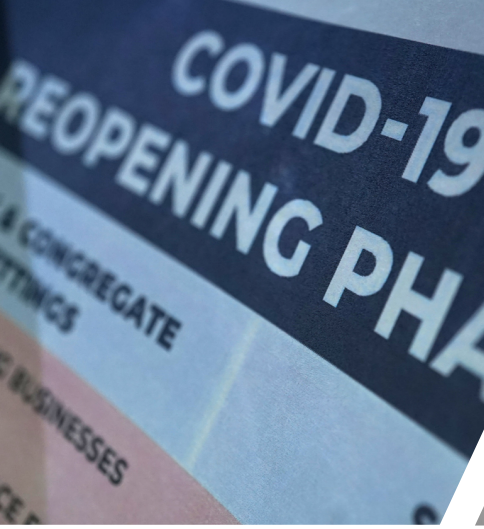
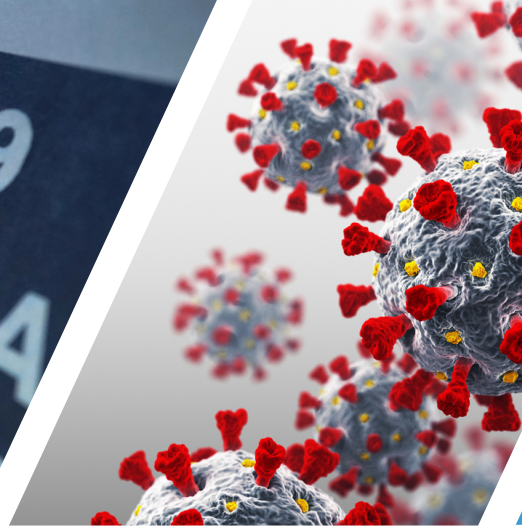
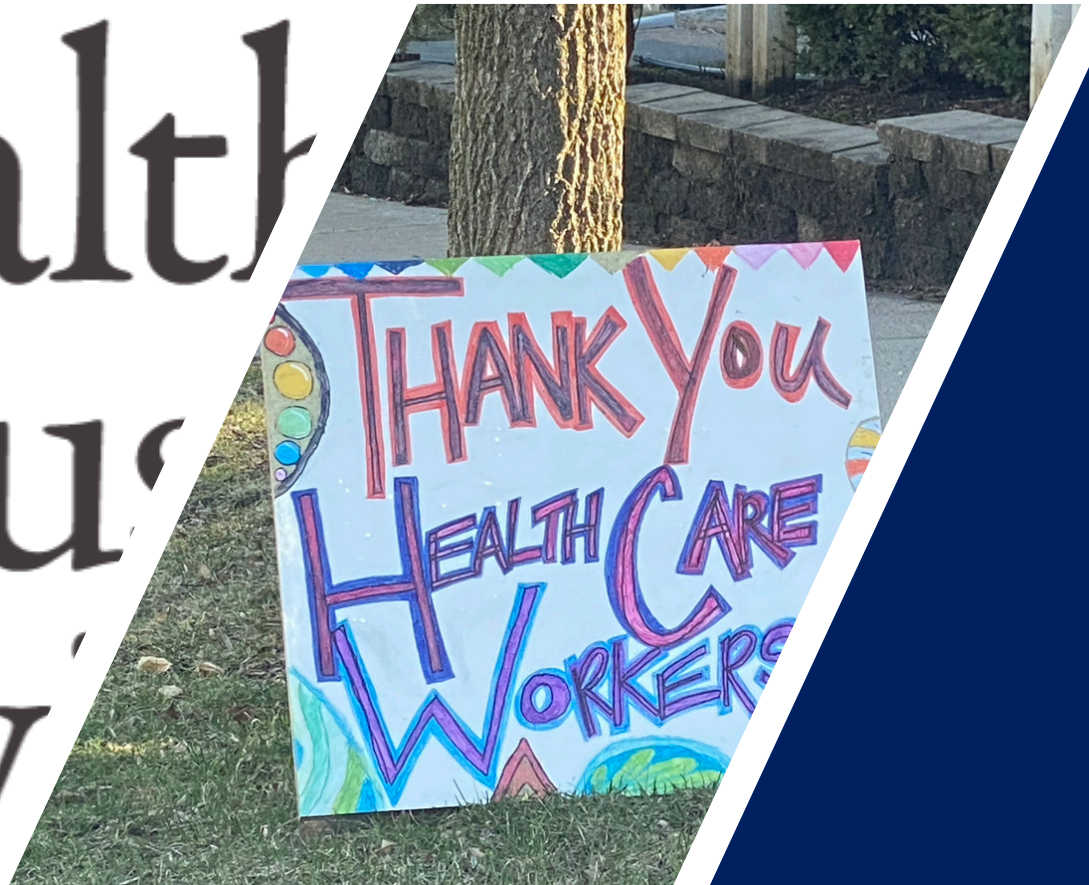




Health
Indus
Adv



Issue # 219

Monday, November 23, 2020

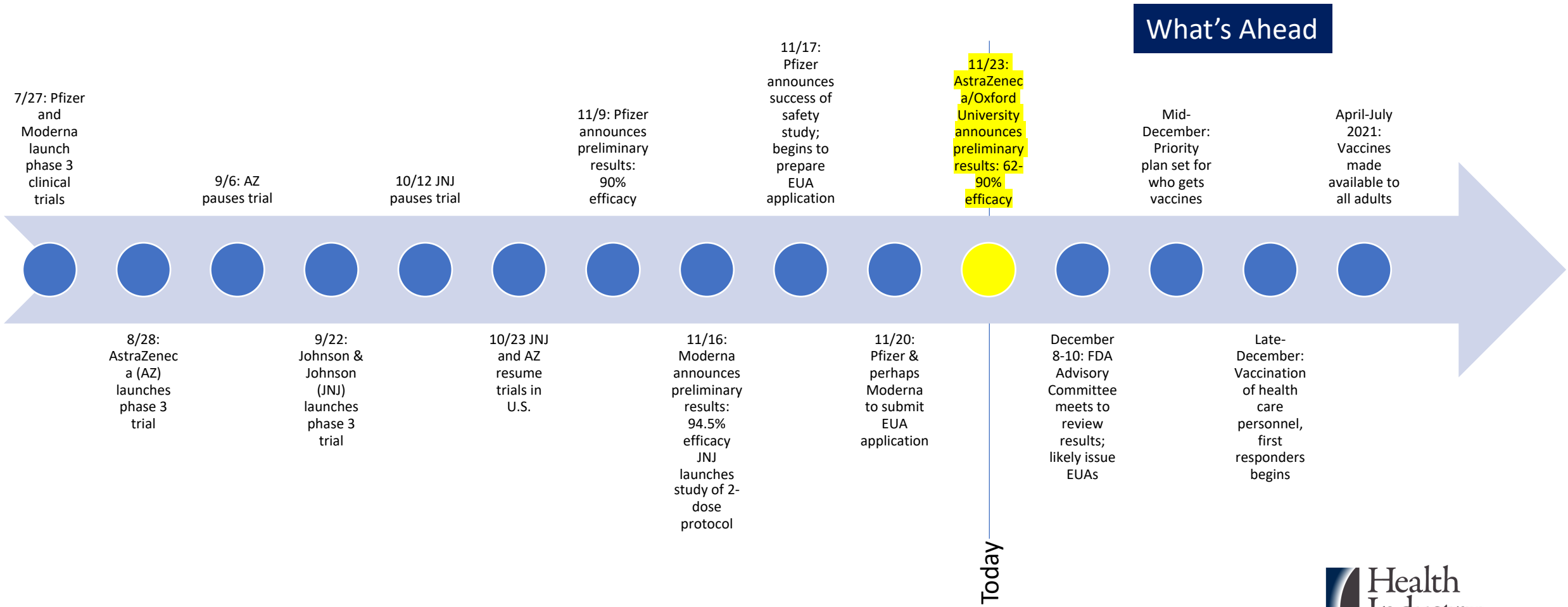
COVID-19 Report

Highlights

- **AstraZeneca and its partner, Oxford University released preliminary results of the Phase 3 clinical trial of their Covid-19 vaccine. Results show a 62-90% efficacy with this vaccine, depending on the dosage administered**. Unlike the Pfizer and Moderna gene-based vaccines, AstraZeneca's is a more traditional vaccine. As such, it does not require subzero temperatures during transportation and storage
  - It is like the others in requiring two doses
  - Curiously, the 62% efficacy came from a two full dose regimen; the 90% efficacy came from a half-dose initial administration, followed by a second, full-dose
- On Friday, **the FDA gave Emergency Use Authorization (EUA) to Regeneron for its antibody cocktail**. This is the first combination therapy approved by the FDA for use in treating Covid-19 patients. **Clinical studies showed statistically-significant results in treating mild-to-moderate Covid-19 infections** that were at high risk of progressing to severe hospitalization
- **For the first time since October 2, the 7-day new infection rate declined yesterday (very slightly). Coming on a weekend, however, it could easily be an artifact of weekend reporting practices**
- While new cases remain too high, we continue to be encouraged by the underlying trends in new cases in the U.S.: **for the twelfth consecutive day, the week-over-week change in new cases declined**
  - On November 10, this rate peaked at an alarming 41.2%
  - As of yesterday, this rate had declined to 12%
  - This pattern resembles what occurred in June/July; at that time, the pattern foretold an upcoming decline in new cases

