COVID-19 JHU "Daily Reports" Longitudinal Data Quality Report 06-02-2020 Update

This automated report describes longitudinal trends and anomalies in CSV files maintained in the Johns Hopkins University (JHU) COVID-19 GitHub "Daily Reports" repository: https://github.com/CSSEGISandData/COVID-19/tree/master/csse_covid_19_data. This PDF is updated daily and is intended to assist researchers and others who are evaluating raw data for US COVID-19 cases and deaths. Heartfelt thanks to the JHU Center for Systems Science and Engineering (CSSE) for creating and continually updating the COVID-19 GitHub repository as well as the COVID-19 international tracker (https://coronavirus.jhu.edu/map.html).

This longitudinal analysis identifies records whose idiosyncrasies or inconsistencies are observed only through inter-record comparison, by evaluating each record with respect to previous and subsequent records of the same county or state to discover missing, duplicate, or potentially invalid data. This report is generated in conjunction with a separate data quality report (https://www.linkedin.com/posts/activity-6671173160479547392-16NG) that identifies changes and issues in the structure and content of the COVID-19 JHU Daily Reports.

Data Coverage

This report references CSV files that span 01-22-2020 to 06-02-2020, comprising 240,312 COVID-19 records; however, only the 212,240 United States records (having "US" in the Country_Region column) are described.

I. State-Level Analysis

Since March 22, JHU COVID-19 data have been reported at the county level, including FIPS codes for most US records. However, county-level records can be aggregated into state-level data sets, after which longitudinal trends (and anomalies) can be identified. This section discusses only state-level issues whereas the next section provides further county-level granularity.

Date on Which a State's First COVID-19 Record Appeared

Although not anomalous, this listing enumerates the date on which each state first appears in a JHU CSV file, with the initial total case and total death counts provided:

State	Date of First Record	Cases	Deaths
Alabama	03-13-2020	5	0
Alaska	03-10-2020	0	0
Arizona	01-26-2020	1	0

Arkansas	03-10-2020	0	0
California	01-26-2020	2	0
Colorado	03-06-2020	4	0
Connecticut	03-07-2020	2	0
Delaware	03-10-2020	0	0
District of Columbia	03-08-2020	2	0
Florida	03-02-2020	2	0
Georgia	03-03-2020	2	0
Hawaii	03-07-2020	1	0
Idaho	03-10-2020	0	0
Illinois	01-24-2020	1	0
Indiana	03-06-2020	1	0
Iowa	03-09-2020	3	0
Kansas	03-08-2020	1	0
Kentucky	03-06-2020	1	0
Louisiana	03-09-2020	1	0
Maine	03-10-2020	0	0
Maryland	03-06-2020	3	0
Massachusetts	02-01-2020	1	0
Michigan	03-10-2020	0	0
Minnesota	03-06-2020	1	0
Mississippi	03-10-2020	0	0
Missouri	03-08-2020	1	0
Montana	03-10-2020	0	0
Nebraska	02-21-2020	11	0
Nevada	03-05-2020	1	0
New Hampshire	03-02-2020	1	0
New Jersey	03-05-2020	2	0
New Mexico	03-10-2020	0	0
New York	03-02-2020	1	0
North Carolina	03-03-2020	1	0
North Dakota	03-10-2020	0	0
Ohio	03-10-2020	3	0
Oklahoma	03-07-2020	1	0
Oregon	02-29-2020	1	0
Pennsylvania	03-06-2020	2	0
Rhode Island	03-01-2020	1	0
South Carolina	03-07-2020	2	0
South Dakota	03-10-2020	0	0

Tennessee	03-05-2020	1	0
Texas	02-13-2020	1	0
Utah	03-07-2020	1	0
Vermont	03-08-2020	1	0
Virginia	03-08-2020	2	0
Washington	01-22-2020	1	0
West Virginia	03-10-2020	0	0
Wisconsin	02-05-2020	1	0
Wyoming	03-10-2020	0	0
American Samoa	03-22-2020	0	0
Guam	03-15-2020	3	0
Northern Mariana Islands	03-22-2020	0	0
Puerto Rico	03-14-2020	3	0
Virgin Islands	03-14-2020	1	0

State Records That Appeared and Disappeared

In some cases, a state initially appeared in a CSV file only to disappear in subsequent CSV files. For example, Ashland, Nebraska reported 11 total cases on February 21, the first reference to Nebraska in JHU data. However, Ashland is never again referenced (in subsequent CSV files) and the next record containing Nebraska data is March 6, which lists only one total case for the state.

State	Date of Missing Record	Previous Total Cases
Alaska	03-14-2020	1
Nebraska	02-22-2020	11
Nebraska	02-23-2020	11
Nebraska	02-24-2020	11
Nebraska	02-25-2020	11
Nebraska	02-26-2020	11
Nebraska	02-27-2020	11
Nebraska	02-28-2020	11
Nebraska	02-29-2020	11
Nebraska	03-01-2020	11
Nebraska	03-02-2020	11
Nebraska	03-03-2020	11
Nebraska	03-04-2020	11
Nebraska	03-05-2020	11

Duplicate State Case Totals

On some days, the recorded total case count for a state remained constant from the previous

day. When COVID-19 case rates are low, this perseveration could be accurate, indicating that no new cases were reported on that day. However, at higher case rates, this omission indicates that new cases occurred but were not initially reported to or by JHU (but may have been reported on a later date).

The following table lists state case totals that were reported identically on consecutive days by JHU. The 7-day moving average of the case rate is also demonstrated to advise the approximate increase in cases that should have been expected. For example, Alabama data reported 6,026 total COVID-19 cases on both April 24 and April 25; however, the 7-day moving average on April 25 (i.e., the mean of Alabama case rates from April 22 to April 28) was 204. Thus, the Alabama April 25 total case count should have been approximately 6,230 (i.e., 6,026 + 204) rather than 6,026.

Because states experiencing "low" case rates (defined here as those with fewer than ten new cases per day) may legitimately have days for which no new cases are reported (which would cause an accurate duplication in the previous day's total case count), records for which the 7-day moving average (for case rate) is fewer than ten are omitted from this table.

State	Duplication Date	Total Cases	7-Day Avg
Alabama	04-25-2020	6,026	204.7
Arkansas	03-17-2020	22	12.9
Arkansas	05-09-2020	3,747	91.3
Colorado	03-17-2020	160	44.9
Colorado	04-09-2020	5,655	336.7
Colorado	04-20-2020	9,730	427.4
Connecticut	03-18-2020	68	24.6
Connecticut	03-21-2020	194	78.6
Connecticut	04-08-2020	7,781	890.6
Connecticut	05-03-2020	29,287	604.0
Delaware	04-19-2020	2,538	169.4
Delaware	05-10-2020	6,277	167.7
Delaware	05-23-2020	8,529	147.0
Hawaii	03-29-2020	149	19.0
Hawaii	04-08-2020	410	16.3
Hawaii	04-10-2020	442	16.7
Idaho	04-27-2020	1,897	21.1
Idaho	04-29-2020	1,952	24.9
Idaho	05-03-2020	2,061	29.4
Idaho	05-08-2020	2,178	22.0
Idaho	05-13-2020	2,293	30.6

Idaho	05-15-2020	2,351	27.9
Idaho	05-17-2020	2,419	30.4
Idaho	05-19-2020	2,455	34.9
Idaho	05-21-2020	2,506	29.6
Idaho	05-23-2020	2,595	24.4
Idaho	05-25-2020	2,626	37.7
Idaho	05-26-2020	2,626	25.0
Idaho	05-29-2020	2,770	30.4
Kentucky	04-03-2020	770	68.0
Kentucky	04-06-2020	955	81.6
Kentucky	04-08-2020	1,149	110.9
Kentucky	04-11-2020	1,693	128.4
Kentucky	05-10-2020	6,440	131.3
Kentucky	05-13-2020	6,853	178.3
Kentucky	05-17-2020	7,688	187.7
Kentucky	05-24-2020	8,571	130.0
Kentucky	05-25-2020	8,571	128.4
Louisiana	05-23-2020	36,925	430.9
Louisiana	05-29-2020	38,802	361.7
Maine	04-01-2020	303	35.0
Maine	04-25-2020	965	21.7
Massachusetts	03-07-2020	7	12.9
Massachusetts	03-09-2020	24	15.1
Massachusetts	03-18-2020	218	55.3
Massachusetts	04-20-2020	38,077	1,977.4
Minnesota	04-13-2020	1,621	81.3
Minnesota	04-16-2020	1,809	105.0
Montana	03-23-2020	34	11.3
New Hampshire	03-20-2020	44	12.0
New Hampshire	03-24-2020	101	16.3
New Hampshire	04-07-2020	715	48.6
New Hampshire	04-10-2020	819	38.6
New Hampshire	04-16-2020	1,139	65.9
New Hampshire	05-30-2020	4,492	74.0
New Jersey	03-13-2020	29	24.7
New Jersey	03-18-2020	267	179.7
New Mexico	03-21-2020	43	11.0
New Mexico	03-26-2020	113	25.7
New Mexico	03-30-2020	237	39.3

New Mexico	04-04-2020	534	80.1
New Mexico	04-16-2020	1,484	85.7
New Mexico	04-21-2020	1,971	132.0
New Mexico	05-23-2020	6,625	134.0
North Dakota	04-17-2020	393	42.3
Oklahoma	04-18-2020	2,465	89.0
Oregon	03-21-2020	114	20.6
Oregon	04-04-2020	899	63.1
Oregon	04-06-2020	1,068	70.7
Rhode Island	04-10-2020	1,727	226.1
Rhode Island	04-13-2020	2,665	257.4
Rhode Island	04-15-2020	3,251	306.0
Rhode Island	05-25-2020	14,065	131.9
South Carolina	03-18-2020	47	21.7
South Carolina	03-26-2020	424	82.6
South Carolina	04-08-2020	2,417	184.9
South Dakota	05-21-2020	4,177	82.3
Tennessee	04-15-2020	5,827	208.1
Tennessee	04-22-2020	7,394	371.4
Tennessee	05-20-2020	18,412	360.3
Utah	03-18-2020	51	18.0
Utah	04-01-2020	888	119.0
Vermont	03-21-2020	29	11.9
Virginia	05-06-2020	20,257	779.7
Washington	03-09-2020	128	53.1
Washington	05-23-2020	19,265	195.7
West Virginia	04-25-2020	1,010	26.7
West Virginia	05-09-2020	1,323	18.9
West Virginia	05-19-2020	1,502	36.9
West Virginia	05-23-2020	1,705	38.9
West Virginia	05-26-2020	1,774	35.1
Puerto Rico	04-03-2020	316	48.4

Duplicate State Death Totals

On some days, the recorded total death count for a state remained constant from the previous day (akin to the previous table that depicts duplicate total case counts). The following table lists state death totals that were reported identically on consecutive days by JHU. The 7-day moving average of the death rate is also demonstrated to advise the approximate increase in deaths that should have been expected.

State	Duplication Date	Total Deaths	7-Day Avg
Arizona	04-27-2020	275	10.1
Arizona	05-02-2020	330	17.1
Arizona	05-04-2020	362	18.6
Arizona	05-24-2020	801	12.4
Colorado	04-01-2020	69	11.4
Colorado	04-09-2020	193	21.3
Colorado	04-20-2020	420	28.1
Connecticut	05-03-2020	2,436	78.4
Illinois	04-09-2020	462	63.7
Iowa	05-25-2020	456	13.7
Louisiana	05-23-2020	2,668	17.3
Louisiana	05-25-2020	2,691	16.0
Massachusetts	04-14-2020	844	92.3
Massachusetts	04-16-2020	1,108	135.7
Massachusetts	04-20-2020	1,706	178.9
North Carolina	05-19-2020	693	15.4
Rhode Island	04-15-2020	80	11.6
Rhode Island	05-25-2020	608	17.3
Virginia	04-07-2020	66	10.7
Virginia	04-08-2020	66	11.1
Virginia	05-06-2020	713	30.0

Negative Case Rates

Case rates cannot be negative but for some records the cumulative case count erroneously decreases from one day to the next, likely representing that case counts were initially overreported, subsequently corrected for future days, and yet never corrected retroactively. The following table demonstrates days on which state case rates were negative and includes (parenthetically) the observed decrease.

State	Date	Total Cases (and Decrease)
Arizona	04-09-2020	3,018 (-18)
California	02-22-2020	10 (-5)
Connecticut	03-08-2020	1 (-1)
Connecticut	05-27-2020	41,288 (-15)
District of Columbia	03-23-2020	120 (-84)
Georgia	03-08-2020	5 (-1)
Hawaii	05-14-2020	637 (-1)
Hawaii	05-22-2020	642 (-5)
Kentucky	05-02-2020	4,879 (-3)

Montana	05-05-2020	456 (-1)
Nebraska	03-06-2020	1 (-10)
Nebraska	05-17-2020	10,177 (-43)
Nevada	03-18-2020	55 (-1)
Nevada	04-11-2020	2,702 (-20)
Nevada	04-27-2020	4,700 (-34)
Nevada	05-10-2020	6,120 (-51)
New Hampshire	03-09-2020	5 (-1)
New Hampshire	03-10-2020	4 (-1)
New Hampshire	04-02-2020	316 (-51)
New Hampshire	04-14-2020	922 (-63)
New Mexico	04-09-2020	865 (-37)
North Dakota	05-26-2020	2,422 (-35)
South Carolina	04-21-2020	4,439 (-7)
Tennessee	04-17-2020	6,263 (-112)
Texas	02-22-2020	1 (-2)
Texas	03-10-2020	13 (-1)
Utah	03-20-2020	78 (-2)
Vermont	05-11-2020	926 (-1)
Washington	03-18-2020	1,014 (-62)
Washington	04-20-2020	12,114 (-141)
West Virginia	05-06-2020	1,242 (-4)
Puerto Rico	04-22-2020	1,252 (-46)
Puerto Rico	04-24-2020	1,276 (-140)
Virgin Islands	03-20-2020	3 (-2)

Negative Death Rates

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State	Date	Total Deaths (and Decrease)
Alabama	05-02-2020	288 (-1)
District of Columbia	04-07-2020	22 (-2)
Hawaii	03-25-2020	0 (-1)
Idaho	05-12-2020	69 (-1)
Indiana	05-02-2020	1,115 (-60)
Kentucky	04-14-2020	106 (-7)

Maryland	05-01-2020	1,080 (-60)
Missouri	04-28-2020	330 (-13)
Missouri	05-27-2020	689 (-4)
Montana	04-03-2020	5 (-1)
Nebraska	05-08-2020	90 (-1)
Nevada	05-08-2020	294 (-3)
Nevada	05-10-2020	310 (-3)
Nevada	05-24-2020	380 (-7)
Tennessee	04-24-2020	169 (-2)
Tennessee	05-07-2020	238 (-1)
Utah	04-13-2020	13 (-5)
Vermont	05-04-2020	52 (-1)
Virginia	03-30-2020	15 (-5)
Puerto Rico	04-22-2020	63 (-1)

"Unassigned" Cases

Since March 22, JHU COVID-19 data have been reported at the county level for all states (although at the territory level for all US territories), with county FIPS codes included for the vast majority of all US records. However, some records instead have "Unassigned" or "Out of [state abbreviation]" in the Admin2 (i.e., county) column and no value (or an arbitrary value) in the FIPS column. In other words, the cases and deaths in these records can be attributed to a specific state, but not to a county therein, which hampers and can confound county-level analysis.

