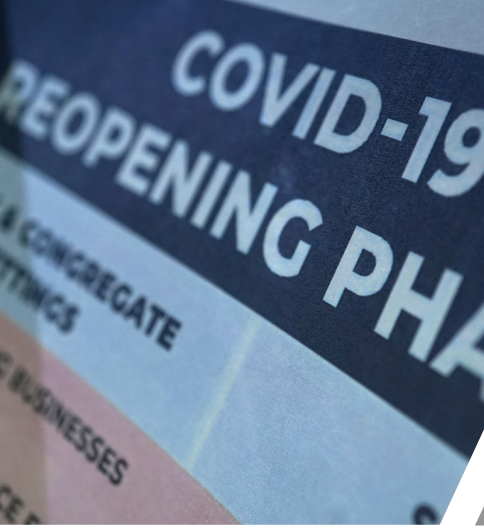

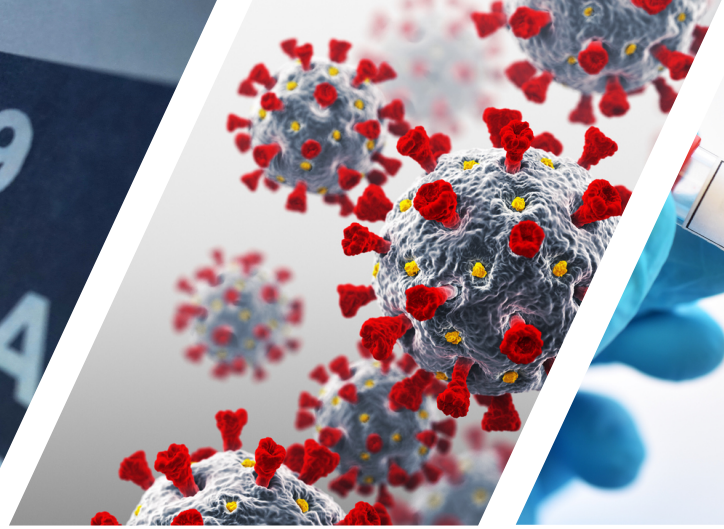

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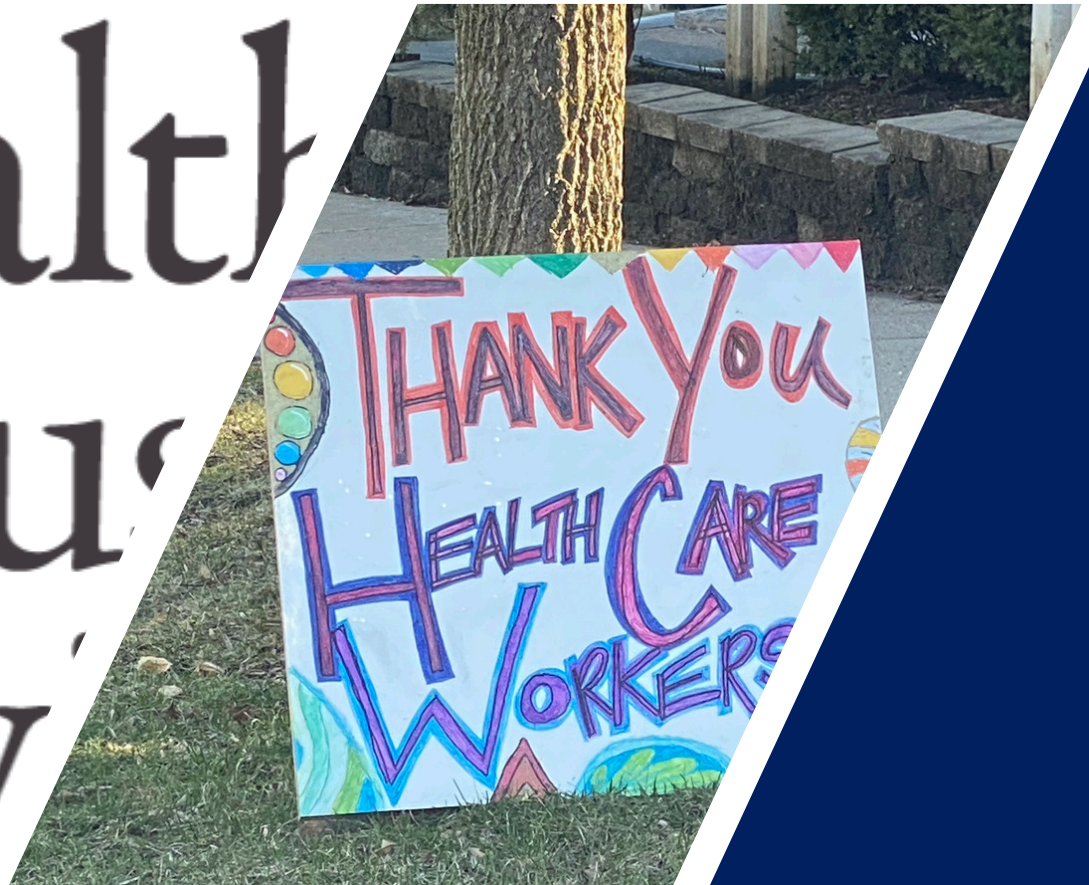


Issue # 222

Friday, November 27, 2020

COVID-19 Report

Highlights

- We provide a "single-frame" - a one-page overview of the anticipated vaccine rollout in the U.S. which could begin two weeks from today:
  - **The FDA advisory committee meeting on December 10 to review and approve one or more vaccines will be streamed live on the FDA's YouTube, Facebook and Twitter channels**
  - If approved, vaccine administration is expected to begin within 24 to 48 hours
  - **20 million Americans are expected to be vaccinated in December, another 25-30 million are to be vaccinated each month thereafter**
  - **The initial 6.4 million doses will be allocated to the states on a pro-rata basis of adult population. Each state will set its own priorities for who is to be vaccinated first; most states are expected to prioritize nursing home residents, health care workers and the elderly**
  - Vaccine distribution is being managed by the Department of Defense, led by Operation Warp Speed Chief Operating Officer, General Gus Perna and Chief Scientific Officer, Dr. Moncref Slaoui
  - The U.S. government has contracted with 60% of the pharmacies in the U.S. for initial vaccine administration; in addition to these pharmacies, vaccines with be administered at hospitals, nursing homes, physician offices, public health clinics and military treatment centers
  - For the seventh consecutive week, Lubbock, Texas - home to Texas Tech University - had the highest new infection rate among the thirty-three campus-based metro areas we follow. Story, Iowa (home of Iowa State University) and St. Joseph, Indiana (home of Note Dame) ranked 2nd and 3rd
  - Of these thirty-three areas, eleven experienced declines in this infection rate compared to a week earlier. Dane County, Wisconsin - home the the University of Wisconsin - showed the largest decline. Boone, Missouri (University of Missouri) and the aforementioned St. Joseph, Indiana also showed significant declines
  - **Among Large Central Metro Areas, Milwaukee, Wisconsin, Providence, Rhode Island and Salt Lake City, Utah reported the highest new infection rates for the seven days through Wednesday**
  - Among Large Fringe Metro Areas, the highest infection rates are concentrated in Illinois, Indiana, Minnesota and Wisconsin
  - **Week-over-week new infection rates have slowed dramatically in the U.S.: after peaking above 40% on November 10, this rate fell on fifteen consecutive days, dropping below 7% on Wednesday**
  - Testing continued to increase, especially as the holiday approached: Wednesday marked the thirteenth consecutive day of higher test volume; With this higher testing, the test-positive rate generally dropped - although it moved up slightly on Wednesday
  - **Covid-19 inpatient occupancy continues to be of concern: As of yesterday, 29% of all inpatient beds in the U.S. are occupied by Covid-19 patients. In Nevada, this rate is 64%**
  - **Deaths with the coronavirus also continue to of great concern : the 7-day average deaths increased for the twenty-third consecutive day on Wednesday.** This rate will likely continue to increase for at least another two weeks, given the continued increase in new cases and the time lag from case-detection to death

Goals

- Ensure safety and effectiveness of Covid-19 vaccines
- Reduce morbidity and mortality of Covid-19 trough effective and efficient distribution of Covid-19 vaccines
- Support rapid vaccine distribution based on CDC guidance for states immunizations services
- Assist with the return *to* pre-pandemic quality of life

Leadership

Chief Scientific Advisor
Dr. Moncref Slaoui

Chief Operating Officer
General Gus Perna

Early Vaccine Candidates (U.S.)

AstraZeneca

moderna

Johnson & Johnson

Pfizer

Distribution Challenges:

$$$$$
$200M allocated to-date
$6-8B needed

Racial & Ethnic Disparity

Providers: Where will vaccine be administered?

