



Health
Industry
Adv



Issue # 245
Thursday, December 24, 2020

COVID-19 Report

Highlights

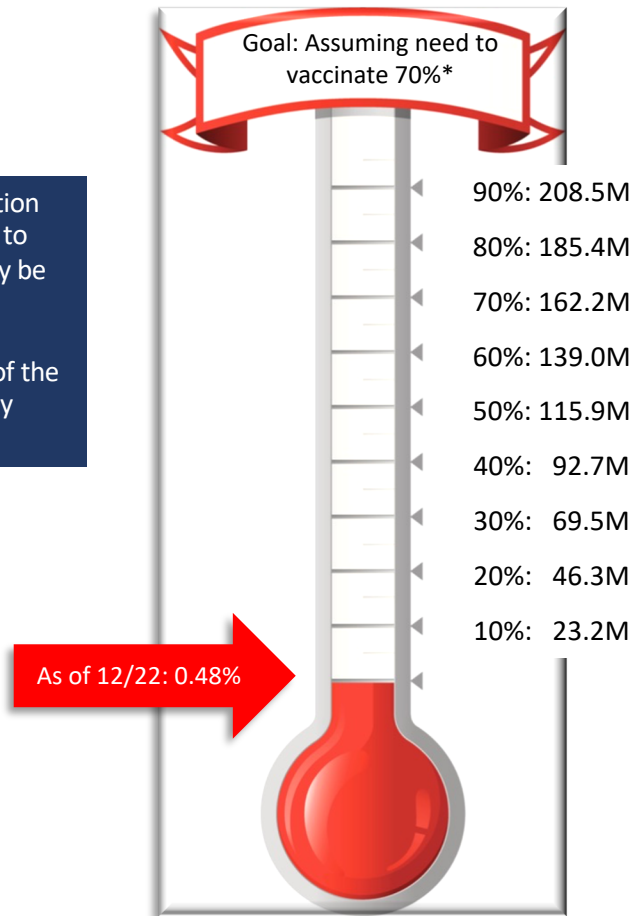
- Pfizer and the U.S. government finalized their contract for an additional 100 million doses of Pfizer's vaccine, with an option to purchase another 400 million. Pfizer is to deliver 70 million doses by June 30 and the remaining 30 million by July 31.
 - We are heading into the holiday in a challenging position with respect to infection rates, hospitalizations and deaths. As we and others have expressed, we face a difficult several weeks ahead
 - Still, there are reasons for optimism: First, the vaccination process is ramping up. We now have two vaccines, Pfizer and Moderna already approved for emergency use and at least another, J&J's on the near-term horizon. **As of yesterday, more than 1.1 million people in the U.S. have received an initial dose of either the Pfizer or Moderna vaccine. 11.5 million doses have been allocated to the states and 9.5 million have been distributed**
 - **Reproduction rates (R_t) are declining and, for the U.S. as a whole and half of the states, they are less than 1.0.** R_t is a measure of how many people a single infected person subsequently infects. An R_t greater than 1.0 indicates that the virus is spreading; An increasing R_t is a signal that this spread is accelerating. Using Youyang Gu's model, R_t declined from November 23 through December 9 (his latest estimate), and has been less than 1.0 for six consecutive days
- **Gu's estimate of new infections (as opposed to detected cases) peaked on December 1 and has declined since.** Gu estimates that 19% of the U.S. population has been infected by the SARS-CoV-2 virus as of December 9. By comparison, 5.7% of the population has had a detected case.
 - **The 7-day rate of newly-detected cases per million peaked on December 18th and has declined since. Eight of the nine states with the highest peak rates during the pandemic now have rates significantly lower than these peaks.** The lone exception, Tennessee, has seen a more modest decline from its peak. Tennessee and California's rates are currently the highest of any state
 - **While the death rate continues to be high, yesterday provided somewhat of a reprieve: For only the second time since November 30, the 7-day average deaths declined.**

Vaccine Tracking – U.S.

Distribution and administration of the Pfizer vaccine began in the U.S. last week; the Moderna vaccine this week
As of 12/23, more than 1.1M people have received the initial dose; 11M doses have been allocated to the states and 9.5M have been distributed

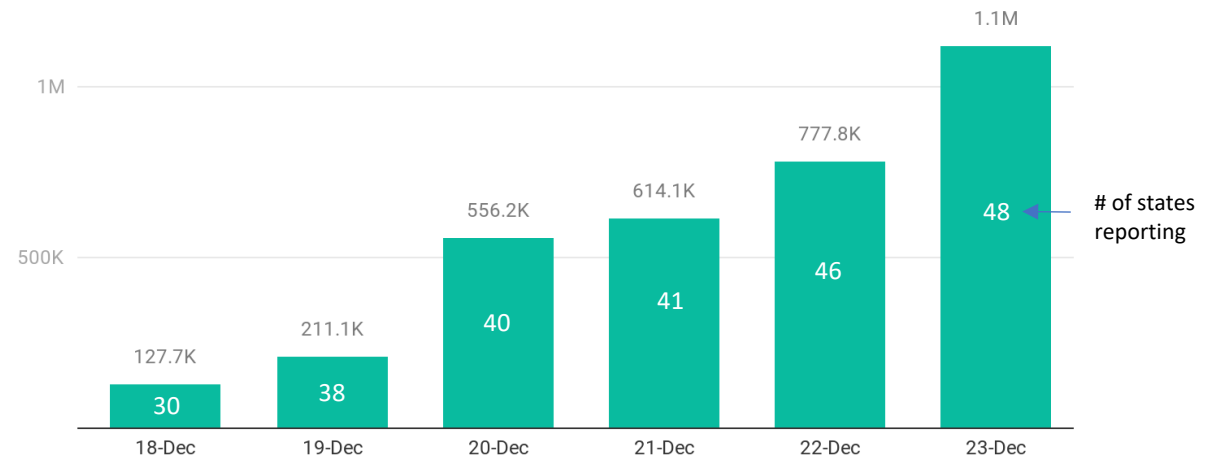
* 70% is used for illustration only. Actual rate needed to reach herd immunity may be higher or lower.

Does not reflect impact of the number of people already infected by the virus



Vaccine: Number of Persons Having Received First Dose (U.S.)

Per Bloomberg Vaccine Tracker, Accessed December 24



If 70% are required for herd immunity, 231.7 million people will need to be vaccinated

Chart: Health Industry Advisor LLC • Source: Bloomberg • Created with Datawrapper

Vaccine data from: [Centers for Disease Control and Prevention](#) and [Bloomberg Vaccine Tracker](#)

State-By-State Scorecard (Next Slide)

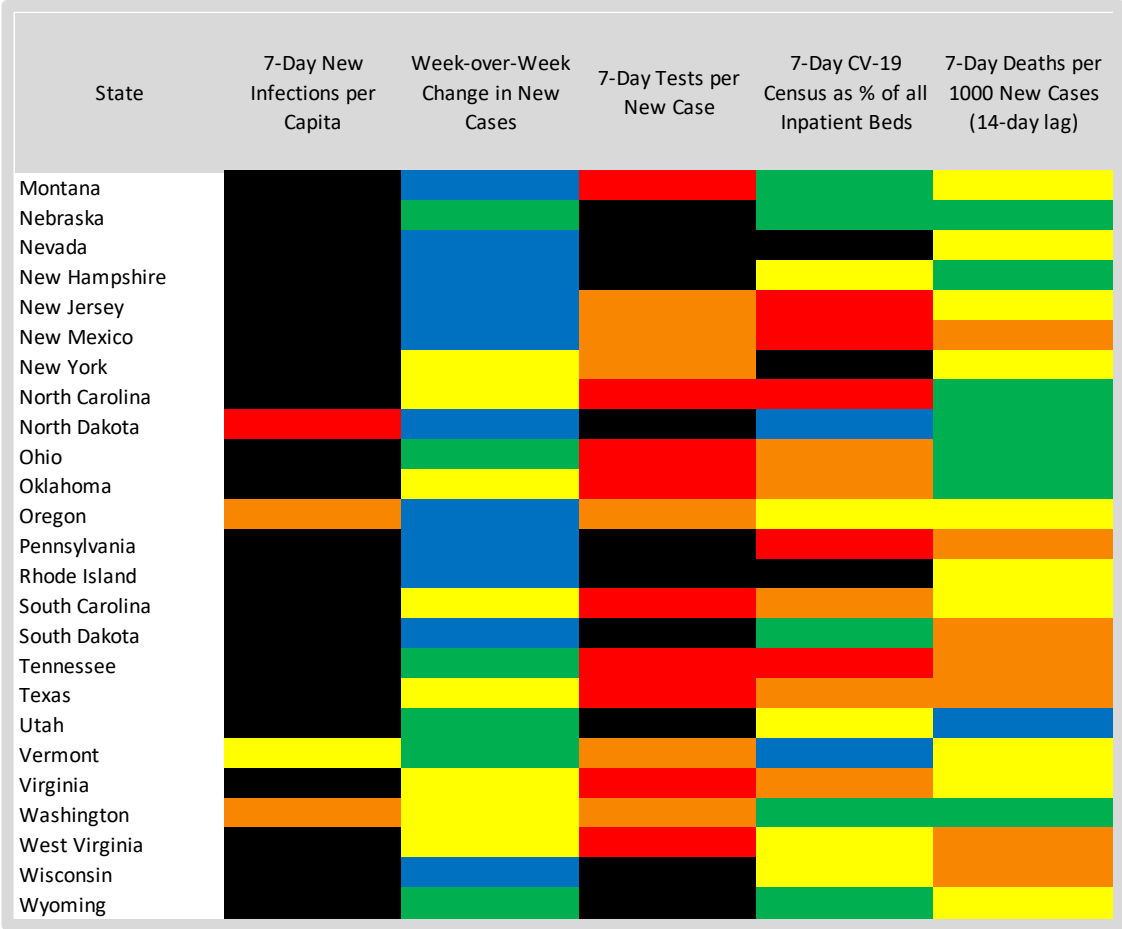
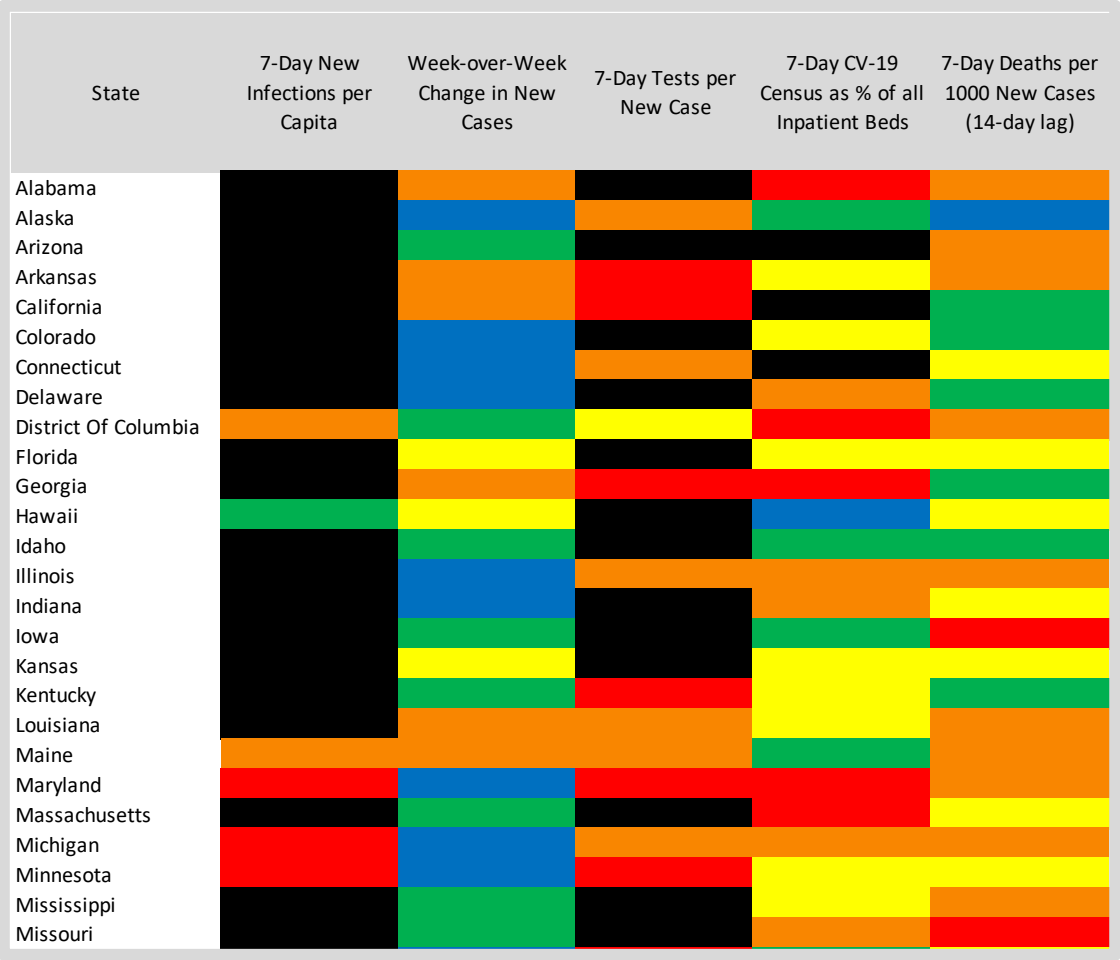
Designed to reflect five critical measures of a state's current experience with Covid-19

