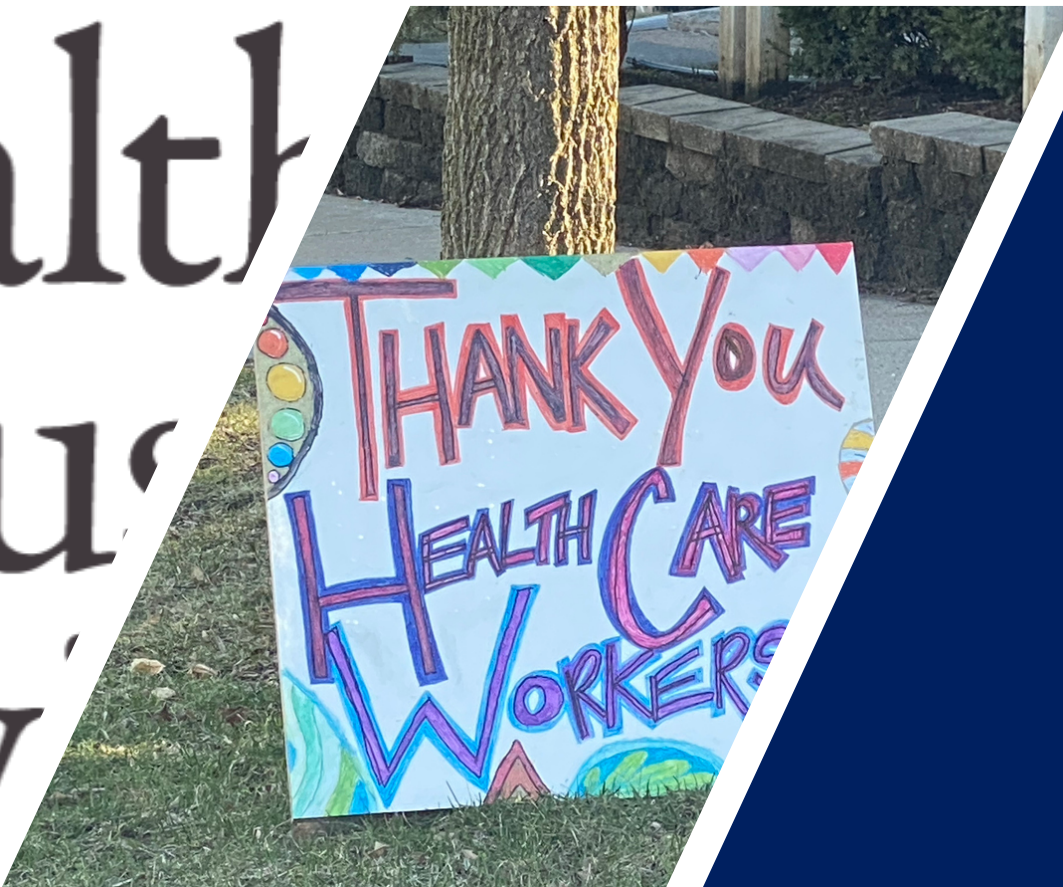




Health
Industry
Adv



Issue # 233
Thursday, December 10, 2020

COVID-19 Report

Highlights

- **The U.S. passed a grim milestone yesterday - for the first time, more than 3,000 people died with the coronavirus. The 7-day average deaths per day has been trending upward for the past eleven days**
- Another unfortunate milestone was reached yesterday - **New York reached a new high in its 7-day rate of new infections per capita. The previous high was set back on April 10**
 - **Florida has gone the longest of any state since its peak infection rate - 145 days (July 17); followed by Hawaii, 102 days**
 - All except twelve states are within 10% of their peak infection rates. Hawaii is 60% below its peak, followed by Iowa, 55%. Others that are at less than 90% of peak: Illinois, Minnesota, Missouri, Montana, New Mexico, North Dakota, South Dakota, Wisconsin and Wyoming (curiously, mostly states that were hardest-hit in September/October)
- **Infection prevalence rates (e.g., the % of the population that has been infected and, presumably, immune) are a significant factor in achieving herd immunity levels**
 - Two modelers provide regular estimates of infection prevalence: Oliver Wyman and Youyang Gu
 - Oliver Wyman uses cases in preparing these estimates; Gu uses deaths (as such, his estimates are delayed two weeks)
 - **Oliver Wyman places its mean estimate at 14.6% of the U.S. population, with a range of 8.2%-25.2%**
 - **Gu places his mean estimate at 17.3% of the population, with a range of 11.5%-25.9%; by comparison, the detected case rate in the U.S. is 4.8%**
 - Using Gu's estimates at the state-level:
 - South Dakota has the highest infection prevalence rate, 37.4%, with a range of 24.9%-56.1%
 - Iowa, Nebraska, New Jersey, North Dakota and Wisconsin are each estimated to have 25% or more of the population infected by this point
 - Vermont is estimated to have the lowest infection prevalence, 2.5%; followed by Maine, New Hampshire, Hawaii and Oregon
- **The Reproduction Rate (R_t) is one way of assessing whether infection spread is increasing or receding (R_t measures how many people a single infected person subsequently infects)**
 - **R_t is currently above 1 for all except twelve states - Illinois, Iowa, Minnesota, Montana, New Mexico, North Dakota, Wisconsin and Wyoming**
 - **Nevertheless, R_t is only marginally different in each state than it was pre-Thanksgiving - suggesting that infections are increasing at about the same rate as before the holiday (i.e., no measurable post-holiday surge yet)**
- Covid-19 inpatient census increased again yesterday; **Covid-19 patients now occupy 34% of inpatient beds in the U.S.**
 - **In Nevada, Covid-19 patients now occupy 81% of inpatient beds; In Connecticut, this rate is 73%**
 - In Arizona, New Mexico and Rhode Island, this rate exceeds 50%
 - **Yet, the rate of Covid-19 census: new cases declined for the eighth consecutive day**
 - Further, the likelihood of a Covid-19 patient would be either in the ICU or on a ventilator continue to be stable
 - Lastly, **the % of ER visits that were for coronavirus-like illnesses had steadily declined since Thanksgiving**

State-By-State Scorecard

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



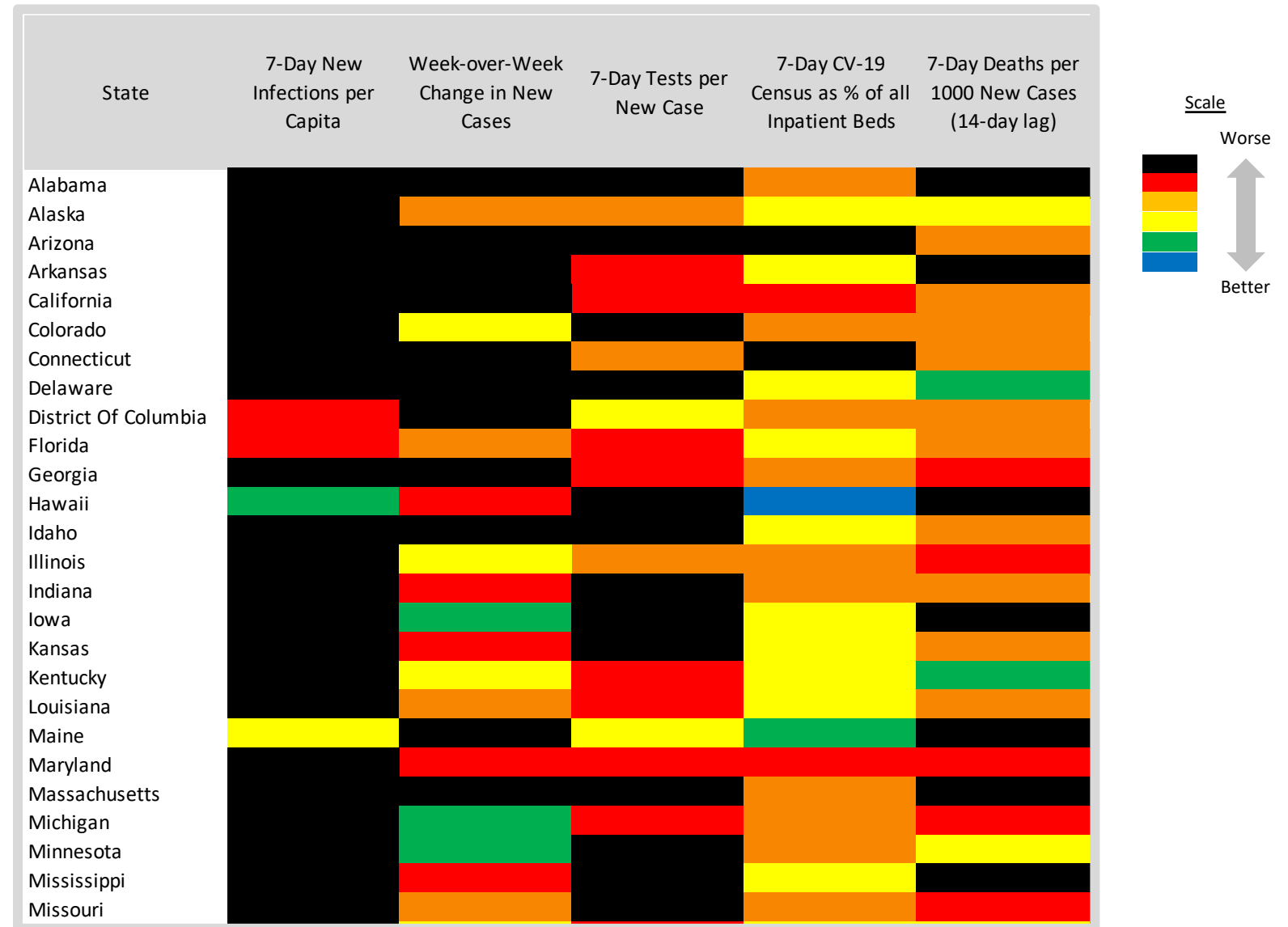
Metric		Black	Red	Orange	Yellow	Green	Blue
7-Day Average New Daily Reported Infections per Capita	Greater than	450	350	250	150	50	0
Week-over-Week Change in Newly Reported Cases	Greater than	30%	20%	10%	0%	-10%	N/A
7-Day Average Viral Tests per 7-Day Average Newly Reported Cases	Less than	5	10	25	50	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

Note: this week, we tightened the criteria for the Covid-19 census and death per case measures. In our view, this represent two of our most significant short- to mid-term challenges. These tightened criteria are intended to better reflect the stress on the healthcare system ad the rising number of deaths in the U.S.

