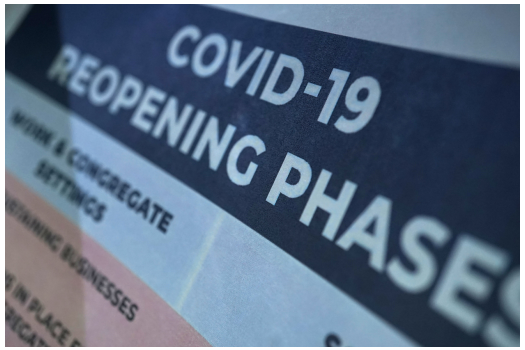
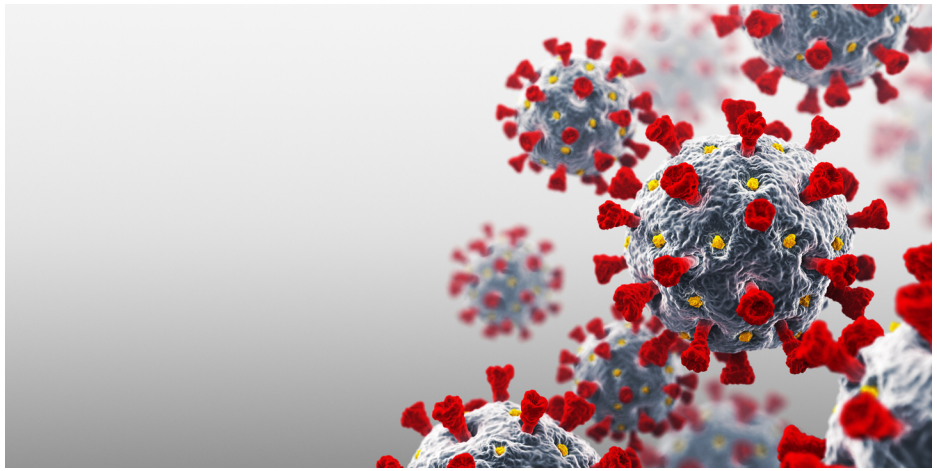
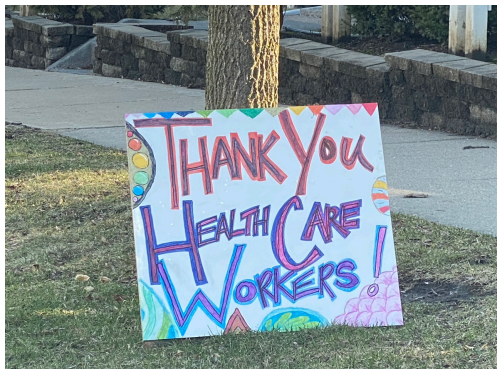






Health Industry Advisor, llc

COVID-19 Report

Issue # 156

Tuesday, September 8, 2020

Today's Highlights

- Projection Models:
  - **Last week, the Institute for Health Metrics and Evaluation (IHME) updated their death projections through the end of the year.** This source is cited frequently by the press so, it drew considerable attention when **they projected 410,000 deaths in the U.S. by January 1 - more than doubling from the current death total**
  - **IHME's death projections are considerably higher than those of Youyang Gu, another frequently-cited source: IHME predicts more than 2x as many additional deaths by November 1 than Gu**
  - Decomposing the IHME model, **Joshua Solomon from Stanford University suggests that the IHME model is highly sensitive to presumed seasonality of the SARS-CoV-2 virus infection**
  - Solomon further calls out **IHME for a lack of transparency in their model and for not providing any sensitivity analysis of their seasonality assumption**
  - **Gu seems to infer that seasonality is less a factor, by suggesting that actual infections peaked in July, not in March/April as indicated by reported test results.** Gu's model reached this determination via consideration of test-positive rates throughout the pandemic. Gu further hypothesizes that the infection fatality rate has declined appreciably over time, as health providers have improved their diagnosis, treatment and therapy protocols
- Infection "Hot-Spots" and Areas of "Cooling-Off":
  - The highest current rates of new infections per capita are in Aruba, Bahrain, Israel, the Maldives, Spain, and Turks and Caicos
  - **Bahrain, France, Israel, Libya, Paraguay and Spain have increased the steepest increases in infection rates over the past two weeks**
  - Bolivia, Brazil, Columbia, South Africa and the U.S. have experienced the steepest decline in these rates during this time
  - Arkansas, Iowa, Missouri and the Dakotas experienced the highest current rate of new infections in the U.S.
  - **The Dakotas, Iowa and Missouri also report the steepest increase in infection rates versus two weeks ago - although Iowa's rate has already begun to recede**
  - California, Mississippi, Nevada and Texas have experienced the steepest decline in these rates during this time
- New Cases and Infection Rates for the U.S.:
  - **New cases are down 5.7% through Monday, on a week-over-week basis**
  - New cases reported on Monday were the lowest for a Monday in twelve weeks - impact of holiday reporting?
  - **The seven-day average new infection rate for the U.S. dropped to its lowest point since June 27; this rate has declined by 42% since peaking on July 22**
- Deaths With Coronavirus:
  - There were fewer deaths reported yesterday than any Monday since March 23; it also represented the 3rd fewest deaths reported on any day since then (again, is this a holiday-reporting phenomenon?)
  - **The 7-day average daily deaths have been declining for 3 1/2 weeks; it is at its lowest point since July 20**
- Healthcare Resource Use:
  - **COVID-19 inpatient census declined for the 40th time in the past 46 days; it has declined by 46% during this period**
  - ICU census of COVID-19 patients continued its steady decline; it is now down 37% since mid-July
  - ER Visits for COVID-19 like illnesses as % of total ER visits declined again and are less than 1/3 the early-July rate; ER Visits for influenza-like illnesses remain low

©2020 Health Industry Advisor LLC
All rights reserved

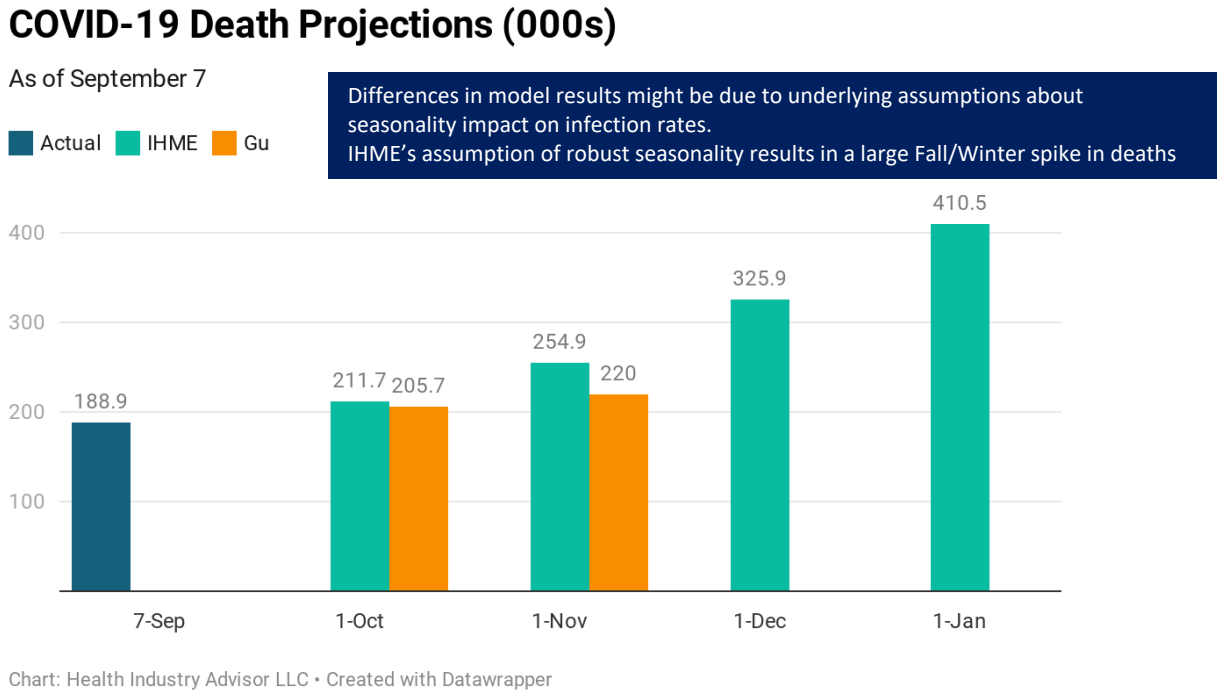
Alternate U.S. Death Projections

Why does IHME project 44k more deaths by November 1st than another leading model? IHME further projects deaths to more than double by New Year's Day Difference appears to be based on assumptions about seasonality influence