Training of Vaccine Administers

Cold Storage
Existing distribution based on childhood vaccination

Two Doses
Accelerated timeframe

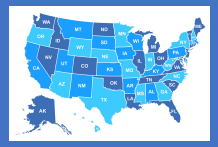
Rollout:

Phase 1
Limited dose supply
Prioritized recipients
Limited # of providers

Phase 2
Increased dose supply
More recipients
Additional providers

Phase 3
Sufficient dose supply
Available to all recipients
Routine vaccine providers

6.4M
Initial doses prorated to states based on adult population



40M
Doses expected to be available in December, sufficient for vaccinating 20M people

Initial priority groups

Nursing Homes

Healthcare Workers

Senior Citizens

Quick facts:

- The FDA advisory committee meeting to consider approving Pfizer's (and, perhaps Moderna's) will be streamed live on December 10
- Americans could begin receiving vaccinations as early as December 11 or 12
- 20 million Americans are expected to be vaccinated by the end of December; another 25-30 million should be vaccinated each month thereafter
- The U.S. government has partnered with 60% of U.S. pharmacies to provide vaccine access
- HHS and DOD have partnered with CVS and Walgreens to provide vaccines to long-term care facility residents with no out-of-pocket costs
- CDC has contracted with McKesson to support vaccine and related supply distribution
- Sufficient ancillary supply kits are already available to support 100 million Moderna doses and 20 million Pfizer doses

Providers

Where will vaccine be administered?

Pharmacies

Nursing Homes

Hospitals

Public Clinics

MD Offices & Mobile Clinics

Military Tx Centers

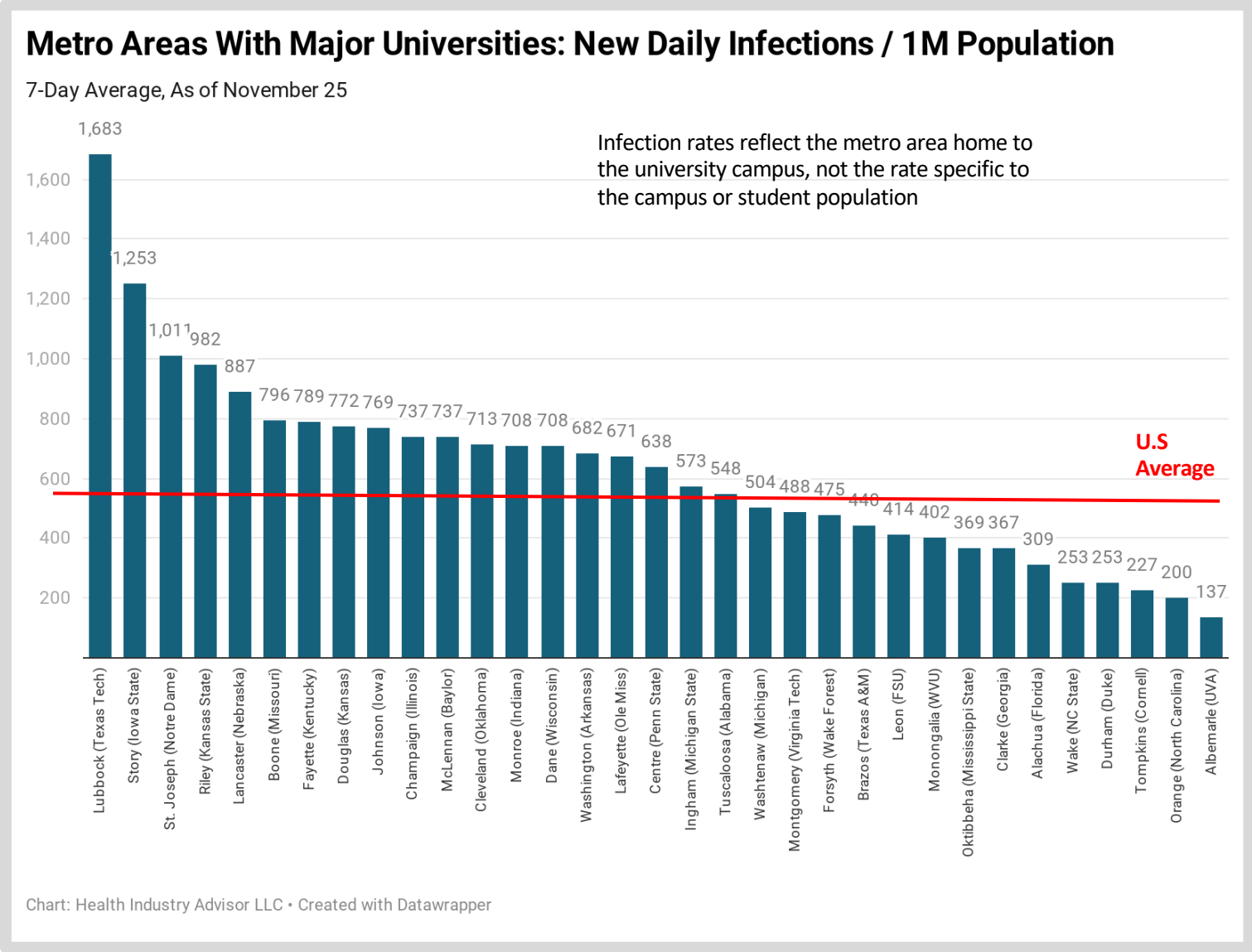
Metro Areas Home to Major Universities:

Of the 33 major areas in our sample, 19 are experiencing infection rates* higher the the national average one more than last week)

For at least the seventh consecutive week, Lubbock, Texas, home to Texas Tech University had the highest infection rate last week. Story, IA (Iowa State University); St. Joseph, IN (Notre Dame), and Riley, KS (Kansas State University) were next

Albemarle, VA (University of Virginia) and Orange, NC (University of North Carolina) experienced the lowest rates

* 7-day average



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Metro Areas Home to Major Universities:

Dane County, Wisconsin – home to the University of Wisconsin experienced the largest decline in its new infection rate relative to last week, followed by Boone Country, Missouri (University of Missouri) and St Josephs Cunty, Indiana (University of Notre Dame)

Riley, Kansas, home to Kansas State University experienced the most significant increase in this rate, followed by Cleveland, Oklahoma (University of Oklahoma)

* 7-day average

Metro Areas With Major Universities: Week-Over-Week Change In New Daily Infections / 1M Population

7-Day Average, November 25 v. November 18

Infection rates reflect the metro area home to the university campus, not the rate specific to the campus or student population