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Only a few “bright spots” on this scorecard:

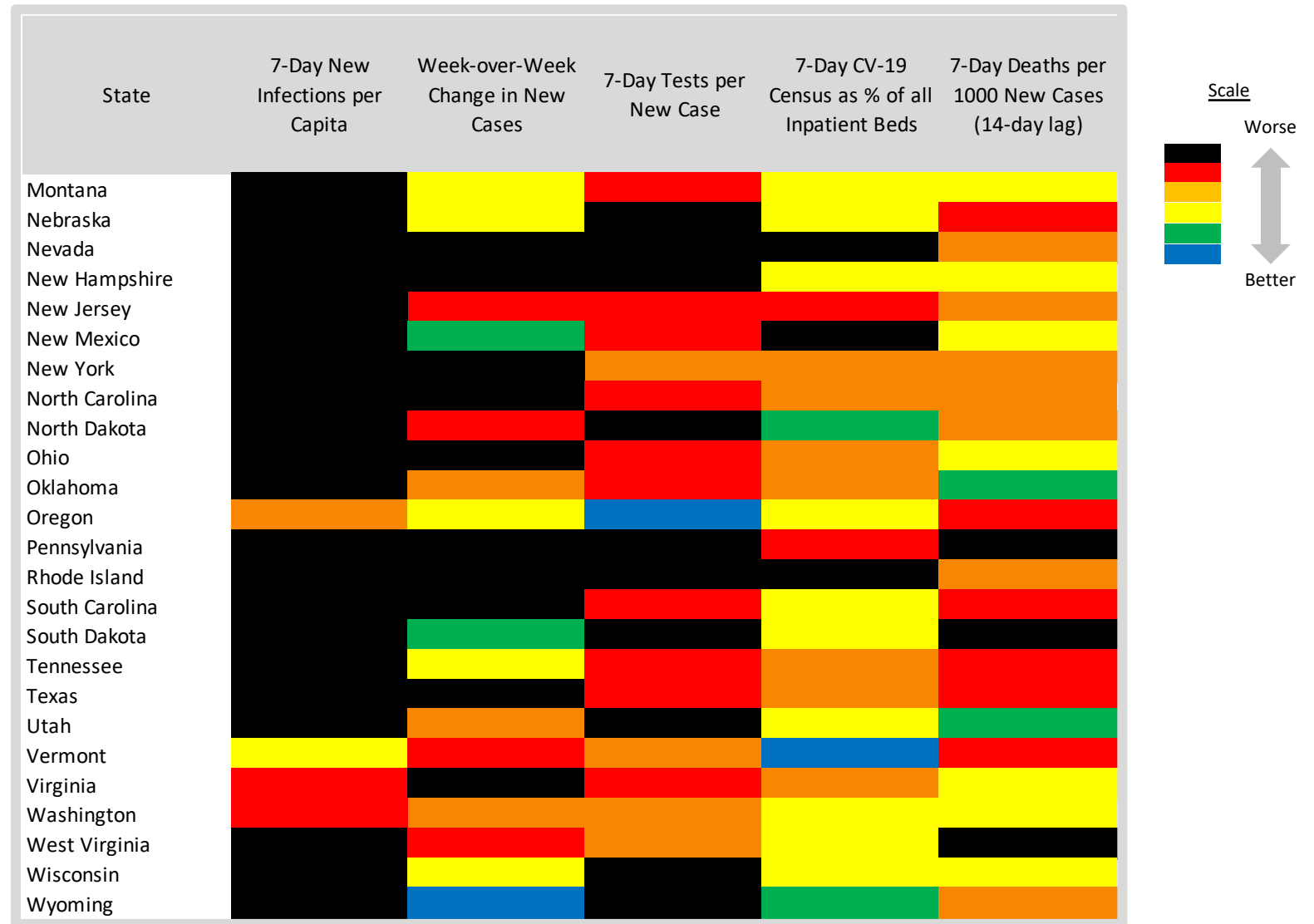
- Infection rate in HI
- Week-over-week change in infection rates in IA, MI and MN
- Covid-19 occupancy in HI and ME
- Case fatality rate in CT and KS



Page 2 of 2

Only a few “bright spots” on this scorecard:

- Week-over-week change in infection rates in NM, SD and WY
- Test effectiveness in OR
- Covid-19 occupancy in ND, VT and WY
- Case fatality rate in OK

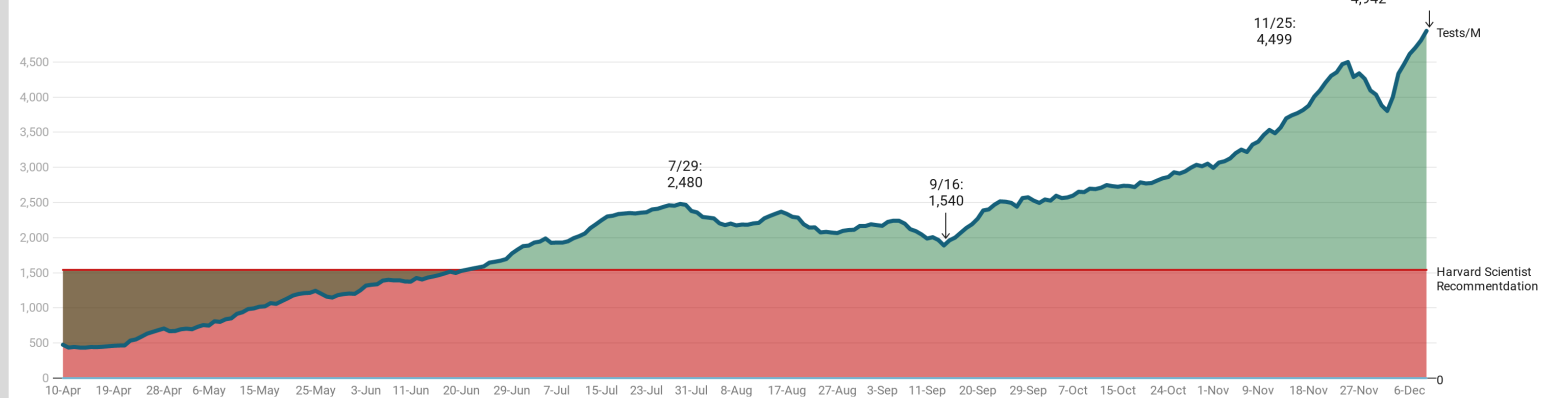


Testing volumes have now returned to record-setting levels

Coincident with this return to relatively-high testing levels, the test-positive rate seems to have stabilized in the past several days

Daily Tests Per 1 Million - United States

Trailing 7-Day Moving Average, As of December 8



Health Industry Advisor LLC analysis

Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

Test-Positive Rate - United States

7-Day Moving Average, As of December 8

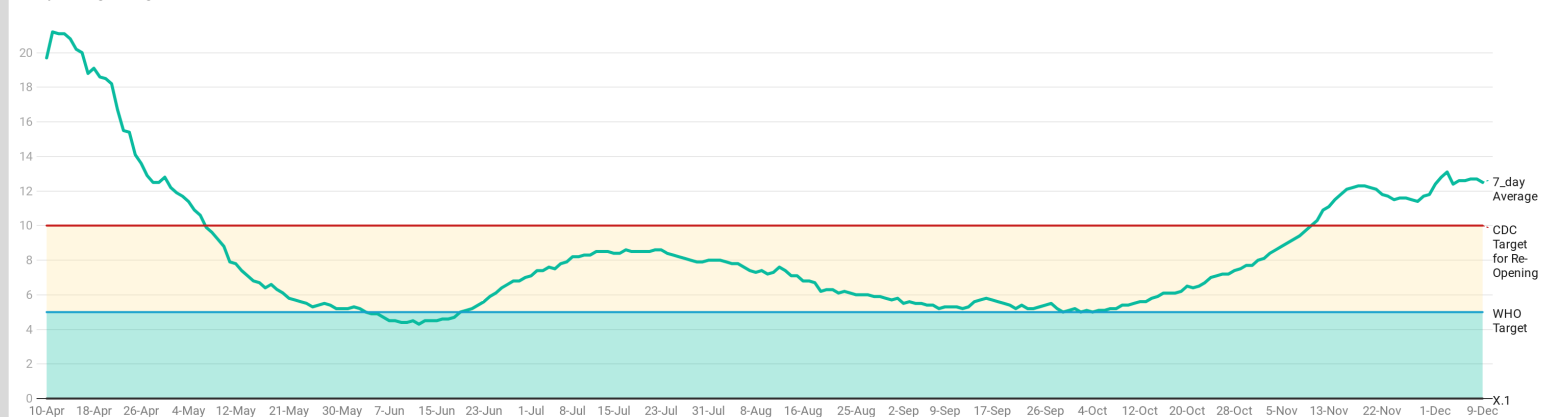


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

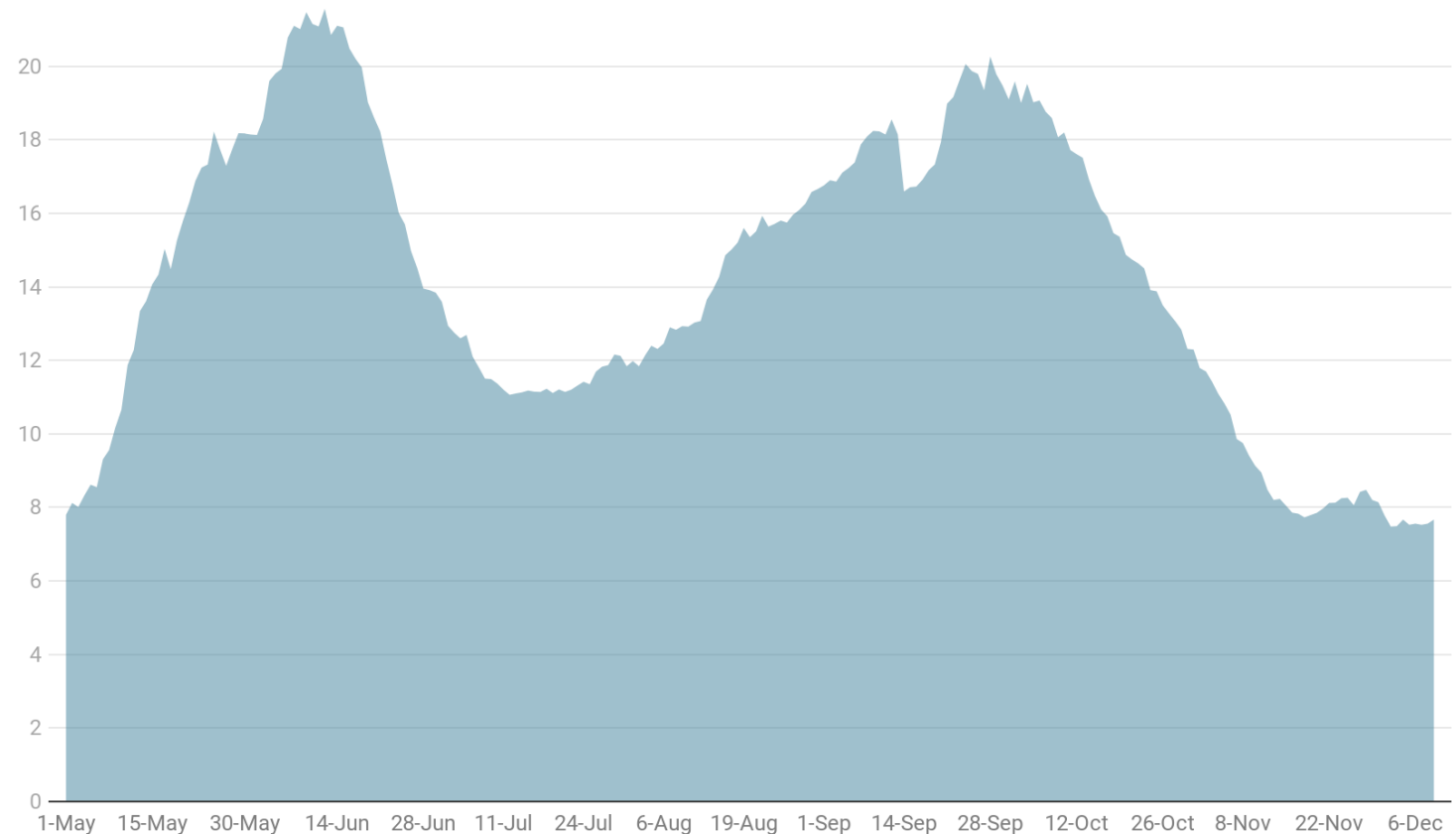
A measure of the effectiveness of testing is the ratio of tests performed to newly-detected cases

This rate had been in a free-fall since mid-September, indicating that the increasing test volumes were insufficient to keep up with rising new infections

Since Thanksgiving, this rate has stabilized and perhaps, even improved slightly

Tests / New Case Detected (7-Day Average)

How many tests does it take to detect a new case?