Unassigned cases result when the county may be unknown or ambiguous. The Seattle Times reported that "Cases are assigned to a county by the labs that conduct the tests, but may not match the jurisdiction designation by the county or DOH until the discrepancy is resolved. These cases are labeled "unassigned" until officials have further information." (https://www.seattletimes.com/seattle-news/health/interactive-map-coronavirus-pandemic-track -outbreak-washington-united-states-world/).

Unassigned cases may represent cases that are newly reported and will be rapidly assigned to their respective counties. In this scenario, the Unassigned bucket could be conceptualized as a brief holding zone through which cases pass, which could delay case rate increases (or decreases) in county-level reporting, but not especially skew trends. In this scenario, you would expect the number of Unassigned cases (for a specific county) to remain fairly stable over time, to decrease as the county's case rate decreases, and to hit and remain at zero when a county is no longer incurring new cases.

Conversely, and much more pernicious to anyone seeking to understand COVID-19 county-level statistics, Unassigned cases could also represent cases that had persisted as Unassigned for several weeks or even months and which would never be assigned to their respective counties. For example, an analysis from May 25 JHU data depicting whether Georgia counties were increasing or decreasing in their respective case rates would omit 2,294 Unassigned Georgia cases, which represents more than three days (on average in May) of new Georgia cases. And if the likelihood of a case being Unassigned varies predictably by county, some counties' data could be grossly underrepresented when depicted at the county level because retroactive county-level corrections are not made to the JHU CSV files.

When large bottlenecks of Unassigned cases arise, confusion can also erupt when the cases are finally adjudicated and assigned to specific counties. For example, Georgia fortunately took tremendous strides to reduce its high number of Unassigned cases, reducing these from 2,294 to 1,790 on May 26, and to 1,372 on May 27. However, this good work on the part of Georgia also effectively flooded its counties with "new" cases, despite some of these cases having first been reported (as Unassigned) days if not weeks before. For example, Georgia JHU data recorded 583 new cases statewide on May 26; however, because the number of Unassigned cases had also been reduced by 504 cases on May 26, Georgia recorded 1,156 "new" cases assigned to specific counties on May 26 (rather than 583), providing no method to determine (at least through JHU data) the true onset dates of these 504 cases. Thus, even as states make headway and resolve bottlenecks of Unassigned cases, the damage has already been done and these delays can significantly skew county-level trends.

The following table records the total number of Unassigned cases for each state on 06-02-2020, as well as the 05-30-2020 7-day moving average of Unassigned cases (which is calculated from records spanning 05-27-2020 to 06-02-2020). The 05-30-2020 7-day moving average for the current case rate is also listed, as well as the ratio of current Unassigned cases to daily case rate (7-day average) for all cases. Larger ratios demonstrate those states that may have more significant Unassigned bottlenecks, and whose county-level data may be commensurately more incomplete or unreliable.

State	Unassigned Cases (7-Day Avg)	Case Rate 7-Day Avg (Ratio)
Alabama	292 (96.6)	445.1 (65.6%)
Alaska	0 (0.0)	10.9 (0.0%)
Arizona	0 (0.0)	628.6 (0.0%)
Arkansas	203 (192.7)	234.0 (86.8%)
California	0 (0.0)	2,546.9 (0.0%)
Colorado	0 (0.0)	317.4 (0.0%)
Connecticut	251 (231.9)	239.4 (104.8%)
Delaware	53 (52.7)	88.4 (59.9%)

District of Columbia	0 (0.0)	78.9 (0.0%)
Florida	87 (84.7)	741.7 (11.7%)
Georgia	1,561 (1,384.0)	603.4 (258.7%)
Hawaii	0 (0.0)	1.4 (0.0%)
Idaho	0 (0.4)	43.9 (0.0%)
Illinois	147 (112.7)	1,379.0 (10.7%)
Indiana	0 (0.0)	451.3 (0.0%)
Iowa	3 (3.0)	330.9 (0.9%)
Kansas	0 (0.0)	109.4 (0.0%)
Kentucky	7 (16.6)	176.3 (4.0%)
Louisiana	85 (84.1)	384.6 (22.1%)
Maine	1 (2.9)	38.3 (2.6%)
Maryland	0 (0.0)	926.9 (0.0%)
Massachusetts	319 (315.3)	1,067.1 (29.9%)
Michigan	12 (12.1)	375.3 (3.2%)
Minnesota	83 (81.0)	506.9 (16.4%)
Mississippi	0 (0.0)	330.0 (0.0%)
Missouri	0 (0.0)	205.1 (0.0%)
Montana	0 (0.0)	6.3 (0.0%)
Nebraska	215 (208.1)	285.3 (75.4%)
Nevada	0 (0.0)	114.4 (0.0%)
New Hampshire	10 (7.7)	74.0 (13.5%)
New Jersey	570 (442.3)	825.9 (69.0%)
New Mexico	342 (235.6)	127.7 (267.8%)
New York	0 (0.0)	1,314.9 (0.0%)
North Carolina	0 (0.0)	795.4 (0.0%)
North Dakota	0 (0.0)	32.0 (0.0%)
Ohio	0 (0.0)	477.7 (0.0%)
Oklahoma	0 (6.1)	79.1 (0.0%)
Oregon	0 (0.0)	52.6 (0.0%)
Pennsylvania	0 (0.0)	635.3 (0.0%)
Rhode Island	2,041 (1,737.0)	128.9 (1583.9%)
South Carolina	0 (0.0)	285.6 (0.0%)
South Dakota	0 (0.1)	59.1 (0.0%)
Tennessee	161 (92.3)	492.4 (32.7%)
Texas	0 (0.0)	1,440.0 (0.0%)
Utah	0 (0.0)	226.0 (0.0%)
Vermont	5 (5.1)	3.0 (166.7%)
Virginia	0 (0.0)	985.3 (0.0%)

Washington	27 (56.1)	282.3 (9.6%)
West Virginia	0 (0.1)	40.3 (0.0%)
Wisconsin	0 (0.0)	436.3 (0.0%)
Wyoming	0 (0.0)	8.9 (0.0%)
American Samoa	0 (0.0)	0.0 (0.0%)
Guam	0 (0.0)	1.1 (0.0%)
Northern Mariana Islands	0 (0.0)	0.1 (0.0%)
Puerto Rico	0 (0.0)	87.3 (0.0%)
Virgin Islands	0 (0.0)	0.1 (0.0%)

Taking a current example from the preceding table, as of 06-02-2020, Rhode Island had 2,041 total cases for which the county was Unassigned. Contrasted with Rhode Island's case rate (7-day moving average) of 128.9 new cases per day, this yields a ratio of 1583.9%. This percentage equates to approximately 15.8 days' worth of cases (at the current case rate) being Unassigned. To put this another way, as of 06-02-2020, Rhode Island had 15,112 total COVID-19 cases, 13.5% of which the county remained Unassigned.

"Unassigned" Deaths

Unassigned deaths represent those deaths for which the state but not the county is known. Please see the previous section for more information about Unassigned cases and deaths, as well as the risks they pose to longitudinal analysis of COVID-19 data.

The following table records the total number of Unassigned deaths for each state on 06-02-2020, as well as the 05-30-2020 7-day moving average of Unassigned deaths (which is calculated from records spanning 05-27-2020 to 06-02-2020). The 05-30-2020 7-day moving average for the current death rate is also listed, as well as the ratio of current Unassigned deaths to daily death rate (7-day average) for all deaths. Larger ratios demonstrate those states that may have more significant Unassigned bottlenecks, and whose county-level data may be commensurately more incomplete or unreliable.

State	Unassigned Deaths (7-Day Avg)	Death Rate 7-Day Avg (Ratio)
Alabama	2 (0.6)	10.4 (19.2%)
Alaska	0 (0.0)	0.0 (0.0%)
Arizona	3 (3.0)	19.0 (15.8%)
Arkansas	0 (0.0)	2.4 (0.0%)
California	0 (0.0)	69.4 (0.0%)
Colorado	0 (0.0)	17.4 (0.0%)
Connecticut	0 (0.1)	29.0 (0.0%)
Delaware	0 (0.0)	5.4 (0.0%)
District of Columbia	0 (0.0)	4.3 (0.0%)

Florida	0 (0.0)	38.7 (0.0%)
Georgia	0 (0.3)	29.4 (0.0%)
Hawaii	0 (0.0)	0.0 (0.0%)
Idaho	0 (0.0)	0.6 (0.0%)
Illinois	0 (0.0)	86.0 (0.0%)
Indiana	175 (165.7)	27.6 (634.7%)
Iowa	0 (0.0)	12.0 (0.0%)
Kansas	0 (0.0)	1.7 (0.0%)
Kentucky	0 (0.0)	6.9 (0.0%)
Louisiana	111 (106.7)	19.0 (584.2%)
Maine	0 (0.0)	2.1 (0.0%)
Maryland	55 (56.7)	37.7 (145.8%)
Massachusetts	12 (8.0)	87.4 (13.7%)
Michigan	0 (0.0)	41.0 (0.0%)
Minnesota	10 (10.0)	24.9 (40.2%)
Mississippi	0 (0.0)	16.4 (0.0%)
Missouri	0 (0.0)	13.3 (0.0%)
Montana	0 (0.0)	0.0 (0.0%)
Nebraska	35 (31.0)	3.3 (1065.2%)
Nevada	2 (2.0)	3.3 (60.9%)
New Hampshire	0 (15.9)	6.0 (0.0%)
New Jersey	0 (0.0)	82.4 (0.0%)
New Mexico	0 (0.0)	6.0 (0.0%)
New York	0 (0.0)	95.1 (0.0%)
North Carolina	0 (0.0)	22.9 (0.0%)
North Dakota	0 (5.4)	1.6 (0.0%)
Ohio	0 (0.0)	36.7 (0.0%)
Oklahoma	0 (0.0)	3.0 (0.0%)
Oregon	0 (0.0)	1.3 (0.0%)
Pennsylvania	0 (0.0)	72.0 (0.0%)
Rhode Island	732 (700.9)	14.0 (5228.6%)
South Carolina	0 (0.0)	7.9 (0.0%)
South Dakota	0 (0.0)	1.7 (0.0%)
Tennessee	0 (0.0)	5.4 (0.0%)
Texas	0 (0.0)	24.3 (0.0%)
Utah	0 (0.0)	1.7 (0.0%)
Vermont	0 (0.0)	0.1 (0.0%)
Virginia	0 (0.0)	24.4 (0.0%)
Washington	0 (0.0)	7.3 (0.0%)

West Virginia	0 (0.0)	0.9 (0.0%)
Wisconsin	0 (0.0)	12.9 (0.0%)
Wyoming	16 (14.7)	0.6 (2800.0%)
American Samoa	0 (0.0)	0.0 (0.0%)
Guam	0 (0.0)	0.0 (0.0%)
Northern Mariana Islands	0 (0.0)	0.0 (0.0%)
Puerto Rico	0 (0.0)	1.3 (0.0%)
Virgin Islands	0 (0.0)	0.0 (0.0%)

Taking a current example from the preceding table, as of 06-02-2020, Rhode Island had 732 total deaths for which the county was Unassigned. Contrasted with Rhode Island's death rate (7-day moving average) of 14.0 new deaths per day, this yields a ratio of 5228.6%. This percentage equates to approximately 52.3 days' worth of deaths (at the current death rate) being Unassigned. To put this another way, as of 06-02-2020, Rhode Island had 732 total COVID-19 deaths, 100.0% of which the county remained Unassigned.

"Out of State" Cases

Since March 22, most US COVID-19 records have included the county name and county FIPS code for cases and deaths. Unassigned records are one type of exception in which the county is unknown (presumably because the record is being processed), whereas "Out of [state abbreviation]" is a second type of exception that omits county. For example, some Georgia records will record "Out of GA" in the Admin2 (i.e., county) column rather than a legitimate county. No further explanation for this exception is provided, only that like Unassigned records, "Out of State" records fail to specify a county (and intimate that the record may not even belong to the state to which it is attributed), so these cases pose risk to longitudinal analysis at the county level, and possibly at the state level as well.

The following table displays the total number of "Out of State" cases for each state on 06-02-2020, as well as the 05-30-2020 7-day moving average of "Out of State" cases (which is calculated from records spanning 05-27-2020 to 06-02-2020). The 05-30-2020 7-day moving average for the current case rate is also listed, as well as the ratio of current "Out of State" cases to daily case rate (7-day average) for all cases. Larger ratios demonstrate those states that may have more significant "Out of State" bottlenecks, and whose county-level data may be commensurately more incomplete or unreliable.

