

COVID-19 Dashboard

Issue # 49
Monday, May 11, 2020

Day's Highlights

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	~580,000 tests on the weekend
Test-Positivity Rate	Decline	7.8%% on Sunday; 8.8% for past 7 days
Number of Cases	Plateau	New cases down 10.7% last 7 days v. prior week
Deaths % of Total Cases	Decline	Steady at 5.9%
Number of Deaths / 1M Population	Plateau	244.1
Recoveries : Death	Increase	3.17

- The U.S continued to broaden its testing, with nearly 600,000 new tests on the weekend; the test-positive rate was 8.1%. For the week, tests averaged 284,000 per day, with an 8.8% test-positive rate. Note: the World Health Organization suggests a 10% rate or lower as a guide to assess whether testing is sufficient to identify true infection rates.
- Recoveries continue to be significantly underreported; the notable culprits are Alabama, Arizona, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Minnesota, New Jersey, New York, Ohio, Pennsylvania and Rhode Island. We estimate the recoveries are undercounted by ~ 190,000 - 250,000.
- Only none states have yet to show evidence of moving past peak daily infections – Alabama, Arizona, Kansas, Kentucky, Minnesota, Mississippi, North Dakota, Oregon and Utah. Of these, however, only Kansas and Minnesota are averaging more than 100 new daily infections per 1 million population.
- Twenty-four states reported 50 or fewer new daily infections per million population during the past week; Three states and the District of Columbia reported ~200 or more. New York, which averaged more than 500 daily at its peak, reported just under 160 per million per day last week.
- Deaths reported from the virus fell for the third consecutive day on Sunday; the 750 deaths were just more than ½ the number reported on Saturday. As a result, recoveries (despite being understated) now outnumber deaths by more than 3:1.
- Japan has joined South Korea and China in falling below the threshold of 1 new daily infection per 1 million in population. This is the standard recommended by the Institute for Health Metrics and Evaluation (IHME) to determine when to relax restrictions.
- 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; Bangladesh, Belarus, Columbia, Indonesia, Poland, Qatar, Romania, UAE and Ukraine have moved up. The original 30 still account for 90.2% of all cases worldwide.

COUNTRY-BY-COUNTRY INFORMATION

Country-by-Country Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

As of May 10

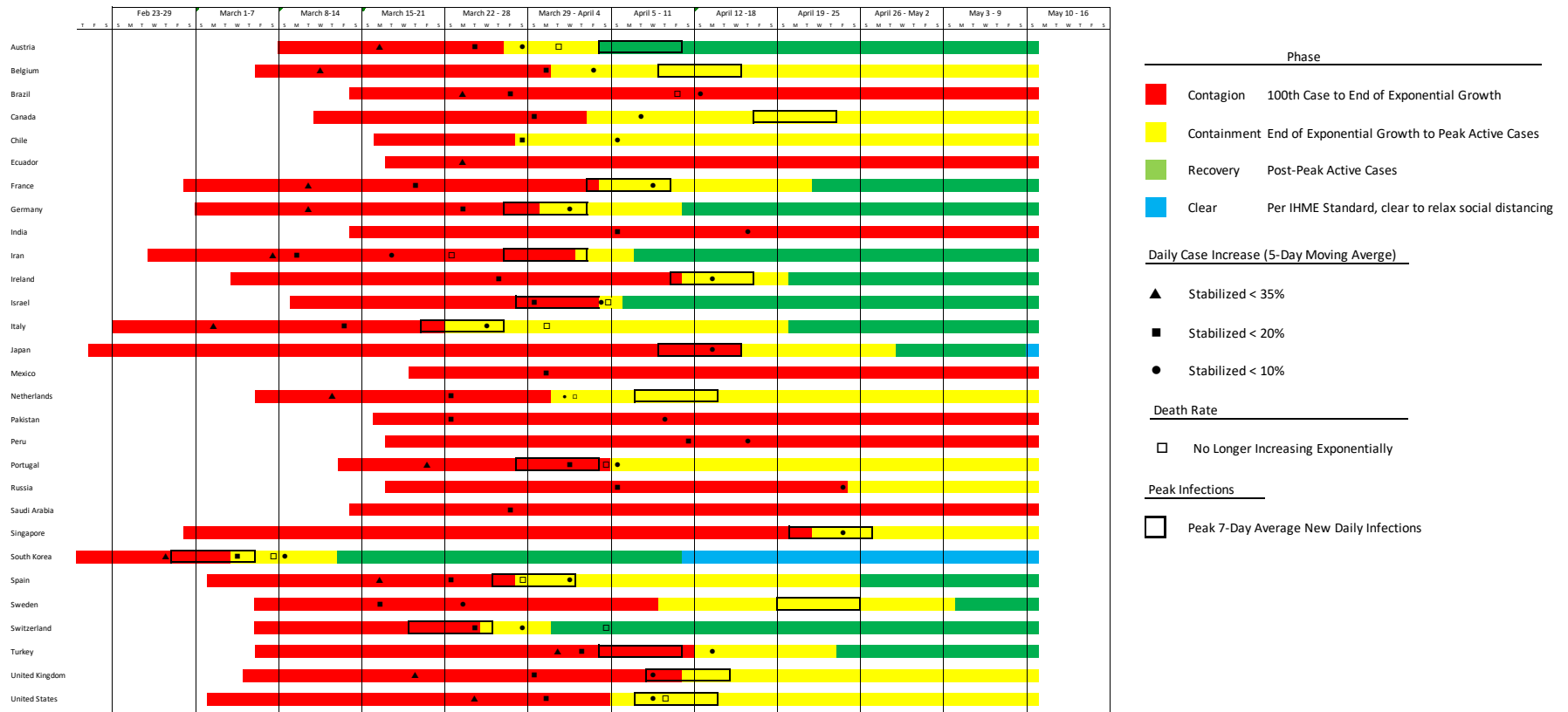
Country	Total Cases	Rank	Cases per 1M Population	Rank	Deaths	Rank	Death Rate	Rank	Deaths per 1 Million Population	Rank	5-day Moving Average Case Growth Rate	Rank	Tests per 1M Population	Rank	New Daily Infections Per 1M Population (5-Day M.A.)	Rank
USA	1,367,638	(1)	4,132	(4)	80,787	(1)	5.9%	(15)	244.1	(9)	2.0%	(13)	28,533	(13)	77.5	(1)
Austria	15,871	(28)	1,762	(17)	618	(25)	3.9%	(20)	68.6	(16)	0.3%	(25)	35,143	(9)	-	(16)
Belgium	53,081	(15)	4,580	(3)	8,656	(7)	16.3%	(1)	746.9	(1)	1.0%	(18)	48,846	(4)	39.1	(5)
Brazil	162,699	(8)	765	(24)	11,123	(6)	6.8%	(11)	52.3	(18)	7.2%	(1)	1,597	(26)	-	(16)
Canada	68,848	(12)	1,824	(16)	4,870	(11)	7.1%	(10)	129.0	(11)	2.1%	(12)	30,099	(11)	35.5	(6)
Chile	28,866	(22)	1,510	(20)	312	(26)	1.1%	(27)	16.3	(22)	5.6%	(7)	14,683	(20)	-	(16)
China	82,901	(11)	58	(29)	4,633	(12)	5.6%	(16)	3.2	(28)	0.0%	(29)	0	(30)	0.0	(15)
Ecuador	29,559	(21)	1,675	(18)	2,127	(17)	7.2%	(9)	120.6	(12)	-1.5%	(30)	4,777	(24)	-	(16)
France	176,970	(6)	2,711	(9)	26,380	(5)	14.9%	(2)	404.1	(5)	0.7%	(20)	21,213	(15)	18.1	(10)
Germany	171,879	(7)	2,051	(13)	7,569	(8)	4.4%	(17)	90.3	(14)	0.6%	(23)	32,891	(10)	-	(16)
India	67,161	(14)	49	(30)	2,212	(16)	3.3%	(21)	1.6	(30)	6.3%	(3)	1,166	(28)	2.6	(13)
Iran	107,603	(10)	1,281	(22)	6,640	(9)	6.2%	(13)	79.1	(15)	1.5%	(14)	6,985	(23)	-	(16)
Ireland	22,996	(26)	4,657	(2)	1,458	(21)	6.3%	(12)	295.3	(8)	0.9%	(19)	43,493	(5)	43.1	(4)
Israel	16,477	(27)	1,904	(15)	252	(28)	1.5%	(26)	29.1	(20)	0.2%	(26)	52,598	(2)	-	(16)
Italy	219,070	(4)	3,623	(6)	30,560	(3)	13.9%	(4)	505.4	(3)	0.6%	(24)	42,439	(6)	19.7	(9)
Japan	15,777	(29)	125	(28)	624	(24)	4.0%	(19)	4.9	(26)	0.7%	(22)	1,694	(25)	-	(16)
Mexico	33,460	(18)	260	(25)	3,353	(14)	10.0%	(8)	26.0	(21)	6.1%	(5)	994	(29)	12.6	(11)
Netherlands	42,627	(16)	2,488	(12)	5,440	(10)	12.8%	(5)	317.5	(7)	0.7%	(21)	14,857	(18)	-	(16)
Pakistan	30,334	(19)	137	(27)	659	(23)	2.2%	(25)	3.0	(29)	6.6%	(2)	1,284	(27)	6.6	(12)
Peru	67,307	(13)	2,041	(14)	1,889	(19)	2.8%	(22)	57.3	(17)	5.6%	(6)	15,314	(17)	-	(16)
Portugal	27,581	(23)	2,705	(10)	1,135	(22)	4.1%	(18)	111.3	(13)	1.4%	(15)	50,767	(3)	32.2	(7)
Russia	209,688	(5)	1,399	(21)	1,915	(18)	0.9%	(28)	12.8	(23)	6.2%	(4)	37,335	(7)	-	(16)
Saudi Arabia	39,048	(17)	1,122	(23)	246	(29)	0.6%	(29)	7.1	(24)	5.2%	(8)	12,949	(21)	49.4	(3)
Singapore	23,336	(25)	3,989	(5)	20	(30)	0.1%	(30)	3.4	(27)	3.8%	(9)	12,916	(22)	-	(16)
South Korea	10,874	(30)	212	(26)	256	(27)	2.4%	(24)	5.0	(25)	0.1%	(28)	30,016	(12)	0.2	(14)
Spain	264,663	(2)	5,661	(1)	26,621	(4)	10.1%	(7)	569.4	(2)	1.1%	(17)	52,781	(1)	-	(16)
Sweden	26,322	(24)	2,606	(11)	3,225	(15)	12.3%	(6)	319.3	(6)	2.5%	(10)	14,704	(19)	56.7	(2)
Switzerland	30,305	(20)	3,539	(7)	1,833	(20)	6.0%	(14)	214.0	(10)	0.2%	(27)	35,772	(8)	-	(16)
Turkey	138,657	(9)	1,644	(19)	3,786	(13)	2.7%	(23)	44.9	(19)	1.4%	(16)	16,251	(16)	21.4	(8)
UK	219,183	(3)	3,229	(8)	31,855	(2)	14.5%	(3)	469.2	(4)	2.4%	(11)	26,829	(14)	-	(16)

