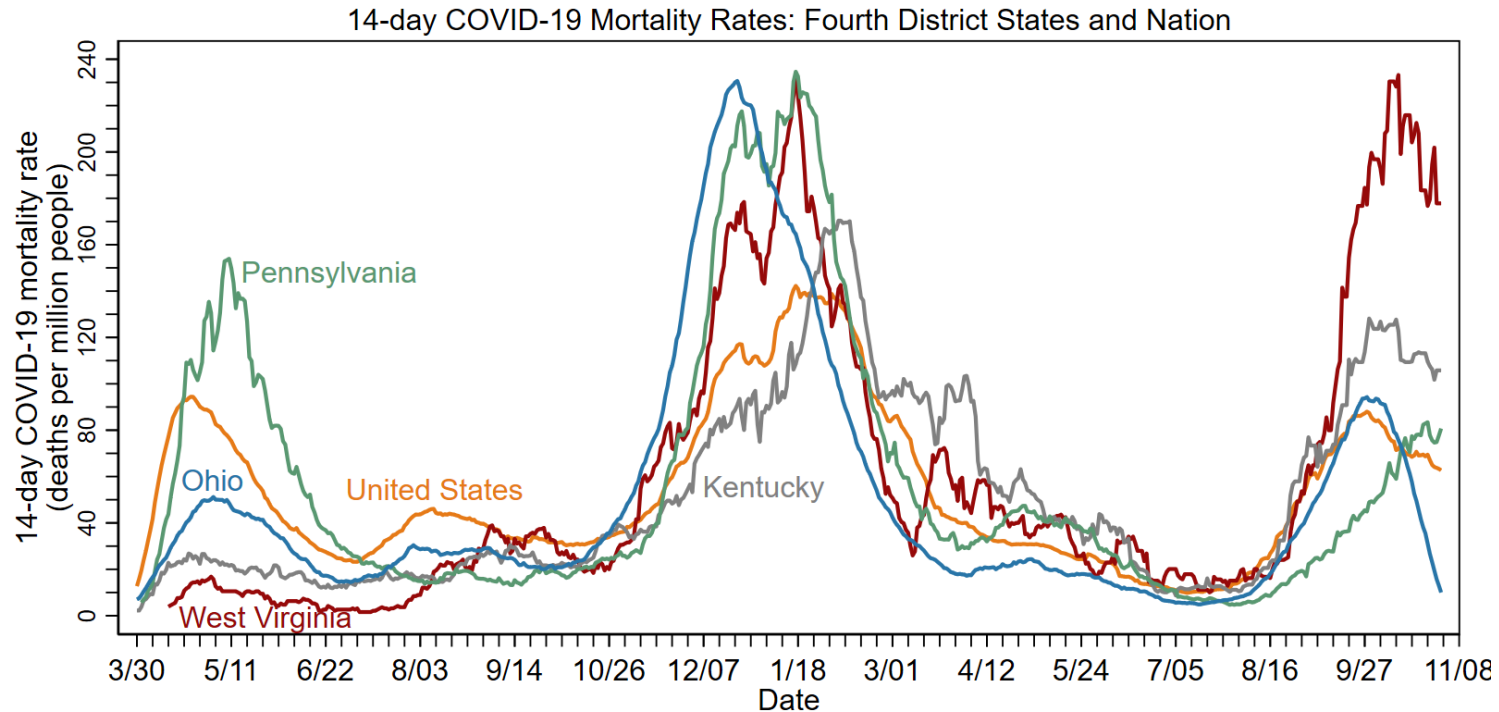
Updated November 3, 2021

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- The charts in this presentation use the same data sources as the charts in two April 2020 District Data Briefs. Please see these reports for additional details.

  - [Getting to Accuracy: Measuring COVID-19 by Mortality Rates and Percentage Changes](#)
  - [A Speeding Rate Starts to Slow: COVID-19 Mortality Rates by State](#)

- Since those reports were completed, additional evidence shows that COVID-19 deaths have been underreported, both in other countries and in the United States. The following charts present the latest data from the Center for Systems Science and Engineering at Johns Hopkins University (CSSE) through October 30, with no attempt to further correct for underreporting.

  - Some large revisions in COVID-19 data have been smoothed. See the appendix for details.

- The designs of some charts have been modified from those in the reports to better convey the current status of the COVID-19 epidemic in the United States.

- Hospitalization data come from the COVID Tracking Project at *The Atlantic* and the US Department of Health and Human Services (HHS). See the appendix for details.

- Data by race come from the COVID Tracking Project at *The Atlantic* and the Centers for Disease Control and Prevention. See the appendix for details.

The COVID-19 mortality rate fell throughout October in Kentucky, Ohio, West Virginia, and in the nation as a whole. This mortality rate rose in Pennsylvania.

