

COVID-19 Dashboard

Issue # 78
Wednesday, June 17, 2020

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	~464,700
Test-Positivity Rate	Decline	5.1% test-positive on Tuesday; 4.6% for past 7 days
Number of Cases	Plateau	~3,200 more new cases on Tuesday than Monday (excluding previously-diagnosed but unreported cases)
Deaths % of Total Cases	Decline	5.4%
Number of Deaths / 1M Population	Plateau	359.9
Recoveries : Death	Increase	7.58

- The United States reported 25,450 new cases on Tuesday, a relatively high number given recent experience. Texas, however, added 1,476 previously-diagnosed but, unreported cases among Texas Department of Criminal Justice inmates. Still, this represents a significant adjusted daily total (23,974). Just four states accounted for 48% of these 23,974 new cases: Arizona (10%), California (14%), Florida (12%) and Texas (12%). No other state accounted for more than 3% of the new cases
- Test volume in the United States was up to ~465,000 on Tuesday, from ~449,000 on Monday. The test-positive rate also was up, to 5.1% from 4.1%
 - The states demonstrating the most-significant upward trend in the test-positive rate over the past 3 weeks are South Carolina, Arizona, Mississippi and Alabama; in all, 15 states demonstrate an increasing trend
 - The states demonstrating the most-significant downward trend in this rate: Massachusetts, Virginia, Delaware, Nebraska and Pennsylvania
 - The overall rate for the United States is ever-so-slightly negative (essentially flat)
- There were 894 deaths recorded in the United States on Tuesday, the 7th consecutive day of fewer than 1,000, and the 10th in the past 11 days. This brought the cumulative death rate down further, to 5.39%
- For those states consistently reporting COVID-19 hospitalizations (this excludes Alabama, Alaska, Florida, Hawaii, Idaho, Nebraska and Tennessee), these are down 10% over the past week and 16% over the past two weeks.
 - Several states, however, are experiencing increasing COVID-19 hospitalizations over recent weeks: Arizona, Arkansas, Montana, Oklahoma, Oregon, South Carolina, Texas and Utah.
 - Conversely, several states have experienced 30% or more declines in hospitalizations over the past 2 weeks: Colorado, Connecticut, Delaware, Illinois, Iowa, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania and Rhode Island
- The five states with the highest current rate of new daily infections, without establishing a peak: Arizona (212 daily infections per million population over the past week), Alabama (160), Arkansas (147), South Dakota (132) and South Carolina (118). While these are high and their continued increase is concerning, contrast these rates to the peak experienced in the hardest-hit states: New York (506), New Jersey (414), Rhode Island (369), Louisiana (339) and Connecticut (309)

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, 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 16

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	2,208,400	(1)	6,673	(5)	119,132	(1)	5.4%	(12)	360.0	(7)	1.1%	(19)	1,548	(7)	71.7	(8)
Brazil	928,834	(2)	4,371	(11)	45,456	(2)	4.9%	(13)	213.9	(12)	3.7%	(10)	422	(20)	144.6	(4)
Russia	545,458	(3)	3,738	(15)	7,284	(13)	1.3%	(25)	49.9	(18)	2.0%	(14)	2,329	(2)	71.0	(9)
India	354,161	(4)	257	(29)	11,921	(8)	3.4%	(17)	8.6	(27)	4.3%	(7)	119	(24)	9.7	(25)
UK	298,136	(5)	4,393	(10)	41,969	(3)	14.1%	(4)	618.4	(2)	0.5%	(22)	2,629	(1)	23.6	(19)
Spain	291,408	(6)	6,233	(6)	27,136	(6)	9.3%	(7)	580.4	(3)	0.1%	(29)	1,103	(9)	8.8	(26)
Italy	237,500	(7)	3,928	(13)	34,405	(4)	14.5%	(3)	569.0	(4)	0.1%	(28)	1,085	(10)	5.7	(28)
Peru	237,156	(8)	7,197	(3)	7,056	(14)	3.0%	(19)	214.1	(11)	2.6%	(12)	834	(13)	172.0	(3)
Iran	192,439	(9)	2,292	(20)	9,065	(10)	4.7%	(15)	108.0	(15)	1.6%	(16)	317	(21)	34.5	(16)
Germany	188,382	(10)	2,249	(21)	8,910	(11)	4.7%	(14)	106.4	(16)	0.2%	(27)	588	(16)	3.6	(29)
Chile	184,449	(11)	9,652	(2)	3,383	(20)	1.8%	(23)	177.0	(13)	4.4%	(6)	1,081	(12)	376.3	(2)
Turkey	181,298	(12)	2,151	(22)	4,842	(17)	2.7%	(20)	57.4	(17)	0.9%	(21)	580	(18)	19.6	(20)
France	157,716	(13)	2,416	(19)	29,547	(5)	18.7%	(1)	452.7	(6)	0.3%	(25)	0	(30)	7.9	(27)
Mexico	150,264	(14)	1,166	(24)	17,580	(7)	11.7%	(6)	136.4	(14)	3.9%	(9)	87	(26)	40.3	(14)
Pakistan	148,921	(15)	675	(26)	2,839	(21)	1.9%	(22)	12.9	(26)	5.5%	(2)	140	(23)	31.9	(17)
Saudi Arabia	136,315	(16)	3,918	(14)	1,052	(26)	0.8%	(26)	30.2	(21)	4.0%	(8)	686	(15)	138.1	(5)
Canada	99,467	(17)	2,636	(18)	8,213	(12)	8.3%	(10)	217.7	(10)	0.5%	(23)	1,084	(11)	12.4	(22)
Bangladesh	94,481	(18)	574	(27)	1,262	(25)	1.3%	(24)	7.7	(28)	4.8%	(3)	107	(25)	23.8	(18)
China	83,221	(19)	58	(30)	4,634	(18)	5.6%	(11)	3.2	(30)	0.0%	(30)	0	(28)	0.0	(30)
Qatar	82,077	(20)	29,232	(1)	80	(29)	0.1%	(29)	28.5	(23)	2.2%	(13)	2,079	(3)	604.2	(1)
South Africa	76,334	(21)	1,288	(23)	1,625	(24)	2.1%	(21)	27.4	(24)	6.6%	(1)	495	(19)	70.6	(10)
Belgium	60,155	(22)	5,191	(9)	9,663	(9)	16.1%	(2)	833.9	(1)	0.2%	(26)	1,174	(8)	10.1	(24)
Belarus	55,369	(23)	5,860	(7)	318	(27)	0.6%	(28)	33.7	(20)	1.6%	(15)	1,928	(5)	91.1	(7)
Colombia	54,931	(24)	1,080	(25)	1,801	(22)	3.3%	(18)	35.4	(19)	4.7%	(4)	276	(22)	44.2	(13)
Sweden	53,323	(25)	5,281	(8)	4,939	(16)	9.3%	(8)	489.2	(5)	2.6%	(11)	700	(14)	128.9	(6)
Netherlands	49,087	(26)	2,865	(16)	6,070	(15)	12.4%	(5)	354.3	(8)	0.4%	(24)	582	(17)	11.7	(23)
Ecuador	47,943	(27)	2,719	(17)	3,970	(19)	8.3%	(9)	225.2	(9)	1.5%	(17)	67	(27)	39.7	(15)
Egypt	47,856	(28)	468	(28)	1,766	(23)	3.7%	(16)	17.3	(25)	4.6%	(5)	0	(29)	18.7	(21)
UAE	42,982	(29)	4,348	(12)	293	(28)	0.7%	(27)	29.6	(22)	1.2%	(18)	1,811	(6)	50.1	(12)
Singapore	40,969	(30)	7,005	(4)	26	(30)	0.1%	(30)	4.4	(29)	1.0%	(20)	1,957	(4)	68.5	(11)

Note: China does not report test volumes

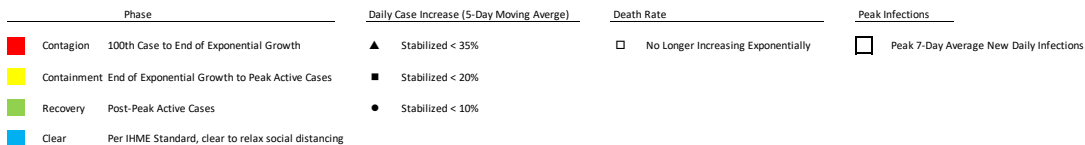
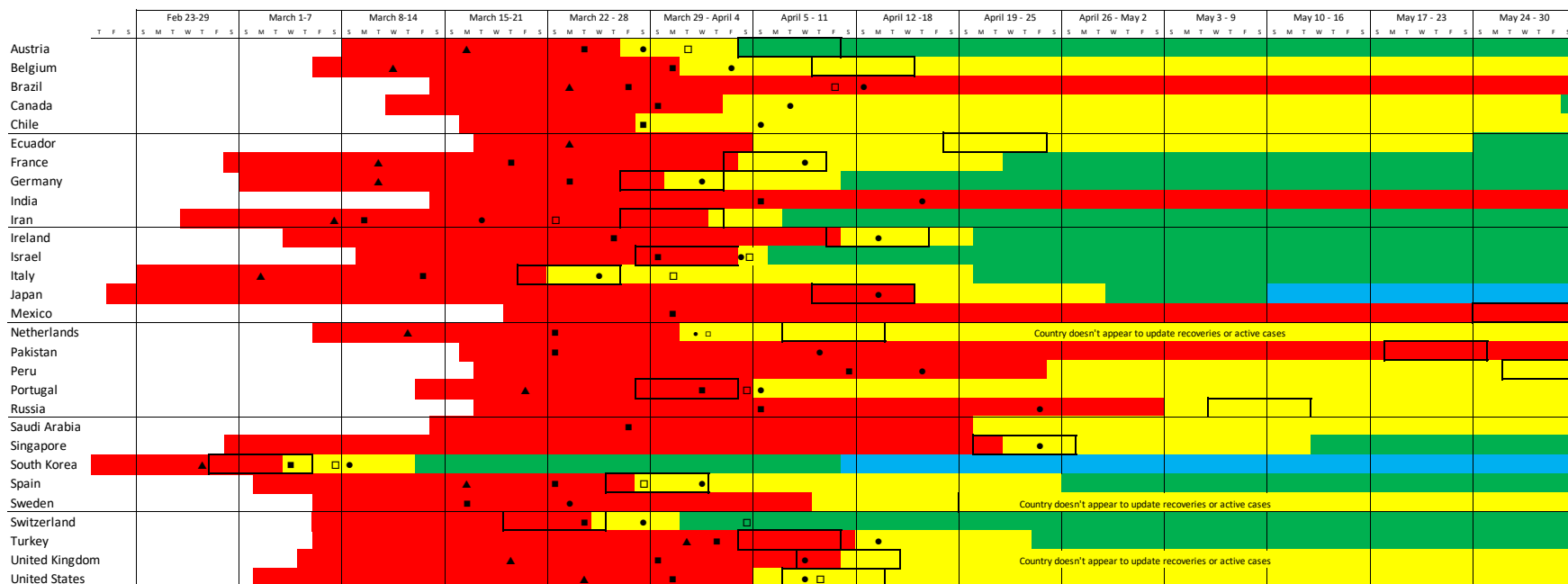
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VIRUS PROGRESSION BY COUNTRY

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.



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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

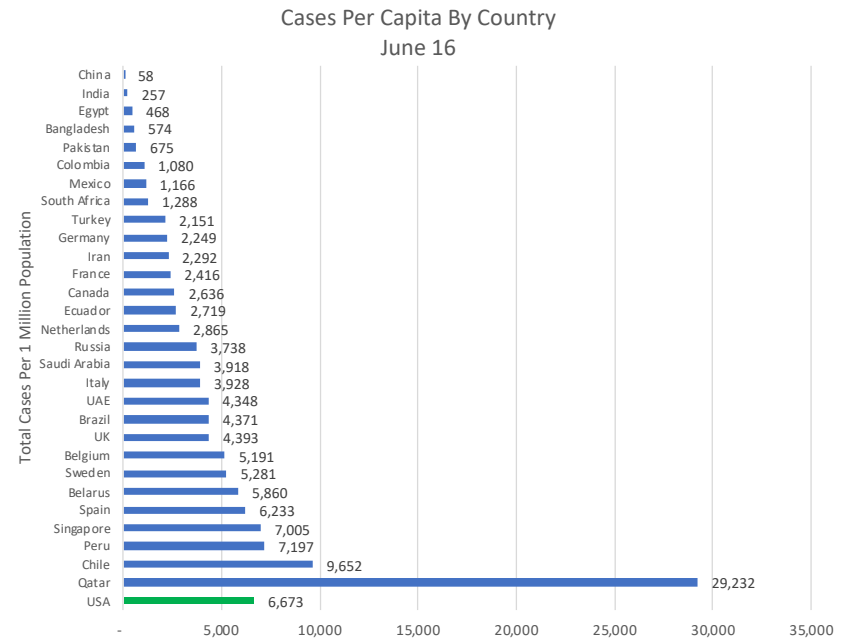
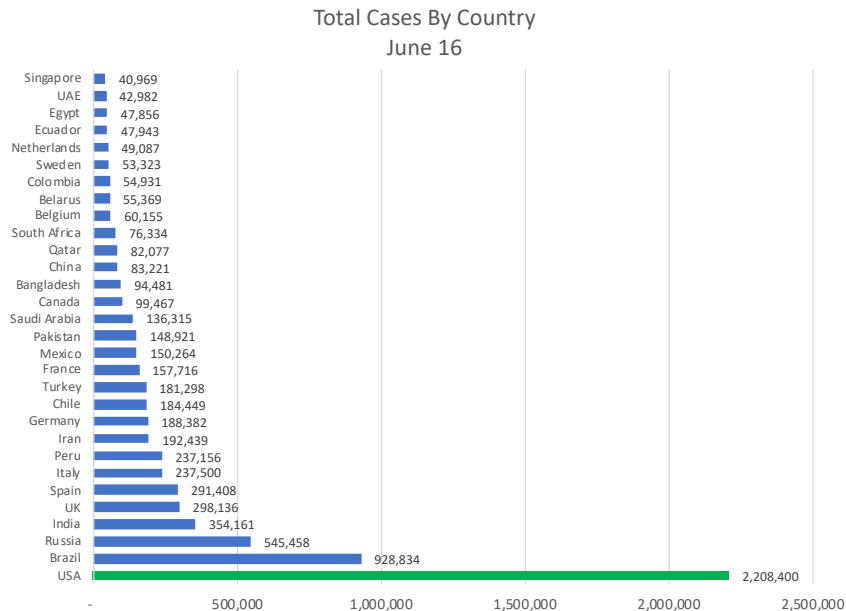
The original 30 still account for 85.3% of all cases worldwide.