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Country-by-Country Virus Progression

“Strategic Guidance in an Era of Unprecedented Change”

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



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Country-By-Country Listing of Countries By Total Cases

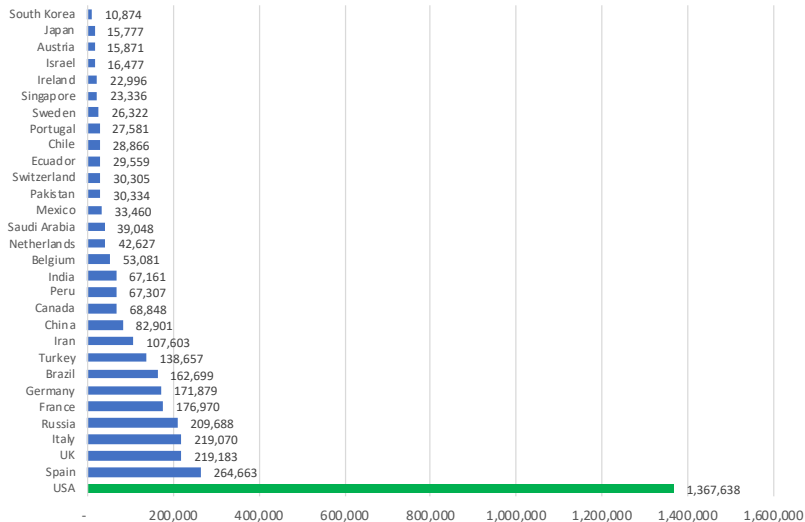
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	Total Cases		
	10-May	6-May	27-Apr
1 USA	1,367,638	1,263,092	1,010,356
2 Spain	264,663	253,682	229,422
3 UK	219,183	214,457	199,414
4 Italy	219,070	201,101	165,842
5 Russia	209,688	174,191	158,758
6 France	176,970	168,162	157,149
7 Germany	171,879	165,929	112,261
8 Brazil	162,699	131,744	91,472
9 Turkey	138,657	126,611	87,147
10 Iran	107,603	101,650	82,830
11 China	82,901	82,883	66,501
12 Canada	68,848	63,496	48,500
13 Peru	67,307	54,817	46,687
14 India	67,161	52,987	38,245
15 Belgium	53,081	50,781	29,451
16 Netherlands	42,627	41,319	29,164
17 Saudi Arabia	39,048	31,938	28,669
18 Mexico	33,460	30,060	24,070
19 Pakistan	30,334	29,420	23,240
20 Switzerland	30,305	26,182	19,648
21 Ecuador	29,559	26,025	18,926
22 Chile	28,866	23,918	18,811
23 Portugal	27,581	23,214	15,555
24 Sweden	26,322	23,048	15,274
25 Singapore	23,336	22,248	14,677
26 Ireland	22,996	20,198	14,423
27 Belarus	22,973	19,255	13,915
28 Qatar	22,520	17,972	13,813
29 UAE	18,198	16,310	13,614
30 Israel	16,477	15,738	11,902
31 Poland	15,996	15,684	11,339
32 Austria	15,871	15,253	11,289
33 Japan	15,777	14,740	11,244
34 Romania	15,362	14,107	10,839
35 Ukraine	15,232	13,184	10,738
36 Bangladesh	14,657	12,438	
37 Indonesia	14,032	11,719	
38 Colombia	11,063	10,806	
39 S. Korea	10,874		
Others	257,340	237,023	207,330
World	4,178,154	3,817,382	3,062,515
Total for Countries we track (in bold)	3,770,781	3,461,206	2,798,572
% of World's cases	90.2%	90.7%	91.4%

