

# COVID-19 Mortality Rate Trends in Countries and US States

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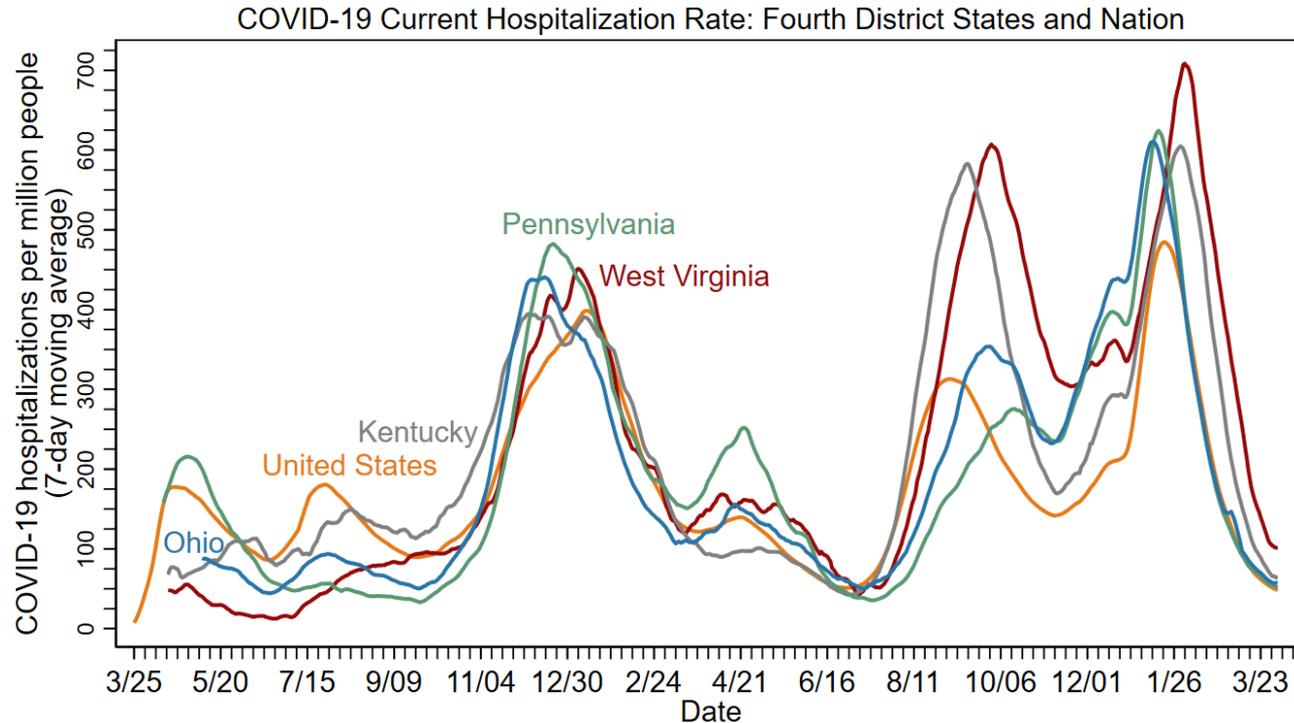
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- The charts in this presentation use the same data sources as the charts in two April 2020 District Data Briefs. Please see these reports for additional details.
  - [Getting to Accuracy: Measuring COVID-19 by Mortality Rates and Percentage Changes](#)
  - [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 April 3, 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 (CDC). See the appendix for details.

## Note regarding state-level data

- Beginning with our April 2022 update, we are shifting our focus on state-level data from mortality rates to hospitalization rates. There are two reasons for this change:
  - Hospitalization rates have become a better indicator than mortality rates of recent trends in the spread of COVID-19 because vaccinations and better treatment have dramatically reduced deaths per infection.
  - Some states, including Kentucky and Ohio, have changed how they tabulate and report COVID-19 deaths, and some of these changes have reduced the timeliness of the data.
- We continue to use state-level cumulative mortality rates because they reflect the full history of the pandemic, not just recent trends.
- We also continue to use state-level mortality rates by race and ethnicity because hospitalization rates are not available for these subgroups.

