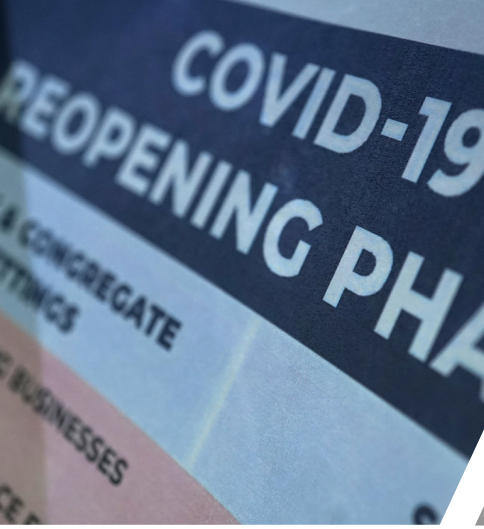

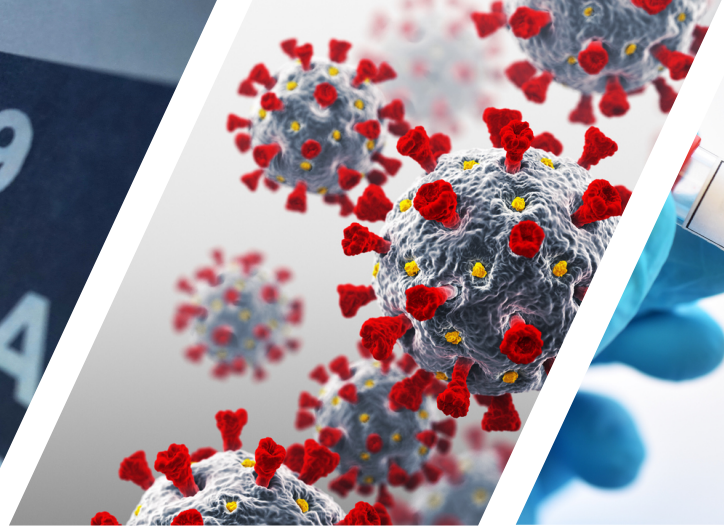

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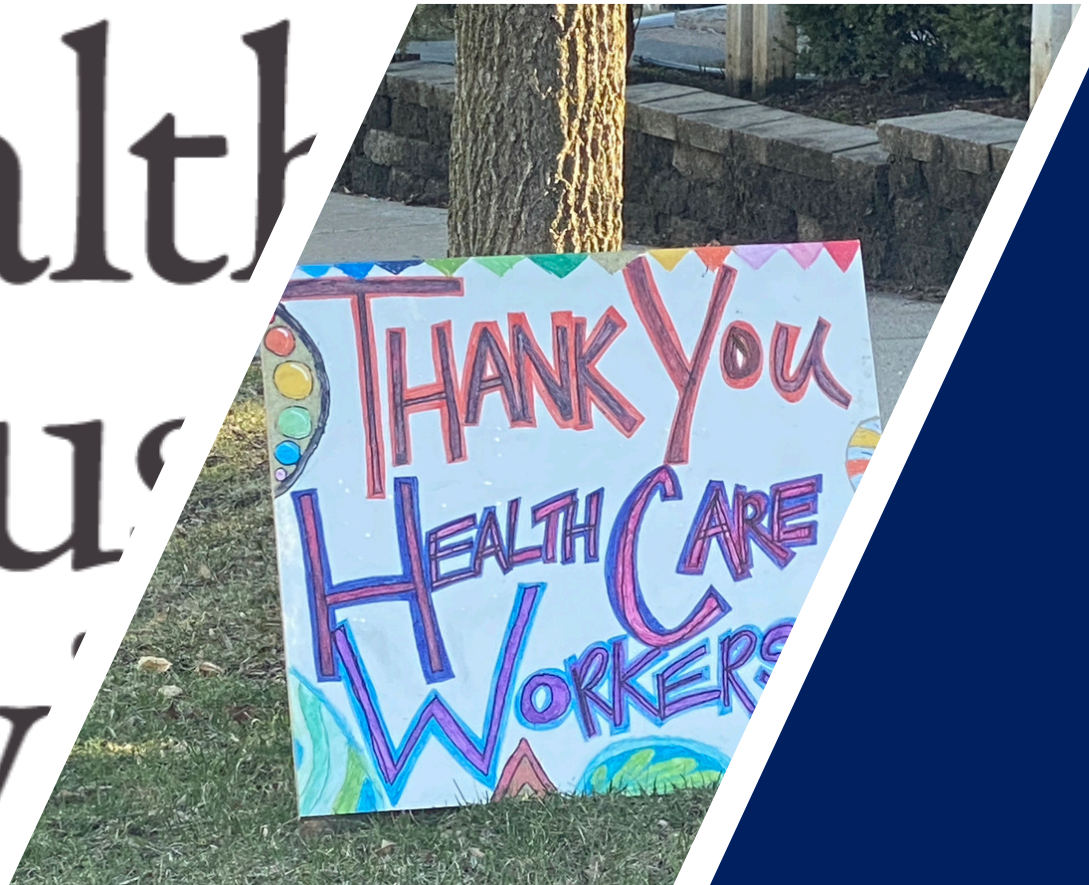


Issue # 248

Tuesday, December 29, 2020

COVID-19 Report

Highlights

- **Yesterday there were 120,000 Covid-19 patients in U.S. hospitals. This represents the highest number of hospitalized Covid-19 patients since the pandemic began**
  - These patients occupied 39% of all inpatient beds
  - **The strain is greatest in Arizona, California, Connecticut, Georgia, Nevada and New York**. These states also have experienced increasing Covid-19 patient census since Thanksgiving
  - In contrast, Midwestern states are experiencing lower - and, declining - occupancy rates
- Providing some relief to our beleaguered healthcare personnel, flu visits continue to be markedly lower than during past flu seasons:
  - We are now in the twelfth week of the flu season; **by this point, we typically see large surges in flu visits and a corresponding spike in hospital stays**
  - Flu visits this season, however, have trailed where they were at comparable points during each of the past five seasons
  - **Last year was the most severe season during this time - at least until the coronavirus hit; During the week of December 19 (the most-recent available), flu visits were only 30% of last season's rate**
- Deaths with the coronavirus were increasing rapidly throughout the Fall; These have declined, however, over the past week
  - Much of this decline, unfortunately, is likely the result of reporting interruptions (even though the decline commenced a few days before Christmas)
- Despite recent declines in **newly-detected cases per capita, this rate in the U.S. remains high**
  - **This high rate was driven by two periods of accelerating growth: An extended period from September 26 to November 9 and a brief period of acceleration from December 1-9**
  - **Since December 9, however, the rate of new case growth has eased . . . and turned negative several days prior to Christmas**
    - **Arizona and California, unfortunately, appear to be countering this trend. These states now have the highest rates in the country . . .and these rates have increased since Thanksgiving**
    - **In California, the challenge seems to be greatest in areas around Bakersfield, Los Angeles, Riverside, San Bernardino, San Luis Obispo and Santa Barbara**
    - **In Arizona, interestingly, the greatest challenge seems to be outside of Phoenix and Tucson**
  - Although reporting interruptions are likely contributing to the on-going decline in case rates, **Youyang Gu's infection projection model provides evidence of a real infection decline:**
    - **Gu's estimate of new daily infections declined 19% during the first half of December** (remember, he backdates from actual deaths to estimate infections two weeks earlier; thus, his estimates always trail by these two weeks)
    - **His estimate of the Reproduction Rate (Rt) continues to decline - it has now declined (i.e., slowing infection spread) twenty-one consecutive days and has been <1 (i.e., declining infections) for twelve consecutive days (both trends are through December 14 - the most-recent available data). The rate for December 14 was as low as it has been since August 27**
    - **Gu estimates that 20% of the U.S. population had been infected by the virus, as of December 14**
- We are anxious to see the ramp-up of vaccinations in the U.S. and worldwide - the data reported to-date aren't there yet
  - **We do know that of the 20-22 million doses needed for the initial round of vaccinations of healthcare personnel and long-term care residents:**
    - **15.7 million have been allocated to the states**
    - **11.4 million have been distributed to local areas**
    - **At least 2.1 million have been administered (likely, far more, given the reporting delays, as well as the number of distributed doses)**
  - **CVS and Walgreens reportedly began to administer the Pfizer and Moderna vaccines to nursing home residents earlier this week. These residents are estimated to account for about 4 million of the 20-22 million people in the initial wave ("Phase 1a') of vaccinations**