- Two of the more recognized COVID-19 projection models:
  - Institute of Health Metrics and Evaluation (IHME)

    Uses a linear regression model, based on projections of covariates: social distancing mandates, changes in mobility, testing per capita, mask use, pneumonia seasonality
  - Youyang Gu, MIT data scientist

    Uses machine-based learning to make daily updates of transmission and fatality rates, based on actual infections, test-positivity rates and deaths
- Models produce significantly different results for estimated deaths:
  - By October 1:
    - IHME: 211.7k (range 205.5k-217.5K)
    - Gu: 205.7k (range 200.2k-213.3k)
  - By November 1:
    - IHME: 254.9k (237.4k—275.0k)
    - Gu: 220.2k (208.1k—237.5k)
- IHME projects 410.5k deaths by January 1 (range: 347.6k-515.3k)
- Joshua Solomon, a Professor of Medicine at Stanford University and Director of the Prevention Policy Modeling Lab, posted on Twitter over the weekend a "decomposition" of the IHME model:
  - Solomon's hypothesis is that the IHME projections are highly-sensitive to assumptions about seasonality
  - He urges IHME to be more transparent about the underpinnings of its model
  - He also asks for a sensitivity analysis by IHME, to better understand how alternate estimates of this seasonality effect would impact death projections

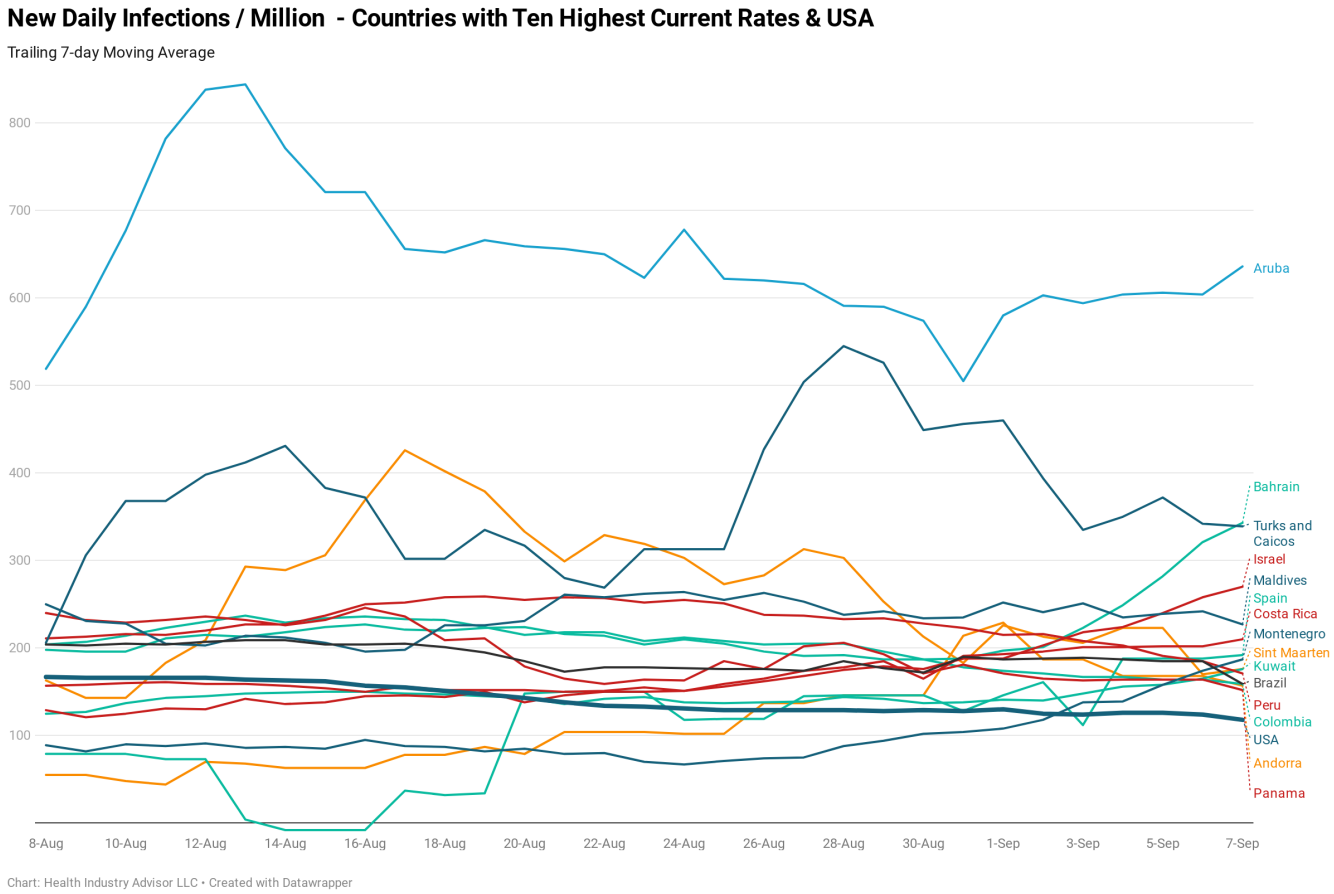


Gu's model infers that seasonality is not as robust as IHME assumes, by estimating that actual infections peaked in July not March/April
Further, Gu does not forecast past November 1, arguing that there are too many unknowns to make meaningful projections too far into the future

©2020 Health Industry Advisor LLC
All rights reserved

New Daily Infection Rates

Island nations Aruba, Turks and Caicos, Maldives plus Bahrain, Israel and Spain experienced highest new infection rates this past week



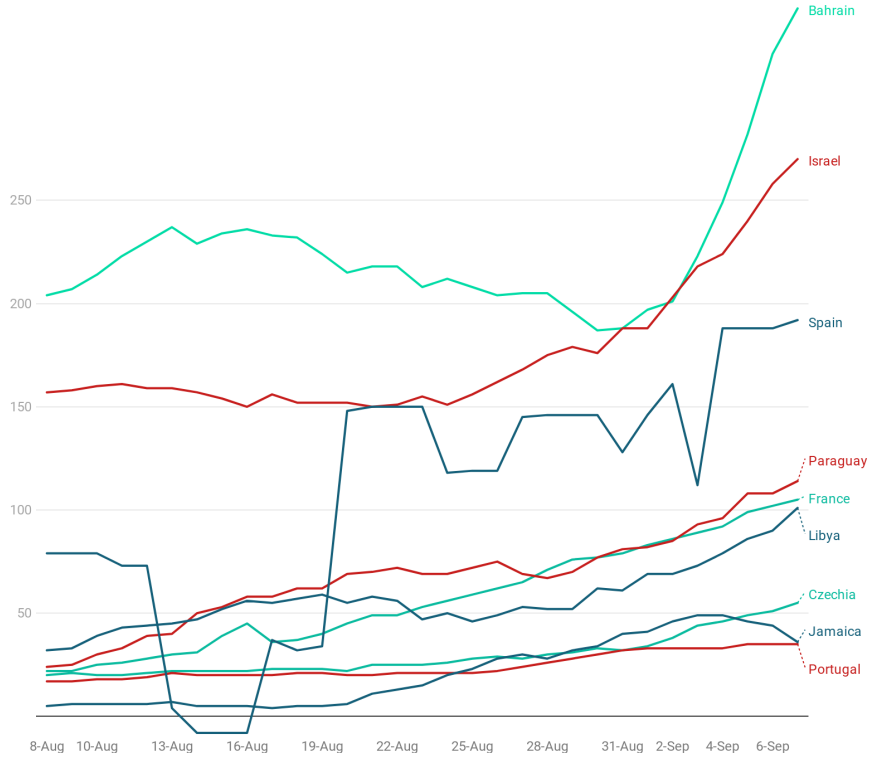
©2020 Health Industry Advisor LLC
All rights reserved

New Daily Infection Rates – Biggest % Increases and % Declines

Bahrain, France, Israel, Libya, Paraguay and Spain experienced significant increases past two weeks and high current in rates
Rates declining across South America, South Africa and U.S.