Country-by-Country Cases & Cases Per Capita

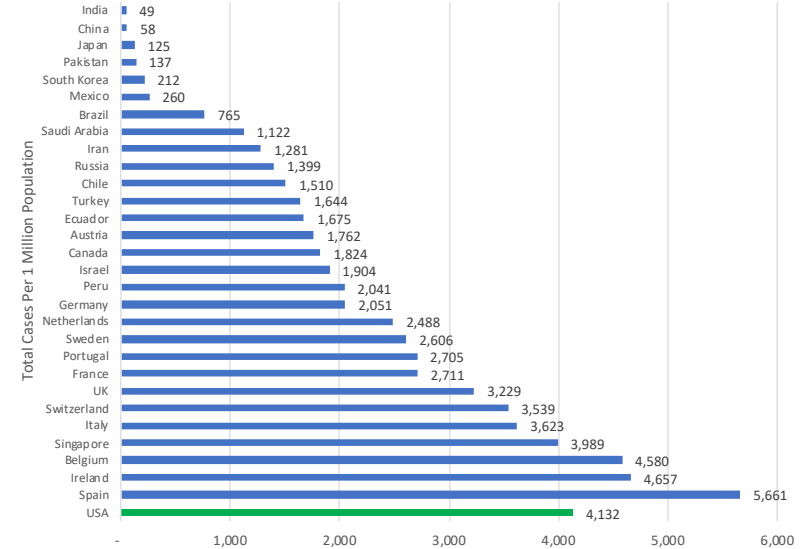
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Total Cases By Country
May 10



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Cases Per Capita By Country
May 10

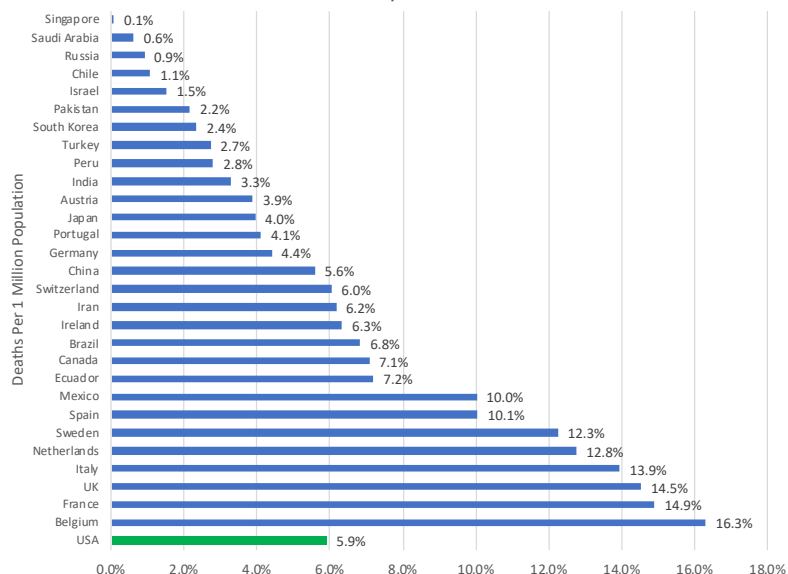


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Deaths Per Cases & Per Capita

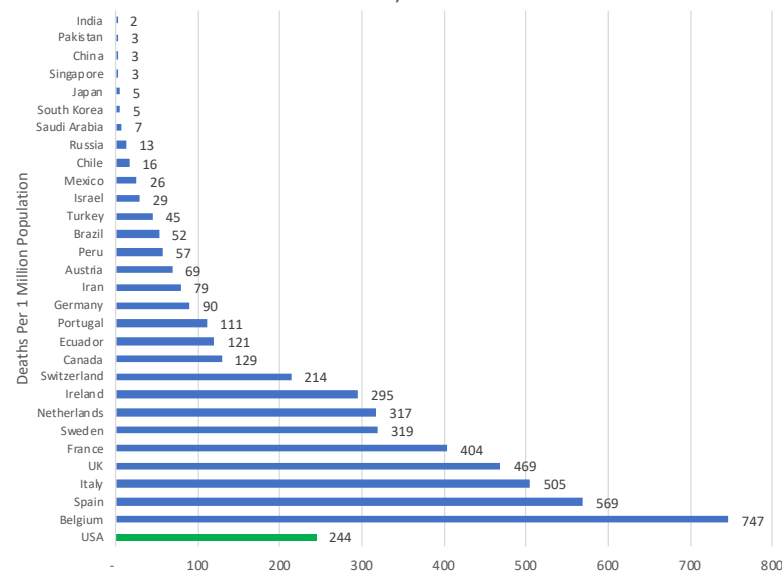
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Death Rate By Country
May 10



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Deaths Per Capita By Country
May 10

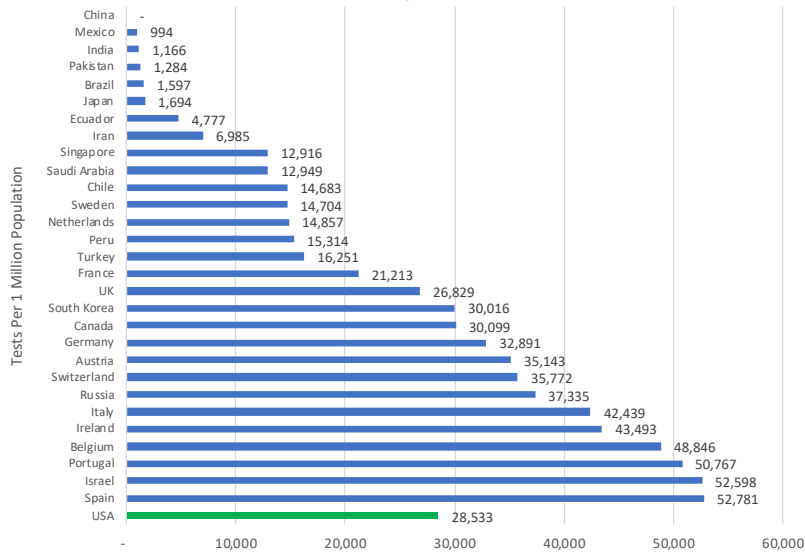


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Country-by-Country Tests Per Capita & Case Growth Rate

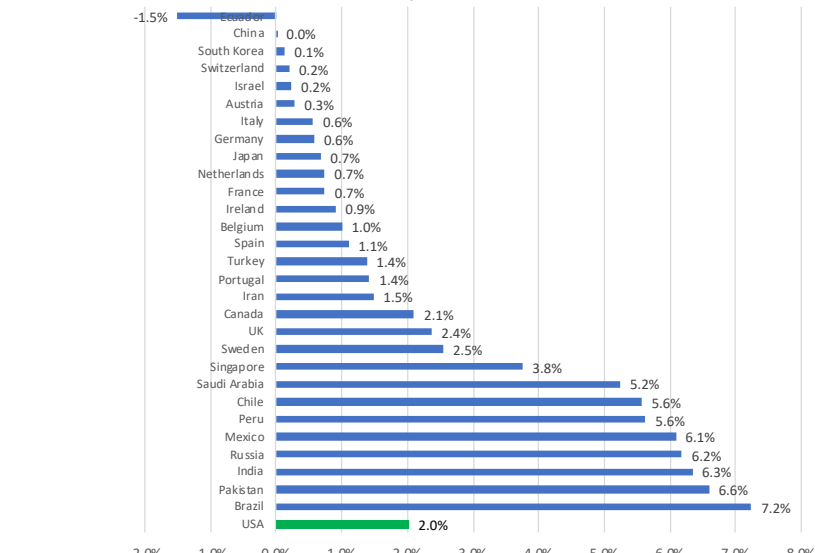
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Tests Per Capita By Country
May 10



