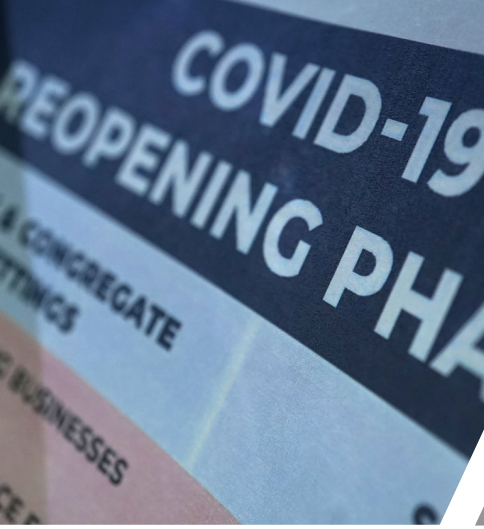

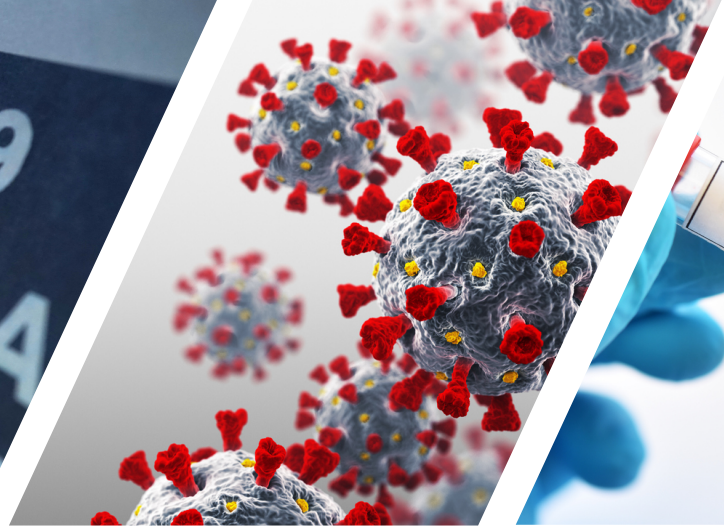

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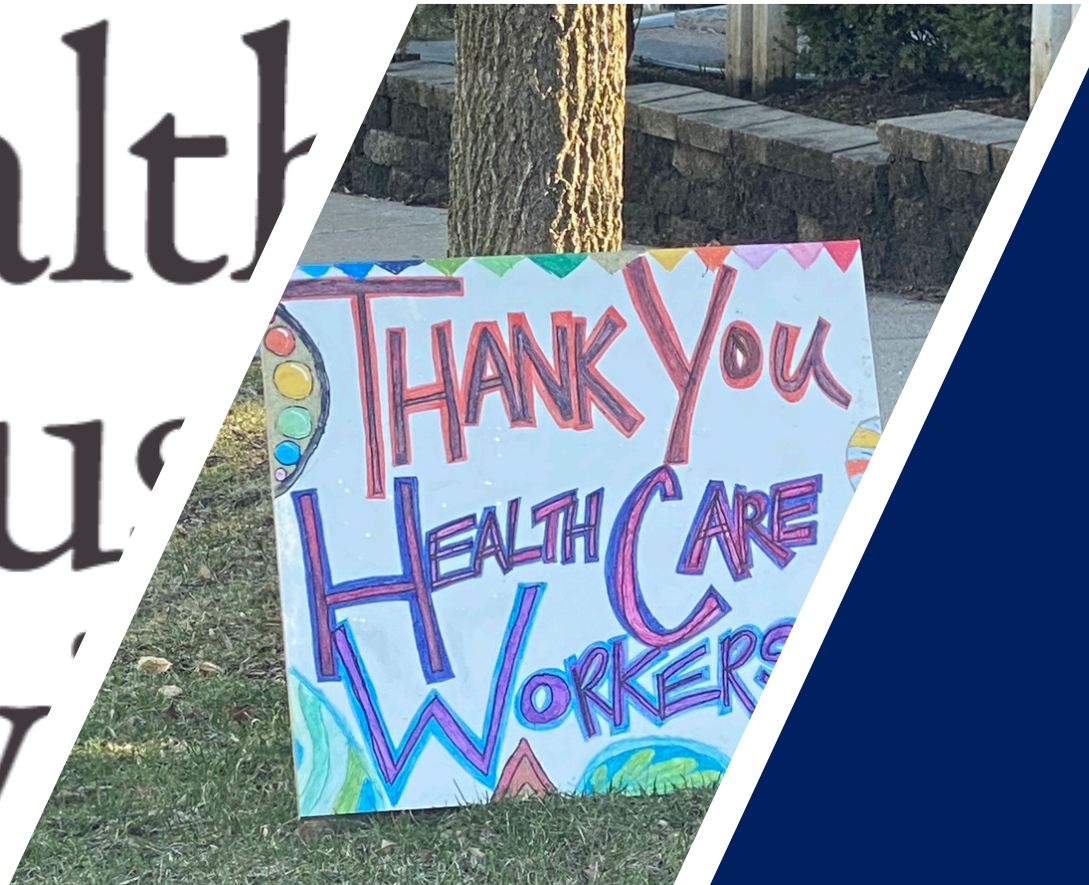

Issue # 167

Tuesday, September 22, 2020

COVID-19 Report

Highlights

- **The FDA maintains a site comparing the sensitivity of 55 of the PCR tests that have been approved for SARS-CoV-2 infection detection. The sensitivity of these tests - that is, the viral material that can be detected in a given sample varies by 1,000x**. The most sensitive tests are listed in our report, as well as a link to the full list
- One of the concerns about the **SARS-CoV-2 virus is its high person-to-person transmission rates. This transmission rate is estimated to be in the range of 1.5 to 3.5**. By comparison, the transmission rate is estimated at 3 for the first SARS virus, 1.5-2.5 for Ebola, 1.3 for the seasonal flu and 0.4-0.9 for MERS
- Another concern is the **fatality rate associated with a SARS-CoV-2 infection**. Based on reported cases, this rate is **estimated at 2.2%** (it may be 1/10th of this, based on actual infections). **There have been several major virus outbreaks in the past fifty years with significantly higher fatality rates**, including Nipath (1998): 77.6%; Hendra (1994), 57.0%; H5N1 Bird Flu (1997): 52.8%; and Ebola: 40.4%. Many of these viruses, however, were highly concentrated geographically
- **Infections continue to spread at a significant rate worldwide**. New daily cases worldwide have increased 10.5% since the beginning of September, 21.6% since the beginning of August and 60.5% since the beginning of July

- **Among countries of >1M population, Israel, Bahrain, Spain and Argentina have experienced the highest rates of new infections per capita over the past 7 days**
- Testing continues to improve in the United States. **The 7-day average test volume is up 29% versus one week ago; the test-positive rate is as low as it has been since June 21**
- New cases and the infection rate per capita in the U.S. are delivering mixed signals: **New cases were up yesterday 11.5% versus a week ago; new cases reported on Monday, however, were lower for than any other Monday except Labor Day in the past 13 weeks**
- **The new daily infection rate appears to have leveled off over the past few days, following a brief period of increasing rates post-Labor Day**
- **The 7-day average of reported deaths per day fell for the sixth consecutive day; Except for Labor Day there were fewer deaths reported yesterday than any other Monday in the past twelve weeks**

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From February to the middle of May, the FDA issued Emergency Use Authorizations (EUAs) for 59 in vitro diagnostic tests for the SARS-CoV-2 virus infection

The graphic on the right shows the 18 most-sensitive tests, based on the test's Limit of Detection (LoD) – the amount of viral material that can be detected in a given sample. The smaller the LoD value, the more sensitive the test

