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*"Strategic Advice in an Era of Unprecedented Change"*


# Covid-19 Report

Issue # 251

January 4, 2021

# Covid-19 Highlights

*The following data sources are accessed on a daily or weekly basis*

- **As feared, the virus continues exerting its grip on the United States and parts of Europe**. The newly discovered strain is sending infection rates soaring in the UK and threatens parts of the US. Unfortunately, this comes as we nervously wait to see the impact of increased social interaction over the recent holidays
  - **New infections in the US appear to have resumed increasing in mid-December, based on estimates from both Youyang Gu's and the Yale School of Public Health models**
    - The UK, believed to be the first infection site of the new strain, has experienced a surge in infections through the holiday; Israel's cases have followed a similar trajectory
    - In the US, Arizona has experienced a large case surge, surpassing pre-holiday rates; California saw a brief holiday-respite in rates, but this rate has begun to rise again lately
    - New York's rate increased steadily throughout the holiday period but, at a lower slope than in these other troubled states and countries
- **Reproduction Rate ($R_t$) estimates are also trending in the wrong direction**:
  - These estimates, using both the Rt.live and Yale School of Public Health models, are >1 for most states
  - **Only Arizona, Minnesota, Montana, Oklahoma and Wyoming have $R_t$<1 in both models**
  - Arkansas, California, Colorado, Delaware, Idaho, Iowa, Maine, New Hampshire, Nevada, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Vermont and Wisconsin had $R_t$<1 using one model and $R_t$>1 in the other
  - Gu's model, which by design has a two-week lag in infection and Rt estimates, suggests the $R_t$ has been increasing since December 13 and was >1 from December 17-20 (latest estimate available)

- **Covid-19 hospitalization rates remain a major concern: yesterday's census marked the continuation of a trend of increasing patients on a same-day, prior-week basis**
  - California and Nevada are using at least 80% of all inpatient beds for Covid-19 patients; Arizona, Connecticut, Georgia and New York are using at least 60%. For the US overall, 40% of inpatient beds are in use by Covid-19 patients
  - Fortunately, the % of these patients that require ICU care has declined each of the past several weeks and is at historically low levels
  - The % of these patients requiring ventilator care also remains at historically low levels
- **Vaccinations in the US are finally starting to pick up steam**
  - According to the tracking site Our World in Data, **the US ranks 4th in the world in doses administered per capita, slightly behind the UK; Israel has vaccinated at a much faster pace than any other country**
  - **Through Saturday, 4.4 million Americans have reportedly received their initial dose - an increase of 800k in a single day**
  - An additional 8.8 million doses have been distributed to the states; Sufficient doses have been allocated to the states to vaccinate 90-100% of the Phase 1a-designated individuals
  - Thus far, North Dakota, South Dakota and West Virginia have vaccinated the highest % of state residents - although these %'s are minimal
  - Based on vaccinated rates and estimated infection prevalence, North Dakota and South Dakota may be closer to achieving herd immunity than any other state. Both states may be nearing 40%immunity; it is presumed that 60-80% is necessary for herd immunity



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# Two Models of Estimated Daily Infections

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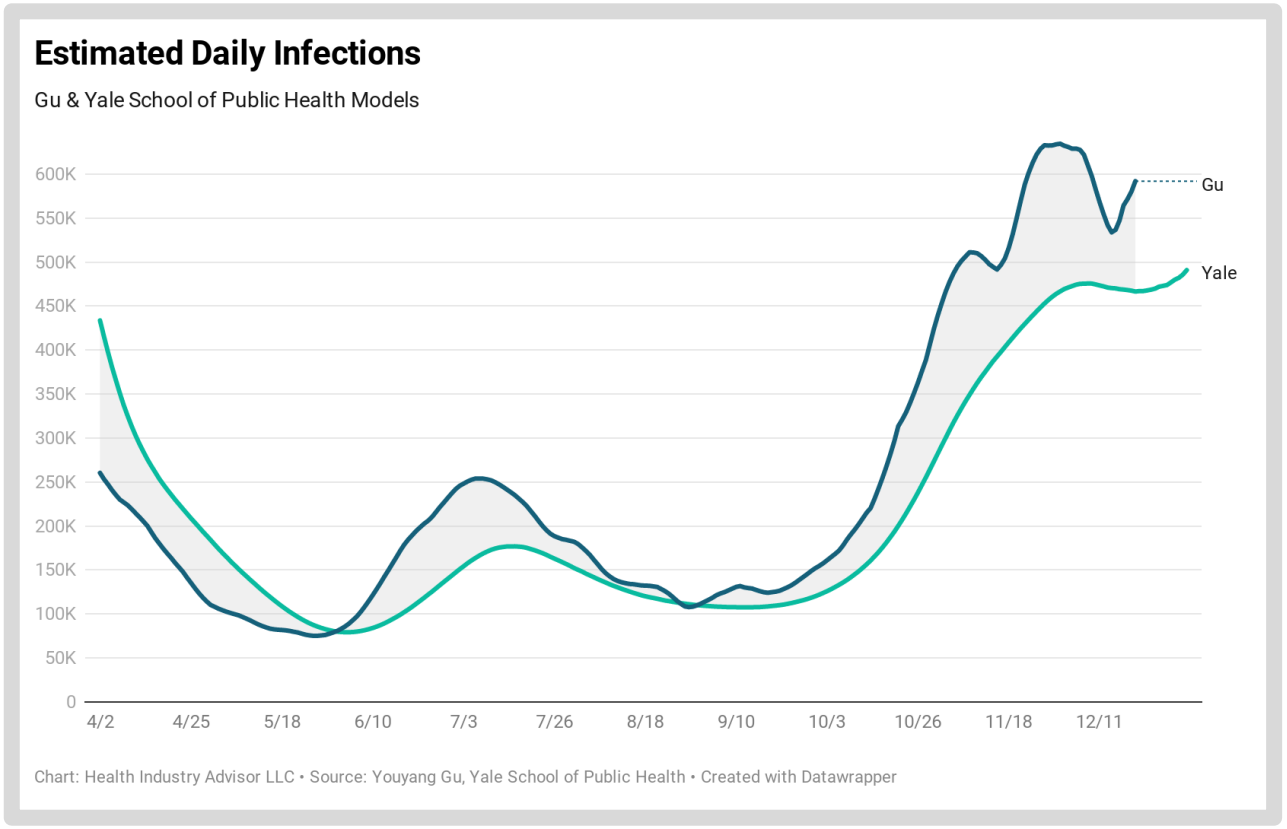
*Models from both Youyang Gu and the Yale School of Public Health estimate that actual infections began increasing in mid-December*

- Two models:
  - Youyang Gu: https://covid19-projections.com
  - Yale School of Public Health: https://covidestim.org
- Gu model lags by two weeks





