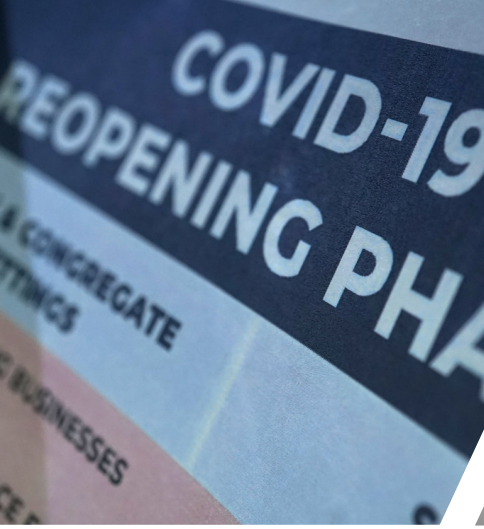

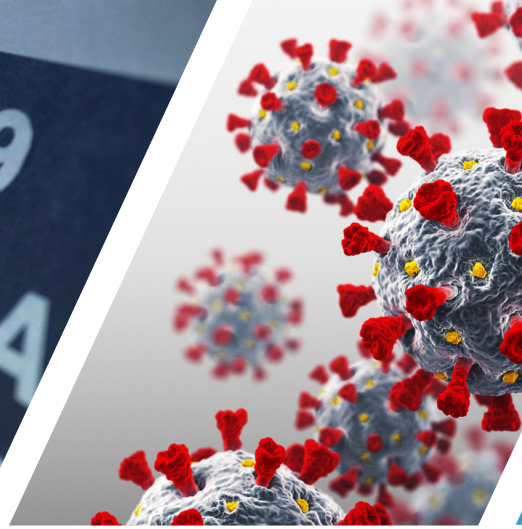

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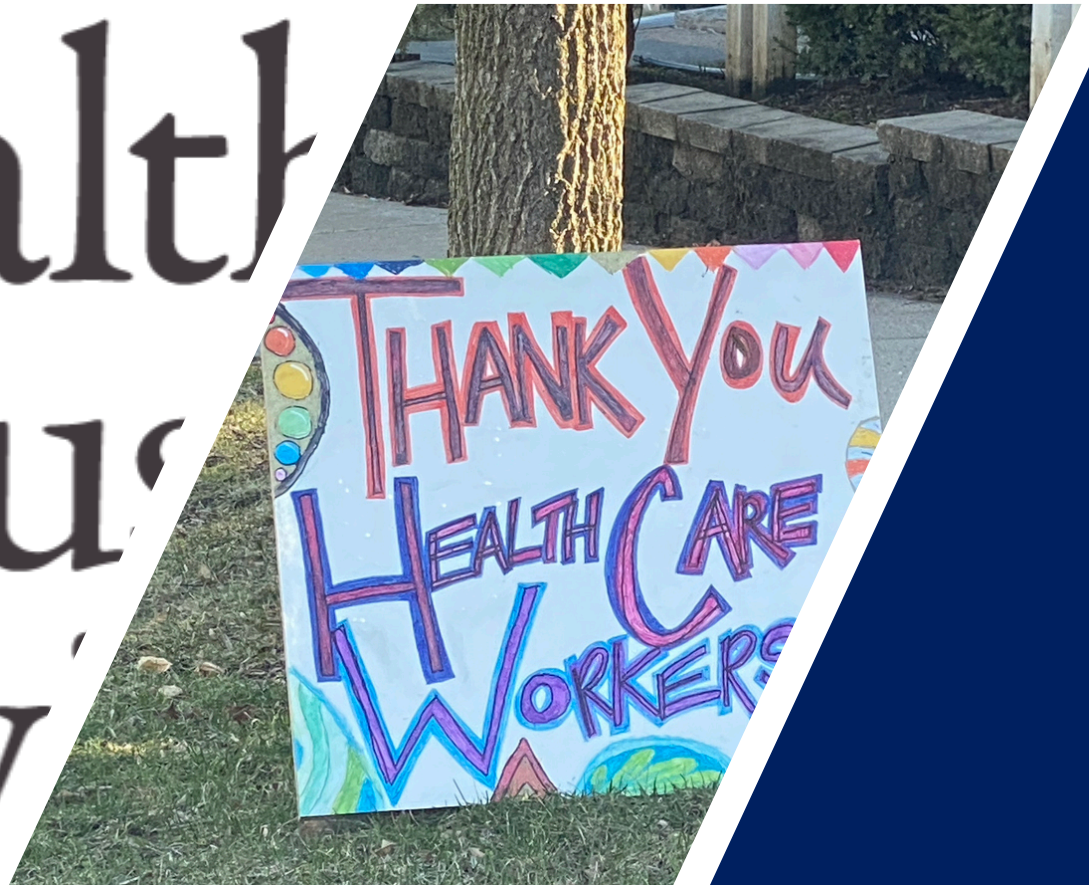


Issue # 179

Tuesday, October 6, 2020

COVID-19 Report

Highlights

- On September 28, **Youyang Gu** announced that he would be discontinuing his widely-respected COVID-19 infection and fatality projection model. Last evening, he published his last forecast
- In recognition of Gu's outstanding contribution, we make note of his final model. **Among his projections**:
  - **In the U.S, the implied infection rate as of October 5: 16.1% of the population has been infected by the virus (range: 11.3%-22.2%)**
  - By November 1, an implied infection rate of 18.7% (range of 12.4%-28.0%)
  - **An additional 22k deaths by November 1 (to 230.7k, with a range of 221.6k-244.8k)**
  - Gu projects that the average daily deaths will rise from 720 to 808 by November 1
- In comparison to Gu's projected deaths:
  - **The CDC publishes a composite forecast of more than thirty distinct models, prepared by COVID-19 Forecast Hub; This composite only projects four weeks out, with a composite forecast of an additional 16k deaths in these next four weeks**
  - **The Institute for Health Metrics and Evaluation (IHME) is one of the only models to project further than 4 weeks; IHME projects:**
    - **An additional 26k deaths by November 1, to 235.0k (range of 229.6k-240.5k)**
    - By December 1, 281.7k deaths (range of 267.1k-299.2k)
    - By January 1, 363.3k deaths (range of 337.3k-392.3k)
    - IMHE's forecast suggests a significant spike in deaths in November and an even-greater one in December; A deconstruction of this model seems to suggest a dependency on an assumption of a pronounced seasonality-impact of the virus

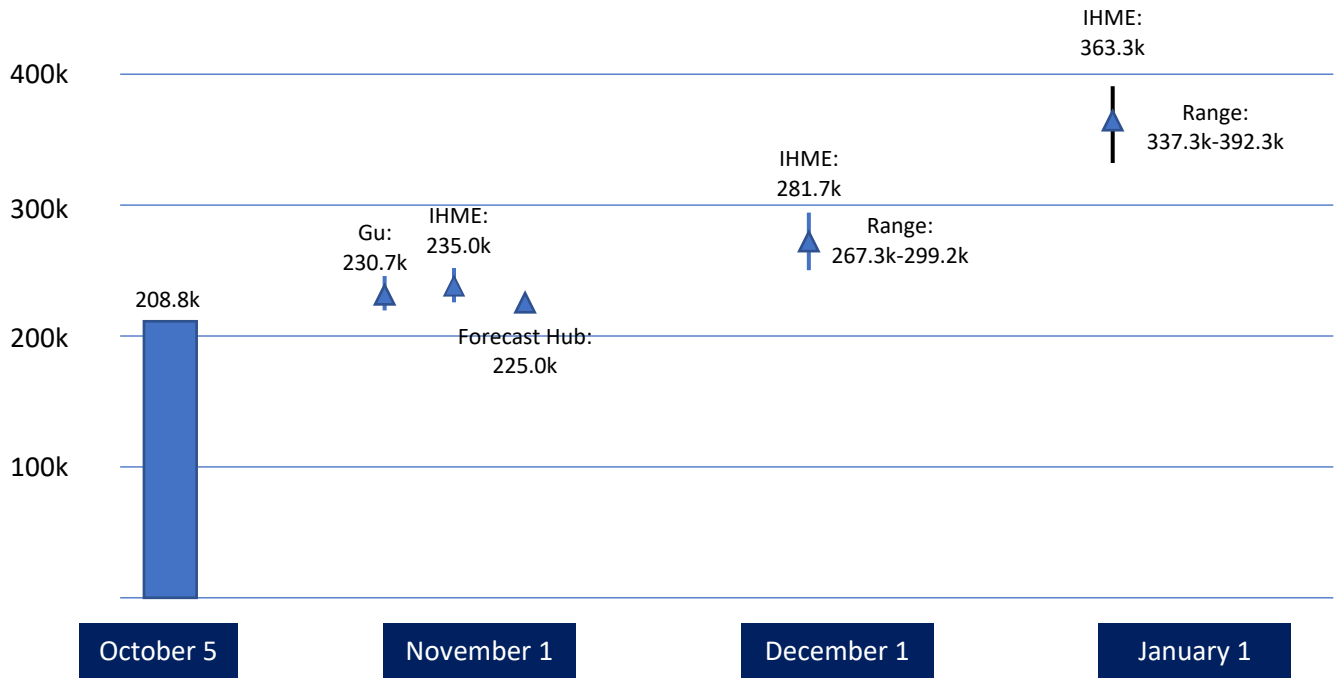
- **New cases and infections are showing clear evidence of increasing in recent days:**
  - New cases yesterday were the highest on a Monday in the past eight weeks
  - **On a same-day, prior-week basis, new cases were higher on three consecutive days and nine of the past thirteen days**
  - The new daily infection rate rose yesterday for the third consecutive day and the seventh time in the past nine days; This rate is up 7% over this nine-day period yet, it remains 36% lower than its July 22nd peak
- Healthcare resource use by COVID-19 patients is a mixed story:
  - **On a same-day, prior-week basis, inpatient COVID-19 census increased for the twelfth consecutive day yesterday**
  - Also on a same-day, prior-week basis, **ICU census of COVID-19 patients increased significantly yesterday; this census had declined, however, the three preceding days and on nine of the past thirteen days**
  - **COVID-19 patients on ventilators, on a same-day, prior-week basis, declined on thirteen of the past fourteen days**
- **Deaths reported with the virus have increased slightly in recent days but, the longer-term trend is still down:**
  - Deaths reported yesterday were higher than the past two Mondays, as well as Labor Day; These were lower, however, than nine of the past twelve Mondays
  - On a same-day, prior week basis, deaths increased for the third consecutive day, following three consecutive days of decline; Deaths have declined on eight of the past fourteen days and the magnitude of the declines have out-paced the increases during this period