At his point, we have elected not to provide an overall score – in our view, different audiences would assign different priorities to each of the five measures

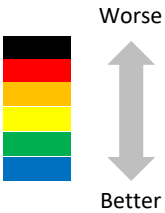
For example, health systems might weigh the Covid-19 census as a % of available beds; A community might weigh the deaths per case highest



Metric		Black	Red	Orange	Yellow	Green	Blue
7-Day Average New Daily Reported Infections per Capita	Greater than	450	350	250	150	50	0
Week-over-Week Change in Newly Reported Cases	Greater than	30%	20%	10%	0%	-10%	N/A
7-Day Average Viral Tests per 7-Day Average Newly Reported Cases	Less than	5	10	25	50	75	N/A
Covid-19 Inpatient Census as % of All Inpatient Beds	Greater than	50%	40%	30%	20%	10%	0%
7-Day Deaths per 1000 New Cases (14-day lag)	Greater than	25	20	15	10	5	0



Scale



According to Gu's model, the reproduction rate been declining since November 23 . . . And has been below 1.0 for six consecutive days

This suggests that the virus spread slowed through and since the Thanksgiving holiday

Notes:

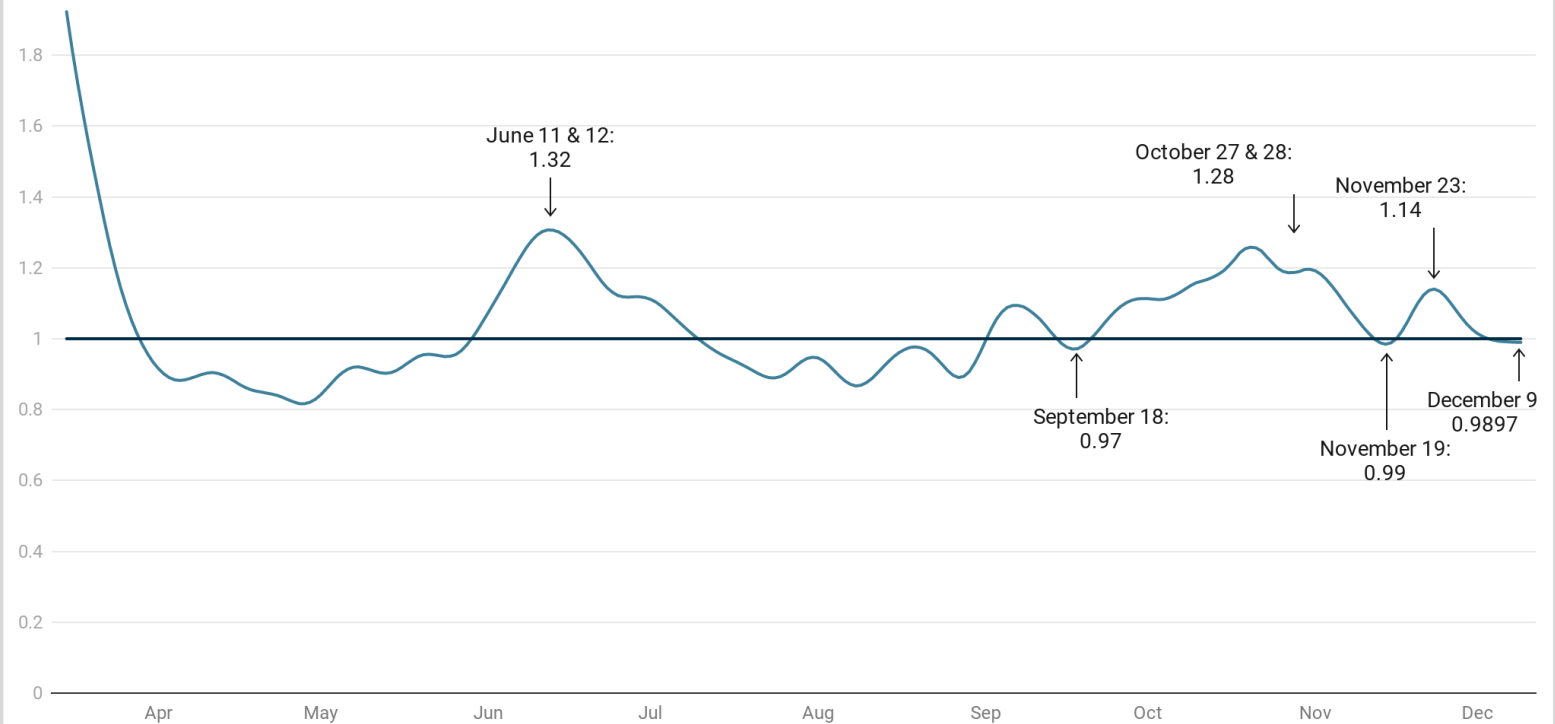
- Gu uses deaths to estimate actual infections and the reproduction rate (R_t), using a machine learning model

- Gu backdates two weeks from the death date to estimate when an infection likely occurred

* - Youyang Gu: Covid-19projections.com

Reproduction Rate (R_t) - U.S.

Youyang Gu Estimate, Through December 9



R_t is an estimate of how many additional people a single person will infect

Chart: Health Industry Advisor LLC • Source: Youyang Gu • Created with Datawrapper

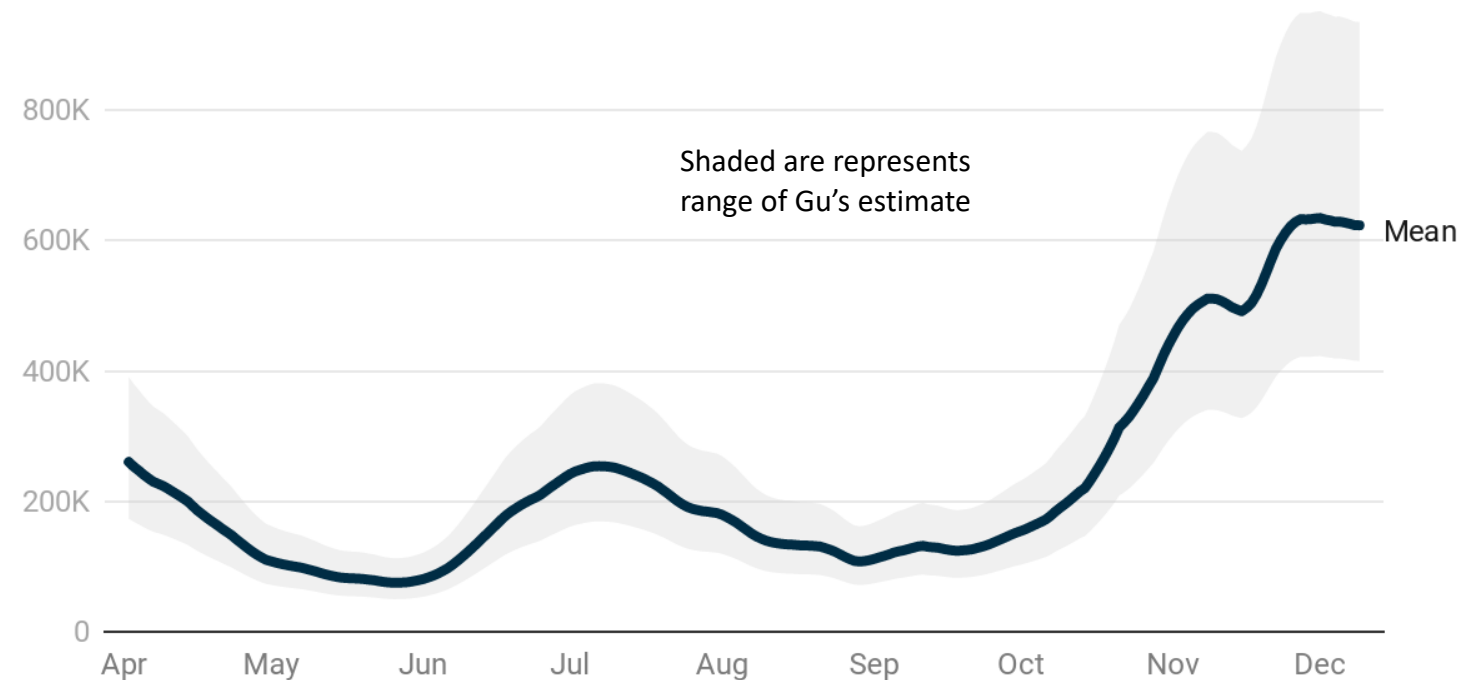
According to Gu's estimates, new infections in the U.S. peaked on December 1 and have gently declined since

