Health Industry Advisor, llc

"Strategic Guidance in an Era of Unprecedented Change"

COVID-19 Dashboard

Issue # 69

Monday, June 8, 2020

Day's Highlights

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	Averaged >500,000 on Saturday & Sunday
Test-Positivity Rate	Decline	4.3% test-positive past 2 days; 4.6% for past 7 days
Number of Cases	Plateau	New Cases up 13.0% week-over-week
Deaths % of Total Cases	Decline	5.6%
Number of Deaths / 1M Population	Plateau	339.8
Recoveries : Death	Increase	6.77

- Total cases in the United States surpassed 2 million on Sunday; total cases worldwide surpassed 7 million. Pakistan moved ahead of Canada and now has the 16th most cases in the world; South Korea fell further down the ranking to 56th
- Among the countries hardest hit early-on by the virus, Brazil, Chile, India, Mexico, Pakistan and Sweden have yet to establish a peak in new daily infections. Sweden is of particular note, given the recent critique of the shortcomings of its laissez-faire approach to lock-downs
- Testing in the United States averaged >500,000 per day this weekend, with a test-positive rate of 4.3%. New cases are up 13% week-over-week; however, this is largely attributable to two states makings large adjustments in their cases counts: On Friday, Michigan added ~5,000 previously-unreported probable cases. On the same day, Suffolk County in New York added ~15,000 previously-unreported, positive serology tests to their count. Adjusting for these two updates, new cases were essentially unchanged week-over-week
- With the re-opening of the economy across the United States, the concern is that new infections will increase. To date, that does not yet seem to be the case. Indeed, Illinois and Wisconsin - two states that were experiencing increasing new infection rates a few weeks ago, have shown declining rates, as of late. There appear to be new outbreaks, however, in Arizona, Arkansas, Florida, Kentucky, Nevada and South Carolina, as well as continued growth in infection rates in California and North Carolina
- On an encouraging note, the death rate continues to inch downward; it is now 5.6% verses 6.0% as recently as May 20. There were fewer deaths on Saturday and Sunday combined than on 3 of the 4 preceding days.

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 215 countries 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 7

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	2,007,449	(1)	6,067	(5)	112,469	(1)	5.6%	(11)	339.9	(8)	1.3%	(17)	1,562	(6)	76.3	(7)
Brazil	691,962	(2)	3,257	(14)	36,499	(3)	5.3%	(13)	171.8	(11)	4.4%	(4)	47	(27)	127.4	(4)
Russia	467,673	(3)	3,205	(15)	5,859	(14)	1.3%	(25)	40.1	(19)	2.0%	(13)	2,035	(3)	60.2	(11)
Spain	288,630	(4)	6,173	(4)	27,136	(6)	9.4%	(8)	580.4	(3)	0.1%	(29)	0	(29)	6.9	(27)
UK	286,194	(5)	4,217	(10)	40,542	(2)	14.2%	(4)	597.4	(2)	0.6%	(22)	2,726	(2)	24.2	(18)
India	257,486	(6)	187	(29)	7,207	(12)	2.8%	(18)	5.2	(28)	4.4%	(5)	96	(22)	7.3	(26)
Italy	234,998	(7)	3,886	(12)	33,899	(4)	14.4%	(3)	560.6	(4)	0.1%	(28)	846	(12)	4.9	(28)
Peru	196,515	(8)	5,966	(6)	5,465	(15)	2.8%	(19)	165.9	(12)	2.4%	(12)	576	(14)	131.3	(3)
Germany	185,869	(9)	2,219	(21)	8,776	(9)	4.7%	(15)	104.8	(16)	0.2%	(27)	675	(13)	4.2	(29)
Iran	171,789	(10)	2,047	(22)	8,281	(10)	4.8%	(14)	98.7	(17)	1.7%	(15)	253	(21)	33.9	(14)
Turkey	170,132	(11)	2,019	(23)	4,692	(16)	2.8%	(20)	55.7	(18)	0.5%	(23)	507	(17)	10.9	(22)
France	153,977	(12)	2,359	(20)	29,155	(5)	18.9%	(1)	446.7	(6)	0.3%	(25)	0	(29)	8.1	(25)
Chile	134,150	(13)	7,021	(2)	2,190	(20)	1.6%	(23)	114.6	(14)	4.3%	(6)	944	(9)	266.6	(2)
Mexico	113,619	(14)	882	(24)	13,511	(7)	11.9%	(6)	104.9	(15)	4.0%	(8)	68	(26)	31.3	(15)
Saudi Arabia	101,914	(15)	2,931	(16)	712	(26)	0.7%	(27)	20.5	(23)	2.7%	(10)	555	(15)	74.2	(8)
Pakistan	98,943	(16)	449	(27)	2,002	(21)	2.0%	(22)	9.1	(26)	5.3%	(2)	88	(23)	20.4	(19)
Canada	95,699	(17)	2,537	(18)	7,800	(11)	8.2%	(10)	206.8	(9)	0.7%	(21)	874	(10)	17.4	(20)
China	83,036	(18)	58	(30)	4,634	(18)	5.6%	(12)	3.2	(30)	0.0%	(30)	0	(28)	0.0	(30)
Qatar	68,790	(19)	24,500	(1)	54	(29)	0.1%	(29)	19.2	(24)	2.7%	(11)	1,973	(4)	607.7	(1)
Bangladesh	65,769	(20)	400	(28)	888	(25)	1.4%	(24)	5.4	(27)	4.6%	(3)	77	(25)	16.2	(21)
Belgium	59,226	(21)	5,112	(8)	9,595	(8)	16.2%	(2)	828.1	(1)	0.2%	(26)	852	(11)	10.5	(24)
Belarus	48,630	(22)	5,146	(7)	269	(28)	0.6%	(28)	28.5	(20)	1.9%	(14)	1,228	(7)	92.6	(6)
South Africa	48,285	(23)	815	(25)	998	(24)	2.1%	(21)	16.8	(25)	6.2%	(1)	470	(18)	42.1	(12)
Netherlands	47,574	(24)	2,777	(17)	6,013	(13)	12.6%	(5)	351.0	(7)	0.4%	(24)	325	(19)	10.8	(23)
Sweden	44,730	(25)	4,431	(9)	4,659	(17)	10.4%	(7)	461.5	(5)	3.0%	(9)	519	(16)	121.7	(5)
Ecuador	43,120	(26)	2,447	(19)	3,621	(19)	8.4%	(9)	205.4	(10)	1.3%	(18)	81	(24)	30.7	(16)
Colombia	39,236	(27)	772	(26)	1,259	(23)	3.2%	(17)	24.8	(22)	4.3%	(7)	255	(20)	29.1	(17)
UAE	38,808	(28)	3,927	(11)	276	(27)	0.7%	(26)	27.9	(21)	1.6%	(16)	5,624	(1)	61.1	(10)
Singapore	37,910	(29)	6,483	(3)	25	(30)	0.1%	(30)	4.3	(29)	1.1%	(19)	1,802	(5)	70.9	(9)
Portugal	34,693	(30)	3,402	(13)	1,479	(22)	4.3%	(16)	145.0	(13)	1.1%	(20)	1,095	(8)	35.3	(13)

Note: China does not report test volumes

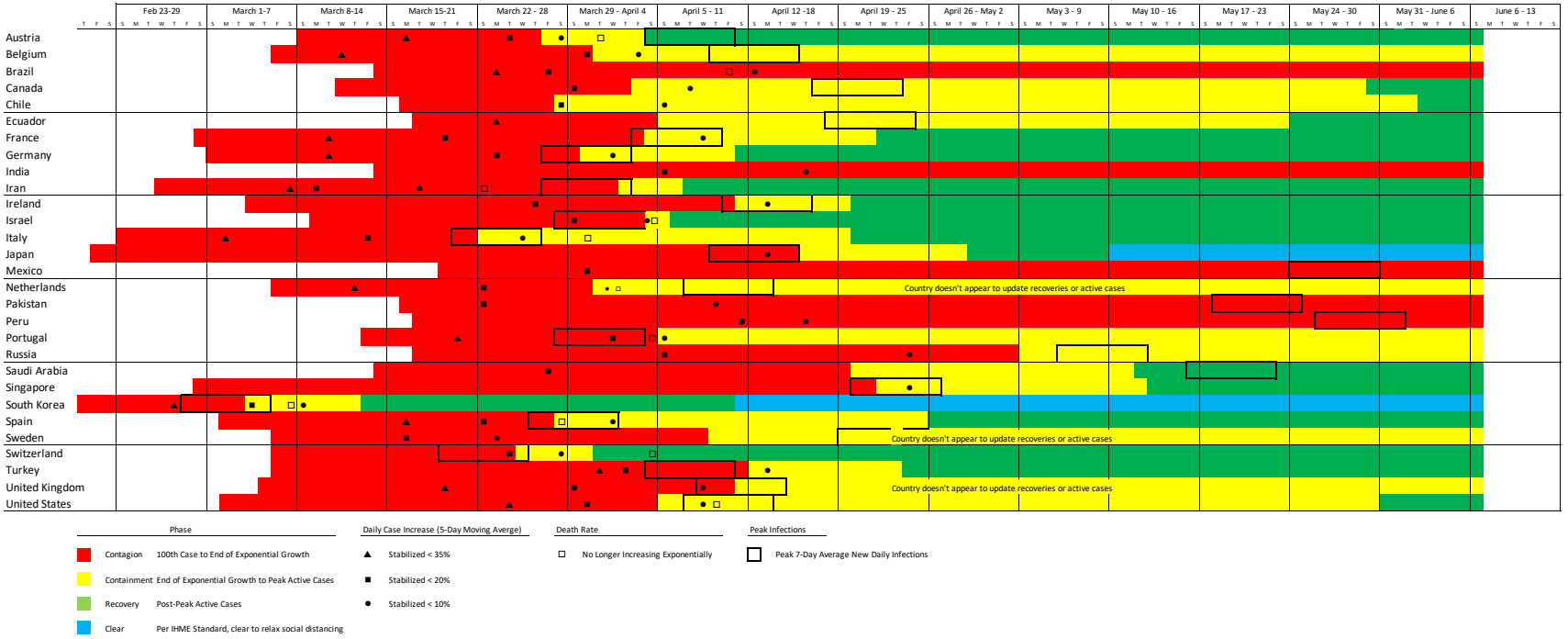
VIRUS PROGRESSION BY COUNTRY

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 86.5% of all cases worldwide.

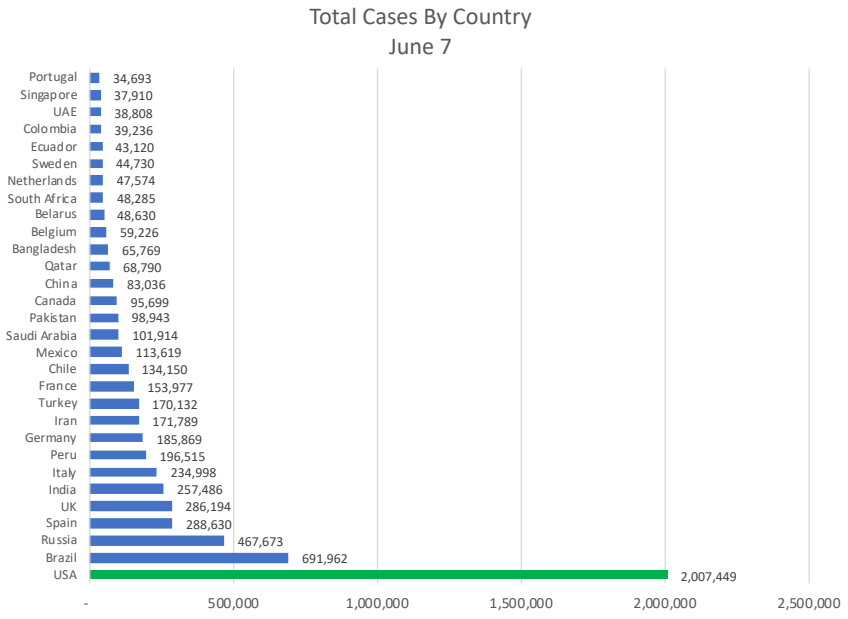
	Total Cases							
Rank	Country	7-Jun	Rank	Country	6-May	Rank	Country	27-Apr
1	USA	2,007,449	1	USA	1,263,092	1	USA	1,010,356
2	Brazil	691,962	2	Spain	253,682	2	Spain	229,422
3	Russia	467,673	3	Italy	214,457	3	Italy	199,414
4	Spain	288,630	4	UK	201,101	4	France	128,339
5	UK	286,194	5	France	174,191	5	Germany	158,758
6	India	257,486	6	Germany	168,162	6	UK	157,149
7	Italy	234,998	7	Russia	165,929	7	Turkey	112,261
8	Peru	196,515	8	Turkey	131,744	8	Iran	91,472
9	Germany	185,869	9	Brazil	126,611	9	Russia	87,147
10	Iran	171,789	10	Iran	101,650	10	China	82,830
11	Turkey	170,132	11	China	82,883	11	Brazil	66,501
12	France	153,977	12	Canada	63,496	12	Canada	48,500
13	Chile	134,150	13	Peru	54,817	13	Belgium	46,687
14	Mexico	113,619	14	India	52,987	14	Netherlands	38,245
15	Saudi Arabia	101,914	15	Belgium	50,781	15	India	29,451
16	Pakistan	98,943	16	Netherlands	41,319	16	Switzerland	29,164
17	Canada	95,699	17	Saudi Arabia	31,938	17	Peru	28,669
18	China	83,036	18	Switzerland	30,060	18	Portugal	24,070
21	Belgium	59,226	19	Ecuador	29,420	19	Ecuador	23,240
24	Netherlands	47,574	20	Portugal	26,182	20	Ireland	19,648
25	Sweden	44,730	21	Mexico	26,025	21	Sweden	18,926
26	Ecuador	43,120	22	Sweden	23,918	22	Saudi Arabia	18,811
29	Singapore	37,910	23	Pakistan	23,214	23	Israel	15,555
30	Portugal	34,693	24	Chile	23,048	24	Austria	15,274
34	Switzerland	30,965	25	Ireland	22,248	25	Mexico	14,677
37	Ireland	25,201	26	Singapore	20,198	26	Singapore	14,423
43	Israel	17,863	29	Israel	16,310	27	Pakistan	13,915
44	Japan	17,141	31	Austria	15,684	28	Chile	13,813
45	Austria	16,902	32	Japan	15,253	29	Japan	13,614
56	S. Korea	11,776	38	S. Korea	10,806	35	South Korea	10,738
	Others	955,060		Others	356,176		Others	301,446
	World	7,082,196			3,817,382		World	3,062,515
	30 countries' share	86.5%			90.7%			90.2%