Health Industry Advisor, llc

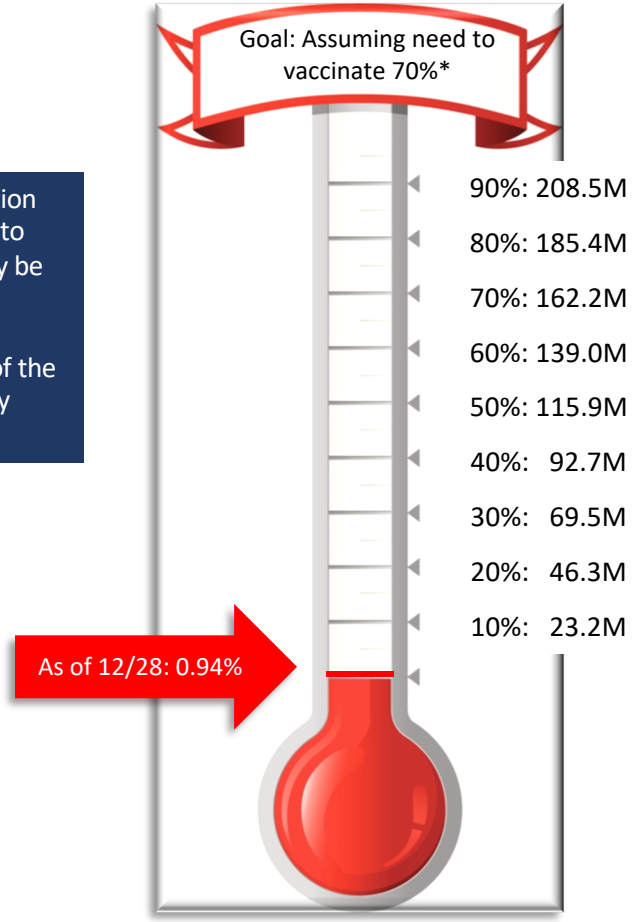
Vaccine Tracking – U.S.

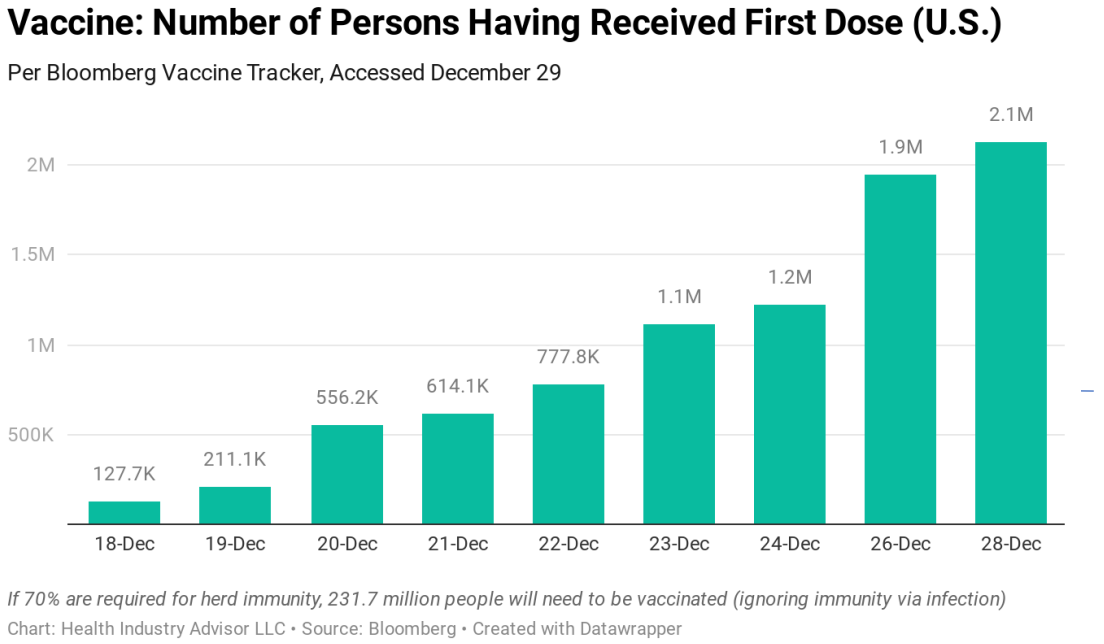
Distribution and administration of the Pfizer vaccine began in the U.S. two weeks ago; the Moderna vaccine last week

As of 12/28, more than 2.1M people have received the initial dose; 15.7M doses have been allocated to the states and 11.4M have been distributed

* 70% is used for illustration only. Actual rate needed to reach herd immunity may be higher or lower.

Does not reflect impact of the number of people already infected by the virus





From the CDC vaccine webpage: "Healthcare providers report doses to state, territorial, and local public health agencies up to 72 hours after administration. There may be additional reporting lag for data to be transmitted from the state, territorial, or local public health agency to CDC."

Vaccine data from: Centers for Disease Control and Prevention and Bloomberg Vaccine Tracker

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According to Gu's model, the reproduction rate been declined twenty-one consecutive days . . . And has been below 1.0 for twelve consecutive days

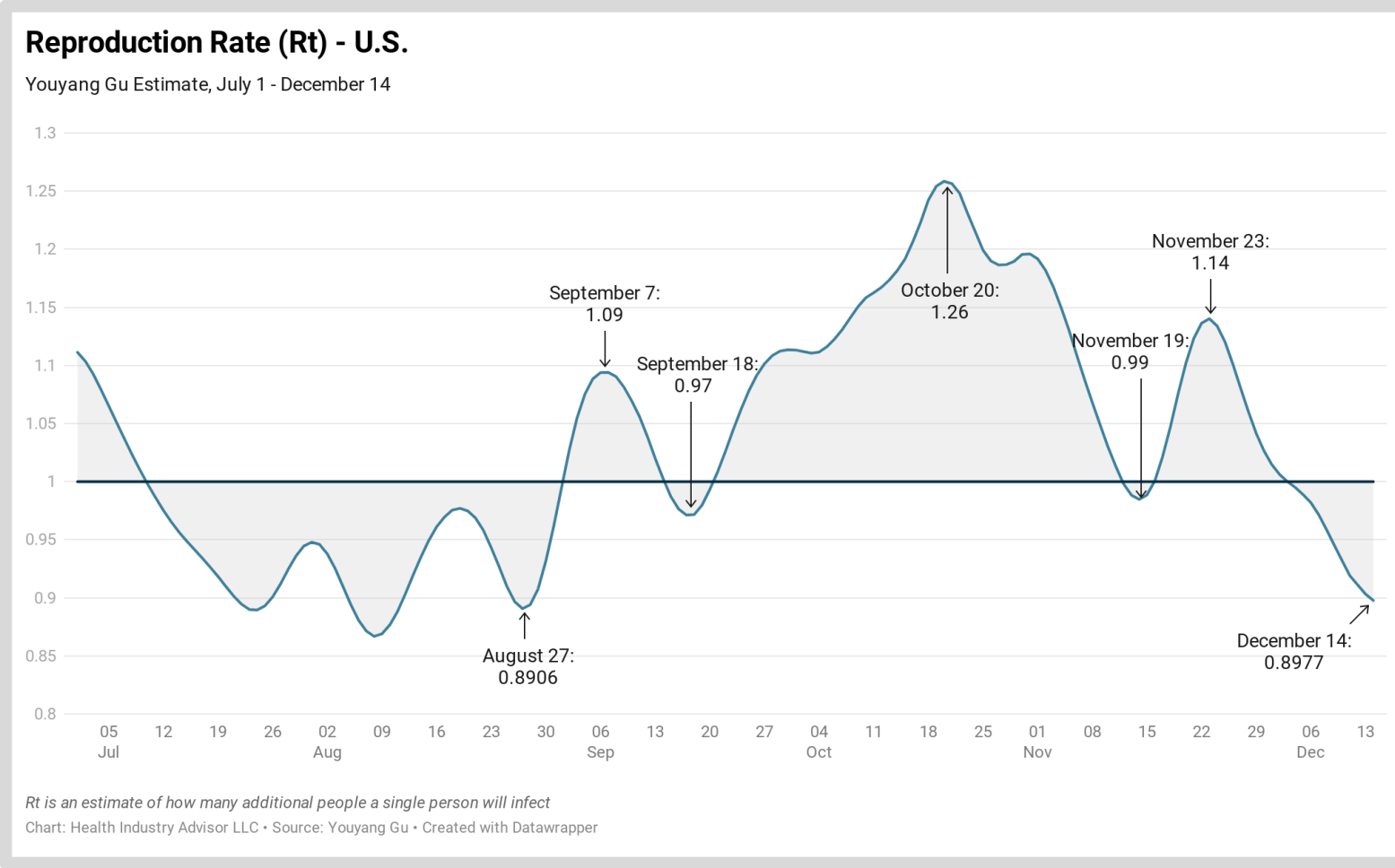
This suggests that the virus spread slowed through and since the Thanksgiving holiday

