Health Industry Advisor, llc

"Strategic Guidance in an Era of Unprecedented Change"

COVID-19 Dashboard

Issue # 73

Friday, June 12, 2020

Day's Highlights

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	420,000 on Wednesday
Test-Positivity Rate	Decline	5.0% test-positive past 2 days; 4.6% for past 7 days
Number of Cases	Plateau	New Cases down 6.5% week-over-week (after adjusting for accounting changes)
Deaths % of Total Cases	Decline	<5.6%
Number of Deaths / 1M Population	Plateau	347.8
Recoveries : Death	Increase	7.02

- Yesterday's news media and financial markets were full of concern about rising infection rates in the United States, particularly in Florida and Texas. As you read here yesterday, we didn't fully share the concern. We believed the issue was concentrated in a few states but, not necessarily Florida and Texas and, that the overall picture was encouraging. Today, we re-enforce this message:
  - Case growth continues to slow, with the average cases per capita for the past 5 days increasing less than 1% per day - this is the lowest rate recorded since the pandemic started
  - Adjusting for the accounting changes made last Friday by New York and Michigan, new cases are 6.4% lower this week versus last week
  - Deaths per case fell slightly again yesterday to 5.55%, continuing its steady decline that began on May 20, when the rate was 5.96%. This lower rate represents ~8,500 fewer deaths from the virus
- Yesterday's market concern seemed to be focused on Florida and Texas. We find this focus somewhat mis-placed. Using a methodology that incorporates rates of: current infections, test-positive %, and COVID-19 hospitalized patients, we judge Alabama, Arizona, Arkansas, North Carolina and Utah to be of "High" concern; California, Florida, Georgia, Maryland, Mississippi, Nebraska, Nevada, South Carolina, South Dakota and Texas are deemed of "Moderately High" concern. The remaining states are deemed either "Moderate" or "Low" concern (see graphic on page 30)
- Internationally, India moved past both the United Kingdom and Spain, and now has the 4th most total cases; Sweden moved past the Netherlands into 24th place. Qatar continues to have the most cases per capita. Among countries of 1 million or more residents, the highest number of cases per capita (in order) are: Qatar, Bahrain, Kuwait, Singapore and Peru. Belgium, United Kingdom, Spain, Italy and Sweden have the most deaths per capita among the countries with 1 million or more residents

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

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Country-by-Country

Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

Top 30 Countries By Total Cases
As of June 11

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	2,089,701	(1)	6,315	(5)	116,034	(1)	5.6%	(12)	350.7	(8)	1.0%	(18)	1,512	(6)	61.1	(9)
Brazil	805,649	(2)	3,792	(13)	41,058	(3)	5.1%	(13)	193.2	(11)	3.6%	(7)	254	(21)	124.3	(4)
Russia	502,436	(3)	3,443	(14)	6,532	(13)	1.3%	(25)	44.8	(18)	1.8%	(14)	2,097	(3)	60.0	(10)
India	298,283	(4)	216	(29)	8,501	(11)	2.8%	(18)	6.2	(28)	3.9%	(5)	100	(24)	7.5	(25)
UK	291,409	(5)	4,294	(10)	41,279	(2)	14.2%	(4)	608.2	(2)	0.5%	(23)	2,599	(2)	19.3	(18)
Spain	289,787	(6)	6,198	(6)	27,136	(6)	9.4%	(8)	580.4	(3)	0.1%	(29)	1,227	(8)	6.0	(26)
Italy	236,142	(7)	3,905	(12)	34,167	(4)	14.5%	(3)	565.1	(4)	0.1%	(28)	932	(11)	4.4	(28)
Peru	214,788	(8)	6,519	(4)	6,109	(14)	2.8%	(19)	185.4	(12)	2.3%	(11)	635	(15)	139.8	(3)
Germany	186,795	(9)	2,230	(20)	8,851	(9)	4.7%	(15)	105.7	(15)	0.1%	(27)	588	(16)	2.6	(29)
Iran	180,156	(10)	2,146	(21)	8,584	(10)	4.8%	(14)	102.3	(16)	1.2%	(17)	261	(20)	25.6	(15)
Turkey	174,023	(11)	2,065	(22)	4,763	(17)	2.7%	(20)	56.5	(17)	0.6%	(21)	493	(19)	11.4	(22)
France	155,561	(12)	2,383	(19)	29,346	(5)	18.9%	(1)	449.6	(6)	0.2%	(25)	0	(30)	5.9	(27)
Chile	154,092	(13)	8,065	(2)	2,648	(20)	1.7%	(23)	138.6	(13)	3.8%	(6)	1,005	(10)	275.8	(2)
Mexico	129,184	(14)	1,003	(23)	15,357	(7)	11.9%	(6)	119.2	(14)	3.3%	(9)	73	(26)	29.7	(13)
Pakistan	119,536	(15)	542	(26)	2,356	(21)	2.0%	(22)	10.7	(26)	4.9%	(2)	107	(23)	23.2	(16)
Saudi Arabia	116,021	(16)	3,336	(15)	857	(26)	0.7%	(26)	24.6	(22)	3.3%	(10)	636	(14)	98.6	(5)
Canada	97,530	(17)	2,585	(17)	7,994	(12)	8.2%	(10)	211.9	(9)	0.5%	(22)	898	(12)	13.1	(21)
China	83,057	(18)	58	(30)	4,634	(18)	5.6%	(11)	3.2	(30)	0.0%	(30)	0	(28)	0.0	(30)
Bangladesh	78,052	(19)	474	(27)	1,049	(25)	1.3%	(24)	6.4	(27)	4.4%	(3)	86	(25)	18.3	(19)
Qatar	75,071	(20)	26,737	(1)	69	(29)	0.1%	(29)	24.6	(23)	2.2%	(12)	1,715	(5)	561.0	(1)
Belgium	59,711	(21)	5,153	(8)	9,636	(8)	16.1%	(2)	831.6	(1)	0.2%	(26)	1,027	(9)	11.0	(23)
South Africa	58,568	(22)	988	(24)	1,284	(24)	2.2%	(21)	21.7	(24)	5.0%	(1)	500	(18)	42.5	(12)
Belarus	51,816	(23)	5,483	(7)	293	(27)	0.6%	(28)	31.0	(19)	1.6%	(15)	1,414	(7)	86.0	(7)
Sweden	48,288	(24)	4,783	(9)	4,814	(16)	10.0%	(7)	476.8	(5)	1.9%	(13)	700	(13)	87.2	(6)
Netherlands	48,251	(25)	2,816	(16)	6,044	(15)	12.5%	(5)	352.8	(7)	0.4%	(24)	561	(17)	10.7	(24)
Colombia	45,212	(26)	889	(25)	1,488	(22)	3.3%	(17)	29.3	(20)	3.5%	(8)	235	(22)	28.3	(14)
Ecuador	44,440	(27)	2,521	(18)	3,720	(19)	8.4%	(9)	211.0	(10)	0.8%	(20)	71	(27)	19.4	(17)
UAE	40,986	(28)	4,147	(11)	286	(28)	0.7%	(27)	28.9	(21)	1.4%	(16)	6,302	(1)	55.0	(11)
Egypt	39,726	(29)	389	(28)	1,377	(23)	3.5%	(16)	13.5	(25)	4.0%	(4)	0	(28)	13.9	(20)
Singapore	39,387	(30)	6,735	(3)	25	(30)	0.1%	(30)	4.3	(29)	1.0%	(19)	1,958	(4)	63.6	(8)

Note: China does not report test volumes

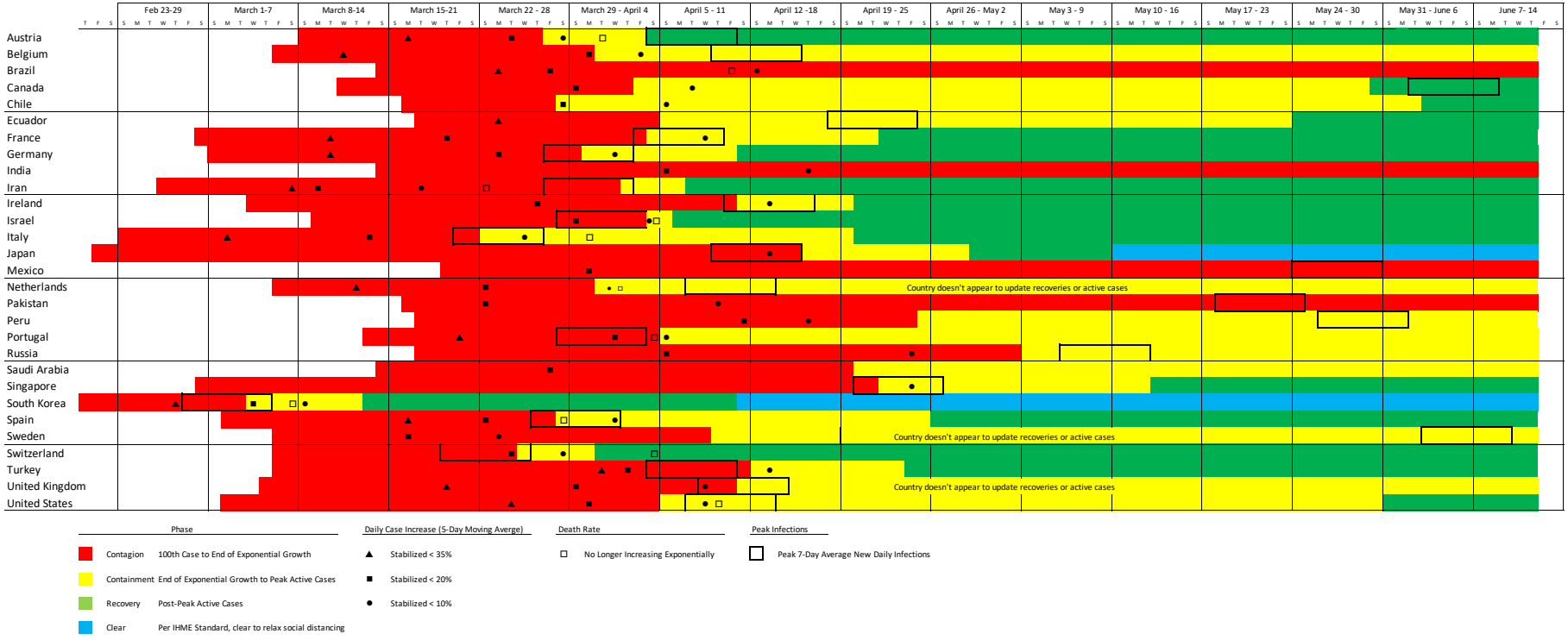
VIRUS PROGRESSION BY COUNTRY

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.



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"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:

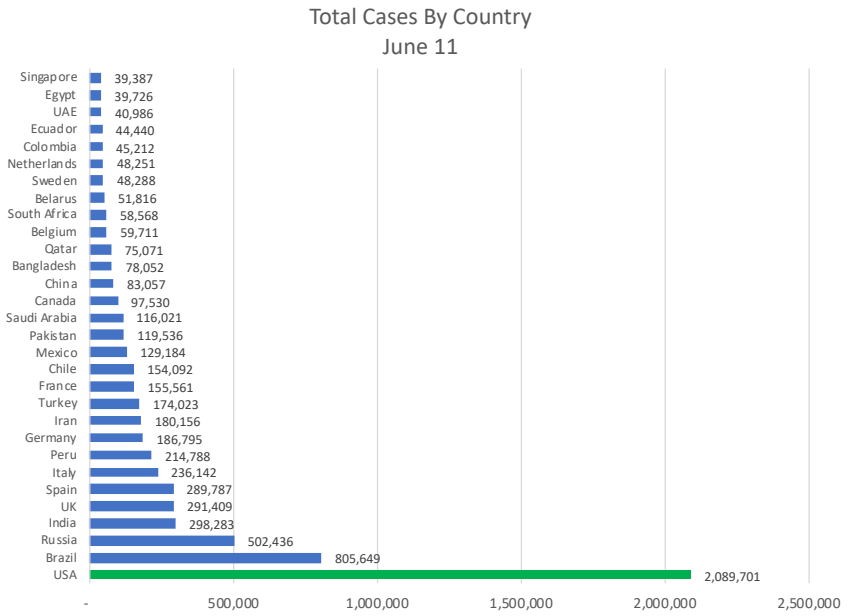
- **Afghanistan**
- **Argentina**
- **Bangladesh**
- **Belarus**
- **Columbia**
- **Denmark**
- **Dominican Republic**
- **Indonesia**
- **Kuwait**
- **Poland**
- **Qatar**
- **Panama**
- **Philippines**
- **Romania**
- **South Africa**
- **UAE**
- **Ukraine**

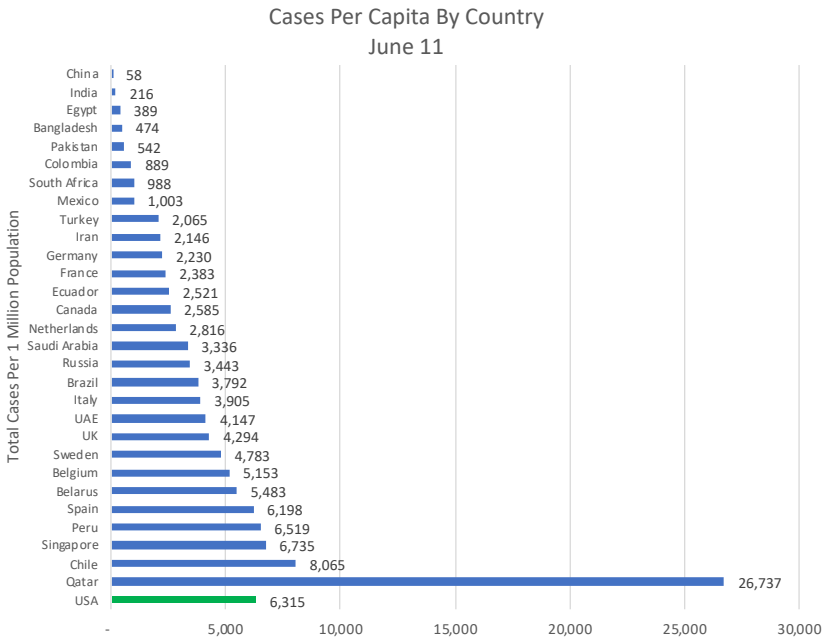
The original 30 still account for 86.0% of all cases worldwide.