In March, COVID-19 hospitalizations continued falling in all Fourth District states, reaching levels last seen in summer 2021. National hospitalizations also fell, reaching a level last seen in April 2020.

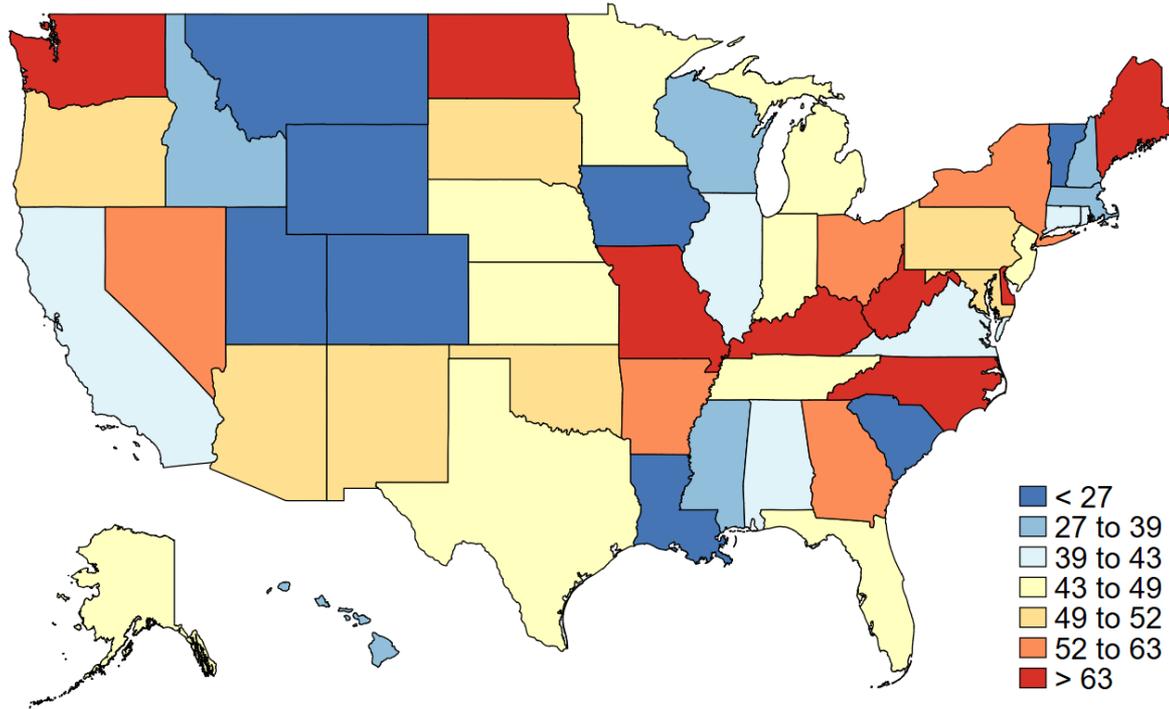


Note: Data through April 3, 2022.

Sources: FRBC calculations, the COVID Tracking Project at *The Atlantic*, BEA, and HHS.

On April 3, only two states, Delaware and West Virginia, had 7-day average COVID-19 hospitalization rates above 100 per million people. On March 2, 39 states had hospitalization rates above 100 per million.