The range of sensitivity was 180 NAAT Detectable Units/mL to 180,000

SARS-CoV-2 Reference Panel Comparative Data

Lower value indicates a greater sensitivity of the test, 18 tests (of 55) with greatest sensitivity listed

Developer	Test	Product Limit of Detection (NDU/mL)
PerkinElmer, Inc.	PerkinElmer New Coronavirus Nucleic Acid Detection Kit	180
ScienCell Research Laboratories	ScienCell SARS-CoV-2 Coronavirus Real-time RT-PCR (RT-qPCR) Detection Kit	540
BioCore Co., Ltd.	BioCore 2019-nCoV Real Time PCR Kit	600
DiaCarta, Inc	QuantiVirus SARS-CoV-2 Test kit	600
DiaCarta, Inc	QuantiVirus SARS-CoV-2 Multiplex Test Kit	600
Hologic, Inc.	Panther Fusion SARS-CoV-2 Assay	600
Hologic, Inc.	Aptima SARS-CoV-2 assay	600
SEASUN BIOMATERIALS	U-TOP COVID-19 Detection Kit	600
Becton, Dickinson & Company (BD)	BioGX SARS-CoV-2 Reagents for BD MAX System	1,800
CirrusDx Laboratories	CirrusDx SARS-CoV-2 Assay	1,800
Euroimmun US, Inc.	EURORealTime SARS-Cov-2	1,800
Helix OpCo LLC (dba Helix)	Helix COVID-19 Test	1,800
LabGenomics Co., Ltd.	LabGun COVID-19 RT-PCR Kit	1,800
Quest Diagnostics Infectious Disease, Inc.	Quest SARS-CoV-2 rRT-PCR	1,800
Rheonix, Inc.	Rheonix COVID-19 MDx Assay	1,800
Roche Molecular Systems, Inc. (RMS)	cobas SARS-CoV-2	1,800
Applied DNA Sciences, Inc.	Linea COVID-19 Assay Kit	2,500
Fulgent Therapeutics, LLC	Fulgent COVID-19 by RT-PCR Test	3,600

Please follow link provided to find full list of tests and sensitivity

Table: Health Industry Advisor LLC • Source: FDA • Created with Datawrapper

Link to article and full list: Here

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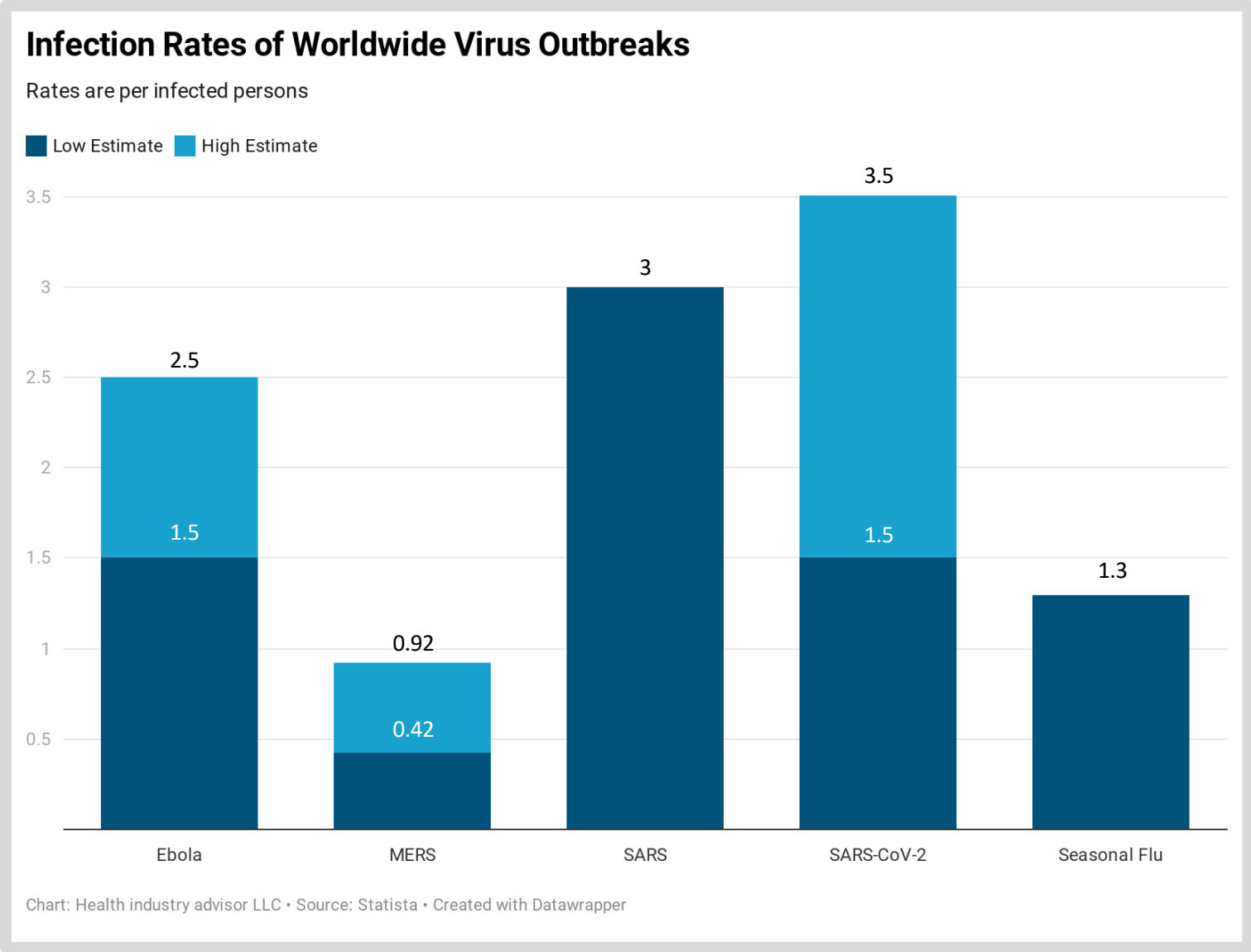
One of the concerns abut the SARS-Cov-2 virus is its high transmission rates from person-to-person (each infected person infects 1.5-3.5 additional persons)

This chart from Statista shows the transmission rate in in the same range, if not higher than SARS and Ebola, and higher than MERS and the seasonal flu



