

COVID-19 Dashboard

Issue # 77
Tuesday, June 16, 2020

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	~450,000
Test-Positivity Rate	Decline	4.1% test-positive on Monday; 4.5% for past 7 days
Number of Cases	Plateau	New Cases up 6.0% week-over-week (after adjusting for accounting changes) – Largely driven by case increases on Friday & Saturday
Deaths % of Total Cases	Decline	5.4%
Number of Deaths / 1M Population	Plateau	357.3
Recoveries : Death	Increase	7.52

- All eyes are on the number of new cases each day. The United States experienced unusually high number of new cases on Friday and Saturday, leading to concern that the relaxed restrictions and widespread protests were causing a new wave of infections. Recent experience does not appear to support that conclusion:
 - New cases were lower on both Sunday (~20,000) on Monday (<21,000), versus Friday (>27,000;) and Saturday (> 25,000). Had a new wave begun, it would be reasonable to expect that new cases would not revert to earlier levels
 - Notably, test volumes on Friday and Saturday were among the highest ever, likely contributing to the increase in cases (we have found a statistically-significant correlation between test volumes and new cases)
 - The test-positive rate for the past week (4.5%) is lower than for any preceding week)
 - New cases are up ~6% week-over-week, driven by the high volume on Friday and Saturday; new cases otherwise would have been essentially flat week-over-week
- Nearly 450,000 tests were reported in the United States yesterday, with a 4.1% test-positive rate. Only Alabama and Arizona are not posting test-positive rates below the upper limit of 10% suggested by the World Health Organization; in 34 states, the rate is <5%
- Hospitalized COVID-19 patients have declined by 11.3% on a week-over-week basis; 18.8% versus 2 weeks ago and 22.4% versus 3 weeks ago
- Deaths were relatively low again on Monday (425). Indeed, the combined deaths on Sunday and Monday were lower than any single day in the past week except Saturday (they were slightly higher). The cumulative death rate is now < 5.4%
- Alabama, Arizona, Arkansas, North Carolina, South Carolina are of the greatest concern ("High" on our scale) for virus spread, given the combination of new daily infection rates, case growth, test-positive % and COVID-19 hospitalized patients. Mississippi "improved" from "High" to "Moderately High" concern. Mississippi is joined by California, Florida, Georgia, Nebraska, Nevada, South Dakota, Tennessee and Texas in the "Moderately High" concern category
- Among Large Central Metro Areas in the United States, Mecklenburg (Charlotte), North Carolina has the highest current new daily infection rate, followed in order by Providence, Rhode Island; Maricopa (Phoenix); Arizona, Davidson (Nashville), Tennessee; and, Salt Lake, Utah. Allegheny (Pittsburgh), Pennsylvania has the lowest rate, followed by Sacramento, California; King (Seattle), Washington; Santa Clara, California; and, Jackson (Kansas City), Missouri.

COUNTRY-BY-COUNTRY INFORMATION

Countries Included

"Strategic Guidance in an Era of Unprecedented Change"

- 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](https://www.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 Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

Top 30 Countries By Total Cases
As of June 15

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 (5-Day M.A.)	Rank8
USA	2,182,950	(1)	6,597	(5)	118,283	(1)	5.4%	(12)	357.4	(7)	1.1%	(18)	1,525	(6)	70.4	(8)
Brazil	891,556	(2)	4,196	(12)	44,118	(2)	4.9%	(13)	207.6	(12)	2.8%	(10)	407	(20)	109.5	(6)
Russia	537,210	(3)	3,681	(15)	7,091	(13)	1.3%	(25)	48.6	(18)	1.7%	(14)	2,100	(2)	59.7	(11)
India	343,026	(4)	249	(29)	9,915	(8)	2.9%	(19)	7.2	(28)	3.6%	(7)	103	(24)	8.1	(25)
UK	296,857	(5)	4,374	(10)	41,736	(3)	14.1%	(4)	614.9	(2)	0.5%	(22)	2,388	(1)	19.8	(18)
Spain	291,189	(6)	6,228	(6)	27,136	(6)	9.3%	(8)	580.4	(3)	0.1%	(28)	1,103	(8)	7.8	(26)
Italy	237,290	(7)	3,924	(13)	34,371	(4)	14.5%	(3)	568.4	(4)	0.1%	(27)	974	(10)	5.1	(28)
Peru	232,992	(8)	7,071	(3)	6,860	(14)	2.9%	(18)	208.2	(11)	2.2%	(12)	746	(13)	146.7	(3)
Iran	189,876	(9)	2,262	(20)	8,950	(10)	4.7%	(15)	106.6	(15)	1.3%	(16)	275	(21)	28.4	(16)
Germany	188,044	(10)	2,245	(21)	8,885	(11)	4.7%	(14)	106.1	(16)	0.1%	(29)	588	(16)	2.8	(29)
Turkey	179,831	(11)	2,133	(22)	4,825	(17)	2.7%	(20)	57.2	(17)	0.8%	(21)	501	(18)	16.1	(20)
Chile	179,436	(12)	9,390	(2)	3,362	(20)	1.9%	(23)	175.9	(13)	3.9%	(6)	972	(11)	323.8	(2)
France	157,372	(13)	2,411	(19)	29,436	(5)	18.7%	(1)	451.0	(6)	0.3%	(25)	0	(29)	6.9	(27)
Mexico	146,837	(14)	1,139	(24)	17,141	(7)	11.7%	(6)	133.0	(14)	3.4%	(8)	78	(26)	35.0	(14)
Pakistan	144,478	(15)	655	(26)	2,729	(21)	1.9%	(22)	12.4	(26)	4.9%	(2)	124	(23)	27.9	(17)
Saudi Arabia	132,048	(16)	3,796	(14)	1,011	(26)	0.8%	(26)	29.1	(22)	3.3%	(9)	614	(15)	113.6	(4)
Canada	99,147	(17)	2,628	(18)	8,175	(12)	8.2%	(10)	216.7	(10)	0.4%	(23)	842	(12)	10.7	(22)
Bangladesh	90,619	(18)	550	(27)	1,209	(25)	1.3%	(24)	7.3	(27)	3.9%	(4)	94	(25)	19.1	(19)
China	83,181	(19)	58	(30)	4,634	(18)	5.6%	(11)	3.2	(30)	0.0%	(30)	0	(28)	0.0	(30)
Qatar	80,876	(20)	28,804	(1)	76	(29)	0.1%	(29)	27.1	(23)	1.9%	(13)	1,816	(4)	518.6	(1)
South Africa	73,533	(21)	1,241	(23)	1,568	(24)	2.1%	(21)	26.5	(24)	5.8%	(1)	496	(19)	61.1	(10)
Belgium	60,100	(22)	5,187	(9)	9,661	(9)	16.1%	(2)	833.7	(1)	0.2%	(26)	1,067	(9)	9.2	(24)
Belarus	54,680	(23)	5,787	(7)	312	(27)	0.6%	(28)	33.0	(20)	1.4%	(15)	1,524	(7)	76.5	(7)
Colombia	53,063	(24)	1,043	(25)	1,726	(22)	3.3%	(17)	33.9	(19)	4.0%	(3)	241	(22)	36.9	(13)
Sweden	52,383	(25)	5,188	(8)	4,891	(16)	9.3%	(7)	484.4	(5)	2.3%	(11)	700	(14)	110.3	(5)
Netherlands	48,948	(26)	2,857	(16)	6,065	(15)	12.4%	(5)	354.0	(8)	0.4%	(24)	514	(17)	10.1	(23)
Ecuador	47,322	(27)	2,684	(17)	3,929	(19)	8.3%	(9)	222.8	(9)	1.3%	(17)	59	(27)	32.7	(15)
Egypt	46,289	(28)	453	(28)	1,672	(23)	3.6%	(16)	16.4	(25)	3.9%	(5)	0	(29)	15.7	(21)
UAE	42,636	(29)	4,313	(11)	291	(28)	0.7%	(27)	29.4	(21)	1.0%	(19)	1,813	(5)	43.1	(12)
Singapore	40,818	(30)	6,979	(4)	26	(30)	0.1%	(30)	4.4	(29)	0.9%	(20)	1,957	(3)	63.4	(9)

Note: China does not report test volumes

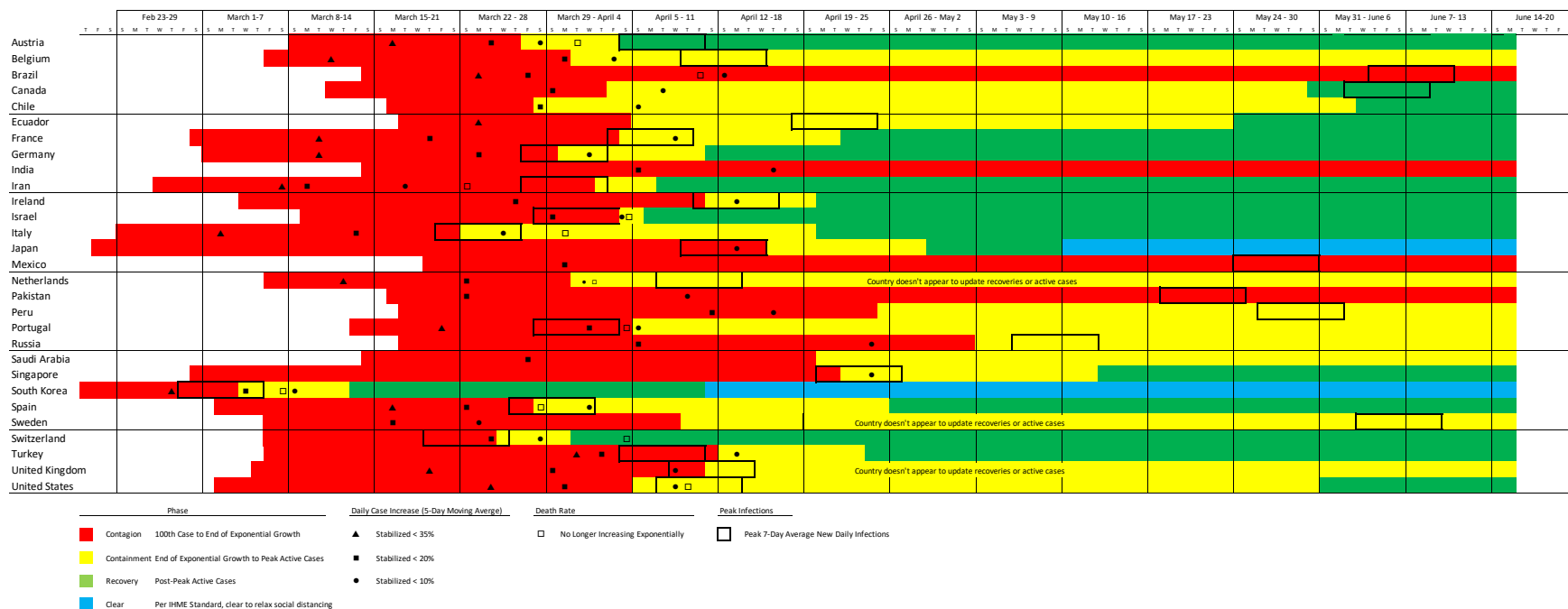
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VIRUS PROGRESSION BY COUNTRY

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.