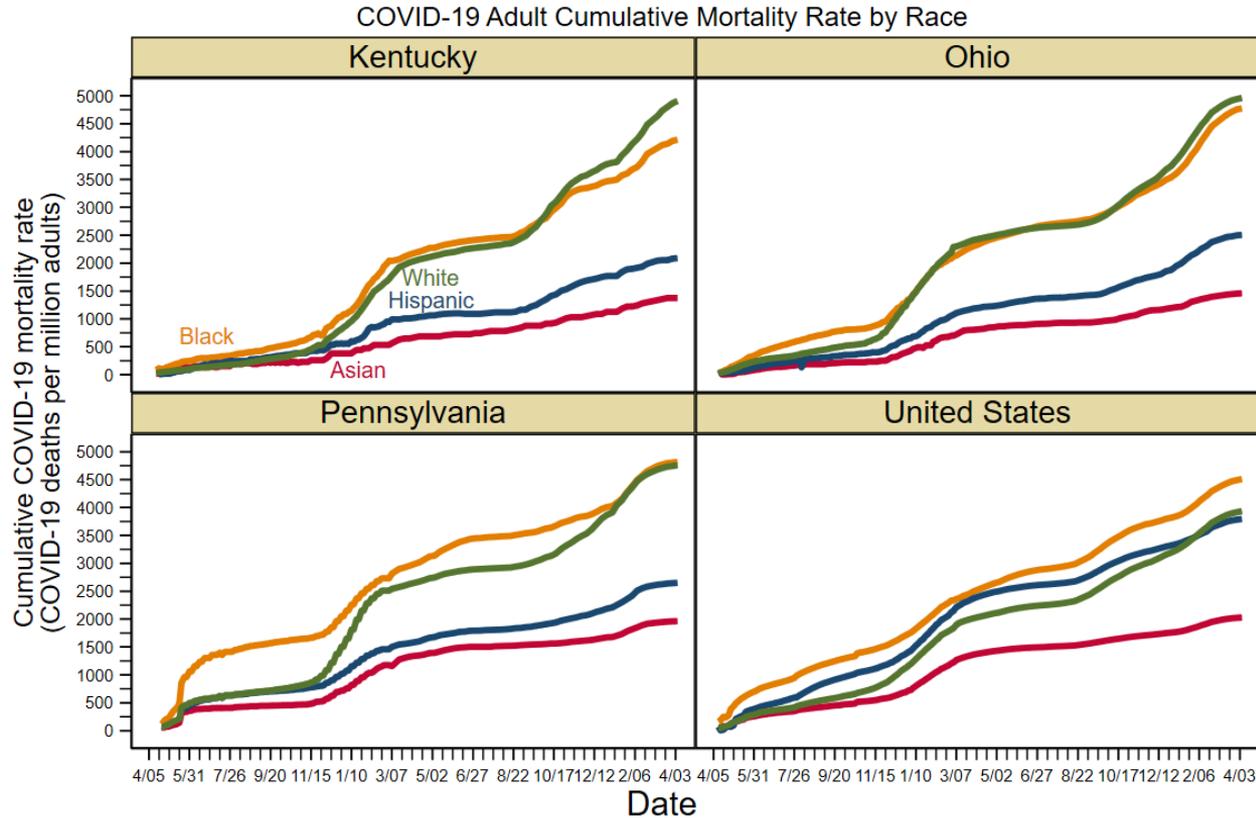
### COVID-19 Hospitalizations per Million People, 7-day moving average as of April 3, 2022



Data for April 3, 2022, accessed on April 6, 2022.  
Sources: FRBC calculations, the COVID Tracking Project at *The Atlantic*, BEA, and HHS.

