Health Industry Advisor, llc

"Strategic Guidance in an Era of Unprecedented Change"

COVID-19 Dashboard

Issue # 85

Wednesday, June 24, 2020

Day's Highlights

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	>511,000
Test-Positivity Rate	Decline	6.5% test-positive on Friday; 5.6% for past 7 days
Number of Cases	Plateau	Cases increased nearly 33.6% week-over-week – concentrated in 6 states
Deaths % of Total Cases	Decline	5.09%
Number of Deaths / 1M Population	Plateau	373.0
Recoveries : Death	Increase	8.26

- The United States continues to experience a surge in new infections. As has been the case, however, a few states are bearing the bulk of this burden: In order of most new cases, California, Texas, Florida, Arizona, North Carolina and Georgia accounted for 56% of the new cases in the United States during the past 7 days
- Fourteen states are experiencing their highest rate of new infections per capita since the pandemic began: Arizona, Arkansas, California, Florida, Georgia, Idaho, Mississippi, Missouri, Nevada, Oklahoma, South Carolina, Texas, Utah and Wyoming
  - Arizona continues to have the highest rate over the past 7 days: 375 new daily infections per million population, followed by South Carolina (184), Arkansas (165), Florida (156), Utah (150) and Texas (144)
  - Oregon (6/21), Tennessee (6/20), North Carolina (6/18), North Dakota (6/18) and Alabama (6/16) each seem to have recently moved past a peak in this infection rate
  - The new infection rate for the United States in total (93.5) is now back to the level last experienced during the last week of April
- Considering rates of new infections, test-positive %, hospitalizations and case growth:
  - 12 states are in our "High" concern category: Alabama, Arizona, Arkansas, California, Florida, Georgia, Mississippi, Nevada, North Carolina, South Carolina, Texas and Utah. These states comprise 43% of the population of the United States
  - Twenty-five states, including Connecticut, Illinois, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania and Wisconsin, and comprising a similar 43% of the population, are in our "Low" concern category
- With the increasing infection rates, we analyzed the trends in new hospitalizations, hospitalized patients and ICU patients in the twelve states named above:
  - Despite increasing new infections, new hospitalizations and hospitalized patients have trended downward in these states since early April. In the few cases where hospitalizations have increased, this increase was at a lower rate than that of new infections
  - Where data were available, the intensity of hospitalized care - % ICU / total patients - was mostly steady, if not declining
- Testing volume was high again on Tuesday (511,000), as was the test-positive rate (6.5%).
  - Test-positive rates over the past week have been increasing in: South Carolina, Washington, Florida, Arizona, Oklahoma, Texas, Idaho, Utah, Georgia, Kentucky. Tennessee, Missouri and Kansas.
  - This rate has declined in Wyoming, Maryland, Virginia, Indiana, Arkansas, Massachusetts, Illinois, Louisiana, Mississippi and Nebraska
- Deaths in the United States were reported at 863 yesterday, bringing the cumulative death rate per case to 5.09%. Compared to the high of 5.98% on May 16, this is the equivalent of 21,400 fewer deaths

UNITED STATES & STATE-BY-STATE INFORMATION

Health Industry Advisor, llc

"Strategic Guidance in an Era of Unprecedented Change"

STATE-BY-STATE
OVERALL ASSESSMENT SCORECARD

Health Industry Advisor, llc

State-By-State

Overall Assessment Scorecard

"Strategic Guidance in an Era of Unprecedented Change"

Several factors should be considered when assessing where a state stands with its virus progression status:

- Current rate of new infections, relative to its peak (is it declining or near its peak?)
- Test-positive rate
- Rate of change in cases
- Hospitalized patients v. its peak

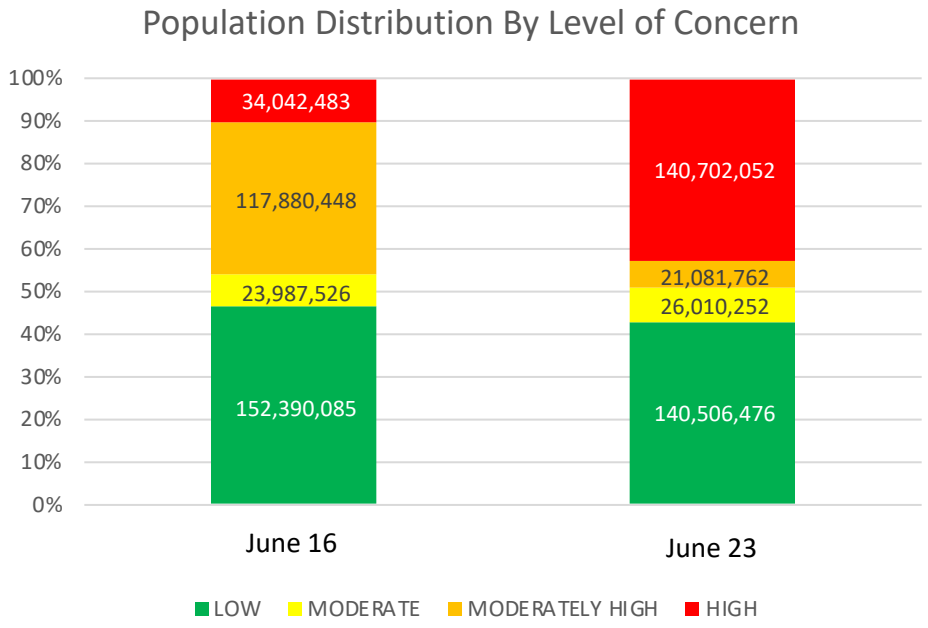
We combined these criteria into a single score, reflective of our relative degree of concern of each state's current status (High, Moderately High, Moderate, Low)

Health Industry Advisor, llc

State-By-State

Population Distribution By Level of Concern

"Strategic Guidance in an Era of Unprecedented Change"

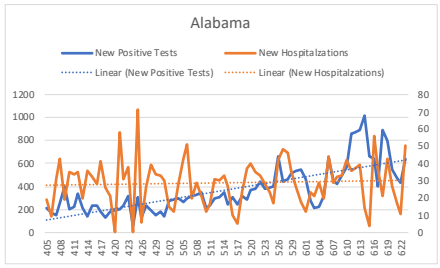


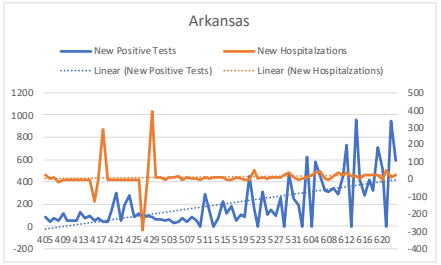
State-by-State

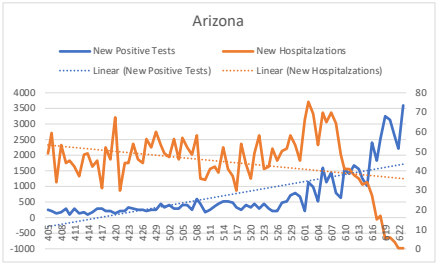
Hospitalization v. New Infection Rates
States in High Concern Category

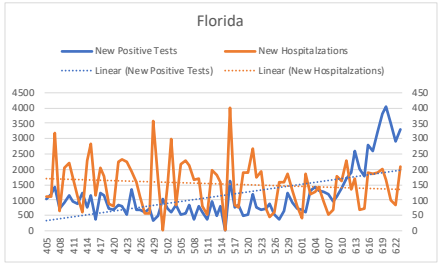
"Strategic Guidance in an Era of Unprecedented Change"

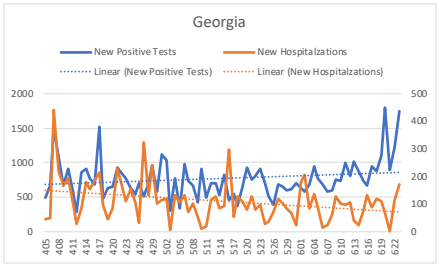
Hospitalizations are declining or increasing at a slower rate in new infections

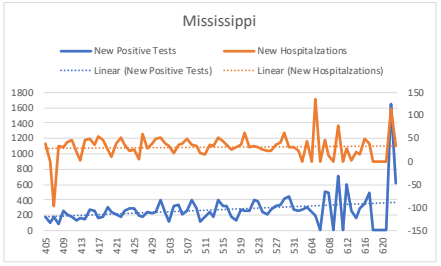


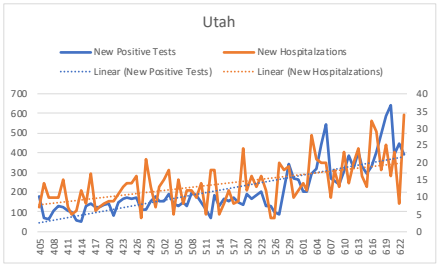


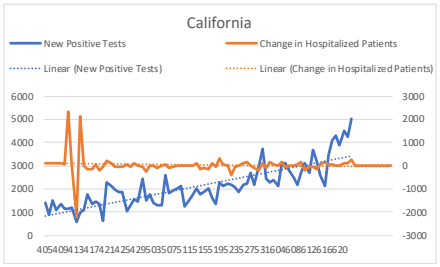


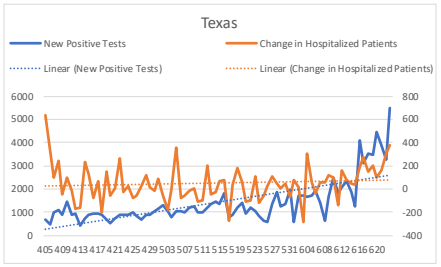












Notes:

- Hospitalizations and infections are plotted on different scales, to improve comparability
- California and Texas do not report New Hospitalizations, thus we use change in Hospitalized Patients

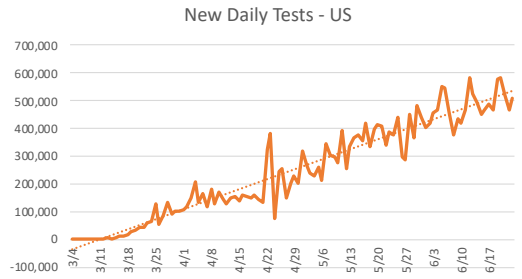
Health Industry Advisor, llc

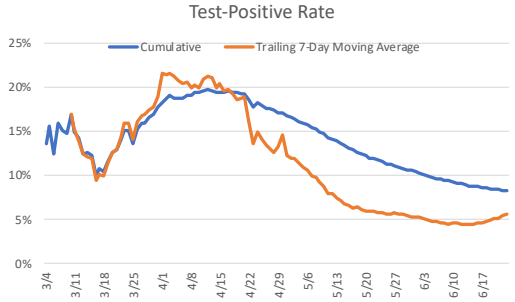
United States

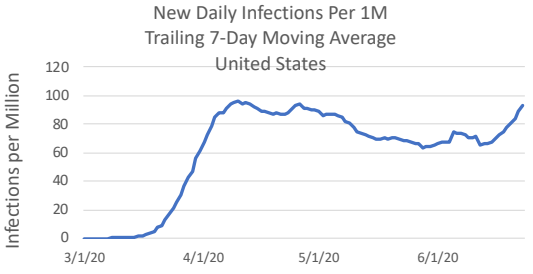
Overall Statistics

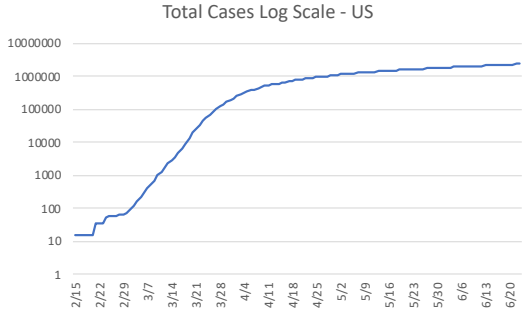
"Strategic Guidance in an Era of Unprecedented Change"

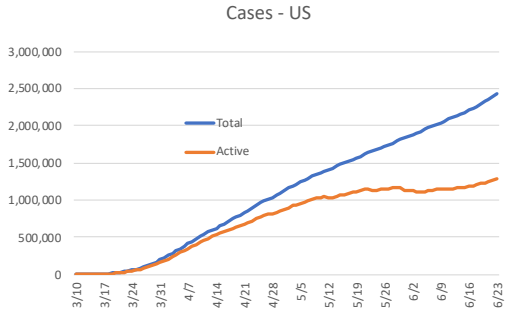
With significantly increased testing, the US is now meeting the WHO standard of <10% test-positives. This suggests that asymptomatic cases are being captured and that we have a better view of true infection rates.
Further, new daily infections continue to decline; the death rate seems to have stabilized.