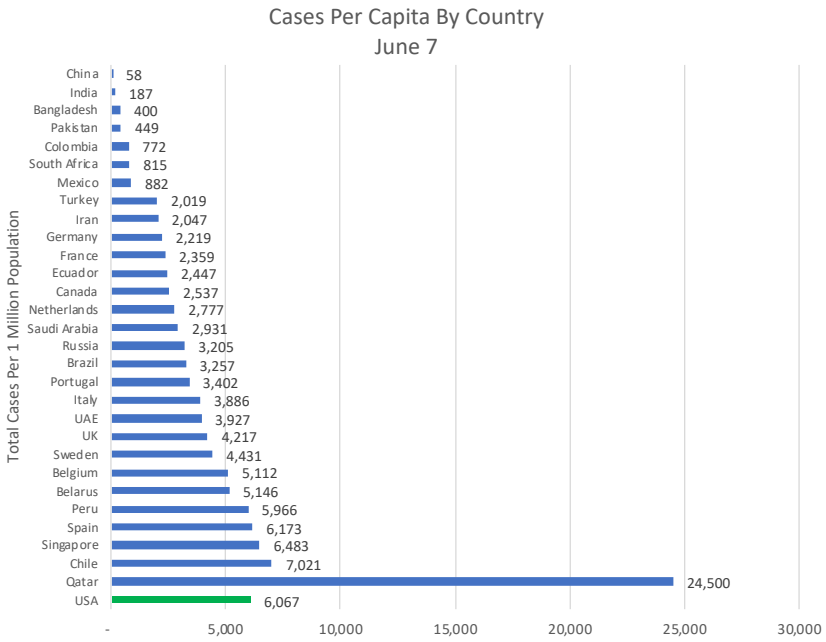
Country-by-Country

Cases & Cases Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases



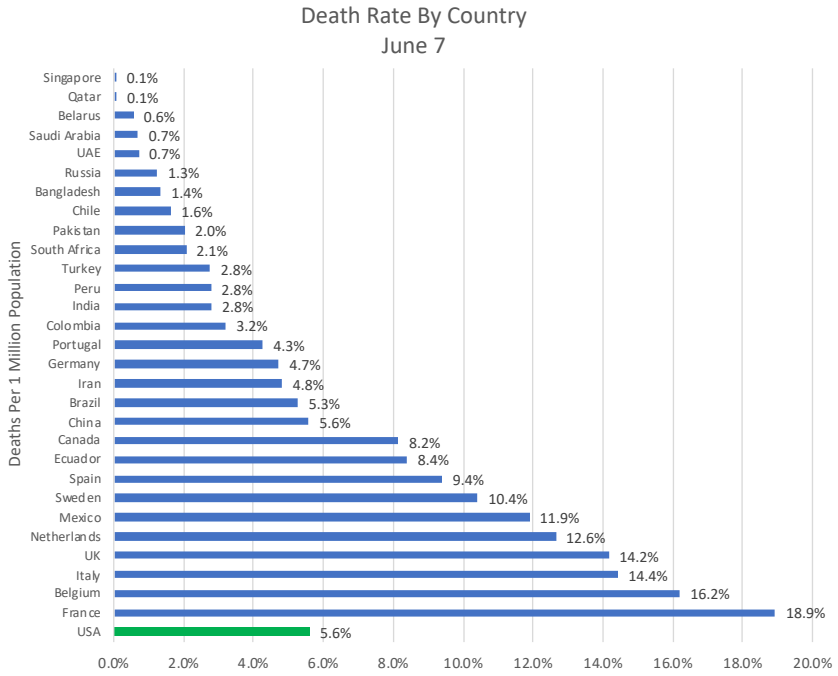


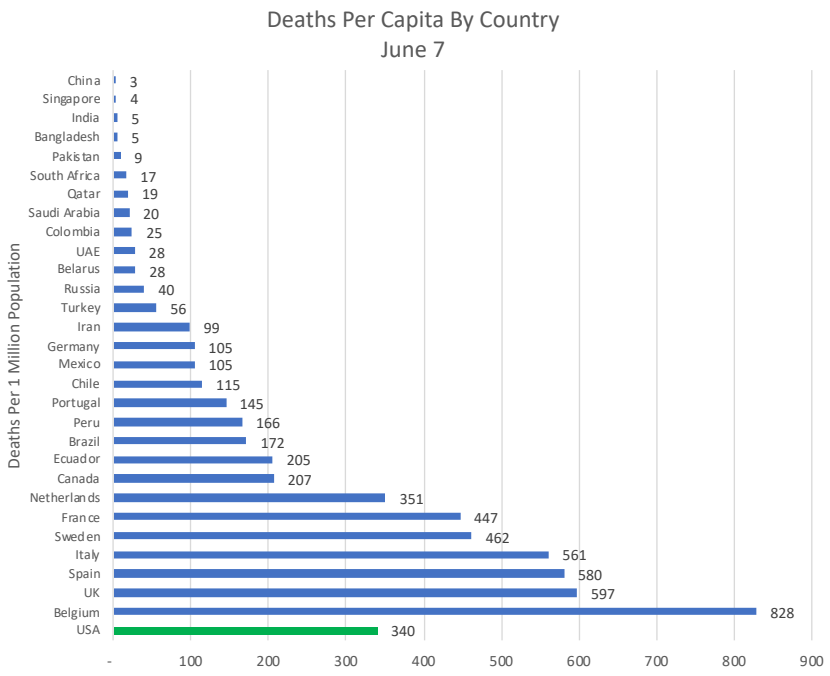
Country-by-Country

Deaths Per Cases & Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases



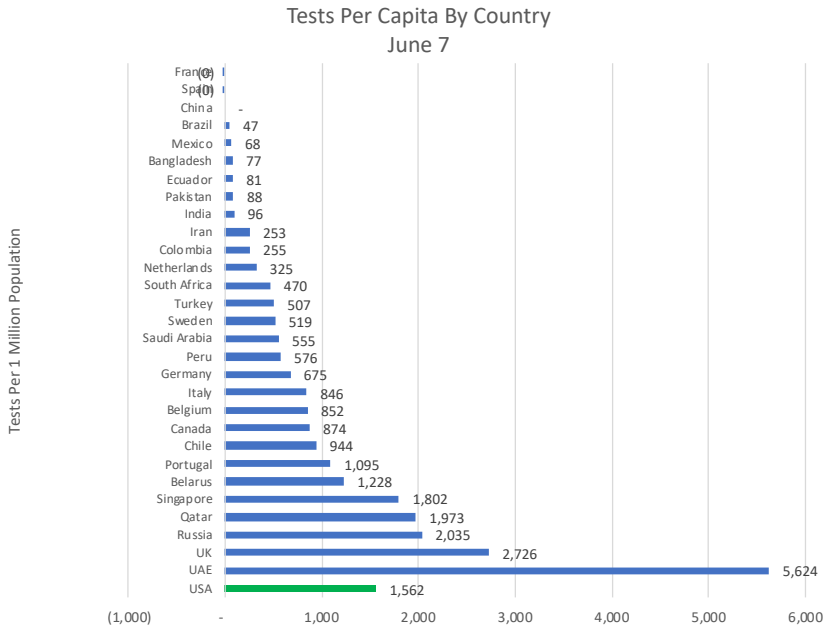


Country-by-Country

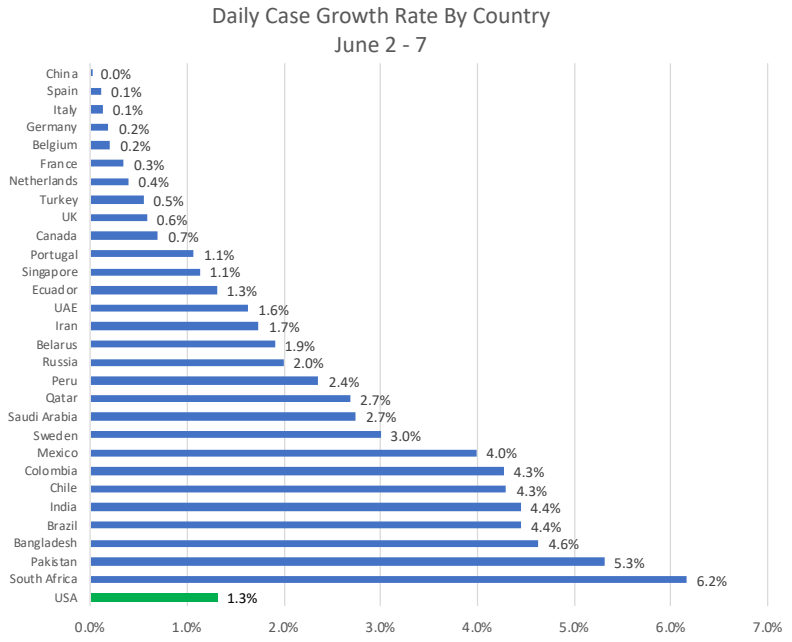
Daily Tests Per Capita & Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

Countries Ranked 1-30 In Total Cases



Daily Tests Per Capita For Past Week

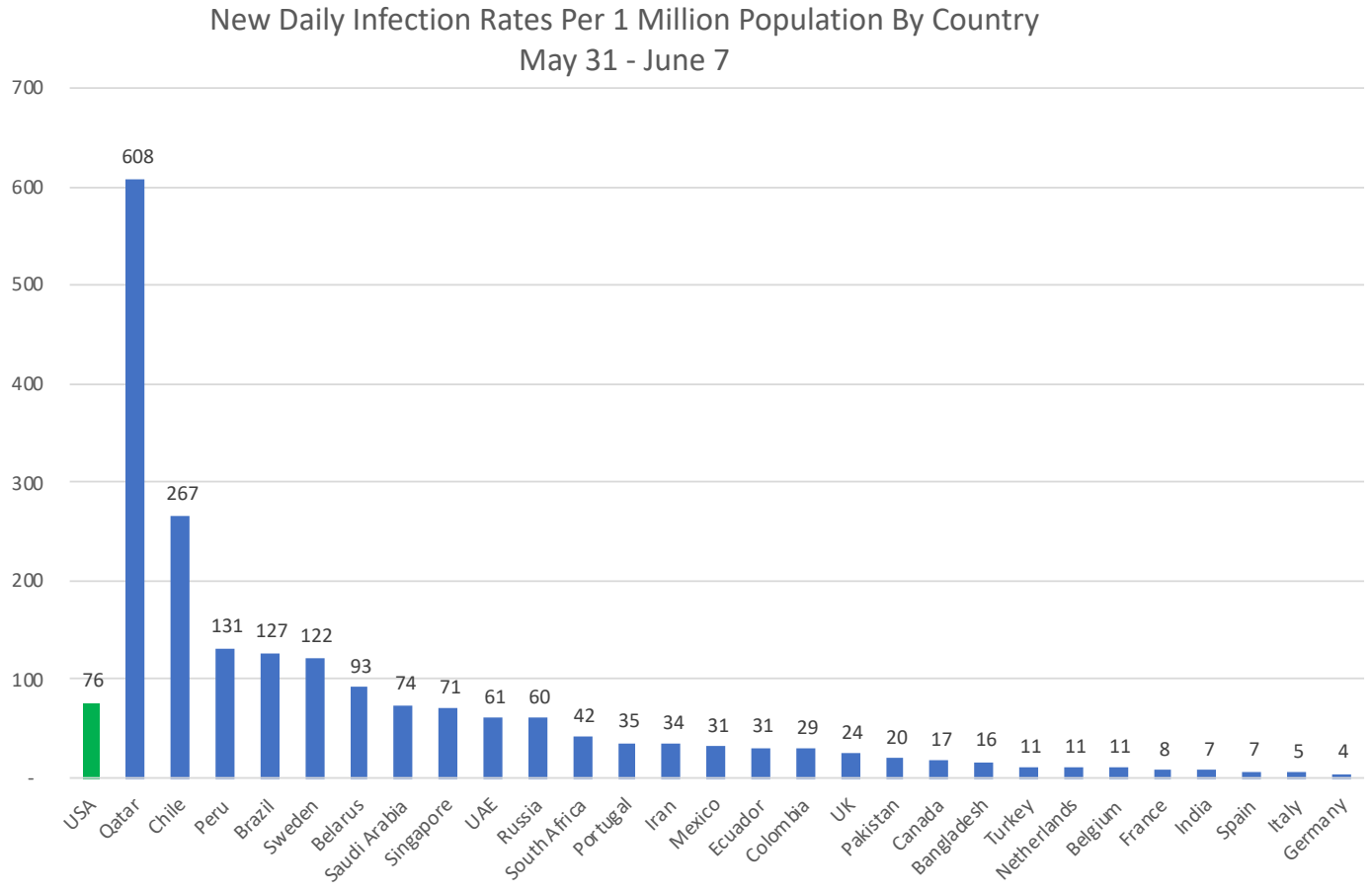


Daily Case Growth – 5-Day Moving Average

Country-by-Country

New Daily Infection Rates

"Strategic Guidance in an Era of Unprecedented Change"