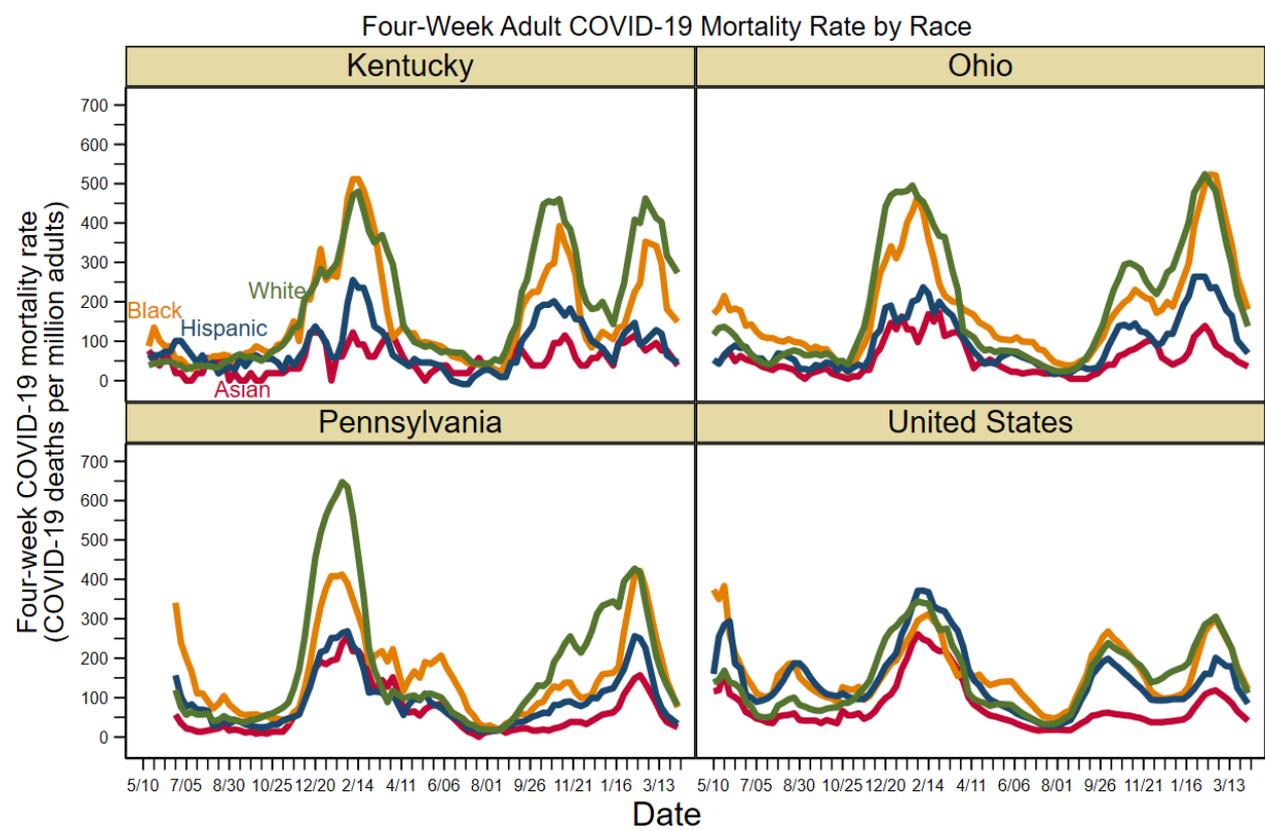
Note: The District of Columbia is in the bin with a hospitalization rate above 63. The color bins on this map are changed with each update to better represent the latest data.

In Kentucky and Ohio, the cumulative COVID-19 mortality rates of white residents remained higher than those of Black residents. In Pennsylvania and the nation as a whole, Black residents had the highest mortality rate.



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 4/3/2022.  
Sources: FRBC calculations, Census Bureau, the COVID Tracking Project at *The Atlantic*, and CDC.

# In March, four-week mortality rates fell for all four racial and ethnic groups in all Fourth District states and the nation as a whole.



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 4/3/2022.  
 Sources: FRBC calculations, Census Bureau, the COVID Tracking Project at *The Atlantic*, and CDC.

Note: Many states rely on death certificates for mortalities by race. While this makes the data less subject to revisions, it also means that it may take longer to count a death.