Country-By-Country Listing of Countries By Total Cases

"Strategic Guidance in an Era of Unprecedented Change"

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 85.4% of all cases worldwide.

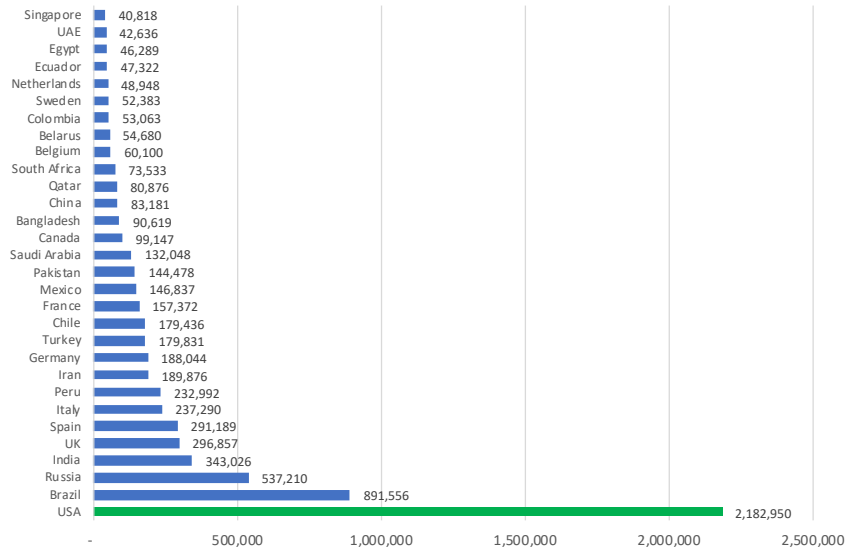
		Total Cases						
Rank	Country	15-Jun	Rank	Country	6-May	Rank	Country	27-Apr
1	USA	2,182,950	1	USA	1,263,092	1	USA	1,010,356
2	Brazil	891,556	2	Spain	253,682	2	Spain	229,422
3	Russia	537,210	3	Italy	214,457	3	Italy	199,414
4	India	343,026	4	UK	201,101	4	France	128,339
5	UK	296,857	5	France	174,191	5	Germany	158,758
6	Spain	291,189	6	Germany	168,162	6	UK	157,149
7	Italy	237,290	7	Russia	165,929	7	Turkey	112,261
8	Peru	232,992	8	Turkey	131,744	8	Iran	91,472
9	Iran	189,876	9	Brazil	126,611	9	Russia	87,147
10	Germany	188,044	10	Iran	101,650	10	China	82,830
11	Turkey	179,831	11	China	82,883	11	Brazil	66,501
12	Chile	179,436	12	Canada	63,496	12	Canada	48,500
13	France	157,372	13	Peru	54,817	13	Belgium	46,687
14	Mexico	146,837	14	India	52,987	14	Netherlands	38,245
15	Pakistan	144,478	15	Belgium	50,781	15	India	29,451
16	Saudi Arabia	132,048	16	Netherlands	41,319	16	Switzerland	29,164
17	Canada	99,147	17	Saudi Arabia	31,938	17	Peru	28,669
19	China	83,181	18	Switzerland	30,060	18	Portugal	24,070
22	Belgium	60,100	19	Ecuador	29,420	19	Ecuador	23,240
25	Sweden	52,383	20	Portugal	26,182	20	Ireland	19,648
26	Netherlands	48,948	21	Mexico	26,025	21	Sweden	18,926
27	Ecuador	47,322	22	Sweden	23,918	22	Saudi Arabia	18,811
30	Singapore	40,818	23	Pakistan	23,214	23	Israel	15,555
32	Portugal	37,036	24	Chile	23,048	24	Austria	15,274
36	Switzerland	31,131	25	Ireland	22,248	25	Mexico	14,677
40	Ireland	25,321	26	Singapore	20,198	26	Singapore	14,423
46	Israel	19,237	29	Israel	16,310	27	Pakistan	13,915
49	Japan	17,502	31	Austria	15,684	28	Chile	13,813
50	Austria	17,135	32	Japan	15,253	29	Japan	13,614
56	S. Korea	12,121	38	S. Korea	10,806	35	South Korea	10,738
	Others	1,186,293		Others	356,176		Others	301,446
	World	8,108,667			3,817,382		World	3,062,515
30 countries' share		85.4%			90.7%			90.2%

Country-by-Country Cases & Cases Per Capita

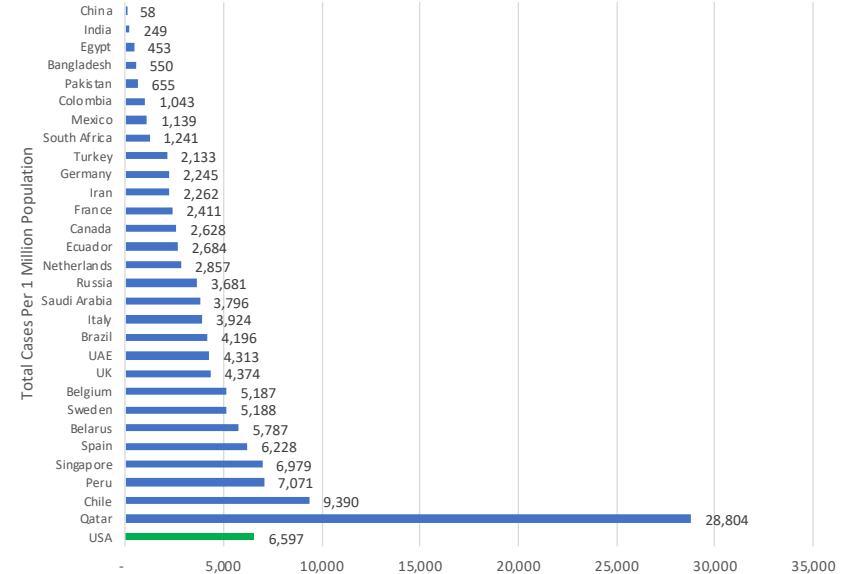
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Countries Ranked 1-30 In Total Cases