Gu's final forecast is for an additional 22k deaths by November 1

The Forecast Hub only projects 4 weeks out; it projects an additional 16k deaths in the next 4 weeks

The Institute for Health Metrics and Evaluation (IHME) projects an additional 26k deaths by November 1; IHME further projects an acceleration of deaths throughout the fall, with 47k additional deaths in November and an additional 81k in December

Projected Deaths in The U.S.



Sources:
- Gu: https://covid19-projections.com/#current-us-projections
- Forecast Hub: https://viz.covid19forecasthub.org
- IHME: https://covid19.healthdata.org/united-states-of-america?view=total-deaths&tab=trend

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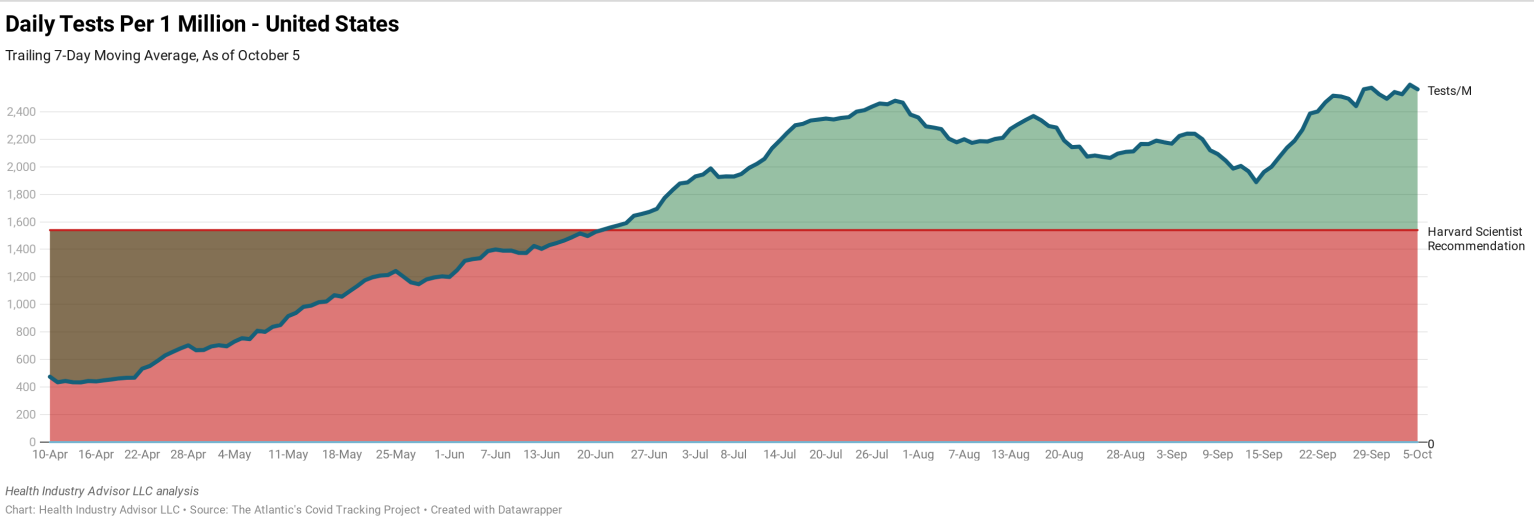
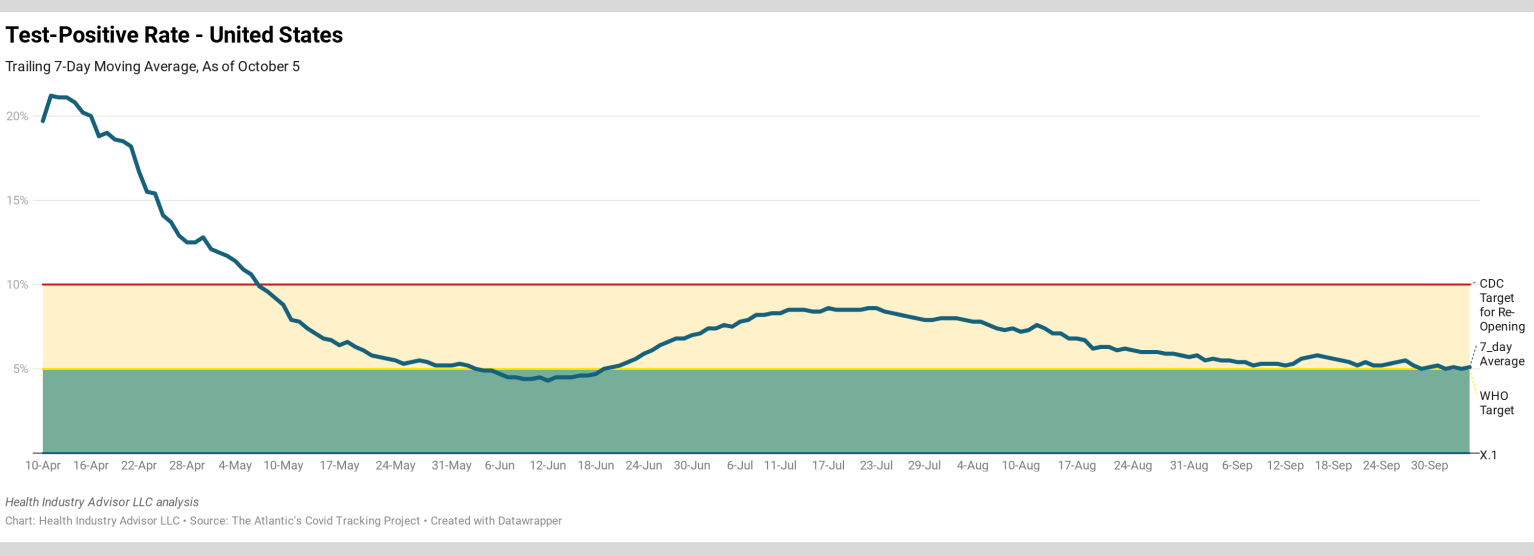
The 7-day average testing volume remains well in the “green“ zone – above minimum targeted levels . . . As well as at historically high levels