The most-recent rate is as low as it has been since August 27

Notes:
- Gu uses deaths to estimate actual infections and the reproduction rate (R_t), using a machine learning model

- Gu backdates two weeks from the death date to estimate when an infection likely occurred

* - Youyang Gu: Covid-19projections.com



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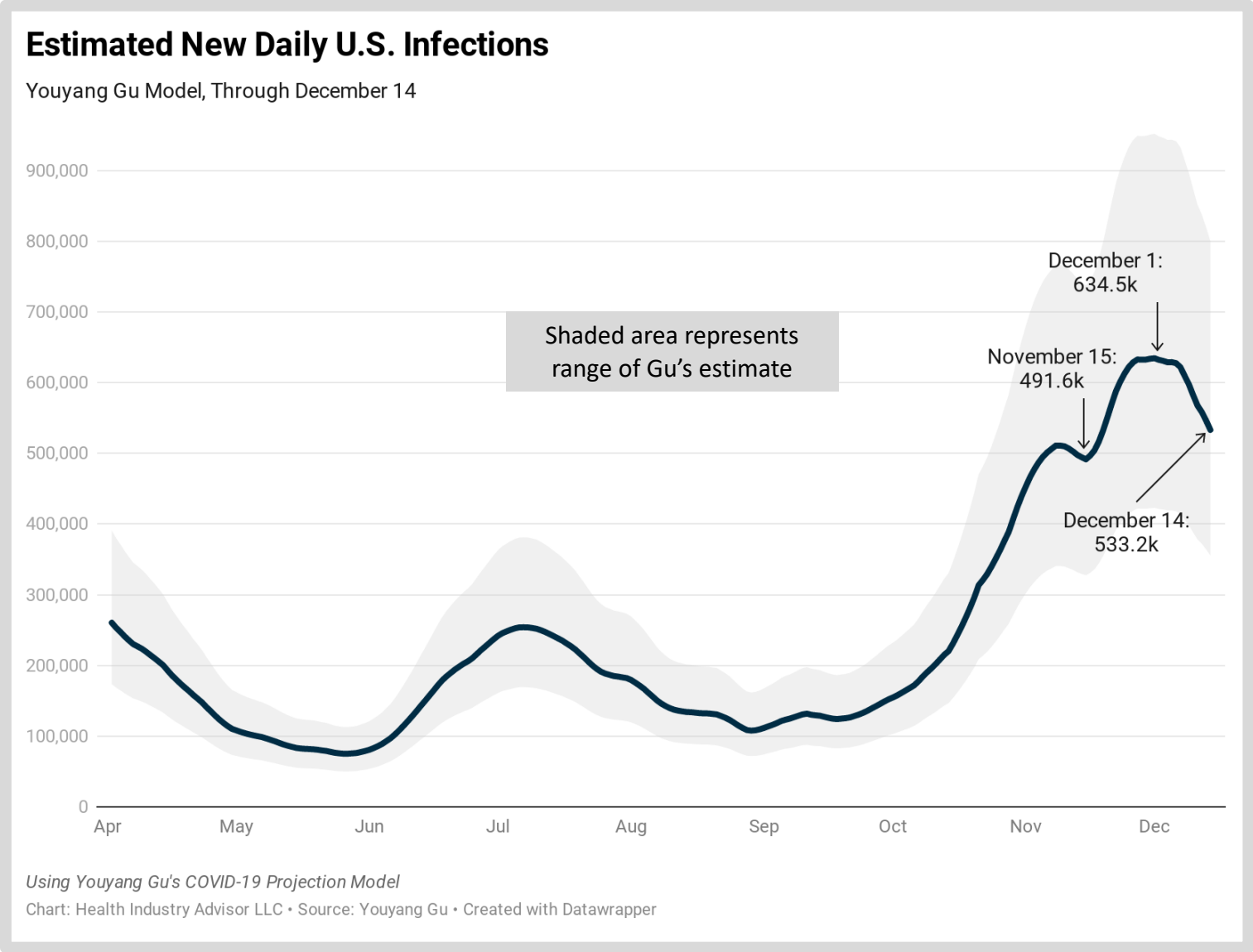
According to Gu's estimates, new infections in the U.S. peaked on December 1 and have declined ~19% since

Estimated new daily infections had not been this low since November 19

Gu estimates that 20% of the U.S. population has been infected by the SARS-CoV-2 virus (range of 13-30%)

*https://pandemicnavigator.oliverwyman.com/forecast?mode=country&region=United%20States&panel=baseline



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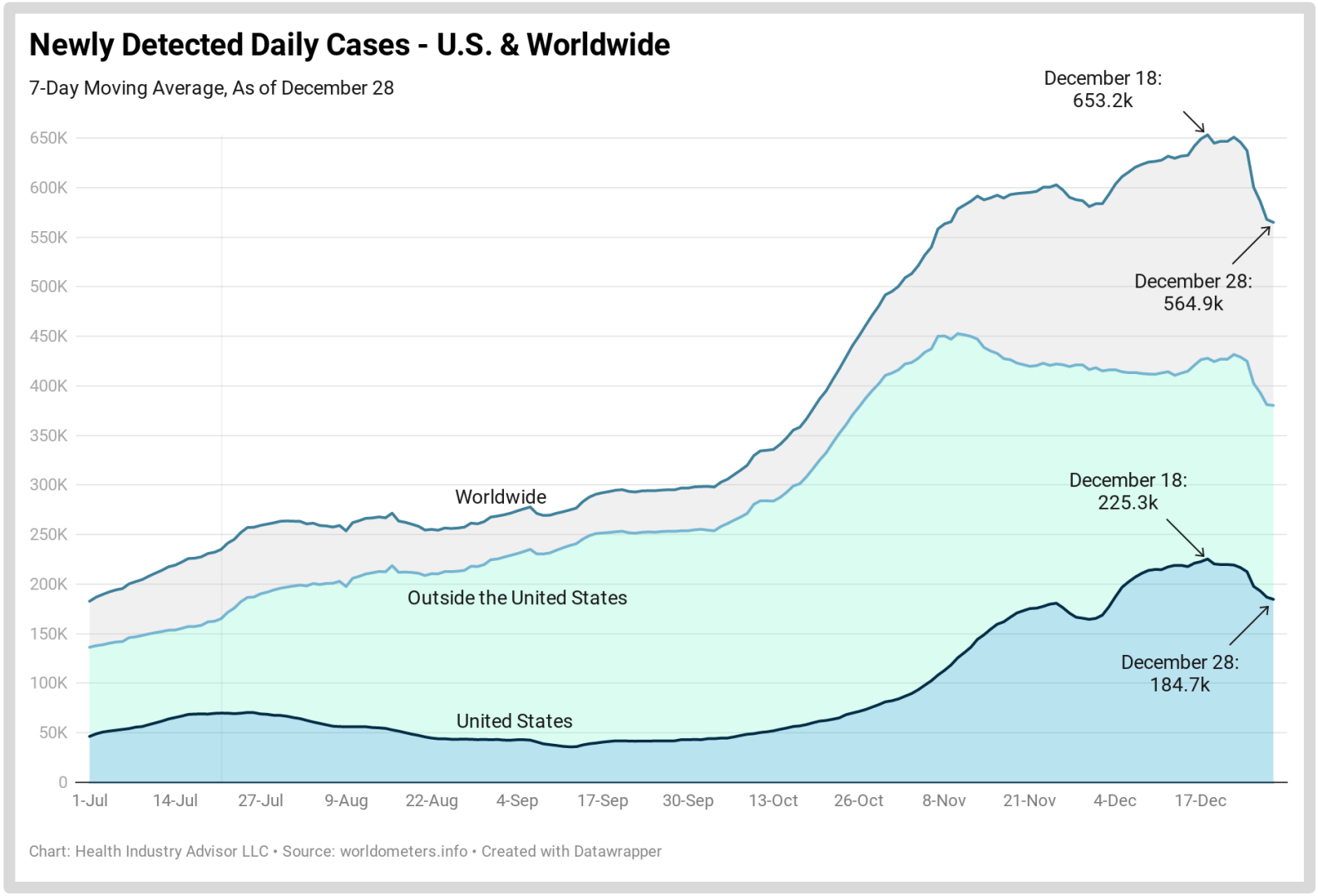
Newly-detected cases had already been declining for a week prior to the Christmas holiday