Total Cases By Country
June 15

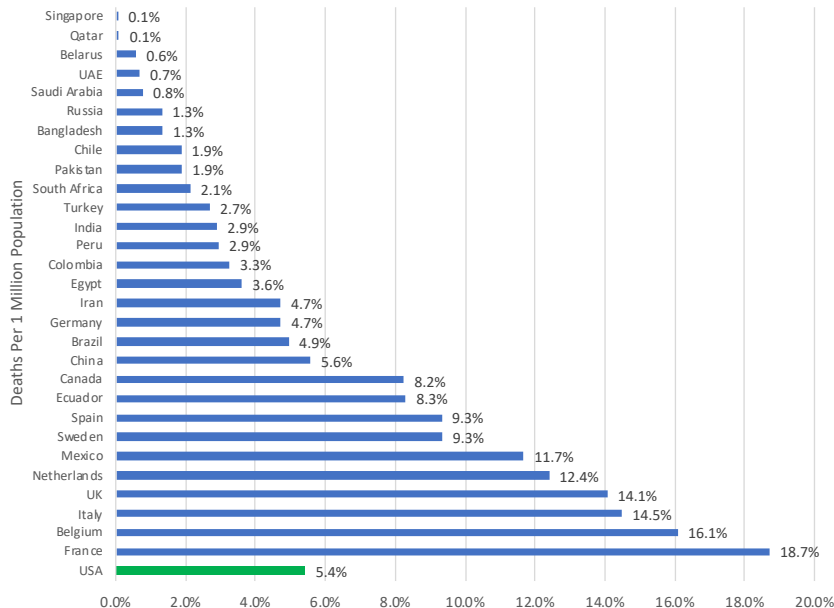


Cases Per Capita By Country
June 15

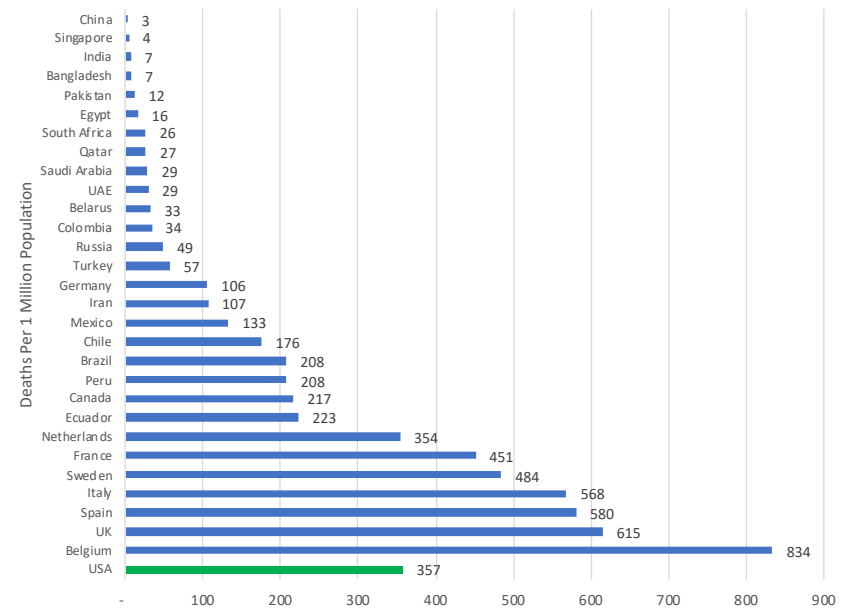


Countries Ranked 1-30 In Total Cases

Death Rate By Country
June 15

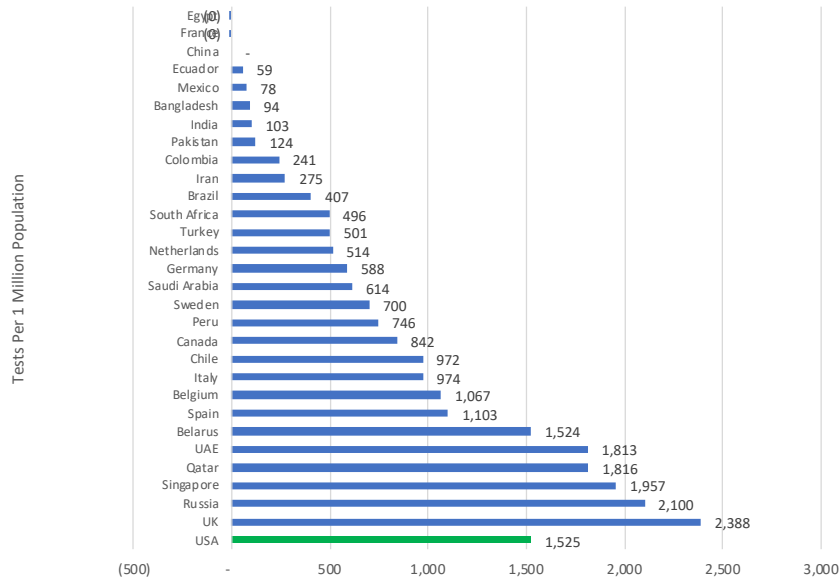


Deaths Per Capita By Country
June 15



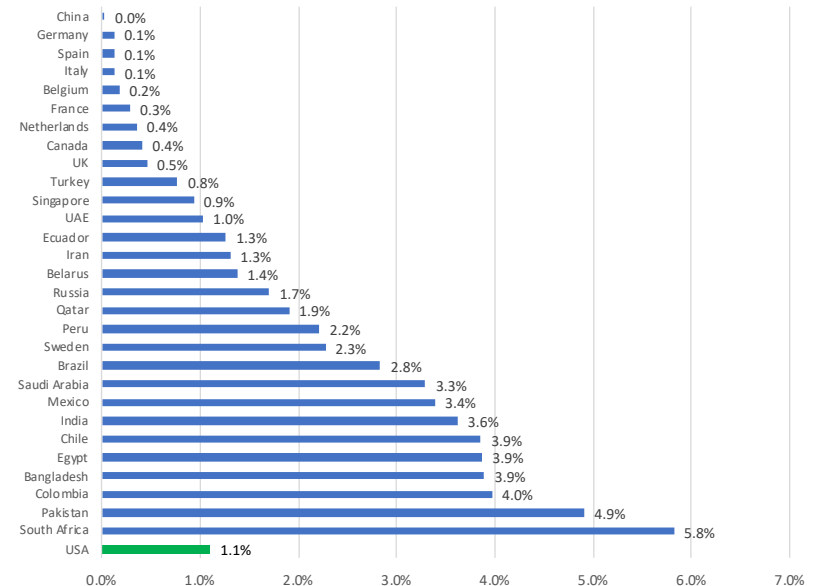
Countries Ranked 1-30 In Total Cases

Tests Per Capita By Country
June 15



Daily Tests Per Capita For Past Week

Daily Case Growth Rate By Country
June 10 - 15

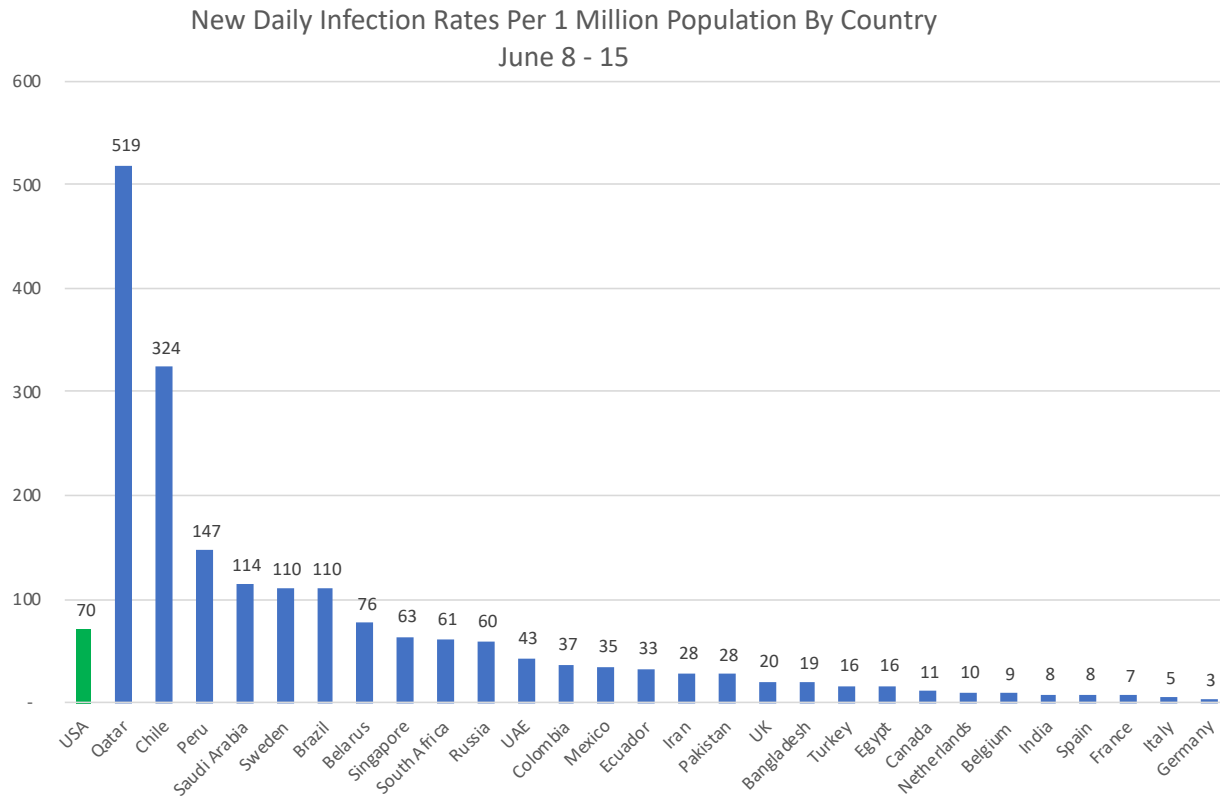


Daily Case Growth – 5-Day Moving Average

Country-by-Country New Daily Infection Rates

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases



UNITED STATES & STATE-BY-STATE INFORMATION

STATE-BY-STATE OVERALL ASSESSMENT SCORECARD

State-By-State Overall Assessment Scorecard

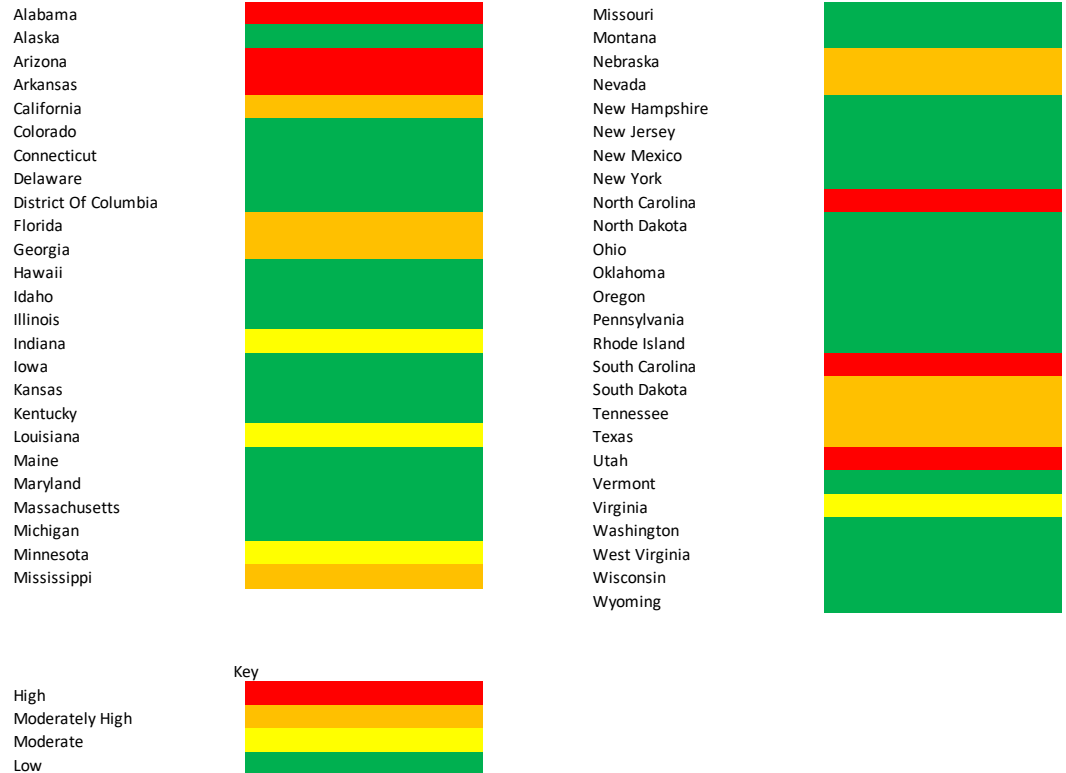
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Status, as of June 15

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)

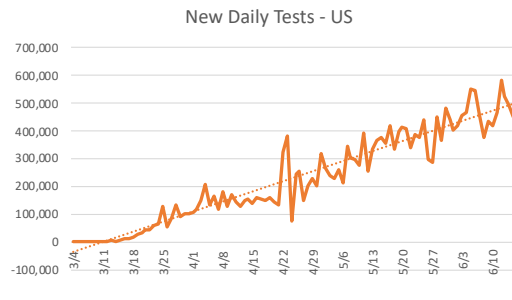


United States Overall Statistics

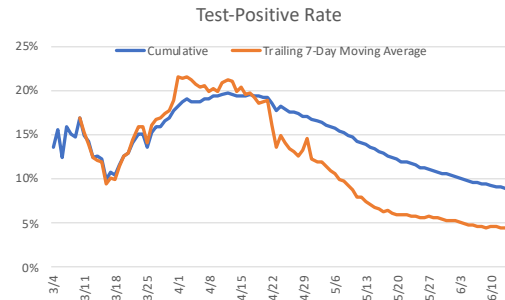
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New York and Michigan made accounting adjustments to the case totals on June 5. These had the effect of adding 8.7 new daily infections per million to the US totals. Data here has not been adjusted to account for these accounting changes

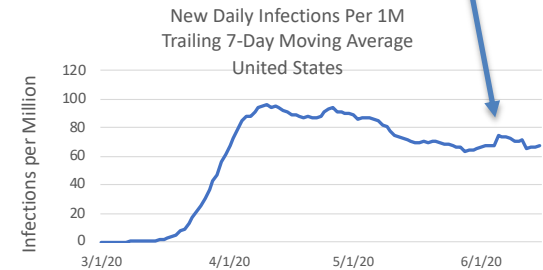
With significantly increased testing, the US is now meeting the WHO standard of <10% test-positives. This suggests that asymptomatic cases are being captured and that we have a better view of true infection rates. Further, new daily infections continue to decline; the death rate seems to have stabilized.



