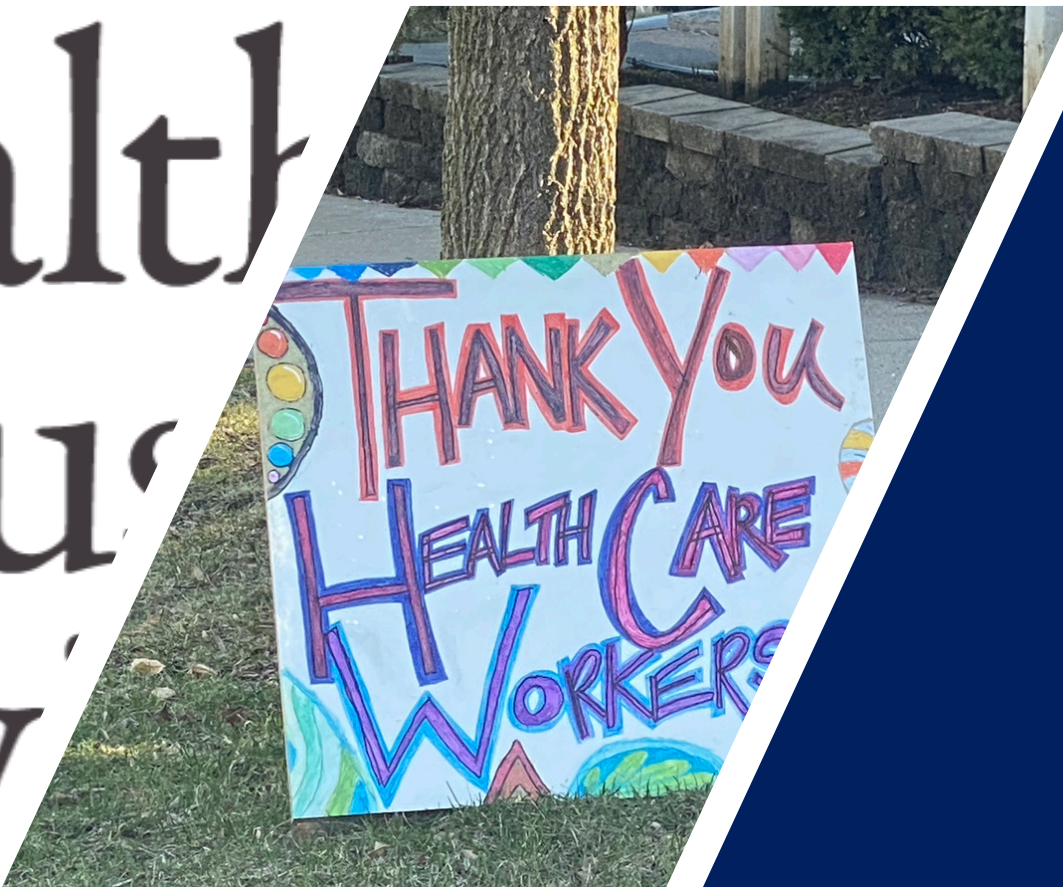




Health
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Adv



Issue # 221
Wednesday, November 25, 2020

COVID-19 Report

Highlights

- **New cases are showing signs of easing in the U.S. and worldwide; Indeed, new cases worldwide were essentially unchanged from yesterday, on a 7-day moving average basis. New cases in the United States, on a week-over-week basis, slowed to the lowest rate of increase since October 7**
- New cases in the U.S. are following a pattern remarkably like that experienced in June/July:
 - On November 10, the week-over-week change in new cases peaked at 41.2%; On June 29, this rate peaked at 43.1%
 - The rate has now declined fourteen consecutive days, dropping below 10% as of yesterday; This rate followed a similar pattern of decline after June 29, until being briefly interrupted by the Fourth of July holiday
 - This interruption started five days after the 4th and continued for five days; at that point, new cases again began to decline week-over-week
 - The new daily infection rate then peaked later in July
- Testing continues to improve in the U.S.:
 - For the twelfth consecutive day, testing per capita, on a 7-day moving average basis, set a record. **Testing has doubled since mid-July and quadrupled since mid-May**
 - **The test-positive rate declined for the sixth consecutive day;** This rate, however, remains higher than suggested by both the CDC and World Health organization
 - The ratio of tests to newly-detected case improved for the sixth consecutive day. This ratio provides an indication of the adequacy of testing in keeping up with the infection spread
- **New Covid-19 cases per capita remain of concern in the U.S.:**
 - **This rate increased in thirty-nine states on a week-over-week basis; This rate, however, declined week-over-week in seven of the nine states with the highest rates a week ago - North Dakota, South Dakota, Iowa, Nebraska, Wisconsin, Minnesota and Illinois. The two exceptions were Wyoming and Montana**
 - On an encouraging note, seventeen states that recently set highs for new infections have now gone four or more days since setting these highs: Arkansas, Connecticut, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Minnesota, Missouri, Montana, North Carolina, North Dakota, South Dakota, Tennessee, Utah, West Virginia and Wisconsin
- **Actual infections, rather than detected cases, are more relevant to understanding how many people will need vaccinations for herd immunity to be achieved**
 - Herd immunity is presumed to require 60-70% of the population having antibodies or being vaccinated
 - **As of yesterday, detected cases represent 3.9% of the population**
 - **According to estimates prepared by Youyang Gu, the mean-estimate actual infection rate is 15% of the population, with a range of 10%-22.5%**
 - Among the states, these estimates range from 1.9% in Vermont (range of 1.3%-2.9%) to 33% in South Dakota (range of 22% to 49.5%)
- Health care resource use continues to be of concern, and will continue to be so until new cases decline
 - **As of yesterday, Covid-19 patients occupy 27% of the available inpatient bed capacity in the U.S.**
 - **In Nevada, 62% of inpatient beds are in use by Covid-19 patients; In Connecticut and New Mexico, 1/2 of inpatient beds are occupied by Covid-19 patients**
 - While the % of Covid-19 patients in the ICU and on ventilators remains significantly lower than these was earlier in the pandemic, the % of ventilator patients has picked up (slightly) over the past week
- Deaths with the coronavirus have been increasing and will likely continue to do so
 - **The 7-day average deaths has increased now twenty-two consecutive days**
 - **Given the lag from case detection-to-death and the continued increase in new cases, this rate will likely continue increasing for at least the next few weeks**
 - The rate of deaths per new case, lagged two weeks, continues to be slightly lower than it was in October and significantly lower than it was in June and July

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

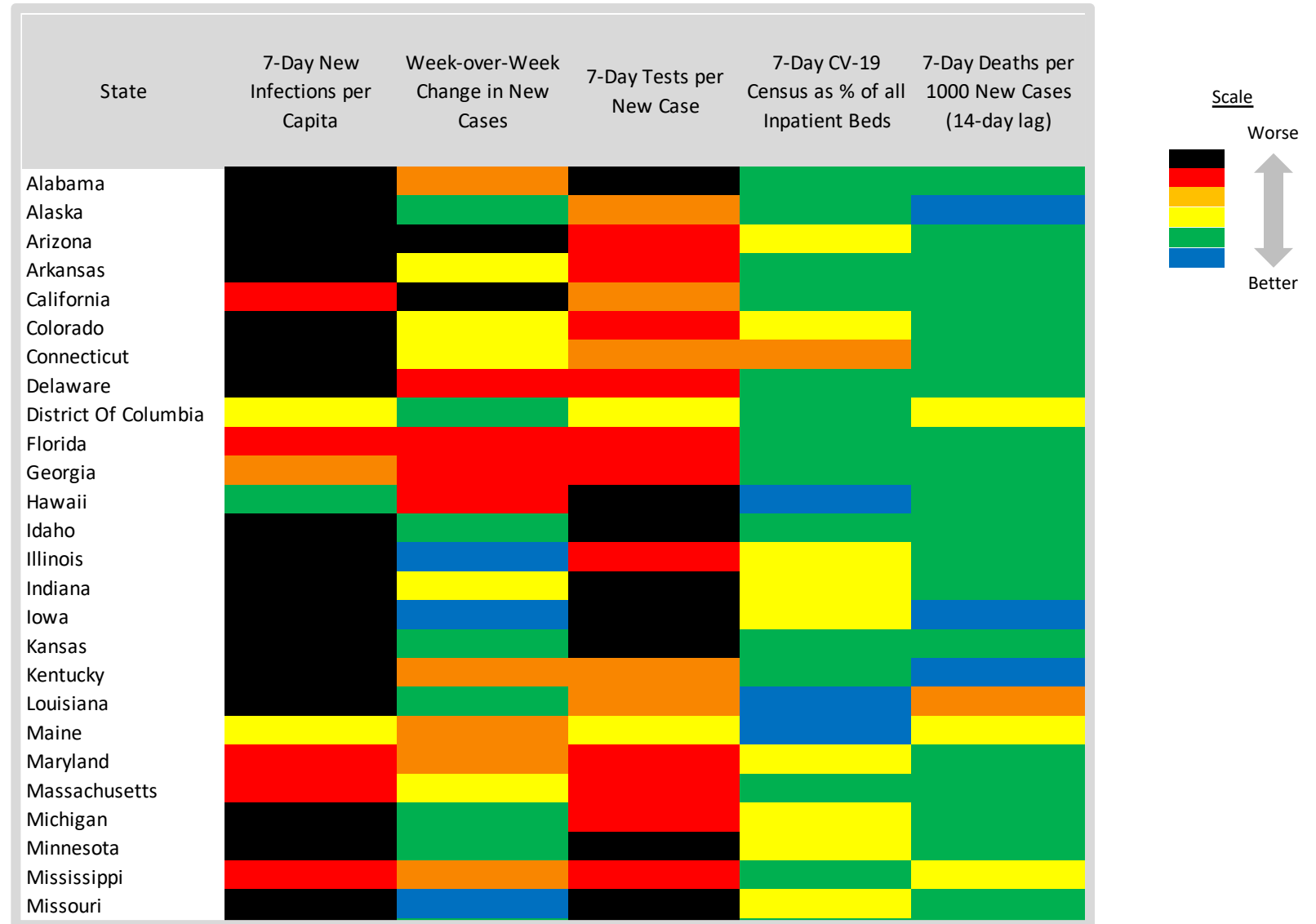


Metric		Black	Red	Orange	Yellow	Green	Blue
7-Day Average New Daily Reported Infections per Capita	Greater than	450	350	250	150	50	0
Week-over-Week Change in Newly Reported Cases	Greater than	30%	20%	10%	0%	-10%	N/A
7-Day Average Viral Tests per 7-Day Average Newly Reported Cases	Less than	5	10	25	50	75	N/A
Covid-19 Inpatient Census as % of All Inpatient Beds	Greater than	75%	60%	45%	30%	15%	0%
7-Day Deaths per 1000 New Cases (14-day lag)	Greater than	50	40	30	20	10	0