Prefer this ratio to be higher rather than lower

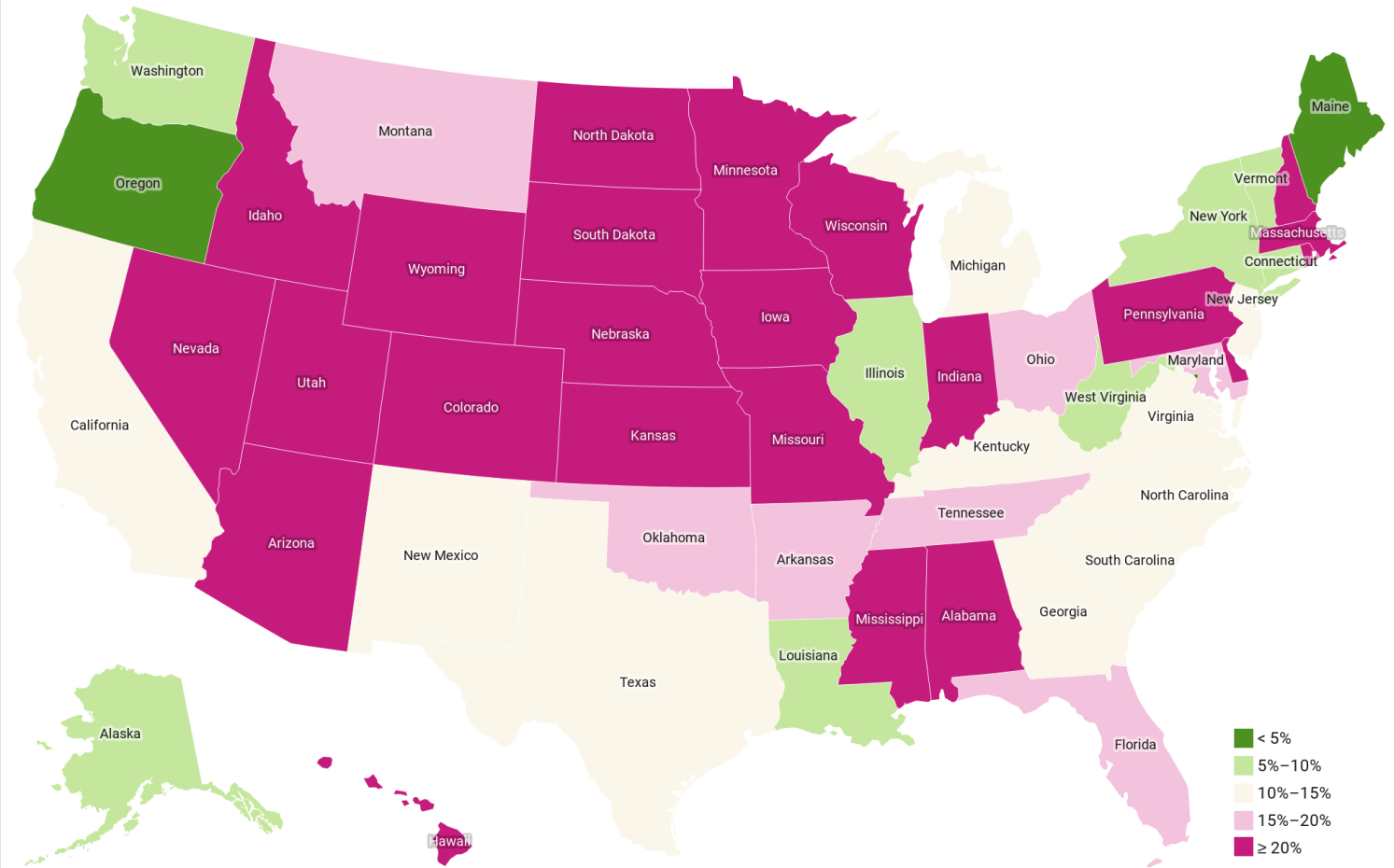
Chart: Health Industry Advisor LLC • Created with Datawrapper

Twenty-one states have
7-day test-positive rates
>20%

Only 11 states have rates
lower than the CDC
target for Phase 3 re-
openings

Test-Positive Rate

7-Day Moving Average, As of December 9



Health Industry Advisor LLC analysis

Map: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

We are experiencing a “dip-and-rebound” in new infection rates, caused in significant part by report-interruptions around the Thanksgiving holiday (a similar pattern occurred around the Labor Day holiday)

There were ~627.4k new cases worldwide each day, as of Wednesday

The United States is now averaging 213k new cases each day

* - 7-day moving average basis

Newly Detected Daily Cases - U.S. & Worldwide

7-Day Moving Average, As of December 9

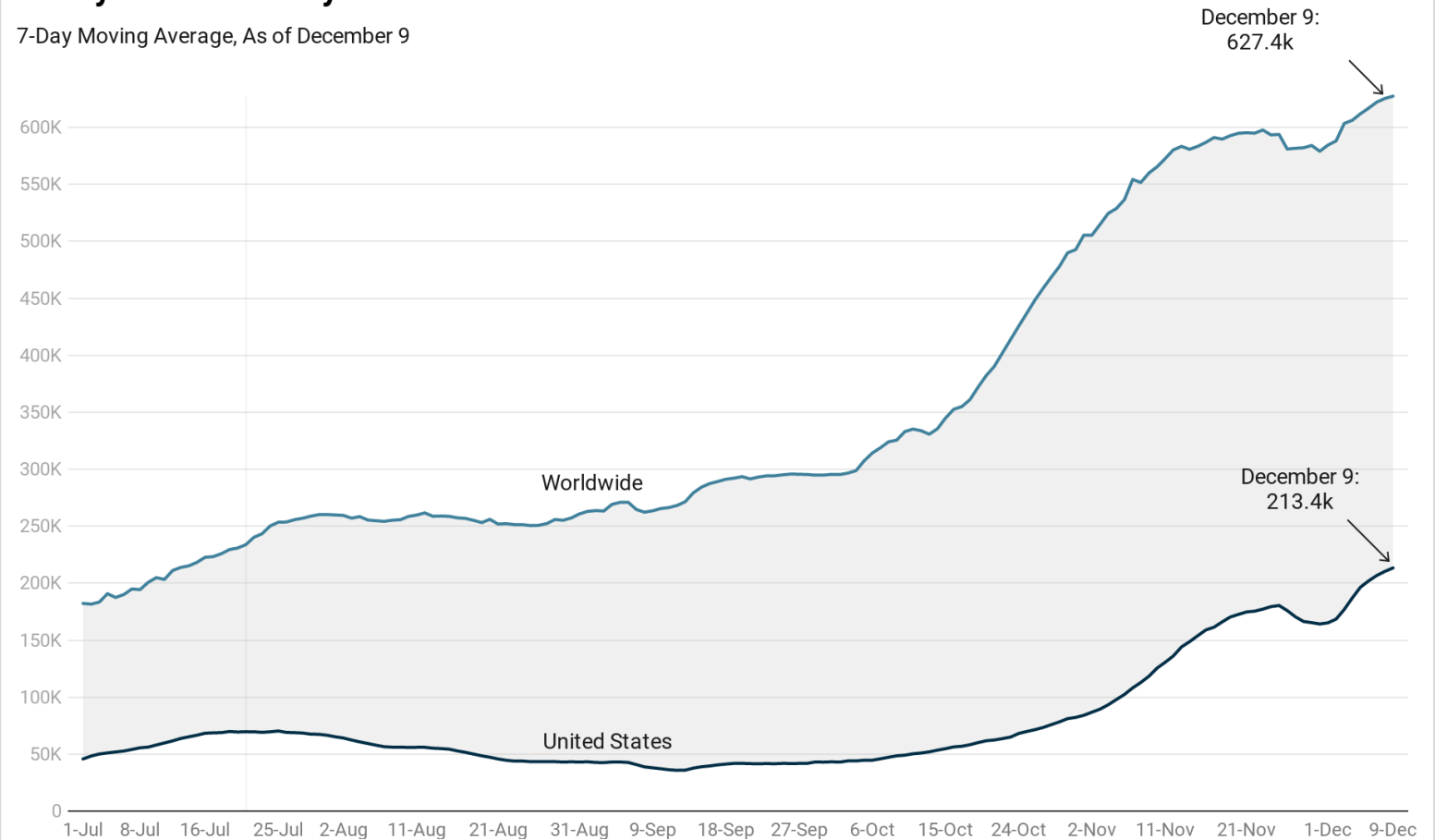


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

The rate of increase in new cases, both worldwide and in the United States, had been easing for an extended period

Reporting interruptions around the Thanksgiving holiday caused this rate to first go negative, then spike

As the Thanksgiving reporting interruptions “wash-through” by this weekend, we will gain a better perspective of true trends