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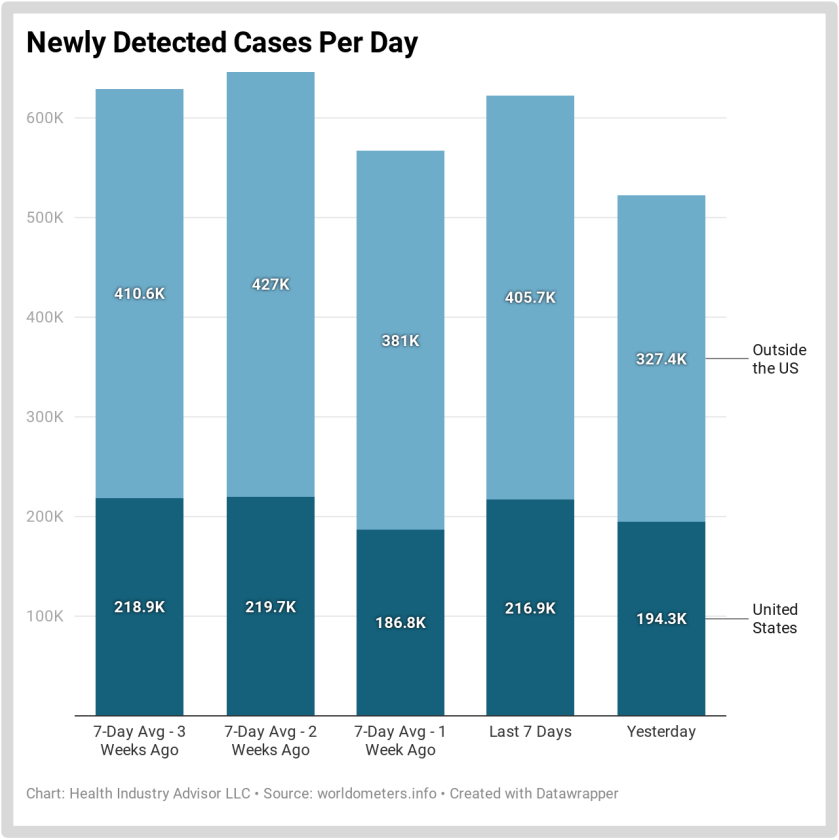
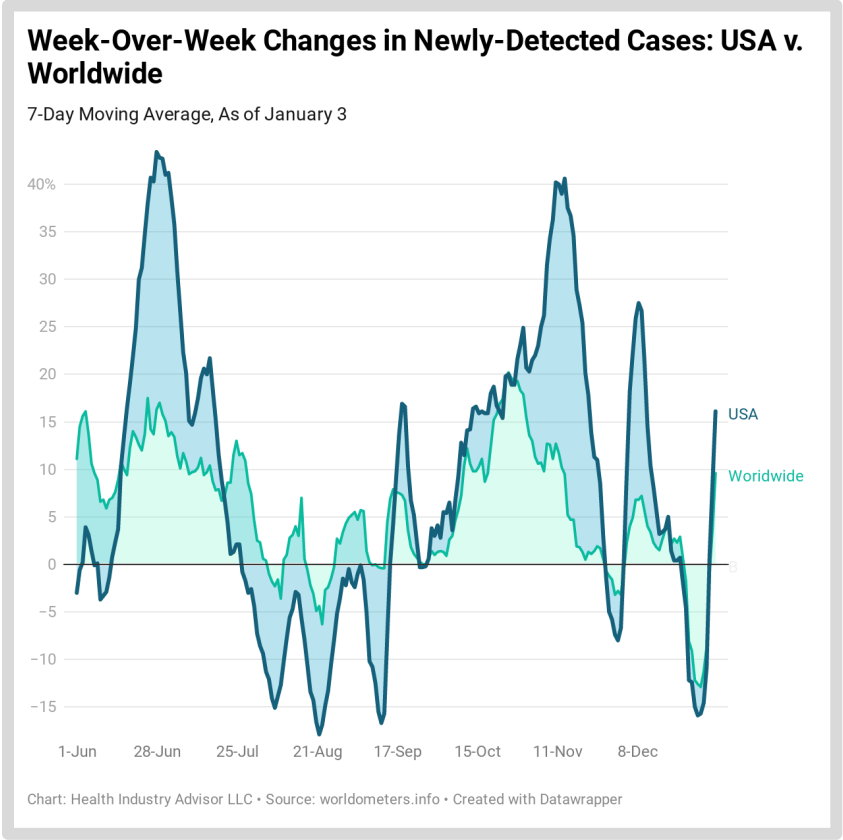
# Covid-19 Newly-Detected Cases Per Day

*Reported cases were lower during the 7-day period including Christmas; In the US the past 7 days, these returned to levels comparable to the pre-Christmas period*





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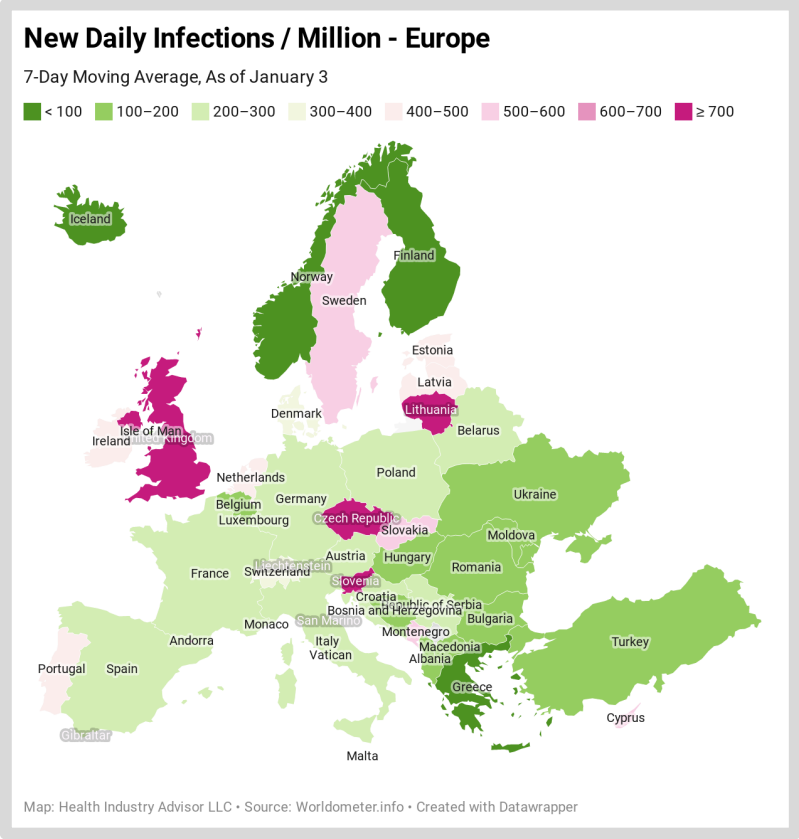
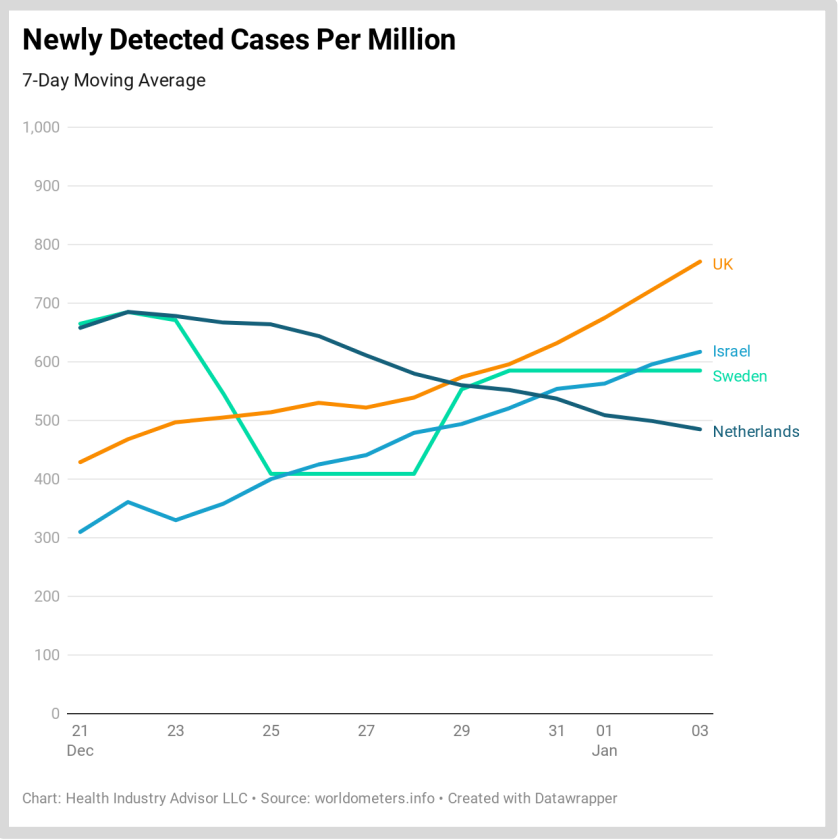
# Newly Detected Cases Per Million – Europe

*The new strain seems to be driving a surge in cases in the UK; Cases in Israel are on a similar trajectory; Netherlands is experiencing some easing in new case rates*