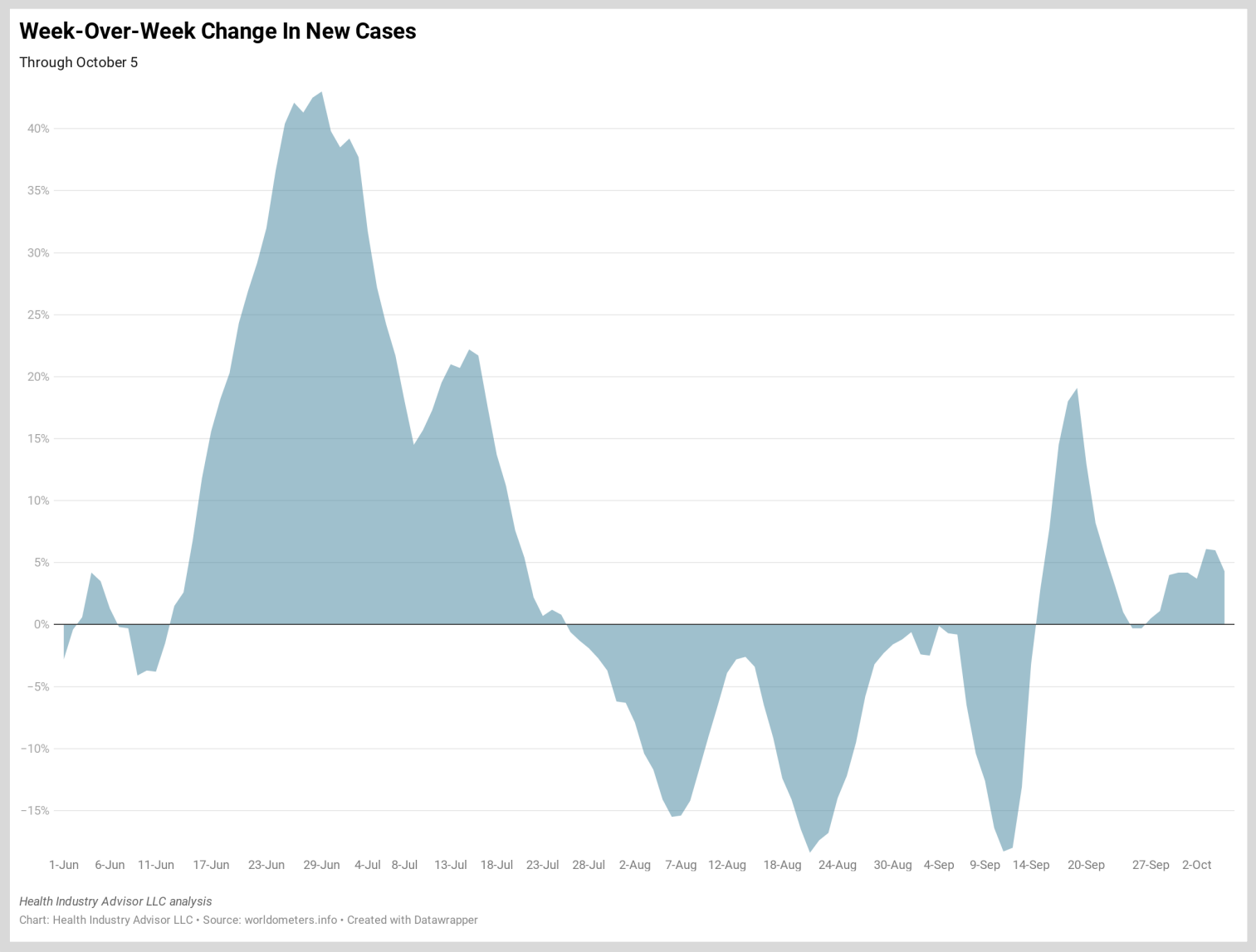
The 7-day test-positive rate is just outside the “green” zone – just above WHO target yet, well-below the CDC target for Phase 3 re-opening





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 4.3% on a week-over-week basis (down from ~6% the past two days)



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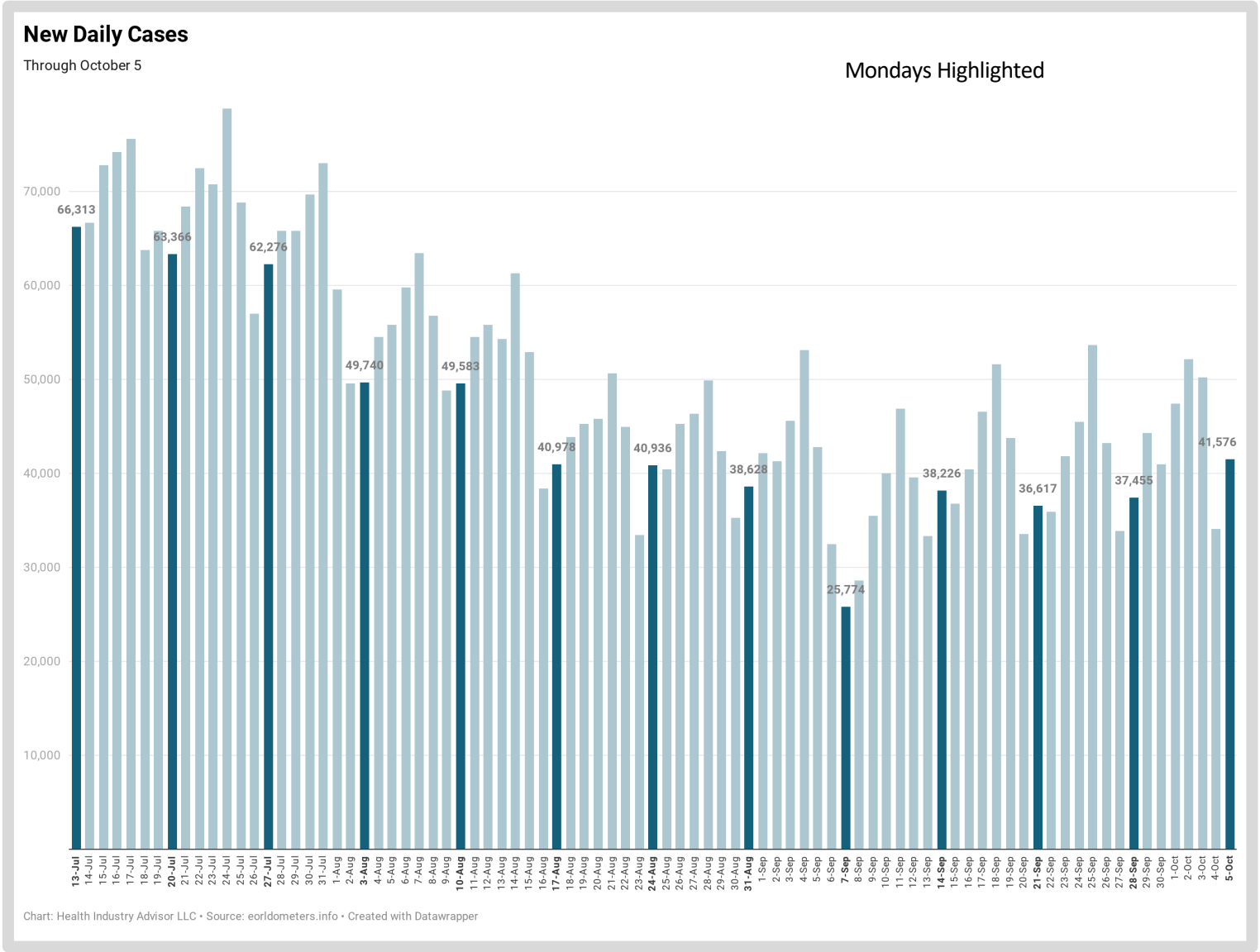
New cases on Monday were high by recent experience – these were most new cases recorded on a Monday in eight weeks



