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"Strategic Advice in an Era of Unprecedented Change"

Covid-19 Report

Issue # 253

January 6, 2021

Covid-19 Highlights

- **Yesterday, the US surpassed 5 million people reportedly receiving their initial dose of the Covid-19 vaccine**.
  - **This represents about 1/4 of the number of persons in the Phase 1a rollout and 1.5% of the US population**
  - Sufficient vaccine doses have been distributed to the states to provide initial doses to 75-85% of the Phase 1a population
- The path to herd immunity may depend on both immunity from infections and vaccinations
  - **In a report published in JAMA Open Network, researchers concluded that 14.3% of the US population had likely been infected with the SARS-CoV-2 virus as of mid-November. At that time, detected cases only represented 3.4% of the population**
  - **This conclusion comports with Youyang Gu's mean estimate of true infections, which he placed at 14.3% as of November 11**
  - Gu's latest estimate places this infection prevalence at 21.5%, as of two weeks ago
  - **Given the infection prevalence estimate and the current vaccination rate, as a country, we are only 1/4 to 1/3 of the way toward herd immunity**
  - With relatively higher rates of both infection prevalence and vaccination rates than other states, North Dakota and South Dakota are furthest along the path toward herd immunity - each at half to two-thirds of the way necessary. Mississippi, New Jersey, New York, Tennessee and Wisconsin could be one-third to halfway to herd immunity
- The **weekly ensemble forecasts of Covid-19 cases and deaths in the US were released yesterday; the ensemble forecast of hospitalizations was most-recently published on December 30**
  - **New cases are projected to remain relatively stable week-over-week for the rest of the month**; these cases are projected to be about 5% lower each week than recorded during the week prior to Christmas
  - **Deaths with coronavirus are similarly projected to be stable during January and slightly lower than reported for the week prior to Christmas**
  - Cumulative deaths with coronavirus are projected to surpass 400k during the third week of January
  - **Hospital admissions with Covid-19 symptoms are projected to decline throughout January for the US overall; California is projected to experience continued growth in these admissions during the month**; Arizona is projected to experience a decline
- **Concerns are rising about new Covid-19 strains in South Africa and the UK**
  - South Africa has seen its new case rate increase by 60% in the last two weeks; the UK, by 76%
  - Two countries with unusually steep increases in case rates during this time: Ireland, ~770% and Israel, >700%
  - **A highly-transmissible strain in South Africa could be particularly acute, as to-date its infection prevalence is only 1.9%, by comparison, it is 4.1% in the UK and 6.5% in the US**
- Estimated true infections (rather than detected cases) continue to rise sharply in the US, according to the models produced by Youyang Gu and the Yale School of Public Health
  - Newly-detected cases in the US over the past 7 days, however, have been comparable to the two weeks prior to Christmas
  - Cases have been increasing in the parts of the Atlantic Seaboard, the South and the West; these have been easing across the Upper Midwest
- **Covid-19 hospitalizations continue to be of acute concern in Arizona, California, and Nevada; Concerns are growing in Connecticut, Georgia, and New York**

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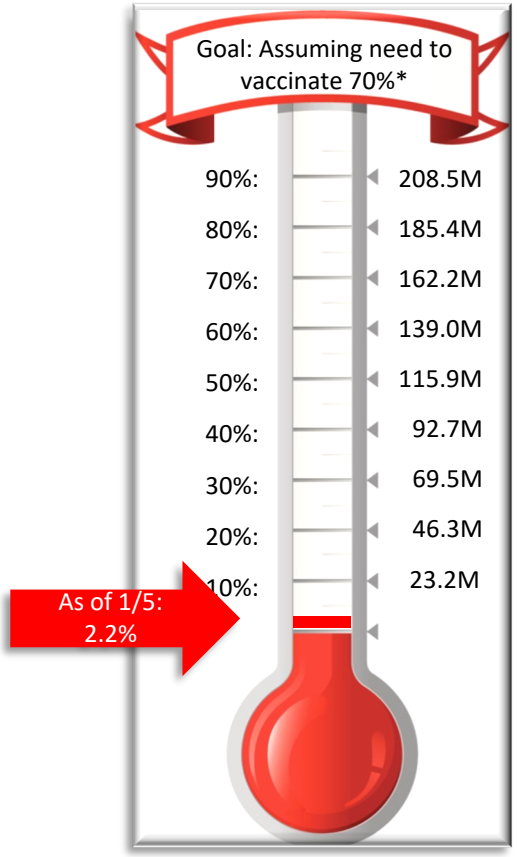
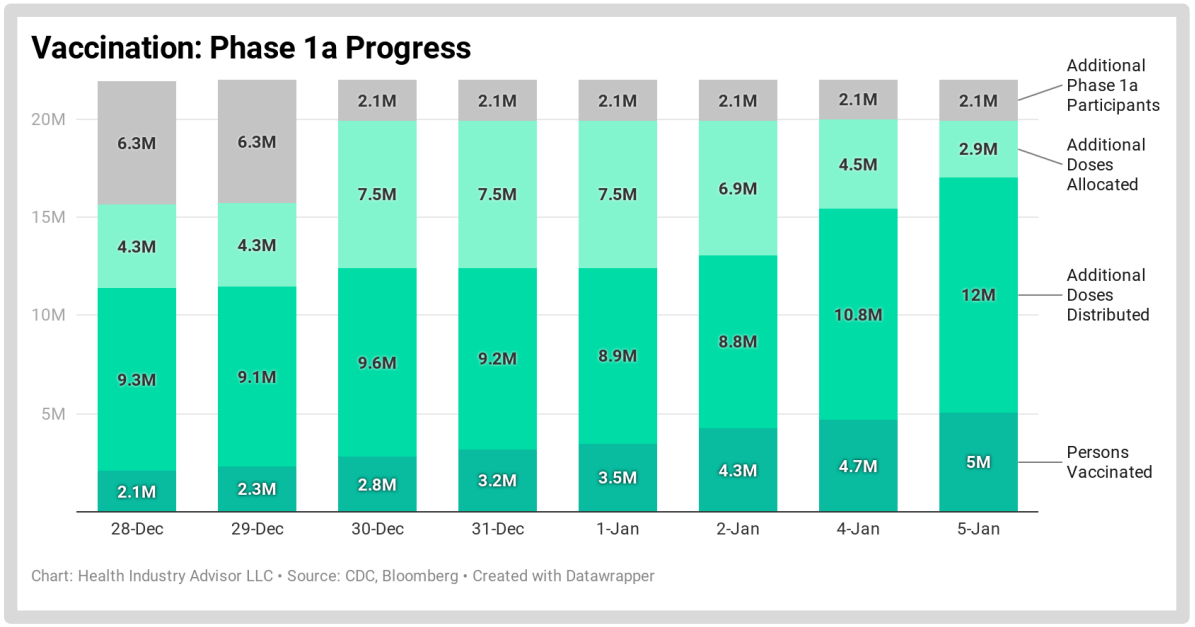
Vaccine Tracking

Covid-19

About 25% of the persons included in Phase1a of the vaccine rollout have received at least the initial dose; Sufficient doses have been distributed to the states to administer one dose to 75-85% of the Phase 1a target population