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 7

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	20,500	(25)	4,181.0	(23)	692	(25)	3.4%	(34)	141.1	(26)	1.8%	(16)	1,224	(28)	75.7	(18)
Alaska	544	(51)	743.6	(49)	10	(51)	1.8%	(45)	13.7	(50)	2.2%	(6)	2,579	(3)	16.4	(47)
Arizona	26,889	(20)	3,694.2	(28)	1,044	(20)	3.9%	(29)	143.4	(24)	4.8%	(1)	1,107	(32)	136.5	(2)
Arkansas	9,426	(36)	3,123.4	(36)	154	(40)	1.6%	(47)	51.0	(43)	3.8%	(2)	1,456	(20)	102.9	(7)
California	131,710	(3)	3,333.4	(32)	4,653	(7)	3.5%	(32)	117.8	(29)	2.2%	(7)	1,509	(16)	69.2	(23)
Colorado	28,001	(18)	4,862.4	(21)	1,527	(16)	5.5%	(12)	265.2	(15)	0.9%	(38)	803	(46)	40.3	(38)
Connecticut	43,968	(13)	12,332.2	(6)	4,071	(8)	9.3%	(1)	1,141.8	(3)	0.5%	(48)	2,096	(8)	70.8	(20)
Delaware	9,942	(34)	10,209.9	(7)	398	(33)	4.0%	(27)	408.7	(12)	0.5%	(47)	1,221	(29)	65.1	(26)
District Of Columbia	9,332	(37)	13,222.8	(5)	489	(29)	5.2%	(13)	692.9	(6)	1.0%	(37)	1,632	(13)	107.5	(6)
Florida	63,938	(9)	2,976.9	(37)	2,703	(11)	4.2%	(24)	125.9	(28)	2.2%	(11)	1,296	(25)	51.7	(32)
Georgia	51,898	(11)	4,888.0	(20)	2,180	(14)	4.2%	(25)	205.3	(18)	1.5%	(25)	1,000	(40)	65.1	(27)
Hawaii	675	(49)	476.7	(51)	17	(50)	2.5%	(41)	12.0	(51)	0.7%	(46)	(57)	(51)	2.3	(51)
Idaho	3,139	(43)	1,751.6	(44)	83	(44)	2.6%	(40)	46.3	(45)	1.4%	(28)	745	(47)	23.9	(43)
Illinois	127,757	(4)	10,082.0	(8)	5,904	(5)	4.6%	(20)	465.9	(10)	0.8%	(42)	1,629	(14)	84.5	(16)
Indiana	37,397	(16)	5,554.9	(18)	2,303	(13)	6.2%	(9)	342.1	(13)	1.2%	(34)	906	(44)	59.9	(28)
Iowa	21,712	(23)	6,881.6	(12)	604	(27)	2.8%	(39)	191.4	(20)	1.6%	(19)	1,444	(21)	97.8	(11)
Kansas	10,476	(33)	3,595.9	(29)	235	(37)	2.2%	(44)	80.7	(38)	0.8%	(44)	917	(43)	31.8	(41)
Kentucky	11,287	(32)	2,526.4	(40)	470	(30)	4.2%	(26)	105.2	(32)	2.1%	(13)	1,129	(31)	50.6	(33)
Louisiana	42,816	(14)	9,210.1	(10)	2,941	(9)	6.9%	(7)	632.6	(7)	1.0%	(36)	1,812	(11)	89.0	(13)
Maine	2,570	(45)	1,911.9	(42)	99	(42)	3.9%	(30)	73.6	(39)	1.6%	(22)	995	(41)	26.0	(42)
Maryland	57,973	(10)	9,589.2	(9)	2,749	(10)	4.7%	(17)	454.7	(11)	1.4%	(29)	1,487	(18)	122.8	(4)
Massachusetts	103,436	(5)	14,883.9	(3)	7,316	(3)	7.1%	(6)	1,052.7	(4)	0.4%	(49)	1,226	(27)	133.0	(3)
Michigan	64,413	(8)	6,449.8	(13)	5,895	(6)	9.2%	(2)	590.3	(8)	2.2%	(8)	2,233	(6)	100.4	(10)
Minnesota	27,886	(19)	4,944.6	(19)	1,197	(18)	4.3%	(23)	212.2	(16)	1.8%	(17)	2,398	(4)	76.9	(17)
Mississippi	17,270	(26)	5,802.8	(17)	817	(23)	4.7%	(18)	274.5	(14)	1.5%	(24)	1,508	(17)	84.9	(15)

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State-by-State

Comparative Statistics- Page 2 of 2

"Strategic Guidance in an Era of Unprecedented Change"

As of June 7

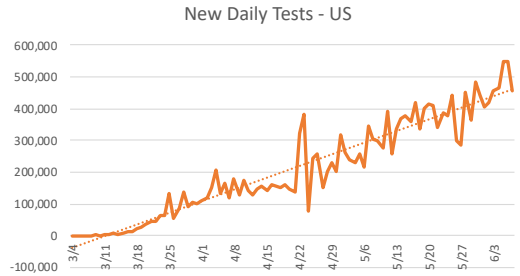
State	Total Cases	Rank	Cases per 1M Population	Rank2	Deaths	Rank3	Death Rate	Rank4	Deaths per 1 Million Population	Rank5	5-day Moving Average Case Growth Rate	Rank6	Tests per 1M Population Past 7 days	Rank7	New Daily Cases Per 1M Population (5-Day M.A.)	Rank8
Missouri	15,065	(29)	2,454.6	(41)	826	(22)	5.5%	(11)	134.6	(27)	1.5%	(23)	1,008	(39)	37.0	(39)
Montana	545	(50)	509.9	(50)	18	(48)	3.3%	(35)	16.8	(49)	0.8%	(41)	1,013	(38)	4.0	(50)
Nebraska	15,634	(27)	8,082.1	(11)	189	(38)	1.2%	(49)	97.7	(34)	1.4%	(30)	1,376	(23)	113.2	(5)
Nevada	9,649	(35)	3,132.6	(35)	438	(31)	4.5%	(21)	142.2	(25)	1.8%	(18)	1,537	(15)	49.0	(34)
New Hampshire	5,043	(41)	3,708.9	(27)	286	(36)	5.7%	(10)	210.3	(17)	1.2%	(33)	1,442	(22)	41.2	(37)
New Jersey	166,006	(2)	18,689.8	(2)	12,216	(2)	7.4%	(5)	1,375.3	(2)	0.3%	(51)	3,446	(1)	68.2	(24)
New Mexico	8,940	(38)	4,263.6	(22)	396	(34)	4.4%	(22)	188.9	(21)	2.2%	(10)	2,364	(5)	85.2	(14)
New York	398,828	(1)	20,501.5	(1)	30,442	(1)	7.6%	(3)	1,564.9	(1)	0.9%	(39)	3,187	(2)	139.0	(1)
North Carolina	35,624	(17)	3,396.6	(31)	1,032	(21)	2.9%	(38)	98.4	(33)	3.5%	(3)	1,293	(26)	93.2	(12)
North Dakota	2,861	(44)	3,754.3	(26)	72	(45)	2.5%	(42)	94.5	(35)	1.6%	(21)	1,480	(19)	53.2	(31)
Ohio	38,507	(15)	3,294.3	(33)	2,385	(12)	6.2%	(8)	204.0	(19)	1.1%	(35)	955	(42)	36.1	(40)
Oklahoma	7,150	(39)	1,806.9	(43)	348	(35)	4.9%	(16)	87.9	(37)	1.3%	(31)	1,030	(37)	23.3	(44)
Oregon	4,808	(42)	1,139.9	(48)	164	(39)	3.4%	(33)	38.9	(46)	2.1%	(12)	650	(50)	19.1	(45)
Pennsylvania	80,004	(6)	6,249.3	(14)	6,010	(4)	7.5%	(4)	469.5	(9)	0.7%	(45)	722	(49)	42.2	(36)
Rhode Island	15,441	(28)	14,575.8	(4)	772	(24)	5.0%	(15)	728.7	(5)	0.4%	(50)	2,191	(7)	69.2	(22)
South Carolina	14,286	(30)	2,774.7	(38)	546	(28)	3.8%	(31)	106.0	(31)	2.8%	(5)	1,044	(36)	67.3	(25)
South Dakota	5,438	(40)	6,147.0	(15)	65	(46)	1.2%	(50)	73.5	(40)	1.4%	(27)	2,088	(9)	71.9	(19)
Tennessee	26,381	(21)	3,860.7	(24)	418	(32)	1.6%	(48)	61.2	(42)	1.6%	(20)	1,313	(24)	70.6	(21)
Texas	75,763	(7)	2,612.9	(39)	1,853	(15)	2.4%	(43)	63.9	(41)	2.2%	(9)	732	(48)	53.5	(30)
Utah	12,066	(31)	3,763.6	(25)	121	(41)	1.0%	(51)	37.7	(47)	3.4%	(4)	1,071	(35)	101.1	(9)
Vermont	1,063	(47)	1,703.6	(45)	55	(47)	5.2%	(14)	88.1	(36)	1.5%	(26)	1,659	(12)	18.8	(46)
Virginia	50,681	(12)	5,937.7	(16)	1,472	(17)	2.9%	(37)	172.5	(22)	1.9%	(15)	1,078	(33)	101.7	(8)
Washington	24,733	(22)	3,248.0	(34)	1,162	(19)	4.7%	(19)	152.6	(23)	1.3%	(32)	867	(45)	42.4	(35)
West Virginia	2,144	(46)	1,199.7	(47)	84	(43)	3.9%	(28)	47.0	(44)	0.8%	(40)	1,134	(30)	10.7	(49)
Wisconsin	20,835	(24)	3,578.4	(30)	647	(26)	3.1%	(36)	111.1	(30)	2.0%	(14)	1,919	(10)	59.7	(29)
Wyoming	947	(48)	1,636.3	(46)	17	(50)	1.8%	(46)	29.4	(48)	0.8%	(43)	1,076	(34)	10.9	(48)
United States	2,007,449		6,064.8		112,469		5.6%		329.7		1.3%		1,422		67.3	

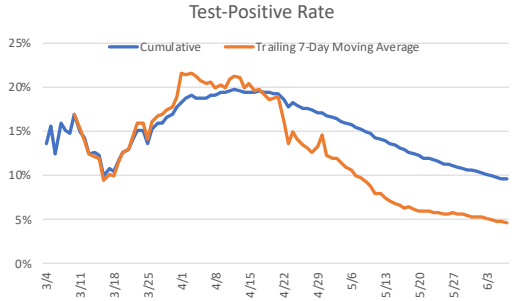
United States

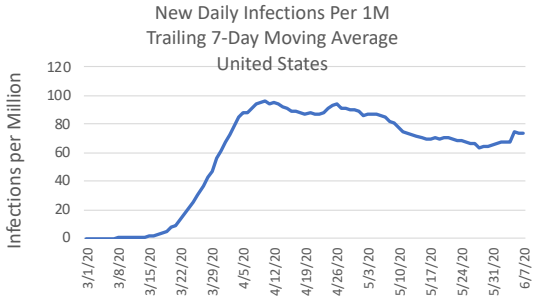
Overall Statistics

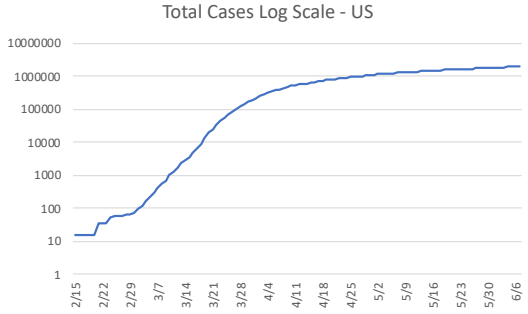
"Strategic Guidance in an Era of Unprecedented Change"

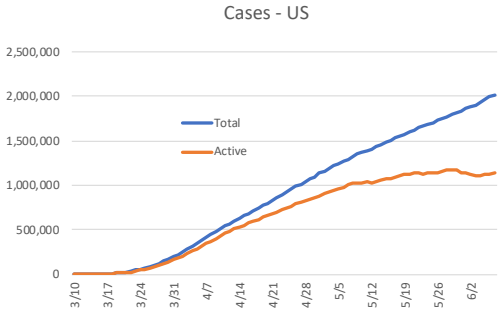
With significantly increased testing, the US is now meeting the WHO standard of <10% test-positives. This suggests that asymptomatic cases are being captured and that we have a better view of true infection rates.
Further, new daily infections continue to decline; the death rate seems to have stabilized.

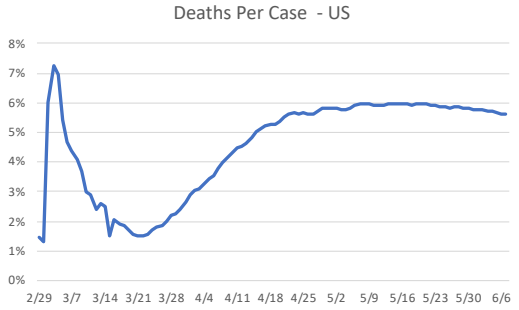












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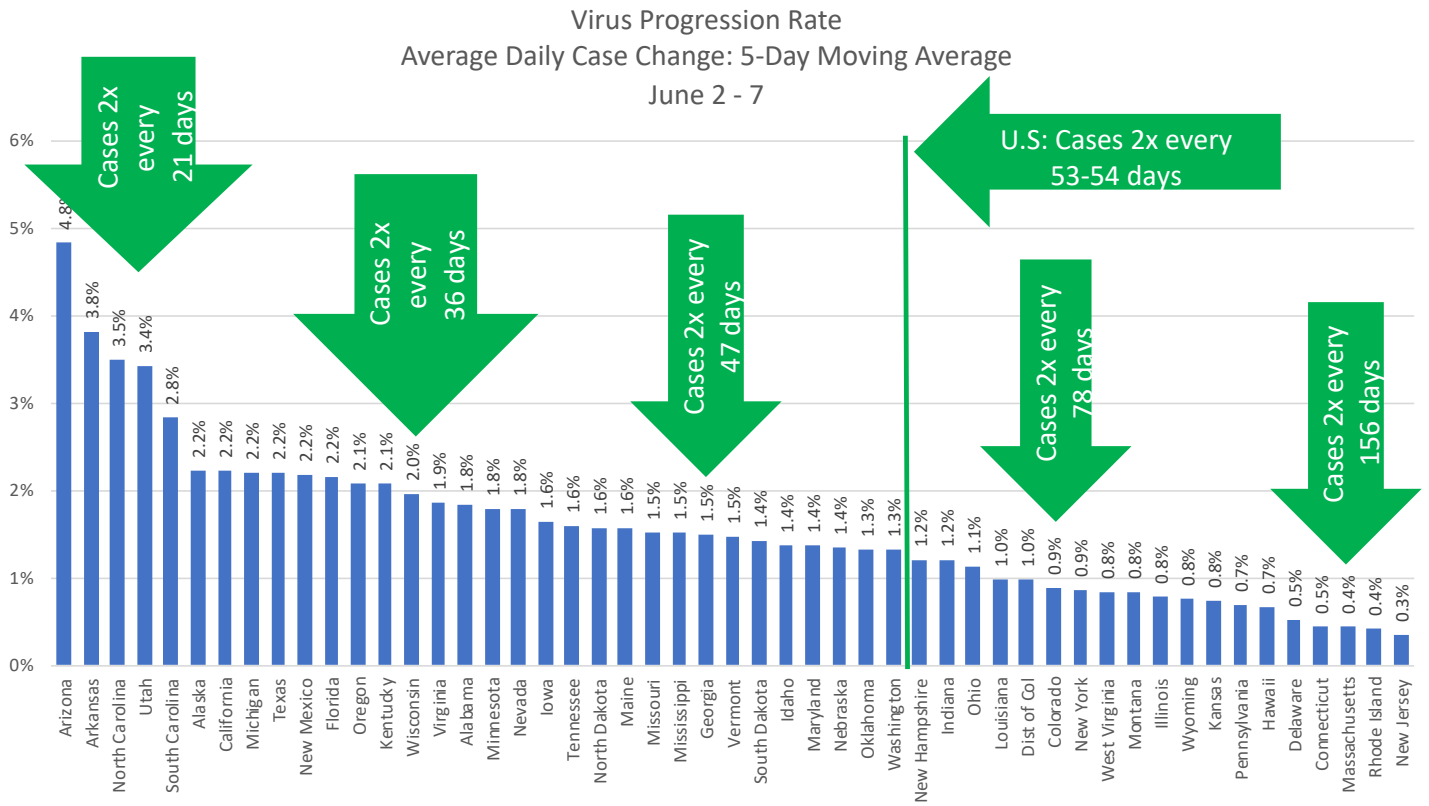
State-by-State