State	"Out of State" Cases (7-Day Avg)	Case Rate 7-Day Avg (Ratio)
Alabama	0 (0.0)	445.1 (0.0%)
Alaska	0 (0.0)	10.9 (0.0%)
Arizona	0 (0.0)	628.6 (0.0%)
Arkansas	0 (0.0)	234.0 (0.0%)

California	0 (0.0)	2,546.9 (0.0%)
Colorado	0 (0.0)	317.4 (0.0%)
Connecticut	0 (0.0)	239.4 (0.0%)
Delaware	0 (0.0)	88.4 (0.0%)
District of Columbia	0 (0.0)	78.9 (0.0%)
Florida	0 (0.0)	741.7 (0.0%)
Georgia	2,144 (2,013.7)	603.4 (355.3%)
Hawaii	10 (10.0)	1.4 (700.0%)
Idaho	0 (0.0)	43.9 (0.0%)
Illinois	115 (139.4)	1,379.0 (8.3%)
Indiana	0 (0.0)	451.3 (0.0%)
Iowa	0 (0.0)	330.9 (0.0%)
Kansas	0 (0.0)	109.4 (0.0%)
Kentucky	0 (0.0)	176.3 (0.0%)
Louisiana	0 (0.0)	384.6 (0.0%)
Maine	0 (0.0)	38.3 (0.0%)
Maryland	0 (0.0)	926.9 (0.0%)
Massachusetts	0 (0.0)	1,067.1 (0.0%)
Michigan	42 (46.9)	375.3 (11.2%)
Minnesota	0 (0.0)	506.9 (0.0%)
Mississippi	0 (0.0)	330.0 (0.0%)
Missouri	0 (0.0)	205.1 (0.0%)
Montana	0 (0.0)	6.3 (0.0%)
Nebraska	0 (0.0)	285.3 (0.0%)
Nevada	0 (0.0)	114.4 (0.0%)
New Hampshire	0 (0.0)	74.0 (0.0%)
New Jersey	0 (0.0)	825.9 (0.0%)
New Mexico	0 (0.0)	127.7 (0.0%)
New York	0 (0.0)	1,314.9 (0.0%)
North Carolina	0 (0.0)	795.4 (0.0%)
North Dakota	0 (0.0)	32.0 (0.0%)
Ohio	0 (0.0)	477.7 (0.0%)
Oklahoma	0 (0.0)	79.1 (0.0%)
Oregon	0 (0.0)	52.6 (0.0%)
Pennsylvania	0 (0.0)	635.3 (0.0%)
Rhode Island	0 (0.0)	128.9 (0.0%)
South Carolina	0 (0.0)	285.6 (0.0%)
South Dakota	0 (0.0)	59.1 (0.0%)
Tennessee	426 (396.7)	492.4 (86.5%)

Texas	0 (0.0)	1,440.0 (0.0%)
Utah	0 (0.0)	226.0 (0.0%)
Vermont	0 (0.0)	3.0 (0.0%)
Virginia	0 (0.0)	985.3 (0.0%)
Washington	0 (0.0)	282.3 (0.0%)
West Virginia	0 (0.0)	40.3 (0.0%)
Wisconsin	0 (0.0)	436.3 (0.0%)
Wyoming	0 (0.0)	8.9 (0.0%)
American Samoa	0 (0.0)	0.0 (0.0%)
Guam	0 (0.0)	1.1 (0.0%)
Northern Mariana Islands	0 (0.0)	0.1 (0.0%)
Puerto Rico	0 (0.0)	87.3 (0.0%)
Virgin Islands	0 (0.0)	0.1 (0.0%)

"Out of State" Deaths

The following table displays the total number of "Out of State" deaths for each state on 06-02-2020, as well as the 05-30-2020 7-day moving average of "Out of State" deaths (which is calculated from records spanning 05-27-2020 to 06-02-2020). The 05-30-2020 7-day moving average for the current death rate is also listed, as well as the ratio of current "Out of State" deaths to daily death rate (7-day average) for all deaths. Larger ratios demonstrate those states that may have more significant "Out of State" bottlenecks, and whose county-level data may be commensurately more incomplete or unreliable.

State	"Out of State" Deaths (7-Day Avg)	Death Rate 7-Day Avg (Ratio)
Alabama	0 (0.0)	10.4 (0.0%)
Alaska	0 (0.0)	0.0 (0.0%)
Arizona	0 (0.0)	19.0 (0.0%)
Arkansas	0 (0.0)	2.4 (0.0%)
California	0 (0.0)	69.4 (0.0%)
Colorado	0 (0.0)	17.4 (0.0%)
Connecticut	0 (0.0)	29.0 (0.0%)
Delaware	0 (0.0)	5.4 (0.0%)
District of Columbia	0 (0.0)	4.3 (0.0%)
Florida	0 (0.0)	38.7 (0.0%)
Georgia	32 (31.7)	29.4 (108.7%)
Hawaii	0 (0.0)	0.0 (0.0%)
Idaho	0 (0.0)	0.6 (0.0%)
Illinois	1 (1.0)	86.0 (1.2%)
Indiana	0 (0.0)	27.6 (0.0%)
Iowa	0 (0.0)	12.0 (0.0%)

Kansas	0 (0.0)	1.7 (0.0%)
Kentucky	0 (0.0)	6.9 (0.0%)
Louisiana	0 (0.0)	19.0 (0.0%)
Maine	0 (0.0)	2.1 (0.0%)
Maryland	0 (0.0)	37.7 (0.0%)
Massachusetts	0 (0.0)	87.4 (0.0%)
Michigan	0 (0.0)	41.0 (0.0%)
Minnesota	0 (0.0)	24.9 (0.0%)
Mississippi	0 (0.0)	16.4 (0.0%)
Missouri	0 (0.0)	13.3 (0.0%)
Montana	0 (0.0)	0.0 (0.0%)
Nebraska	0 (0.0)	3.3 (0.0%)
Nevada	0 (0.0)	3.3 (0.0%)
New Hampshire	0 (0.0)	6.0 (0.0%)
New Jersey	0 (0.0)	82.4 (0.0%)
New Mexico	0 (0.0)	6.0 (0.0%)
New York	0 (0.0)	95.1 (0.0%)
North Carolina	0 (0.0)	22.9 (0.0%)
North Dakota	0 (0.0)	1.6 (0.0%)
Ohio	0 (0.0)	36.7 (0.0%)
Oklahoma	0 (0.0)	3.0 (0.0%)
Oregon	0 (0.0)	1.3 (0.0%)
Pennsylvania	0 (0.0)	72.0 (0.0%)
Rhode Island	0 (0.0)	14.0 (0.0%)
South Carolina	0 (0.0)	7.9 (0.0%)
South Dakota	0 (0.0)	1.7 (0.0%)
Tennessee	4 (4.0)	5.4 (73.7%)
Texas	0 (0.0)	24.3 (0.0%)
Utah	0 (0.0)	1.7 (0.0%)
Vermont	0 (0.0)	0.1 (0.0%)
Virginia	0 (0.0)	24.4 (0.0%)
Washington	0 (0.0)	7.3 (0.0%)
West Virginia	0 (0.0)	0.9 (0.0%)
Wisconsin	0 (0.0)	12.9 (0.0%)
Wyoming	0 (0.0)	0.6 (0.0%)
American Samoa	0 (0.0)	0.0 (0.0%)
Guam	0 (0.0)	0.0 (0.0%)
Northern Mariana Islands	0 (0.0)	0.0 (0.0%)
Puerto Rico	0 (0.0)	1.3 (0.0%)

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        Virgin Islands              0 (0.0)            0.0 (0.0%)
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II. County-Level Analysis

County names and county FIPS codes began being reliably reported within JHU files on March 22, so this section evaluates records occurring only on or after that date. All county names are provided by the US Census, as derived from county FIPS code, so subtle discrepancies may exist between the county name in this report and the raw JHU records.

Date on Which a County's COVID-19 Last Record Appeared

This table demonstrates counties not represented in the current JHU CSV file, and lists the last date on which each county was observed. Some counties have disappeared because they were absorbed into multi-county regions (such as is common in Utah), whereas other counties disappeared because they no longer have COVID-19 cases. For reference, the last-observed cumulative case and death counts are provided for each county.

County	Date of Last Record	Cases	Deaths
Aleutians East Borough, AK	03-30-2020	0	0
Aleutians West Census Area, AK	03-30-2020	0	0
Bristol Bay Borough, AK	03-30-2020	0	0
Denali Borough, AK	03-30-2020	0	0
Dillingham Census Area, AK	03-30-2020	0	0
Haines Borough, AK	03-30-2020	0	0
Hoonah-Angoon Census Area, AK	03-30-2020	0	0
Kusilvak Census Area, AK	03-30-2020	0	0
Lake and Peninsula Borough, AK	03-30-2020	0	0
Skagway Municipality, AK	03-30-2020	0	0
Valdez-Cordova Census Area, AK	03-30-2020	0	0
Wrangell City and Borough, AK	03-30-2020	0	0
Yakutat City and Borough, AK	03-30-2020	0	0
Calhoun County, AR	03-30-2020	0	0
Modoc County, CA	03-30-2020	0	0
Dolores County, CO	03-30-2020	0	0
Jackson County, CO	03-30-2020	0	0
Kiowa County, CO	03-30-2020	0	0
Sedgwick County, CO	03-30-2020	0	0
Kalawao County, HI	03-30-2020	0	0
Bear Lake County, ID	03-30-2020	0	0
Boise County, ID	03-30-2020	0	0
Butte County, ID	03-30-2020	0	0

Clark County, ID	03-30-2020	0	0
Clearwater County, ID	03-30-2020	0	0
Oneida County, ID	03-30-2020	0	0
Shoshone County, ID	03-30-2020	0	0
Scott County, IL	03-30-2020	0	0
Decatur County, KS	03-30-2020	0	0
Graham County, KS	03-30-2020	0	0
Greeley County, KS	03-30-2020	0	0
Kingman County, KS	03-30-2020	0	0
Lincoln County, KS	03-30-2020	0	0
Logan County, KS	03-30-2020	0	0
Marshall County, KS	03-30-2020	0	0
Pawnee County, KS	03-30-2020	0	0
Rawlins County, KS	03-30-2020	0	0
Rush County, KS	03-30-2020	0	0
Russell County, KS	03-30-2020	0	0
Thomas County, KS	03-30-2020	0	0
Wallace County, KS	03-30-2020	0	0
Wichita County, KS	05-17-2020	1	0
Robertson County, KY	03-30-2020	0	0
Dukes County, MA	03-30-2020	0	0
Nantucket County, MA	03-30-2020	0	0
Alger County, MI	03-30-2020	0	0
Keweenaw County, MI	03-30-2020	0	0
Cook County, MN	03-30-2020	0	0
Lake of the Woods County, MN	03-30-2020	0	0
Issaquena County, MS	03-30-2020	0	0
Barton County, MO	03-30-2020	0	0
Dade County, MO	03-30-2020	0	0
Dent County, MO	03-30-2020	0	0
Douglas County, MO	03-30-2020	0	0
Grundy County, MO	03-30-2020	0	0
Hickory County, MO	03-30-2020	0	0
Knox County, MO	03-30-2020	0	0
Mercer County, MO	03-30-2020	0	0
Monroe County, MO	03-30-2020	0	0
Ozark County, MO	03-30-2020	0	0
Putnam County, MO	03-30-2020	0	0
Schuyler County, MO	03-30-2020	0	0

Shannon County, MO	03-30-2020	0	0
Wayne County, MO	03-30-2020	0	0
Blaine County, MT	03-30-2020	0	0
Carter County, MT	03-30-2020	0	0
Chouteau County, MT	03-30-2020	0	0
Custer County, MT	03-30-2020	0	0
Daniels County, MT	03-30-2020	0	0
Dawson County, MT	03-30-2020	0	0
Fallon County, MT	03-30-2020	0	0
Garfield County, MT	03-30-2020	0	0
Granite County, MT	03-30-2020	0	0
Judith Basin County, MT	03-30-2020	0	0
McCone County, MT	03-30-2020	0	0
Mineral County, MT	03-30-2020	0	0
Petroleum County, MT	03-30-2020	0	0
Phillips County, MT	03-30-2020	0	0
Powder River County, MT	03-30-2020	0	0
Powell County, MT	03-30-2020	0	0
Prairie County, MT	03-30-2020	0	0
Sanders County, MT	03-30-2020	0	0
Sheridan County, MT	03-30-2020	0	0
Sweet Grass County, MT	03-30-2020	0	0
Teton County, MT	03-30-2020	0	0
Treasure County, MT	03-30-2020	0	0
Valley County, MT	03-30-2020	0	0
Wibaux County, MT	03-30-2020	0	0
Banner County, NE	03-30-2020	0	0
Blaine County, NE	03-30-2020	0	0
Brown County, NE	03-30-2020	0	0
Deuel County, NE	03-30-2020	0	0
Dundy County, NE	03-30-2020	0	0
Grant County, NE	03-30-2020	0	0
Hayes County, NE	03-30-2020	0	0
Loup County, NE	03-30-2020	0	0
Pawnee County, NE	03-30-2020	0	0
Perkins County, NE	03-30-2020	0	0
Rock County, NE	03-30-2020	0	0
Sioux County, NE	03-30-2020	0	0
Wheeler County, NE	03-30-2020	0	0

Esmeralda County, NV	03-30-2020	0	0
Mora County, NM	03-30-2020	0	0
Bronx County, NY	03-30-2020	0	0
Kings County, NY	03-30-2020	0	0
Queens County, NY	03-30-2020	0	0
Richmond County, NY	03-30-2020	0	0
Adams County, ND	03-30-2020	0	0
Billings County, ND	03-30-2020	0	0
Cavalier County, ND	03-30-2020	0	0
Golden Valley County, ND	03-30-2020	0	0
Hettinger County, ND	03-30-2020	0	0
Kidder County, ND	03-30-2020	0	0
LaMoure County, ND	03-30-2020	0	0
Logan County, ND	03-30-2020	0	0
Sheridan County, ND	03-30-2020	0	0
Towner County, ND	03-30-2020	0	0
Ellis County, OK	03-30-2020	0	0
Harmon County, OK	03-30-2020	0	0
Roger Mills County, OK	03-30-2020	0	0
Gilliam County, OR	03-30-2020	0	0
Wheeler County, OR	03-30-2020	0	0
Bennett County, SD	03-30-2020	0	0
Campbell County, SD	03-30-2020	0	0
Custer County, SD	03-30-2020	0	0
Haakon County, SD	03-30-2020	0	0
Hanson County, SD	03-30-2020	0	0
Harding County, SD	03-30-2020	0	0
Jones County, SD	03-30-2020	0	0
Mellette County, SD	03-30-2020	0	0
Perkins County, SD	03-30-2020	0	0
Potter County, SD	03-30-2020	0	0
Baylor County, TX	03-30-2020	0	0
Borden County, TX	03-30-2020	0	0
Crockett County, TX	03-30-2020	0	0
Culberson County, TX	03-30-2020	0	0
Edwards County, TX	03-30-2020	0	0
Foard County, TX	03-30-2020	0	0
Jeff Davis County, TX	03-30-2020	0	0
Kenedy County, TX	03-30-2020	0	0

Kent County, TX	03-30-2020	0	0
King County, TX	03-30-2020	0	0
Loving County, TX	03-30-2020	0	0
McMullen County, TX	03-30-2020	0	0
Menard County, TX	03-30-2020	0	0
Real County, TX	03-30-2020	0	0
Schleicher County, TX	03-30-2020	0	0
Somervell County, TX	03-30-2020	0	0
Sterling County, TX	03-30-2020	0	0
Stonewall County, TX	03-30-2020	0	0
Sutton County, TX	03-30-2020	0	0
Terrell County, TX	03-30-2020	0	0
Throckmorton County, TX	03-30-2020	0	0
Upton County, TX	03-30-2020	0	0
Beaver County, UT	03-30-2020	0	0
Cache County, UT	04-16-2020	37	0
Carbon County, UT	04-16-2020	2	0
Daggett County, UT	03-30-2020	0	0
Duchesne County, UT	04-16-2020	3	0
Emery County, UT	04-16-2020	3	0
Garfield County, UT	04-16-2020	1	0
Grand County, UT	04-16-2020	1	0
Iron County, UT	04-16-2020	15	0
Juab County, UT	03-30-2020	0	0
Kane County, UT	04-16-2020	3	0
Millard County, UT	03-30-2020	0	0
Morgan County, UT	03-30-2020	0	0
Piute County, UT	03-30-2020	0	0
Rich County, UT	03-30-2020	0	0
Sanpete County, UT	03-30-2020	0	0
Sevier County, UT	03-30-2020	0	0
Uintah County, UT	04-16-2020	6	0
Washington County, UT	04-18-2020	77	1
Wayne County, UT	03-30-2020	0	0
Weber County, UT	04-18-2020	112	1
Doddridge County, WV	03-30-2020	0	0
Webster County, WV	03-30-2020	0	0

Duplicate County Case Totals

On some days, the recorded total case count for a county remained constant from the previous day. When COVID-19 case rates are low, this perseveration could be accurate, indicating that no new cases were reported on that day. However, at higher case rates, this omission indicates that new cases occurred but were not initially reported to or by JHU (but may have been reported on a later date).