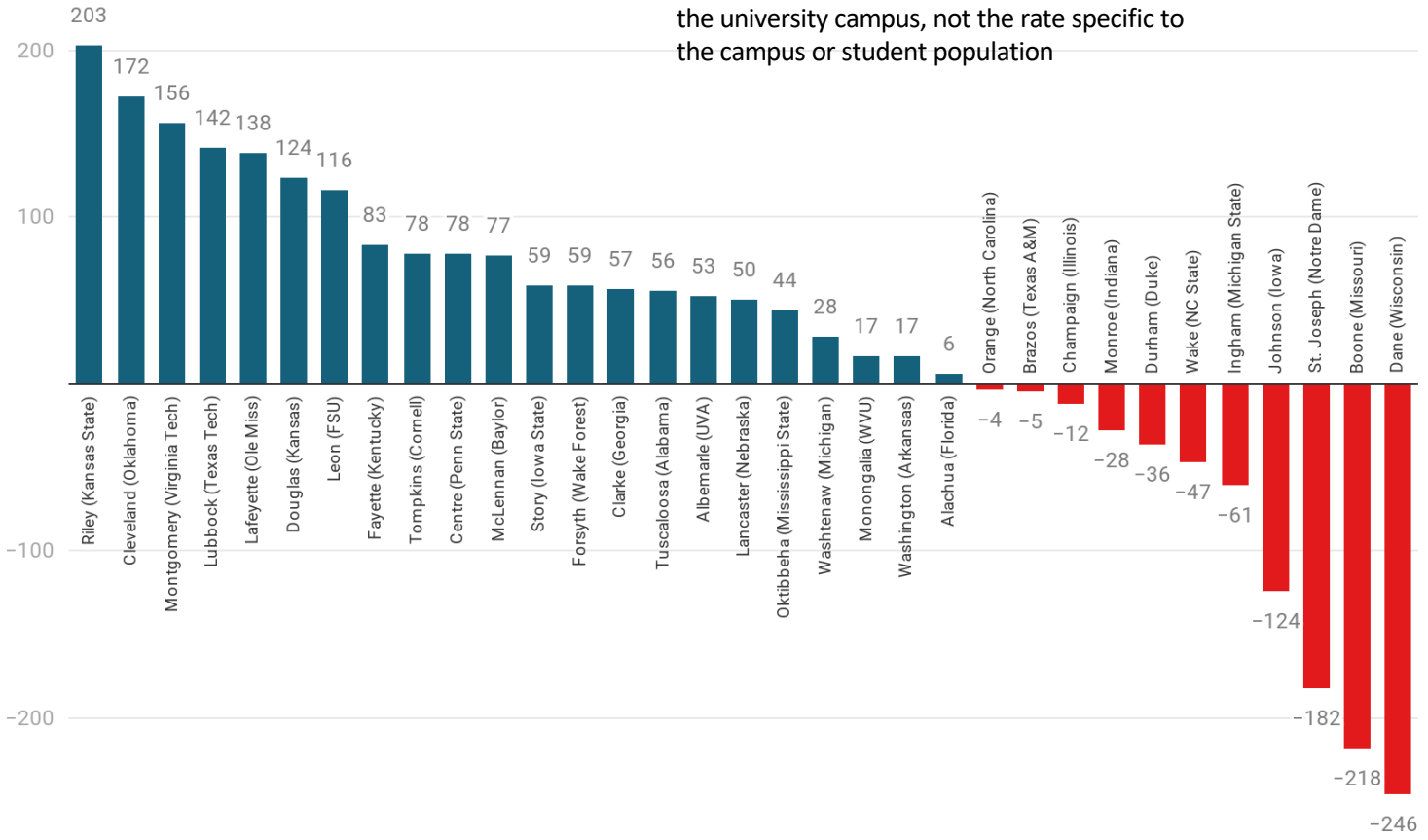

Chart: Health Industry Advisor LLC • Created with Datawrapper

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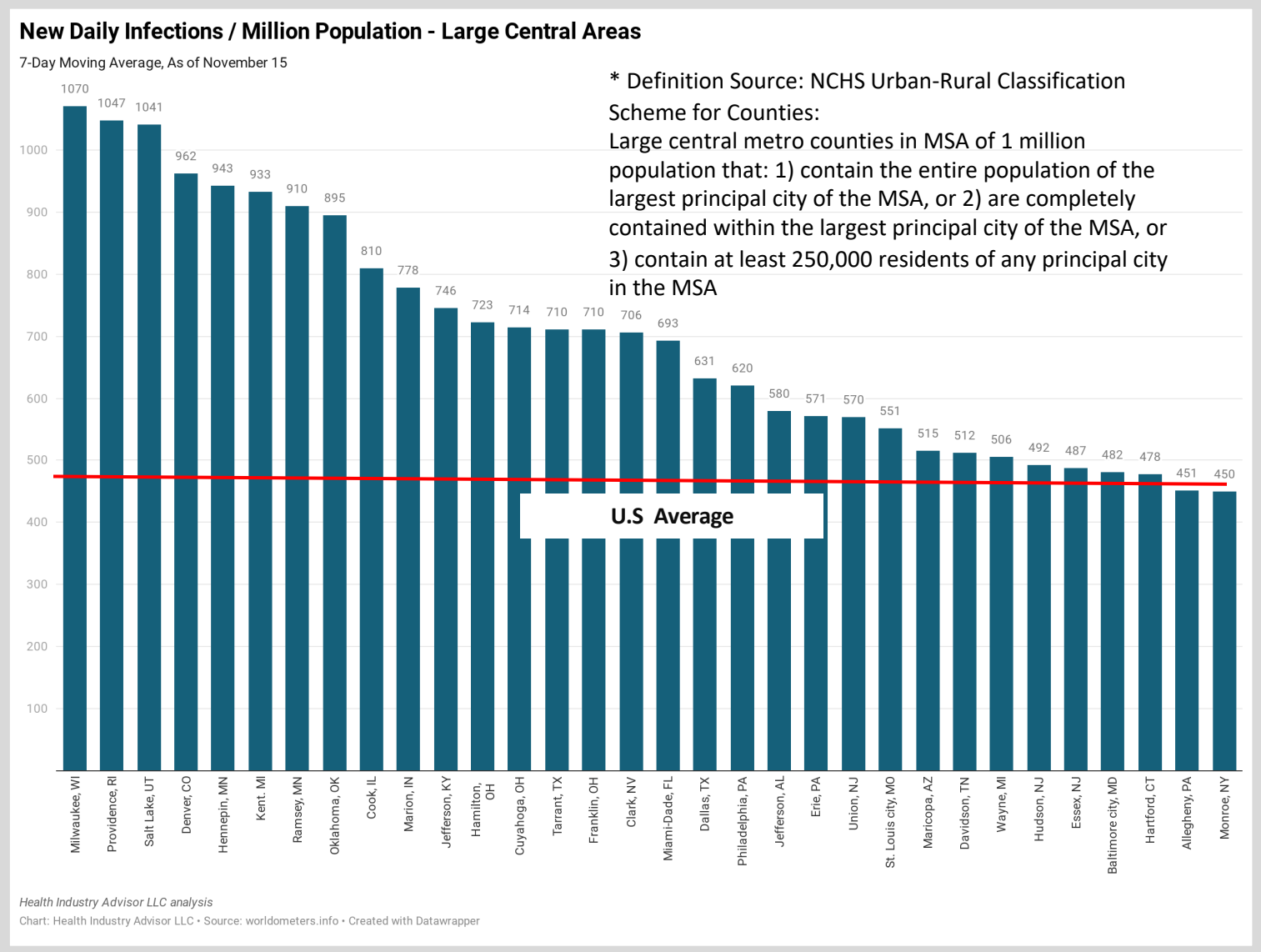
Thirty-two Large Central Metro Areas* (out of 64) experienced new daily infections per capita > 450 per million over the past seven days

Milwaukee, WI experienced the highest infection rate over the past seven days, followed by Providence, RI, Salt Lake City and Denver



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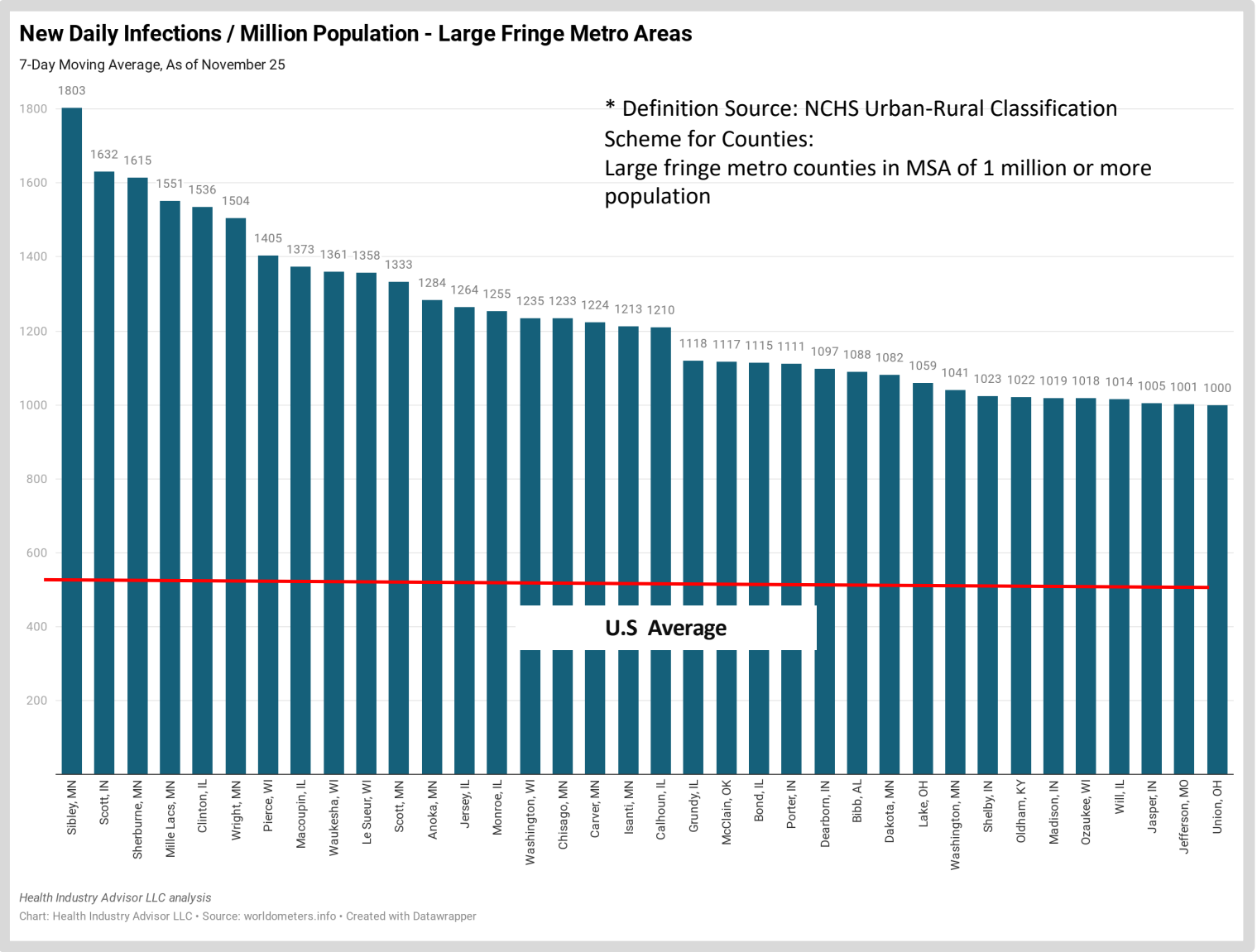
Thirty-six Large Fringe Metro Areas* (of 367) experienced new daily infections per capita > 1000 per million over the past seven days