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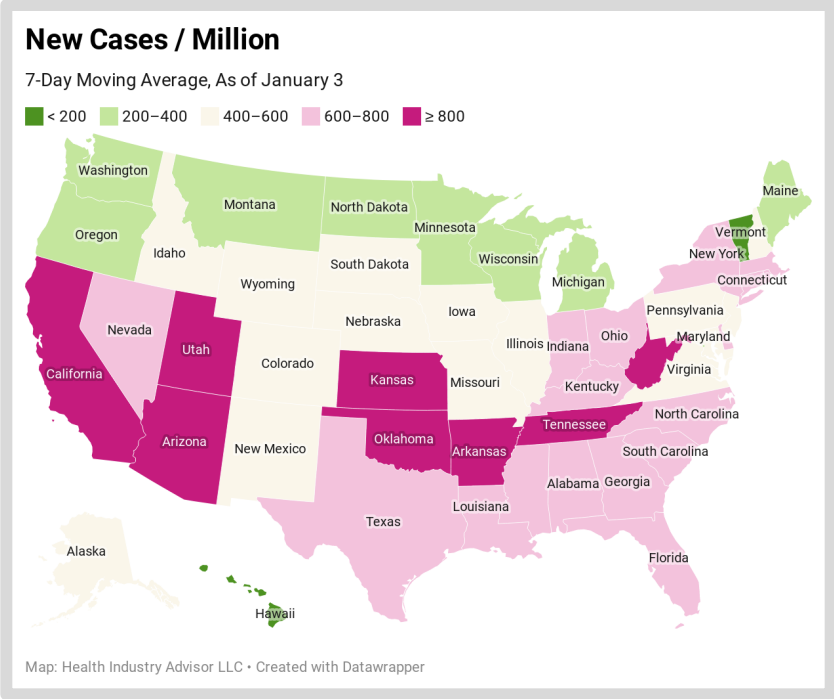
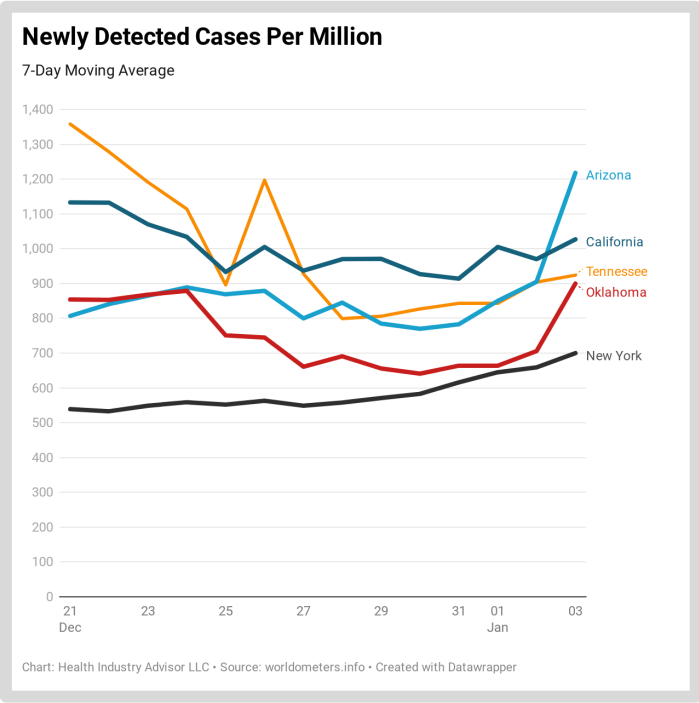
# Newly Detected Cases Per Million – US

*Coming out of the holidays, the Southwest and part of the Plains have the highest case rates; rate in Arizona are surging; rate steadily increasing in New York*





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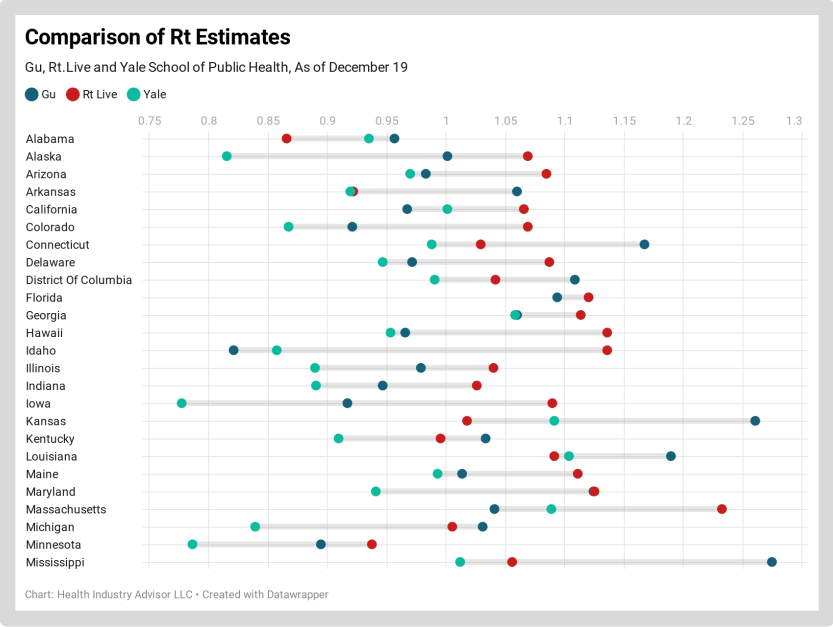
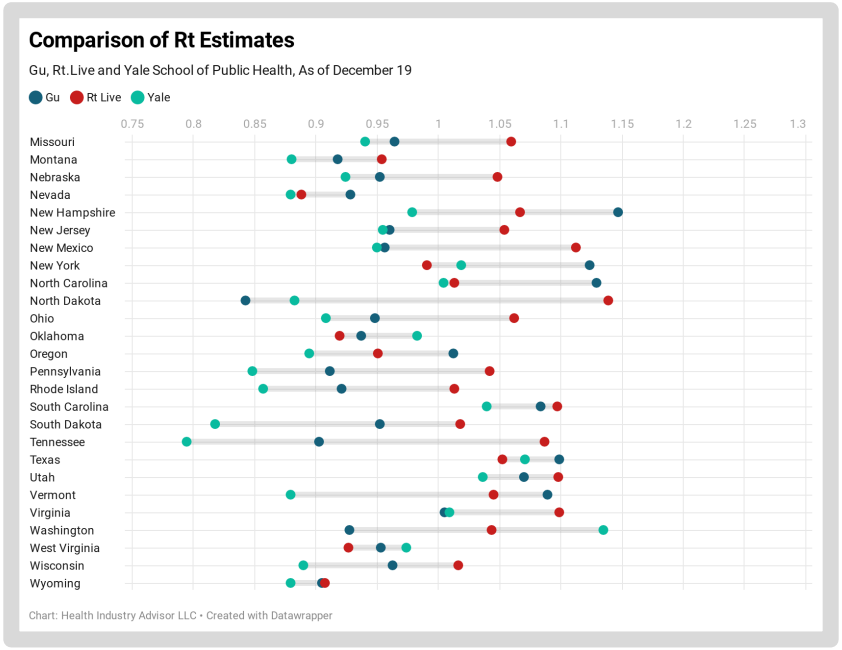
# Comparison of $R_t$ Estimates

*Rt.Live was highest for 28 of the states; Yale was the lowest for 35 states; and Gu was in the middle for 28 states*

*Using Estimates for December 19, as of January 3. Results will likely vary over time*




Three models of estimating $R_t$:

- Youyang Gu - https://covid19-projections.com
- Rt.live
- Yale School of Public Health - https://covidestim.org





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# Most Recent Reproduction Rates ($R_t$)