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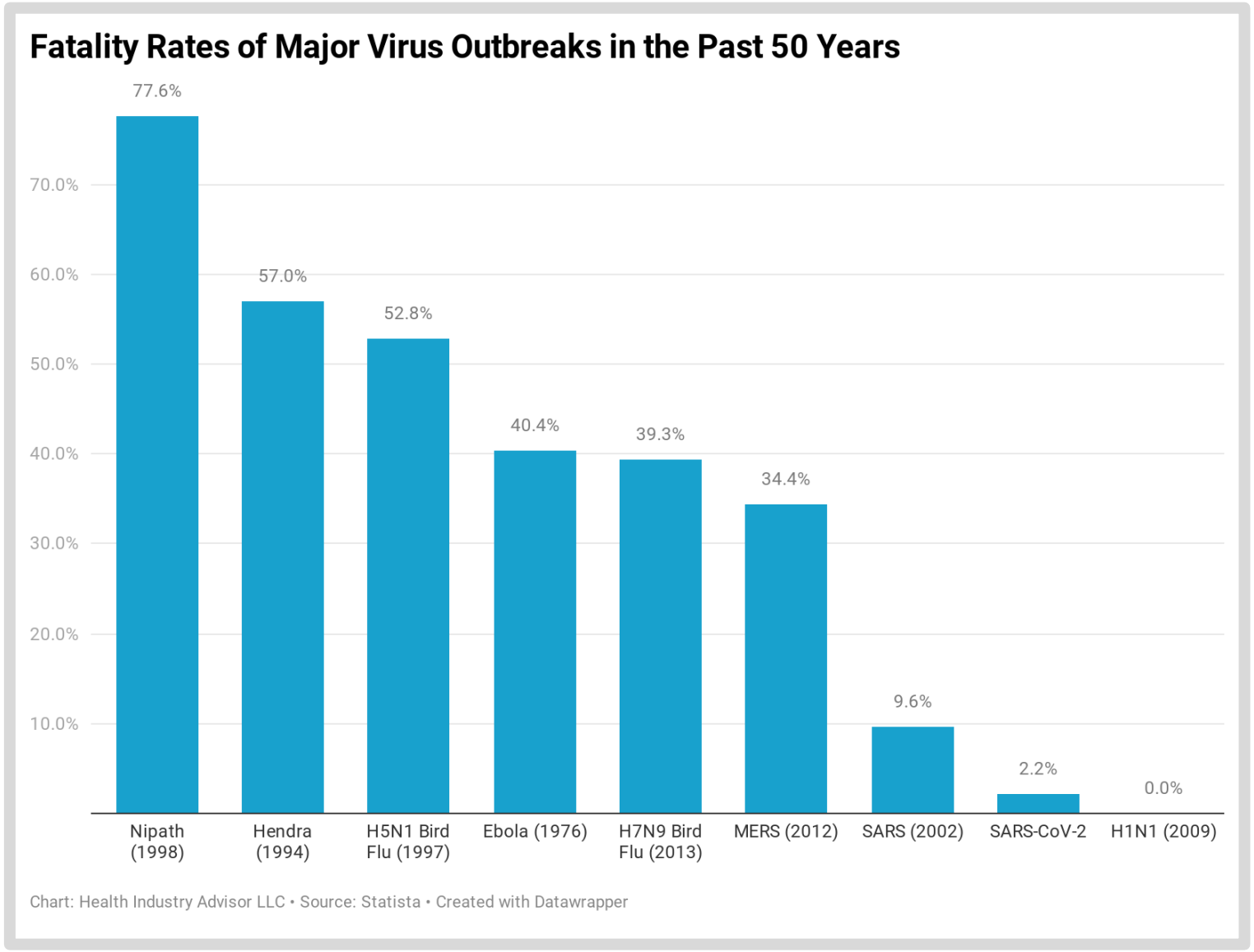
This chart produced by Statista indicates that the SARS-CoV-2 virus is substantially less fatal than many other major viruses of the past 50 years



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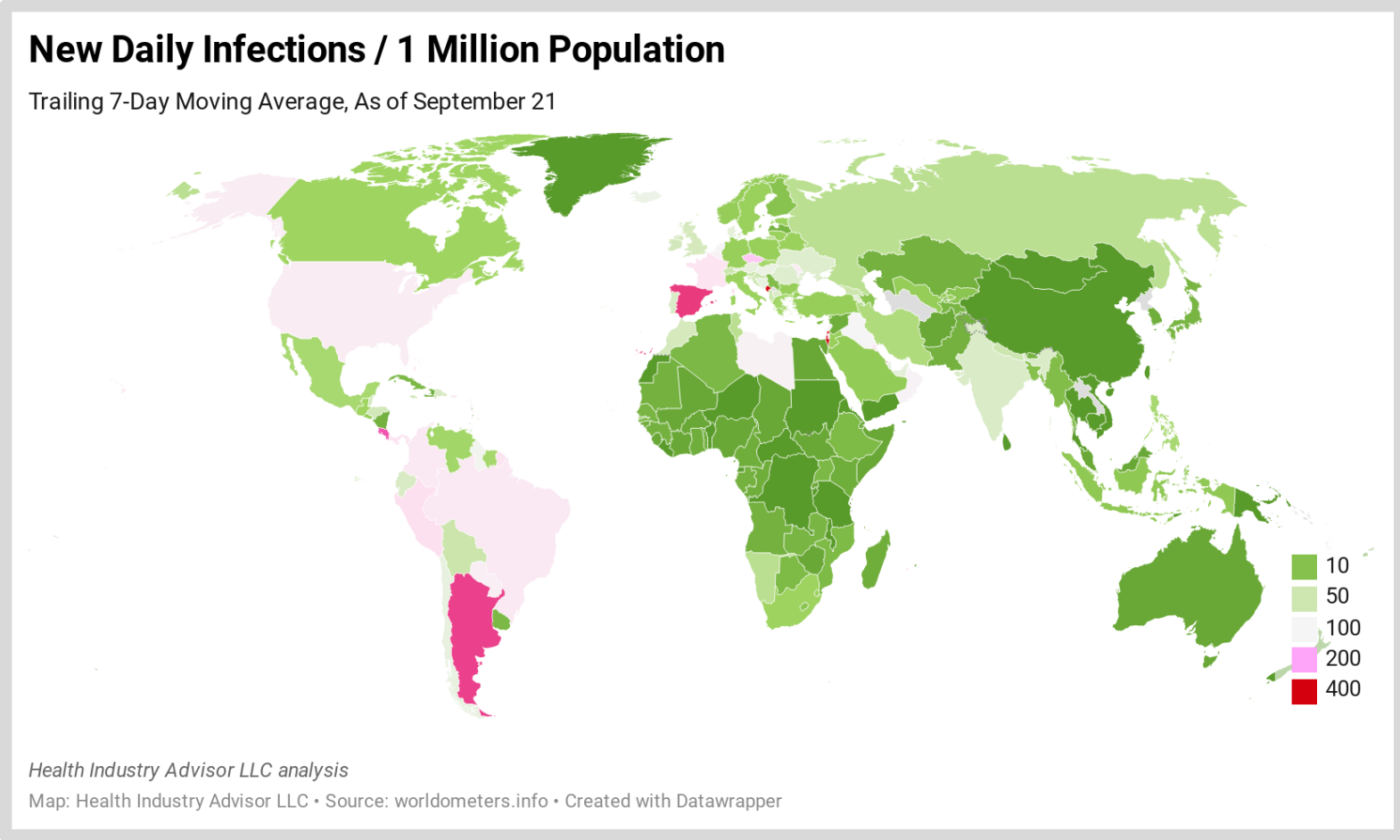
Among large countries (population > 1M), Israel, Bahrain, Spain, Argentina, Costa Rica, Czechia, Peru and France experienced the highest rates of new infections per capita over the past 7 days

Israel, Czechia and Ecuador experienced the largest increases in ne infection rates over the past two weeks