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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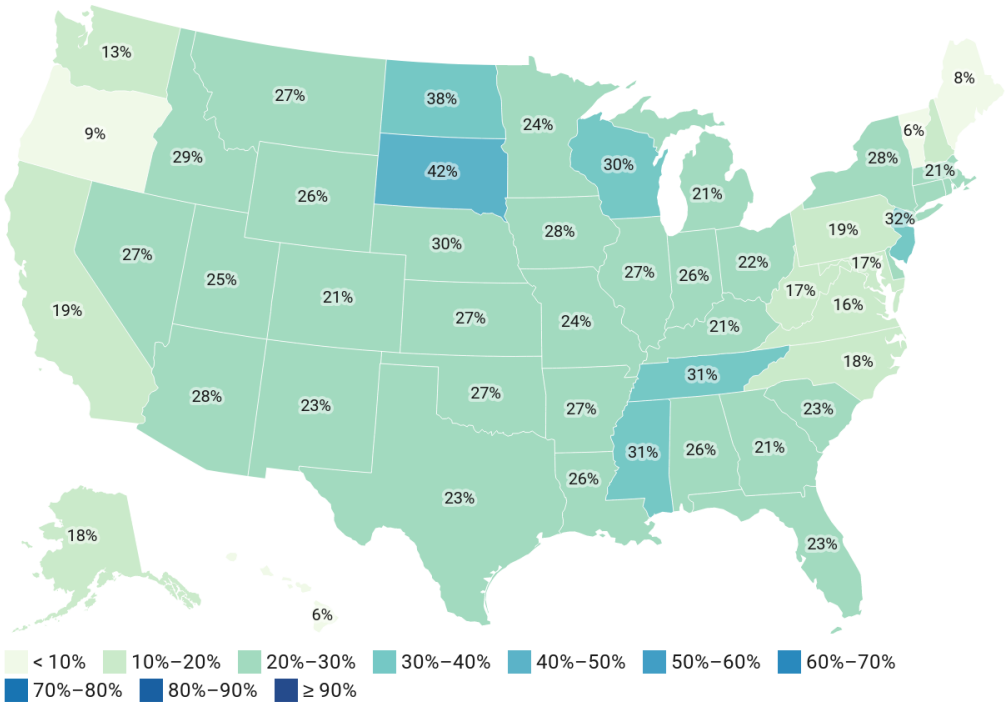
Estimated Immunity By State

Covid-19

South Dakota and North Dakota may be furthest along toward herd immunity levels – perhaps, ½ to 2/3 of the necessary immunity required; Mississippi, New Jersey, New York, Tennessee and Wisconsin could be at 1/3 to 1/2

- Public health experts have suggested that 60-80% of the population would need immunity, for herd immunity to be reached
- Immunity could result from an infection or via vaccination
- It is not established how long immunity, from either infection of vaccination, will last
- For purposes of this illustration, we use both reported vaccination rates and Youyang Gu's*mean estimates of true infections

* https://covid19-projections.com



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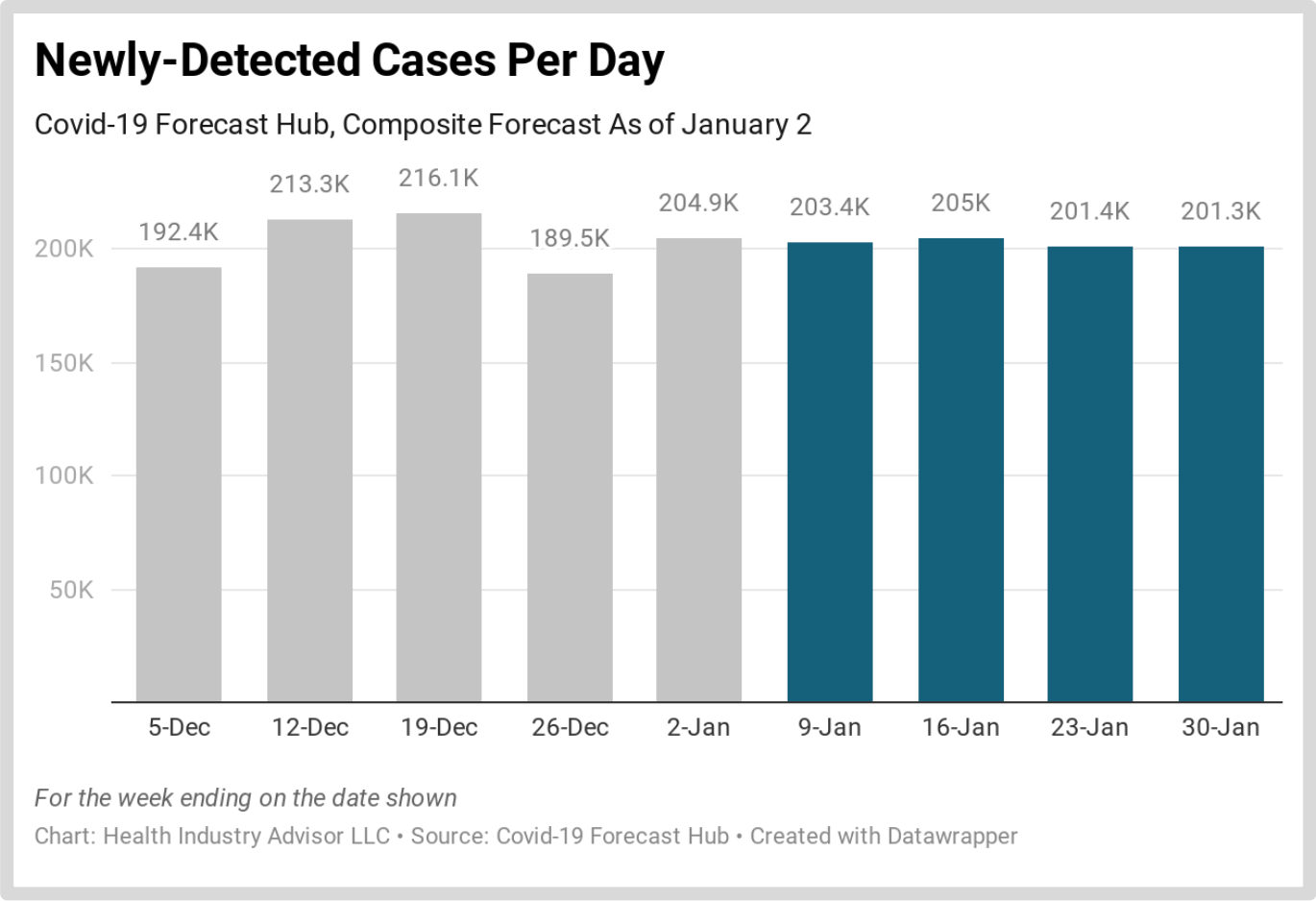
Covid-19 Case Projections (US)

Covid-19

New cases are projected to be fairly level through January – and lower than the peak set in the middle of December



