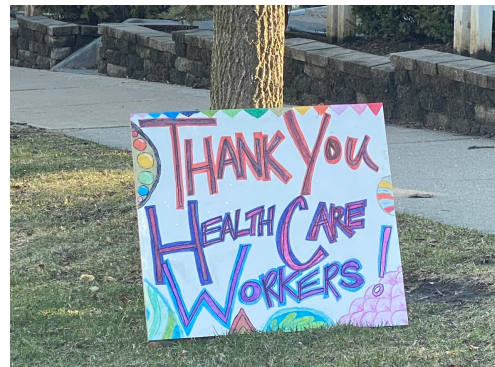
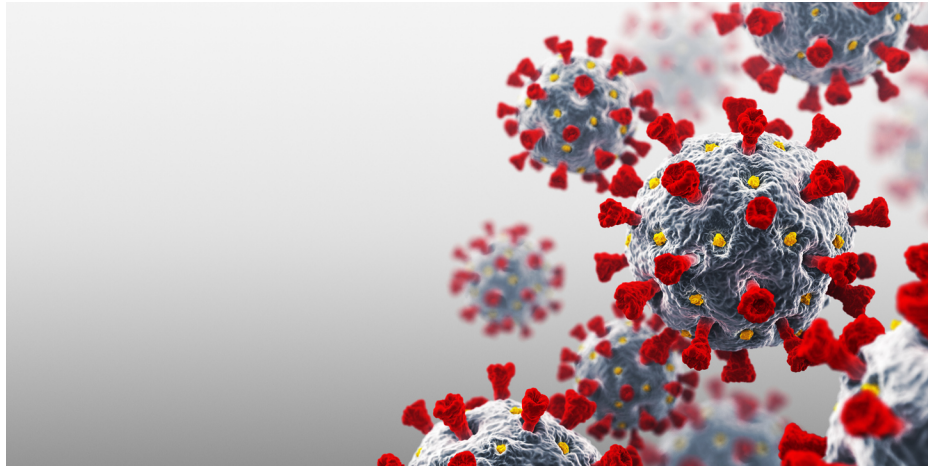
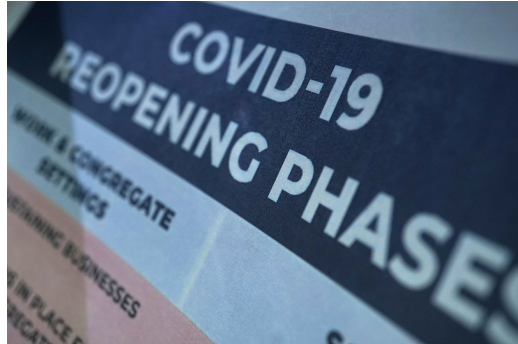




COVID-19 Report

Issue # 134

Thursday, August 13, 2020

- Vaccine development - *Operation Warp Speed*
 - The US government's **multi-agency effort aims to produce 300 million doses of a viable vaccine by January**
 - To-date, at least **\$10B has been committed to fund at least six development efforts - Moderna/NIH, BioNTech, Pfizer, AstraZeneca/Oxford University, Novavax, Sanofi/GlaxoSmithKline and Johnson & Johnson**
 - Typically, vaccine development take several years - the shortest was the mumps vaccine, which was accomplished in 4.5 years
 - **Government funding accelerates this process, without shortcutting safety and efficacy considerations** in two ways:
 - Minimizing company investment risk, allowing them to accelerate through a series of typical investment go/no-go decisions
 - Funding production simultaneous with Phase III clinical trials - typically, companies would withhold production until after the vaccine successfully completes the clinical trial process
 - The six funded-efforts contract for 800 million -1.6 billion doses by January - if all are proven successful. Again, the goal is 300 million by that date
- Infection Prevalence - Seeking effective herd immunity
 - Studies by the CDC and others confirm that actual infections are significantly higher than reported using testing results - by perhaps 10x or more
 - Experts initially projected that herd immunity would not occur until 60-80% of the population was infected by the virus
 - More recent studies show that infection spread slows at much lower infection prevalence - whether due to shutdowns/behavior modification and/or protections provided by prior exposure to similar virus strains. Some have suggested that effective immunity may occur at 10-35% infection prevalence
- Using Youyang Gu's [infection prevalence models](#), we looked at States that have moved into the 20-35% prevalence range:
 - **Six states - Connecticut, Massachusetts, Michigan, New Jersey, New York and Rhode Island, as well as the District of Columbia - each of which were hard-hit in March/April, indicate long-term plateaus in infection prevalence.** These states currently have inflection prevalence rates from 8.5% in Michigan to 21.3% in New Jersey
 - Eighteen states currently have infection prevalence rates of between 9.1% in Virginia to 22.4% in Louisiana, however, have not yet demonstrated a plateau. We will monitor this states to see whether any will begin to show a plateau in this rate
 - **Vermont has also demonstrated a long-term plateau in the infection-prevalence rate. This has occurred at a remarkably low rate, 1.7%. (We have several readers from the Vermont state government; perhaps they can shed some light on their successful efforts.)**
- New case/infection rates
 - **New cases are down 3.9% on a week-over-week basis.** The rate by which these cases are declining, however, is slowing
 - New cases have shown a consistent day-of-week pattern - low on weekends then, rising each day until the end-of-the-week. Yesterday, the U.S reported the fewest new cases on a Wednesday in five weeks
 - **New infections per capita, however, continue to show a plateau - at a relatively high rate**
 - Still, infection rates are down in most states versus two weeks ago

The United States government, via Operation Warp Speed, is investing heavily to accelerate the vaccine development process

- Operation Warp Speed is a multi-agency effort to accelerate the availability of multiple vaccines
 - Typical vaccine development takes years; fastest to-date is 4.5 years – mumps vaccine
 - Goal is to accomplish it for SRS-CoV-2 in 1.5 years or less
- Program plans to achieve this by minimize investment risk, allowing companies to progress faster. Typically, companies:
 - Control their investment risk by proceeding through development process using a series of Go/No-Go decision points – by funding the development effort, the government allows these companies to move more quickly (this is primarily an investment issue, not a safety issue)
 - Delay production until after a vaccine is proven both safe and efficacious – government is funding production simultaneous with the Phase III clinical trials for safety and efficacy
- With a goal of making 300 million doses of a safe, effective vaccine(s) by January 1, the government has committed more than \$10B in at least six development efforts
 - Moderna/NIH - \$2.5B, for 100 million doses, with an option for an additional 400 million
 - BioNTech/Pfizer - \$1.9B, also for 100 million doses, with an option for an additional 400 million (they claim capacity for 1.3 billion worldwide by the end of 2021)
 - AstraZeneca/Oxford University - \$1.2B, for 300 million doses
 - Novavax - \$1.6B, for 100 million doses
 - Sanofi/GlaxoSmithKline - \$2B, for 100 million doses
 - Johnson & Johnson - \$1B, for 100 million doses
- Of these six efforts, Moderna/NIH, BioNTech/Pfizer and AstraZeneca/GSK are in Phase III clinical trials, with results reportedly expected in October

