



Health
Industry
Adv



Issue # 204
Thursday, November 5, 2020
COVID-19
Report

Highlights

- **With the arrival of colder weather, the rise in new cases is unsurprising - particularly in the northern hemisphere. Perhaps what may be surprising is the rapid pace of new cases being detected, as well as the high rates of new cases per capita in certain areas**
- The level of testing in the U.S. is establishing new record highs on nearly a daily basis. Unfortunately, the test-positive rate has been increasing too, suggesting that the **high testing rate is still insufficient to keep pace with the pace of infection spread**
- There is evidence, however, that **the rapid pace of new case detection may be easing in certain areas:**
 - Belgium, which has the highest rate of new cases per capita over the past week, has experienced a decline in this rate on three consecutive days. The Netherlands, which also ranks high in new cases per capita, has seen its rate decline on four consecutive days
 - **Worldwide, newly detected cases have been increasing since early-October; the rate of increase has declined, however, on ten consecutive days** (for the geeky, analytically-inclined readers, look at the discussion of speed, acceleration and "jerk" (the "third derivative" - essentially, a measure of the rate that the rate of change is changing)
- The United States has followed a similar pattern as the world overall in week-over-week changes in new cases throughout the pandemic. Given the worldwide trend, might we expect the rate to begin easing in the U.S?
- **As new cases have surged in the U.S., it has resulted in increasing hospital census and in deaths. Nonetheless, these have not increased at the same pace as new cases.** Does this reflect a less-lethal virus, a younger infected population, better treatment regimens? Or, a combination of each?
 - **A person diagnosed with the virus in the U.S. is less-likely to be hospitalized today than at any time during the pandemic; This likelihood is 40% lower now than it was in mid-September and more than 70% lower than in it was in May**
 - **The average deaths per day with the coronavirus are now higher than they have been since early-September. Still, the case fatality rate (deaths per new cases, 4-week lagged) has been stable for at least the past week, and is 40% lower than it was in mid-July**

Newly-detected cases in the U.S. follows a similar pattern as newly-detected cases worldwide - although the peaks and valleys are more pronounced in the U.S.

Worldwide, the rate of growth slowed over the ten days – will the U.S. follow?