Average Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

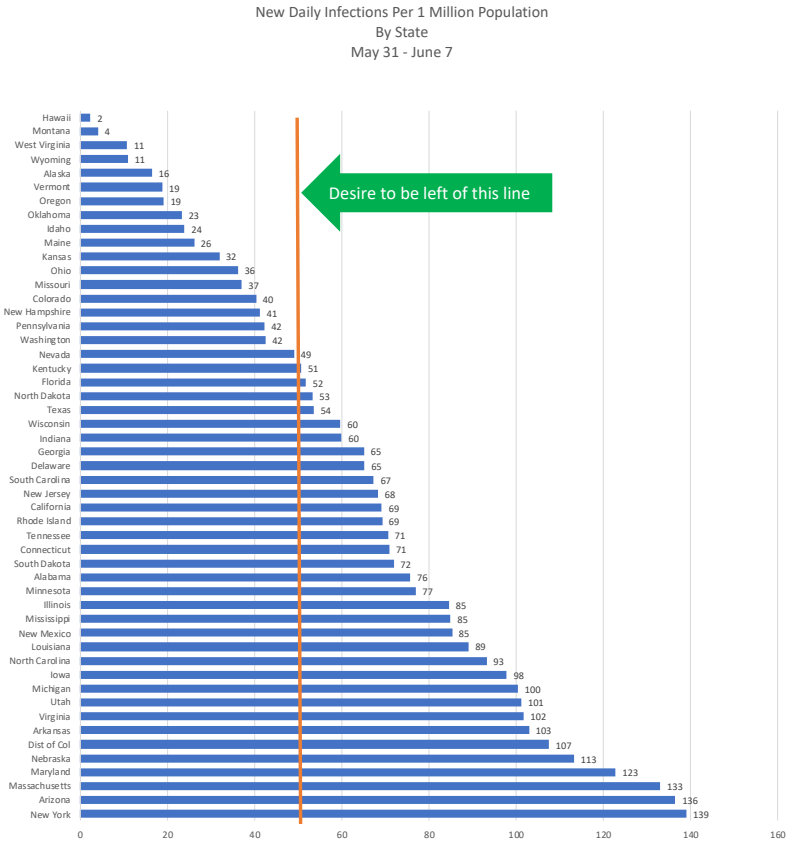
At the height of the epidemic, cases in some states were doubling every few days. Now, they would take from 15 – 199 days to double

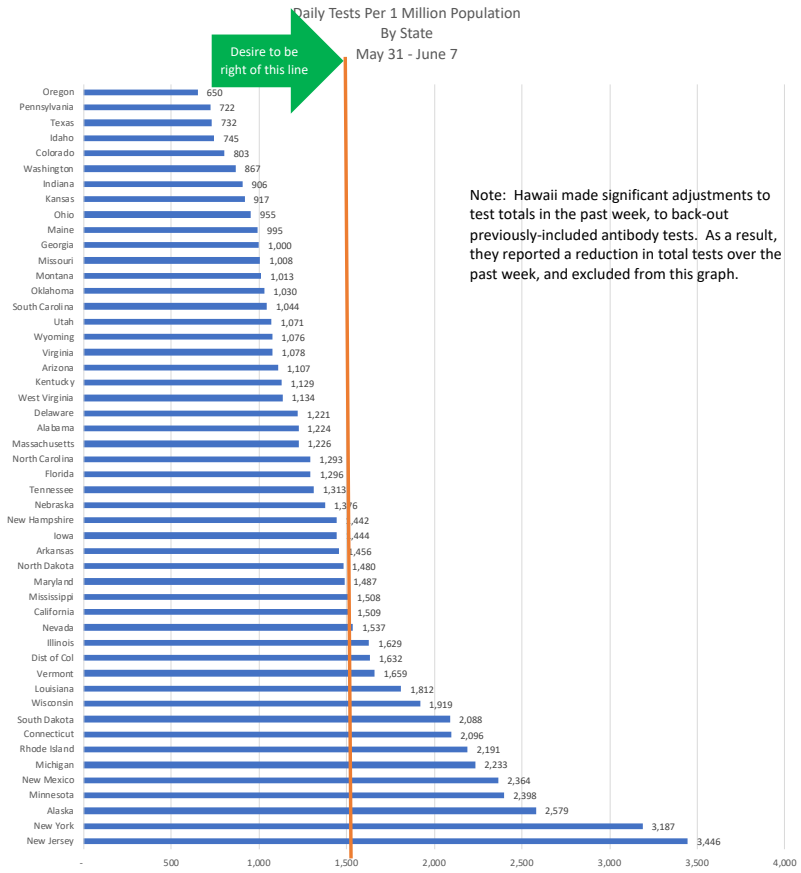


State-by-State

New Daily Infections & Tests Per Capita

"Strategic Guidance in an Era of Unprecedented Change"



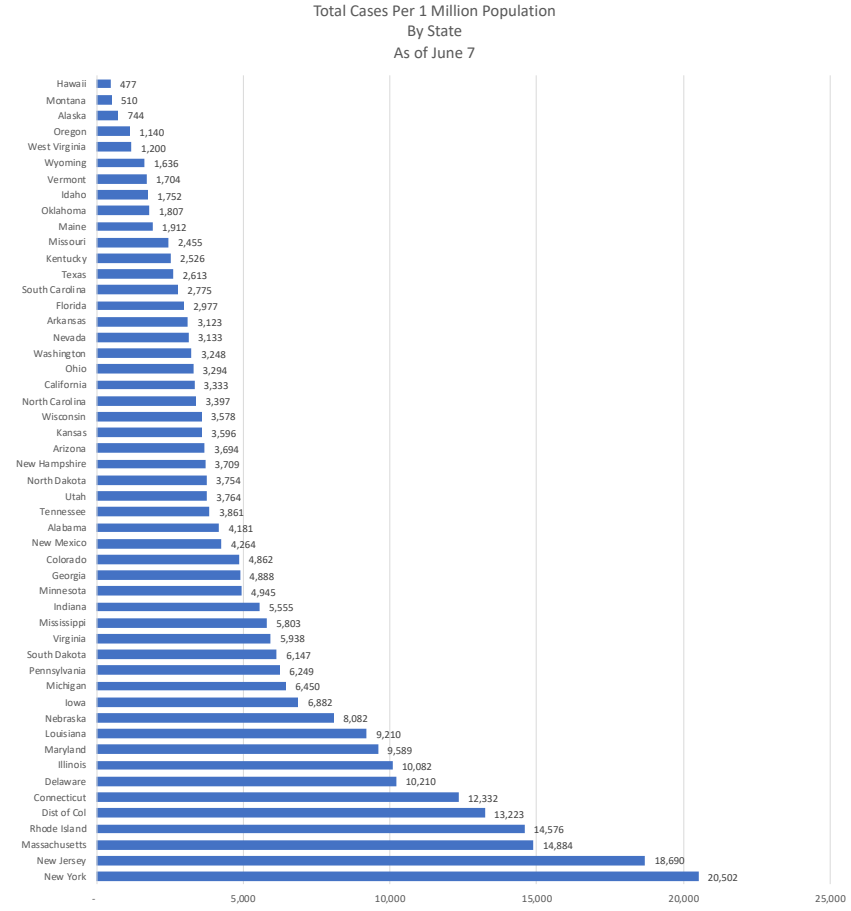


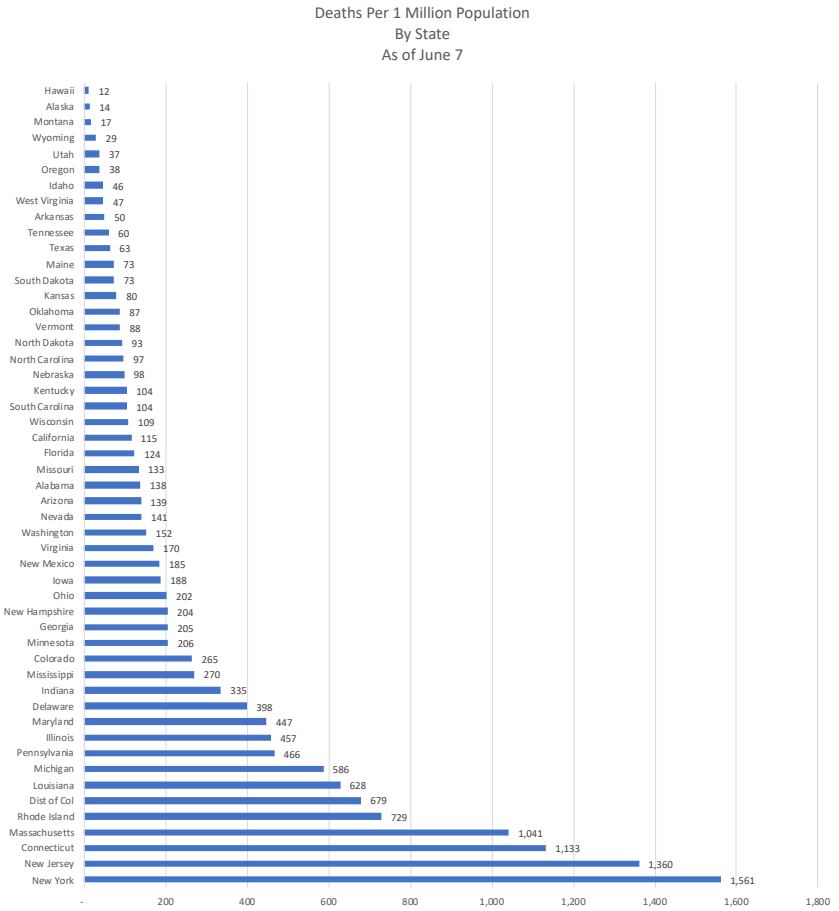
Note: Hawaii made significant adjustments to test totals in the past week, to back-out previously-included antibody tests. As a result, they reported a reduction in total tests over the past week, and excluded from this graph.

State-by-State

Cases & Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"



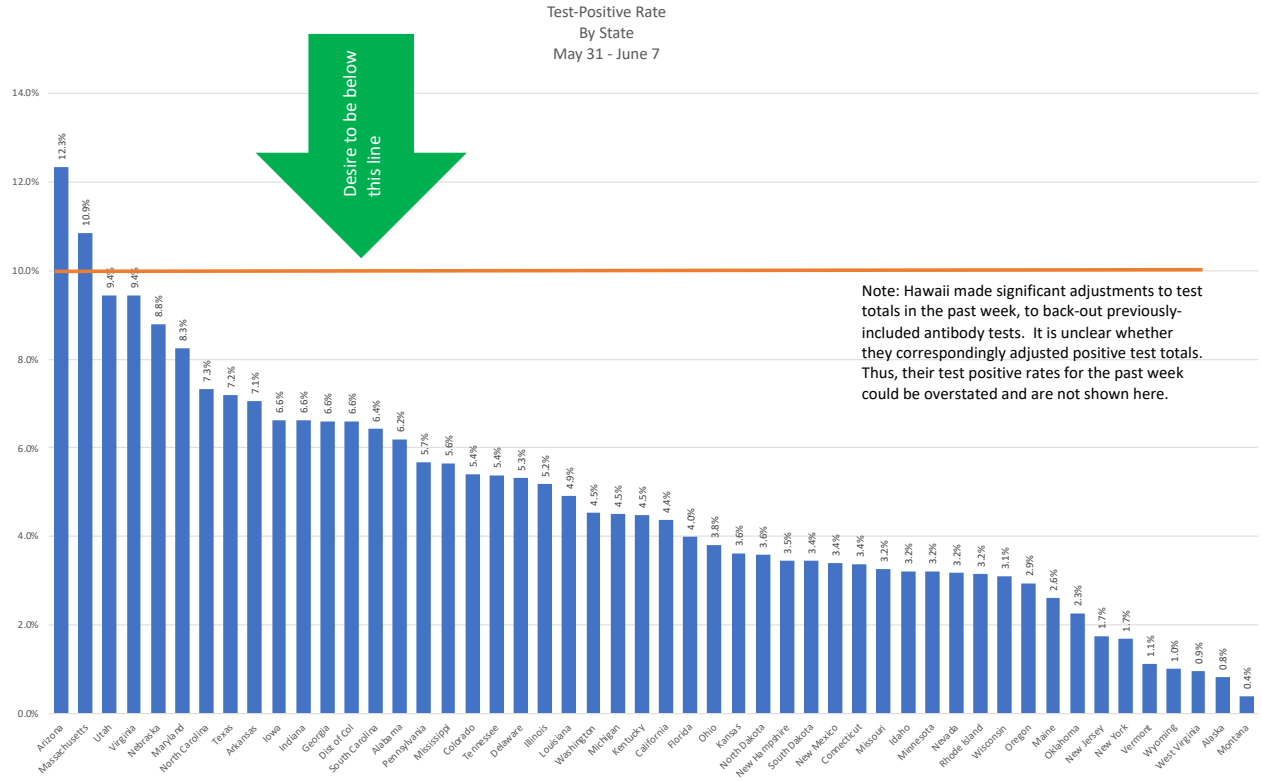


State-by-State

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. All except 2 states met this guideline for the past week.