Infection Prevalence - States May Have Stabilized

Using Mean Estimate From Gu Model, As of August 10

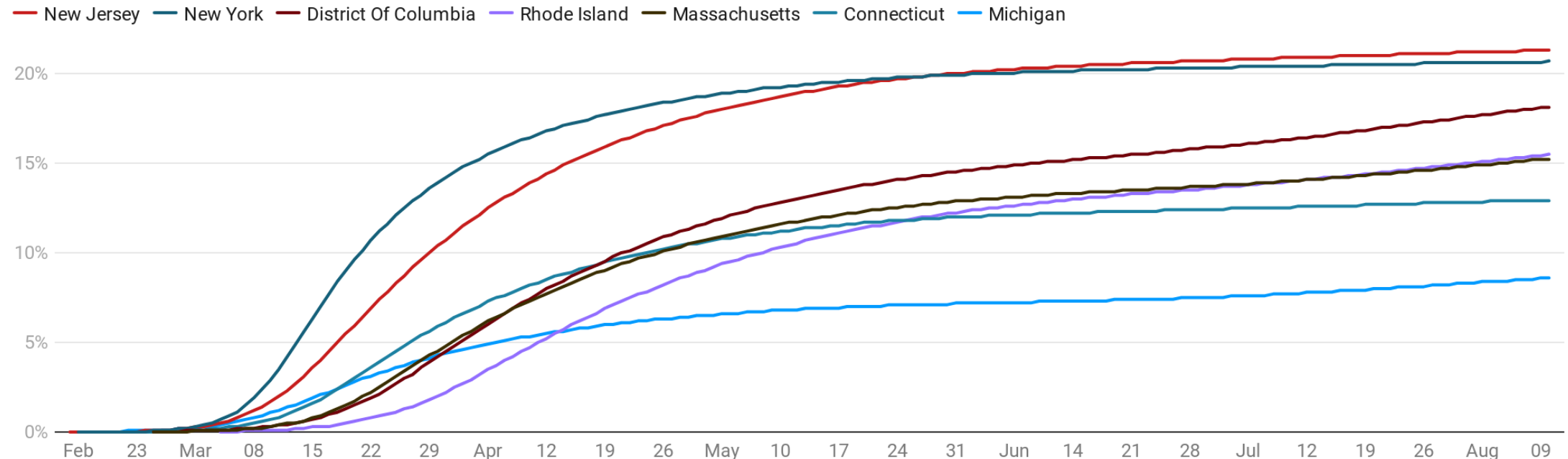


Chart: Health Industry Advisor LLC • Created with Datawrapper

* [“Estimating True Infections: A Simple Heuristic to Measure Implied Infection Fatality Rate”, Youyang Gu, July 29, 2020 \(Updated August 12\)](#)

At least eighteen states have infection prevalence rates approaching the level suggested by Gu for achieving effective herd immunity

Infection Prevalence - States Approaching the Threshold for Effective Immunity

Using Mean Estimate From Gu Model, As of August 10

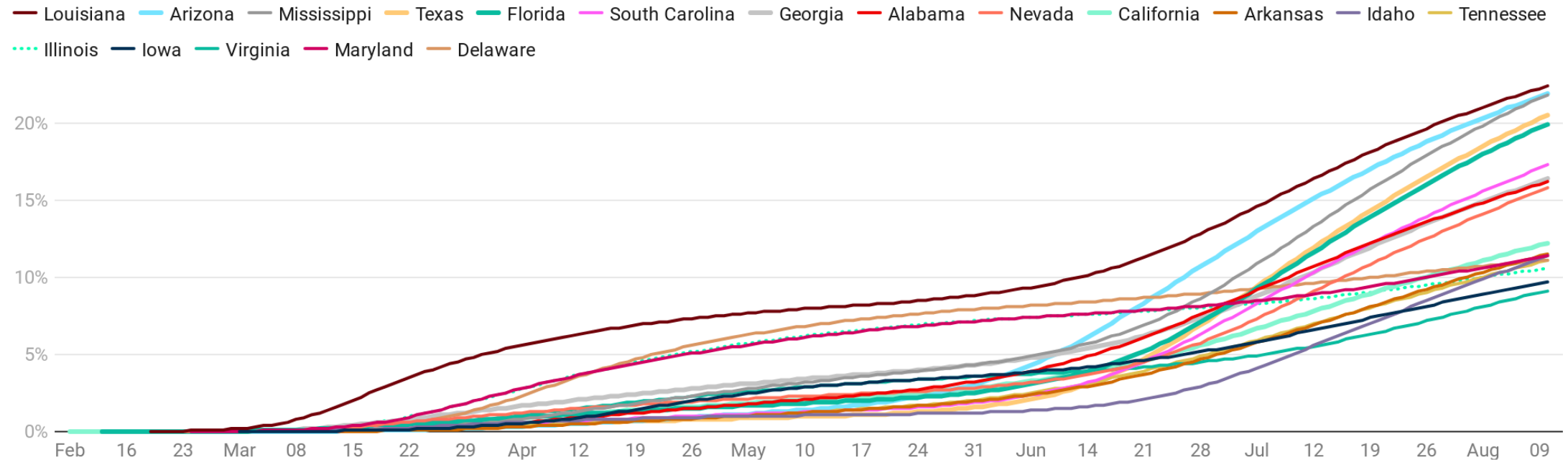


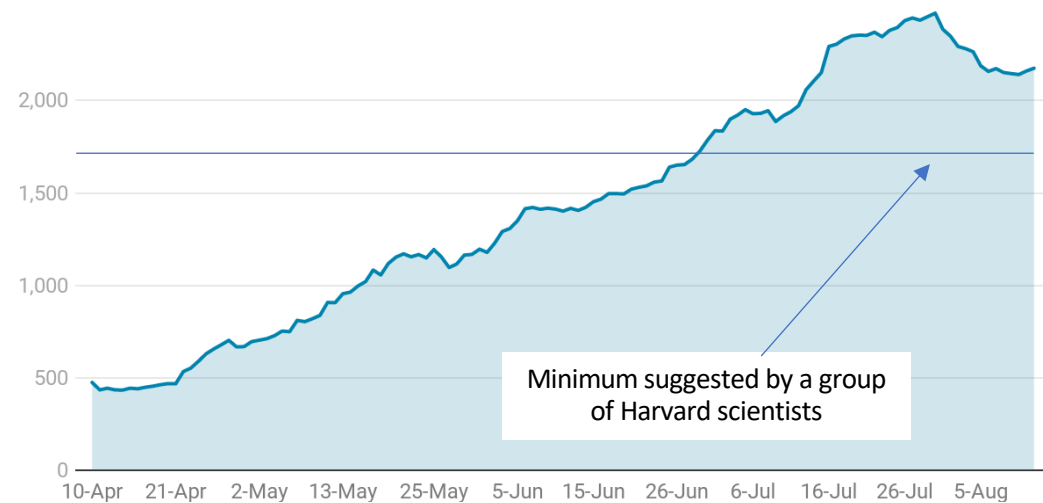
Chart: Health Industry Advisor LLC • Created with Datawrapper