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

7-Day Moving Average

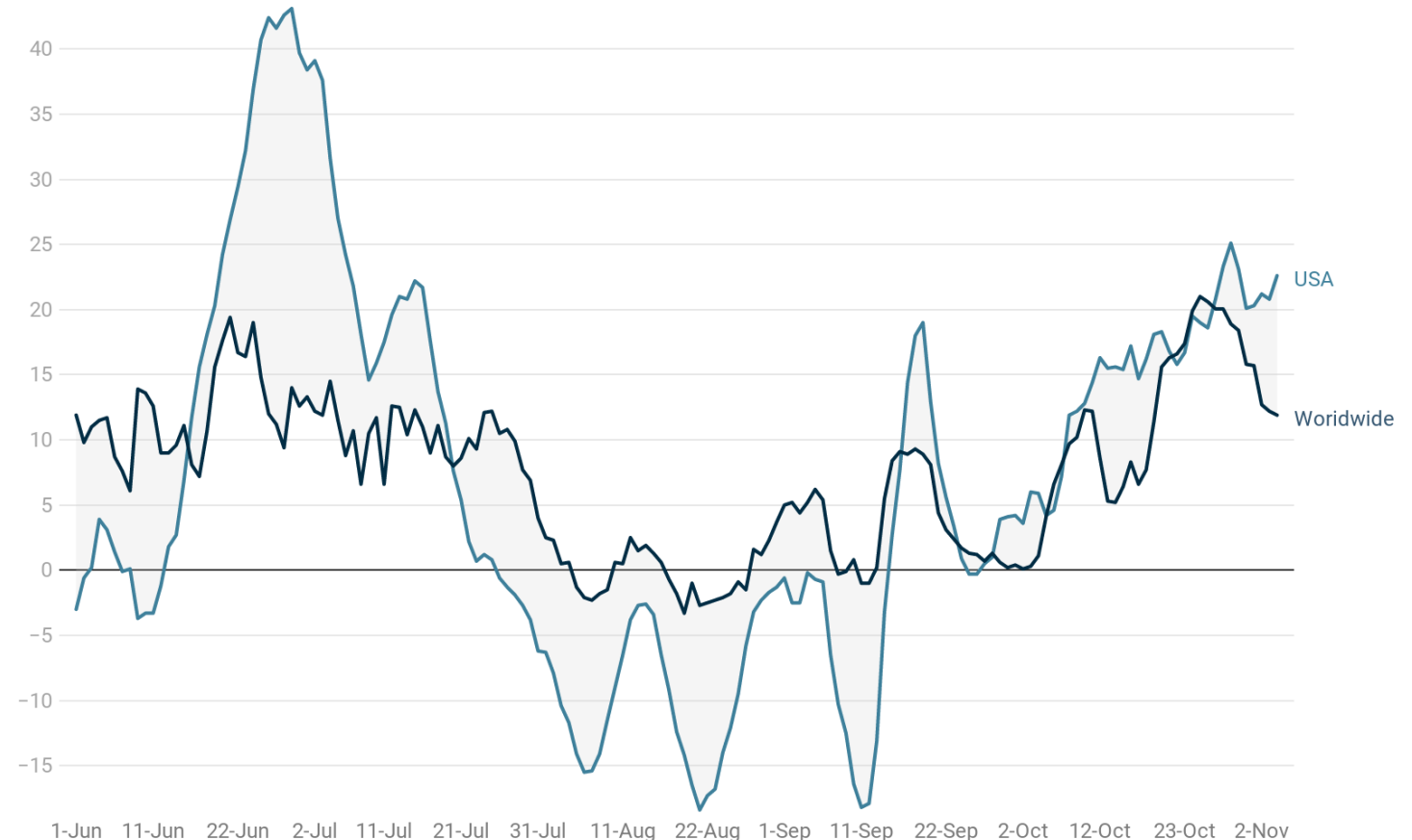


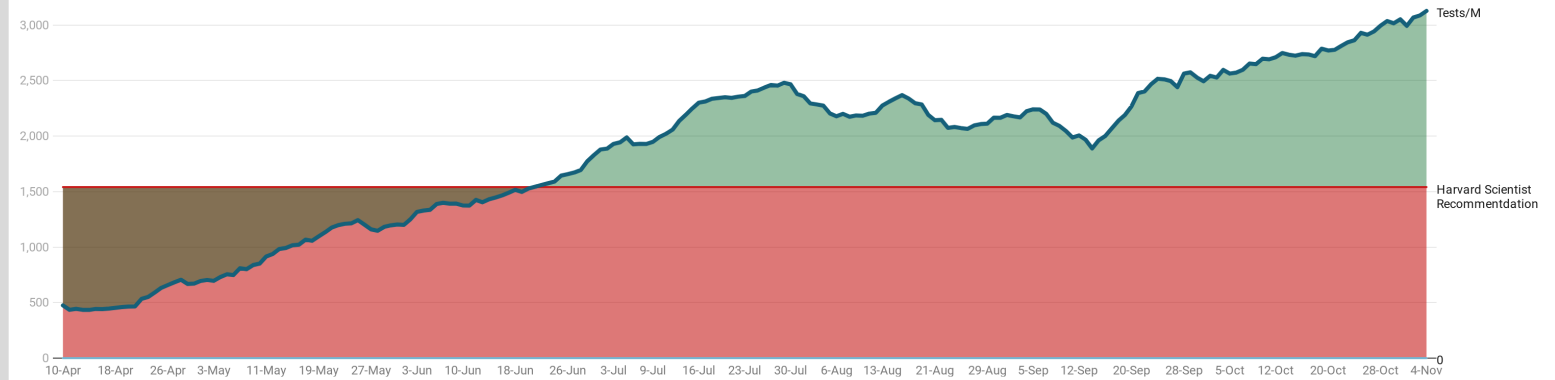
Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

The 7-day average testing volume set another new high on Wednesday; this rate has increased by nearly 60% since mid-September

The 7-day test-positive rate, however, has been trending upward since the beginning of October

Daily Tests Per 1 Million - United States

Trailing 7-Day Moving Average, As of November 4

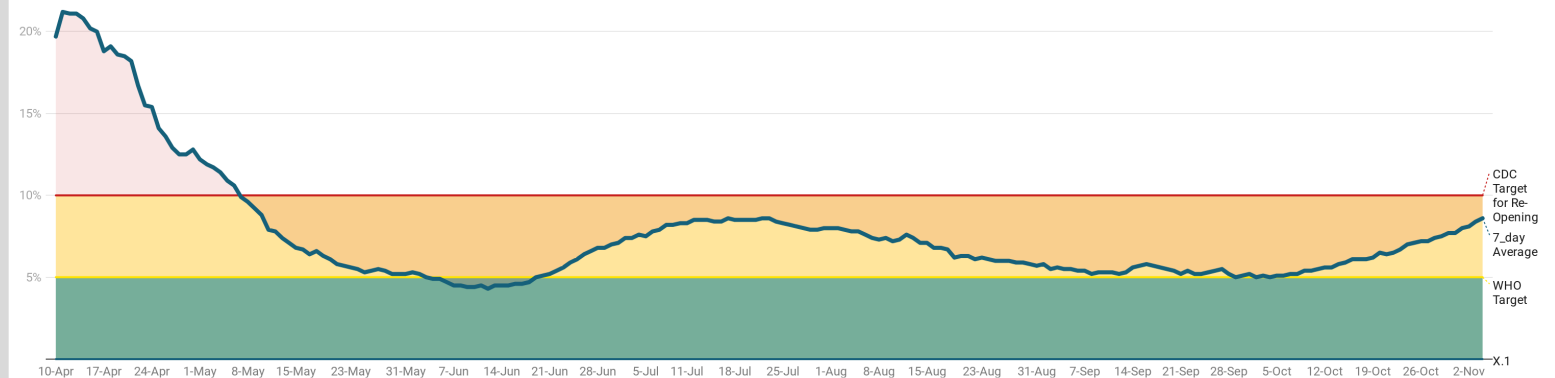


Health Industry Advisor LLC analysis

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 4



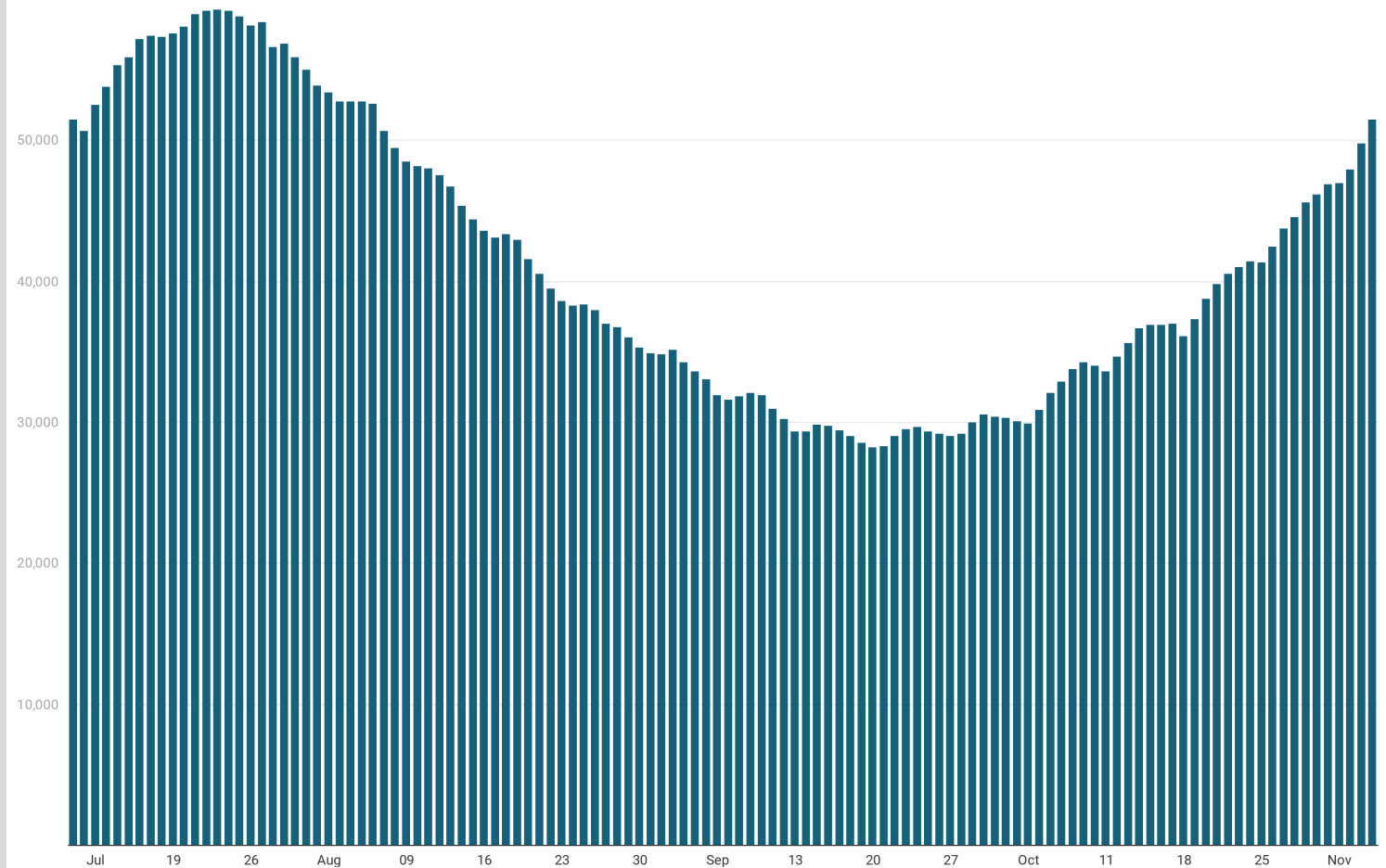
Health Industry Advisor LLC analysis

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

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

Hospital Census: COVID-19 Patients

As of November 4



Florida data first available on July 10

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

Covid-19 Hospitalizations, while increasing, have not kept pace with the increase in newly-detected cases