These were highly concentrated in the Midwest and in Illinois, Minnesota and Wisconsin in particular



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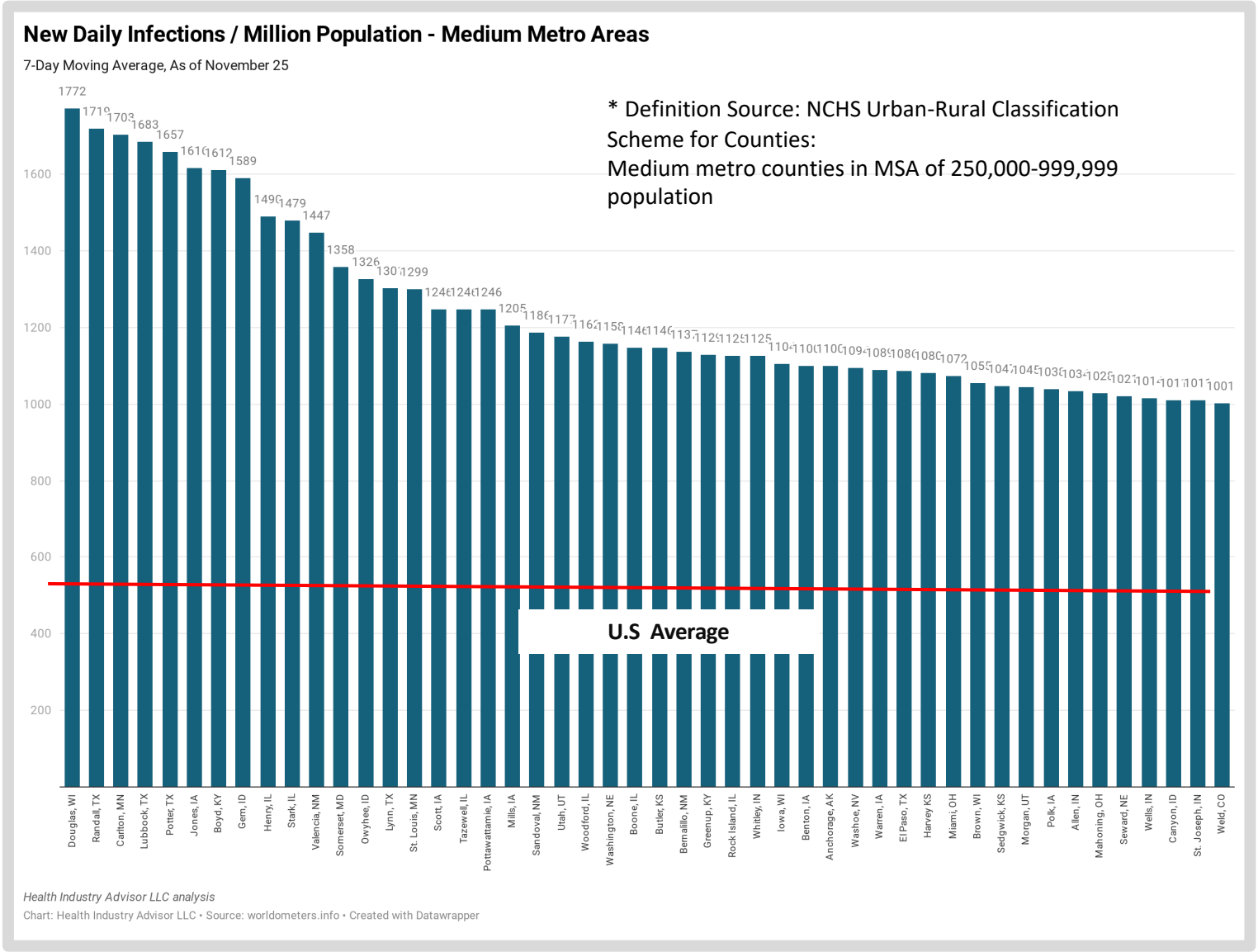
Forty-eight Medium Metro Areas* (of 368) experienced new daily infections per capita > 1000 per million over the past seven days



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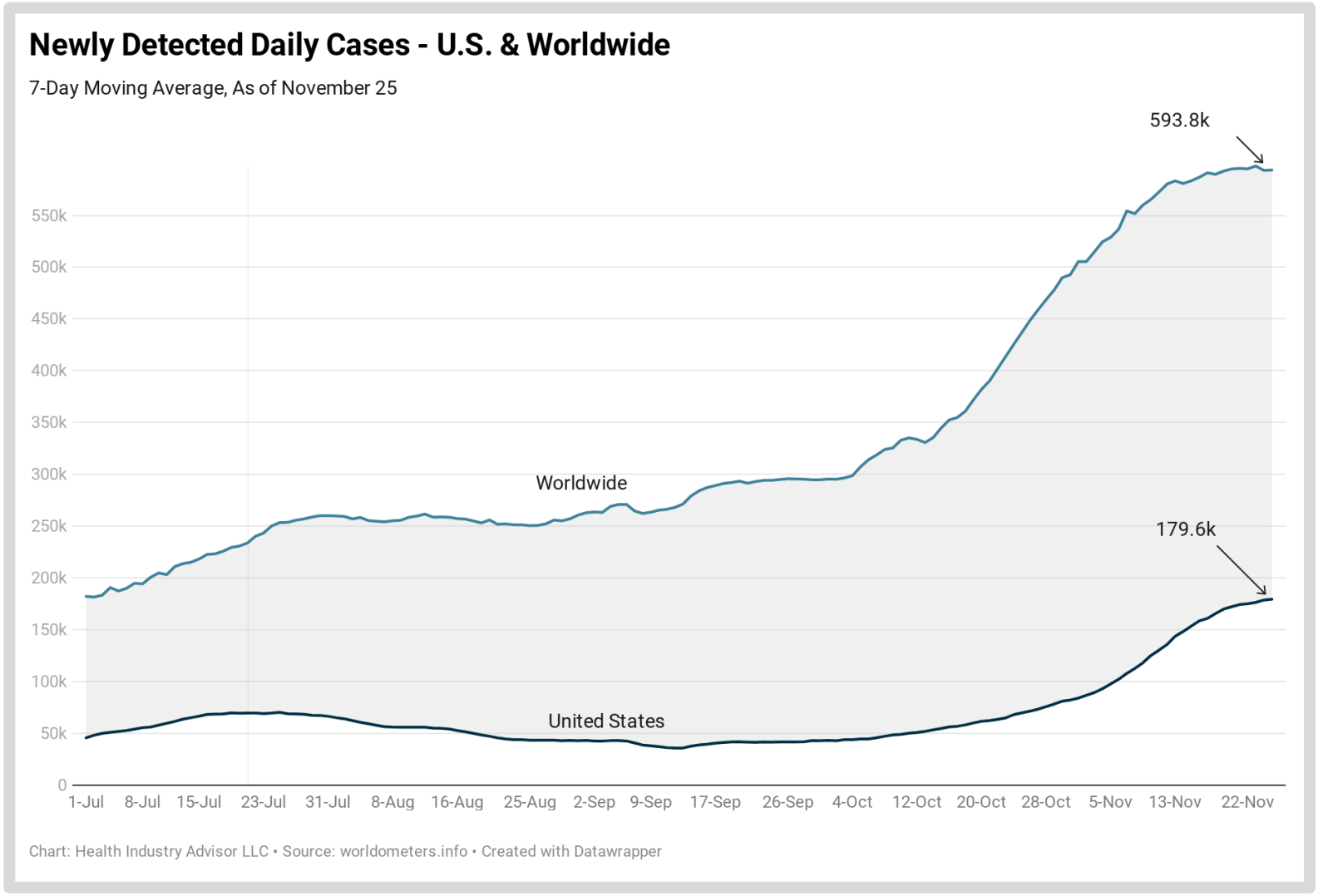
On a 7-day moving average basis, new cases worldwide are plateauing worldwide and nearing plateau in the U.S.