		Total Cases						
Rank	Country	11-Jun	Rank	Country	6-May	Rank	Country	27-Apr
1	USA	2,089,701	1	USA	1,263,092	1	USA	1,010,356
2	Brazil	805,649	2	Spain	253,682	2	Spain	229,422
3	Russia	502,436	3	Italy	214,457	3	Italy	199,414
4	India	298,283	4	UK	201,101	4	France	128,339
5	UK	291,409	5	France	174,191	5	Germany	158,758
6	Spain	289,787	6	Germany	168,162	6	UK	157,149
7	Italy	236,142	7	Russia	165,929	7	Turkey	112,261
8	Peru	214,788	8	Turkey	131,744	8	Iran	91,472
9	Germany	186,795	9	Brazil	126,611	9	Russia	87,147
10	Iran	180,156	10	Iran	101,650	10	China	82,830
11	Turkey	174,023	11	China	82,883	11	Brazil	66,501
12	France	155,561	12	Canada	63,496	12	Canada	48,500
13	Chile	154,092	13	Peru	54,817	13	Belgium	46,687
14	Mexico	129,184	14	India	52,987	14	Netherlands	38,245
15	Pakistan	119,536	15	Belgium	50,781	15	India	29,451
16	Saudi Arabia	116,021	16	Netherlands	41,319	16	Switzerland	29,164
17	Canada	97,530	17	Saudi Arabia	31,938	17	Peru	28,669
18	China	83,057	18	Switzerland	30,060	18	Portugal	24,070
21	Belgium	59,711	19	Ecuador	29,420	19	Ecuador	23,240
24	Sweden	48,288	20	Portugal	26,182	20	Ireland	19,648
25	Netherlands	48,251	21	Mexico	26,025	21	Sweden	18,926
27	Ecuador	44,440	22	Sweden	23,918	22	Saudi Arabia	18,811
30	Singapore	39,387	23	Pakistan	23,214	23	Israel	15,555
31	Portugal	35,910	24	Chile	23,048	24	Austria	15,274
34	Switzerland	31,044	25	Ireland	22,248	25	Mexico	14,677
38	Ireland	25,238	26	Singapore	20,198	26	Singapore	14,423
45	Israel	18,569	29	Israel	16,310	27	Pakistan	13,915
46	Japan	17,292	31	Austria	15,684	28	Chile	13,813
47	Austria	17,034	32	Japan	15,253	29	Japan	13,614
56	S. Korea	11,947	38	S. Korea	10,806	35	South Korea	10,738
	Others	1,062,647		Others	356,176		Others	301,446
	World	7,583,908			3,817,382		World	3,062,515
	30 countries' share	86.0%			90.7%			90.2%

Cases & Cases Per Capita

Countries Ranked 1-30 In Total Cases





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Country-by-Country

Deaths Per Cases & Per Capita

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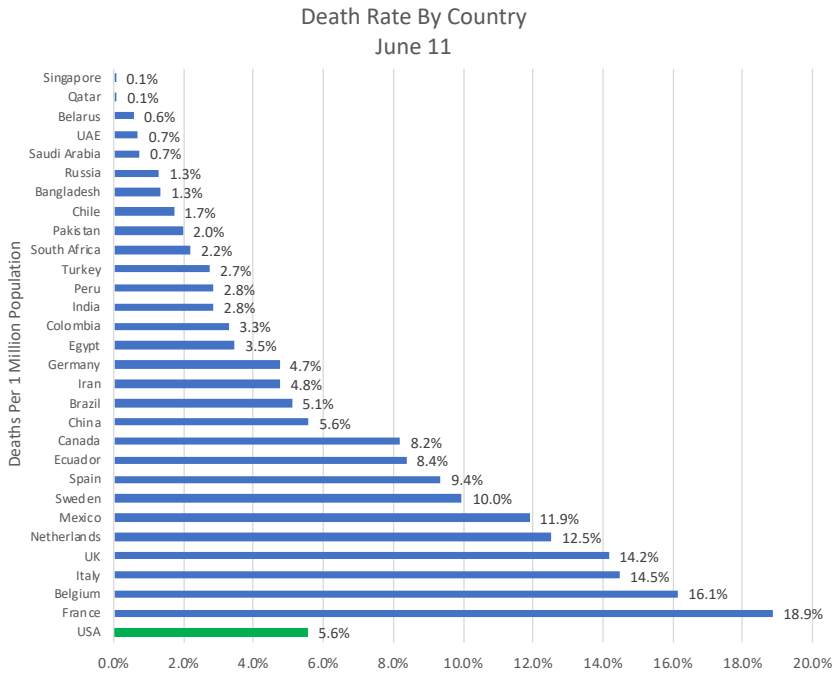
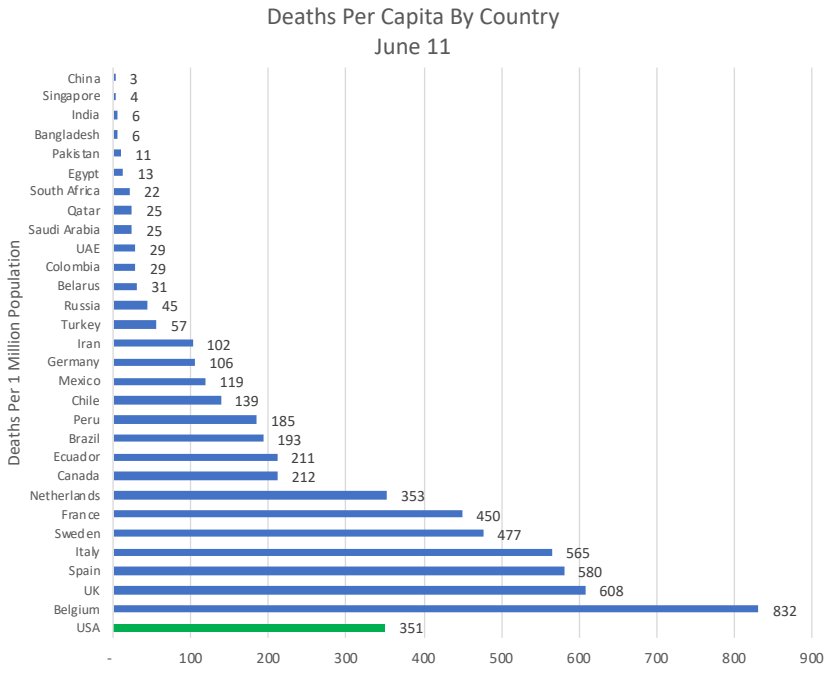
Countries Ranked 1-30 In Total Cases





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Country-by-Country

Daily Tests Per Capita & Daily Case Growth

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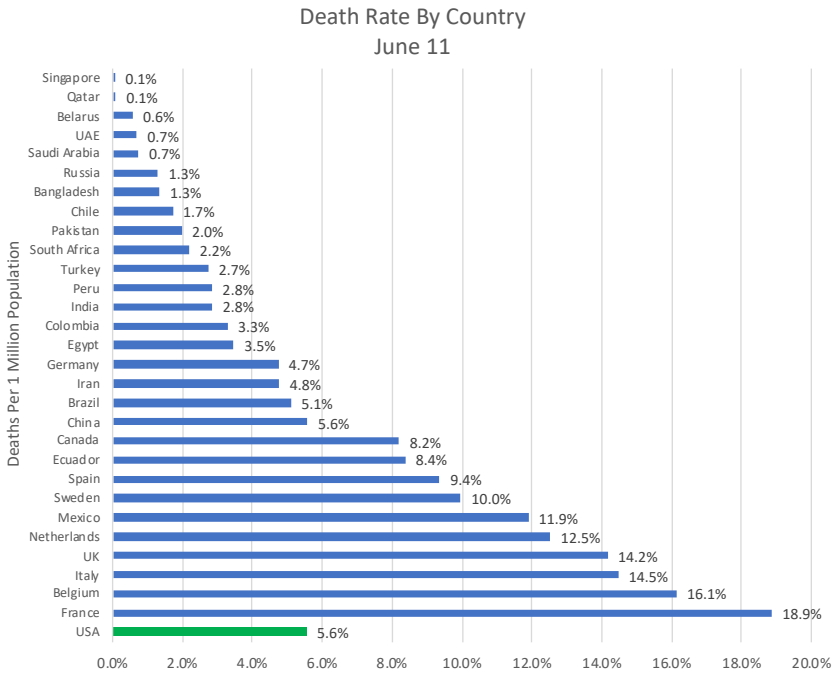
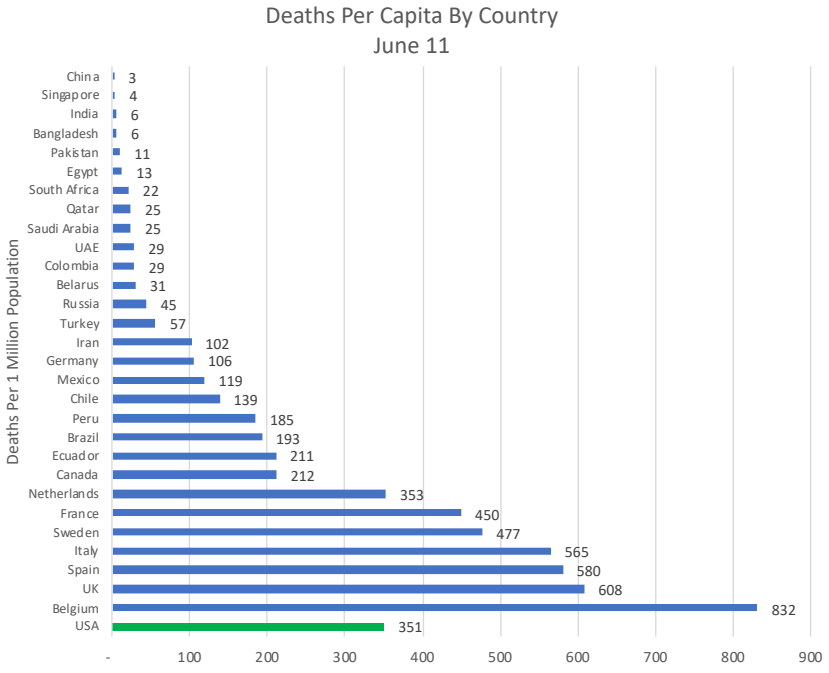
Countries Ranked 1-30 In Total Cases



Daily Tests Per Capita For Past Week

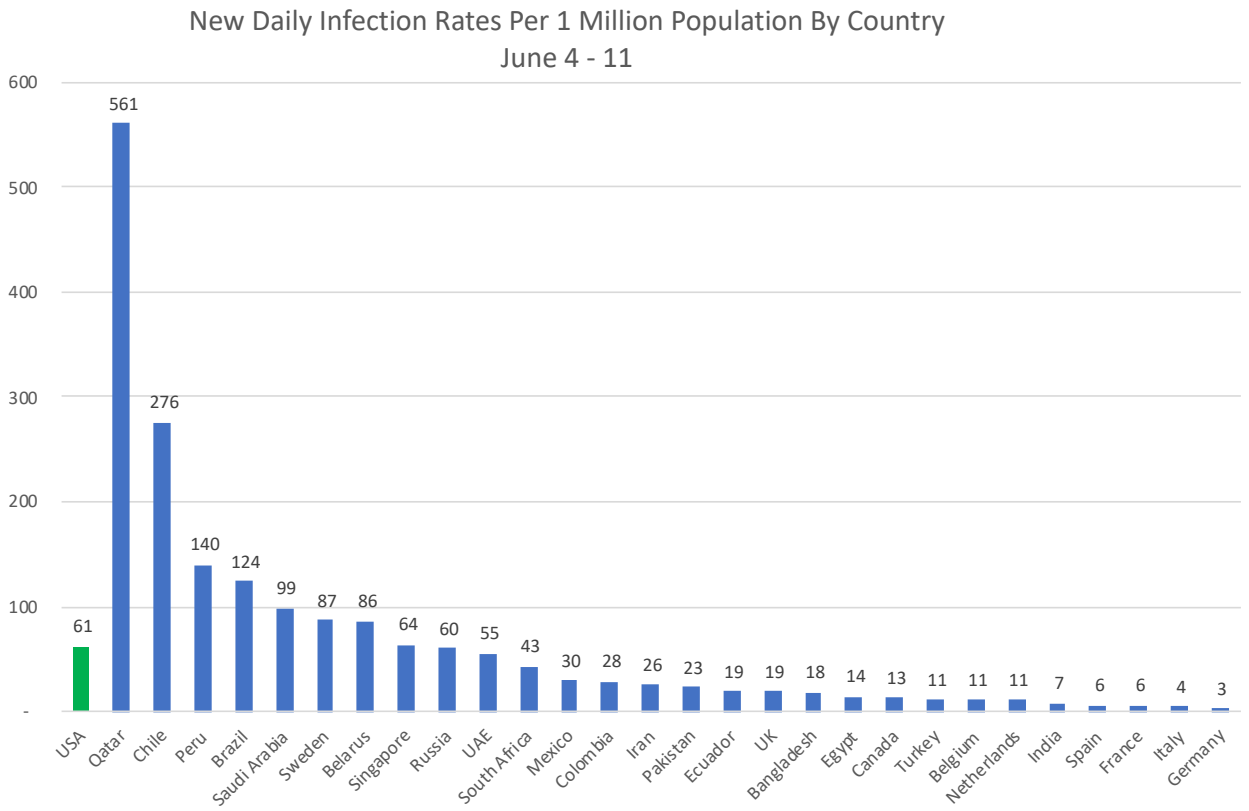


Daily Case Growth – 5-Day Moving Average

Country-by-Country

New Daily Infection Rates

"Strategic Guidance in an Era of Unprecedented Change"



UNITED STATES & STATE-BY-STATE INFORMATION

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State-by-State

Comparative Statistics- Page 1 of 2

"Strategic Guidance in an Era of Unprecedented Change"