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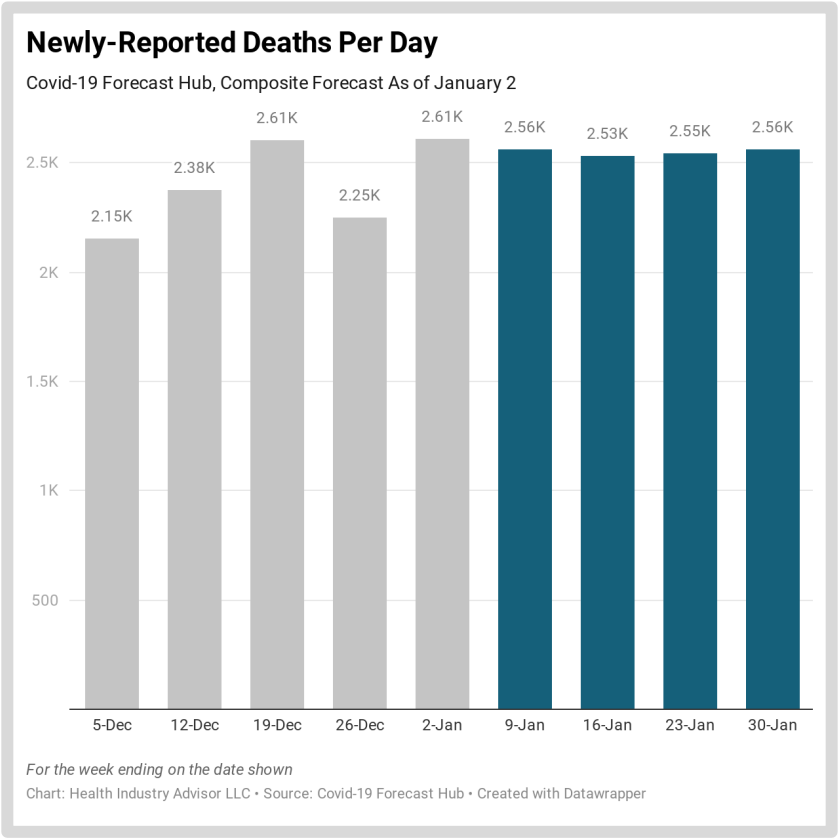
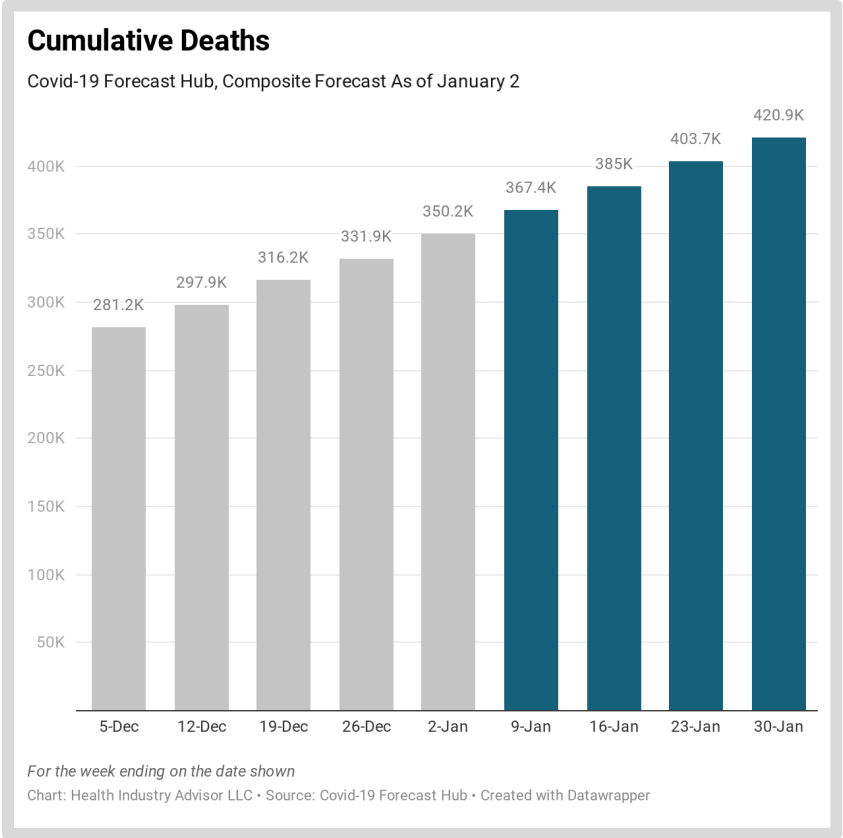
Death Projections (US)

Covid-19

Deaths with coronavirus are projected to be consistent week-to-week through January and slightly lower than the third week of December; Cumulative deaths are projected to surpass 400k in the third week of January





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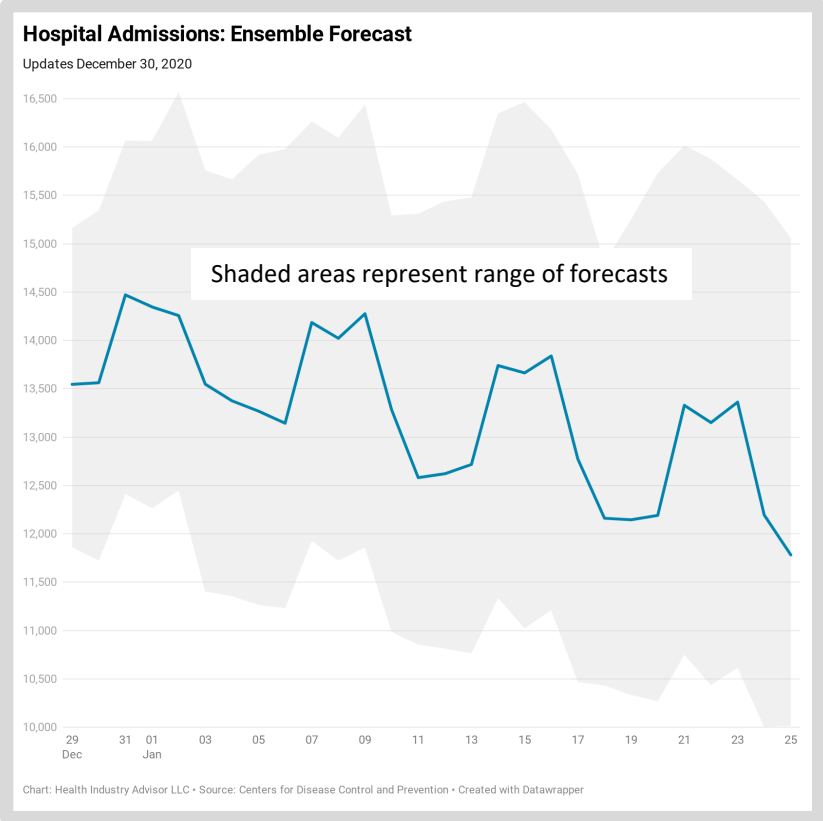
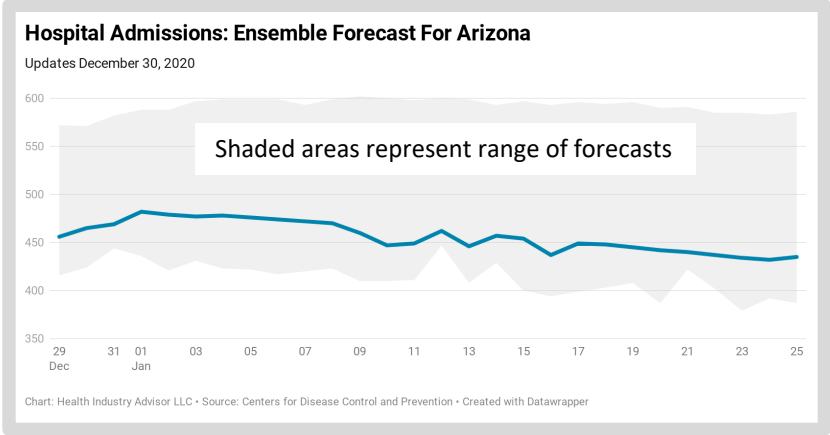
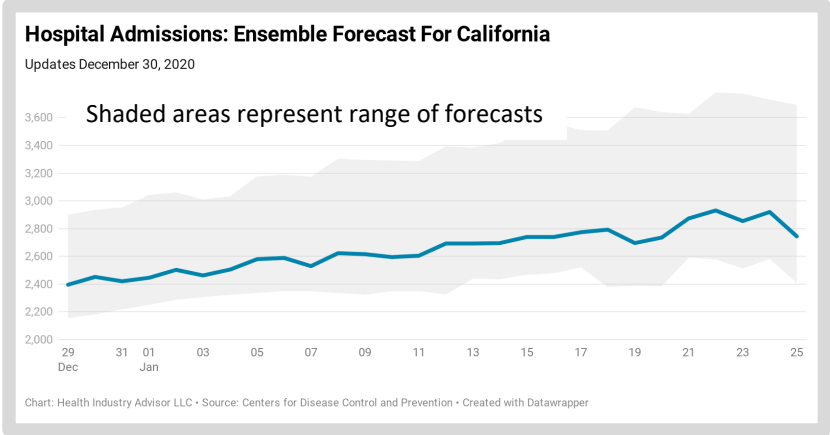
Projections of Hospital Admissions (US)

