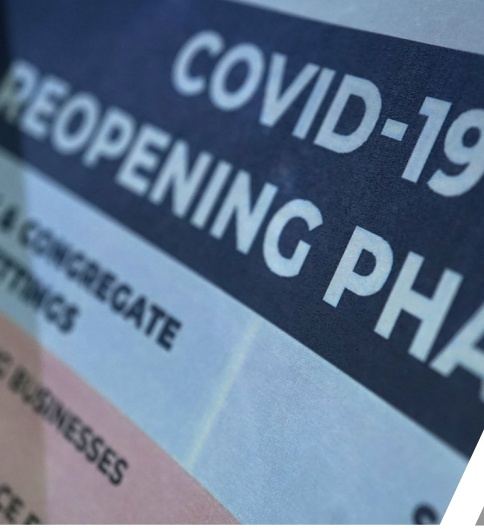

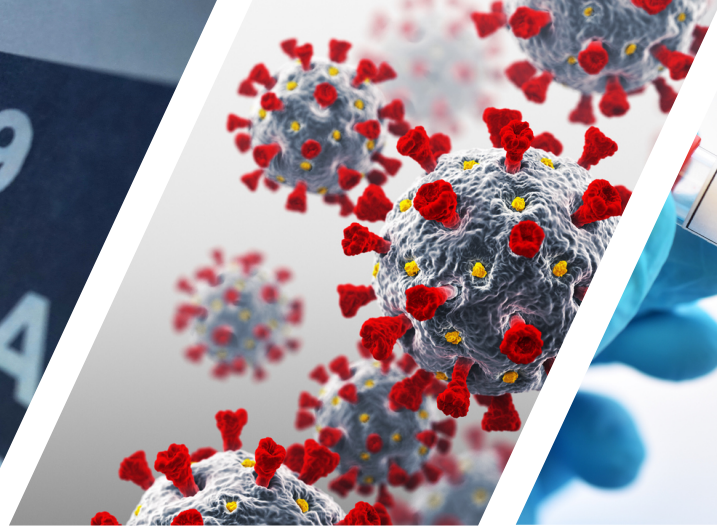

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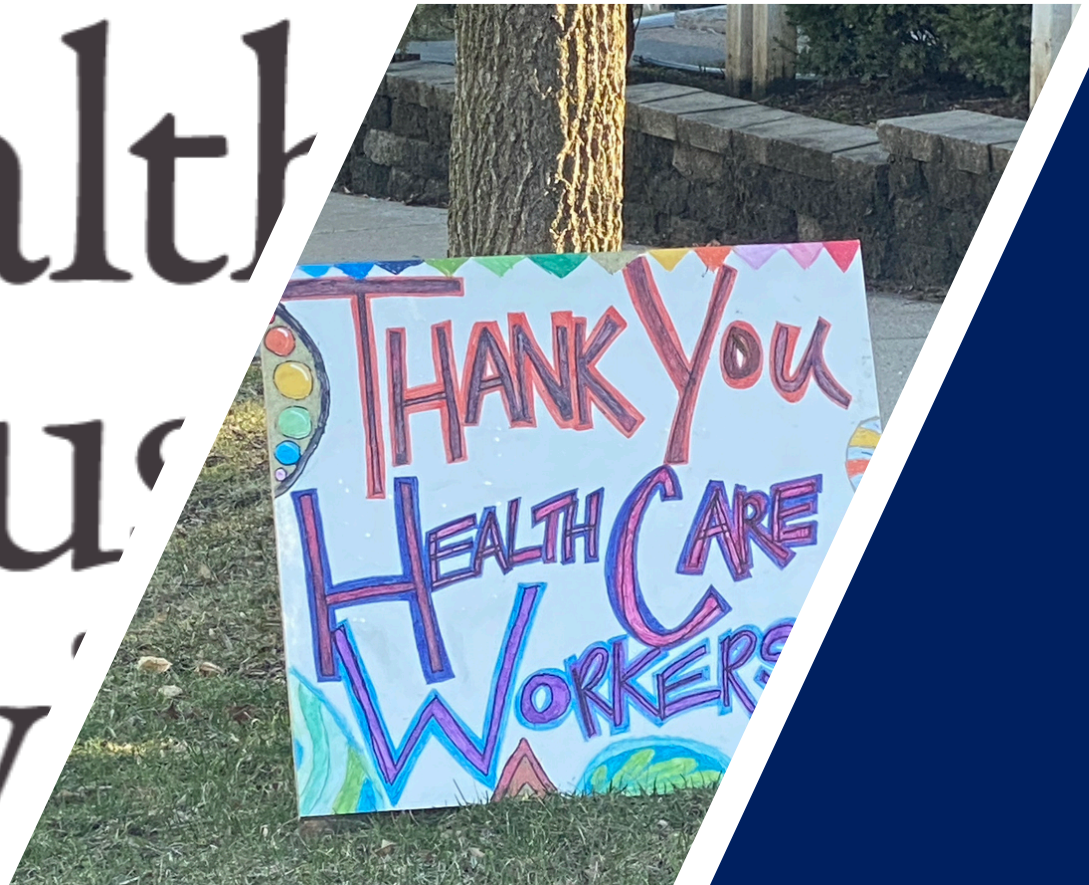


Issue # 181

Thursday, October 8, 2020

COVID-19 Report

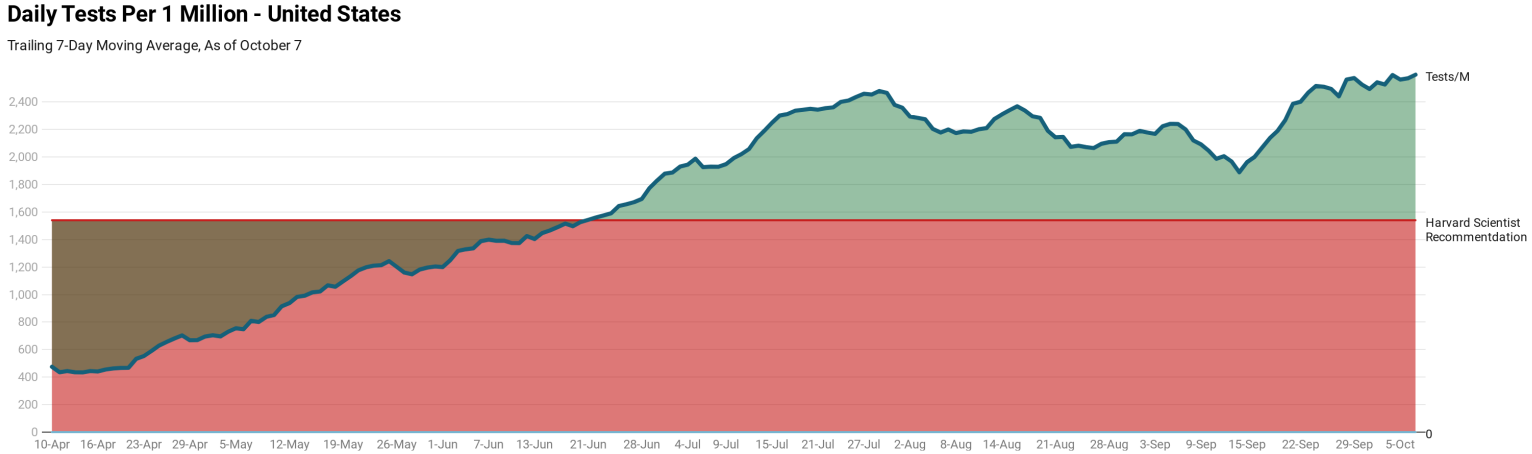
Highlights

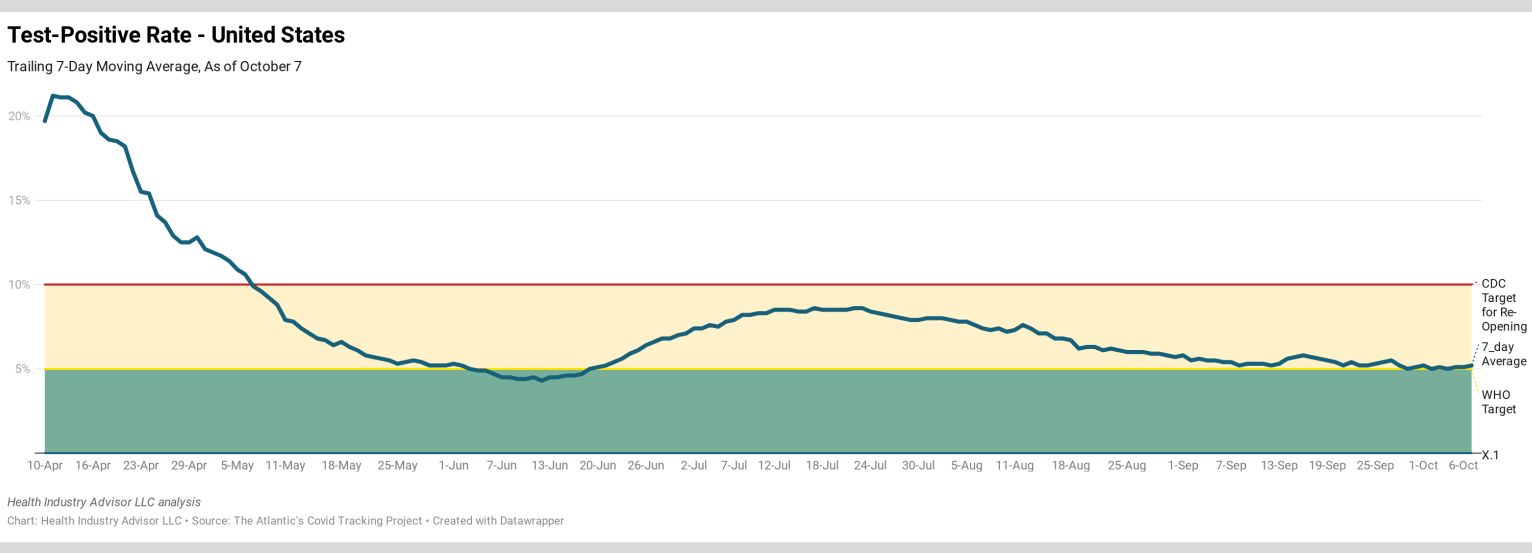
- **7-day average testing volume in the United States set another record high yesterday; the 7-day test-positive rate remains just above the World Health Organization target (5.2% v. 5%) and well below the Centers for Disease Control and Prevention (CDC) target for Phase 3 re-opening (10%)**
  - In today's report, we explore the adequacy of testing at the state level. In this analysis, adequacy is a function of not only testing per capita but of test-positive rates as well
  - For example, Montana tested at 3.6x the rate per capita as Vermont over the past seven days; Nevertheless, from the test-positive rates, we conclude that Vermont (1.4% 7-day test-positive %) is conducting sufficient tests, while Montana is not (9.1% test-positive %)
  - In a related analysis, Idaho's high test-positive rate appears to be related to its relative low testing volume; while South Dakota's lower test-positive rate may be a greater concern, as its based on a nearly 2x testing rate
- **New cases and the infection rate are now clearly on the rise in the U.S.**:
  - New cases yesterday were the highest on a Wednesday since August 12; On a week-over-week basis new cases are up 7%
  - On a same-day, prior-week basis, new cases have increased on five consecutive days
  - **The increase in new cases drove the 7-day rate of new daily infections per capita up again; it is now back to where it last was on August 21 but, remains 1/3 lower than its peak rate (July 23)**
  - Montana, North Dakota, South Dakota and Wisconsin experienced the highest 7-day rates of new infections per capita; Montana and South Dakota have experienced the most significant increases in this rate over the past two weeks
- As far as inpatient Covid-19 census, as mentioned above:
  - **Inpatient COVID-19 census increased on a same-day, prior week basis for the fourteenth consecutive day; This streak follows a fifty-eight-day streak of declines in this measure**
  - **During the recent 14-day increase in this metric, Covid-19 census increased by by an average of 242 patients per day; during the 58-day decline in this metric, Covid-19 census declined by an average of 467 patients per day. As a result, inpatient Covid-19 census yesterday was >40% lower than it was when this initial decline began on July 28**
- The increase in Covid-19 census over the past week has been concentrated in twelve states:
  - These states - **Arizona, Indiana, Kentucky, Michigan, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas and Wisconsin - account for 70% of the increased census**
  - **Of these states, only in Kentucky, Oklahoma and Wisconsin is this census at or near the peak levels experienced during this pandemic; this census in Arizona, Michigan, New Jersey, New York, Pennsylvania and Texas is at 1/3 or less the peak rate experienced in these states**
- **Covid-19 ICU census, on a same-day, prior-week basis, increased yesterday, for the third consecutive day:**
  - **This census had declined on fifty-nine of the preceding sixty-three days, including a streak of fifty-four consecutive days from August 3 - September 25**
  - **During the fifty-nine consecutive days of decline in this measure, ICU census decline an average of 79 patients per day; During the past three days, this census has increased an average of 187 patients per day**
- Deaths with the coronavirus:
  - There were seven more deaths reported yesterday than last Wednesday; there were fewer new deaths reported yesterday, however, than on any other Wednesday since July 8
  - The **7-day average deaths per day were lower Tuesday and Wednesday than they have been since July 10**
- **Active Covid-19 cases in the U.S. have remained steady since mid- to late-August, while total recoveries during that time increased by >40%**