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

7-Day Moving Average, As of December 9

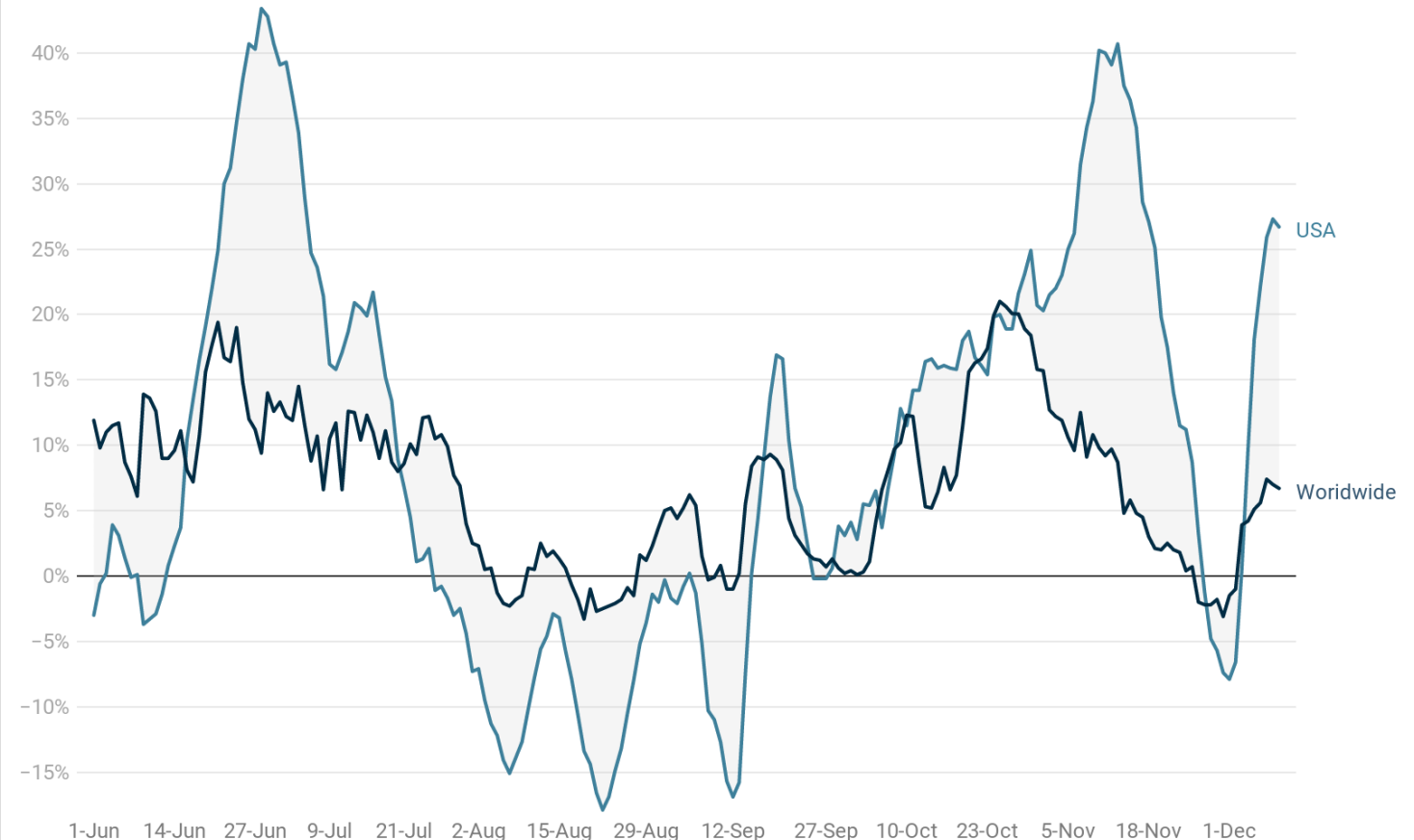


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

As of yesterday, we are in a similar situation as we were going into the Thanksgiving holiday

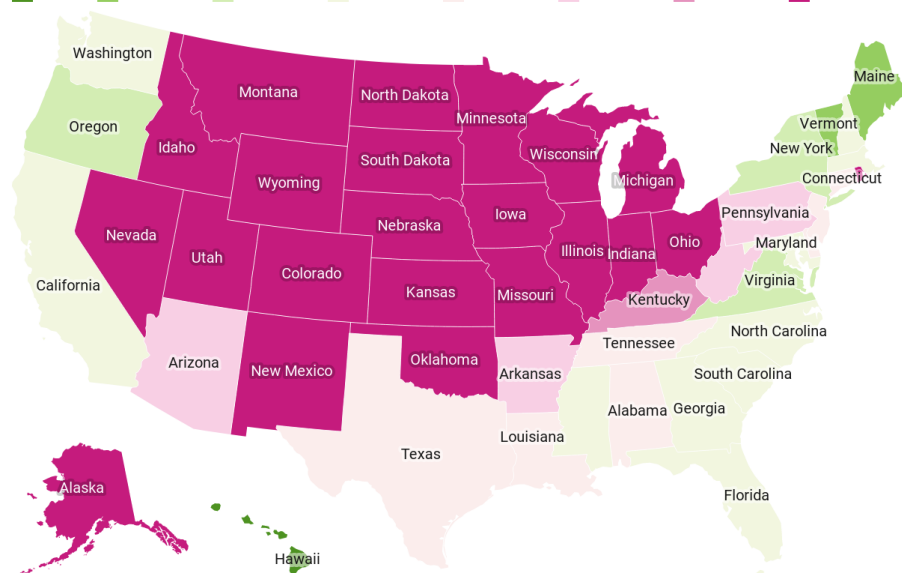
Notably, California, Florida, New York and Pennsylvania are experiencing higher infection rates than pre-Thanksgiving; loaw, Michigan, Missouri and Wisconsin are doing better

As of November 25

New Cases / Million

7-Day Moving Average, As of November 25

< 100 100–200 200–300 300–400 400–500 500–600 600–700 ≥ 700



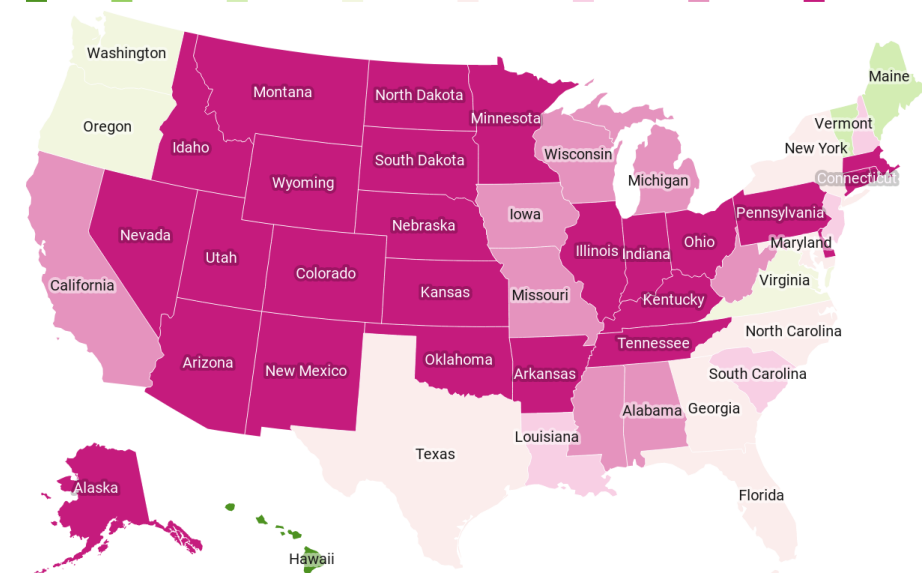
Map: Health Industry Advisor LLC • Created with Datawrapper

As of December 7

New Cases / Million

7-Day Moving Average, As of December 9

< 100 100–200 200–300 300–400 400–500 500–600 600–700 ≥ 700



Map: Health Industry Advisor LLC • Created with Datawrapper

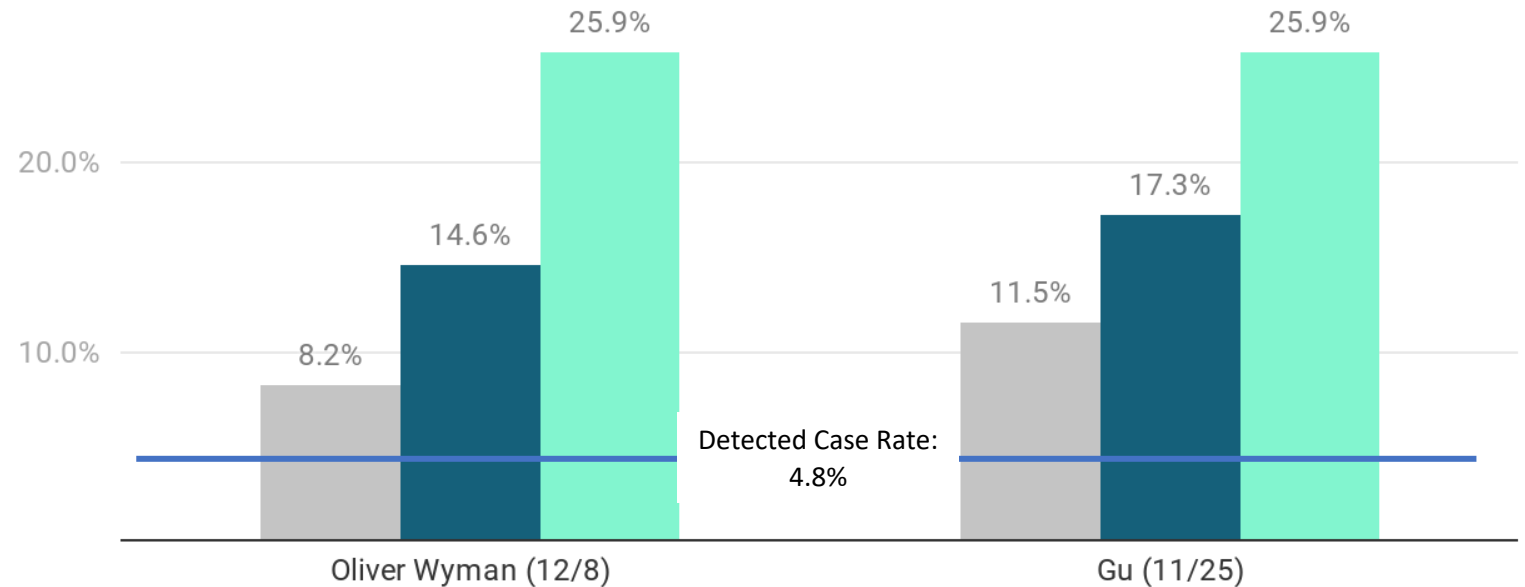
Oliver Wyman and Youyang Gu each provide estimates of actual infection rates

The latest estimates suggest that 15-17% of people in the U.S. have been infected by the SARS-CoV-2 virus (with an upper limit of nearly 26%)