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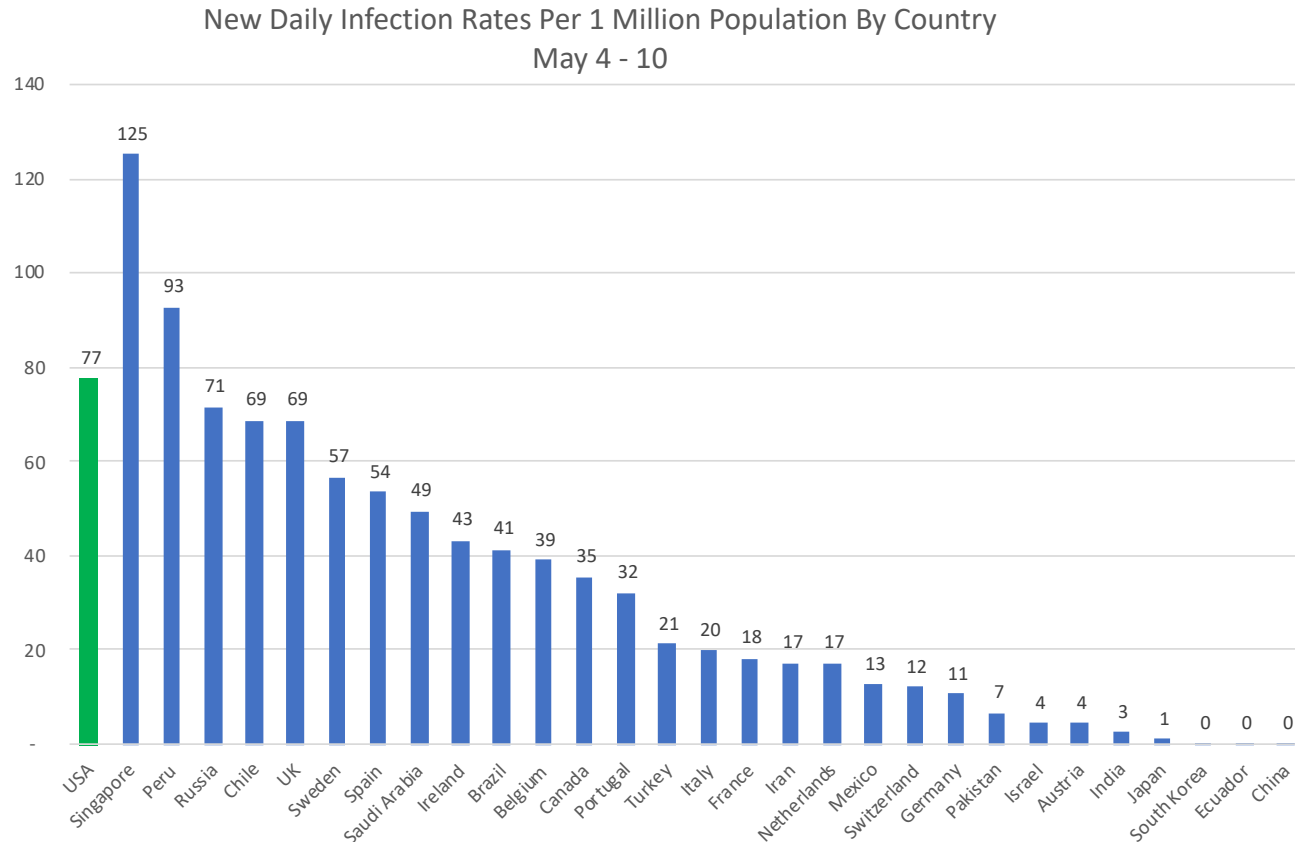
Daily Case Growth Rate By Country
May 6 - 10



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Country-by-Country New Daily Infection Rate

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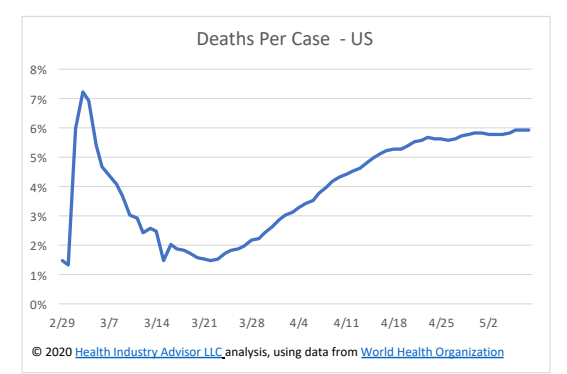
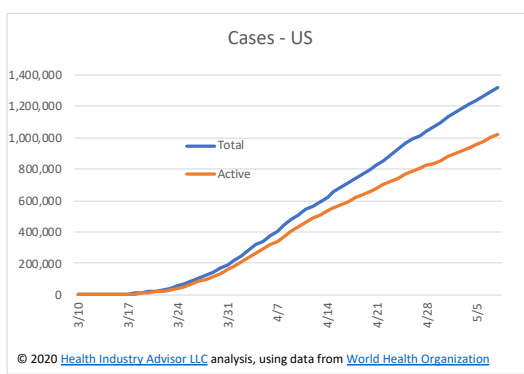
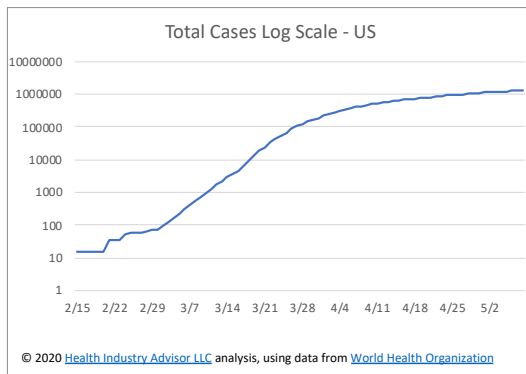
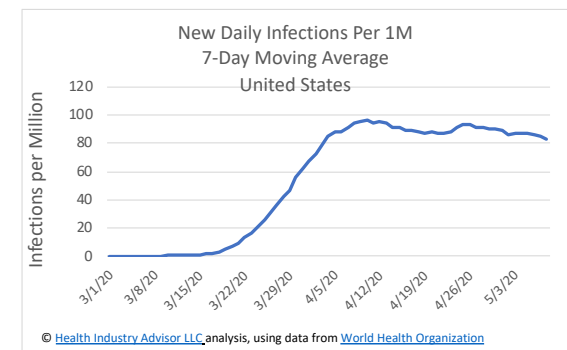
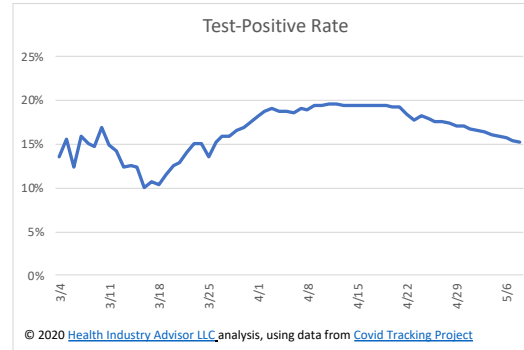
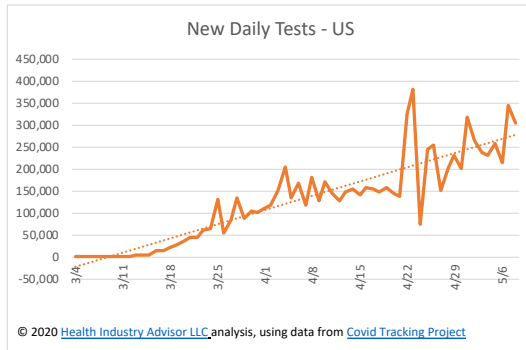
UNITED STATES & STATE-BY-STATE INFORMATION