New Daily Infections / Million - Largest % Increase Past 2 Weeks

Trailing 7-day Moving Average

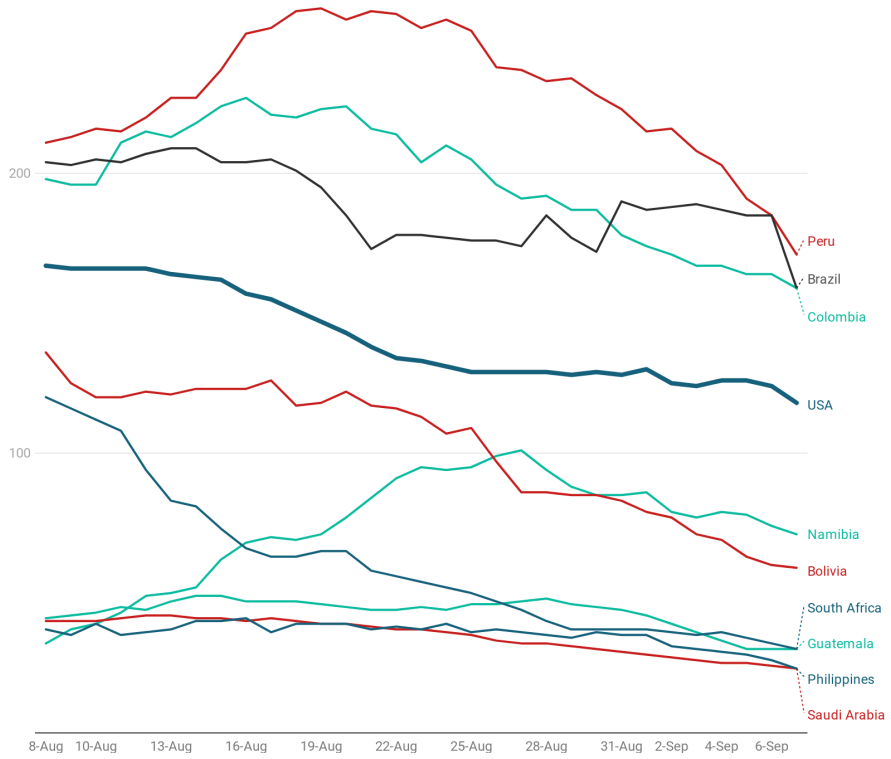


Israel + Population >1M & New Daily Infections/Million >25

Chart: Health Industry Advisor LLC • Created with Datawrapper

New Daily Infections / Million - Largest % Decline, Past 2 Weeks

Trailing 7-day Moving Average



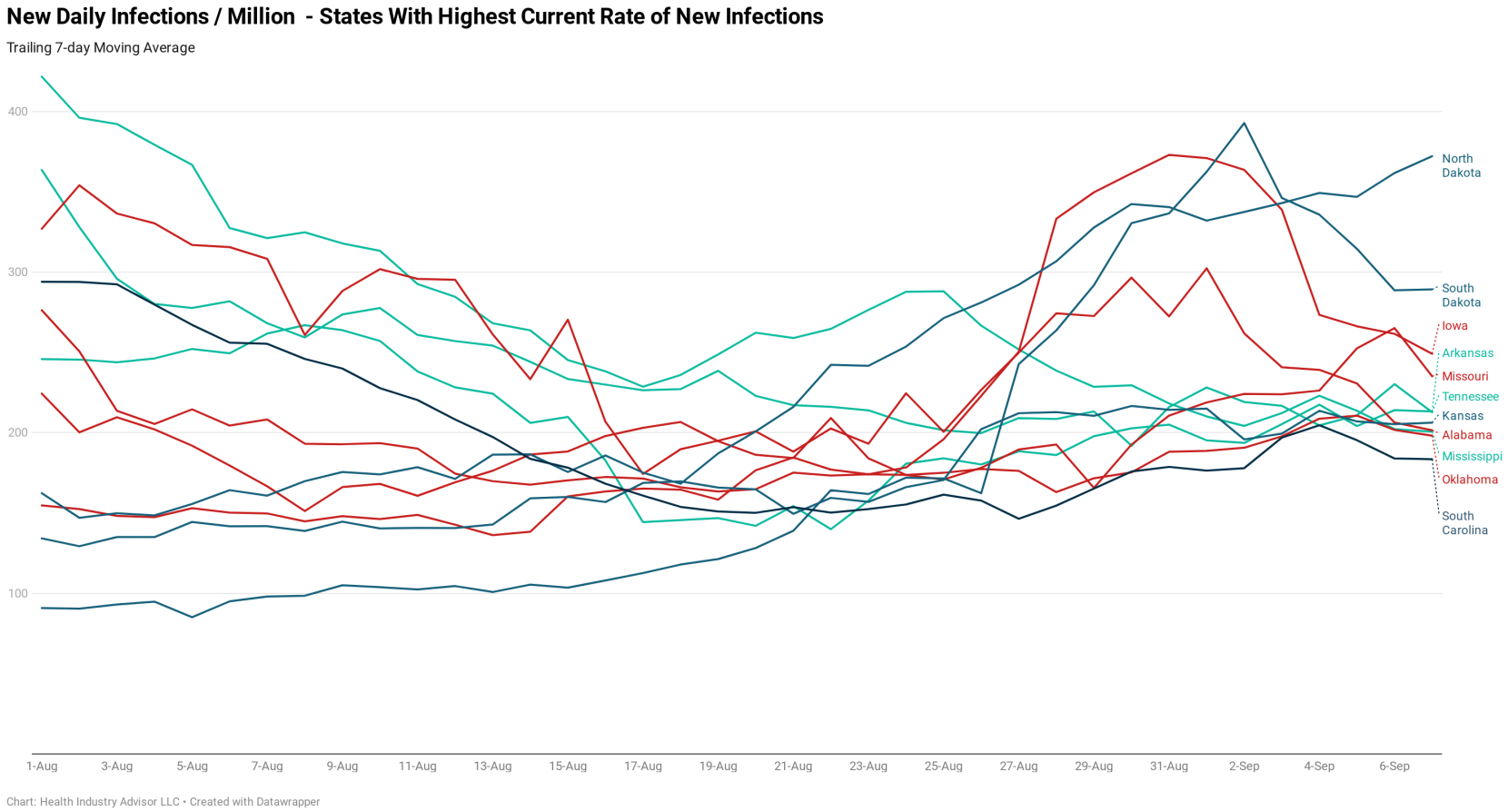
Population > 1M & New Daily Infections/Million >25

Chart: Health Industry Advisor LLC • Created with Datawrapper

©2020 Health Industry Advisor LLC
All rights reserved

New Daily Infection Rates

Arkansas, Iowa, Missouri and the Dakotas experienced the highest new infection rates this past week



©2020 Health Industry Advisor LLC
All rights reserved

New Daily Infection Rates – Biggest % Increases and % Declines

The Dakotas, Iowa and Missouri experienced significant increases during the past 2 weeks – although Iowa's rate dropped from a peak last week

California, Mississippi, Nevada and Texas experienced significant declines during the same period