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 7

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 31

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 month

June 7

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 7

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

State-By-State

Relative "Readiness" For Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

Legend:

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

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 8, 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 8, 2020

VIRUS PROGRESSION: ROADMAP TO RECOVERY

Virus Progression

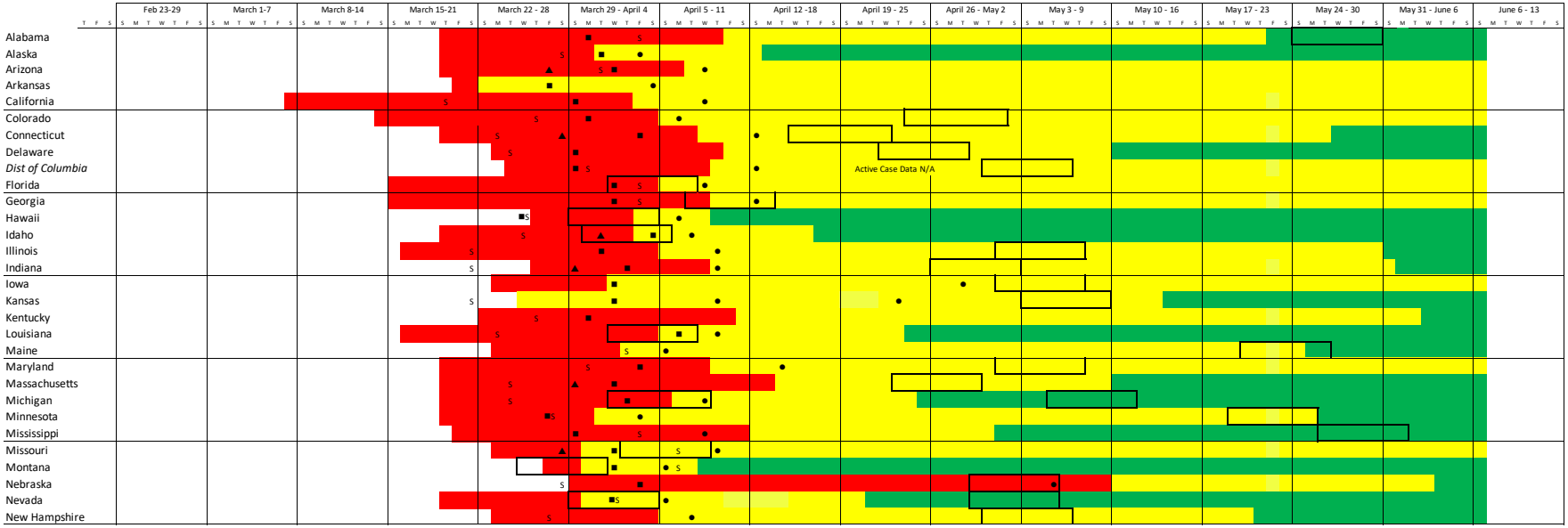
The graphic on the following two pages illustrates when the state first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were recorded (start of the "recovery" phase). It uses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

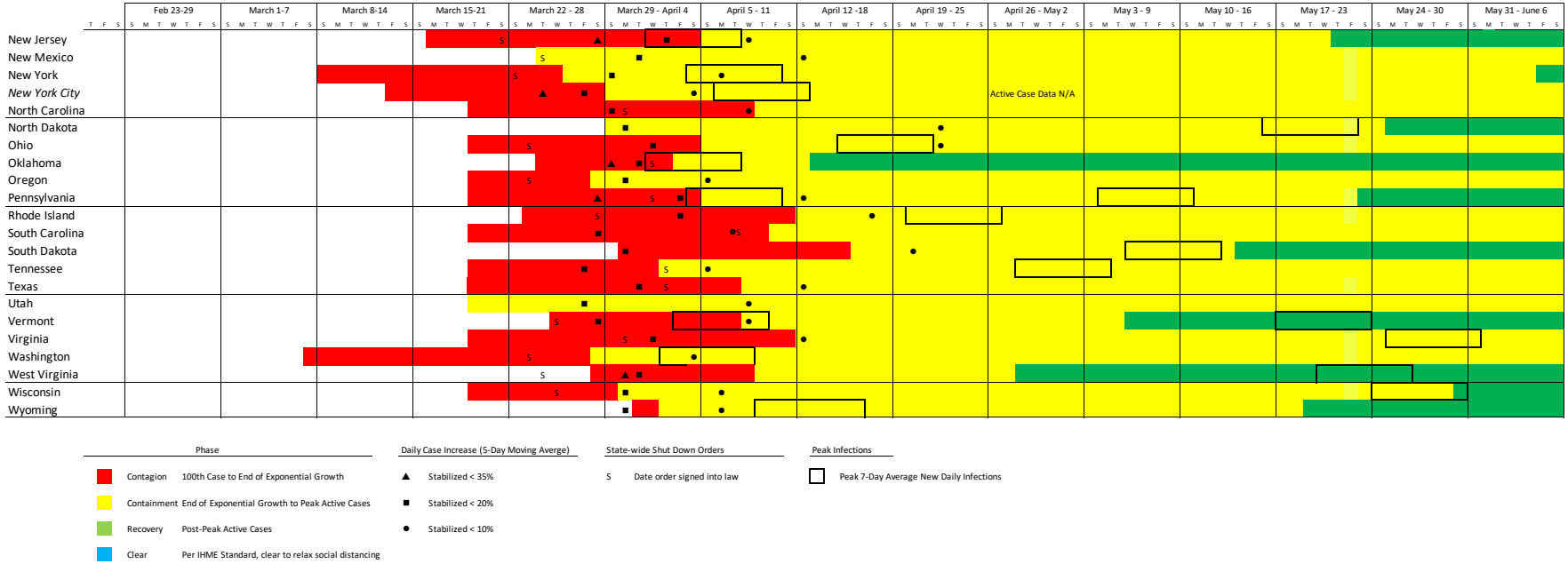


Legend on following page

State-by-State

Virus Progression – *2 of 2*

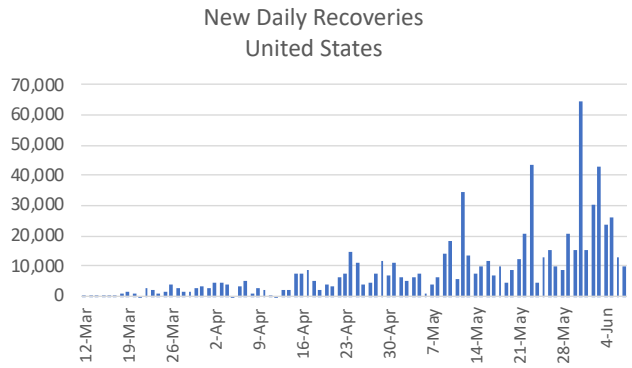
"Strategic Guidance in an Era of Unprecedented Change"

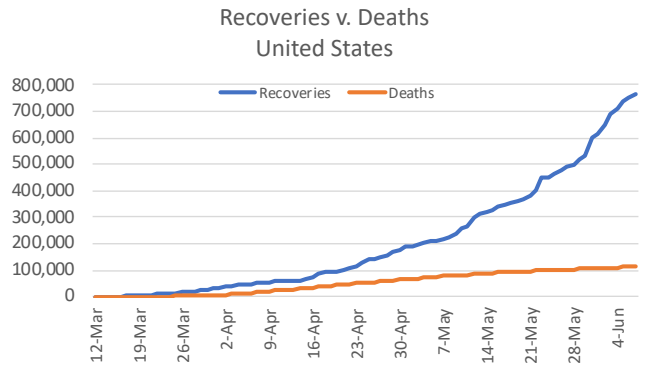


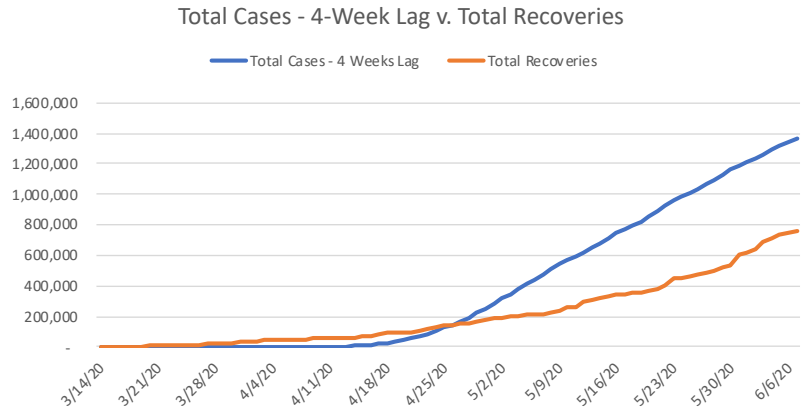
UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

Recoveries

"Strategic Guidance in an Era of Unprecedented Change"







Health Industry Advisor, llc

Recoveries

Reporting of Recoveries Seems to Be Lagging

"Strategic Guidance in an Era of Unprecedented Change"

Which states seem to be lagging in reporting?

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

Comparing the reported recoveries to Total Cases 4 weeks ago*, this shortfall is ~322-470k

State	Recoveries	Expected Recoveries Low	High
Alabama	11,395	7,911	8,900
Alaska	382	303	341
Arizona	174	8,895	10,007
Arkansas	6,424	3,210	3,611
California	32,630	54,334	61,125
Colorado	2,319	15,762	17,733
Connecticut	7,689	26,843	30,199
Delaware	5,792	5,158	5,802
District Of Columbia	1,143	5,018	5,645
Florida	11,723	32,477	36,536
Georgia	858	26,806	30,157
Hawaii	617	506	569
Idaho	2,461	1,784	2,007
Illinois	67,896	62,193	69,967
Indiana	25,138	19,301	21,713
Iowa	12,816	9,567	10,763
Kansas	5,216	5,562	6,258
Kentucky	3,344	5,152	5,796
Louisiana	31,728	25,280	28,440
Maine	1,864	1,149	1,292
Maryland	4,240	26,070	29,328
Massachusetts	78,108	62,234	70,014
Michigan	42,041	37,710	42,424
Minnesota	22,992	9,017	10,144
Mississippi	11,203	7,601	8,551
Missouri	3,449	8,006	9,007
Montana	475	366	412
Nebraska	8,455	6,652	7,484
Nevada	7,172	4,878	5,488
New Hampshire	3,392	2,457	2,764
New Jersey	26,279	112,006	126,007
New Mexico	3,307	3,890	4,377
New York	84,691	276,325	310,865
North Carolina	18,860	11,951	13,445
North Dakota	2,307	1,193	1,342
Ohio	7,704	19,265	21,673
Oklahoma	5,981	3,671	4,130
Oregon	2,237	2,582	2,905
Pennsylvania	53,670	48,045	54,050
Rhode Island	1,336	9,019	10,147
South Carolina	7,347	6,122	6,888
South Dakota	4,335	2,714	3,054
Tennessee	17,222	11,988	13,487
Texas	49,758	31,912	35,901
Utah	7,108	5,001	5,626
Vermont	890	742	834
Virginia	6,538	19,265	21,673
Washington	7,709	14,088	15,849
West Virginia	1,451	1,090	1,226
Wisconsin	14,047	8,175	9,197
Wyoming	757	530	596
United States	761,708	1,094,110	1,230,874

* - 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 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 presented at a time. Today, we provide:

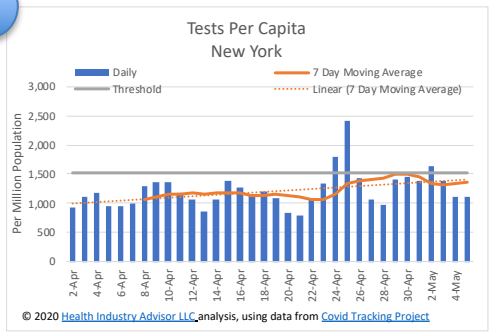
- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas

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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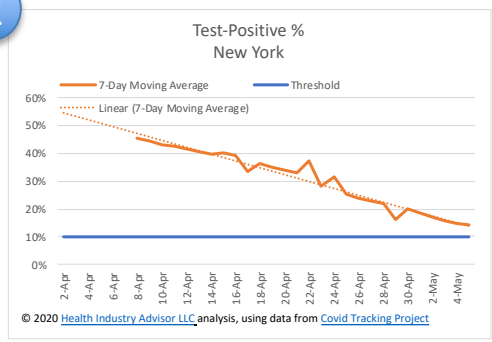

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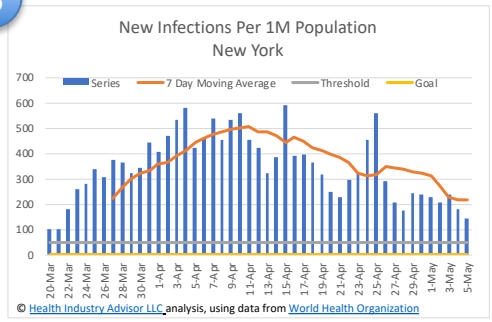

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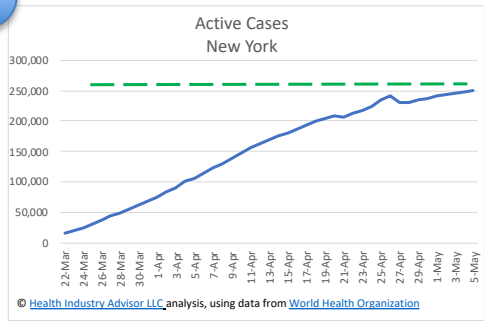
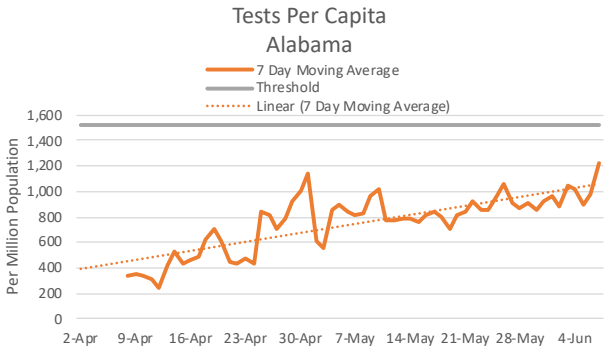
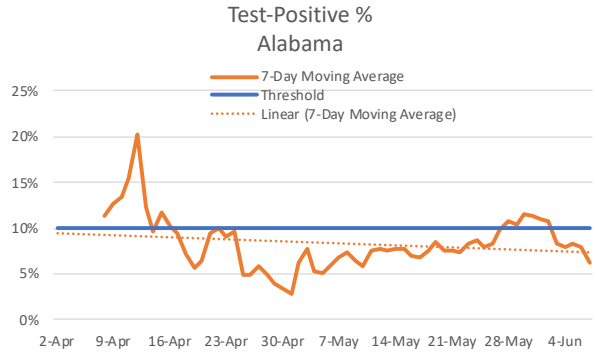
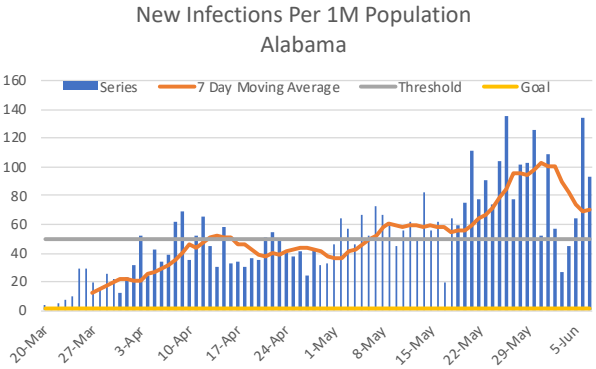
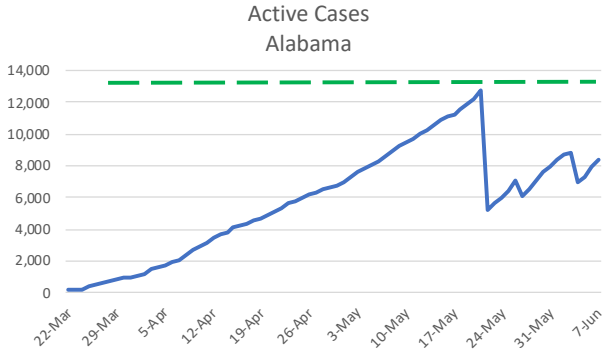