Test volume has stabilized and may be increasing again

Test-positive rate on a downward trend since July 11; current rate is lowest since July 1

Daily Tests Per 1 Million - United States

Trailing 7-Day Moving Average, As of August 12

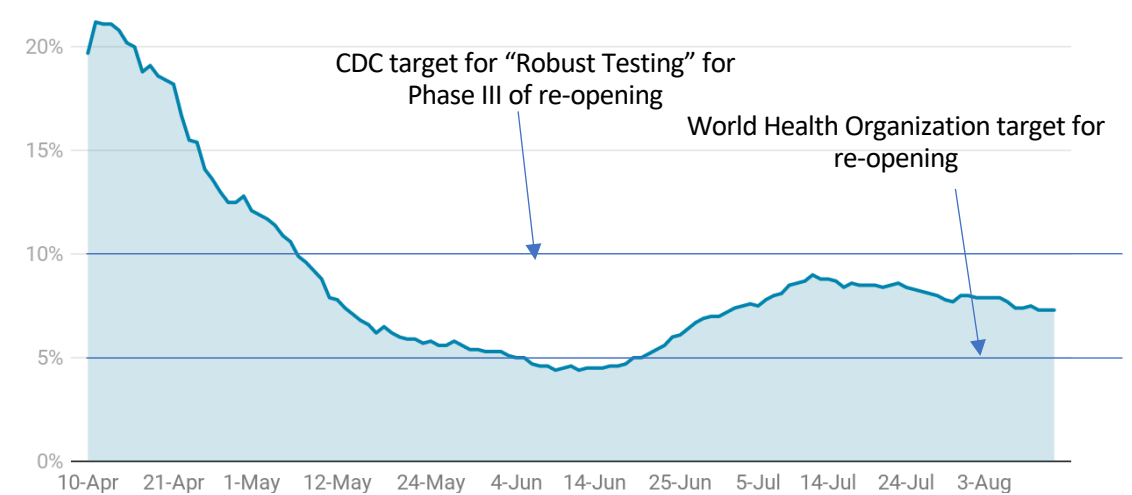


Health Industry Advisor LLC analysis

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

Test-Positive Rate - United States

Trailing 7-Day Moving Average, As of August 12



Health Industry Advisor LLC analysis

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

Note: On August 11, North Carolina made a significant adjustment, removing 220,000 tests from their YTD totals. We manually removed this negative adjustment from the August 11 data to better reflect actual testing for that date

Note: Due to a computer glitch, Washington has only reported positive results since August 1. Therefore, test-positive rates from that point forward are slightly overstated by ~0.1%

State-By-State

Twenty-seven states have test-positive rates above the WHO-recommended level; Twelve of these saw this rate increase last week. Thirty-three states, however, saw a declining rate last week

Test-Positive Rate

Trailing 7-Day Moving Average, As of August 12

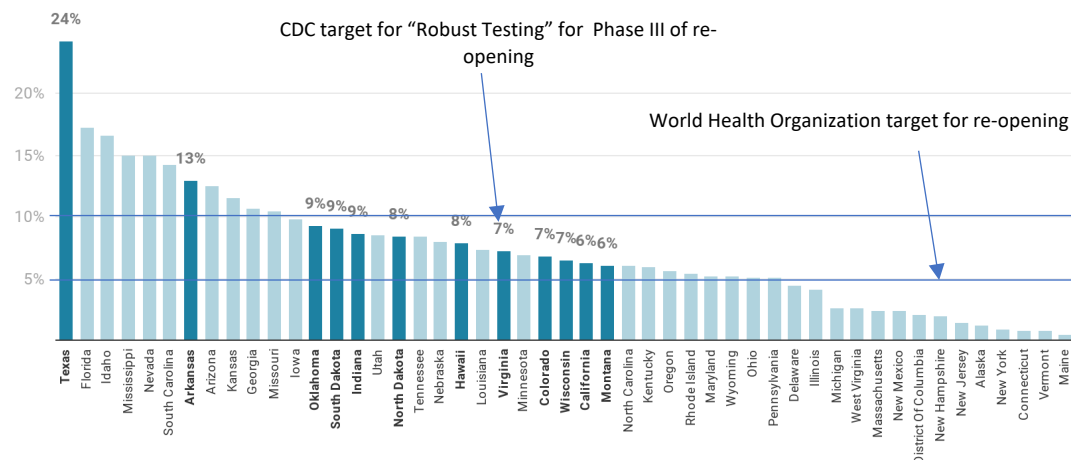


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Projects • Created with Datawrapper

1 – source: (source: <https://www.kff.org/coronavirus-policy-watch/what-testing-capacity-do-we-need/>)

2- Minnesota made an adjustment to tests counts this week, rendering this value meaningless

Week-Over-Week Change in Test-Positive Rate

Trailing 7-Day Moving Average, As of August 12 v August 5

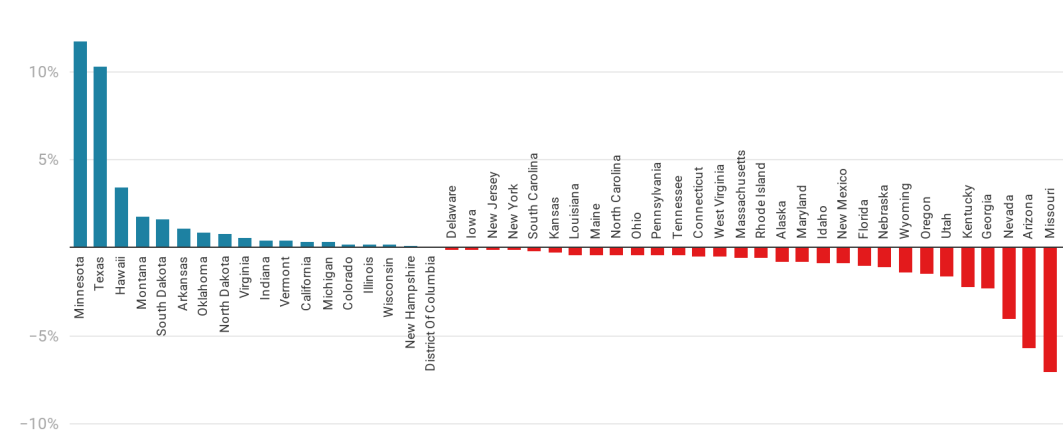


Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Projects • Created with Datawrapper

Note: Due to a computer glitch, Washington has only reported positive results since August 1. On August 11, North Carolina made a significant adjustment, removing 220,000 tests from their YTD totals. We manually removed this negative adjustment from the August 11 data to better reflect actual testing for that date

New cases were down slightly yesterday; were the fewest new cases on a Wednesday since July 1); Week-over-week, new cases are down 3.9%, although this rate of decline is diminishing