New Daily Infections / Million - Largest % Increase, Past 2 Weeks

Trailing 7-day Moving Average

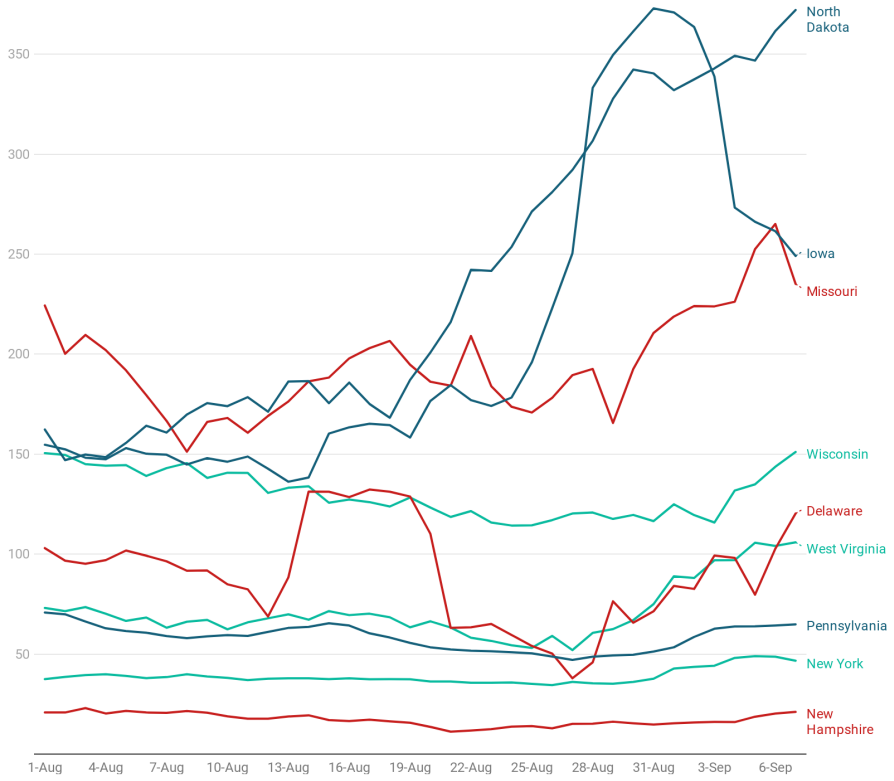


Chart: Health Industry Advisor LLC • Created with Datawrapper

New Daily Infections / Million - Largest % Decline, Past 2 Weeks

Trailing 7-day Moving Average

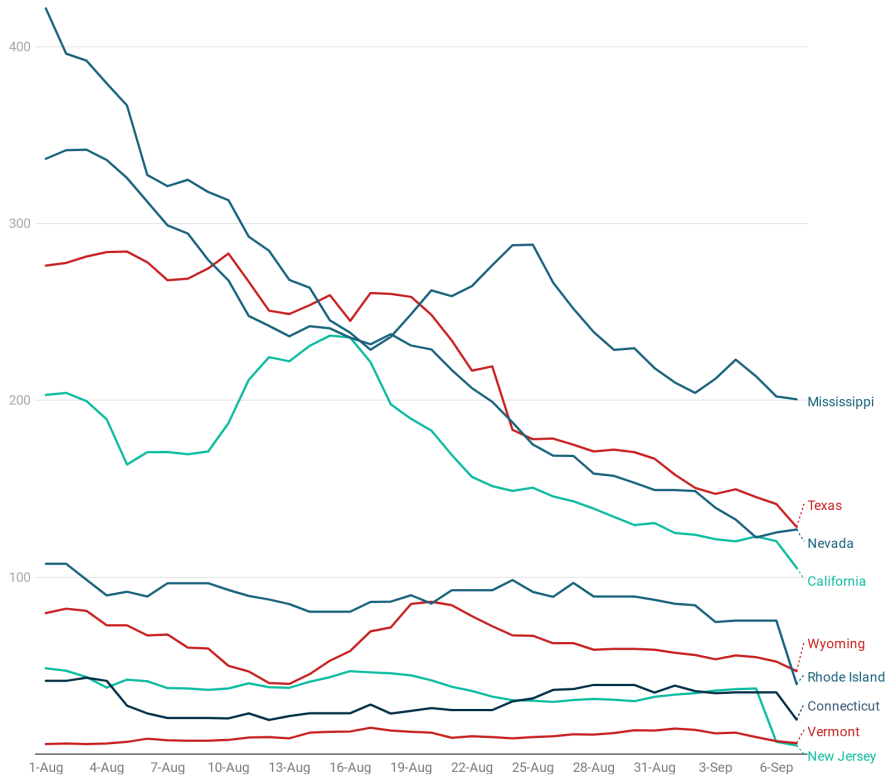


Chart: Health Industry Advisor LLC • Created with Datawrapper

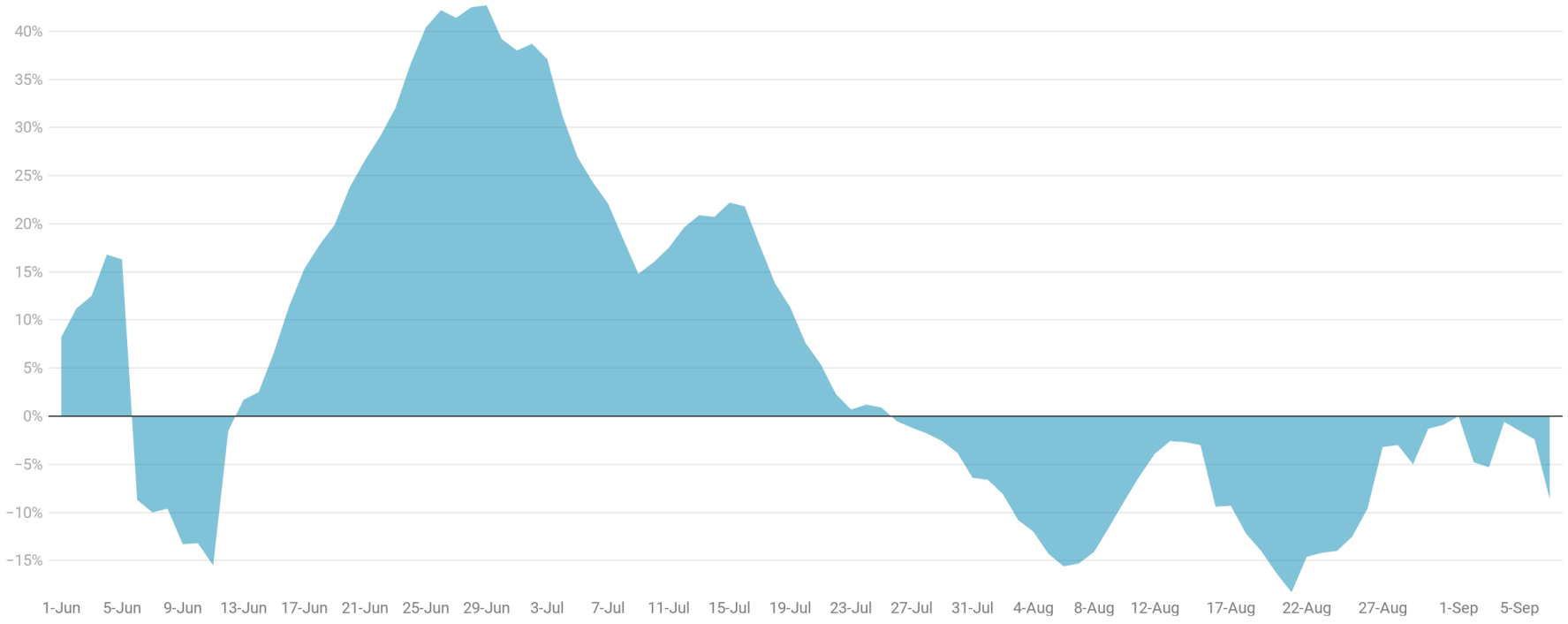
©2020 Health Industry Advisor LLC
All rights reserved

United States

Week-over-week, new cases are down by 5.7%; New cases haven't increased week-over-week in more than six weeks