Infection Prevalence Estimates

Oliver Wyman & Youyang Gu

Low Mean High

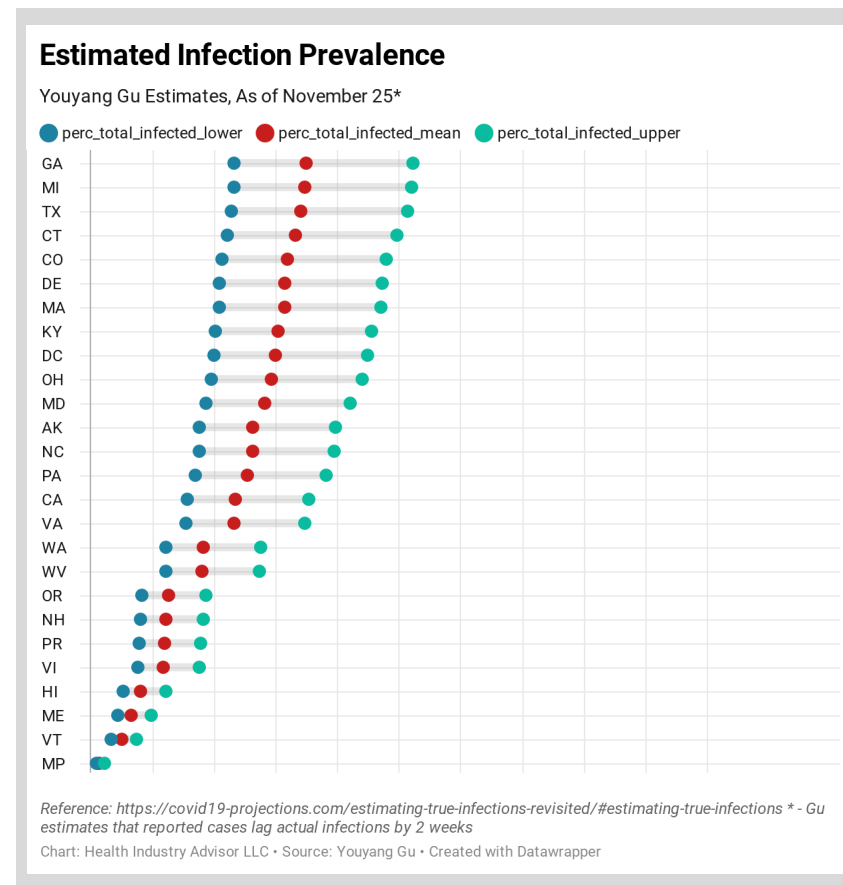
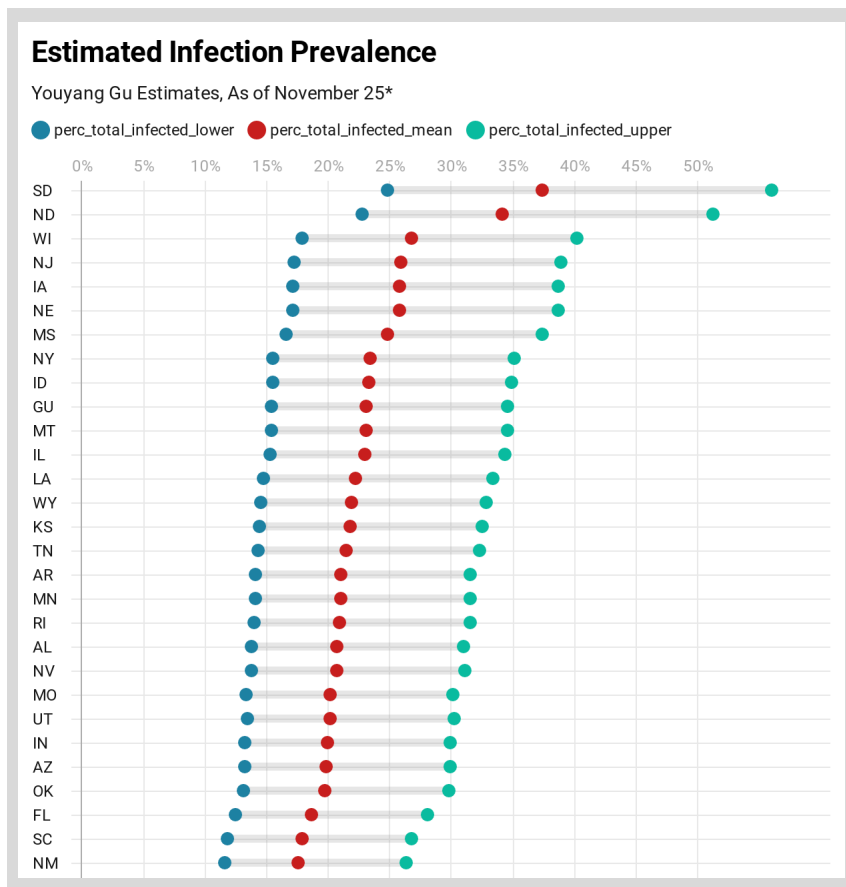


United States

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

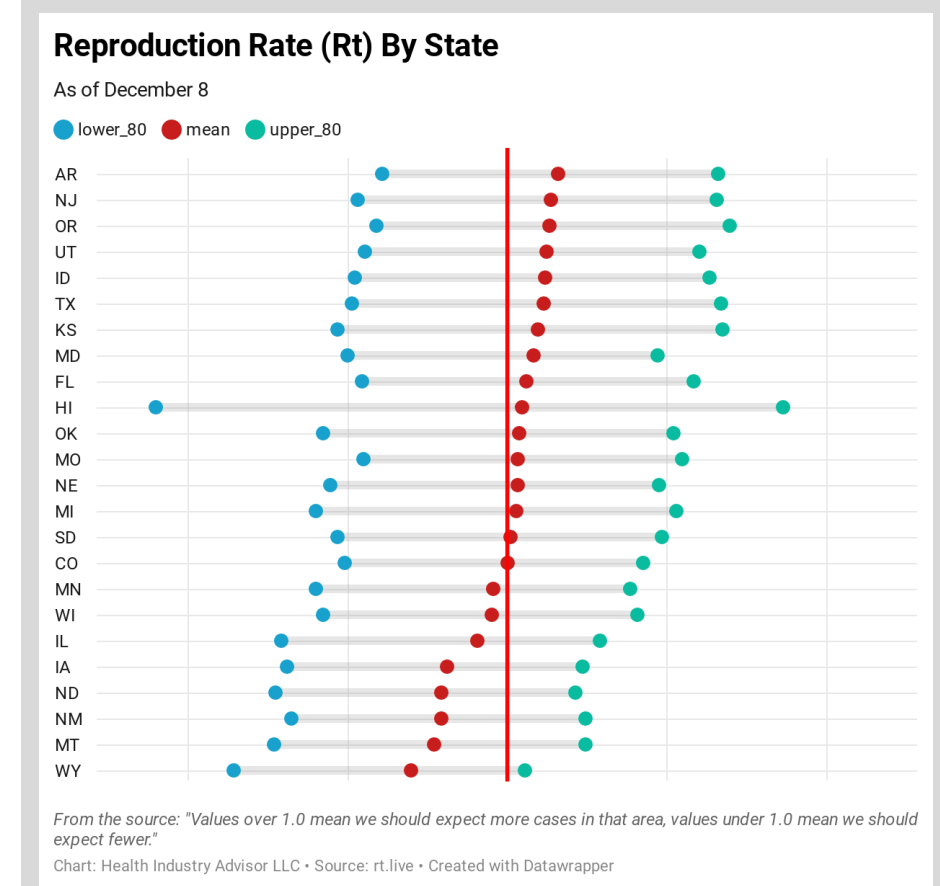
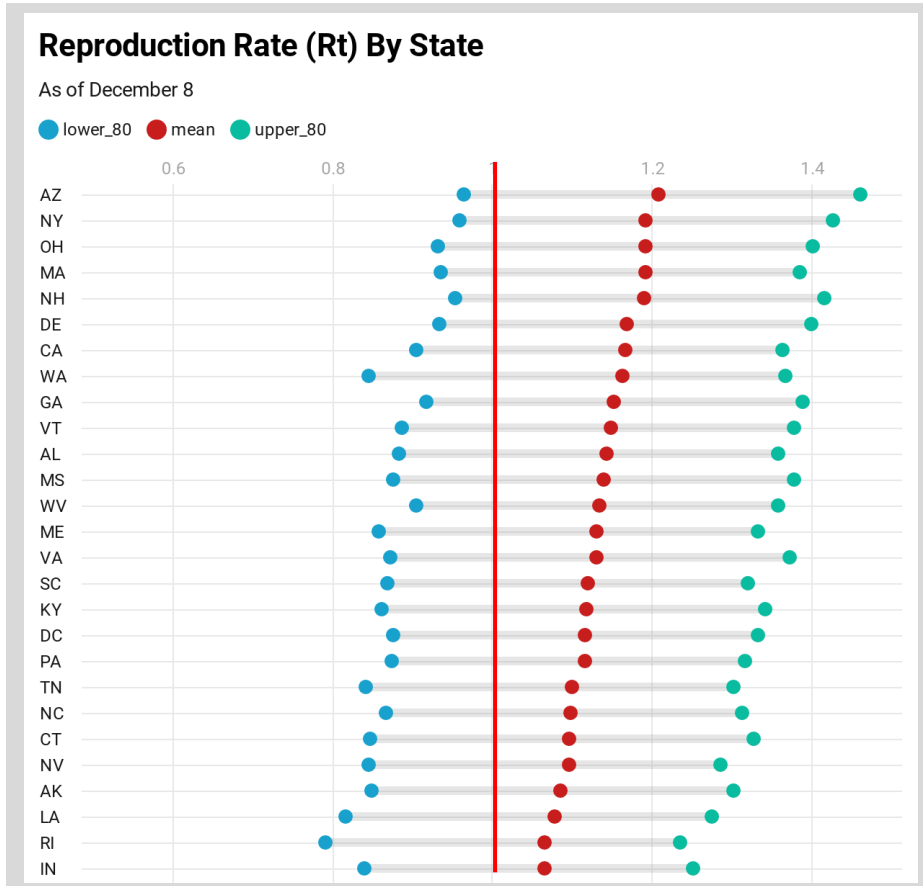
Estimated Infection Prevalence

Detected cases undercount the number of true infections. Youyang Gu, 's best estimates of infection prevalence range from a low of 2.5% of Vermont's population to a high of 37.4% of South Dakota's (Gu places the high-end estimate for South Dakota at 56.1% of its population)



Reproduction Rate (R_t) – An indication of whether the virus spread is increasing ($R_t > 1$), or decreasing ($R_t < 1$)

As of last Wednesday, the mean estimate R_t was >1 for most states; it is <1 for only Illinois, Iowa, Minnesota, Montana, New Mexico, North Dakota, Wisconsin and Wyoming

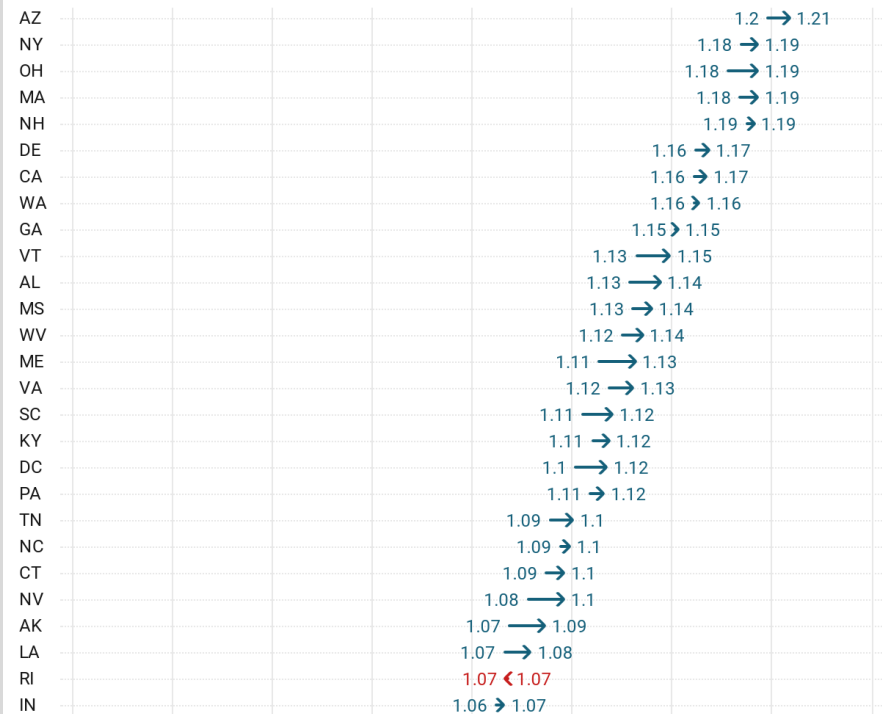


Comparing Reproduction Rates from pre-Thanksgiving to Tuesday (latest available data) shows very little change in any state

Is this an indication that the much-anticipated post-Thanksgiving surge had yet to materialize?