Gu estimates that more than 19% of the U.S. population has been infected by the SARS-CoV-2 virus (range of 13-29%)

*<https://pandemicnavigator.oliverwyman.com/forecast?mode=country®ion=United%20States&panel=baseline>

Estimated New Daily Infections

Youyang Gu's Covid19-Projection Model (Mean Value)



Gu backdates from daily deaths to estimate the number of new infections that occurred two weeks earlier

Chart: Health Industry Advisor LLC • Source: Youyang Gu • Created with Datawrapper

Reproduction Rates (R_t) are an indication of how fast the virus is spreading. Rates > 1 suggest that spread is increasing; < 1 , that it is declining

Alabama - California

Reproduction Rates (R_t) By State

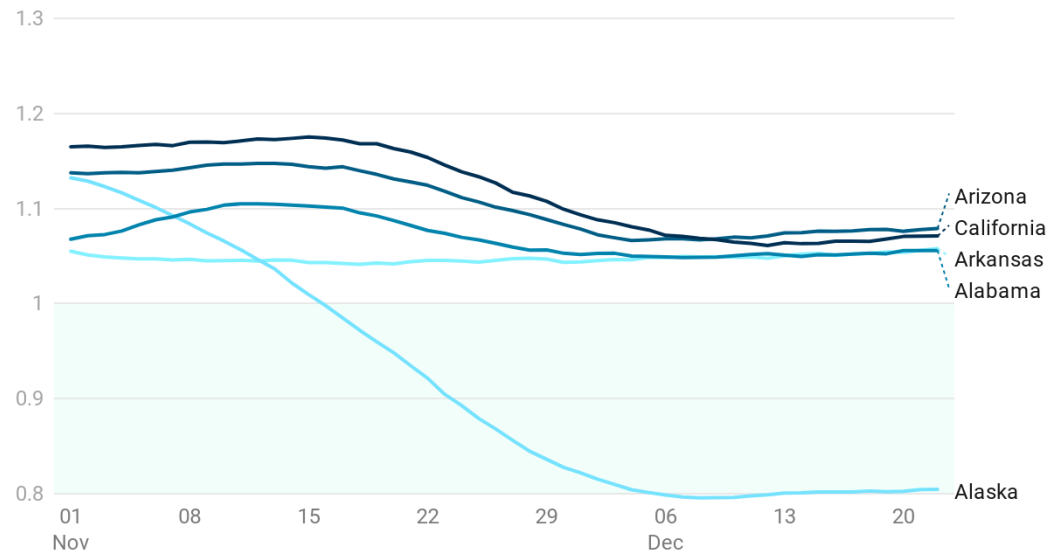


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Colorado - Georgia

Reproduction Rates (R_t) By State

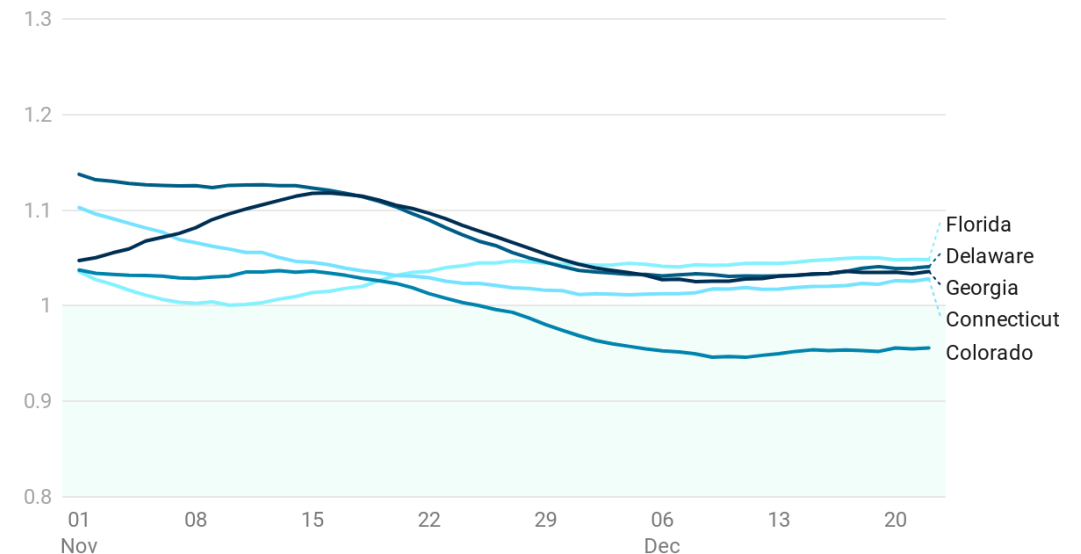


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Reproduction Rates (R_t) are an indication of how fast the virus is spreading. Rates > 1 suggest that spread is increasing; < 1 , that it is declining

Half of the states have $R_t > 1$; Half have rates < 1

Maine, West Virginia and Oklahoma have the highest rates; Alaska, New Jersey and North Dakota, the lowest

Reproduction Rate (R_t)

Source: Rt.live, As of December 22

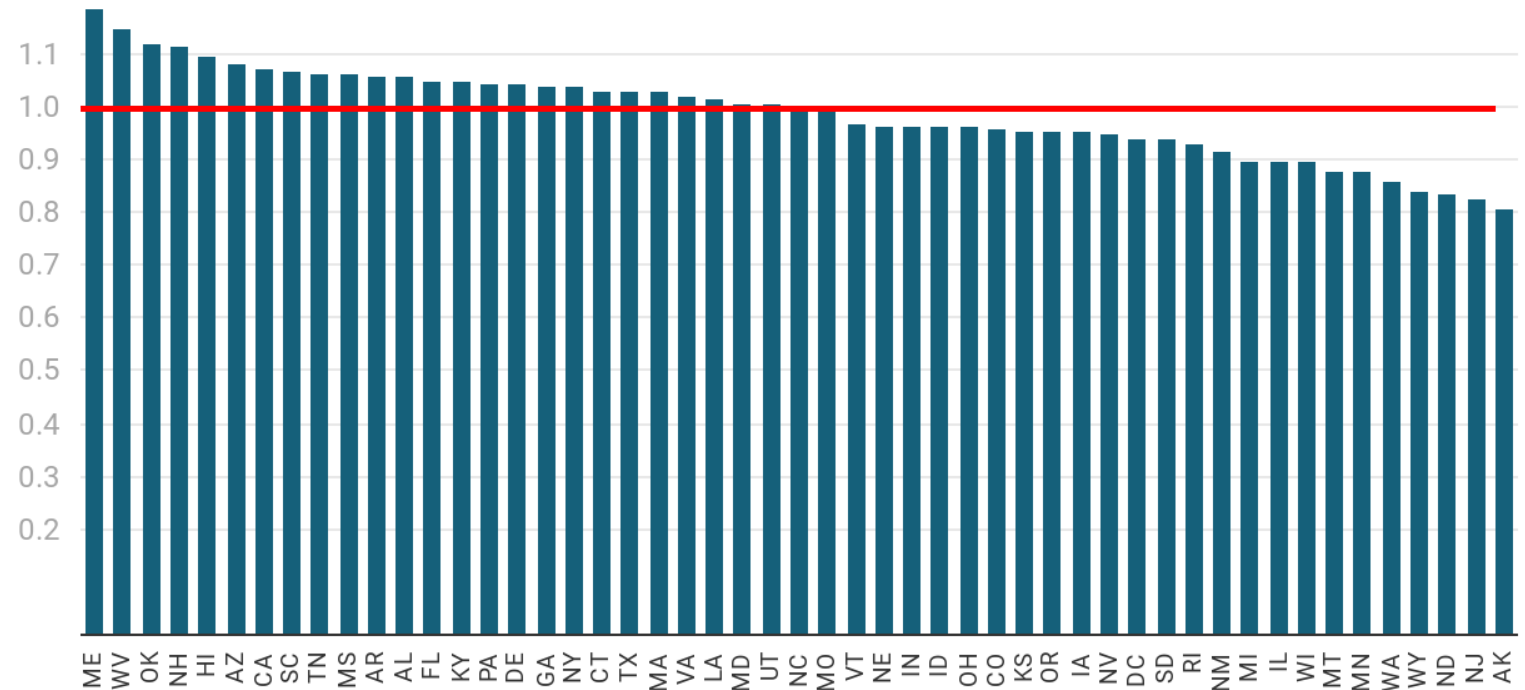


Chart: Health Industry Advisor LLC • Source: Rt.live • Created with Datawrapper

Reproduction Rates (R_t) are an indication of how fast the virus is spreading. Rates > 1 suggest that spread is increasing; <1 , that it is declining