Week-Over-Week Change In New Cases

Through September 7



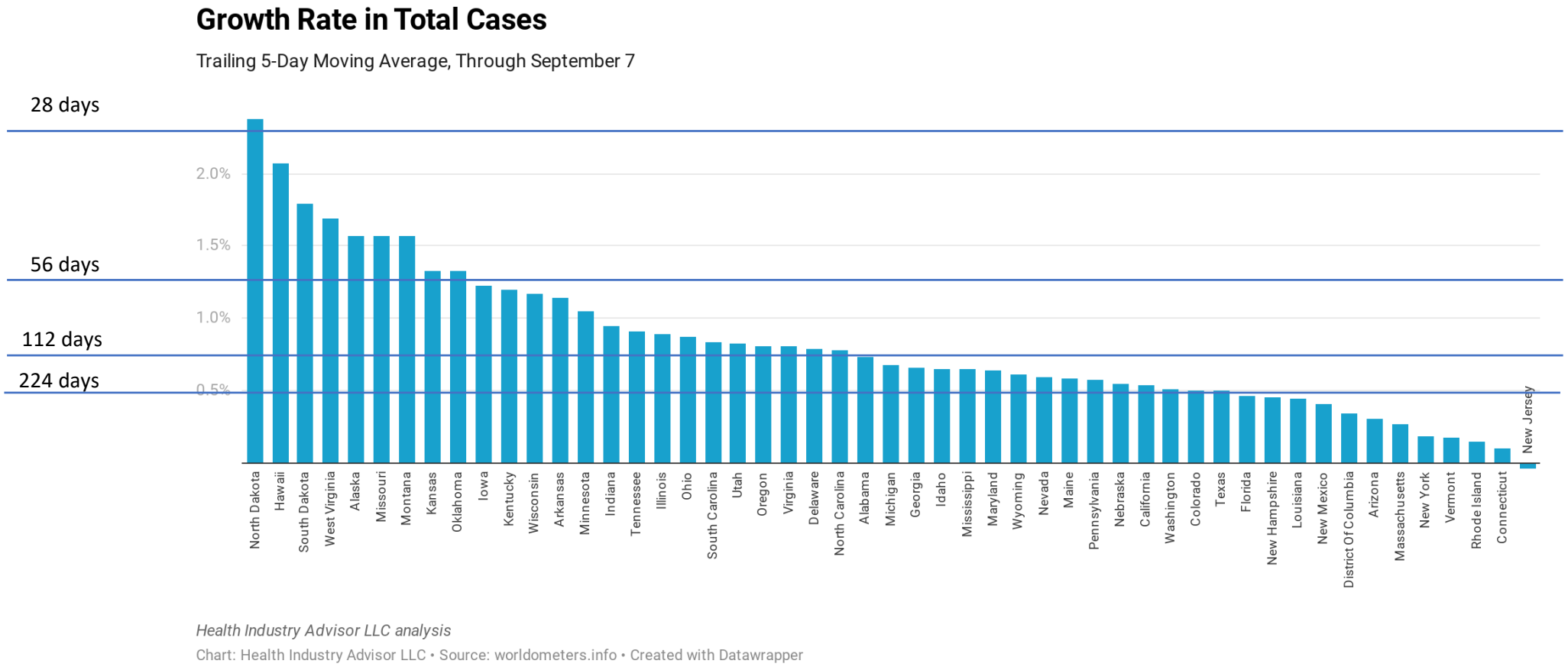
Health Industry Advisor LLC analysis

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

©2020 Health Industry Advisor LLC
All rights reserved

State-By-State

Case growth is slowing -
At current rates, cases are doubling every 30 days in North Dakota; every 718 days in Connecticut; every 114-115 days for the United States overall



©2020 Health Industry Advisor LLC
All rights reserved

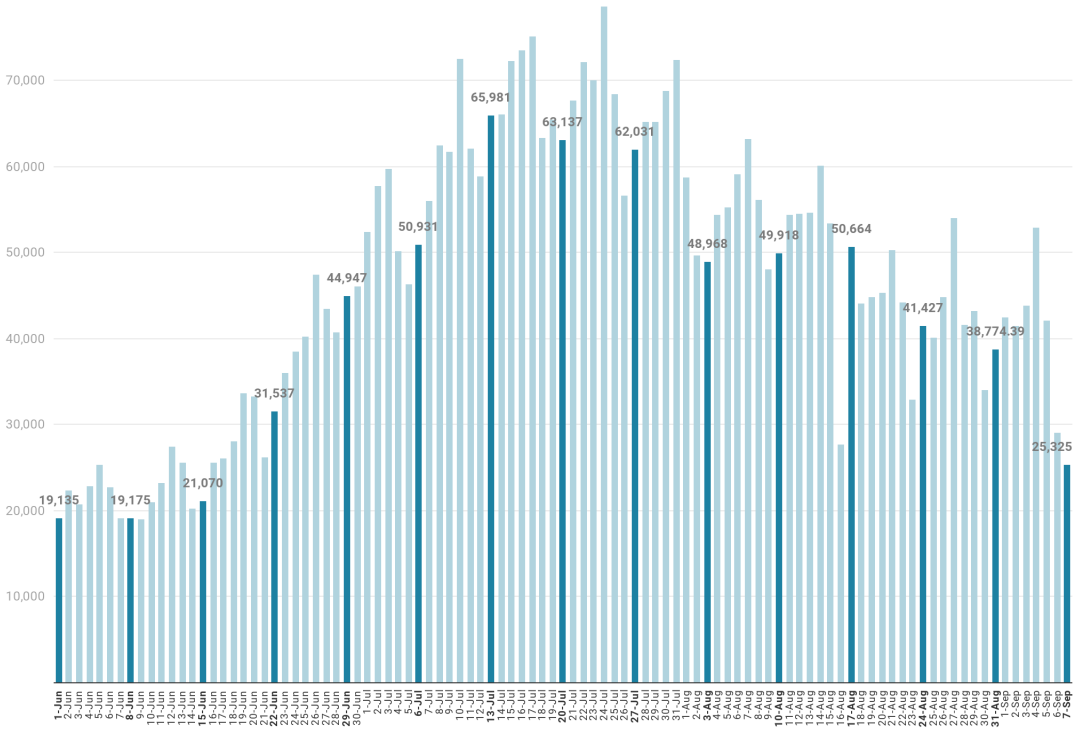
Wednesday's Experience– New Cases & Deaths

New cases on Monday were lowest on a Monday in 12 weeks
Fewer deaths reported yesterday than any Monday and 3rd fewest of any day since March 23

New Daily Cases

Through September 7

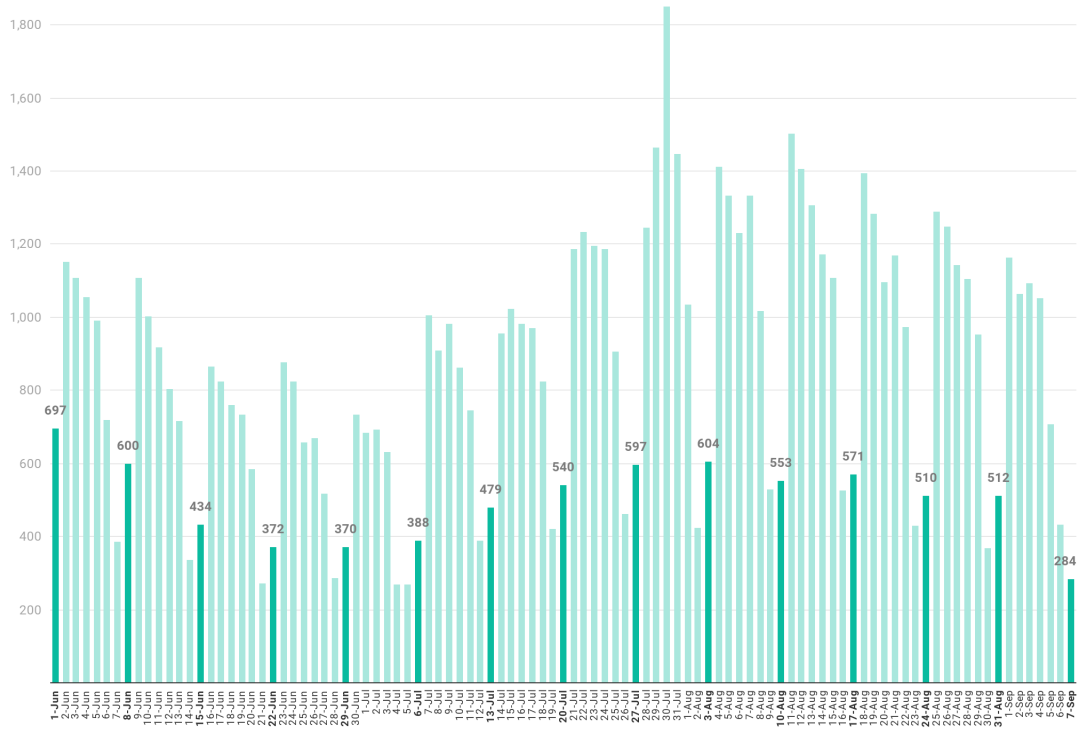
Mondays Highlighted



Newly Reported Deaths

Through September 7

Mondays Highlighted



Note the daily pattern: new cases are typically low on Sunday, then increase each day through the week. While we have been noting this for the past few weeks, researchers from MIT, Boston University and Harvard Medical School confirmed this in a report published by CIDRAP on August 17