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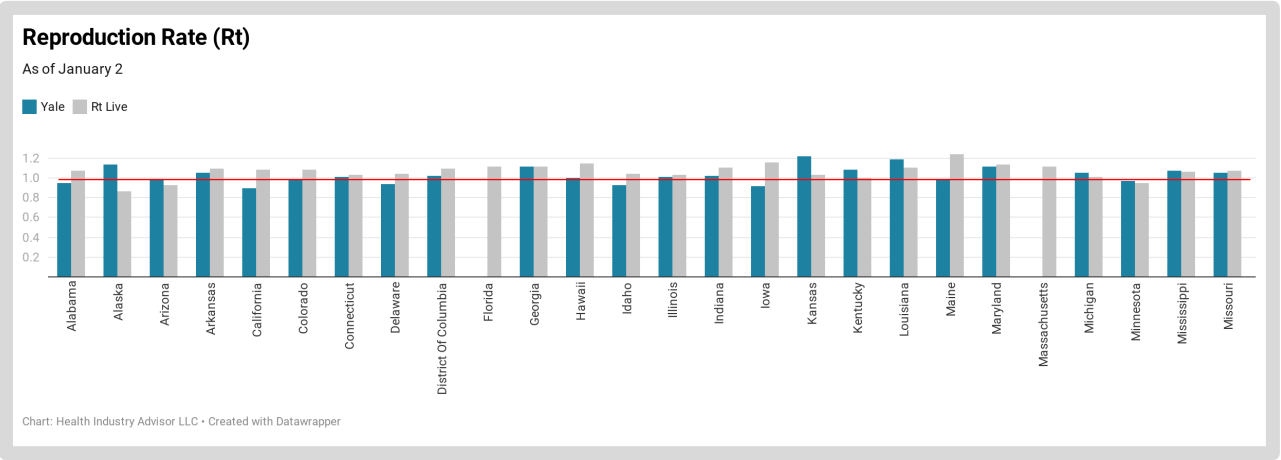
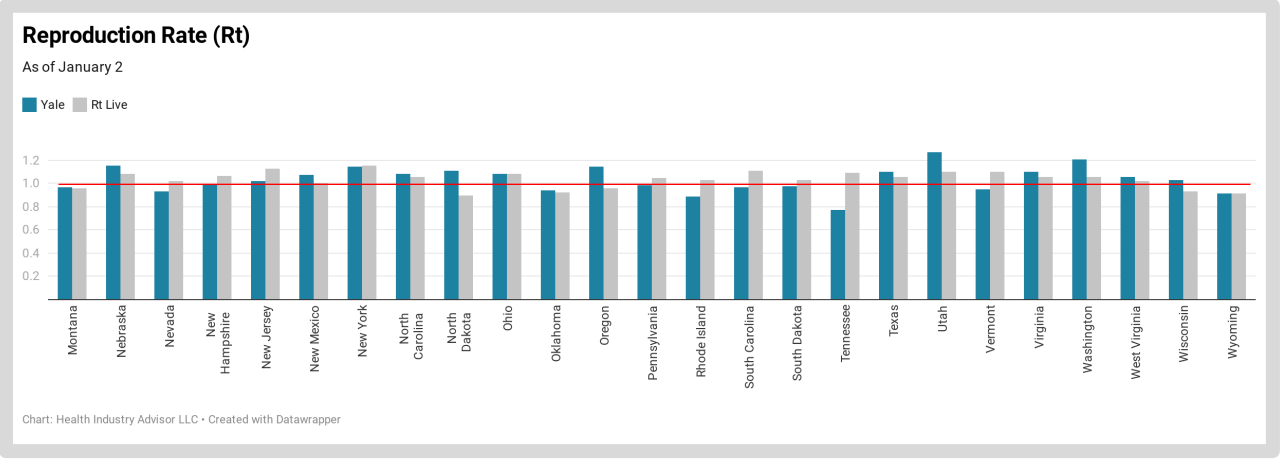
*Both the Rt.Live and Yale models estimate $R_t$>1 for most states. Both estimate $R_t$<1 for Arizona, Minnesota, Montana, Oklahoma and Wyoming; One of the two had $R_t$<1 for Arkansas, California, Colorado, Delaware, Idaho, Iowa, Maine, New Hampshire, Nevada, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Vermont and Wisconsin*




Sources:

- Rt.live
- Yale School of Public Health: https://covidestim.org





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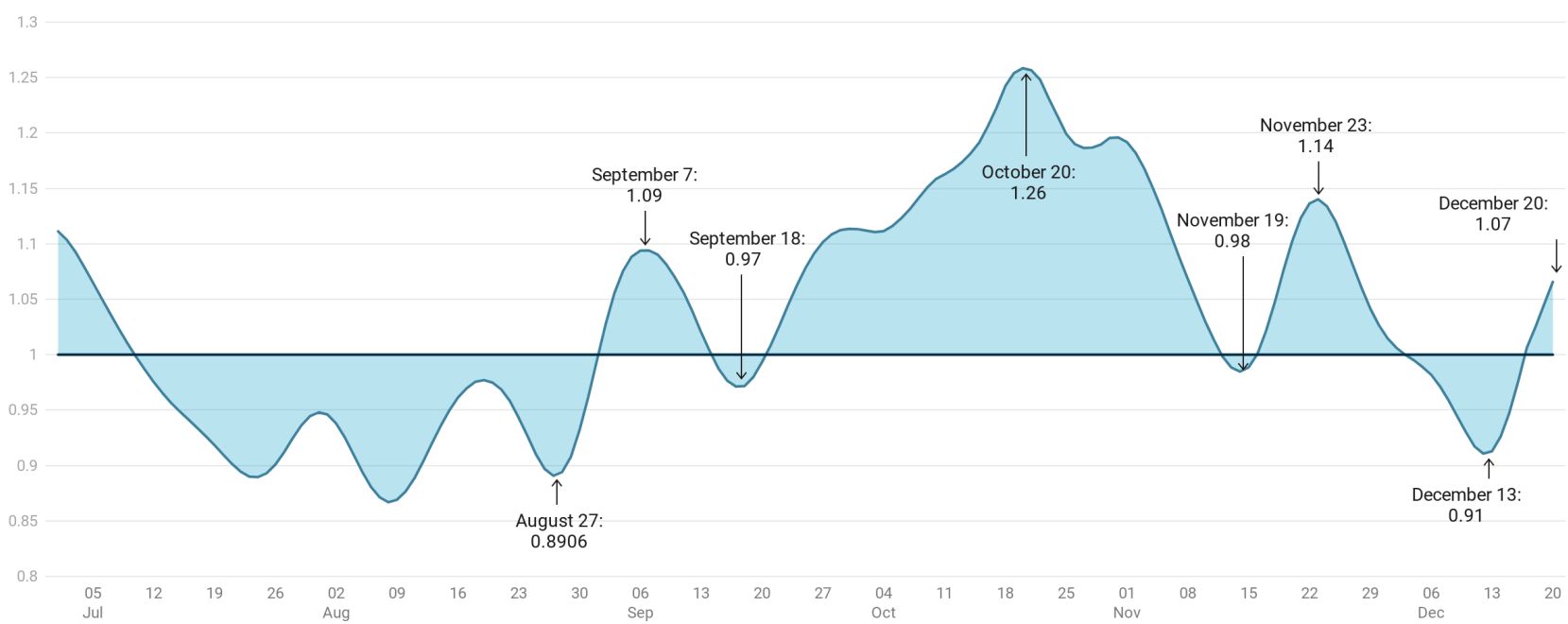
# Reproduction Rate ($R_t$) – Gu* Model

*Gu's estimate of $R_t$ exceeded 1.0 on December 17 and continues to rise; it had been below 1.0 since December 2*





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# Hospitalized Covid-19 Patients