- **Testing results are starting to provide additional support for a "turn" in the infection rate:**
  - Test volumes continue to establish new records on nearly a daily basis - yesterday marked the tenth consecutive day that a new high was established
  - **After increasing steadily since October 2, the test-positive rate has now declined four consecutive days**
  - Half of the U.S. states have seen test-positive rates decline week-over-week
  - **The rate of new cases detected per test - a measure of testing robustness and infection spread - has declined (i.e., improved) four consecutive days and five of the past six days**
- **Hospitals are under increasing strain from SARS-CoV-2 infections:**
  - **As of yesterday, 27% of all inpatients beds in the U.S. are occupied by Covid-19 patients**
  - **Nevada continues to face the greatest challenge, with 57% of its beds occupied by Covid-19 patients; Connecticut and New Mexico are just under 50%; Colorado, Illinois, Indiana, Michigan, Minnesota, Missouri, Rhode Island and Wisconsin are above 33%**
  - The % of these Covid-19 inpatients that are in the ICU or on a ventilator remains low compared to levels earlier in the pandemic; however, the % on ventilators has moved up slightly in the past few days
- Deaths with the coronavirus also continue to rise
  - **The 7-day average deaths with the coronavirus increased yesterday, for the twentieth consecutive day**
  - **Given the lag from case-detection to death and the continued increase in new cases, the death rate will likely continue to increase over the next few weeks**

Vaccine Timeline in the U.S

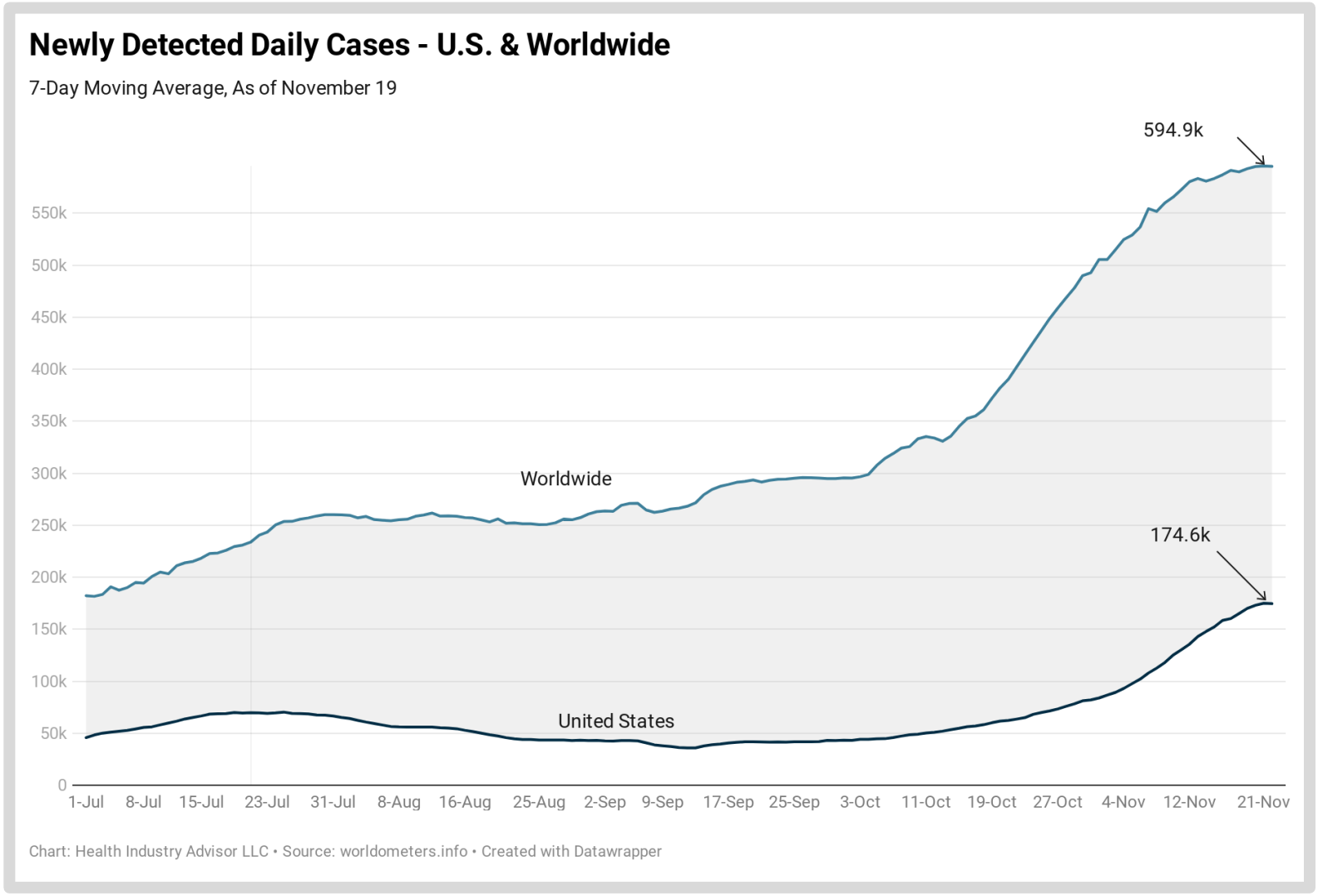


Health Industry Advisor, llc

Worldwide, we are experiencing ~595k new cases each day – note that newly-detected cases appear to be plateauing worldwide

The United States is averaging ~174.6k new cases each day

* - 7-day moving average basis

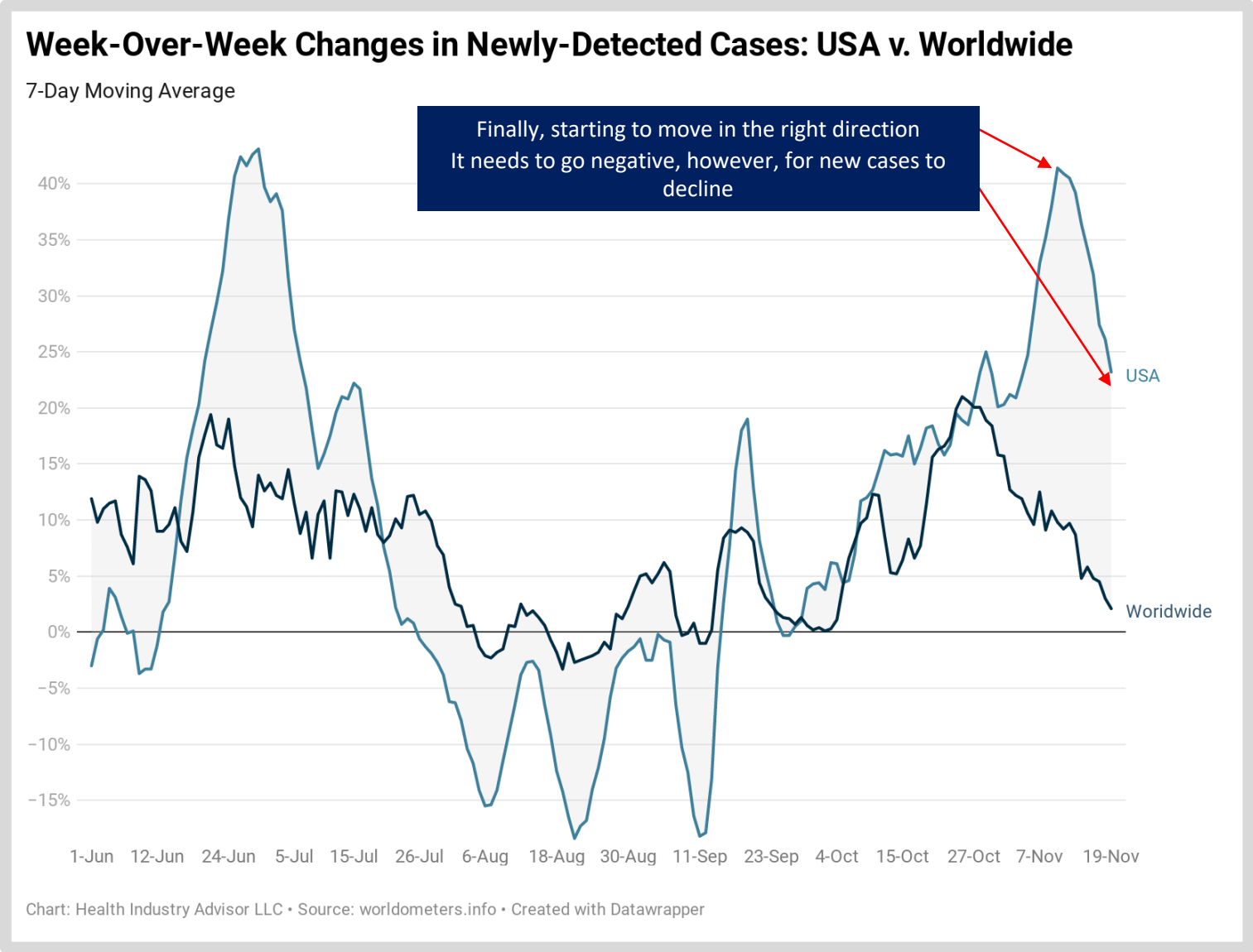


Health Industry Advisor, llc

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 three weeks, and approaching zero