Covid-19

Hospital admissions with Covid-19 symptoms are projected to trend lower throughout January; These admissions are expected to decline in Arizona but, continue increasing in California







Source: CDC https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/hospitalizations-forecasts.html
As of December 30, 2020. Accessed January 5, 2021

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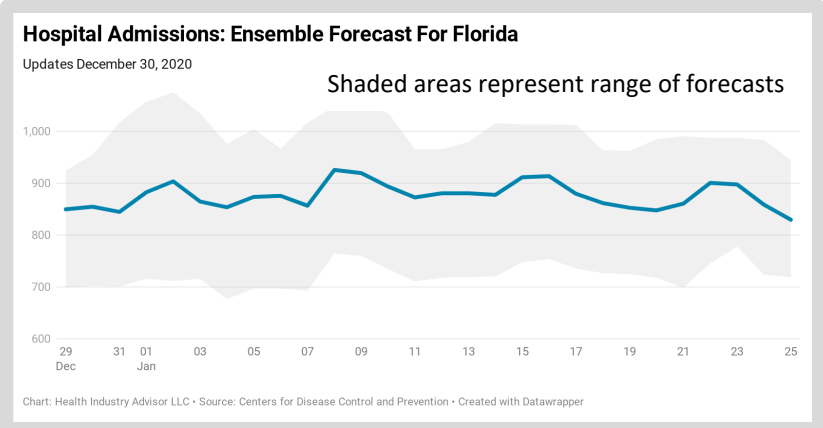
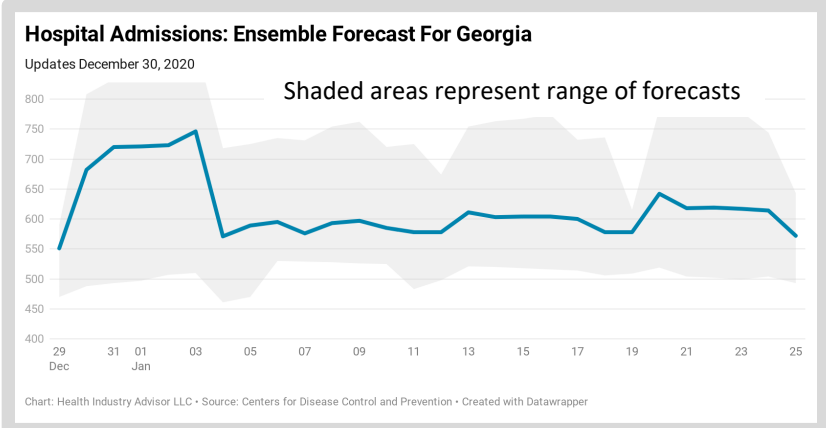
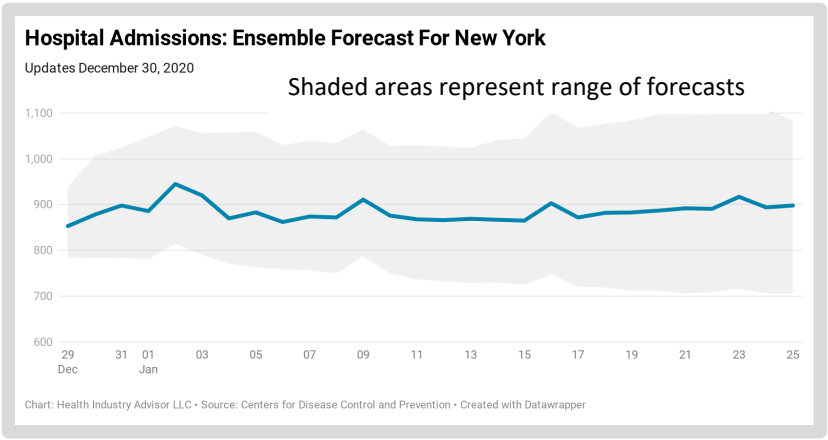
Projections of Hospital Admissions

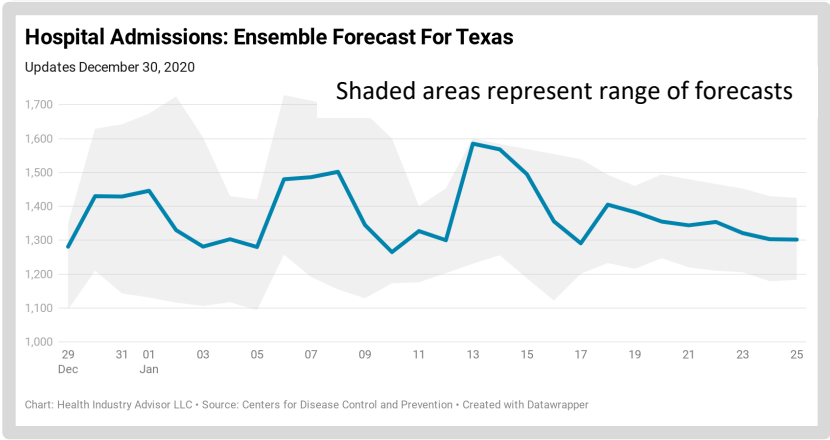
Covid-19

Hospital admissions with Covid-19 symptoms are projected to trend up slightly in New York in January; drop in Georgia at the beginning of January then, level-off; decline in Texas later in the month