Note: this week, we convert from a 28-day lag from new case detection-to-death to a 14-day lag. In our observation of the data, this seems to provide a better indication of trends in infection severity

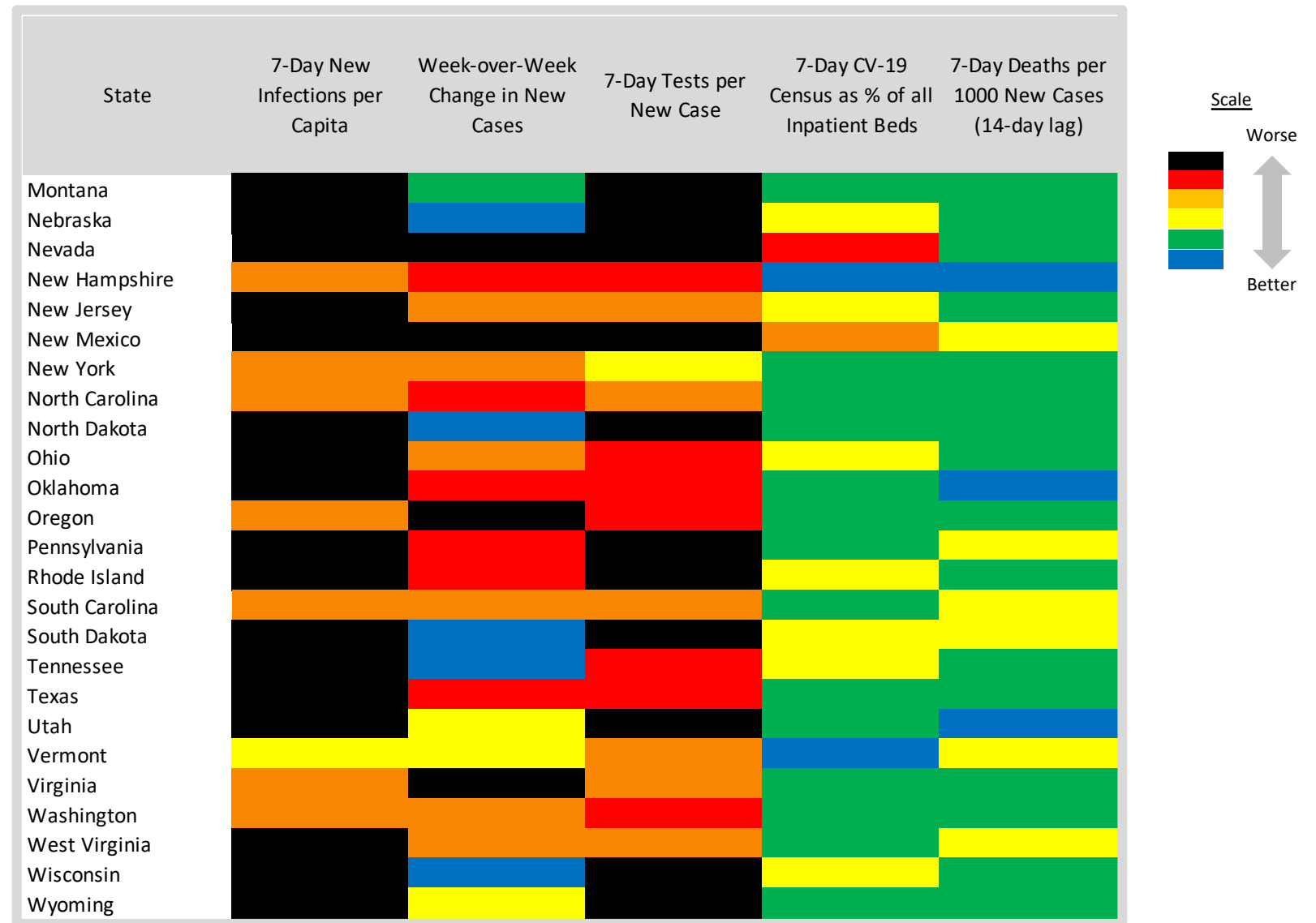
Page 1 of 2

Several states are challenged with high and increasing infection rates, along with inadequate testing: Alabama, Arizona, California, Delaware, Florida, Georgia, Kentucky, Maryland and Mississippi



Page 2 of 2

Several states are challenged with high and increasing infection rates, along with inadequate testing: Nevada, New Hampshire, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Virginia, Washington and West Virginia



On a 7-day moving average basis, new cases worldwide declined slightly yesterday; we are experiencing ~593k new cases each day

The United States is averaging ~178.7k new cases each day

* - 7-day moving average basis

Newly Detected Daily Cases - U.S. & Worldwide

7-Day Moving Average, As of November 24

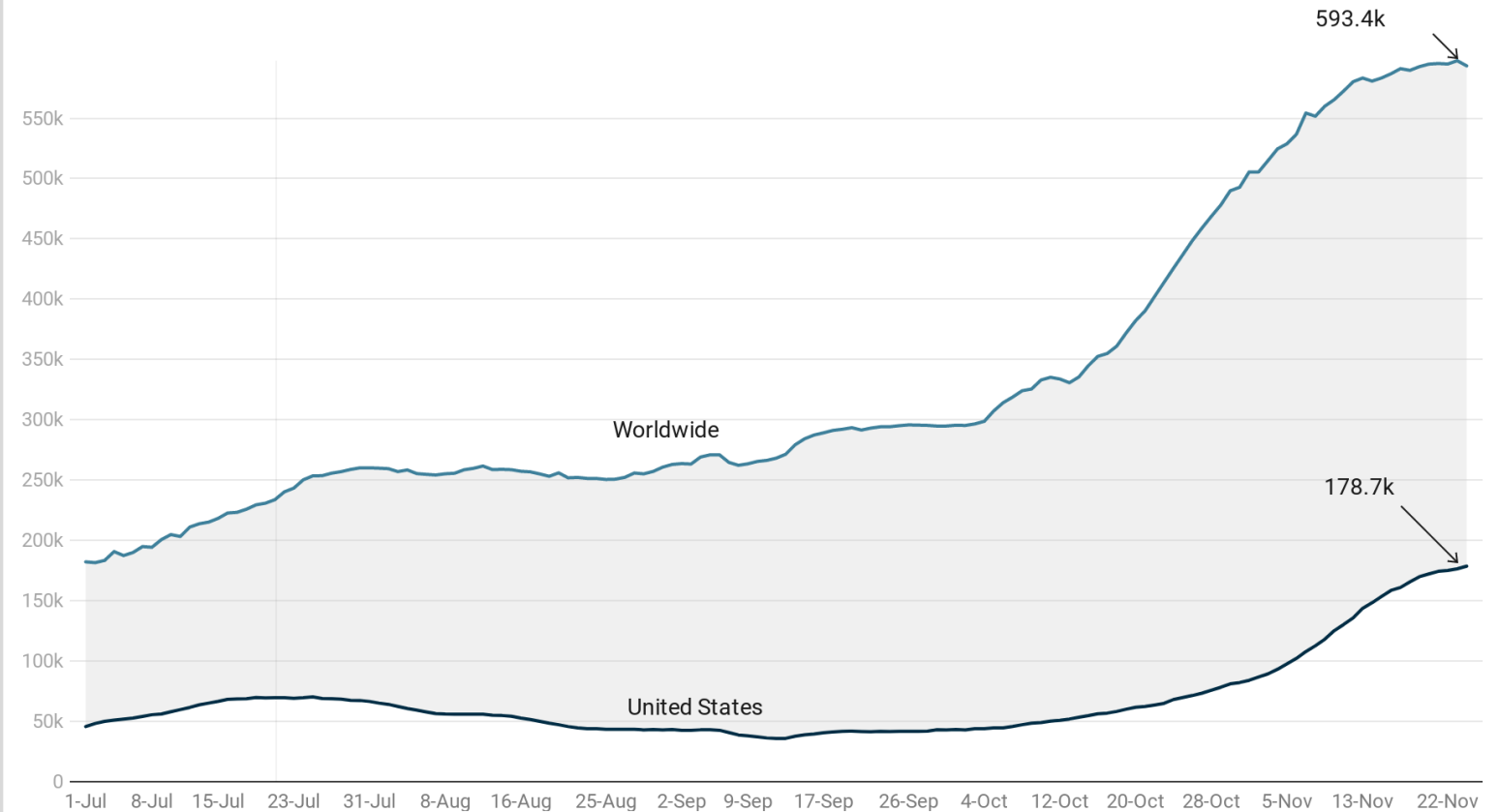


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Although new cases continue to increase in the U.S. and worldwide, the rate of increase has been easing:

Worldwide, the rate of increase has been declining for more than four weeks, and approaching zero