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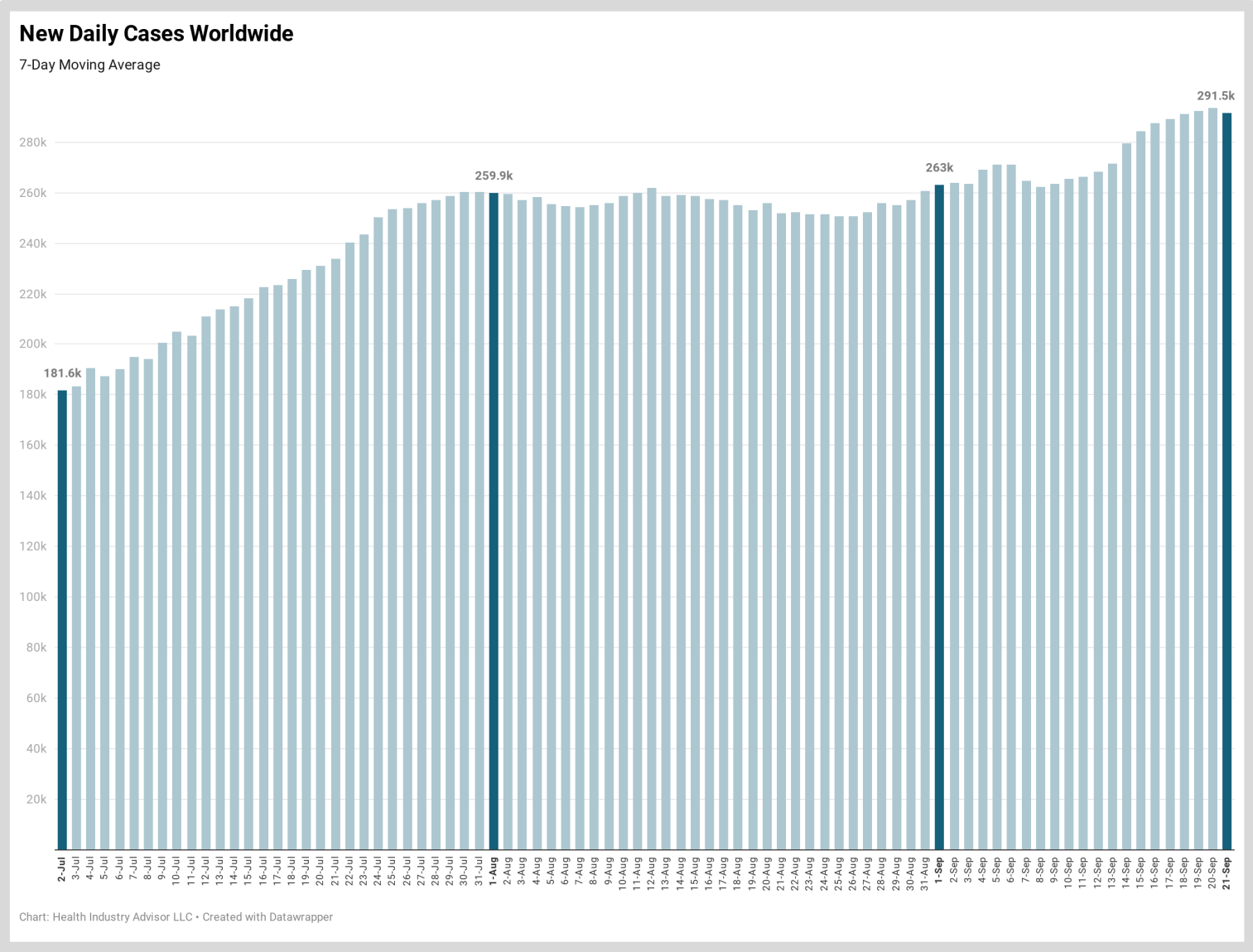
New daily cases worldwide continue to increase

10.5% since the beginning of September*

21.6% since the beginning of August

60.5% since the beginning of July

* - 7-day moving average basis



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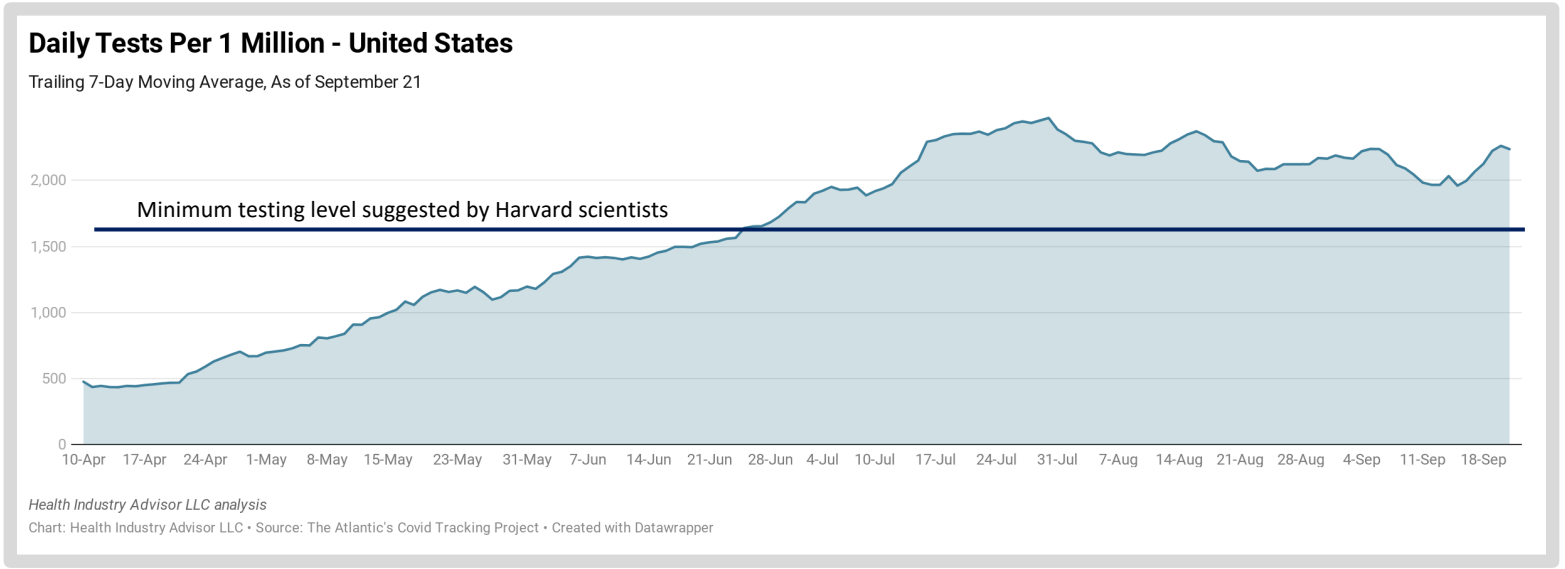
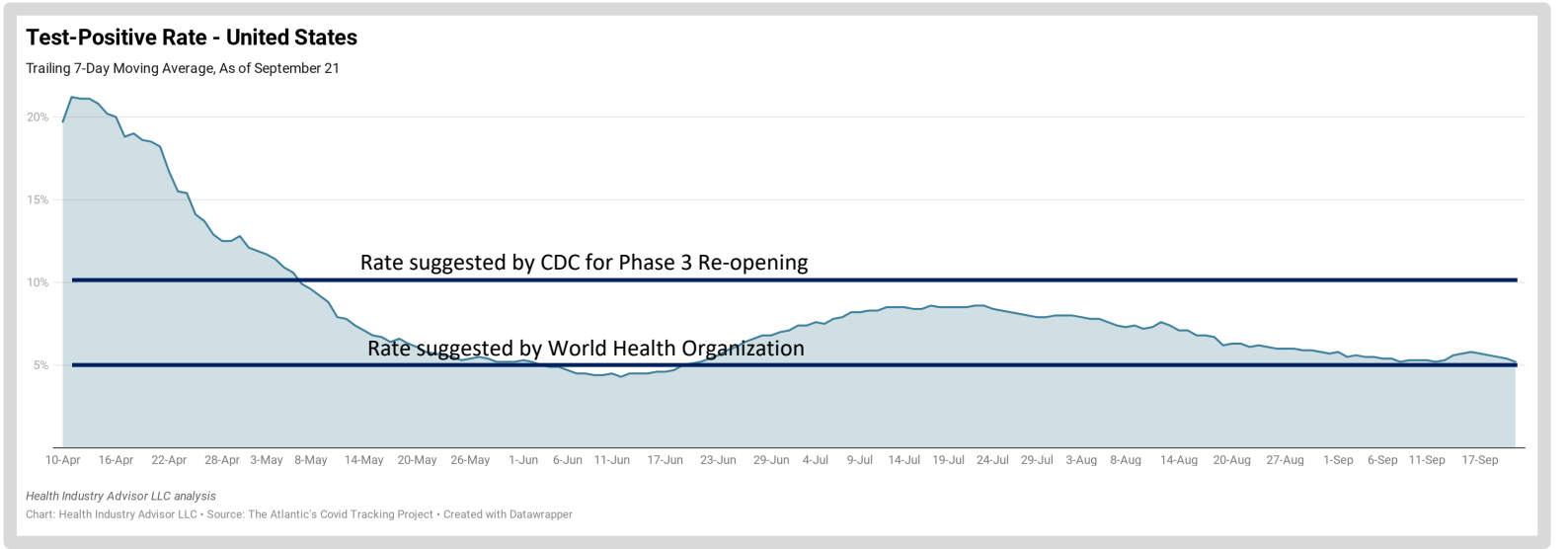
7-day average daily test volume has increased 29% week-over-week