©2020 Health Industry Advisor LLC
All rights reserved

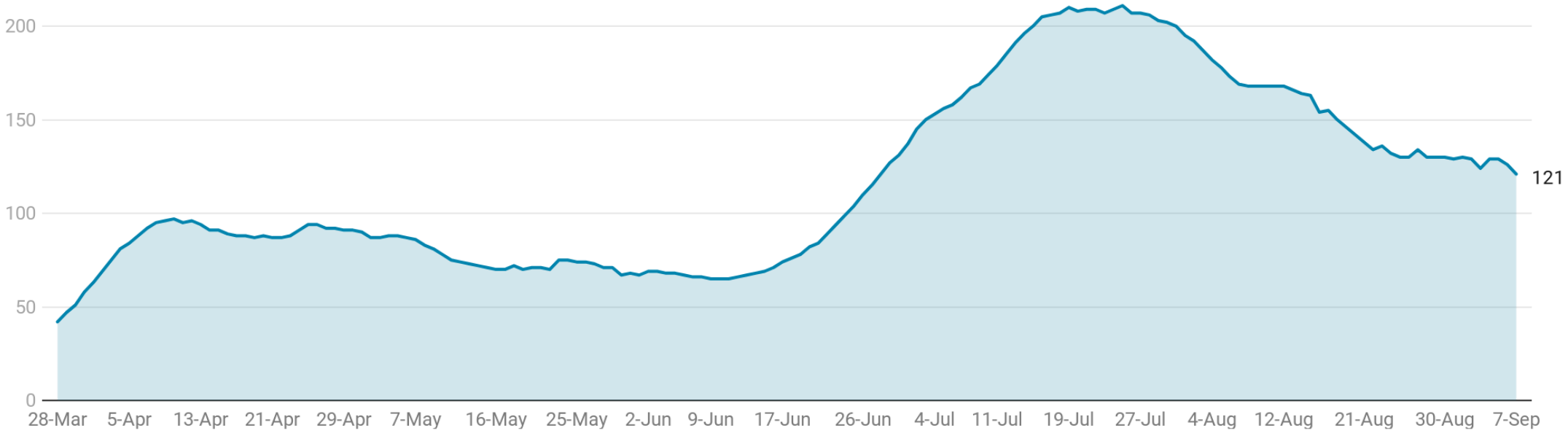
Health Industry Advisor, llc

United States

New infections per capita* dropped again yesterday, to its lowest point since June 27
Rate has dropped 42% since July 22

New Infections Per 1 Million Population - United States

Trailing 7-Day Moving Average, Through September 7



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

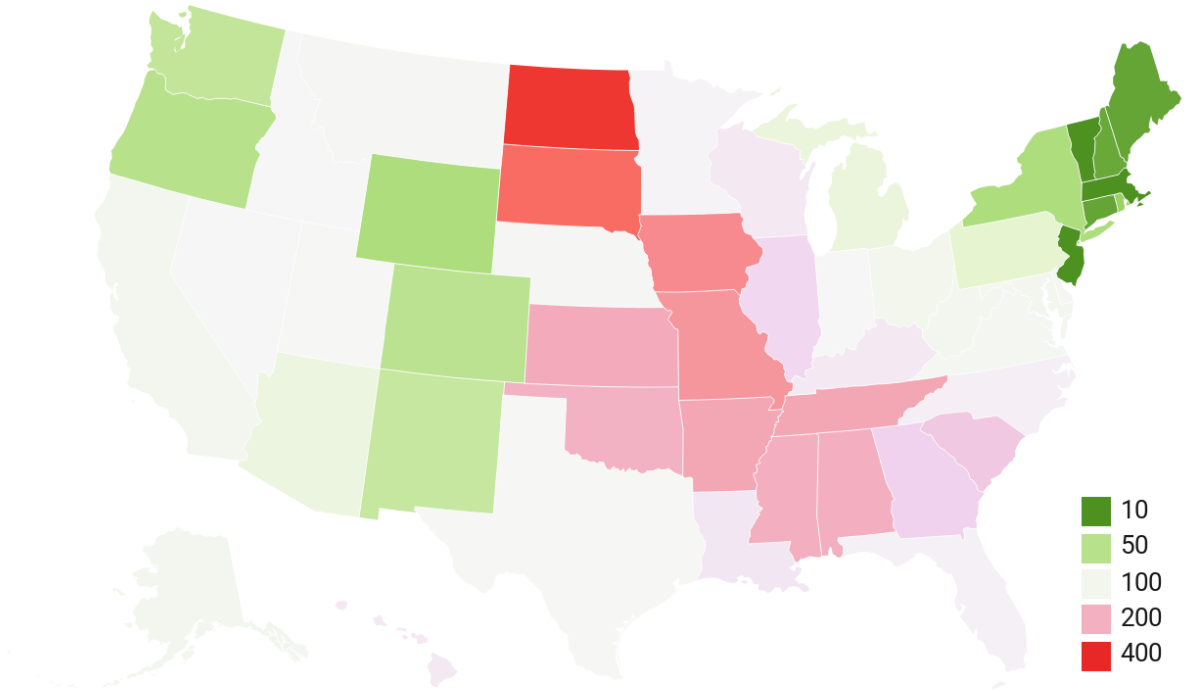
©2020 Health Industry Advisor LLC
All rights reserved

State-By-State New Infection Rates

Infection rates easing in the Southeast; Rates intensifying in Dakotas, Iowa and Missouri