Total Cases								
Rank	Country	16-Jun	Rank	Country	6-May	Rank	Country	27-Apr
1	USA	2,208,400	1	USA	1,263,092	1	USA	1,010,356
2	Brazil	928,834	2	Spain	253,682	2	Spain	229,422
3	Russia	545,458	3	Italy	214,457	3	Italy	199,414
4	India	354,161	4	UK	201,101	4	France	128,339
5	UK	298,136	5	France	174,191	5	Germany	158,758
6	Spain	291,408	6	Germany	168,162	6	UK	157,149
7	Italy	237,500	7	Russia	165,929	7	Turkey	112,261
8	Peru	237,156	8	Turkey	131,744	8	Iran	91,472
9	Iran	192,439	9	Brazil	126,611	9	Russia	87,147
10	Germany	188,382	10	Iran	101,650	10	China	82,830
12	Turkey	181,298	11	China	82,883	11	Brazil	66,501
11	Chile	184,449	12	Canada	63,496	12	Canada	48,500
13	France	157,716	13	Peru	54,817	13	Belgium	46,687
14	Mexico	150,264	14	India	52,987	14	Netherlands	38,245
15	Pakistan	148,921	15	Belgium	50,781	15	India	29,451
16	Saudi Arabia	136,315	16	Netherlands	41,319	16	Switzerland	29,164
17	Canada	99,467	17	Saudi Arabia	31,938	17	Peru	28,669
19	China	83,221	18	Switzerland	30,060	18	Portugal	24,070
22	Belgium	60,155	19	Ecuador	29,420	19	Ecuador	23,240
25	Sweden	53,323	20	Portugal	26,182	20	Ireland	19,648
26	Netherlands	49,087	21	Mexico	26,025	21	Sweden	18,926
27	Ecuador	47,943	22	Sweden	23,918	22	Saudi Arabia	18,811
30	Singapore	40,969	23	Pakistan	23,214	23	Israel	15,555
32	Portugal	37,336	24	Chile	23,048	24	Austria	15,274
36	Switzerland	31,154	25	Ireland	22,248	25	Mexico	14,677
40	Ireland	25,334	26	Singapore	20,198	26	Singapore	14,423
47	Israel	19,495	29	Israel	16,310	27	Pakistan	13,915
49	Japan	17,587	31	Austria	15,684	28	Chile	13,813
51	Austria	17,189	32	Japan	15,253	29	Japan	13,614
58	S. Korea	12,155	38	S. Korea	10,806	35	South Korea	10,738
	Others	1,215,972		Others	356,176		Others	301,446
	World	8,251,224			3,817,382		World	3,062,515
30 countries' share		85.3%			90.7%			90.2%

Country-by-Country Cases & Cases Per Capita

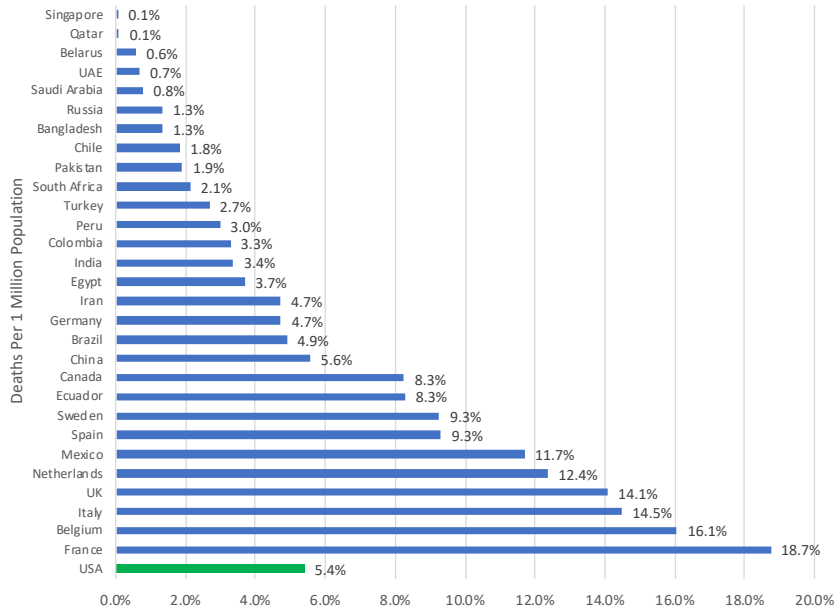
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Countries Ranked 1-30 In Total Cases

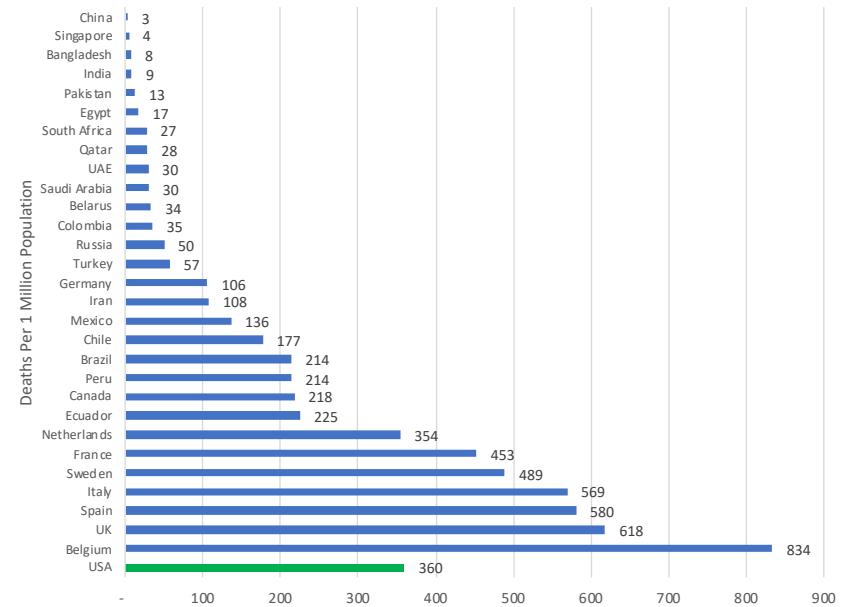


Countries Ranked 1-30 In Total Cases

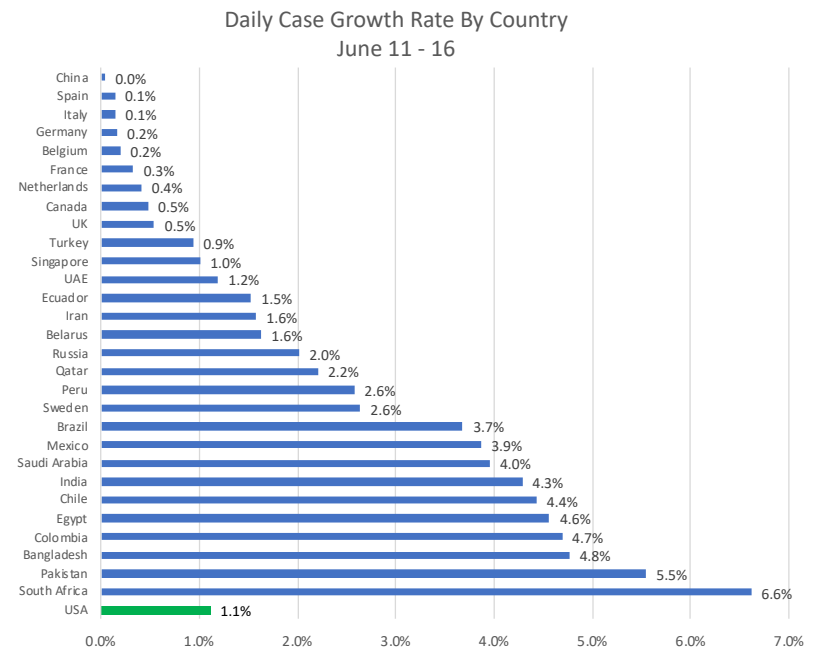
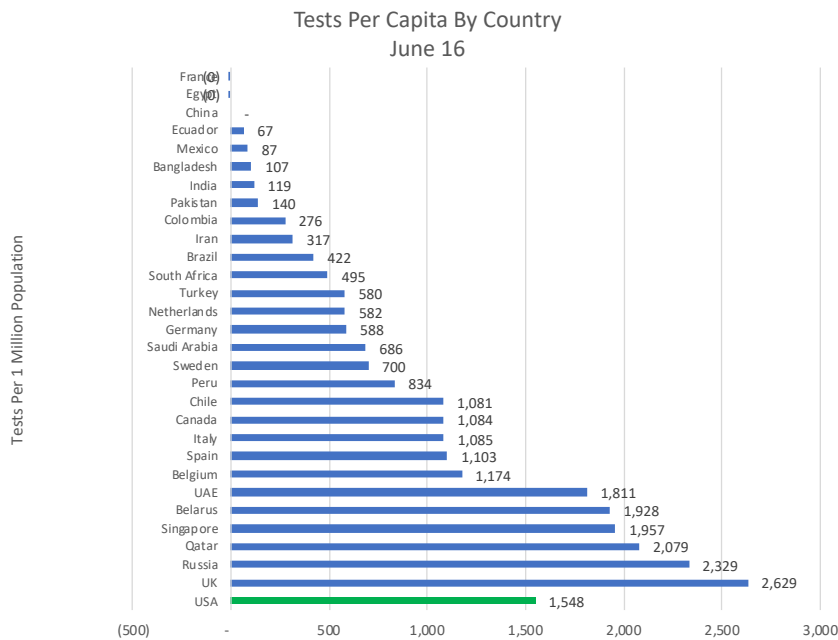
Death Rate By Country
June 16



Deaths Per Capita By Country
June 16



Countries Ranked 1-30 In Total Cases

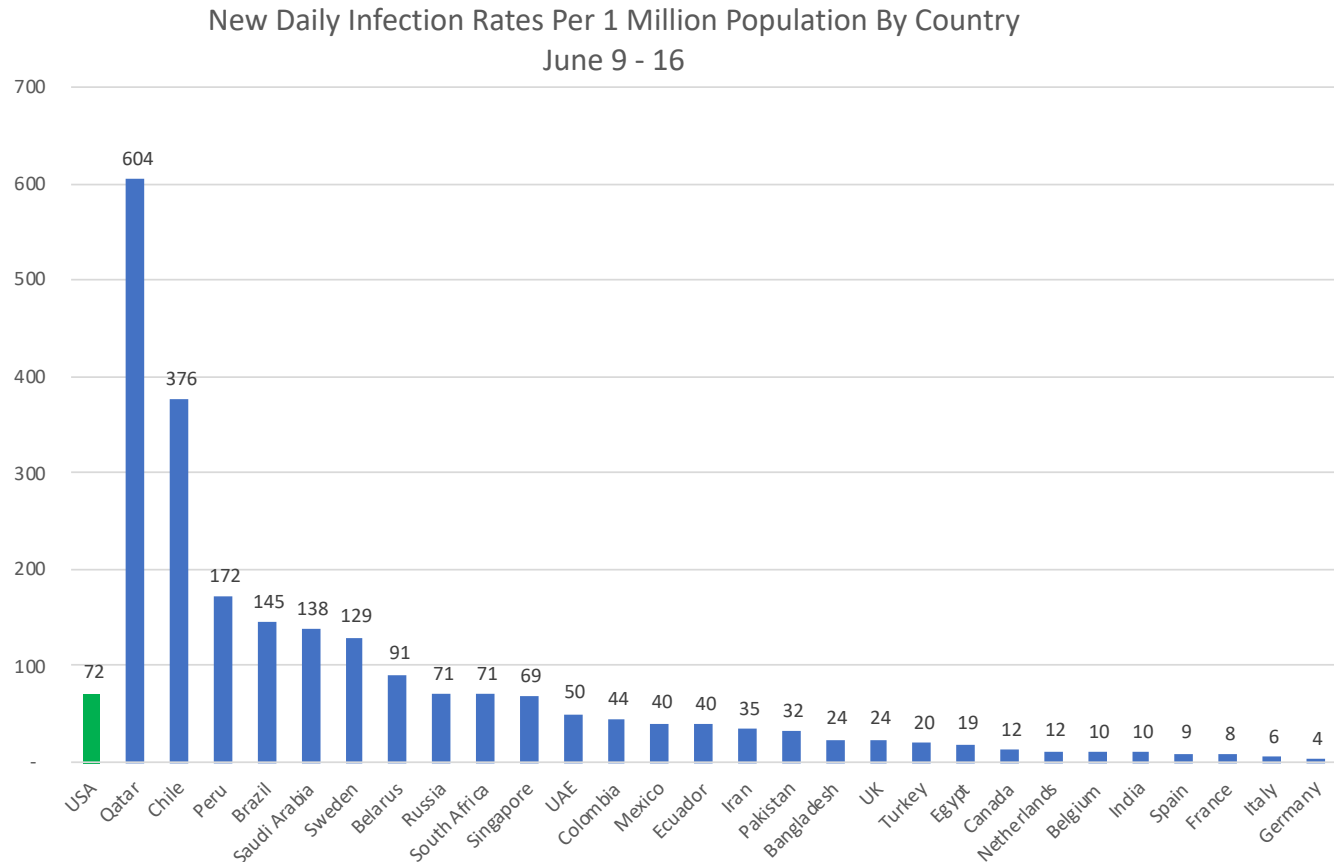


Daily Tests Per Capita For Past Week

Daily Case Growth – 5-Day Moving Average

Country-by-Country New Daily Infection Rates

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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 16

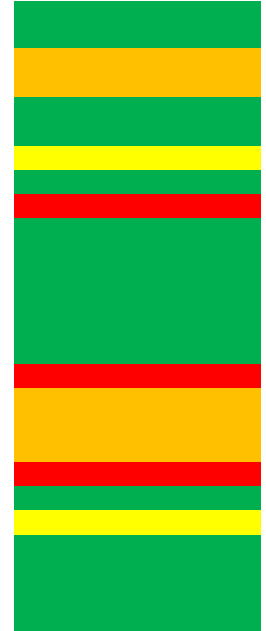
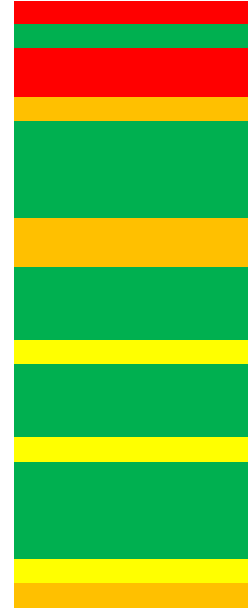
Several factors should be considered when assessing where a state stands with its virus progression status:

- 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)

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
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South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming



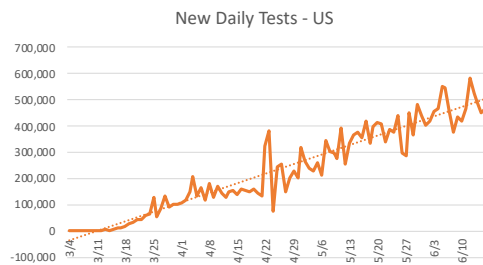
Key

High
Moderately High
Moderate
Low

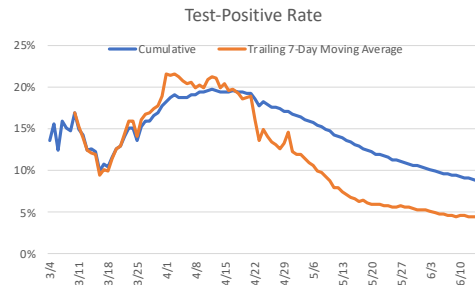


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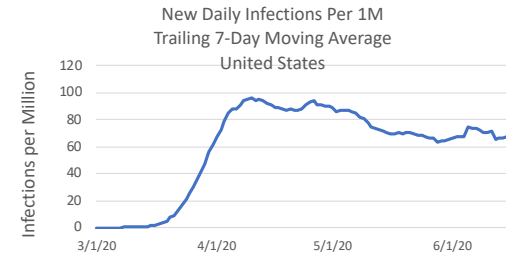
With significantly increased testing, the US is now meeting the WHO standard of <10% test-positives. This suggests that asymptomatic cases are being captured and that we have a better view of true infection rates. Further, new daily infections continue to decline; the death rate seems to have stabilized.