State-by-State Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

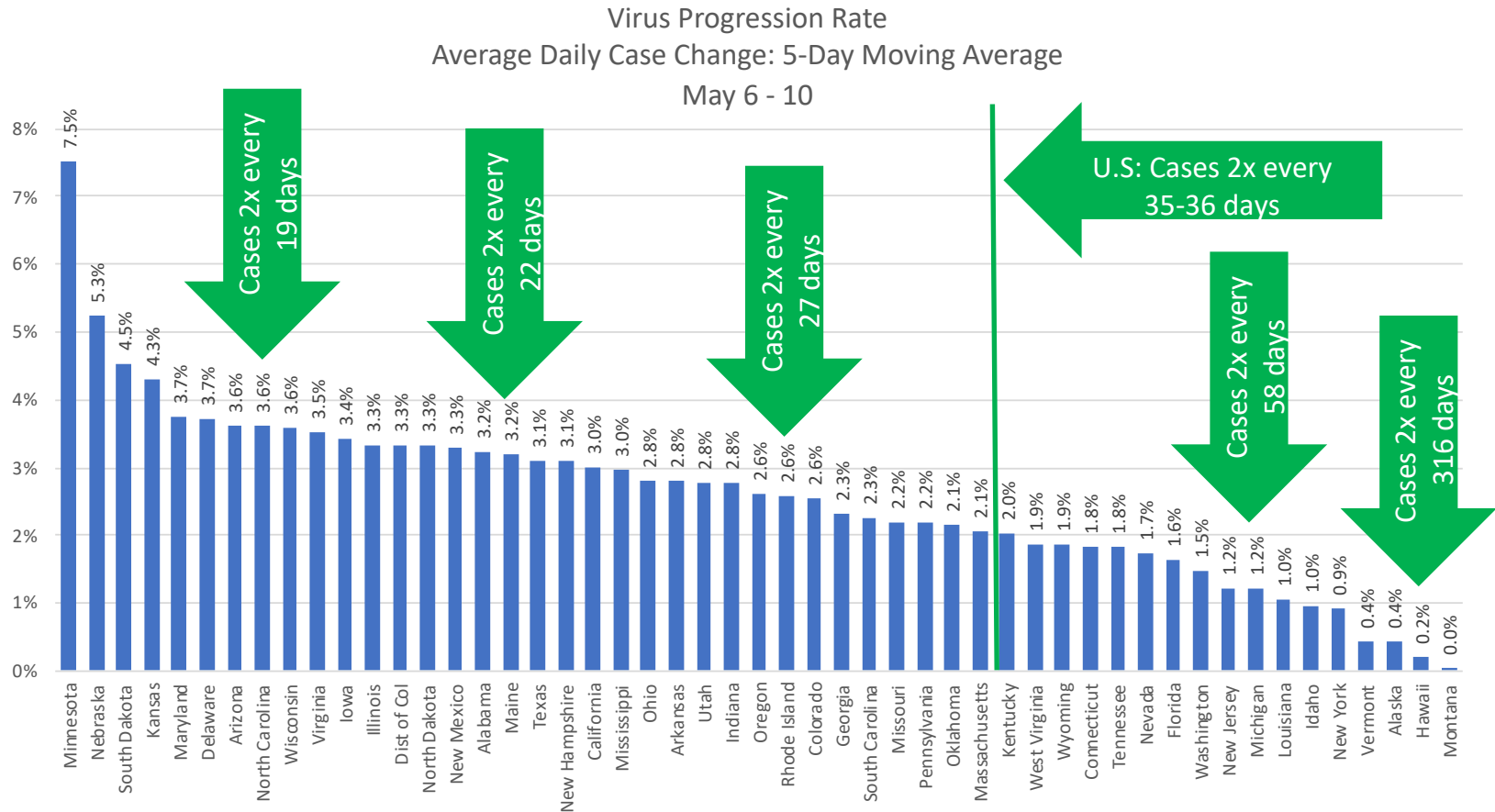
State	Total Cases	Rank	Cases per 1M Population	Rank	Deaths	Rank	Death Rate	Rank	Deaths per 1 Million Population	Rank	5-day Moving Average Case Growth Rate	Rank	Tests per 1M Population Past 7 days	Rank	New Daily Cases Per 1M Population (5-Day M.A.)	Rank
Alabama	9,889	(27)	2,016.9	(27)	393	(26)	4.0%	(30)	80.2	(27)	3.2%	(16)	1,017	(18)	58.3	(23)
Alaska	379	(51)	518.1	(49)	10	(50)	2.6%	(42)	13.7	(49)	0.4%	(49)	1,130	(11)	2.1	(49)
Arizona	11,119	(24)	1,527.6	(36)	536	(21)	4.8%	(19)	73.6	(29)	3.6%	(7)	1,111	(12)	48.7	(28)
Arkansas	4,012	(39)	1,329.4	(42)	91	(40)	2.3%	(45)	30.2	(45)	2.8%	(23)	598	(39)	27.5	(41)
California	67,917	(5)	1,718.9	(34)	2,717	(8)	4.0%	(29)	68.8	(30)	3.0%	(20)	867	(25)	47.2	(31)
Colorado	19,703	(17)	3,421.4	(17)	971	(16)	4.9%	(18)	168.6	(14)	2.6%	(28)	514	(44)	76.1	(19)
Connecticut	33,554	(10)	9,411.3	(5)	2,967	(7)	8.8%	(2)	832.2	(3)	1.8%	(38)	1,110	(13)	171.0	(8)
Delaware	6,447	(32)	6,620.7	(8)	224	(34)	3.5%	(38)	230.0	(12)	3.7%	(6)	1,071	(15)	181.8	(7)
District Of Columbia	6,272	(34)	8,887.0	(6)	323	(28)	5.1%	(13)	457.7	(6)	3.3%	(13)	1,309	(6)	254.2	(1)
Florida	40,596	(8)	1,890.1	(32)	1,721	(10)	4.2%	(26)	80.1	(28)	1.6%	(41)	737	(28)	30.1	(39)
Georgia	33,508	(11)	3,155.9	(19)	1,405	(13)	4.2%	(27)	132.3	(16)	2.3%	(29)	921	(21)	65.1	(22)
Hawaii	632	(49)	446.4	(50)	17	(48)	2.7%	(41)	12.0	(51)	0.2%	(50)	436	(48)	1.2	(50)
Idaho	2,230	(43)	1,244.4	(43)	67	(42)	3.0%	(39)	37.4	(42)	1.0%	(46)	186	(51)	13.5	(46)
Illinois	77,741	(4)	6,135.0	(9)	3,405	(6)	4.4%	(23)	268.8	(11)	3.3%	(12)	1,248	(7)	183.1	(6)
Indiana	24,126	(14)	3,583.7	(16)	1,508	(12)	6.3%	(8)	224.0	(13)	2.8%	(25)	661	(34)	89.0	(18)
Iowa	11,959	(21)	3,790.4	(15)	265	(32)	2.2%	(46)	84.0	(25)	3.4%	(11)	950	(19)	126.3	(11)
Kansas	6,953	(31)	2,386.6	(21)	174	(36)	2.5%	(43)	59.7	(35)	4.3%	(4)	771	(26)	100.9	(14)
Kentucky	6,440	(33)	1,441.5	(39)	304	(30)	4.7%	(20)	68.0	(33)	2.0%	(35)	936	(20)	41.9	(33)
Louisiana	31,600	(13)	6,797.5	(7)	2,286	(9)	7.2%	(4)	491.7	(5)	1.0%	(45)	1,220	(8)	69.4	(20)
Maine	1,436	(45)	1,068.3	(46)	64	(43)	4.5%	(22)	47.6	(38)	3.2%	(17)	297	(49)	26.7	(42)
Maryland	32,587	(12)	5,390.1	(10)	1,644	(11)	5.0%	(15)	271.9	(10)	3.7%	(5)	641	(36)	168.4	(9)
Massachusetts	77,793	(3)	11,194.0	(3)	4,979	(3)	6.4%	(6)	716.5	(4)	2.1%	(34)	1,516	(3)	199.5	(4)
Michigan	47,138	(7)	4,720.0	(11)	4,551	(4)	9.7%	(1)	455.7	(7)	1.2%	(44)	1,046	(17)	48.4	(29)
Minnesota	11,271	(23)	1,998.5	(28)	578	(19)	5.1%	(14)	102.5	(19)	7.5%	(1)	721	(30)	116.7	(13)
Mississippi	9,501	(28)	3,192.4	(18)	430	(23)	4.5%	(21)	144.5	(15)	3.0%	(21)	192	(50)	93.6	(15)
Missouri	10,008	(26)	1,630.7	(35)	497	(22)	5.0%	(17)	81.0	(26)	2.2%	(31)	758	(27)	36.6	(36)
Montana	458	(50)	428.5	(51)	16	(49)	3.5%	(36)	15.0	(48)	0.0%	(51)	895	(22)	0.4	(51)
Nebraska	8,315	(29)	4,298.5	(13)	98	(39)	1.2%	(48)	50.7	(37)	5.3%	(2)	1,057	(16)	196.1	(5)
Nevada	6,098	(36)	1,979.8	(29)	306	(29)	5.0%	(16)	99.3	(20)	1.7%	(40)	628	(37)	31.2	(38)
New Hampshire	3,071	(42)	2,258.6	(24)	133	(37)	4.3%	(24)	97.8	(22)	3.1%	(19)	532	(43)	58.1	(24)
New Jersey	140,008	(2)	15,762.8	(2)	9,264	(2)	6.6%	(5)	1,043.0	(2)	1.2%	(43)	601	(38)	202.2	(3)
New Mexico	4,863	(37)	2,319.2	(22)	200	(35)	4.1%	(28)	95.4	(23)	3.3%	(15)	1,506	(4)	69.0	(21)
New York	345,406	(1)	17,755.4	(1)	26,812	(1)	7.8%	(3)	1,378.3	(1)	0.9%	(47)	1,447	(5)	158.1	(10)
North Carolina	14,939	(20)	1,424.4	(40)	564	(20)	3.8%	(34)	53.8	(36)	3.6%	(8)	658	(35)	43.5	(32)
North Dakota	1,491	(44)	1,956.5	(30)	35	(46)	2.3%	(44)	45.9	(39)	3.3%	(14)	2,159	(2)	56.2	(25)
Ohio	24,081	(16)	2,060.1	(26)	1,341	(14)	5.6%	(11)	114.7	(18)	2.8%	(22)	668	(33)	50.9	(27)
Oklahoma	4,589	(38)	1,159.7	(44)	272	(31)	5.9%	(9)	68.7	(31)	2.1%	(33)	1,162	(10)	22.3	(43)
Oregon	3,228	(41)	765.3	(47)	127	(38)	3.9%	(32)	30.1	(46)	2.6%	(26)	456	(46)	18.6	(45)
Pennsylvania	60,056	(6)	4,691.1	(12)	3,823	(5)	6.4%	(7)	298.6	(9)	2.2%	(32)	488	(45)	89.4	(17)
Rhode Island	11,274	(22)	10,642.3	(4)	422	(24)	3.7%	(35)	398.4	(8)	2.6%	(27)	2,601	(1)	242.3	(2)
South Carolina	7,653	(30)	1,486.4	(37)	331	(27)	4.3%	(25)	64.3	(34)	2.3%	(30)	562	(41)	28.5	(40)
South Dakota	3,393	(40)	3,835.4	(14)	34	(47)	1.0%	(51)	38.4	(41)	4.5%	(3)	884	(23)	123.0	(12)
Tennessee	14,985	(19)	2,193.0	(25)	243	(33)	1.6%	(47)	35.6	(43)	1.8%	(39)	1,197	(9)	37.8	(35)
Texas	39,890	(9)	1,375.7	(41)	1,133	(15)	2.8%	(40)	39.1	(40)	3.1%	(18)	548	(42)	38.9	(34)
Utah	6,251	(35)	1,949.8	(31)	67	(42)	1.1%	(49)	20.9	(47)	2.8%	(24)	1,088	(14)	47.9	(30)
Vermont	927	(47)	1,485.6	(38)	53	(45)	5.7%	(10)	84.9	(24)	0.4%	(48)	708	(31)	6.9	(48)
Virginia	24,081	(16)	2,821.3	(20)	839	(18)	3.5%	(37)	98.3	(21)	3.5%	(10)	587	(40)	90.5	(16)
Washington	17,610	(18)	2,312.6	(23)	932	(17)	5.3%	(12)	122.4	(17)	1.5%	(32)	669	(32)	34.4	(37)
West Virginia	1,362	(46)	762.1	(48)	54	(44)	4.0%	(31)	30.2	(44)	1.9%	(36)	880	(24)	13.3	(47)
Wisconsin	10,219	(25)	1,755.1	(33)	400	(25)	3.9%	(33)	68.7	(32)	3.6%	(9)	722	(29)	55.3	(26)
Wyoming	662	(48)	1,143.8	(45)	7	(51)	1.1%	(50)	12.1	(50)	1.9%	(37)	455	(47)	18.8	(44)
United States	1,367,638		4,131.8		80,787		5.9%		244.1		2.0%		838		77.5	