New Cases

Through August 12

Wednesdays Highlighted

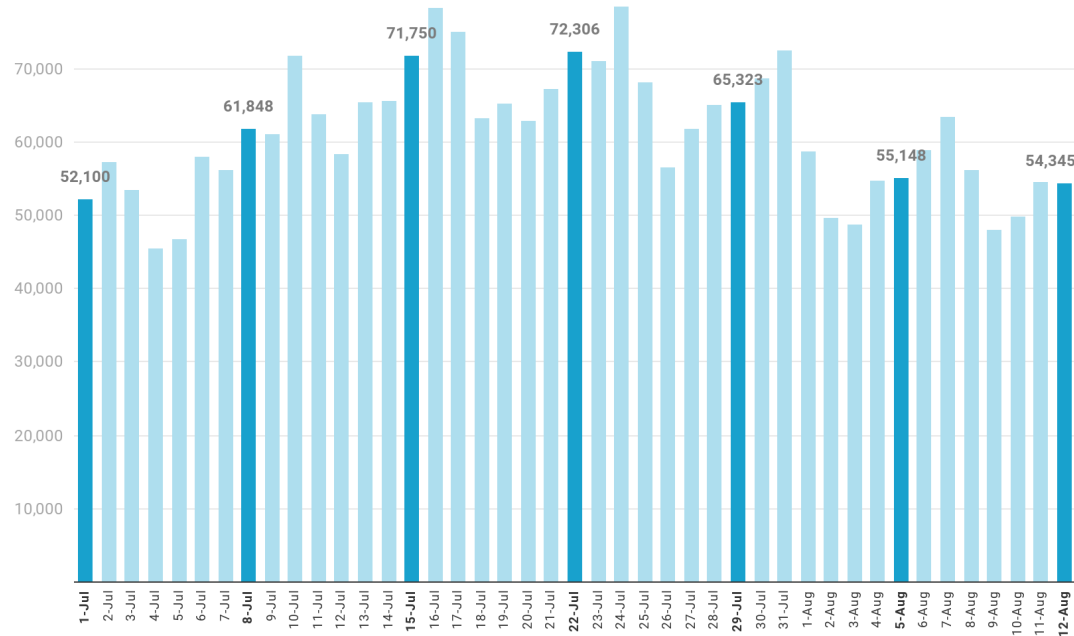
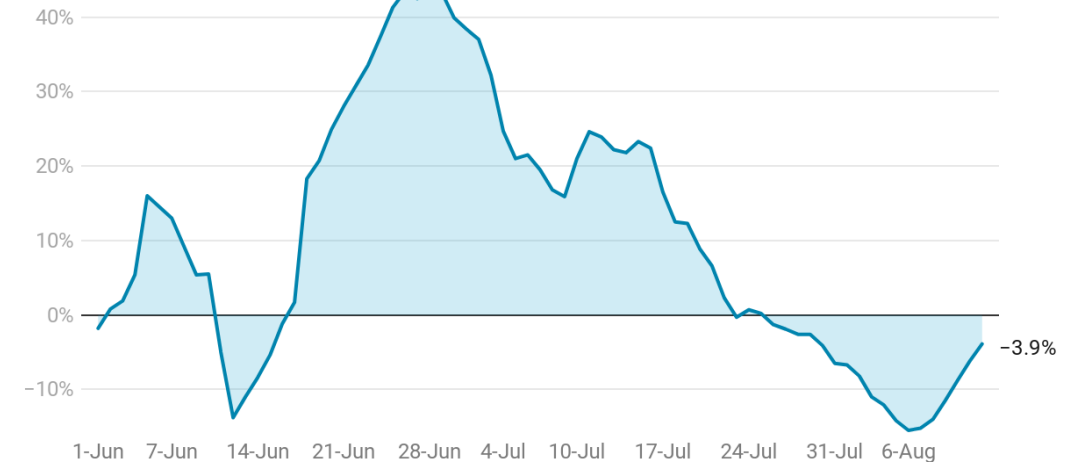


Chart: Health Industry Advisor LLC • Source: eorlometers.info • Created with Datawrapper

Note the daily pattern: new cases are typically low on Sunday, then increase each day through the week

Week-Over-Week Change In New Cases

Through August 12



Health Industry Advisor LLC analysis

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

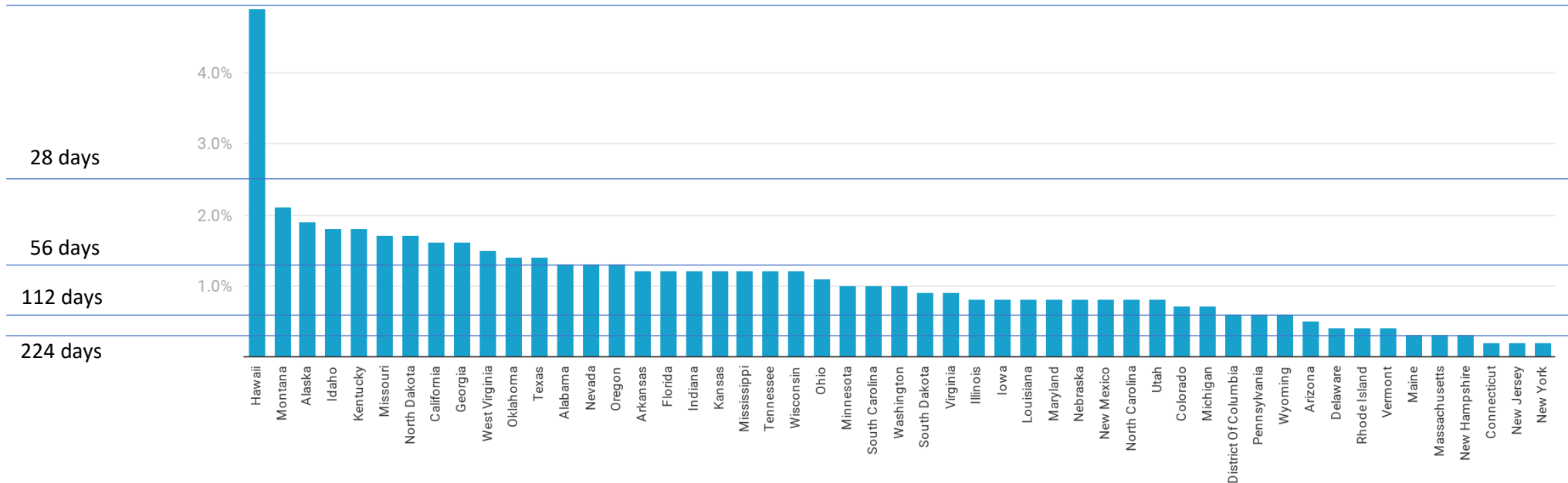
State-By-State

Case growth is slowing but, Hawaii remains the outlier. At current rates, cases are doubling every 14 days in Hawaii; every 453 days in New York; 69 days for the United States overall