The impact of holiday reporting interruptions exacerbated this trend

The question is – once states (and countries) catch-up on the delays, where will new cases stand?

* - 7-day moving average basis



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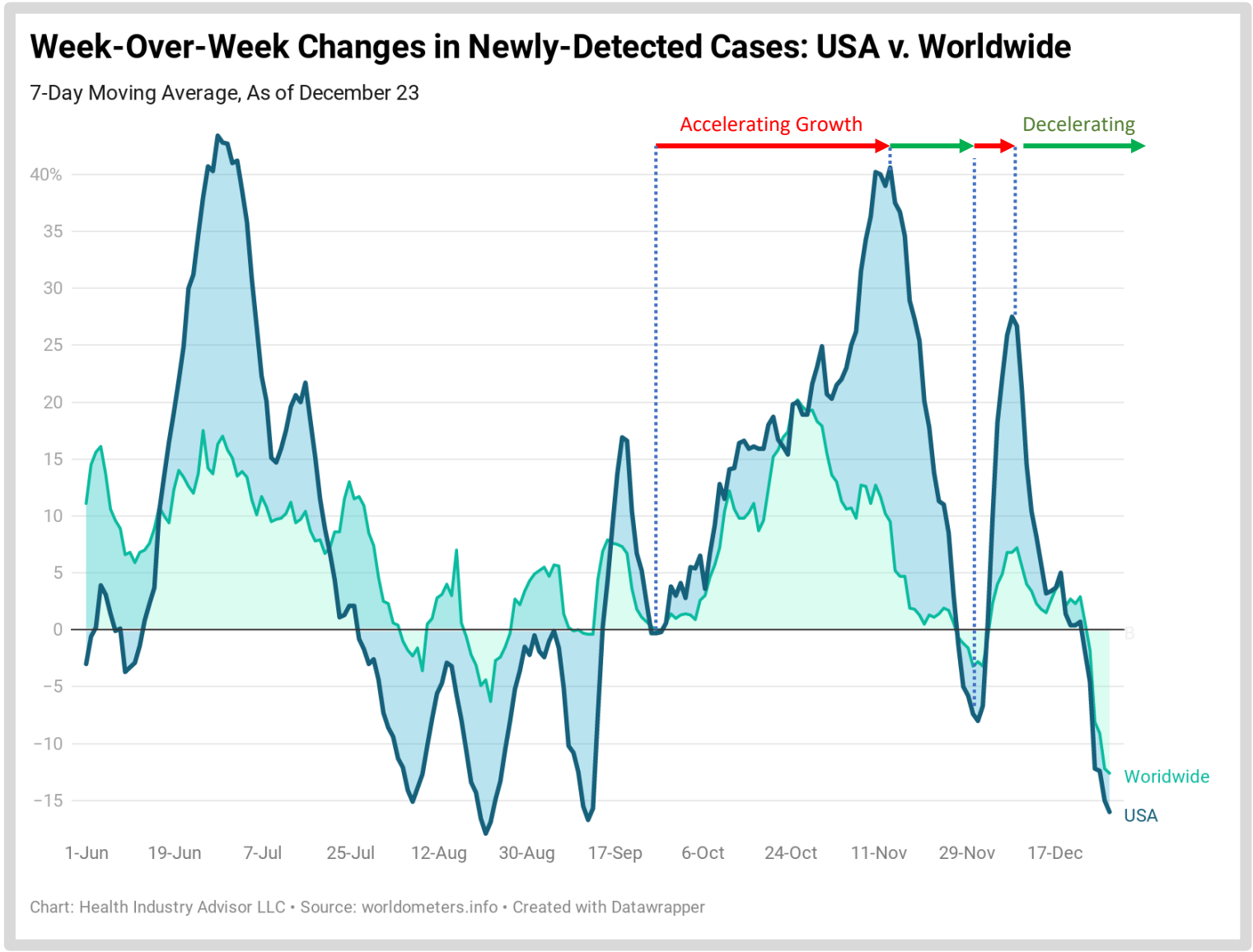
The high rates of newly-detected cases we have been experiencing were driven by two periods of accelerating growth – An extended period from September 26 – November 13, followed by a brief one December 1-9

Since December 9th, this growth has slowed - even starting to recede several days prior to Christmas