In the U.S., the rate of increase has now declined on fourteen consecutive days

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

7-Day Moving Average

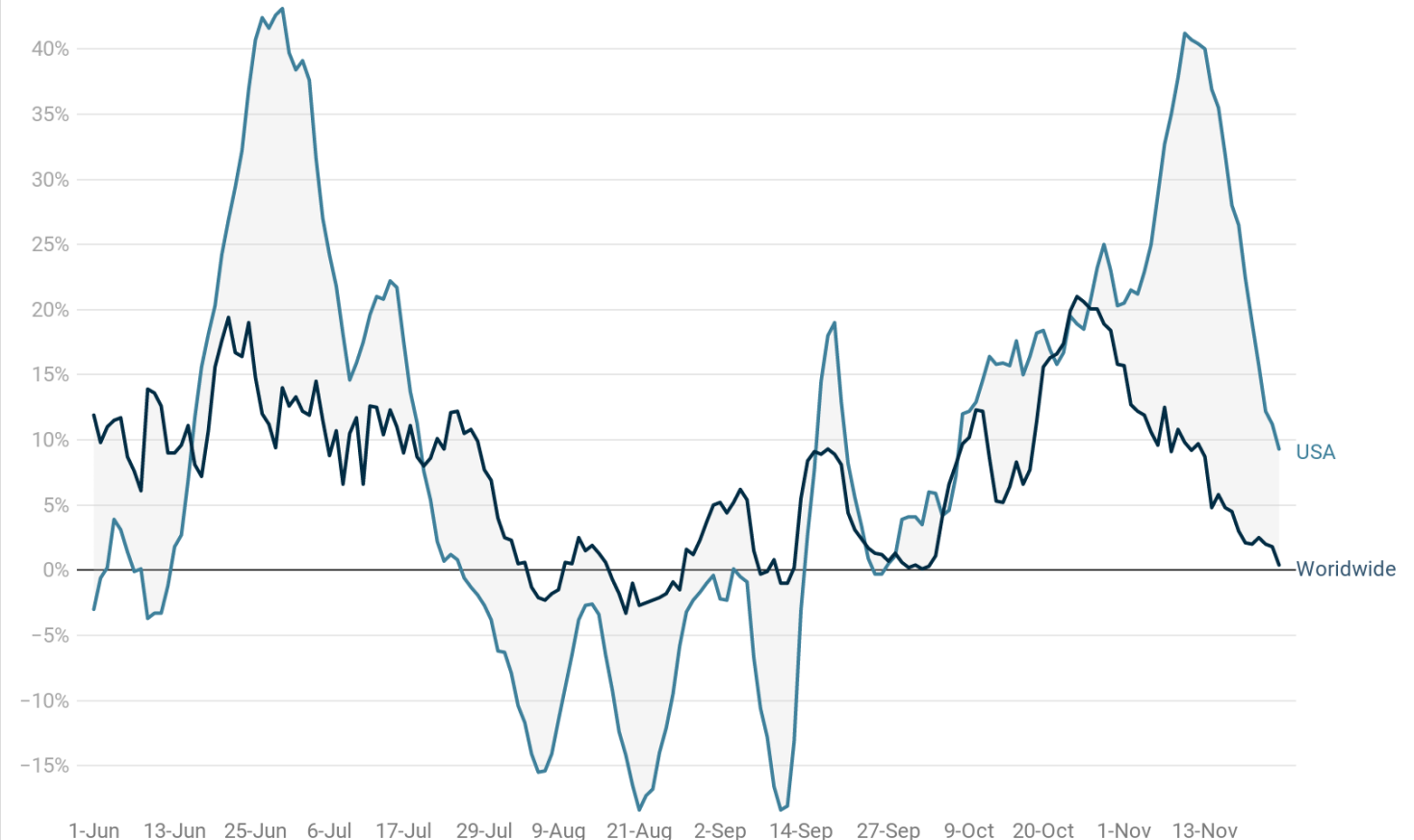


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Momentum Charts – New Cases in the U.S.:

The pattern we are experiencing now parallels what we experienced in June/July. Note that the week-over-week change in new cases peaked above 40% in both periods, before declining precipitously

If we continue this pattern, the June/July experience suggests that actual new cases could finally begin to decline in about two-three weeks (subject to the effect of holiday gatherings, state lockdowns, etc.)

New cases in the U.S. have followed definitive patterns throughout the pandemic – rising cases beget further rises (perhaps, reflective of the high transmissibility of the virus). This is evidenced by ever-increasing week-over-week changes in new cases. Yet, once this measure begins to decline, it tends to continue to decline for a period

Week-Over-Week Change in New Cases

7-Day Moving Average, Current Period v. June/July

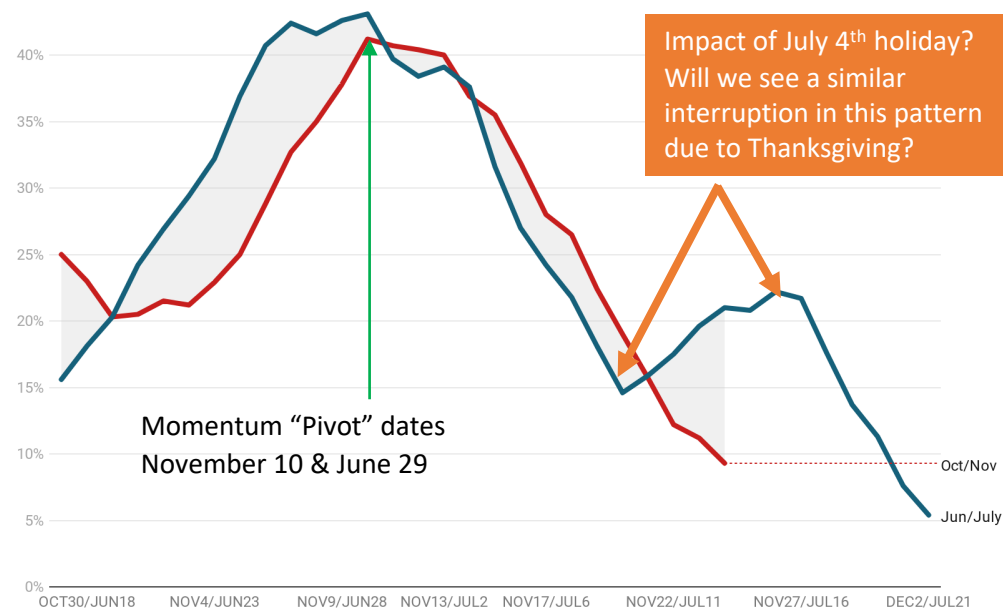


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Seeds of this change in momentum can be seen early, by observing the *rate of change* in week-over-week change in new cases: This rate-of-change-measure turns downward several days ahead of the turn observed in the week-over-week change measure

Change in Rate of Week-Over-Week Change in New Cases

7-Day Moving Average, Current Period v. June/July

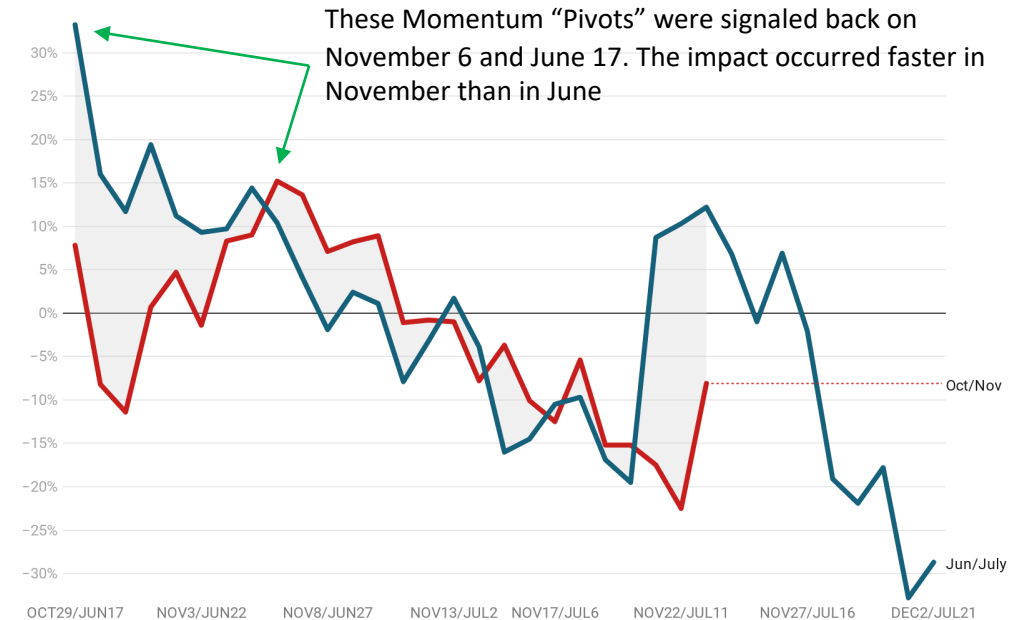


Chart: Health Industry Advisor LLC • Source: worlometer.info • Created with Datawrapper

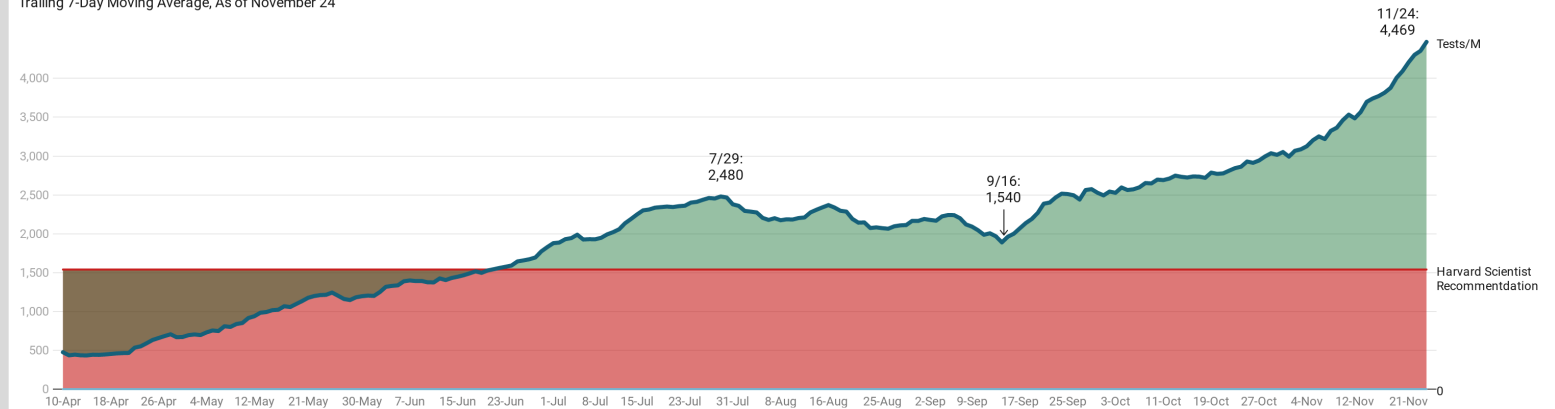
The 7-day test volume has increased twelve consecutive days