Hawaii - Iowa

Reproduction Rates (R_t) By State

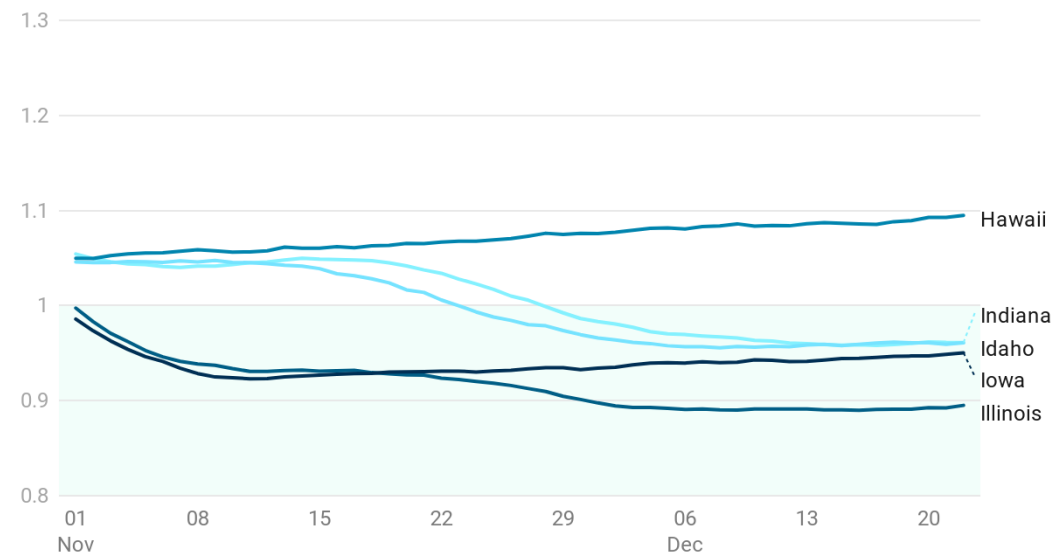


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Kansas - Maryland

Reproduction Rates (R_t) By State

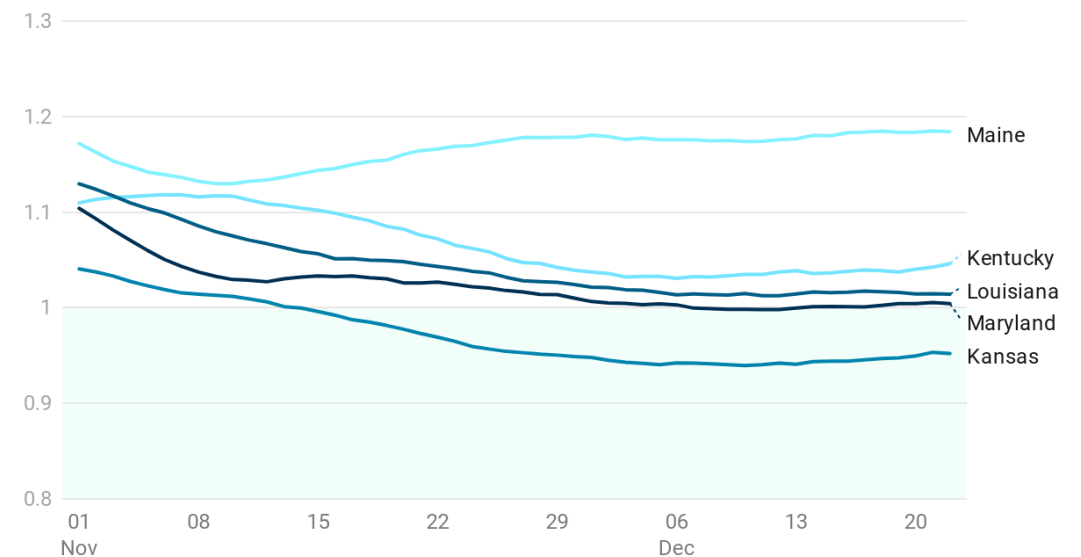


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Reproduction Rates (R_t) are an indication of how fast the virus is spreading. Rates > 1 suggest that spread is increasing; < 1 , that it is declining

Massachusetts - Missouri

Reproduction Rates (R_t) By State

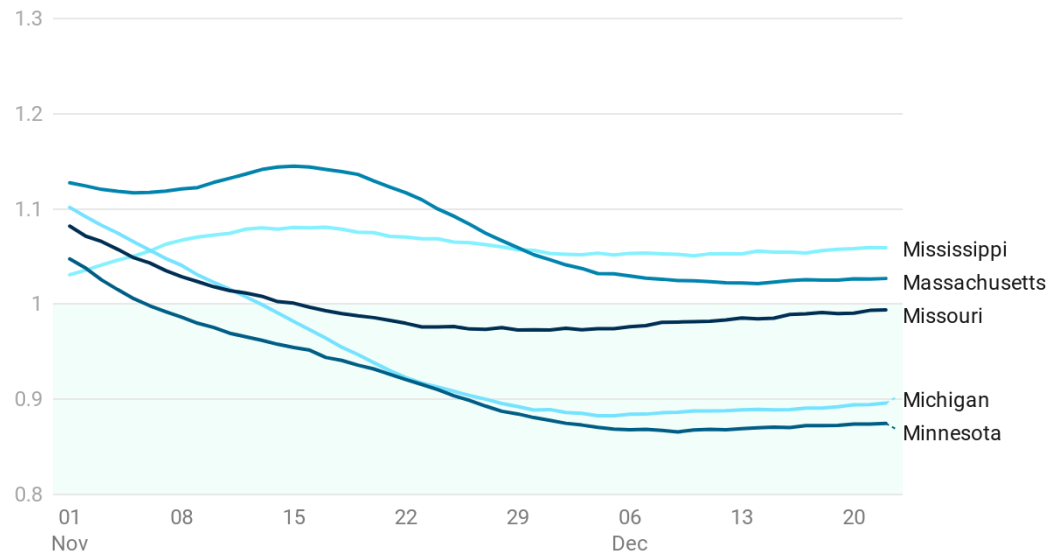


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Montana – New Jersey

Reproduction Rates (R_t) By State

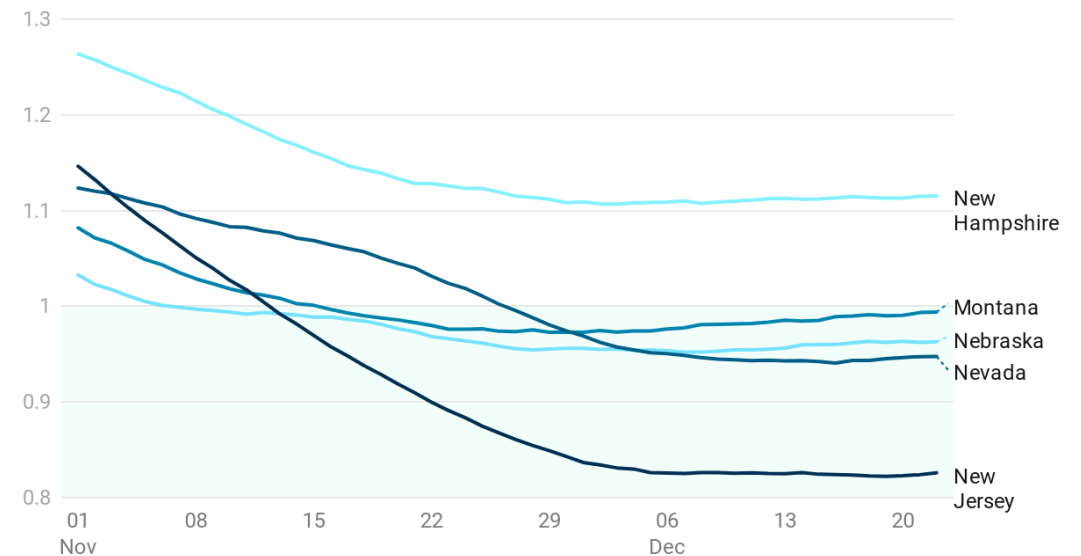


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Reproduction Rates (R_t) are an indication of how fast the virus is spreading. Rates > 1 suggest that spread is increasing; <1 , that it is declining

New Mexico - Ohio

Reproduction Rates (R_t) By State

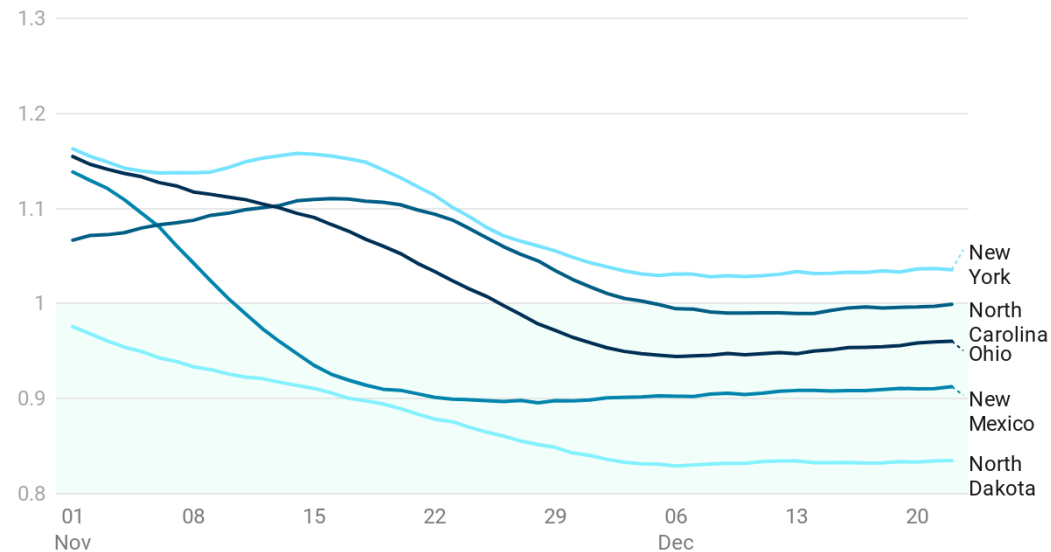


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Oklahoma – South Carolina

Reproduction Rates (R_t) By State

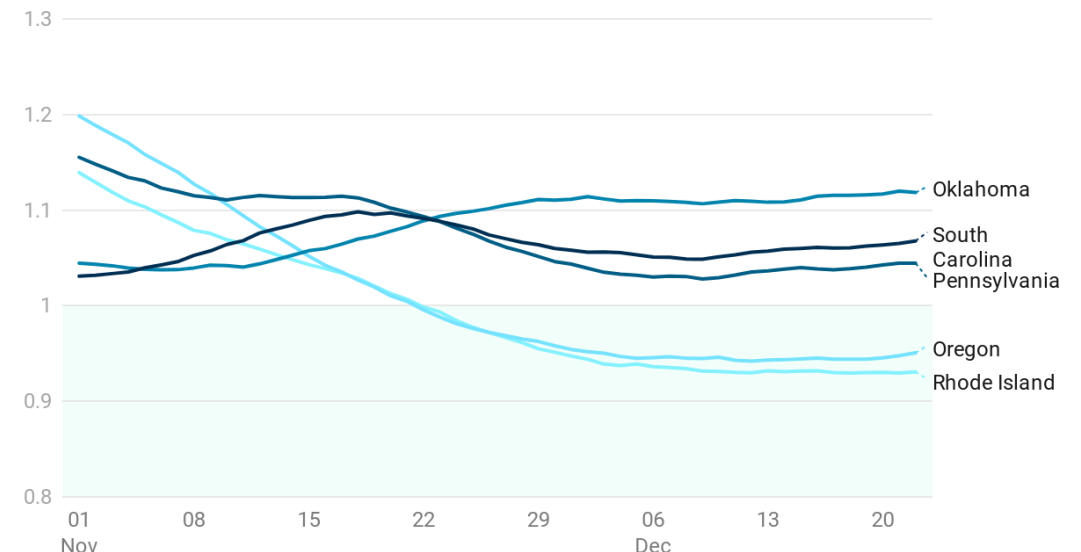


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Reproduction Rates (R_t) are an indication of how fast the virus is spreading. Rates > 1 suggest that spread is increasing; < 1 , that it is declining