As of June 11

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	22,845	(24)	4,659.2	(22)	755	(25)	3.3%	(33)	154.0	(25)	2.7%	(4)	1,268	(27)	109.9	(4)
Alaska	610	(50)	833.9	(49)	11	(51)	1.8%	(45)	15.0	(50)	2.6%	(6)	1,741	(10)	18.9	(48)
Arizona	31,264	(18)	4,295.3	(24)	1,127	(20)	3.6%	(30)	154.8	(24)	4.2%	(1)	1,174	(34)	167.0	(1)
Arkansas	10,816	(34)	3,584.0	(33)	171	(40)	1.6%	(47)	56.7	(43)	3.5%	(2)	1,618	(13)	113.2	(3)
California	143,505	(3)	3,631.9	(32)	4,941	(7)	3.4%	(32)	125.0	(29)	2.2%	(10)	1,500	(16)	74.8	(16)
Colorado	28,647	(20)	4,974.5	(21)	1,583	(16)	5.5%	(11)	274.9	(15)	0.6%	(43)	822	(44)	31.9	(39)
Connecticut	44,461	(14)	12,470.5	(6)	4,146	(8)	9.3%	(1)	1,162.9	(3)	0.3%	(50)	1,620	(12)	49.0	(33)
Delaware	10,106	(36)	10,378.3	(7)	414	(34)	4.1%	(27)	425.2	(12)	0.5%	(46)	1,192	(32)	52.8	(30)
District Of Columbia	9,589	(37)	13,587.0	(5)	502	(29)	5.2%	(13)	711.3	(6)	0.7%	(39)	1,658	(11)	94.9	(11)
Florida	69,069	(8)	3,215.8	(37)	2,851	(11)	4.1%	(25)	132.7	(28)	1.9%	(11)	1,328	(24)	59.1	(27)
Georgia	54,973	(11)	5,177.6	(20)	2,375	(14)	4.3%	(24)	223.7	(18)	1.4%	(17)	1,183	(33)	69.0	(19)
Hawaii	692	(49)	488.7	(51)	17	(50)	2.5%	(42)	12.0	(51)	0.6%	(44)	672	(50)	3.7	(50)
Idaho	3,302	(43)	1,842.6	(44)	86	(44)	2.6%	(40)	48.0	(45)	1.0%	(30)	822	(45)	19.8	(46)
Illinois	130,603	(4)	10,306.6	(8)	6,185	(5)	4.7%	(17)	488.1	(9)	0.6%	(42)	1,590	(14)	65.9	(23)
Indiana	38,748	(17)	5,755.6	(18)	2,380	(13)	6.1%	(9)	353.5	(13)	0.9%	(32)	894	(42)	56.3	(28)
Iowa	22,979	(23)	7,283.2	(12)	640	(27)	2.8%	(39)	202.8	(20)	1.4%	(18)	1,522	(15)	98.4	(9)
Kansas	10,903	(33)	3,742.5	(31)	243	(37)	2.2%	(44)	83.4	(38)	0.8%	(35)	769	(46)	33.9	(38)
Kentucky	11,945	(32)	2,673.7	(40)	493	(30)	4.1%	(26)	110.3	(32)	1.1%	(25)	1,444	(21)	39.6	(34)
Louisiana	44,472	(13)	9,566.4	(10)	2,992	(9)	6.7%	(7)	643.6	(7)	0.9%	(34)	1,797	(9)	89.4	(13)
Maine	2,667	(45)	1,984.1	(42)	100	(42)	3.7%	(29)	74.4	(40)	1.1%	(27)	984	(38)	23.5	(44)
Maryland	60,197	(10)	9,957.0	(9)	2,875	(10)	4.8%	(16)	475.5	(11)	0.9%	(33)	1,308	(26)	102.5	(7)
Massachusetts	104,667	(5)	15,061.1	(3)	7,492	(3)	7.2%	(6)	1,078.1	(4)	0.3%	(49)	1,195	(31)	53.5	(29)
Michigan	65,449	(9)	6,553.5	(13)	5,985	(6)	9.1%	(2)	599.3	(8)	0.5%	(47)	2,311	(5)	103.1	(6)
Minnesota	29,316	(19)	5,198.2	(19)	1,280	(18)	4.4%	(23)	227.0	(16)	1.3%	(19)	2,691	(4)	77.1	(15)
Mississippi	18,483	(26)	6,210.4	(16)	868	(23)	4.7%	(18)	291.7	(14)	1.6%	(14)	1,387	(23)	92.3	(12)

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State-by-State

Comparative Statistics- Page 2 of 2

"Strategic Guidance in an Era of Unprecedented Change"

As of June 11

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	15,891	(29)	2,589.2	(41)	878	(22)	5.5%	(12)	143.1	(27)	1.2%	(23)	940	(39)	31.9	(41)
Montana	563	(51)	526.8	(50)	18	(49)	3.2%	(35)	16.8	(49)	0.8%	(36)	1,488	(17)	3.2	(51)
Nebraska	16,025	(28)	8,284.2	(11)	195	(38)	1.2%	(50)	100.8	(34)	0.6%	(40)	1,138	(36)	67.1	(22)
Nevada	10,399	(35)	3,376.1	(36)	458	(31)	4.4%	(22)	148.7	(26)	1.9%	(12)	1,476	(18)	60.7	(24)
New Hampshire	5,209	(42)	3,831.0	(28)	308	(36)	5.9%	(10)	226.5	(17)	0.7%	(38)	1,465	(20)	35.0	(37)
New Jersey	168,204	(2)	18,937.2	(2)	12,552	(2)	7.5%	(5)	1,413.2	(2)	0.3%	(48)	2,783	(3)	59.3	(26)
New Mexico	9,367	(38)	4,467.2	(23)	420	(33)	4.5%	(21)	200.3	(21)	1.3%	(22)	2,218	(6)	69.1	(18)
New York	402,021	(1)	20,665.7	(1)	30,741	(1)	7.6%	(3)	1,580.2	(1)	0.2%	(51)	3,202	(1)	133.1	(2)
North Carolina	39,570	(16)	3,772.9	(29)	1,106	(21)	2.8%	(38)	105.5	(33)	2.7%	(5)	1,422	(22)	102.1	(8)
North Dakota	2,980	(44)	3,910.4	(27)	74	(45)	2.5%	(41)	97.1	(35)	1.1%	(26)	1,320	(25)	51.4	(31)
Ohio	40,032	(15)	3,424.7	(34)	2,490	(12)	6.2%	(8)	213.0	(19)	1.0%	(31)	921	(40)	31.9	(40)
Oklahoma	7,626	(39)	1,927.2	(43)	357	(35)	4.7%	(19)	90.2	(36)	1.6%	(15)	1,073	(37)	26.0	(42)
Oregon	5,237	(41)	1,241.7	(47)	171	(40)	3.3%	(34)	40.5	(47)	2.4%	(7)	762	(47)	25.8	(43)
Pennsylvania	81,936	(7)	6,400.3	(15)	6,205	(4)	7.6%	(4)	484.7	(10)	0.6%	(41)	702	(49)	39.1	(35)
Rhode Island	15,862	(30)	14,973.2	(4)	823	(24)	5.2%	(14)	776.9	(5)	0.5%	(45)	2,951	(2)	72.4	(17)
South Carolina	16,441	(27)	3,193.2	(38)	588	(28)	3.6%	(31)	114.2	(31)	3.4%	(3)	(22)	(51)	95.3	(10)
South Dakota	5,665	(40)	6,403.6	(14)	73	(46)	1.3%	(49)	82.5	(39)	1.1%	(28)	1,473	(19)	67.5	(20)
Tennessee	28,340	(21)	4,147.4	(25)	441	(32)	1.6%	(48)	64.5	(42)	1.7%	(13)	1,237	(28)	67.3	(21)
Texas	83,457	(6)	2,878.2	(39)	1,945	(15)	2.3%	(43)	67.1	(41)	2.2%	(9)	827	(43)	60.4	(25)
Utah	13,252	(31)	4,133.6	(26)	131	(41)	1.0%	(51)	40.9	(46)	2.4%	(8)	1,210	(29)	108.7	(5)
Vermont	1,110	(47)	1,778.9	(45)	55	(47)	5.0%	(15)	88.1	(37)	1.2%	(24)	2,146	(7)	19.2	(47)
Virginia	52,647	(12)	6,168.0	(17)	1,520	(17)	2.9%	(37)	178.1	(22)	1.3%	(21)	901	(41)	80.2	(14)
Washington	25,759	(22)	3,382.7	(35)	1,199	(19)	4.7%	(20)	157.5	(23)	1.0%	(29)	713	(48)	35.9	(36)
West Virginia	2,217	(46)	1,240.5	(48)	86	(44)	3.9%	(28)	48.1	(44)	0.7%	(37)	1,205	(30)	9.2	(49)
Wisconsin	21,926	(25)	3,765.8	(30)	682	(26)	3.1%	(36)	117.1	(30)	1.3%	(20)	1,882	(8)	49.9	(32)
Wyoming	1,009	(48)	1,743.4	(46)	18	(49)	1.8%	(46)	31.1	(48)	1.4%	(16)	1,143	(35)	21.7	(45)
United States	2,089,701		6,313.2		116,034		5.6%		329.7		1.0%		1,402		67.3	

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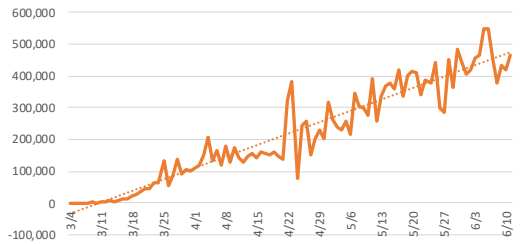
United States

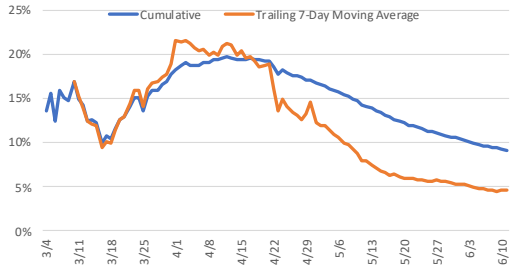
Overall Statistics

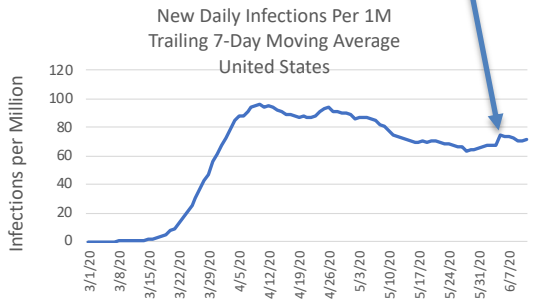
New York and Michigan made accounting adjustments to the case totals on June 5. These had the effect of adding 8.7 new daily infections per million to the US totals. Data here has not been adjusted to account for these accounting changes

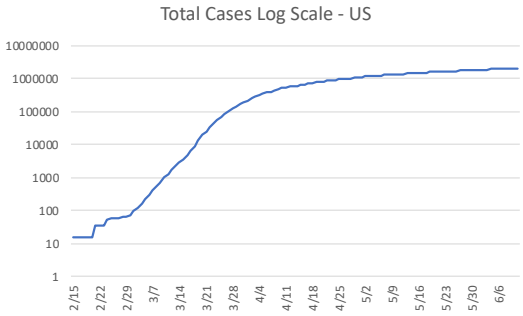
"Strategic Guidance in an Era of Unprecedented Change"

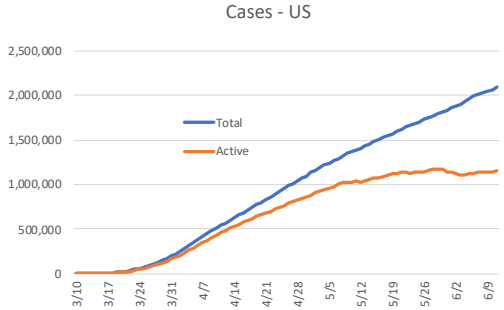
With significantly increased testing, the US is now meeting the WHO standard of <10% test-positives. This suggests that asymptomatic cases are being captured and that we have a better view of true infection rates.
Further, new daily infections continue to decline; the death rate seems to have stabilized.

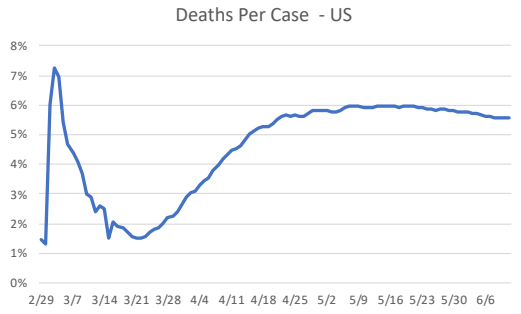












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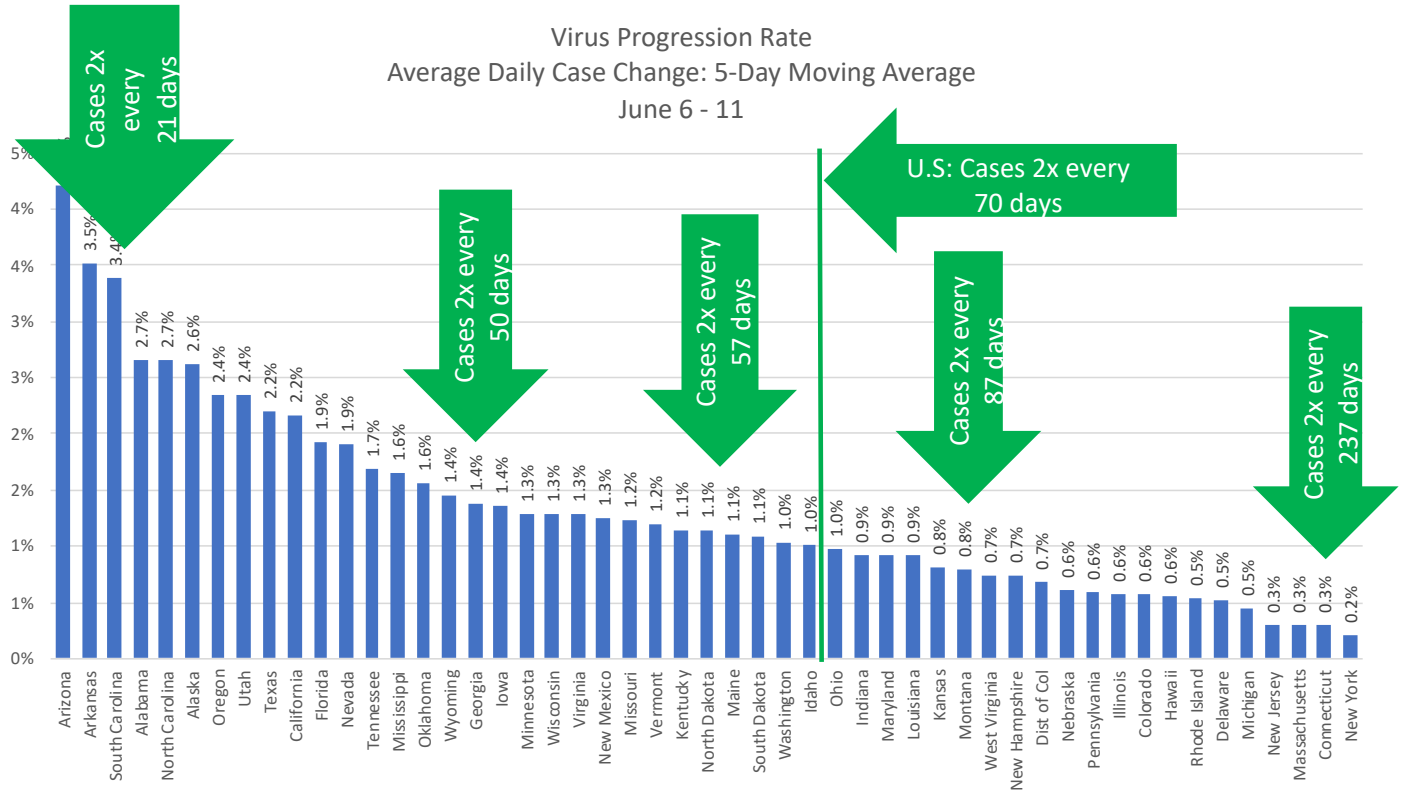
State-by-State