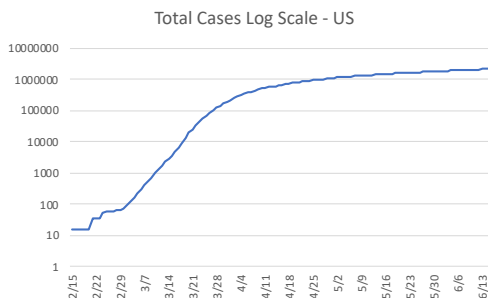
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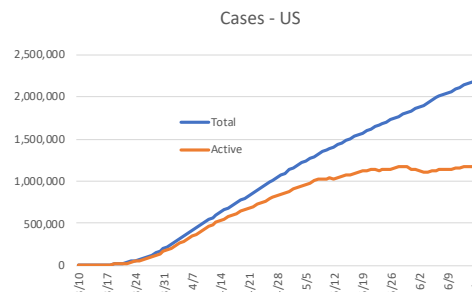
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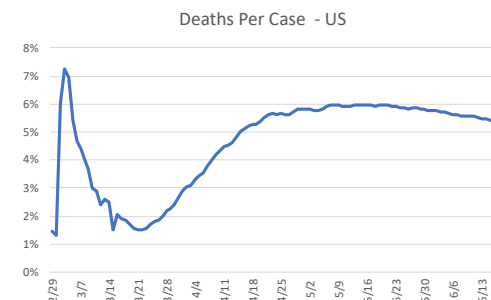
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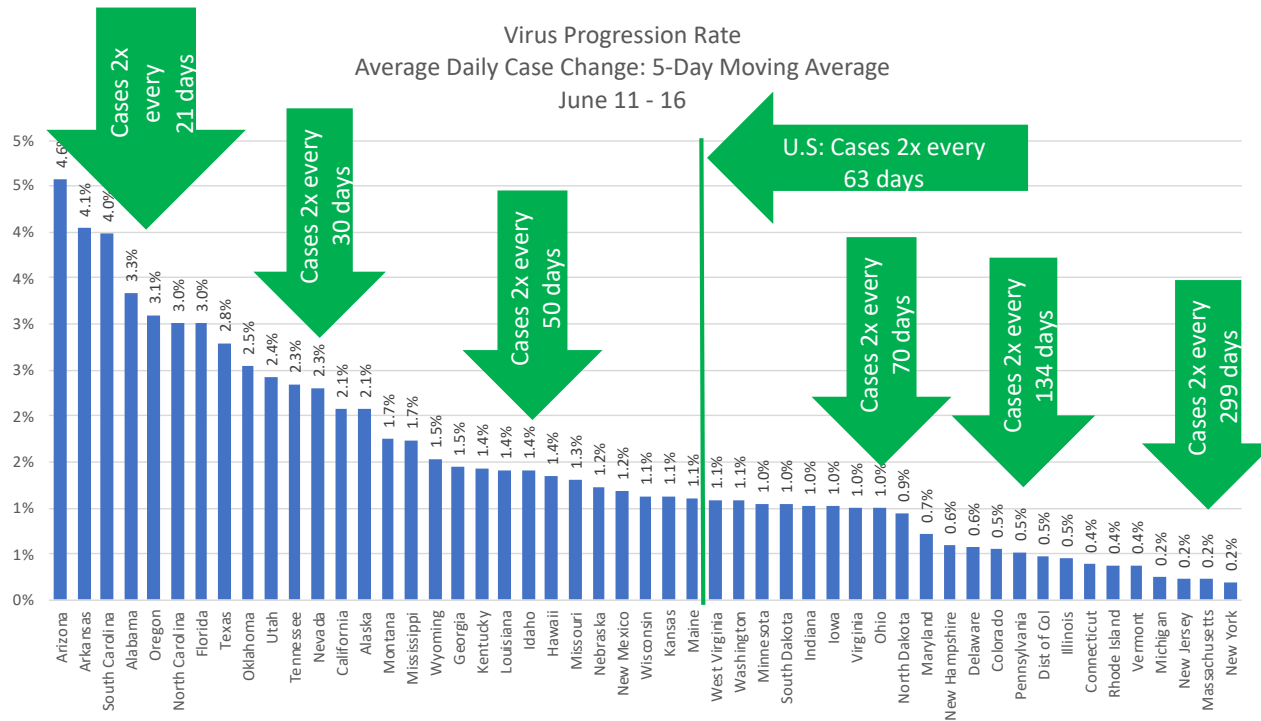


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Average Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

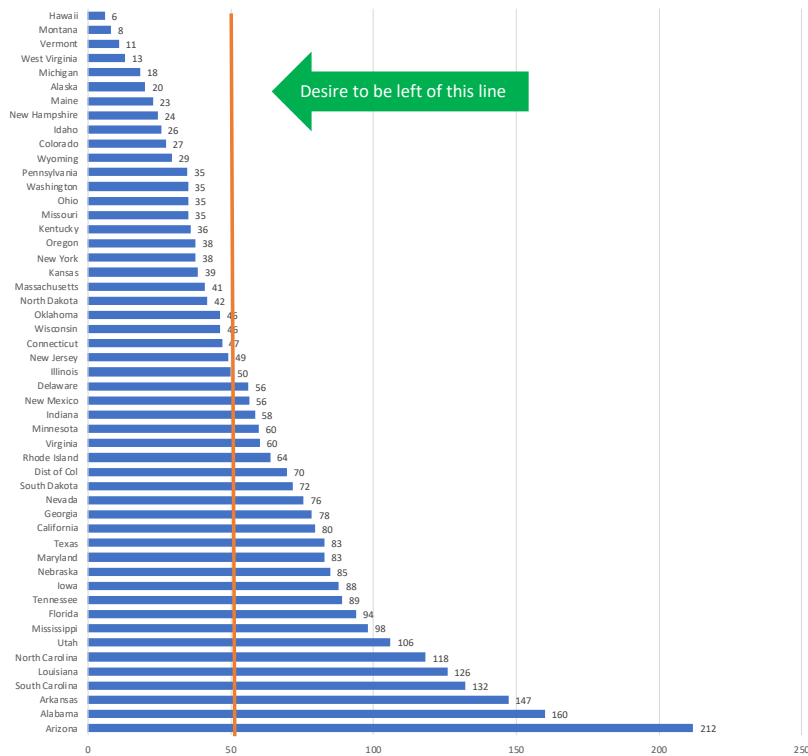
At the height of the epidemic, cases in some states were doubling every few days. Now, they would take from 15 – 371 days to double



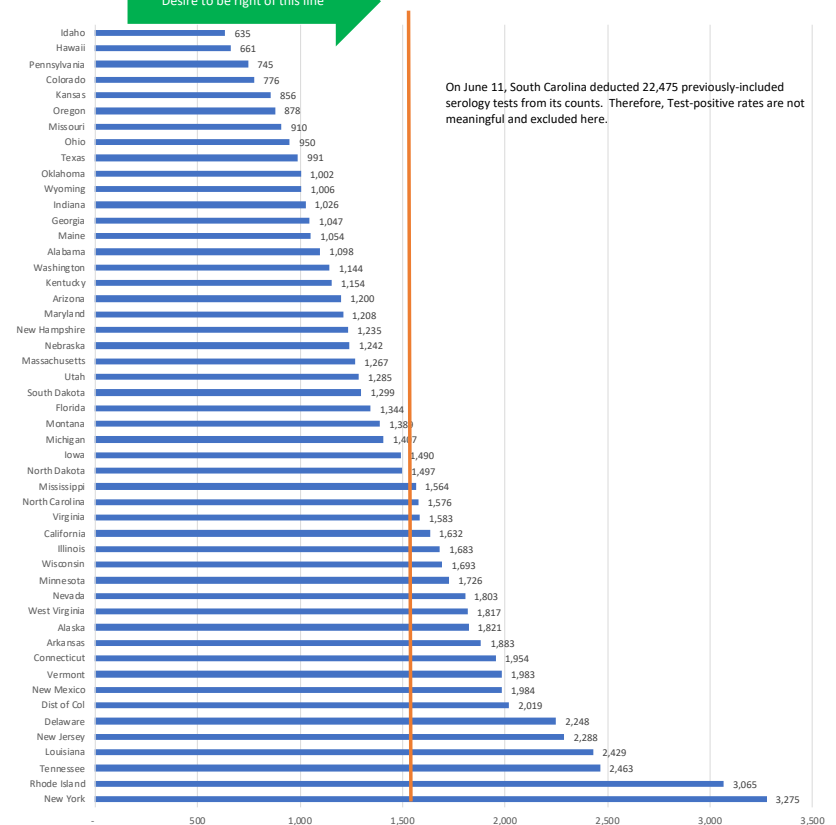
State-by-State New Daily Infections & Tests Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

New Daily Infections Per 1 Million Population
By State
June 9 - 16



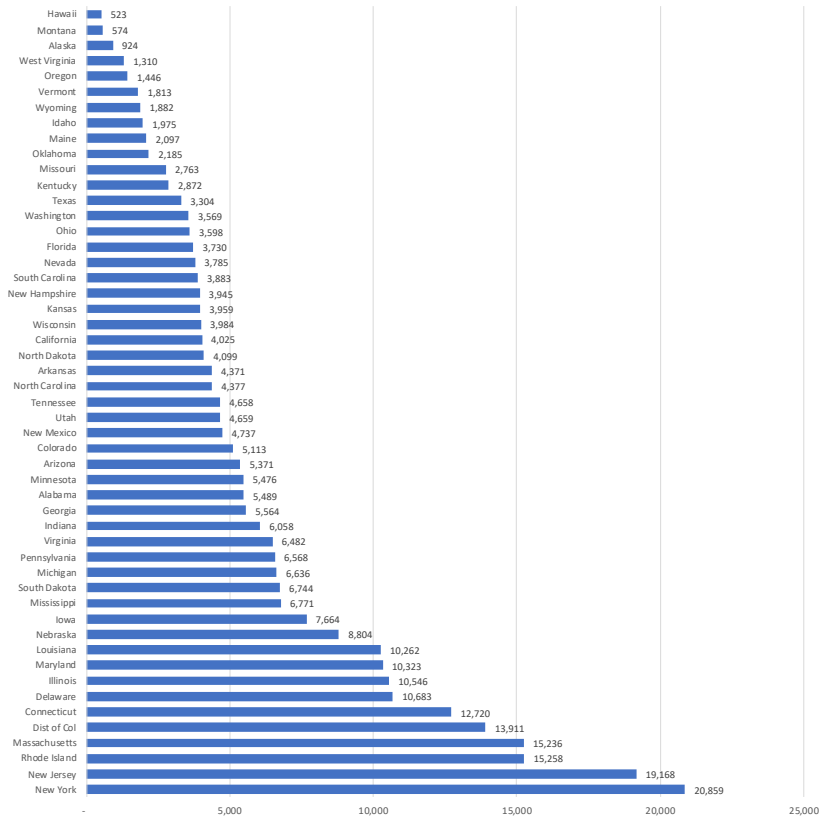
Daily Tests Per 1 Million Population
By State
June 9 - 16



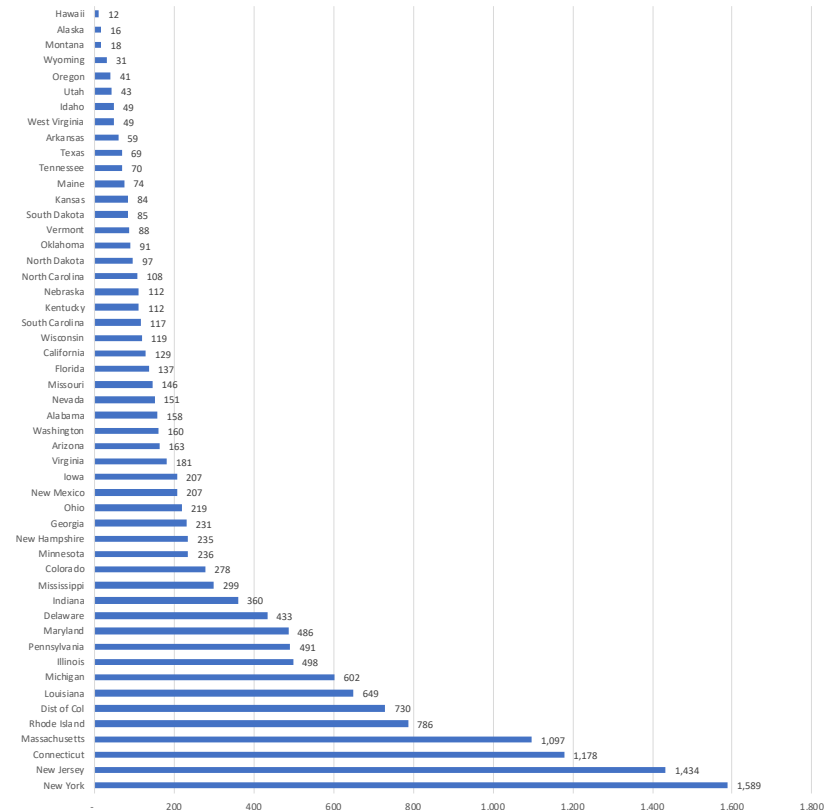
State-by-State Cases & Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Total Cases Per 1 Million Population
By State
As of June 16