The following table lists county case totals that were reported identically on consecutive days by JHU. The 7-day moving average of the case rate is also demonstrated to advise the approximate increase in cases that should have been expected.

Because counties experiencing "low" case rates (defined here as those with fewer than ten new cases per day) may legitimately have days for which no new cases are reported (which would cause an accurate duplication in the previous day's total case count), records for which the 7-day moving average (for case rate) is fewer than ten are omitted from this table.

County	Duplication Date	Total Cases	7-Day Avg
Jefferson County, AL	04-25-2020	797	23.3
Jefferson County, AL	04-27-2020	839	15.4
Marshall County, AL	04-25-2020	267	17.0
Mobile County, AL	04-25-2020	845	40.0
Tuscaloosa County, AL	05-17-2020	345	18.4
Apache County, AZ	05-25-2020	1,191	24.1
Pima County, AZ	04-07-2020	415	37.6
Yuma County, AZ	05-17-2020	363	25.1
Yuma County, AZ	05-19-2020	443	28.3
Yuma County, AZ	05-22-2020	508	32.4
Yuma County, AZ	05-25-2020	670	61.1
Yuma County, AZ	05-29-2020	936	66.7
Jefferson County, AR	05-09-2020	226	10.6
Jefferson County, AR	05-18-2020	491	28.6
Lincoln County, AR	04-14-2020	56	12.0
Lincoln County, AR	04-21-2020	258	87.6
Lincoln County, AR	05-09-2020	907	12.7
Pulaski County, AR	05-09-2020	603	10.7
St. Francis County, AR	05-09-2020	108	30.0
Alameda County, CA	03-25-2020	135	31.4
Alameda County, CA	03-28-2020	220	25.4
Alameda County, CA	04-01-2020	313	31.9
Alameda County, CA	04-04-2020	443	45.9
Alameda County, CA	04-09-2020	674	39.9

Alameda County, CA	04-14-2020	888	42.4
Contra Costa County, CA	03-29-2020	168	20.1
Contra Costa County, CA	04-04-2020	307	32.9
Contra Costa County, CA	04-14-2020	552	19.6
Contra Costa County, CA	05-11-2020	1,048	12.9
Fresno County, CA	04-13-2020	201	15.6
Fresno County, CA	04-20-2020	315	22.0
Fresno County, CA	04-25-2020	443	21.0
Fresno County, CA	04-27-2020	458	17.0
Fresno County, CA	04-30-2020	538	25.0
Fresno County, CA	05-02-2020	615	24.9
Fresno County, CA	05-04-2020	633	34.1
Fresno County, CA	05-07-2020	777	36.0
Fresno County, CA	05-13-2020	984	45.0
Fresno County, CA	05-15-2020	1,074	35.3
Fresno County, CA	05-18-2020	1,192	37.7
Fresno County, CA	05-21-2020	1,338	36.6
Fresno County, CA	05-26-2020	1,482	40.9
Fresno County, CA	05-29-2020	1,658	37.3
Imperial County, CA	04-19-2020	155	11.1
Imperial County, CA	04-25-2020	251	15.6
Imperial County, CA	04-26-2020	251	17.7
Imperial County, CA	04-30-2020	319	15.3
Imperial County, CA	05-03-2020	358	14.3
Imperial County, CA	05-09-2020	512	29.0
Imperial County, CA	05-10-2020	512	32.6
Imperial County, CA	05-16-2020	786	42.7
Imperial County, CA	05-17-2020	786	48.3
Imperial County, CA	05-22-2020	1,076	56.9
Imperial County, CA	05-24-2020	1,145	52.4
Imperial County, CA	05-27-2020	1,352	69.9
Imperial County, CA	05-30-2020	1,634	63.7
Kings County, CA	05-07-2020	233	16.7
Kings County, CA	05-12-2020	319	16.3
Kings County, CA	05-18-2020	399	15.6
Kings County, CA	05-20-2020	416	19.1
Los Angeles County, CA	03-28-2020	1,465	336.7
Marin County, CA	05-21-2020	343	10.1
Marin County, CA	05-29-2020	436	11.4

Monterey County, CA	05-27-2020	429	19.7
Riverside County, CA	04-01-2020	371	65.0
Riverside County, CA	04-03-2020	493	93.6
Riverside County, CA	04-13-2020	1,619	117.9
Riverside County, CA	04-15-2020	1,961	146.6
Riverside County, CA	04-18-2020	2,457	126.6
Riverside County, CA	04-21-2020	2,847	122.6
Riverside County, CA	04-25-2020	3,315	126.9
Riverside County, CA	05-02-2020	4,079	102.7
Riverside County, CA	05-08-2020	4,756	119.3
Riverside County, CA	05-10-2020	4,992	82.3
Riverside County, CA	05-13-2020	5,248	89.4
Riverside County, CA	05-16-2020	5,618	115.0
Riverside County, CA	05-17-2020	5,618	133.7
Riverside County, CA	05-23-2020	6,464	155.1
Riverside County, CA	05-24-2020	6,464	136.4
Riverside County, CA	05-27-2020	7,139	146.0
Riverside County, CA	05-30-2020	7,486	145.1
Sacramento County, CA	03-26-2020	113	15.9
Sacramento County, CA	03-28-2020	164	19.4
Sacramento County, CA	03-29-2020	164	15.9
Sacramento County, CA	03-31-2020	224	32.3
Sacramento County, CA	04-01-2020	224	32.3
Sacramento County, CA	04-04-2020	390	43.0
Sacramento County, CA	04-09-2020	580	37.9
Sacramento County, CA	04-11-2020	653	41.6
Sacramento County, CA	04-25-2020	1,019	14.1
San Bernardino County, CA	03-27-2020	54	13.4
San Bernardino County, CA	03-29-2020	76	20.7
San Bernardino County, CA	04-12-2020	810	61.4
San Bernardino County, CA	04-15-2020	977	58.4
San Bernardino County, CA	04-22-2020	1,489	63.9
San Bernardino County, CA	04-25-2020	1,666	48.3
San Bernardino County, CA	05-03-2020	2,182	72.0
San Bernardino County, CA	05-04-2020	2,182	72.0
San Bernardino County, CA	05-10-2020	2,902	103.0
San Bernardino County, CA	05-25-2020	4,365	132.9
San Bernardino County, CA	05-27-2020	4,567	126.4
San Diego County, CA	04-26-2020	2,943	134.4

San Diego County, CA	04-30-2020	3,432	140.6
San Diego County, CA	05-04-2020	3,927	126.7
San Diego County, CA	05-07-2020	4,319	121.3
San Diego County, CA	05-13-2020	5,161	142.9
San Diego County, CA	05-15-2020	5,391	110.1
San Diego County, CA	05-18-2020	5,836	107.0
San Diego County, CA	05-21-2020	6,140	103.3
San Diego County, CA	05-24-2020	6,559	106.0
San Diego County, CA	05-29-2020	7,100	111.4
San Joaquin County, CA	05-25-2020	752	15.6
San Joaquin County, CA	05-27-2020	771	15.1
San Joaquin County, CA	05-30-2020	858	30.1
San Mateo County, CA	03-31-2020	309	35.3
San Mateo County, CA	04-12-2020	652	18.6
San Mateo County, CA	04-19-2020	838	30.1
San Mateo County, CA	04-26-2020	1,019	25.4
San Mateo County, CA	05-03-2020	1,233	29.3
San Mateo County, CA	05-10-2020	1,425	24.9
San Mateo County, CA	05-17-2020	1,602	26.0
San Mateo County, CA	05-24-2020	1,833	38.0
San Mateo County, CA	05-25-2020	1,833	40.6
Santa Barbara County, CA	05-04-2020	514	18.3
Santa Barbara County, CA	05-07-2020	613	105.1
Santa Barbara County, CA	05-10-2020	1,250	108.3
Santa Barbara County, CA	05-13-2020	1,371	24.0
Santa Barbara County, CA	05-15-2020	1,387	16.0
Santa Barbara County, CA	05-18-2020	1,474	19.0
Santa Barbara County, CA	05-21-2020	1,520	11.0
Santa Barbara County, CA	05-24-2020	1,551	12.0
Santa Barbara County, CA	05-25-2020	1,551	16.6
Santa Barbara County, CA	05-26-2020	1,551	13.7
Santa Barbara County, CA	05-29-2020	1,636	14.0
Santa Clara County, CA	04-03-2020	1,019	51.3
Santa Clara County, CA	04-06-2020	1,207	51.6
Santa Clara County, CA	04-09-2020	1,380	51.3
Santa Clara County, CA	04-14-2020	1,666	61.1
Santa Clara County, CA	04-18-2020	1,870	36.6
Santa Clara County, CA	04-19-2020	1,870	24.1
Santa Clara County, CA	04-21-2020	1,922	21.1

Santa Clara County, CA	05-15-2020	2,391	16.0
Santa Clara County, CA	05-18-2020	2,453	14.4
Santa Clara County, CA	05-21-2020	2,492	23.4
Santa Clara County, CA	05-22-2020	2,492	28.4
Solano County, CA	04-26-2020	199	10.4
Solano County, CA	04-27-2020	199	10.3
Solano County, CA	05-02-2020	266	10.1
Solano County, CA	05-03-2020	266	11.9
Solano County, CA	05-07-2020	337	12.1
Solano County, CA	05-25-2020	455	10.6
Stanislaus County, CA	04-25-2020	264	11.4
Stanislaus County, CA	04-30-2020	339	17.9
Stanislaus County, CA	05-02-2020	380	16.6
Stanislaus County, CA	05-04-2020	411	17.4
Stanislaus County, CA	05-07-2020	461	12.1
Stanislaus County, CA	05-13-2020	517	10.1
Stanislaus County, CA	05-29-2020	683	14.0
Tulare County, CA	04-04-2020	81	16.3
Tulare County, CA	04-08-2020	157	17.4
Tulare County, CA	04-11-2020	203	19.9
Tulare County, CA	04-21-2020	422	12.9
Tulare County, CA	05-23-2020	1,641	33.1
Tulare County, CA	05-24-2020	1,641	34.9
Tulare County, CA	05-25-2020	1,641	33.1
Tulare County, CA	05-30-2020	1,844	33.3
Ventura County, CA	04-06-2020	221	16.3
Ventura County, CA	04-11-2020	298	10.6
Ventura County, CA	04-18-2020	396	15.9
Ventura County, CA	04-21-2020	428	11.4
Ventura County, CA	04-25-2020	476	11.4
Ventura County, CA	05-08-2020	631	14.4
Ventura County, CA	05-16-2020	764	18.1
Ventura County, CA	05-17-2020	764	16.0
Ventura County, CA	05-18-2020	764	15.7
Ventura County, CA	05-24-2020	912	25.7
Ventura County, CA	05-25-2020	912	29.1
Ventura County, CA	05-26-2020	912	25.6
Ventura County, CA	05-29-2020	1,062	34.3
Adams County, CO	03-27-2020	50	13.1

Adams County, CO	03-30-2020	110	23.1
Adams County, CO	04-01-2020	181	31.9
Adams County, CO	04-09-2020	417	41.9
Adams County, CO	04-15-2020	726	45.3
Adams County, CO	04-20-2020	915	46.3
Arapahoe County, CO	03-27-2020	119	26.1
Arapahoe County, CO	03-30-2020	241	37.4
Arapahoe County, CO	04-01-2020	333	49.3
Arapahoe County, CO	04-09-2020	764	67.9
Arapahoe County, CO	04-15-2020	1,183	69.7
Arapahoe County, CO	04-20-2020	1,536	83.0
Boulder County, CO	04-09-2020	207	12.4
Boulder County, CO	04-20-2020	352	18.0
Denver County, CO	03-27-2020	262	37.1
Denver County, CO	03-30-2020	408	46.3
Denver County, CO	04-01-2020	539	57.7
Denver County, CO	04-09-2020	927	60.3
Denver County, CO	04-15-2020	1,402	74.7
Denver County, CO	04-20-2020	1,784	100.6
Douglas County, CO	03-30-2020	102	13.0
Douglas County, CO	04-01-2020	141	16.4
Douglas County, CO	04-09-2020	244	10.7
Douglas County, CO	04-15-2020	311	10.1
Douglas County, CO	04-20-2020	368	12.4
Eagle County, CO	03-27-2020	147	13.6
Eagle County, CO	03-30-2020	187	21.1
Eagle County, CO	04-01-2020	227	23.3
Eagle County, CO	04-09-2020	374	16.1
El Paso County, CO	03-27-2020	137	20.7
El Paso County, CO	03-30-2020	214	25.3
El Paso County, CO	04-01-2020	286	30.6
El Paso County, CO	04-09-2020	472	25.4
El Paso County, CO	04-15-2020	652	22.6
El Paso County, CO	04-20-2020	731	18.6
Jefferson County, CO	03-27-2020	131	22.6
Jefferson County, CO	03-30-2020	213	32.1
Jefferson County, CO	04-01-2020	304	40.3
Jefferson County, CO	04-09-2020	610	34.9
Jefferson County, CO	04-15-2020	809	29.3