Source: CDC https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/hospitalizations-forecasts.html
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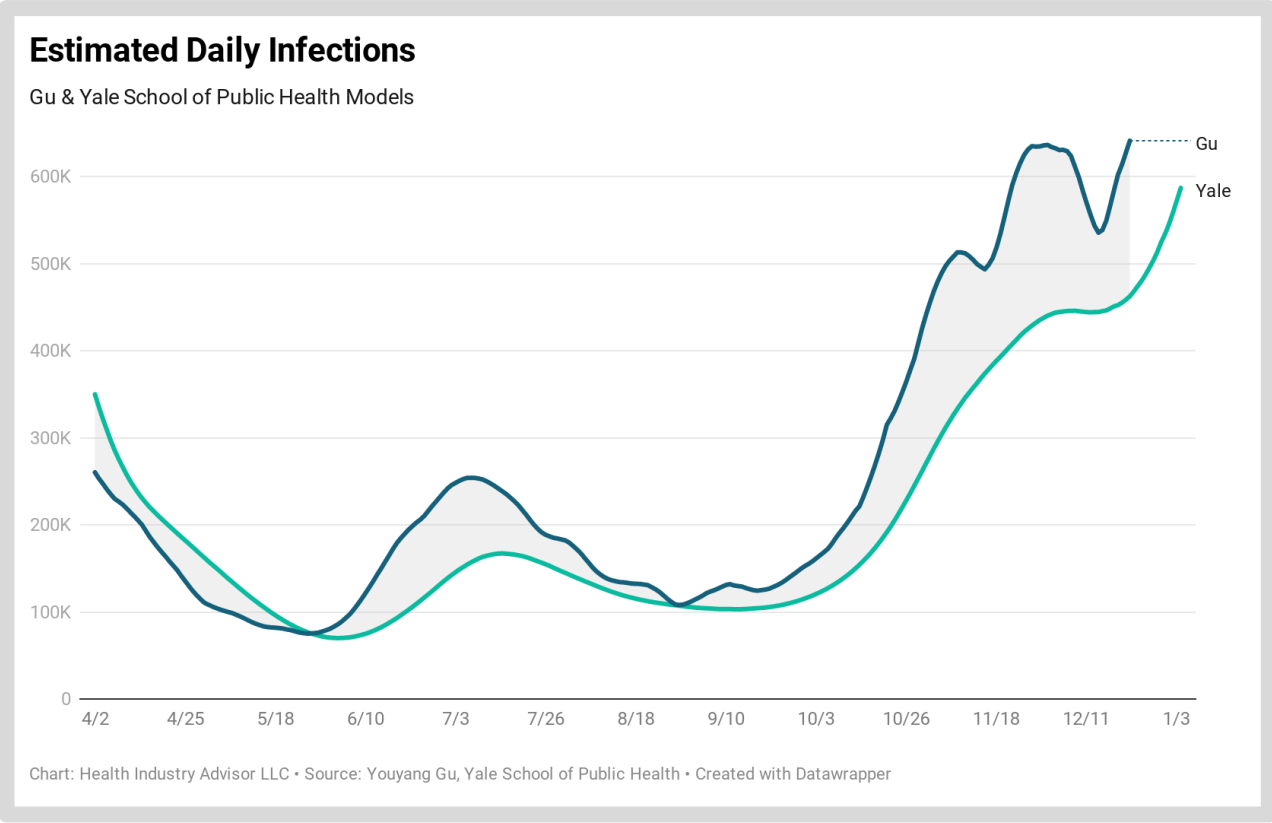
Two Models of Estimated Daily Infections

Covid-19

Models from both Youyang Gu and the Yale School of Public Health suggests that actual infections are spiking

- 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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Selected Hot-Spots Around the Globe

Covid-19

Several countries have experienced significant spikes in cases over the past two weeks; New strains in the UK and South Africa are concerning. Prior to this, South Africa had relatively low infection prevalence

As of January 5, 2021

Country	Infection Prevalence (% of population with a detected case)	Current Case Rate (7-Day Average: Cases/M)	Two-Week Change in Case Rate
United States	6.5%	689	4%
Ireland	2.3%	679	767.8%
Israel	5.0%	716	708%
South Africa	1.9%	254	59.8%
United Kingdom	4.1%	822	76.2%

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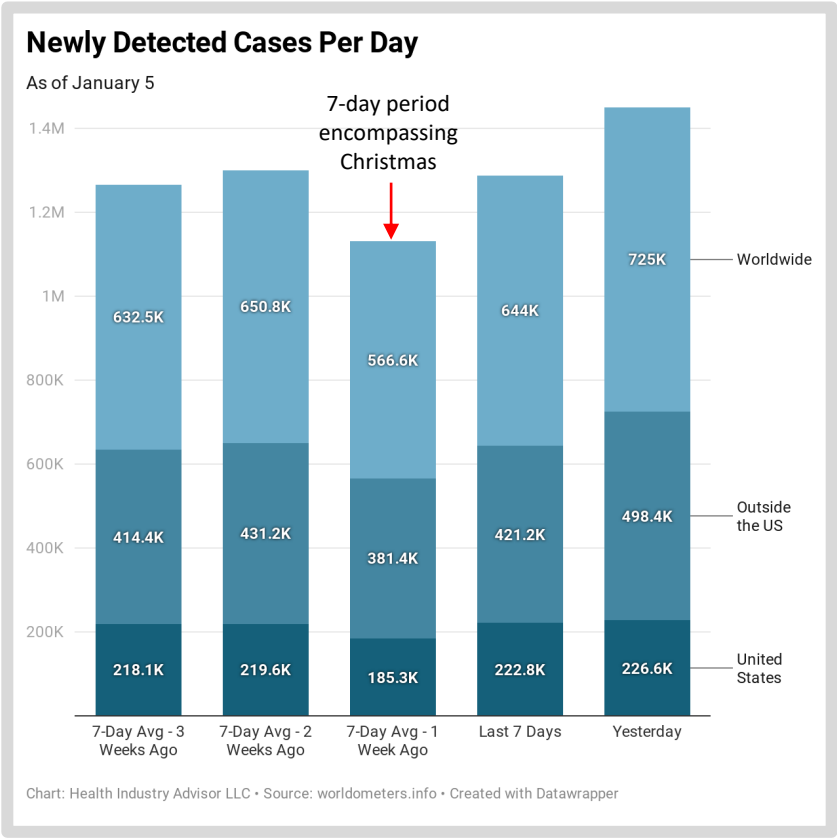
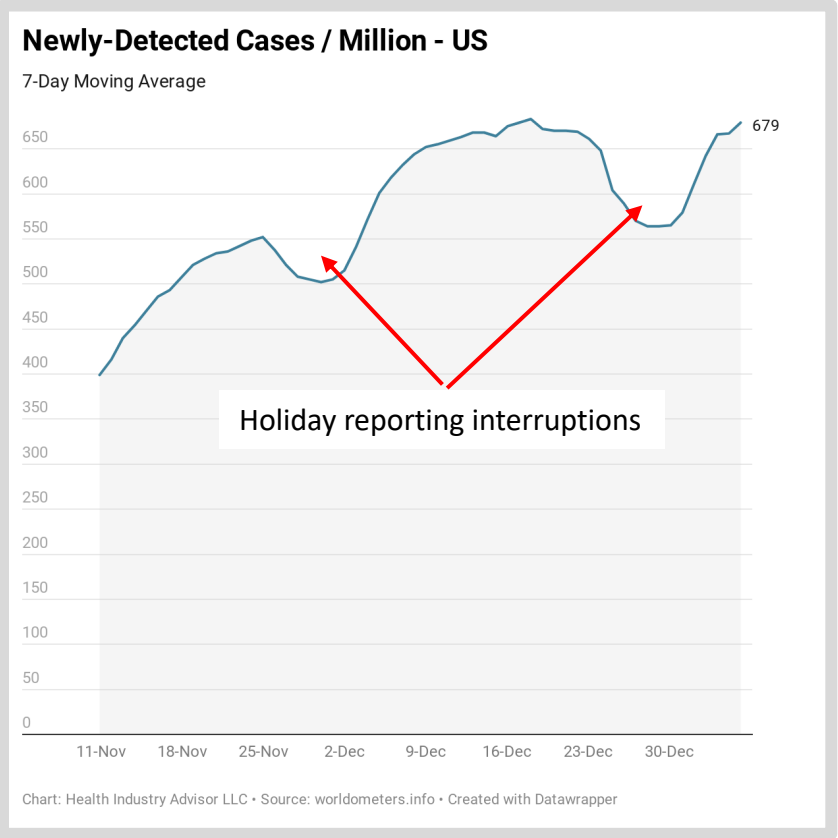
Newly-Detected Cases Per Day