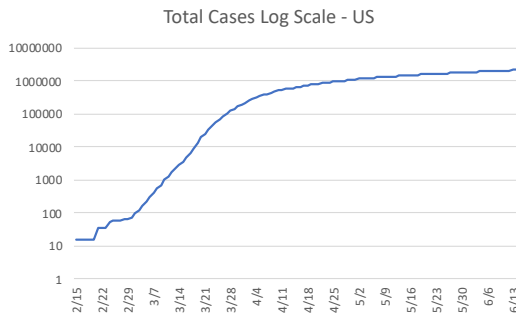
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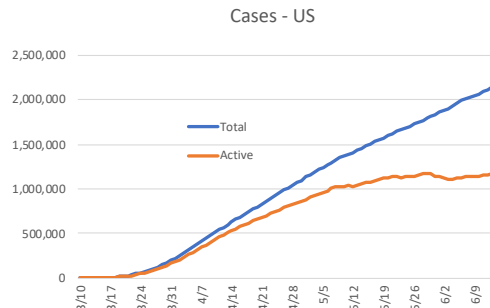
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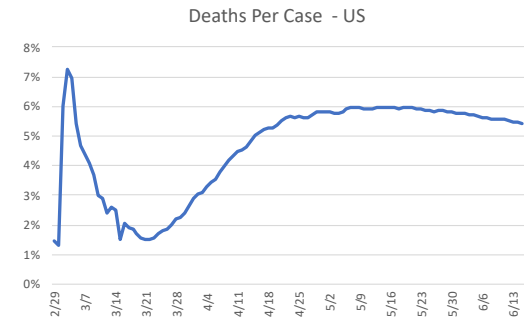
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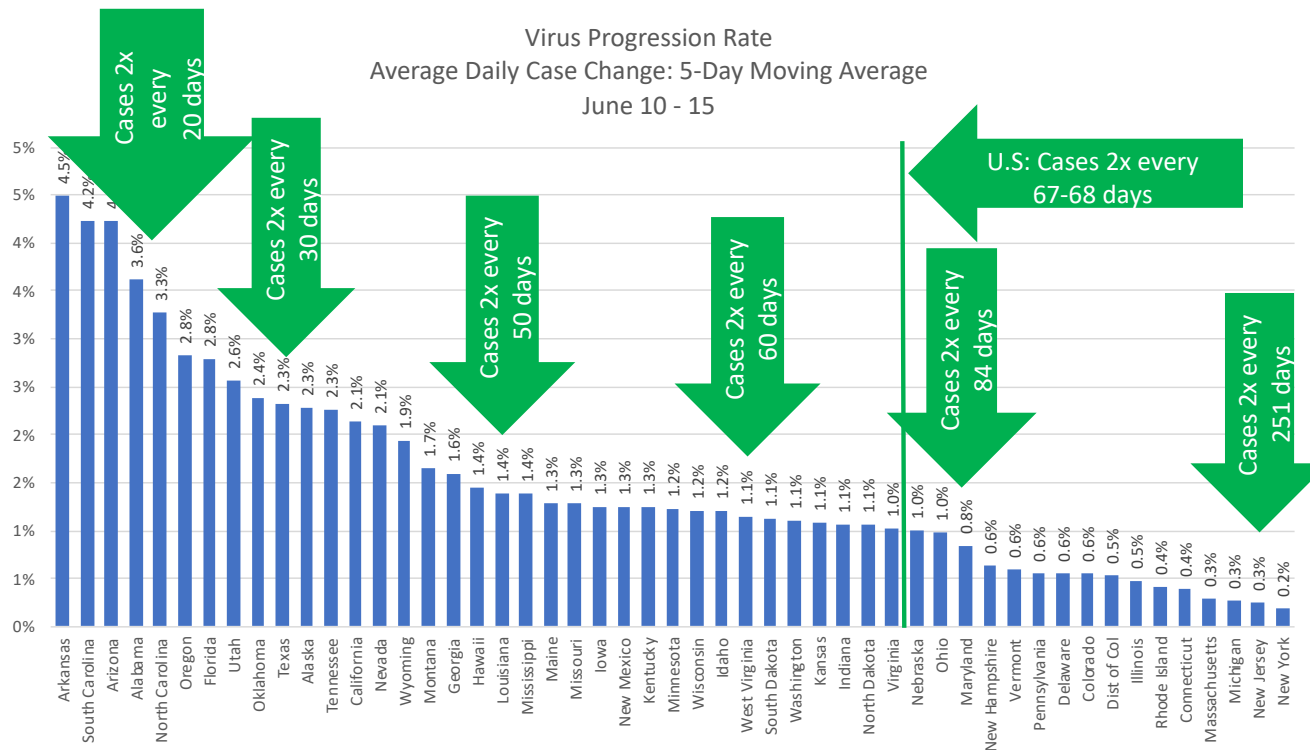


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Average Daily Case Growth

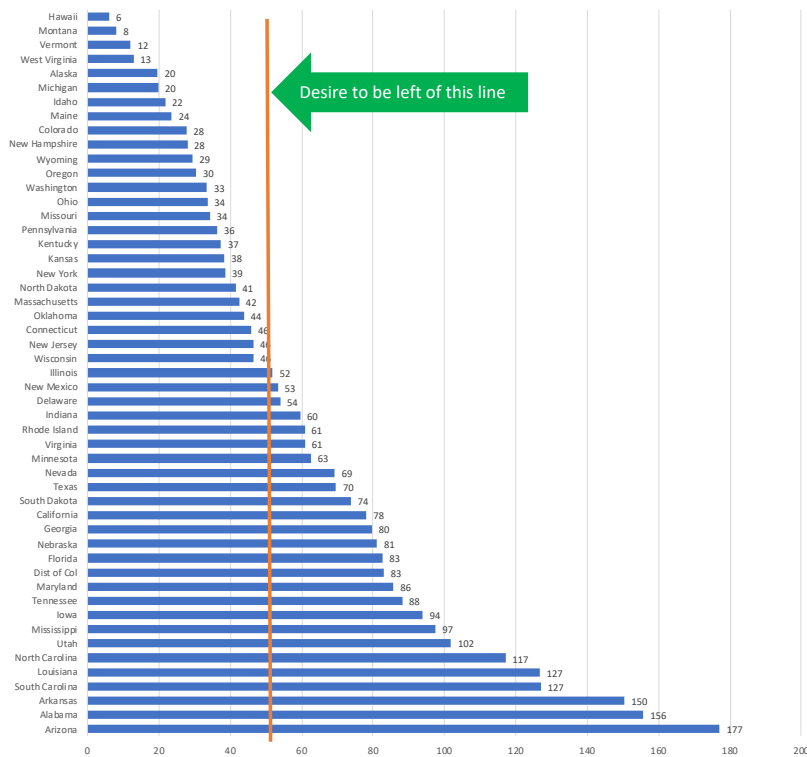
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At the height of the epidemic, cases in some states were doubling every few days. Now, they would take from 15 – 367 days to double

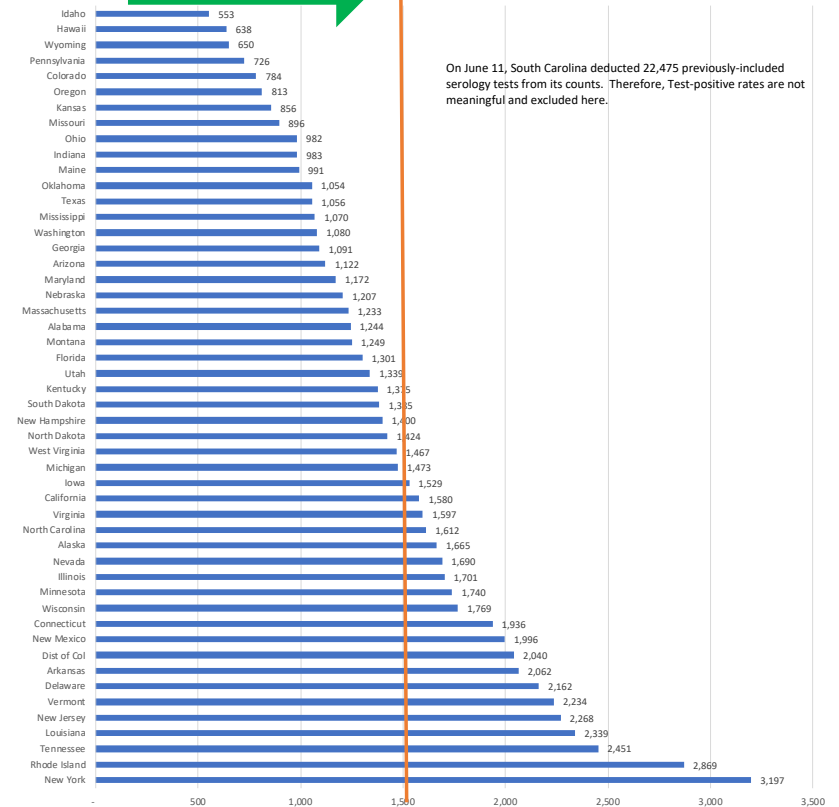


"Strategic Guidance in an Era of Unprecedented Change"