Health Industry Advisor, llc

The 7-day average testing volume as of yesterday was the highest ever recorded

The 7-day test-positive rate is just outside the “green” zone – just above WHO target yet, well-below the CDC target for Phase 3 re-opening





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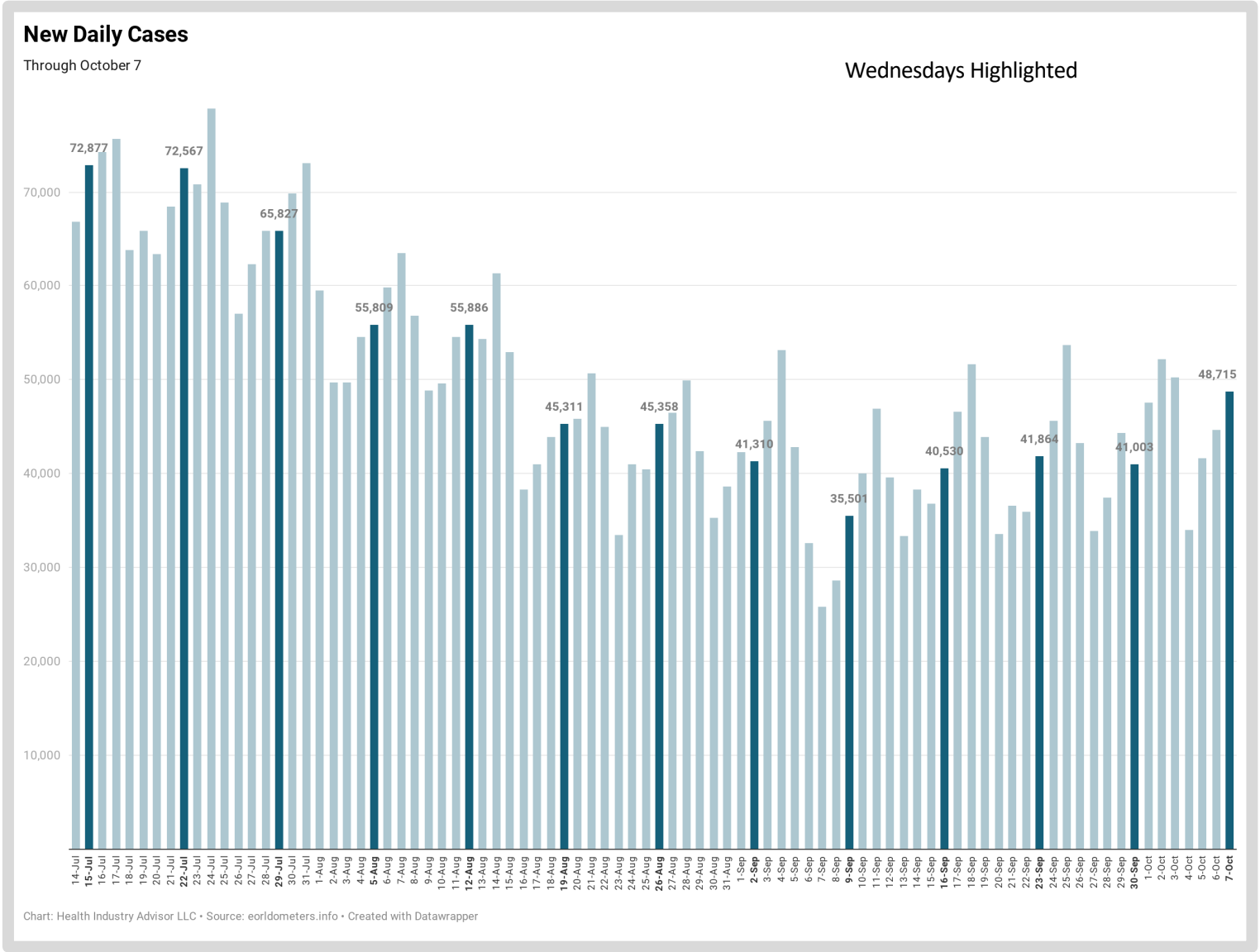
New cases on Wednesday with the most recorded on a Wednesday since August 12



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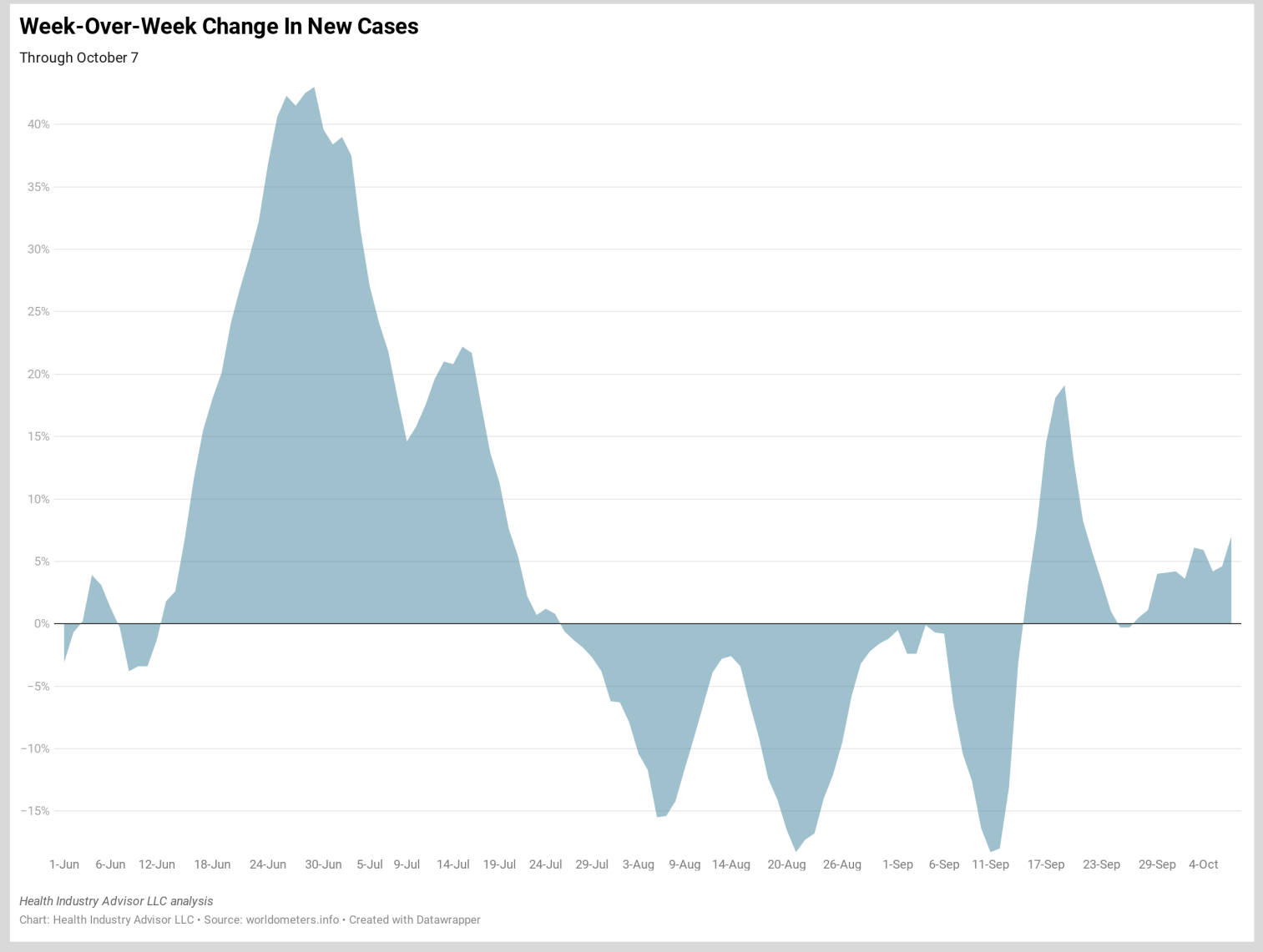
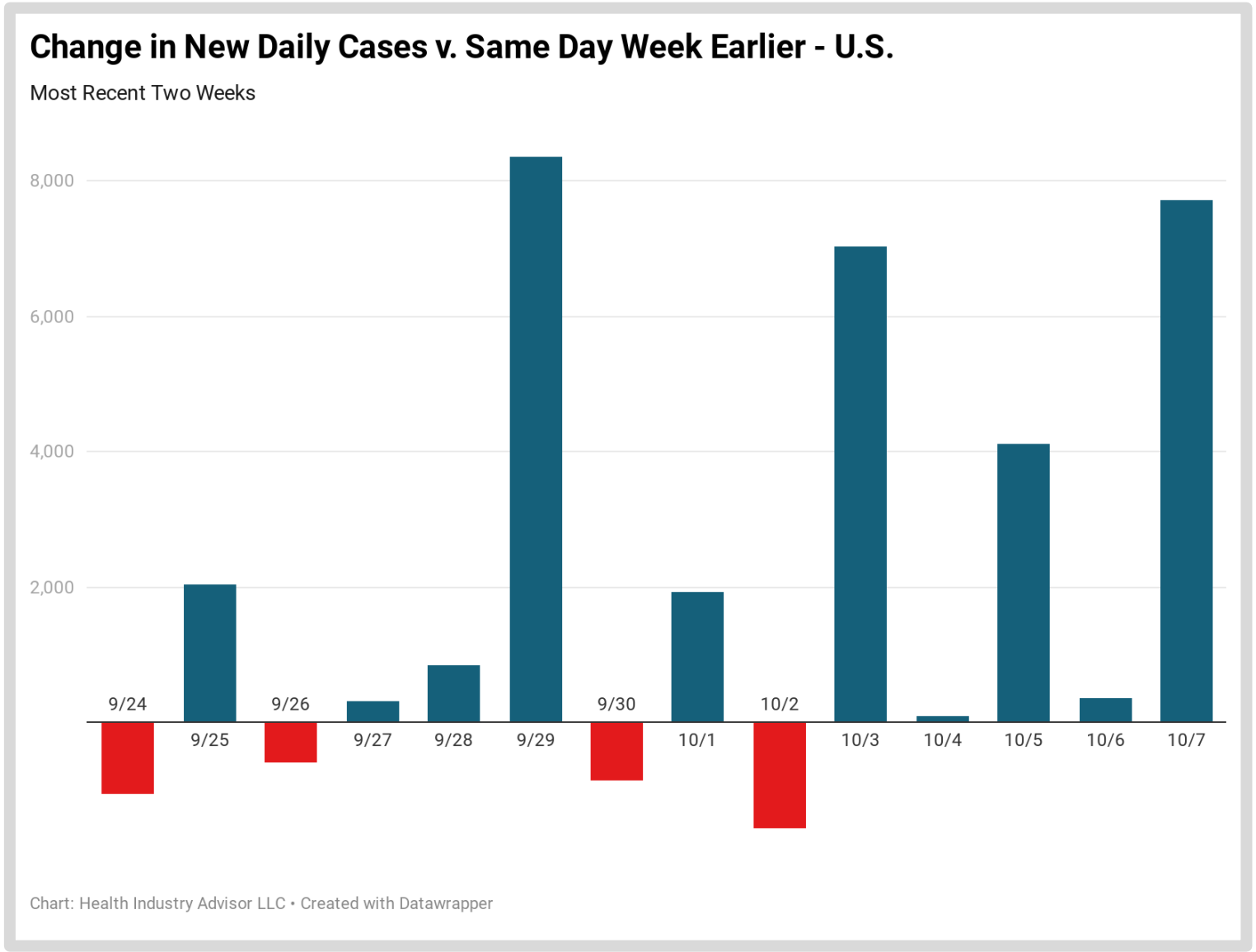
Following a seven-week period of decline, new cases began increasing on a week-over-week basis on September 15