Test, New Daily Infection and Active Case Trends





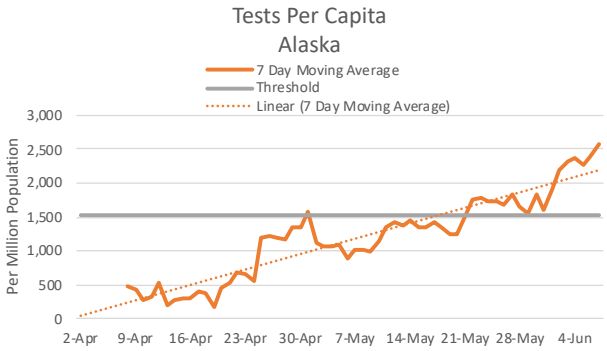


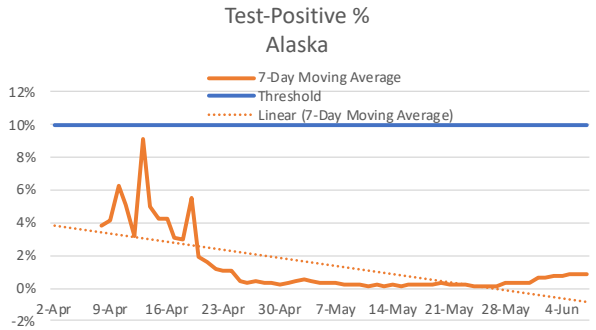


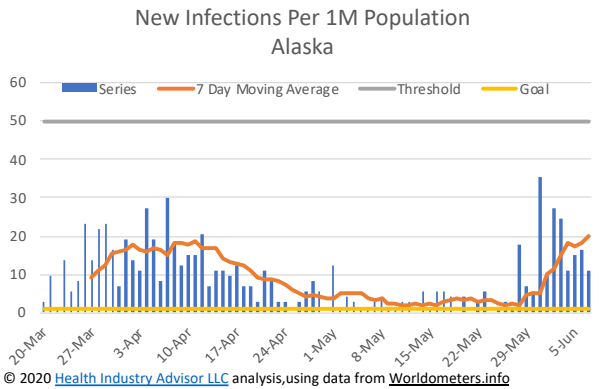
State-by-State

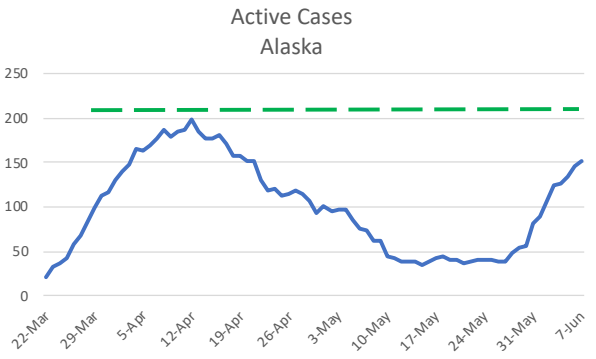
Test, New Daily Infection and Active Case Trends

"Strategic Guidance in an Era of Unprecedented Change"

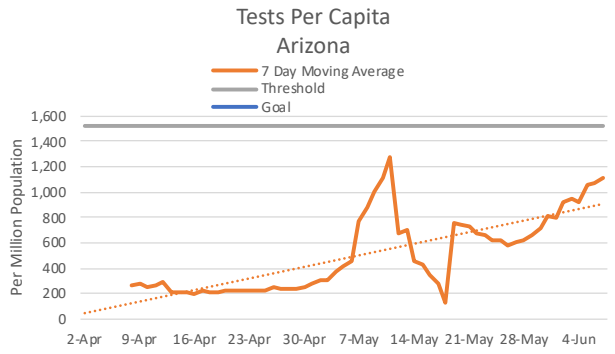


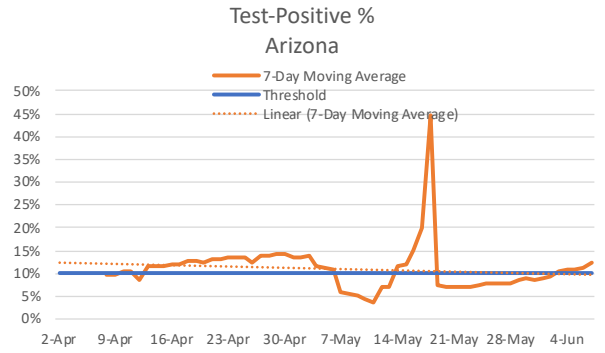


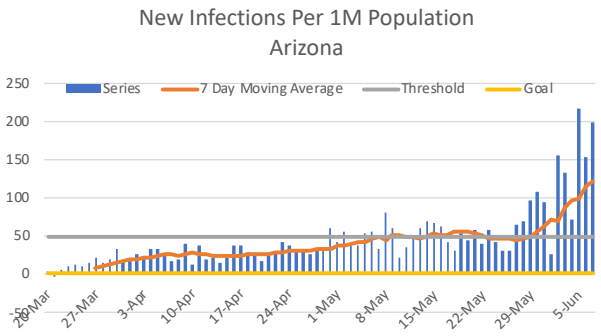


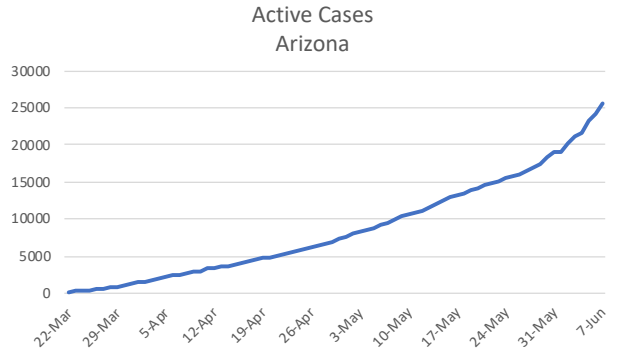


Test, New Daily Infection and Active Case Trends









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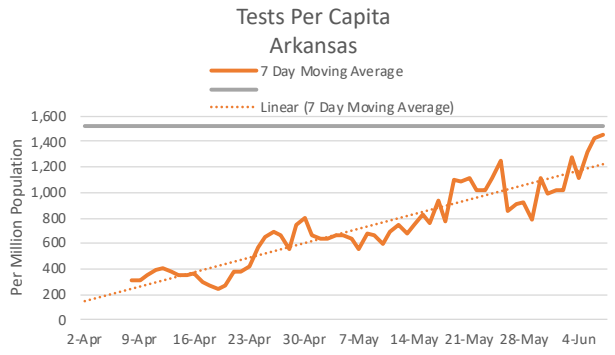

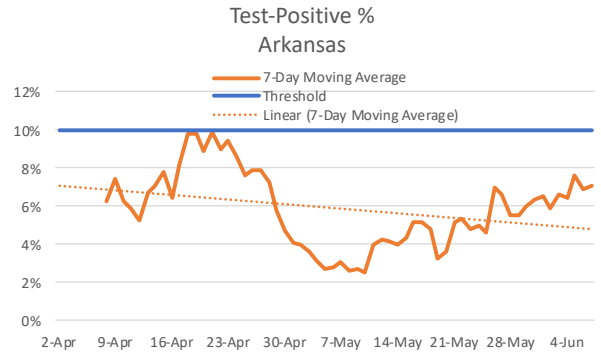

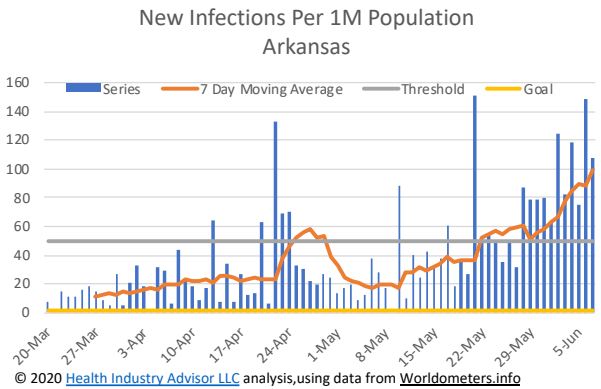

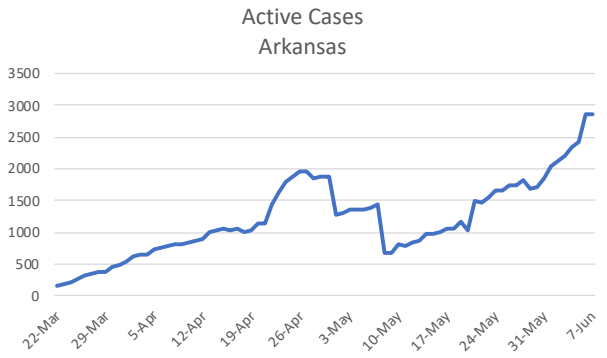

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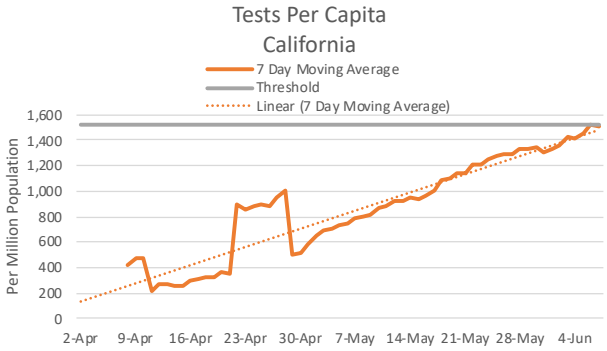

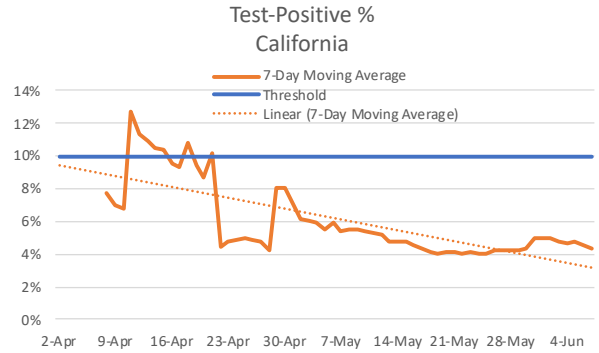

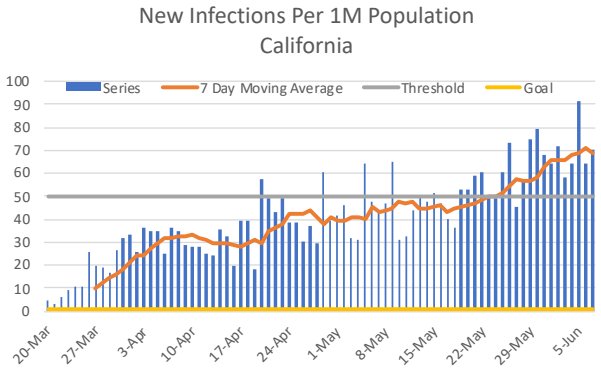

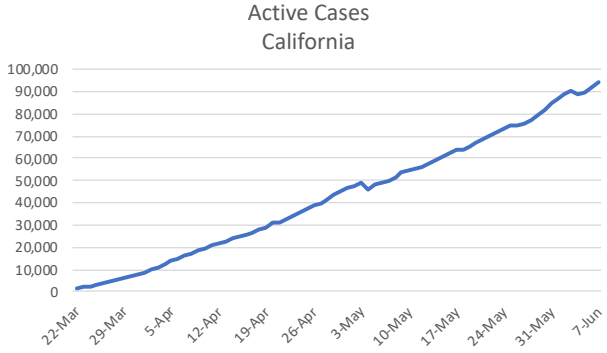

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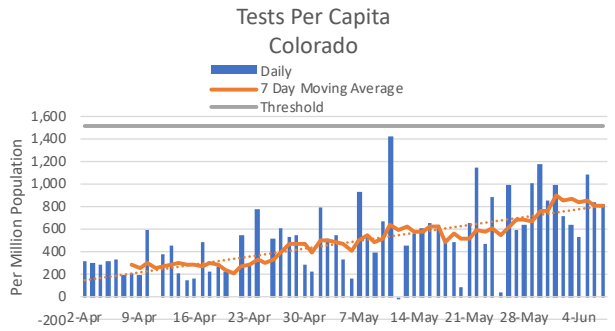

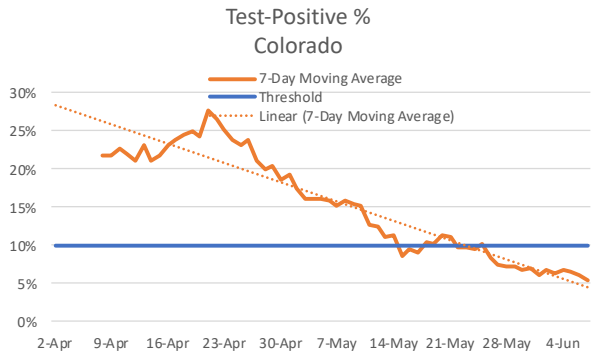

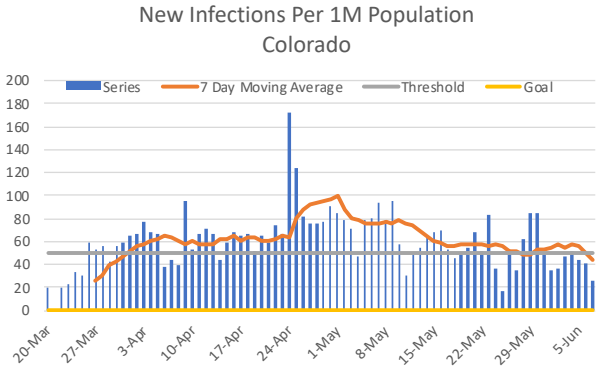

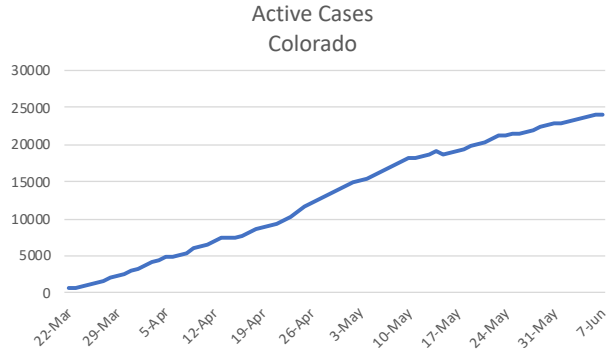

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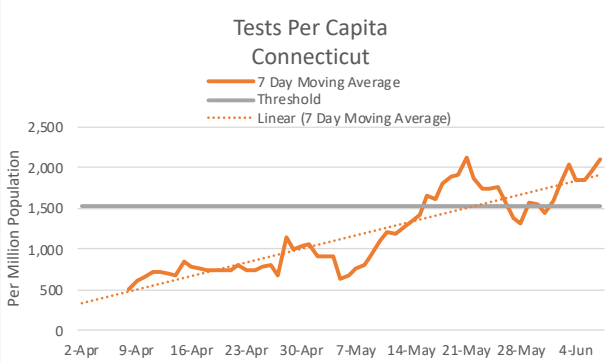