Jefferson County, CO	04-20-2020	957	34.0
Larimer County, CO	04-20-2020	239	10.3
Logan County, CO	04-23-2020	24	33.0
Logan County, CO	05-25-2020	582	13.6
Logan County, CO	05-26-2020	582	15.7
Logan County, CO	05-27-2020	582	15.6
Morgan County, CO	04-15-2020	89	12.0
Morgan County, CO	04-20-2020	157	15.9
Weld County, CO	03-27-2020	107	18.6
Weld County, CO	03-30-2020	180	26.6
Weld County, CO	04-01-2020	255	35.7
Weld County, CO	04-09-2020	573	38.3
Weld County, CO	04-15-2020	858	48.1
Weld County, CO	04-20-2020	1,063	47.9
Fairfield County, CT	04-08-2020	4,136	369.0
Fairfield County, CT	05-03-2020	11,801	210.0
Hartford County, CT	04-08-2020	1,045	158.0
Hartford County, CT	05-03-2020	6,112	163.1
Litchfield County, CT	04-08-2020	255	29.4
Litchfield County, CT	05-03-2020	1,036	23.7
Litchfield County, CT	05-27-2020	1,360	11.0
Middlesex County, CT	04-08-2020	150	27.1
Middlesex County, CT	05-03-2020	707	15.9
New Haven County, CT	04-08-2020	1,664	241.6
New Haven County, CT	05-03-2020	8,024	173.4
New London County, CT	04-08-2020	85	18.3
New London County, CT	05-03-2020	623	23.4
Tolland County, CT	04-08-2020	111	11.4
Tolland County, CT	05-03-2020	461	12.3
Windham County, CT	05-03-2020	211	11.0
Kent County, DE	04-19-2020	417	22.6
Kent County, DE	05-10-2020	985	27.6
Kent County, DE	05-23-2020	1,296	18.6
New Castle County, DE	04-19-2020	1,205	54.0
New Castle County, DE	05-10-2020	2,275	58.4
New Castle County, DE	05-23-2020	3,132	94.7
Sussex County, DE	04-19-2020	886	91.3
Sussex County, DE	05-10-2020	2,990	81.7
Sussex County, DE	05-23-2020	4,048	32.6

Escambia County, FL	04-01-2020	94	12.9
Hamilton County, FL	05-12-2020	19	19.4
Hamilton County, FL	05-16-2020	144	18.3
Leon County, FL	04-14-2020	150	13.1
Liberty County, FL	05-04-2020	60	15.9
Liberty County, FL	05-05-2020	60	27.1
Liberty County, FL	05-09-2020	196	19.7
Liberty County, FL	05-11-2020	198	12.1
Orange County, FL	05-10-2020	1,505	13.3
Volusia County, FL	04-01-2020	80	12.9
Volusia County, FL	04-06-2020	151	11.0
Carroll County, GA	03-29-2020	64	14.9
Colquitt County, GA	05-29-2020	461	18.6
Gwinnett County, GA	05-16-2020	2,597	39.3
Mitchell County, GA	04-25-2020	288	11.3
Honolulu County, HI	03-25-2020	58	15.4
Honolulu County, HI	03-29-2020	108	14.1
Honolulu County, HI	04-08-2020	312	11.0
Ada County, ID	04-01-2020	195	40.6
Ada County, ID	04-13-2020	517	17.1
Ada County, ID	04-15-2020	538	11.4
Blaine County, ID	04-06-2020	410	24.6
Twin Falls County, ID	05-19-2020	326	10.9
Champaign County, IL	05-06-2020	212	14.3
Cook County, IL	03-26-2020	1,418	377.1
Cook County, IL	04-07-2020	8,728	908.7
Cook County, IL	04-09-2020	10,520	935.9
DuPage County, IL	03-26-2020	131	27.9
DuPage County, IL	04-07-2020	715	72.6
DuPage County, IL	04-09-2020	875	72.3
Jackson County, IL	05-26-2020	228	10.1
Kane County, IL	03-26-2020	38	12.4
Kane County, IL	04-07-2020	234	23.3
Kane County, IL	04-09-2020	296	26.1
Kankakee County, IL	04-07-2020	85	15.6
Kankakee County, IL	04-09-2020	145	18.3
Kankakee County, IL	05-03-2020	358	12.9
Lake County, IL	03-26-2020	139	33.0
Lake County, IL	04-07-2020	815	88.9

Lake County, IL	04-09-2020	1,041	100.4
McHenry County, IL	04-07-2020	144	14.9
McHenry County, IL	04-09-2020	180	14.6
McHenry County, IL	04-19-2020	340	19.3
St. Clair County, IL	04-07-2020	92	14.6
St. Clair County, IL	04-09-2020	127	14.7
Will County, IL	03-26-2020	40	23.0
Will County, IL	04-07-2020	697	88.9
Will County, IL	04-09-2020	914	82.9
Delaware County, IN	05-20-2020	297	11.3
Dubois County, IN	05-20-2020	162	12.3
Greene County, IN	05-04-2020	96	10.9
Howard County, IN	05-17-2020	285	10.4
Jasper County, IA	04-30-2020	130	15.7
Louisa County, IA	04-16-2020	166	19.4
Marshall County, IA	04-23-2020	239	32.1
Tama County, IA	04-23-2020	225	10.9
Finney County, KS	04-25-2020	162	32.6
Finney County, KS	04-29-2020	270	55.4
Finney County, KS	05-03-2020	550	67.1
Finney County, KS	05-10-2020	902	51.6
Finney County, KS	05-16-2020	1,234	48.1
Finney County, KS	05-17-2020	1,234	37.4
Finney County, KS	05-23-2020	1,418	17.1
Finney County, KS	05-24-2020	1,418	13.6
Ford County, KS	05-17-2020	1,311	29.7
Ford County, KS	05-21-2020	1,437	35.6
Ford County, KS	05-23-2020	1,555	27.1
Ford County, KS	05-26-2020	1,601	25.3
Ford County, KS	05-28-2020	1,622	26.0
Ford County, KS	05-30-2020	1,732	26.9
Johnson County, KS	04-10-2020	252	13.9
Leavenworth County, KS	05-16-2020	958	16.4
Leavenworth County, KS	05-17-2020	958	15.4
Lyon County, KS	04-20-2020	77	15.7
Lyon County, KS	04-26-2020	176	13.0
Sedgwick County, KS	04-10-2020	161	10.9
Wyandotte County, KS	04-10-2020	272	21.6
Wyandotte County, KS	05-12-2020	1,086	18.4

Wyandotte County, KS	05-26-2020	1,275	14.1
Boone County, KY	05-13-2020	238	15.1
Boone County, KY	05-17-2020	316	17.3
Daviess County, KY	05-02-2020	194	10.4
Fayette County, KY	03-28-2020	28	13.6
Fayette County, KY	04-01-2020	110	13.1
Fayette County, KY	04-11-2020	148	10.6
Fayette County, KY	05-10-2020	368	14.7
Fayette County, KY	05-13-2020	409	26.0
Fayette County, KY	05-17-2020	550	26.0
Jefferson County, KY	03-26-2020	35	10.3
Jefferson County, KY	03-27-2020	35	11.9
Jefferson County, KY	04-01-2020	206	28.0
Jefferson County, KY	04-03-2020	228	26.9
Jefferson County, KY	04-06-2020	304	21.7
Jefferson County, KY	04-08-2020	319	11.6
Jefferson County, KY	04-10-2020	380	35.1
Jefferson County, KY	04-11-2020	380	30.3
Jefferson County, KY	04-25-2020	1,121	42.7
Jefferson County, KY	05-02-2020	1,352	39.0
Jefferson County, KY	05-10-2020	1,642	25.4
Jefferson County, KY	05-13-2020	1,713	31.9
Jefferson County, KY	05-17-2020	1,865	36.4
Jefferson County, KY	05-24-2020	2,050	40.7
Jefferson County, KY	05-25-2020	2,050	39.0
Kenton County, KY	05-02-2020	286	13.3
Kenton County, KY	05-17-2020	444	11.1
Muhlenberg County, KY	05-02-2020	125	46.9
Muhlenberg County, KY	05-04-2020	132	46.1
Muhlenberg County, KY	05-07-2020	446	45.9
Warren County, KY	05-02-2020	344	23.3
Warren County, KY	05-10-2020	530	27.1
Warren County, KY	05-13-2020	637	35.1
Warren County, KY	05-17-2020	776	32.3
Warren County, KY	05-24-2020	920	12.4
Warren County, KY	05-25-2020	920	12.3
Acadia Parish, LA	05-20-2020	262	13.9
Acadia Parish, LA	05-23-2020	289	19.0
Acadia Parish, LA	05-29-2020	401	17.6

Caddo Parish, LA	05-23-2020	2,293	62.1
Caddo Parish, LA	05-29-2020	2,480	33.6
East Baton Rouge Parish, LA	05-23-2020	3,370	45.3
East Baton Rouge Parish, LA	05-29-2020	3,526	32.6
Franklin Parish, LA	05-12-2020	208	17.1
Franklin Parish, LA	05-29-2020	311	11.7
Iberia Parish, LA	05-10-2020	285	10.6
Iberville Parish, LA	04-26-2020	433	21.6
Jefferson Parish, LA	05-23-2020	7,232	33.9
Jefferson Parish, LA	05-29-2020	7,424	50.6
Lafayette Parish, LA	05-23-2020	637	10.4
Lafayette Parish, LA	05-29-2020	695	17.0
Orleans Parish, LA	05-23-2020	6,944	21.7
Orleans Parish, LA	05-29-2020	7,067	19.4
Ouachita Parish, LA	05-23-2020	1,041	22.7
Ouachita Parish, LA	05-29-2020	1,166	23.1
Rapides Parish, LA	05-07-2020	316	11.6
Rapides Parish, LA	05-23-2020	600	22.7
Rapides Parish, LA	05-29-2020	703	20.9
St. Tammany Parish, LA	05-23-2020	1,609	17.0
St. Tammany Parish, LA	05-29-2020	1,703	14.1
Tangipahoa Parish, LA	05-03-2020	584	11.7
Cumberland County, ME	04-01-2020	169	15.9
Cumberland County, ME	04-25-2020	426	11.4
Carroll County, MD	03-30-2020	82	14.0
Carroll County, MD	04-11-2020	214	14.3
Harford County, MD	05-11-2020	605	15.9
St. Mary's County, MD	05-27-2020	400	13.1
Barnstable County, MA	04-20-2020	632	22.6
Bristol County, MA	04-20-2020	1,731	82.3
Essex County, MA	04-20-2020	5,153	282.0
Hampden County, MA	04-20-2020	2,337	121.6
Hampshire County, MA	04-20-2020	317	17.0
Hampshire County, MA	05-01-2020	546	17.1
Middlesex County, MA	04-20-2020	8,737	502.6
Norfolk County, MA	04-20-2020	3,789	171.3
Plymouth County, MA	04-20-2020	2,832	151.9
Suffolk County, MA	04-20-2020	8,074	417.0
Worcester County, MA	04-20-2020	3,069	185.0

Ingham County, MI	05-04-2020	506	12.4
Jackson County, MI	05-26-2020	438	11.4
Muskegon County, MI	05-08-2020	344	10.1
Ottawa County, MI	05-04-2020	321	18.9
Ottawa County, MI	05-07-2020	368	15.9
Ottawa County, MI	05-10-2020	432	10.9
Washtenaw County, MI	04-19-2020	870	16.3
Wayne County, MI	04-16-2020	12,544	361.1
Wayne County, MI	04-21-2020	13,912	310.6
Wayne County, MI	04-25-2020	15,407	323.0
Hennepin County, MN	04-13-2020	557	39.4
Hennepin County, MN	04-16-2020	651	52.4
Rice County, MN	05-06-2020	30	12.0
Stearns County, MN	04-26-2020	38	20.9
Todd County, MN	05-28-2020	296	17.0
Hinds County, MS	03-30-2020	66	10.7
Buchanan County, MO	05-17-2020	506	12.3
Jackson County, MO	04-03-2020	242	30.1
Jackson County, MO	04-05-2020	307	26.0
Jackson County, MO	04-08-2020	396	30.0
St. Charles County, MO	04-03-2020	105	18.9
St. Charles County, MO	04-05-2020	151	25.4
St. Charles County, MO	04-28-2020	572	10.7
St. Charles County, MO	04-30-2020	596	11.7
St. Louis County, MO	04-03-2020	712	95.3
St. Louis County, MO	04-05-2020	864	85.4
St. Louis County, MO	04-08-2020	1,203	100.6
St. Louis County, MO	04-15-2020	1,851	85.0
St. Louis County, MO	05-22-2020	4,472	52.3
St. Louis County, MO	05-23-2020	4,472	45.1
St. Louis County, MO	05-26-2020	4,690	51.4
St. Louis County, MO	05-28-2020	4,832	62.1
St. Louis County, MO	05-29-2020	4,832	49.1
St. Louis city, MO	03-30-2020	102	24.3
St. Louis city, MO	04-03-2020	239	36.6
Dakota County, NE	04-24-2020	246	58.3
Dakota County, NE	04-29-2020	608	87.1
Dakota County, NE	05-02-2020	942	53.1
Dakota County, NE	05-04-2020	980	51.6