Growth Rate in Total Cases

Trailing 5-Day Moving Average, Through August 12

14 days to double



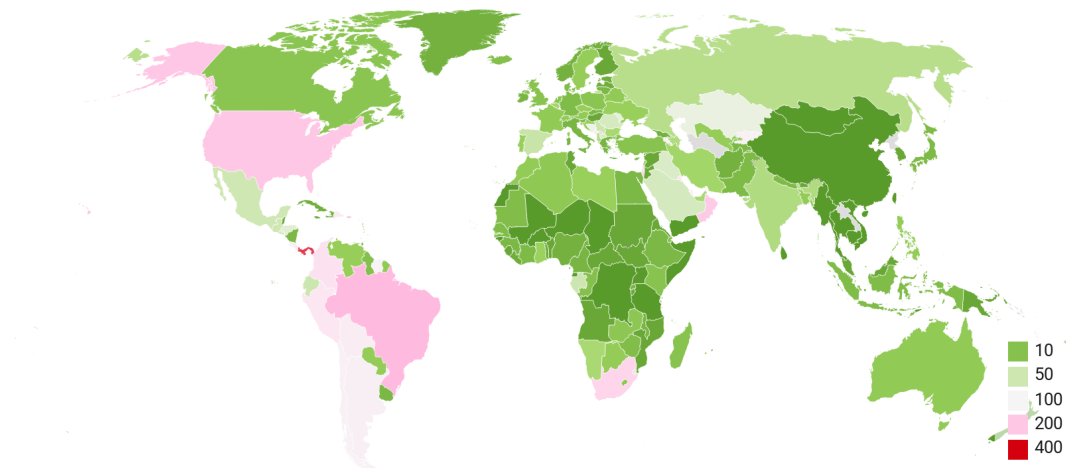
Health Industry Advisor LLC analysis

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

New infection rates have intensified in much of South America in the past two weeks; while easing in the United States and South Africa