There were ~594k new cases worldwide each day, as of Wednesday

The United States is averaging ~179.6k new cases each day

* - 7-day moving average basis



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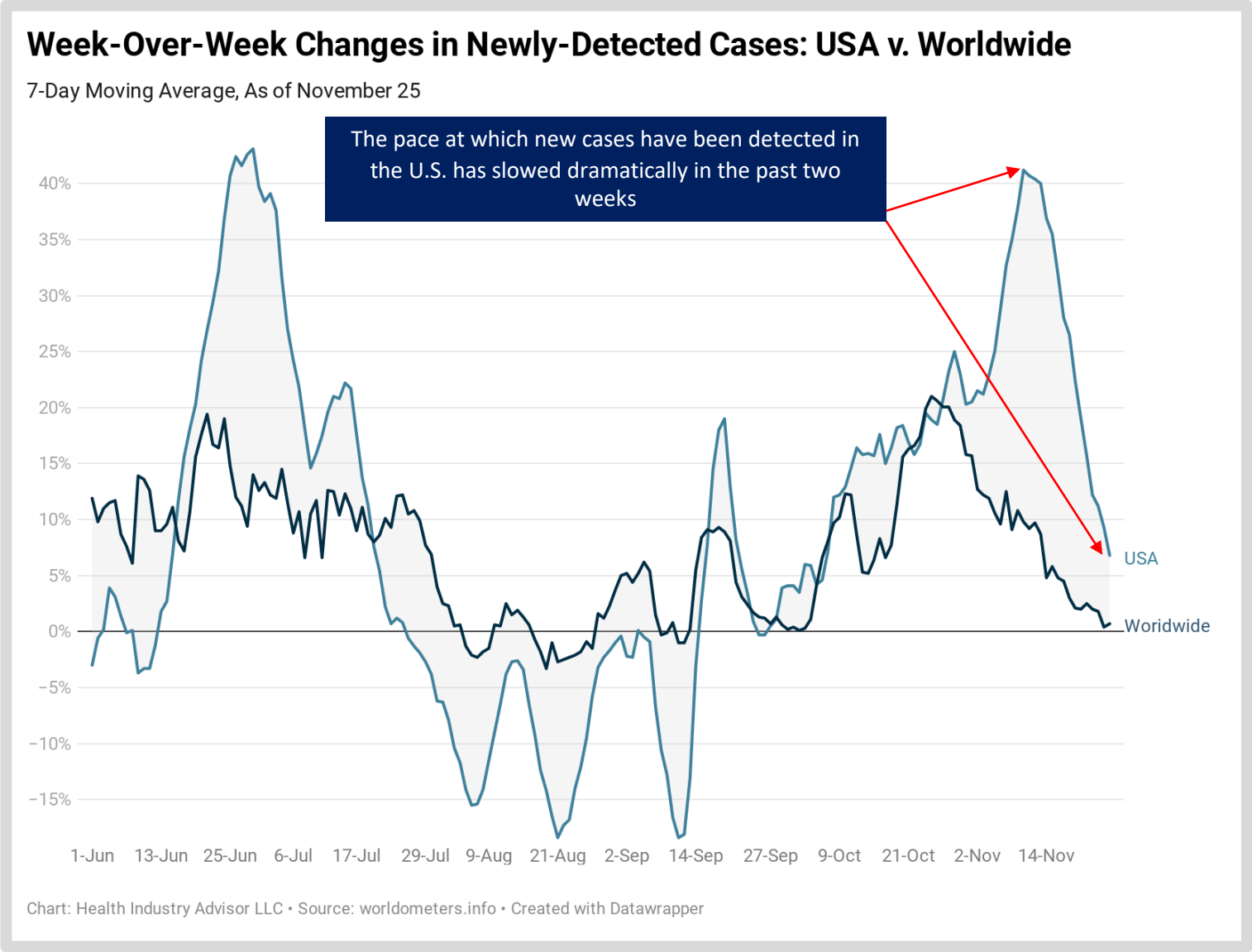
Although new cases continue to increase in the U.S. and worldwide, the rate of increase has been easing:

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 fifteen consecutive days



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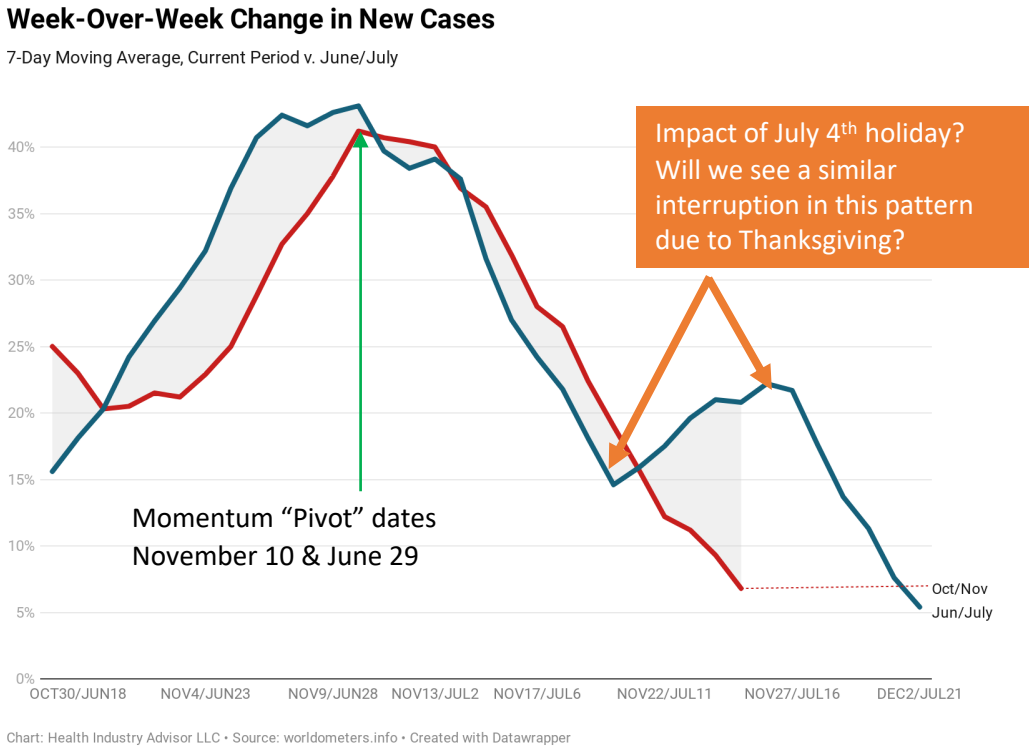
Momentum Charts – New Cases in the U.S.:

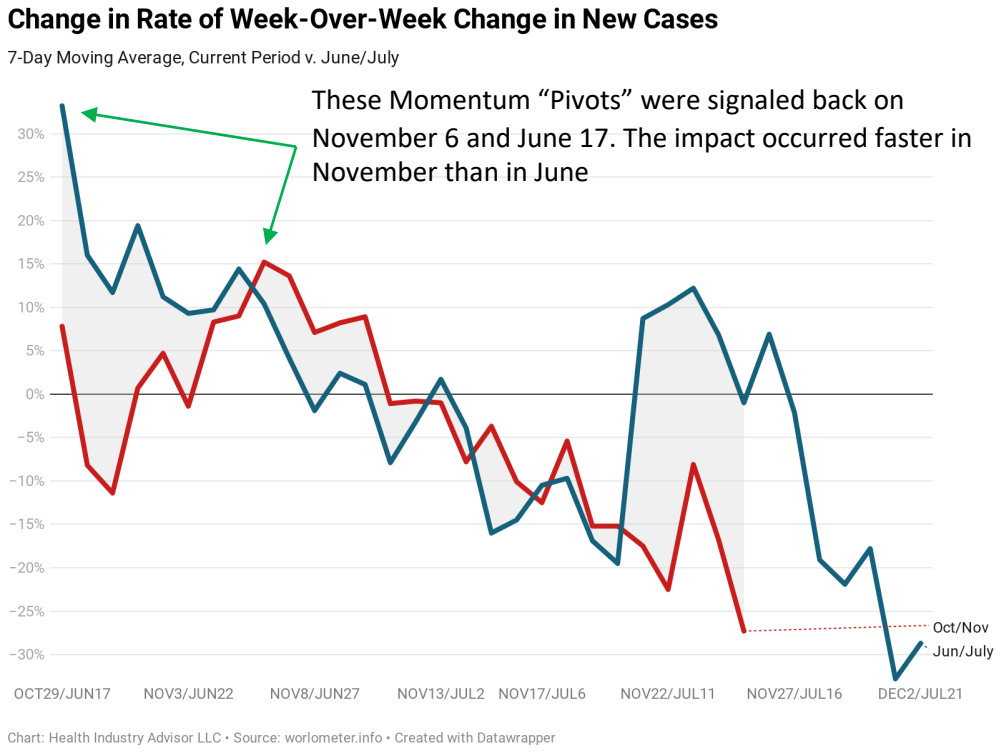
The pattern we are experiencing now parallels what we experienced in June/July. Note that the week-over-week change in new cases peaked above 40% in both periods, before declining precipitously