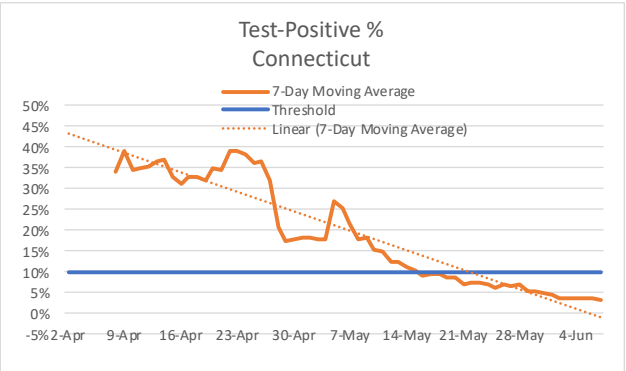

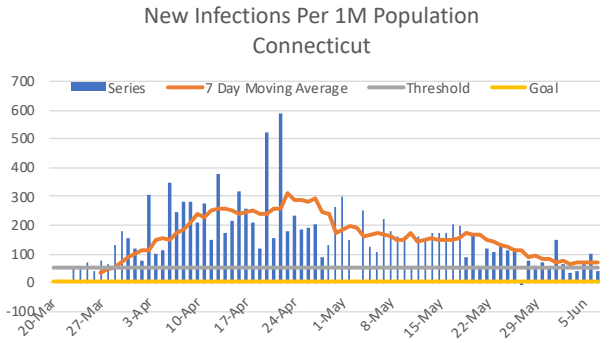

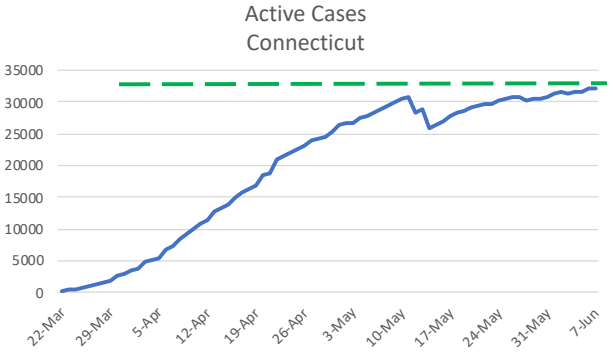

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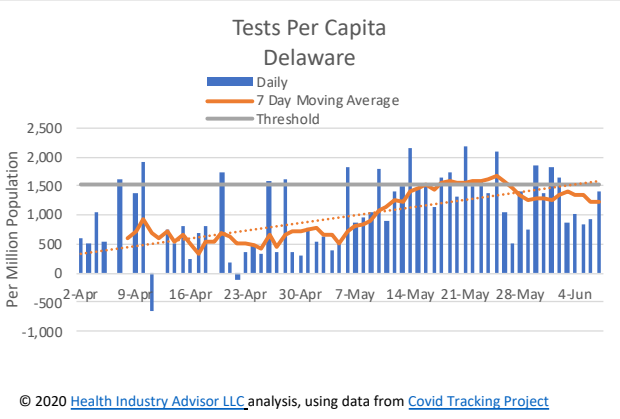

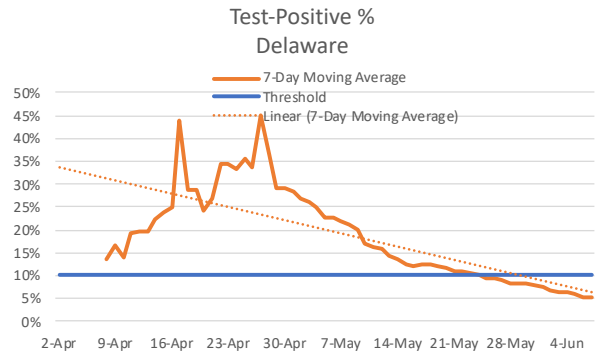

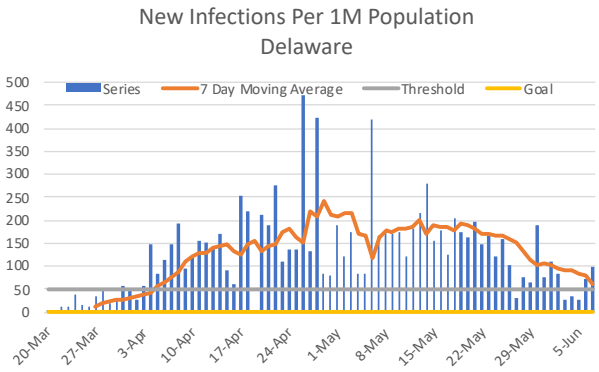

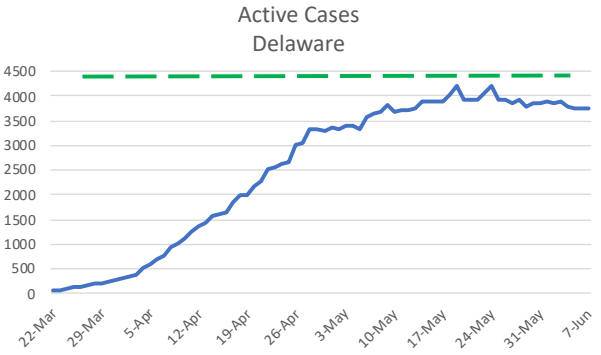

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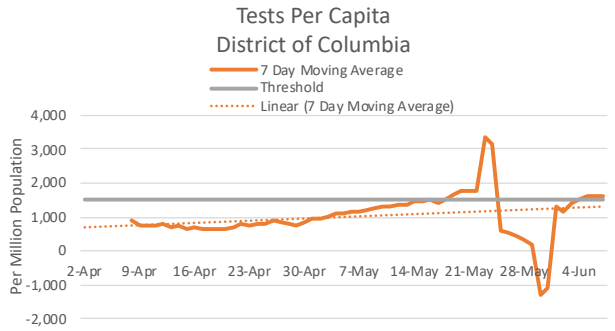

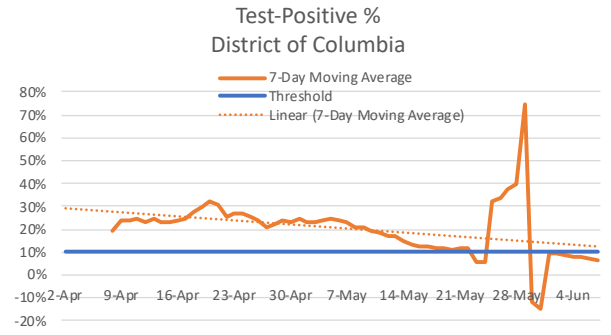

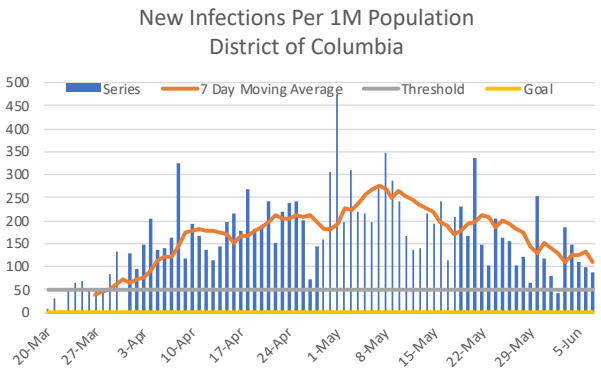

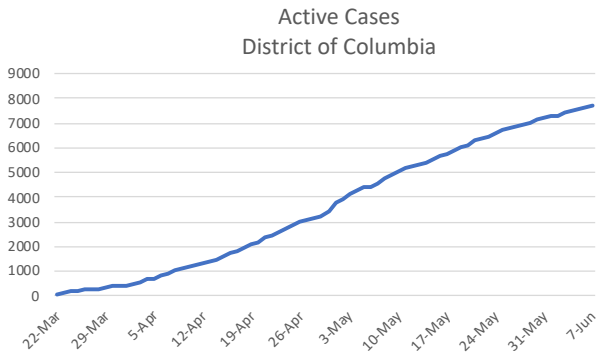

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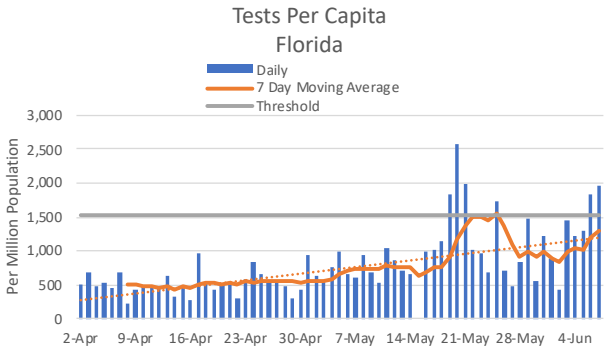

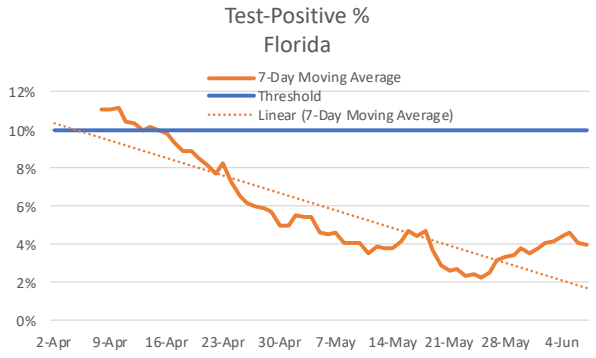

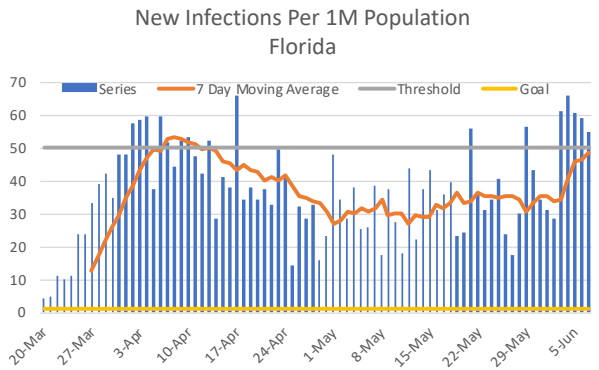

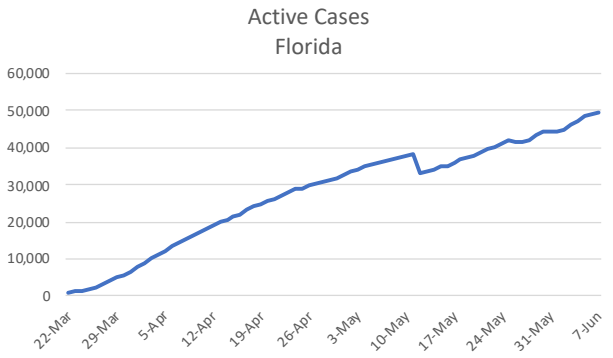

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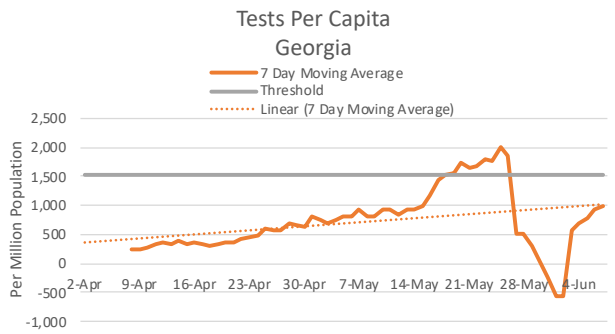

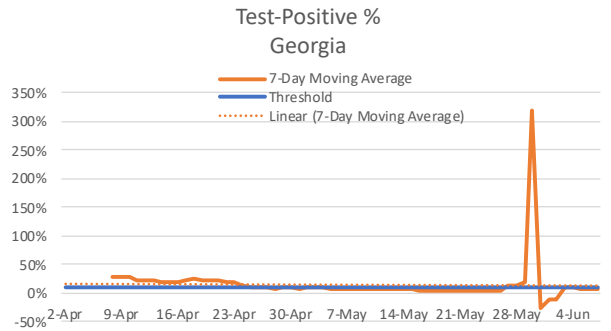

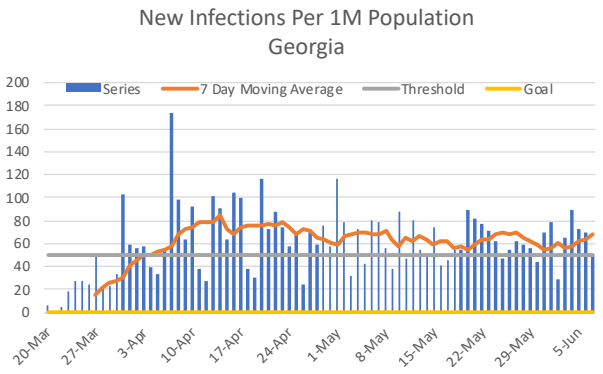

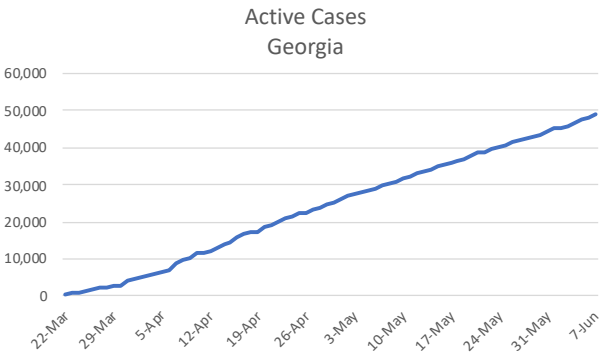

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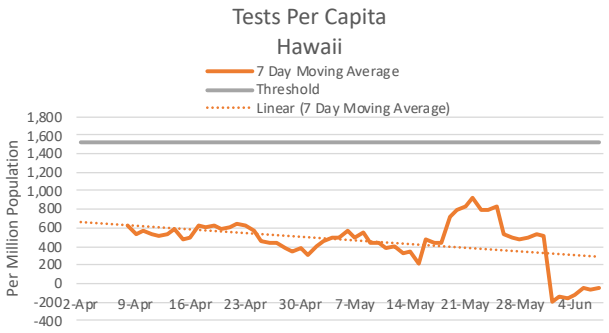