This rate has doubled since mid-July and quadrupled since mid-May

The 7-day test-positive rate has now declined six consecutive days

Daily Tests Per 1 Million - United States

Trailing 7-Day Moving Average, As of November 24

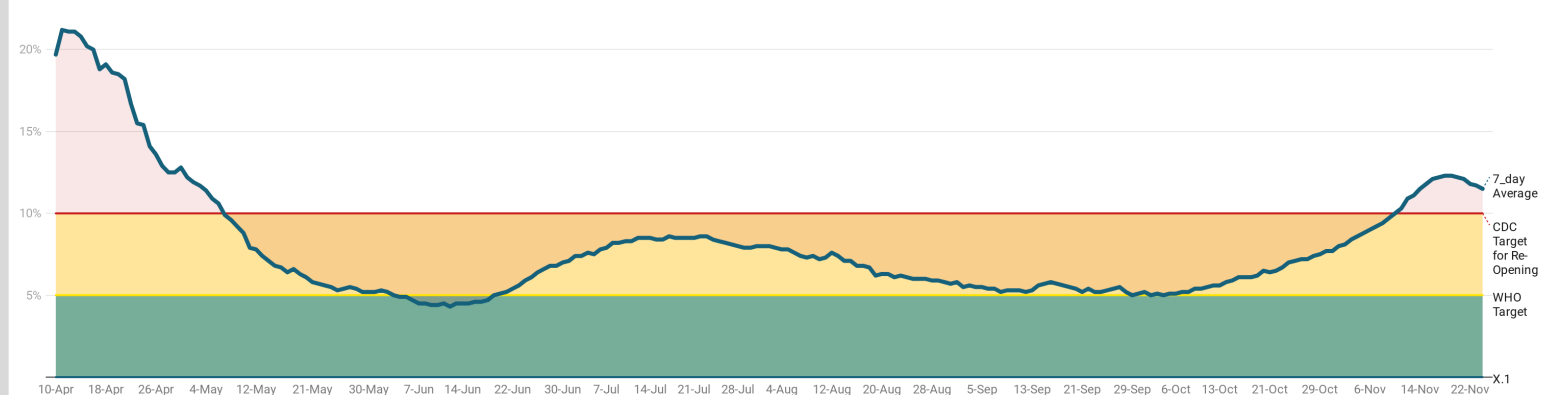


Health Industry Advisor LLC analysis

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

Test-Positive Rate - United States

Trailing 7-Day Moving Average, As of November 24



Health Industry Advisor LLC analysis

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

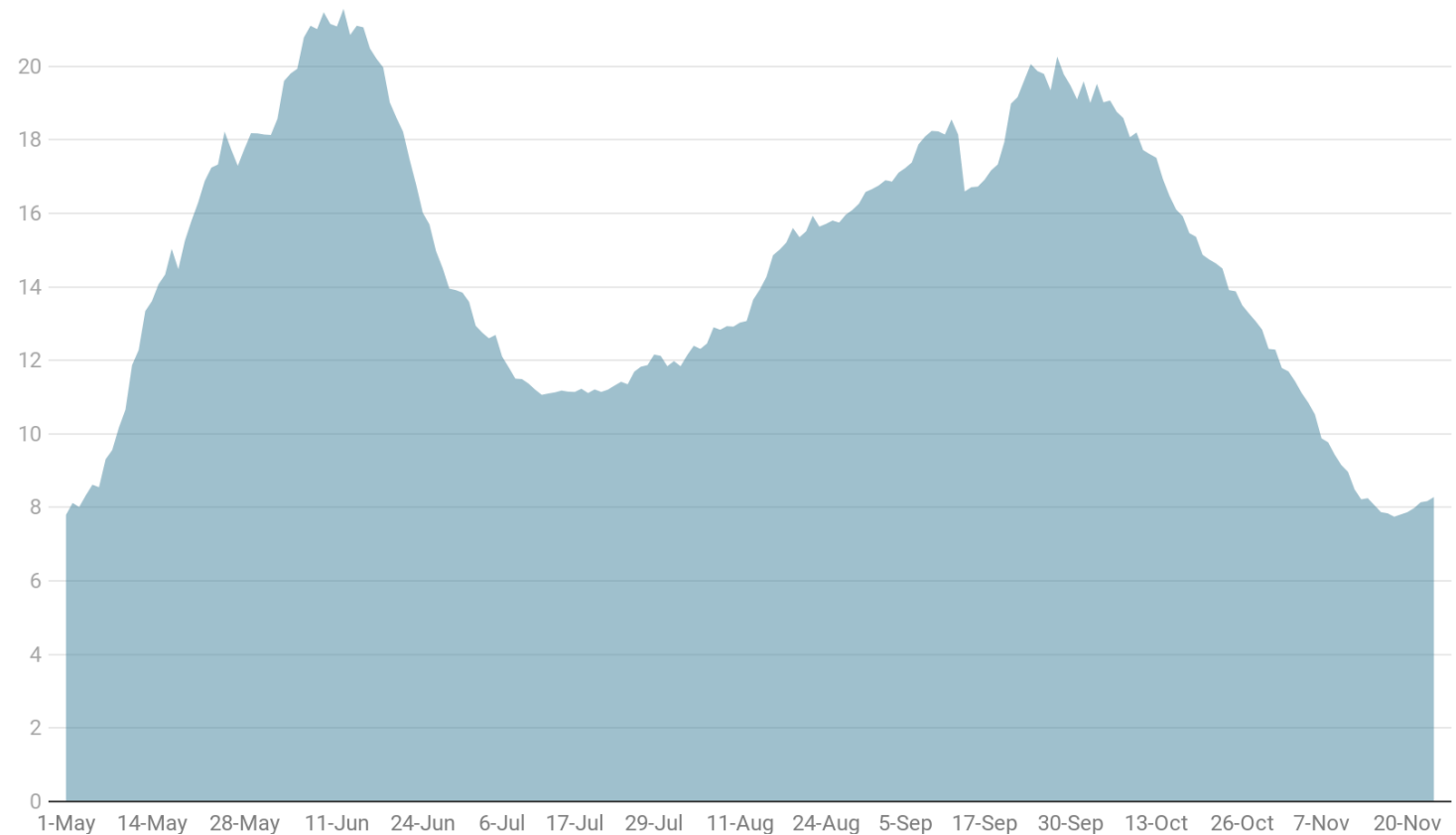
A measure of the effectiveness of testing is the ratio of tests performed to newly-detected cases

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

This rate has improved, however, on six consecutive days

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

The rate of new infections per capita* in the U.S. may be nearing a plateau – although the Thanksgiving holiday may disrupt the current trends

* - 7-day moving average basis

Newly Detected Infections Per 1 Million Population - United States

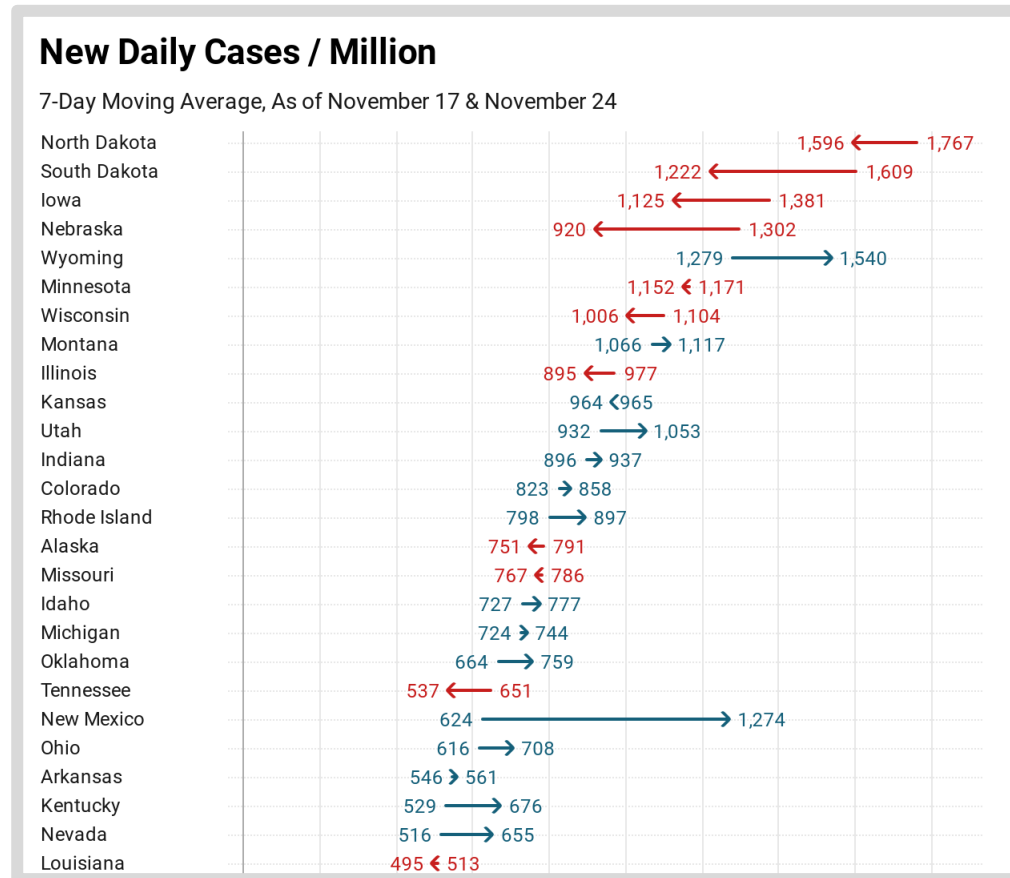
7-Day Moving Average, Through November 24



Health Industry Advisor LLC analysis

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

New Daily Cases / Million:
Seven of the nine states with the highest rates last week each experienced declines this past week
Wyoming and new Mexico, however, experienced large increases in this rate