Covid-19

Reported cases were lower during the 7-day period including Christmas; For the US and worldwide, these have returned to levels comparable to the two weeks pre-Christmas





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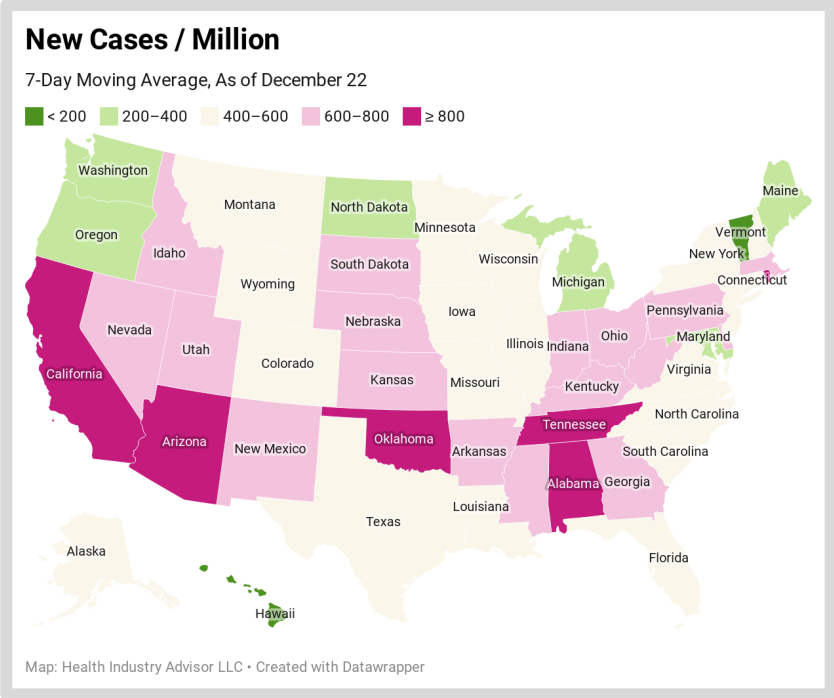
Newly Detected Cases / Million

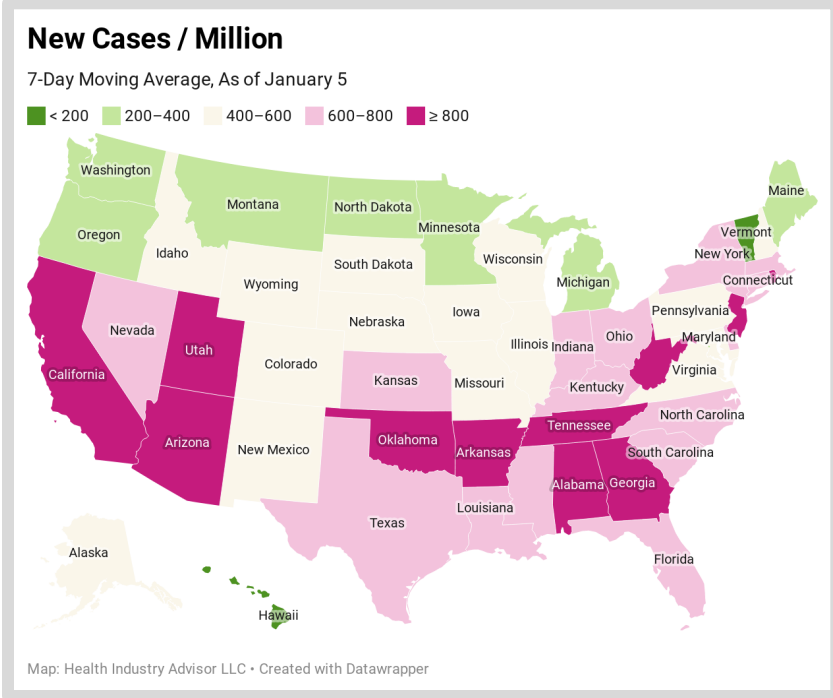
Covid-19

Case rates may have eased in the Upper Midwest since just prior to Christmas; worsened across the Atlantic Seaboard and parts of the South