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 17 – 329 days to double



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State-by-State

New Daily Infections & Tests Per Capita

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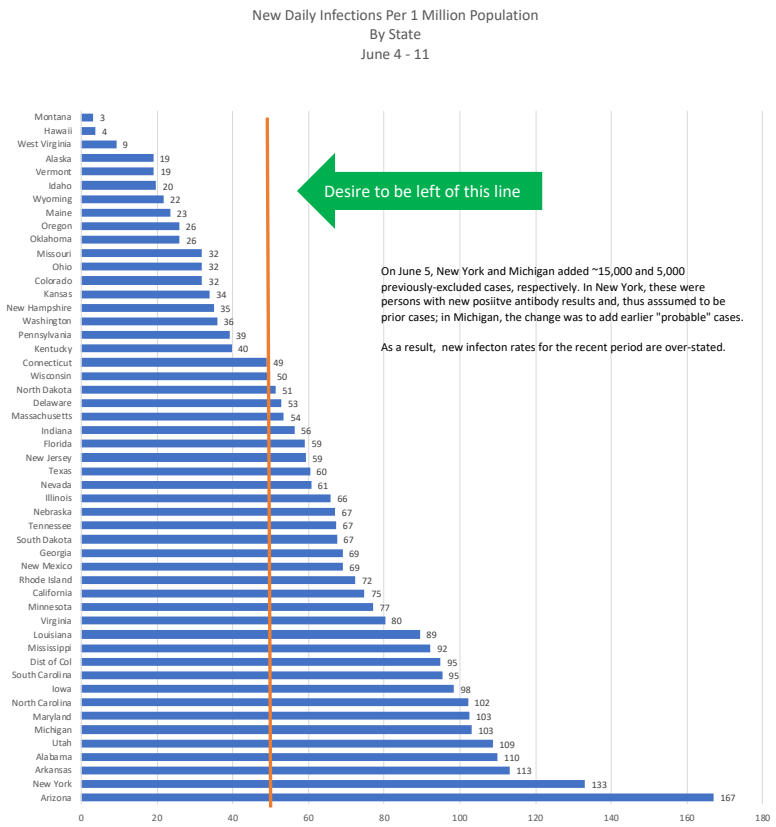
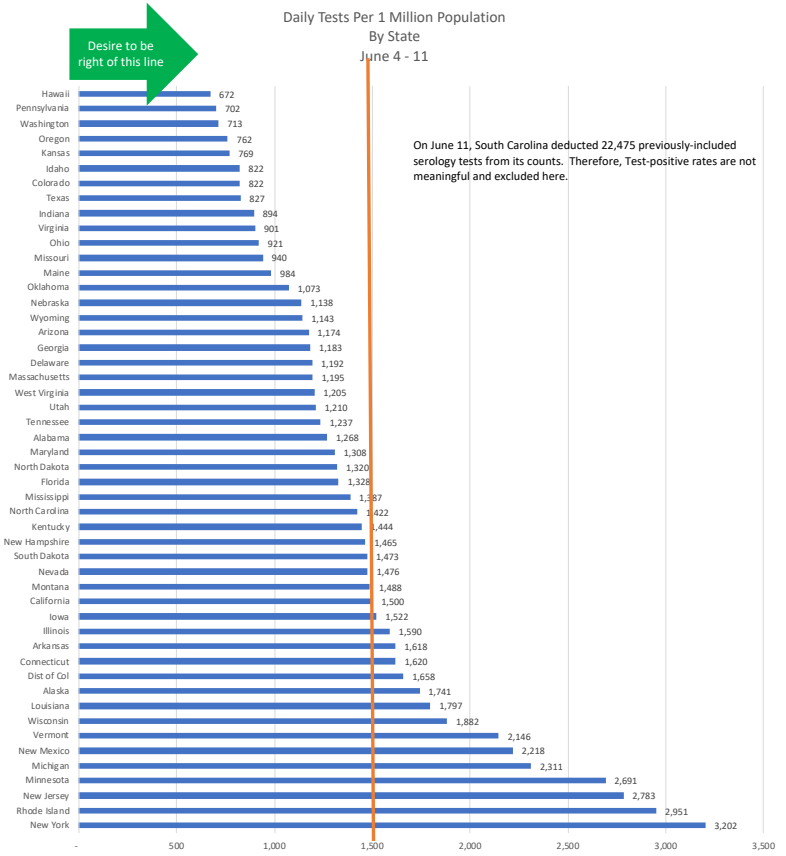
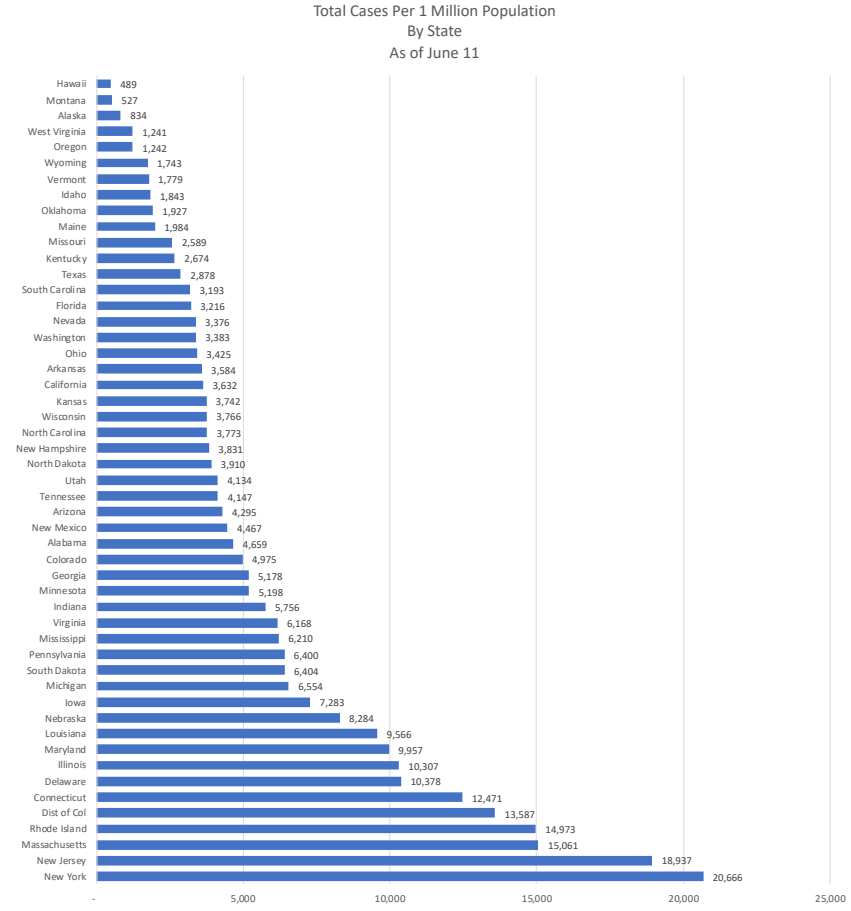


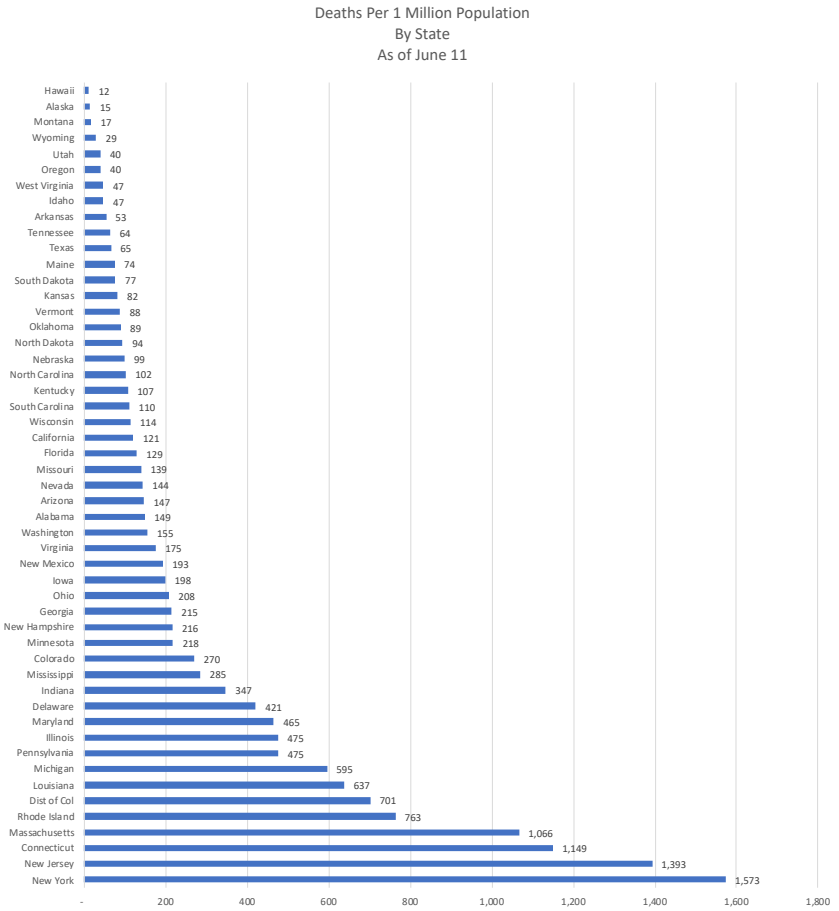


State-by-State

Cases & Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"



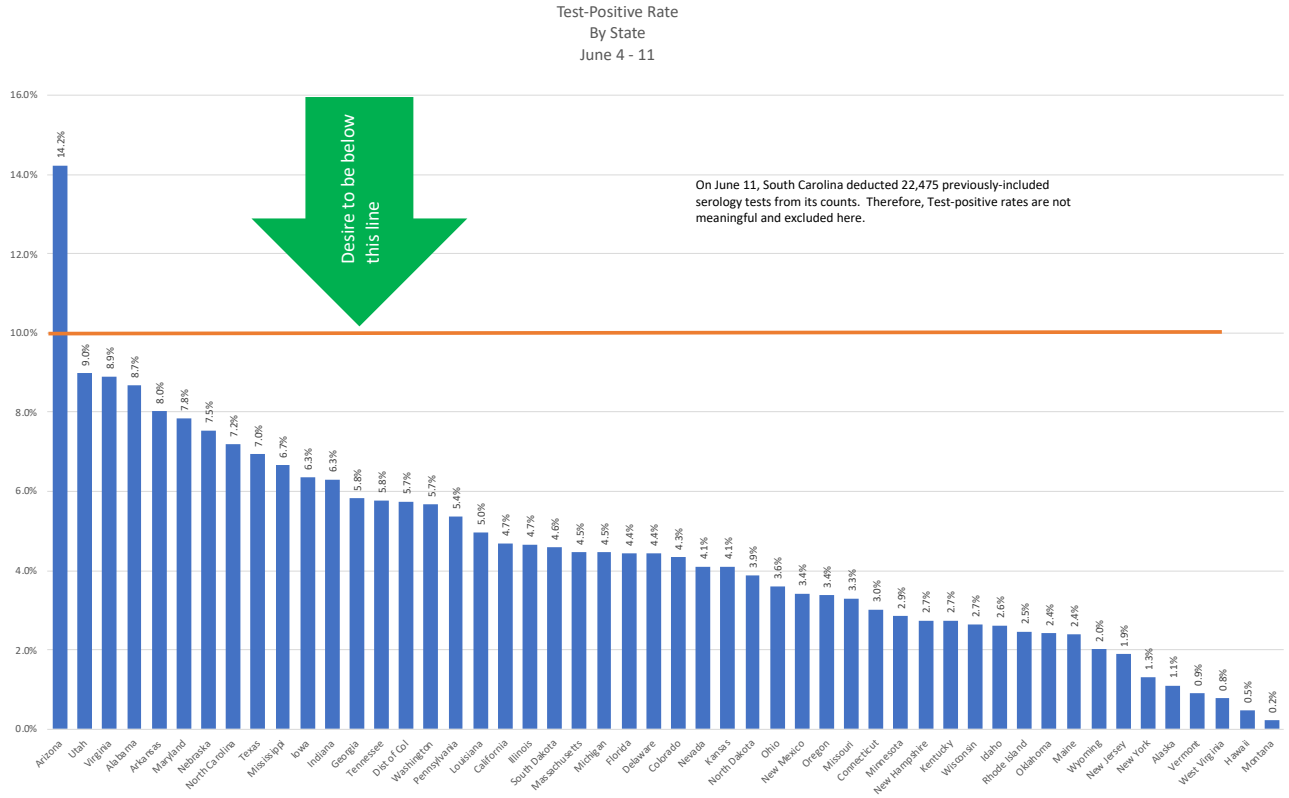


State-by-State

Which States Are Performing Sufficient Tests?

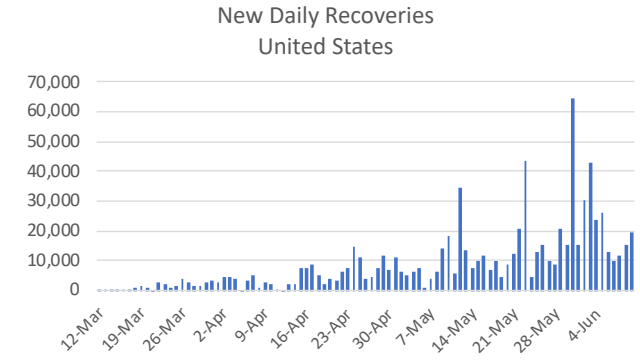
"Strategic Guidance in an Era of Unprecedented Change"

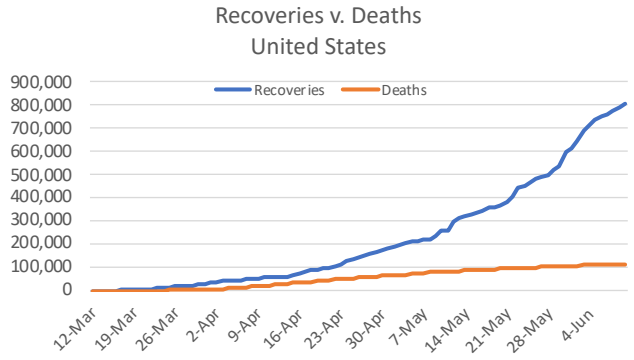
The World Health Organization suggested that the test-positive rate should be 10% or lower, for testing to be sufficient to assess the true prevalence of the virus. Only Arizona states met this guideline for the past week.