14-day COVID-19 Mortality Rates: Fourth District States and Nation
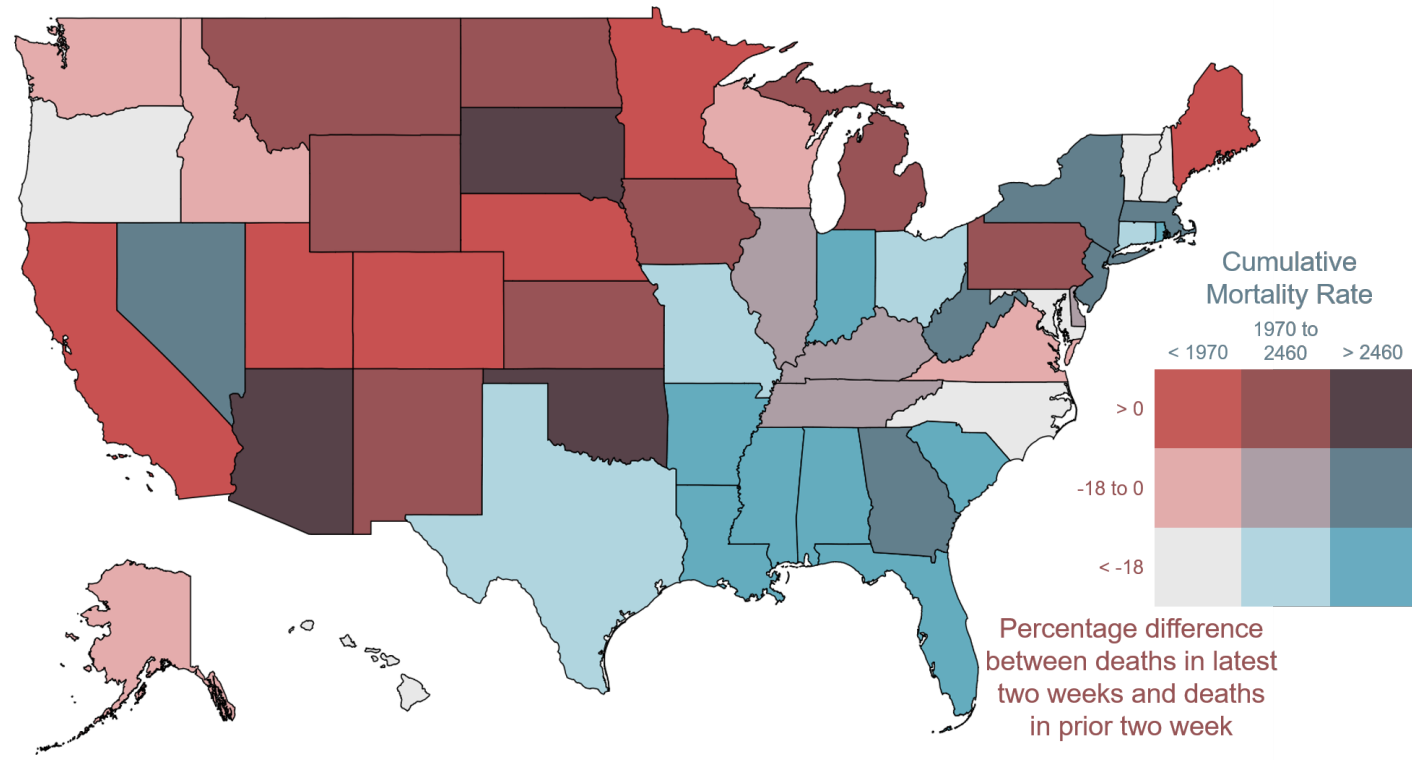
Note: Data through October 30, 2021.
Sources: FRBC calculations, the Center for Systems Science and Engineering at Johns Hopkins University, and Bureau of Economic Analysis.