Yesterday, this rate was up 7% on a week-over-week basis



New cases were higher than for same-day, previous week on five consecutive days and ten times in the past two weeks



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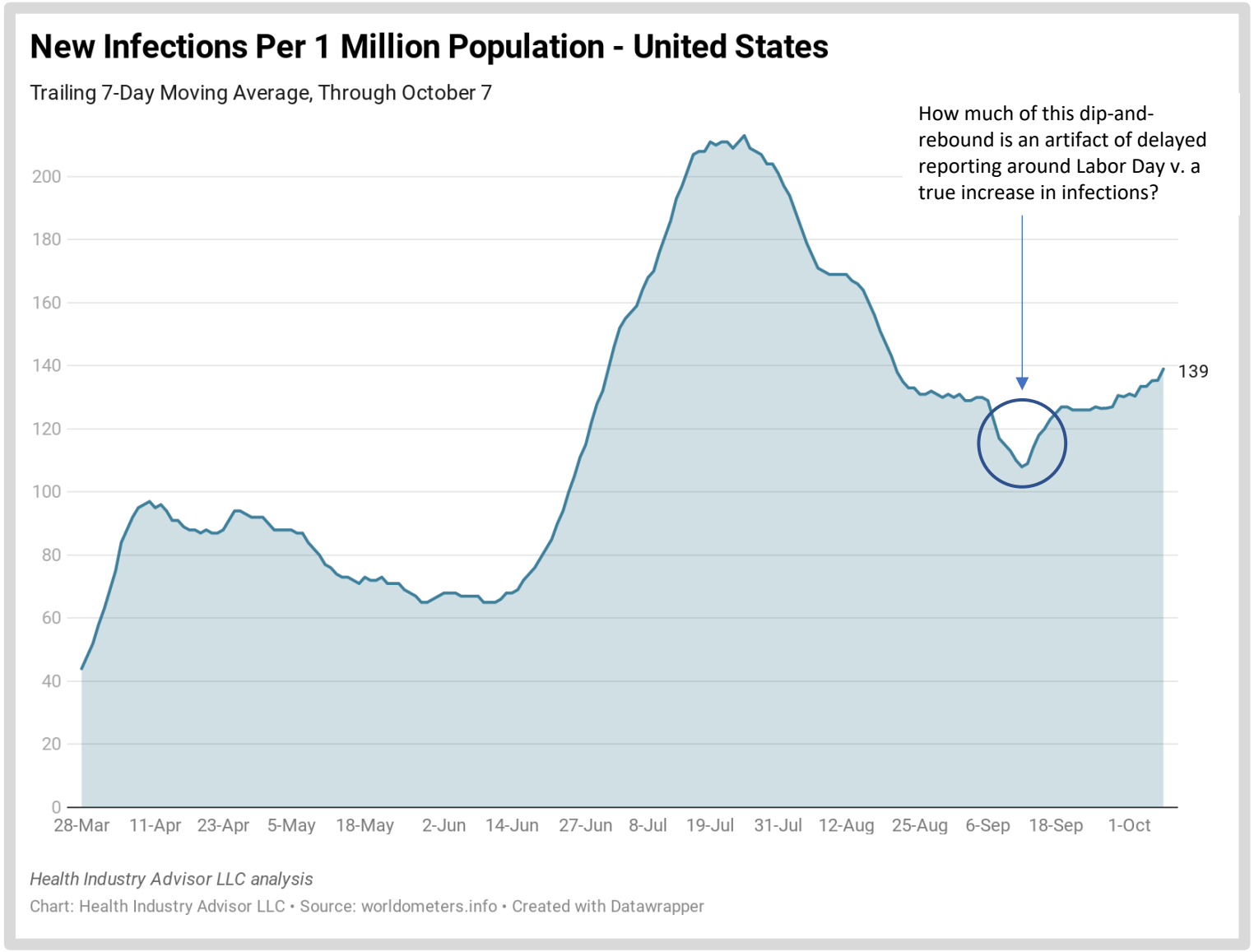
The rate of new infections per capita* in the U.S. Is now trending upward

This rate is now back to where it was on August 21

* - 7-day moving average basis

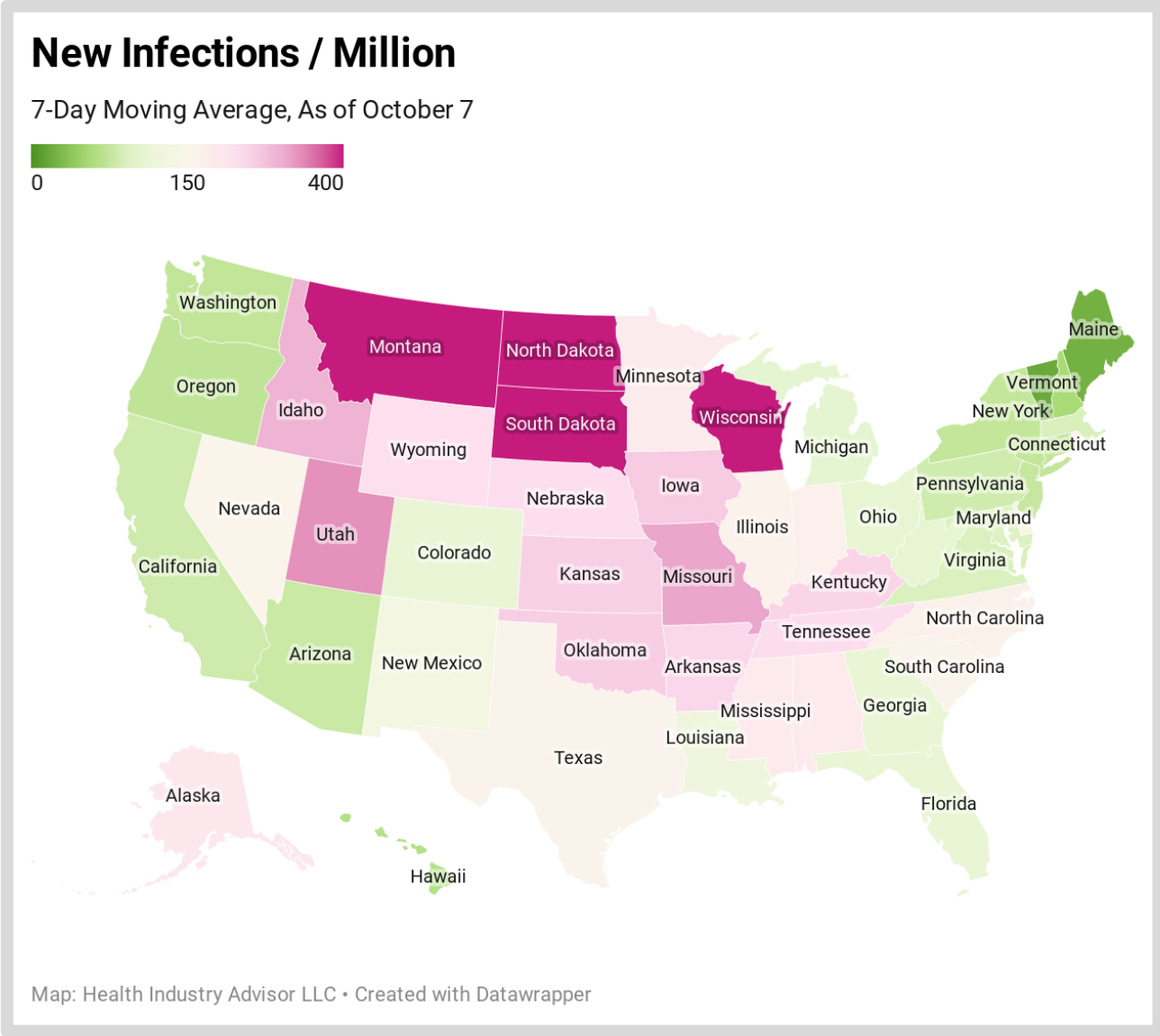


Health Industry Advisor, llc

Montana, North and South Dakota and Wisconsin continue to experience the highest rates of new infections per capita*

Arkansas, Idaho, Iowa, Kansas, Kentucky, Montana, Nebraska, Oklahoma, Tennessee, Utah and Wyoming also are of concern

* - 7-day moving average basis



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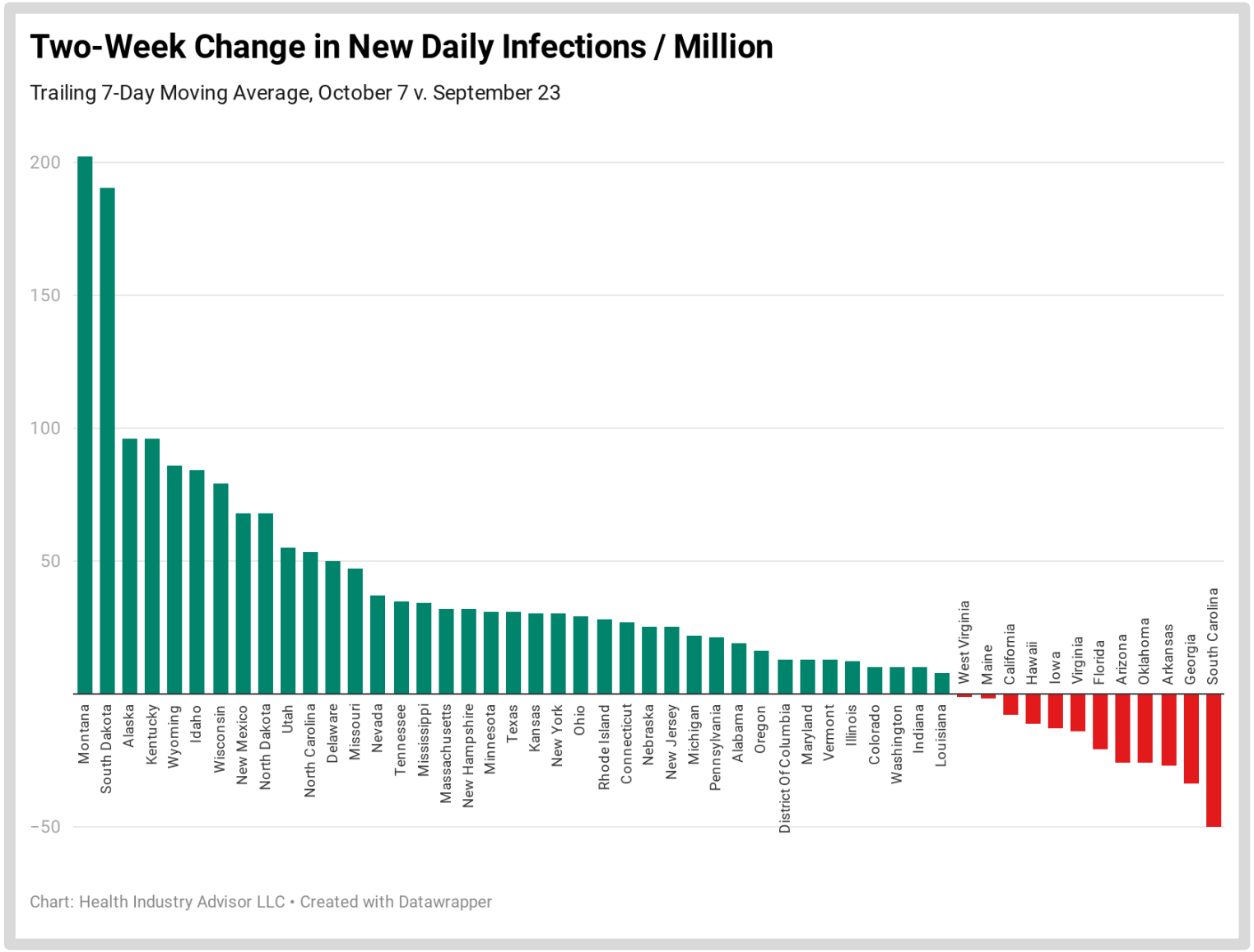
New daily infection rates are increasing fastest in Montana, South Dakota, Alaska, Kentucky, Wyoming, Idaho and Wisconsin