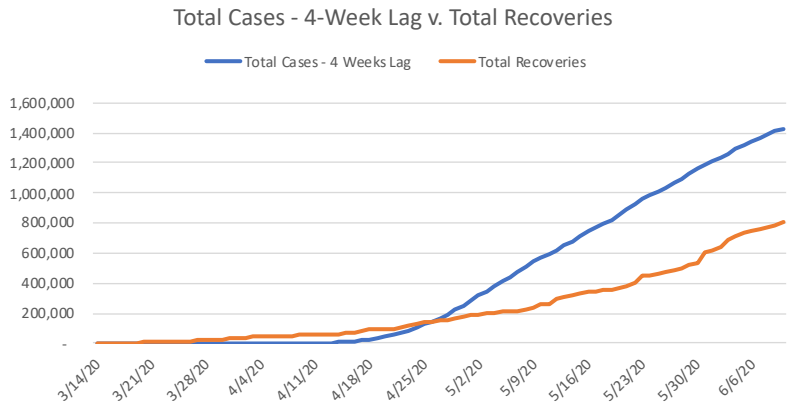


UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

Recoveries







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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 ~350-500k

State	Recoveries	Expected Recoveries Low	High
Alabama	13,508	8,881	9,991
Alaska	397	310	348
Arizona	174	10,139	11,407
Arkansas	7,351	3,493	3,929
California	38,668	59,828	67,307
Colorado	2,488	16,670	18,754
Connecticut	8,121	28,371	31,918
Delaware	6,001	5,778	6,501
District Of Columbia	1,143	5,389	6,062
Florida	12,917	34,568	38,889
Georgia	858	28,782	32,379
Hawaii	623	510	573
Idaho	2,684	1,881	2,116
Illinois	71,127	70,350	79,143
Indiana	27,321	20,842	23,448
Iowa	13,956	10,940	12,308
Kansas	5,779	6,162	6,933
Kentucky	3,379	5,780	6,503
Louisiana	33,904	26,791	30,140
Maine	2,062	1,252	1,409
Maryland	4,365	28,722	32,313
Massachusetts	84,621	65,746	73,964
Michigan	42,041	39,666	44,624
Minnesota	24,870	10,748	12,092
Mississippi	13,356	8,386	9,435
Missouri	3,645	8,444	9,500
Montana	487	370	416
Nebraska	8,946	7,533	8,474
Nevada	7,545	5,199	5,849
New Hampshire	3,665	2,706	3,044
New Jersey	30,089	115,219	129,622
New Mexico	3,806	4,402	4,953
New York	85,384	282,477	317,786
North Carolina	23,653	13,597	15,296
North Dakota	2,515	1,370	1,541
Ohio	8,286	21,094	23,730
Oklahoma	6,166	3,970	4,466
Oregon	2,350	2,783	3,131
Pennsylvania	55,252	50,576	56,898
Rhode Island	1,419	9,613	10,814
South Carolina	7,928	6,551	7,370
South Dakota	4,573	3,034	3,413
Tennessee	18,516	13,359	15,029
Texas	52,472	35,820	40,298
Utah	7,587	5,399	6,074
Vermont	903	746	839
Virginia	6,895	22,250	25,032
Washington	8,271	14,928	16,794
West Virginia	1,548	1,147	1,291
Wisconsin	14,999	9,020	10,148
Wyoming	814	561	631
United States	816,086	1,166,074	1,311,834

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

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

STATE-BY-STATE READINESS FOR RELAXING RESTRICTIONS

Readiness For Relaxing Restrictions

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

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State-By-State

Relative "Readiness" For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

Change over past week

June 11

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 4

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 2nd following page

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State-By-State

Relative "Readiness" For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

Progress over past 4 weeks

June 11

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 15

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

Relative "Readiness" For Relaxing Restrictions

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 7, 2020

Test data from Covid Tracking Project (https://covidtracking.com/), accessed March 21-June 12, 2020

Hospital resource Need projections from Institure for Health Metrics and Evaluation (), accessed April 30- June 7, 2020

Infection rate data from worldometer.info, accessed March 21-June 12, 2020

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)

Status, as of June 11

VIRUS PROGRESSION: ROADMAP TO RECOVERY

Virus Progression

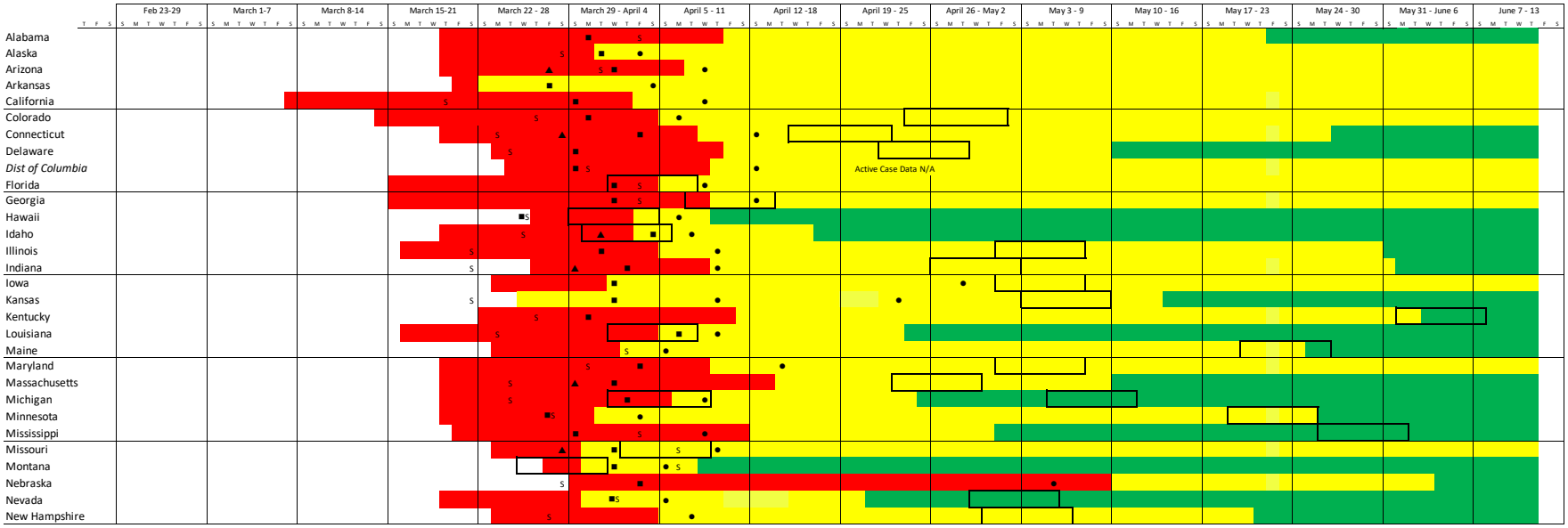
The graphic on the following two pages illustrates when the state first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were recorded (start of the "recovery" phase). It uses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

State-by-State

Virus Progression – *1 of 2*

"Strategic Guidance in an Era of Unprecedented Change"



Legend on following page

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State-by-State

Virus Progression – *2 of 2*

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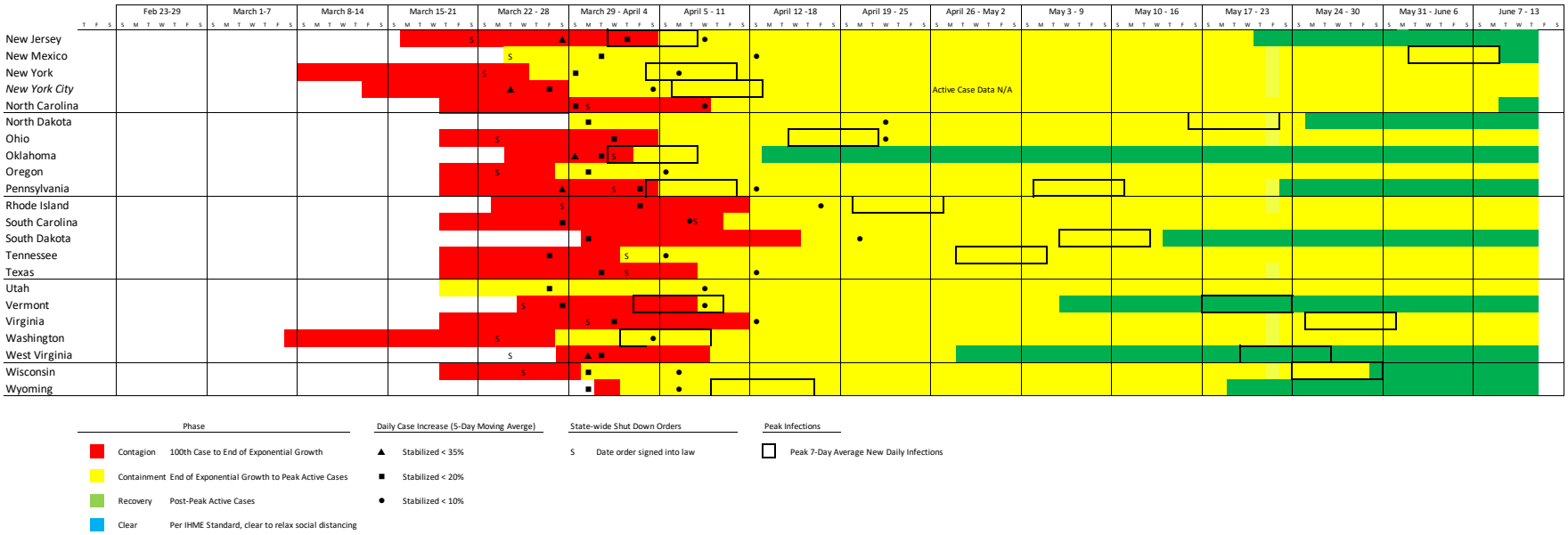


STATE TEST, INFECTION AND CASE TRENDS

Test, New Daily Infection and Active Case Trends

On Mondays, Wednesday and Fridays we provide graphics relevant to judging how far a state (or the District of Columbia) has progressed against the virus. Seventeen states (or, sixteen and D.C.) are provided at a time. Today, we provide:

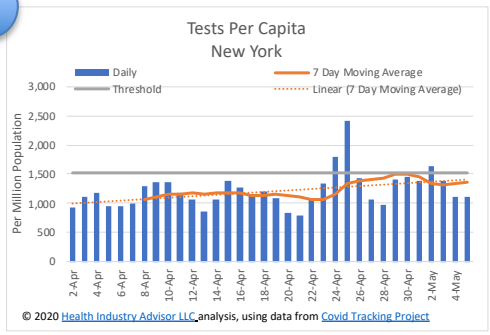
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Test, New Daily Infection and Active Case Trends

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

1



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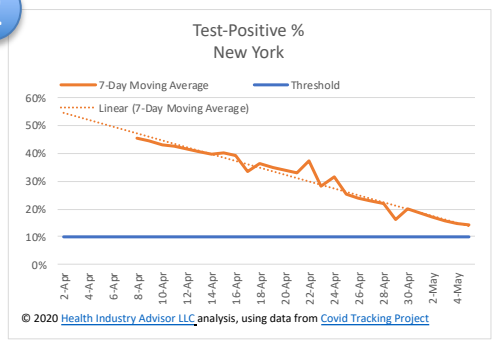

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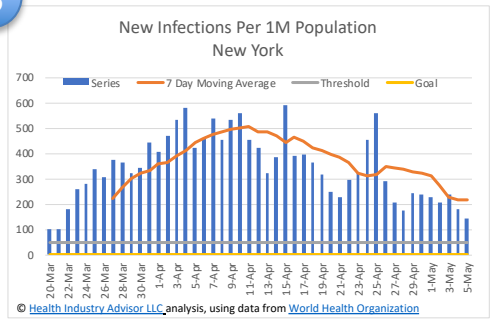

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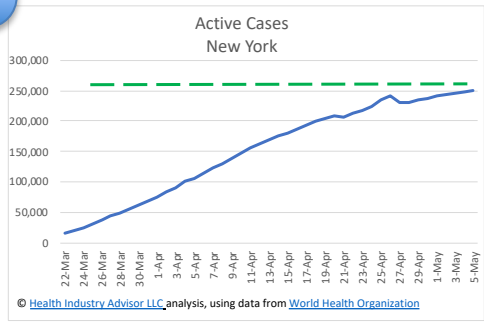
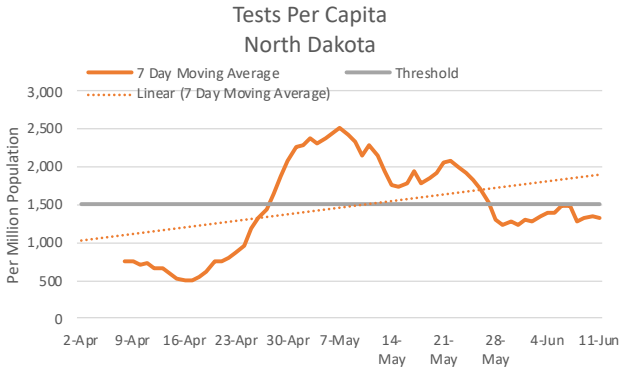
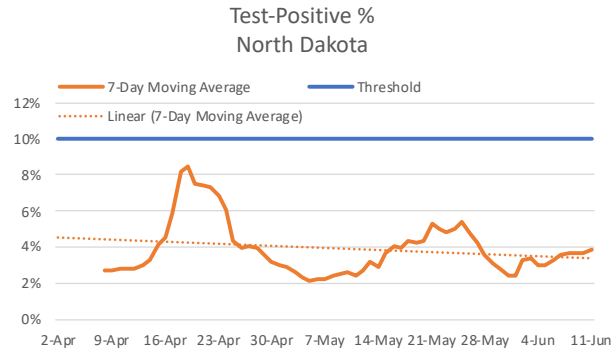


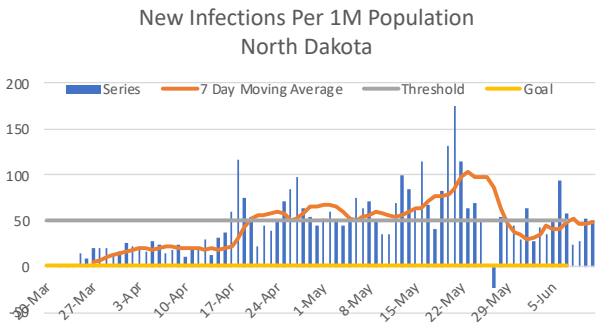
State-by-State

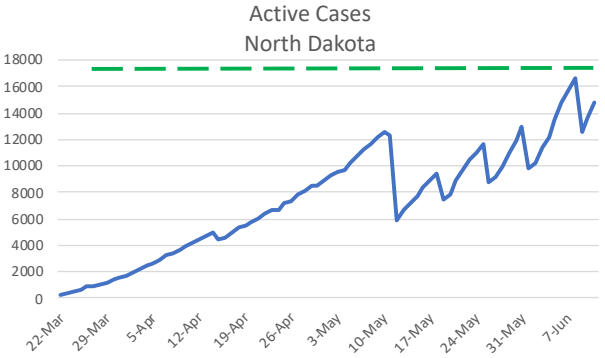
Test, New Daily Infection and Active Case Trends

"Strategic Guidance in an Era of Unprecedented Change"