South Dakota - Vermont

Reproduction Rates (R_t) By State

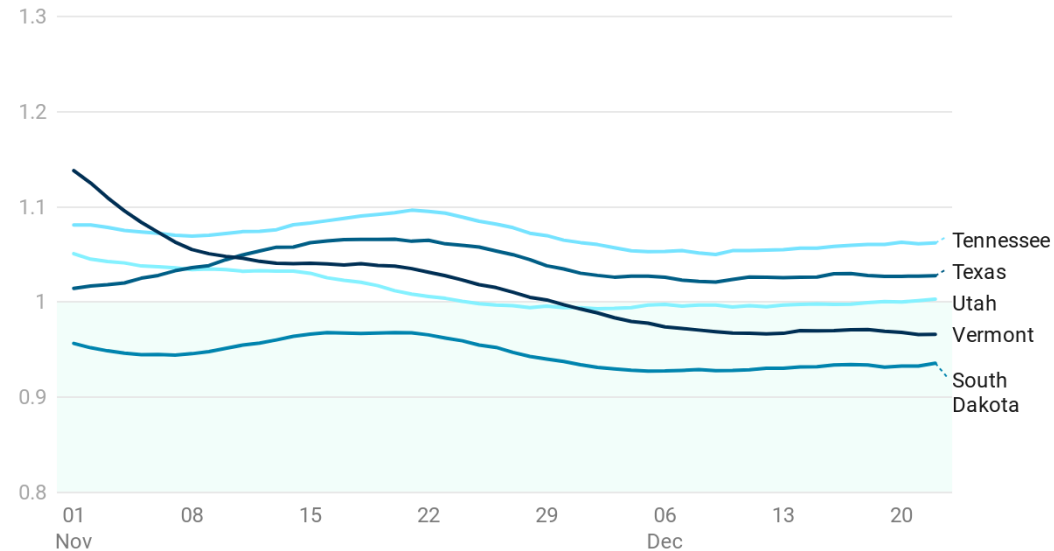


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

Virginia - Wyoming

Reproduction Rates (R_t) By State

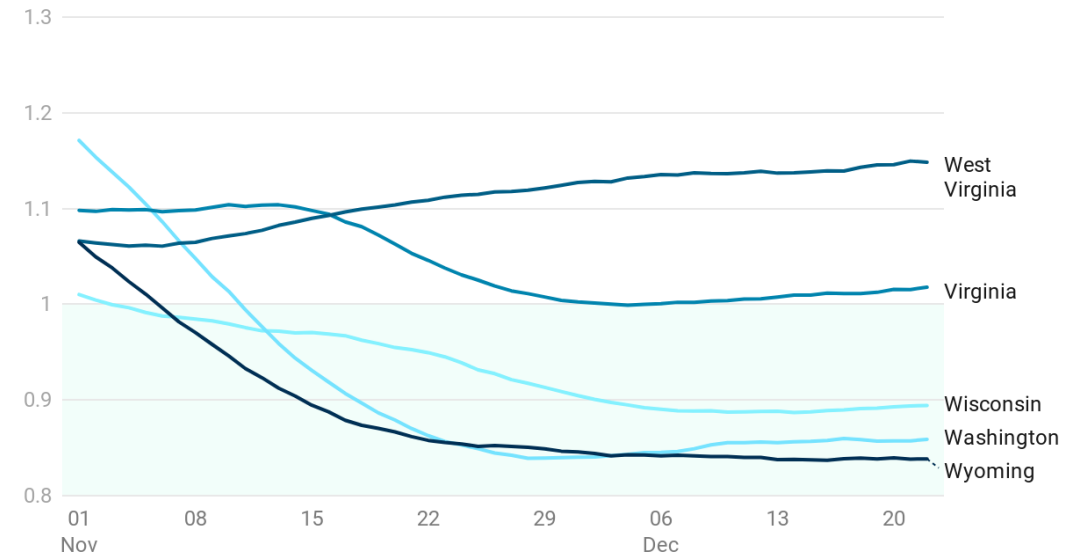


Chart: Health Industry Advisor LLC • Source: rt.live • Created with Datawrapper

There were fewer new cases in the U.S. the last seven days than there were during the prior seven-day period

Week-Over-Week Changes in Newly-Detected Cases: USA v. Worldwide

7-Day Moving Average, As of December 23

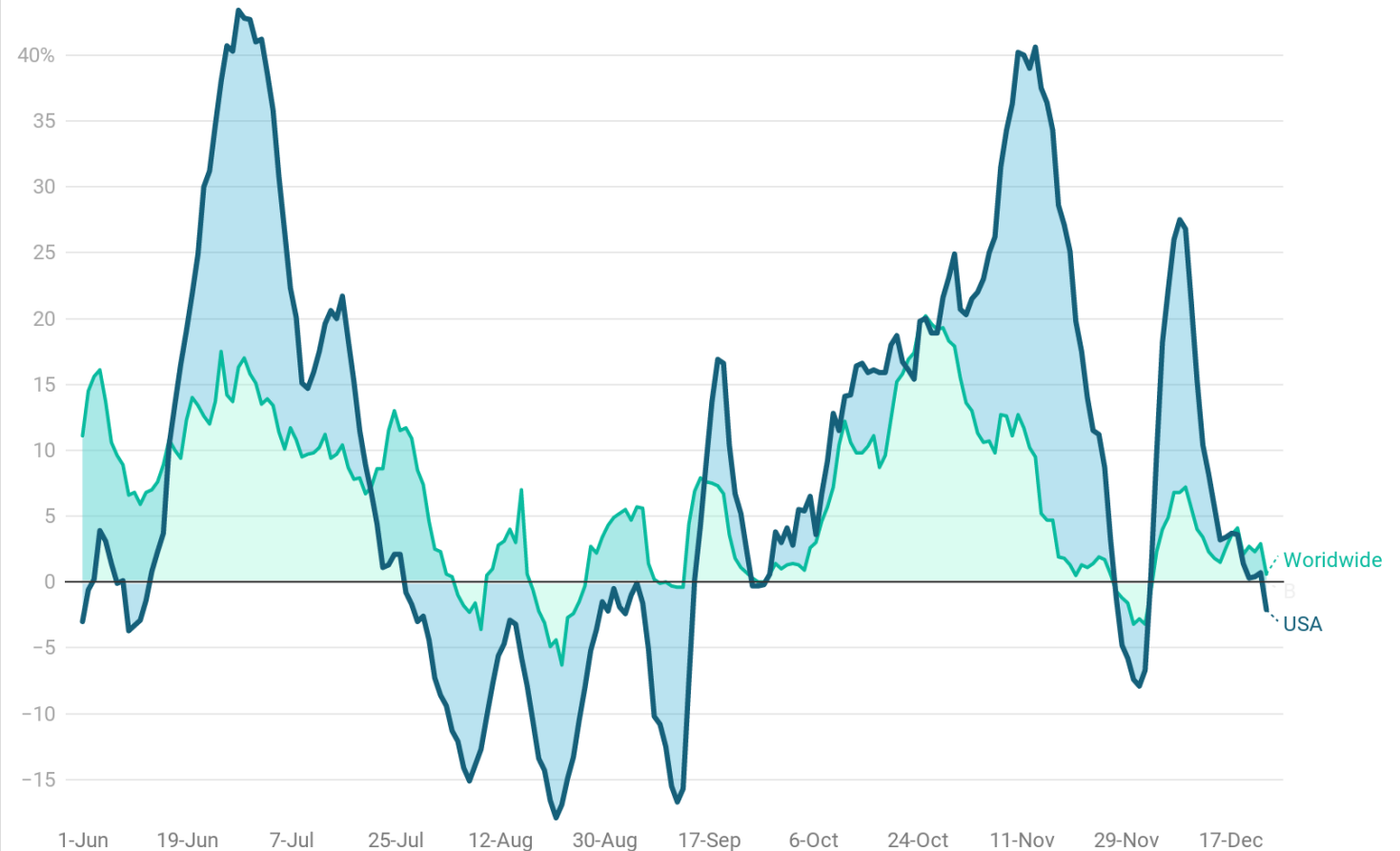


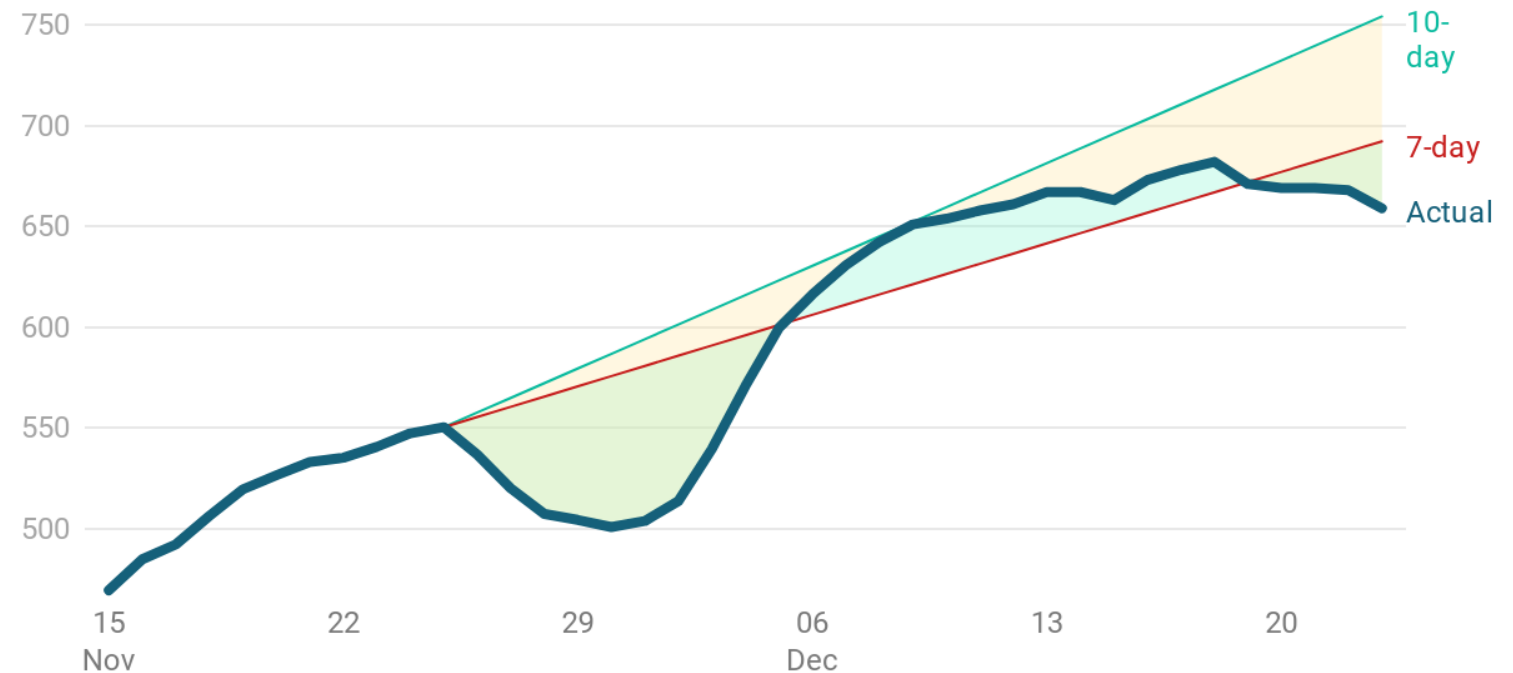
Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