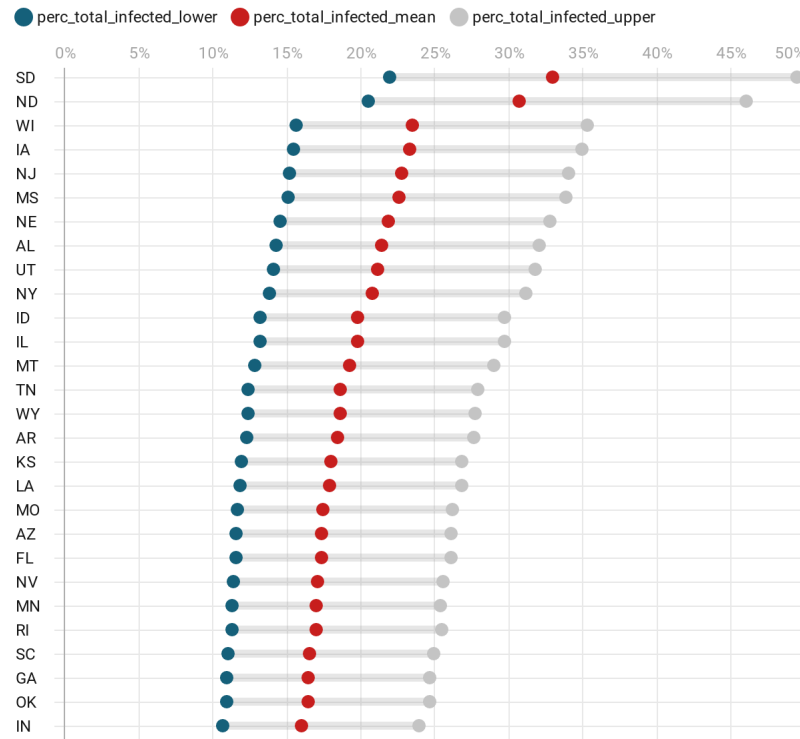


Estimated Infection Prevalence

Detected cases undercount the number of true infections. One source of actual infection estimates, Youyang Gu, suggests that 15% of the U.S. population had been infected with Covid-19, as of November 10 (best guess; the high-end estimate is 22.5%; the low-end, 10%) Best estimates of infection prevalence range from a low of 1.9% of Vermont's population to a high of 33% of South Dakota's (Gu places the high-end estimate for South Dakota at nearly 50% of its population)

Estimated Infection Prevalence

Youyang Gu Estimates, As of November 10



Estimated Infection Prevalence

Youyang Gu Estimates, As of November 10

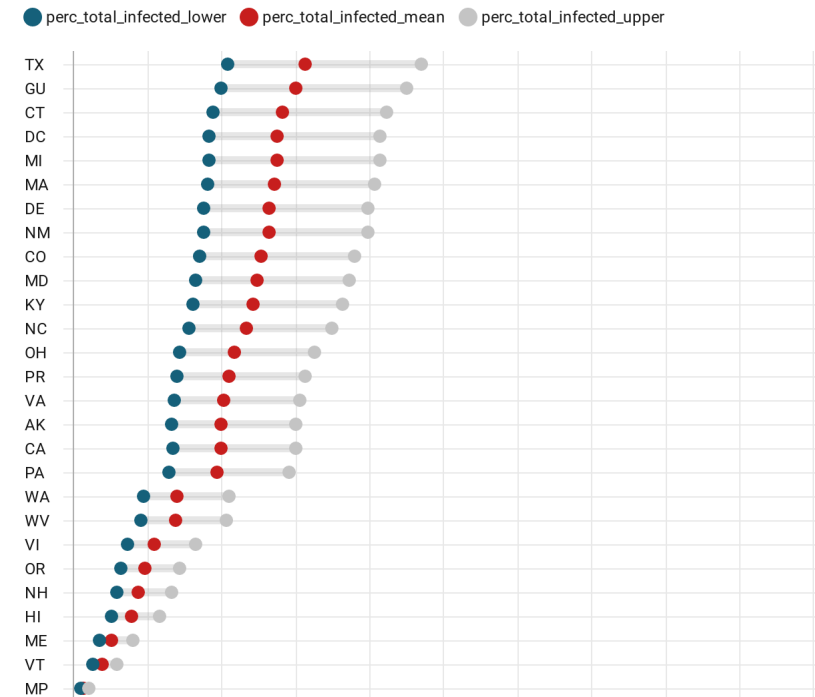


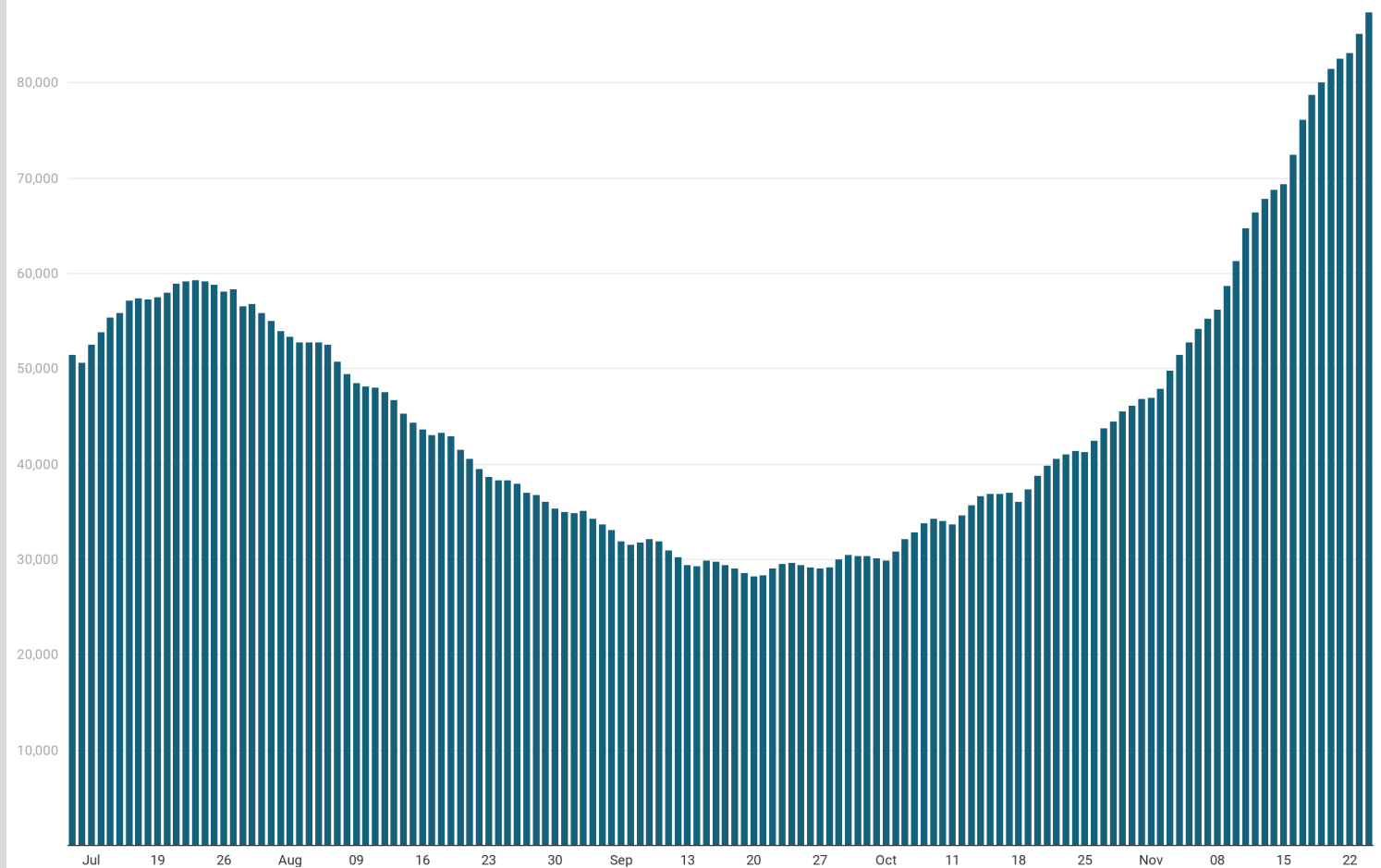
Chart: Health Industry Advisor LLC • Source: Youyang Gu • Created with Datawrapper

On a same-day, prior-week basis, inpatient Covid-19 census increased every day since September 23

Given new case trends, inpatient Covid-19 census could continue increasing, at least for the short term

Hospital Census: COVID-19 Patients

As of November 24



Florida data first available on July 10

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

In Nevada, 62% of all inpatient beds are occupied by Covid-19 patients

In Connecticut and New Mexico, its more than 50%

In Arizona, Colorado, Illinois, Indiana, Maryland, Michigan, Minnesota, Missouri, New Jersey, Rhode Island and Wisconsin it is more than 1/3 of inpatient beds