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



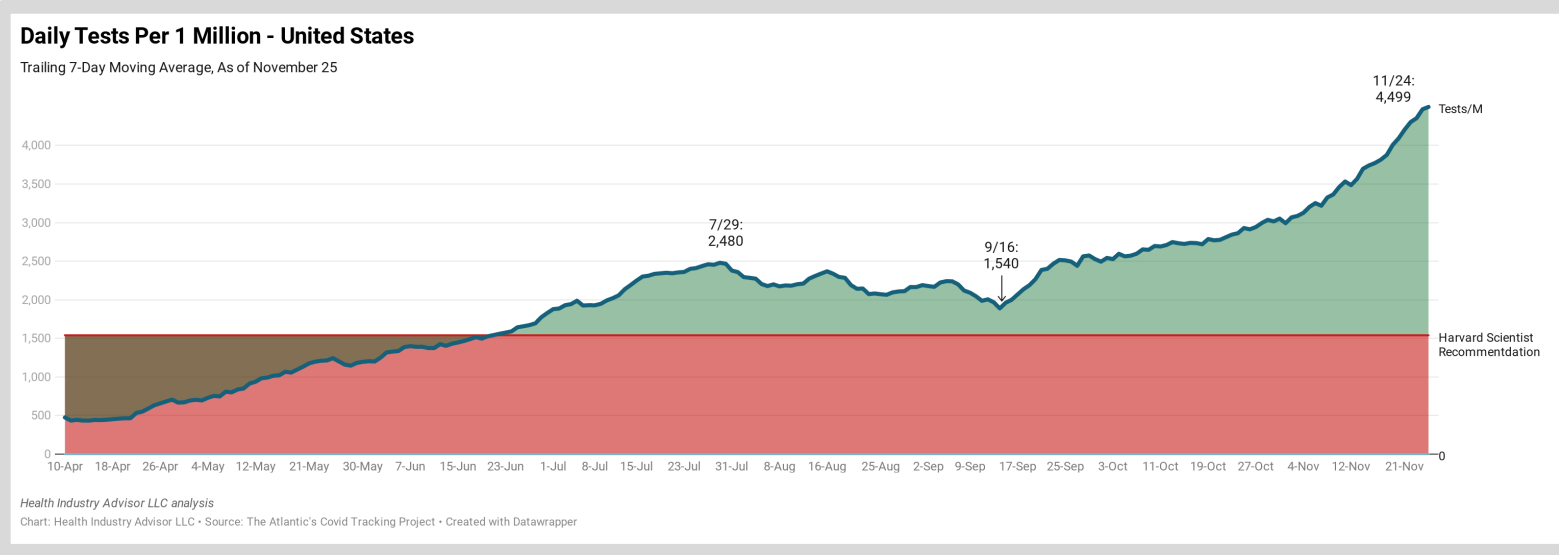
Seeds of this change in momentum can be seen early, by observing the *rate of change* in week-over-week change in new cases: This rate-of change-measure turns downward several days ahead of the turn observed in the week-over-week change measure

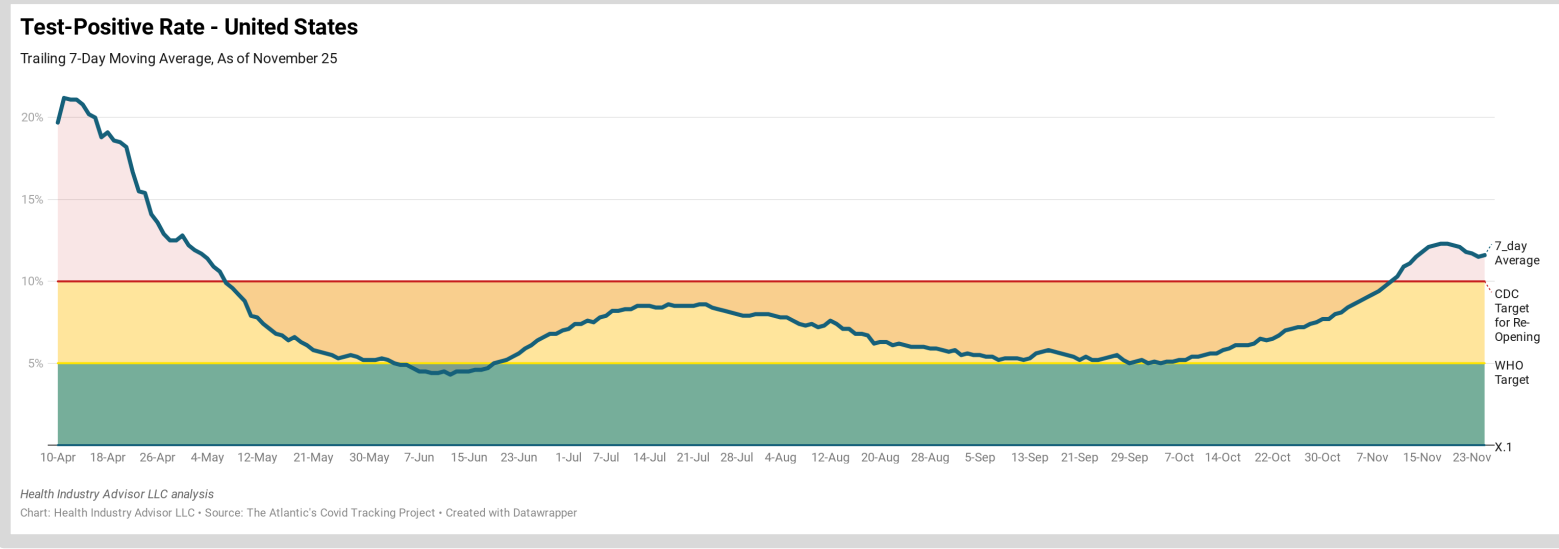


The 7-day test volume has increased thirteen consecutive days

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

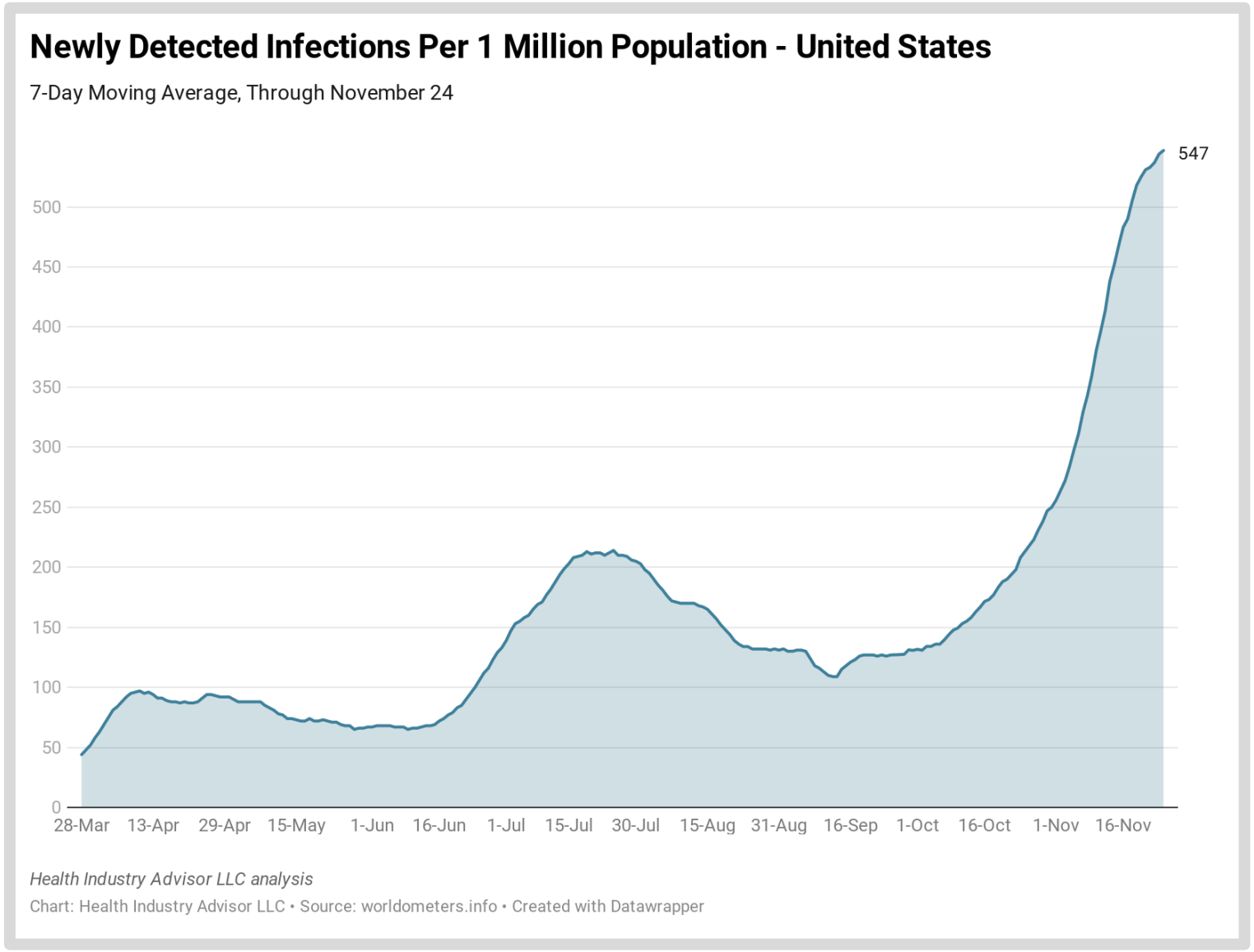
The 7-day test-positive rate increased slightly on Wednesday, after declining the previous six days