Deaths Per 1 Million Population
By State
As of June 16



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 16

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	26,912	(23)	5,488.7	(20)	785	(25)	2.9%	(36)	160.1	(25)	3.3%	(4)	1,098	(36)	155.8	(2)
Alaska	676	(50)	924.1	(49)	12	(51)	1.8%	(45)	16.4	(50)	2.1%	(14)	1,821	(12)	19.7	(47)
Arizona	39,097	(18)	5,371.4	(22)	1,219	(20)	3.1%	(31)	167.5	(23)	4.6%	(1)	1,200	(33)	177.2	(1)
Arkansas	13,191	(32)	4,371.0	(28)	188	(39)	1.4%	(48)	62.3	(43)	4.1%	(2)	1,883	(11)	150.4	(3)
California	159,041	(3)	4,025.1	(30)	5,205	(7)	3.3%	(30)	131.7	(29)	2.1%	(13)	1,632	(18)	78.1	(16)
Colorado	29,442	(21)	5,112.6	(23)	1,617	(16)	5.5%	(11)	280.8	(15)	0.5%	(41)	776	(47)	27.7	(43)
Connecticut	45,349	(15)	12,719.6	(6)	4,210	(8)	9.3%	(1)	1,180.8	(3)	0.4%	(45)	1,954	(10)	45.8	(29)
Delaware	10,403	(36)	10,683.3	(7)	424	(34)	4.1%	(24)	435.4	(12)	0.6%	(40)	2,248	(6)	54.0	(24)
District Of Columbia	9,818	(38)	13,911.5	(5)	520	(29)	5.3%	(14)	736.8	(6)	0.5%	(43)	2,019	(7)	83.0	(12)
Florida	80,109	(8)	3,729.9	(36)	2,996	(10)	3.7%	(28)	139.5	(28)	3.0%	(7)	1,344	(26)	82.6	(13)
Georgia	59,078	(11)	5,564.3	(19)	2,529	(13)	4.3%	(22)	238.2	(18)	1.5%	(18)	1,047	(38)	79.6	(15)
Hawaii	740	(49)	522.6	(51)	17	(50)	2.3%	(42)	12.0	(51)	1.4%	(22)	661	(49)	6.1	(51)
Idaho	3,540	(43)	1,975.4	(44)	88	(44)	2.5%	(40)	49.1	(45)	1.4%	(21)	635	(50)	21.8	(45)
Illinois	133,639	(4)	10,546.2	(8)	6,398	(4)	4.8%	(16)	504.9	(9)	0.5%	(44)	1,683	(17)	51.9	(26)
Indiana	40,786	(17)	6,058.3	(18)	2,447	(14)	6.0%	(10)	363.5	(13)	1.0%	(33)	1,026	(39)	59.6	(23)
Iowa	24,179	(24)	7,663.5	(12)	669	(27)	2.8%	(38)	212.0	(21)	1.0%	(34)	1,490	(23)	94.0	(9)
Kansas	11,534	(35)	3,959.1	(32)	248	(37)	2.2%	(44)	85.1	(39)	1.1%	(27)	856	(46)	38.4	(34)
Kentucky	12,829	(33)	2,871.5	(40)	512	(30)	4.0%	(26)	114.6	(33)	1.4%	(19)	1,154	(34)	37.4	(35)
Louisiana	47,706	(13)	10,262.0	(10)	3,047	(9)	6.4%	(7)	655.4	(7)	1.4%	(20)	2,429	(4)	126.7	(5)
Maine	2,819	(45)	2,097.1	(43)	101	(42)	3.6%	(29)	75.1	(40)	1.1%	(28)	1,054	(37)	23.6	(44)
Maryland	62,409	(10)	10,322.9	(9)	2,982	(11)	4.8%	(17)	493.2	(11)	0.7%	(38)	1,208	(32)	85.7	(11)
Massachusetts	105,885	(5)	15,236.3	(4)	7,665	(3)	7.2%	(6)	1,103.0	(4)	0.2%	(50)	1,267	(29)	42.4	(31)
Michigan	66,269	(9)	6,635.6	(15)	6,034	(6)	9.1%	(2)	604.2	(8)	0.2%	(48)	1,407	(24)	19.8	(46)
Minnesota	30,882	(20)	5,475.9	(21)	1,344	(18)	4.4%	(21)	238.3	(17)	1.0%	(31)	1,726	(15)	62.5	(20)
Mississippi	20,152	(26)	6,771.2	(13)	915	(22)	4.5%	(19)	307.4	(14)	1.7%	(16)	1,564	(21)	97.5	(8)

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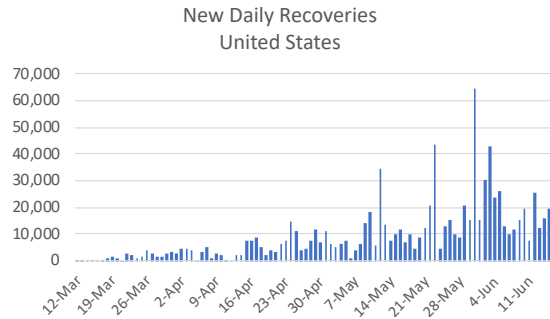
As of June 16

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	16,958	(29)	2,763.0	(41)	905	(23)	5.3%	(13)	147.5	(27)	1.3%	(23)	910	(44)	34.3	(37)
Montana	614	(51)	574.5	(50)	19	(48)	3.1%	(32)	17.8	(49)	1.7%	(15)	1,389	(25)	8.2	(50)
Nebraska	17,031	(28)	8,804.2	(11)	231	(38)	1.4%	(49)	119.4	(31)	1.2%	(24)	1,242	(30)	81.2	(14)
Nevada	11,658	(34)	3,784.9	(35)	467	(32)	4.0%	(25)	151.6	(26)	2.3%	(12)	1,803	(14)	69.2	(19)
New Hampshire	5,364	(42)	3,945.0	(33)	326	(36)	6.1%	(9)	239.8	(16)	0.6%	(39)	1,235	(31)	27.9	(42)
New Jersey	170,250	(2)	19,167.6	(2)	12,837	(2)	7.5%	(5)	1,445.3	(2)	0.2%	(49)	2,288	(5)	46.4	(28)
New Mexico	9,933	(37)	4,737.2	(24)	447	(33)	4.5%	(20)	213.2	(20)	1.2%	(25)	1,984	(8)	53.3	(25)
New York	405,785	(1)	20,859.2	(1)	30,998	(1)	7.6%	(3)	1,593.4	(1)	0.2%	(51)	3,275	(1)	38.5	(33)
North Carolina	45,906	(14)	4,377.0	(27)	1,169	(21)	2.5%	(39)	111.5	(34)	3.0%	(6)	1,576	(20)	117.1	(6)
North Dakota	3,124	(44)	4,099.4	(29)	74	(46)	2.4%	(41)	97.1	(35)	0.9%	(37)	1,497	(22)	41.4	(32)
Ohio	42,062	(16)	3,598.4	(37)	2,602	(12)	6.2%	(8)	222.6	(19)	1.0%	(36)	950	(43)	33.6	(38)
Oklahoma	8,645	(39)	2,184.8	(42)	363	(35)	4.2%	(23)	91.7	(36)	2.5%	(9)	1,002	(41)	43.8	(30)
Oregon	6,098	(40)	1,445.8	(47)	182	(40)	3.0%	(35)	43.2	(47)	3.1%	(5)	878	(45)	30.4	(40)
Pennsylvania	84,083	(7)	6,568.0	(16)	6,347	(5)	7.5%	(4)	495.8	(10)	0.5%	(42)	745	(48)	36.3	(36)
Rhode Island	16,164	(30)	15,258.3	(3)	865	(24)	5.4%	(12)	816.5	(5)	0.4%	(46)	3,065	(2)	60.8	(22)
South Carolina	19,990	(27)	3,882.5	(34)	607	(28)	3.0%	(33)	117.9	(32)	4.0%	(3)	547	(51)	127.0	(4)
South Dakota	5,966	(41)	6,743.8	(14)	77	(45)	1.3%	(50)	87.0	(38)	1.0%	(32)	1,299	(27)	73.8	(17)
Tennessee	31,830	(19)	4,658.2	(26)	493	(31)	1.5%	(47)	72.1	(41)	2.3%	(11)	2,463	(3)	88.1	(10)
Texas	95,793	(6)	3,303.7	(39)	2,062	(15)	2.2%	(43)	71.1	(42)	2.8%	(8)	991	(42)	69.6	(18)
Utah	14,937	(31)	4,659.1	(25)	145	(41)	1.0%	(51)	45.2	(46)	2.4%	(10)	1,285	(28)	101.9	(7)
Vermont	1,131	(47)	1,812.5	(46)	55	(47)	4.9%	(15)	88.1	(37)	0.4%	(47)	1,983	(9)	12.1	(49)
Virginia	55,331	(12)	6,482.4	(17)	1,570	(17)	2.8%	(37)	183.9	(22)	1.0%	(35)	1,583	(19)	60.8	(21)
Washington	27,174	(22)	3,568.5	(38)	1,234	(19)	4.5%	(18)	162.1	(24)	1.1%	(30)	1,144	(35)	33.5	(39)
West Virginia	2,341	(46)	1,309.9	(48)	88	(44)	3.8%	(27)	49.2	(44)	1.1%	(29)	1,817	(13)	12.9	(48)
Wisconsin	23,198	(25)	3,984.2	(31)	703	(26)	3.0%	(34)	120.7	(30)	1.1%	(26)	1,693	(16)	46.5	(27)
Wyoming	1,089	(48)	1,881.6	(45)	18	(49)	1.7%	(46)	31.1	(48)	1.5%	(17)	1,006	(40)	29.4	(41)
United States	2,208,400		6,671.8		119,132		5.4%		329.7		1.1%		1,467		67.3	

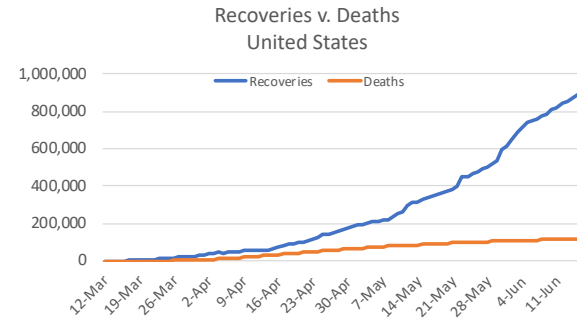
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UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

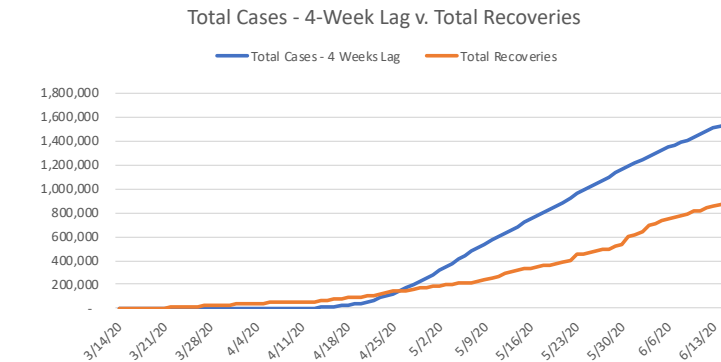
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Which states seem to be lagging in reporting?

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 ~350-510k

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

State	Recoveries	Expected Recoveries	
		Low	High
Alabama	13,508	9,901	11,138
Alaska	429	319	359
Arizona	6,598	11,653	13,109
Arkansas	8,665	3,938	4,431
California	43,129	67,043	75,424
Colorado	4,261	17,986	20,234
Connecticut	8,764	30,744	34,587
Delaware	6,256	6,430	7,233
District Of Columbia	1,155	5,947	6,691
Florida	15,690	37,555	42,250
Georgia	3,518	31,084	34,970
Hawaii	637	513	577
Idaho	2,921	1,981	2,228
Illinois	85,002	78,424	88,227
Indiana	29,093	22,964	25,835
Iowa	15,025	12,279	13,814
Kansas	6,702	6,673	7,507
Kentucky	3,431	6,455	7,262
Louisiana	37,017	28,030	31,534
Maine	2,233	1,393	1,567
Maryland	4,579	33,237	37,391
Massachusetts	84,621	70,340	79,133
Michigan	44,964	41,880	47,115
Minnesota	27,006	13,623	15,326
Mississippi	15,323	9,363	10,534
Missouri	3,793	9,089	10,225

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

State	Recoveries	Expected Recoveries	
		Low	High
Montana	535	377	424
Nebraska	10,529	8,677	9,761
Nevada	8,409	5,637	6,341
New Hampshire	4,067	2,977	3,349
New Jersey	33,963	120,811	135,913
New Mexico	4,217	4,954	5,573
New York	86,221	290,104	326,367
North Carolina	29,219	15,875	17,860
North Dakota	2,720	1,595	1,795
Ohio	9,040	23,193	26,092
Oklahoma	6,765	4,391	4,940
Oregon	2,457	2,981	3,353
Pennsylvania	57,250	53,942	60,684
Rhode Island	1,479	10,361	11,656
South Carolina	9,734	7,245	8,150
South Dakota	5,069	3,268	3,677
Tennessee	20,710	14,702	16,540
Texas	60,644	40,538	45,605
Utah	8,470	6,014	6,766
Vermont	914	755	850
Virginia	7,341	25,716	28,931
Washington	8,783	15,711	17,675
West Virginia	1,636	1,211	1,363
Wisconsin	17,122	10,308	11,597
Wyoming	852	621	698
United States	903,041	1,256,466	1,413,525

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

STATE-BY-STATE READINESS FOR RELAXING RESTRICTIONS

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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

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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

State-By-State Relative "Readiness" For Relaxing Restrictions

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Change over past 2 weeks

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									
Massachusetts									
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									

June 2

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									
Massachusetts									
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

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									
Massachusetts									
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 Carolina									
South Dakota									
Tennessee									
Texas									
Utah									
Vermont									
Virginia									
Washington									
West Virginia									
Wisconsin									
Wyoming									

May 19

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									

Legend and sources provided on following page

Legend:

Time period	Tests per Capita	Direction	Test-Positive Rate	Direction	New Daily Infection Rate	Direction	Baseline	Direction	Hospital Resources
	per 1M Average last 2 weeks	last 14 days v prior 2 weeks	last 7 days	last 14 days v prior 2 weeks	per 1M last 7 days	last 14 days v prior 2 weeks	CDC Baseline by region	last 14 days v prior 2 weeks	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	

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Sources:

Influenza guidelines and data from Centers for Disease Control (<https://gis.cdc.gov/grasp/fluview/fluportaldashboard.html>), accessed April 30 - June 7, 2020

Test data from Covid Tracking Project (<https://covidtracking.com/>), accessed March 21-June 17, 2020

Hospital resource Need projections from Institute for Health Metrics and Evaluation (<https://www.ihme.washington.edu/>), accessed April 30-June 7, 2020

VIRUS PROGRESSION: ROADMAP TO RECOVERY

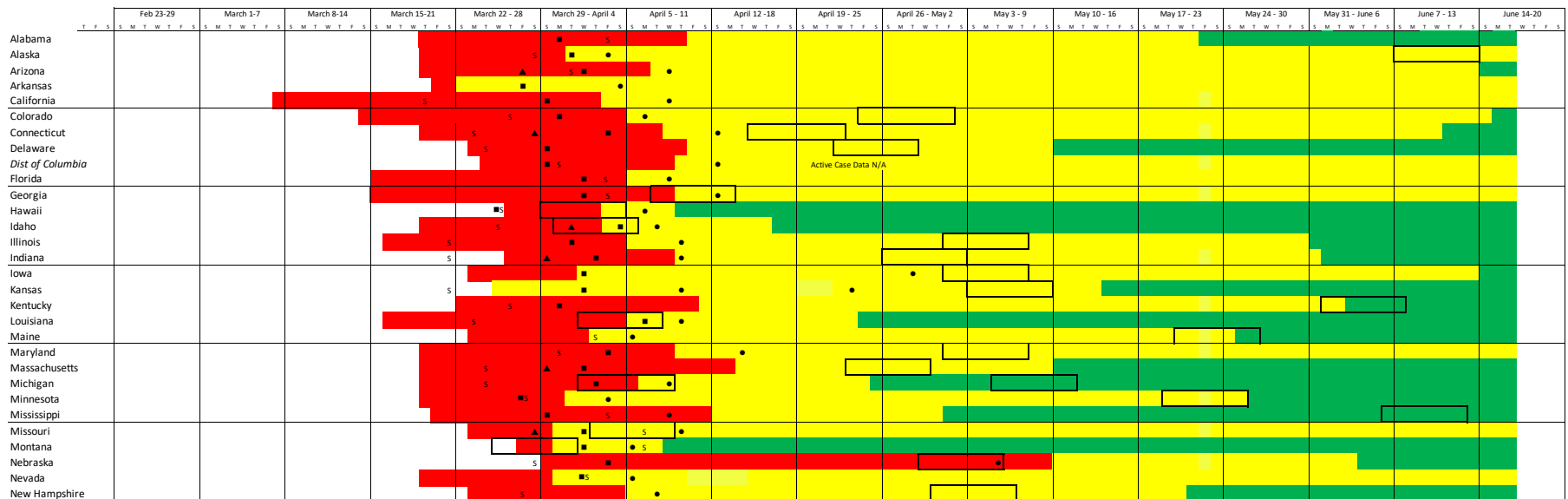
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The graphic on the following two pages illustrates when the state first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were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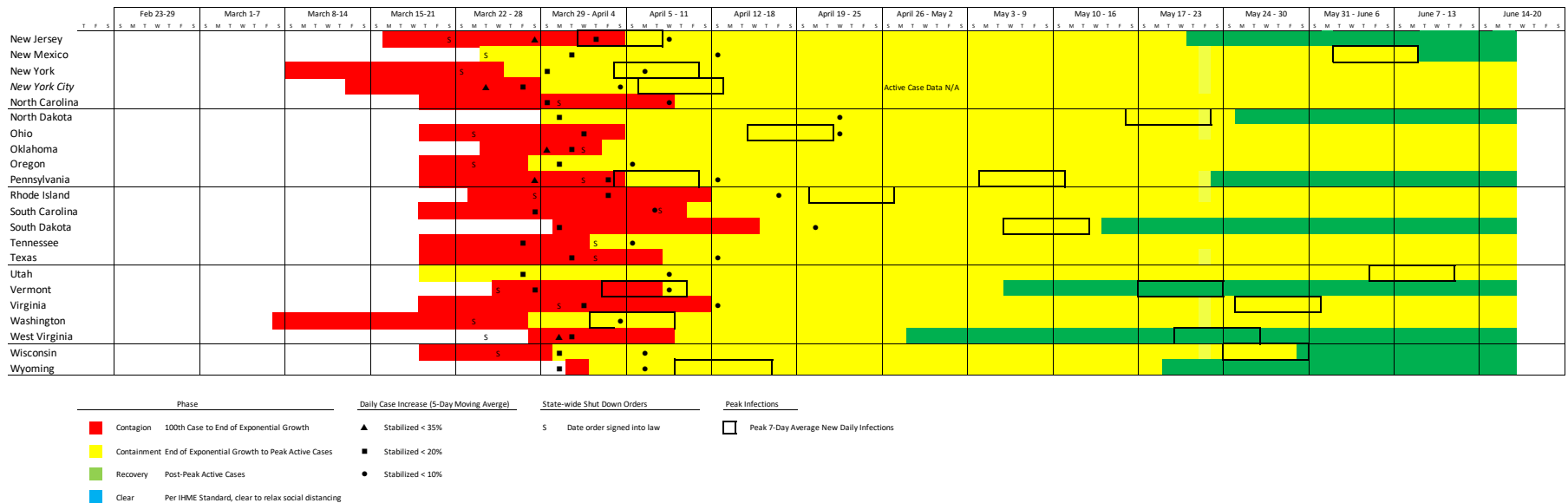


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State-by-State Virus Progression – 2 of 2

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STATE TEST, INFECTION AND CASE TRENDS

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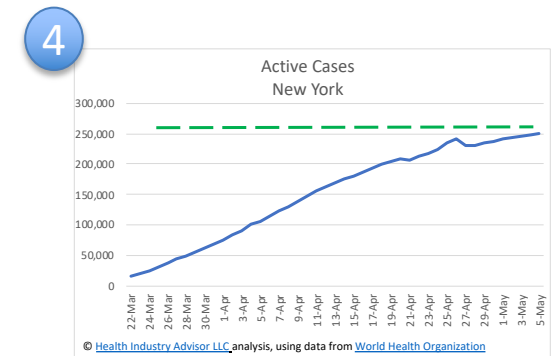
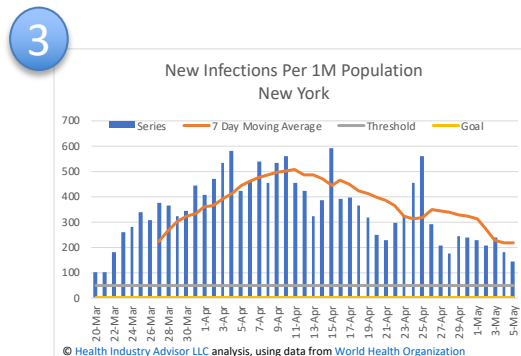
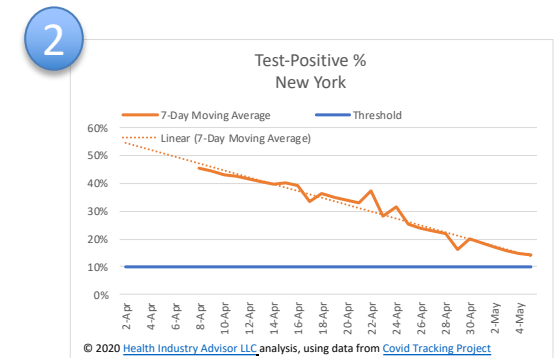
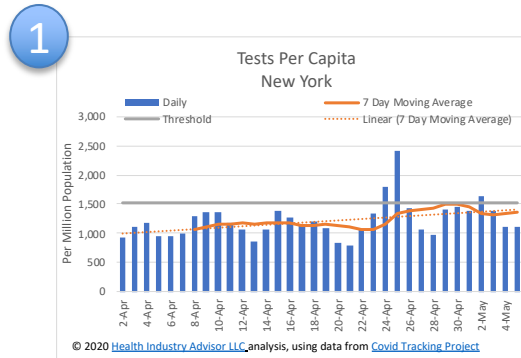
Graphics relevant to judging how far a state has progressed against the virus are provided on the following pages for:

- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina

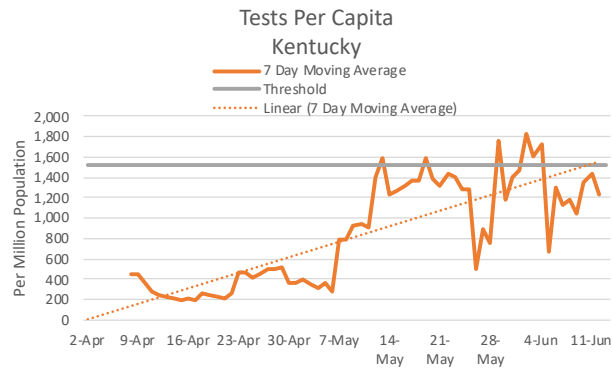
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How to "read" these charts:

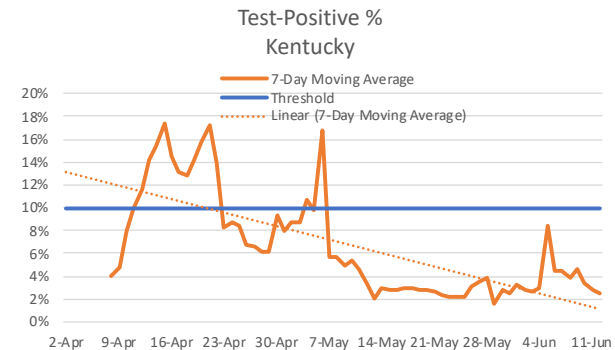
- Chart 1 – Desire to see tests per capita:
 - Above the threshold
 - Increasing or stable
- Chart 2 - Desire to see Test-Positive %:
 - Below the threshold
 - Declining or stable
- Chart 3 - Desire to see New Infections Per Capita:
 - Below the threshold
 - Declining or stable
- Chart 4 - Desire to see Active Cases:
 - Declining



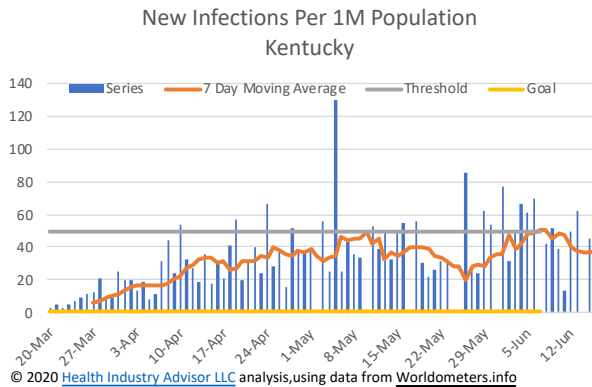
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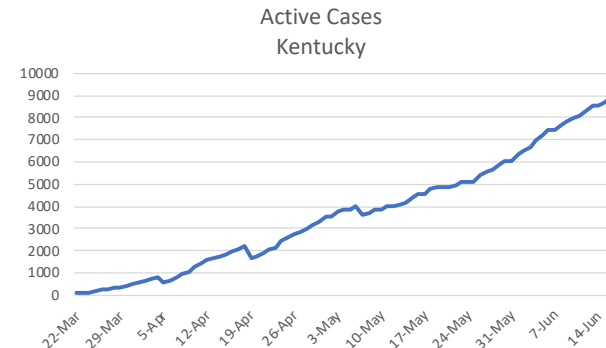
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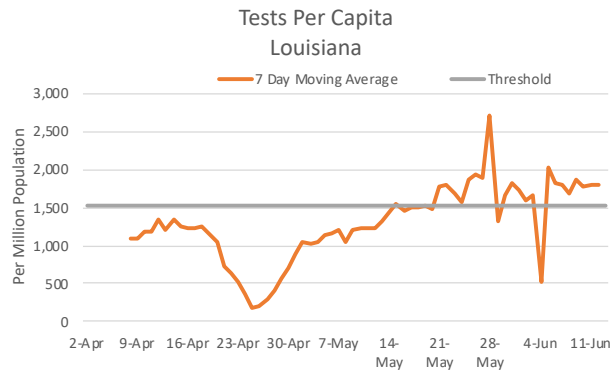
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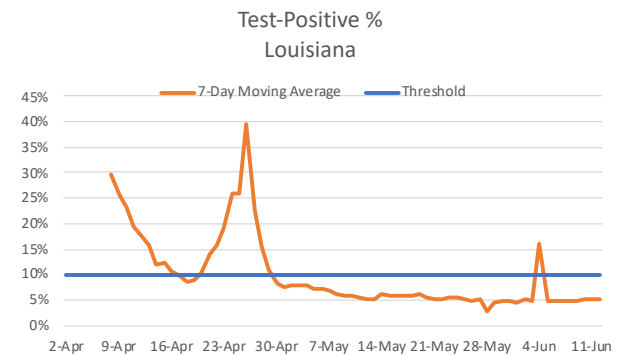
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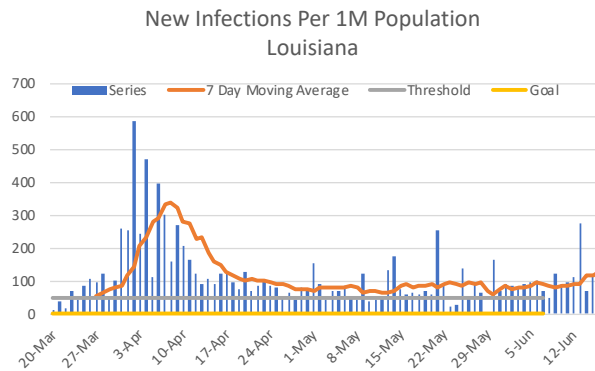
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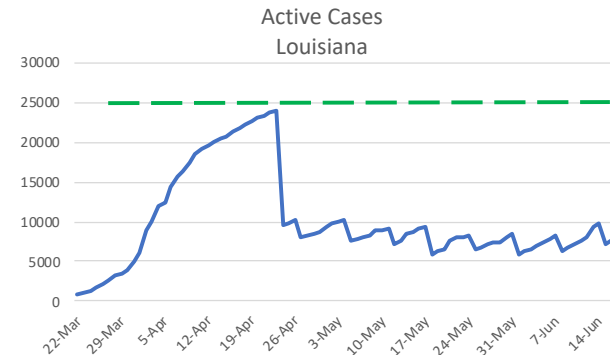
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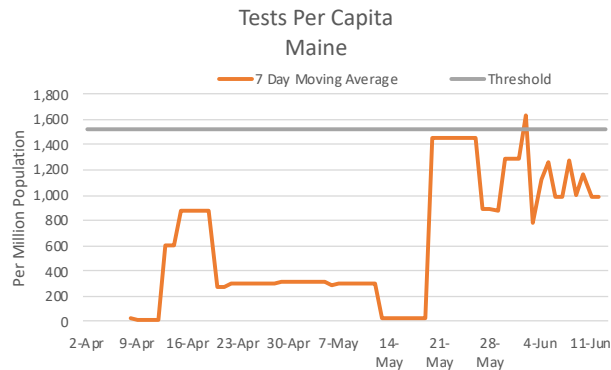