For the U.S. overall, its 27%

Covid-19 Patients / Total Inpatient Beds

7-Day Moving Average, As of November 24

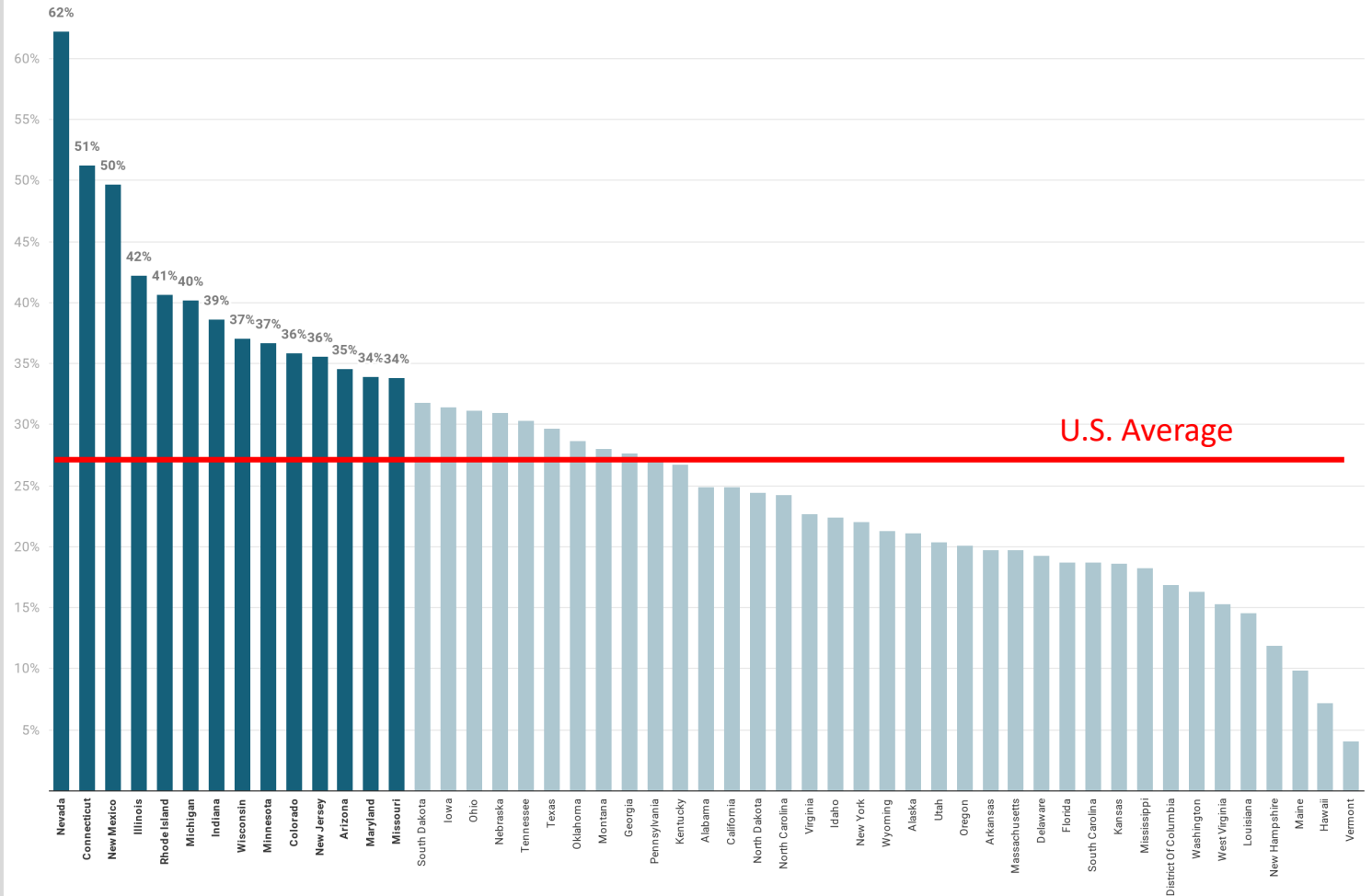


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking project & worldometers.info • Created with Datawrapper

The average Covid-19 census per 100 new cases increased slightly each of the past eight days; this increase amounts to only 4 days per 100 new cases

Covid-19 Hospital Census / 100 Daily New Detected Cases

7-Day Moving Average, As of November 23

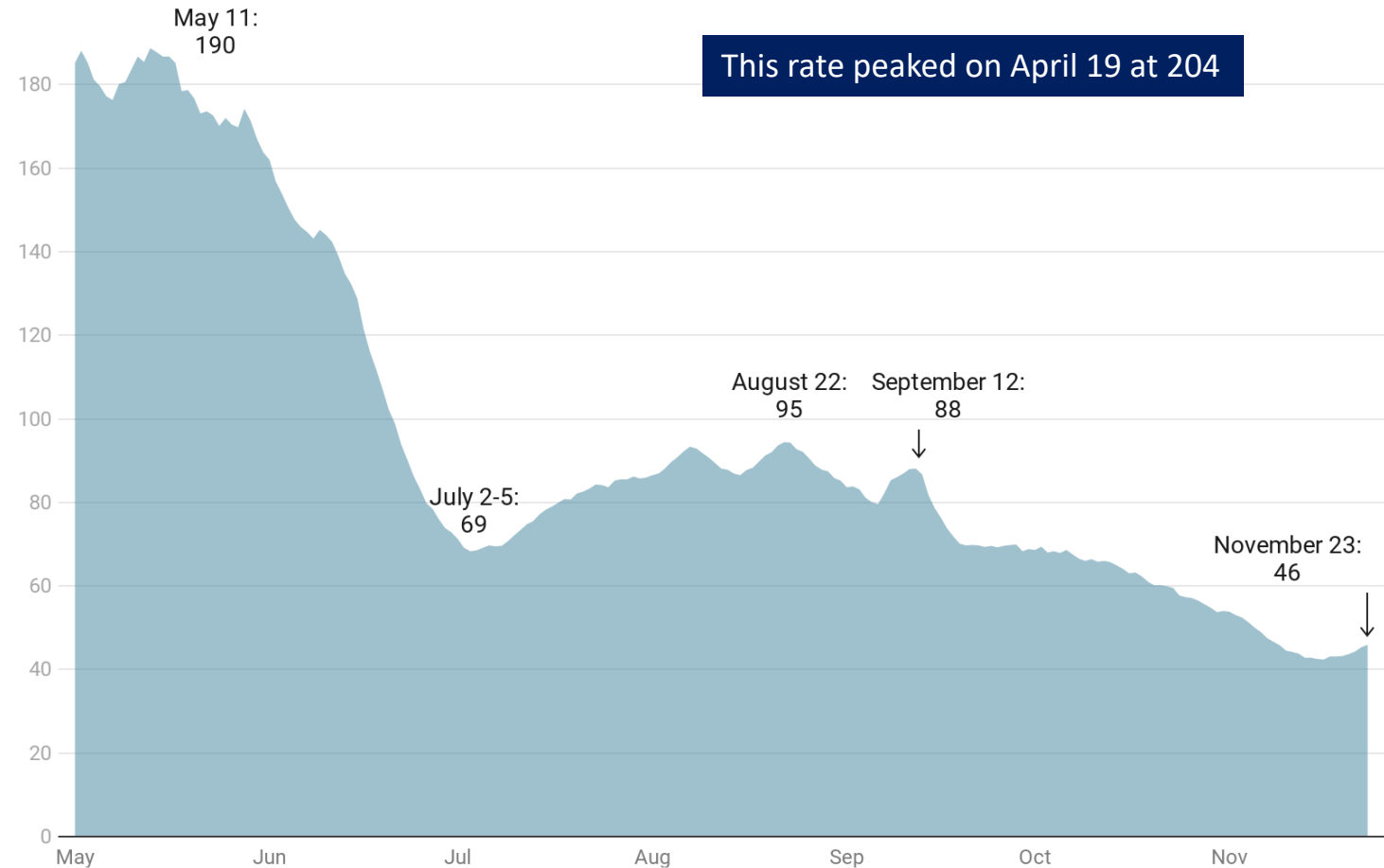


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking project & worldometers.info • Created with Datawrapper

The highest average census per new case is currently experienced in the District of Columbia, Mississippi and Hawaii