Note: On March 3, 2021, Ohio began reporting COVID-19 deaths from death certificates only. While this makes the data less subject to revisions, it also means that it may take longer to count a death.
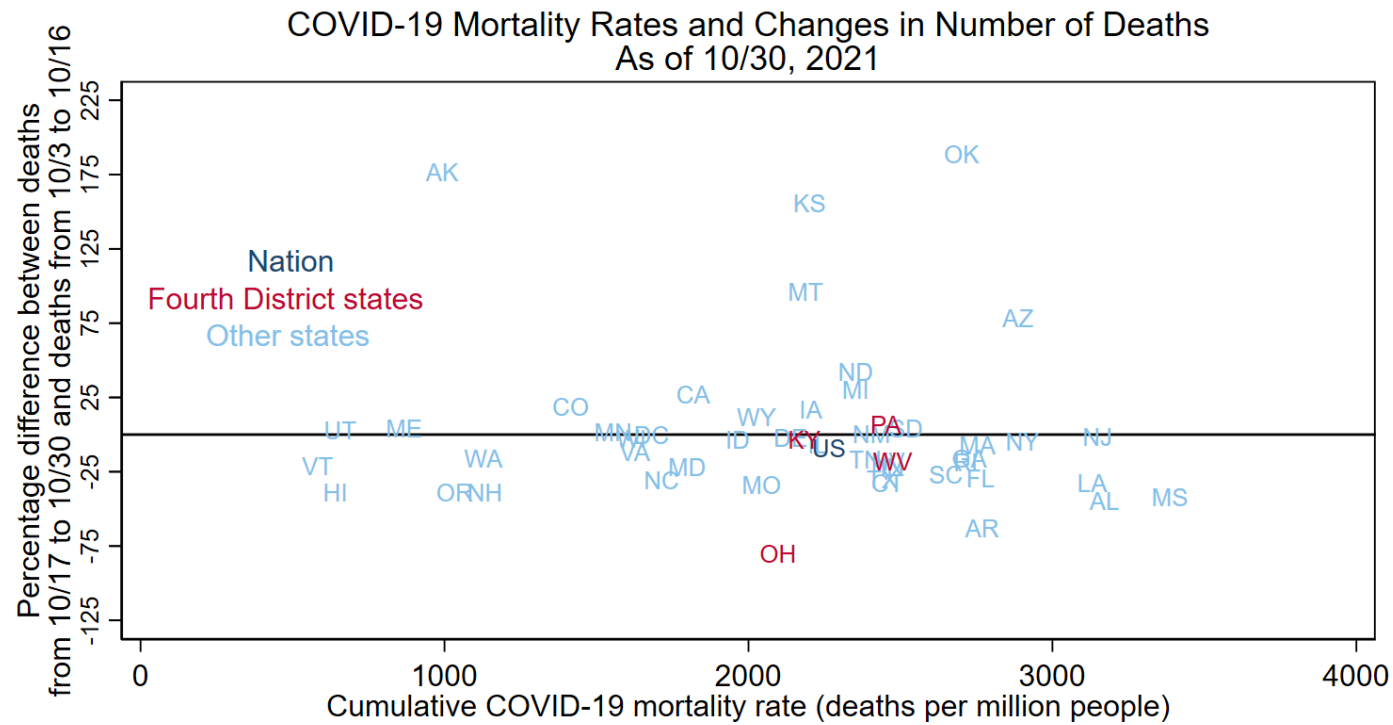
Between October 17 and October 30, the 14-day COVID-19 mortality rate rose in 16 states, including California, Maine, and Michigan, along with many Great Plains states.

Cumulative Mortality Rate

| | 1970 to | |
| < 1970 | 2460 | > 2460 |

> 0

-18 to 0

< -18

Percentage difference between deaths in latest two weeks and deaths in prior two week

Data for October 30, 2021, accessed on Nov 3, 2021.
"Latest two weeks" is 10/17/21 to 10/30/21; "prior two weeks" is 10/3/21 to 10/16/21.

Sources: FRBC calculations, CSSE, and BEA.

Note: The District of Columbia is in the bin with the mortality rate < 1970 and percentage difference from -18 to 0. The color bins on this map are changed with each update to better represent the latest data.
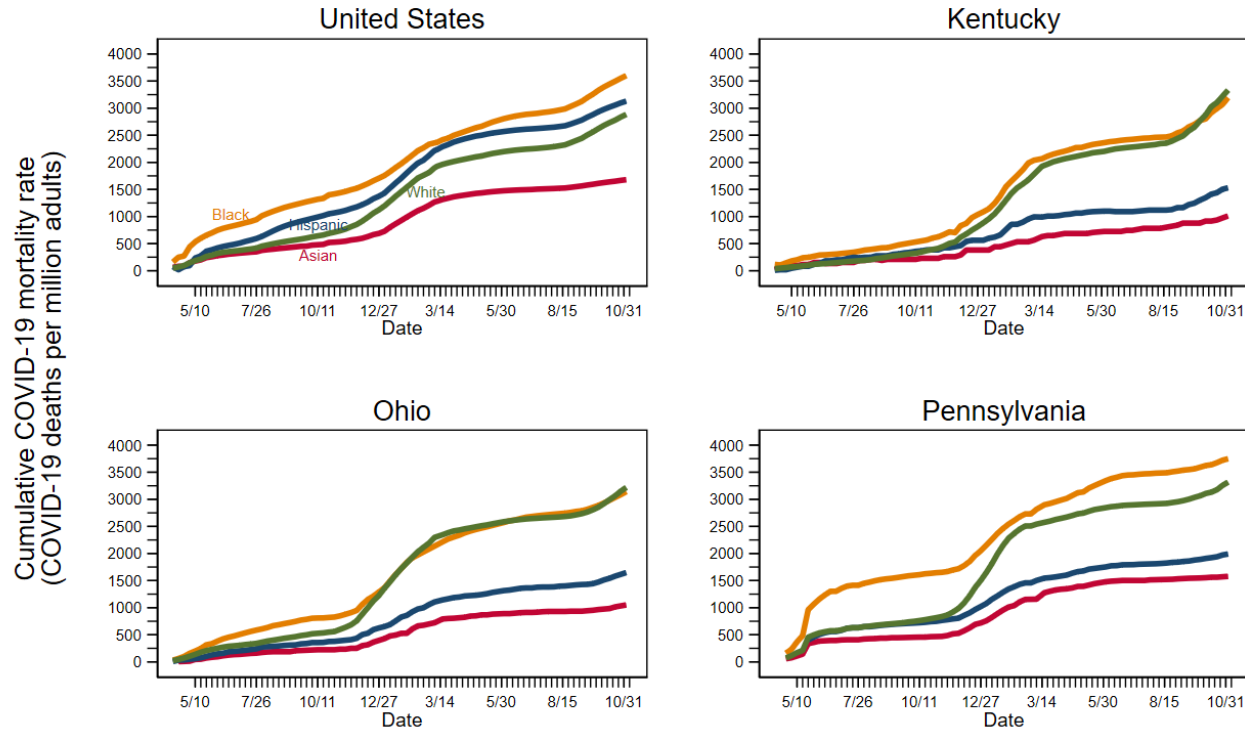
This chart gives similar information to the map, but it is more precise and includes the nation as a whole.