New Daily Infections / 1 Million Population

Trailing 7-Day Moving Average, As of July 29

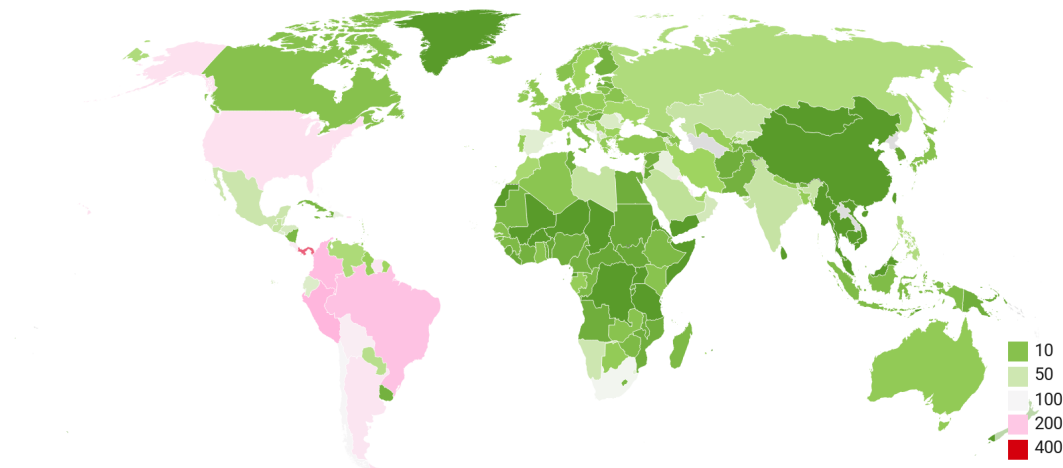


Health Industry Advisor LLC analysis

Map: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

New Daily Infections / 1 Million Population

Trailing 7-Day Moving Average, As of August 12

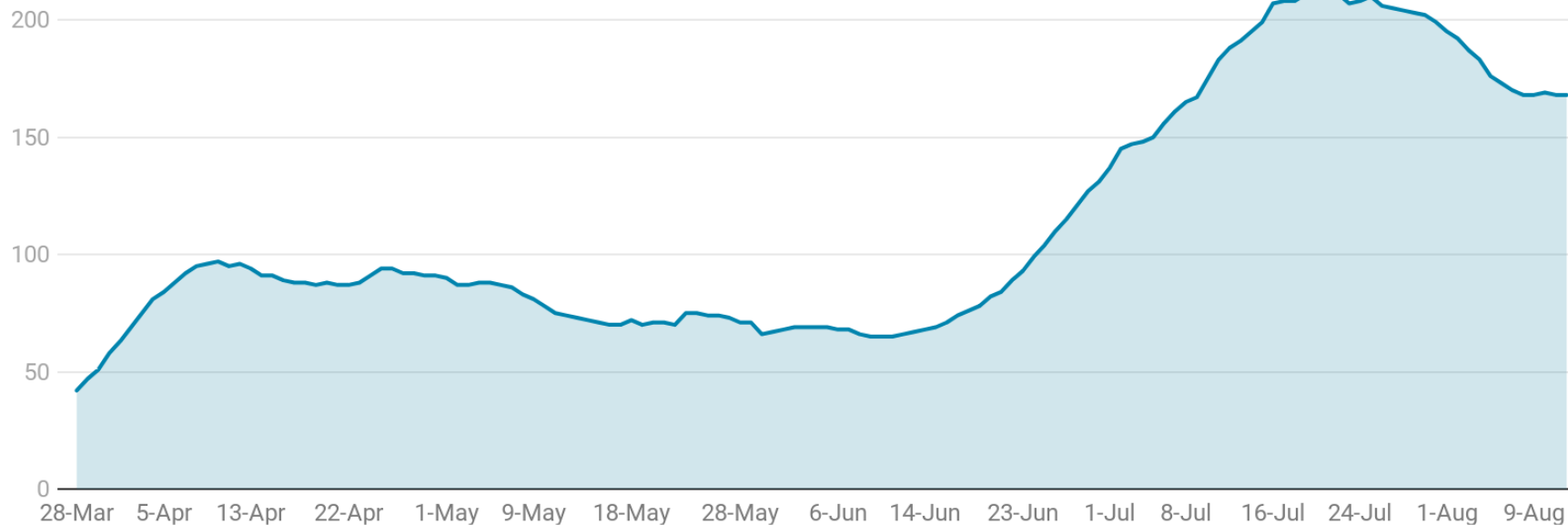


Health Industry Advisor LLC analysis

Map: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

New Infections Per 1 Million Population - United States

Trailing 7-Day Moving Average, Through August 12



Health Industry Advisor LLC analysis

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

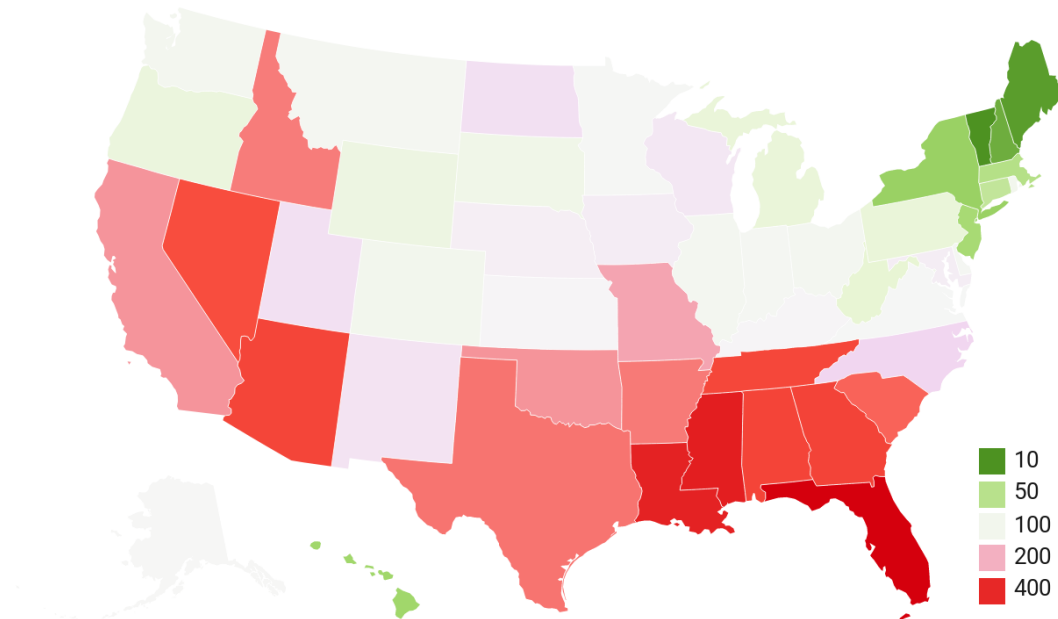
* - per million per day, trailing 7-day moving average

State-By-State

New daily infection rates have eased in many states over the past two weeks yet, remain high in the Southeast and parts of the West

New Daily Infections Per 1 Million Population

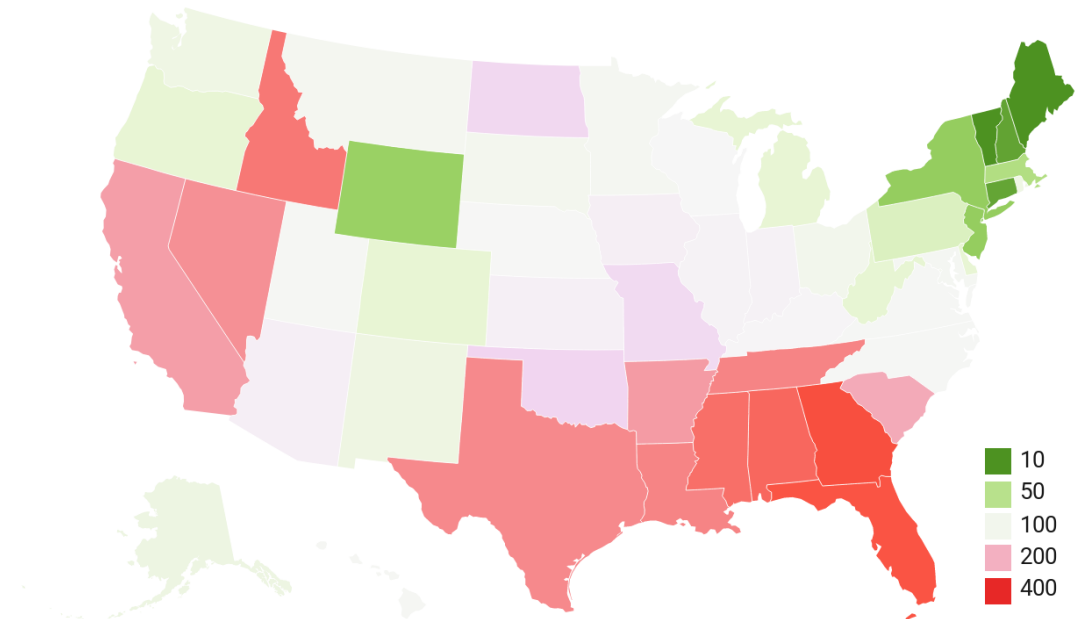
Trailing 7-Day Moving Average, As of July 29



Map: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

New Daily Infections Per 1 Million Population

Trailing 7-Day Moving Average, As of August 12



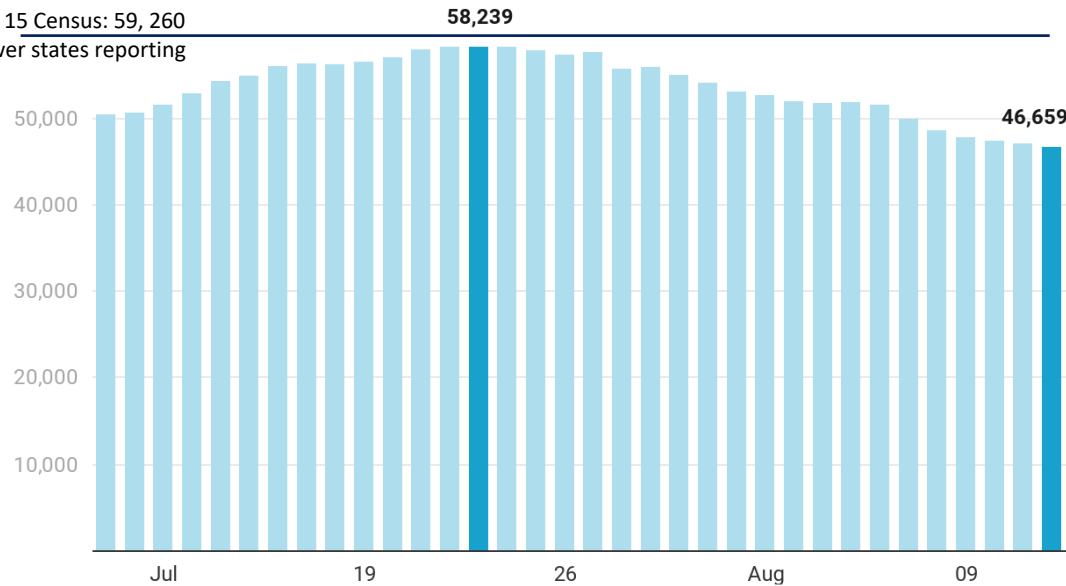
Map: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