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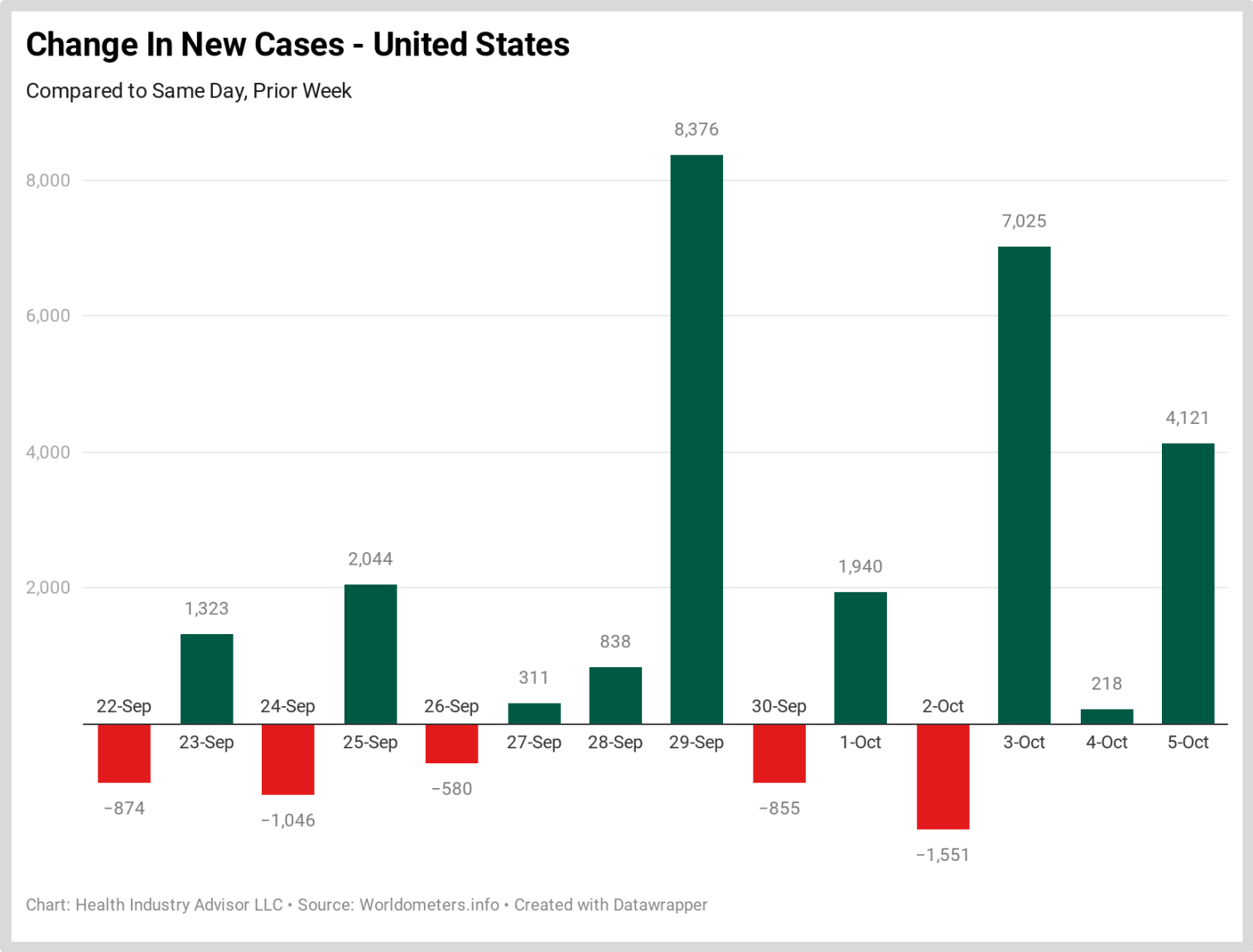
New cases are showing signs of moving upward

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

Amplitude of increases is greater than decreases



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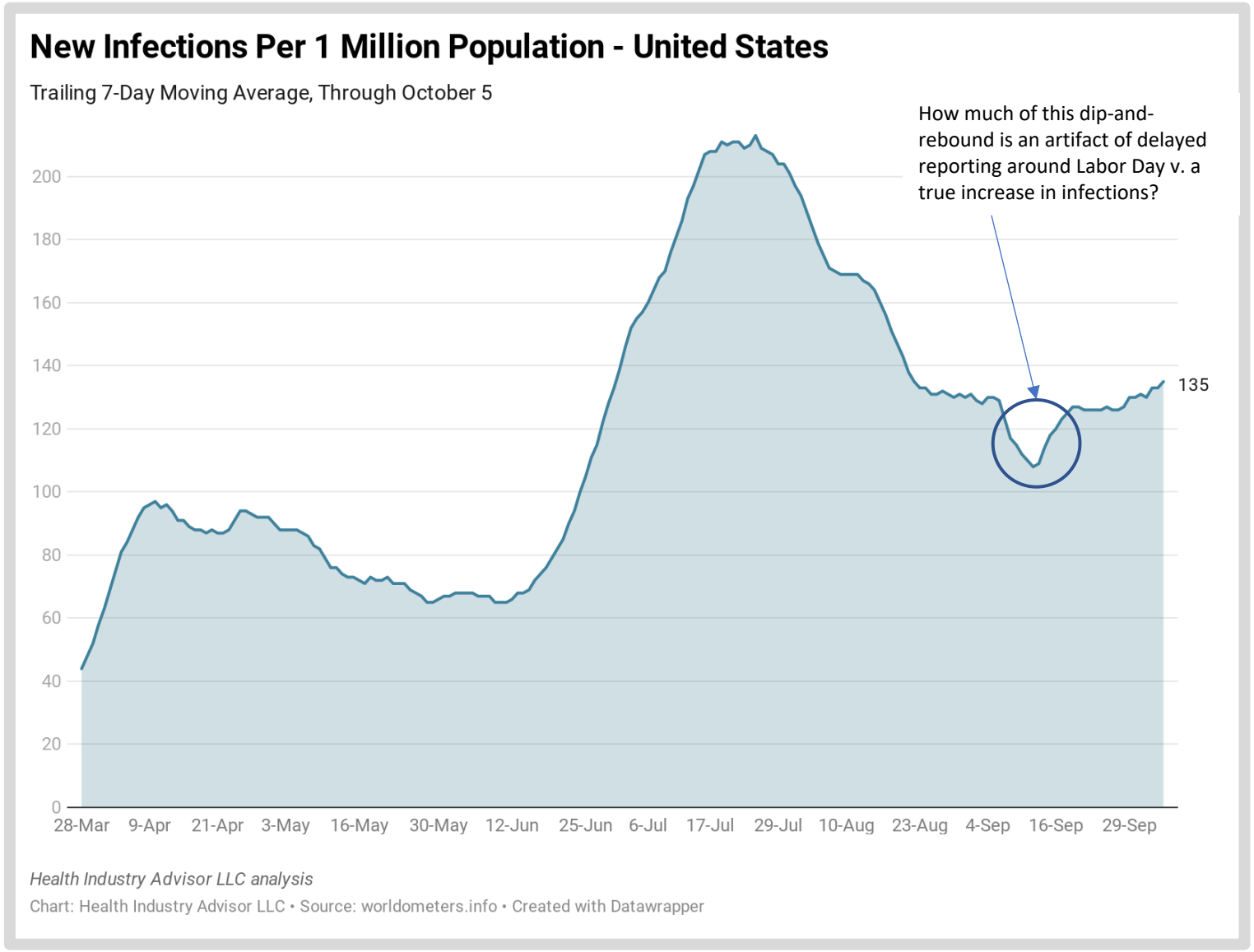
The rate of new infections per capita* in the U.S. Is now trending upward