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



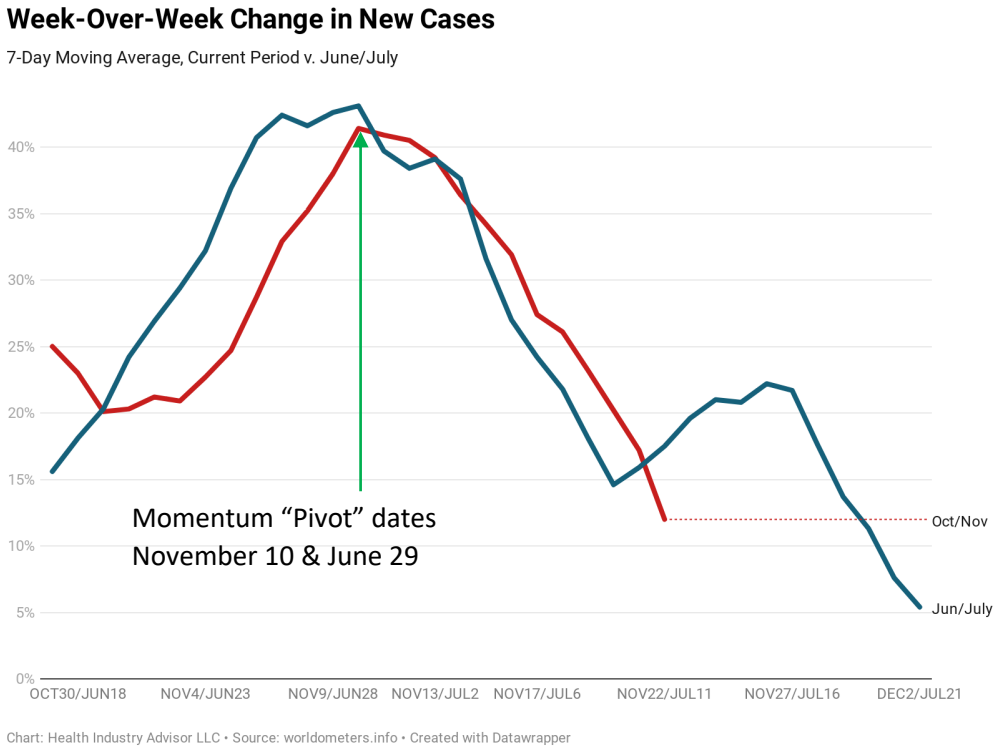
Health Industry Advisor, llc

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

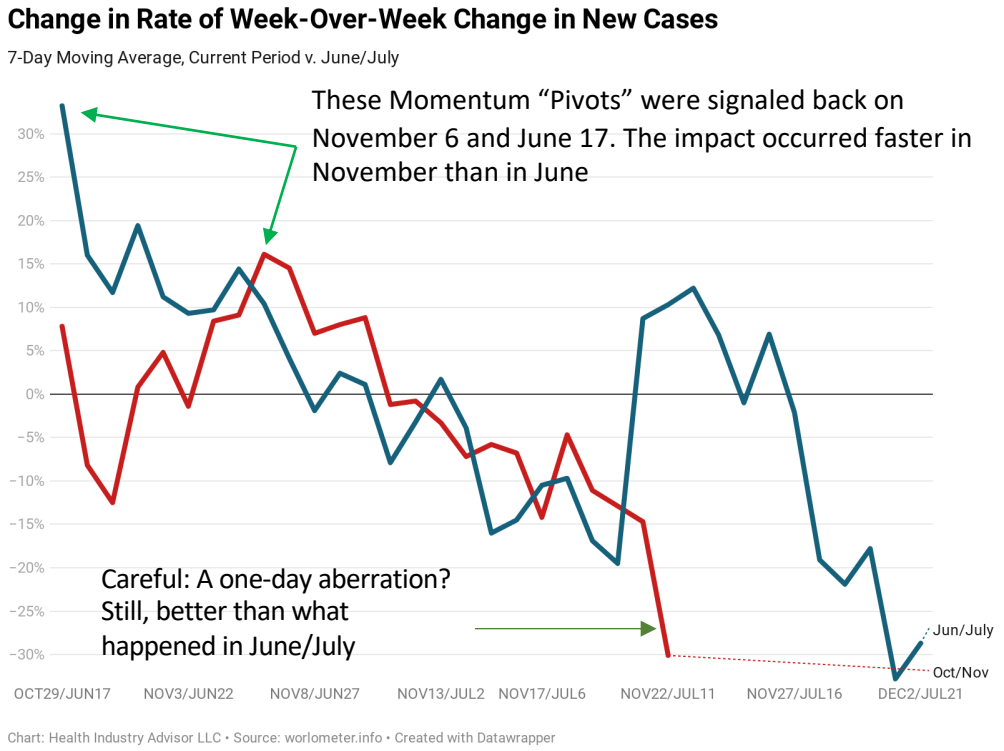
The pattern we are experiencing now parallels what we experienced in June/July. Note that the week-over-week change in new cases peaked above 40% in both periods, before declining precipitously

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



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



Another way of looking at the momentum:

Although new cases are continuing to rise, the underlying trends have turned favorable:

The week-over-week change in new case began to decline on November 11 (see ”A” on graph)

The rate of change in this factor began to decline on November 6 (see “B” on graph)

New Case Trends in the United States

Including "first" and "second derivative"

Is an easing in new cases in the near-term future?
The underlying trends provide a hint (however, there is a long-way to go yet)

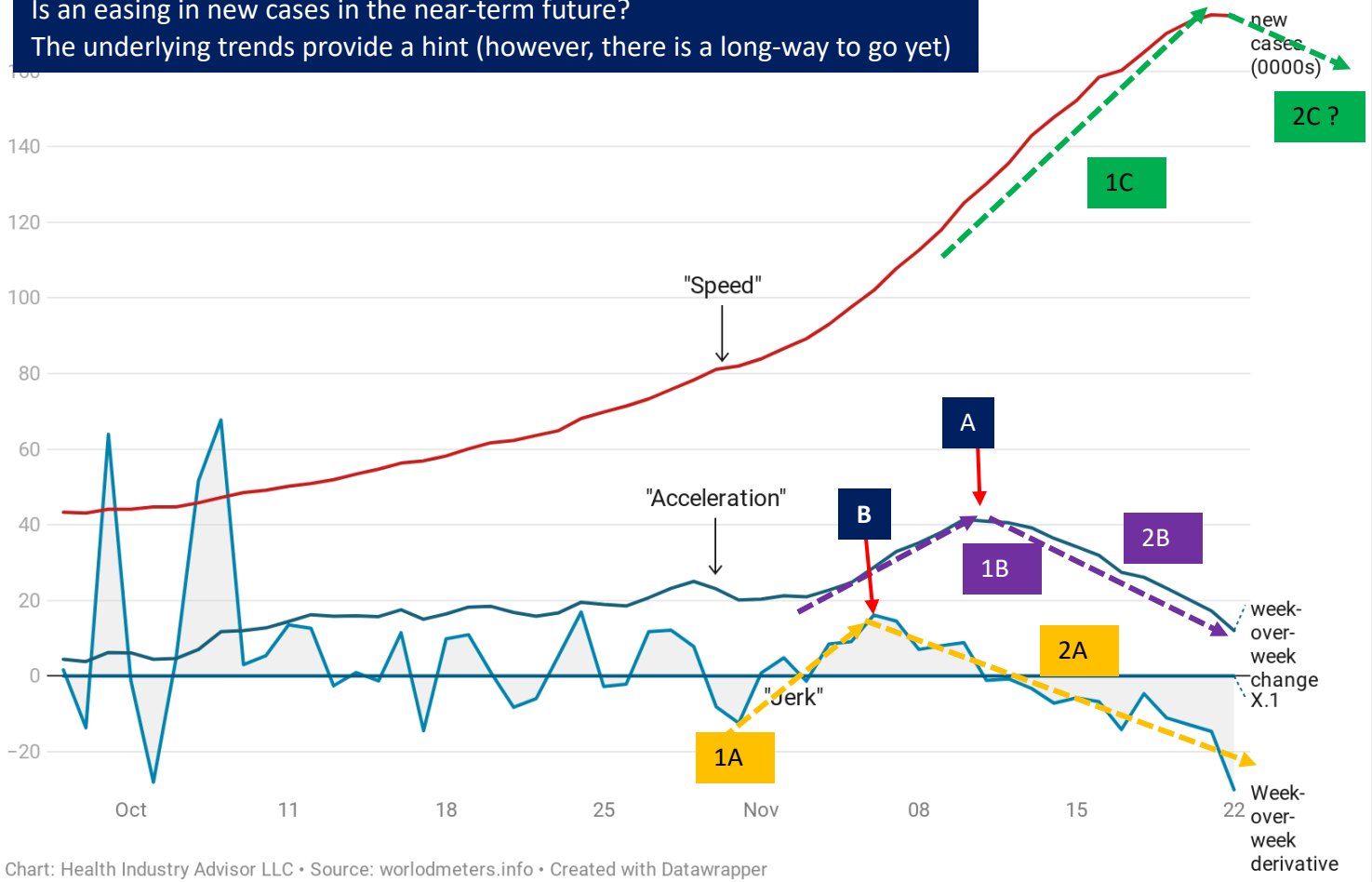
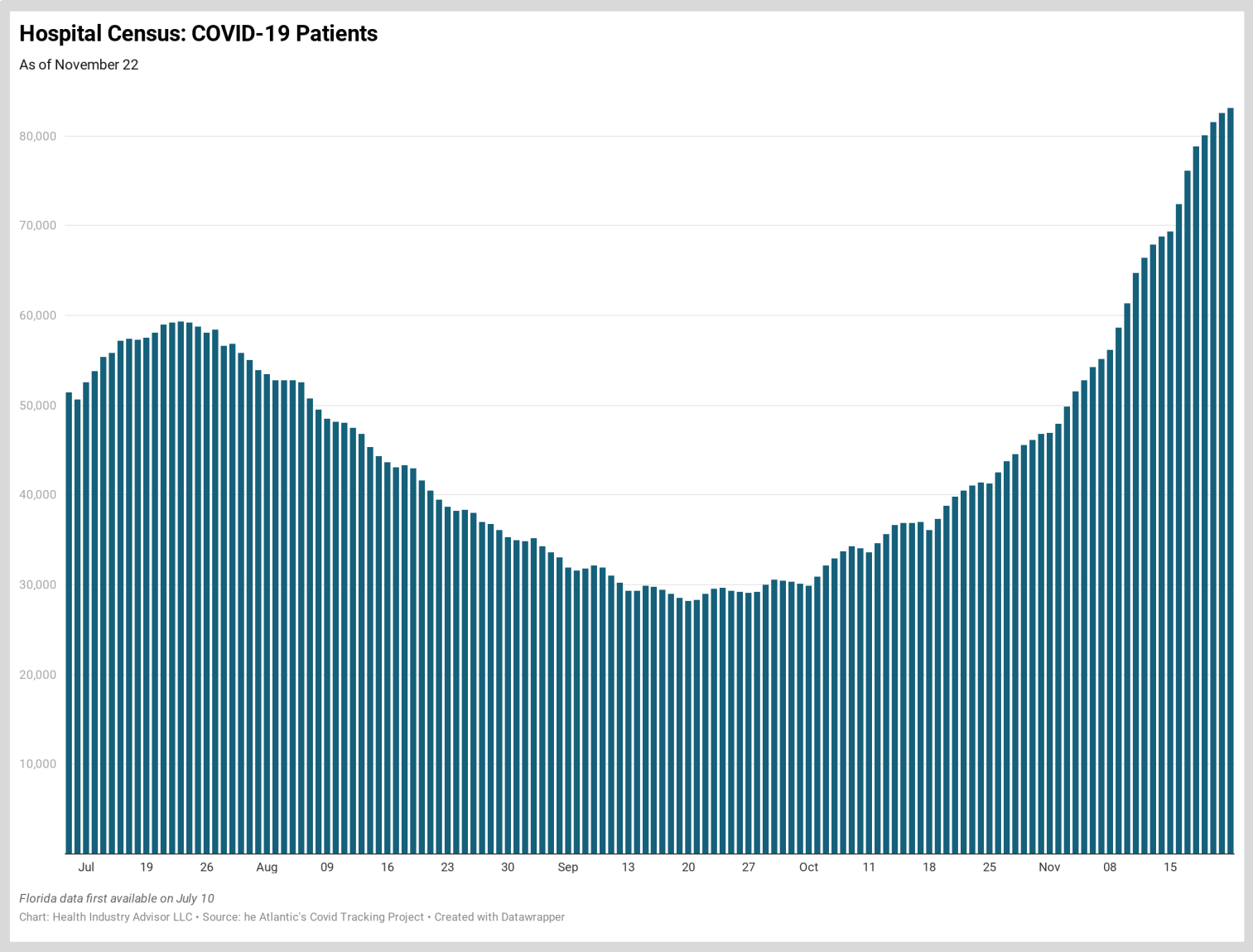