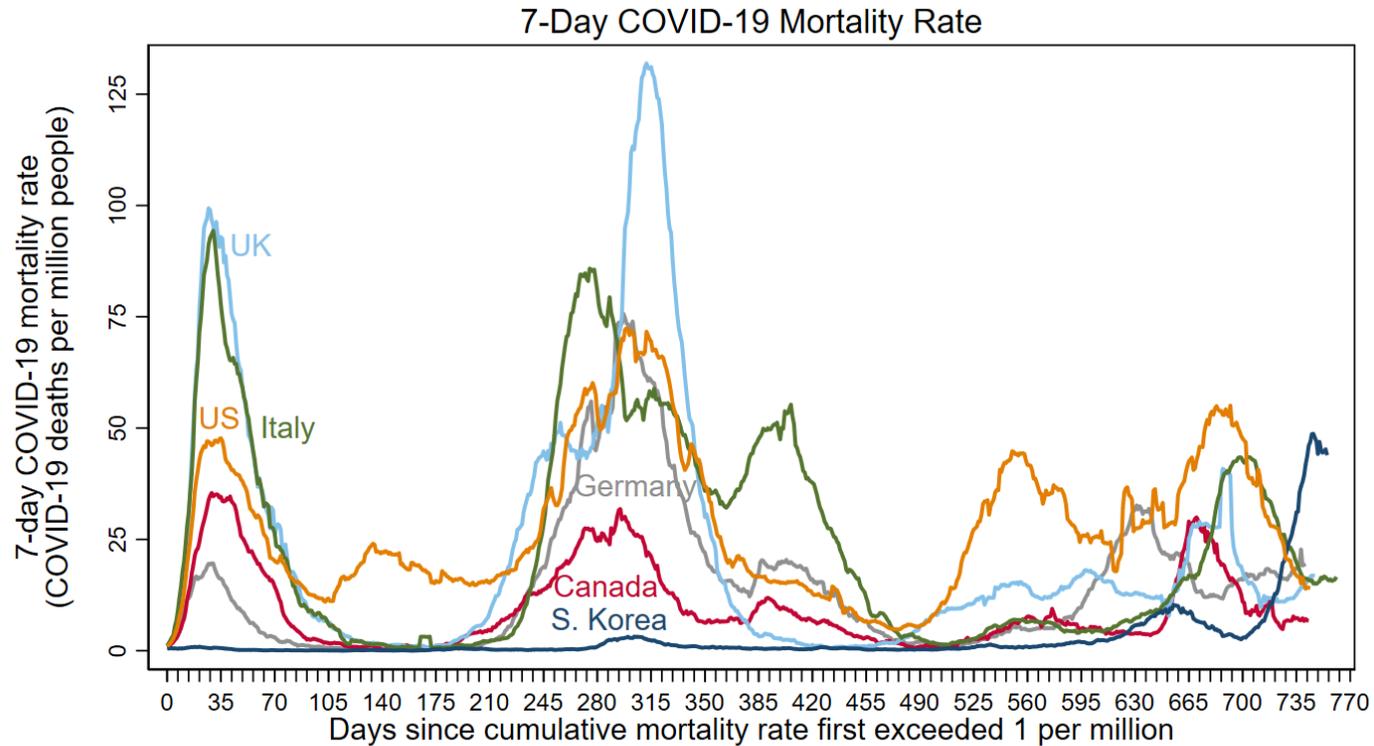
# COVID-19 statistics for Fourth District states and the nation as of April 3, 2022.

COVID-19 Statistic	Kentucky	Ohio	Pennsylvania	West Virginia	United States
<b>Levels</b>					
Cumulative deaths	14,993	38,042	44,313	6,835	981,152
Average daily hospitalizations in the past week	283	667	662	181	15,894
<b>Rates (per million residents)</b>					
Cumulative mortality rate	3,354	3,252	3,460	3,822	2,983
Average daily hospitalization rate in the past week	63	57	52	101	48
<b>Four-week adult mortality rate by race</b>					
Asian	38	36	24	84	41
Black	149	180	75	342	120
Hispanic	46	69	33	0	85
White	273	138	80	314	111
<b>Cumulative adult mortality rate by race</b>					
Asian	1,375	1,458	1,963	1,597	2,029
Black	4,213	4,774	4,820	4,019	4,512
Hispanic	2,090	2,506	2,650	1,468	3,796
White	4,908	4,962	4,760	4,776	3,936

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.

Sources: FRBC calculations, CSSE, Census Bureau, the COVID Tracking Project at *The Atlantic*, BEA, CDC, and HHS.