COVID-19 Mortality Rates and Changes in Number of Deaths
As of 10/30, 2021

Notes: NE is excluded, as the state's two-week deaths increased by more than 300 percent.
Sources: FRBC calculations, the Center for Systems Science and Engineering at Johns Hopkins University, and Bureau of Economic Analysis.

In Kentucky and Ohio, the cumulative COVID-19 mortality rates of white residents are now higher than those of Black residents. In Pennsylvania and the nation as a whole, Black residents continue to have the highest mortality rate.
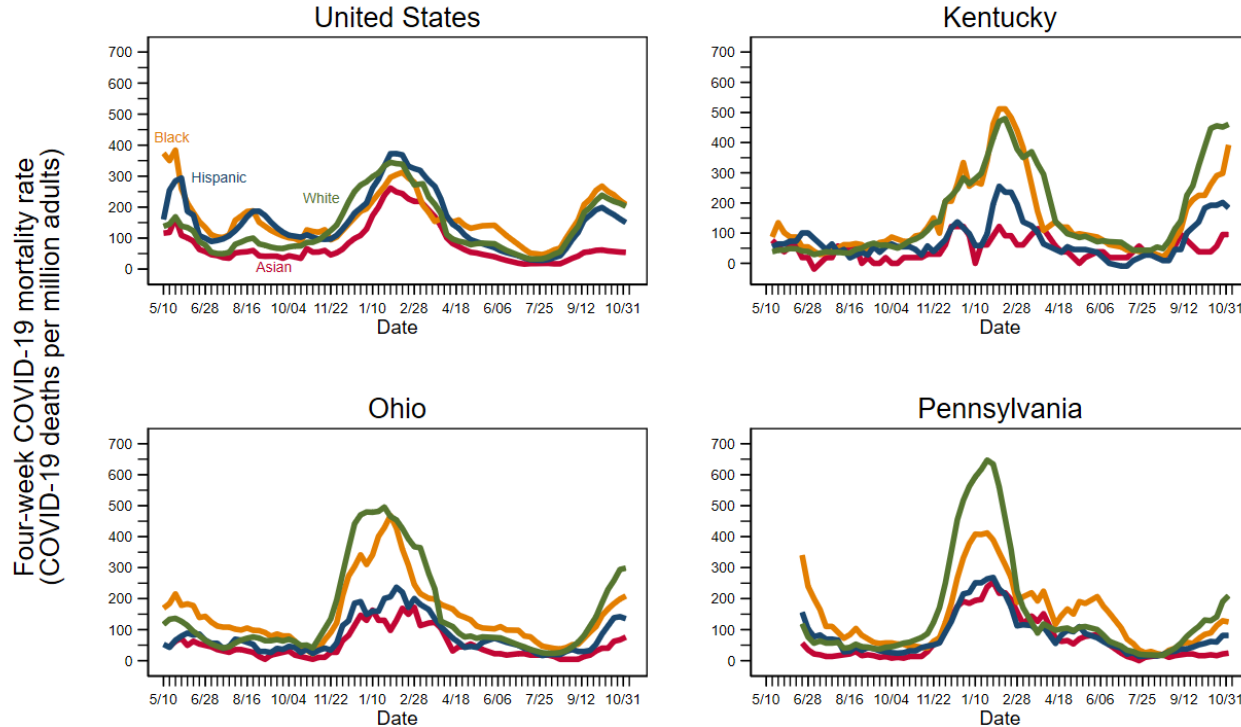
COVID-19 Adult Cumulative Mortality Rate by Race

Notes: WV is excluded because race is missing in the data for a relatively high share of WV's COVID-19 deaths.
Data from 4/12/2020 to 10/30/2021.
Sources: FRBC calculations, Census Bureau's 2019 ACS 5-Year estimates, the COVID Tracking Project at *The Atlantic*, and the Centers for Disease Control and Prevention.