This rate is now back to where it was during the third week of August

* - 7-day moving average basis



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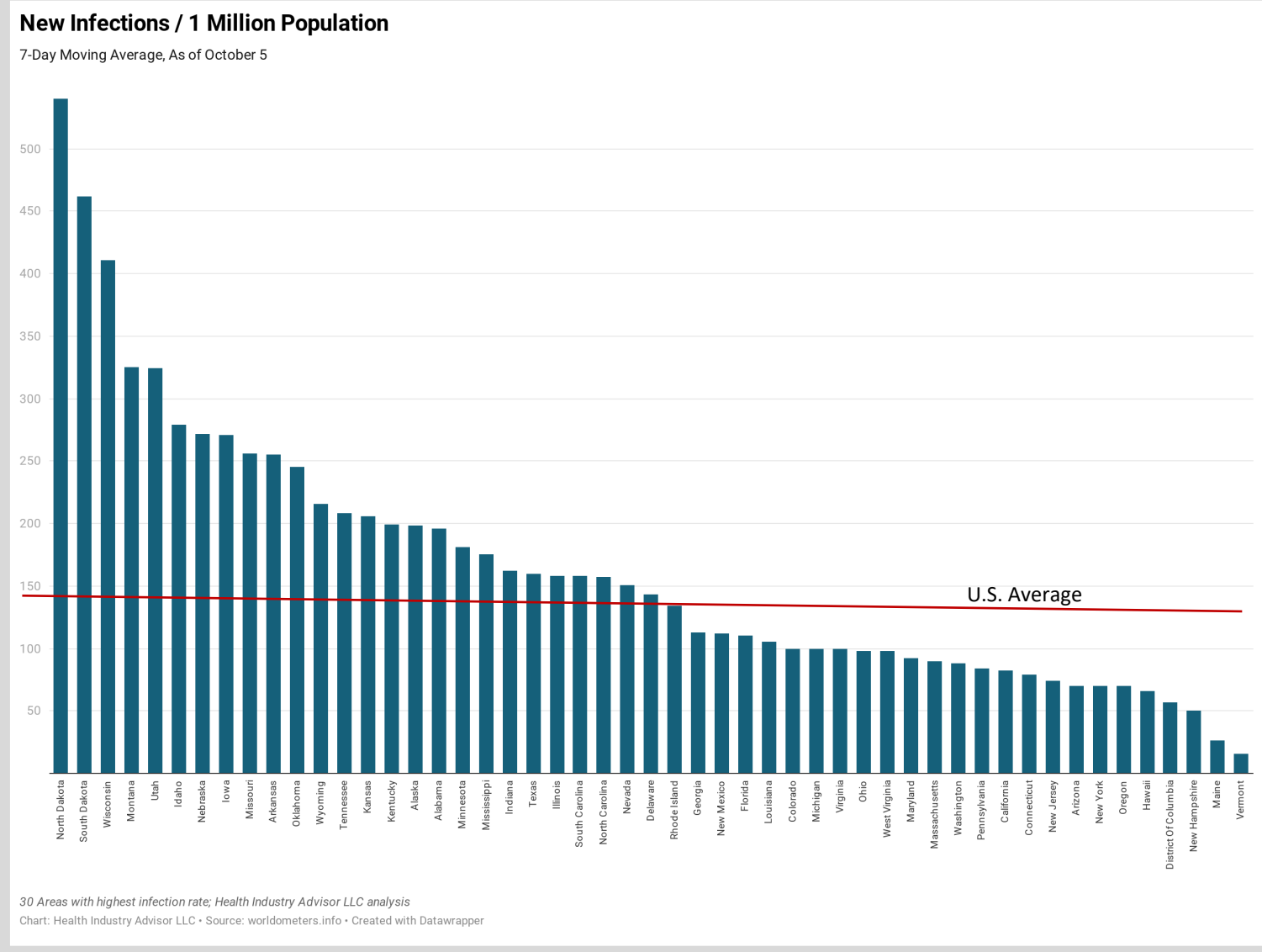
North and South Dakota and Wisconsin continue to experience the highest rates of new infections per capita*

Arkansas, Idaho, Iowa, Missouri, Montana, Nebraska and Utah also are of concern (>200)

Notably, seven of the ten largest states experienced rates below the national average

* - 7-day moving average basis



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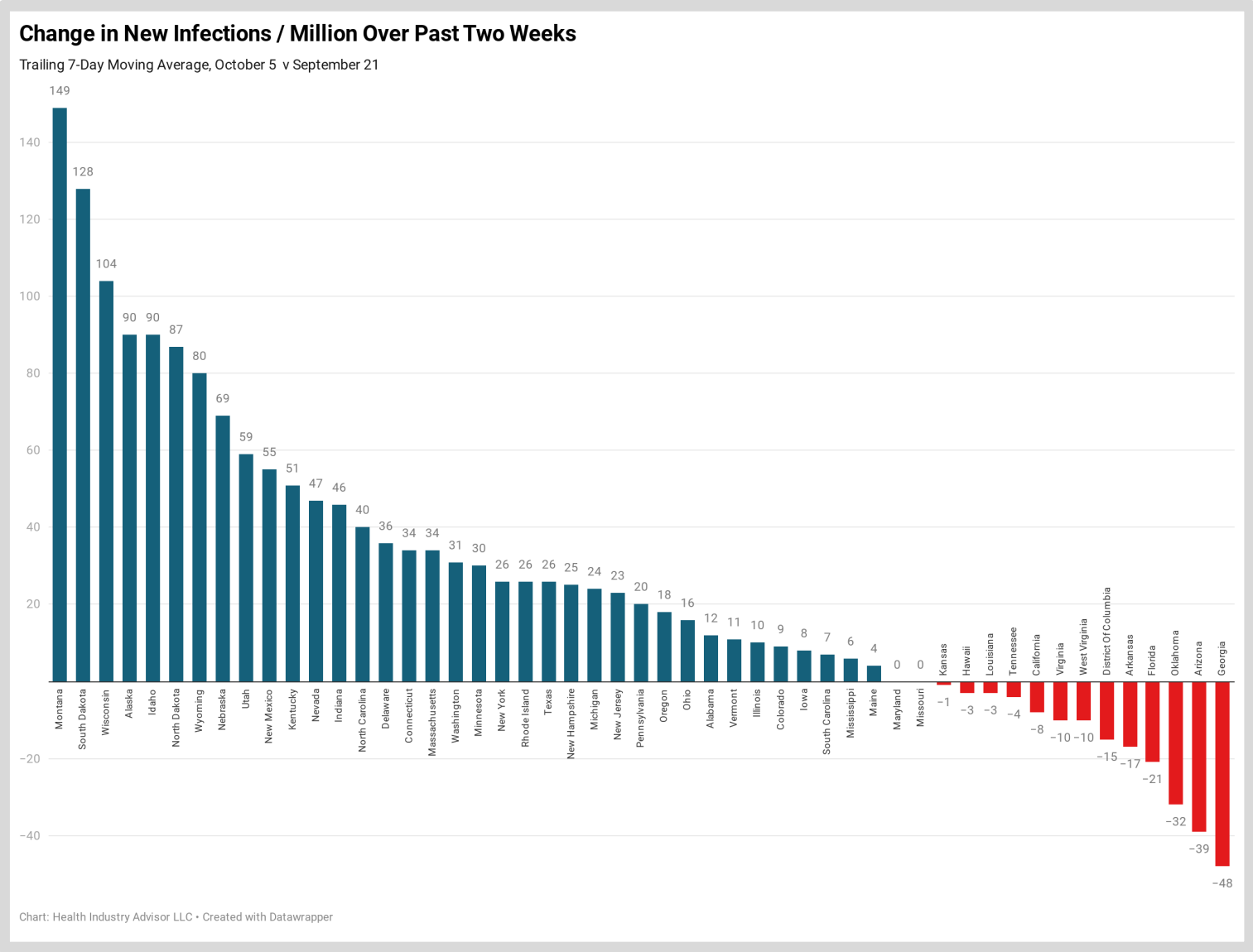
Upper Midwest and Mountain States dominate the list of states with the largest increases in new daily infections per capita over the past two weeks

Thirty-six states experienced increasing rates during this two-week period; Twelve experienced decreasing rates; Two experienced no change

Among the ten largest states, seven experienced an increasing rate, led by North Carolina; Three - California, Florida and Georgia - experienced declining rates



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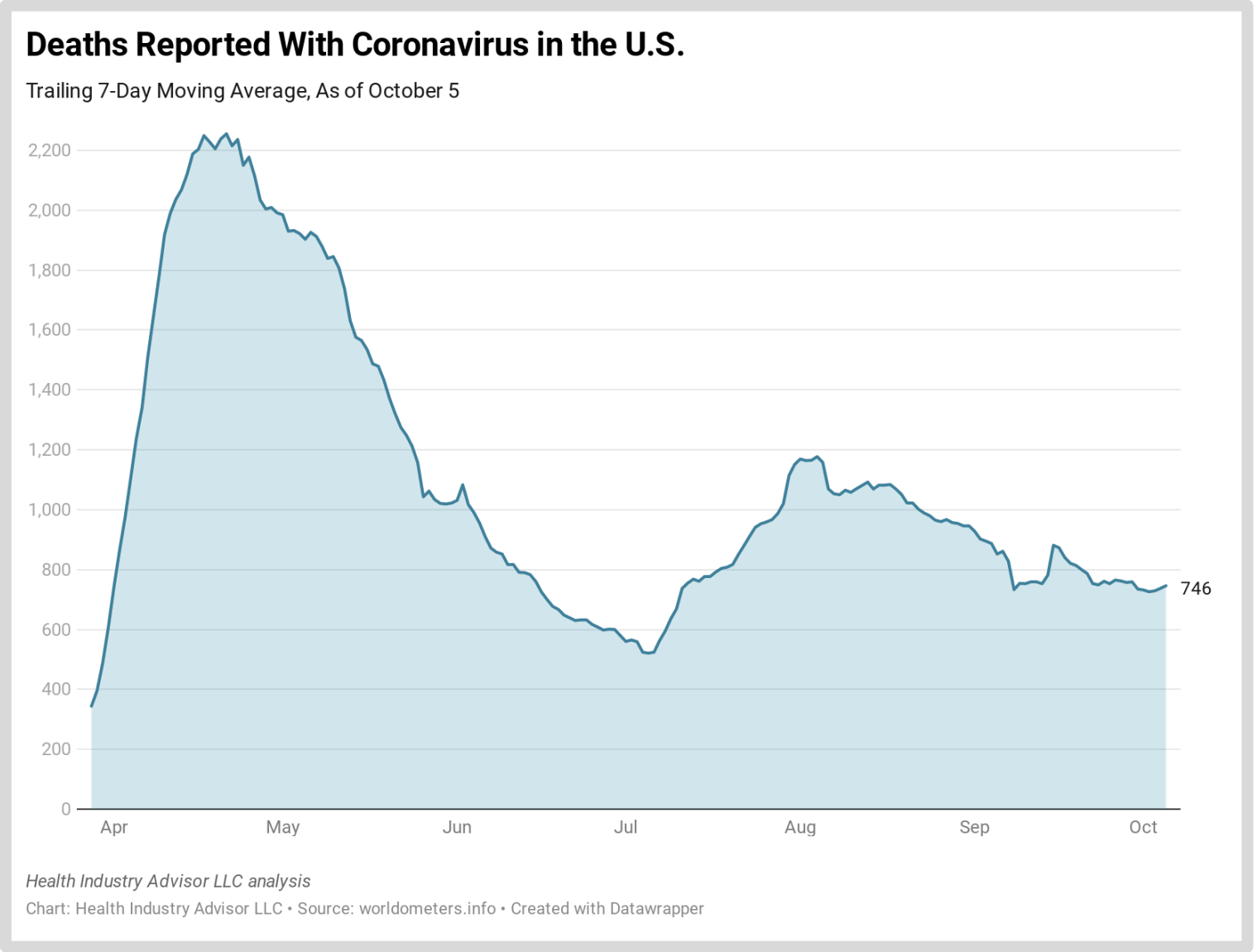
The 7-day average deaths per day has now increased on three consecutive days; the 3-day increase, however, is relatively small