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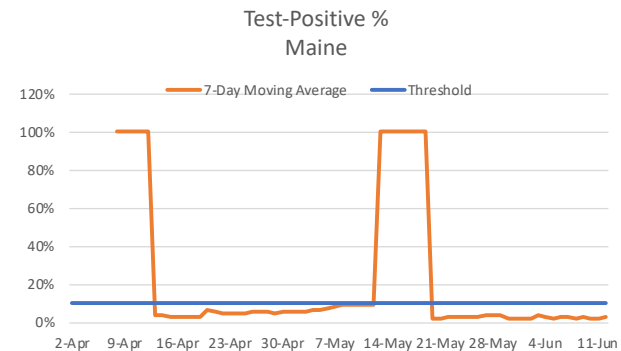


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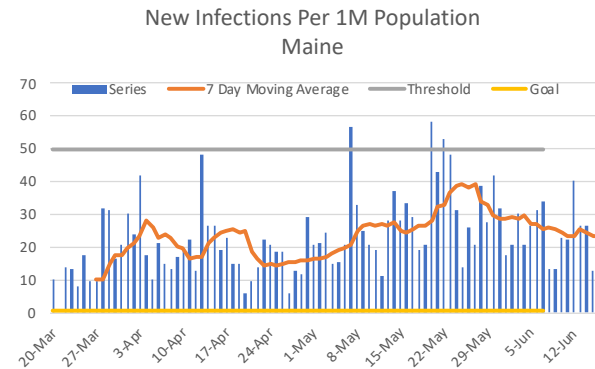
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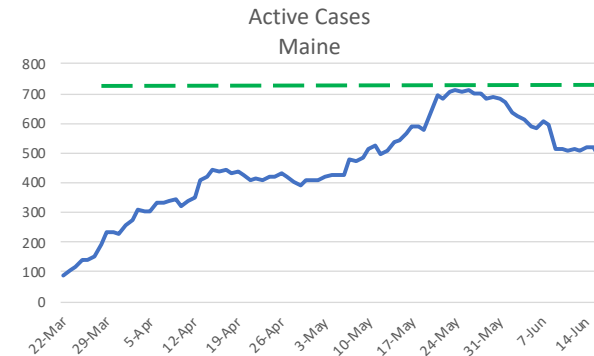
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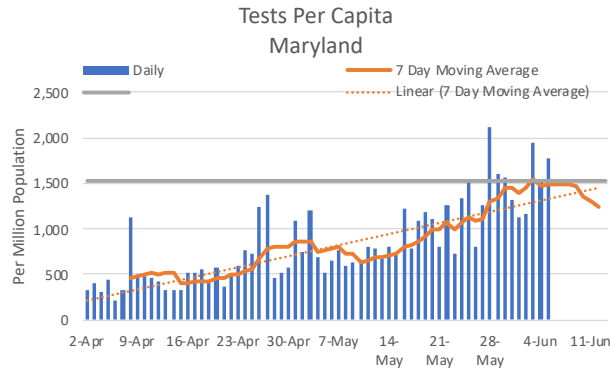


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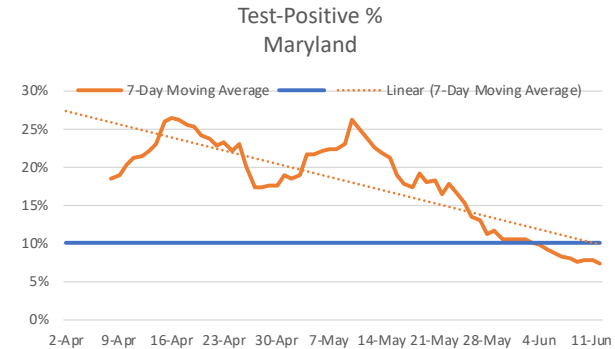


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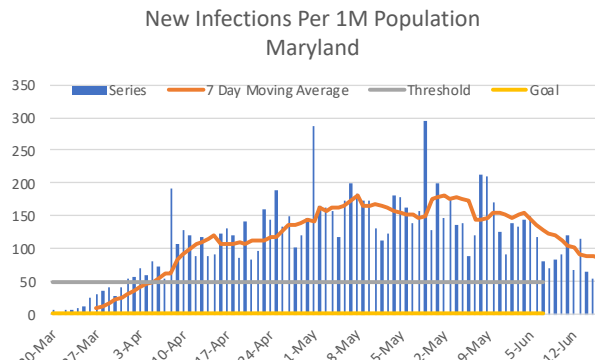
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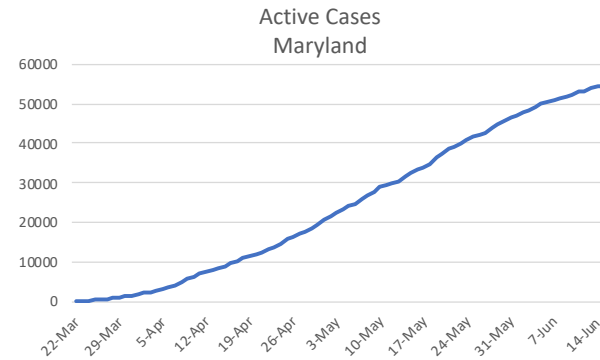
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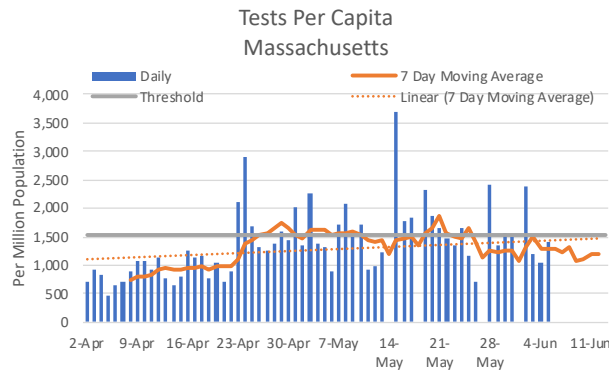


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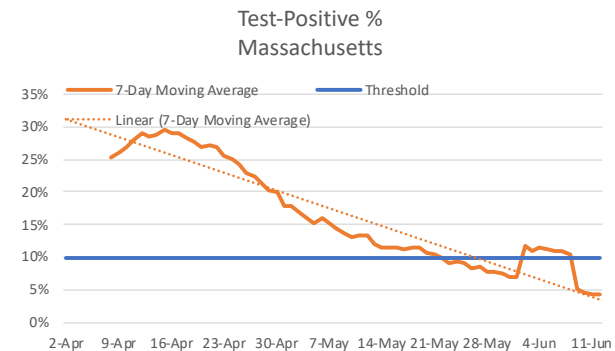


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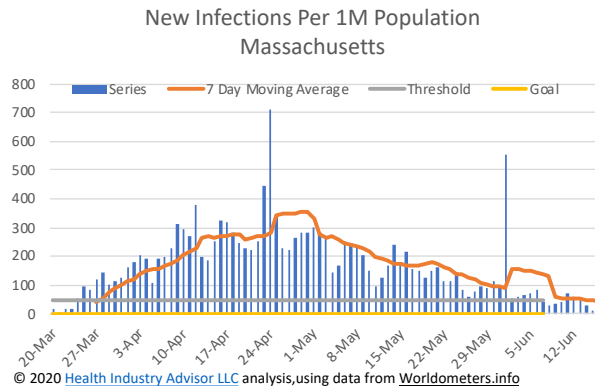
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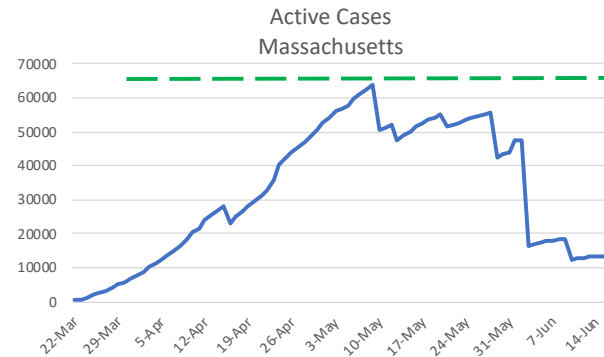
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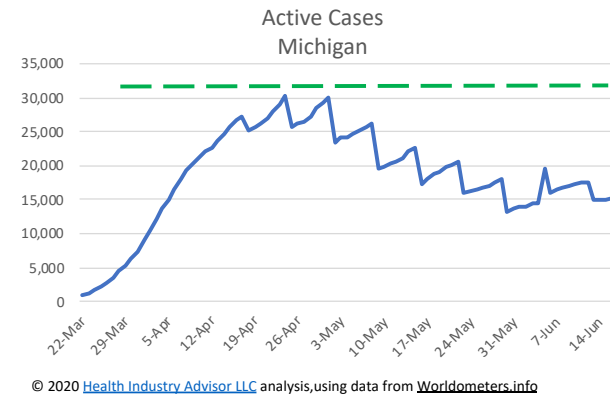
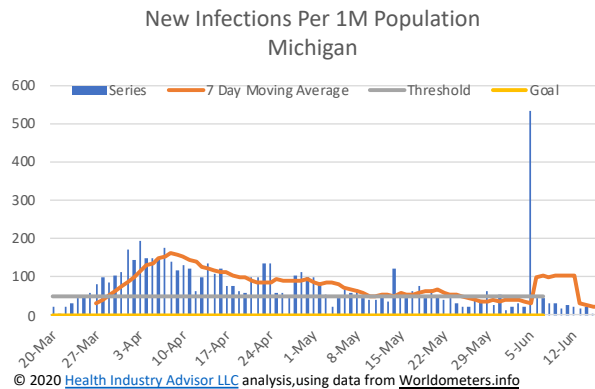
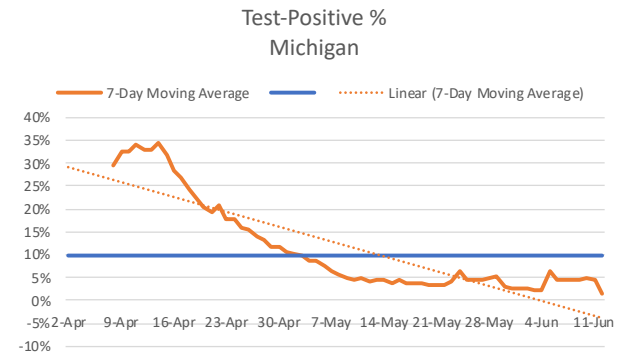
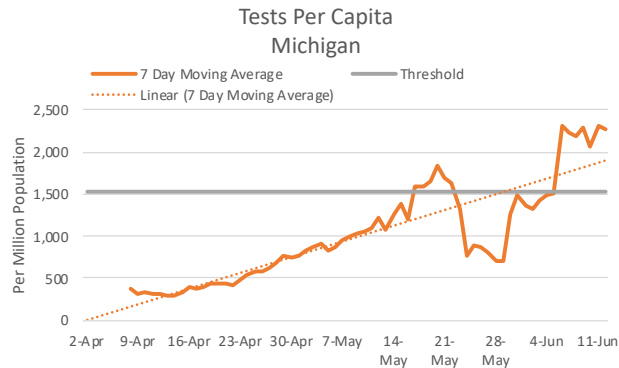
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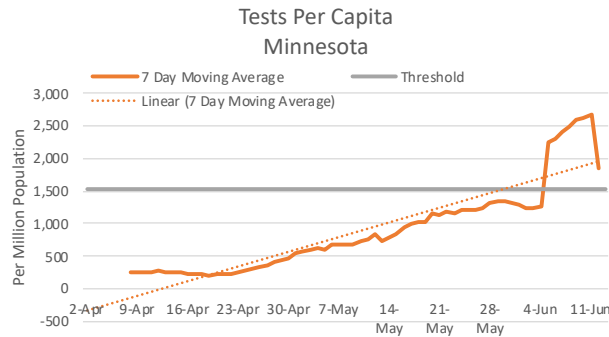
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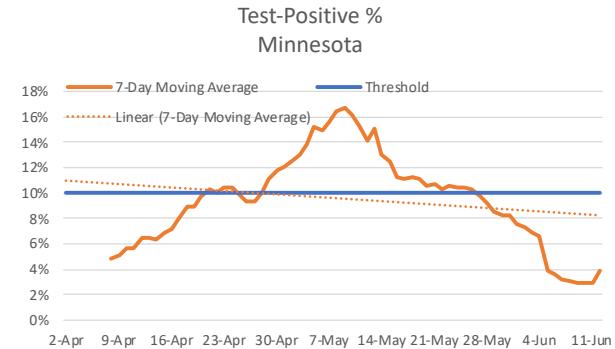
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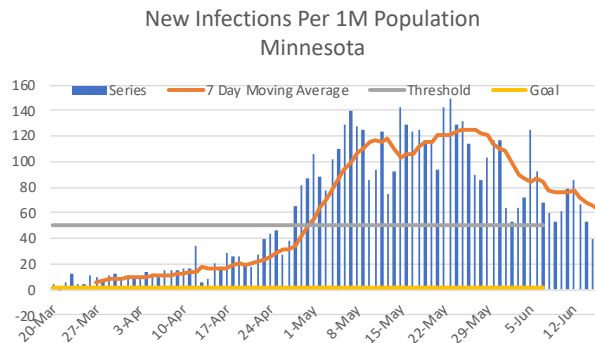
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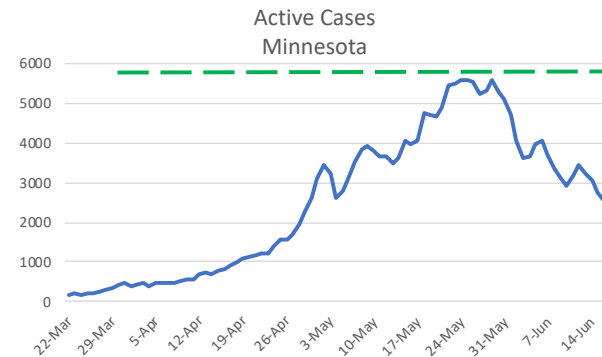
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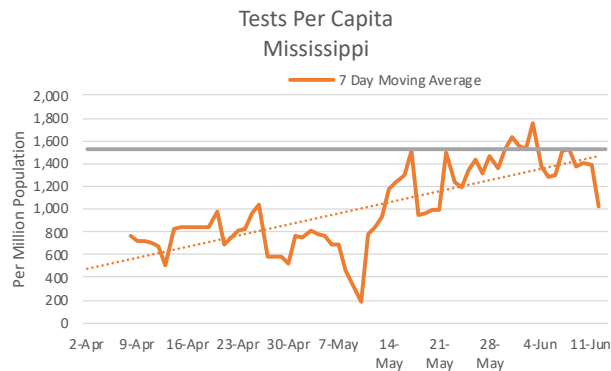