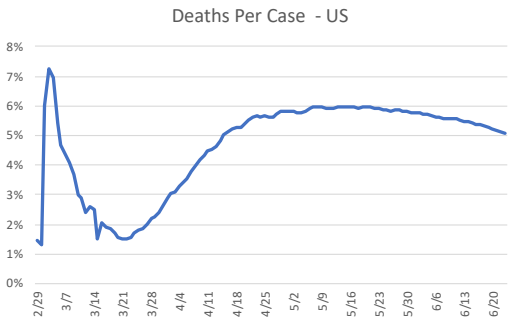












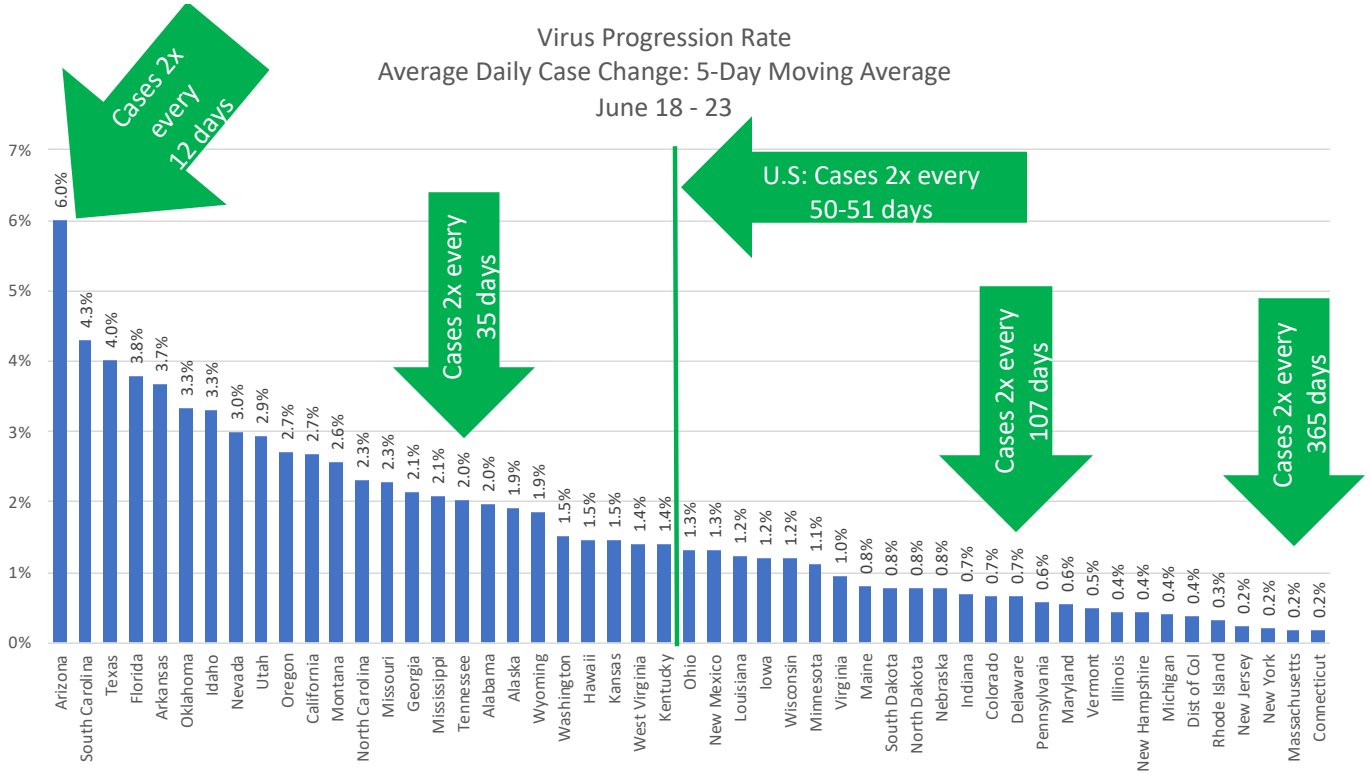
Health Industry Advisor, llc

State-by-State

Average Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

At the height of the epidemic, cases in some states were doubling every few days. Now, they would take from 12 – 408 days to double

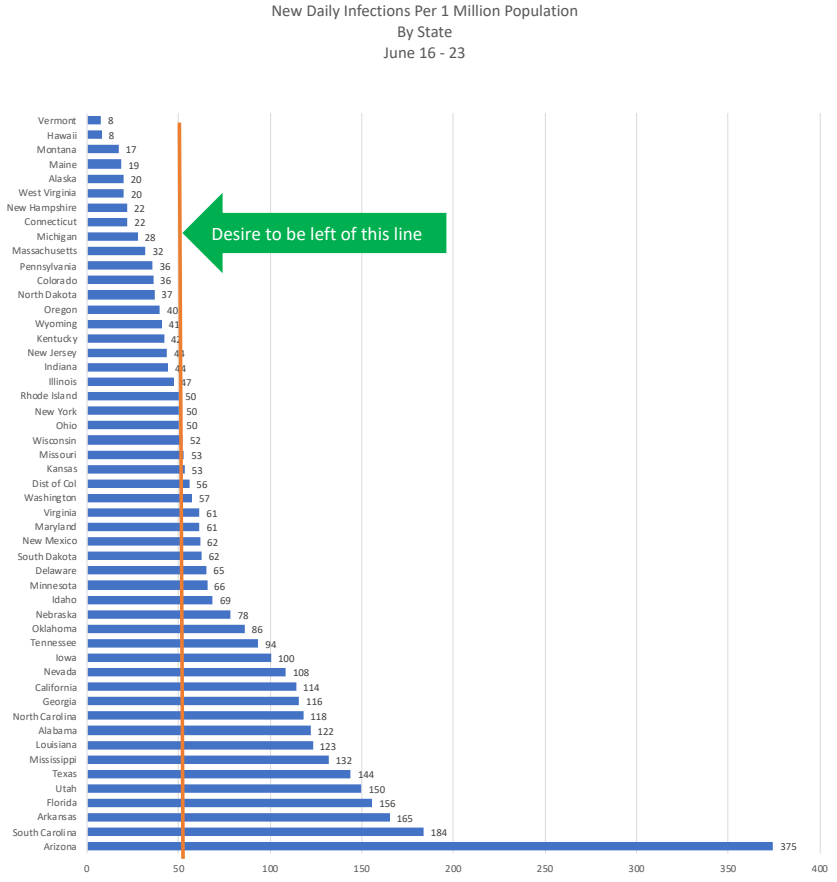


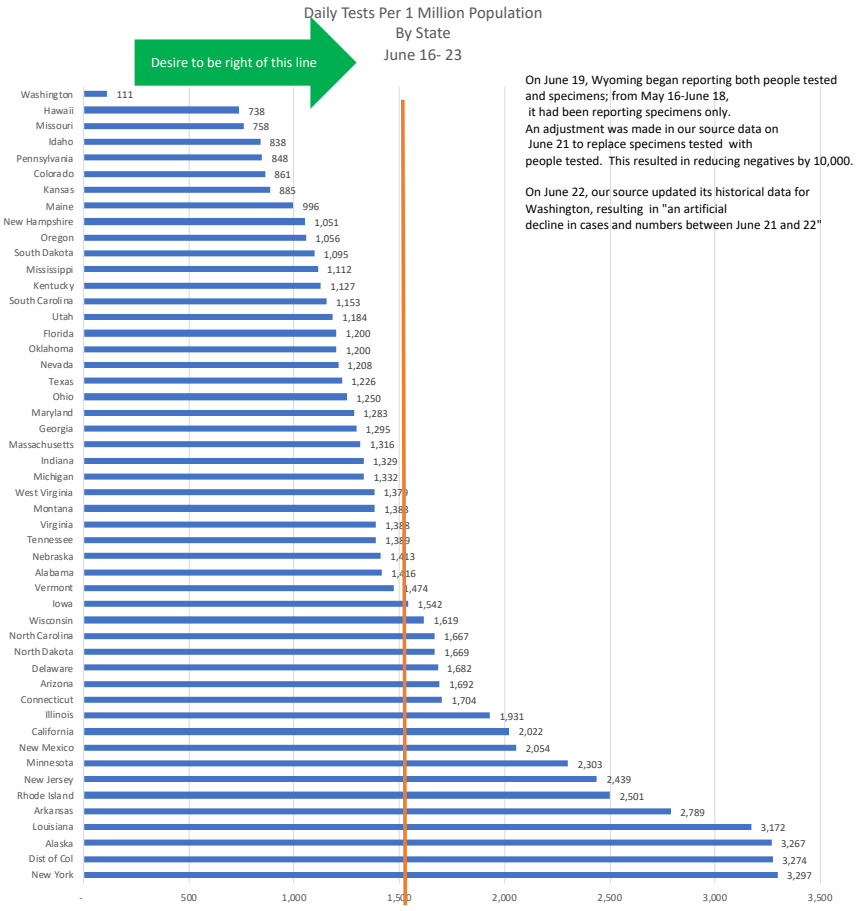
Health Industry Advisor, llc

State-by-State

New Daily Infections & Tests Per Capita

"Strategic Guidance in an Era of Unprecedented Change"