Rates are declining fastest in South Carolina, Georgia, Alabama, Oklahoma, Arizona and Florida



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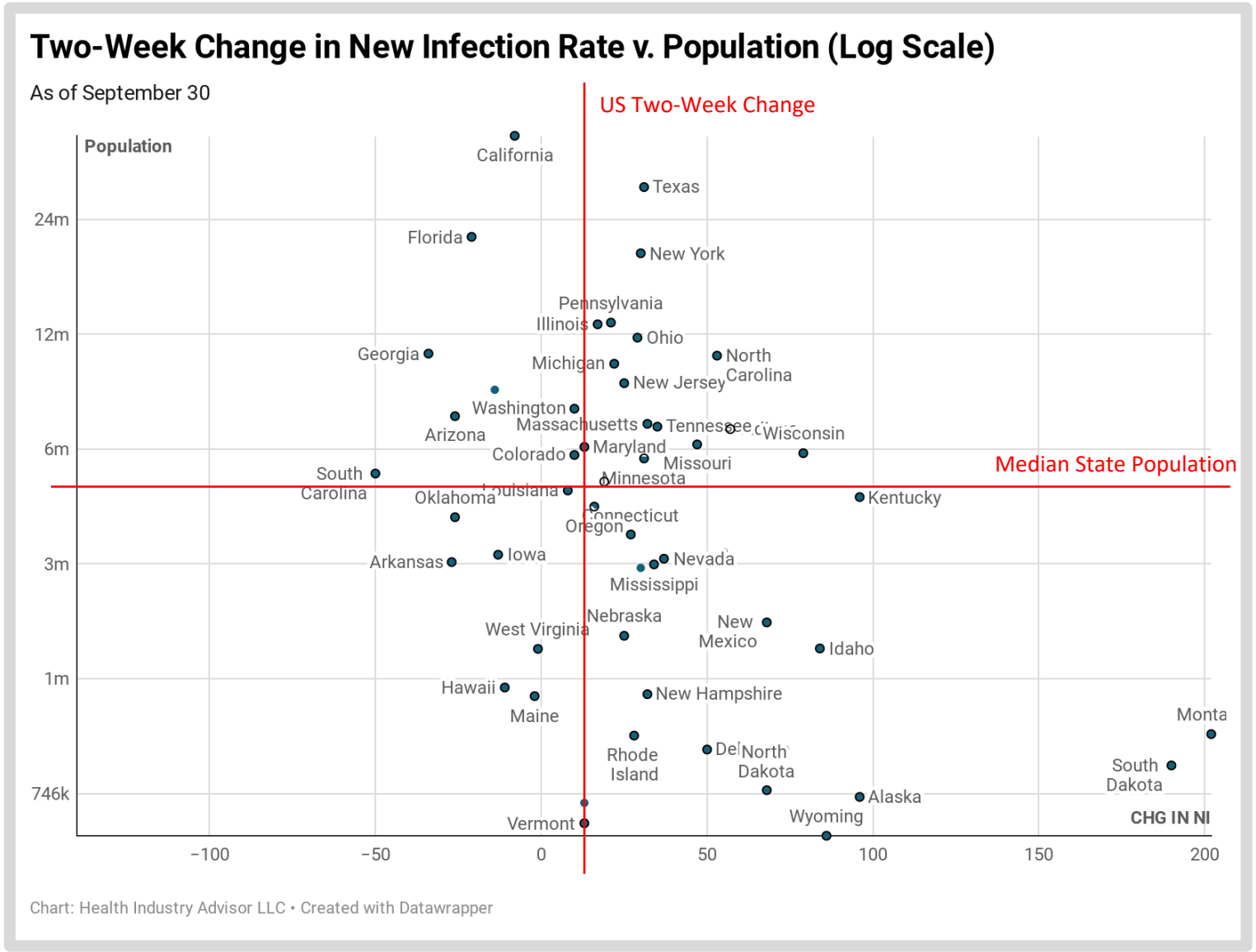
The six states with the highest rates of new daily infections are among the least densely-populated in the country

Among more densely-populated states, California and Florida have experienced declining infection rates, while Texas and New York have experienced increases modestly above the national average



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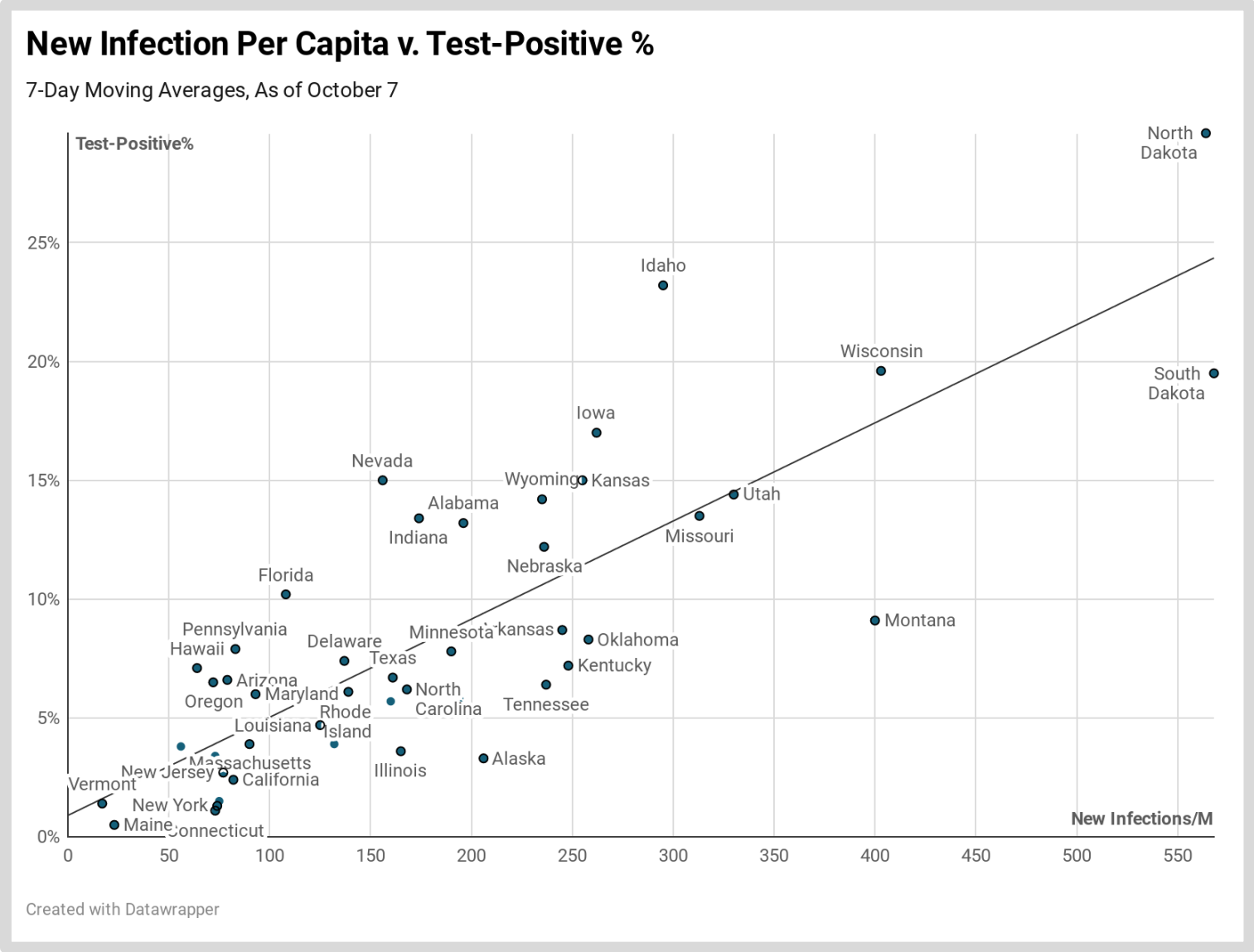
Strong correlation between test-positive % and new daily infection rates

Idaho, North and South Dakota and Wisconsin, with three of the four highest 7-day test-positive % rates, also experienced the highest 7-day new daily infection rates

Connecticut, Maine, and Vermont experienced among the lowest test-positive % and new daily infection rates



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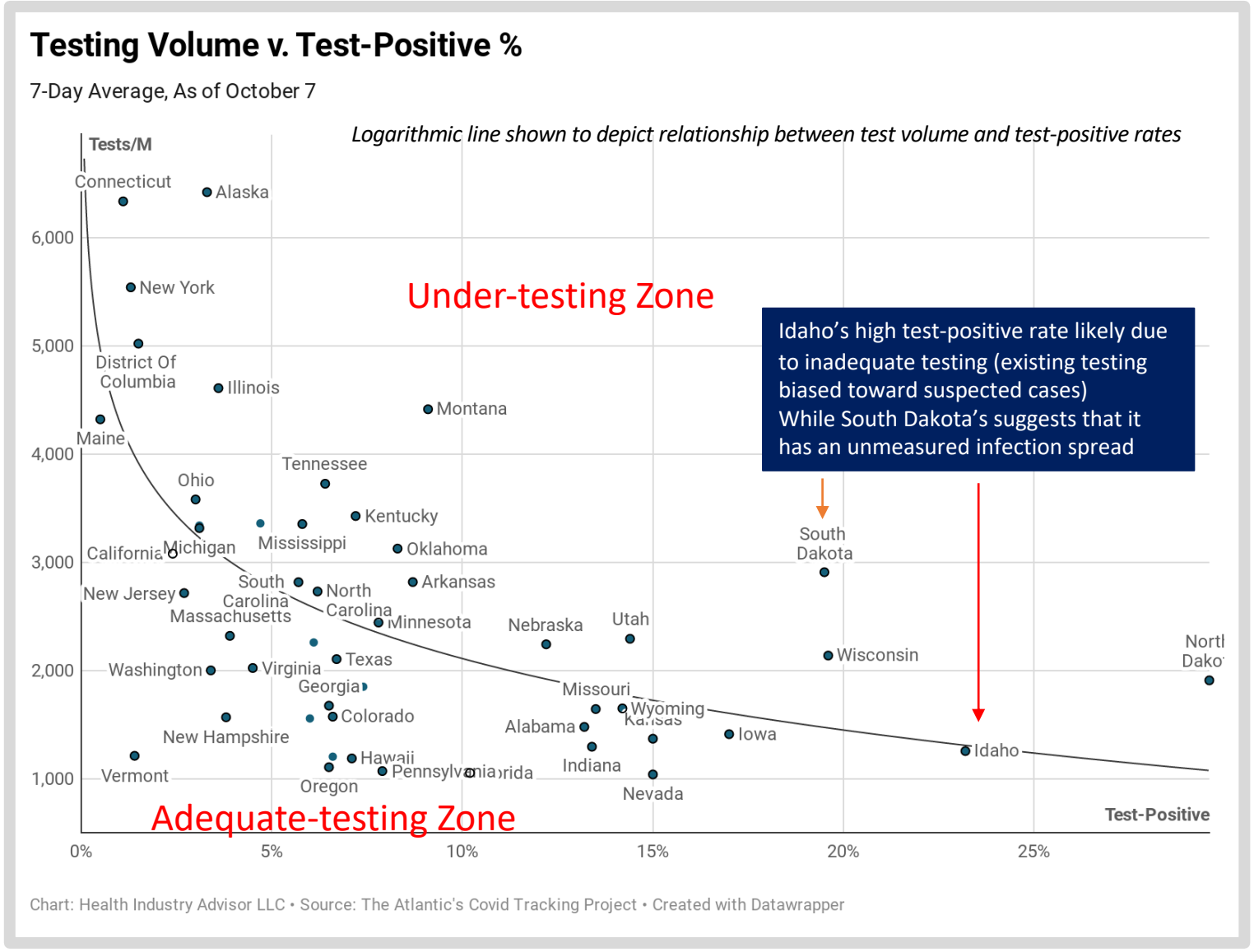
The appropriate testing level depends on the test-positive results (not simply the volume per capita)