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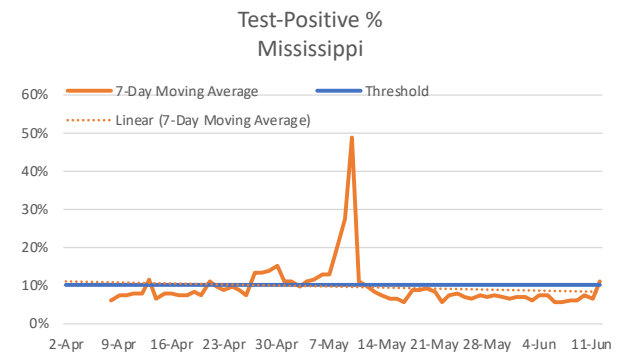


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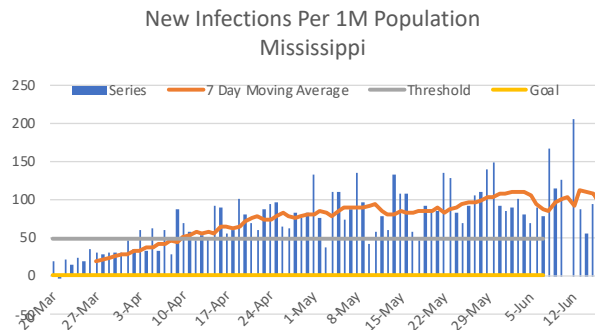
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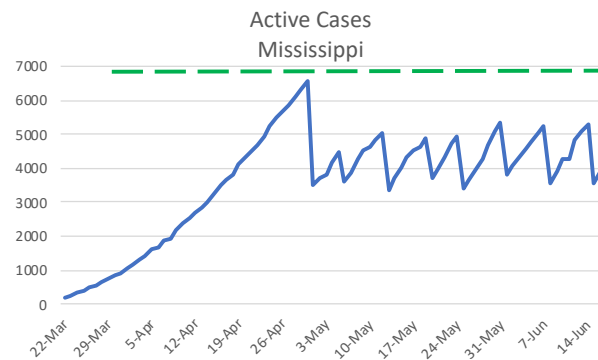
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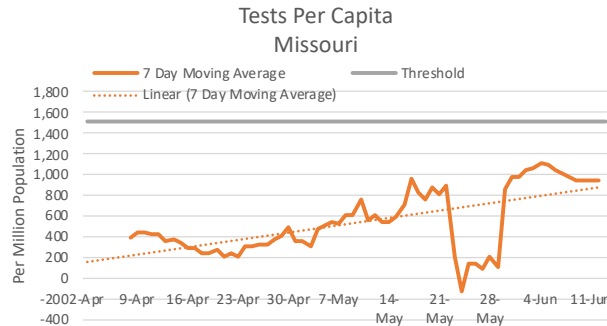
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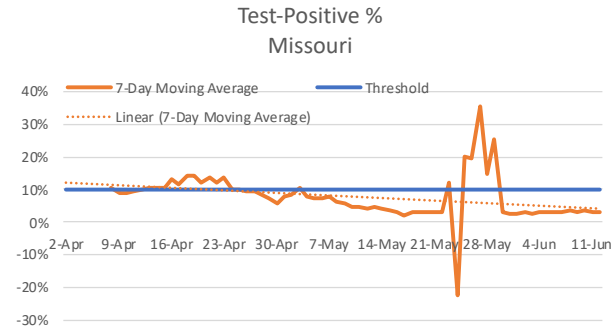
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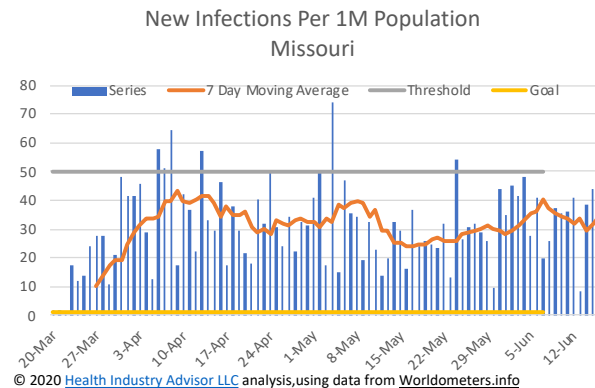
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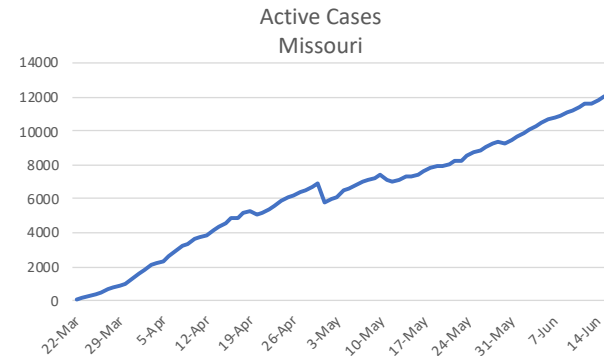
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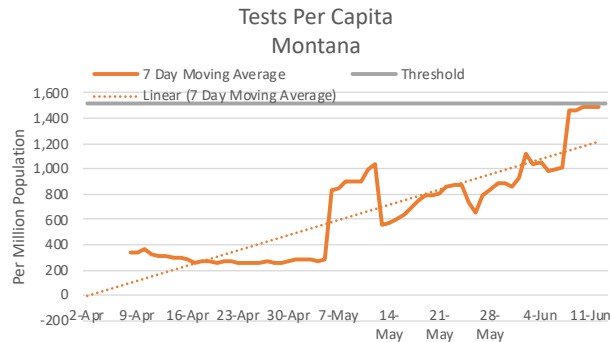


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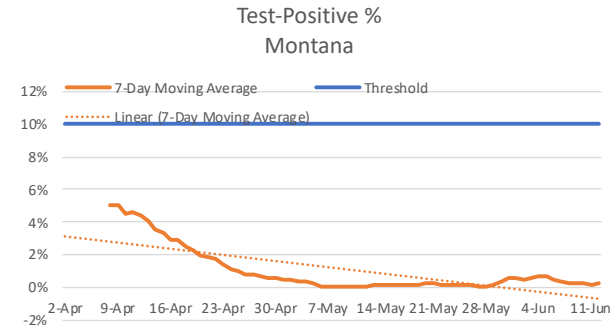


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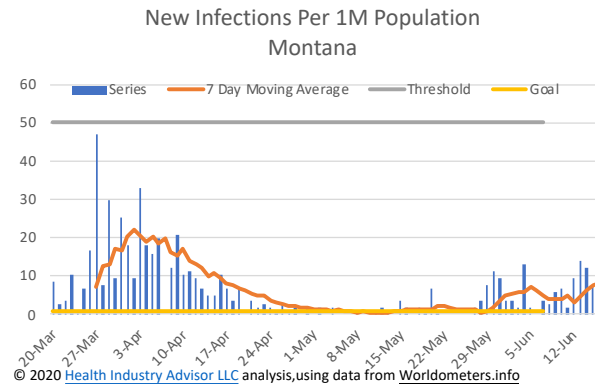
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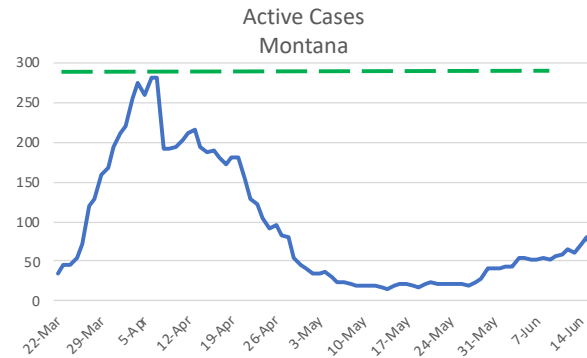
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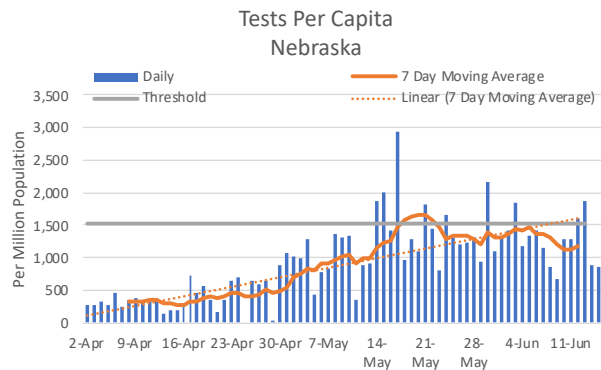


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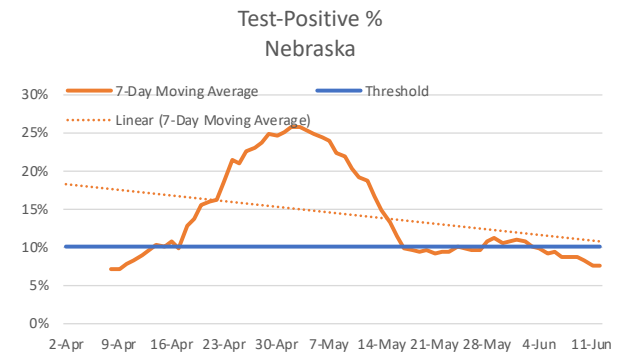


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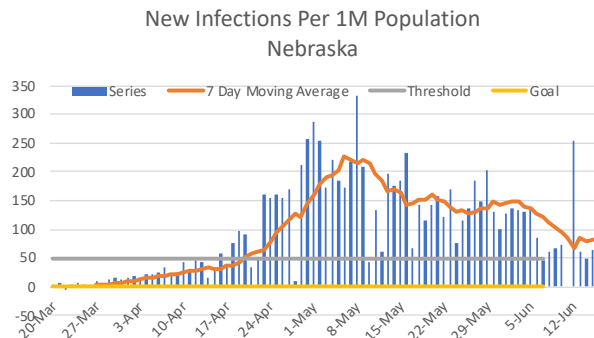
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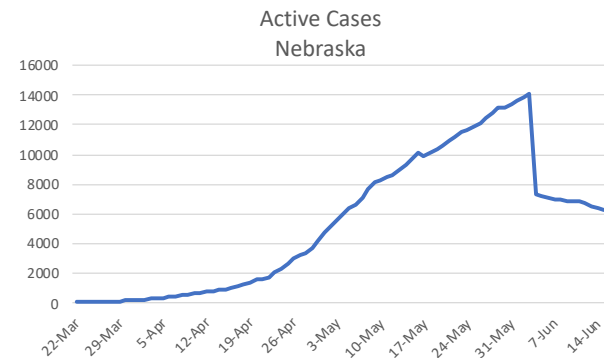
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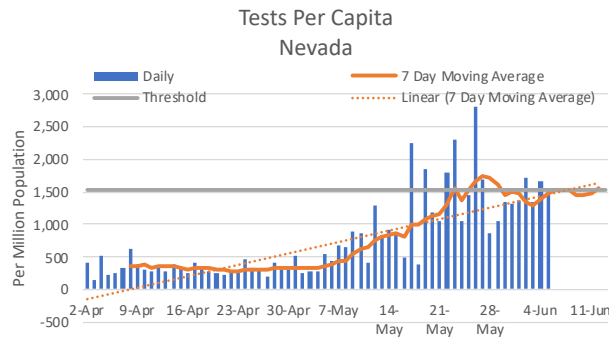


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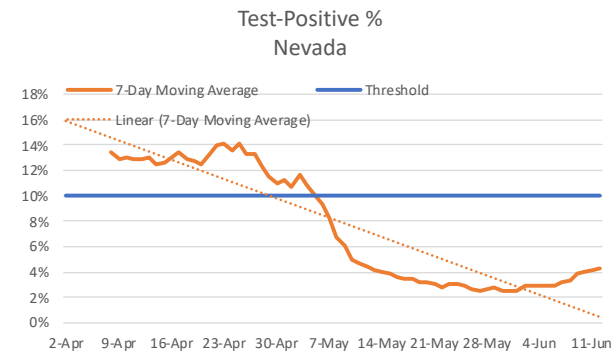


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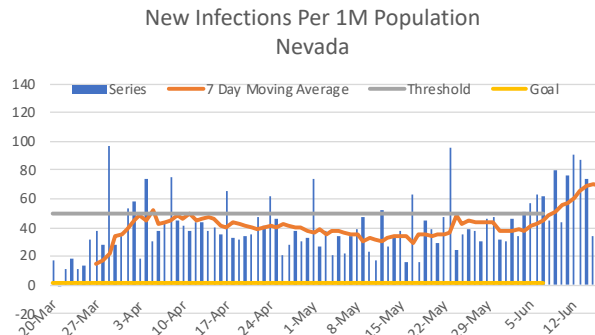
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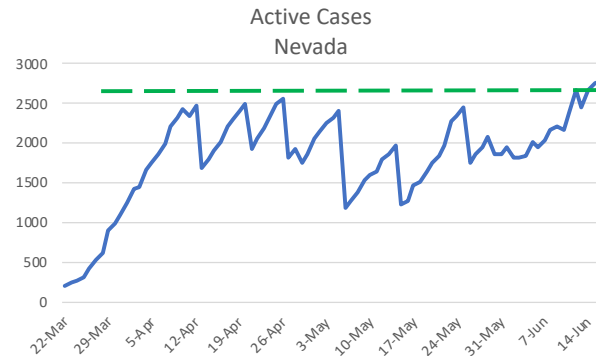
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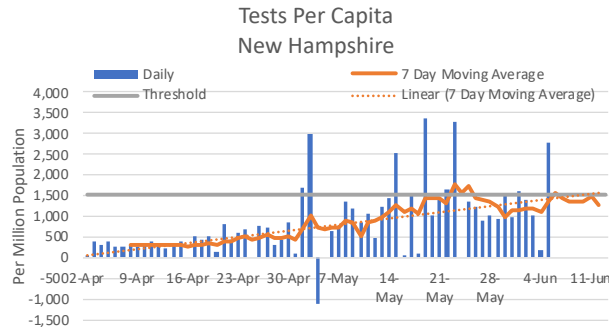