New Daily Infections Per 1 Million Population
By State
June 8 - 15



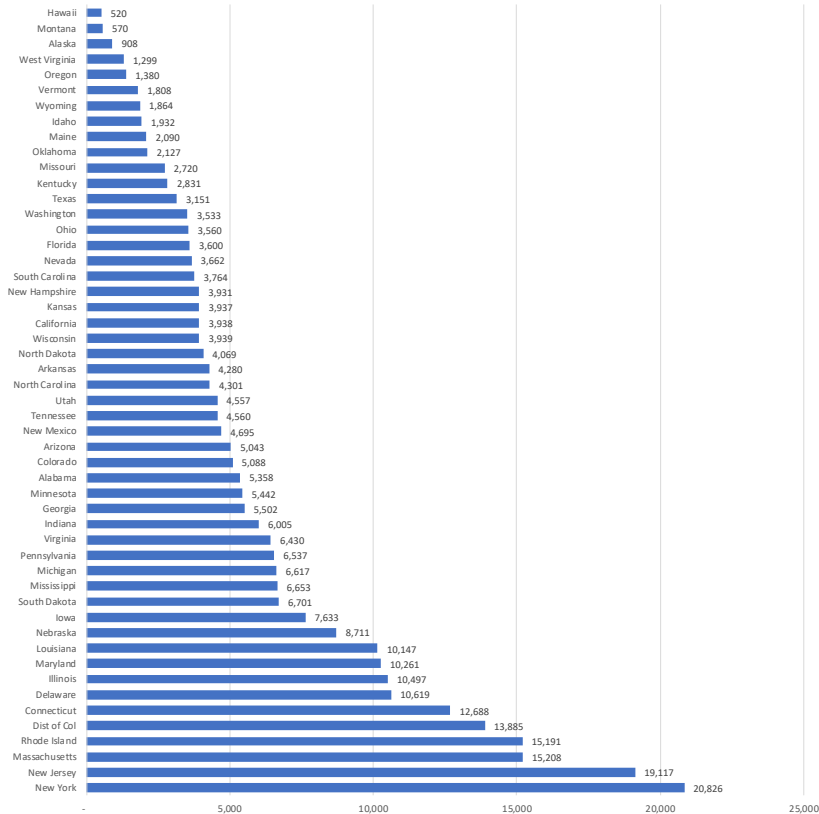
Daily Tests Per 1 Million Population
By State
June 8 - 15



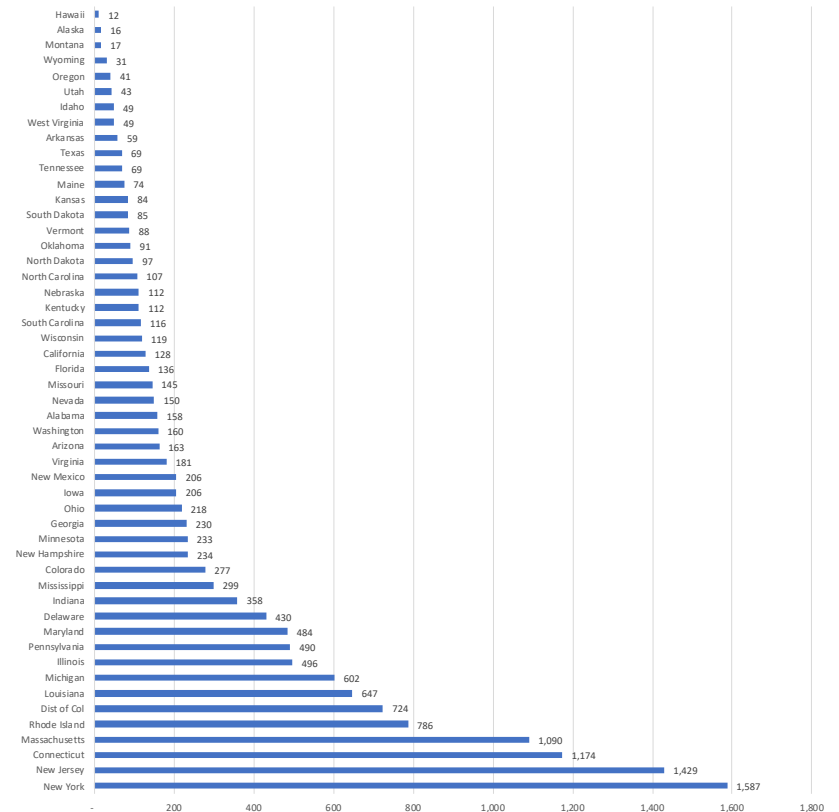
State-by-State Cases & Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Total Cases Per 1 Million Population
By State
As of June 15



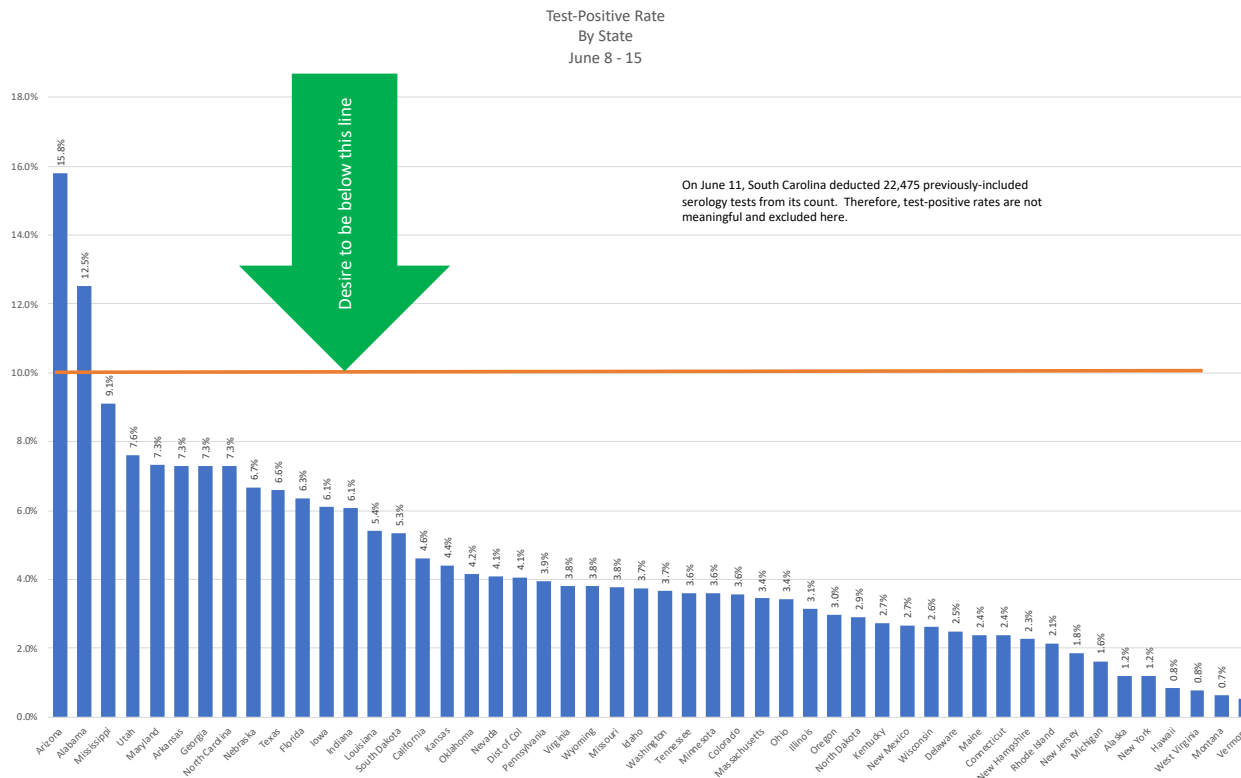
Deaths Per 1 Million Population
By State
As of June 15



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. Only Alabama and Arizona failed to meet this guideline for the past week.