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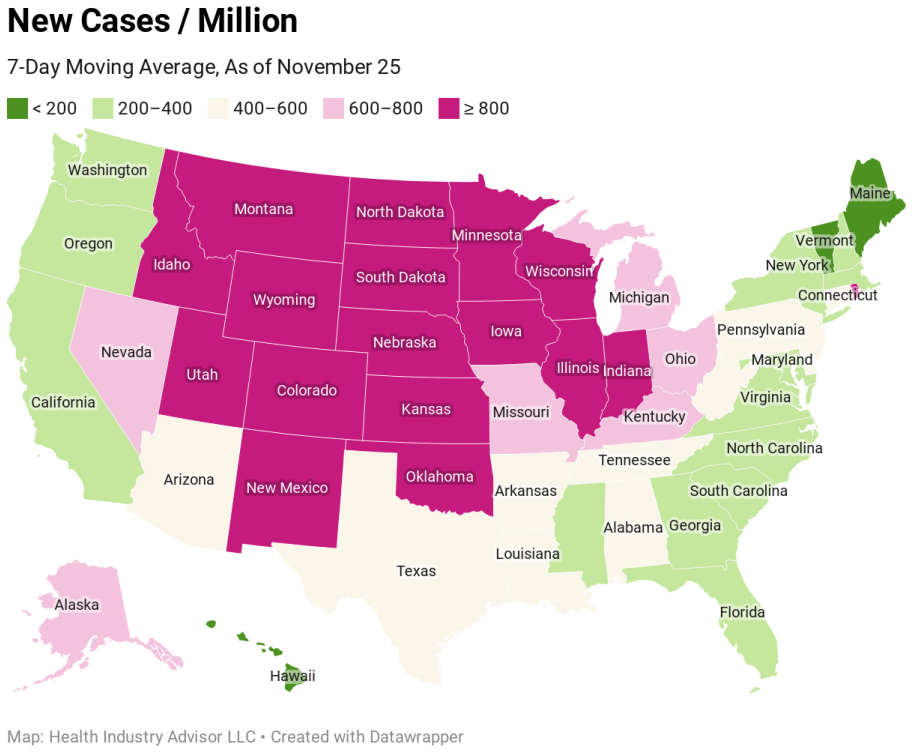
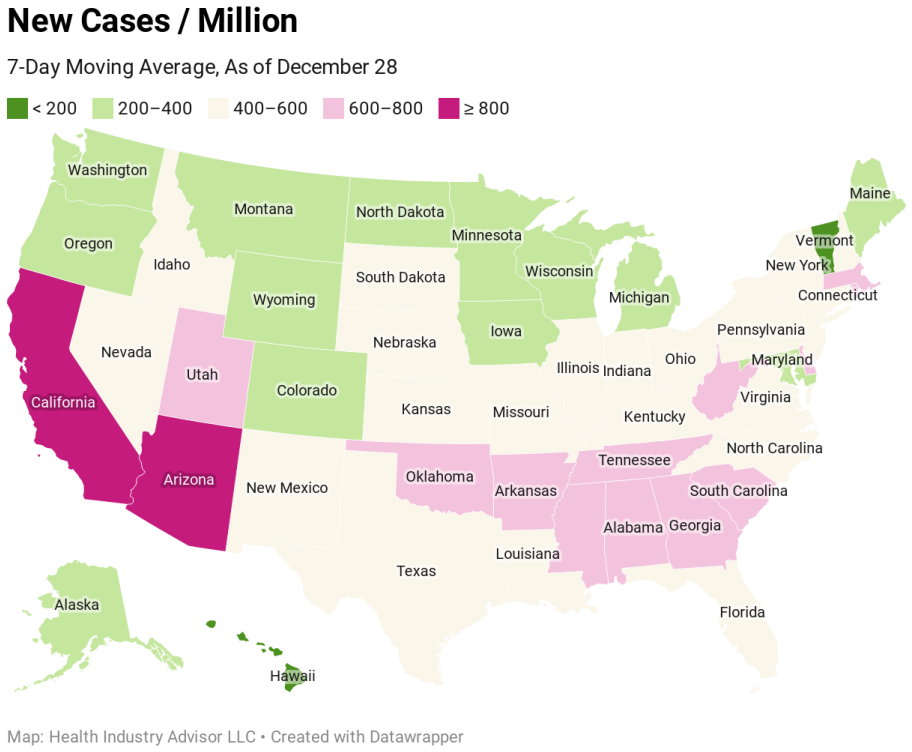
Rates of newly-detected cases have eased across the country since Thanksgiving – due to a combination of reporting interruptions and apparent actual case declines
Rates are clearly rising in Arizona and California, however, and to a lessor degree, in Connecticut, West Virginia and several states in the Southeast

As of November 25



As of December 28



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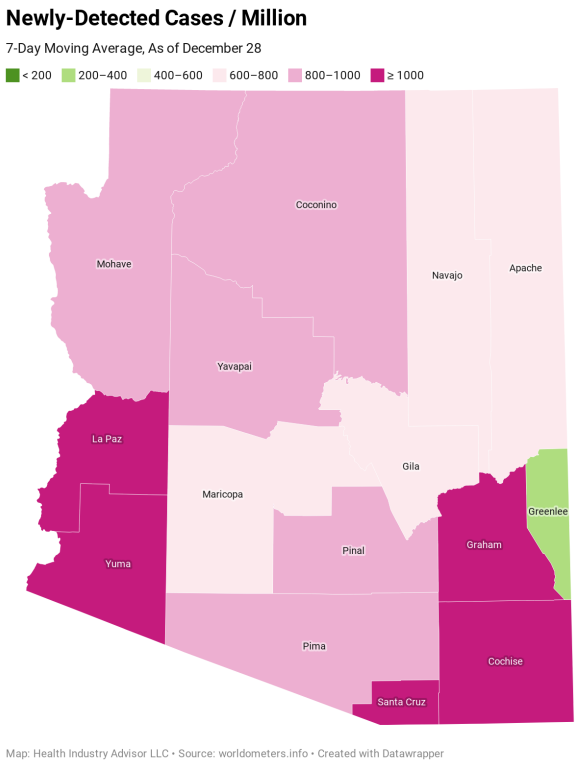
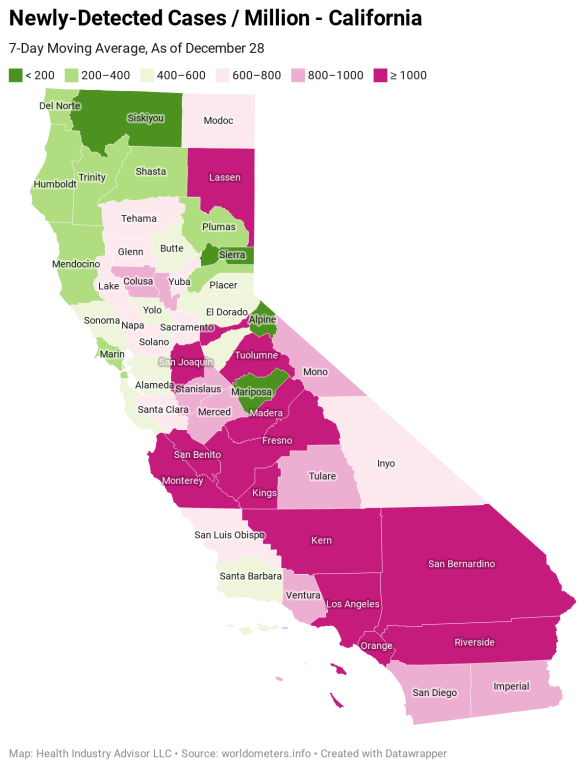
California's challenge seems to be concentrated in the southern and central portions of the state, including Bakersfield, Los Angeles, Riverside, San Bernardino, San Luis Obispo and Santa Barbara

Interestingly, Arizona's challenge is not necessarily the Phoenix or Tucson areas