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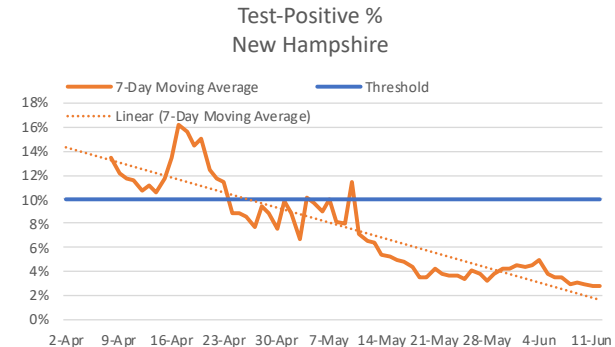


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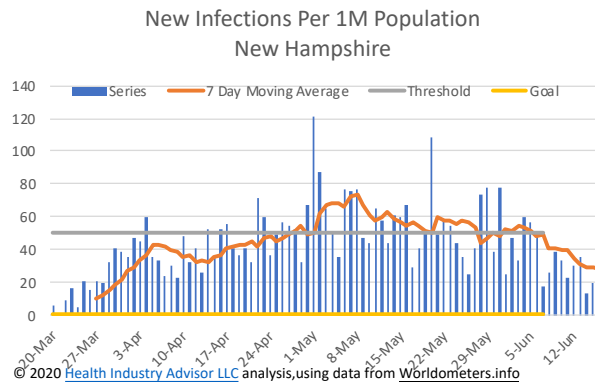
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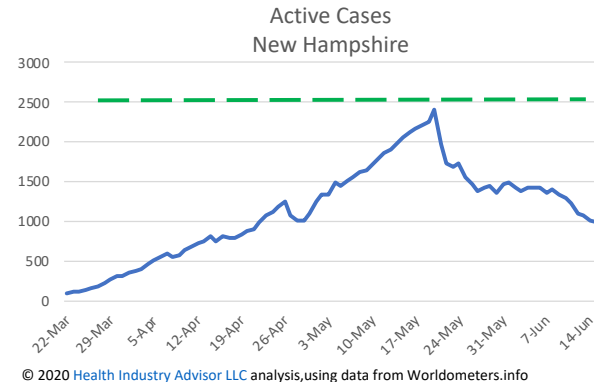
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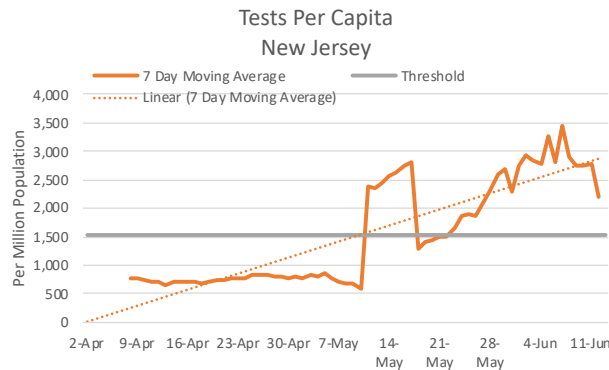
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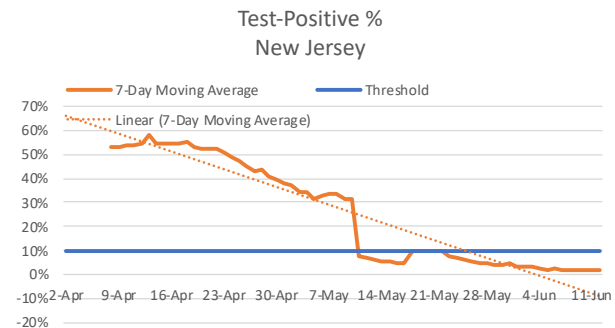
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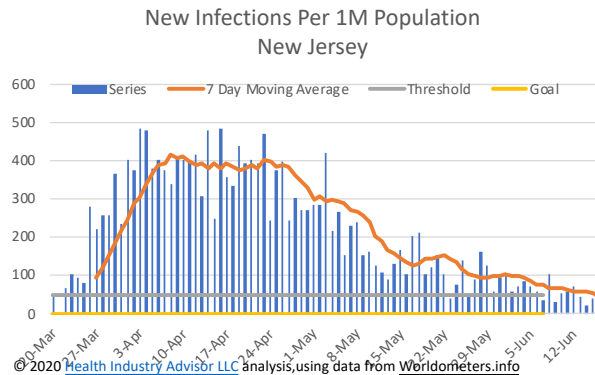
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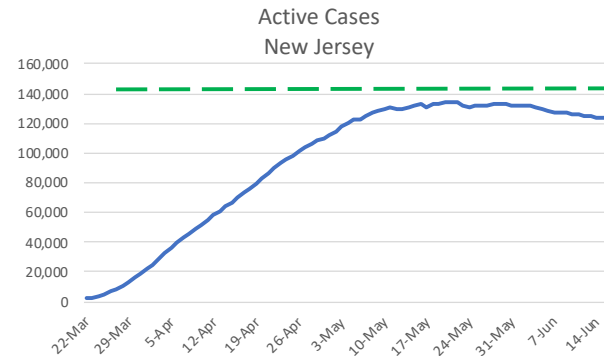
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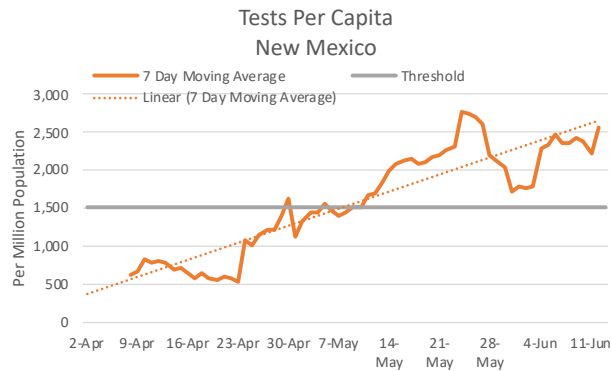
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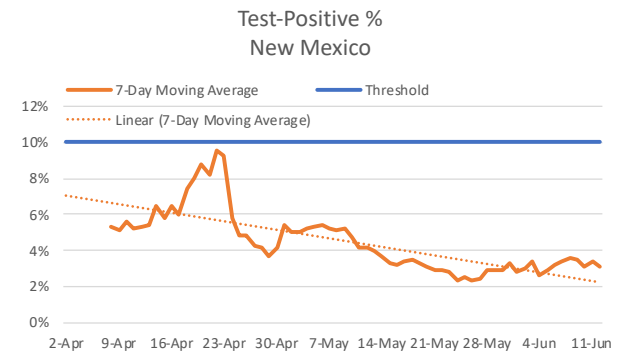
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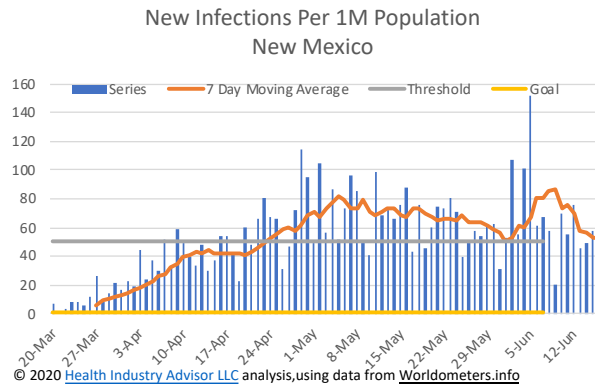
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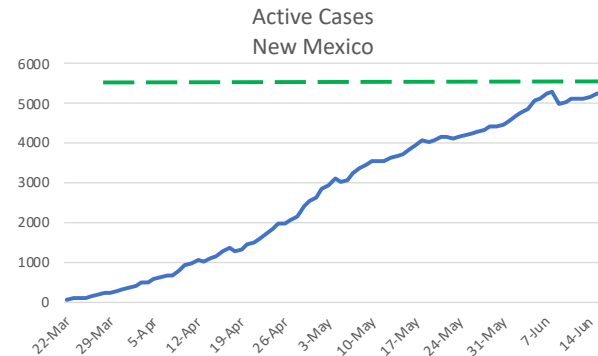
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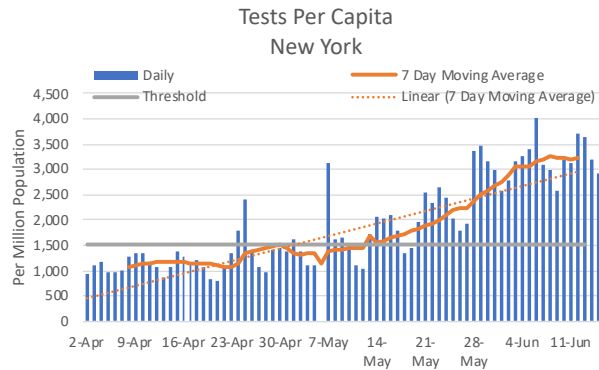
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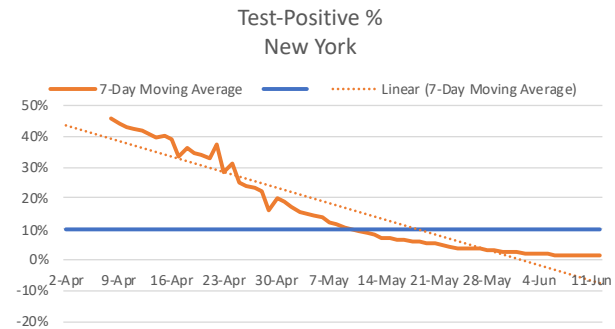
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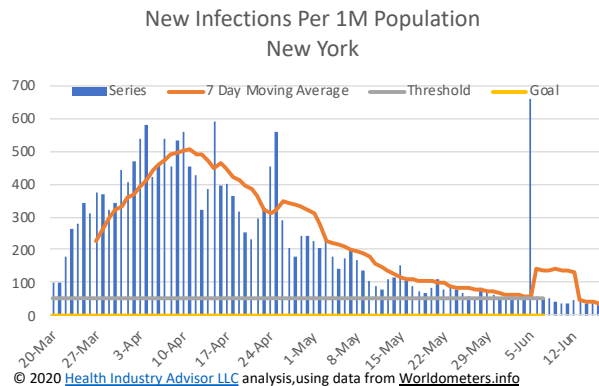
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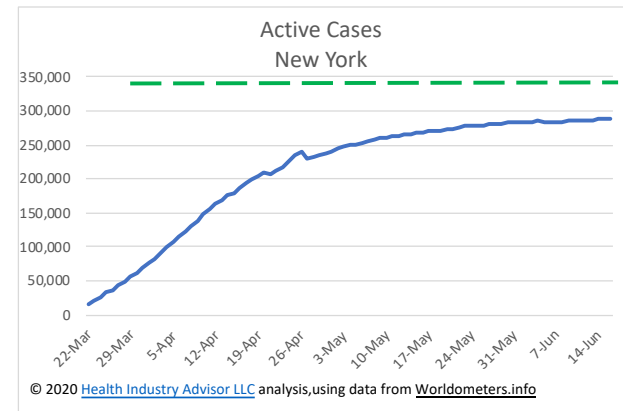
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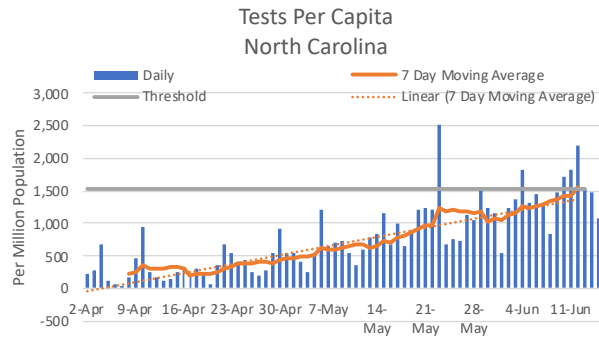


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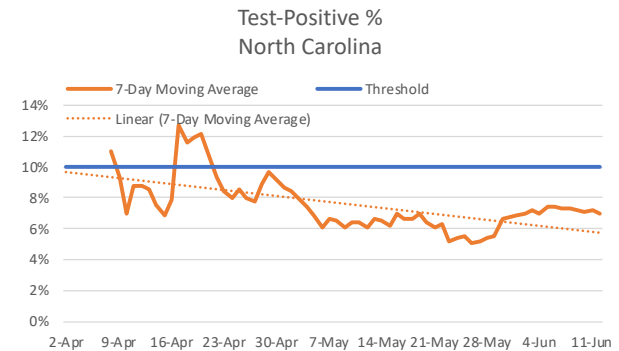


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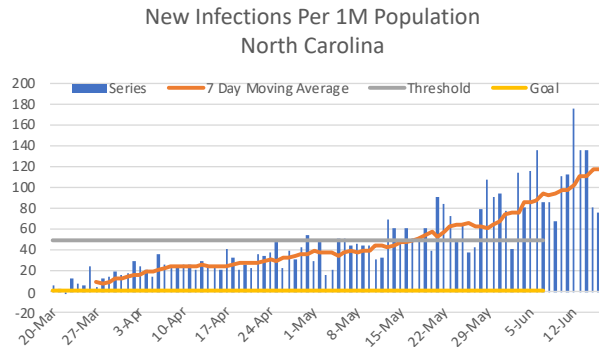
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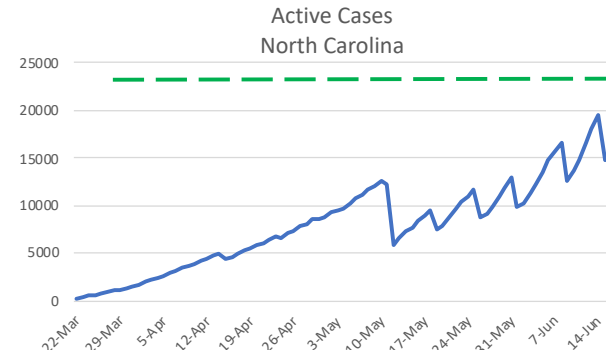
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