Chart: Health Industry Advisor LLC • Source: worlodmeters.info • Created with Datawrapper

Health Industry Advisor, llc

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



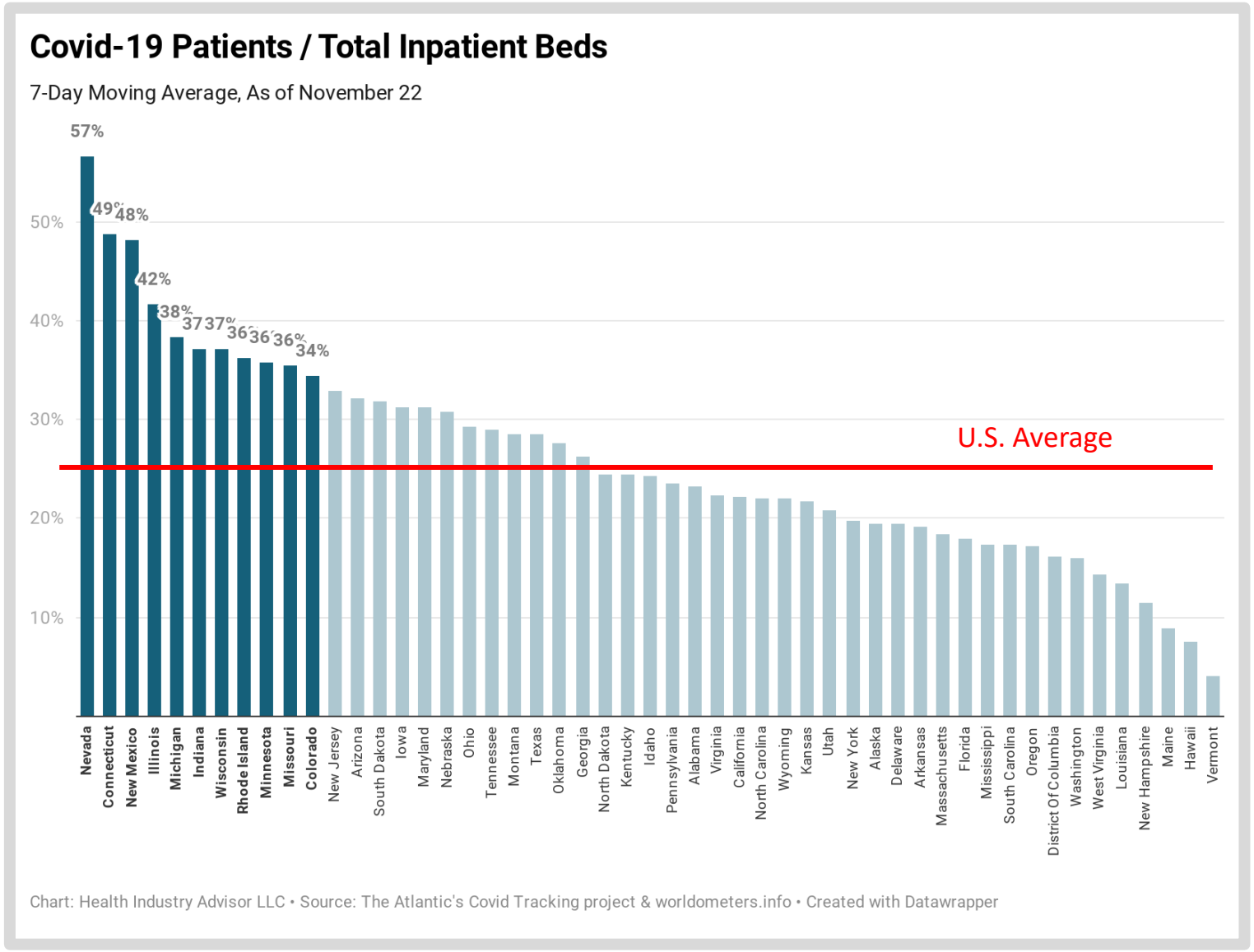
Health Industry Advisor, llc

In Nevada, 57% of all inpatient beds are occupied by Covid-19 patients

In Connecticut, Illinois and New Mexico, its more than 40%

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

For the U.S. overall, its 27%

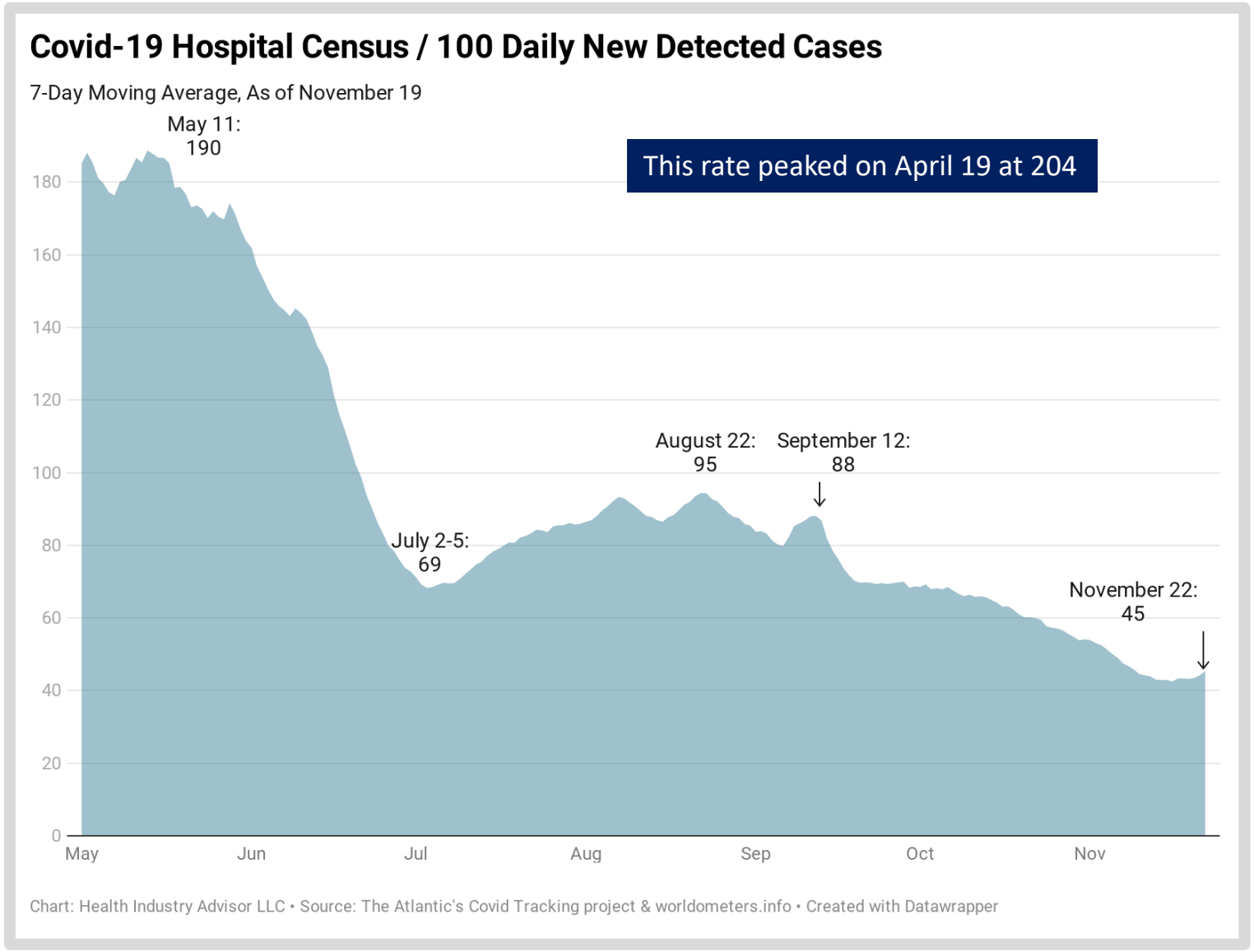


Health Industry Advisor, llc

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

The average Covid-19 census per 100 new cases increased slightly each of the past three days