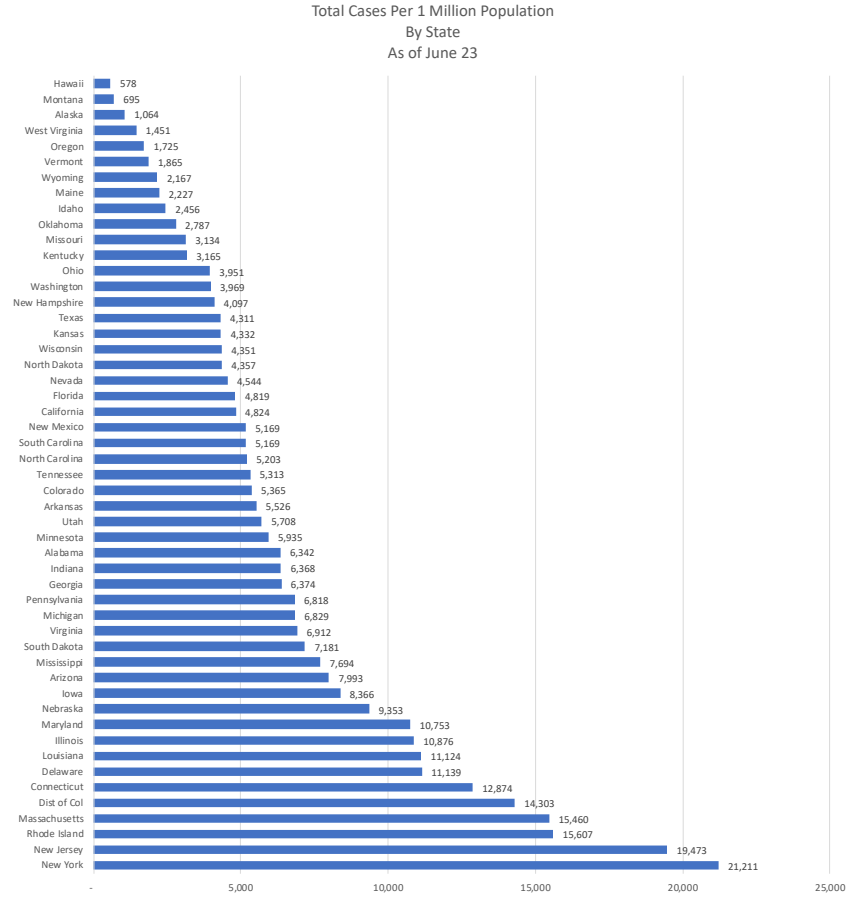
On June 19, Wyoming began reporting both people tested and specimens; from May 16-June 18, it had been reporting specimens only. An adjustment was made in our source data on June 21 to replace specimens tested with people tested. This resulted in reducing negatives by 10,000.

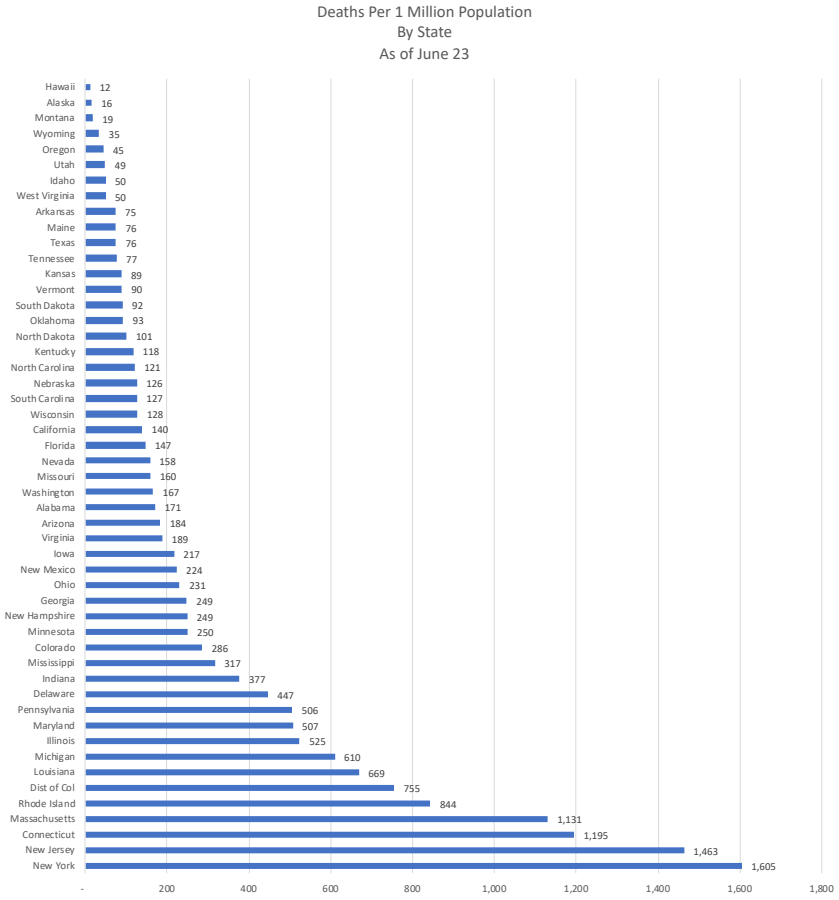
On June 22, our source updated its historical data for Washington, resulting in "an artificial decline in cases and numbers between June 21 and 22"

State-by-State

Cases & Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"





Health Industry Advisor, llc

State-by-State

Which States Are Performing Sufficient Tests?

"Strategic Guidance in an Era of Unprecedented Change"

The World Health Organization suggested that the test-positive rate should be 10% or lower, for testing to be sufficient to assess the true prevalence of the virus. Several states failed to meet this guideline for the past week

STATE-BY-STATE READINESS FOR RELAXING RESTRICTIONS

Health Industry Advisor, llc

State-By-State

Readiness For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

We recently modified the tests/capita metric in two ways: first, we changed to tests/capita past 2 weeks (v. cumulative); second, we adopted the Harvard based study of susceptible-infected-recovered model (SEIR) identification of a goal of 2.7% of population tested per week; and, a minimum of 1520 tests per 1 million population. This will serve as a more challenging standard.

- We recently introduced a scorecard to provide a snapshot of each state's readiness for relaxing restrictions on businesses and individuals.
- To portray readiness we have incorporated the following measures into to the scorecard, (along with the rationale for the scoring within each measure):
  - Tests/Capita – last 14 days; indicates testing robustness; grading quintiles based on Harvard study using susceptible-infected-recovered model (SEIR) 2.7% of population tested per week, 1%, 0.7%, 0.35%, all others
    - Direction – whether test volume increased/stayed level, or decreased the past 2 weeks v. prior two weeks
  - Test-Positive Rate – indicates whether testing is identifying sufficient numbers of non-infected persons; grading based on comparison to best reported in the world (South Korea, Australia, New Zealand), next group of countries (Canada, Germany, Denmark), then, next 3 levels set to differentiate among states
    - Direction – whether test positive rate increased/stayed level, or past 2 weeks v. prior two weeks
  - New Infections / 1 Million – indicates how quickly the virus is spreading; grading based on: rate proposed by IHME for ending social distancing, top ten, top 20, top 25 among the countries we track, then all others
    - Direction – whether new infection per capita rate increased/stayed level, or past 2 weeks v. prior two weeks
  - Influenza-Like Illness – Using CDC-reported data, indicates whether the state's visits for influenza the past week were above or below CDC baseline for the state's region
    - Direction – whether the % visits for influenza the last 3 weeks increased or decreased the past 3 weeks v. the prior 3 weeks
  - Hospital Resources – using IHME projections, whether the state is pre- or post- peak projected hospital resource needs due to the virus; and the 5 of peak resources projected to be needed today. Grading based on current need at <45% of peak, 45-60%, 60-75%, 75-85%, and all others.
- On the following pages, we portray state-by-state readiness on various dates.
- **These scorecards are for informational purposes only. The measures and grading used are not based on any scientific standard and should not be considered a substitute for public health considerations or other clinical or economic judgement. States may elect to move faster or slower than the scorecard might otherwise indicate.**

Readiness For Relaxing Restrictions

Highlights:

- Progress has been made in several states, on both testing volumes and test-positive rates
  - Most states are still testing far below the minimum 152 daily tests per 1 million population cited in a recent NY Times article; and the higher standard of 2.7% of the population tested weekly (386 daily per 1 million, as suggested by a recent Kaiser Family Foundation article. Both articles referenced Harvard researchers as the source of these metrics
  - Test-positive rates in many states, however, are below or close to the 10% threshold suggested by Dr. Maria Van Kerkhove of the World Health Organization, as indicative of sufficient testing to have reasonable visibility to true infection rates
- As we have progressed past the peak flu season in many states, that "constraint" on re-opening is diminishing
- With the relaxing of restrictions in many states, the Institute for Health Metrics and Evaluation's (IHME) projections of these states' hospital resources needs have increased significantly in the past week. Note: these metrics consider hospital resource needs, however, they do not consider capacity

Health Industry Advisor, llc

State-By-State

Relative "Readiness" For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

Change over past week

June 23

State	Tests / Capita		Test-Positive Rate		New Infections / 1 Million		Influenza-Like Illness		Hospital Resources
	#	Direction	#	Direction	#	Direction	Baseline	Direction	
Alabama		✓		✗		✗	✓	✓	
Alaska		✓		✓		✗	✓	✓	
Arizona		✓		✗		✗	✓	✗	
Arkansas		✓		✗		✗	✓	✓	
California		✓		✓		✗	✓	✓	
Colorado		✓		✓		✓	✓	✓	
Connecticut		✓		✓		✓	✓	✓	
Delaware		✓		✓		✓	✓	✗	
District Of Columbia		✓		✓		✓	✓	✓	
Florida		✓		✗		✗	●	●	
Georgia		✓		✓		✗	✓	✓	
Hawaii		✓		✓		✗	✓	✓	
Idaho		✓		✗		✗	✓	✓	
Illinois		✓		✓		✓	✓	✓	
Indiana		✓		✓		✓	✓	✗	
Iowa		✓		✓		✓	✓	✓	
Kansas		✓		✓		✗	✓	✓	
Kentucky		✓		✓		✓	✓	✓	
Louisiana		✓		✓		✗	✓	✓	
Maine		✓		✓		✓	✓	✓	
Maryland		✓		✓		✓	✓	✓	
Massachusetts		✓		✓		✓	✓	✓	
Michigan		✓		✓		✓	✓	✓	
Minnesota		✓		✓		✓	✓	✓	
Mississippi		✓		✗		✗	✓	✓	
Missouri		✓		✓		✓	✓	✓	
Montana		✓		✓		✗	✓	✓	
Nebraska		✓		✓		✓	✓	✓	
Nevada		✓		✗		✗	✓	✓	
New Hampshire		✓		✓		✓	✓	✓	
New Jersey		✓		✓		✓	✓	✓	
New Mexico		✓		✓		✓	✓	✓	
New York		✓		✓		✓	✓	✓	
North Carolina		✓		✗		✓	✓	✓	
North Dakota		✓		✓		✓	✓	✓	
Ohio		✓		✓		✗	✓	✗	
Oklahoma		✓		✗		✗	✓	✓	
Oregon		✓		✗		✗	✓	✓	
Pennsylvania		✓		✓		✓	✓	✓	
Rhode Island		✓		✓		✓	✓	✓	
South Carolina		✓		✗		✗	✓	✓	
South Dakota		✓		✓		✓	✓	✓	
Tennessee		✓		✓		✗	✓	✓	
Texas		✓		✗		✗	✓	✓	
Utah		✓		✗		✗	✓	✓	
Vermont		✓		✓		✓	✓	✗	
Virginia		✓		✓		✓	✓	✓	
Washington		✓		✗		✗	✓	✓	
West Virginia		✓		✓		✗	✓	✓	
Wisconsin		✓		✓		✓	✓	✓	
Wyoming		✗		✗		✗	✓	✓	