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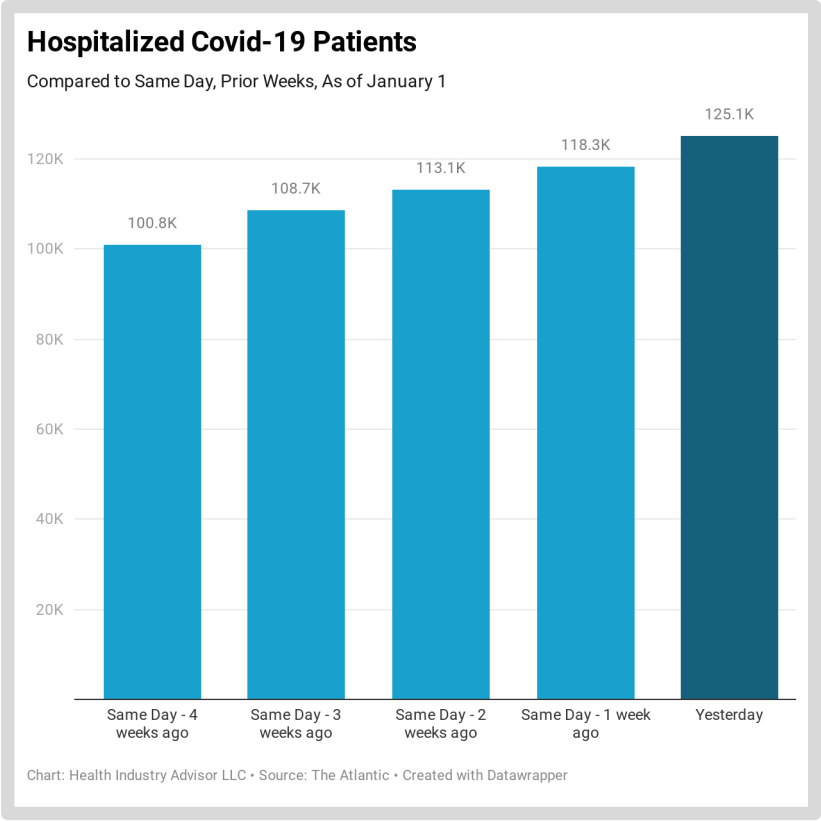
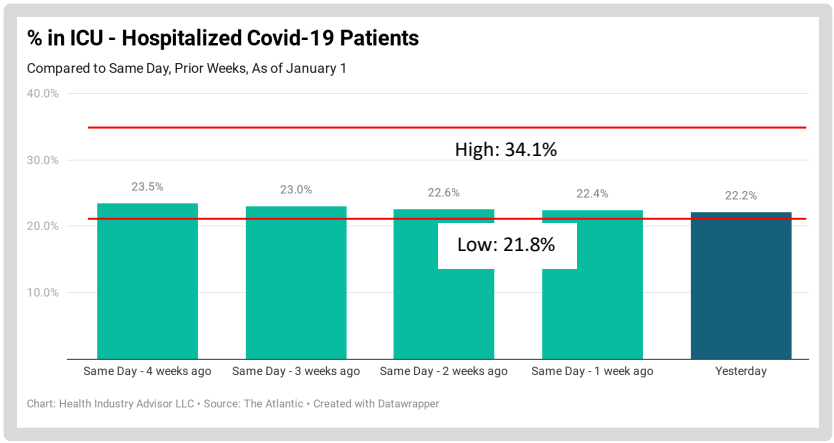
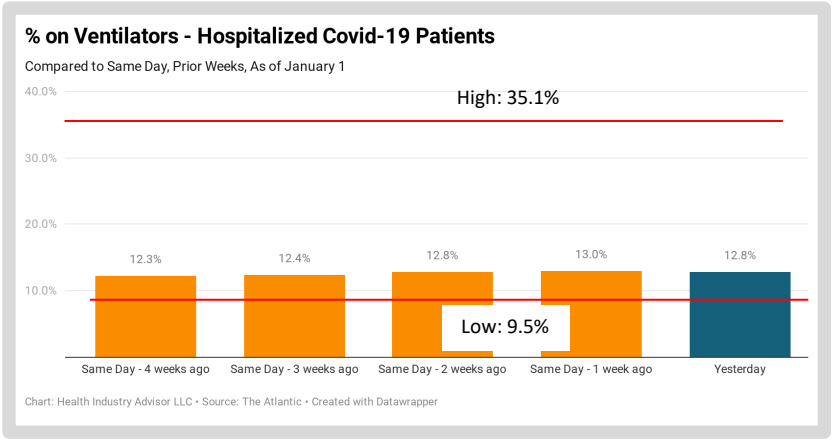
*Hospitalized patients at historically high levels; % of ICU patients continues to decline; % of ventilator patients just above historical lows*





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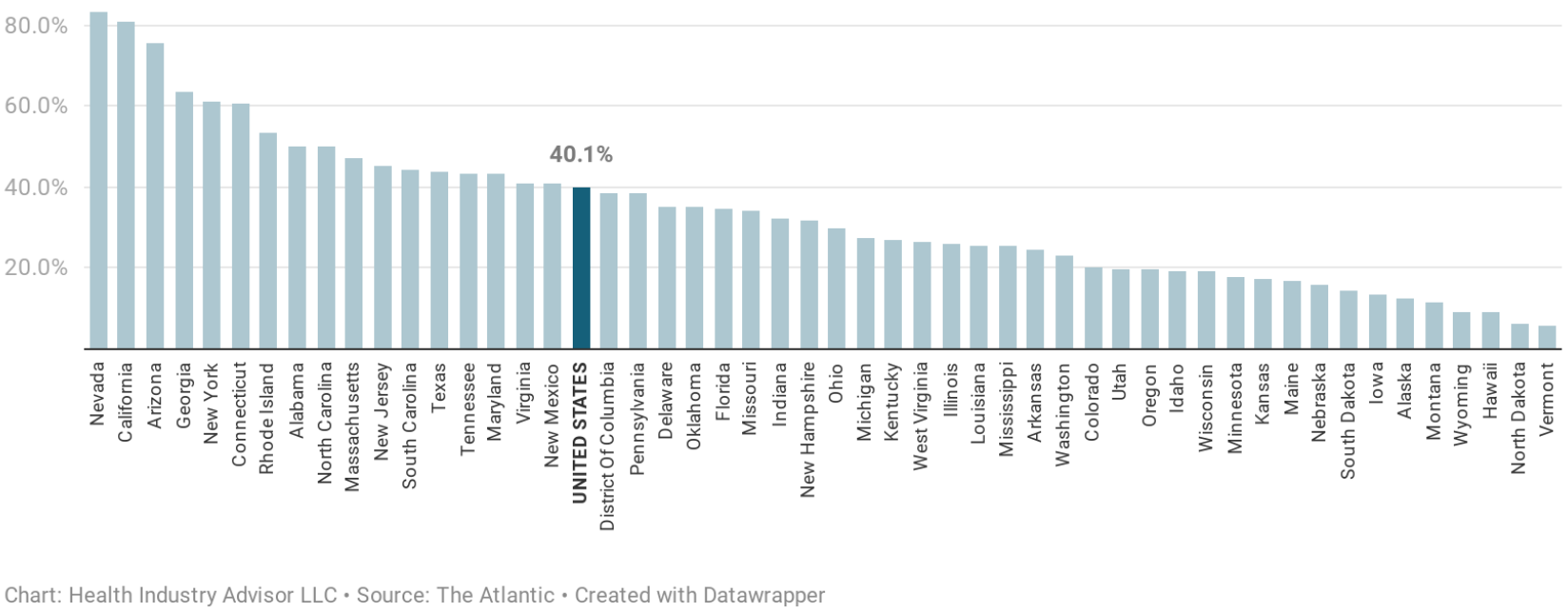
# Covid-19 Hospital Occupancy By State

*California and Nevada are using at least 80% of all inpatient beds for Covid-19 patients; Arizona, Connecticut, Georgia and New York are using at least 60%*