Dakota County, NE	05-05-2020	980	54.4
Dakota County, NE	05-06-2020	980	57.1
Dakota County, NE	05-19-2020	1,476	17.7
Dakota County, NE	05-27-2020	1,639	12.3
Dodge County, NE	05-10-2020	147	10.9
Douglas County, NE	04-07-2020	159	12.9
Hall County, NE	04-15-2020	214	39.1
Hall County, NE	04-28-2020	908	53.9
Lancaster County, NE	05-10-2020	595	33.6
Saline County, NE	04-28-2020	87	24.0
Saline County, NE	05-06-2020	285	21.9
Saline County, NE	05-08-2020	320	14.7
Saline County, NE	05-10-2020	349	15.3
Saline County, NE	05-12-2020	367	11.9
Clark County, NV	03-28-2020	443	93.9
Clark County, NV	04-11-2020	2,144	110.7
Clark County, NV	04-16-2020	2,559	88.0
Clark County, NV	05-08-2020	4,573	50.1
Clark County, NV	05-14-2020	5,045	88.0
Clark County, NV	05-19-2020	5,463	82.9
Clark County, NV	05-23-2020	5,815	109.0
Washoe County, NV	04-06-2020	264	23.3
Washoe County, NV	04-09-2020	326	21.6
Washoe County, NV	04-16-2020	549	31.7
Washoe County, NV	04-21-2020	662	23.4
Washoe County, NV	04-24-2020	736	20.3
Washoe County, NV	04-27-2020	804	19.6
Washoe County, NV	05-16-2020	1,190	25.6
Washoe County, NV	05-23-2020	1,356	23.4
Hillsborough County, NH	04-02-2020	109	25.4
Hillsborough County, NH	04-07-2020	272	20.0
Hillsborough County, NH	04-10-2020	303	16.1
Hillsborough County, NH	04-16-2020	458	30.6
Hillsborough County, NH	05-30-2020	2,342	54.1
Rockingham County, NH	04-01-2020	137	16.4
Rockingham County, NH	04-03-2020	170	20.9
Rockingham County, NH	04-07-2020	246	14.0
Rockingham County, NH	04-10-2020	268	14.1
Rockingham County, NH	04-16-2020	399	23.6

Rockingham County, NH	05-15-2020	1,040	17.0
Rockingham County, NH	05-30-2020	1,284	11.4
Cape May County, NJ	04-27-2020	281	12.4
Essex County, NJ	05-14-2020	15,905	79.7
Hudson County, NJ	05-09-2020	17,365	225.4
Hudson County, NJ	05-16-2020	18,048	143.1
Hudson County, NJ	05-18-2020	18,498	182.6
Hudson County, NJ	05-21-2020	18,880	54.4
Hudson County, NJ	05-22-2020	18,880	54.4
Hunterdon County, NJ	05-23-2020	938	11.7
Mercer County, NJ	04-21-2020	2,591	137.6
Middlesex County, NJ	04-21-2020	8,346	354.4
Monmouth County, NJ	04-21-2020	4,787	136.3
Morris County, NJ	04-21-2020	4,236	127.7
Ocean County, NJ	04-21-2020	4,868	169.7
Passaic County, NJ	04-21-2020	8,479	383.9
Salem County, NJ	05-11-2020	411	11.4
Somerset County, NJ	04-21-2020	2,488	103.7
Union County, NJ	04-21-2020	9,972	397.0
Warren County, NJ	04-21-2020	613	29.7
Bernalillo County, NM	03-30-2020	101	14.3
Bernalillo County, NM	04-01-2020	129	15.6
Bernalillo County, NM	04-04-2020	202	25.4
Bernalillo County, NM	04-08-2020	307	29.3
Bernalillo County, NM	04-11-2020	407	21.1
Bernalillo County, NM	04-14-2020	455	12.0
Bernalillo County, NM	04-16-2020	477	14.6
Bernalillo County, NM	04-21-2020	566	22.9
Bernalillo County, NM	05-23-2020	1,313	19.6
DoÃ±a Ana County, NM	05-23-2020	370	15.6
McKinley County, NM	04-11-2020	113	16.1
McKinley County, NM	04-13-2020	144	24.6
McKinley County, NM	04-16-2020	242	31.3
McKinley County, NM	04-21-2020	416	53.4
McKinley County, NM	05-23-2020	2,086	35.6
Sandoval County, NM	04-04-2020	66	14.1
Sandoval County, NM	04-08-2020	128	15.9
Sandoval County, NM	04-11-2020	177	16.6
Sandoval County, NM	04-13-2020	235	17.0

Sandoval County, NM	04-16-2020	262	11.4
San Juan County, NM	04-04-2020	72	17.7
San Juan County, NM	04-13-2020	151	12.0
San Juan County, NM	04-16-2020	200	17.7
San Juan County, NM	04-21-2020	293	27.3
San Juan County, NM	05-23-2020	1,490	28.1
Columbia County, NY	05-09-2020	304	12.1
Erie County, NY	04-18-2020	2,023	79.1
Erie County, NY	04-20-2020	2,192	71.3
Erie County, NY	04-22-2020	2,284	107.1
Niagara County, NY	03-31-2020	41	10.1
Niagara County, NY	04-09-2020	155	11.1
Niagara County, NY	04-13-2020	194	10.6
Onondaga County, NY	04-09-2020	422	18.6
Onondaga County, NY	04-11-2020	456	20.0
Onondaga County, NY	04-18-2020	598	15.6
Orange County, NY	04-15-2020	5,830	238.1
Orange County, NY	04-18-2020	6,514	171.3
Orange County, NY	04-19-2020	6,514	188.9
Orange County, NY	04-20-2020	6,514	78.6
Putnam County, NY	03-31-2020	167	20.1
Putnam County, NY	04-13-2020	507	25.4
Putnam County, NY	04-15-2020	634	34.0
Putnam County, NY	04-16-2020	634	38.7
Putnam County, NY	04-18-2020	732	24.7
Rensselaer County, NY	04-16-2020	140	12.0
Schenectady County, NY	04-18-2020	295	14.4
Schenectady County, NY	04-19-2020	295	16.4
Steuben County, NY	04-07-2020	75	10.1
Steuben County, NY	04-11-2020	117	10.3
Sullivan County, NY	04-05-2020	193	25.0
Sullivan County, NY	04-09-2020	296	23.6
Sullivan County, NY	04-22-2020	592	23.6
Ulster County, NY	04-09-2020	462	42.4
Ulster County, NY	04-14-2020	716	50.0
Ulster County, NY	04-18-2020	880	43.1
Ulster County, NY	04-22-2020	1,018	40.9
Westchester County, NY	04-07-2020	14,294	818.0
Alamance County, NC	05-19-2020	224	10.3

Alamance County, NC	05-23-2020	268	10.9
Alamance County, NC	05-25-2020	278	13.0
Alamance County, NC	05-30-2020	342	13.0
Buncombe County, NC	05-19-2020	176	15.4
Buncombe County, NC	05-21-2020	183	13.4
Burke County, NC	05-19-2020	198	11.1
Burke County, NC	05-21-2020	210	11.9
Cabarrus County, NC	04-16-2020	204	13.0
Chatham County, NC	05-21-2020	543	10.1
Columbus County, NC	04-29-2020	103	11.0
Columbus County, NC	05-01-2020	153	10.4
Craven County, NC	05-19-2020	129	12.4
Cumberland County, NC	04-27-2020	200	12.0
Cumberland County, NC	04-29-2020	224	12.9
Cumberland County, NC	05-03-2020	289	15.1
Cumberland County, NC	05-04-2020	289	16.9
Cumberland County, NC	05-08-2020	356	11.3
Cumberland County, NC	05-09-2020	356	11.3
Cumberland County, NC	05-19-2020	471	18.6
Cumberland County, NC	05-23-2020	569	17.0
Davidson County, NC	05-19-2020	293	10.4
Duplin County, NC	05-19-2020	438	27.3
Duplin County, NC	05-21-2020	470	34.3
Durham County, NC	04-22-2020	439	21.0
Durham County, NC	04-27-2020	555	33.3
Durham County, NC	05-04-2020	767	15.4
Durham County, NC	05-11-2020	886	15.4
Forsyth County, NC	05-19-2020	698	36.1
Granville County, NC	04-24-2020	123	18.3
Guilford County, NC	04-19-2020	176	11.7
Guilford County, NC	04-20-2020	176	11.4
Guilford County, NC	04-27-2020	314	20.1
Guilford County, NC	05-19-2020	872	30.0
Johnston County, NC	05-19-2020	259	11.6
Johnston County, NC	05-21-2020	276	12.0
Lee County, NC	05-01-2020	169	11.0
Mecklenburg County, NC	05-19-2020	2,652	88.0
Mecklenburg County, NC	05-21-2020	2,780	91.4
Randolph County, NC	04-28-2020	154	14.6

Randolph County, NC	05-19-2020	461	17.3
Robeson County, NC	04-30-2020	162	14.9
Robeson County, NC	05-03-2020	201	23.0
Robeson County, NC	05-07-2020	323	26.7
Robeson County, NC	05-15-2020	519	20.0
Robeson County, NC	05-17-2020	531	18.9
Robeson County, NC	05-18-2020	531	15.6
Robeson County, NC	05-19-2020	531	18.1
Robeson County, NC	05-23-2020	646	20.4
Robeson County, NC	05-30-2020	786	21.4
Rowan County, NC	04-14-2020	204	22.3
Rowan County, NC	04-16-2020	216	19.6
Rowan County, NC	05-03-2020	388	10.4
Rowan County, NC	05-19-2020	540	11.4
Sampson County, NC	05-19-2020	259	18.0
Sampson County, NC	05-27-2020	409	13.6
Wake County, NC	03-28-2020	123	18.1
Wake County, NC	04-22-2020	613	10.3
Wake County, NC	05-19-2020	1,253	32.6
Wayne County, NC	05-19-2020	867	21.1
Wayne County, NC	05-21-2020	888	24.0
Wayne County, NC	05-26-2020	1,031	19.9
Wilkes County, NC	05-19-2020	425	25.0
Cass County, ND	04-17-2020	152	18.6
Grand Forks County, ND	04-17-2020	23	18.1
Marion County, OH	04-30-2020	2,196	21.6
Miami County, OH	05-06-2020	144	14.4
Comanche County, OK	05-10-2020	124	10.1
Comanche County, OK	05-11-2020	124	11.7
Oklahoma County, OK	04-17-2020	497	17.0
Oklahoma County, OK	04-18-2020	497	16.6
Tulsa County, OK	04-17-2020	376	12.1
Tulsa County, OK	04-18-2020	376	10.6
Washington County, OK	04-18-2020	124	10.6
Marion County, OR	04-06-2020	198	10.1
Marion County, OR	04-10-2020	235	11.7
Multnomah County, OR	04-04-2020	175	18.1
Multnomah County, OR	04-06-2020	233	20.3
Multnomah County, OR	04-10-2020	302	23.6

Washington County, OR	04-04-2020	228	12.1
Washington County, OR	04-06-2020	259	14.3
Washington County, OR	04-10-2020	311	14.4
Beaver County, PA	05-03-2020	435	11.3
Berks County, PA	03-28-2020	65	13.4
Bucks County, PA	04-26-2020	2,541	101.3
Philadelphia County, PA	04-22-2020	10,028	409.0
Philadelphia County, PA	04-25-2020	11,877	488.1
Philadelphia County, PA	05-02-2020	15,137	423.6
Philadelphia County, PA	05-03-2020	15,137	413.4
Philadelphia County, PA	05-17-2020	19,606	225.7
Philadelphia County, PA	05-24-2020	21,234	230.9
Philadelphia County, PA	05-25-2020	21,234	207.1
Kent County, RI	04-04-2020	59	10.6
Kent County, RI	04-09-2020	137	12.4
Kent County, RI	04-12-2020	169	15.3
Kent County, RI	04-13-2020	169	16.0
Kent County, RI	04-14-2020	169	21.1
Kent County, RI	04-18-2020	299	31.0
Kent County, RI	05-08-2020	703	22.3
Kent County, RI	05-09-2020	703	21.0
Kent County, RI	05-10-2020	703	25.7
Kent County, RI	05-14-2020	883	25.7
Kent County, RI	05-17-2020	883	10.7
Kent County, RI	05-18-2020	883	13.0
Kent County, RI	05-19-2020	883	14.6
Providence County, RI	03-25-2020	52	13.0
Providence County, RI	03-27-2020	91	14.9
Providence County, RI	03-28-2020	91	22.3
Providence County, RI	03-30-2020	156	46.7
Providence County, RI	04-03-2020	418	54.6
Providence County, RI	04-04-2020	418	59.1
Providence County, RI	04-09-2020	832	112.4
Providence County, RI	04-12-2020	1,278	160.7
Providence County, RI	04-13-2020	1,278	177.1
Providence County, RI	04-14-2020	1,278	249.7
Providence County, RI	04-18-2020	2,703	349.9
Providence County, RI	05-05-2020	7,138	79.9
Providence County, RI	05-06-2020	7,138	45.1

Providence County, RI	05-07-2020	7,138	15.7
Providence County, RI	05-08-2020	7,138	219.4
Providence County, RI	05-09-2020	7,138	237.1
Providence County, RI	05-10-2020	7,138	282.0
Providence County, RI	05-14-2020	9,112	282.0
Providence County, RI	05-15-2020	9,112	62.6
Providence County, RI	05-16-2020	9,112	44.9
Providence County, RI	05-17-2020	9,112	123.4
Providence County, RI	05-18-2020	9,112	149.7
Providence County, RI	05-19-2020	9,112	172.6
Providence County, RI	05-25-2020	10,607	115.4
Providence County, RI	05-26-2020	10,607	104.6
Providence County, RI	05-30-2020	11,052	63.6
Washington County, RI	04-09-2020	120	13.1
Washington County, RI	04-10-2020	120	12.4
Washington County, RI	04-14-2020	140	15.0
Charleston County, SC	03-26-2020	52	14.9
Charleston County, SC	04-05-2020	274	16.4
Florence County, SC	04-21-2020	153	14.9
Greenville County, SC	04-08-2020	214	20.3
Greenville County, SC	04-21-2020	498	15.7
Lexington County, SC	04-08-2020	130	15.3
Lexington County, SC	04-13-2020	212	15.1
Richland County, SC	04-08-2020	340	33.9
Richland County, SC	04-13-2020	494	23.1
Richland County, SC	04-21-2020	657	22.0
Spartanburg County, SC	04-08-2020	120	14.0
Beadle County, SD	05-21-2020	68	14.3
Minnehaha County, SD	05-21-2020	3,182	17.9
Pennington County, SD	05-21-2020	85	14.3
Bedford County, TN	04-22-2020	105	14.6
Bledsoe County, TN	04-22-2020	11	82.6
Bledsoe County, TN	04-27-2020	588	34.7
Davidson County, TN	04-15-2020	1,237	50.6
Davidson County, TN	04-22-2020	1,719	95.9
Davidson County, TN	05-20-2020	4,174	84.7
Hamilton County, TN	05-20-2020	377	24.1
Lake County, TN	05-10-2020	59	34.4
Lake County, TN	05-15-2020	401	49.0