7-day average test-positive rate is as low as it has been since June 21





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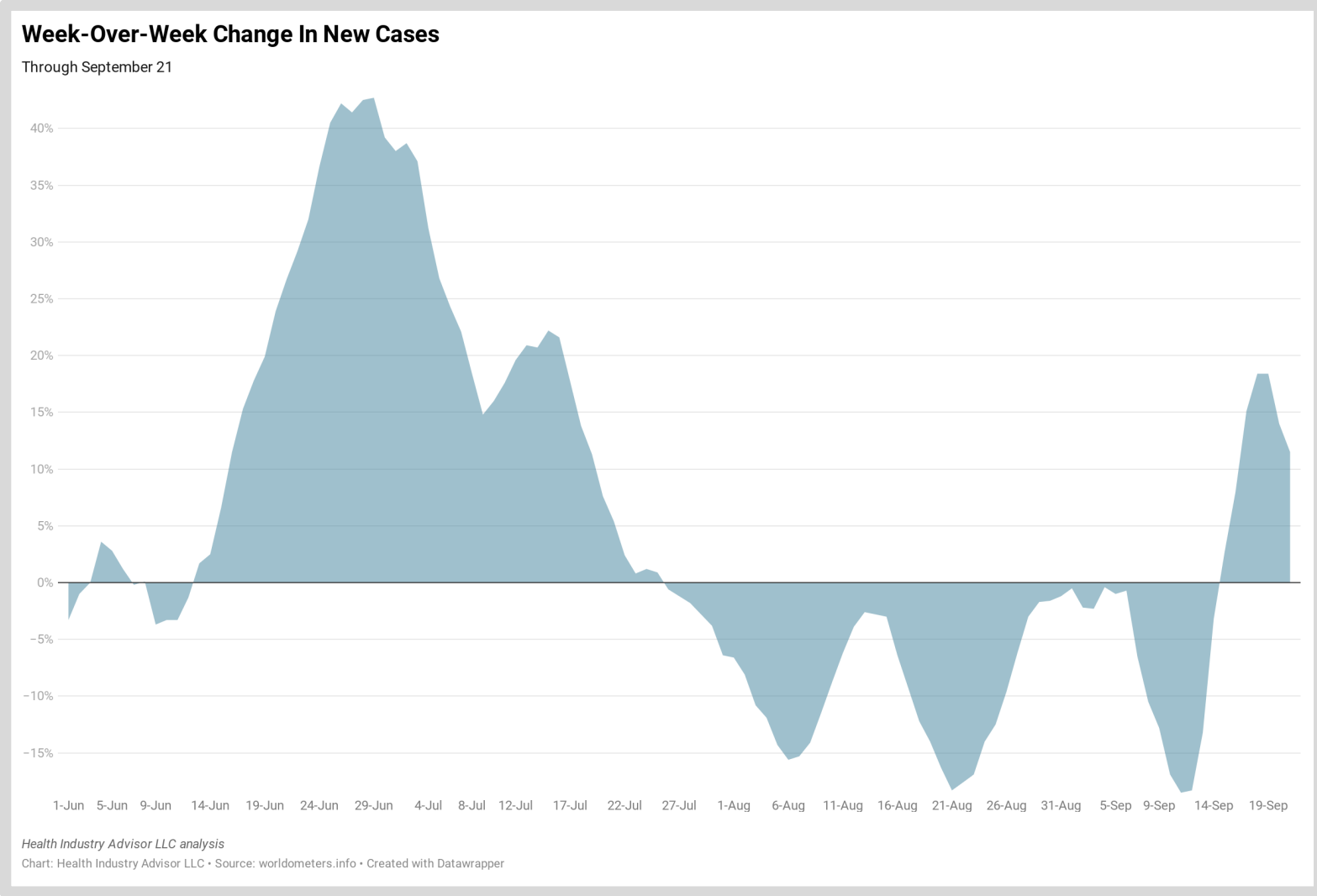
Following a seven-week period of decline, new cases began increasing on a week-over-week basis one week ago.

Yesterday, this rate was up 11.5% versus a week ago (although the rate of increase has declined ach of the past two days)



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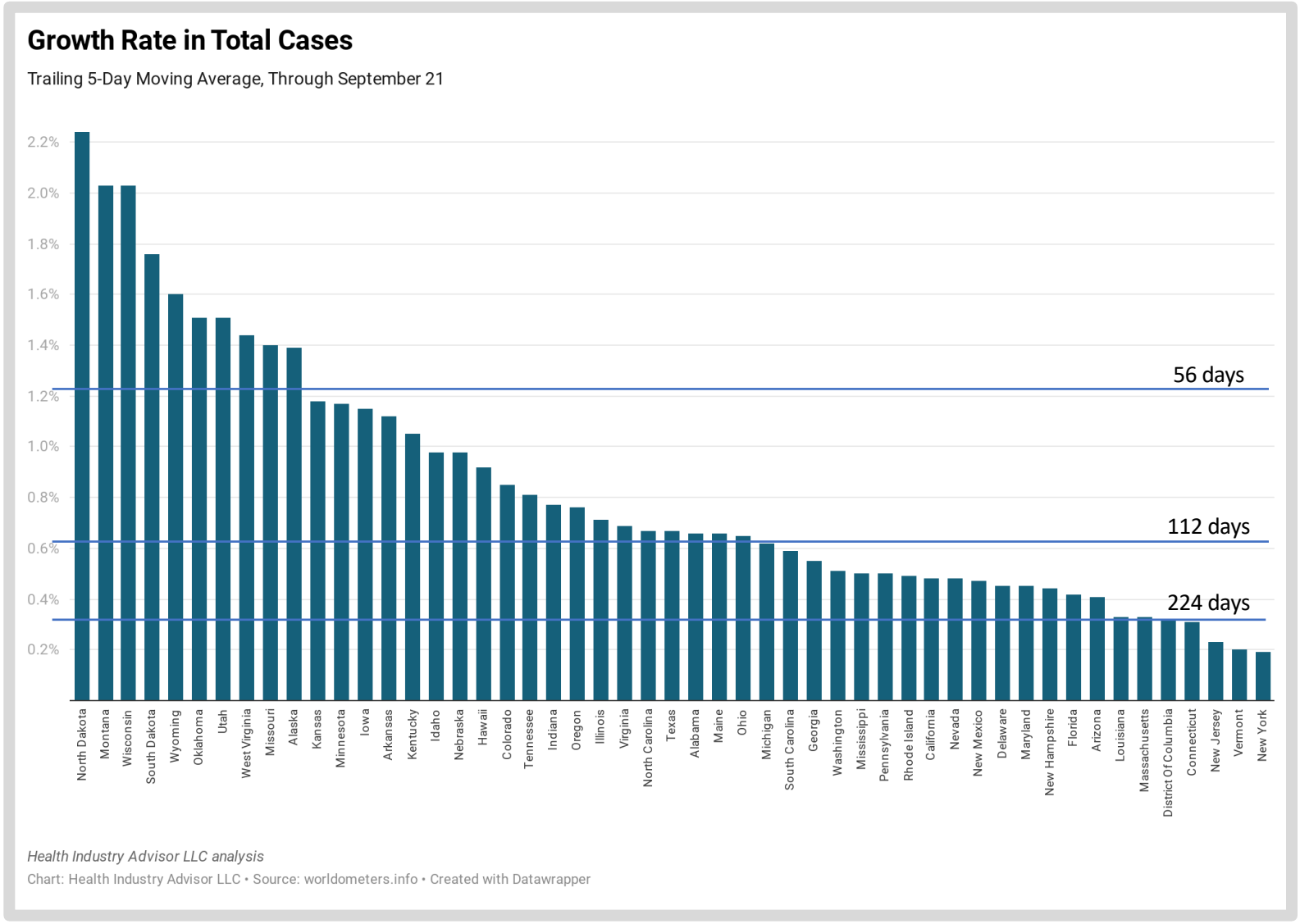
Case growth:

At current rates, cases are doubling every 31 days in North Dakota

Every 369 days in New York

Every 109 days for the United States overall



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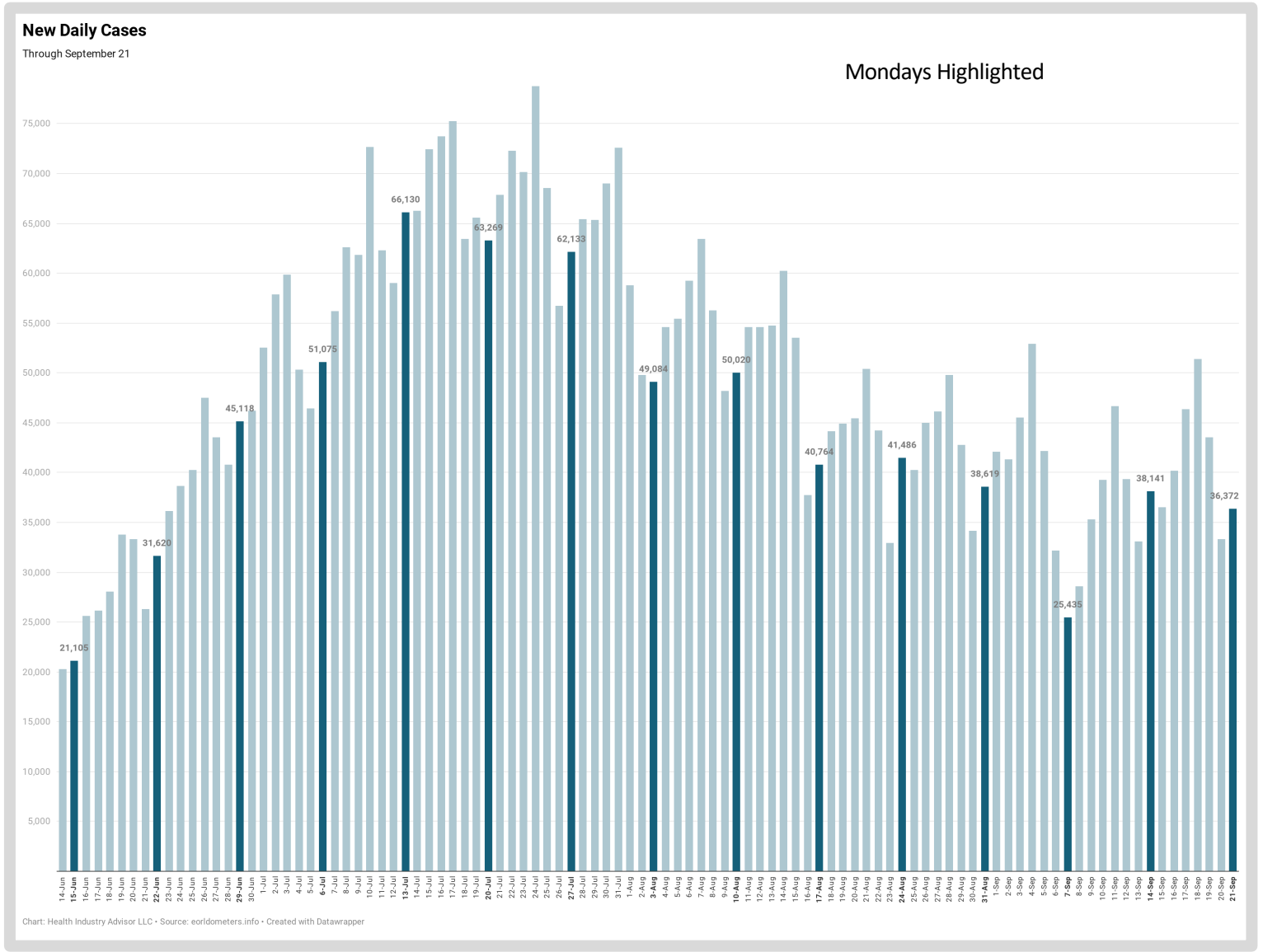
Except for Labor Day , there were fewer new cases on Monday than any other Monday in the past 13 weeks



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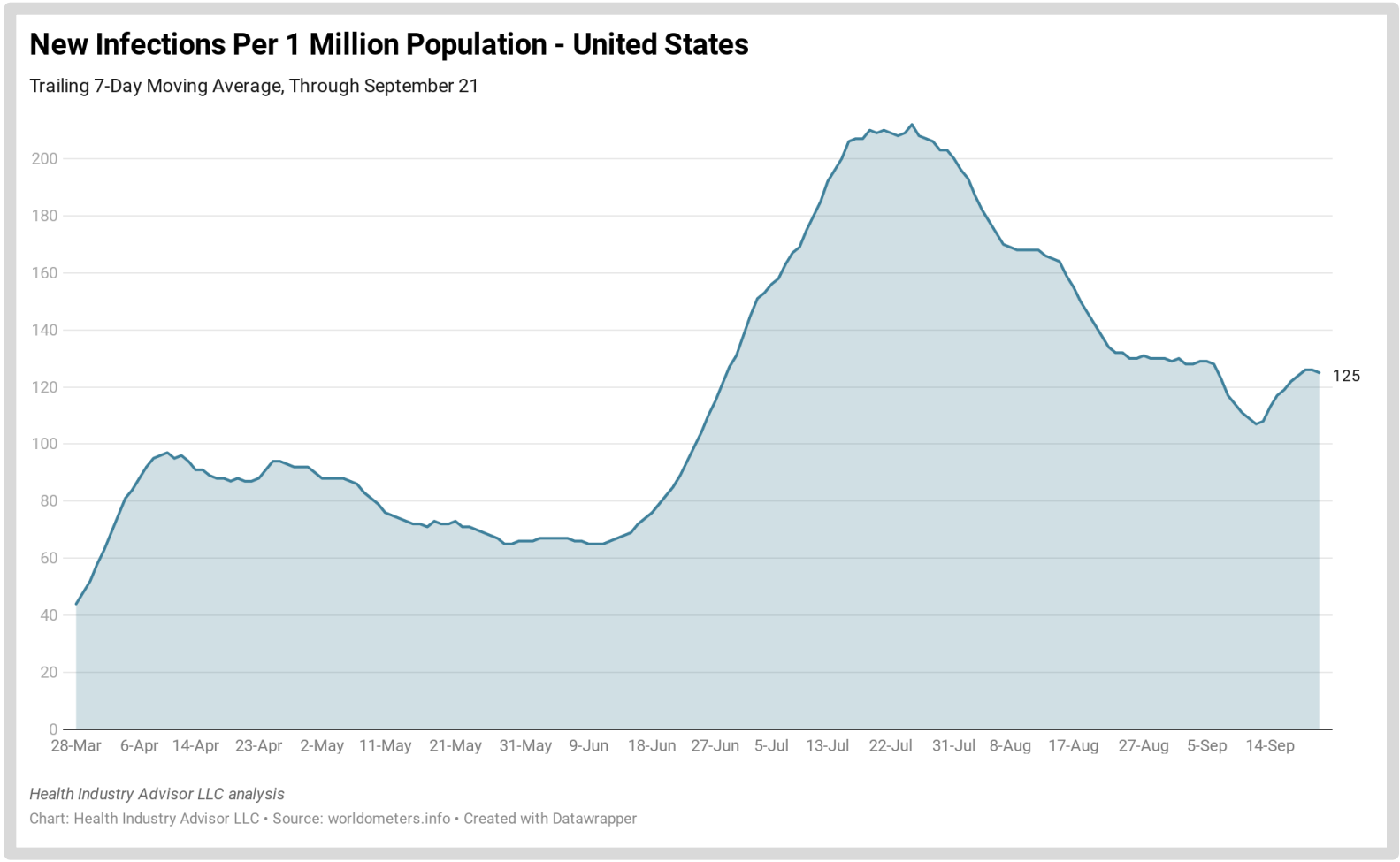
New infections per capita in the U.S.* bottomed-out on September 12 then increased through Saturday