Nevertheless, this rate has been reduced by nearly 1/2 since mid-September and by ¾ since mid-May



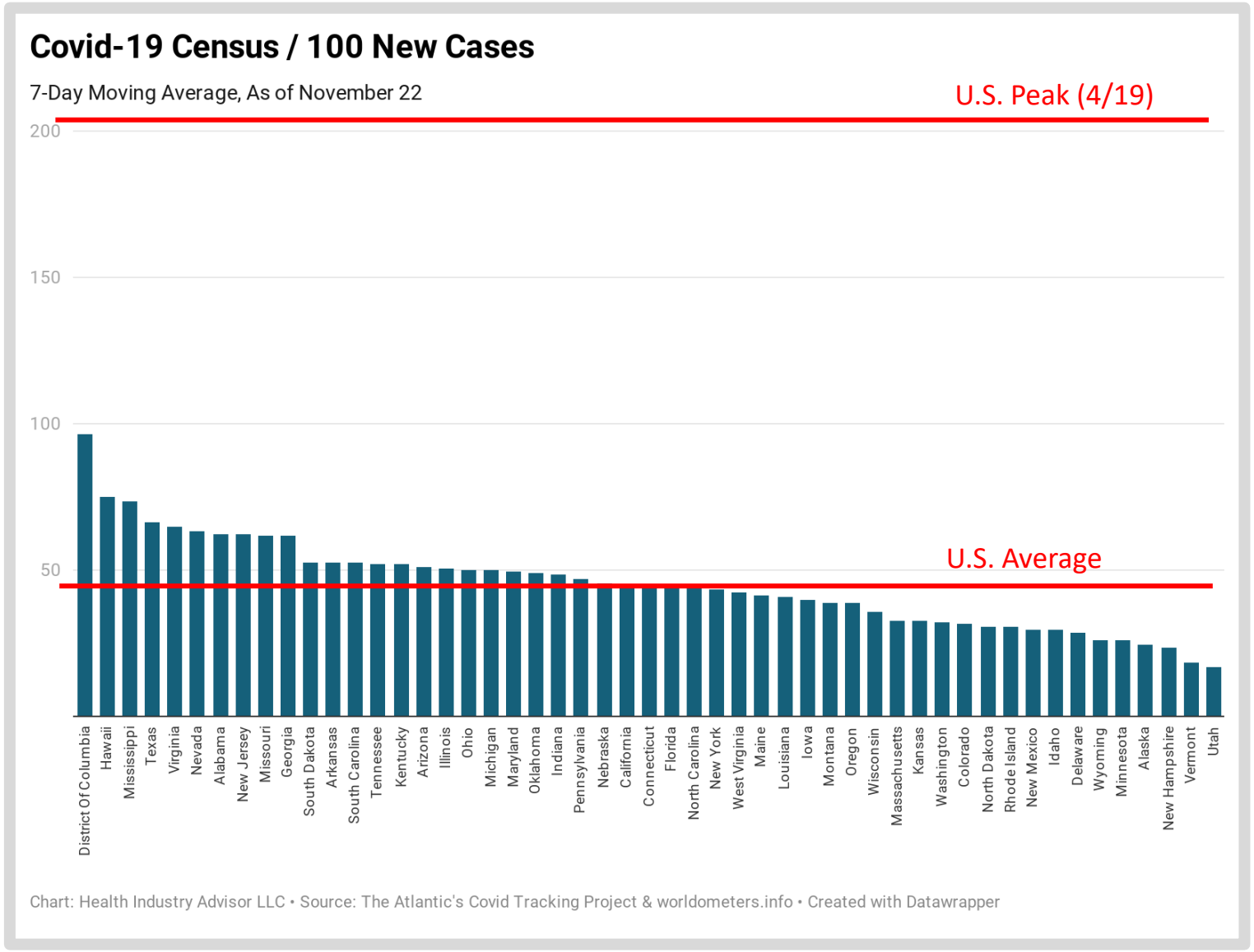
Health Industry Advisor, llc

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

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

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)



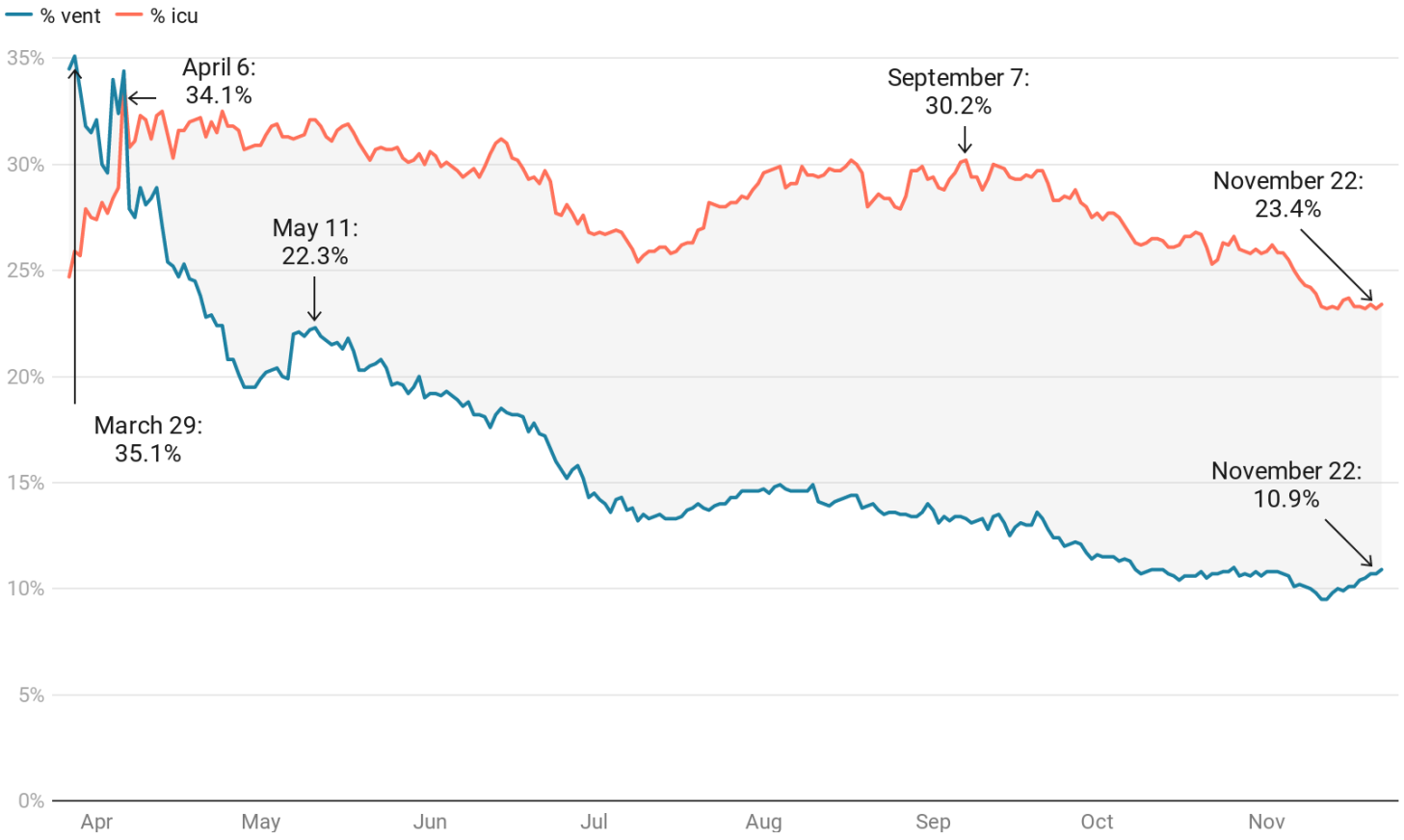
Health Industry Advisor, llc

The likelihood of a hospitalized Covid-19 patient would require ICU care has declined 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 recently

Severity of Hospitalized Patients

% of patients on ventilators and in the ICU, As of November 22



Health Industry Advisor LLC analysis

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

Health Industry Advisor, llc

The % of ER visits for COVID-19-like illnesses (CLI) has generally been increasing since late-October – with a slight easing 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 16