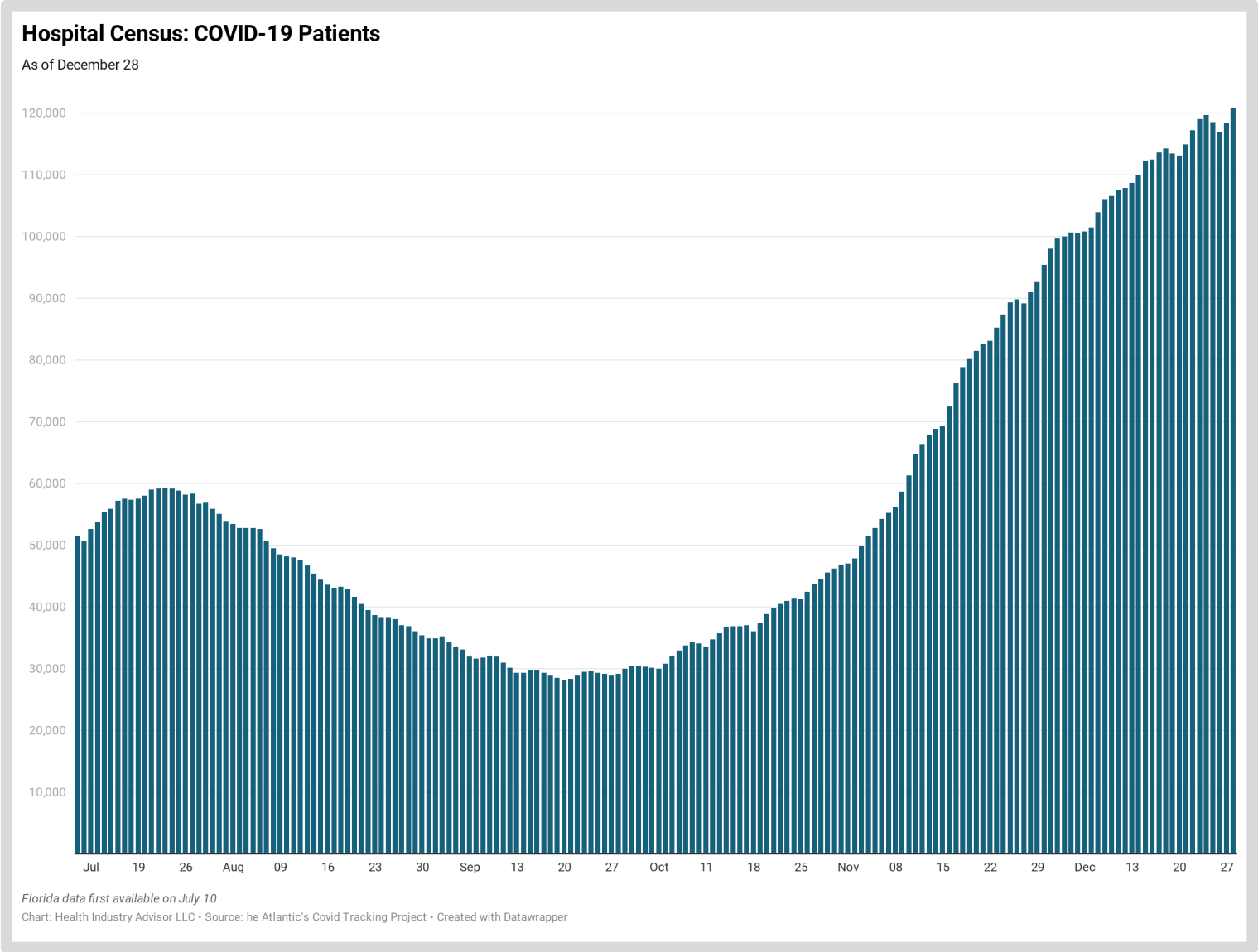


Health Industry Advisor, llc

Despite the apparent decline in newly-detected cases, the number of Covid-19 patients in the hospital continues to increase

Yesterday, there were more than 120,000 Covid-19 patients in U.S. hospitals

This represents the most hospitalized Covid-19 patients at any point during the pandemic



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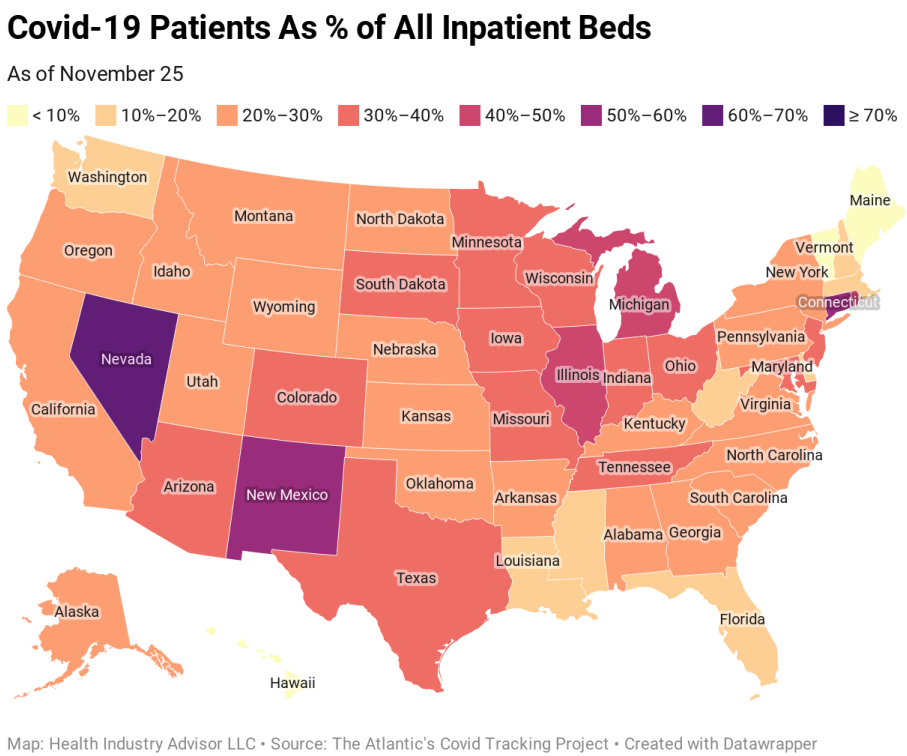
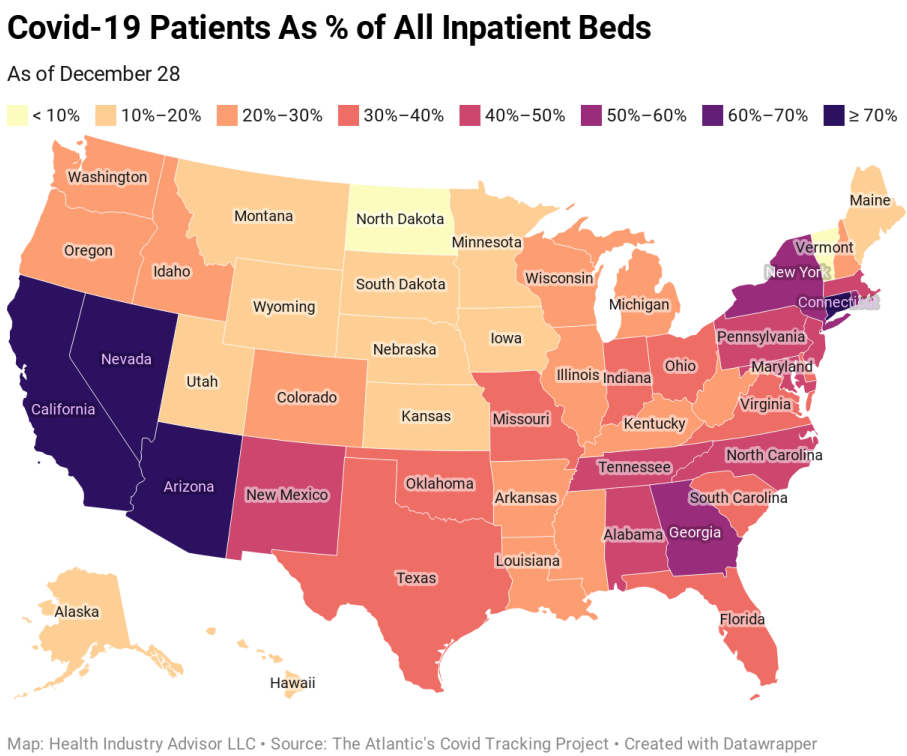
Overall, Covid-19 patients occupied nearly 39% of inpatient beds yesterday, up from 36.2% a week ago
States currently under the most strain are Arizona, California, Connecticut, Georgia, Nevada and New York – each of which have experienced increasing Covid-19 patients since Thanksgiving
In contrast, Midwestern states have experienced declining Covid-19 census during that time