As of December 22



As of January 5



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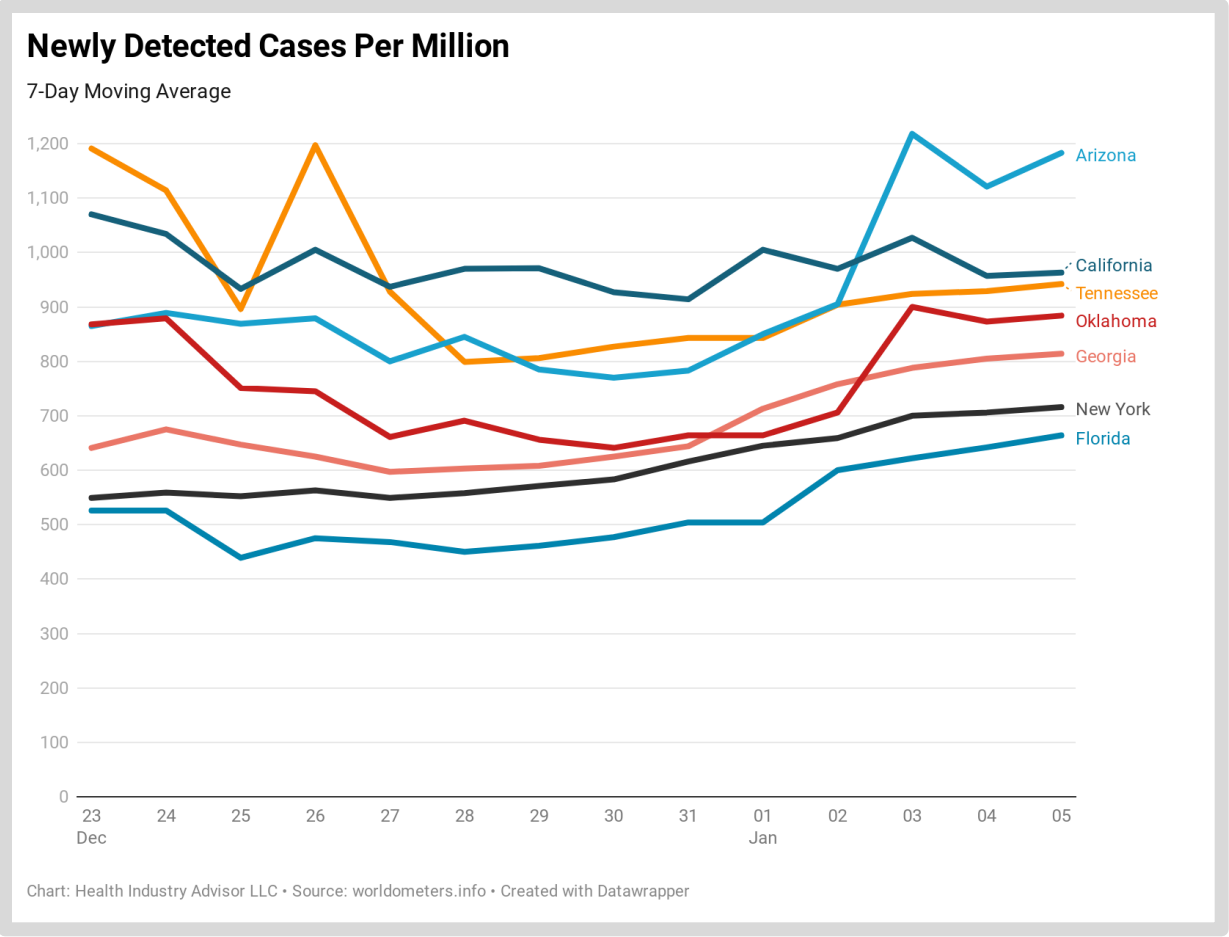
Newly Detected Cases / Million

Covid-19

Case rates are spiking in Arizona, Oklahoma and, to a lessor degree in Georgia; These rare rising, albeit at a lower trajectory in Florida and New York. Rates in California may be stabilizing



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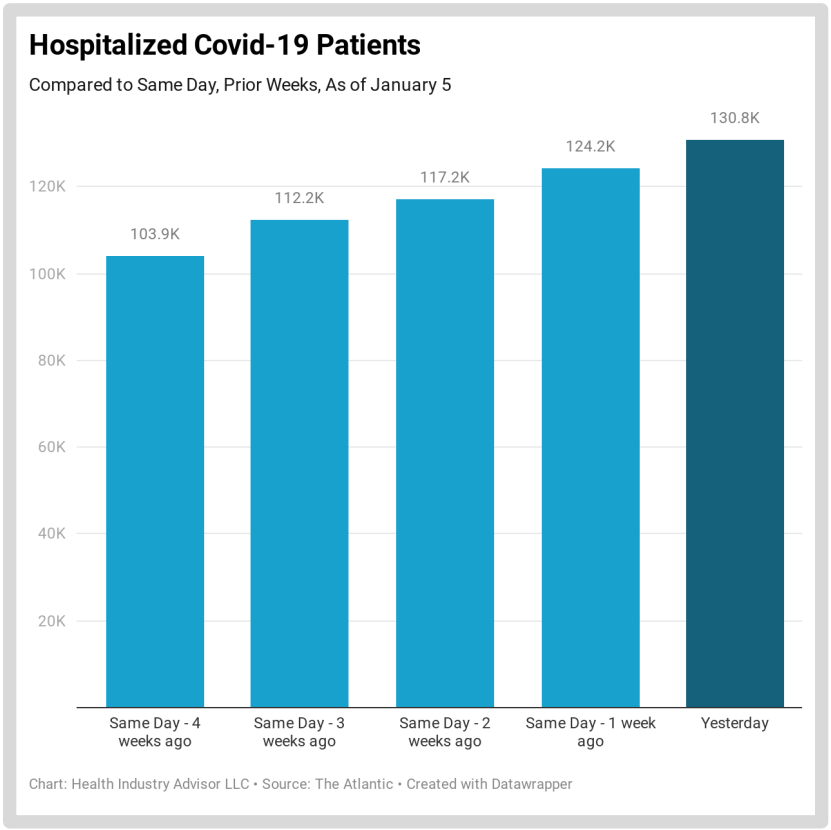
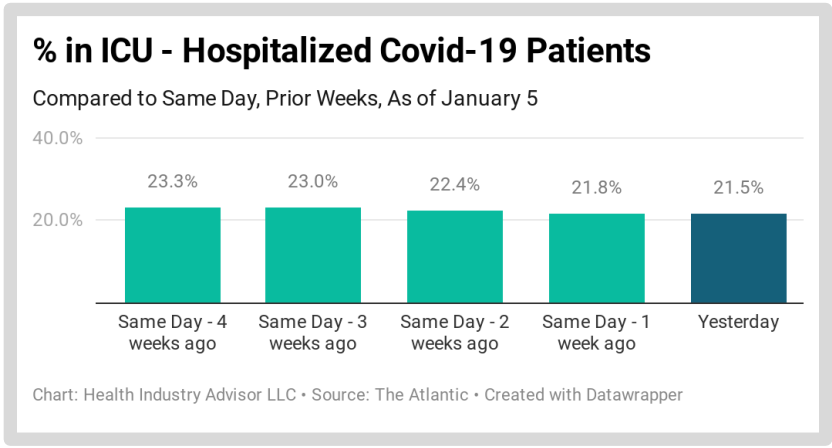
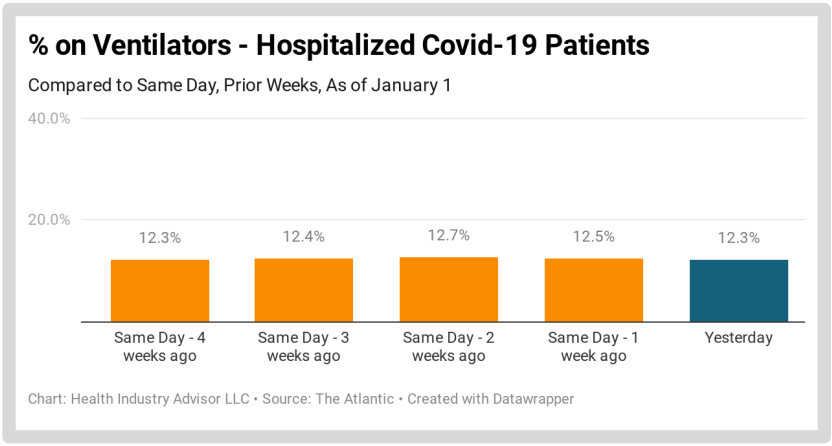
Covid-19 Hospitalizations

Covid-19 hospitalizations continue to rise, growing 20% in the past 3 weeks; the mix of ICU patients is slowing declining; the mix of ventilator patients is relative stable