Reproduction Rates (Rt)

Pre-Thanksgiving & Current



Reproduction Rates (Rt)

Pre-Thanksgiving & Current

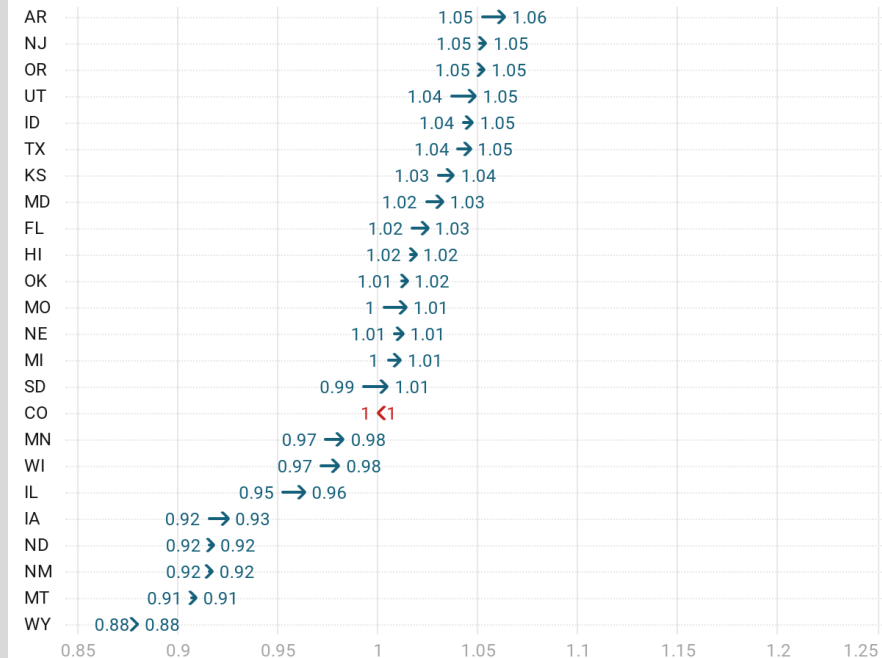
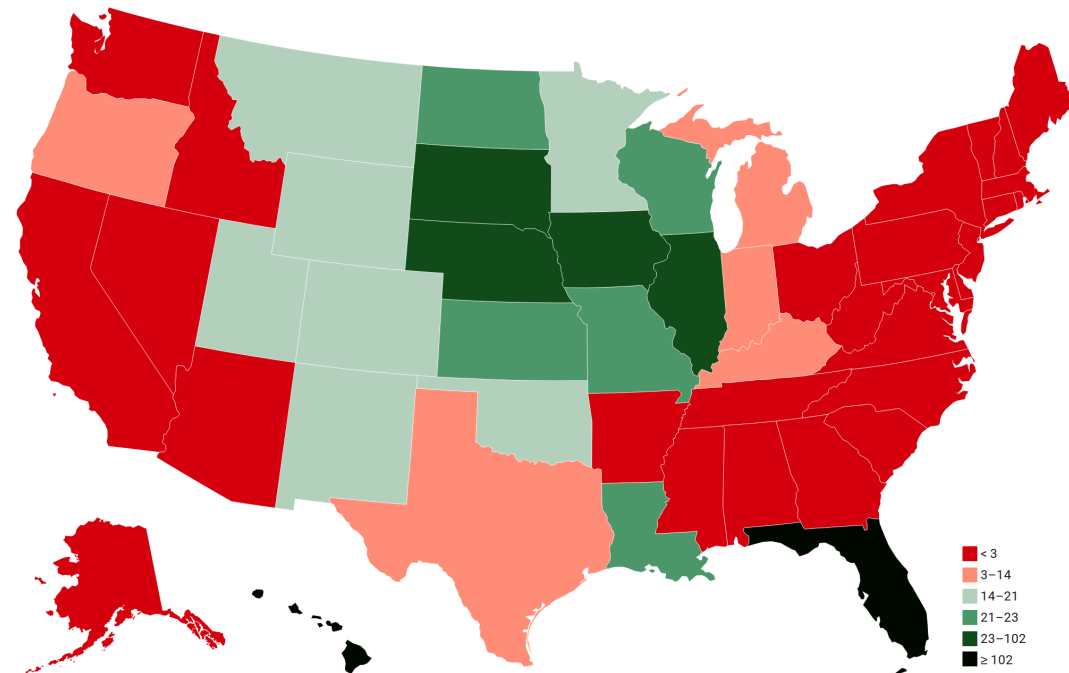


Chart: Health Industry Advisor LLC • Source: Rt.live • Created with Datawrapper

Observing when states set peak new infection rates, as well as how close current rates are to these peak rates:
 Surprisingly, Florida, Louisiana and states in the Upper Midwest and the Mountain State region have gone the longest time since experiencing their peak rate
 Many of these same states have experienced significant declines in rates from peak levels

Days Since Peak New Infections Per Capita

Trailing 7-Day Moving Average, As of December 9



Health Industry Advisor LLC analysis

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

New Daily Infections / Million - Current Rate as % of Peak

Trailing 7-Day Moving Average, As of December 9

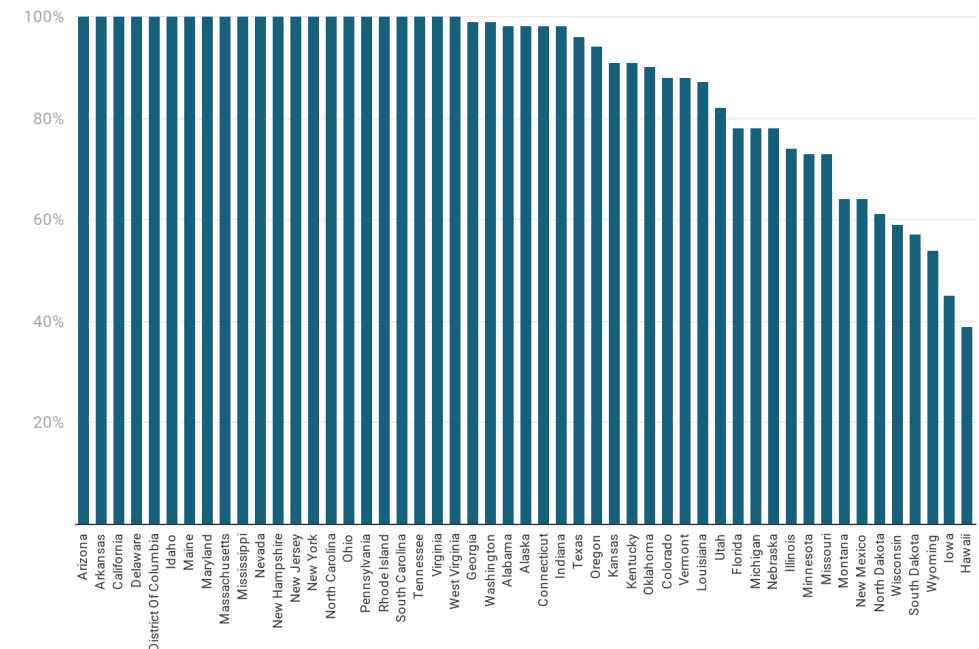


Chart: Health Industry Advisor LLC • Created with Datawrapper

Covid-19 census increased to 34% of all inpatient beds – more than doubling since November 1

Nevada is now devoting 80% of its inpatient beds to treating Covid-19 patients; in Connecticut, its >70%; and in Arizona and Rhode Island, its >50%

Covid-19 Patients / Total Inpatient Beds

7-Day Moving Average, As of December 8

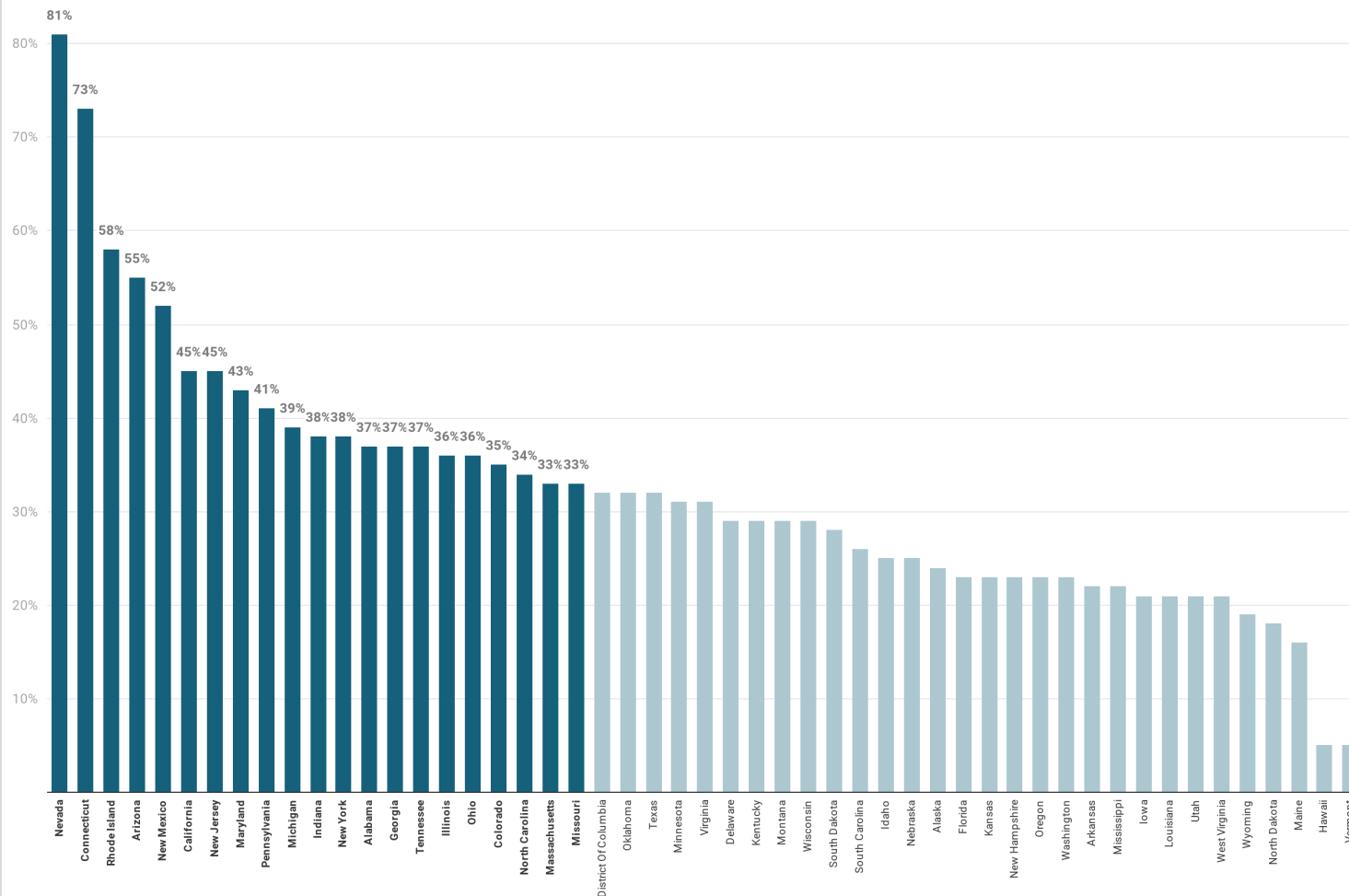


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking project & worldometers.info • Created with Datawrapper