For example, Montana performed 3.6x as many tests per capita in the last seven days than Vermont. Based on each stat's test-positive results, however, Vermont is conducting sufficient testing; Montana is not

This analysis also shows where high-test-positive rates are likely a function of insufficient testing (e.g. Idaho) v. being indicative of an infection spread not being fully captured (e.g. South Dakota)



Health Industry Advisor, llc

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

Interesting contrast between Alaska and Connecticut: both have high testing rates and low test-positive %. Yet, Alaska has a relatively high rate of new infections. This suggests that Alaska's high infection rate is driven by its high testing rate, more so than an infection spread issue

Idaho's high infection rate, coupled with its low test-volume and high test-positive rate indicates a more significant challenge with infection spread

State-By-State Comparisons

As of October 7

State	Cases per 1M Population (YTD)	Deaths per 1 Million Population (YTD)	Death Rate (YTD)	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 Moving Average)
Alabama	32,729	530	1.6%	1,479	13.2%	196	8
Alaska	11,964	81	0.7%	6,418	3.3%	206	31
Arizona	30,491	788	2.6%	1,204	6.6%	79	15
Arkansas	29,184	491	1.7%	2,817	8.7%	245	11
California	21,226	414	1.9%	3,079	2.4%	82	38
Colorado	12,883	362	2.8%	1,574	6.6%	109	14
Connecticut	16,616	1,268	7.6%	6,333	1.1%	73	87
Delaware	22,044	666	3.0%	1,850	7.4%	137	13
District Of Columbia	22,178	896	4.0%	5,019	1.5%	75	67
Florida	33,529	694	2.1%	1,054	10.2%	108	10
Georgia	30,577	684	2.2%	1,675	6.5%	109	15
Hawaii	9,137	115	1.2%	1,188	7.1%	64	19
Idaho	25,156	279	1.1%	1,256	23.2%	295	4
Illinois	24,286	720	2.9%	4,608	3.6%	165	28
Indiana	18,856	554	2.9%	1,296	13.4%	174	7
Iowa	29,657	448	1.5%	1,412	17.0%	262	5
Kansas	21,939	248	1.1%	1,370	15.0%	255	5

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

Montana has high infection rate yet and a moderate test-positive %; suggesting that its high infection rate may be slightly understated

In contrast, Missouri has a low testing rate and high test-positive %; Missouri. This state would benefit from grater testing, which would likely lower the test-positive % perhaps without appreciably increasing the infection rate

State-By-State Comparisons

As of October 7

State	Cases per 1M Population (YTD)	Deaths per 1 Million Population (YTD)	Death Rate (YTD)	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 Moving Average)
Kentucky	16,607	274	1.6%	3,427	7.2%	248	14
Louisiana	36,363	1,205	3.3%	3,359	4.7%	125	27
Maine	4,140	106	2.5%	4,320	0.5%	23	191
Maryland	21,206	657	3.1%	1,557	6.0%	93	17
Massachusetts	19,564	1,375	7.0%	2,320	3.9%	90	26
Michigan	14,407	718	4.9%	3,315	3.1%	101	33
Minnesota	18,749	382	2.0%	2,443	7.8%	190	13
Mississippi	33,837	1,025	3.0%	3,353	5.8%	194	17
Missouri	23,046	387	1.7%	1,644	13.5%	313	5
Montana	14,359	181	1.2%	4,413	9.1%	400	11
Nebraska	25,205	262	1.0%	2,242	12.2%	236	10
Nevada	26,919	531	2.0%	1,040	15.0%	156	7
New Hampshire	6,421	329	5.1%	1,568	3.8%	56	28
New Jersey	23,999	1,832	7.6%	2,715	2.7%	77	35
New Mexico	14,759	427	2.9%	3,130	3.9%	132	24
New York	25,796	1,715	6.6%	5,539	1.3%	74	74
North Carolina	21,096	352	1.7%	2,730	6.2%	168	16

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

With low test-volumes and high test-positive %, North Dakota, South Dakota and Wisconsin do not appear to be conducting sufficient testing to have a true picture of the infection spread

State-By-State Comparisons

As of October 7

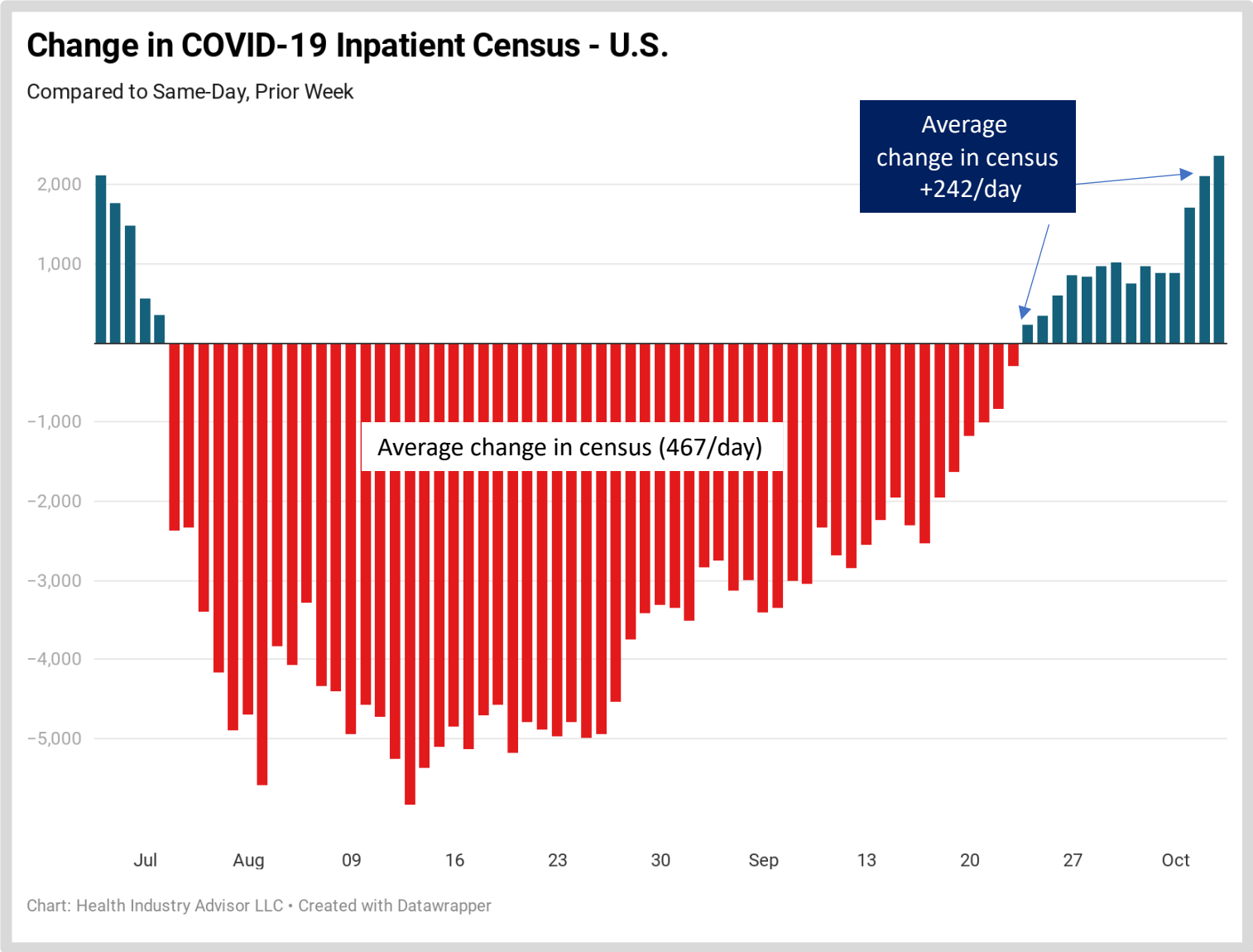
State	Cases per 1M Population (YTD)	Deaths per 1 Million Population (YTD)	Death Rate (YTD)	Tests per 1M Population Past 7 days	Test-Positive % (7-Day Moving Average)	New Daily Cases Per 1M Population (7-Day M.A.)	Tests / New Case (7-Day Moving Average)
North Dakota	31,971	399	1.2%	1,909	29.6%	564	3
Ohio	13,803	426	3.1%	3,580	3.0%	106	34
Oklahoma	23,590	272	1.1%	3,126	8.3%	258	12
Oregon	8,379	138	1.6%	1,107	6.5%	72	15
Pennsylvania	13,299	653	4.9%	1,071	7.9%	83	13
Rhode Island	24,162	1,063	4.4%	2,259	6.1%	139	16
South Carolina	29,710	680	2.3%	2,816	5.7%	160	18
South Dakota	28,119	292	1.0%	2,908	19.5%	568	5
Tennessee	30,056	387	1.3%	3,725	6.4%	237	16
Texas	28,084	579	2.0%	2,105	6.7%	161	13
Utah	24,779	155	0.6%	2,293	14.4%	330	7
Vermont	2,918	93	3.2%	1,212	1.4%	17	71
Virginia	17,946	387	2.1%	2,023	4.5%	91	22
Washington	12,302	286	2.3%	2,001	3.4%	73	27
West Virginia	9,477	206	2.2%	3,339	3.1%	103	32
Wisconsin	23,423	243	1.0%	2,138	19.6%	403	5
Wyoming	11,697	92	0.8%	1,650	14.2%	235	7

Table: Health Industry Advisor LLC • Created with Datawrapper

Health Industry Advisor, llc

Inpatient COVID-19 census has increased on a same-day, prior week basis for fourteen consecutive days; it had previously declined on 58 consecutive days