June 16

State	Tests / Capita		Test-Positive Rate		New Infections / 1 Million		Influenza-Like Illness		Hospital Resources
	#	Direction	#	Direction	#	Direction	Baseline	Direction	
Alabama		✓		✗		✗	✓	✓	
Alaska		✓		✓		✗	✓	✓	
Arizona		✓		✗		✗	✓	✗	
Arkansas		✓		✗		✗	✓	✓	
California		✓		✓		✗	✓	✓	
Colorado		✓		✓		✓	✓	✓	
Connecticut		✓		✓		✓	✓	✓	
Delaware		✓		✓		✓	✓	✗	
District Of Co		✓		✓		✓	✓	✓	
Florida		✓		✓		✗	✗	●	
Georgia		✓		✓		✗	✓	✓	
Hawaii		✓		✓		✗	✓	✓	
Idaho		✓		✓		✗	✓	✓	
Illinois		✓		✓		✓	✓	✓	
Indiana		✓		✓		✓	✓	✓	
Iowa		✓		✓		✓	✓	✓	
Kansas		✓		✓		✓	✓	✓	
Kentucky		✓		✓		✗	✓	✓	
Louisiana		✓		✓		✗	✓	✓	
Maine		✓		✓		✓	✓	✓	
Maryland		✓		✓		✓	✓	✓	
Massachuset		✓		✓		✓	✓	✓	
Michigan		✓		✓		✗	✓	✓	
Minnesota		✓		✓		✓	✓	✓	
Mississippi		✓		✓		✓	✓	✓	
Missouri		✓		✓		✗	✓	✓	
Montana		✓		✓		✗	✓	✓	
Nebraska		✓		✓		✓	✓	✓	
Nevada		✓		✓		✗	✓	✓	
New Hampsh		✓		✓		✓	✓	✓	
New Jersey		✓		✓		✓	✓	✓	
New Mexico		✓		✓		✗	✓	✓	
New York		✓		✓		✗	✓	✓	
North Carolin		✓		✓		✗	✓	✓	
North Dakota		✓		✓		✓	✓	✓	
Ohio		✓		✓		✓	✓	✓	
Oklahoma		✓		✓		✗	✓	✓	
Oregon		✓		✓		✗	✓	✓	
Pennsylvania		✓		✓		✓	✓	✓	
Rhode Island		✓		✓		✓	✓	✗	
South Carolin		✓		✗		✗	✓	✓	
South Dakota		✓		✓		✗	✓	✓	
Tennessee		✓		✓		✗	✓	✓	
Texas		✓		✓		✗	✓	✓	
Utah		✓		✗		✗	✓	✓	
Vermont		✓		✓		✗	✓	✓	
Virginia		✓		✓		✗	✓	✓	
Washington		✓		✓		✗	✓	✓	
West Virginia		✓		✓		✗	✓	✗	
Wisconsin		✓		✓		✓	✓	✓	
Wyoming		✓		✓		✗	✓	✓	

Legend and sources provided on 2nd following page

Health Industry Advisor, llc

State-By-State

Relative "Readiness" For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

Progress over past 4 weeks

June 23

State	Tests / Capita		Test-Positive Rate		New Infections / 1 Million		Influenza-Like Illness		Hospital Resources
	#	Direction	#	Direction	#	Direction	Baseline	Direction	
Alabama		✓		✗		✗	✓	✓	
Alaska		✓		✓		✗	✓	✓	
Arizona		✓		✗		✗	✓	✗	
Arkansas		✓		✗		✗	✓	✓	
California		✓		✓		✗	✓	✓	
Colorado		✓		✓		✓	✓	✓	
Connecticut		✓		✓		✓	✓	✓	
Delaware		✓		✓		✓	✓	✗	
District Of Columbia		✓		✓		✓	✓	✓	
Florida		✓		✗		✗	!	!	
Georgia		✓		✓		✗	✓	✓	
Hawaii		✓		✓		✗	✓	✓	
Idaho		✓		✗		✗	✓	✓	
Illinois		✓		✓		✓	✓	✓	
Indiana		✓		✓		✓	✓	✗	
Iowa		✓		✓		✓	✓	✓	
Kansas		✓		✓		✗	✓	✓	
Kentucky		✓		✓		✓	✓	✓	
Louisiana		✓		✓		✗	✓	✓	
Maine		✓		✓		✓	✓	✓	
Maryland		✓		✓		✓	✓	✓	
Massachusetts		✓		✓		✓	✓	✓	
Michigan		✓		✓		✓	✓	✓	
Minnesota		✓		✓		✓	✓	✓	
Mississippi		✓		✗		✗	✓	✓	
Missouri		✓		✓		✗	✓	✓	
Montana		✓		✓		✗	✓	✓	
Nebraska		✓		✓		✓	✓	✓	
Nevada		✓		✗		✗	✓	✓	
New Hampshire		✓		✓		✓	✓	✓	
New Jersey		✓		✓		✓	✓	✓	
New Mexico		✓		✓		✓	✓	✓	
New York		✓		✓		✓	✓	✓	
North Carolina		✓		✗		✗	✓	✓	
North Dakota		✓		✓		✓	✓	✓	
Ohio		✓		✓		✗	✓	✗	
Oklahoma		✓		✗		✓	✓	✓	
Oregon		✓		✗		✗	✓	✓	
Pennsylvania		✓		✓		✓	✓	✓	
Rhode Island		✓		✓		✓	✓	✓	
South Carolina		✓		✗		✗	✓	✓	
South Dakota		✓		✓		✓	✓	✓	
Tennessee		✓		✓		✗	✓	✓	
Texas		✓		✗		✗	✓	✓	
Utah		✓		✗		✓	✓	✓	
Vermont		✓		✓		✓	✓	✗	
Virginia		✓		✓		✓	✓	✓	
Washington		✓		✗		✗	✓	✓	
West Virginia		✓		✓		✗	✓	✓	
Wisconsin		✓		✓		✓	✓	✓	
Wyoming		✗		✗		✗	✓	✓	

May 26

State	Tests / Capita		Test-Positive Rate		New Infections / 1 Million		Influenza-Like Illness		Hospital Resources
	#	Direction	#	Direction	#	Direction	Baseline	Direction	
Alabama		✓		✓		✗	✓	✓	
Alaska		✓		✓		✓	✓	✓	
Arizona		✓		✓		✗	✓	✓	
Arkansas		✓		✓		✗	✓	✗	
California		✓		✓		✗	✓	✓	
Colorado		✓		✓		✓	✓	✓	
Connecticut		✓		✓		✓	✓	✓	
Delaware		✓		✓		✓	✓	✓	
District Of Co		✓		✓		✓	✗	✓	
Florida		✓		✓		✗	✗	!	
Georgia		✓		✓		✓	✓	✓	
Hawaii		✓		✓		✓	✓	✓	
Idaho		✓		✓		✗	✗	✗	
Illinois		✓		✓		✓	✓	✓	
Indiana		✓		✓		✓	✓	✓	
Iowa		✓		✓		✓	✓	✓	
Kansas		✓		✓		✓	✓	✓	
Kentucky		✓		✓		✓	✓	✓	
Louisiana		✓		✓		✗	✓	✓	
Maine		✓		✗		✗	✓	✓	
Maryland		✓		✗		✓	✗	✓	
Massachuset		✓		✓		✓	✓	✓	
Michigan		✓		✓		✓	✓	✓	
Minnesota		✓		✗		✗	✗	✓	
Mississippi		✓		✓		✗	✓	✓	
Missouri		✓		✓		✓	✓	✓	
Montana		✓		✓		✗	✓	✓	
Nebraska		✓		✓		✓	✓	✓	
Nevada		✓		✓		✗	✓	✓	
New Hampsh		✓		✓		✓	✓	✓	
New Jersey		✓		✓		✓	✓	✓	
New Mexico		✓		✓		✓	✓	✓	
New York		✓		✓		✓	✓	✓	
North Carolin		✓		✓		✗	✓	✓	
North Dakota		✓		✓		✗	✓	✓	
Ohio		✓		✓		✓	✓	✓	
Oklahoma		✓		✓		✓	✓	✓	
Oregon		✓		✓		✓	✓	✓	
Pennsylvania		✓		✓		✓	✓	✓	
Rhode Island		✓		✓		✗	✓	✓	
South Carolin		✓		✓		✗	✓	✓	
South Dakota		✓		✓		✓	✓	✗	
Tennessee		✓		✓		✓	✓	✓	
Texas		✓		✓		✓	✓	✓	
Utah		✓		✓		✓	✓	✓	
Vermont		✓		✓		✓	✓	✗	
Virginia		✓		✓		✗	✓	✓	
Washington		✓		✓		✓	✓	✓	
West Virginia		✓		✓		✗	✓	✓	
Wisconsin		✓		✓		✗	✗	✗	
Wyoming		✓		✓		✗	✓	✓	

Legend and sources provided on following page

Health Industry Advisor, llc

State-By-State

Relative "Readiness" For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

Legend:

Time period	Tests per Capita (per 1M) Average last 2 weeks	Direction last 14 days v prior 2 weeks	Test-Positive Rate last 7 days	Direction last 14 days v prior 2 weeks	New Daliy Infection Rate (per 1M) last 7 days	Direction last 14 days v prior 2 weeks	Baseline CDC Baseline by region	Direction last 14 days v prior 2 weeks	Hospital Resources As of 4/26
	>3,850		<=2%		<10				<45% of Peak
	1520 - 3,850		2-10%		10-50				45-60% of Peak
	1,501 - 3,850		10-14%		50-100				60-75% of Peak
	501 - 1,500		14-18%		100-150				75-85% of peak
	<750		>18%		>150				>85% of Peak or Pre-Peak
✓		Up		Down		Down by 40%	Below Baseline	Down	
!						Down by 10%		N/A	
✗		Down		Up		Down <10% or Up	Above Baseline	Up	

Sources:

Influenza guidelines and data from Centers fo Disease Control (https://gis.cdc.gov/grasp/fluview/fluportaldashboard.html), accessed April 30 - June 21, 2020

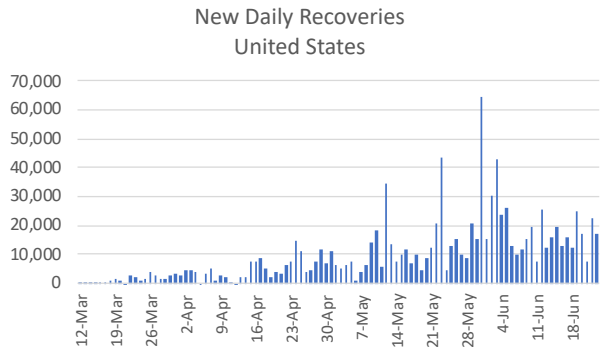
Test data from Covid Tracking Project (https://covidtracking.com/), accessed March 21-June 22, 2020