Despite this increase, average daily deaths remain lower than any period from the mid-July to September 29



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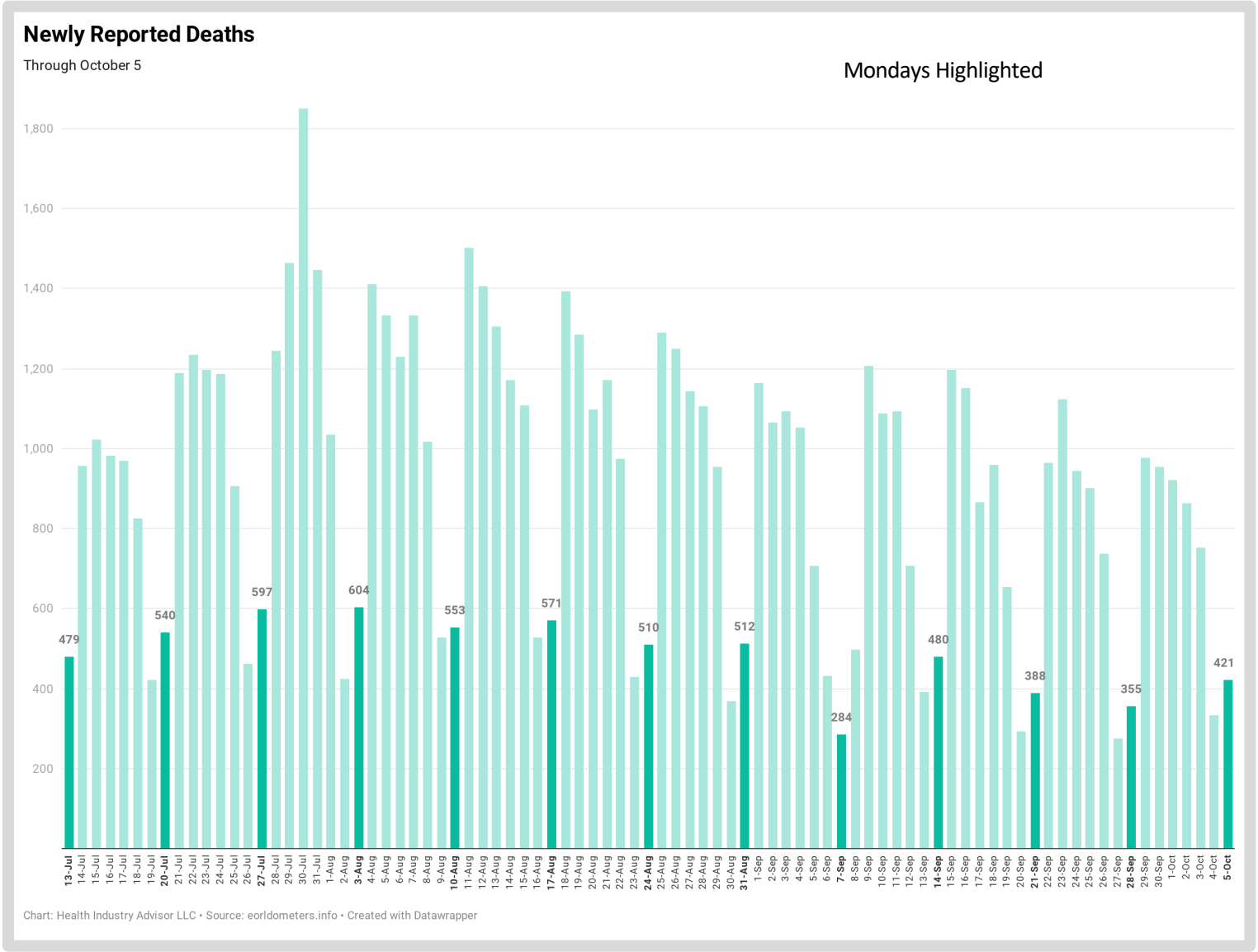
There were more deaths reported this yesterday than on each of the past two Mondays, as well as on Labor Day

Nevertheless, there were fewer deaths reported yesterday than on nine of the past twelve Mondays



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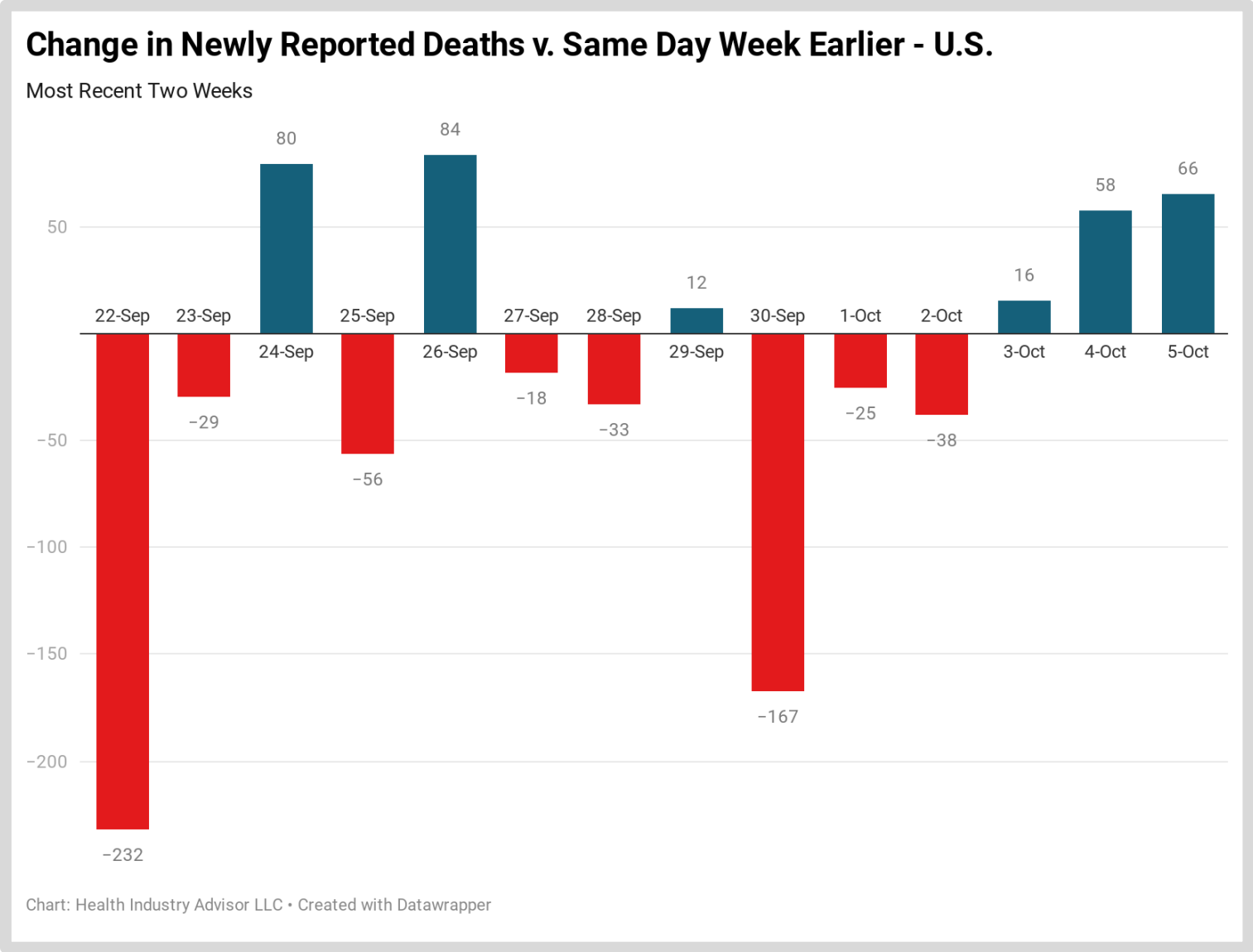
Newly reported deaths, on a same-day, prior-week basis, have now increased on three consecutive days