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

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 November 24

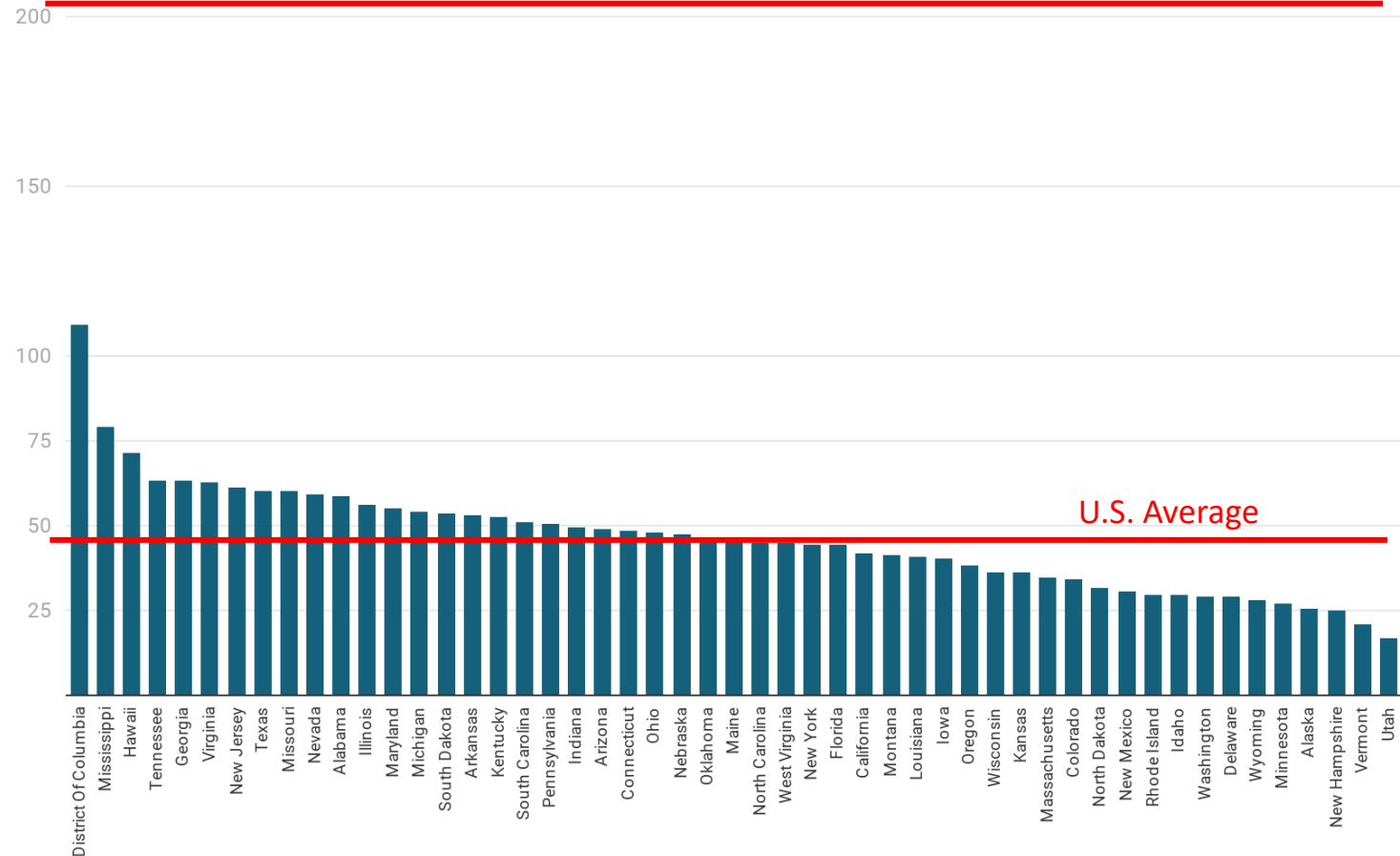


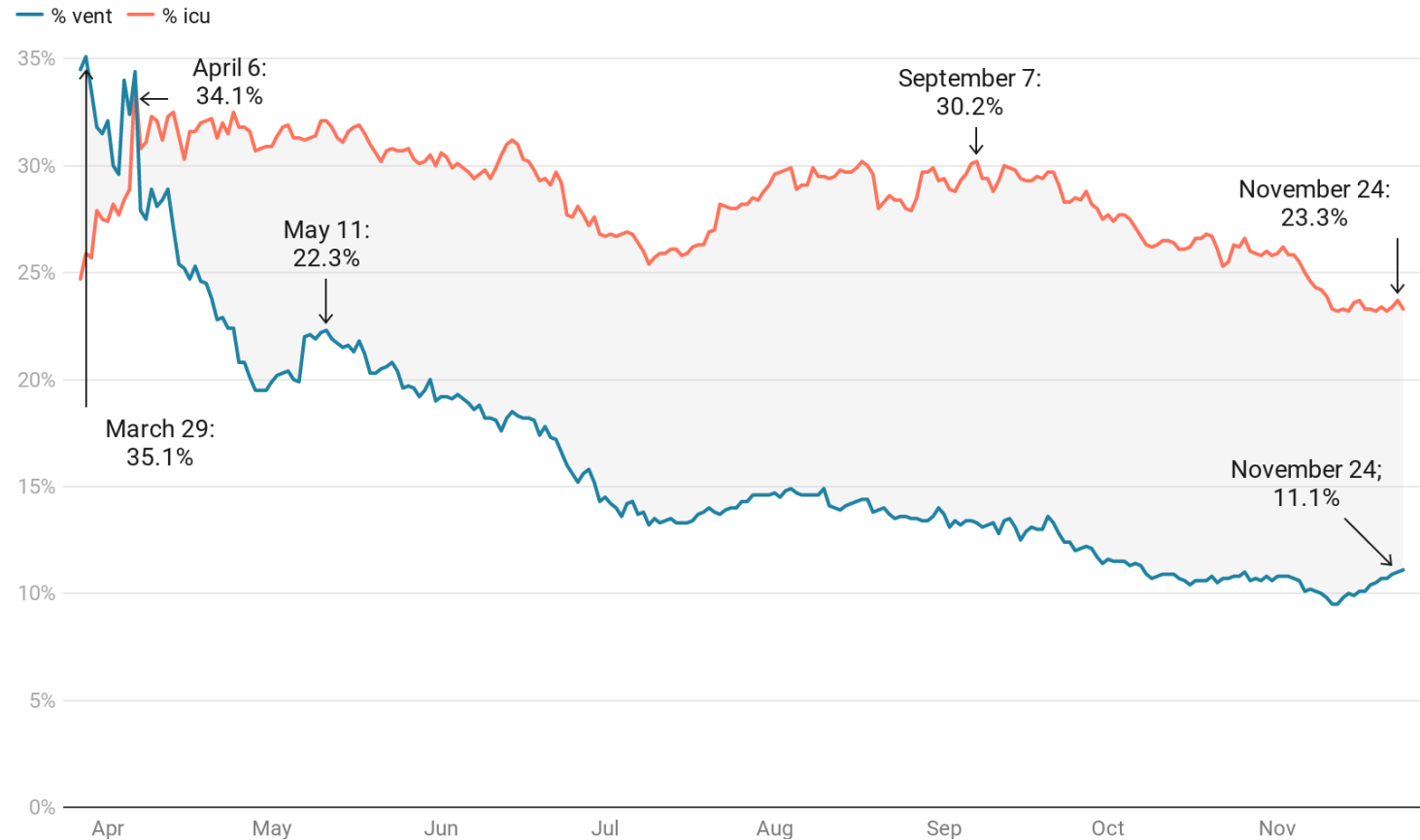
Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project & worldometers.info • Created with Datawrapper

The likelihood of a hospitalized Covid-19 patient would require ICU care has been relatively stable for the past week, after declining markedly during the past three months

The likelihood of a hospitalized Covid-19 patients would be on a ventilator had declined significantly since the early days of the pandemic – however, it has picked up in the past week

Severity of Hospitalized Patients

% of patients on ventilators and in the ICU, As of November 24



Health Industry Advisor LLC analysis

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

On average, less than 1-in-4 Covid-19 inpatients are in the ICU

Rates are highest in Maine, Arkansas and Utah, where more than 1-in-3 Covid-19 inpatients are in the ICU

% of Covid-19 Inpatients in the ICU

November 24

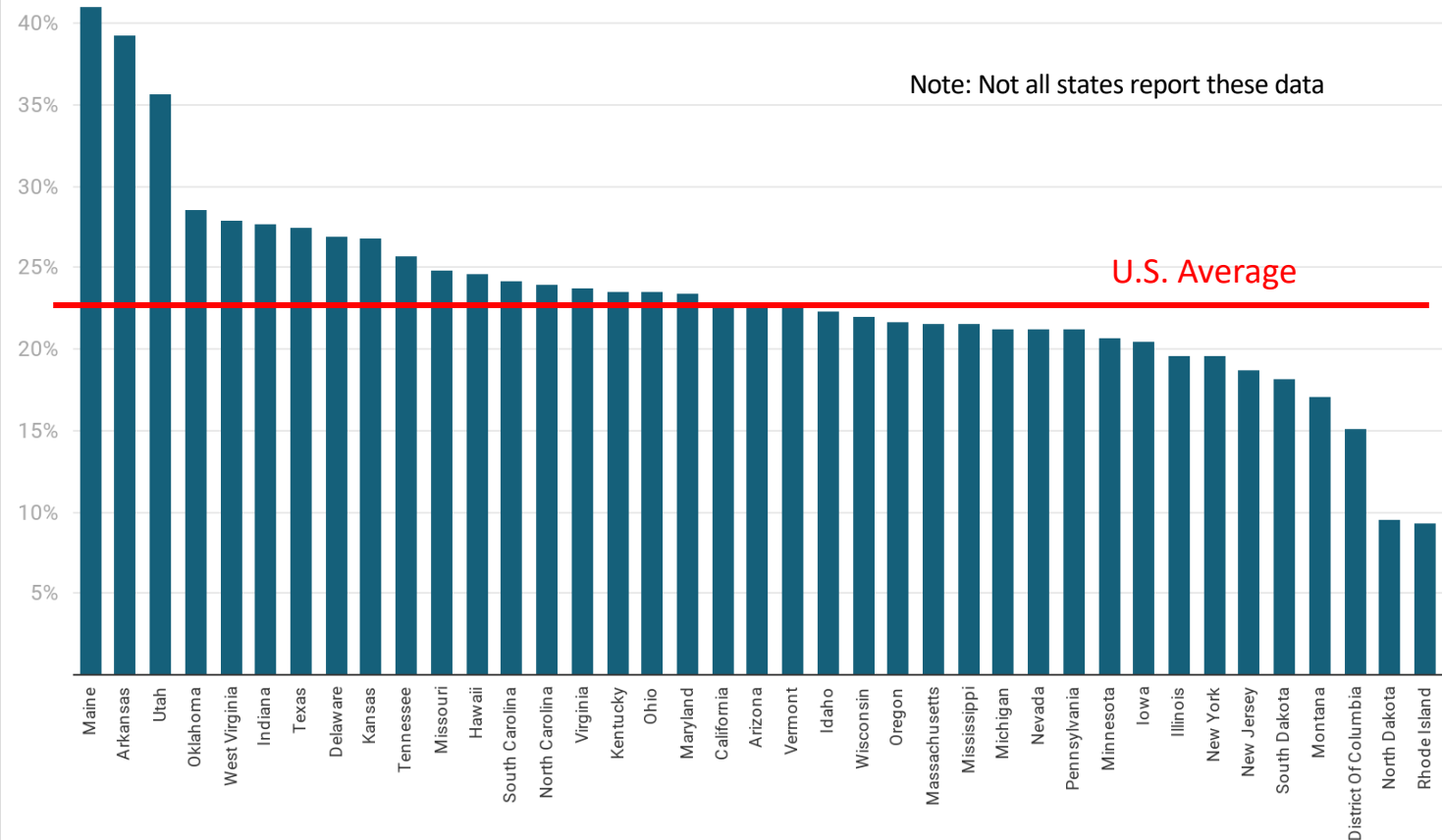


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking project • Created with Datawrapper

The % of ER visits for COVID-19-like illnesses (CLI) has generally been increasing since late-October, however, this rate has now eased in the past week