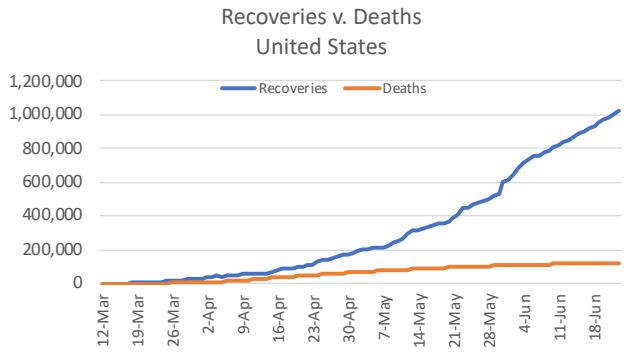
Hospital resource Need projections from Institure for Health Metrics and Evaluation (), accessed April 30- June 21, 2020

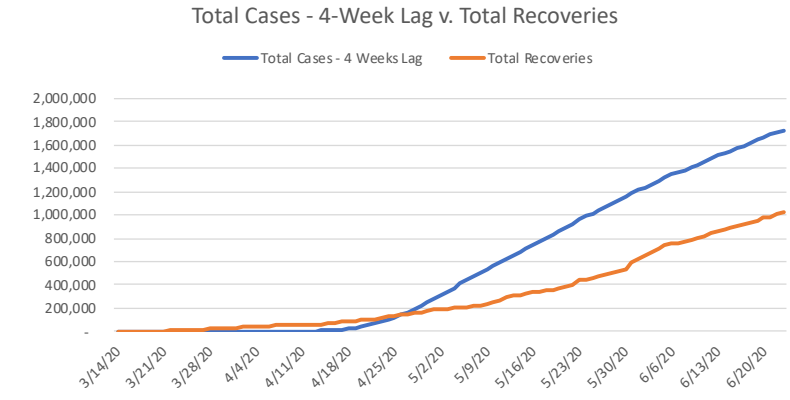
Infection rate data from worldometer.info, accessed March 21-June 22, 2020

UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

Recoveries







Health Industry Advisor, llc

Recoveries

Reporting of Recoveries Seems to Be Lagging

"Strategic Guidance in an Era of Unprecedented Change"

Which states seem to be lagging in reporting?

At this point, we should be expecting far more recoveries in the U.S.

Comparing the reported recoveries to Total Cases 4 weeks ago*, this shortfall is ~360-530k

State	Recoveries	Expected Recoveries Low	Expected Recoveries High
Alabama	15,974	12,520	14,085
Alaska	502	329	370
Arizona	7,746	13,426	15,105
Arkansas	11,220	4,944	5,562
California	51,428	79,821	89,798
Colorado	5,078	19,652	22,109
Connecticut	9,224	33,042	37,173
Delaware	6,554	7,253	8,159
District Of Columbia	1,182	6,667	7,501
Florida	20,239	41,804	47,030
Georgia	5,680	35,186	39,585
Hawaii	673	514	579
Idaho	3,484	2,159	2,429
Illinois	105,076	90,556	101,876
Indiana	32,152	25,662	28,870
Iowa	16,706	14,163	15,934
Kansas	7,788	7,411	8,338
Kentucky	3,591	7,161	8,056
Louisiana	39,792	30,454	34,261
Maine	2,391	1,687	1,898
Maryland	4,797	38,150	42,918
Massachusetts	88,725	74,954	84,324
Michigan	49,290	44,083	49,594
Minnesota	29,399	17,568	19,764
Mississippi	17,242	10,985	12,358
Missouri	4,032	10,093	11,354

State	Recoveries	Expected Recoveries Low	Expected Recoveries High
Montana	566	383	431
Nebraska	12,099	10,095	11,357
Nevada	9,545	6,398	7,198
New Hampshire	4,316	3,385	3,808
New Jersey	38,078	125,612	141,314
New Mexico	4,874	5,704	6,417
New York	87,335	298,898	336,260
North Carolina	36,921	19,563	22,009
North Dakota	3,008	1,966	2,211
Ohio	10,416	26,460	29,768
Oklahoma	7,888	4,910	5,523
Oregon	2,604	3,174	3,570
Pennsylvania	64,502	58,301	65,588
Rhode Island	1,562	11,368	12,789
South Carolina	12,317	8,333	9,374
South Dakota	5,497	3,722	4,188
Tennessee	24,068	16,772	18,869
Texas	70,714	46,195	51,970
Utah	10,057	6,896	7,758
Vermont	926	774	870
Virginia	7,725	31,474	35,408
Washington	9,681	16,967	19,088
West Virginia	1,813	1,483	1,669
Wisconsin	19,852	12,690	14,277
Wyoming	953	680	765
United States	1,020,381	1,380,220	1,552,748

Low = 80% of Total Cases 4 week ago
High = 90% of Total Cases 4 week ago

- States seemingly up-to-date with reporting recoveries
- States only reporting~ 1/2 expected recoveries
- States well-behind in reporting recoveries

* - 4 weeks is the presumed time from infection-onset to recovery referenced by many states

VIRUS PROGRESSION: ROADMAP TO RECOVERY

State-by-State

Virus Progression

The graphic on the following two pages illustrates when the state first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were recorded (start of the "recovery" phase). It uses symbols to indicate when average daily case growth rates fell (and were sustained) below certain benchmarks, as well as when deaths stopped growing exponentially.

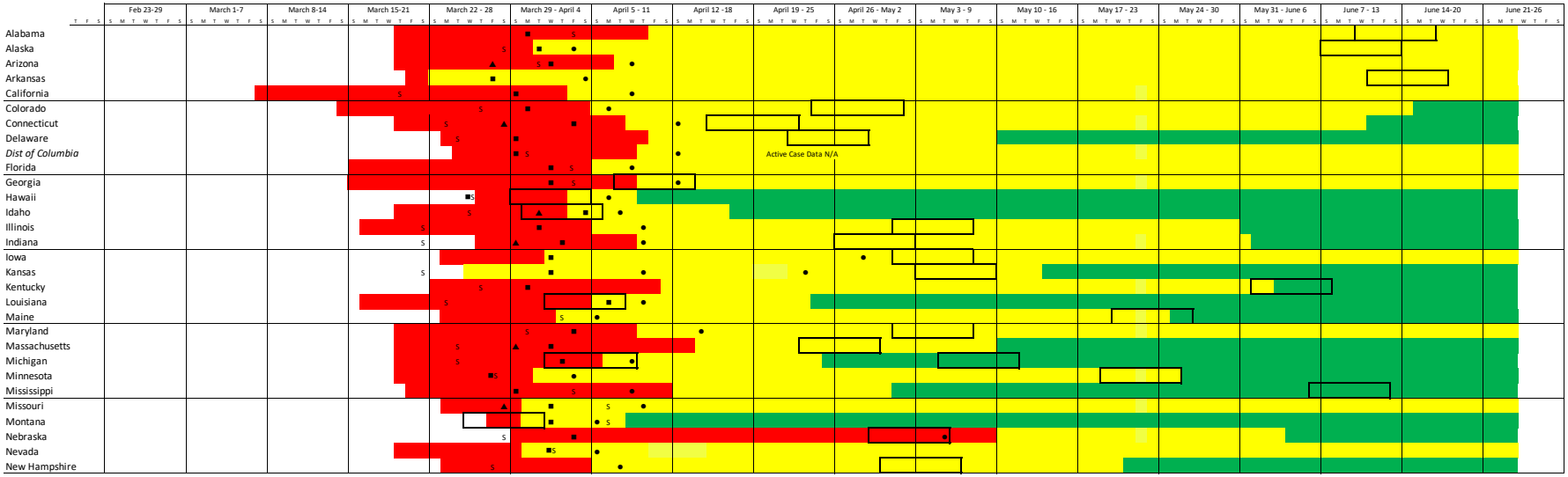
A state is not shaded green until active cases appear to have peaked.

Health Industry Advisor, llc

State-by-State

Virus Progression – *1 of 2*

"Strategic Guidance in an Era of Unprecedented Change"



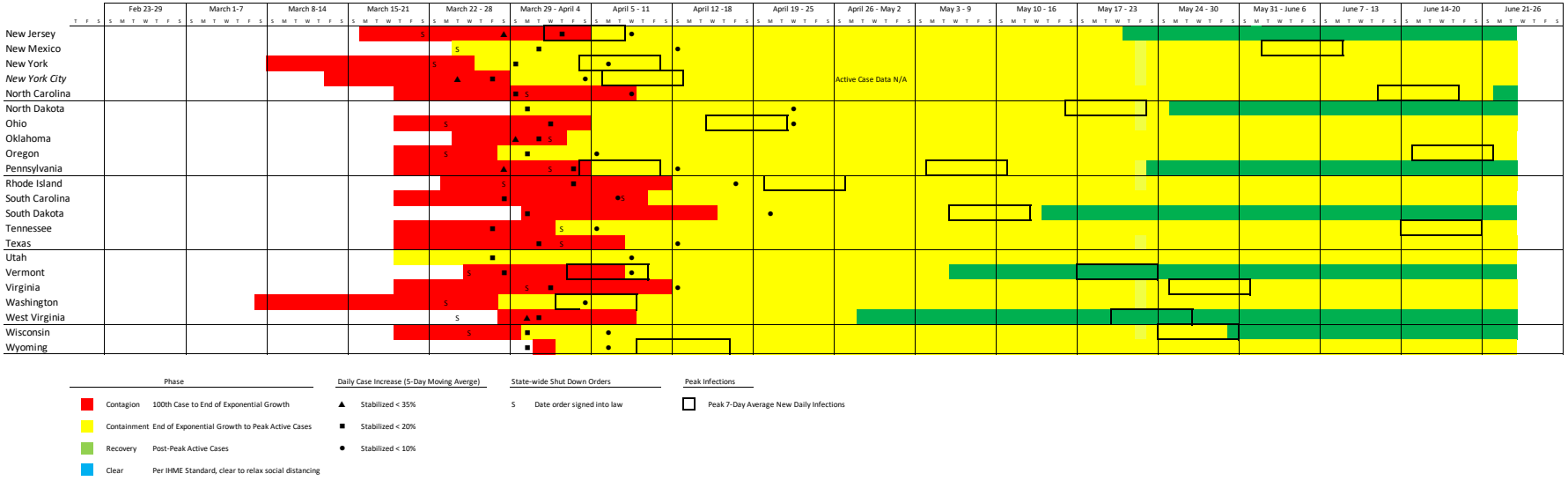
Note: Many states are in yellow because they fail to keep up-to-date in reporting recovered patients

Legend on following page

State-by-State

Virus Progression – *2 of 2*

"Strategic Guidance in an Era of Unprecedented Change"



Note: Many states are in yellow because they fail to keep up-to-date in reporting recovered patients

Health Industry Advisor, llc

State-by-State

Comparative Statistics- Page 1 of 2

"Strategic Guidance in an Era of Unprecedented Change"