7-day newly-detected case rates peaked on December 18 and have declined since

On this basis, we are heading into the Christmas/New Year's period on a better trajectory than where we were heading into the Thanksgiving holiday

Newly-Detected Cases / Million

7-Day Moving Average v. Pre-Thanksgiving Trends



7- & 10-day trends are extrapolation of trends leading up to Thanksgiving Day

Chart: Health Industry Advisor LLC • Created with Datawrapper

Eight of the nine states (ND, SD, WY, IA, MN, NE, NH and AK) with the highest peak infection rates per capita have seen these rates recede significantly from these peaks – even the lone “holdout”, Tennessee’s has receded somewhat

The highest rates are now being experienced in Tennessee, and California

New Daily Detected Cases Per Million - By State

7-Day Average As of December 23 & Difference From State's Highest Rate To-Date

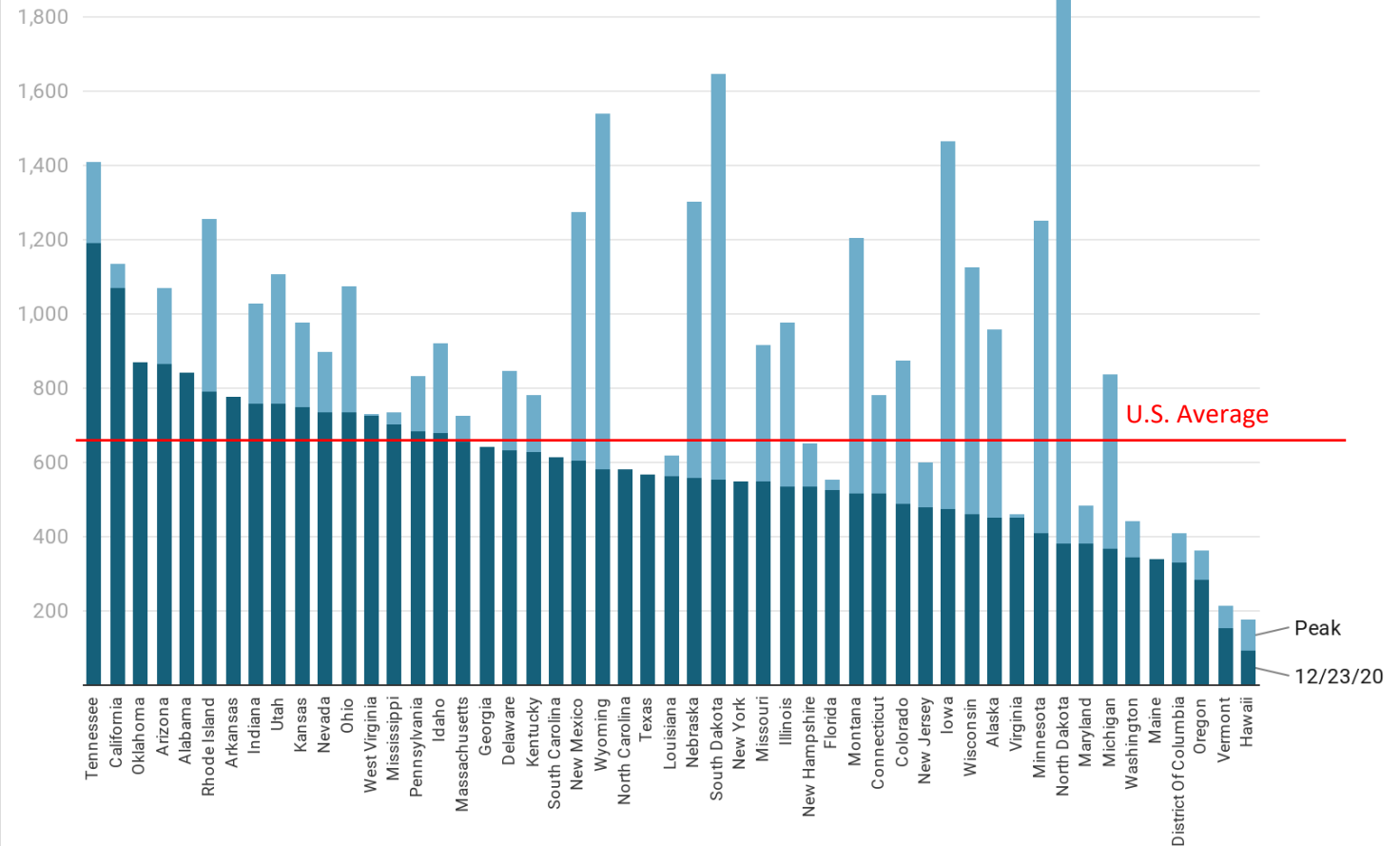


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Newly-Detected Cases / Million

Alabama - California

Newly Detected Cases / Million

7-day Average

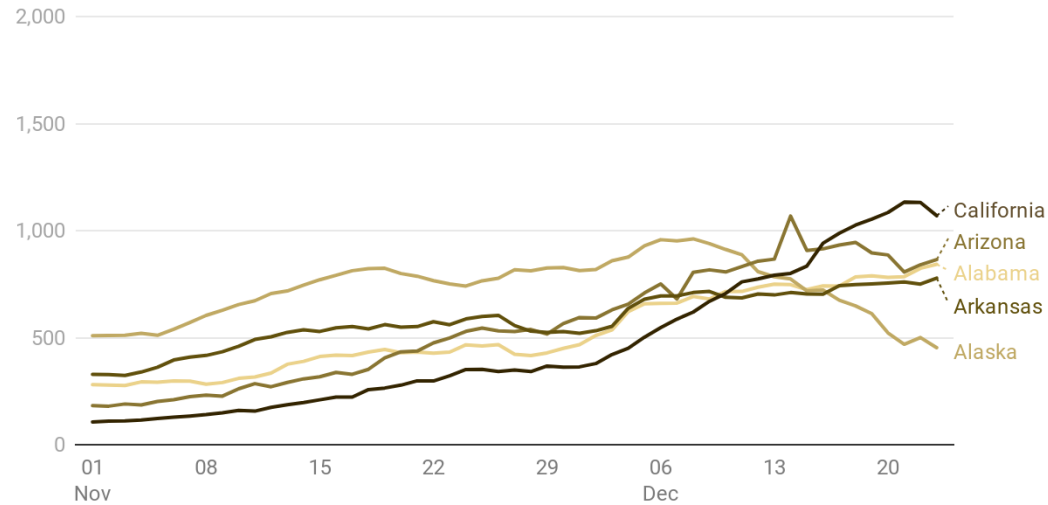


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Colorado - Georgia

Newly Detected Cases / Million

7-day Average

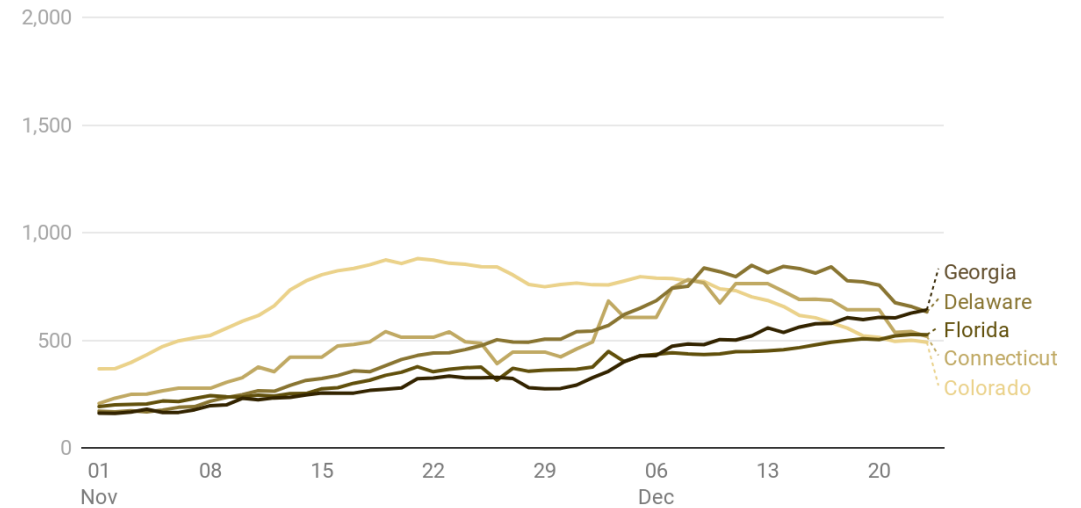


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Newly-Detected Cases / Million