Indeed, the average Covid-19 census for the past week per 100 new cases is lower than it has been since at least April

Covid-19 Hospital Census / 100 Daily New Detected Cases

7-Day Moving Average, As of November 4

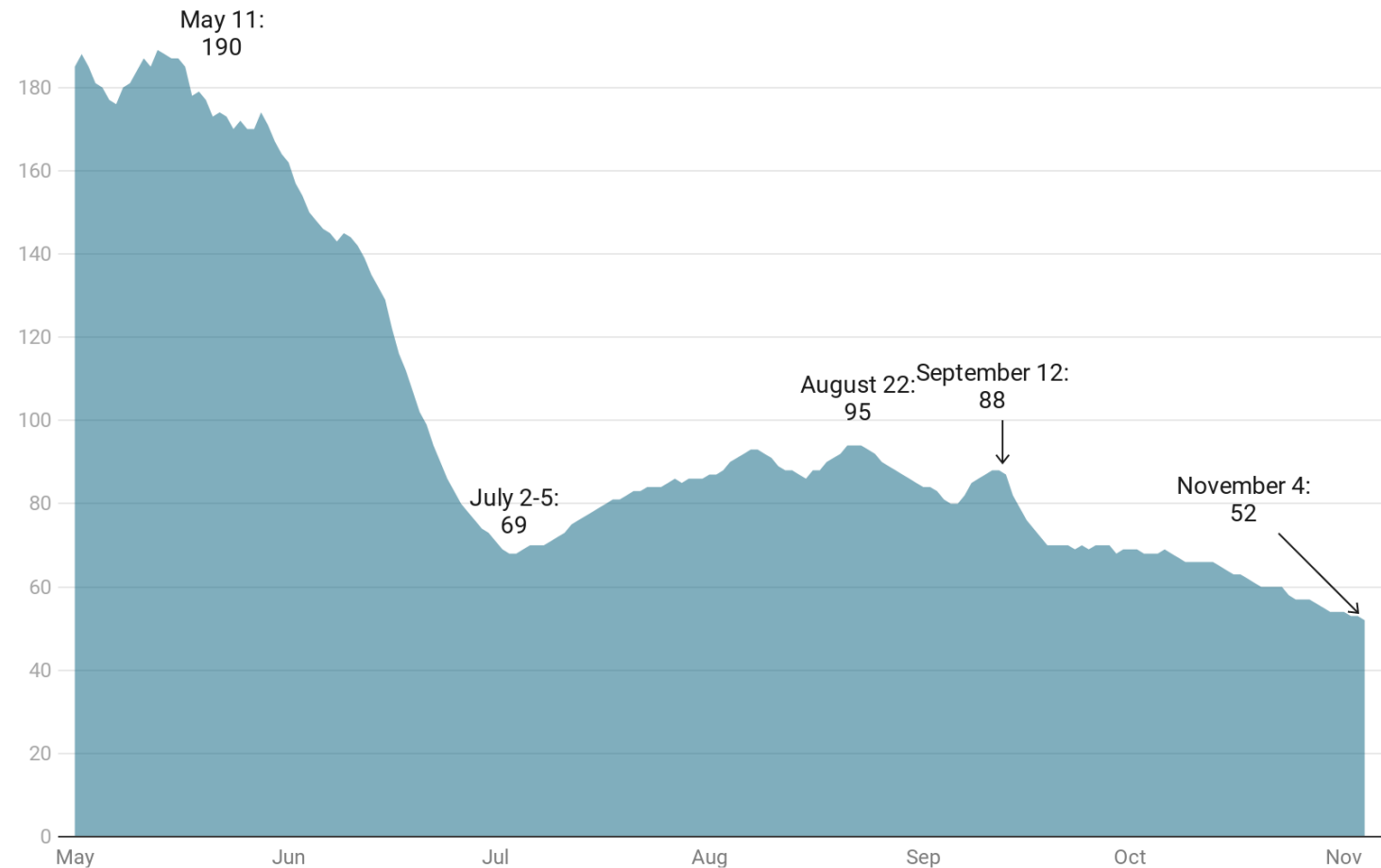


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking project & worldometers.info • Created with Datawrapper

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

The 7-day average deaths per day has generally been higher from mid-October to now than from early-September through early October

Deaths Reported With Coronavirus in the U.S.

Trailing 7-Day Moving Average, As of November 4



Health Industry Advisor LLC analysis

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

State-By-State Scorecard

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

At this 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 v. peak highest; A community might weigh the deaths per case highest