The current rate has been essentially flat for the past few days



* - 7-day moving average basis

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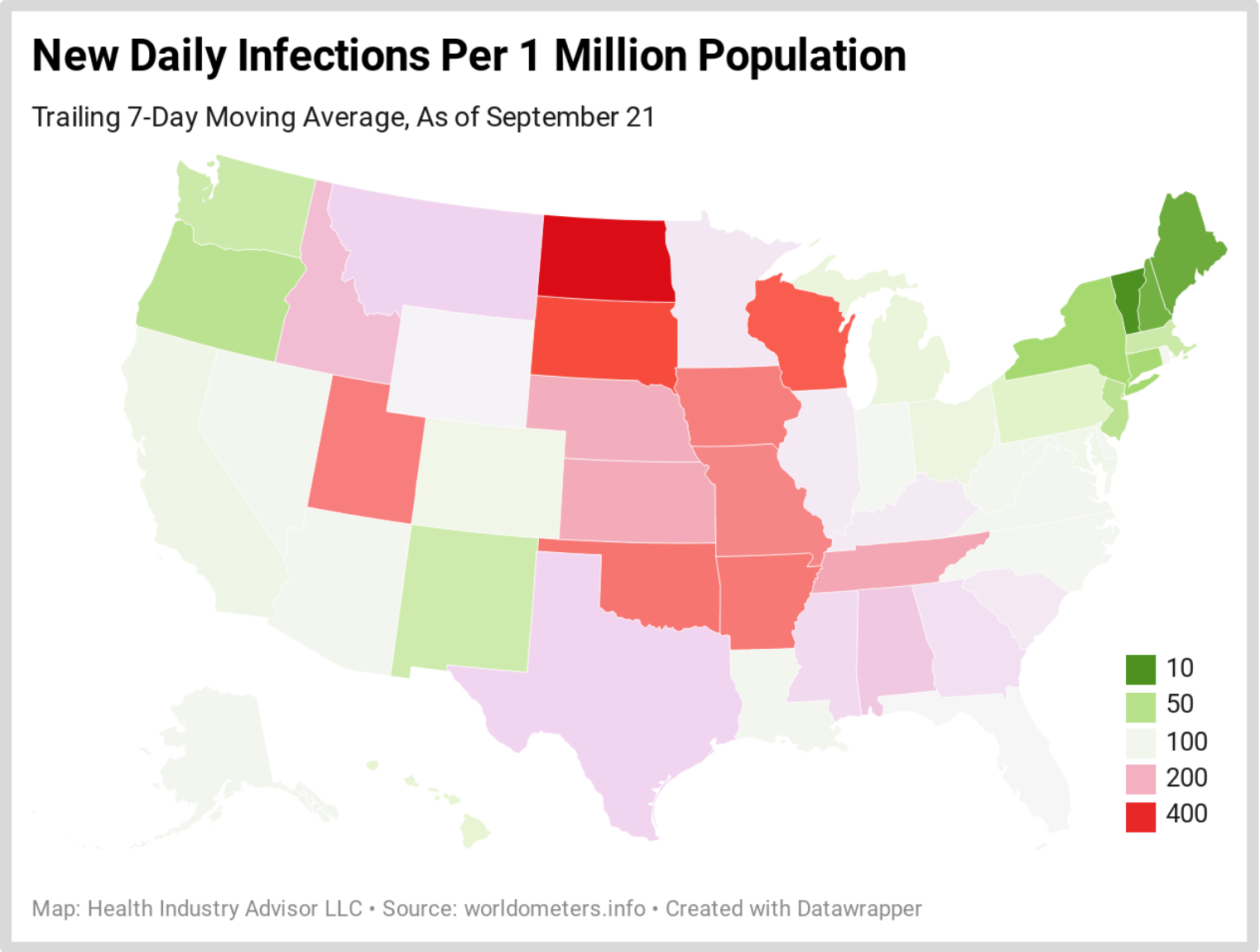
Infection rates* are highest in the Heartland, Plaines and Upper Midwest

Vermont's rate is down to 6 new daily infections per million



* - 7-day moving average basis

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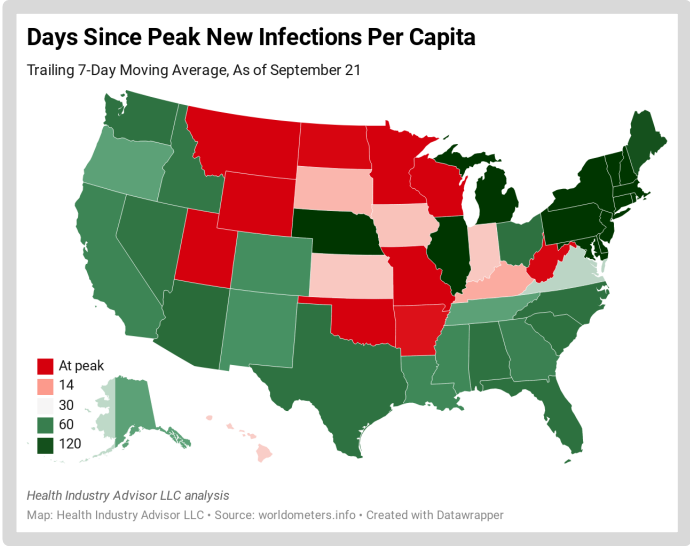
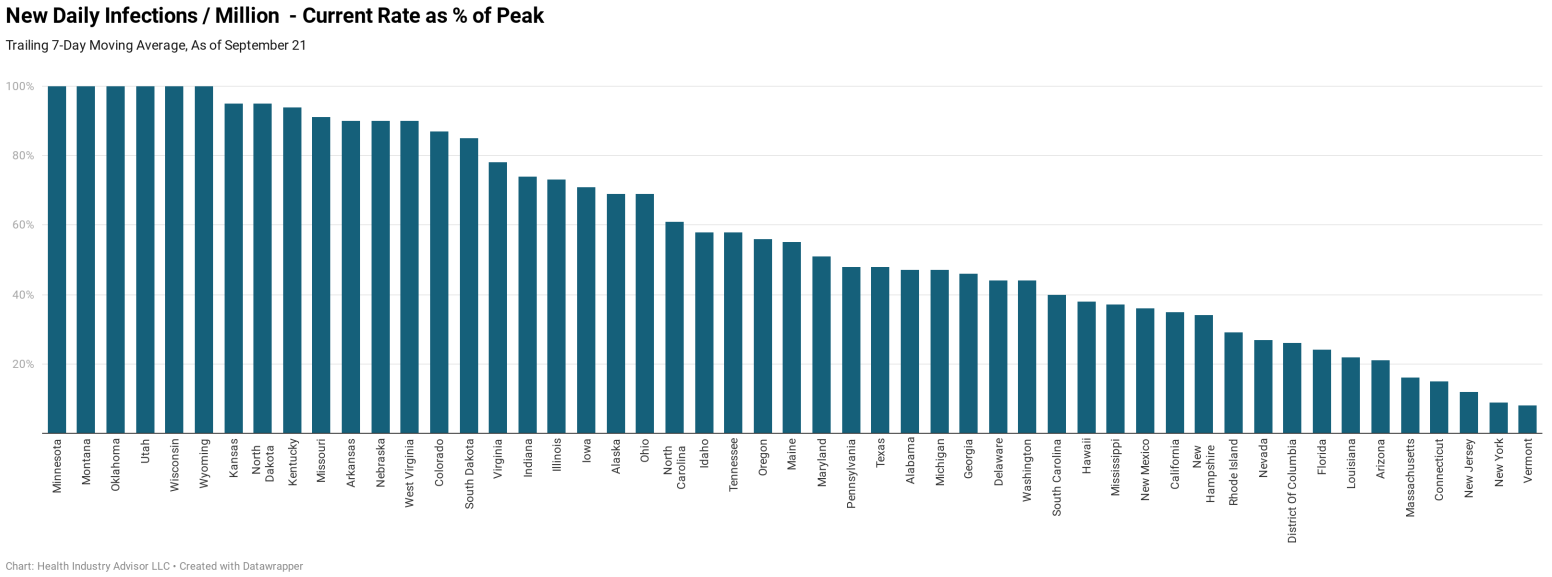
Several states in the Central and Mountain time zones are at or near their highest new infection rates – in terms of both % of peak and days since peak