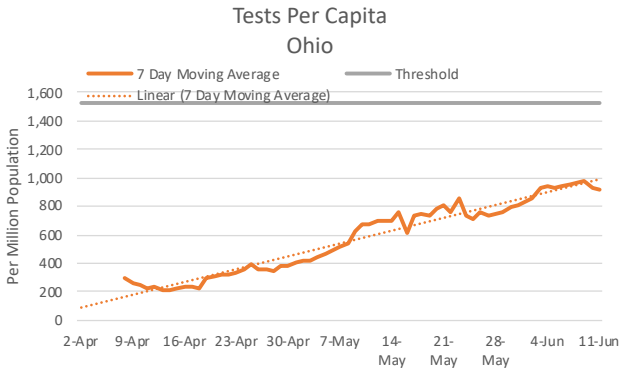


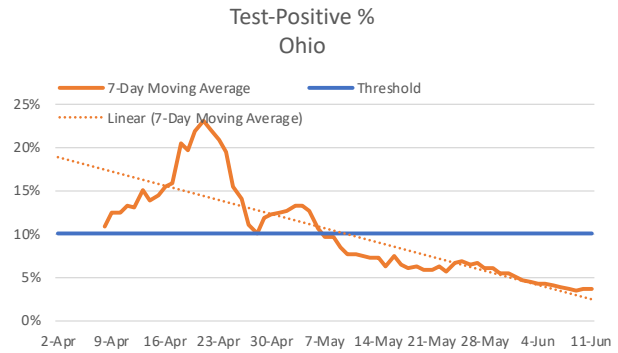


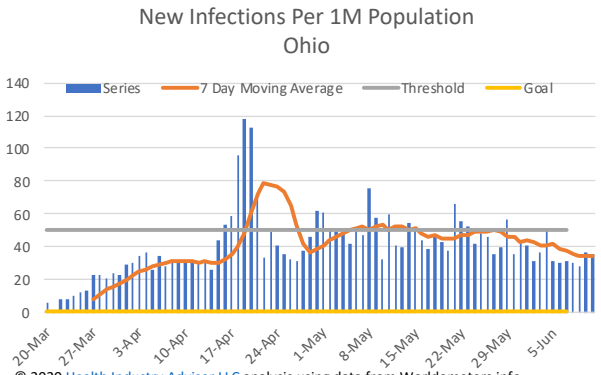
State-by-State

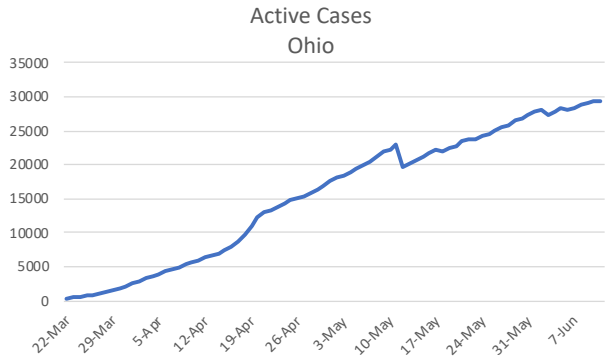
Test, New Daily Infection and Active Case Trends

"Strategic Guidance in an Era of Unprecedented Change"