Hawaii - Iowa

Newly Detected Cases / Million

7-day Average

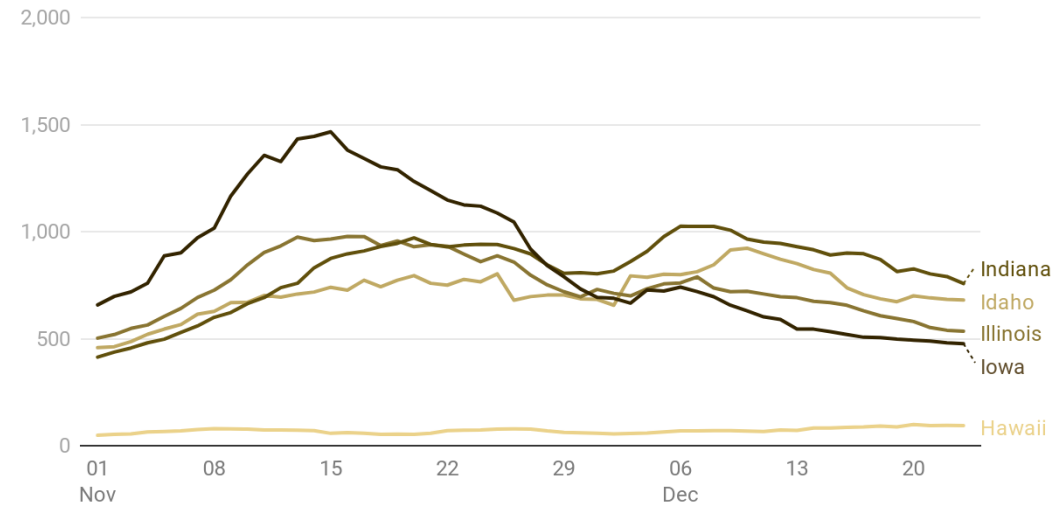


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Kansas - Maryland

Newly Detected Cases / Million

7-day Average

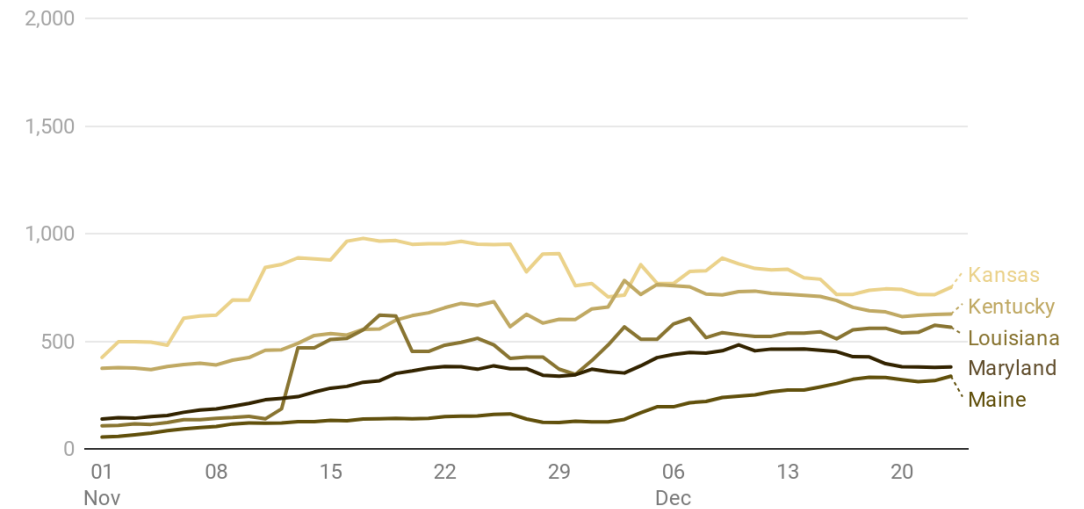


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Newly-Detected Cases / Million

Massachusetts - Missouri

Newly Detected Cases / Million

7-day Average

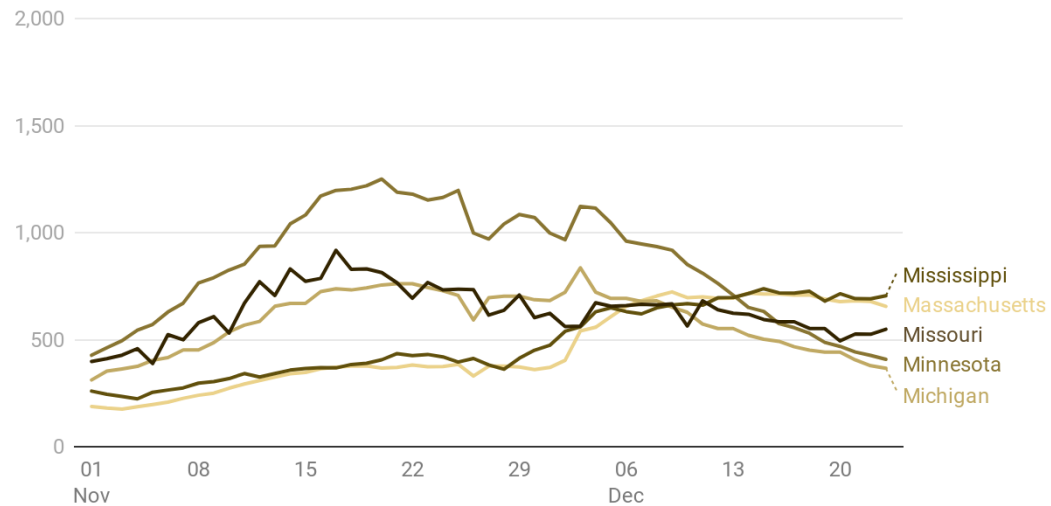


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Montana – New Jersey

Newly Detected Cases / Million

7-day Average

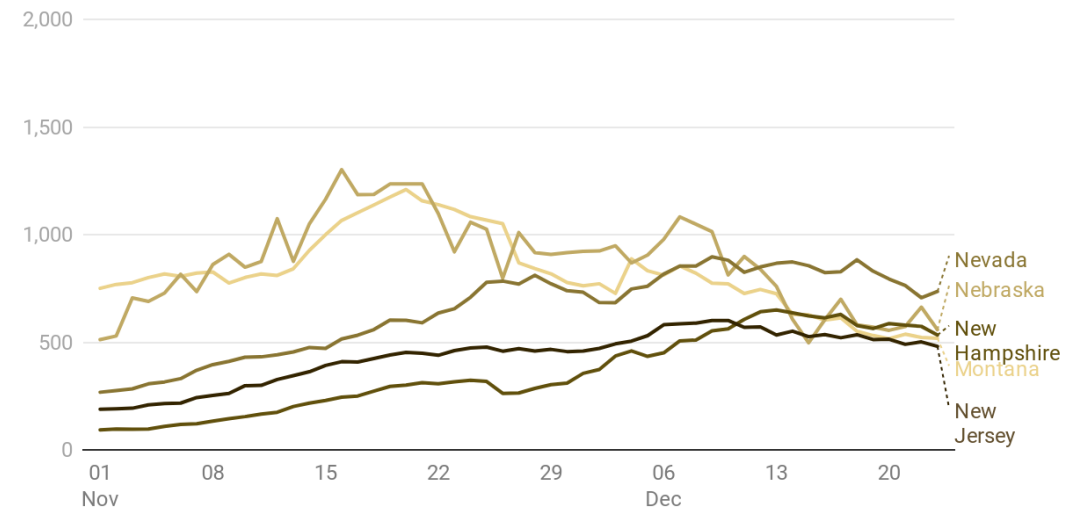


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Newly-Detected Cases / Million

New Mexico - Ohio

Newly Detected Cases / Million

7-day Average

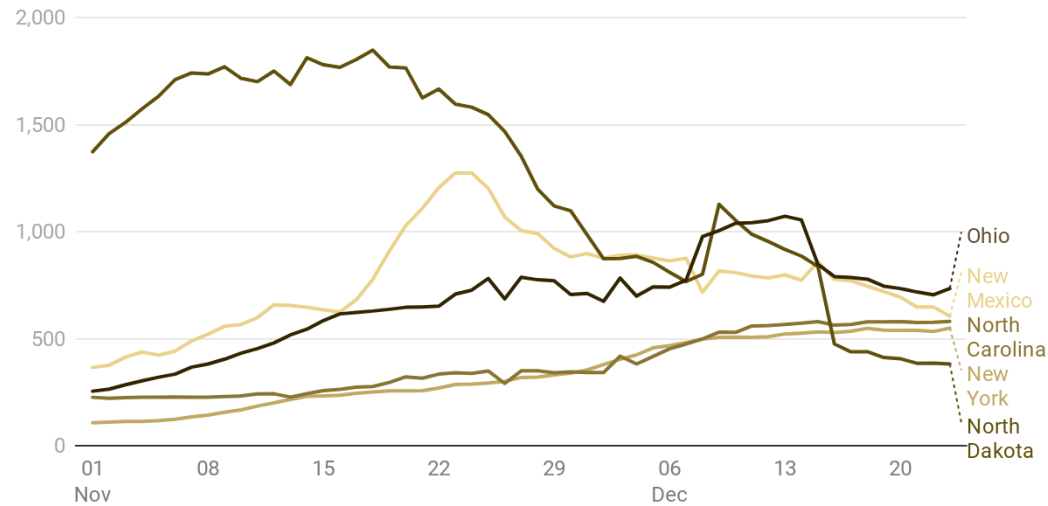


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Oklahoma – South Carolina

Newly Detected Cases / Million

7-day Average

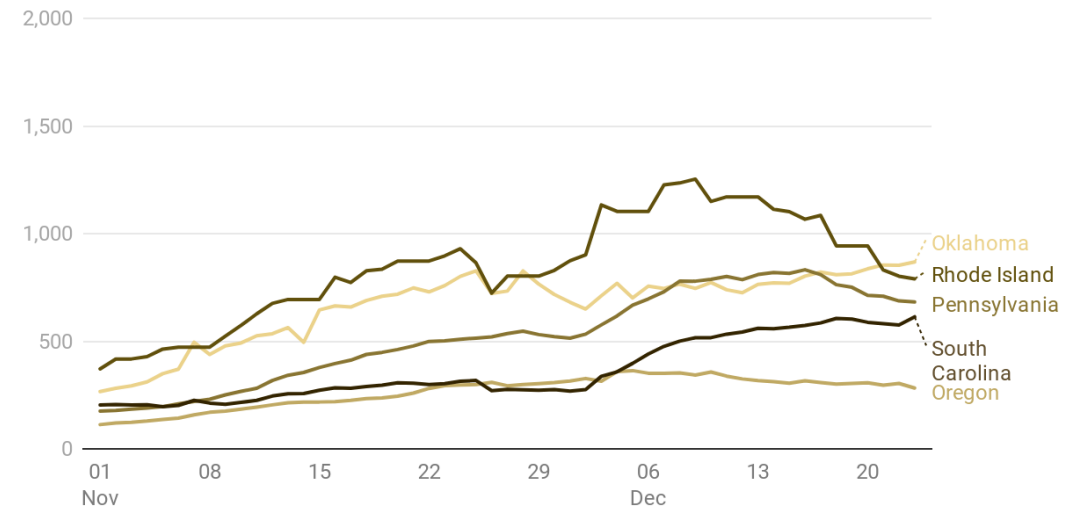


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Newly-Detected Cases / Million