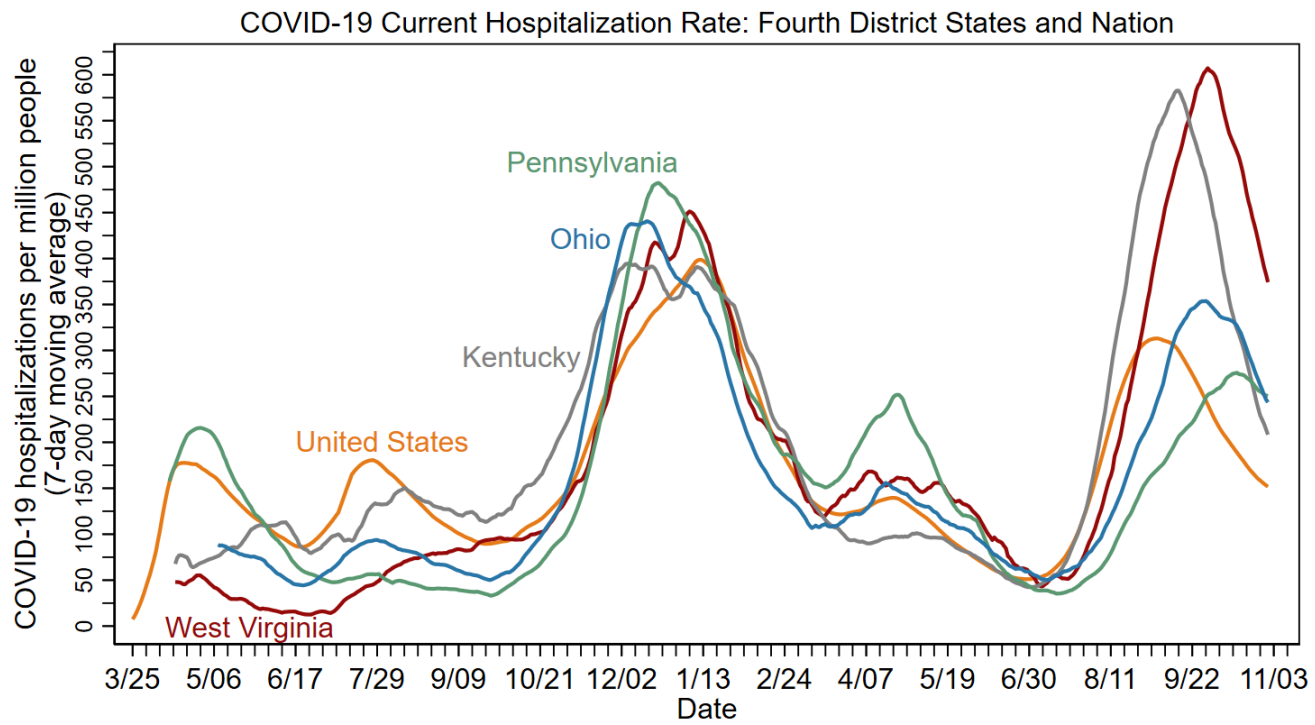Four-Week Adult COVID-19 Mortality Rate by Race

Notes: WV is excluded because race is missing in the data for a relatively high share of WV's COVID-19 deaths.
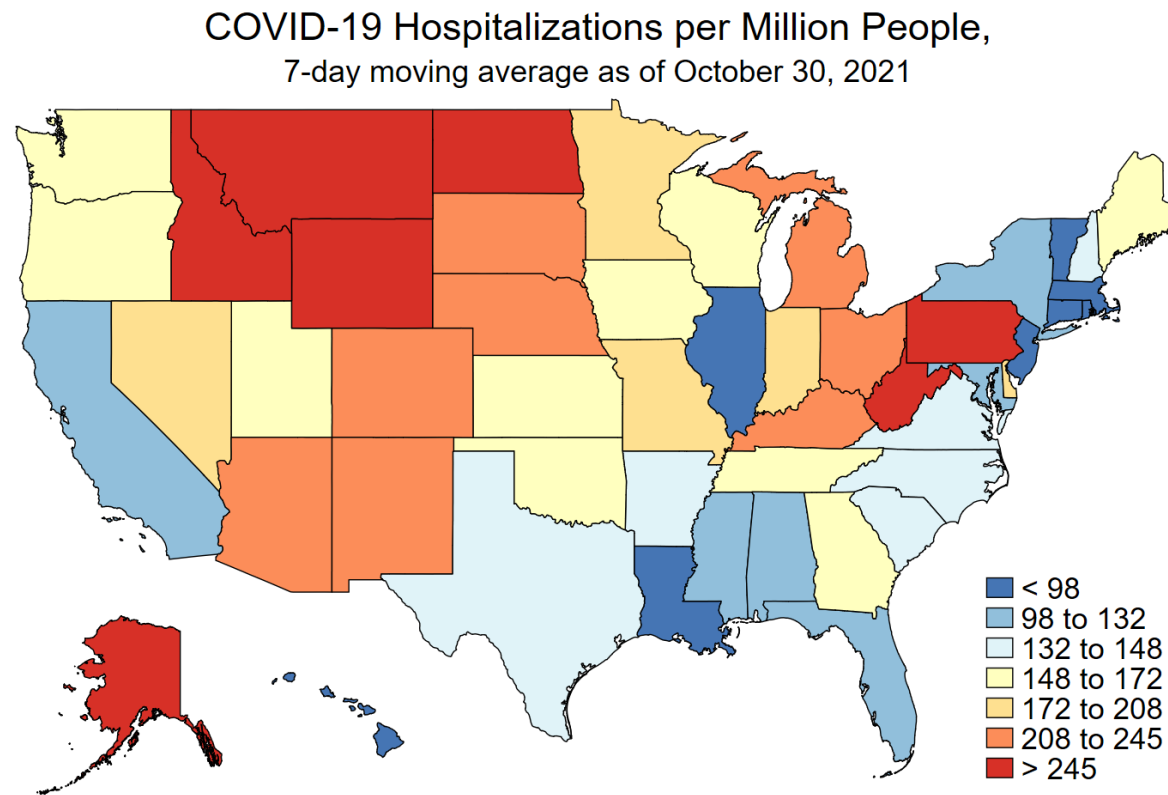Data from 5/10/2020 to 10/30/2021.
Sources: FRBC calculations, Census Bureau's 2019 ACS 5-Year estimates, the COVID Tracking Project at *The Atlantic*, and the Centers for Disease Control and Prevention.