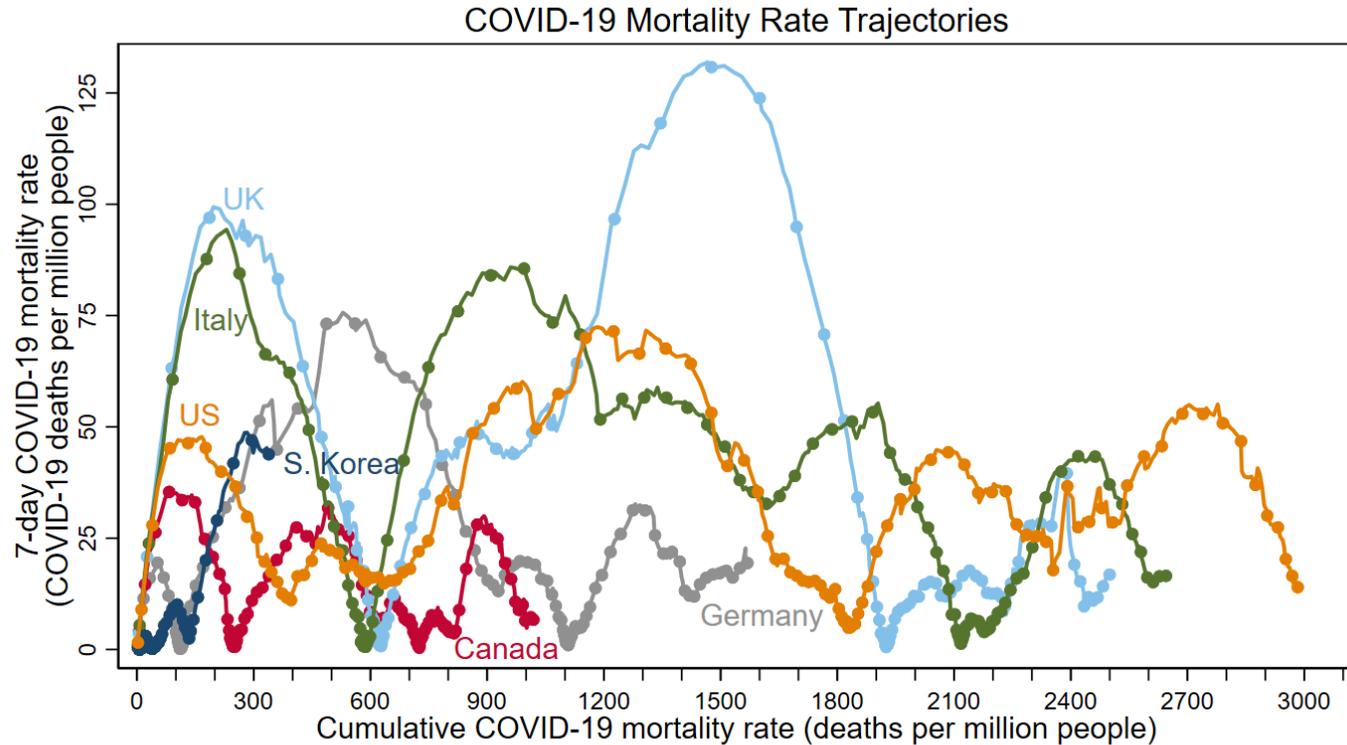
The 7-day COVID-19 mortality rate of the United States fell throughout March into April. Of the nations we use for comparison, South Korea saw a large increase in March for the second month in a row.



Notes: 3/22/2020 was first day US rate > 1. Data through 4/3/2022.

Sources: FRBC calculations, CSSE, and the World Bank

As of March 6, the cumulative COVID-19 mortality rate of the United States is 2,983 deaths per million people. This is almost triple the mortality rate of Canada and above those of Italy and the UK.



Notes: Excluding days when mortality rate < 1. Dots on Sundays to show time. Data through April 3, 2022.  
Sources: FRBC calculations, CSSE, and the World Bank



- 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.
  - Kentucky began reporting death counts almost exclusively on Mondays, starting March 5, 2022. To account for this day of week bias, we take the 7-day moving average for the state through the current period.