South Dakota - Vermont

Newly Detected Cases / Million

7-day Average

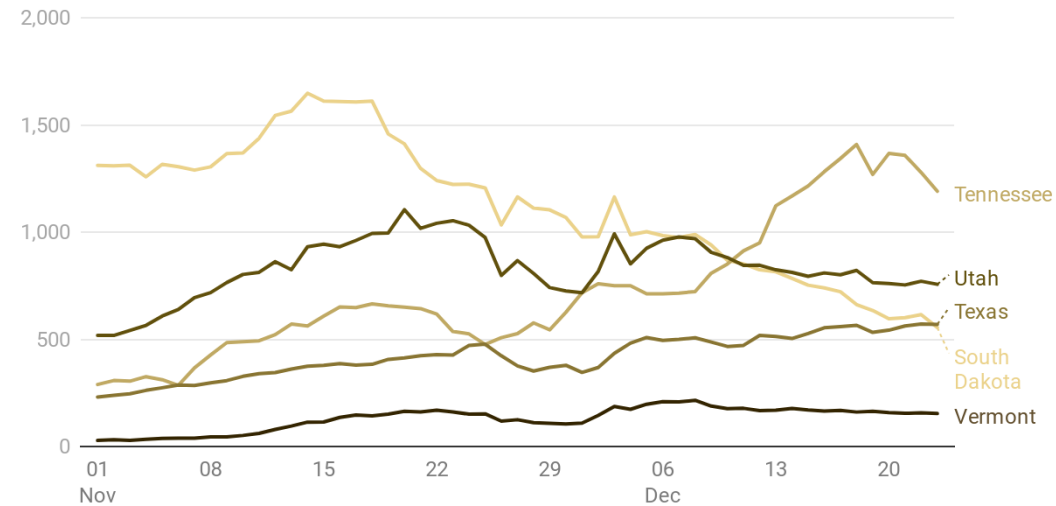


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Virginia - Wyoming

Newly Detected Cases / Million

7-day Average

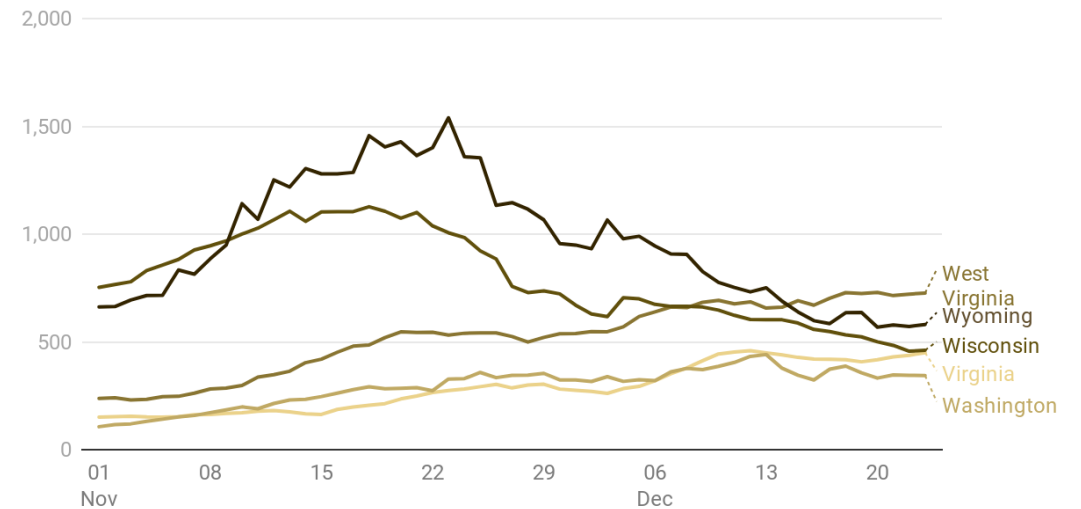


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

The 7-day average death rate declined yesterday, for only the second time since November 30

Nevertheless, this rate remains very high relative to rates throughout the pandemic

Deaths Reported With Coronavirus in the U.S.

Trailing 7-Day Moving Average, As of December 23



Health Industry Advisor LLC analysis

Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

State-By-State Comparisons

As of December 23

State ▲	Cases per 1M Population	Deaths per 1 Million Population	Tests per 1M Population Past 7 days	Test-Positive % (7-Day Moving Average)	New Daily Cases Per 1M Population (7-Day M.A.)	Tests / New Case	Covid-19 Census % of All Beds	Week-Over-Week Change in New Cases	7-Day Deaths /1000 New Cases , 14-Day Lag
Alabama	68.2k	936	2,316	36.4%	843	3	44%	14%	17
Alaska	59.3k	268	10,913	4.2%	453	24	16%	-37%	3
Arizona	65k	1,124	2,771	31.2%	865	3	69%	-5%	16
Arkansas	68.9k	1,119	4,244	18.3%	778	5	22%	11%	20
California	50.9k	598	8,384	12.6%	1,070	8	73%	14%	9
Colorado	55k	775	2,115	23.2%	491	4	28%	-19%	10
Connecticut	47.9k	1,609	8,696	6.0%	518	17	66%	-25%	12
Delaware	53.6k	895	2,458	25.7%	632	4	36%	-22%	7
District Of Columbia	38.6k	1,064	10,446	3.1%	329	32	42%	-7%	15
Florida	57.5k	972	2,427	21.3%	526	5	28%	10%	10
Georgia	57.3k	991	3,609	13.3%	641	6	50%	11%	8
Hawaii	14.5k	201	97	100.0%	94	1	7%	10%	10
Idaho	74.8k	739	1,671	40.9%	680	2	19%	-8%	8
Illinois	72.4k	1,329	7,134	7.5%	535	13	32%	-18%	17
Indiana	70.8k	1,136	2,014	37.6%	757	3	37%	-16%	11
Iowa	86k	1,163	1,069	32.7%	476	2	15%	-8%	22
Kansas	72.8k	861	2,155	34.4%	751	3	21%	5%	14
Kentucky	56k	552	4,056	15.4%	626	6	27%	-9%	9

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As of December 23

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Louisiana	63.2k	1,554	5,741	9.8%	565	10	23%	11%	17
Maine	15.2k	231	5,358	6.3%	338	16	18%	11%	20
Maryland	42.7k	921	2,300	16.5%	380	6	45%	-16%	15
Massachusetts	48.3k	1,710	3,206	20.4%	655	5	43%	-8%	11
Michigan	50.9k	1,243	4,512	8.1%	367	12	31%	-25%	18
Minnesota	71.4k	892	2,469	16.5%	408	6	22%	-29%	11
Mississippi	67.3k	1,523	3,009	23.4%	705	4	24%	-2%	17
Missouri	65.2k	936	1,260	37.9%	549	2	34%	-6%	21
Montana	73.5k	855	4,028	12.9%	518	8	15%	-14%	13
Nebraska	82.5k	807	1,569	35.1%	558	3	18%	-8%	8
Nevada	68.2k	932	1,837	40.0%	736	2	89%	-11%	11
New Hampshire	28.3k	498	1,926	27.7%	534	4	30%	-13%	10
New Jersey	51.3k	2,094	6,466	7.5%	481	13	49%	-10%	12
New Mexico	63.5k	1,070	6,435	9.4%	605	11	46%	-22%	16
New York	47.2k	1,896	10,036	5.4%	549	18	53%	4%	14
North Carolina	47.1k	606	5,573	10.4%	581	10	43%	3%	10

State-By-State Comparisons

As of December 23

State ▲	Cases per 1M Population	Deaths per 1 Million Population	Tests per 1M Population Past 7 days	Test-Positive % (7-Day Moving Average)	New Daily Cases Per 1M Population (7-Day M.A.)	Tests / New Case	Covid-19 Census % of All Beds	Week-Over-Week Change in New Cases	7-Day Deaths /1000 New Cases , 14-Day Lag
North Dakota	119k	1,631	1,206	31.7%	382	3	8%	-20%	8
Ohio	55.2k	715	4,546	16.1%	734	6	33%	-7%	7
Oklahoma	68.1k	577	5,032	17.3%	868	6	32%	8%	8
Oregon	25.1k	333	5,063	5.6%	283	18	22%	-11%	14
Pennsylvania	45.8k	1,133	1,752	39.4%	683	3	43%	-18%	18
Rhode Island	77.5k	1,609	2,986	26.5%	790	4	56%	-26%	12
South Carolina	54.8k	977	5,107	12.0%	613	8	36%	7%	12
South Dakota	108.6k	1,570	1,536	36.1%	555	3	19%	-25%	15
Tennessee	79.2k	934	5,960	20.0%	1,191	5	41%	-7%	18
Texas	57.1k	921	3,426	16.8%	570	6	37%	3%	16
Utah	80.4k	373	2,380	31.8%	757	3	22%	-6%	5
Vermont	10.7k	188	2,081	7.4%	154	14	5%	-7%	15
Virginia	37.4k	658	4,299	10.5%	450	10	39%	7%	10
Washington	30.5k	433	3,510	12.2%	344	10	16%	6...	9
West Virginia	42.5k	668	5,874	12.4%	726	8	24%	8%	18
Wisconsin	79.6k	792	1,610	33.9%	461	3	23%	-17%	15
Wyoming	73.7k	644	1,527	38.1%	581	3	15%	-3%	13

Table: Health Industry Advisor LLC • Created with Datawrapper

Data Sources

The following data sources are accessed on a daily or weekly basis:

- The Atlantic's Covid Tracking Project: <https://covidtracking.com>
- Worldometers.info: <https://www.worldometers.info/coronavirus/>
- Centers for Disease Control and Prevention, National, Regional, and State Level Outpatient Illness and Viral Surveillance
<https://gis.cdc.gov/grasp/fluview/fluportaldashboard.html>
- Centers for Disease Control and Prevention, COVID-19 Laboratory-Confirmed Hospitalizations https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html
- Centers for Disease Control and Prevention, COVID Data Tracker
<https://www.cdc.gov/covid-data-tracker/index.html#mobility>
- Centers for Disease Control and Prevention, Vaccines,
<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html>
- Institute for Health Metrics and Evaluation, COVID-19 estimate downloads
<http://www.healthdata.org/covid/data-downloads>
- New York Times, Covid-19 data <https://github.com/nytimes/covid-19-data>
- COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University <https://github.com/CSSEGISandData/COVID-19>
- COVID-19 Projections Using Machine Learning, <https://covid19-projections.com>
- Oliver Wyman Pandemic Navigator,
<https://pandemicnavigator.oliverwyman.com/forecast?mode=country®ion=United%20States&panel=mortality>
- Bloomberg Vaccine Trackers, <https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/?sref=Z0b6TmHW>