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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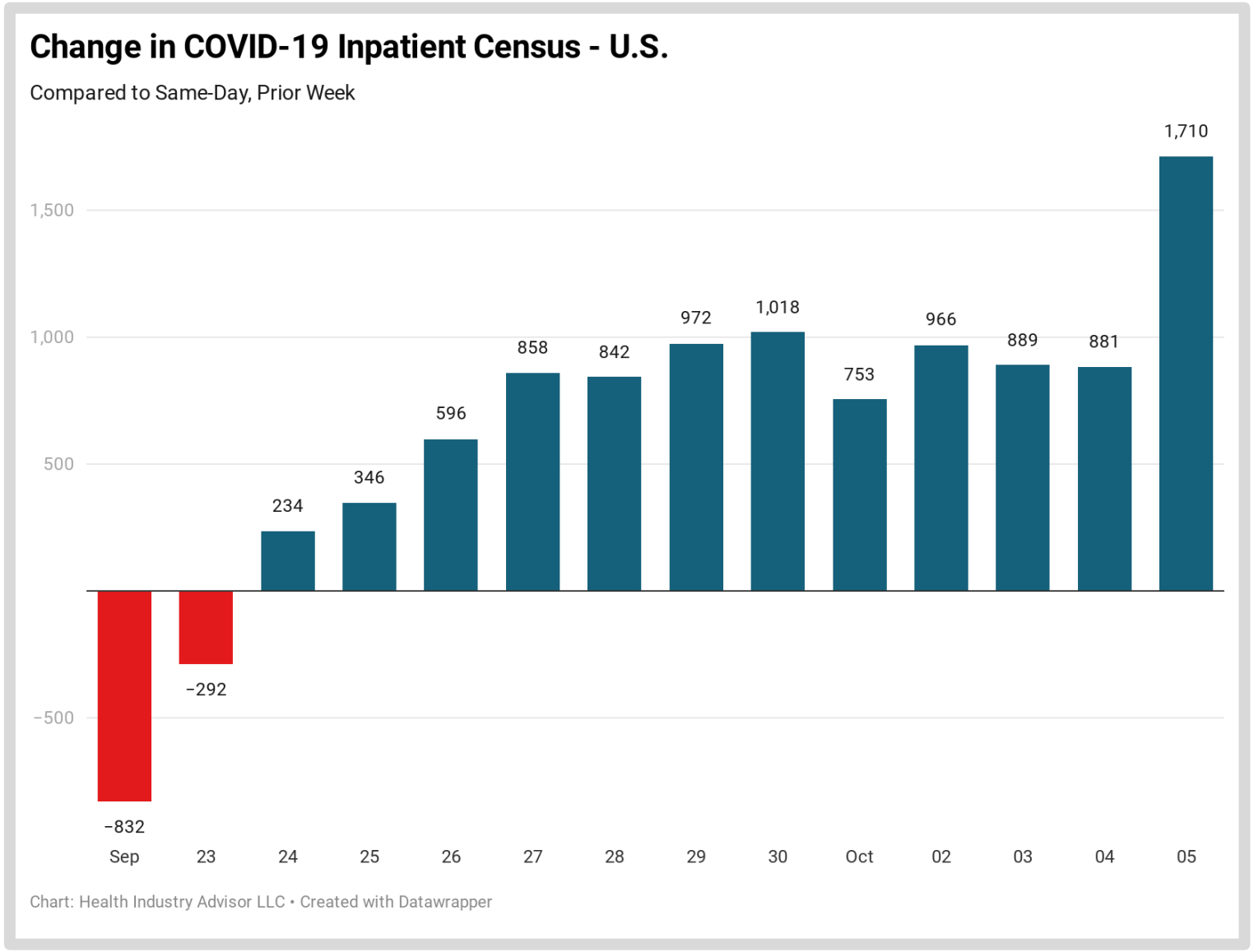
Inpatient COVID-19 census has increased relative to same-day, prior week on twelve consecutive days

Yesterday's increase was the largest during this two-week period



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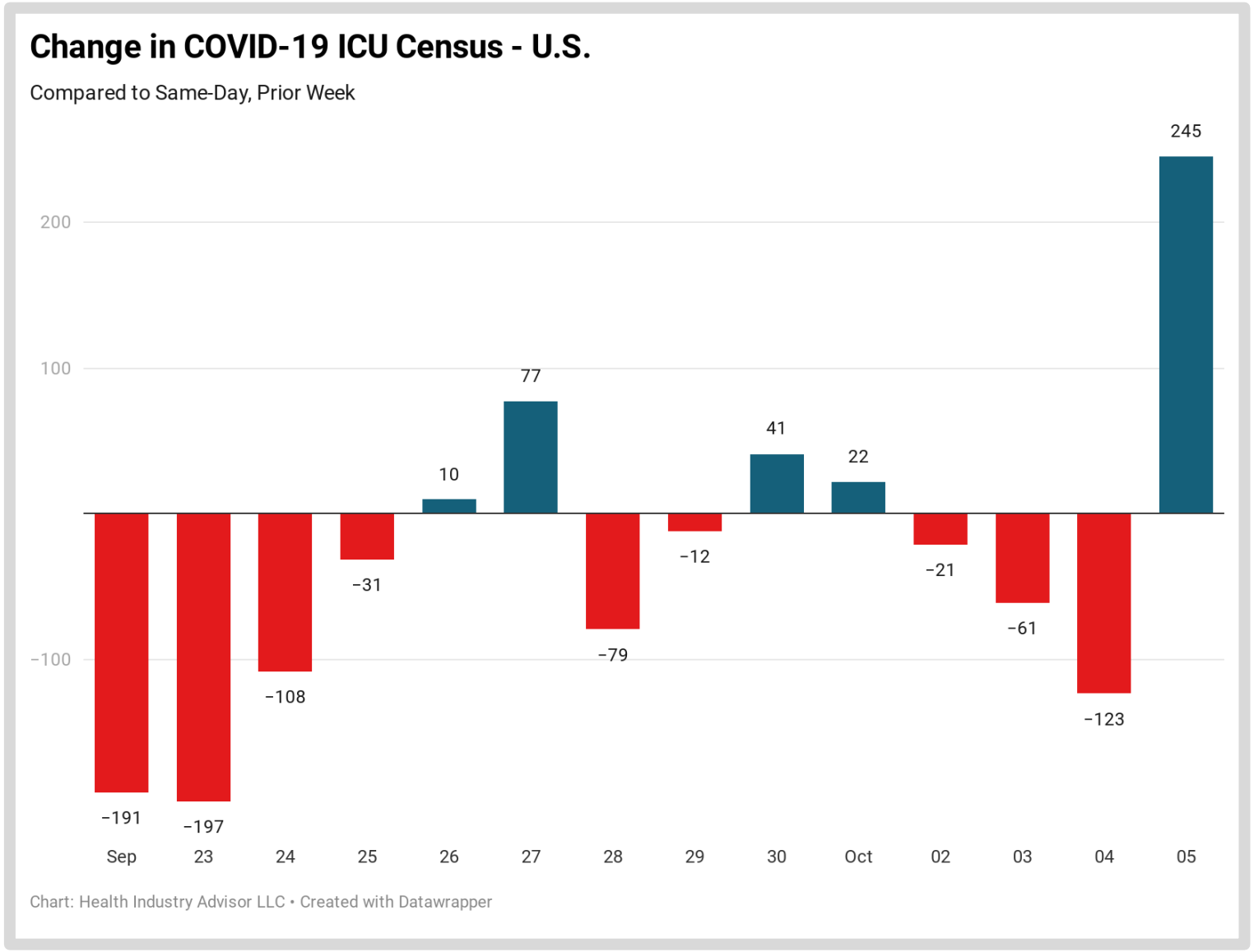
ICU census of COVID-19 patients increased significantly yesterday, on a same-day, prior week basis