As of June 23

State	Total Cases	Rank	Cases per 1M Population	Rank2	Deaths	Rank3	Death Rate	Rank4	Deaths per 1 Million Population	Rank5	5-day Moving Average Case Growth Rate	Rank6	Tests per 1M Population Past 7 days	Rank7	New Daily Cases Per 1M Population (5-Day M.A.)	Rank8
Alabama	31,097	(21)	6,342.2	(21)	864	(25)	2.8%	(34)	176.2	(24)	2.0%	(18)	1,416	(20)	121.8	(7)
Alaska	778	(50)	1,063.5	(49)	12	(51)	1.5%	(46)	16.4	(50)	1.9%	(19)	3,267	(3)	18.9	(47)
Arizona	58,179	(13)	7,993.0	(13)	1,384	(19)	2.4%	(38)	190.1	(23)	6.0%	(1)	1,692	(13)	350.9	(1)
Arkansas	16,678	(31)	5,526.5	(24)	237	(39)	1.4%	(48)	78.5	(41)	3.7%	(5)	2,789	(5)	149.9	(4)
California	190,598	(2)	4,823.8	(30)	5,633	(7)	3.0%	(31)	142.6	(29)	2.7%	(11)	2,022	(10)	103.0	(11)
Colorado	30,893	(22)	5,364.5	(25)	1,665	(16)	5.4%	(12)	289.1	(15)	0.7%	(38)	861	(45)	34.9	(40)
Connecticut	45,899	(17)	12,873.9	(6)	4,277	(8)	9.3%	(1)	1,199.6	(3)	0.2%	(51)	1,704	(12)	21.9	(45)
Delaware	10,847	(37)	11,139.2	(7)	504	(32)	4.6%	(18)	517.6	(10)	0.7%	(39)	1,682	(14)	70.4	(18)
District Of Columbia	10,094	(39)	14,302.5	(5)	537	(31)	5.3%	(13)	760.9	(6)	0.4%	(46)	3,274	(2)	52.4	(26)
Florida	103,503	(7)	4,819.1	(31)	3,240	(9)	3.1%	(29)	150.9	(28)	3.8%	(4)	1,200	(35)	152.3	(3)
Georgia	67,678	(10)	6,374.2	(19)	2,688	(13)	4.0%	(23)	253.2	(16)	2.1%	(15)	1,295	(29)	101.1	(12)
Hawaii	819	(49)	578.4	(51)	17	(50)	2.1%	(42)	12.0	(51)	1.5%	(22)	738	(49)	8.1	(50)
Idaho	4,402	(43)	2,456.4	(43)	89	(44)	2.0%	(43)	49.7	(46)	3.3%	(7)	838	(47)	63.1	(21)
Illinois	137,825	(4)	10,876.5	(9)	6,707	(4)	4.9%	(15)	529.3	(9)	0.4%	(43)	1,931	(11)	47.4	(33)
Indiana	42,871	(18)	6,368.0	(20)	2,569	(14)	6.0%	(9)	381.6	(13)	0.7%	(37)	1,329	(27)	46.7	(34)
Iowa	26,396	(25)	8,366.2	(12)	689	(27)	2.6%	(36)	218.4	(21)	1.2%	(29)	1,542	(18)	93.4	(14)
Kansas	12,621	(35)	4,332.2	(35)	262	(37)	2.1%	(41)	89.9	(38)	1.5%	(23)	885	(44)	51.3	(28)
Kentucky	14,141	(33)	3,165.2	(40)	537	(31)	3.8%	(24)	120.2	(34)	1.4%	(25)	1,127	(38)	38.1	(38)
Louisiana	51,713	(15)	11,124.0	(8)	3,142	(10)	6.1%	(8)	675.9	(7)	1.2%	(28)	3,172	(4)	94.2	(13)
Maine	2,994	(45)	2,227.3	(44)	102	(42)	3.4%	(27)	75.9	(43)	0.8%	(33)	996	(43)	17.1	(49)
Maryland	65,007	(11)	10,752.6	(10)	3,092	(11)	4.8%	(17)	511.4	(11)	0.6%	(41)	1,283	(30)	60.8	(22)
Massachusetts	107,439	(6)	15,460.0	(4)	7,890	(3)	7.3%	(6)	1,135.3	(4)	0.2%	(50)	1,316	(28)	31.2	(42)
Michigan	68,197	(9)	6,828.7	(17)	6,109	(6)	9.0%	(2)	611.7	(8)	0.4%	(45)	1,332	(26)	26.8	(43)
Minnesota	33,469	(20)	5,934.6	(22)	1,425	(18)	4.3%	(21)	252.7	(17)	1.1%	(31)	2,303	(8)	64.2	(20)
Mississippi	22,898	(27)	7,693.8	(14)	989	(23)	4.3%	(20)	332.3	(14)	2.1%	(16)	1,112	(39)	119.4	(8)

Health Industry Advisor, llc

State-by-State

Comparative Statistics- Page 2 of 2

"Strategic Guidance in an Era of Unprecedented Change"

As of June 23

State	Total Cases	Rank	Cases per 1M Population	Rank2	Deaths	Rank3	Death Rate	Rank4	Deaths per 1 Million Population	Rank5	5-day Moving Average Case Growth Rate	Rank6	Tests per 1M Population Past 7 days	Rank7	New Daily Cases Per 1M Population (5-Day M.A.)	Rank8
Missouri	19,235	(28)	3,134.0	(41)	995	(22)	5.2%	(14)	162.1	(26)	2.3%	(14)	758	(48)	49.9	(30)
Montana	743	(51)	695.2	(50)	21	(48)	2.8%	(32)	19.6	(49)	2.6%	(12)	1,383	(24)	17.5	(48)
Nebraska	18,092	(30)	9,352.7	(11)	256	(38)	1.4%	(49)	132.3	(30)	0.8%	(36)	1,413	(21)	81.7	(17)
Nevada	13,997	(34)	4,544.3	(32)	492	(33)	3.5%	(26)	159.7	(27)	3.0%	(8)	1,208	(33)	104.6	(10)
New Hampshire	5,571	(42)	4,097.2	(37)	343	(36)	6.2%	(7)	252.3	(18)	0.4%	(44)	1,051	(42)	22.4	(44)
New Jersey	172,960	(3)	19,472.7	(2)	13,081	(2)	7.6%	(4)	1,472.7	(2)	0.2%	(48)	2,439	(7)	41.6	(36)
New Mexico	10,838	(38)	5,168.8	(29)	476	(34)	4.4%	(19)	227.0	(20)	1.3%	(27)	2,054	(9)	57.8	(24)
New York	412,636	(1)	21,211.3	(1)	31,314	(1)	7.6%	(3)	1,609.7	(1)	0.2%	(49)	3,297	(1)	50.2	(29)
North Carolina	54,571	(14)	5,203.1	(27)	1,294	(20)	2.4%	(39)	123.4	(33)	2.3%	(13)	1,667	(16)	117.5	(9)
North Dakota	3,320	(44)	4,356.6	(33)	78	(46)	2.3%	(40)	102.4	(35)	0.8%	(35)	1,669	(15)	39.7	(37)
Ohio	46,184	(16)	3,951.0	(39)	2,740	(12)	5.9%	(10)	234.4	(19)	1.3%	(26)	1,250	(31)	48.8	(32)
Oklahoma	11,028	(36)	2,787.0	(42)	371	(35)	3.4%	(28)	93.8	(37)	3.3%	(6)	1,200	(34)	83.6	(16)
Oregon	7,274	(40)	1,724.6	(47)	192	(40)	2.6%	(35)	45.5	(47)	2.7%	(10)	1,056	(41)	42.8	(35)
Pennsylvania	87,284	(8)	6,818.0	(18)	6,527	(5)	7.5%	(5)	509.8	(12)	0.6%	(40)	848	(46)	33.2	(41)
Rhode Island	16,533	(32)	15,606.6	(3)	906	(24)	5.5%	(11)	855.2	(5)	0.3%	(47)	2,501	(6)	49.4	(31)
South Carolina	26,613	(24)	5,168.9	(28)	673	(28)	2.5%	(37)	130.7	(31)	4.3%	(2)	1,153	(37)	175.4	(2)
South Dakota	6,353	(41)	7,181.3	(15)	83	(45)	1.3%	(50)	93.8	(36)	0.8%	(34)	1,095	(40)	64.3	(19)
Tennessee	36,303	(19)	5,312.8	(26)	542	(29)	1.5%	(47)	79.3	(40)	2.0%	(17)	1,389	(22)	91.8	(15)
Texas	125,015	(5)	4,311.5	(36)	2,251	(15)	1.8%	(44)	77.6	(42)	4.0%	(3)	1,226	(32)	139.3	(6)
Utah	18,300	(29)	5,708.1	(23)	163	(41)	0.9%	(51)	50.8	(45)	2.9%	(9)	1,184	(36)	147.0	(5)
Vermont	1,164	(48)	1,865.4	(46)	56	(47)	4.8%	(16)	89.7	(39)	0.5%	(42)	1,474	(19)	8.0	(51)
Virginia	58,994	(12)	6,911.6	(16)	1,645	(17)	2.8%	(33)	192.7	(22)	1.0%	(32)	1,388	(23)	59.9	(23)
Washington	30,225	(23)	3,969.2	(38)	1,285	(21)	4.3%	(22)	168.7	(25)	1.5%	(21)	111	(50)	52.8	(25)
West Virginia	2,593	(46)	1,450.9	(48)	92	(43)	3.5%	(25)	51.5	(44)	1.4%	(24)	1,379	(25)	19.9	(46)
Wisconsin	25,331	(26)	4,350.6	(34)	750	(26)	3.0%	(30)	128.8	(32)	1.2%	(30)	1,619	(17)	52.4	(27)
Wyoming	1,254	(47)	2,166.7	(45)	20	(49)	1.6%	(45)	34.6	(48)	1.9%	(20)	(1,401)	(51)	37.3	(39)
United States	2,424,168		7,323.7		123,473		5.1%		373.1		1.4%		1,539		93.1	

COUNTRY-BY-COUNTRY INFORMATION

Countries Included

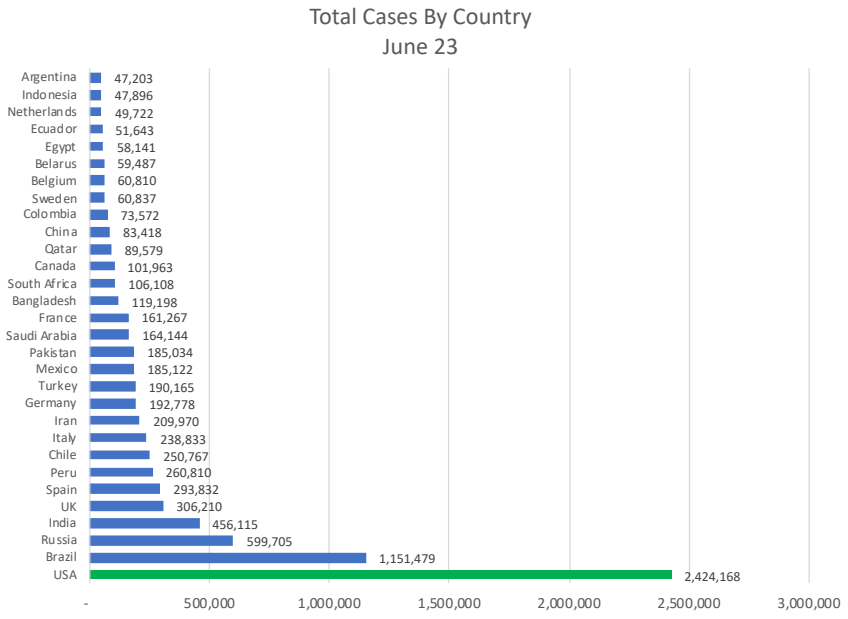
- In Mid-March, we began tracking the twenty countries with the most coronavirus cases; in mid-April, we expanded it to the thirty countries with the most cases
- We now have visibility to all 213 countries and 2 conveyances that have at least 1 coronavirus case
- Case and death information is sourced from the worldometers.info, the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University and the New York Times, each of which are accessed daily; analysis by Health Industry Advisor LLC