Lake County, TN	05-16-2020	401	43.4
Loudon County, TN	05-20-2020	97	11.9
Putnam County, TN	05-20-2020	286	18.1
Rhea County, TN	05-20-2020	15	26.7
Robertson County, TN	05-20-2020	298	12.3
Rutherford County, TN	03-30-2020	48	12.3
Rutherford County, TN	04-22-2020	338	13.1
Rutherford County, TN	05-17-2020	847	18.0
Rutherford County, TN	05-20-2020	906	18.6
Shelby County, TN	04-15-2020	1,359	76.4
Shelby County, TN	04-22-2020	1,873	57.7
Shelby County, TN	05-20-2020	3,936	77.7
Sumner County, TN	04-22-2020	530	12.4
Sumner County, TN	05-20-2020	768	10.3
Tipton County, TN	05-08-2020	158	32.1
Tipton County, TN	05-09-2020	158	35.1
Trousdale County, TN	04-27-2020	48	13.7
Williamson County, TN	03-30-2020	101	18.4
Bell County, TX	05-29-2020	335	11.4
Bexar County, TX	03-25-2020	69	17.9
Bexar County, TX	04-25-2020	1,334	35.1
Bexar County, TX	04-26-2020	1,334	32.4
Bexar County, TX	04-27-2020	1,334	29.6
Bexar County, TX	05-01-2020	1,374	35.9
Bexar County, TX	05-04-2020	1,585	55.3
Bexar County, TX	05-09-2020	1,805	35.6
Bexar County, TX	05-12-2020	1,901	24.4
Bexar County, TX	05-15-2020	1,976	31.3
Bexar County, TX	05-17-2020	2,120	48.0
Bexar County, TX	05-18-2020	2,120	49.4
Bexar County, TX	05-20-2020	2,278	38.9
Bexar County, TX	05-25-2020	2,418	37.3
Bexar County, TX	05-27-2020	2,449	34.9
Bexar County, TX	05-29-2020	2,583	58.9
Bowie County, TX	05-29-2020	189	16.3
Brazoria County, TX	04-01-2020	95	11.9
Brazoria County, TX	04-05-2020	144	11.1
Brazoria County, TX	04-08-2020	173	10.3
Brazoria County, TX	04-25-2020	417	18.7

Brazoria County, TX	05-07-2020	588	16.3
Brazoria County, TX	05-22-2020	805	10.1
Brazoria County, TX	05-29-2020	861	11.3
Brazos County, TX	05-22-2020	362	16.1
Brazos County, TX	05-23-2020	362	15.4
Cameron County, TX	04-13-2020	195	19.4
Cameron County, TX	04-20-2020	298	11.3
Cameron County, TX	05-11-2020	512	14.3
Cameron County, TX	05-17-2020	619	15.0
Cameron County, TX	05-18-2020	619	13.6
Cameron County, TX	05-22-2020	664	11.3
Cameron County, TX	05-26-2020	698	11.3
Collin County, TX	03-30-2020	134	20.1
Collin County, TX	04-07-2020	306	25.6
Collin County, TX	04-14-2020	472	14.1
Collin County, TX	04-19-2020	522	15.3
Collin County, TX	04-25-2020	639	15.1
Collin County, TX	05-11-2020	918	19.9
Collin County, TX	05-22-2020	1,090	17.6
Collin County, TX	05-29-2020	1,217	23.0
Dallas County, TX	04-21-2020	2,512	92.0
Dallas County, TX	04-27-2020	3,014	109.7
Dallas County, TX	04-29-2020	3,240	141.4
Dallas County, TX	05-12-2020	6,123	238.1
Dallas County, TX	05-20-2020	7,904	199.9
Dallas County, TX	05-30-2020	9,787	218.7
Denton County, TX	03-30-2020	165	24.4
Denton County, TX	04-01-2020	206	17.9
Denton County, TX	04-04-2020	273	22.9
Denton County, TX	04-08-2020	366	25.9
Denton County, TX	04-10-2020	426	24.3
Denton County, TX	04-14-2020	507	19.7
Denton County, TX	04-25-2020	680	18.1
Denton County, TX	05-22-2020	1,161	22.1
Denton County, TX	05-29-2020	1,285	21.3
El Paso County, TX	04-07-2020	132	20.0
El Paso County, TX	04-25-2020	706	41.3
El Paso County, TX	05-22-2020	2,046	86.3
El Paso County, TX	05-29-2020	2,569	59.7

County	Date	Cases	Rate
Fort Bend County, TX	03-25-2020	46	14.4
Fort Bend County, TX	03-28-2020	101	16.7
Fort Bend County, TX	03-30-2020	119	15.4
Fort Bend County, TX	04-01-2020	163	22.0
Fort Bend County, TX	04-07-2020	318	37.7
Fort Bend County, TX	04-14-2020	543	24.4
Fort Bend County, TX	04-16-2020	627	31.3
Fort Bend County, TX	04-19-2020	755	25.9
Fort Bend County, TX	04-22-2020	808	21.4
Fort Bend County, TX	04-24-2020	889	24.1
Fort Bend County, TX	05-13-2020	1,404	21.9
Fort Bend County, TX	05-19-2020	1,559	25.9
Fort Bend County, TX	05-22-2020	1,652	18.0
Fort Bend County, TX	05-25-2020	1,685	16.3
Fort Bend County, TX	05-27-2020	1,732	22.3
Fort Bend County, TX	05-29-2020	1,766	28.0
Galveston County, TX	03-30-2020	70	11.1
Galveston County, TX	04-07-2020	256	25.4
Galveston County, TX	04-13-2020	355	16.3
Galveston County, TX	04-25-2020	522	11.4
Grayson County, TX	05-22-2020	268	21.1
Grayson County, TX	05-23-2020	268	19.7
Grimes County, TX	05-29-2020	113	16.7
Harris County, TX	04-25-2020	5,482	97.7
Harris County, TX	04-27-2020	5,628	146.6
Hidalgo County, TX	04-05-2020	86	11.7
Hidalgo County, TX	04-13-2020	190	12.3
Jefferson County, TX	04-19-2020	171	10.6
Jefferson County, TX	04-24-2020	240	12.6
Jones County, TX	05-25-2020	135	27.0
Jones County, TX	05-27-2020	101	38.1
Jones County, TX	05-29-2020	323	38.0
Lubbock County, TX	04-07-2020	180	16.7
Montgomery County, TX	04-10-2020	231	15.0
Montgomery County, TX	04-12-2020	251	17.3
Montgomery County, TX	04-16-2020	331	18.0
Montgomery County, TX	04-18-2020	370	12.1
Montgomery County, TX	04-20-2020	377	19.4
Montgomery County, TX	04-26-2020	506	17.4

Montgomery County, TX	04-29-2020	562	18.3
Montgomery County, TX	05-03-2020	634	15.7
Montgomery County, TX	05-09-2020	699	11.4
Montgomery County, TX	05-10-2020	699	12.3
Montgomery County, TX	05-16-2020	798	15.1
Montgomery County, TX	05-17-2020	798	14.7
Montgomery County, TX	05-30-2020	954	17.4
Moore County, TX	05-04-2020	399	18.1
Moore County, TX	05-28-2020	583	15.3
Moore County, TX	05-29-2020	583	15.7
Pecos County, TX	05-29-2020	56	10.7
Potter County, TX	05-11-2020	1,124	64.3
Potter County, TX	05-18-2020	2,129	110.7
Potter County, TX	05-22-2020	2,196	15.6
Potter County, TX	05-29-2020	2,266	11.9
Randall County, TX	05-11-2020	358	15.9
Randall County, TX	05-18-2020	602	25.9
Tarrant County, TX	04-11-2020	705	58.9
Tarrant County, TX	04-19-2020	1,229	49.0
Tarrant County, TX	04-22-2020	1,333	86.7
Tarrant County, TX	04-27-2020	1,947	98.1
Tarrant County, TX	05-01-2020	2,246	91.0
Tarrant County, TX	05-08-2020	2,956	158.7
Tarrant County, TX	05-22-2020	4,711	75.7
Tarrant County, TX	05-26-2020	4,977	68.4
Tarrant County, TX	05-29-2020	5,190	76.6
Taylor County, TX	04-21-2020	144	16.3
Taylor County, TX	04-25-2020	203	15.9
Titus County, TX	05-17-2020	96	11.9
Titus County, TX	05-23-2020	248	27.4
Titus County, TX	05-24-2020	248	29.3
Titus County, TX	05-29-2020	443	22.7
Travis County, TX	04-01-2020	244	35.9
Travis County, TX	04-03-2020	351	42.3
Travis County, TX	04-07-2020	502	41.6
Travis County, TX	04-18-2020	1,074	45.4
Travis County, TX	04-25-2020	1,379	41.4
Travis County, TX	05-17-2020	2,425	43.9
Travis County, TX	05-22-2020	2,644	55.4

Travis County, TX	05-29-2020	3,057	60.7
Walker County, TX	04-22-2020	114	13.7
Walker County, TX	04-26-2020	164	14.0
Walker County, TX	05-02-2020	269	14.0
Walker County, TX	05-15-2020	374	11.6
Walker County, TX	05-26-2020	475	61.9
Walker County, TX	05-29-2020	869	140.1
Webb County, TX	04-07-2020	122	14.4
Williamson County, TX	04-29-2020	287	15.3
Davis County, UT	04-01-2020	84	11.1
Salt Lake County, UT	04-01-2020	396	53.4
Salt Lake County, UT	04-09-2020	858	55.0
Summit County, UT	04-01-2020	172	14.7
Utah County, UT	04-01-2020	70	22.3
Utah County, UT	04-09-2020	267	13.9
Chittenden County, VT	03-30-2020	117	14.6
Chittenden County, VT	04-08-2020	308	15.1
Chittenden County, VT	04-10-2020	336	12.4
Accomack County, VA	04-21-2020	52	10.3
Accomack County, VA	05-06-2020	429	20.4
Accomack County, VA	05-08-2020	463	14.1
Arlington County, VA	05-06-2020	1,169	41.1
Buckingham County, VA	04-29-2020	55	14.7
Buckingham County, VA	05-03-2020	137	16.6
Buckingham County, VA	05-04-2020	137	23.9
Buckingham County, VA	05-06-2020	171	15.6
Buckingham County, VA	05-08-2020	225	15.6
Buckingham County, VA	05-10-2020	246	25.1
Buckingham County, VA	05-11-2020	246	17.6
Buckingham County, VA	05-17-2020	411	10.3
Chesterfield County, VA	04-06-2020	108	12.1
Chesterfield County, VA	04-27-2020	457	18.4
Chesterfield County, VA	05-04-2020	601	25.1
Chesterfield County, VA	05-06-2020	646	24.6
Chesterfield County, VA	05-24-2020	1,193	23.3
Culpeper County, VA	05-06-2020	201	10.9
Fairfax County, VA	05-06-2020	4,834	223.4
Hanover County, VA	05-24-2020	252	10.1
Henrico County, VA	05-06-2020	985	18.3

Loudoun County, VA	03-30-2020	61	13.3
Loudoun County, VA	05-06-2020	998	35.1
Prince William County, VA	05-06-2020	2,223	92.6
Richmond County, VA	04-22-2020	53	10.1
Richmond County, VA	04-24-2020	66	17.6
Rockingham County, VA	04-19-2020	100	11.1
Rockingham County, VA	04-26-2020	184	10.7
Rockingham County, VA	05-06-2020	282	11.4
Shenandoah County, VA	05-06-2020	165	15.4
Southampton County, VA	04-25-2020	75	13.9
Stafford County, VA	05-06-2020	308	13.1
Alexandria city, VA	05-06-2020	983	42.0
Harrisonburg city, VA	05-06-2020	525	15.4
Manassas city, VA	05-06-2020	289	14.3
Norfolk city, VA	05-06-2020	251	11.3
Richmond city, VA	05-06-2020	438	18.6
Virginia Beach city, VA	05-03-2020	413	11.4
Benton County, WA	03-28-2020	42	11.4
Benton County, WA	05-23-2020	674	10.7
Clark County, WA	03-30-2020	90	11.9
Clark County, WA	04-10-2020	206	10.1
Franklin County, WA	04-20-2020	191	11.6
Island County, WA	03-27-2020	64	11.4
King County, WA	03-27-2020	1,577	141.6
King County, WA	04-01-2020	2,330	117.3
King County, WA	04-13-2020	4,426	115.9
King County, WA	04-18-2020	4,902	106.3
King County, WA	04-20-2020	5,174	119.3
King County, WA	05-23-2020	7,669	38.6
Pierce County, WA	03-28-2020	231	34.1
Pierce County, WA	03-30-2020	317	44.6
Pierce County, WA	04-01-2020	377	55.6
Pierce County, WA	04-14-2020	969	30.1
Pierce County, WA	04-18-2020	1,086	35.7
Snohomish County, WA	04-03-2020	1,376	76.4
Snohomish County, WA	05-23-2020	2,863	14.0
Spokane County, WA	03-29-2020	108	17.9
Spokane County, WA	03-31-2020	136	15.9
Spokane County, WA	05-23-2020	437	12.3

Whatcom County, WA	03-30-2020	116	12.7
Whatcom County, WA	04-01-2020	139	13.9
Yakima County, WA	04-01-2020	161	29.6
Yakima County, WA	05-23-2020	2,594	80.6
Berkeley County, WV	05-23-2020	256	10.1
Jackson County, WV	04-21-2020	101	10.9
Randolph County, WV	05-25-2020	36	16.3
Randolph County, WV	05-26-2020	36	14.0
Brown County, WI	05-26-2020	2,249	14.9
Kenosha County, WI	04-04-2020	81	10.7
Milwaukee County, WI	04-04-2020	1,023	87.6
Rock County, WI	04-26-2020	151	13.9

Duplicate County Death Totals

On some days, the recorded total death count for a county remained constant from the previous day (akin to the previous table that depicts duplicate total case counts). The following table lists county death totals that were reported identically on consecutive days by JHU. The 7-day moving average of the death rate is also demonstrated to advise the approximate increase in deaths that should have been expected.