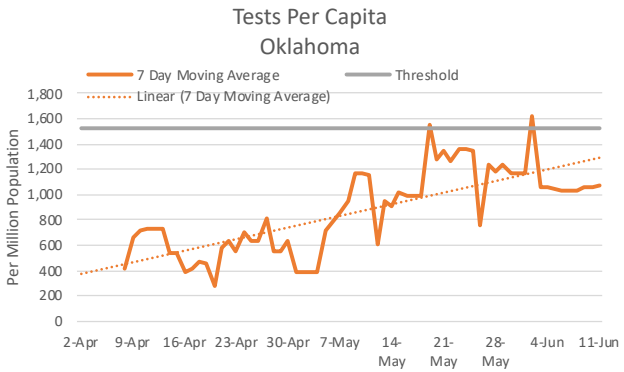


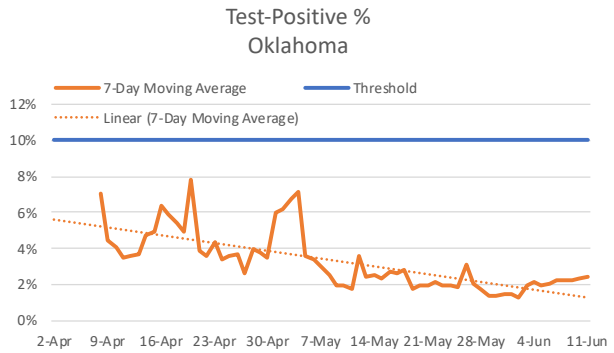


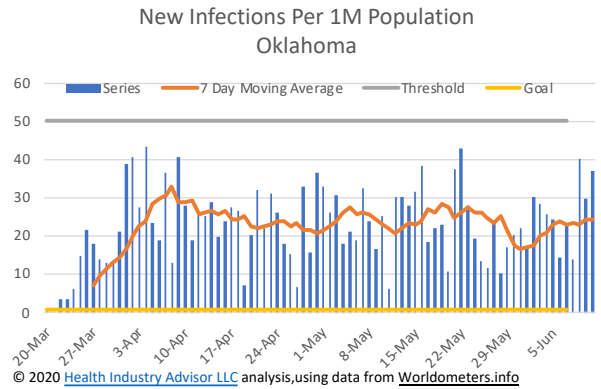


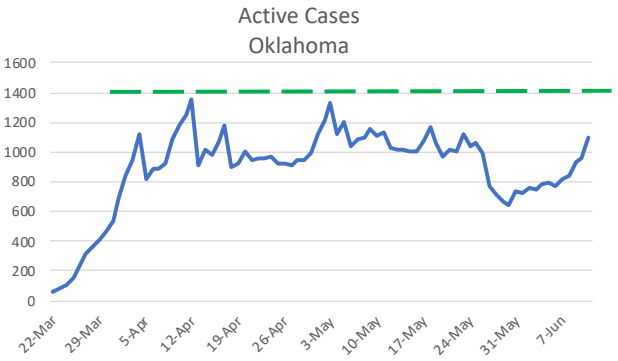


Test, New Daily Infection and Active Case Trends

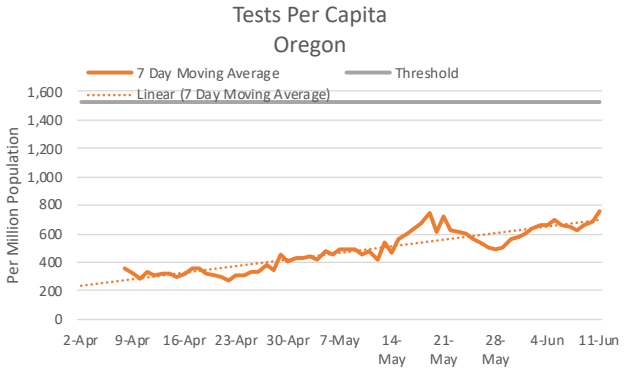


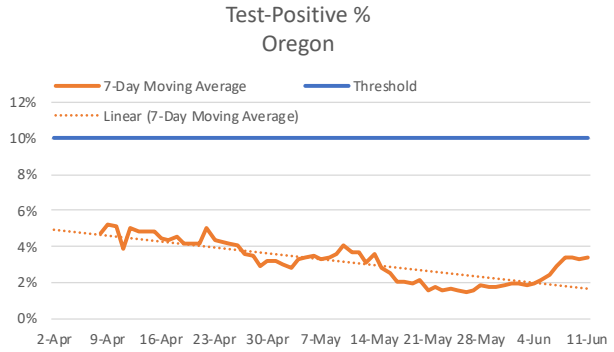


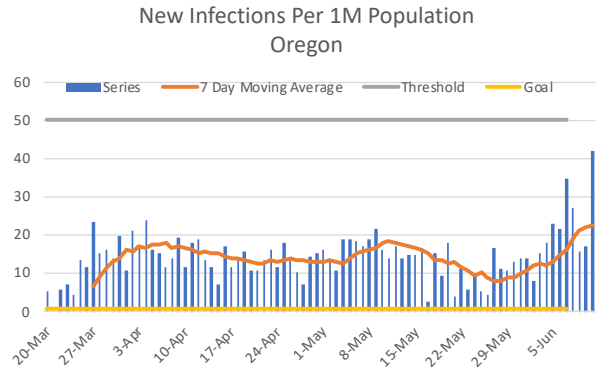


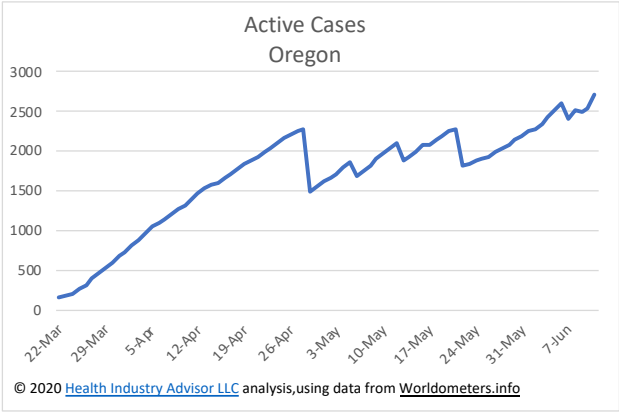


Test, New Daily Infection and Active Case Trends

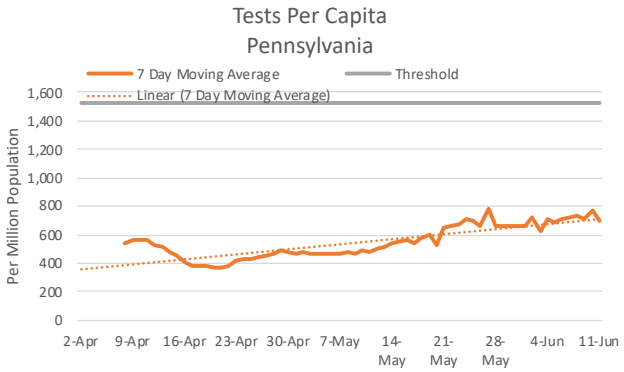


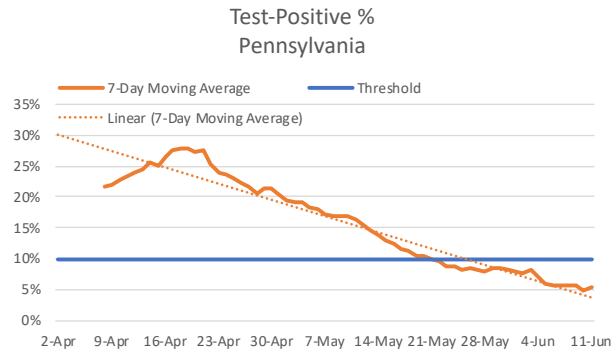


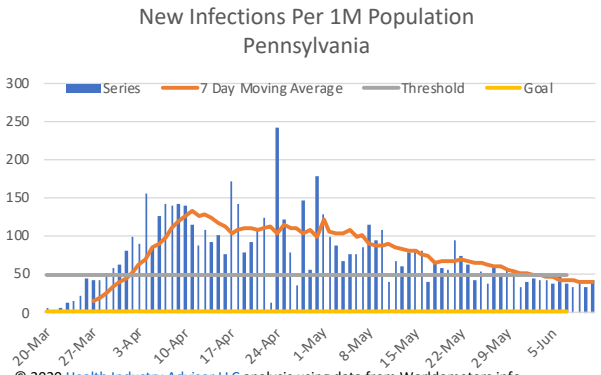


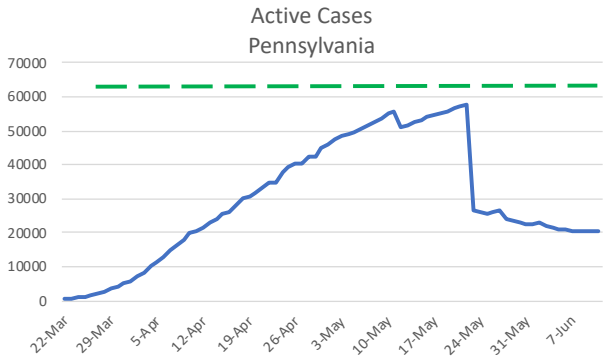


Test, New Daily Infection and Active Case Trends

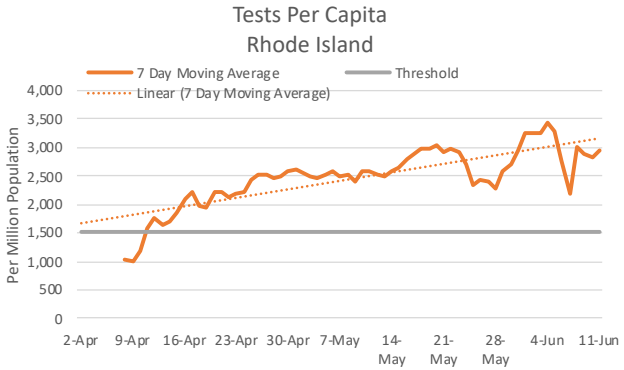


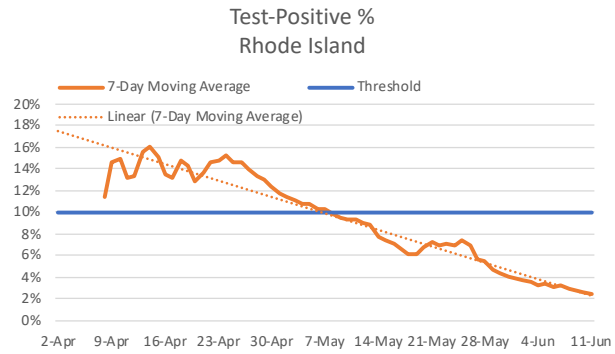


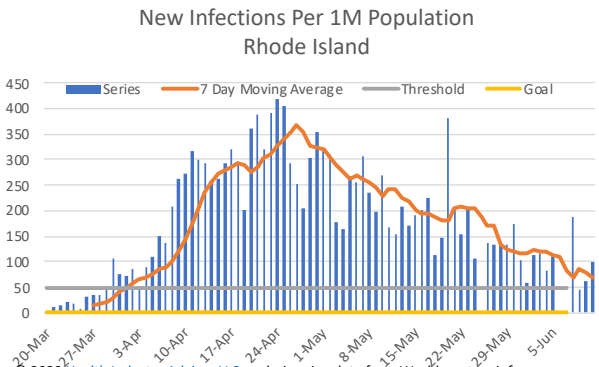


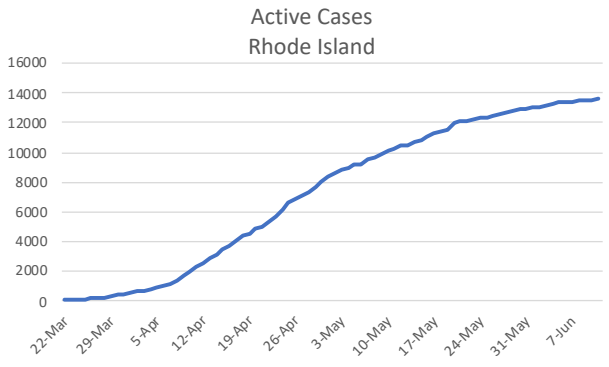


Test, New Daily Infection and Active Case Trends

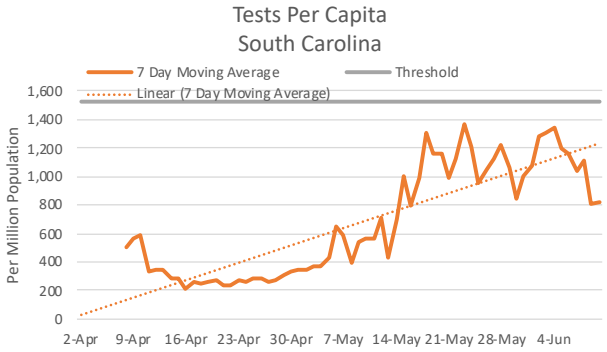


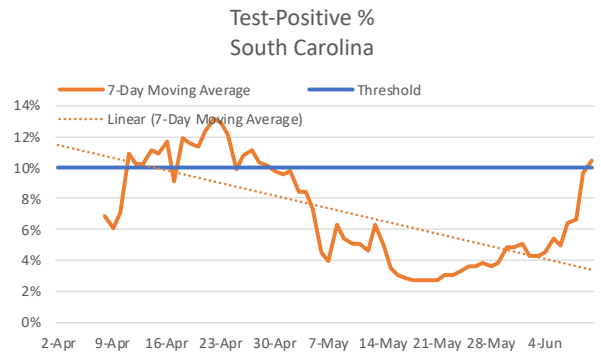


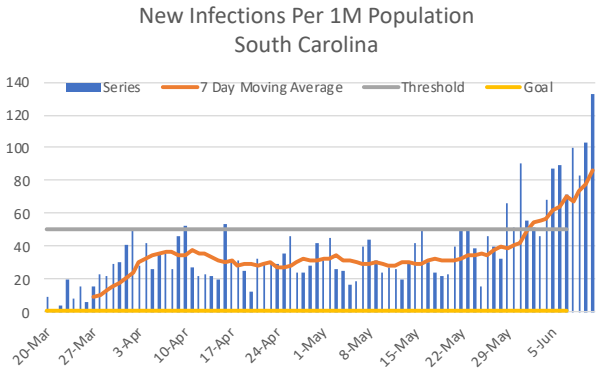


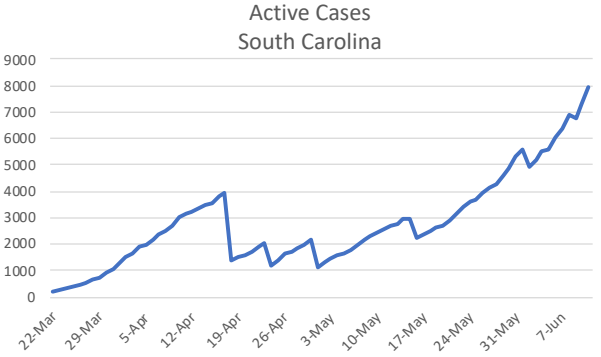


Test, New Daily Infection and Active Case Trends









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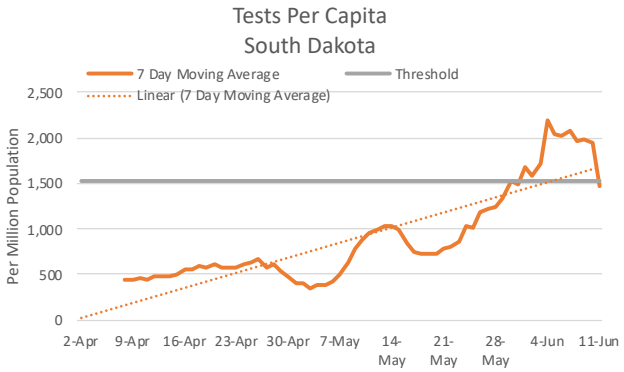

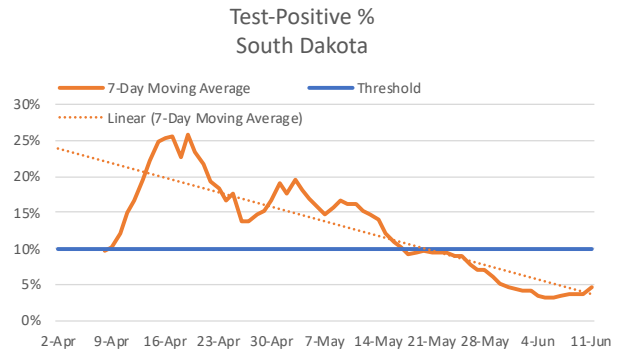

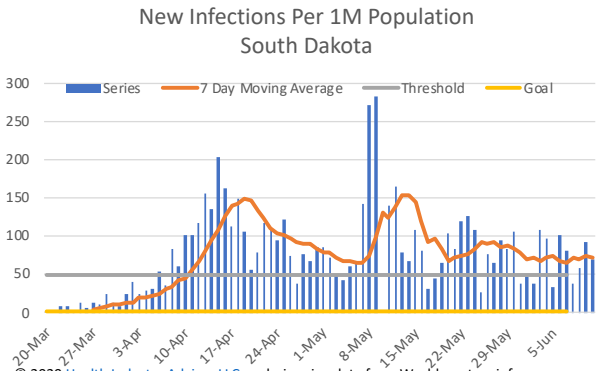

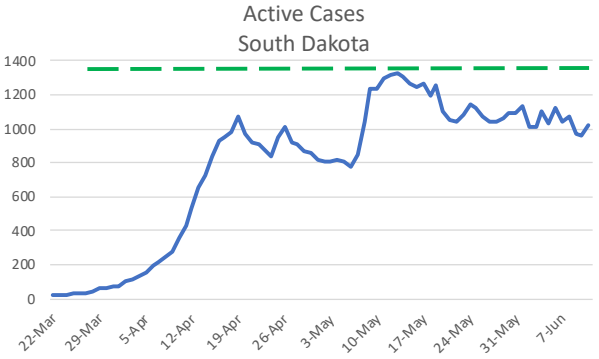

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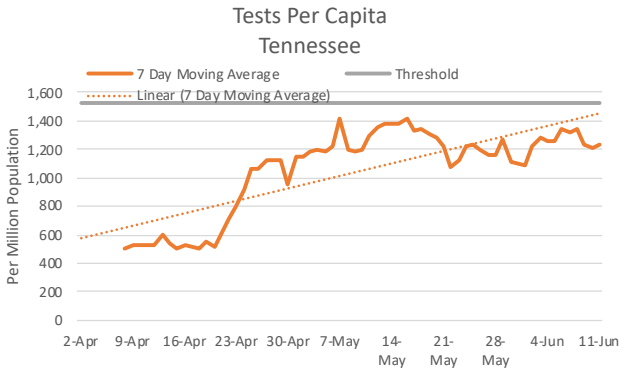

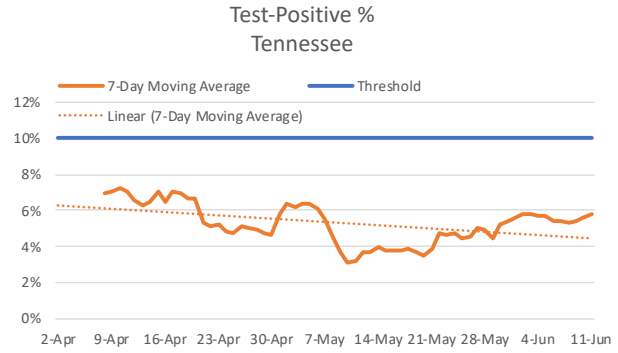

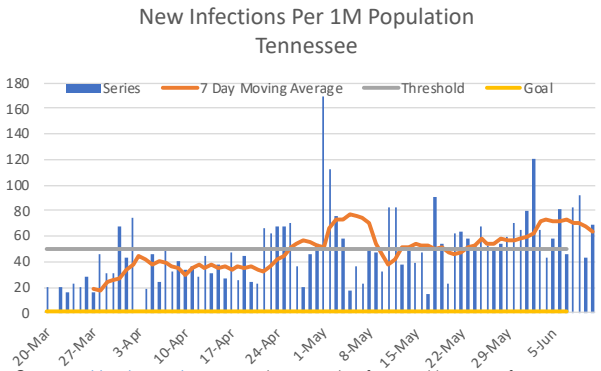

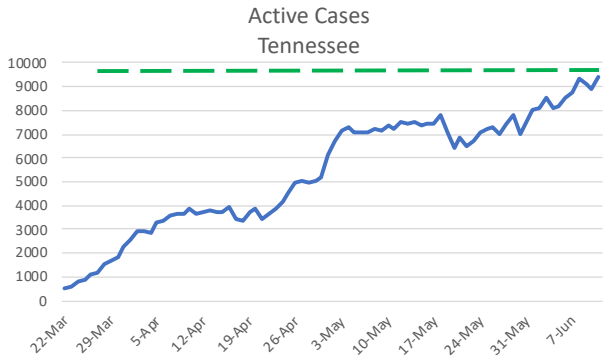

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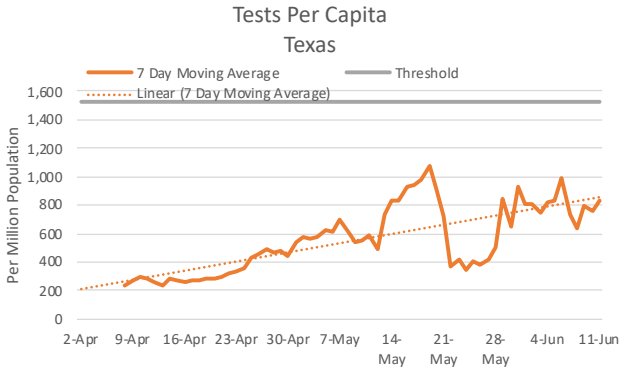

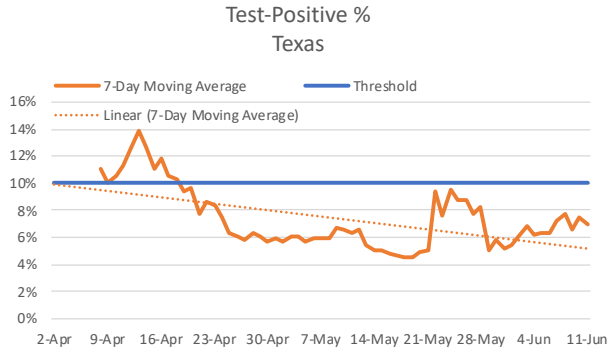

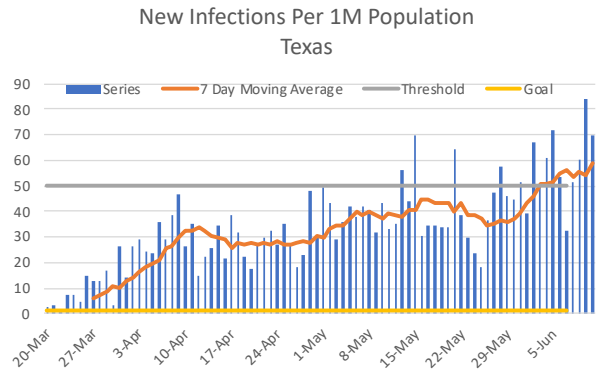

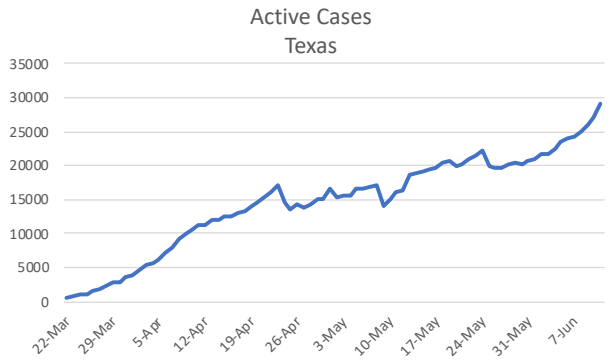

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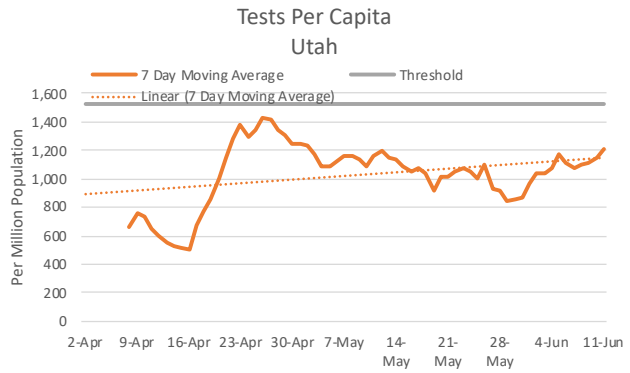

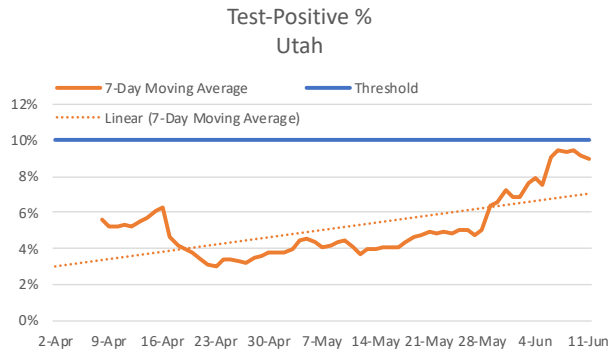

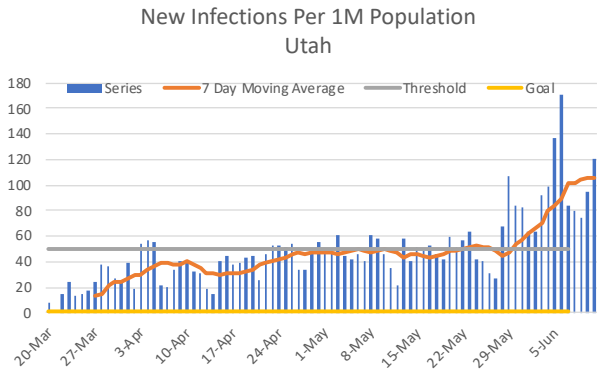

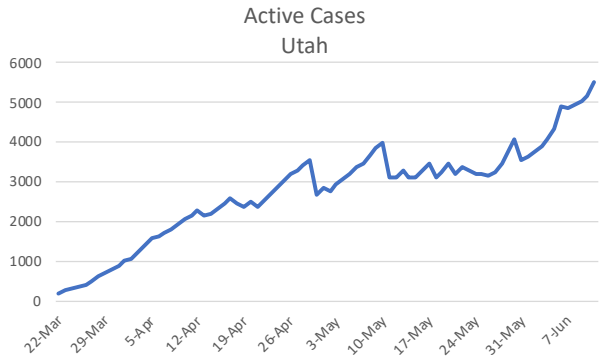

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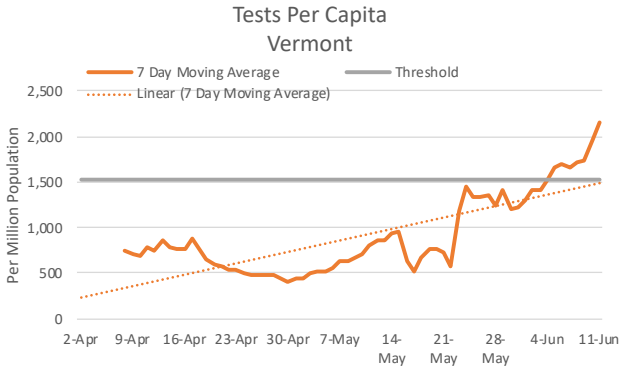