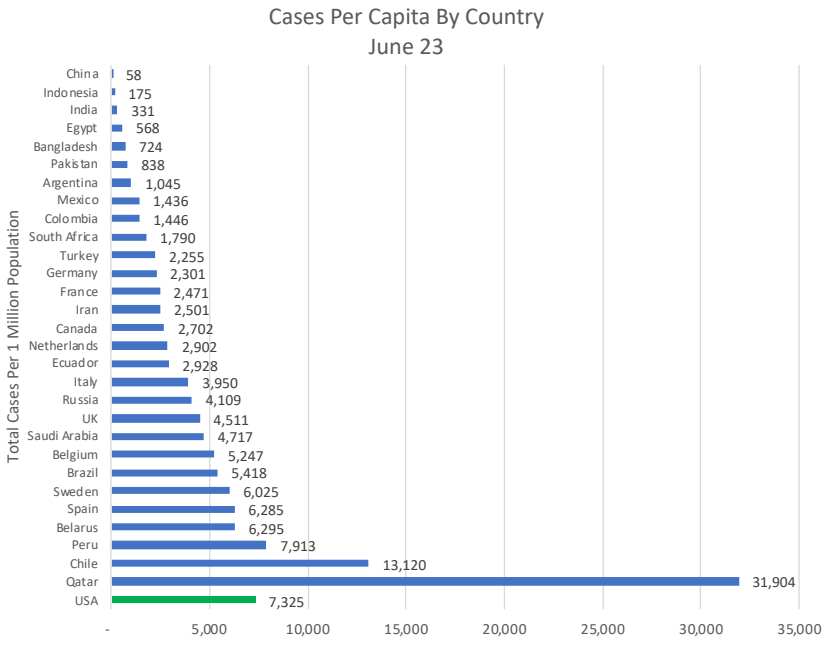
Country-by-Country

Cases & Cases Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases





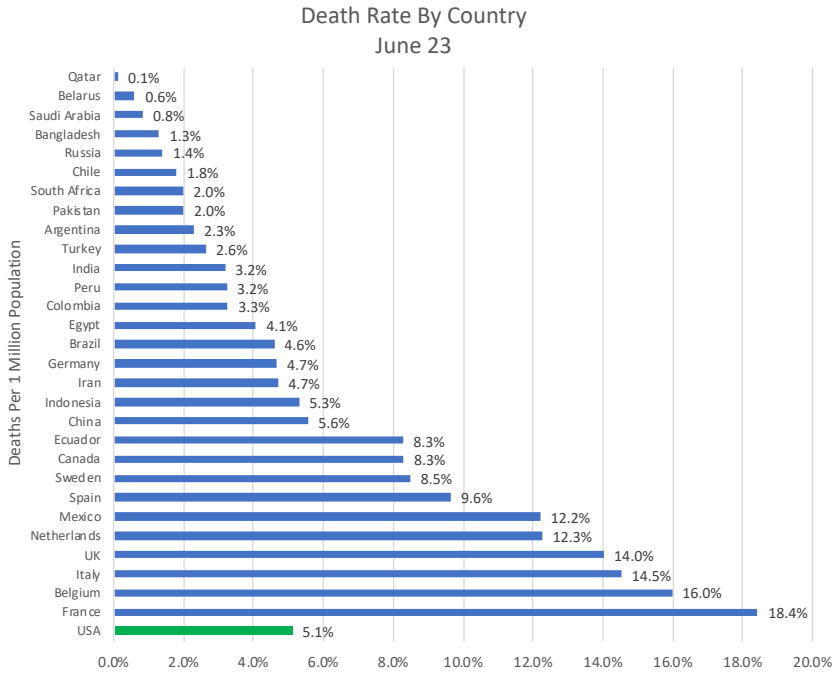
Health Industry Advisor, llc

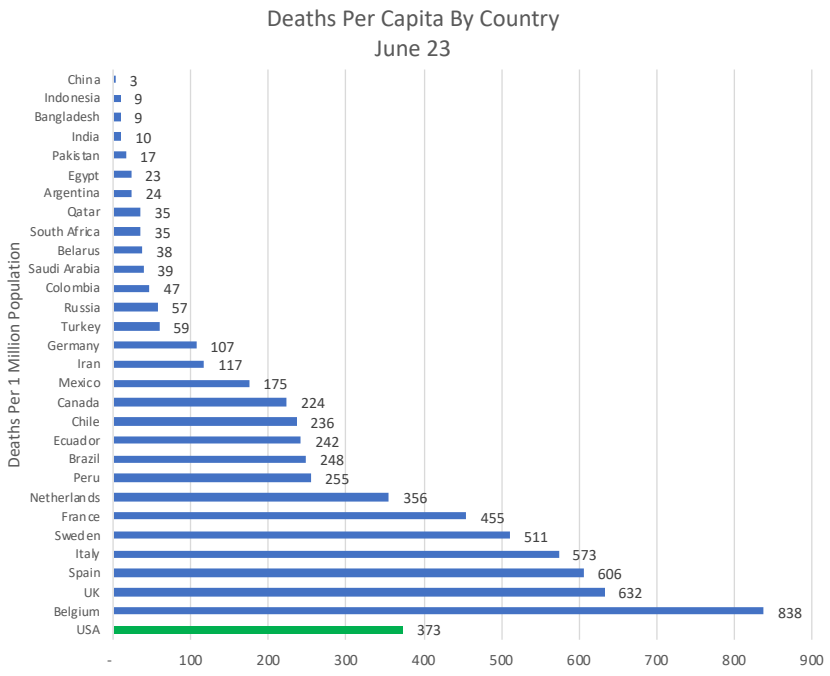
Country-by-Country

Deaths Per Cases & Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases



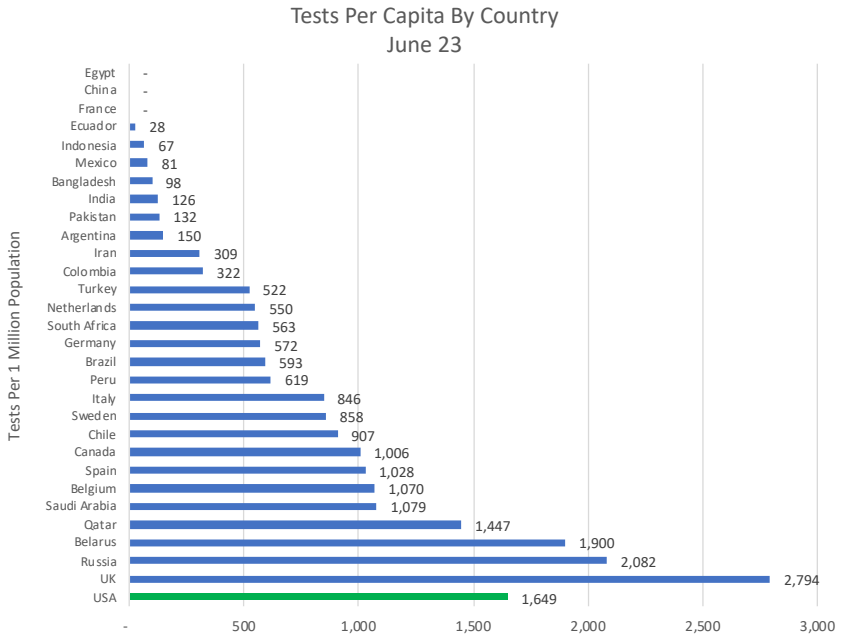


Country-by-Country

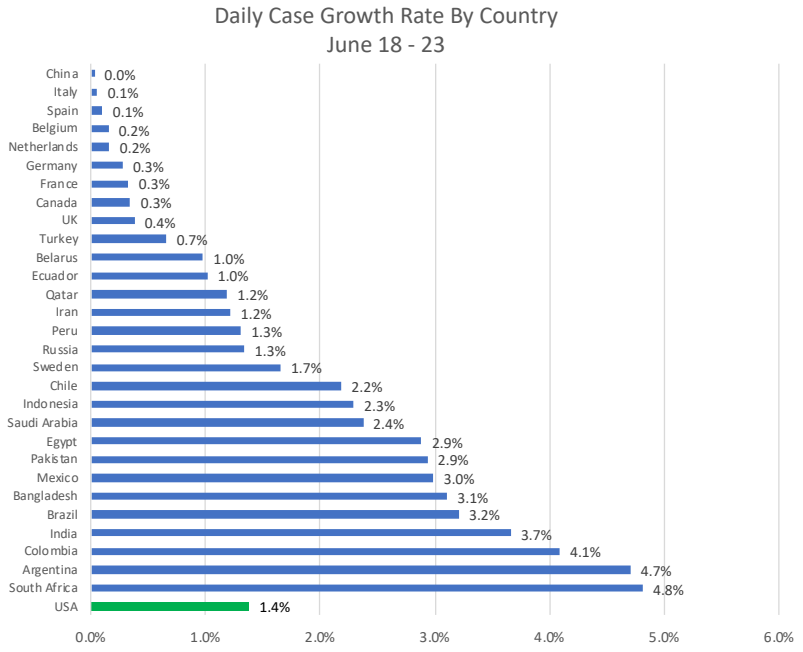
Daily Tests Per Capita & Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases