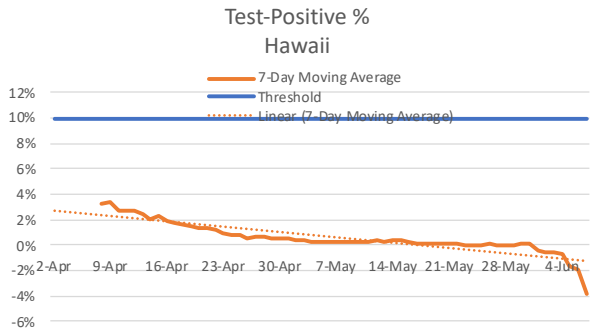

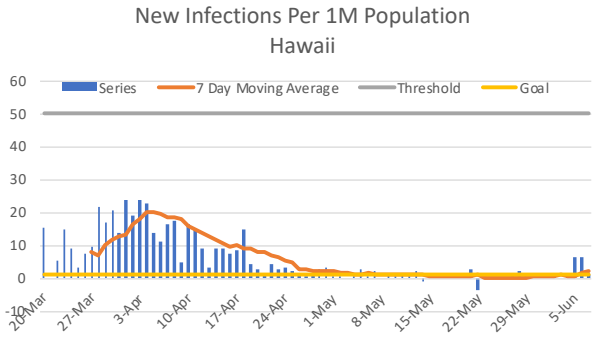

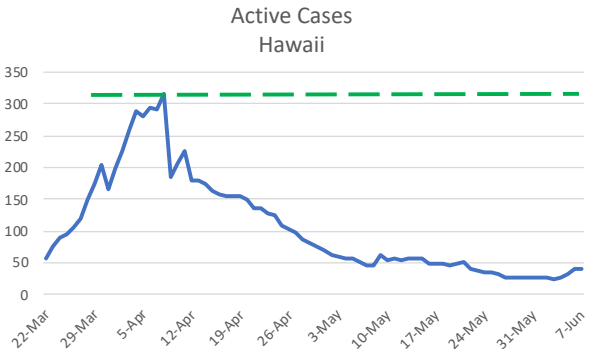

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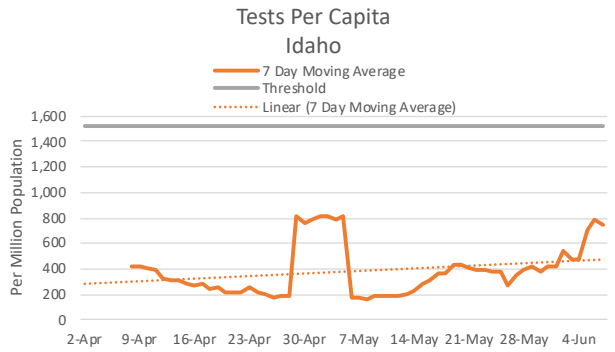

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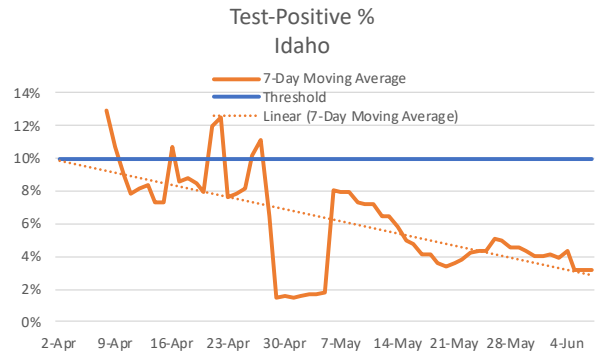

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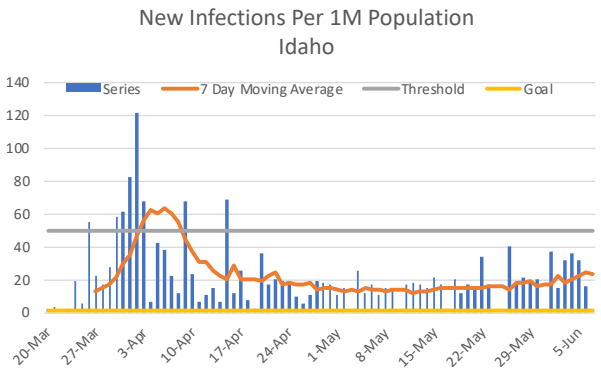

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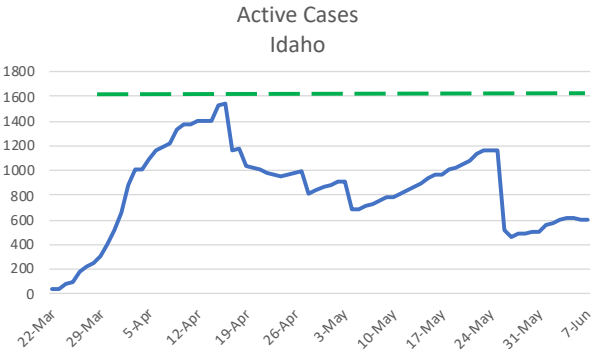

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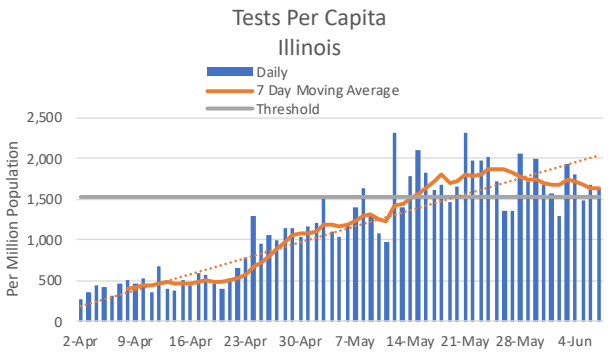

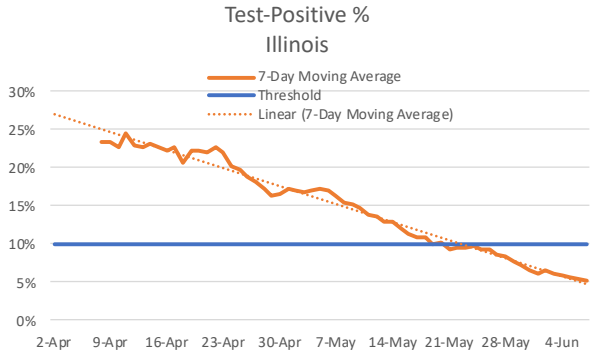

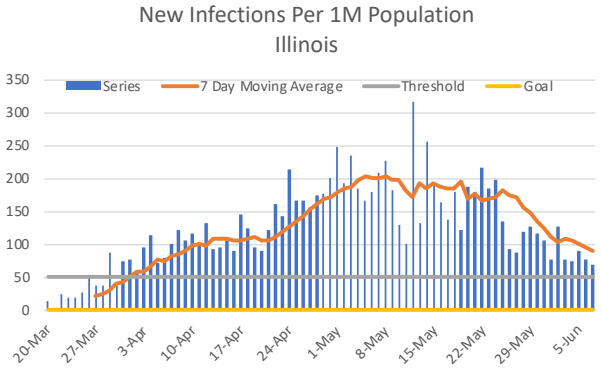

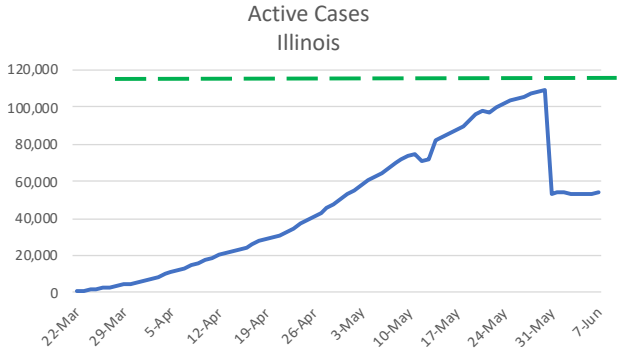

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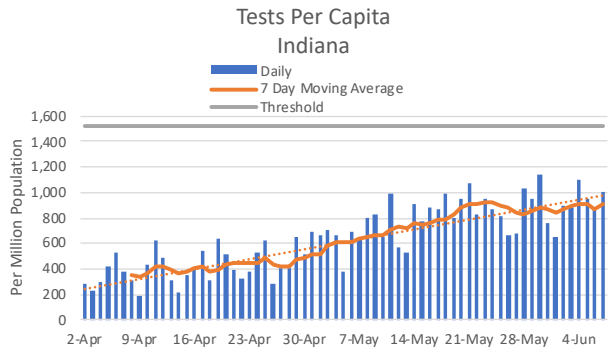

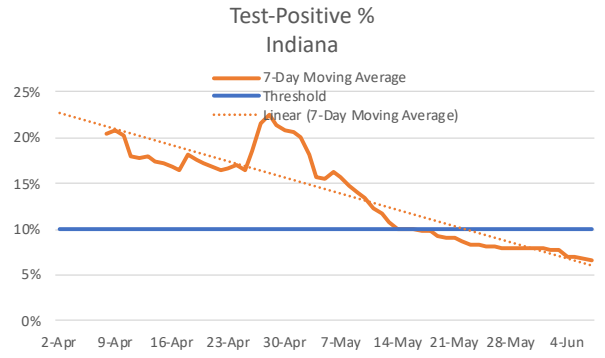

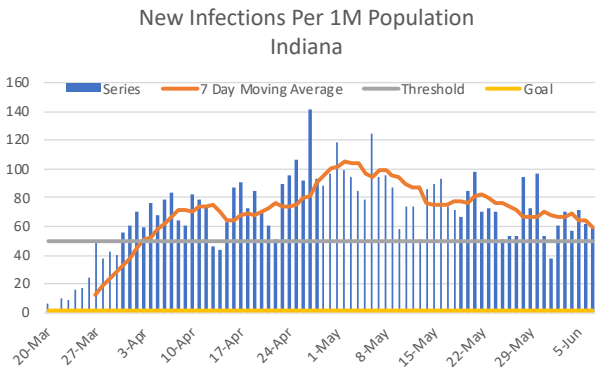

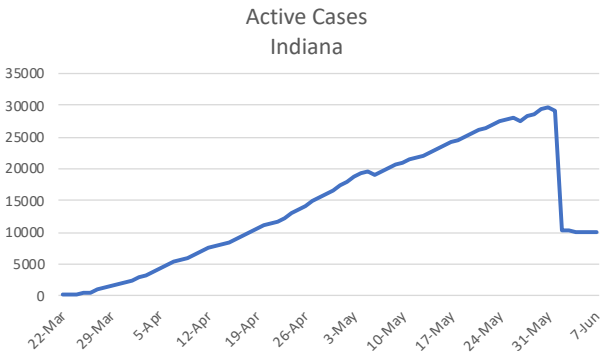

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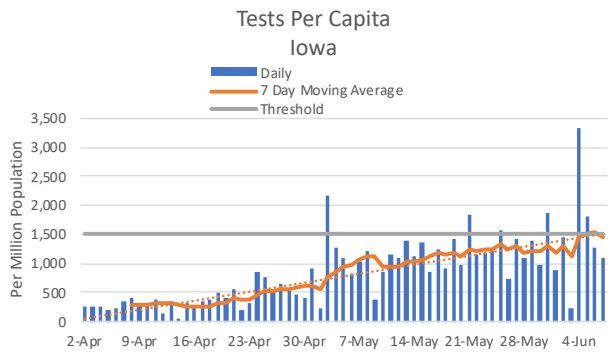

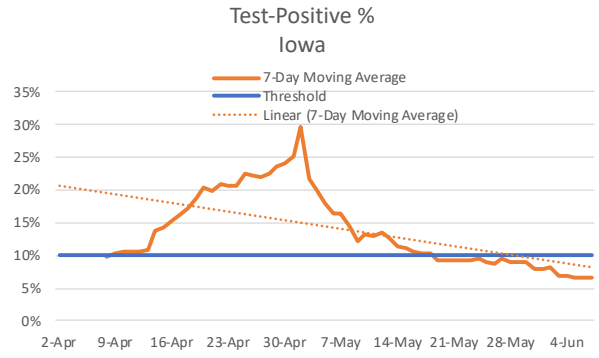

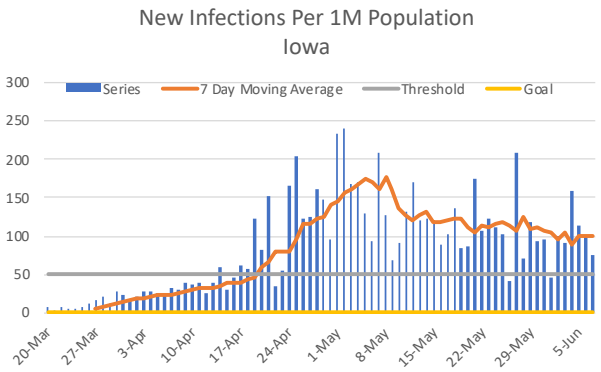

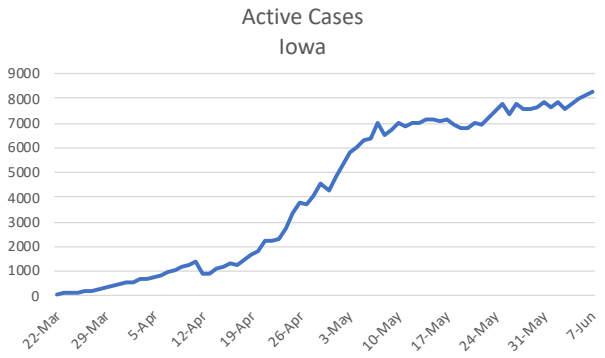

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