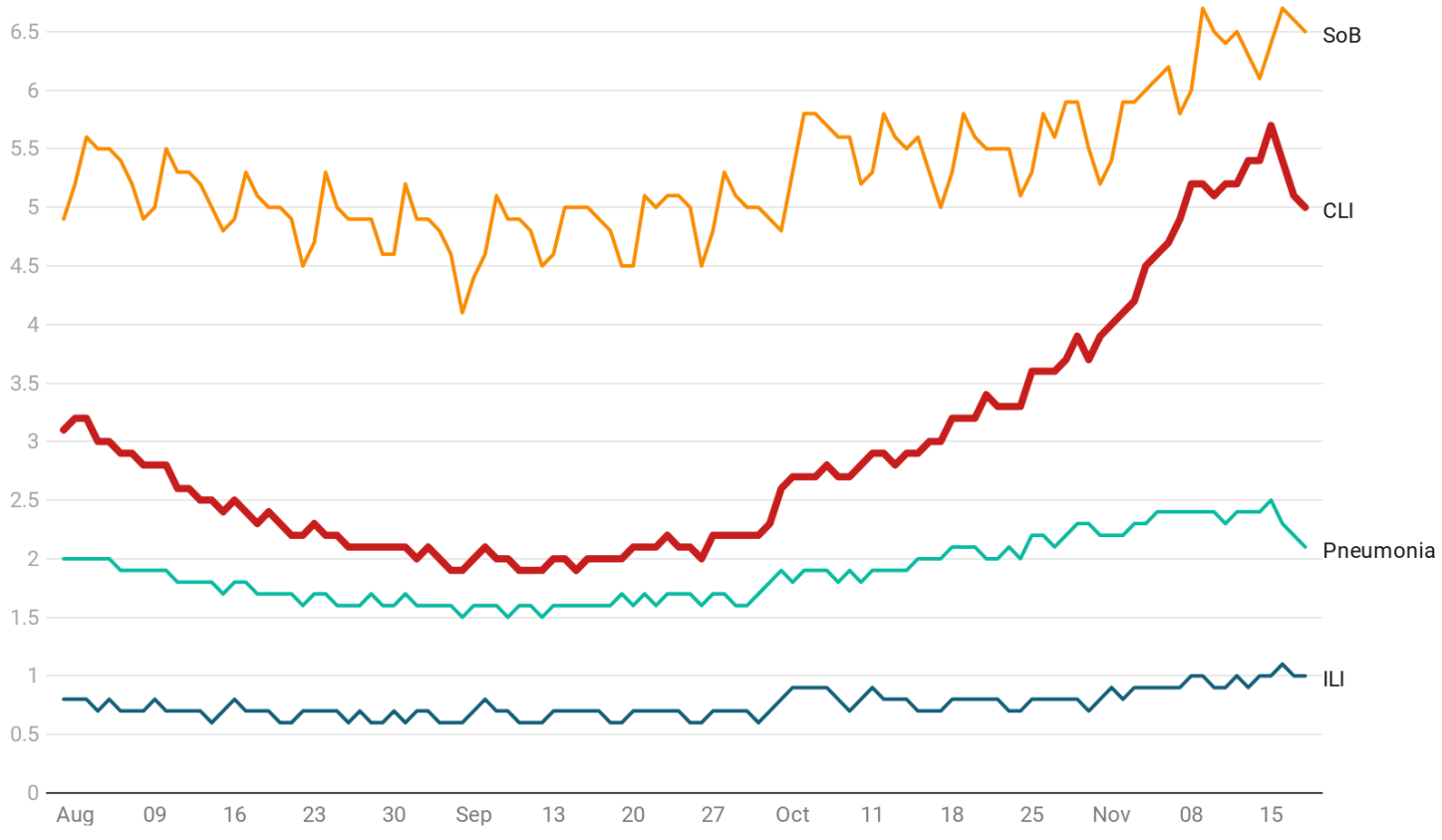


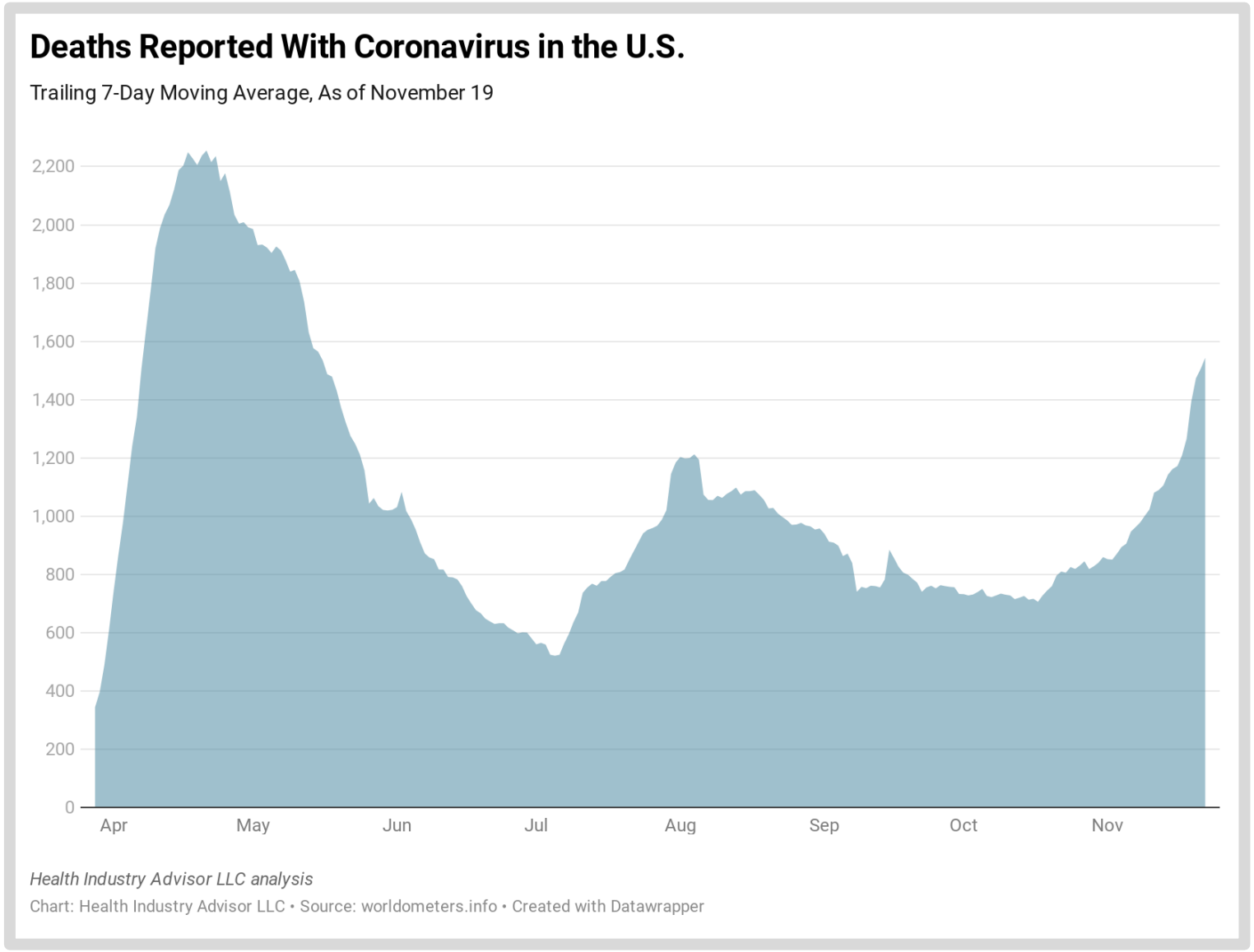
Chart: Health Industry Advisor LLC • Source: CDC • Created with Datawrapper