As of June 15

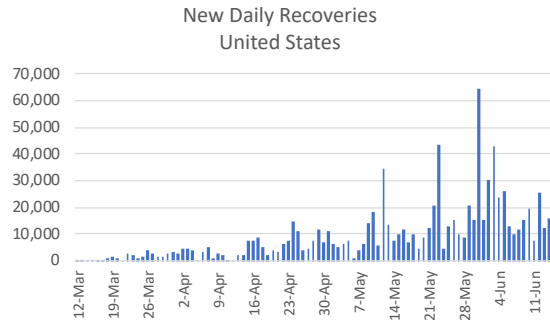
State	Total Cases	Rank	Cases per 1M Population	Rank2	Deaths	Rank3	Death Rate	Rank4	Deaths per 1 Million Population	Rank5	5-day Moving Average Case Growth Rate	Rank6	Tests per 1M Population Past 7 days	Rank7	New Daily Cases Per 1M Population (5-Day M.A.)	Rank8
Alabama	26,272	(23)	5,358.1	(21)	774	(25)	2.9%	(36)	157.9	(25)	3.6%	(4)	1,244	(30)	149.0	(2)
Alaska	664	(50)	907.7	(49)	12	(51)	1.8%	(45)	16.4	(50)	2.3%	(11)	1,665	(16)	22.8	(46)
Arizona	36,705	(18)	5,042.8	(23)	1,194	(20)	3.3%	(31)	164.0	(23)	4.2%	(3)	1,122	(34)	172.8	(1)
Arkansas	12,917	(32)	4,280.2	(28)	182	(39)	1.4%	(48)	60.3	(43)	4.5%	(1)	2,062	(8)	145.6	(3)
California	155,601	(3)	3,938.0	(31)	5,119	(7)	3.3%	(30)	129.6	(29)	2.1%	(13)	1,580	(19)	76.5	(16)
Colorado	29,299	(21)	5,087.7	(22)	1,605	(16)	5.5%	(11)	278.7	(15)	0.6%	(43)	784	(46)	28.0	(41)
Connecticut	45,235	(14)	12,687.6	(6)	4,204	(8)	9.3%	(1)	1,179.1	(3)	0.4%	(47)	1,936	(11)	44.9	(29)
Delaware	10,340	(36)	10,618.6	(7)	423	(34)	4.1%	(25)	434.4	(12)	0.6%	(42)	2,162	(7)	47.2	(27)
District Of Columbia	9,799	(38)	13,884.5	(5)	515	(29)	5.3%	(14)	729.7	(6)	0.5%	(44)	2,040	(9)	88.1	(11)
Florida	77,326	(8)	3,600.3	(36)	2,941	(11)	3.8%	(27)	136.9	(28)	2.8%	(7)	1,301	(28)	77.4	(15)
Georgia	58,414	(11)	5,501.7	(19)	2,494	(13)	4.3%	(22)	234.9	(18)	1.6%	(17)	1,091	(35)	77.8	(14)
Hawaii	736	(49)	519.8	(51)	17	(50)	2.3%	(42)	12.0	(51)	1.4%	(18)	638	(49)	5.3	(51)
Idaho	3,462	(43)	1,931.8	(44)	88	(44)	2.5%	(39)	49.1	(45)	1.2%	(28)	553	(50)	20.7	(47)
Illinois	133,016	(4)	10,497.0	(8)	6,326	(4)	4.8%	(16)	499.2	(9)	0.5%	(45)	1,701	(14)	54.0	(24)
Indiana	40,430	(17)	6,005.4	(18)	2,433	(14)	6.0%	(9)	361.4	(13)	1.1%	(33)	983	(41)	53.3	(26)
Iowa	24,082	(24)	7,632.8	(12)	658	(27)	2.7%	(38)	208.6	(21)	1.3%	(23)	1,529	(20)	100.2	(8)
Kansas	11,471	(34)	3,937.4	(32)	247	(37)	2.2%	(44)	84.8	(38)	1.1%	(32)	856	(44)	31.8	(38)
Kentucky	12,647	(33)	2,830.8	(40)	505	(30)	4.0%	(26)	113.0	(33)	1.3%	(25)	1,375	(26)	37.0	(34)
Louisiana	47,172	(13)	10,147.1	(10)	3,023	(9)	6.4%	(7)	650.3	(7)	1.4%	(19)	2,339	(4)	116.9	(6)
Maine	2,810	(45)	2,090.4	(43)	101	(42)	3.6%	(29)	75.1	(40)	1.3%	(21)	991	(40)	23.7	(44)
Maryland	62,032	(10)	10,260.5	(9)	2,947	(10)	4.8%	(17)	487.5	(11)	0.8%	(38)	1,172	(33)	88.1	(10)
Massachusetts	105,690	(5)	15,208.3	(3)	7,647	(3)	7.2%	(6)	1,100.4	(4)	0.3%	(48)	1,233	(31)	44.5	(30)
Michigan	66,085	(9)	6,617.2	(15)	6,017	(6)	9.1%	(2)	602.5	(8)	0.3%	(49)	1,473	(21)	23.5	(45)
Minnesota	30,693	(20)	5,442.4	(20)	1,335	(18)	4.3%	(21)	236.7	(16)	1.2%	(26)	1,740	(13)	65.5	(21)
Mississippi	19,799	(26)	6,652.6	(14)	895	(23)	4.5%	(19)	300.7	(14)	1.4%	(20)	1,070	(37)	107.8	(7)

As of June 15

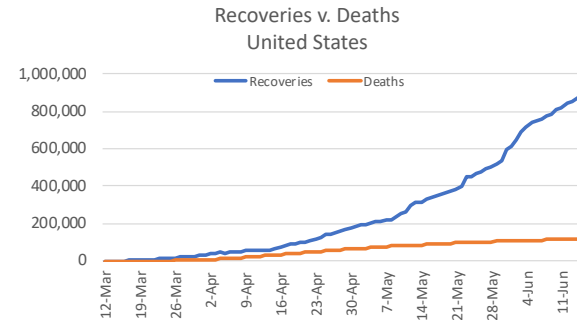
State	Total Cases	Rank	Cases per 1M Population	Rank2	Deaths	Rank3	Death Rate	Rank4	Deaths per 1 Million Population	Rank5	5-day Moving Average Case Growth Rate	Rank6	Tests per 1M Population Past 7 days	Rank7	New Daily Cases Per 1M Population (5-Day M.A.)	Rank8
Missouri	16,696	(29)	2,720.4	(41)	895	(23)	5.4%	(12)	145.8	(27)	1.3%	(22)	896	(43)	31.7	(39)
Montana	609	(51)	569.8	(50)	19	(48)	3.1%	(32)	17.8	(49)	1.7%	(16)	1,249	(29)	7.5	(50)
Nebraska	16,851	(28)	8,711.2	(11)	220	(38)	1.3%	(49)	113.7	(32)	1.0%	(36)	1,207	(32)	80.6	(13)
Nevada	11,279	(35)	3,661.8	(35)	465	(32)	4.1%	(24)	151.0	(26)	2.1%	(14)	1,690	(15)	70.7	(18)
New Hampshire	5,345	(42)	3,931.0	(33)	320	(36)	6.0%	(10)	235.3	(17)	0.6%	(39)	1,400	(24)	28.9	(40)
New Jersey	169,804	(2)	19,117.4	(2)	12,782	(2)	7.5%	(5)	1,439.1	(2)	0.3%	(50)	2,268	(5)	55.2	(23)
New Mexico	9,845	(37)	4,695.2	(24)	440	(33)	4.5%	(20)	209.8	(20)	1.3%	(24)	1,996	(10)	53.3	(25)
New York	405,139	(1)	20,826.0	(1)	30,952	(1)	7.6%	(3)	1,591.1	(1)	0.2%	(51)	3,197	(1)	41.4	(31)
North Carolina	45,113	(15)	4,301.4	(27)	1,140	(21)	2.5%	(40)	108.7	(34)	3.3%	(5)	1,612	(17)	117.7	(5)
North Dakota	3,101	(44)	4,069.2	(29)	74	(46)	2.4%	(41)	97.1	(35)	1.1%	(34)	1,424	(23)	41.1	(32)
Ohio	41,612	(16)	3,559.9	(37)	2,578	(12)	6.2%	(8)	220.5	(19)	1.0%	(37)	982	(42)	32.8	(37)
Oklahoma	8,417	(39)	2,127.1	(42)	359	(35)	4.3%	(23)	90.7	(36)	2.4%	(9)	1,054	(39)	39.0	(33)
Oregon	5,820	(41)	1,379.9	(47)	180	(40)	3.1%	(34)	42.7	(47)	2.8%	(6)	813	(45)	24.6	(43)
Pennsylvania	83,689	(7)	6,537.2	(16)	6,322	(5)	7.6%	(4)	493.8	(10)	0.6%	(41)	726	(47)	36.8	(35)
Rhode Island	16,093	(30)	15,191.2	(4)	851	(24)	5.3%	(13)	803.3	(5)	0.4%	(46)	2,869	(2)	68.2	(19)
South Carolina	19,378	(27)	3,763.7	(34)	602	(28)	3.1%	(33)	116.9	(31)	4.2%	(2)	302	(51)	125.1	(4)
South Dakota	5,928	(40)	6,700.9	(13)	75	(45)	1.3%	(50)	84.8	(39)	1.1%	(30)	1,385	(25)	74.3	(17)
Tennessee	31,160	(19)	4,560.1	(25)	483	(31)	1.6%	(47)	70.7	(41)	2.3%	(12)	2,451	(3)	84.7	(12)
Texas	91,380	(6)	3,151.5	(39)	2,016	(15)	2.2%	(43)	69.5	(42)	2.3%	(10)	1,056	(38)	66.4	(20)
Utah	14,608	(31)	4,556.5	(26)	143	(41)	1.0%	(51)	44.6	(46)	2.6%	(8)	1,339	(27)	100.1	(9)
Vermont	1,128	(47)	1,807.7	(46)	55	(47)	4.9%	(15)	88.1	(37)	0.6%	(40)	2,234	(6)	14.7	(48)
Virginia	54,886	(12)	6,430.3	(17)	1,552	(17)	2.8%	(37)	181.8	(22)	1.0%	(35)	1,597	(18)	64.0	(22)
Washington	26,901	(22)	3,532.7	(38)	1,224	(19)	4.6%	(18)	160.7	(24)	1.1%	(31)	1,080	(36)	34.5	(36)
West Virginia	2,322	(46)	1,299.3	(48)	88	(44)	3.8%	(28)	49.2	(44)	1.1%	(29)	1,467	(22)	11.7	(49)
Wisconsin	22,932	(25)	3,938.6	(30)	694	(26)	3.0%	(35)	119.2	(30)	1.2%	(27)	1,769	(12)	47.2	(28)
Wyoming	1,079	(48)	1,864.3	(45)	18	(49)	1.7%	(46)	31.1	(48)	1.9%	(15)	650	(48)	27.9	(42)
United States	2,182,950		6,595.0		118,283		5.4%		329.7		1.1%		1,453		67.3	

UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

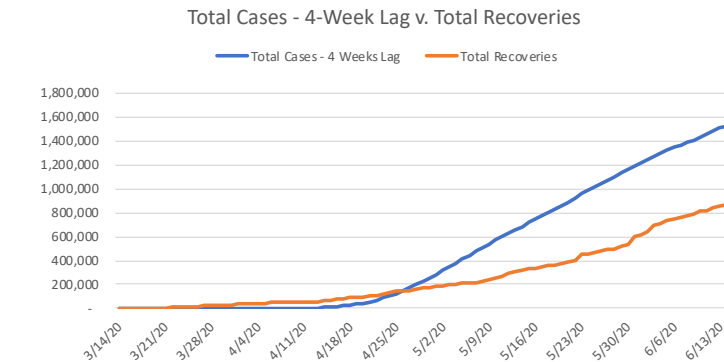
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Which states seem to be lagging in reporting?