County	Duplication Date	Total Deaths	7-Day Avg
Maricopa County, AZ	05-17-2020	319	10.9
Fairfield County, CT	04-08-2020	132	19.1
Fairfield County, CT	05-03-2020	865	25.4
Hartford County, CT	04-08-2020	48	10.7
Hartford County, CT	05-03-2020	741	24.6
New Haven County, CT	04-08-2020	60	11.1
New Haven County, CT	05-03-2020	565	19.4
Miami-Dade County, FL	05-26-2020	633	10.1
Cook County, IL	04-07-2020	209	36.9
Cook County, IL	04-09-2020	310	42.7
Marion County, IN	04-13-2020	123	11.9
Essex County, MA	04-09-2020	50	10.6
Essex County, MA	04-10-2020	50	10.3
Essex County, MA	04-13-2020	101	12.9
Essex County, MA	04-14-2020	101	15.6
Essex County, MA	04-16-2020	140	15.4
Essex County, MA	04-20-2020	209	15.0
Essex County, MA	04-22-2020	245	22.6
Essex County, MA	04-23-2020	245	18.1

Essex County, MA	04-24-2020	245	21.4
Essex County, MA	04-26-2020	336	25.7
Hampden County, MA	04-13-2020	102	12.7
Hampden County, MA	04-14-2020	102	14.1
Hampden County, MA	04-16-2020	151	15.6
Hampden County, MA	04-20-2020	211	13.3
Hampden County, MA	04-22-2020	244	19.1
Hampden County, MA	04-23-2020	244	14.9
Hampden County, MA	04-24-2020	244	18.0
Hampden County, MA	04-26-2020	315	16.3
Middlesex County, MA	04-09-2020	80	15.4
Middlesex County, MA	04-10-2020	80	14.6
Middlesex County, MA	04-13-2020	149	20.1
Middlesex County, MA	04-14-2020	149	25.4
Middlesex County, MA	04-16-2020	221	31.9
Middlesex County, MA	04-20-2020	372	29.6
Middlesex County, MA	04-22-2020	428	47.9
Middlesex County, MA	04-23-2020	428	42.6
Middlesex County, MA	04-24-2020	428	46.9
Norfolk County, MA	04-13-2020	91	15.1
Norfolk County, MA	04-14-2020	91	18.9
Norfolk County, MA	04-16-2020	147	21.9
Norfolk County, MA	04-20-2020	244	20.4
Norfolk County, MA	04-22-2020	290	29.3
Norfolk County, MA	04-23-2020	290	22.3
Norfolk County, MA	04-24-2020	290	26.4
Norfolk County, MA	04-26-2020	400	27.7
Plymouth County, MA	04-16-2020	89	10.9
Plymouth County, MA	04-22-2020	141	15.3
Plymouth County, MA	04-23-2020	141	11.6
Plymouth County, MA	04-24-2020	141	15.6
Plymouth County, MA	04-26-2020	212	18.9
Suffolk County, MA	04-13-2020	86	13.9
Suffolk County, MA	04-14-2020	86	16.6
Suffolk County, MA	04-16-2020	145	21.4
Suffolk County, MA	04-20-2020	236	20.0
Suffolk County, MA	04-22-2020	285	29.0
Suffolk County, MA	04-23-2020	285	22.1
Suffolk County, MA	04-24-2020	285	30.3

Suffolk County, MA	04-26-2020	391	31.3
Worcester County, MA	04-22-2020	133	13.0
Worcester County, MA	04-24-2020	133	14.4
Worcester County, MA	04-26-2020	183	17.1
Wayne County, MI	04-16-2020	884	59.3
Wayne County, MI	04-21-2020	1,148	57.0
Wayne County, MI	04-25-2020	1,443	76.3
Bergen County, NJ	03-30-2020	23	16.3
Bergen County, NJ	04-21-2020	787	31.4
Essex County, NJ	03-30-2020	13	13.6
Essex County, NJ	04-21-2020	751	41.6
Hudson County, NJ	04-20-2020	612	43.0
Hudson County, NJ	04-25-2020	706	12.3
Hudson County, NJ	05-04-2020	845	19.6
Mercer County, NJ	04-21-2020	122	11.0
Middlesex County, NJ	04-21-2020	345	14.9
Morris County, NJ	04-13-2020	162	14.1
Morris County, NJ	04-21-2020	269	15.4
Morris County, NJ	05-04-2020	449	12.9
Ocean County, NJ	04-21-2020	222	14.3
Passaic County, NJ	04-21-2020	263	23.1
Union County, NJ	04-21-2020	387	30.3
Dutchess County, NY	05-11-2020	98	10.6
Erie County, NY	04-20-2020	135	11.6
Erie County, NY	04-22-2020	162	11.9
Erie County, NY	04-27-2020	207	11.1
Erie County, NY	05-01-2020	266	10.9
Erie County, NY	05-02-2020	266	14.4
Erie County, NY	05-03-2020	266	10.9
Erie County, NY	05-07-2020	323	13.0
Erie County, NY	05-10-2020	357	11.0
Erie County, NY	05-11-2020	357	11.0
Nassau County, NY	04-02-2020	76	17.6
Nassau County, NY	04-04-2020	95	64.6
Nassau County, NY	04-06-2020	162	79.6
Nassau County, NY	04-08-2020	500	99.6
Nassau County, NY	04-17-2020	1,109	59.9
Nassau County, NY	04-18-2020	1,109	55.6
Nassau County, NY	04-19-2020	1,109	53.4

New York County, NY	04-18-2020	13,202	997.4
Orange County, NY	04-10-2020	115	13.6
Orange County, NY	04-15-2020	178	11.3
Rockland County, NY	04-05-2020	69	19.4
Rockland County, NY	04-11-2020	200	18.3
Rockland County, NY	04-12-2020	200	20.6
Rockland County, NY	04-17-2020	319	13.3
Rockland County, NY	04-19-2020	334	14.7
Rockland County, NY	04-20-2020	334	16.7
Rockland County, NY	04-22-2020	401	17.0
Rockland County, NY	04-25-2020	453	11.4
Rockland County, NY	04-26-2020	453	14.1
Suffolk County, NY	04-17-2020	693	41.6
Suffolk County, NY	04-18-2020	693	40.0
Suffolk County, NY	04-19-2020	693	39.0
Westchester County, NY	04-04-2020	67	28.7
Westchester County, NY	04-05-2020	67	36.9
Westchester County, NY	04-07-2020	211	46.0
Westchester County, NY	04-17-2020	668	31.3
Westchester County, NY	04-18-2020	668	30.4
Westchester County, NY	04-19-2020	668	28.3
Berks County, PA	05-17-2020	208	13.4
Bucks County, PA	05-04-2020	240	16.4
Delaware County, PA	05-03-2020	255	14.6
Lancaster County, PA	04-22-2020	107	14.7
Montgomery County, PA	05-11-2020	525	11.6
Philadelphia County, PA	04-09-2020	87	21.1
Philadelphia County, PA	04-22-2020	394	15.3
Philadelphia County, PA	04-25-2020	449	17.4
Philadelphia County, PA	04-30-2020	541	23.7
Philadelphia County, PA	05-02-2020	638	32.4
Philadelphia County, PA	05-03-2020	638	37.4
Philadelphia County, PA	05-17-2020	1,031	23.7
Philadelphia County, PA	05-24-2020	1,233	15.7
Philadelphia County, PA	05-25-2020	1,233	14.9
Fairfax County, VA	05-06-2020	201	11.0
King County, WA	04-20-2020	346	10.4

Negative Case Rates

Case rates cannot be negative but for some records the cumulative case count erroneously decreases from one day to the next, likely representing that case counts were initially overreported, subsequently corrected for future days, and yet never corrected retroactively. The following table demonstrates days on which county case rates were negative and includes (parenthetically) the observed decrease. Only errors for which the decrease in total cases is greater than ten are shown.

County	Date	Total Cases (and Decrease)
Cullman County, AL	04-18-2020	42 (-11)
Madison County, AL	04-18-2020	197 (-20)
Tuscaloosa County, AL	04-18-2020	141 (-11)
Apache County, AZ	04-09-2020	52 (-26)
Coconino County, AZ	04-09-2020	210 (-78)
Navajo County, AZ	04-09-2020	286 (-118)
Alameda County, CA	05-16-2020	2,351 (-16)
San Francisco County, CA	06-01-2020	2,570 (-18)
Sutter County, CA	04-14-2020	23 (-14)
Sutter County, CA	04-28-2020	29 (-16)
Pitkin County, CO	05-02-2020	51 (-14)
Saguache County, CO	05-27-2020	25 (-11)
Fairfield County, CT	05-27-2020	15,314 (-41)
New London County, CT	05-27-2020	1,053 (-22)
District of Columbia, DC	03-23-2020	120 (-84)
Alachua County, FL	04-13-2020	187 (-28)
Jackson County, FL	05-13-2020	106 (-25)
Bibb County, GA	05-09-2020	365 (-19)
Dougherty County, GA	04-24-2020	1,465 (-13)
Dougherty County, GA	05-28-2020	1,764 (-20)
Henry County, GA	05-19-2020	611 (-16)
Tazewell County, IL	04-19-2020	26 (-15)
Dearborn County, IN	04-14-2020	60 (-69)
DeKalb County, IN	04-14-2020	6 (-54)
Jasper County, IN	05-01-2020	33 (-13)
Ripley County, IN	04-17-2020	77 (-12)
Jefferson County, KY	04-14-2020	531 (-19)
Evangeline Parish, LA	05-26-2020	75 (-91)
Iberville Parish, LA	05-16-2020	524 (-19)
Lafayette Parish, LA	04-04-2020	229 (-47)
St. Charles Parish, LA	04-17-2020	471 (-15)
St. Landry Parish, LA	04-04-2020	45 (-23)

St. Landry Parish, LA	05-16-2020	230 (-14)
Baltimore County, MD	05-05-2020	3,430 (-18)
Baltimore County, MD	05-09-2020	3,737 (-26)
St. Mary's County, MD	04-20-2020	107 (-15)
Baltimore city, MD	06-01-2020	5,604 (-60)
Jackson County, MI	05-02-2020	364 (-17)
Jackson County, MI	05-31-2020	448 (-62)
Macomb County, MI	05-04-2020	5,736 (-20)
Oakland County, MI	04-27-2020	6,913 (-15)
Oakland County, MI	05-04-2020	7,499 (-19)
Ottawa County, MI	05-11-2020	420 (-12)
Clay County, MN	05-03-2020	176 (-13)
Dakota County, NE	05-12-2020	1,362 (-16)
Madison County, NE	05-15-2020	264 (-17)
Washoe County, NV	05-21-2020	1,316 (-79)
Hillsborough County, NH	04-14-2020	271 (-114)
Bergen County, NJ	05-14-2020	17,080 (-70)
Bergen County, NJ	05-30-2020	18,211 (-12)
Hudson County, NJ	05-12-2020	17,677 (-124)
Hudson County, NJ	05-13-2020	17,451 (-226)
Hudson County, NJ	05-24-2020	18,879 (-80)
Hudson County, NJ	05-27-2020	18,606 (-321)
Hudson County, NJ	05-31-2020	18,767 (-152)
Union County, NJ	05-24-2020	15,169 (-17)
Bernalillo County, NM	05-21-2020	1,273 (-11)
McKinley County, NM	04-09-2020	70 (-17)
Sandoval County, NM	05-21-2020	528 (-14)
San Juan County, NM	04-09-2020	116 (-57)
Delaware County, NY	04-23-2020	50 (-12)
Madison County, NY	04-23-2020	106 (-15)
New York County, NY	04-23-2020	145,855 (-1,442)
Onondaga County, NY	04-23-2020	600 (-67)
Orange County, NY	04-23-2020	6,816 (-336)
Putnam County, NY	04-23-2020	615 (-216)
Rensselaer County, NY	04-23-2020	191 (-11)
Saratoga County, NY	04-23-2020	265 (-12)
Schenectady County, NY	04-23-2020	288 (-64)
Steuben County, NY	04-23-2020	171 (-43)
Sullivan County, NY	04-23-2020	580 (-12)

Ulster County, NY	04-23-2020	942 (-76)
Alamance County, NC	04-15-2020	43 (-30)
Beaufort County, NC	04-26-2020	20 (-11)
Granville County, NC	04-28-2020	133 (-107)
Pitt County, NC	04-26-2020	111 (-32)
Traill County, ND	05-26-2020	10 (-11)
Ward County, ND	05-26-2020	36 (-18)
Bristol County, RI	03-26-2020	6 (-18)
Washington County, RI	04-18-2020	183 (-42)
Washington County, RI	04-23-2020	256 (-12)
Davidson County, TN	04-03-2020	685 (-100)
Davidson County, TN	04-13-2020	1,207 (-142)
Davidson County, TN	04-17-2020	1,307 (-185)
Shelby County, TN	04-17-2020	1,492 (-16)
Bexar County, TX	04-28-2020	1,275 (-59)
Bowie County, TX	05-24-2020	153 (-23)
Jones County, TX	05-26-2020	101 (-34)
Taylor County, TX	05-07-2020	206 (-172)
Titus County, TX	05-31-2020	451 (-13)
Walker County, TX	05-14-2020	374 (-19)
Walker County, TX	05-22-2020	436 (-116)
Cache County, UT	04-17-2020	0 (-37)
Iron County, UT	04-17-2020	0 (-15)
Washington County, UT	04-19-2020	0 (-77)
Weber County, UT	04-19-2020	0 (-112)
Rutland County, VT	04-14-2020	8 (-31)
Benton County, WA	03-31-2020	89 (-13)
Clark County, WA	04-23-2020	291 (-22)
Franklin County, WA	04-16-2020	152 (-33)
Pierce County, WA	04-23-2020	1,192 (-44)

Negative Death Rates

Death rates cannot be negative but for some records the cumulative death count erroneously decreases from one day to the next, likely representing that death counts were initially overreported, subsequently corrected for future days, and yet never corrected retroactively. The following table demonstrates days on which county death rates were negative and includes (parenthetically) the observed decrease. Only errors for which the decrease in total deaths is greater than ten are shown.

County	Date	Total Deaths (and Decrease)

```
Lincoln County, MO          04-28-2020          1 (-40)
Bergen County, NJ           03-31-2020          4 (-19)
Hudson County, NJ           04-26-2020          661 (-45)
Middlesex County, NJ        03-31-2020          0 (-12)
Nassau County, NY           05-28-2020          2,114 (-23)
New York County, NY         05-08-2020          19,561 (-65)
New York County, NY         05-10-2020          19,789 (-29)
Beaver County, PA           05-18-2020          70 (-13)
Delaware County, PA         05-18-2020          436 (-42)
Lackawanna County, PA       05-18-2020          125 (-24)
Lancaster County, PA        04-16-2020          33 (-36)
Montgomery County, PA       04-24-2020          208 (-22)
Montgomery County, PA       05-18-2020          566 (-54)
Northampton County, PA      05-18-2020          171 (-28)
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