Health Industry Advisor, llc

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

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

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

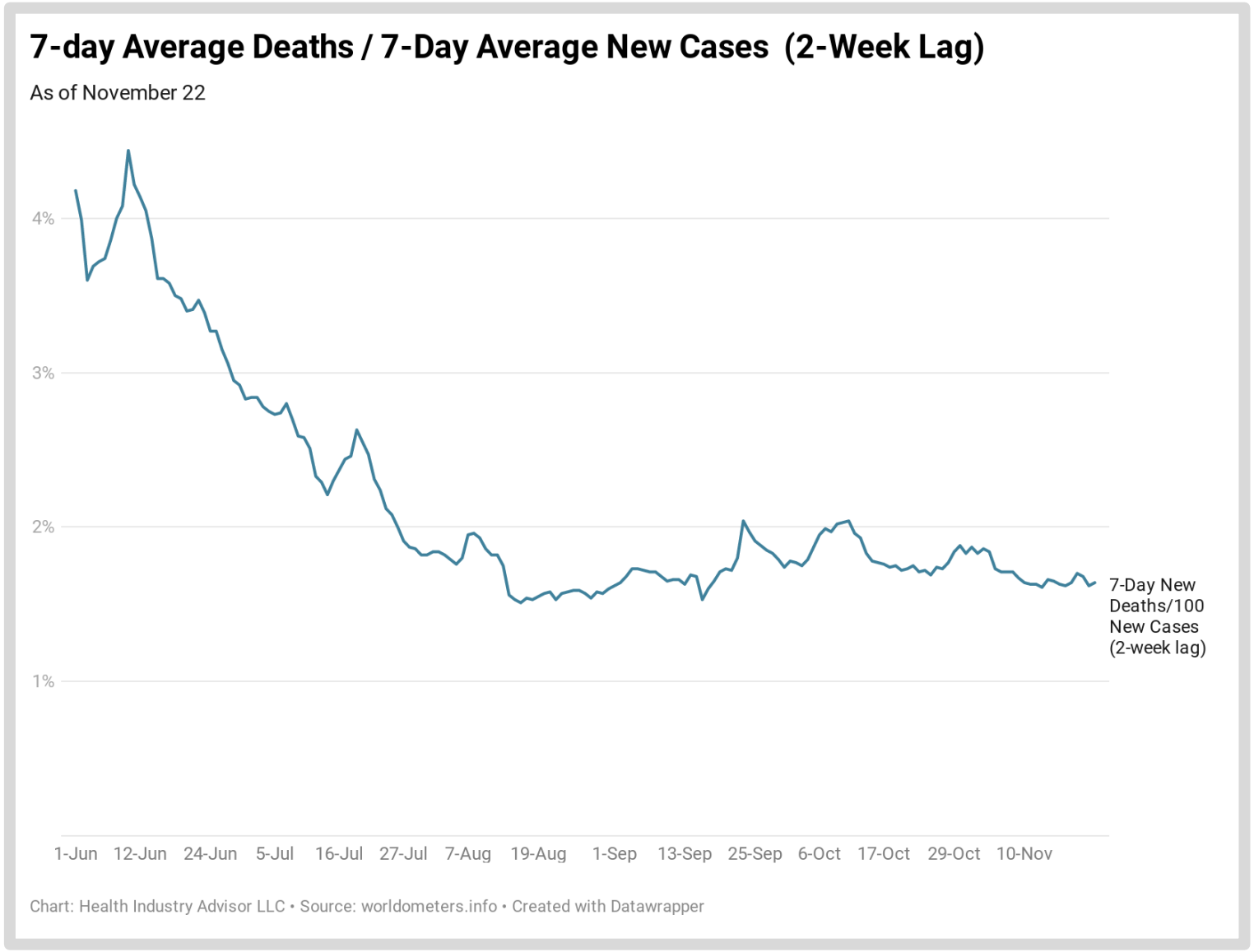


Health Industry Advisor, llc

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

This rate declined rapidly in July and August

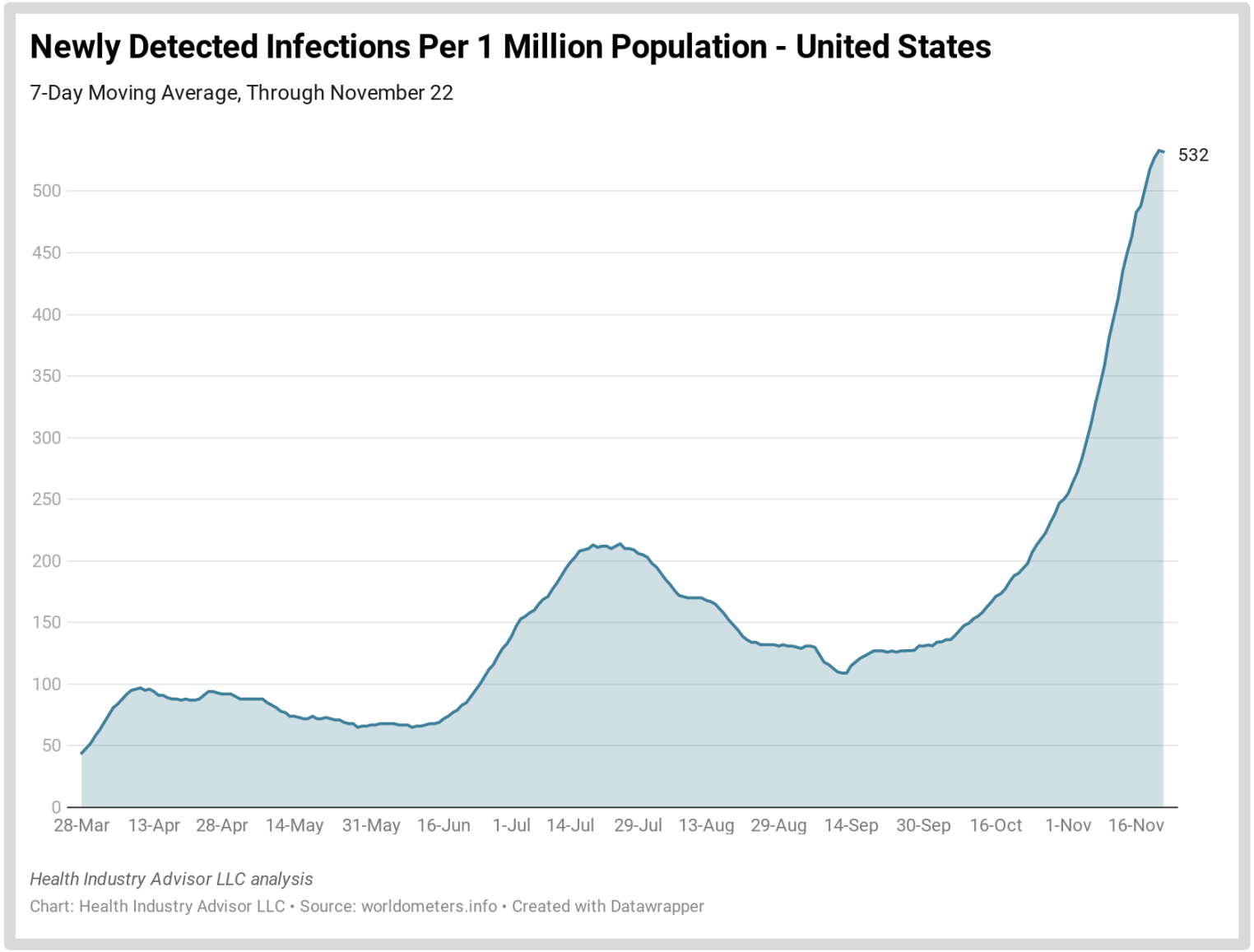
The current rate is lower than it was throughout October



Health Industry Advisor, llc

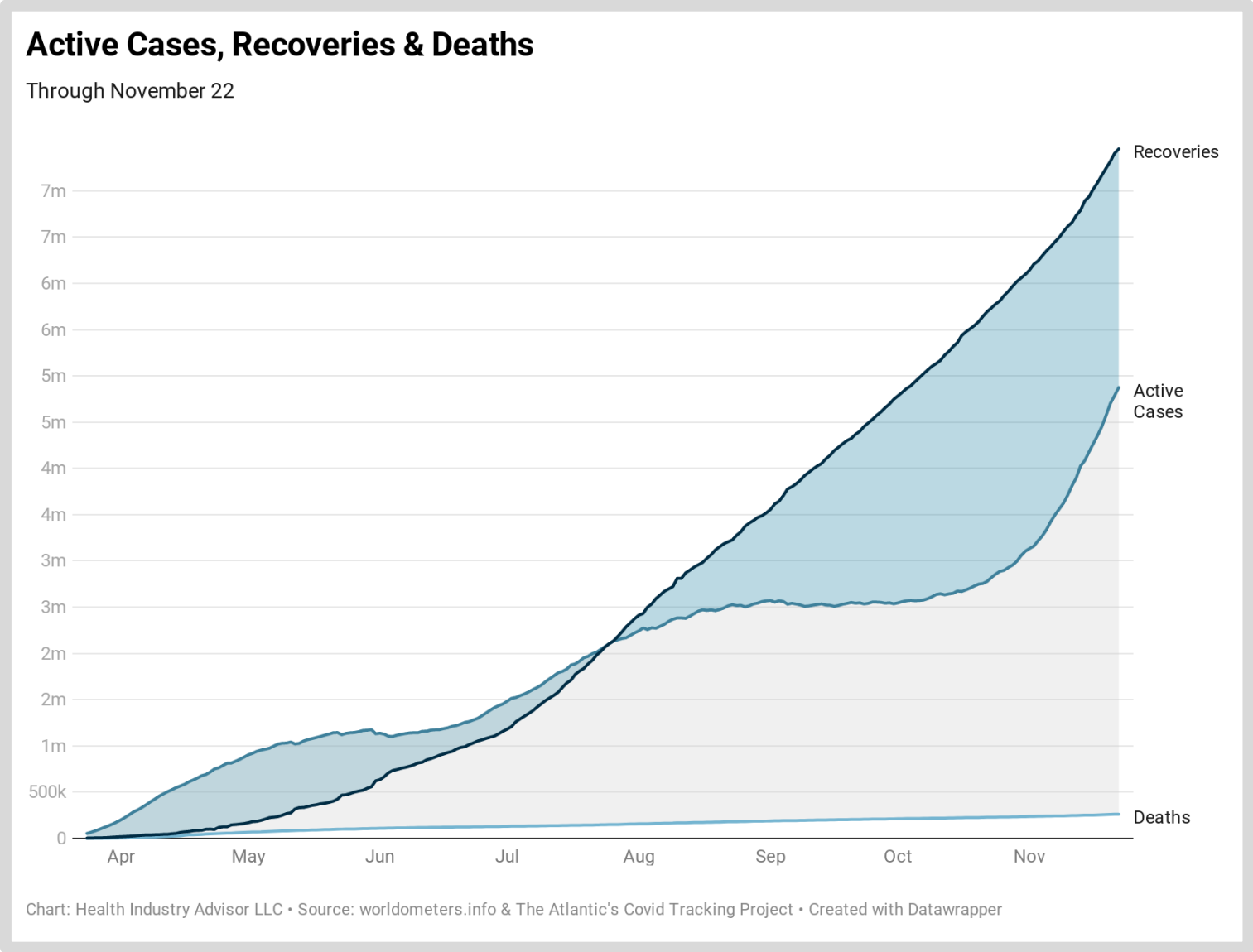
The rate of new infections per capita* in the U.S. actually declined slightly yesterday, it had risen every day since October 2