In October, COVID-19 hospitalizations fell in all Fourth District States and in the nation as a whole. All Fourth District states and the nation as a whole are now below their December 2020 rates.

COVID-19 Current Hospitalization Rate: Fourth District States and Nation

Note: Data through October 30, 2021.
Sources: FRBC calculations, the COVID Tracking Project at *The Atlantic*, BEA, and HHS.

Between October 24 and October 30, the 7-day COVID-19 hospitalization rate rose in 12 states. Hospitalization rates are especially high in Colorado, Utah, and a number of states in the West.

COVID-19 Hospitalizations per Million People,
7-day moving average as of October 30, 2021

Legend:
- < 98
- 98 to 132
- 132 to 148
- 148 to 172
- 172 to 208
- 208 to 245
- > 245

Data for October 30, 2021, accessed on November 3, 2021.
Sources: FRBC calculations, the COVID Tracking Project at *The Atlantic*, BEA, and HHS.

Note: The District of Columbia is in the bin with a hospitalization rate between 98 and 132. The color bins on this map are changed with each update to better represent the latest data.
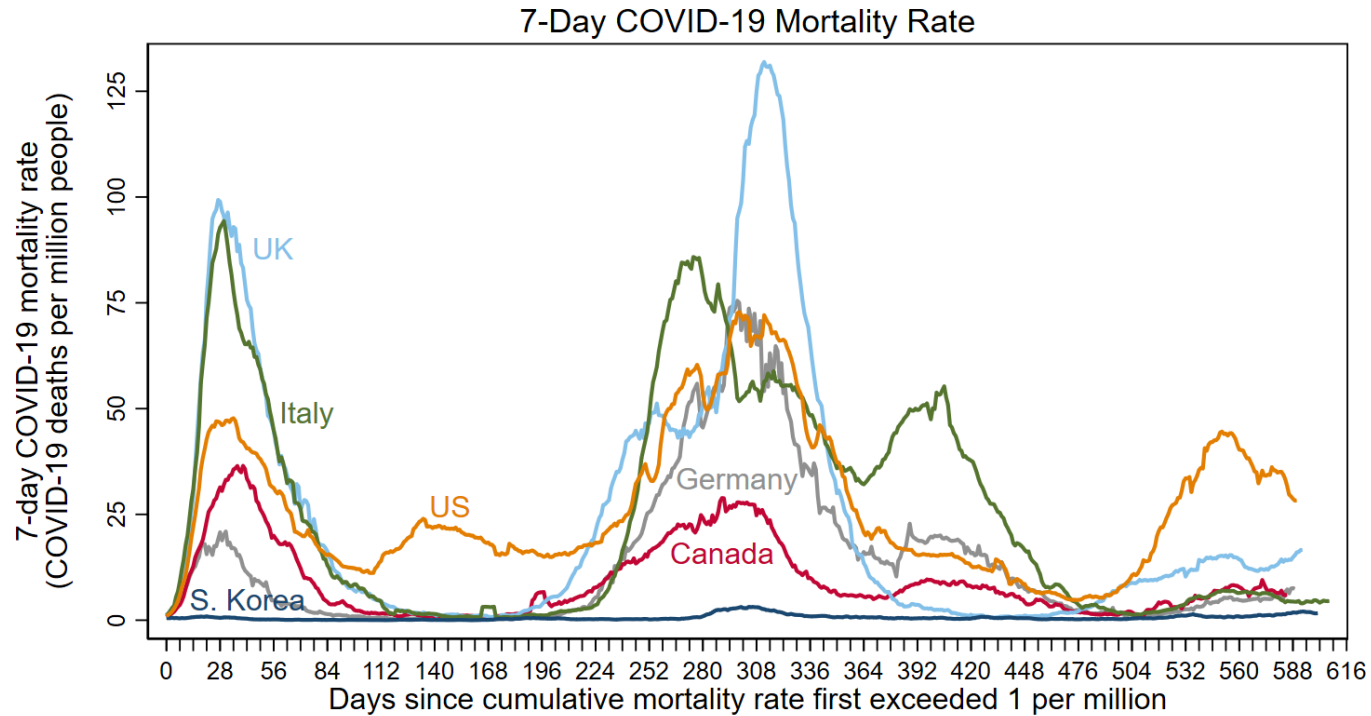
COVID-19 statistics for Fourth District states and the nation as of Nov 3, 2021.