This countered a decline in this rate on the three preceding days and on nine of the preceding thirteen days



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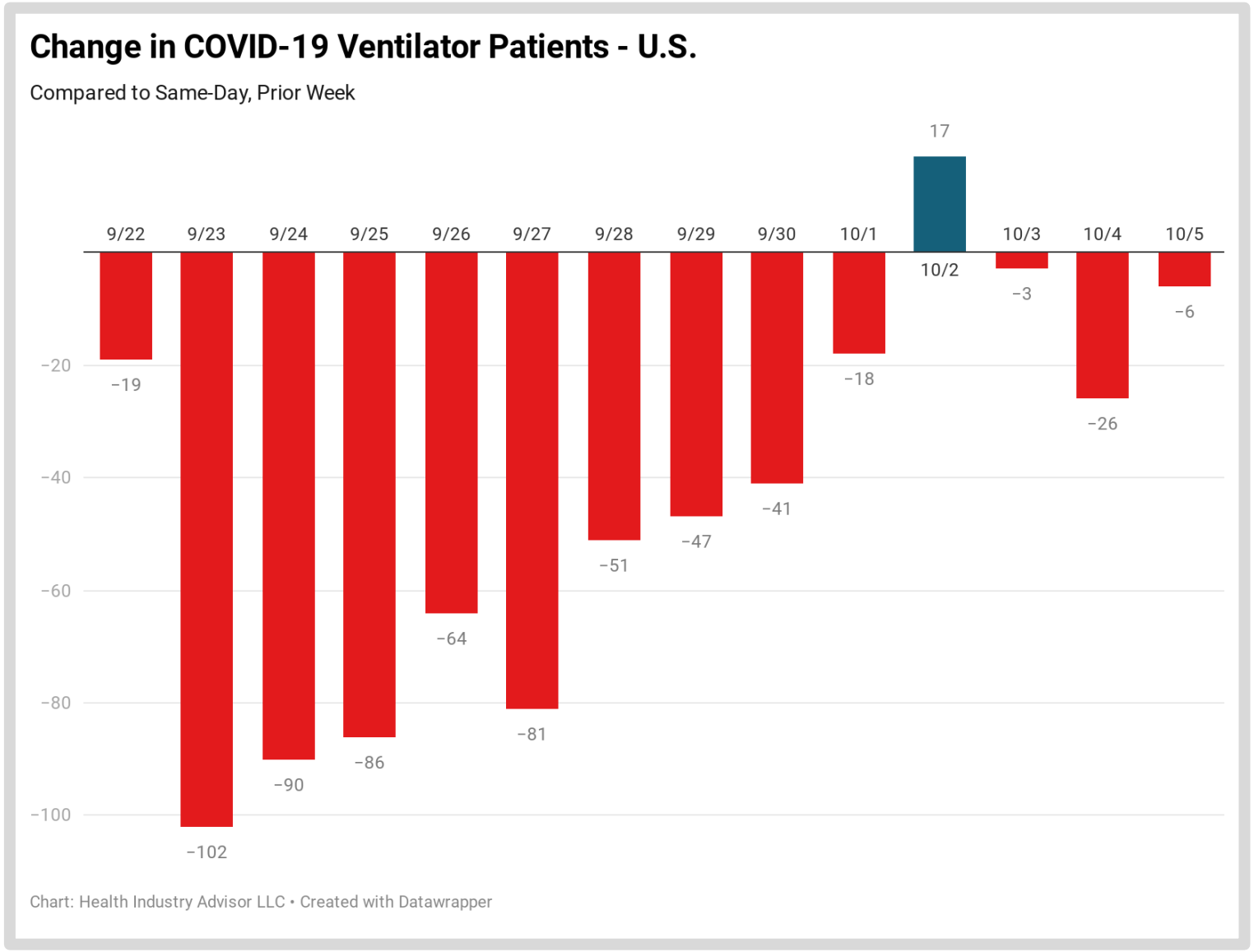
Covid-19 patients on ventilators declined yesterday on a same-day, prior week basis, as it has done on thirteen of the past fourteen days



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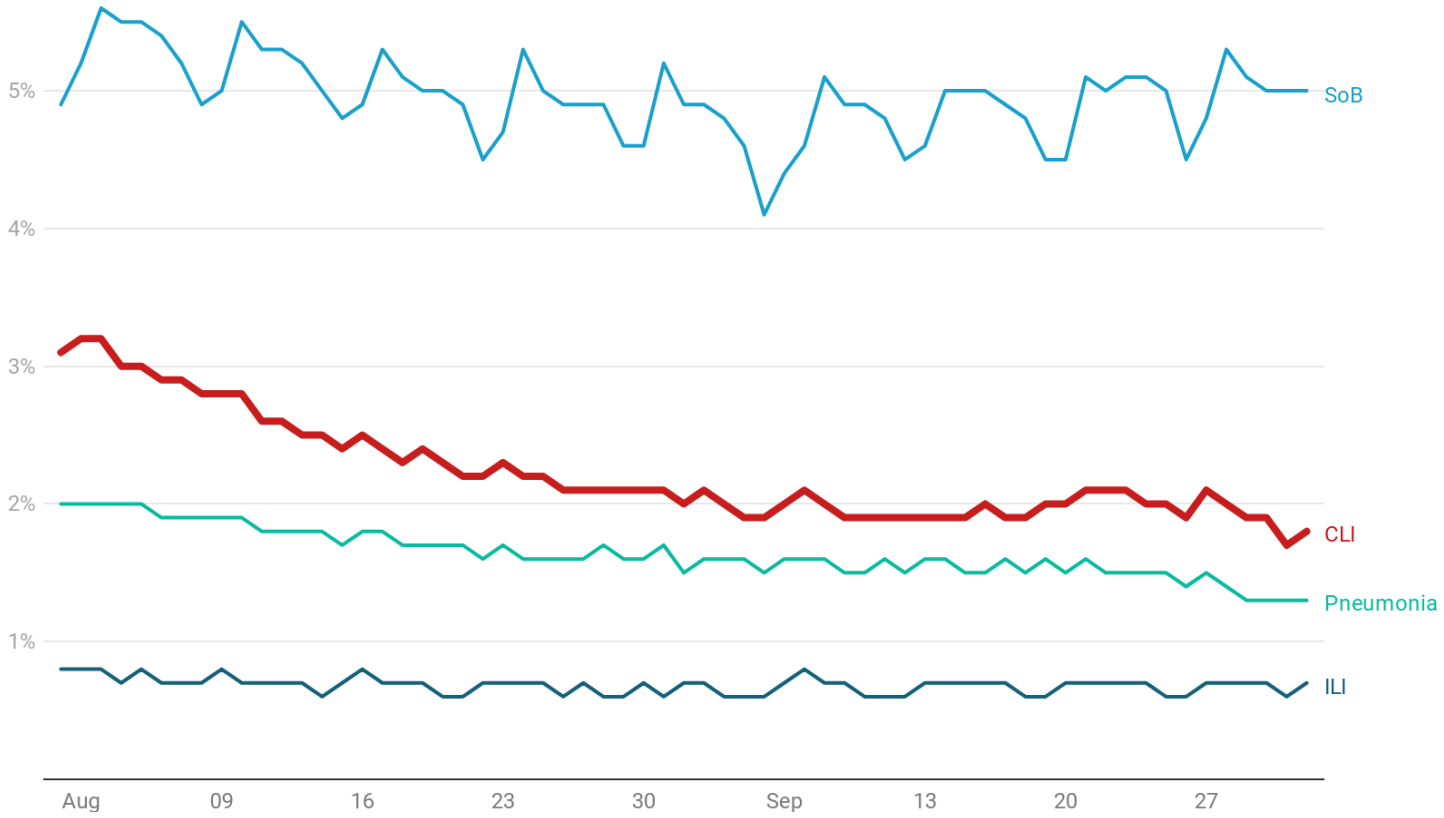
The % of ER visits for COVID-19-like illnesses (CLI) has steadily declined since July

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 1



Health Industry Advisor LLC analysis

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

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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