This rate remains than it was in in March/April

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 November 21

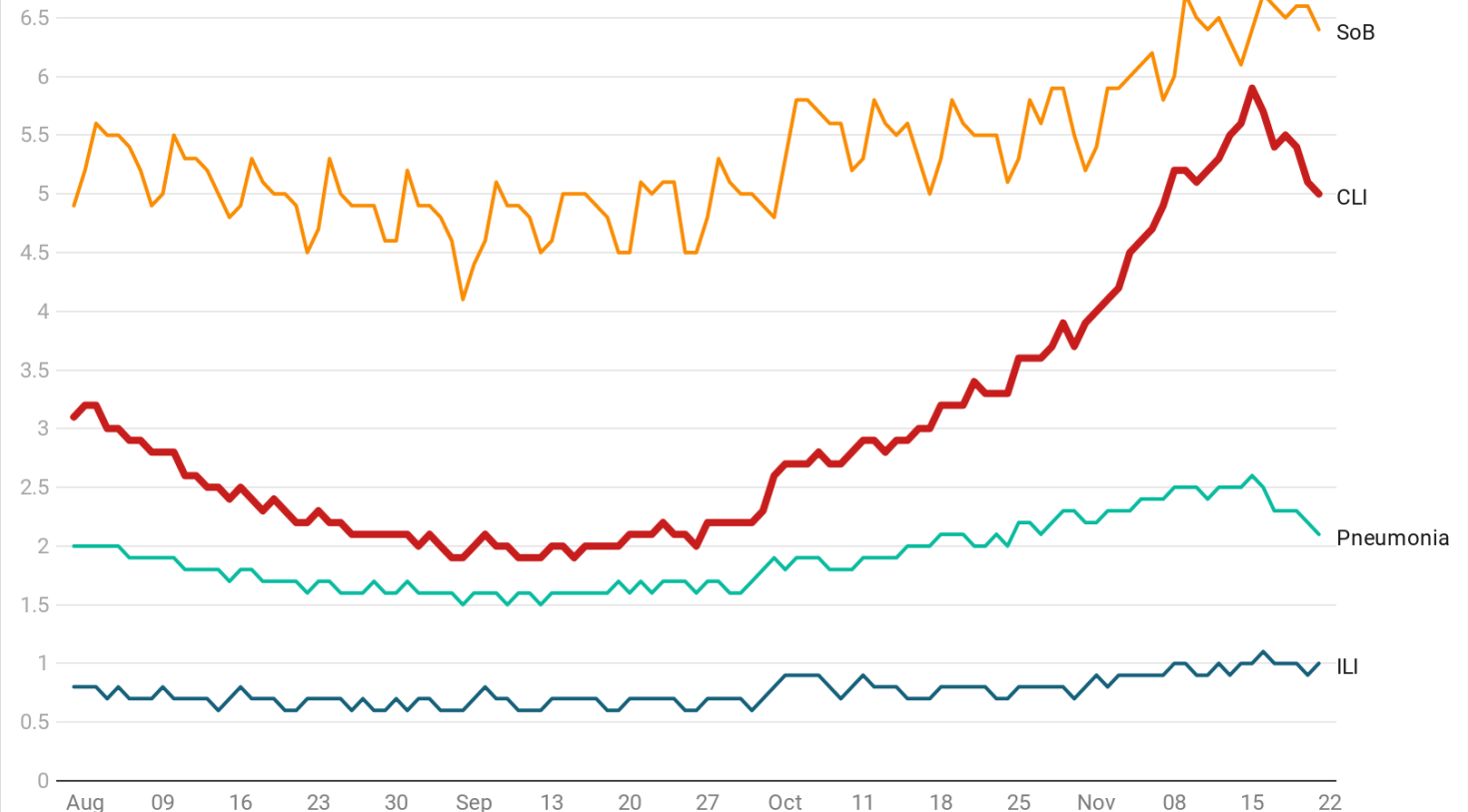


Chart: Health Industry Advisor LLC • Source: CDC • Created with Datawrapper

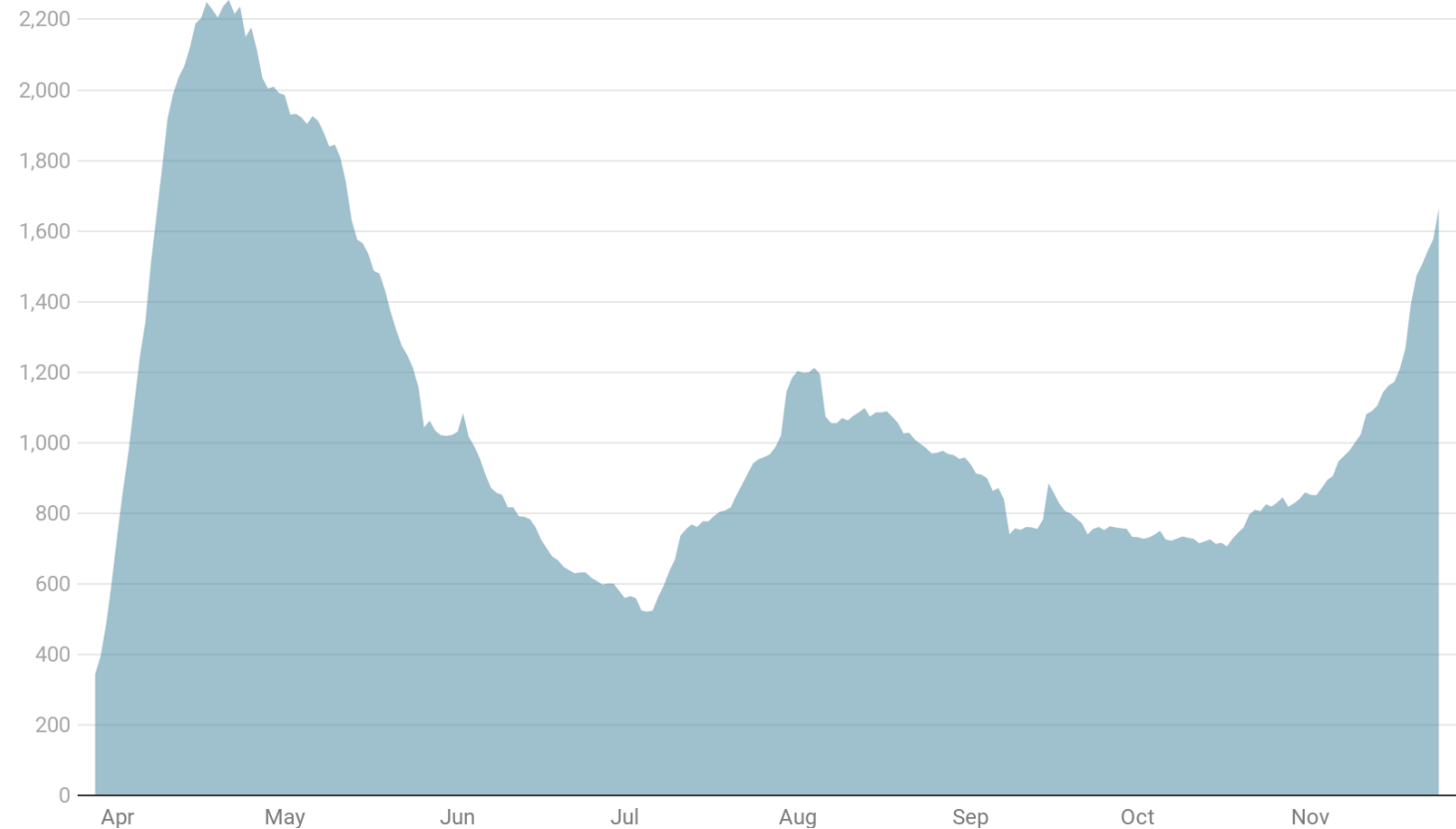
The recent uptick in newly-detected cases is resulting in increased deaths:

The 7-day average deaths per day has increased twenty-two consecutive days

This rate is now higher than where it peaked in early-August

Deaths Reported With Coronavirus in the U.S.

Trailing 7-Day Moving Average, As of November 24



Health Industry Advisor LLC analysis

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

Deaths with coronavirus, relative to new cases (lagged 2 weeks) have moved within a narrow range for the past eleven days

This rate declined rapidly in July and August

The current rate is lower than it was throughout October

7-day Average Deaths / 7-Day Average New Cases (2-Week Lag)

As of November 23



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

State-By-State Comparisons

As of November 24

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	48.3k	708	2,196	21.3%	467	5	25%	12%	19
Alaska	37.8k	157	12,650	5.9%	741	17	21%	-9%	5
Arizona	42.2k	895	2,691	19.7%	529	5	35%	61%	16
Arkansas	49.1k	797	4,514	13.0%	587	8	20%	6%	19
California	29.1k	478	5,359	5.9%	351	15	25%	58%	14
Colorado	35.8k	497	4,299	22.3%	853	5	36%	2%	12
Connecticut	30.1k	1,369	9,026	5.5%	493	18	51%	3%	14
Delaware	33.5k	777	3,041	15.0%	457	7	19%	28%	11
District Of Columbia	28.9k	954	10,562	2.1%	223	47	17%	-3%	23
Florida	44.4k	846	2,121	17.0%	372	6	19%	24%	17
Georgia	42.8k	868	2,954	7.8%	325	9	28%	28%	15
Hawaii	12.3k	165	76	100.0%	73	1	7%	26%	18
Idaho	52.9k	488	2,039	38.1%	766	3	22%	-1%	11
Illinois	53.2k	968	8,282	10.4%	859	10	42%	-12%	14
Indiana	45.5k	807	2,942	32.0%	941	3	39%	3%	15
Iowa	68.5k	706	2,162	41.1%	1,119	2	31%	-17%	8
Kansas	49.4k	500	2,478	38.2%	951	3	19%	-3%	17
Kentucky	36.4k	405	6,756	9.9%	666	10	27%	20%	10

State-By-State Comparisons

As of November 24

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	48.3k	1,360	7,008	7.3%	514	14	15%	-7%	37
Maine	8k	141	7,294	2.1%	153	48	10%	10%	23
Maryland	30.7k	741	2,751	13.5%	370	7	34%	20%	18
Massachusetts	30.4k	1,518	3,443	10.9%	375	9	20%	1%	16
Michigan	34.8k	911	6,703	10.9%	728	9	40%	-1%	18
Minnesota	50.2k	596	4,535	25.7%	1,164	4	37%	-3%	13
Mississippi	48.6k	1,253	2,353	17.8%	420	6	18%	14%	25
Missouri	47.8k	641	1,551	44.7%	733	2	34%	-20%	17
Montana	53.8k	589	5,209	20.8%	1,083	5	28%	-2%	17
Nebraska	59.9k	483	2,794	37.9%	1,058	3	31%	-11%	14
Nevada	45.2k	665	2,376	29.8%	709	3	62%	33%	13
New Hampshire	13.5k	377	1,820	15.8%	323	6	12%	29%	8
New Jersey	36.2k	1,909	5,644	8.1%	473	12	36%	16%	13
New Mexico	41.1k	681	6,211	22.8%	1,273	5	50%	87%	22
New York	33.2k	1,763	9,663	2.9%	288	34	22%	18%	12
North Carolina	32.6k	484	4,511	7.5%	338	13	24%	24%	15

State-By-State Comparisons

As of November 24

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	97.6k	1,159	2,567	61.6%	1,581	2	24%	-12%	14
Ohio	31.8k	523	5,375	13.5%	727	7	31%	17%	11
Oklahoma	45.6k	421	5,776	13.9%	802	7	29%	22%	10
Oregon	16k	201	1,855	16.0%	297	6	20%	32%	14
Pennsylvania	25.5k	784	2,014	25.2%	509	4	27%	24%	28
Rhode Island	48.5k	1,251	3,694	25.2%	930	4	41%	20%	13
South Carolina	40.6k	838	4,583	6.9%	314	15	19%	12%	23
South Dakota	84.6k	928	2,815	43.4%	1,223	2	32%	-24%	23
Tennessee	50.6k	640	3,435	15.3%	525	7	30%	-19%	19
Texas	41.8k	739	3,938	9.5%	469	8	30%	28%	20
Utah	56.8k	252	3,699	27.9%	1,032	4	20%	7%	5
Vermont	6k	103	3,325	4.5%	151	22	4%	3%	26
Virginia	26.2k	466	3,815	7.4%	282	14	23%	42%	16
Washington	20.6k	355	1,968	15.3%	330	6	16%	18%	13
West Virginia	23.5k	382	8,488	6.4%	540	16	15%	13%	25
Wisconsin	62.5k	535	3,048	35.6%	984	3	37%	-11%	11
Wyoming	51.8k	349	2,371	57.3%	1,359	2	21%	6%	11

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>