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# Vaccine Tracking

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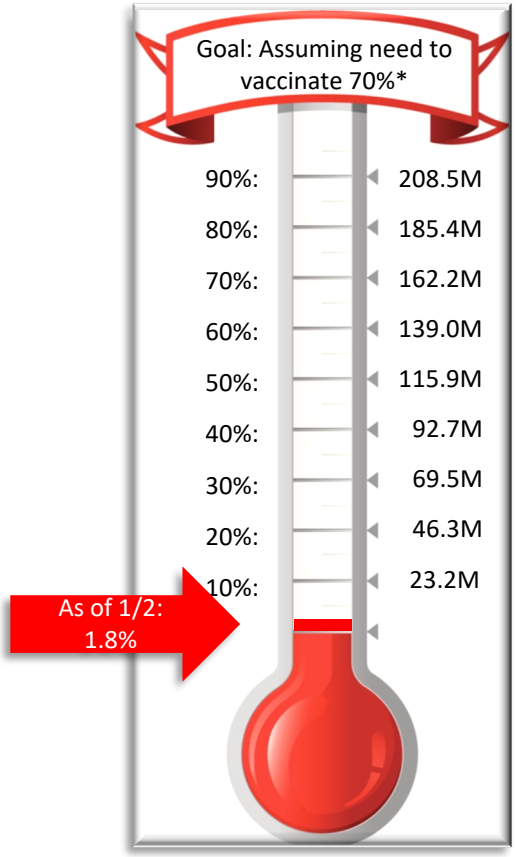
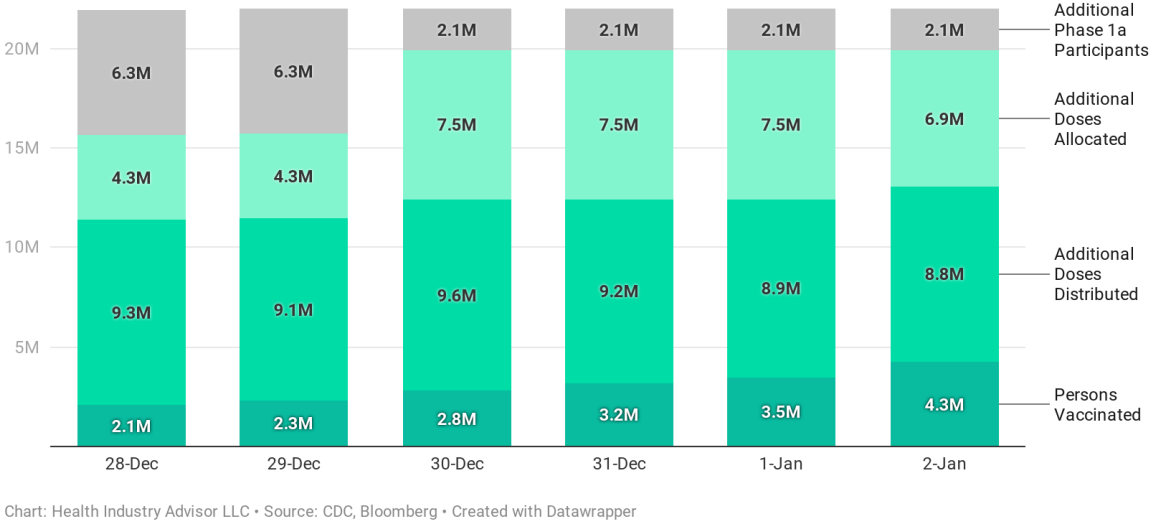
*Initial vaccinations have been slow but began to ramp-up on the weekend; Sufficient doses have been distributed to vaccinate 60-65% of targeted individuals; sufficient doses have been allocated to the states to reach 90-100% of target*




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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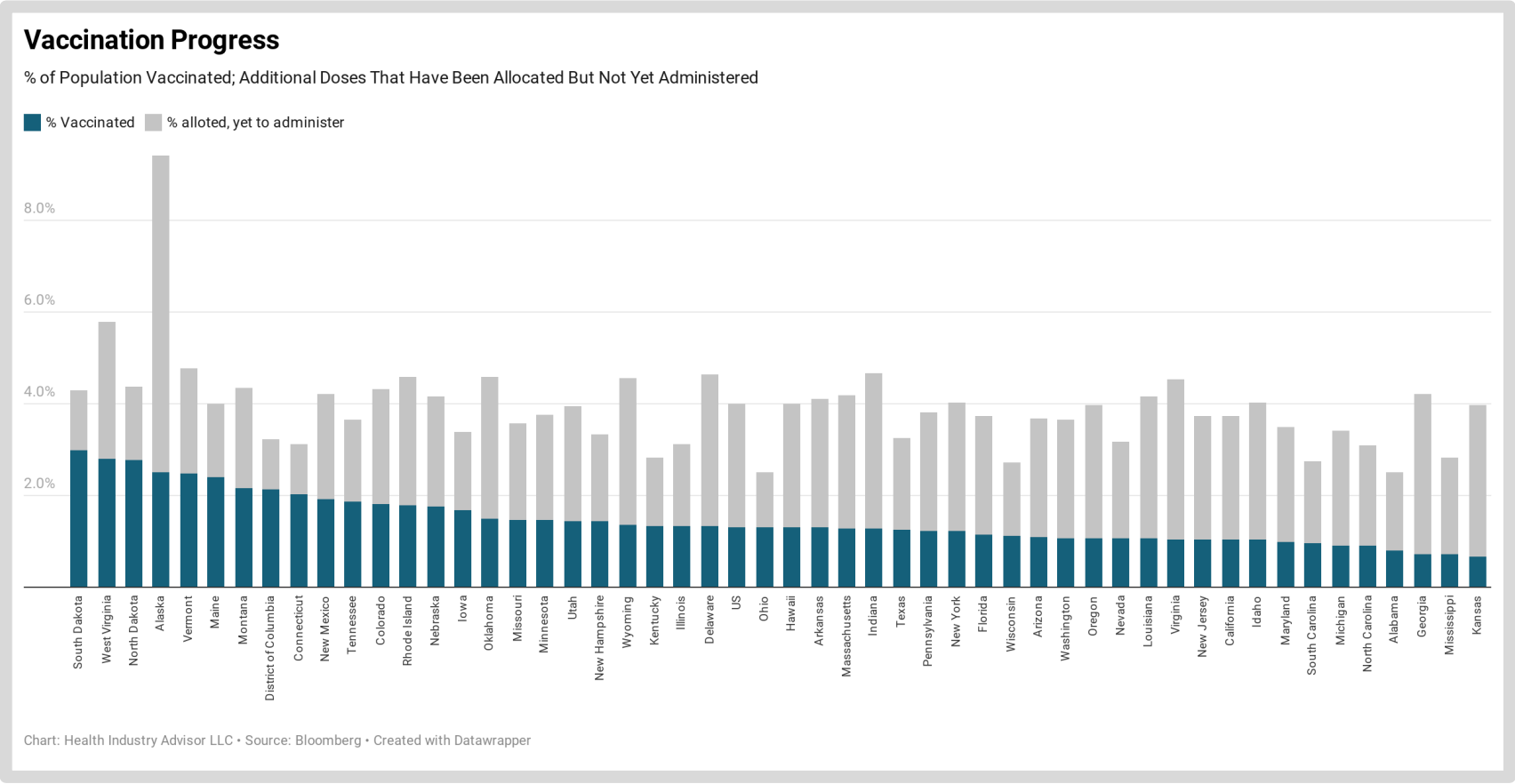
# Vaccination Progress By State

*South Dakota West Virginia and North Dakota have vaccinated the highest % of residents; Few states have administered most of their allocated doses*