COVID-19 Statistic	Kentucky	Ohio	Pennsylvania	West Virginia	United States
Levels					
Average daily deaths in past two weeks	34	8	74	23	1,473
Cumulative deaths	9,766	24,527	31,452	4,426	745,510
Average daily hospitalizations in the past week	931	2,848	3,207	669	49,892
Rates (per million residents)					
14-day mortality rate	106	10	81	178	63
Cumulative mortality rate	2,184	2,097	2,456	2,475	2,266
Average daily hospitalization rate in the past week	208	244	250	374	152
Four-week adult mortality rate by race					
Asian	95	76	24	84	54
Black	393	209	125	261	208
Hispanic	183	135	81	142	150
White	461	299	210	516	202
Cumulative adult mortality rate by race					
Asian	1,012	1,051	1,579	1,009	1,680
Black	3,195	3,143	3,749	2,492	3,601
Hispanic	1,531	1,649	1,992	900	3,130
White	3,335	3,221	3,319	3,063	2,886

Note: West Virginia's data are missing race for a relatively high share of COVID-19 deaths, and the state did not begin reporting COVID-19 deaths for Asian residents until 9/29/2021.

7-Day COVID-19 Mortality Rate

Notes: 3/22/2020 was first day US rate > 1. Data through 10/30/2021.
Sources: FRBC calculations, the Center for Systems Science and Engineering at Johns Hopkins University, and the World Bank.
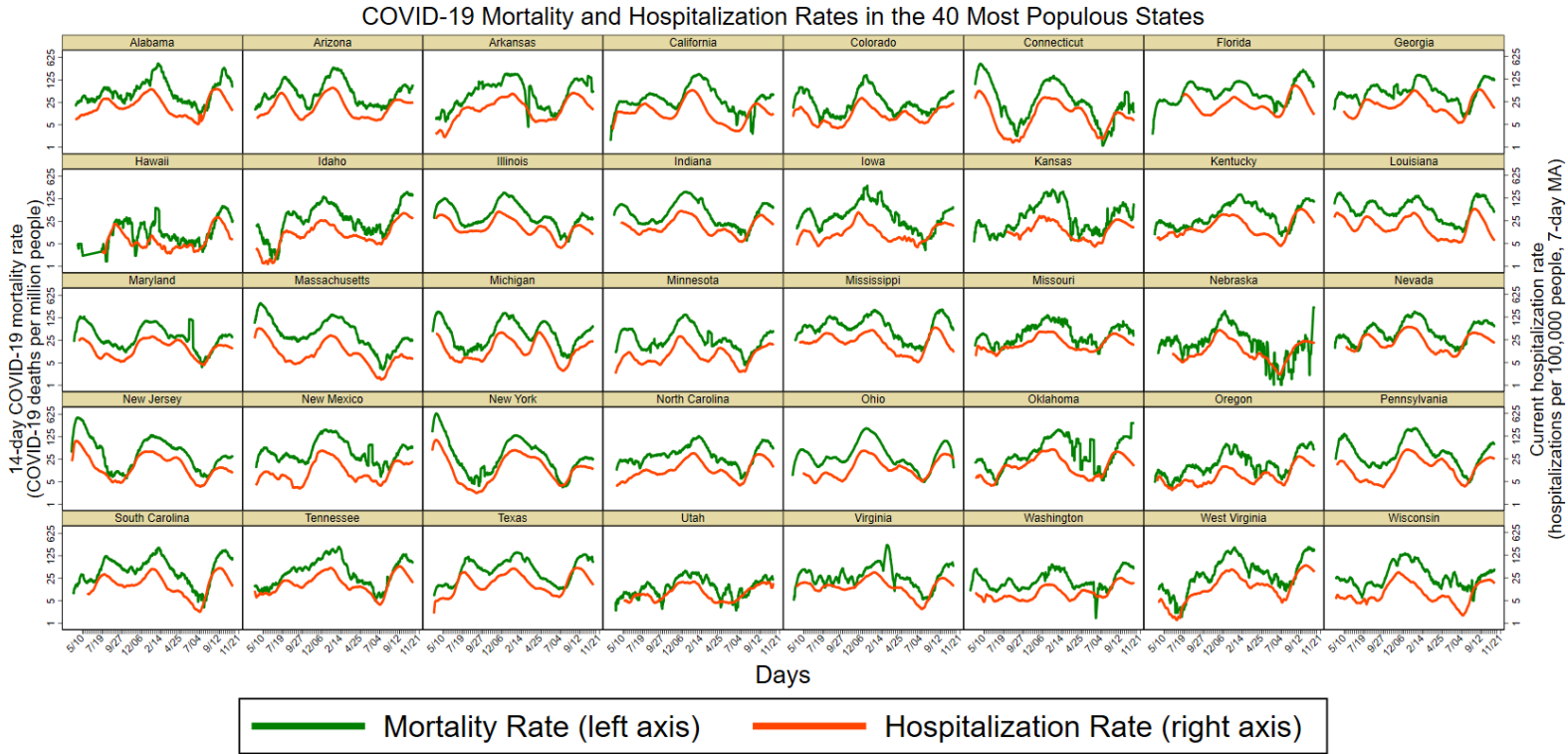
COVID-19 Mortality Rate Trajectories

Notes: Excluding days when mortality rate < 1. Dots on Sundays to show time.
Data through October 30, 2021.
Sources: FRBC calculations, the Center for Systems Science and Engineering at Johns Hopkins University, and the World Bank.