* - per million per day, trailing 7-day moving average

Hospital Census: COVID-19 Patients

As of August 12

April 15 Census: 59,260
8 fewer states reporting

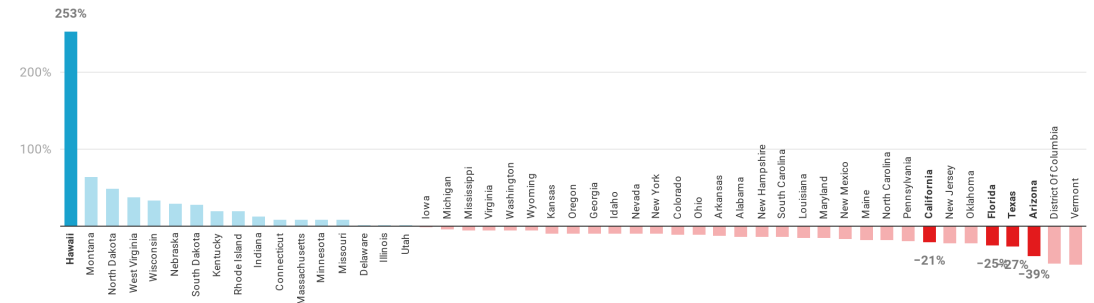


Florida data first available on July 10

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

Change in COVID-19 Census - Past Two Weeks

Trailing 7-Day Moving Average, August 12 v. July 29



Health Industry Advisor LLC analysis

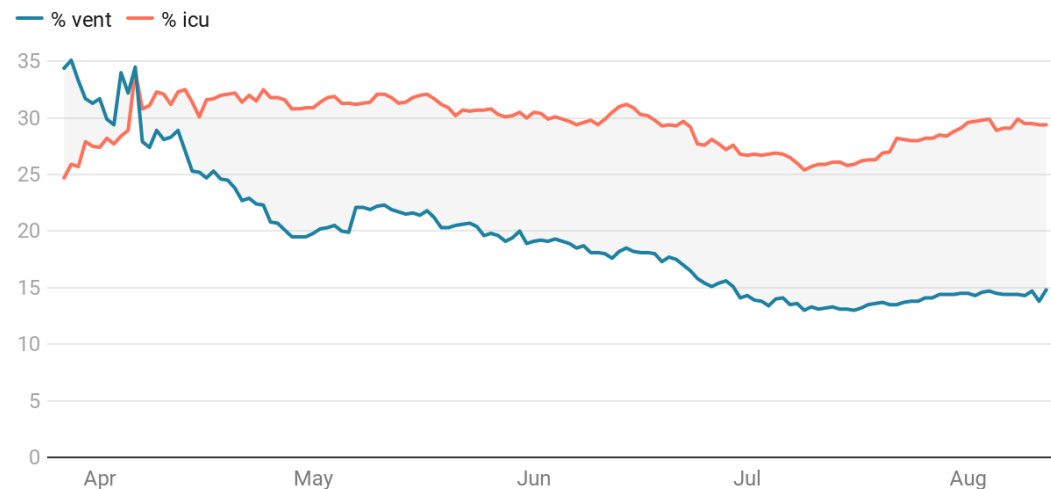
Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

ER Visits for COVID-19 are Declining

ICU COVID-19 Census Also Down

Severity of Hospitalized Patients

% of patients on ventilators and in the ICU, As of August 12



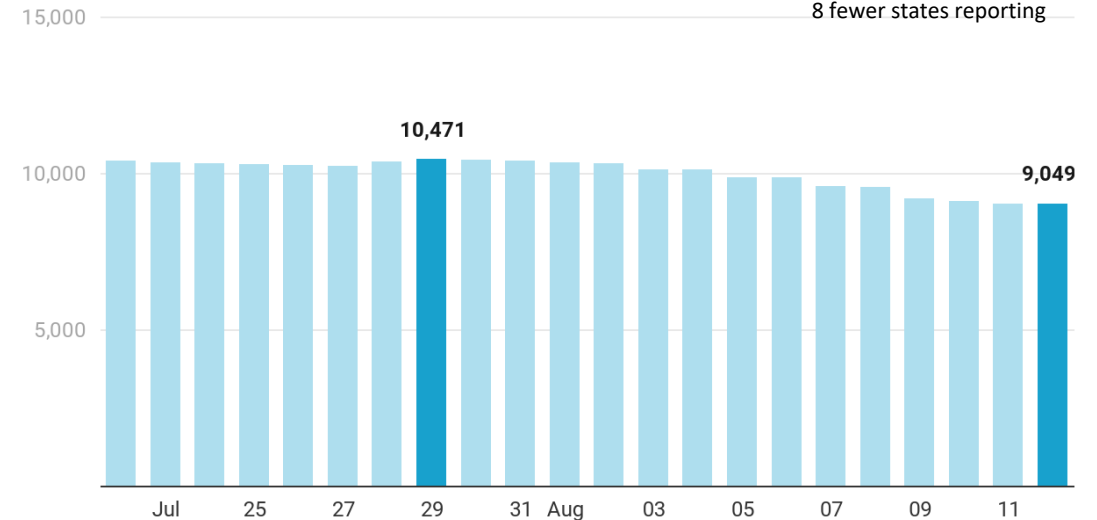
Health Industry Advisor LLC analysis

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

COVID-19 ICU Census

April 22 Census: 15,013

8 fewer states reporting

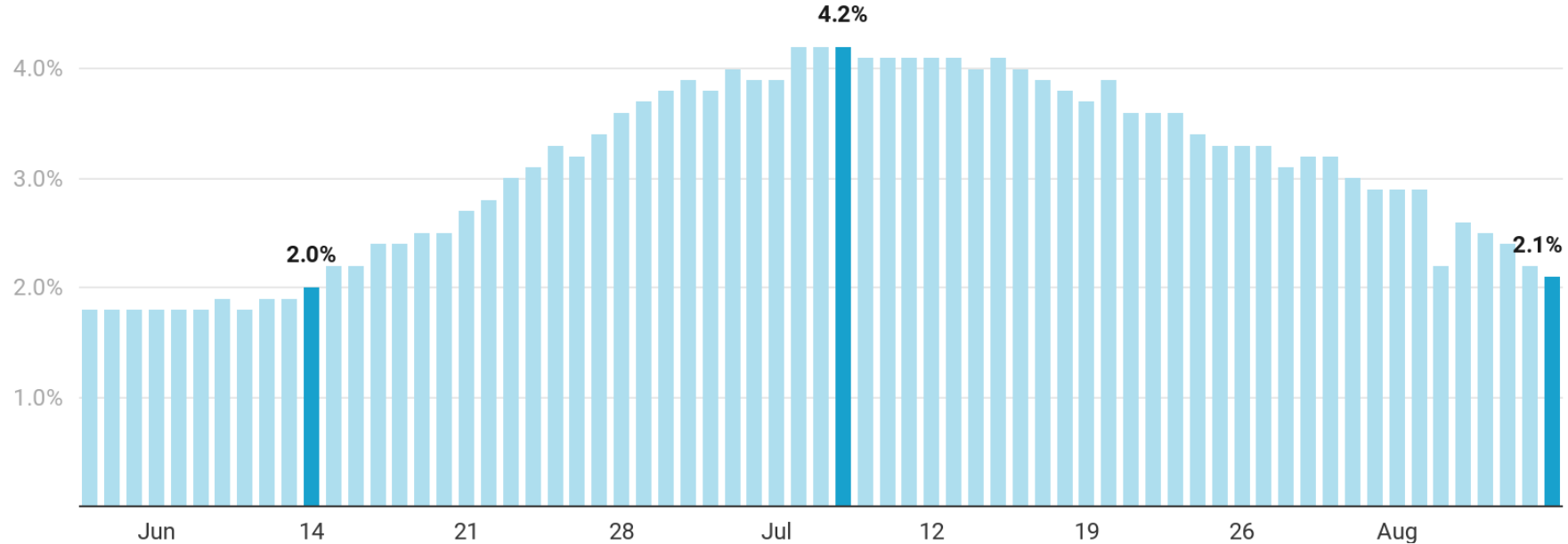


For states reporting these data: AZ, CA, ID, IL, IN, IA, KS, KY, ME, MD, MA, MI, MN, MS, NV, NJ, NY, NC, OH, OK, OR, RI, SC, TX, UT, VA, WI & WY