November 25



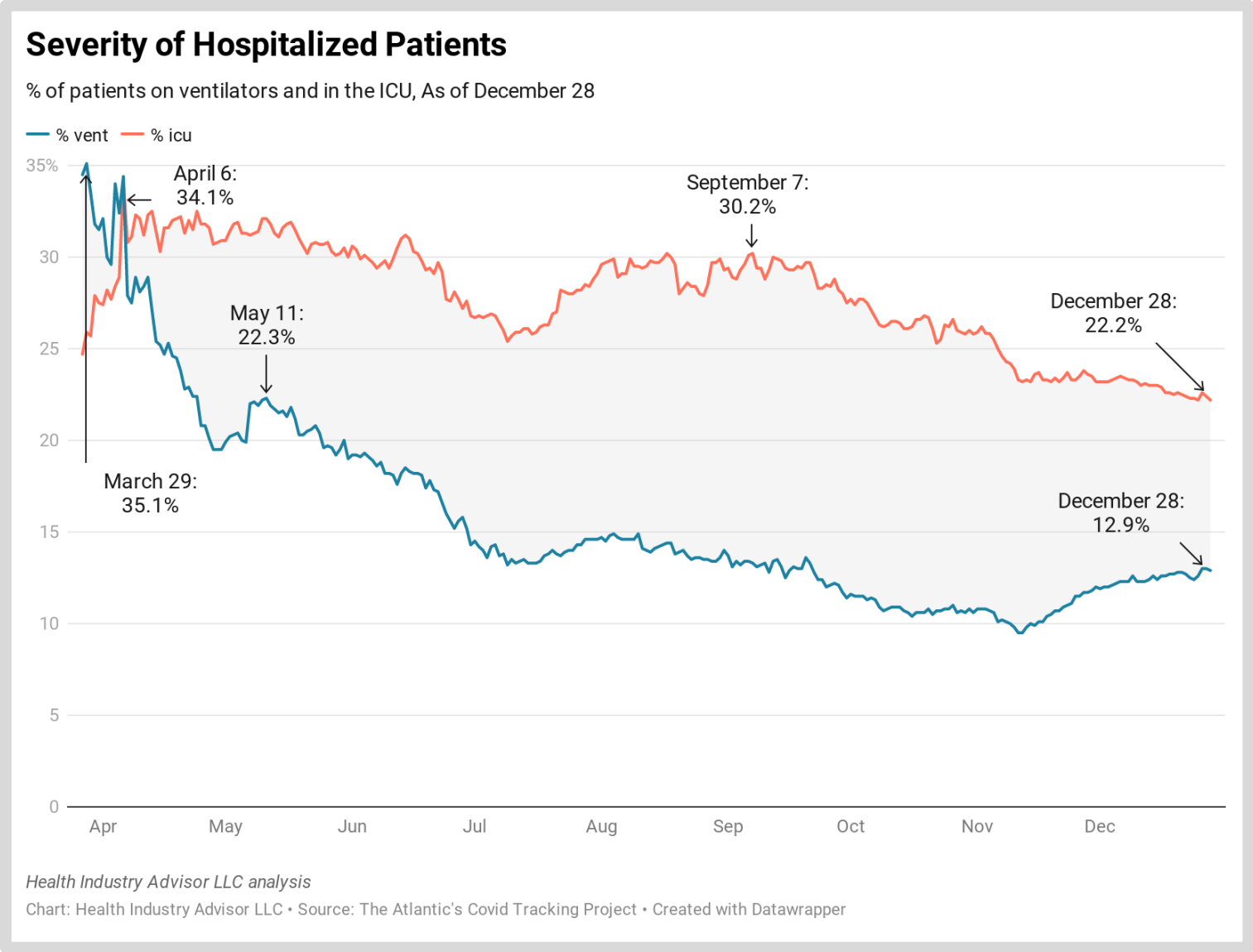
December 28



Over the past 4-6 weeks:

- the likelihood of a Covid-19 inpatient would require ICU care has declined

- the likelihood a Covid-19 inpatient would require ventilator care has increased



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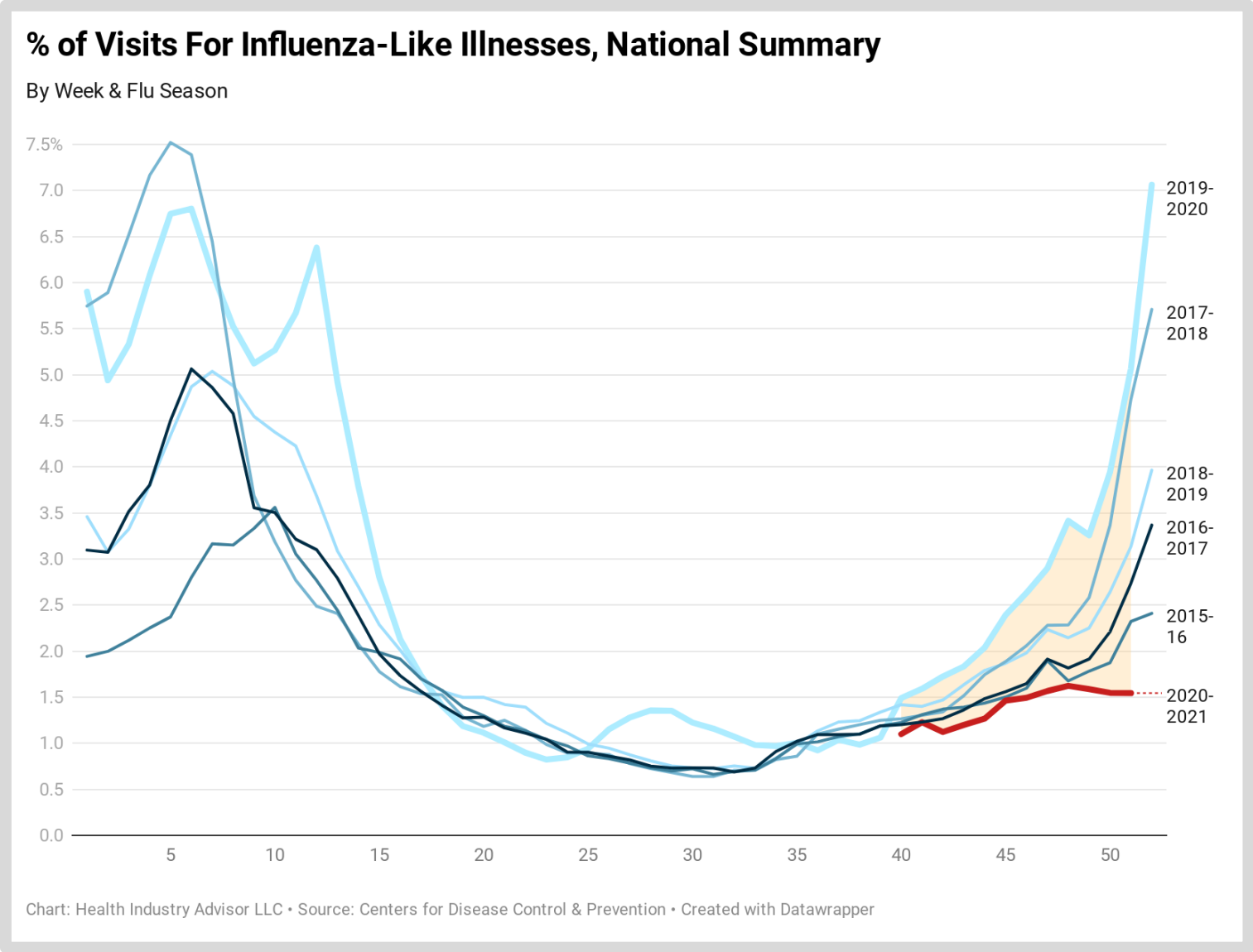
Now eleven weeks into the 2020-21 flu season, flu visits have consistently been lower than each of the past five years - and, sharply lower than the past three flu seasons

For the most recently-reported week (ending December 19), flu visits were only 30% of last year's rate