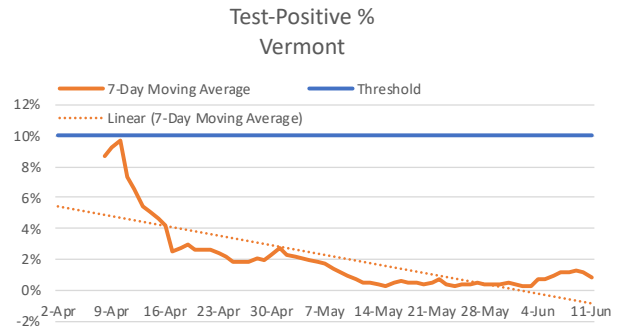

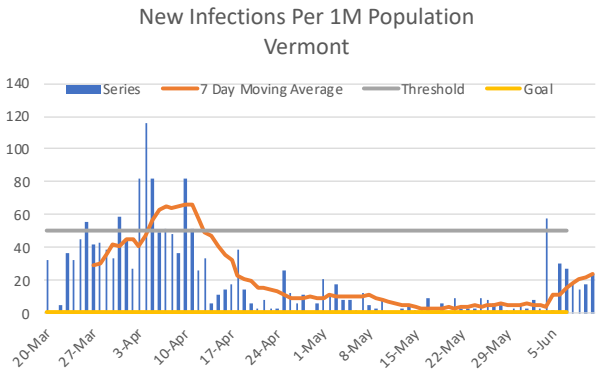

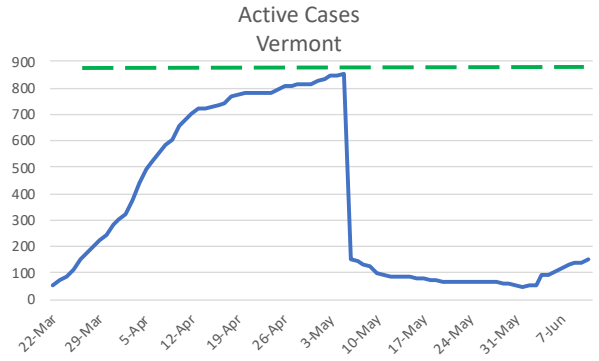

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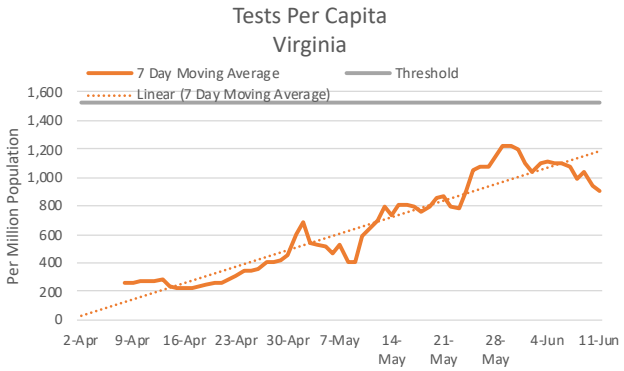

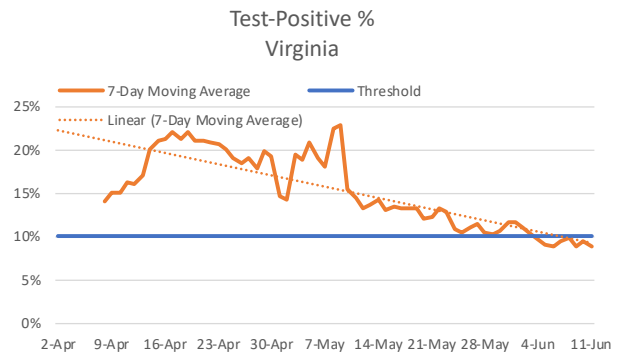

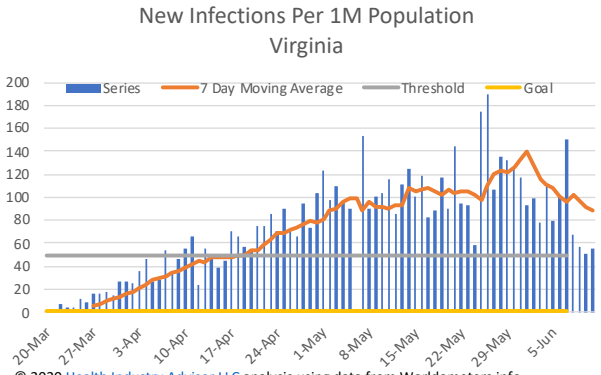

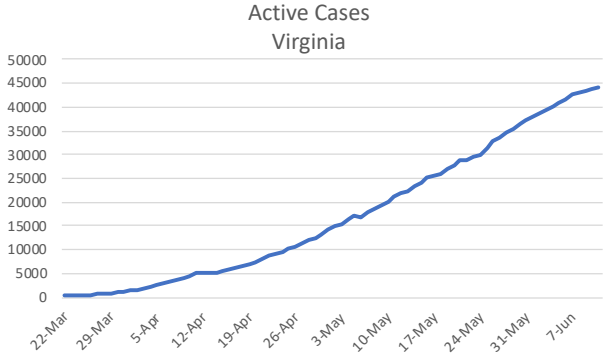

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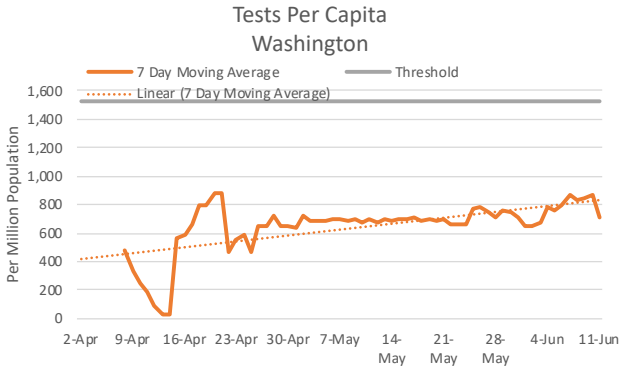

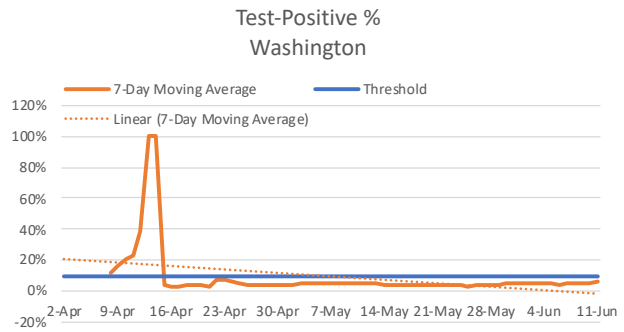

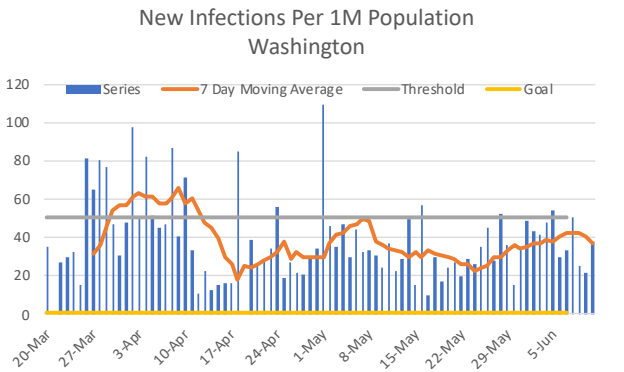

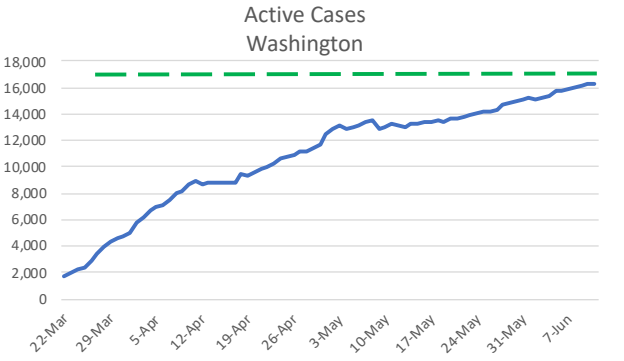

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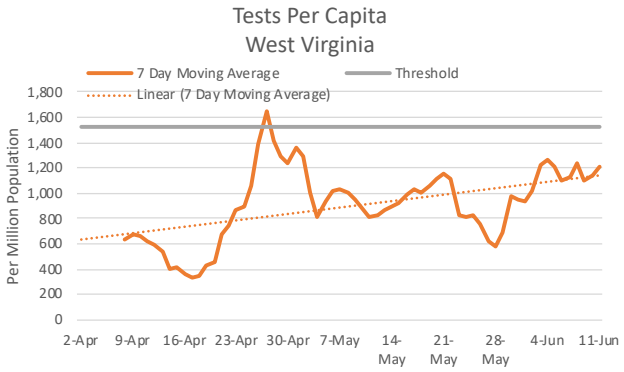

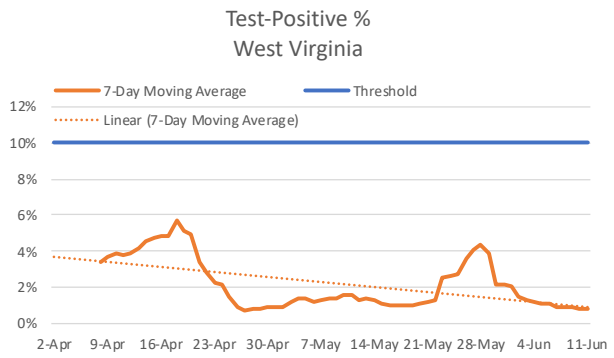

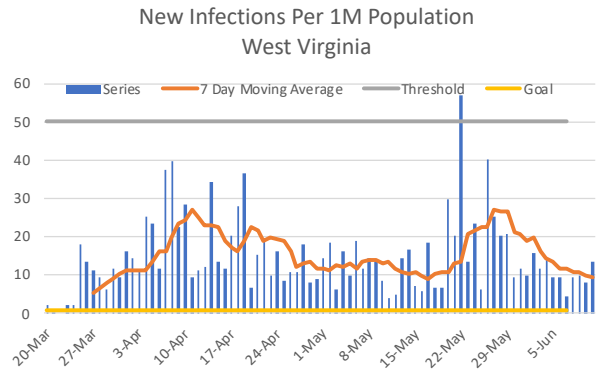

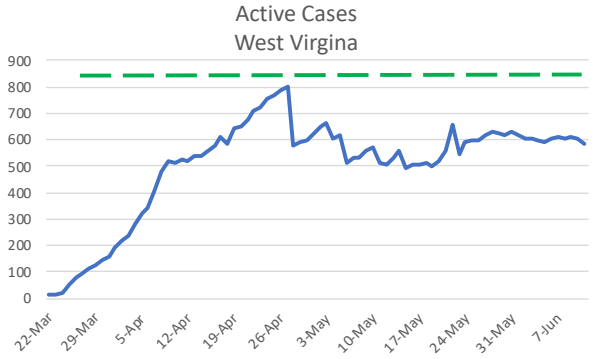

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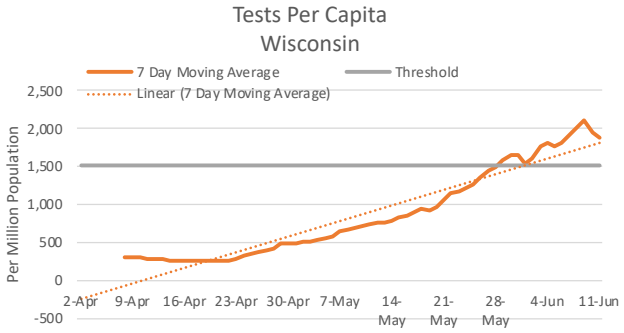

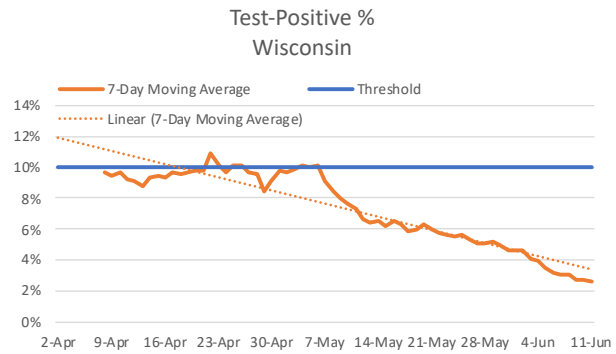

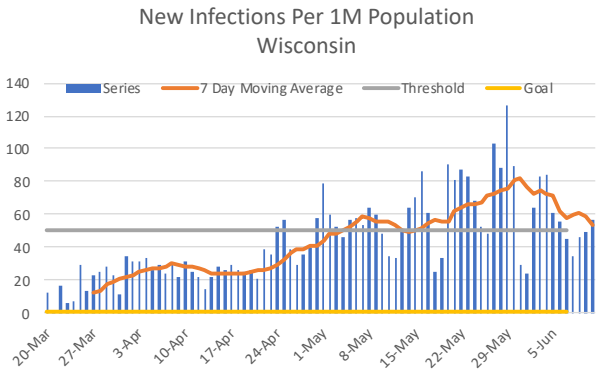

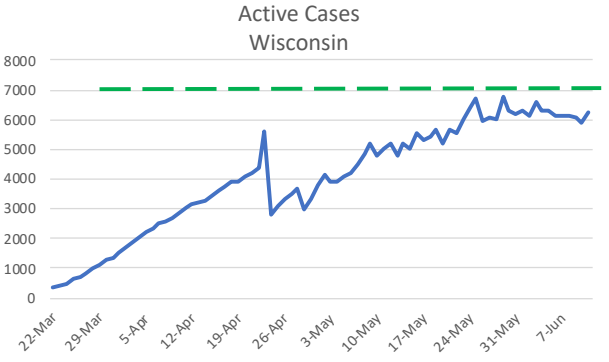

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