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

% of Emergency Department Visits for COVID-Like Illness

As of August 9

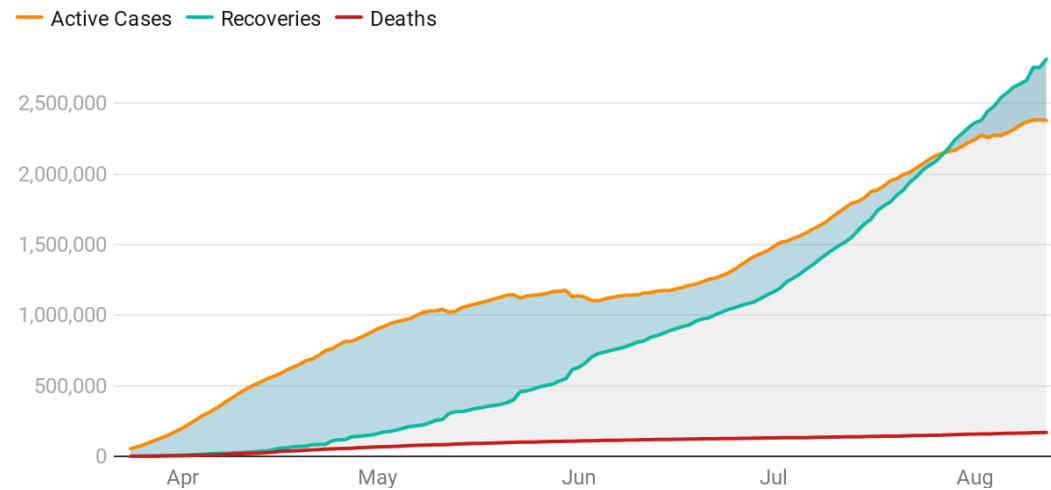


Health Industry Advisor LLC analysis

Chart: Health Industry Advisor LLC • Source: Centers for Disease Control • Created with Datawrapper

Active Cases v. Recoveries & Deaths

Through August 12

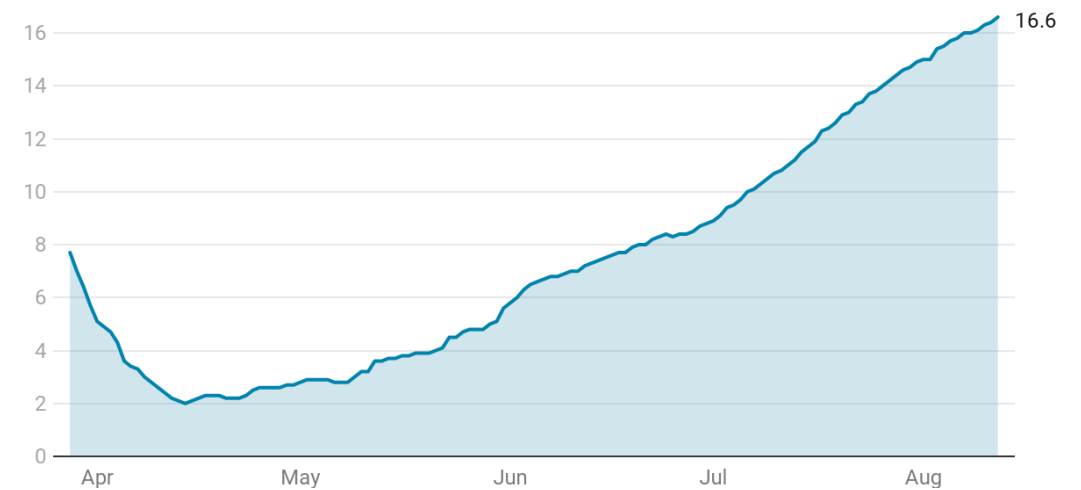


Health Industry Advisor LLC analysis

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

Recoveries: Deaths - United States

As of August 12



Health Industry Advisor LLC analysis

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

Deaths down slightly day-over-day yet remained high on Wednesday,
Week-over-week rate consistent with range during August
Deaths per case down to 3.16%

Deaths Recorded With Coronavirus in the U.S.

Trailing 7-Day Moving Average, As of August 12

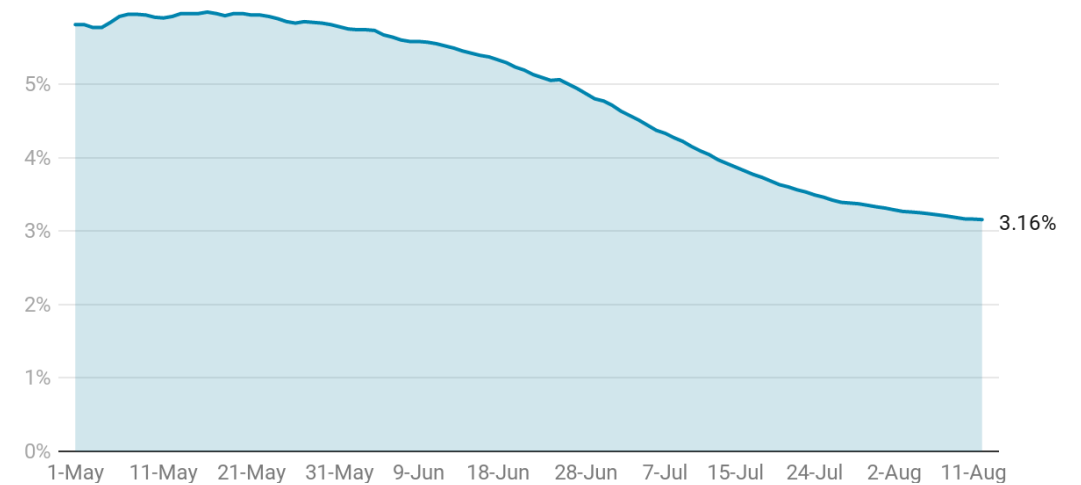


Health Industry Advisor LLC analysis

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

Deaths Per Case

As of August 12



Health Industry Advisor LLC analysis

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

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>