Daily Tests Per Capita For Past Week

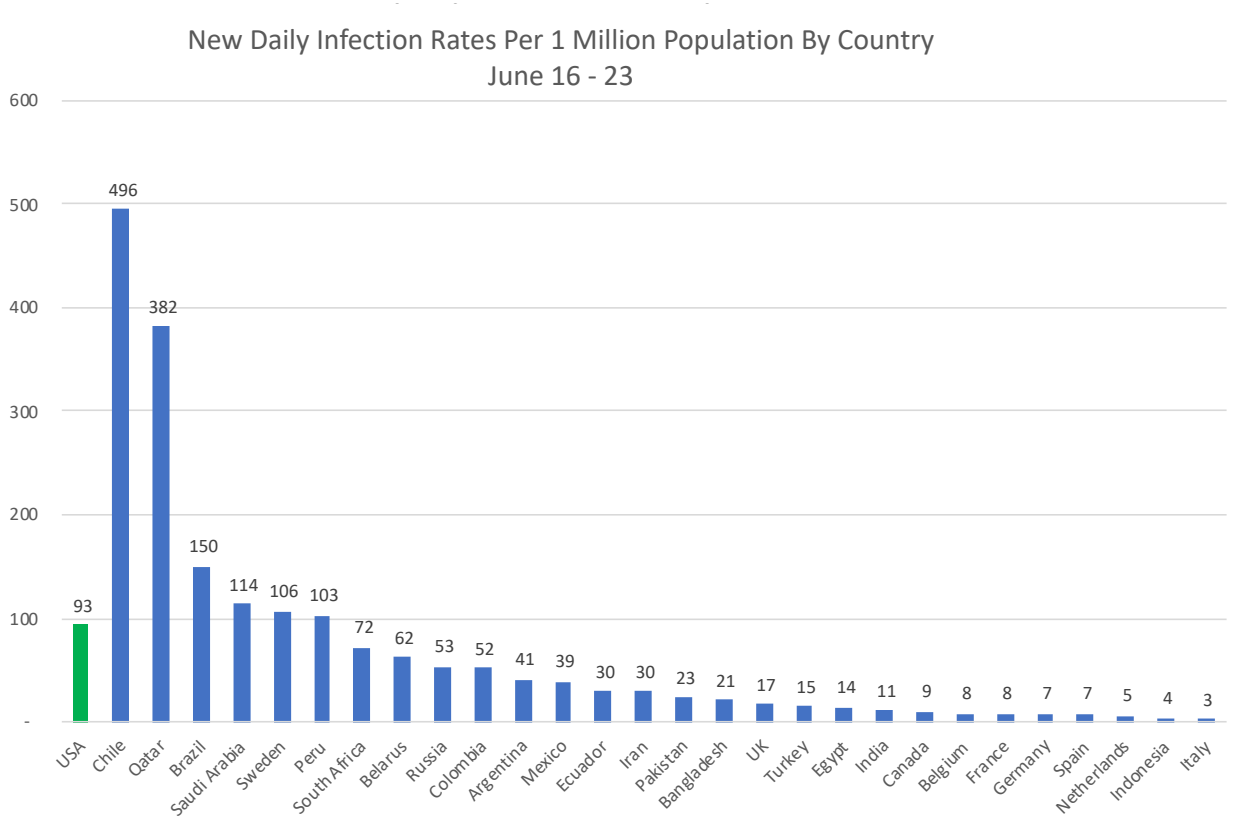


Daily Case Growth – 5-Day Moving Average

Country-by-Country

New Daily Infection Rates

"Strategic Guidance in an Era of Unprecedented Change"



Health Industry Advisor, llc

"Strategic Guidance in an Era of Unprecedented Change"

Country-By-Country

Listing of Countries By Total Cases

Countries making large upward movements are highlighted

When we first expanded our tracking to 30 countries in mid-April, they represented the most countries with cases in the world. Since that time, Austria, Israel, Japan and South Korea have dropped in the rankings. Among the countries that have moved up:

- **Afghanistan**
- **Argentina**
- **Bangladesh**
- **Belarus**
- **Columbia**
- **Denmark**
- **Dominican Republic**
- **Indonesia**
- **Kuwait**
- **Poland**
- **Qatar**
- **Panama**
- **Philippines**
- **Romania**
- **South Africa**
- **UAE**
- **Ukraine**

The original 30 still account for 84.4% of all cases worldwide.

Rank	Country	23-Jun	Rank	Country	6-May	Rank	Country	27-Apr
1	USA	2,424,168	1	USA	1,263,092	1	USA	1,010,356
2	Brazil	1,151,479	2	Spain	253,682	2	Spain	229,422
3	Russia	599,705	3	Italy	214,457	3	Italy	199,414
4	India	456,115	4	UK	201,101	4	France	128,339
5	UK	306,210	5	France	174,191	5	Germany	158,758
6	Spain	293,832	6	Germany	168,162	6	UK	157,149
7	Peru	260,810	7	Russia	165,929	7	Turkey	112,261
8	Chile	250,767	8	Turkey	131,744	8	Iran	91,472
9	Italy	238,833	9	Brazil	126,611	9	Russia	87,147
10	Iran	209,970	10	Iran	101,650	10	China	82,830
11	Germany	192,778	11	China	82,883	11	Brazil	66,501
12	Turkey	190,165	12	Canada	63,496	12	Canada	48,500
13	Mexico	185,122	13	Peru	54,817	13	Belgium	46,687
14	Pakistan	185,034	14	India	52,987	14	Netherlands	38,245
15	Saudi Arabia	164,144	15	Belgium	50,781	15	India	29,451
16	France	161,267	16	Netherlands	41,319	16	Switzerland	29,164
19	Canada	101,963	17	Saudi Arabia	31,938	17	Peru	28,669
21	China	83,418	18	Switzerland	30,060	18	Portugal	24,070
23	Sweden	60,837	19	Ecuador	29,420	19	Ecuador	23,240
24	Belgium	60,810	20	Portugal	26,182	20	Ireland	19,648
27	Ecuador	51,643	21	Mexico	26,025	21	Sweden	18,926
28	Netherlands	49,722	22	Sweden	23,918	22	Saudi Arabia	18,811
32	Singapore	42,432	23	Pakistan	23,214	23	Israel	15,555
34	Portugal	39,737	24	Chile	23,048	24	Austria	15,274
40	Switzerland	31,332	25	Ireland	22,248	25	Mexico	14,677
45	Ireland	25,391	26	Singapore	20,198	26	Singapore	14,423
48	Israel	21,512	29	Israel	16,310	27	Pakistan	13,915
52	Japan	17,968	31	Austria	15,684	28	Chile	13,813
53	Austria	17,408	32	Japan	15,253	29	Japan	13,614
61	S. Korea	12,484	38	S. Korea	10,806	35	South Korea	10,738
	Others	1,458,513		Others	356,176		Others	301,446
	World	9,345,569			3,817,382		World	3,062,515

Health Industry Advisor, llc

Country-by-Country

Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

Top 30 Countries By Total Cases
As of June 23

Country	Total Cases	Rank	Cases per 1M Population	Rank2	Deaths	Rank3	Death Rate	Rank4	Deaths per 1 Million Population	Rank5	5-day Moving Average Case Growth Rate	Rank6	Tests per 1M Population - Past 7 Days	Rank7	New Daily Infections Per 1M Population (7-Day M.A.)	Rank8
USA	2,424,168	(1)	7,325	(4)	123,473	(1)	5.1%	(13)	373.1	(7)	1.4%	(14)	1,649	(4)	93.1	(7)
Brazil	1,151,479	(2)	5,418	(8)	52,771	(2)	4.6%	(16)	248.3	(10)	3.2%	(5)	593	(14)	149.7	(3)
Russia	599,705	(3)	4,109	(12)	8,359	(14)	1.4%	(26)	57.3	(18)	1.3%	(15)	2,082	(2)	53.1	(10)
India	456,115	(4)	331	(28)	14,483	(8)	3.2%	(20)	10.5	(27)	3.7%	(4)	126	(23)	10.6	(21)
UK	306,210	(5)	4,511	(11)	42,927	(3)	14.0%	(4)	632.4	(2)	0.4%	(22)	2,794	(1)	17.0	(18)
Spain	293,832	(6)	6,285	(6)	28,325	(6)	9.6%	(7)	605.8	(3)	0.1%	(28)	1,028	(8)	7.4	(26)
Peru	260,810	(7)	7,913	(3)	8,404	(13)	3.2%	(19)	255.0	(9)	1.3%	(16)	619	(13)	102.5	(6)
Chile	250,767	(8)	13,120	(2)	4,505	(19)	1.8%	(25)	235.7	(12)	2.2%	(12)	907	(10)	495.7	(1)
Italy	238,833	(9)	3,950	(13)	34,675	(4)	14.5%	(3)	573.5	(4)	0.1%	(29)	846	(12)	3.1	(29)
Iran	209,970	(10)	2,501	(17)	9,863	(9)	4.7%	(14)	117.5	(15)	1.2%	(17)	309	(20)	29.8	(15)
Germany	192,778	(11)	2,301	(19)	8,986	(11)	4.7%	(15)	107.3	(16)	0.3%	(25)	572	(15)	7.5	(25)
Turkey	190,165	(12)	2,255	(20)	5,001	(17)	2.6%	(21)	59.3	(17)	0.7%	(21)	522	(18)	15.0	(19)
Mexico	185,122	(13)	1,436	(23)	22,584	(7)	12.2%	(6)	175.2	(14)	3.0%	(7)	81	(25)	38.6	(13)
Pakistan	185,034	(14)	838	(25)	3,695	(21)	2.0%	(23)	16.7	(26)	2.9%	(8)	132	(22)	23.4	(16)
Saudi Arabia	164,144	(15)	4,717	(10)	1,346	(27)	0.8%	(28)	38.7	(20)	2.4%	(10)	1,079	(6)	114.2	(4)
France	161,267	(16)	2,471	(18)	29,720	(5)	18.4%	(1)	455.3	(6)	0.3%	(24)	0	(28)	7.8	(24)
Bangladesh	119,198	(17)	724	(26)	1,545	(26)	1.3%	(27)	9.4	(28)	3.1%	(6)	98	(24)	21.4	(17)
South Africa	106,108	(18)	1,790	(21)	2,102	(25)	2.0%	(24)	35.5	(22)	4.8%	(1)	563	(16)	71.7	(8)
Canada	101,963	(19)	2,702	(16)	8,454	(12)	8.3%	(9)	224.0	(13)	0.3%	(23)	1,006	(9)	9.4	(22)
Qatar	89,579	(20)	31,904	(1)	99	(30)	0.1%	(30)	35.3	(23)	1.2%	(18)	1,447	(5)	381.7	(2)
China	83,418	(21)	58	(30)	4,634	(18)	5.6%	(11)	3.2	(30)	0.0%	(30)	0	(28)	0.0	(30)
Colombia	73,572	(22)	1,446	(22)	2,404	(23)	3.3%	(18)	47.3	(19)	4.1%	(3)	322	(19)	52.3	(11)
Sweden	60,837	(23)	6,025	(7)	5,161	(16)	8.5%	(8)	511.1	(5)	1.7%	(13)	858	(11)	106.3	(5)
Belgium	60,810	(24)	5,247	(9)	9,713	(10)	16.0%	(2)	838.1	(1)	0.2%	(27)	1,070	(7)	8.1	(23)
Belarus	59,487	(25)	6,295	(5)	357	(29)	0.6%	(29)	37.8	(21)	1.0%	(20)	1,900	(3)	62.3	(9)
Egypt	58,141	(26)	568	(27)	2,365	(24)	4.1%	(17)	23.1	(25)	2.9%	(9)	0	(28)	14.4	(20)
Ecuador	51,643	(27)	2,928	(14)	4,274	(20)	8.3%	(10)	242.3	(11)	1.0%	(19)	28	(27)	30.0	(14)
Netherlands	49,722	(28)	2,902	(15)	6,095	(15)	12.3%	(5)	355.7	(8)	0.2%	(26)	550	(17)	5.3	(27)
Indonesia	47,896	(29)	175	(29)	2,535	(22)	5.3%	(12)	9.3	(29)	2.3%	(11)	67	(26)	3.9	(28)
Argentina	47,203	(30)	1,045	(24)	1,078	(28)	2.3%	(22)	23.9	(24)	4.7%	(2)	150	(21)	41.2	(12)

Note: China does not report test volumes

VIRUS PROGRESSION BY COUNTRY

Country-by-Country

Virus Progression – Original 30 Hardest-Hit Countries

"Strategic Guidance in an Era of Unprecedented Change"

This graphic illustrates when the country first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were recorded (start of the "recovery" phase). It uses symbols to indicate when average daily case growth rates fell (and were sustained) below certain benchmarks, as well as when deaths stopped growing exponentially.