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



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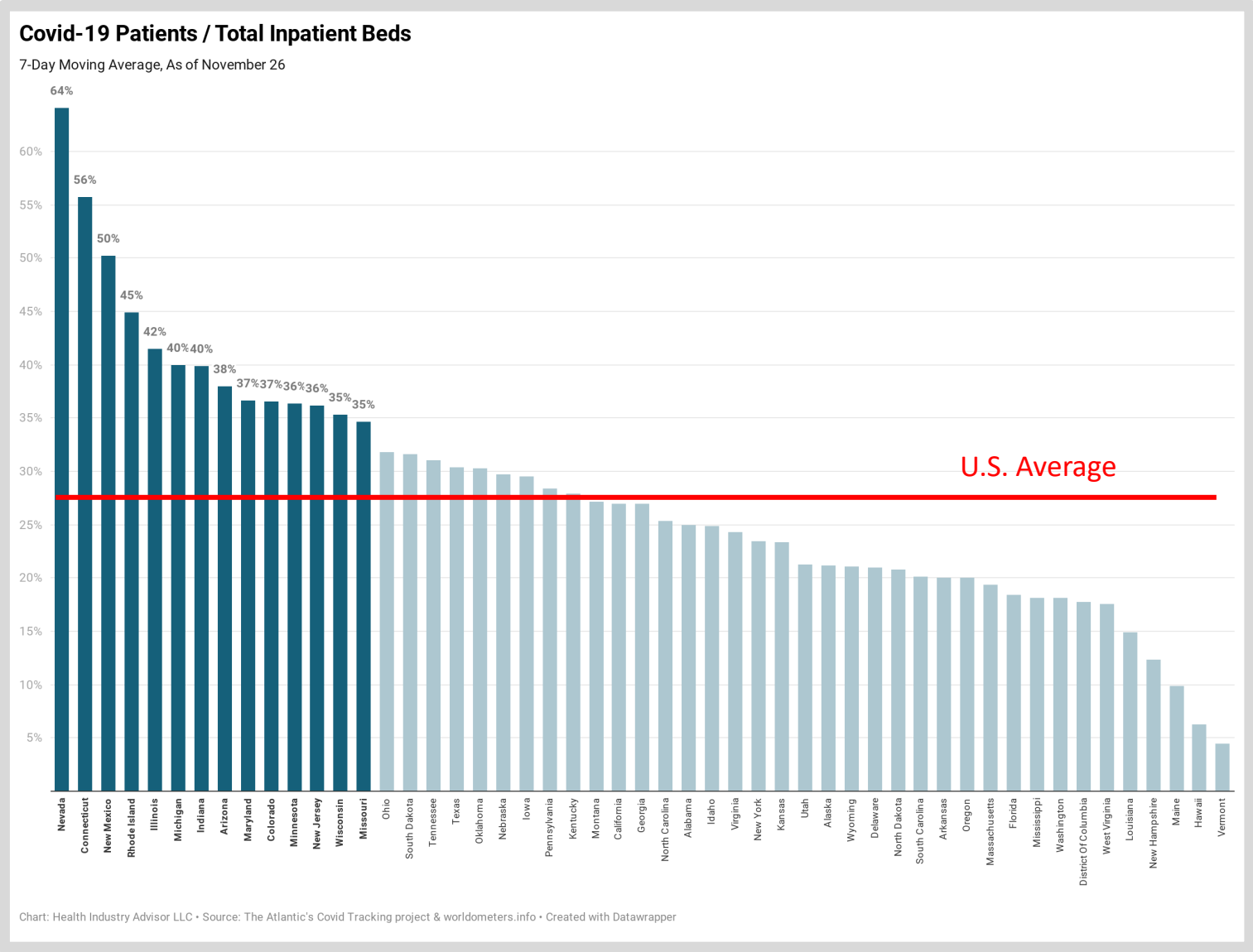
In Nevada, 64% of all inpatient beds are occupied by Covid-19 patients

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 29%



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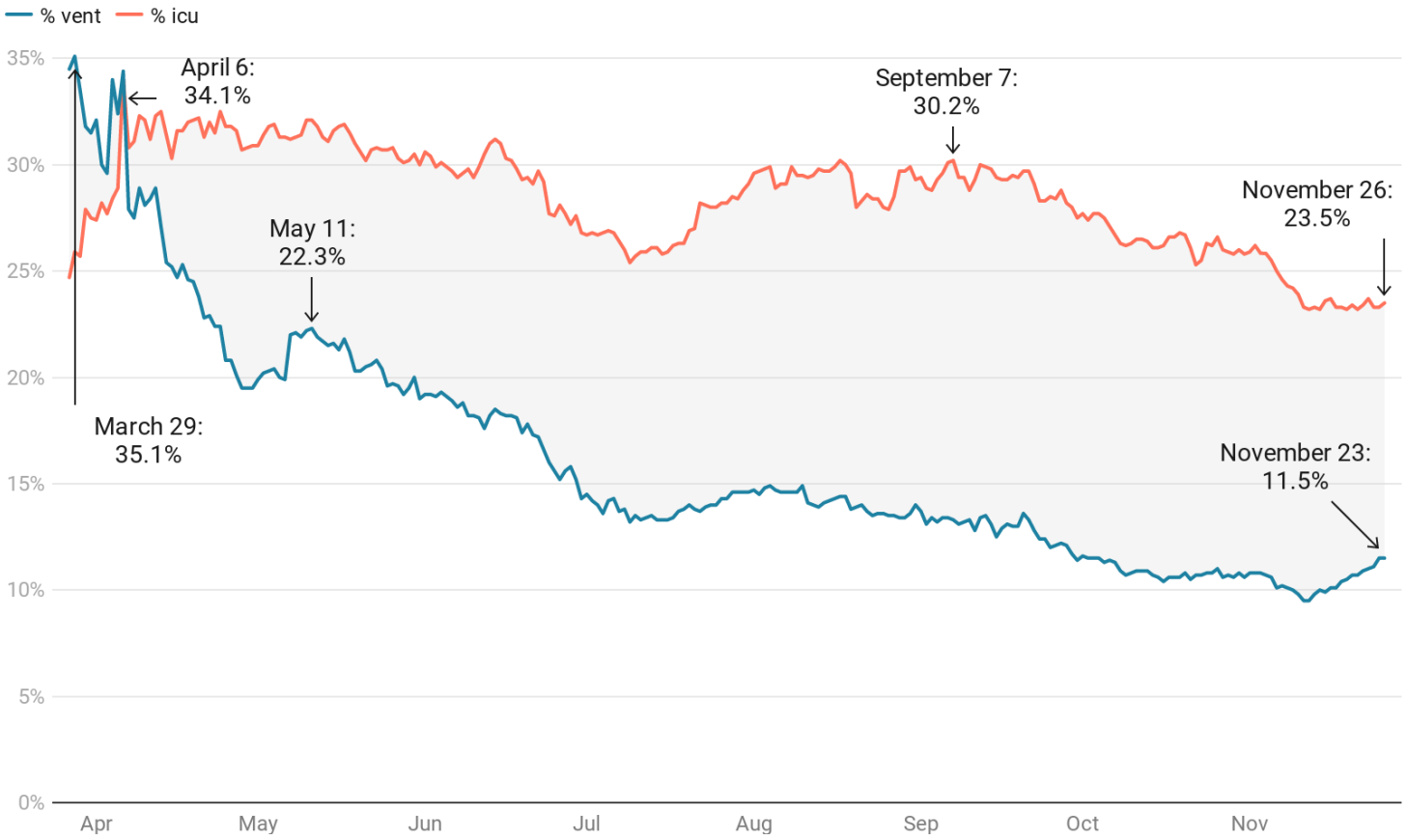
The likelihood of a hospitalized Covid-19 patient would require ICU care has been relatively stable for the past week, after declining markedly during the past three months