New Daily Infections Per 1 Million Population

Trailing 7-Day Moving Average, As of September 7

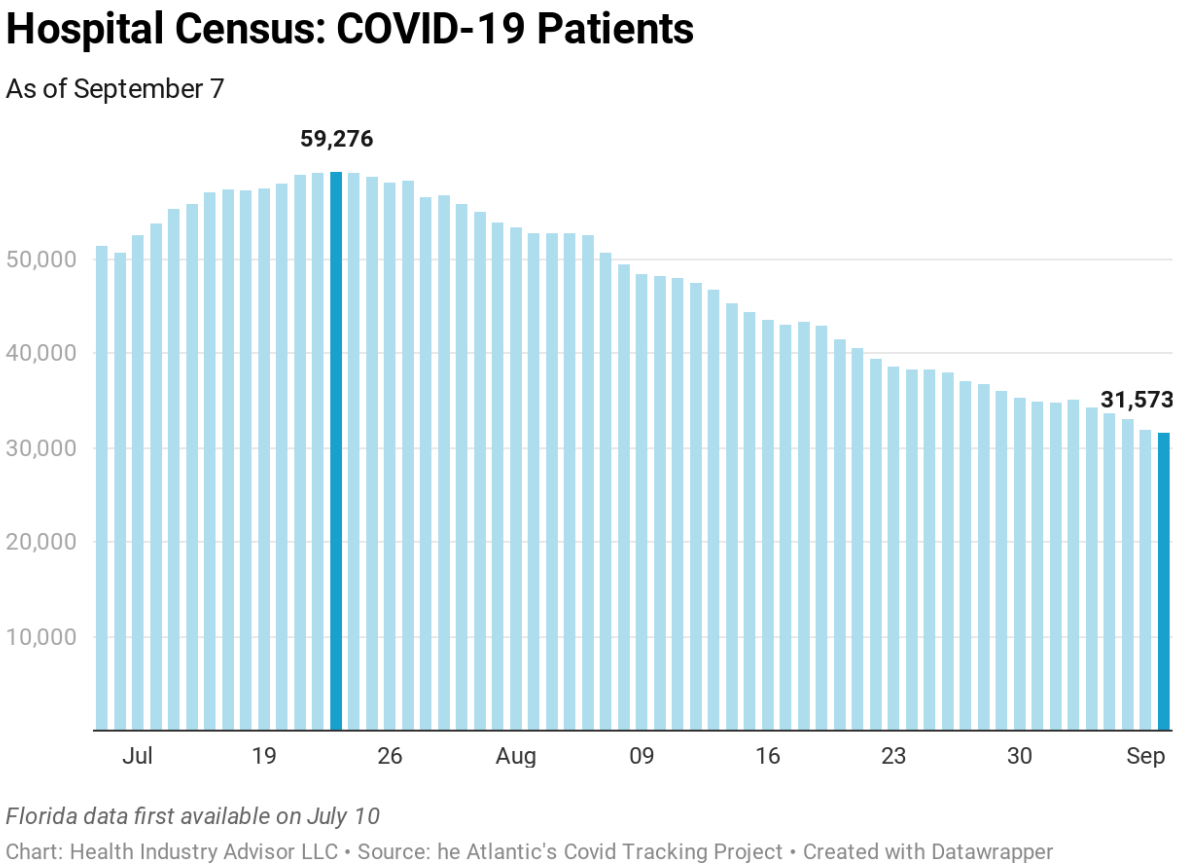


Map: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

©2020 Health Industry Advisor LLC
All rights reserved

United States

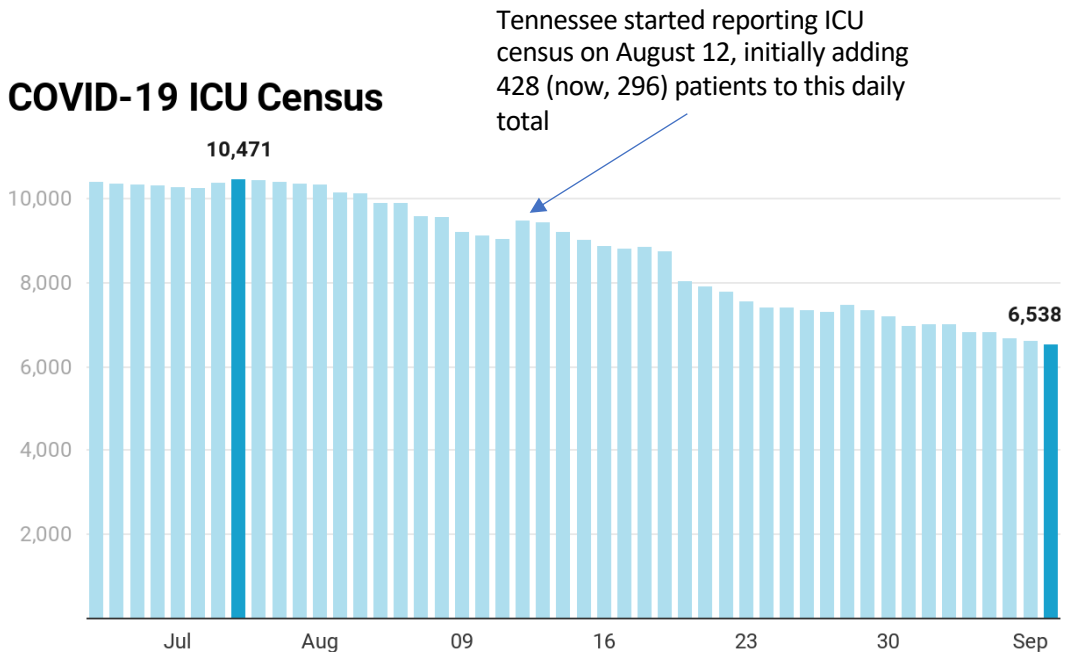
COVID-19 inpatient declined again yesterday, for only the 40th time in 46 days
This census has dropped 46% during this time



©2020 Health Industry Advisor LLC
All rights reserved

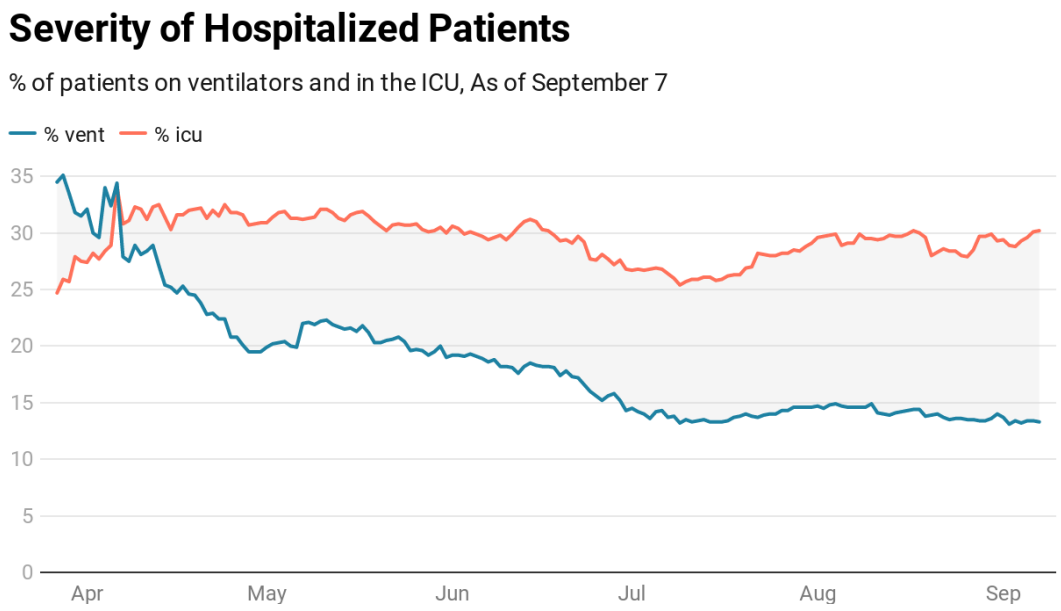
United States

Stress on ICU beds and ventilators continues to ease:
Daily ICU census has declined >37% since mid-July
Recently, % of inpatients in the ICU or on ventilators are both steady or decreasing
. . . even as census declines



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



Health Industry Advisor LLC analysis

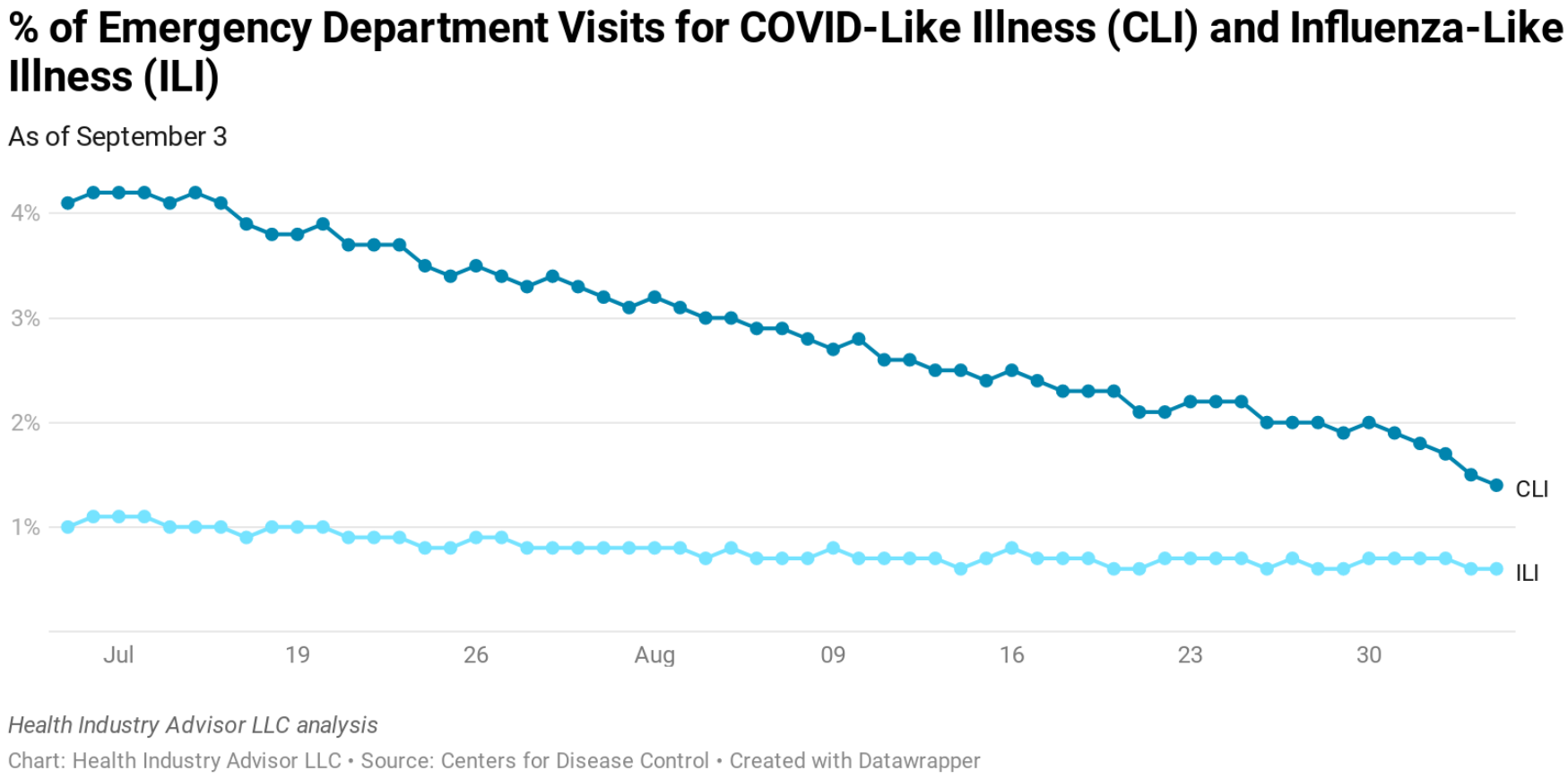
Chart: Health Industry Advisor LLC • Source: The Atlantic's Covid Tracking Project • Created with Datawrapper