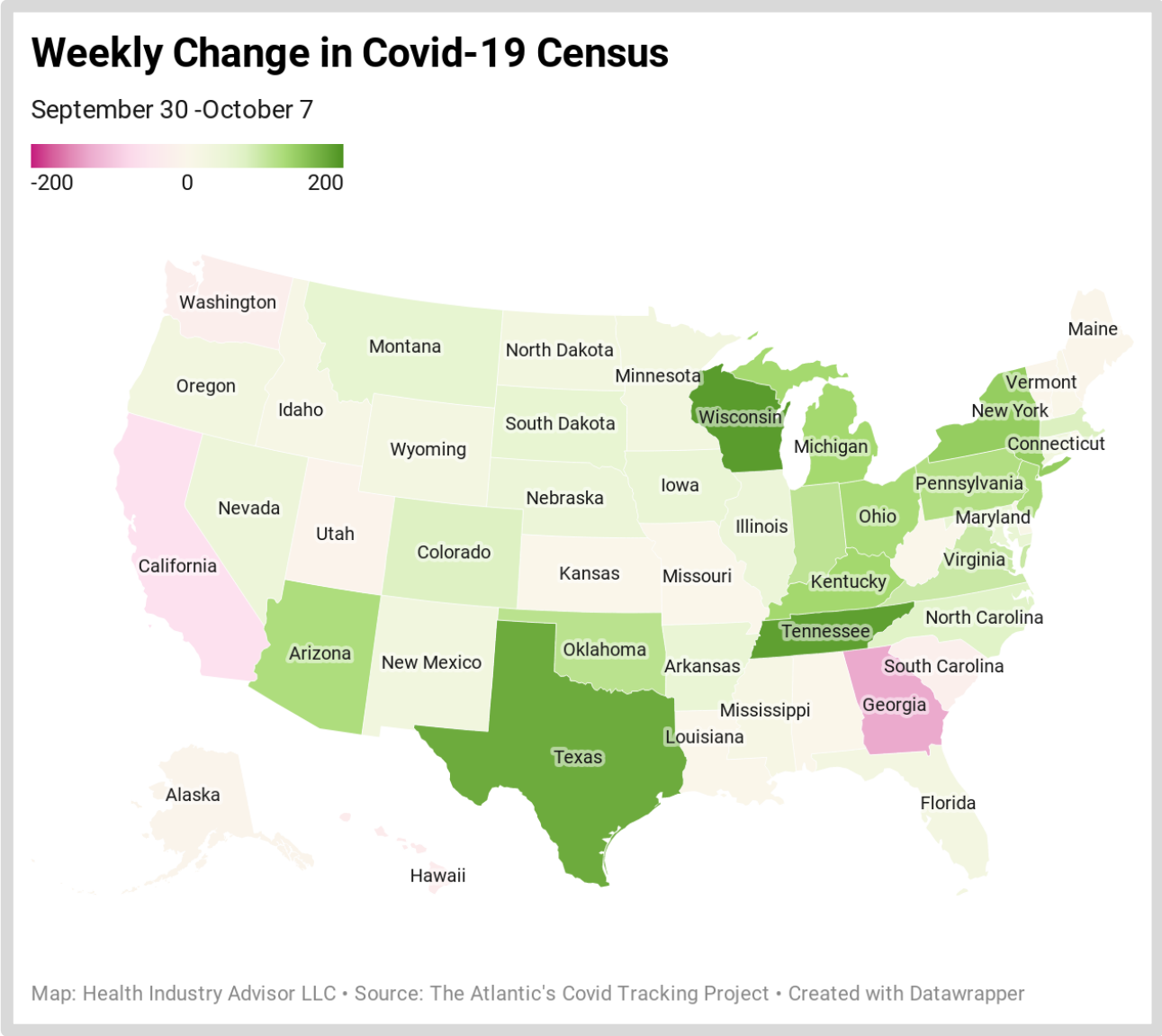
The average daily census increased over the past fourteen days by 242 patients/day; the average daily census declined during the preceding fifty-eight days by 467/day



Health Industry Advisor, llc

Wisconsin, Texas, Tennessee and New York have experienced the largest increases in COVID-19 inpatient census during the past week

California and Georgia have experienced the largest declines



Health Industry Advisor, llc

Twelve states have experienced an increase in Covid-19 census >100 during the past week; these states account for 70% of the increase in census during this week

Of these twelve, Kentucky, Oklahoma and Wisconsin are at or near their highest census of these patients to-date

In contrast, Arizona, Michigan, New Jersey, New York, Pennsylvania and Texas are at less than 1/3 of their peak Covid-19 census

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

As of October 7

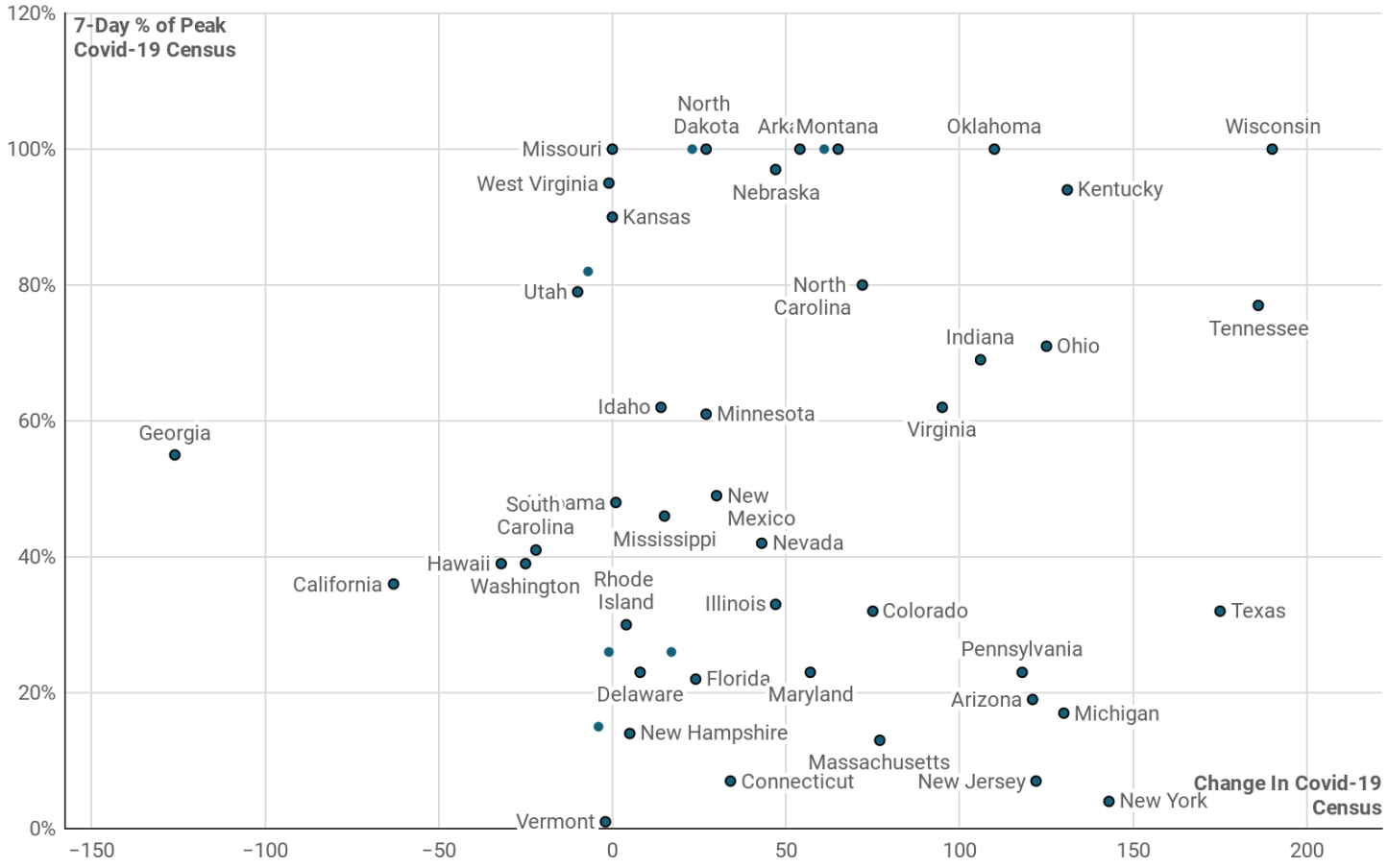


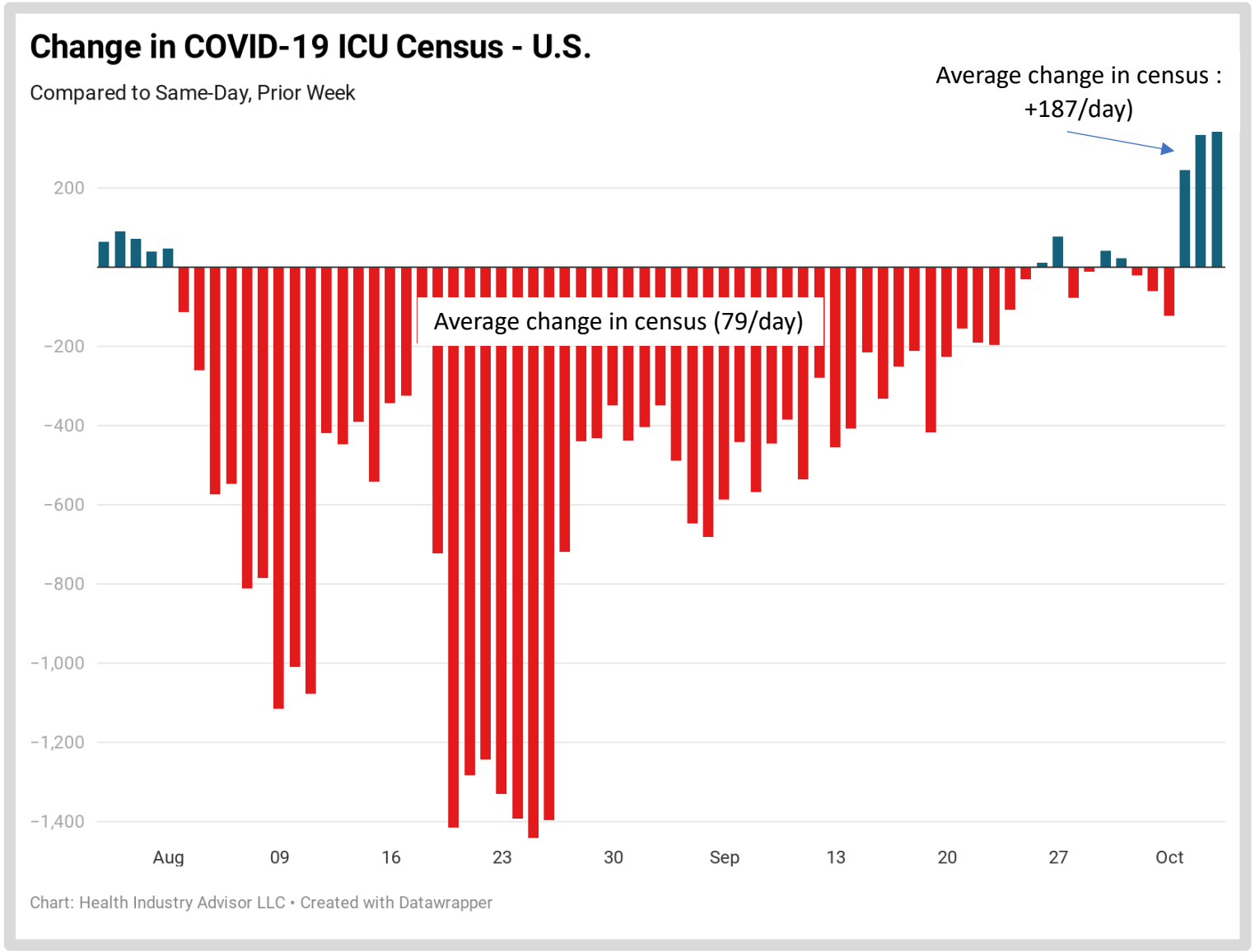
Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

Health Industry Advisor, llc

ICU census of COVID-19 patients increased for the third consecutive day yesterday, on a same-day, prior week basis

This countered a decline in this rate on fifty-four consecutive days (August 3 – September 25) and fifty-nine of sixty-three days (through October 4)