* - 7-day moving average basis



Recoveries from the virus continue to increase

Active cases have increased during the recent surge in new infections

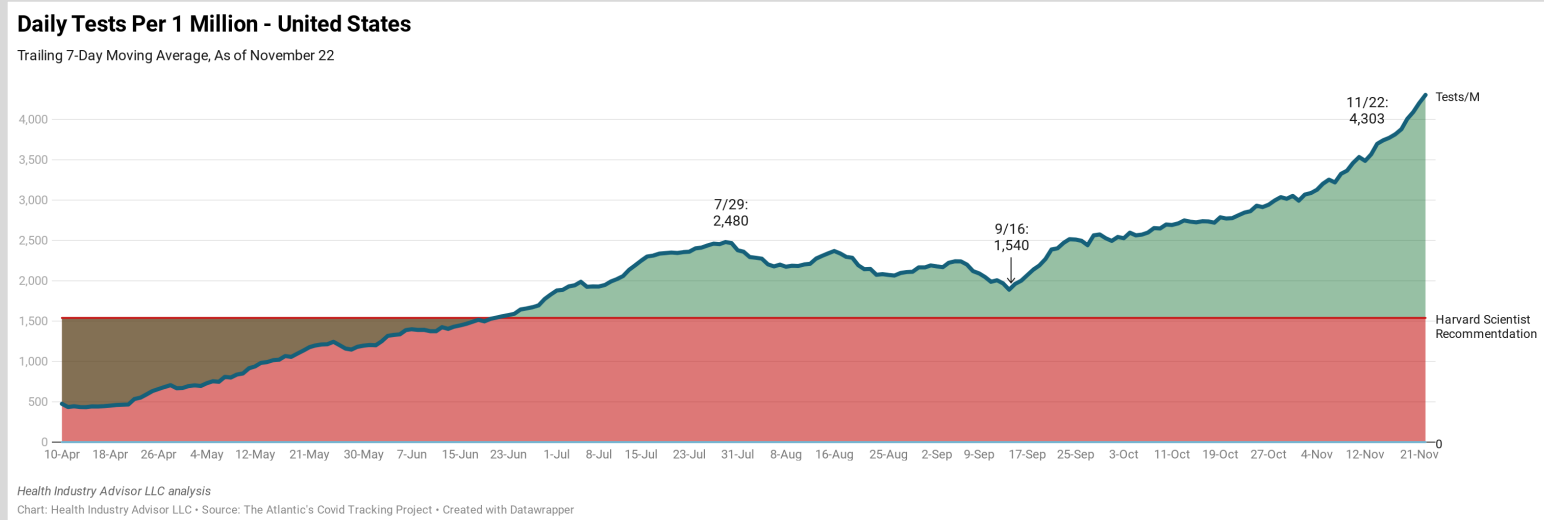


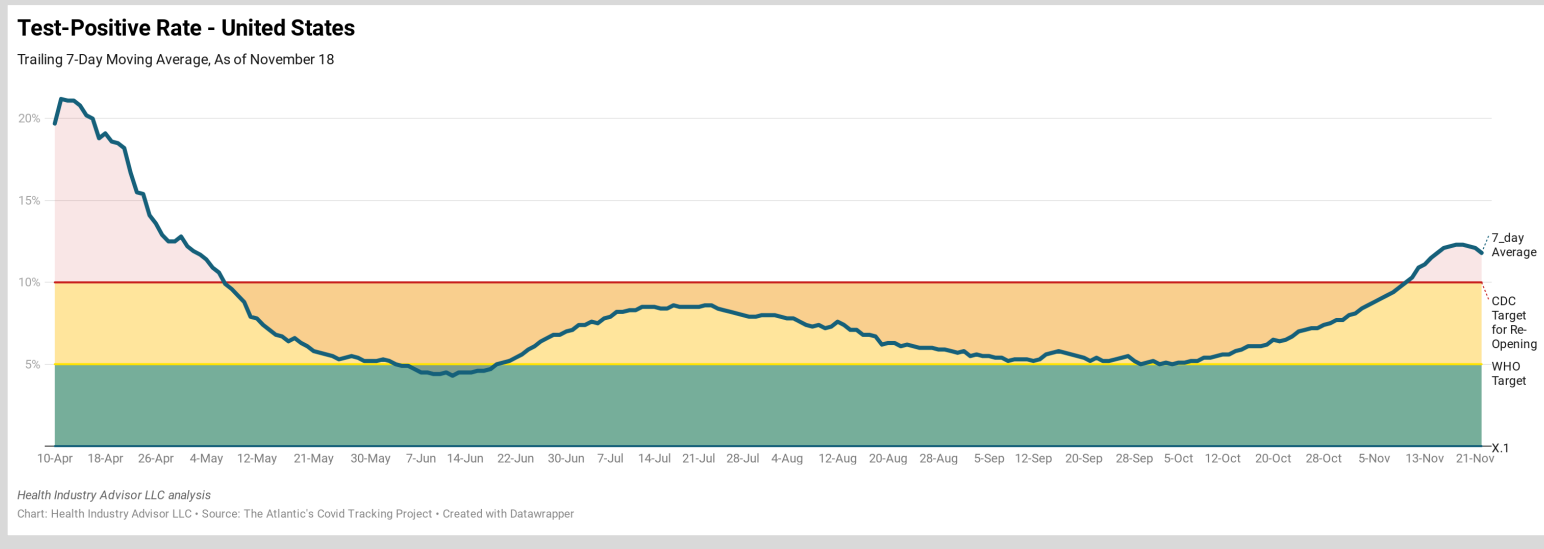
Health Industry Advisor, llc

The 7-day test volume has increased ten consecutive days

This rate exceeded 4,000 per million per day for the first time on Thursday; it had surpassed 3,000 just three weeks ago; it was 2,000 as recently as September 12

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

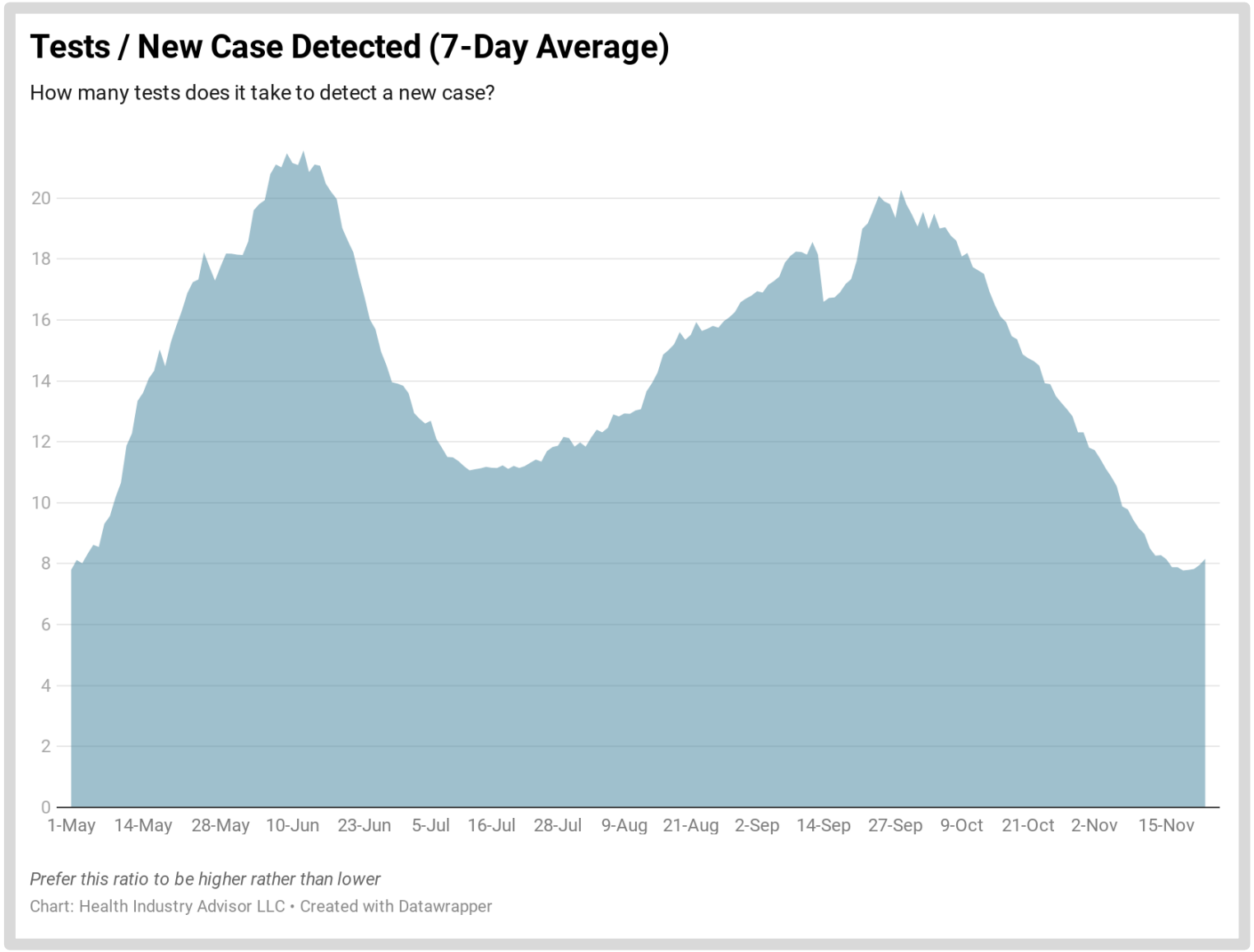




A measure of the effectiveness of testing is the ratio of tests performed to newly-detected cases

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 four consecutive days and five of the past six days



Health Industry Advisor, llc

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&region=United%20States&panel=mortality