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State-by-State Average Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

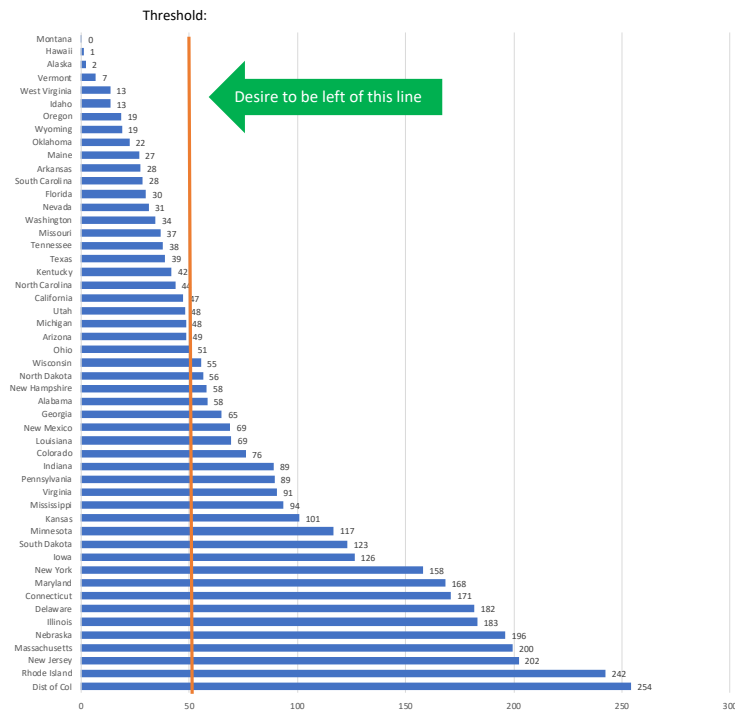


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State-by-State New Daily Infections & Tests Per Capita