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 26



Health Industry Advisor LLC analysis

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

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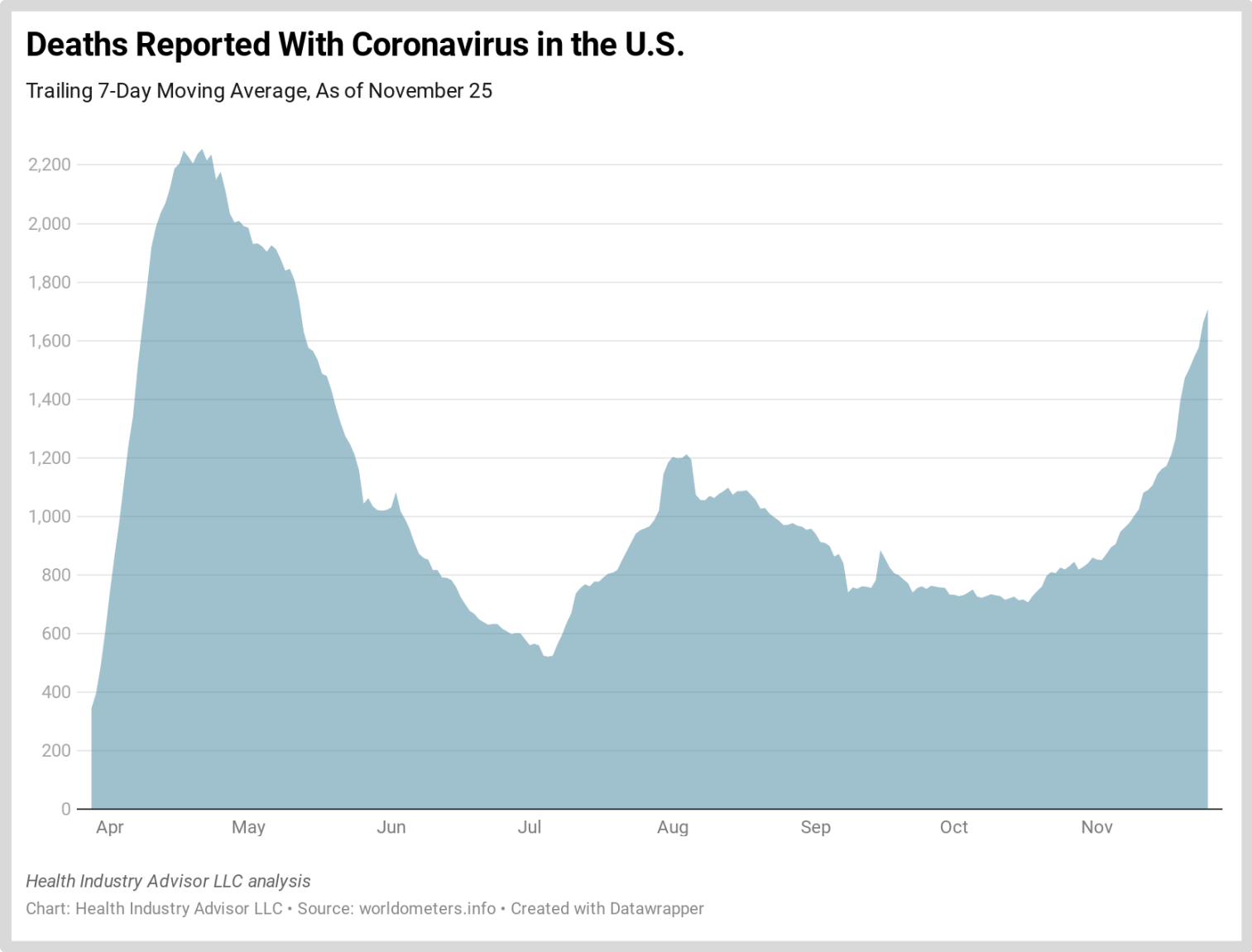
The recent uptick in newly-detected cases is is resulting in increased deaths:

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

This rate is now higher than where it peaked in early-August . . . and, is approaching levels reached in April and May



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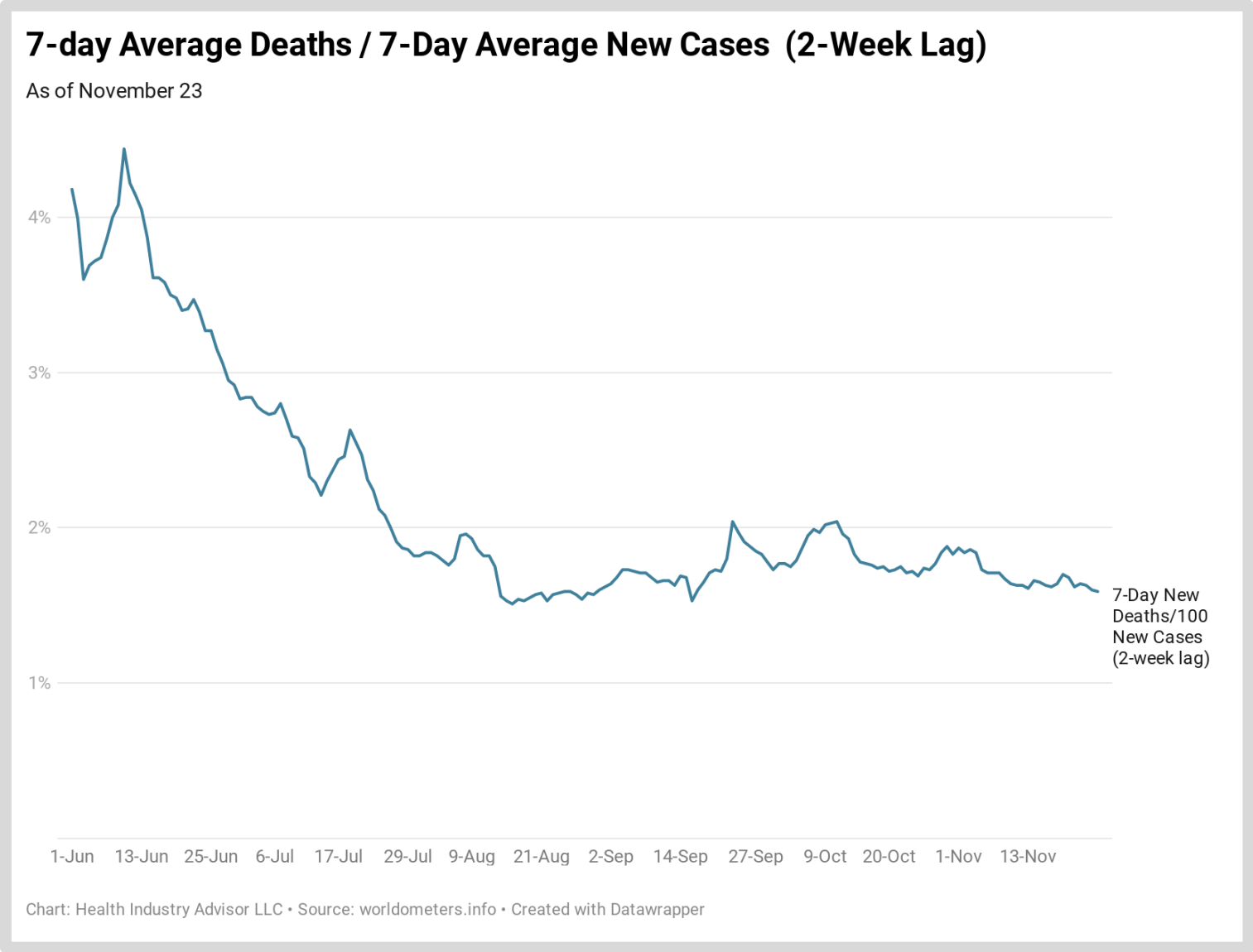
Deaths with coronavirus, relative to new cases (lagged 2 weeks) have moved within a narrow range for the past two weeks

This rate declined rapidly in July and August

The current rate is lower than it was throughout October



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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
- Oliver Wyman Pandemic Navigator, https://pandemicnavigator.oliverwyman.com/forecast?mode=country&region=United%20States&panel=mortality