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 ~350-500k

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

State	Recoveries	Expected Recoveries	
		Low	High
Alabama	13,508	9,669	10,877
Alaska	417	319	359
Arizona	6,462	11,336	12,753
Arkansas	8,352	3,850	4,332
California	42,179	65,369	73,540
Colorado	4,196	17,762	19,982
Connecticut	8,692	30,493	34,304
Delaware	6,172	6,295	7,082
District Of Columbia	1,143	5,816	6,543
Florida	15,065	37,154	41,798
Georgia	1,772	30,626	34,455
Hawaii	630	512	576
Idaho	2,877	1,964	2,210
Illinois	84,045	77,188	86,837
Indiana	28,744	22,604	25,430
Iowa	14,625	12,066	13,575
Kansas	6,127	6,672	7,506
Kentucky	3,416	6,348	7,142
Louisiana	37,017	27,767	31,238
Maine	2,189	1,370	1,542
Maryland	4,567	31,810	35,786
Massachusetts	84,621	69,642	78,347
Michigan	44,964	41,532	46,724
Minnesota	26,609	13,098	14,735
Mississippi	15,323	9,146	10,289
Missouri	3,786	8,962	10,083

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

State	Recoveries	Expected Recoveries	
		Low	High
Montana	510	376	423
Nebraska	10,351	8,500	9,563
Nevada	8,064	5,525	6,215
New Hampshire	4,041	2,922	3,287
New Jersey	33,528	120,070	135,078
New Mexico	4,160	4,877	5,486
New York	86,091	289,013	325,139
North Carolina	29,219	15,366	17,287
North Dakota	2,683	1,545	1,738
Ohio	8,919	22,788	25,637
Oklahoma	6,578	4,318	4,858
Oregon	2,431	2,950	3,318
Pennsylvania	56,822	53,339	60,007
Rhode Island	1,435	10,236	11,516
South Carolina	8,682	7,154	8,048
South Dakota	4,899	3,222	3,624
Tennessee	19,896	14,409	16,210
Texas	59,104	39,747	44,716
Utah	8,380	5,907	6,646
Vermont	912	752	846
Virginia	7,230	24,912	28,026
Washington	8,763	15,608	17,559
West Virginia	1,607	1,202	1,352
Wisconsin	16,837	10,150	11,418
Wyoming	838	613	689
United States	889,866	1,240,235	1,395,265

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

VIRUS PROGRESSION: ROADMAP TO RECOVERY

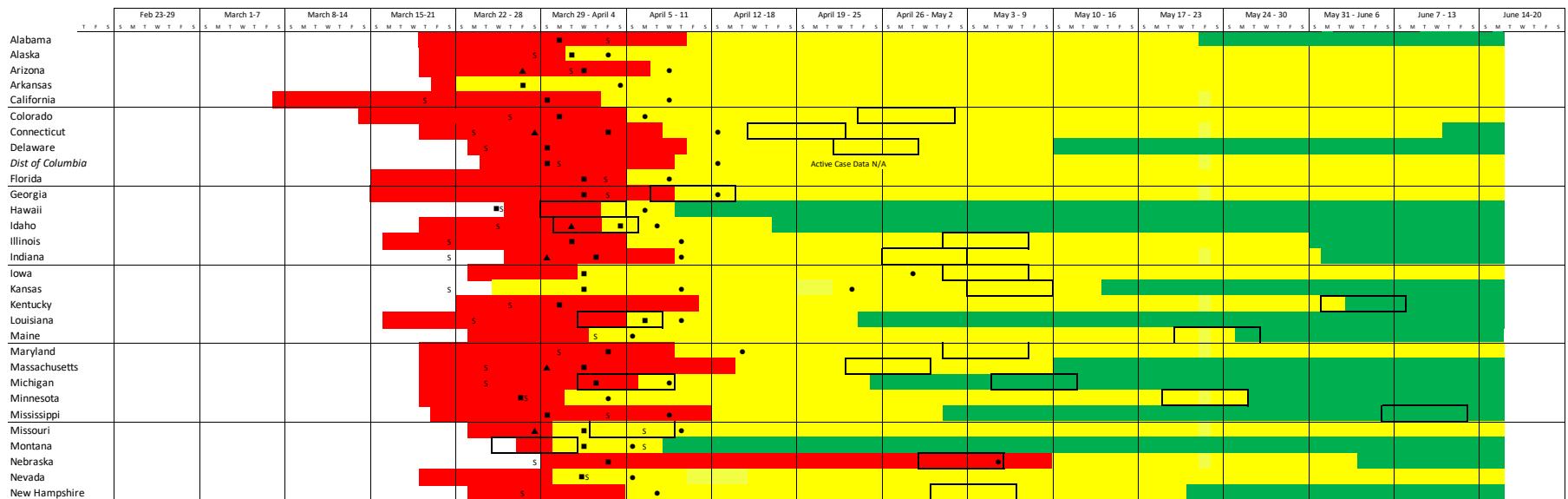
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The graphic on the following two pages illustrates when the state first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were 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.

State-by-State Virus Progression – 1 of 2

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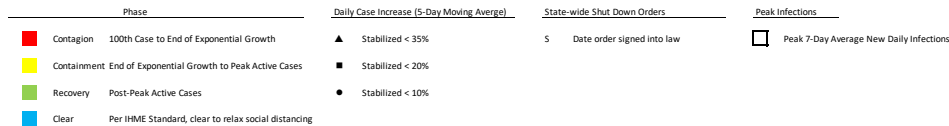
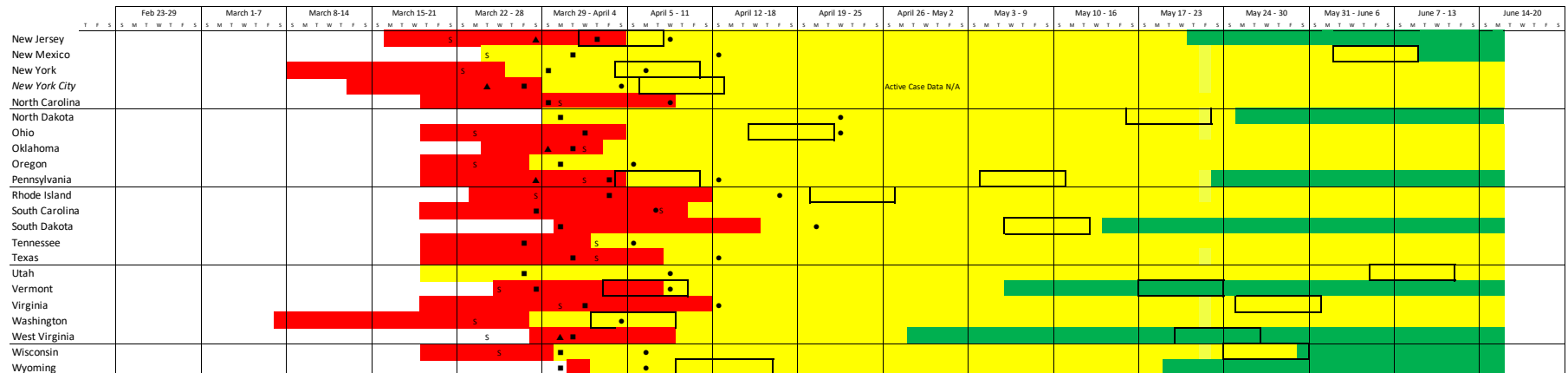


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State-by-State Virus Progression – 2 of 2

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U.S. COUNTY-BY-COUNTY INFORMATION

Case and Death Information By County For States With Increasing Infection Rates

"Strategic Guidance in an Era of Unprecedented Change"

- On the following pages, case and death information¹ is presented by county/municipality in the United States
 - New York case and death information are reported on a combined basis for Bronx, Kings, New York, Queens and Richmond counties
 - Cities that are not otherwise part of a county are listed separately
- Counties are grouped according to the 2013 Rural/Urban classification from Center for Disease Control, "[NCHS Urban-Rural Classification Scheme for Counties](#)"³:
 - **Large Central Metro Areas** – Located in MSA of 1 million population that: 1) contain the entire population of the largest principal city of the MSA, or 2) are completely contained within the largest principal city of the MSA, or 3) contain at least 250,000 residents of any principal city in the MSA
 - **Large Fringe Metro Areas** – Located in in MSA of 1 million or more population
 - **Medium Metro Areas** – Located in in MSA of 250,000-999,999 population
 - **Small Metro Areas** – Located in MSAs of less than 250,000 population
 - **Micropolitan Areas** – Located in micropolitan statistical area
 - **Non-Core Areas** - not in micropolitan statistical areas data access website
- Population information is the 2019 official estimate from the US Census Bureau²

1. Data from [The New York Times](#), based on reports from state and local health agencies. Accessed May 10-20, 2020

2. "Annual Estimates of the Resident Population for Counties in the United States: April 1, 2010 to July 1, 2019 (CO-EST2019-ANNRES)", Source: U.S. Census Bureau, Population Division, Release Date: March 2020. Accessed May 12, 2020

3. Urban-Rural Classification of counties from CDC's "[NCHS Urban-Rural Classification Scheme for Counties](#)". Accessed May 19, 2020

"Strategic Guidance in an Era of Unprecedented Change"

Ranked By Highest Recent Daily Infection Rate (15 Highest)

FIPS	County	State	2013 CDC Urban / Rural Classification	Total Cases	Cases Per 1M	Daily Inf Rate (Last 7- Day MA)	Peak Daily Inf Rate (Trailing 7- Day MA)	Highest Occured in Past 3 Days?	Total Deaths	Deaths Per 1M	Deaths / Case
37119	Mecklenburg	North Carolina	1	7,131	6,630	215	215	yes	126	117	1.8%
44007	Providence	Rhode Island	1	11,959	19,611	212	600		637	1,045	5.3%
4013	Maricopa	Arizona	1	18,692	4,302	171	171	yes	551	127	2.9%
47037	Davidson	Tennessee	1	6,885	10,326	156	187		84	126	1.2%
49035	Salt Lake	Utah	1	7,309	6,433	142	142	yes	93	82	1.3%
47157	Shelby	Tennessee	1	6,773	7,390	135	141		151	165	2.2%
6037	Los Angeles	California	1	73,018	7,338	132	144		2,907	292	4.0%
51760	Richmond city	Virginia	1	1,814	8,352	127	235		29	134	1.6%
12086	Miami-Dade	Florida	1	21,916	8,054	124	160		825	303	3.8%
6065	Riverside	California	1	10,931	4,522	118	118	yes	383	158	3.5%
48113	Dallas	Texas	1	14,232	5,469	117	117	yes	284	109	2.0%
27123	Ramsey	Minnesota	1	3,936	7,358	115	222		190	355	4.8%
24510	Baltimore city	Maryland	1	6,698	11,568	114	261		301	520	4.5%
55079	Milwaukee	Wisconsin	1	9,511	10,265	105	247		350	378	3.7%
37183	Wake	North Carolina	1	3,021	2,824	102	107	yes	42	39	1.4%