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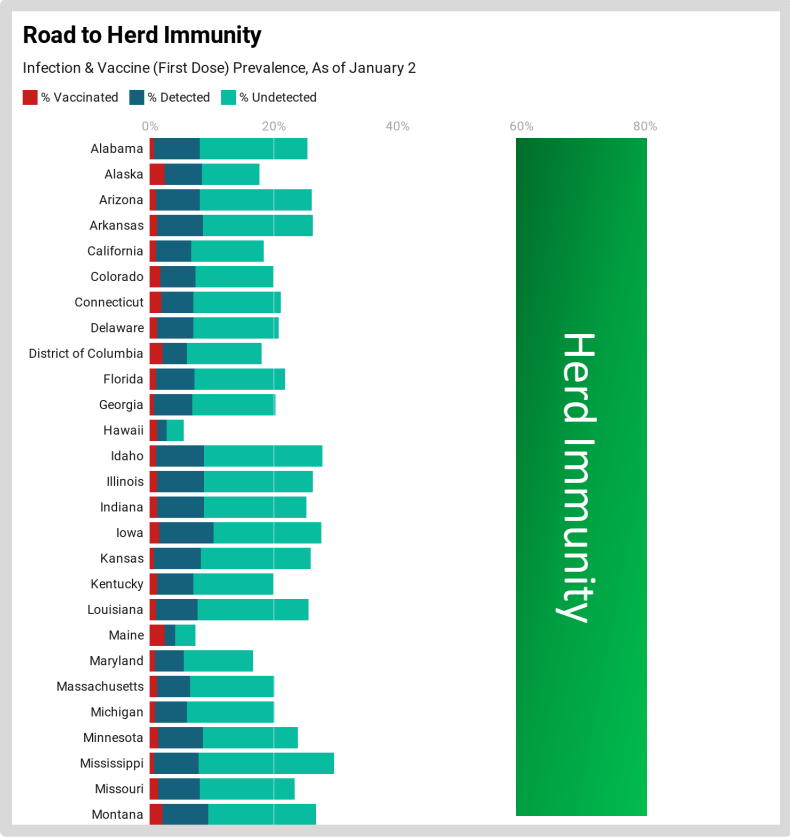
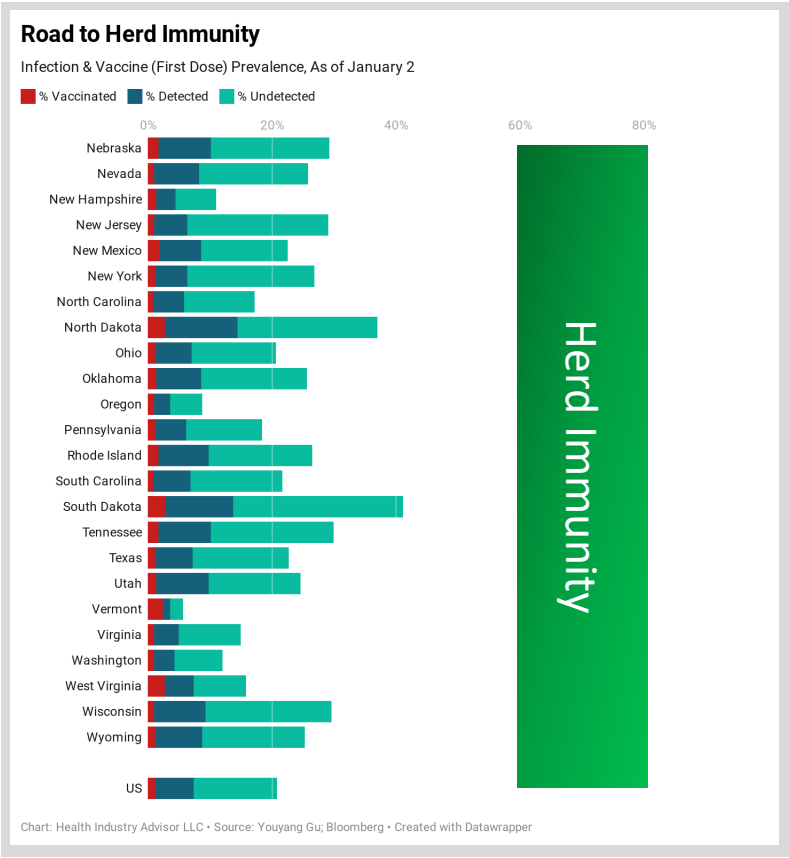
# Covid-19 Road To Herd Immunity

*North and South Dakota are setting the pace, with potentially 40% immunity*





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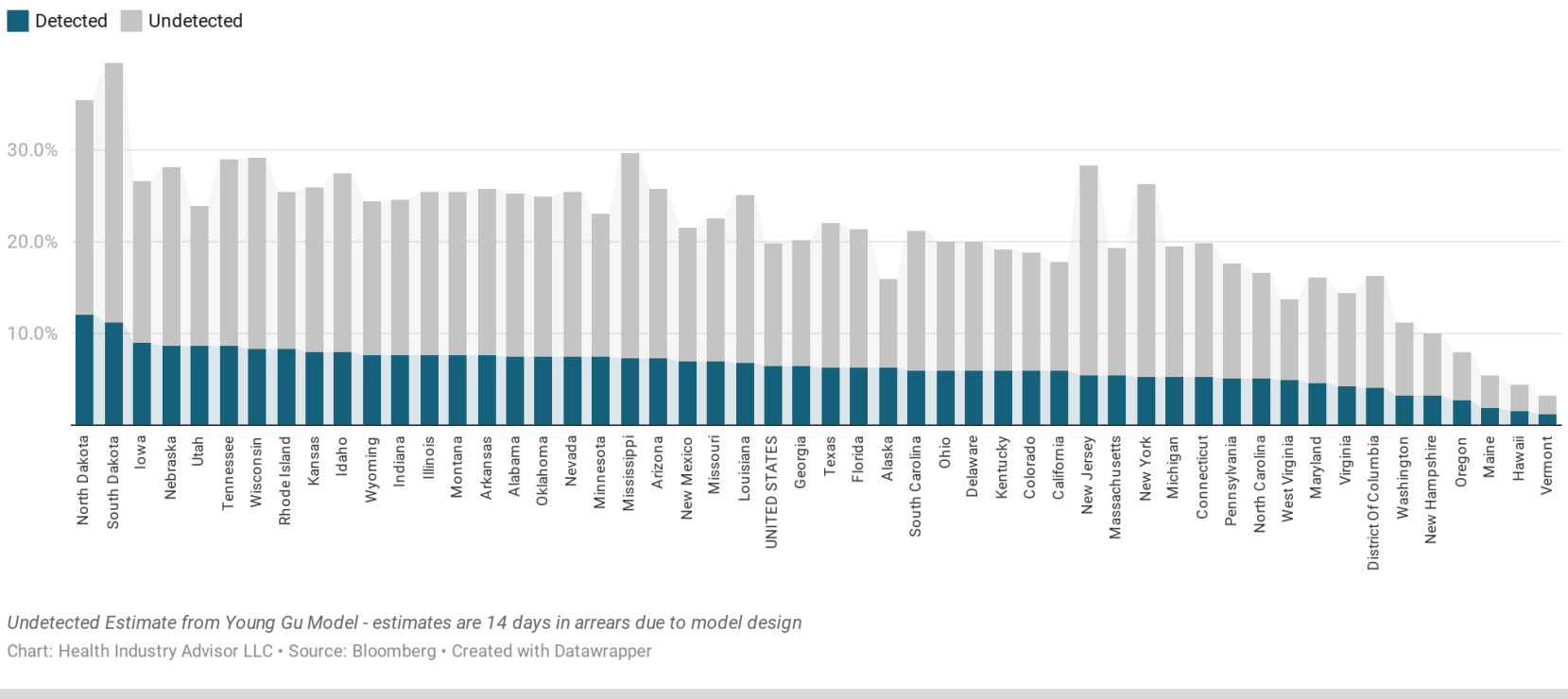
# Infection Prevalence By State

*North and South Dakota lead the country in estimated % of residents infected; Mississippi, New Jersey, New York, Tennessee and Wisconsin rank higher than detected cases would suggest*