The highest average census per new case is currently experienced in the District of Columbia

The lowest rates are found in Alaska, Delaware, New Hampshire, Vermont and Utah,

Contrast these rates to those experienced in selected hard-hit states during earlier surges:

- Arizona: 305 (4/20)
- California: 416 (4/17)
- Connecticut: 293 (4/29)
- Massachusetts: 475 (6/21)
- Michigan: 422 (4/21)
- New York: 330 (5/22)

Covid-19 Census / 100 New Cases

7-Day Moving Average, As of December 9

U.S. Peak (4/19)

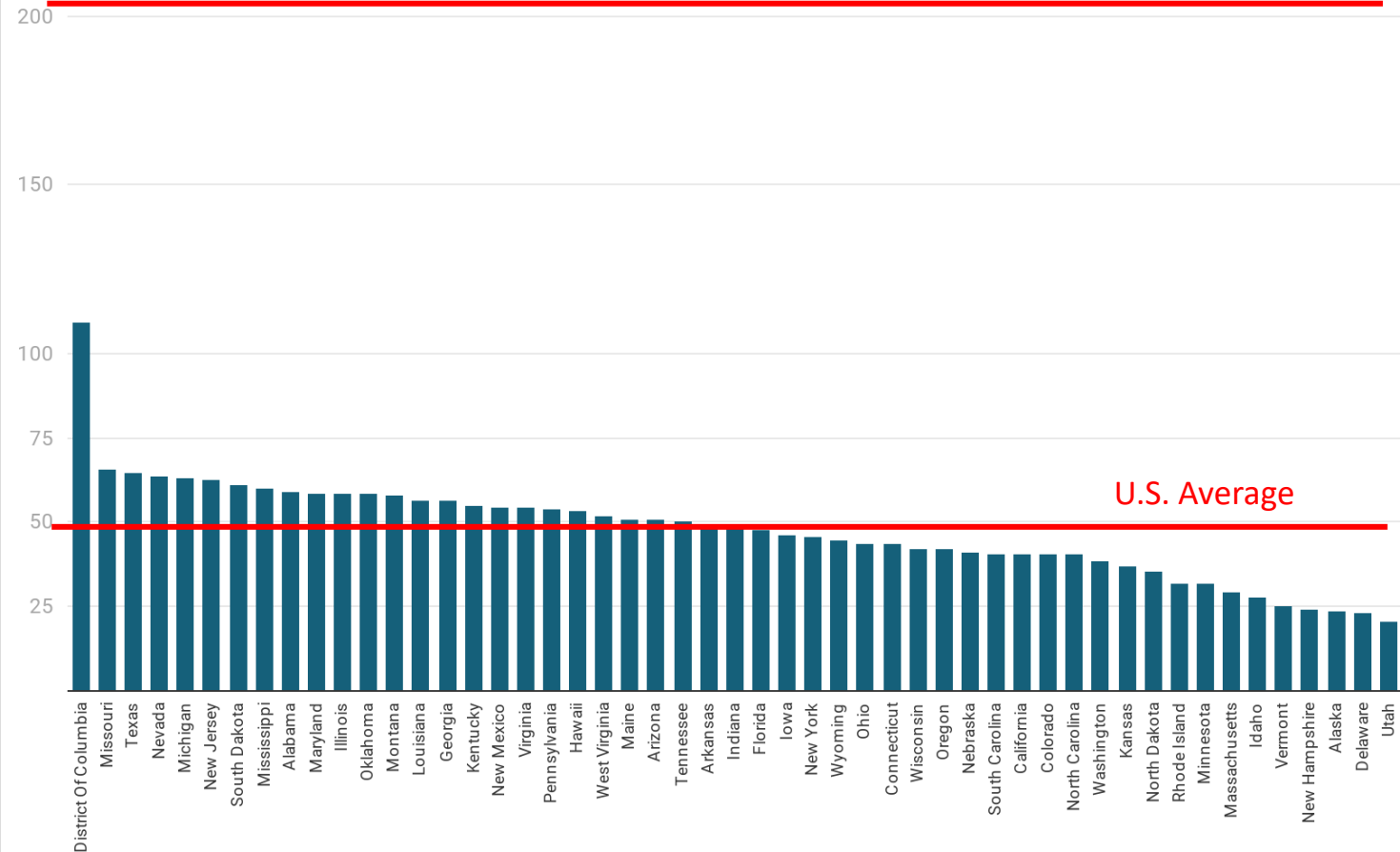


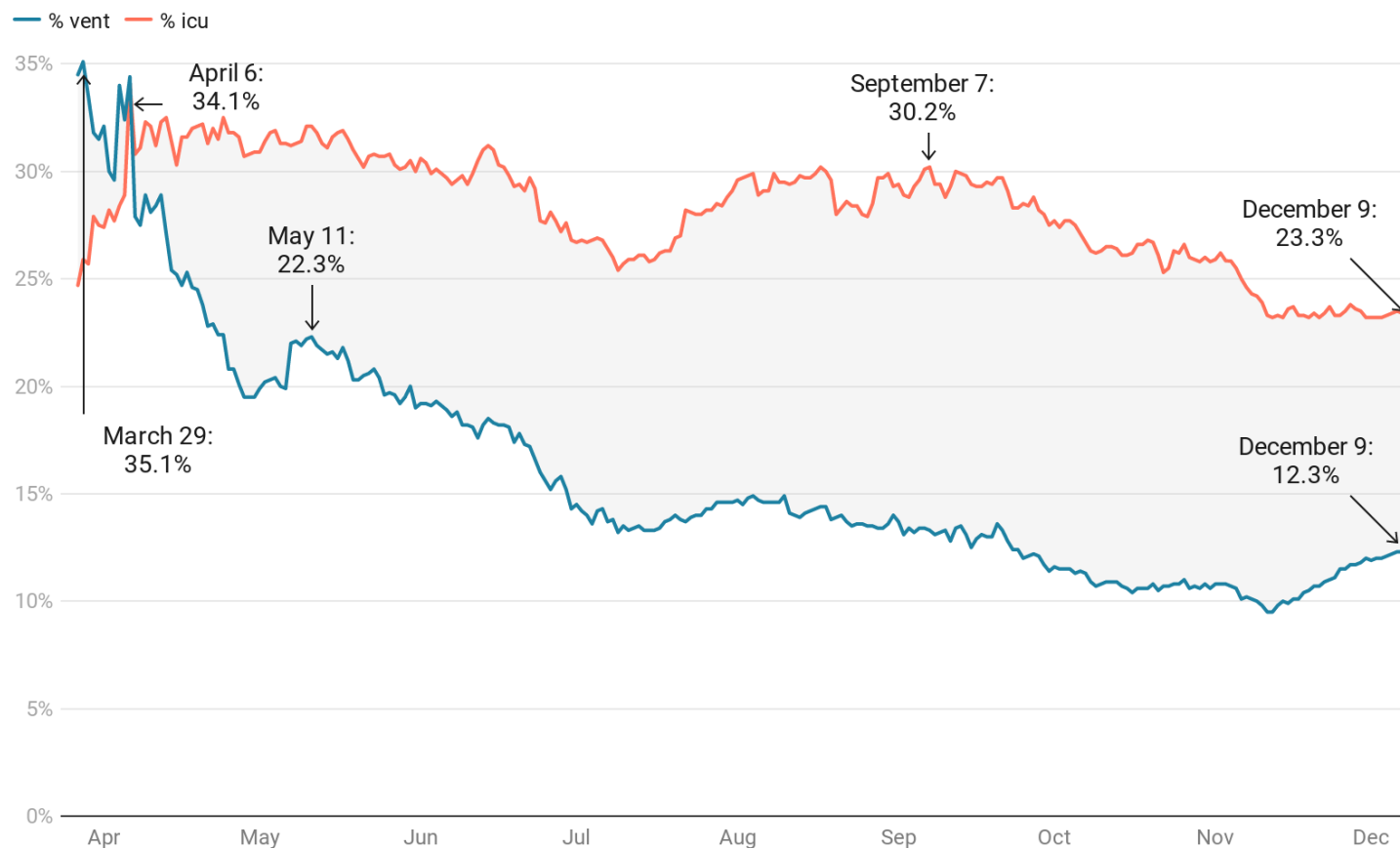
Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project & worldometers.info • Created with Datawrapper

The likelihood of a hospitalized Covid-19 patient would require ICU care has been lower throughout November and into December than at any time during the pandemic

The likelihood of a hospitalized Covid-19 patients would be on a ventilator trended up for several weeks before stabilizing the past few days

Severity of Hospitalized Patients

% of patients on ventilators and in the ICU, As of December 9



Health Industry Advisor LLC analysis

Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

The % of ER visits for COVID-19-like illnesses (CLI) seems to have waned since Thanksgiving

The rate of influenza visits remains low given where we are in the flu season

% of ER Visits For Covid-19-Like Illnesses (CLI); Influenza-Like Illnesses (ILI); Shortness-of-Breath (SoB) and Pneumonia