©2020 Health Industry Advisor LLC
All rights reserved

United States – ER Visits for Flu and COVID-19

COVID-19 Visits to the ER have been declining all summer – now ~1/3 of early-July rate

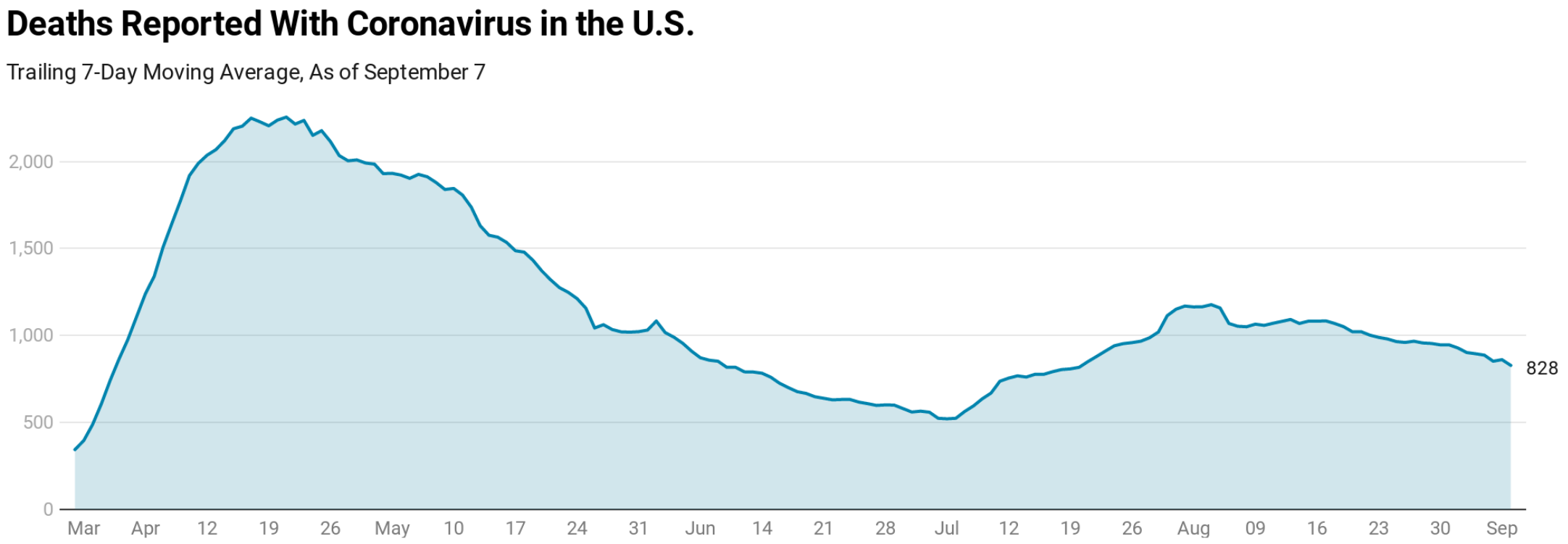
Flu season – which is of great interest in how we manage the Fall – has yet to arrive



©2020 Health Industry Advisor LLC
All rights reserved

United States – Deaths with Coronavirus

7-day average deaths have been declining for past 3 - 1/2 weeks – now, at lowest 7-day average rate since July 20



Health Industry Advisor LLC analysis

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

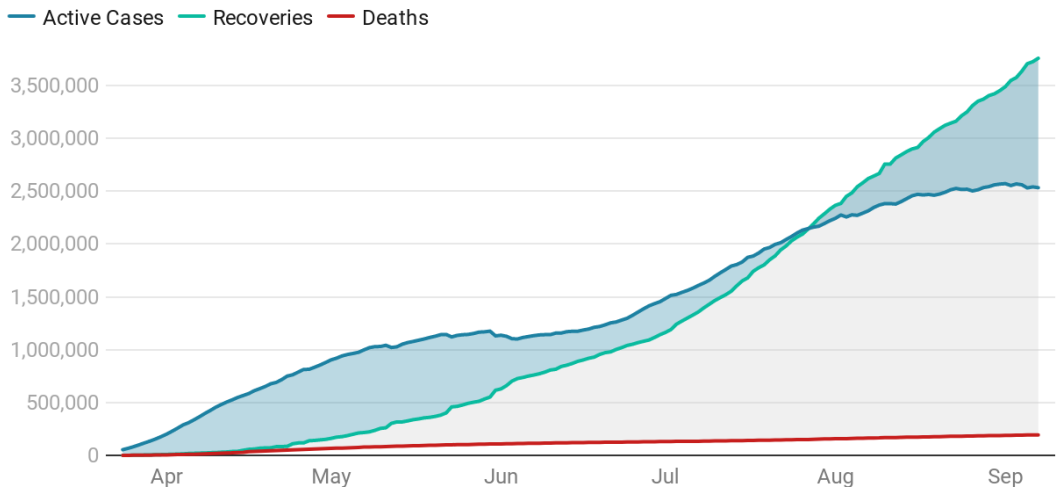
©2020 Health Industry Advisor LLC
All rights reserved

United States

Recoveries are on a steep upward climb
Active cases may have peaked?
~50% more recoveries than active cases at this point

Active Cases v. Recoveries & Deaths

Through September 7

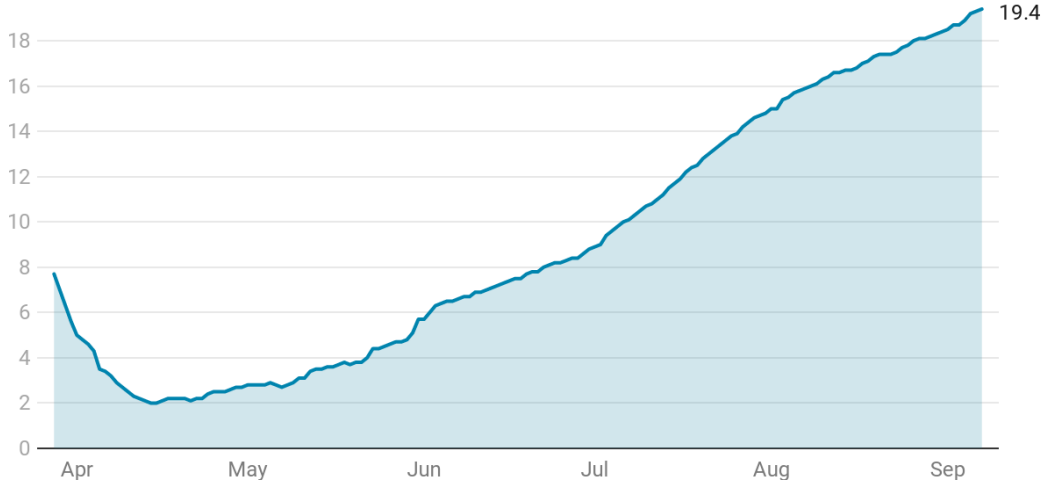


Health Industry Advisor LLC analysis

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

Recoveries: Deaths - United States

As of September 7



Health Industry Advisor LLC analysis

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

©2020 Health Industry Advisor LLC
All rights reserved

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

©2020 Health Industry Advisor LLC
All rights reserved