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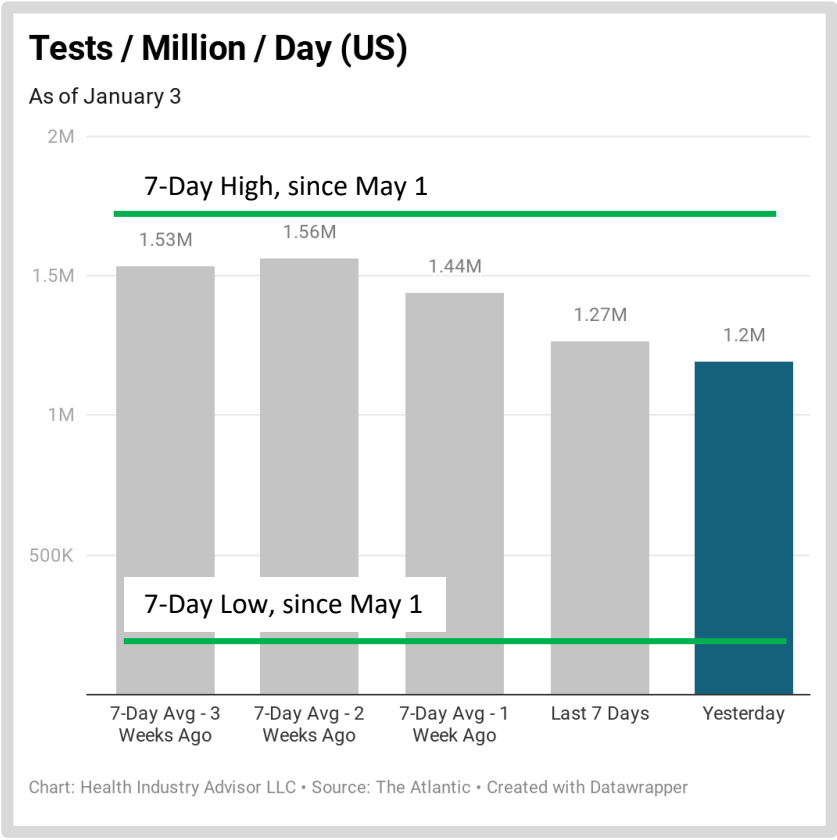
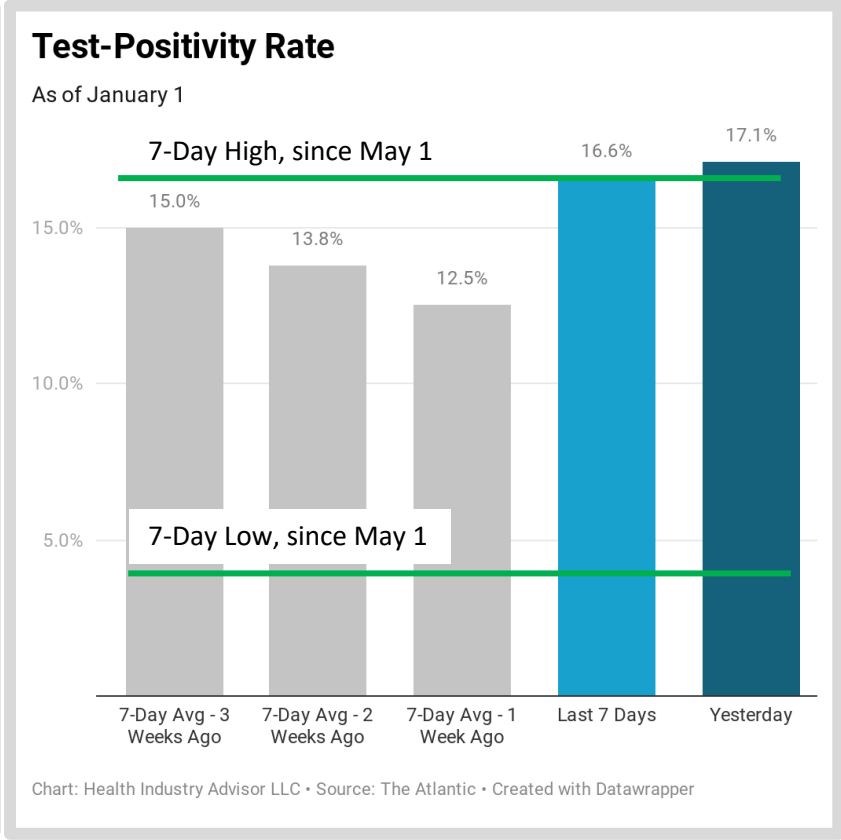
# Testing Results - US

*Test volume declined during the holiday, resulting in higher test-positive rates; the test-positive rate for the last 7 days was the highest for any 7-day period since April*





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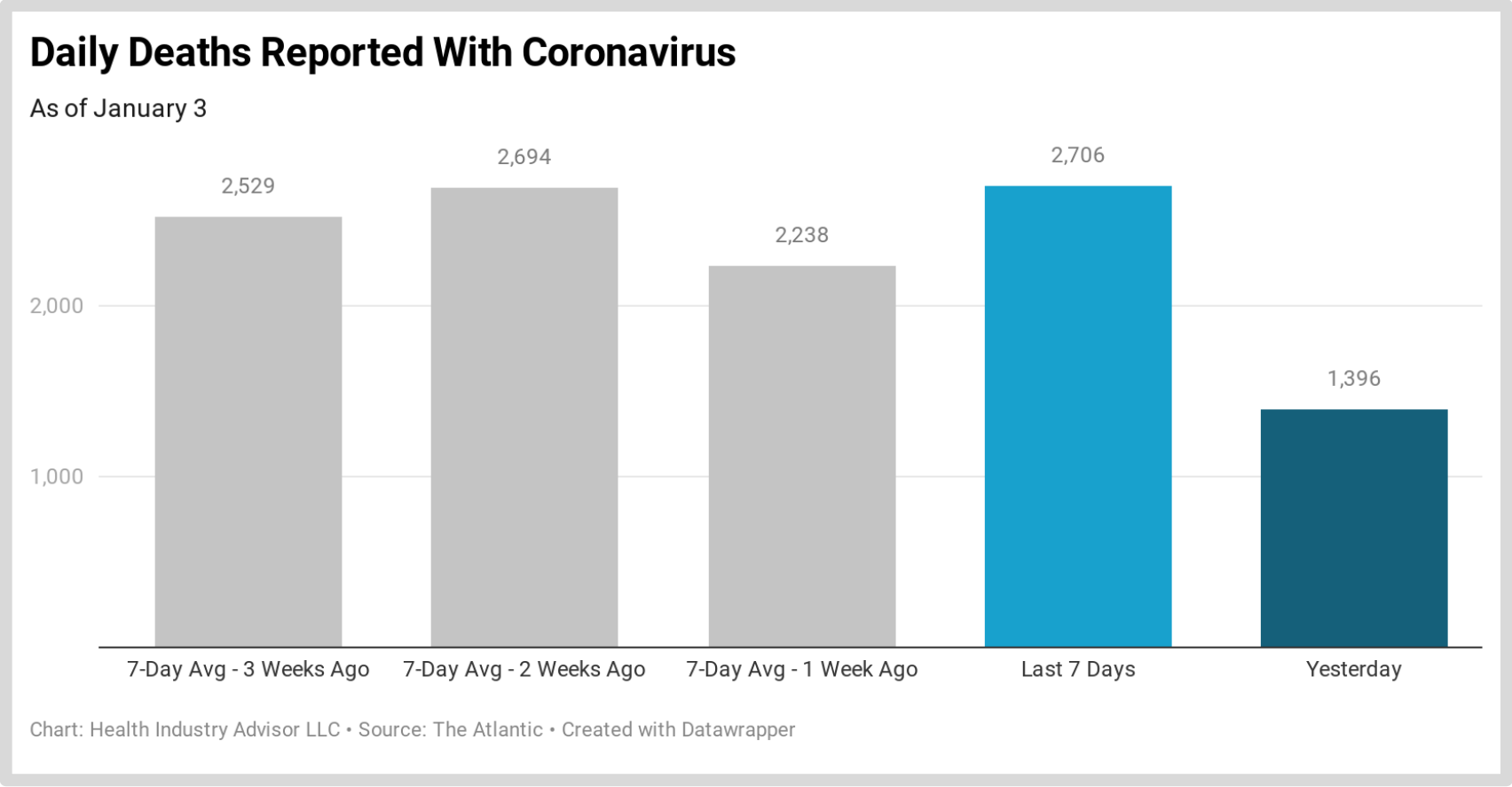
# Daily Deaths Reported With Covid-19

*With several states not reporting on Sundays, reporting deaths were relatively low; For the last 7 days, however, deaths were higher than each of prior three weeks*





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# 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



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