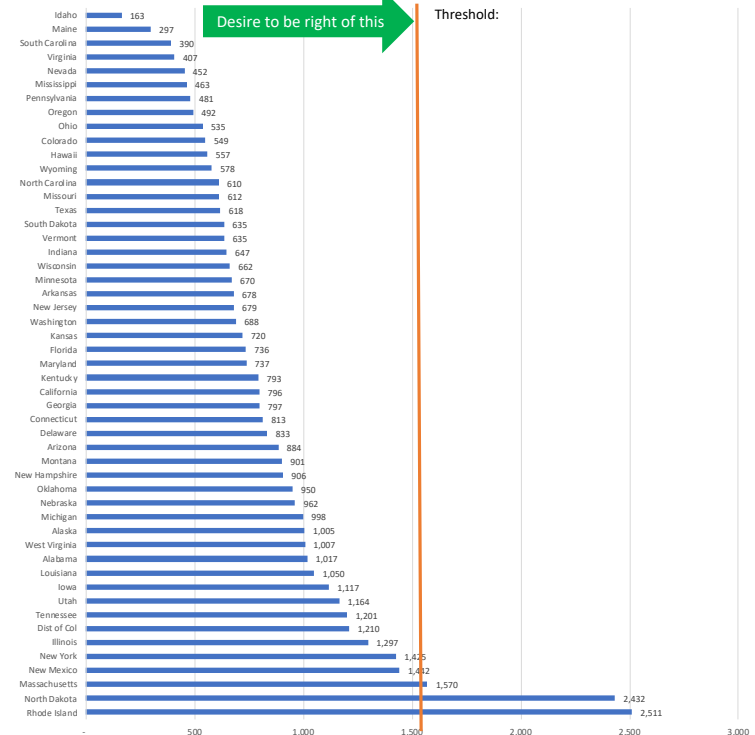
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New Daily Infections Per 1 Million Population
By State
May 6 - 10



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Daily Tests Per 1 Million Population
By State
May 6 - 10

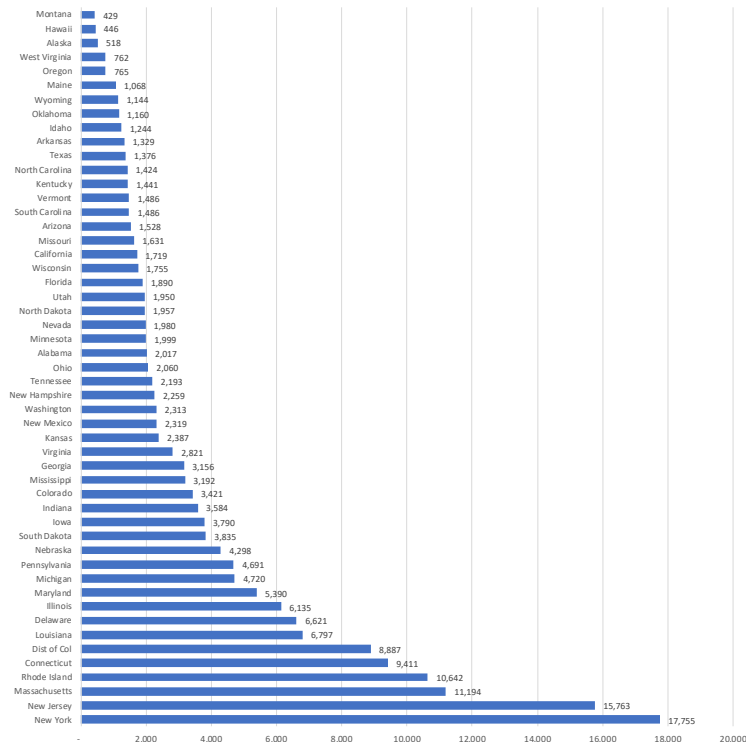


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State-by-State Cases & Deaths Per Capita

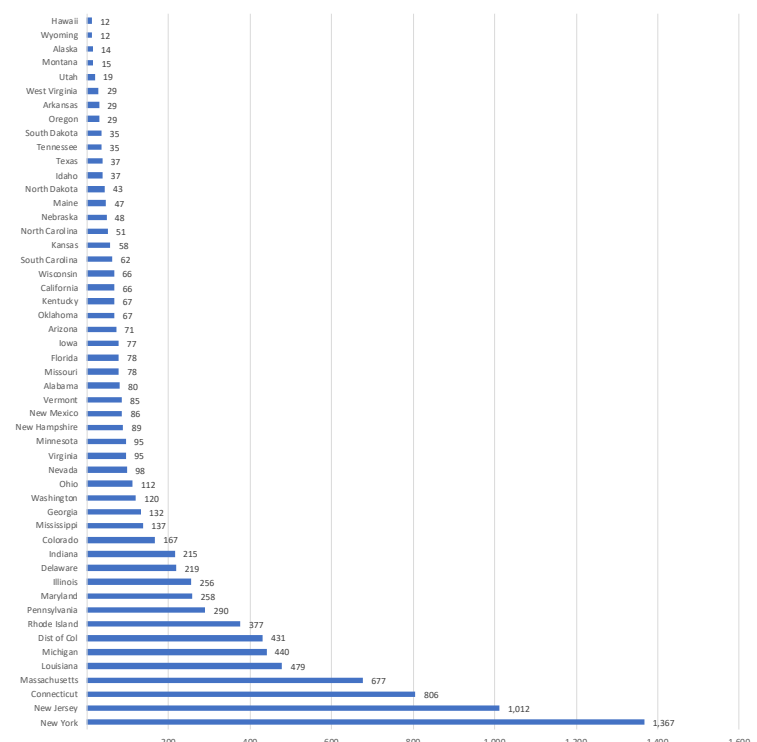
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Total Cases Per 1 Million Population
By State
As of May 10



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Deaths Per 1 Million Population
By State
As of May 10



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STATE-BY-STATE READINESS FOR RELAXING RESTRICTIONS

Readiness For Relaxing Restrictions

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We 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.**

May 10

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									

April 30

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

May 10

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									
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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									

April 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

"Strategic Guidance in an Era of Unprecedented Change"

Legend:

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

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Sources:

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

Test data from Covid Tracking Project (<https://covidtracking.com/>), accessed March 21-May 2, 2020