2013 Rural/Urban classification from Center for Disease Control, ["NCHS Urban-Rural Classification Scheme for Counties"](#)

"Strategic Guidance in an Era of Unprecedented Change"

Ranked By Lowest Recent Daily Infection Rate (15 Lowest)

FIPS	County	State	2013 CDC Urban / Rural Classification	Total Cases	Cases Per 1M	Daily Inf Rate (Last 7- Day MA)	Peak Daily Inf Rate (Trailing 7- Day MA)	Highest Occured in Past 3 Days?	Total Deaths	Deaths Per 1M	Deaths / Case
42003	Allegheny	Pennsylvania	1	2,079	1,754	9	44		172	145	8.3%
6067	Sacramento	California	1	1,752	1,151	17	28		63	41	3.6%
53033	King	Washington	1	8,753	3,973	19	88		593	269	6.8%
6085	Santa Clara	California	1	3,197	1,673	19	42		152	80	4.8%
29095	Jackson	Missouri	1	819	1,188	24	26		22	32	2.7%
51810	Virginia Beach city	Virginia	1	890	2,024	29	44		27	61	3.0%
6075	San Francisco	California	1	2,931	3,378	30	62		45	52	1.5%
26163	Wayne	Michigan	1	21,749	12,542	30	437		2,670	1,540	12.3%
12031	Duval	Florida	1	1,990	2,140	30	49		57	61	2.9%
48085	Collin	Texas	1	1,667	1,667	31	38		37	37	2.2%
34039	Union	New Jersey	1	16,322	29,590	35	888		1,126	2,041	6.9%
36055	Monroe	New York	1	3,371	4,685	36	101		246	342	7.3%
39035	Cuyahoga	Ohio	1	5,175	4,255	37	74		311	256	6.0%
34017	Hudson	New Jersey	1	18,746	28,098	39	773		1,254	1,880	6.7%
6001	Alameda	California	1	4,341	2,649	39	4,341		112	68	2.6%

2013 Rural/Urban classification from Center for Disease Control, ["NCHS Urban-Rural Classification Scheme for Counties"](#)

"Strategic Guidance in an Era of Unprecedented Change"

Ranked By Highest Recent Daily Infection Rate (15 Highest)

FIPS	County	State	2013 CDC Urban / Rural Classification	Total Cases	Cases Per 1M	Daily Inf Rate (Last 7- Day MA)	Peak Daily Inf Rate (Trailing 7- Day MA)	Highest Occured in Past 3 Days?	Total Deaths	Deaths Per 1M	Deaths / Case
47169	Trousdale	Tennessee	2	1,456	172,757	1,051	22,069		4	475	0.3%
51683	Manassas city	Virginia	2	1,309	31,680	280	989		12	290	0.9%
1127	Walker	Alabama	2	578	9,220	264	355		6	96	1.0%
48055	Caldwell	Texas	2	147	3,547	241	241	yes	-	-	0.0%
48209	Hays	Texas	2	727	3,391	219	219	yes	5	23	0.7%
1007	Bibb	Alabama	2	107	5,294	191	191	yes	1	49	0.9%
51685	Manassas Park city	Virginia	2	378	21,942	191	622		6	348	1.6%
21077	Gallatin	Kentucky	2	57	6,507	179	571		7	799	12.3%
5035	Crittenden	Arkansas	2	522	11,041	178	338		9	190	1.7%
22051	Jefferson	Louisiana	2	8,379	19,475	172	906		466	1,083	5.6%
21211	Shelby	Kentucky	2	274	5,831	170	252		6	128	2.2%
28137	Tate	Mississippi	2	128	4,673	167	188		1	37	0.8%
37101	Johnston	North Carolina	2	849	4,234	163	163	yes	25	125	2.9%
47147	Robertson	Tennessee	2	633	9,033	163	261		9	128	1.4%
12099	Palm Beach	Florida	2	8,831	6,028	156	156	yes	426	291	4.8%

2013 Rural/Urban classification from Center for Disease Control, ["NCHS Urban-Rural Classification Scheme for Counties"](#)

"Strategic Guidance in an Era of Unprecedented Change"

Ranked By Highest Recent Daily Infection Rate (15 Highest)

FIPS	County	State	2013 CDC Urban / Rural Classification	Total Cases	Cases Per 1M	Daily Inf Rate (Last 7- Day MA)	Peak Daily Inf Rate (Trailing 7- Day MA)	Highest Occured in Past 3 Days?	Total Deaths	Deaths Per 1M	Deaths / Case
1085	Lowndes	Alabama	3	387	39,246	1,463	1,463	yes	15	1,521	3.9%
13053	Chattahoochee	Georgia	3	251	30,760	1,366	2,328		-	-	0.0%
5087	Madison	Arkansas	3	111	6,796	499	499	yes	-	-	0.0%
5143	Washington	Arkansas	3	1,804	7,905	493	499	yes	12	53	0.7%
1101	Montgomery	Alabama	3	2,830	13,088	493	493	yes	69	319	2.4%
48245	Jefferson	Texas	3	1,235	5,172	364	370	yes	31	130	2.5%
28029	Copiah	Mississippi	3	405	14,565	329	411		6	216	1.5%
13145	Harris	Georgia	3	201	5,918	320	320	yes	6	177	3.0%
28163	Yazoo	Mississippi	3	348	15,346	296	435		6	265	1.7%
37023	Burke	North Carolina	3	716	8,192	276	276	yes	16	183	2.2%
29119	McDonald	Missouri	3	70	3,071	276	282	yes	-	-	0.0%
53021	Franklin	Washington	3	1,034	11,343	274	348		25	274	2.4%
37063	Durham	North Carolina	3	2,695	8,891	274	303	yes	58	191	2.2%
48305	Lynn	Texas	3	19	3,266	270	270	yes	1	172	5.3%
1001	Autauga	Alabama	3	361	6,555	246	246	yes	6	109	1.7%

2013 Rural/Urban classification from Center for Disease Control, ["NCHS Urban-Rural Classification Scheme for Counties"](#)

Daily Infection Rates Large Central & Fringe Metro Areas

"Strategic Guidance in an Era of Unprecedented Change"

Areas Yet To Peak Ranked By Recent Daily Infection Rate (Highest 15)

FIPS	County	State	2013 CDC Urban / Rural Classification	Total Cases	Cases Per 1M	Daily Inf Rate (Last 7- Day MA)	Peak Daily Inf Rate (Trailing 7- Day MA)	Highest Occured in Past 3 Days?	Total Deaths	Deaths Per 1M	Deaths / Case
48055	Caldwell	Texas	2	147	3,547	241	241	yes	-	-	0.0%
48209	Hays	Texas	2	727	3,391	219	219	yes	5	23	0.7%
37119	Mecklenburg	North Carolina	1	7,131	6,630	215	215	yes	126	117	1.8%
1007	Bibb	Alabama	2	107	5,294	191	191	yes	1	49	0.9%
4013	Maricopa	Arizona	1	18,692	4,302	171	171	yes	551	127	2.9%
37101	Johnston	North Carolina	2	849	4,234	163	163	yes	25	125	2.9%
12099	Palm Beach	Florida	2	8,831	6,028	156	156	yes	426	291	4.8%
49035	Salt Lake	Utah	1	7,309	6,433	142	142	yes	93	82	1.3%
4021	Pinal	Arizona	2	1,500	3,561	132	147	yes	44	104	2.9%
6065	Riverside	California	1	10,931	4,522	118	118	yes	383	158	3.5%
48113	Dallas	Texas	1	14,232	5,469	117	117	yes	284	109	2.0%
48167	Galveston	Texas	2	1,255	3,775	112	114	yes	40	120	3.2%
37183	Wake	North Carolina	1	3,021	2,824	102	107	yes	42	39	1.4%
48071	Chambers	Texas	2	109	2,587	102	102	yes	-	-	0.0%
48453	Travis	Texas	1	4,545	3,705	99	99	yes	104	85	2.3%
37071	Gaston	North Carolina	2	515	2,350	98	98	yes	8	37	1.6%

2013 Rural/Urban classification from Center for Disease Control, ["NCHS Urban-Rural Classification Scheme for Counties"](#)

"Strategic Guidance in an Era of Unprecedented Change"

Areas Yet To Peak Ranked By Recent Daily Infection Rate (Highest 15)

FIPS	County	State	2013 CDC Urban / Rural Classification	Total Cases	Cases Per 1M	Daily Inf Rate (Last 7- Day MA)	Peak Daily Inf Rate (Trailing 7- Day MA)	Highest Occured in Past 3 Days?	Total Deaths	Deaths Per 1M	Deaths / Case
1085	Lowndes	Alabama	3	387	39,246	1,463	1,463	yes	15	1,521	3.9%
5087	Madison	Arkansas	3	111	6,796	499	499	yes	-	-	0.0%
5143	Washington	Arkansas	3	1,804	7,905	493	499	yes	12	53	0.7%
1101	Montgomery	Alabama	3	2,830	13,088	493	493	yes	69	319	2.4%
48245	Jefferson	Texas	3	1,235	5,172	364	370	yes	31	130	2.5%
13145	Harris	Georgia	3	201	5,918	320	320	yes	6	177	3.0%
37023	Burke	North Carolina	3	716	8,192	276	276	yes	16	183	2.2%
29119	McDonald	Missouri	3	70	3,071	276	282	yes	-	-	0.0%
37063	Durham	North Carolina	3	2,695	8,891	274	303	yes	58	191	2.2%
48305	Lynn	Texas	3	19	3,266	270	270	yes	1	172	5.3%
1001	Autauga	Alabama	3	361	6,555	246	246	yes	6	109	1.7%
45045	Greenville	South Carolina	3	2,920	5,805	244	244	yes	69	137	2.4%
12085	Martin	Florida	3	1,170	7,444	239	259	yes	18	115	1.5%
5007	Benton	Arkansas	3	1,406	5,211	238	254	yes	7	26	0.5%
19155	Pottawattamie	Iowa	3	507	5,561	238	254	yes	11	121	2.2%

2013 Rural/Urban classification from Center for Disease Control, ["NCHS Urban-Rural Classification Scheme for Counties"](#)