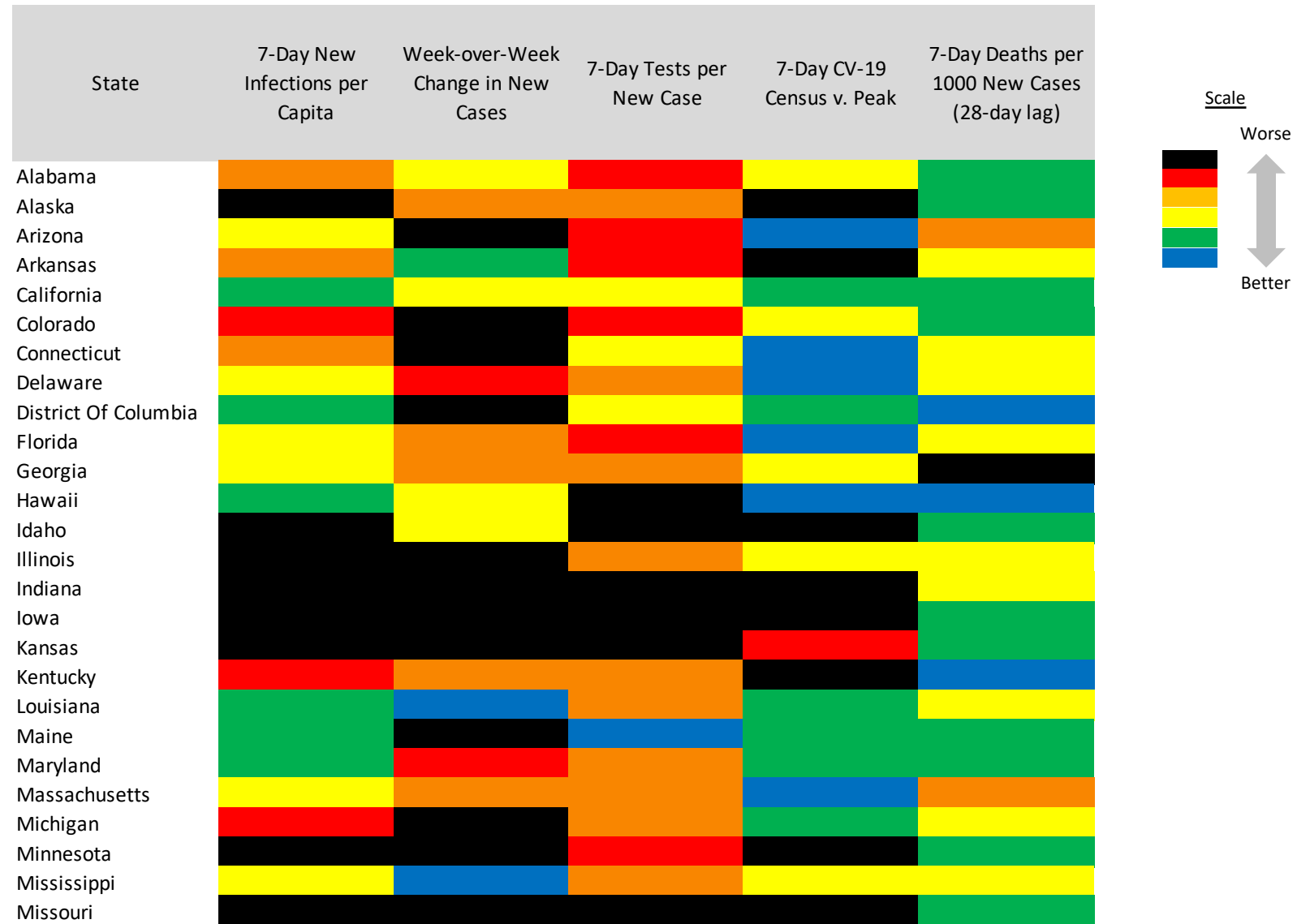
Metric		Black	Red	Orange	Yellow	Green	Blue
7-Day Average New Daily Reported Infections per Capita	Greater than	450	350	250	150	50	0
Week-over-Week Change in Newly Reported Cases	Greater than	30%	20%	10%	0%	-10%	N/A
7-Day Average Viral Tests per 7-Day Average Newly Reported Cases	Less than	5	10	25	50	75	N/A
7-Day Covid-19 Inpatient Census v. Peak Covid-19 Inpatient Census	Greater than	95%	85%	75%	50%	25%	0%
7-Day Deaths per 1000 New Cases (28-day lag)	Greater than	50	40	30	20	10	0

Scorecard (1 of 2)

Alaska, Illinois, Indiana, Kansas, Kentucky, Minnesota and Missouri are challenged across all metrics, except the case fatality rate

California is doing OK to well across all metrics

Maine is doing well, except for the week-over-week increase in cases per capita



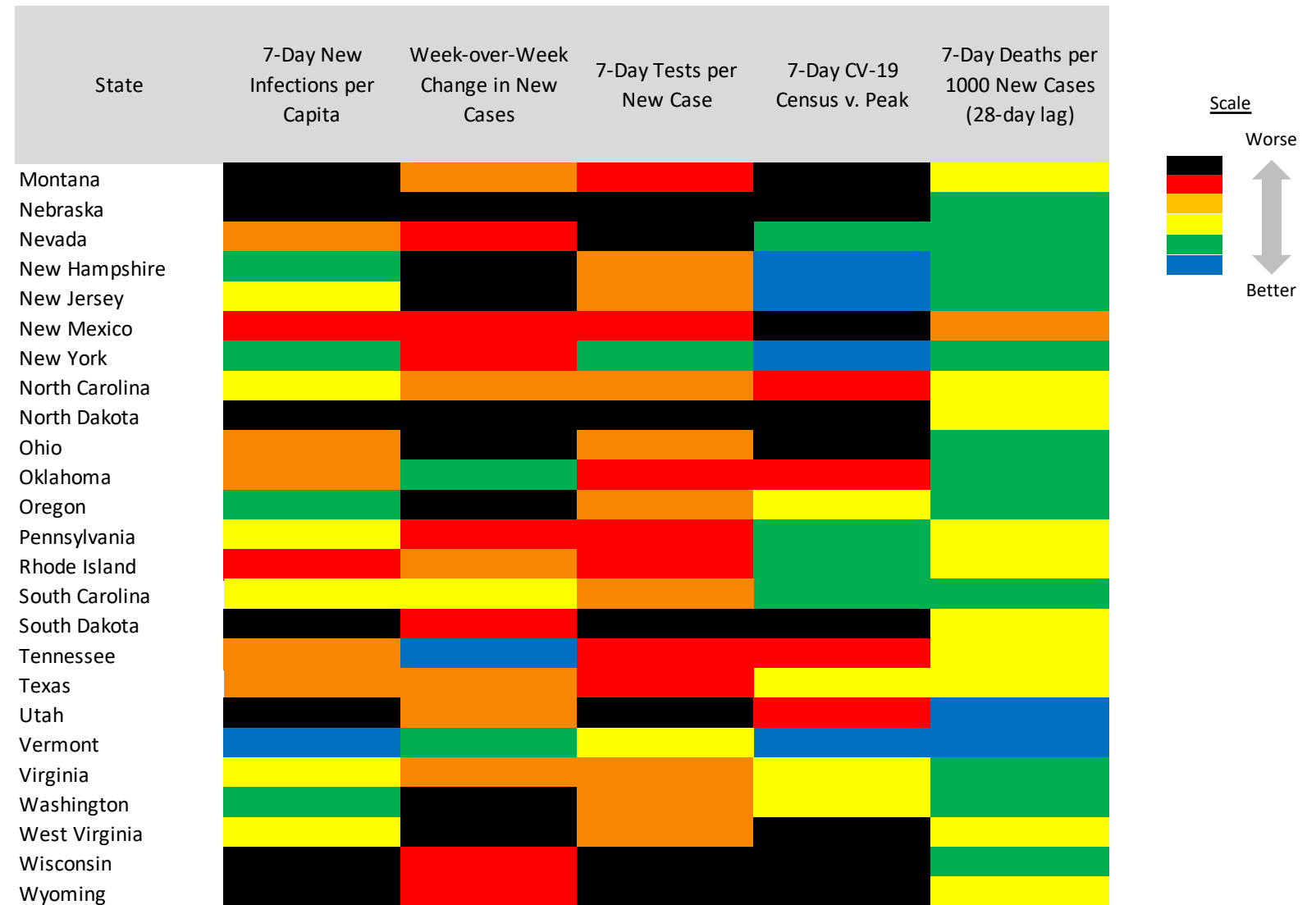
Scorecard (page 2 of 2)

New Mexico is challenged across all metrics

Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin and Wyoming are challenged across all metrics, except the case fatality rate

Vermont is doing well across most metrics; OK on tests per new case

New York is doing well across most metrics, except for week-over-week increase in new cases



Is a bad situation getting worse?