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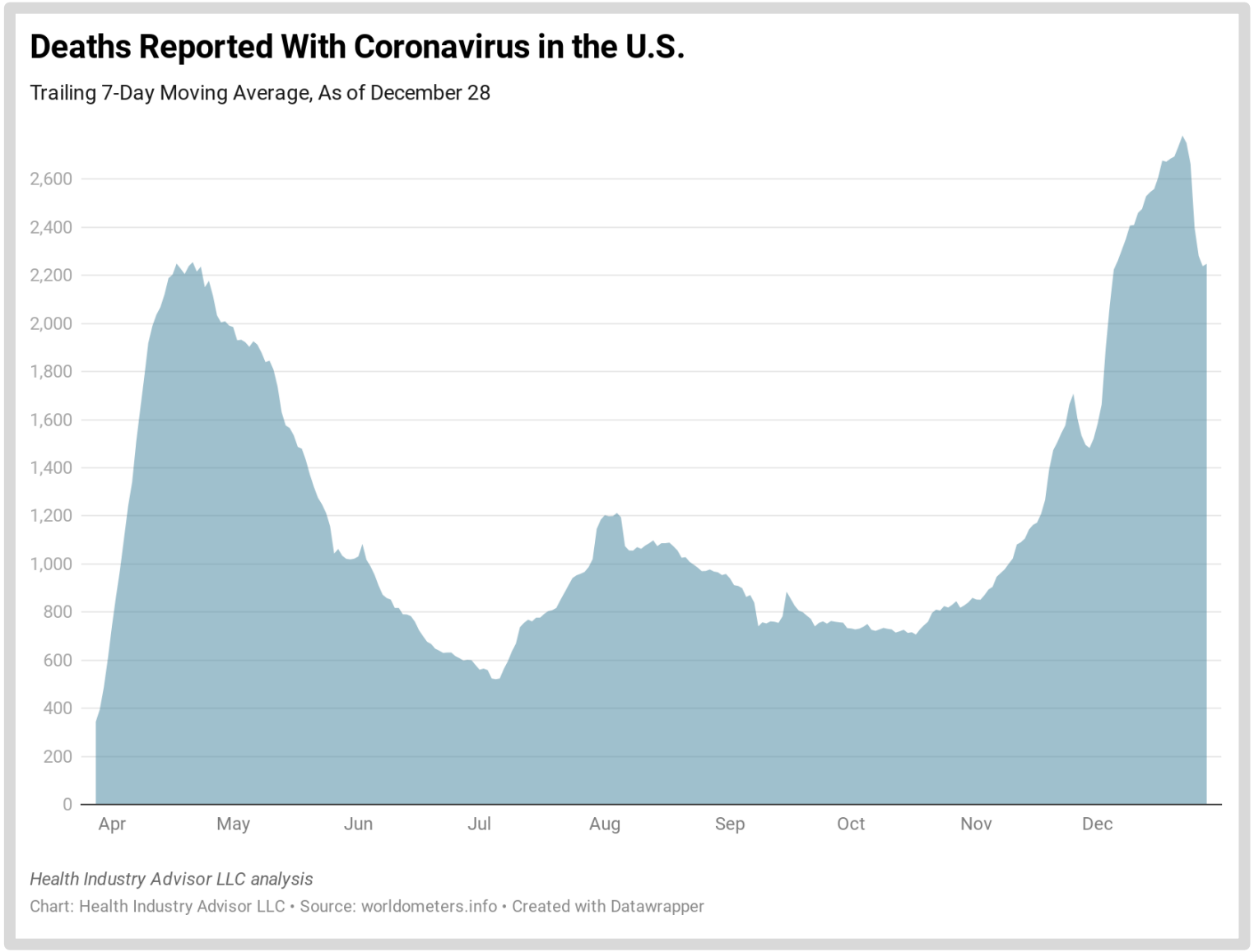
The reported 7-day average death rate has declined since December 22 - much of this decline, however, is likely due to reporting interruptions during the holiday



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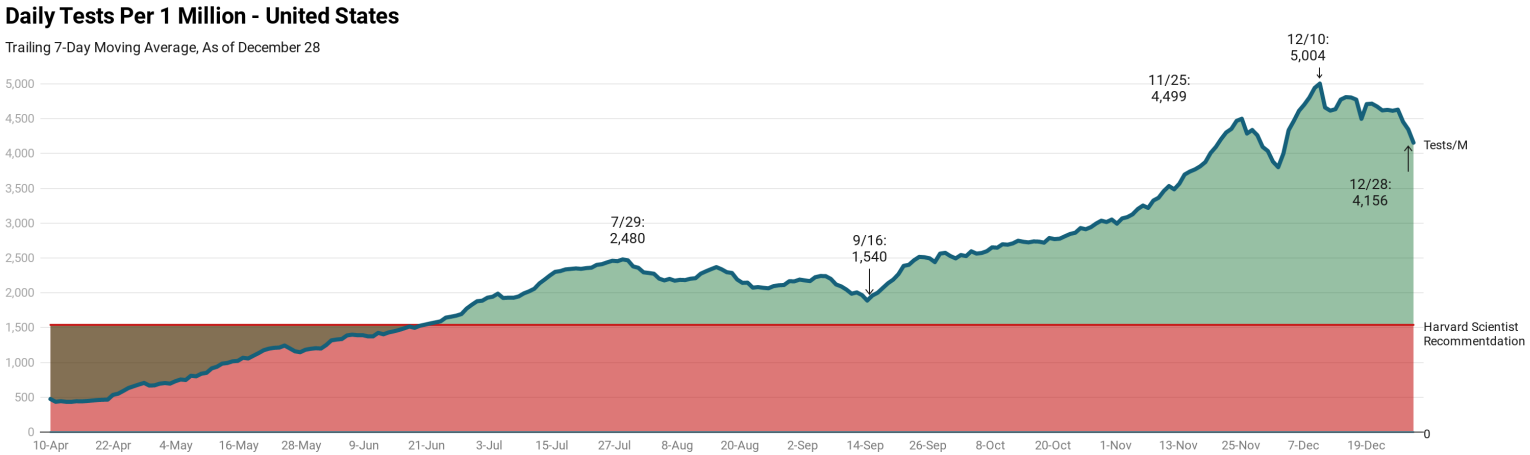
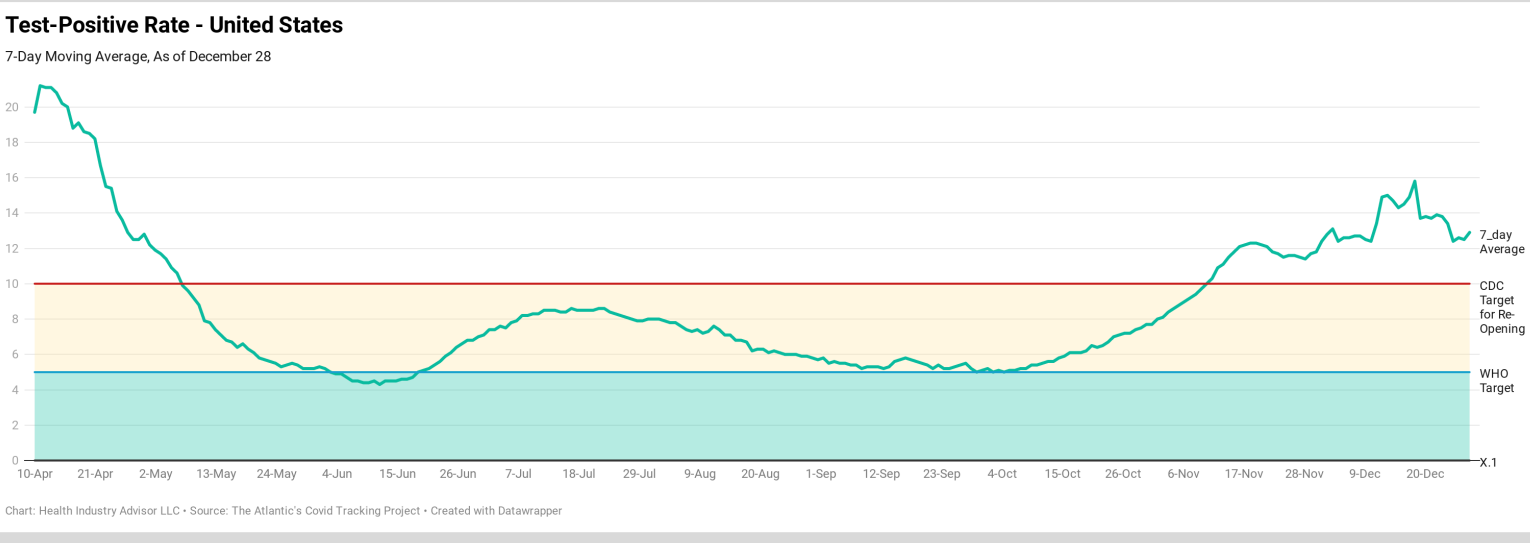
Like the Thanksgiving holiday, reporting delays contributed to declining 7-day test volume since Christmas (This rate bottomed a week post-Thanksgiving)

The7-day average test-positive rate has improved since the first half of December. Nonetheless, it remains higher than desired





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 and Prevention, National, Regional, and State Level Outpatient Illness and Viral Surveillance https://gis.cdc.gov/grasp/fluview/fluportaldashboard.html
- Centers for Disease Control and Prevention, COVID-19 Laboratory-Confirmed Hospitalizations https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html
- Centers for Disease Control and Prevention, COVID Data Tracker https://www.cdc.gov/covid-data-tracker/index.html#mobility
- Centers for Disease Control and Prevention, Vaccines, https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html
- 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
- Bloomberg Vaccine Trackers, https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/?sref=Z0b6TmHW