COVID-19 Mortality and Hospitalization Rates in the 40 Most Populous States

Notes: Data from 3/30/2020-10/30/2021. Both vertical axes have log scales.
Sources: FRBC calculations, the Center for Systems Science and Engineering at Johns Hopkins University, BEA, HHS, and the COVID Tracking Project at *The Atlantic*.

- Series that use different sources at different times

  - Hospitalization data prior to February 1, 2021, are from the COVID Tracking Project at *The Atlantic*. To smooth transition to a new source, the February 2021 data uses a weighted average of the data from the COVID Tracking Project and data from HHS via HealthData.gov, with weight on the COVID Tracking Project falling over time. From March 1, 2021, onward, we use the HHS data.

  - Data by racial groups are from the COVID Tracking Project through March 7, 2021, and from the Centers for Disease Control and Prevention starting on March 8, 2021. The rates we report for racial groups are per million adults, rather than population as a whole, because COVID-19 mortality is closely related to age, and racial groups have different age distributions.

- Some significant revisions to the reported number of COVID-19 deaths cause large single-day jumps.

- We smooth some of these jumps by multiplying daily changes for a period of time by a scaling factor so that the adjusted series meets the post-revision series.

- We have used this approach for the following revisions and periods in 2020:
  - Spain revised deaths downward on May 25; data are adjusted from 3/3 to 5/24.
  - New Jersey revised deaths downward on June 25; data are adjusted from 3/10 to 6/24.
  - Illinois revised deaths upward on July 7; Illinois and the United States are adjusted from 3/23 to 7/6.
  - New Jersey revised deaths downward on August 26; data are adjusted from 3/18 to 8/25.
  - US revised deaths up on October 21 for all race categories; data adjusted from 6/6 to 10/18.

- Other data cleaning in 2020
  - Ohio's reported cumulative deaths jumped up on August 29 and reversed on August 30. We set Ohio's cumulative deaths on August 29 to the midpoint of deaths on August 28 and 30 and incorporated this change into the US total for August 29.
  - Ohio's reported cumulative deaths for Hispanic residents jumped up on August 5 and reversed on August 9. We set Ohio's cumulative deaths on August 5 to the average between August 2 and August 9, given data are only available every Sunday and Wednesday.

- Data cleaning in 2021
  - West Virginia's reported cumulative deaths for Black residents fell on January 3 and January 6 and reversed on January 10. We set West Virginia's cumulative deaths on January 3 and January 6 to the average between December 30 and January 10, excluding January 3 and January 6.
  - On February 10, Ohio announced that it underreported COVID-19 deaths in November and December and adjusted the data. The CSSE data is adjusted for this change, but the race-level data from the COVID Tracking Project at *The Atlantic* is not. We smooth this jump in the race-level data by multiplying daily changes from November to February 14 by a scaling factor so that the adjusted series meets the post-revision series.
  - Ohio continued to review and revise its COVID-19 deaths after February 14. We smoothed the latest changes by assuming that deaths rose at a steady rate from February 17 to February 28.
  - Virginia revised death counts in the week leading up to February 28, with the guidance that the additional deaths occurred in 2021. Lacking information on when the deaths occurred, we revised Virginia's data so the state's 14-day mortality rate has been constant since January 15.
  - West Virginia revised death counts upward between February 7 and February 14 to account for deaths between December 1, 2020, and January 30, 2021. We smoothed these changes using method described on slide 14.

- Data cleaning in 2021 (continued)
  - Death counts of Asian residents were revised on March 17 in Ohio, Pennsylvania, and the United States. Also on March 17, the death counts of all racial groups in Kentucky were revised. We adjusted these weekly series from November 11, 2020, through March 10, 2021, to account for these revisions, using the rescaling methodology described on slide 14.
  - Oklahoma revised death counts upward between April 6 and April 7 to account for deaths between December 1, 2020, and March 31, 2021. We smoothed these changes using the rescaling methodology described on slide 14.
  - Texas pediatric hospitalizations published by HHS contained a 33,000 one-day jump on April 11. We believe this is an error and replaced the one-day change with the average change over the prior 10 days. This jump was included in the national-level data by April 25, and we smoothed the jump similarly.
  - West Virginia revised death counts downward between April 26 and April 27 after an internal review at the state's health department. We smoothed these changes using the rescaling methodology described on slide 14.