Using a physics model, we can assess that, not only are North Dakota and Iowa's rates of new cases high . . . They are getting worse at ever-increasing rate

On the other hand, the current difficult situation in South Dakota could begin to ease, if trends in rates of new case growth continue to decelerate

Let's adopt a physics model to better understand the infection track in selected states: Speed, acceleration ... and *jerk*

- "Speed" – rate of new cases per capita
- "Acceleration" - rate of change in new cases per capita (week-over-week change); if this is positive, speed (or, new cases per capita) will increase
- "Jerk" – rate of change in the rate of change (third derivative); if this is positive, acceleration increases
- Like a roller coaster that will not slow down until it stops accelerating, it doesn't stop accelerating until its jerk is negative

North Dakota is in a challenging situation (Iowa is in a similar circumstance):

- It has the highest rate of any state in new cases per capita over the past seven days
- Its case rate is accelerating – that is, its new cases are increasing week-over-week and,
- The rate by which the case rate is increasing (its "jerk") has increased for seven of the past eight days

Contrast this situation with that of South Dakota :

- This state has the 2nd highest rate of new cases per capita
- Its case rates is also accelerating (week-over-week, cases are increasing); however,
- The rate at which this cases rate is accelerating has declined over past few days

North Dakota, and Iowa
are only getting worse

In South Dakota, the
acceleration in case
growth has at least
slowed recently

In Wisconsin and
Montana its not yet clear
if the rate of case
increase is accelerating
or decelerating

State	New Cases / Capita ("Speed")	Week-Over-Week Change in New Cases / Capita ("Acceleration")	Direction of Week- Over-Week Change in New Cases / Capita ("Jerk")
North Dakota	1,573.6	46.2%	Increased 7 of past 8 days
South Dakota	1,258.1	12.0%	Declined 3 of past 4 days
Wisconsin	831.2	23.5%	Oscillating
Montana	800.5	14.0%	Oscillating
Iowa	758.9	62.4%	Increased 3 of past 4 days

State-By-State Comparisons (page 1 of 3):

States with high infection rates:

Alaska is at peak Covid-19 census, is experiencing a low test-positive rate, a modest week-over-week increase in cases and a low case fatality rate

Colorado is seeing a surge in new cases and a relatively high test-positive rate

Idaho, Indiana and Iowa have very high test-positive rates and are at peak Covid-19 census

State-By-State Comparisons

As of November 4

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	7-Day M.A. Hospital Census % of Peak	Week-Over-Week Change in New Cases	7-Day Deaths /1000 New Cases, 28-Day Lag
Alabama	38.3k	613	1,486	18.8%	293	5	63%	8%	14
Alaska	19.3k	115	9,632	5.4%	521	18	99%	14%	12
Arizona	33.1k	832	1,536	11.7%	186	8	25%	32%	38
Arkansas	36k	671	3,323	9.8%	340	10	98%	-1%	29
California	23.3k	451	3,361	3.2%	115	29	34%	9%	12
Colorado	17.4k	405	2,164	17.0%	432	5	60%	56%	19
Connecticut	19.4k	1,303	6,413	3.6%	250	26	16%	49%	23
Delaware	25k	731	1,848	9.1%	168	11	23%	24%	26
District Of Columbia	24k	917	6,069	2.1%	127	48	27%	36%	8
Florida	36.8k	788	1,501	13.0%	204	7	25%	18%	21
Georgia	36.2k	803	1,821	8.2%	179	10	56%	13%	74
Hawaii	10.5k	155	49	100.0%	64	1	21%	4%	9
Idaho	34.5k	371	1,470	31.1%	520	3	100%	4%	18
Illinois	31.1k	806	6,220	8.3%	564	11	57%	53%	22
Indiana	25.1k	663	1,795	24.4%	481	4	100%	42%	29
Iowa	38.1k	567	1,570	37.4%	759	2	100%	82%	18
Kansas	28.6k	373	1,439	36.0%	496	3	89%	73%	15

State-By-State Comparisons (page 2 of 3):

States with high infection rates:

Minnesota, Nebraska and New Mexico are at peak Covid-19 census and cases are increasing at a significant rate

Montana is at peak Covid-19 census

State-By-State Comparisons

As of November 4

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	7-Day M.A. Hospital Census % of Peak	Week-Over-Week Change in New Cases	7-Day Deaths /1000 New Cases , 28-Day Lag
Kentucky	22.7k	339	3,797	9.9%	368	10	100%	14%	9
Louisiana	39k	1,285	2,640	4.9%	114	23	29%	-14%	21
Maine	4.8k	112	5,928	1.0%	73	81	27%	114%	19
Maryland	23.6k	690	1,703	8.5%	150	11	29%	27%	14
Massachusetts	22.2k	1,448	2,478	7.3%	187	13	15%	20%	32
Michigan	18.6k	779	5,091	6.9%	375	14	33%	60%	25
Minnesota	24.7k	458	2,751	16.8%	544	5	100%	79%	19
Mississippi	39.5k	1,141	5,413	4.5%	224	24	53%	-12%	23
Missouri	29.8k	528	1,447	27.6%	458	3	100%	42%	18
Montana	28k	378	4,358	17.6%	801	5	100%	14%	26
Nebraska	34.4k	346	2,021	28.8%	690	3	100%	84%	11
Nevada	31.6k	589	1,165	23.6%	307	4	48%	22%	14
New Hampshire	7.8k	356	1,585	6.1%	97	16	23%	31%	11
New Jersey	26.8k	1,860	4,287	4.2%	209	20	12%	36%	14
New Mexico	20.9k	505	4,338	8.4%	438	10	100%	22%	35
New York	27.6k	1,735	6,892	1.6%	113	61	6%	23%	12
North Carolina	25.4k	430	3,469	6.4%	227	15	92%	10%	21

State-By-State Comparisons (page 3 of 3):

States with high infection rates:

North Dakota, South Dakota, Utah, Wisconsin and Wyoming have high test-positive rates and are at peak Covid-19 census