As of December 4

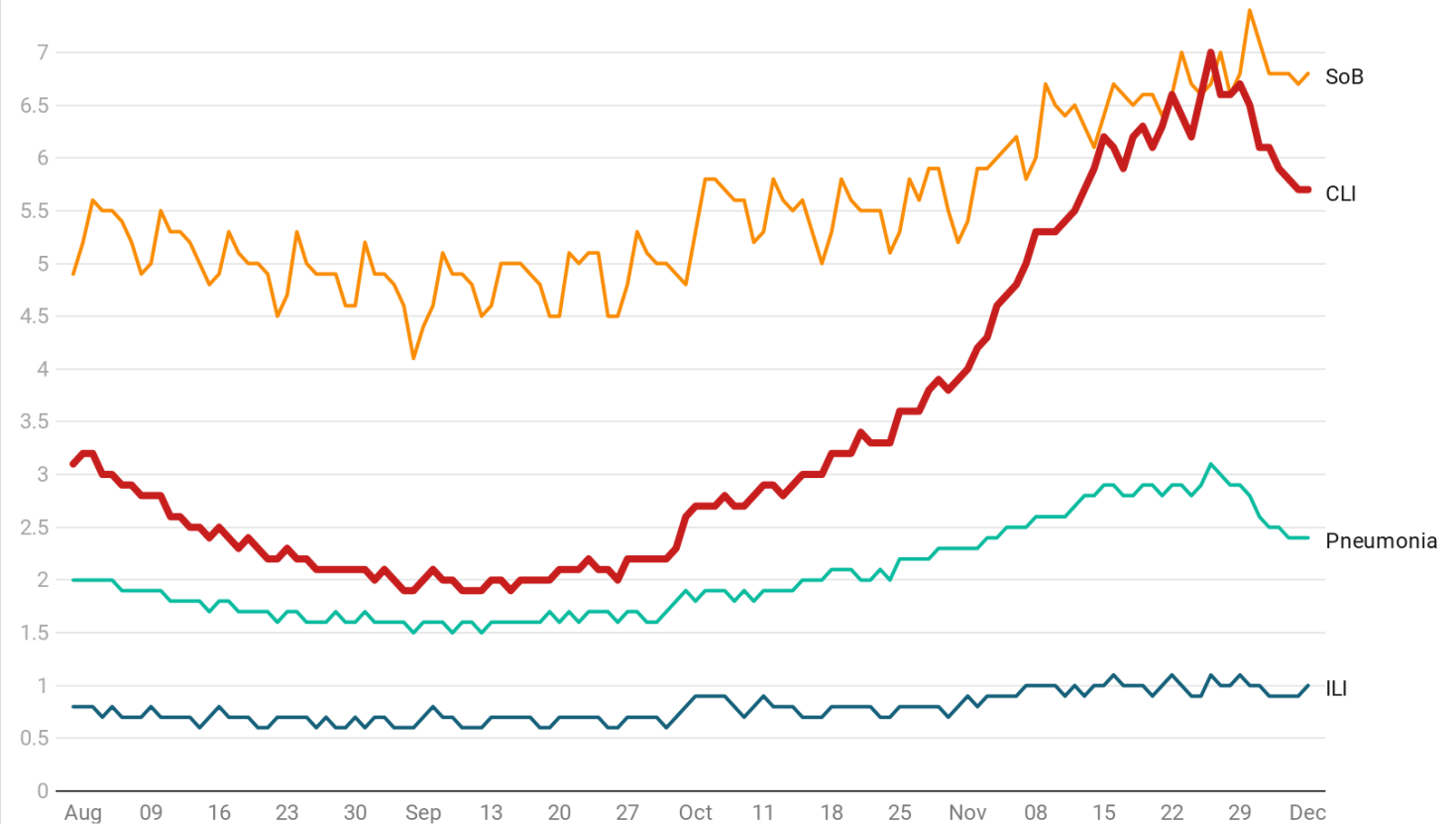


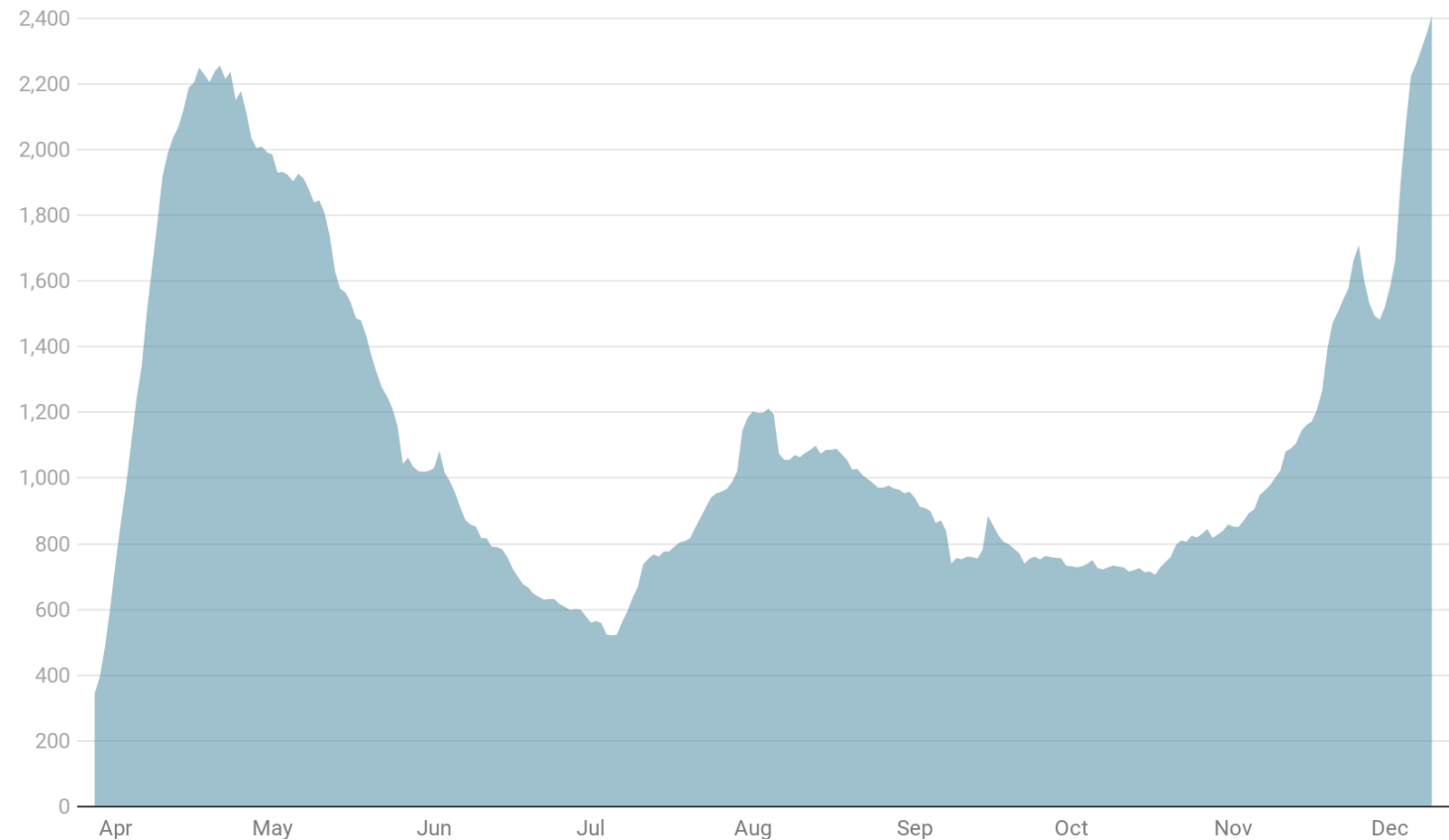
Chart: Health Industry Advisor LLC • Source: CDC • Created with Datawrapper

After a relative respite in the 7-day average deaths since Thanksgiving Day, these have now increased eleven consecutive days

This rate now exceeds the rate marked in April . . . And will likely continue rising for at least the next few weeks

Deaths Reported With Coronavirus in the U.S.

Trailing 7-Day Moving Average, As of December 8



Health Industry Advisor LLC analysis

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

State-By-State Comparisons

As of December 9

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	57.1k	813	2,174	31.3%	681	3	37%	33%	26
Alaska	51k	204	14,629	6.4%	939	16	24%	15%	11
Arizona	52.6k	973	2,629	31.1%	817	3	55%	38%	18
Arkansas	58.5k	923	3,935	15.4%	716	5	22%	35%	31
California	36.8k	518	6,302	10.0%	670	9	45%	77%	15
Colorado	47.3k	632	3,003	25.8%	773	4	35%	2%	17
Connecticut	39.4k	1,482	11,076	6.9%	766	14	73%	56%	20
Delaware	43.5k	825	3,265	25.6%	835	4	29%	54%	10
District Of Columbia	33.8k	998	10,328	3.9%	407	25	32%	52%	17
Florida	50.4k	906	2,220	19.1%	434	5	23%	15%	17
Georgia	48.8k	934	2,895	12.6%	480	6	37%	47%	20
Hawaii	13.2k	188	72	100.0%	70	1	5%	28%	37
Idaho	64.8k	615	1,394	60.6%	914	2	25%	39%	17
Illinois	64.1k	1,153	7,528	9.6%	720	10	36%	1%	21
Indiana	59.2k	966	2,562	39.3%	1,007	3	38%	23%	16
Iowa	79k	958	1,334	37.1%	656	2	21%	-5%	32
Kansas	62.5k	666	2,200	39.5%	887	2	23%	26%	19
Kentucky	46.8k	474	5,662	12.6%	715	8	29%	9%	9

State-By-State Comparisons

As of December 9

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
Louisiana	55.7k	1,438	4,960	10.9%	540	9	21%	12%	16
Maine	10.8k	183	6,257	3.8%	239	26	16%	90%	27
Maryland	36.8k	821	2,809	16.2%	456	6	43%	27%	21
Massachusetts	38.8k	1,607	3,516	20.6%	723	5	33%	79%	27
Michigan	44.9k	1,072	5,792	11.2%	651	9	39%	-10%	23
Minnesota	64.5k	739	3,552	25.8%	918	4	31%	-5%	12
Mississippi	57.3k	1,358	2,770	23.9%	663	4	22%	23%	29
Missouri	57.3k	775	1,447	41.0%	667	2	33%	19%	22
Montana	65.6k	721	4,797	16.1%	774	6	29%	0%	10
Nebraska	74.4k	669	2,371	38.6%	1,014	2	25%	10%	21
Nevada	57.2k	774	2,250	39.9%	897	3	81%	31%	17
New Hampshire	20.3k	419	2,330	23.7%	553	4	23%	48%	14
New Jersey	44.1k	1,989	5,709	9.9%	601	9	45%	28%	18
New Mexico	53.9k	869	5,385	15.2%	817	7	52%	-7%	14
New York	39.7k	1,811	9,857	5.1%	506	19	38%	34%	18
North Carolina	39.1k	540	5,188	10.2%	530	10	34%	55%	16

State-By-State Comparisons

As of December 9

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	113k	1,417	1,819	62.0%	1,127	2	18%	29%	18
Ohio	44.5k	615	5,206	19.3%	1,004	5	36%	49%	12
Oklahoma	56.4k	492	4,904	15.2%	746	7	32%	15%	8
Oregon	20.9k	263	38,834	0.9%	343	113	23%	5%	24
Pennsylvania	35.2k	928	2,119	36.8%	779	3	41%	46%	32
Rhode Island	64.5k	1,401	3,927	31.9%	1,253	3	58%	39%	20
South Carolina	46.5k	896	4,547	11.4%	516	9	26%	87%	21
South Dakota	99.5k	1,297	1,927	48.8%	940	2	28%	-4%	29
Tennessee	61.9k	757	4,283	18.9%	809	5	37%	7%	25
Texas	48.2k	822	3,393	12.1%	476	7	32%	32%	21
Utah	69.4k	310	2,966	30.5%	906	3	21%	11%	5
Vermont	8.5k	138	2,443	7.7%	189	13	5%	30%	22
Virginia	31.3k	502	3,824	10.8%	413	9	31%	52%	14
Washington	25.9k	399	5,191	7.3%	372	14	23%	18%	13
West Virginia	32.7k	504	8,006	8.5%	684	12	21%	25%	25
Wisconsin	72.5k	668	2,078	36.9%	662	3	29%	5%	15
Wyoming	65.5k	517	2,332	35.8%	826	3	19%	-11%	17

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, National, Regional, and State Level Outpatient Illness and Viral Surveillance <https://gis.cdc.gov/grasp/fluview/fluportaldashboard.html>
- Centers for Disease Control, COVID-19 Laboratory-Confirmed Hospitalizations https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html
- Centers for Disease Control, COVID Data Tracker <https://www.cdc.gov/covid-data-tracker/index.html#mobility>
- 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>