Yesterday's ICU census was ~1/3 lower than it was on August 3



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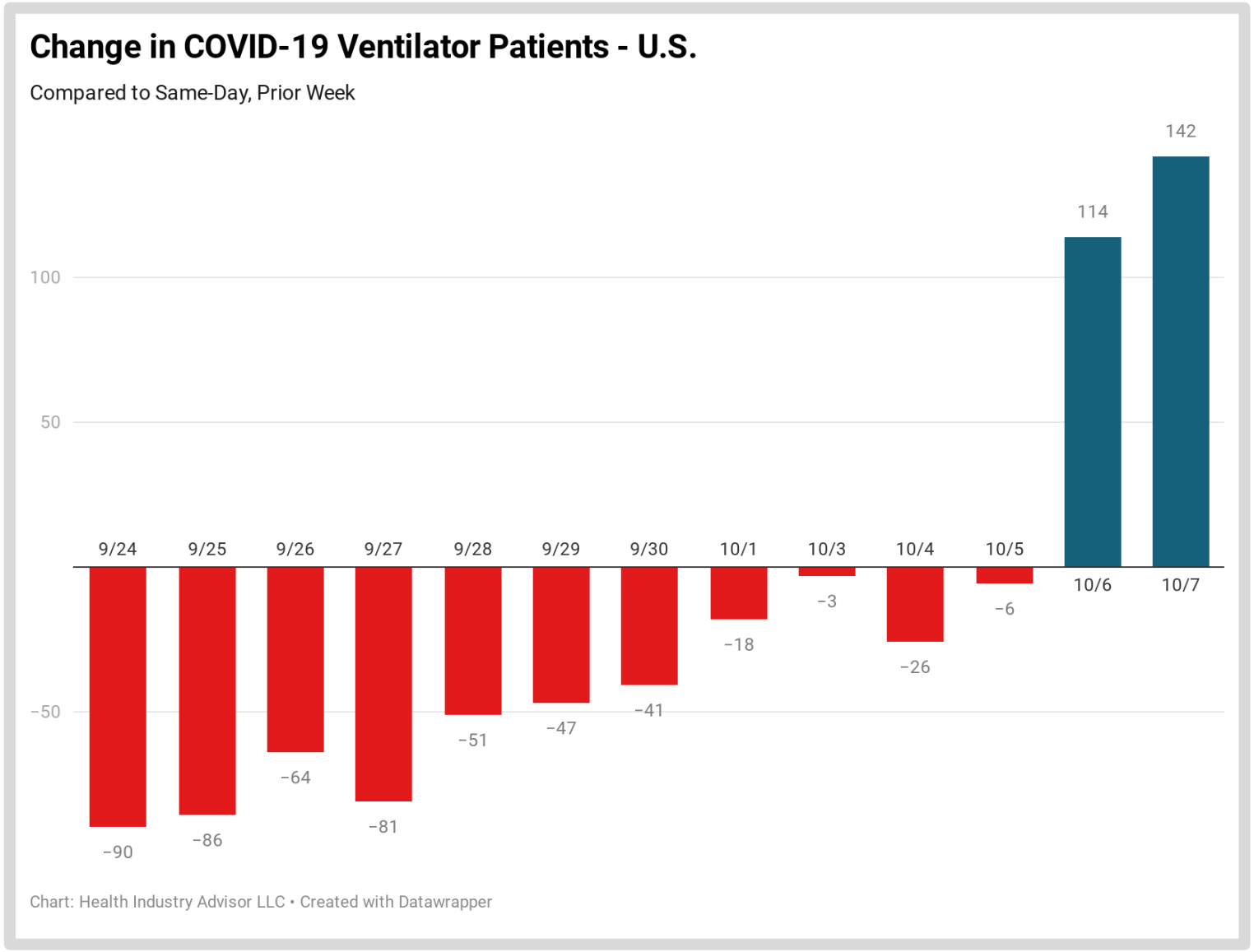
Covid-19 patients on ventilators declined yesterday on a same-day, prior week basis, as it has done on thirteen of the past fourteen days



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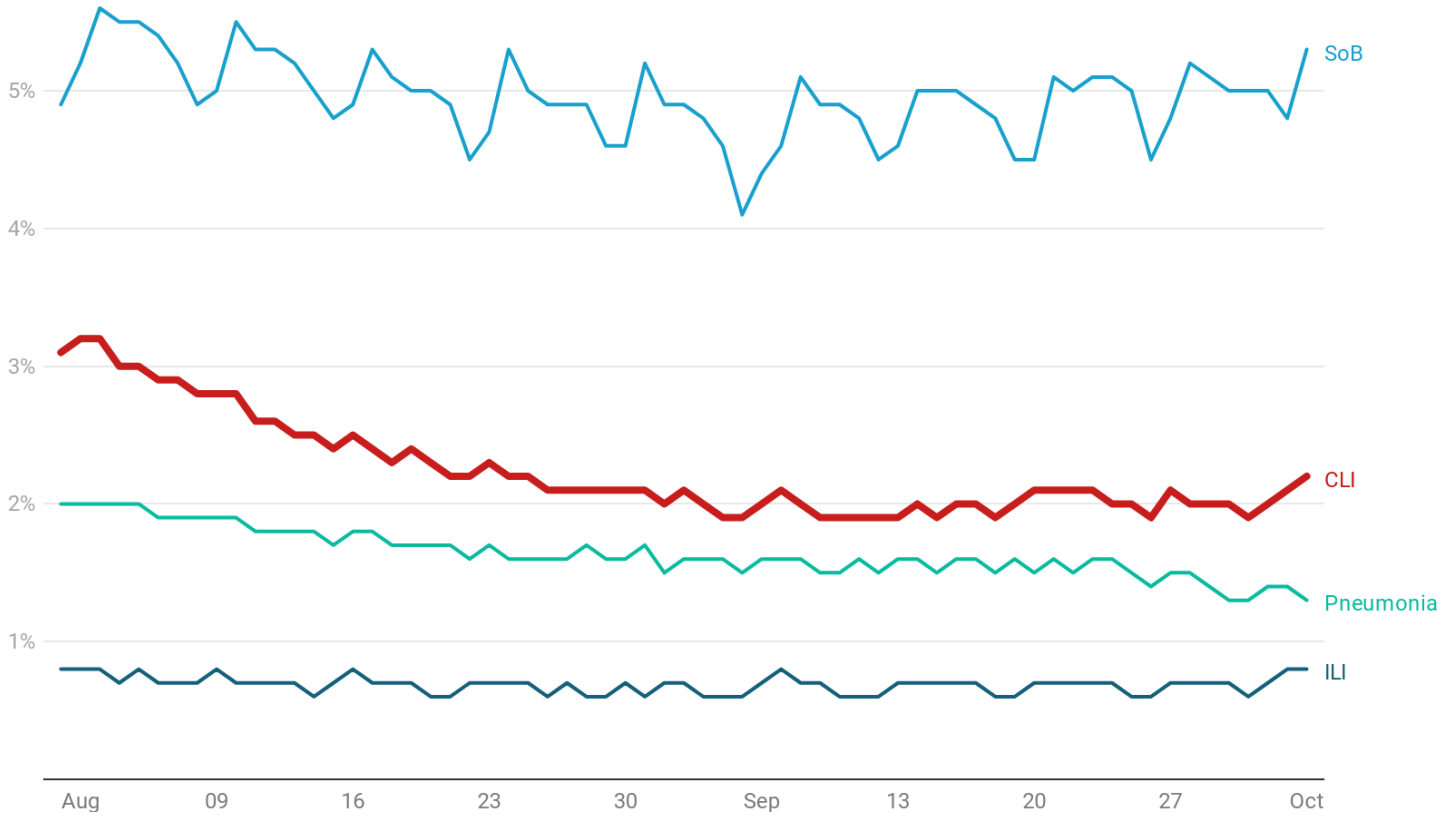
The % of ER visits for COVID-19-like illnesses (CLI) increased for the fourth consecutive day; it remains less than ½ of the rate in mid-July

Flu season is not in evidence yet, based on influenza-like illness (ILI) visits to the ER

% of Emergency Department Visits for COVID-Like Illness (CLI), Influenza-Like Illness (ILI), Pneumonia & Shortness-of-Breath (SoB)

As of October 4



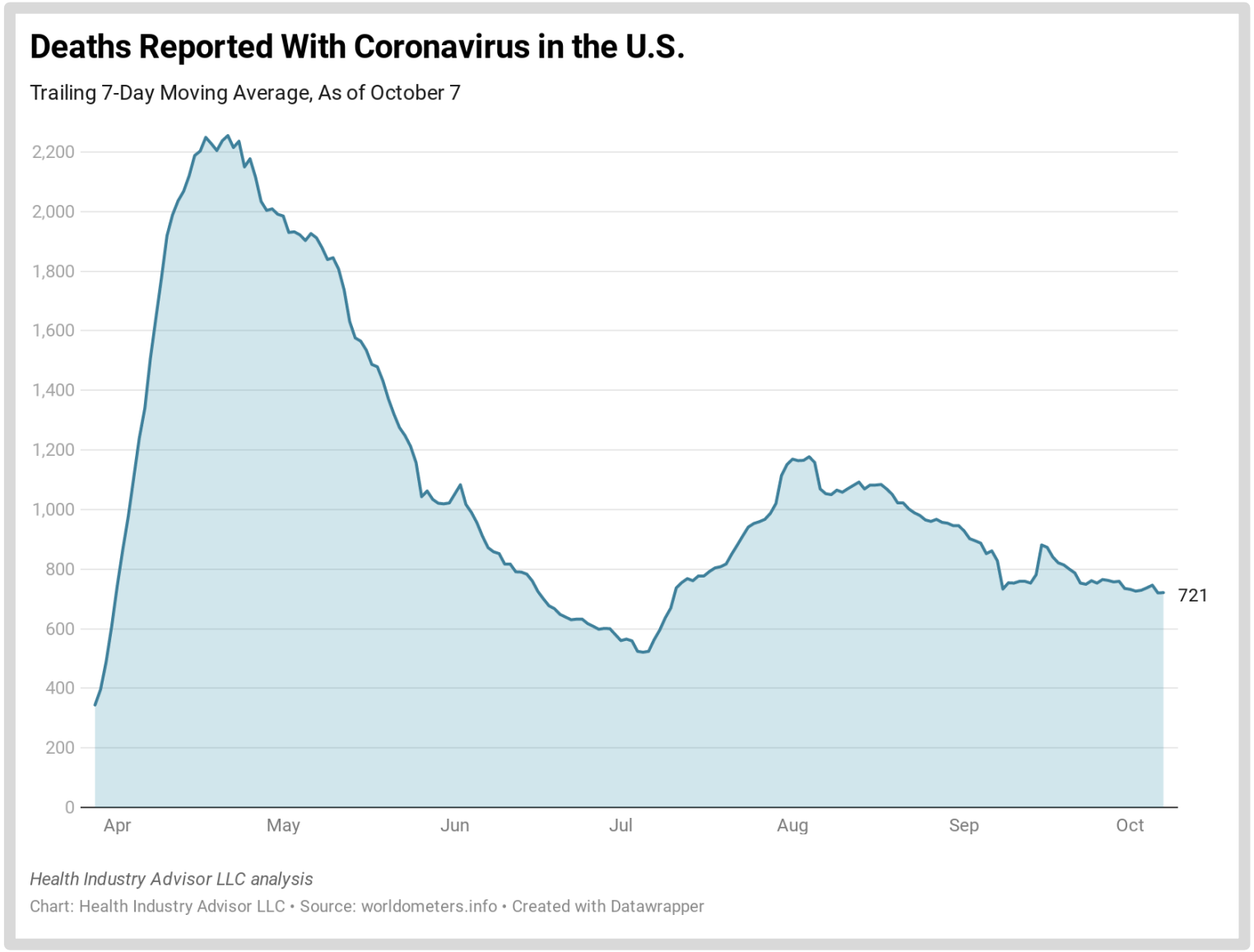
Health Industry Advisor LLC analysis

Chart: Health Industry Advisor LLC • Source: Centers for Disease Control • Created with Datawrapper