State-By-State Comparisons

As of November 4

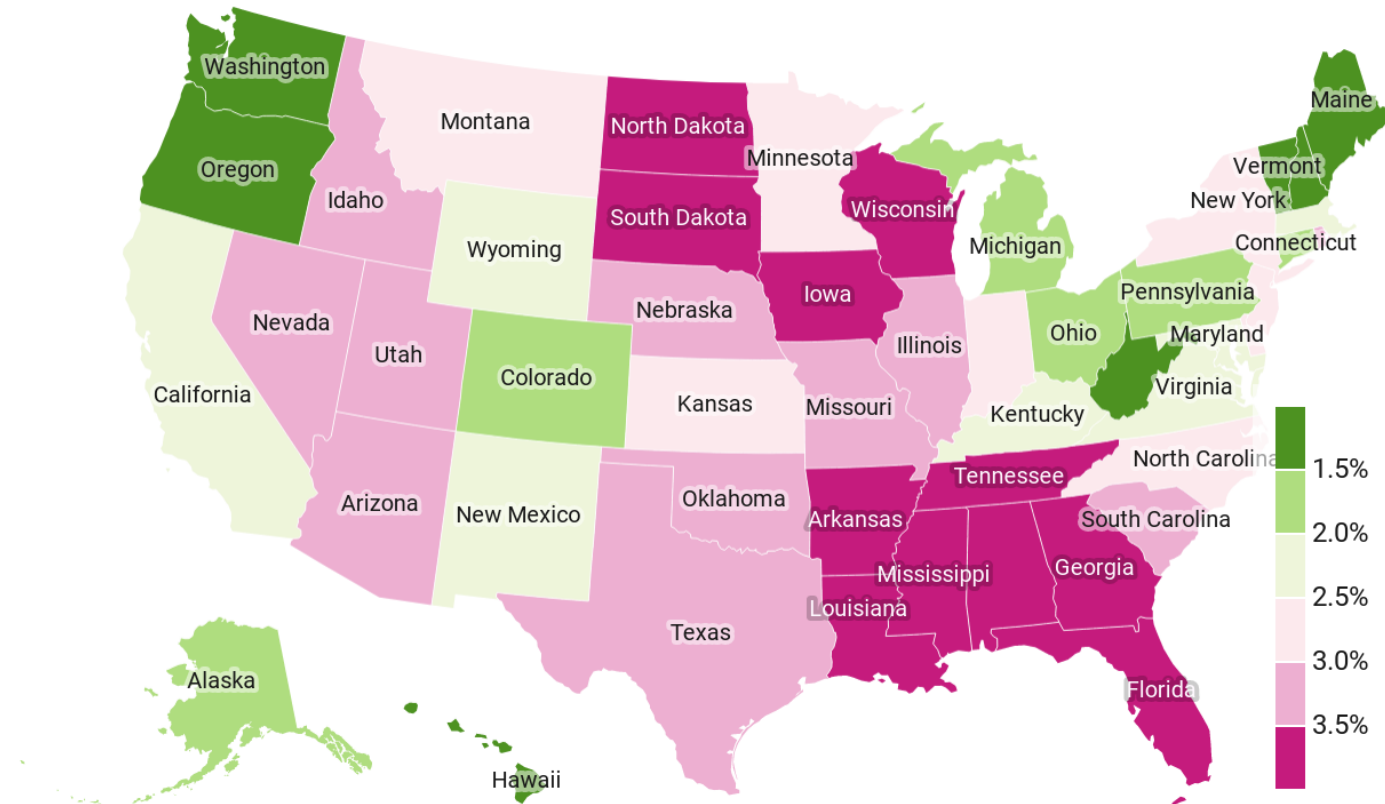
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North Dakota	52.4k	744	2,431	59.9%	1,574	2	100%	54%	26
Ohio	17.6k	468	4,024	6.6%	303	13	100%	45%	19
Oklahoma	30.1k	352	3,083	9.1%	311	10	93%	-3%	15
Oregon	10.2k	167	1,410	8.5%	129	11	64%	43%	16
Pennsylvania	16.1k	701	1,267	14.4%	190	7	42%	26%	23
Rhode Island	30.2k	1,146	2,796	14.9%	429	7	39%	14%	21
South Carolina	33.7k	774	3,019	6.8%	205	15	47%	4%	19
South Dakota	47.5k	520	2,591	50.5%	1,258	2	100%	24%	22
Tennessee	37.2k	509	3,162	9.7%	326	10	92%	-14%	21
Texas	32.2k	652	2,377	8.7%	264	9	52%	20%	25
Utah	33.9k	195	2,689	19.3%	565	5	93%	20%	5
Vermont	3.4k	93	985	3.2%	34	29	10%	-6%	0
Virginia	20.7k	431	2,340	6.5%	152	15	66%	19%	11
Washington	14.2k	319	2,040	5.0%	132	15	51%	37%	18
West Virginia	12.9k	264	4,645	5.2%	234	20	100%	34%	28
Wisconsin	36.1k	370	2,496	32.4%	831	3	100%	22%	16
Wyoming	21k	181	2,186	30.4%	715	3	99%	27%	29

States in the Southeast and the Upper Midwest have the highest proportion of residents that have or have had a known infection

States hit early – those in the Northeast and Pacific Northwest – have among the lowest rates; Is this a function of low testing rates early-on?

What % of Each State's Population Has/Had A Known Infection?