Oklahoma set a new high infection rate yesterday – 51 days after setting its previous high





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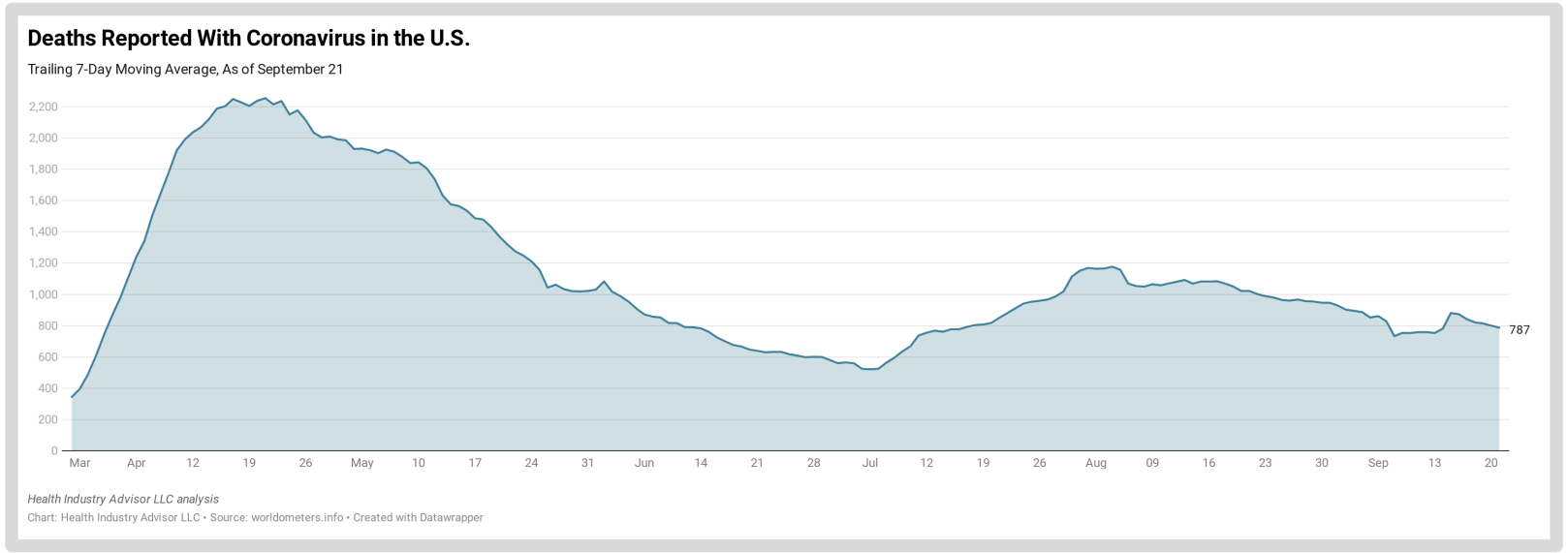
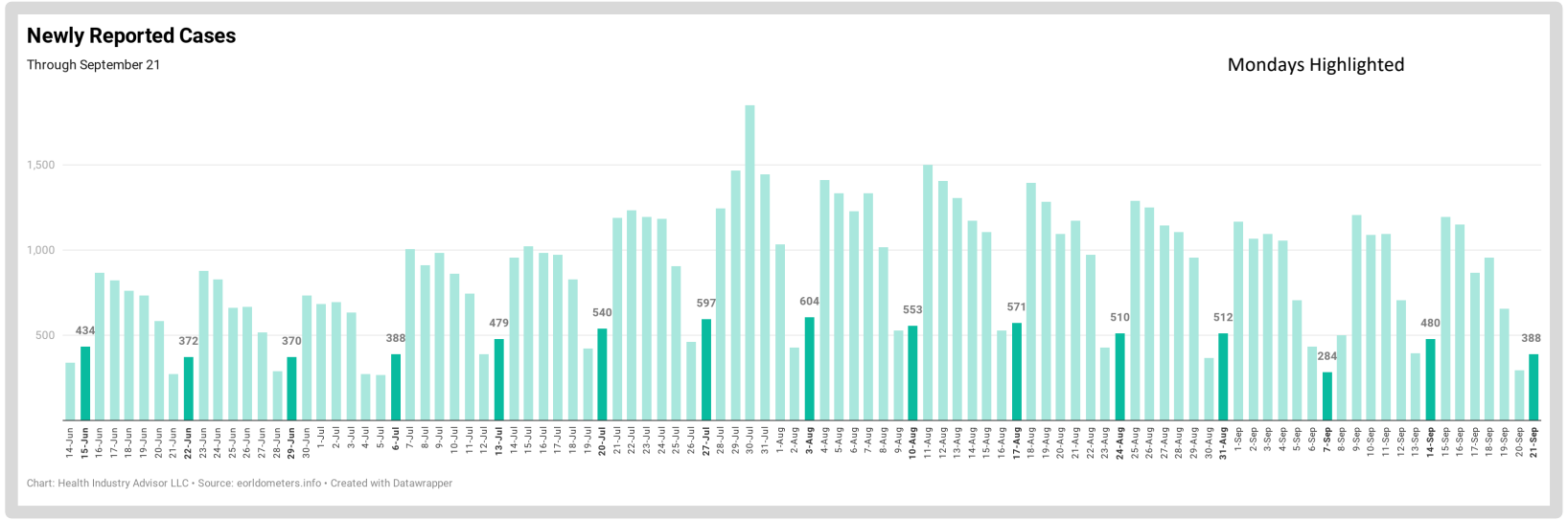
7-day average daily deaths have declined on six consecutive days

Except for Labor Day, there were fewer deaths reported on Monday than any other Monday in the past 12 weeks





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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

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