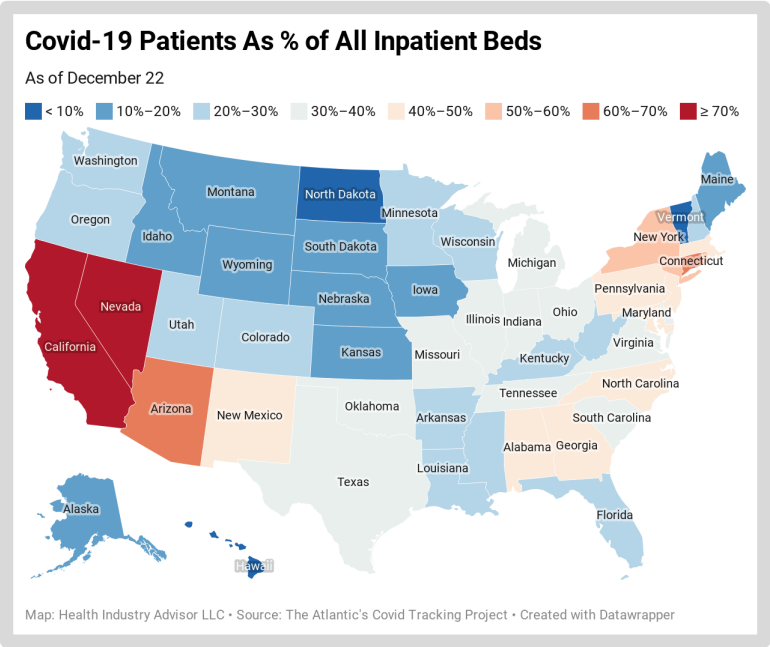


Hospitalized Covid-19 Patients

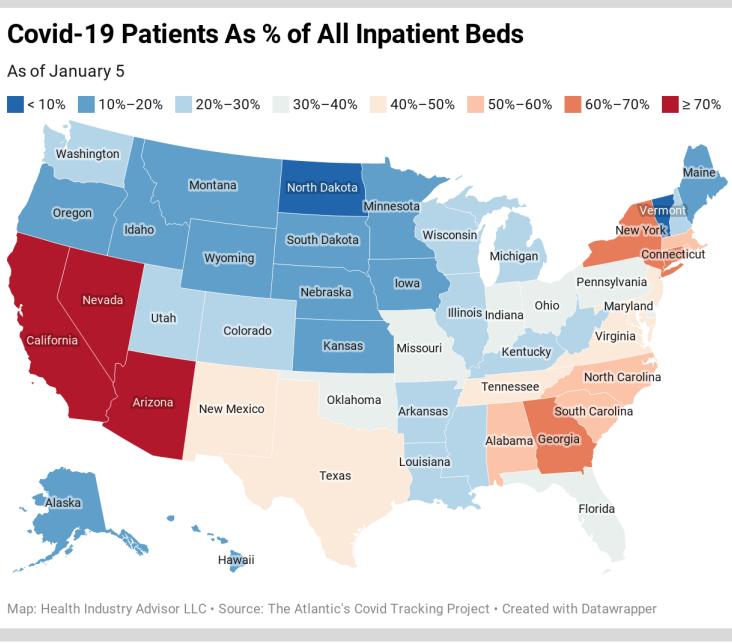
Covid-19

Greatest strain on hospital beds continues to be in Arizona, California and Nevada; Situation is worsening in Connecticut, Georgia and New York

As of December 22



As of January 5



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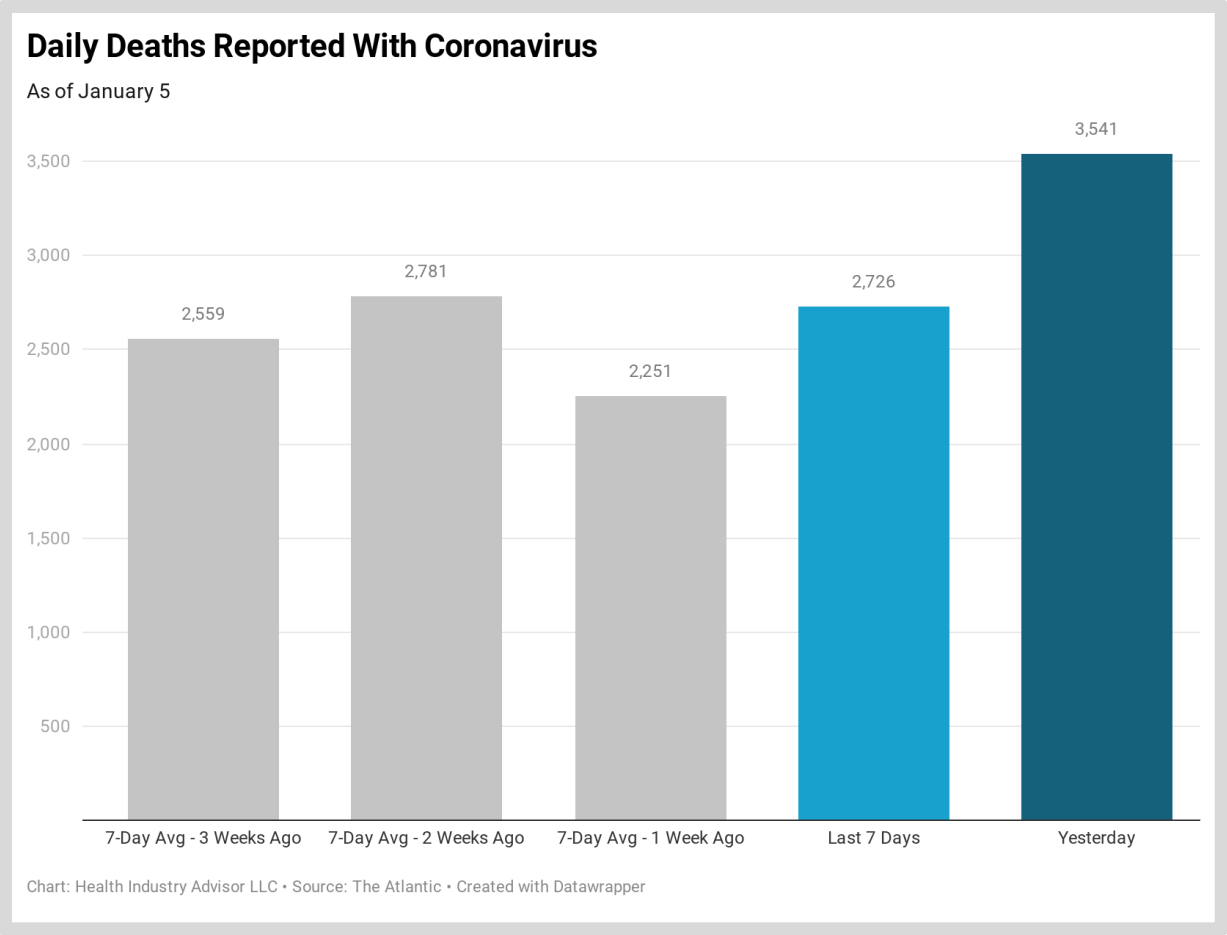
Deaths Reported With Coronavirus

Covid-19

There were a significant number of deaths reported with coronavirus yesterday; the 7-day average, however, is comparable to the number reported prior to Christmas



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Covid-19

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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