Reported Cases / Population, As of November 4

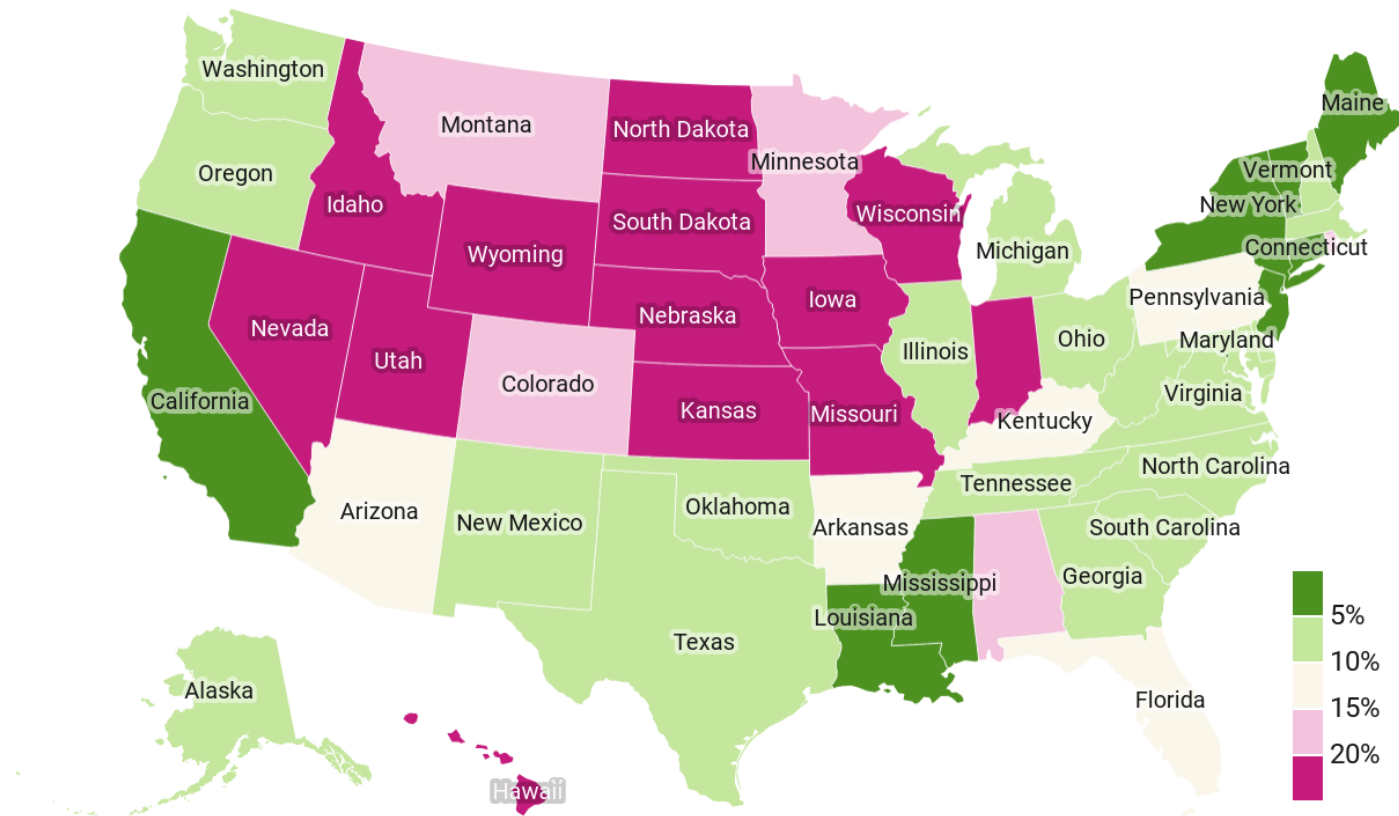


Map: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

High test-positive rates continue to plague the mid-section of the country

Test-Positive Rate

7-Day Moving Average, As of November 4



Health Industry Advisor LLC analysis

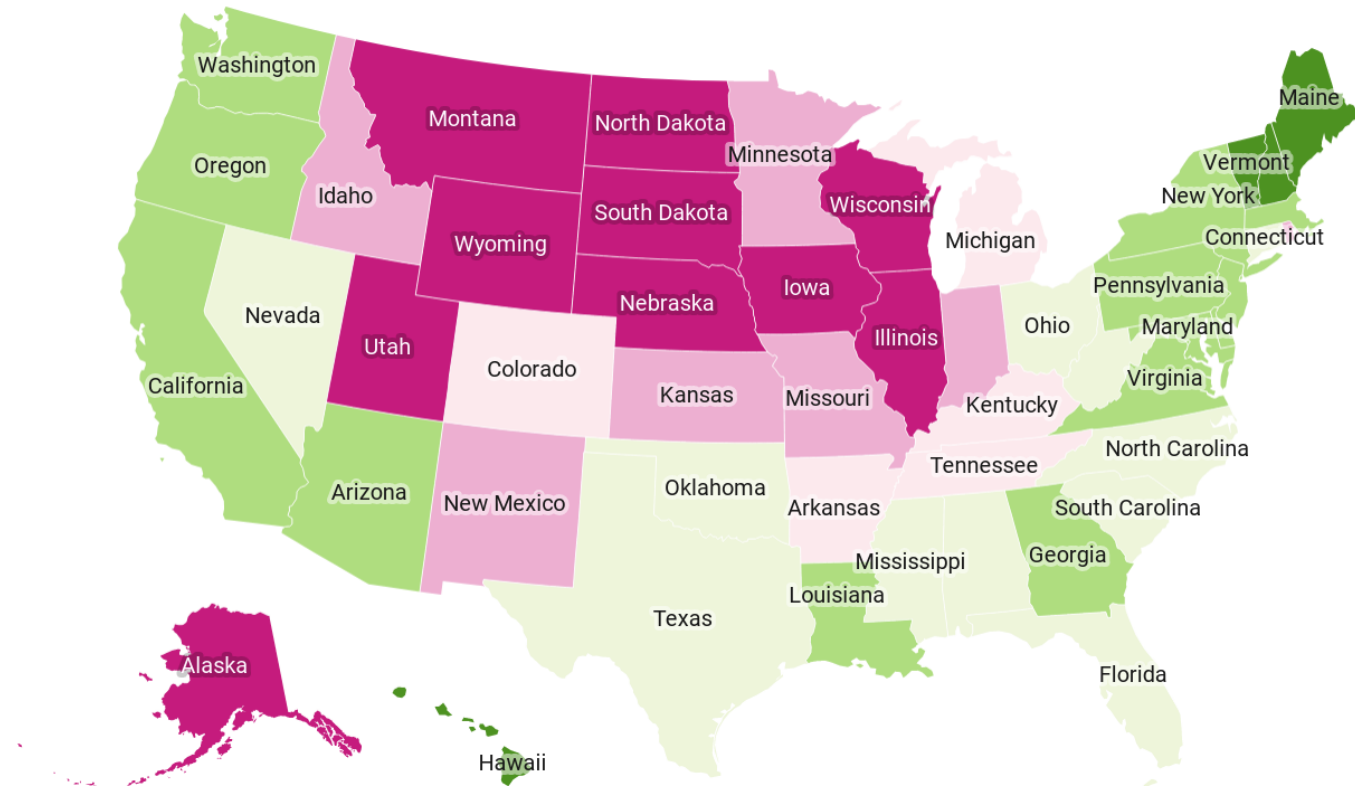
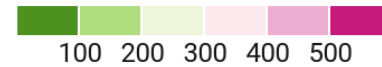
Map: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

The highest current new infection rates per capita are found in the Upper Midwest and Mountain States