Health Industry Advisor, llc

The 7-day average deaths per day increased yesterday by 1 death / day

Despite this increase, average daily deaths remain lower than any period from the July 10 – October 6



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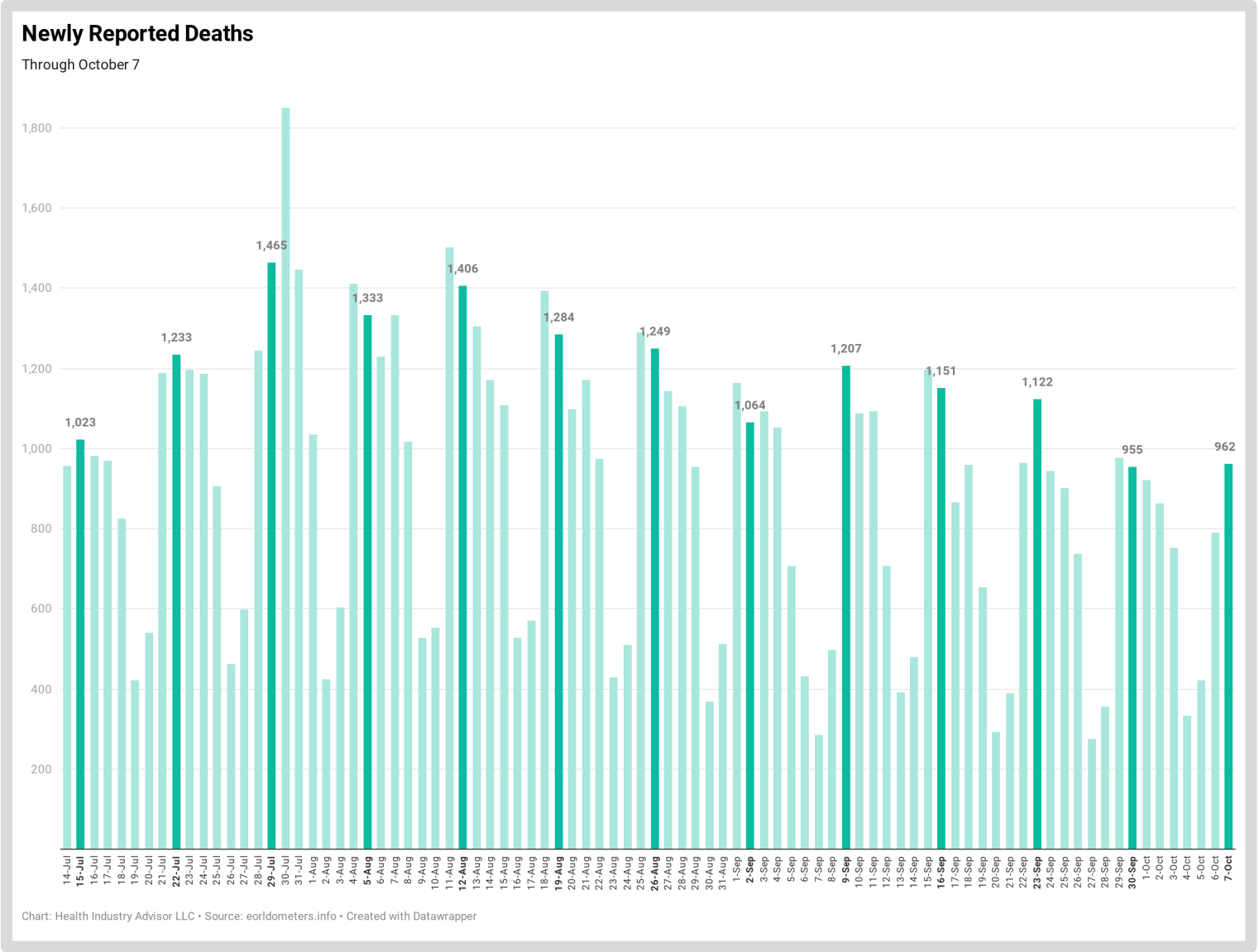
There were seven more deaths reported yesterday than last Wednesday

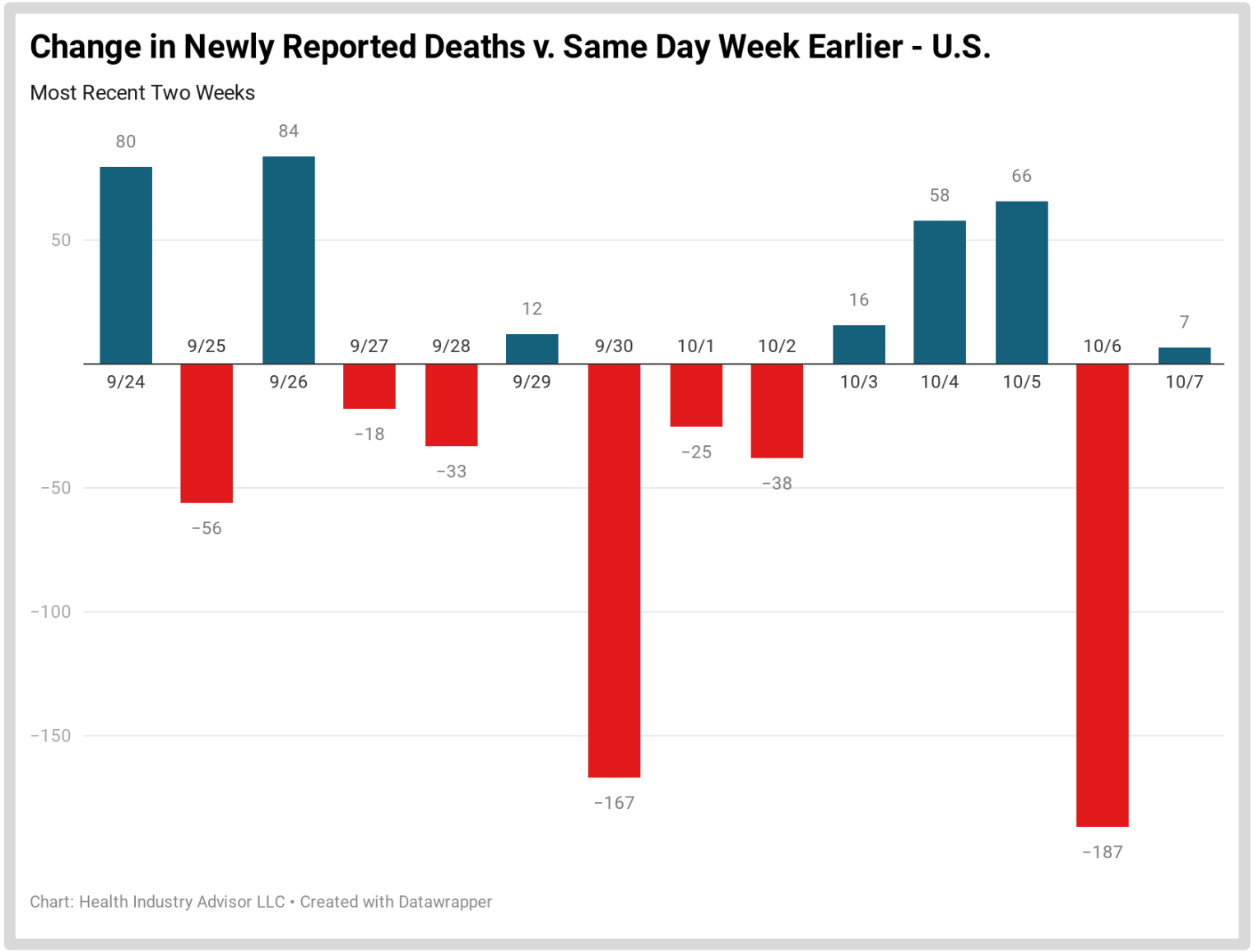
Nevertheless, there were fewer deaths reported yesterday any previous Wednesday since July 8



Health Industry Advisor, llc

Newly reported deaths, on a same-day, prior-week basis, have now increased on three consecutive days

Overall trend, however, remains negative:
- eight of past fourteen days show fewer new deaths than same-day, prior week
- amplitude of declines were greater than for increases



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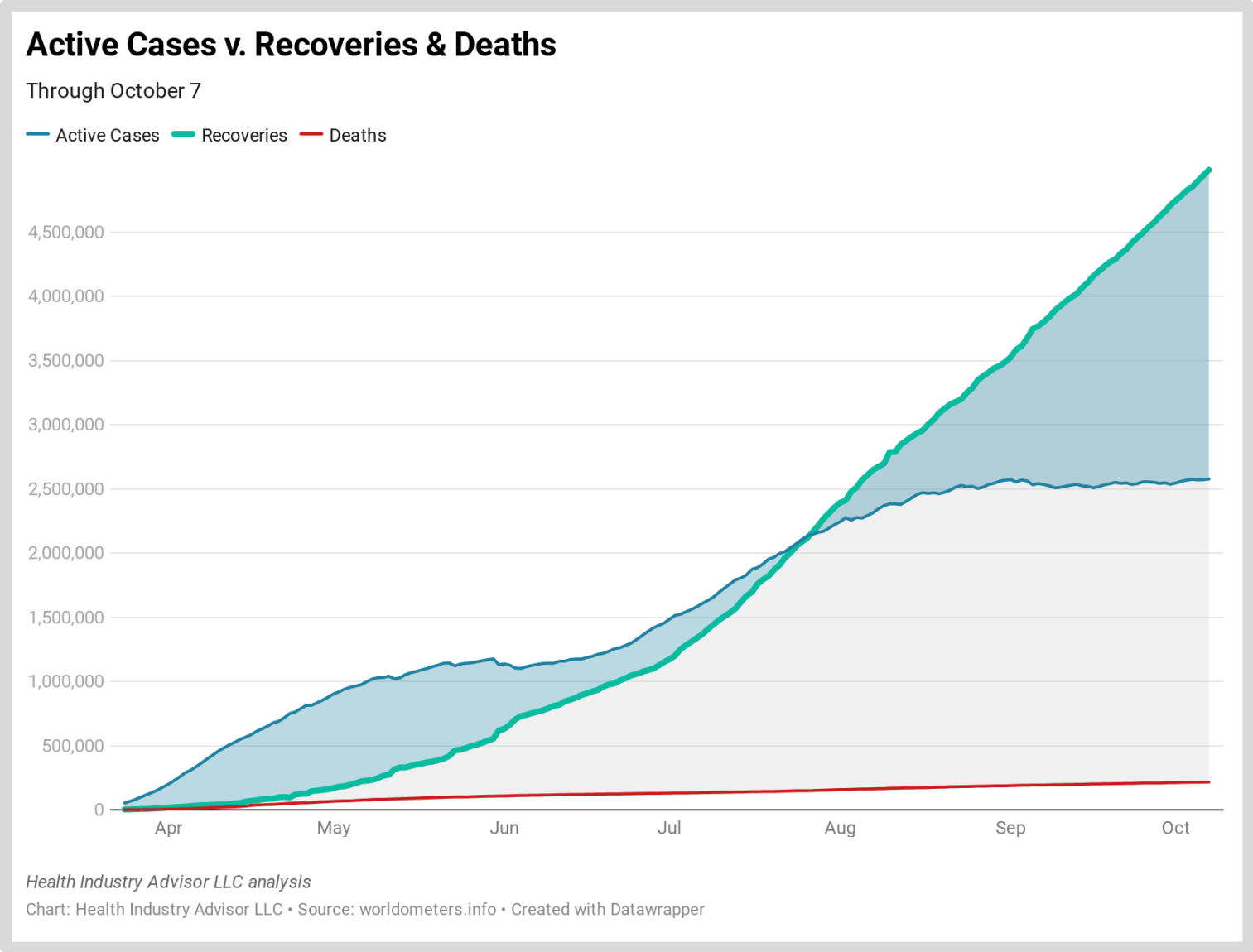
Recoveries from the virus continue to increase

Active cases have plateaued since mid-August



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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