Coastal states and those in the South are seeing lower rates

New Cases / Million

7-Day Moving Average, As of November 4

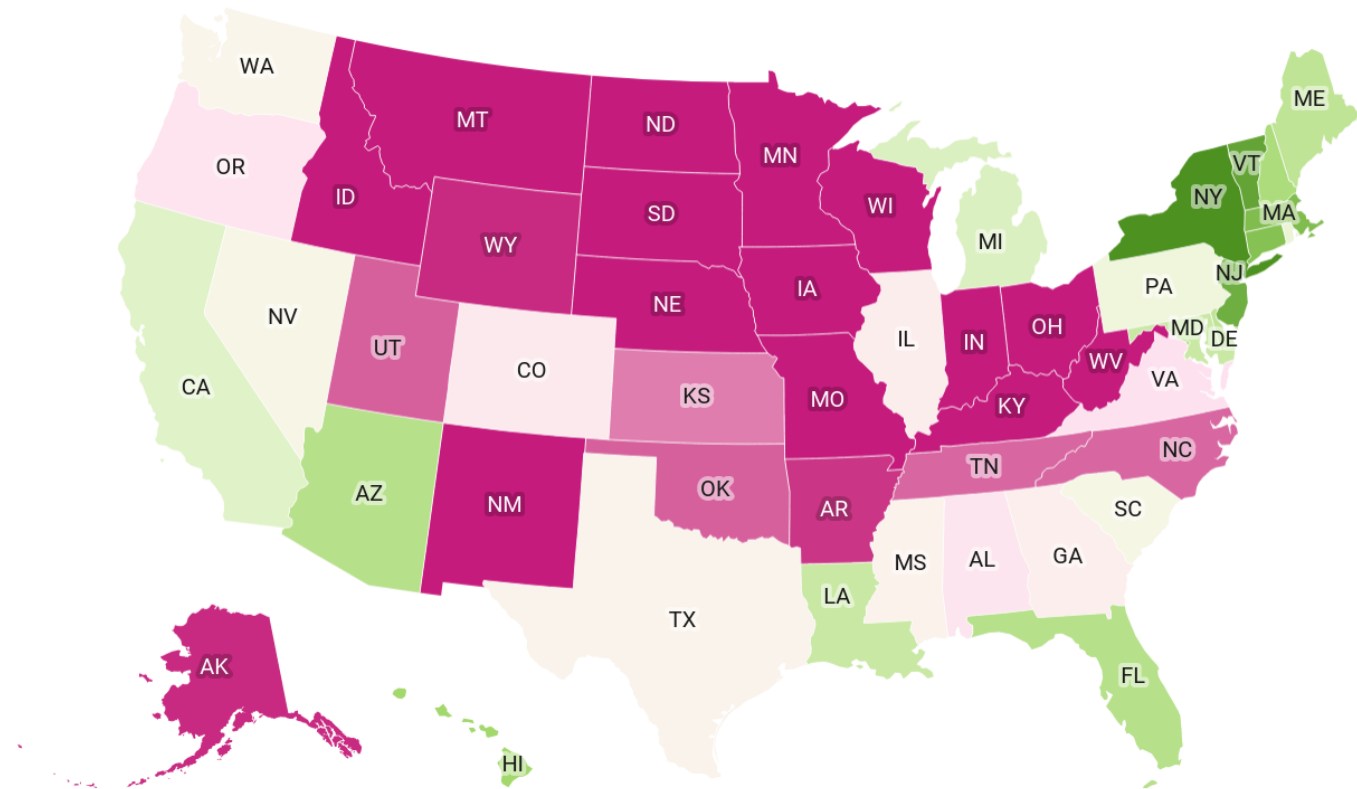
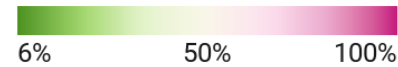


Map: Health Industry Advisor LLC • Created with Datawrapper

A significant number of states are at or near the highest Covid-19 census experienced at any time during the pandemic

Current 7-Day Covid-19 Inpatient Census v. Peak

As of November 4



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

Michigan and Illinois experienced by far the largest increases in Covid-19 census in the past week; in both states, however, this census is <60% of peak Covid-19 census

Of the states with the ten largest increases in Covid-19 census last week, Nebraska, Ohio, Tennessee and Wisconsin are at or near peak Covid-19 census

Week-Over-Week Change in Average Daily Covid-19 Census v. % of Peak Census

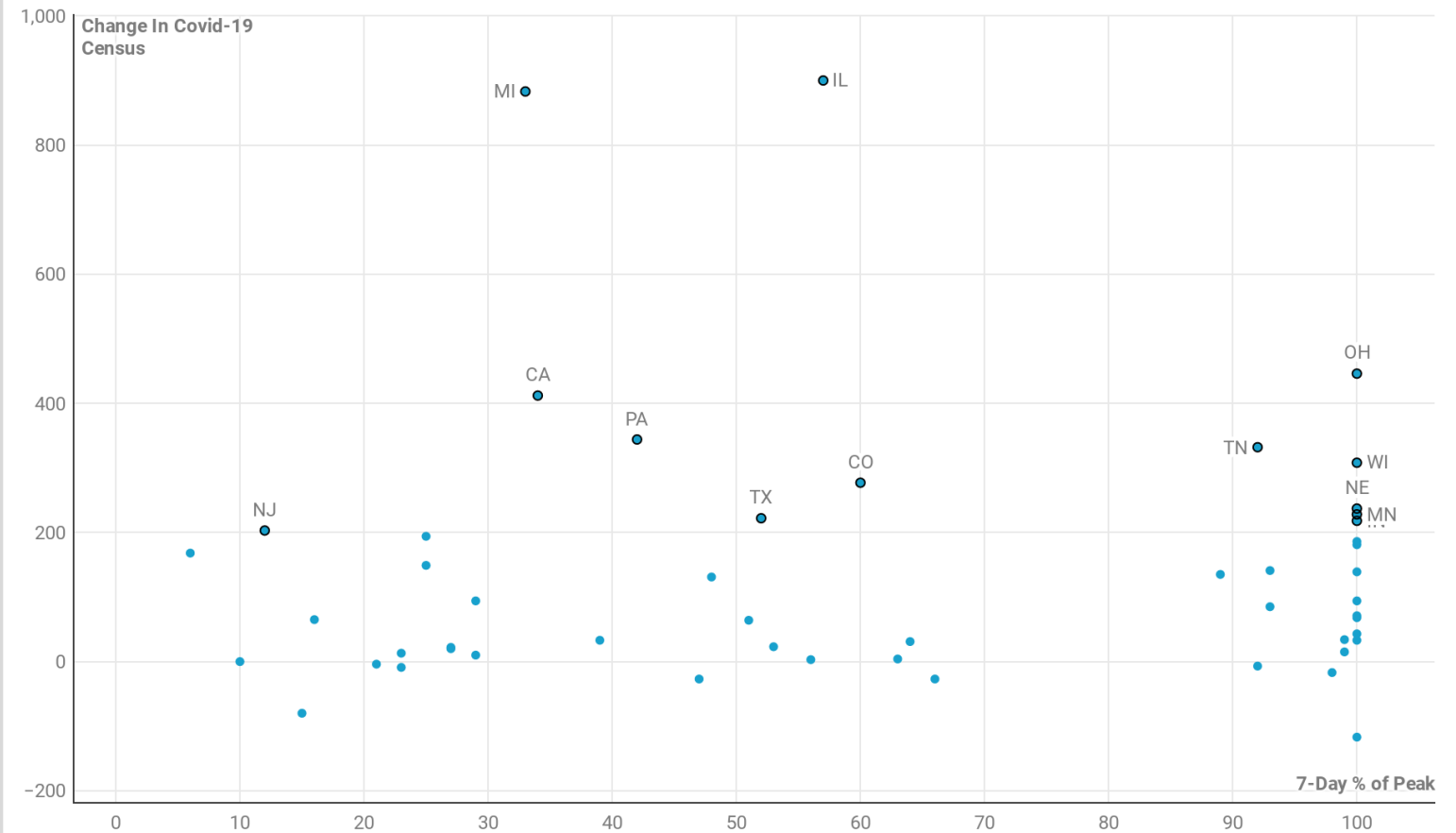


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking project • Created with Datawrapper

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>