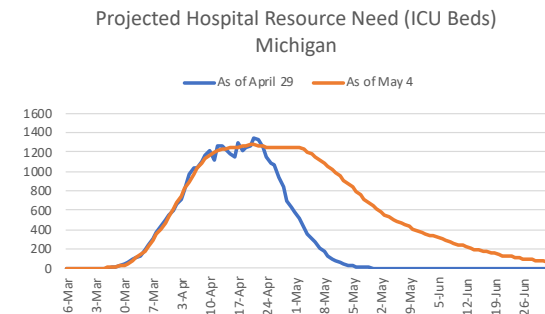
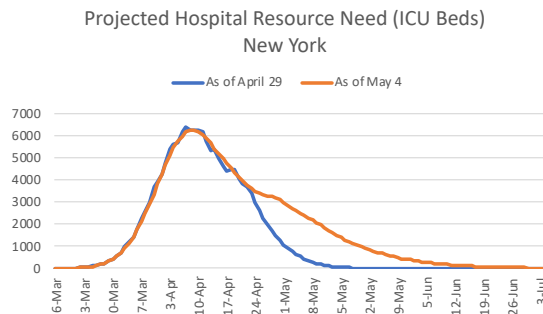
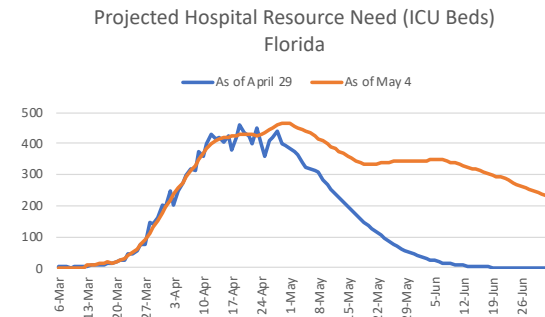
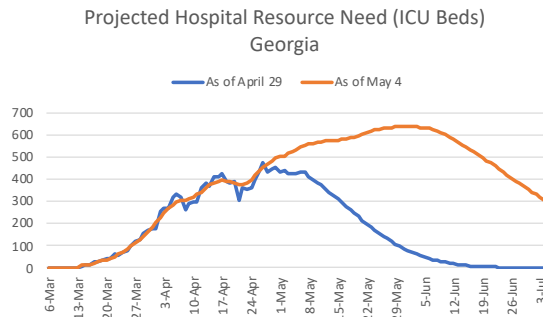
Hospital resource Need projections from Institute for Health Metrics and Evaluation (), accessed April 30, 2020

Infection rate data from World Health Organization (worldometer.info), accessed March 21-May 2, 2020

IHME's Hospital Resource Need Projections Are Sensitive to Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

The Institute for Health Metrics and Evaluation (IHME) regularly updates [projections of hospital resource](#) needs. Comparing their projections from April 29 and May 4 indicates how much relaxing restrictions factors into these projections. Consider how much the projections changed for Florida and Georgia:

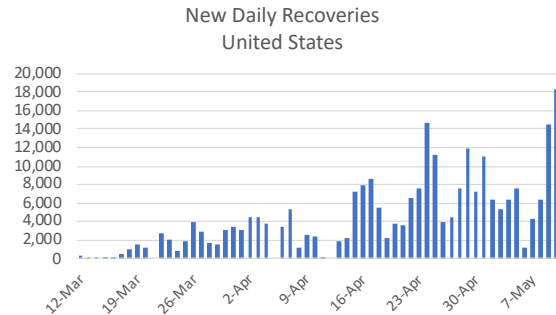


Note: ICU beds were selected as representative of the three metrics that IHME uses: total beds, ICU beds and ventilators. HIA does not vouch for the accuracy of these projections; in our limited experience, they seem to over-state actual needs.

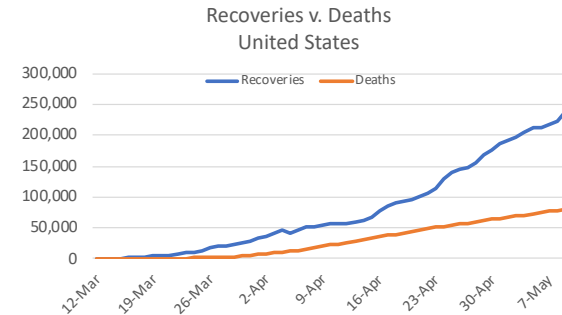
UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

United States Recoveries

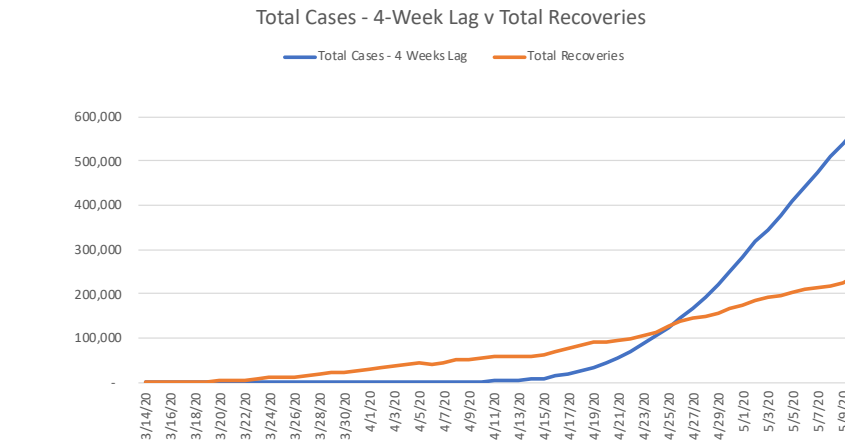
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Which states seem to be lagging in reporting?

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

Comparing the reported recoveries to Total Cases 4 weeks ago¹, this shortfall is ~190-250k

As of May 10

Note 1: 4 weeks is the presumed time from infection-onset to recovery referenced by many states

State	Recoveries	Expected Recoveries	
		Low	High
Alabama	20	2,866	3,225
Alaska	324	218	245
Arizona	70	2,831	3,185
Arkansas	3,112	1,024	1,152
California	10,980	18,542	20,859
Colorado	559	5,842	6,573
Connecticut	65	9,628	10,832
Delaware	2,537	1,300	1,463
District Of Columbia	880	1,500	1,688
Florida	1,046	15,916	17,906
Georgia	340	10,040	11,295
Hawaii	561	399	449
Idaho	1,379	1,141	1,283
Illinois	645	16,682	18,767
Indiana	1,559	6,342	7,135
Iowa	4,685	1,270	1,428
Kansas	1,675	1,070	1,203
Kentucky	2,308	1,570	1,767
Louisiana	20,316	16,476	18,536
Maine	861	506	570
Maryland	2,041	6,580	7,403
Massachusetts	22,148	20,380	22,928
Michigan	22,686	19,710	22,174
Minnesota	6,882	1,297	1,459
Mississippi	4,421	2,225	2,503
Missouri	2,063	3,328	3,744

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

State	Recoveries	Expected Recoveries	
		Low	High
Montana	422	310	348
Nebraska	22	633	712
Nevada	4,197	2,269	2,552
New Hampshire	1,229	788	887
New Jersey	1,535	49,480	55,665
New Mexico	1,125	996	1,121
New York	58,100	151,532	170,474
North Carolina	1,808	3,666	4,124
North Dakota	792	246	277
Ohio	448	5,283	5,944
Oklahoma	3,204	1,576	1,773
Oregon	1,125	1,222	1,374
Pennsylvania	1,100	18,336	20,628
Rhode Island	730	2,132	2,399
South Carolina	4,881	2,655	2,987
South Dakota	2,125	584	657
Tennessee	7,369	4,246	4,777
Texas	23,589	10,912	12,276
Utah	2,185	1,842	2,073
Vermont	777	582	654
Virginia	3,124	4,219	4,747
Washington	3,646	8,424	9,477
West Virginia	738	489	550
Wisconsin	5,014	2,673	3,007
Wyoming	428	216	243
United States	256,336	448,240	504,270

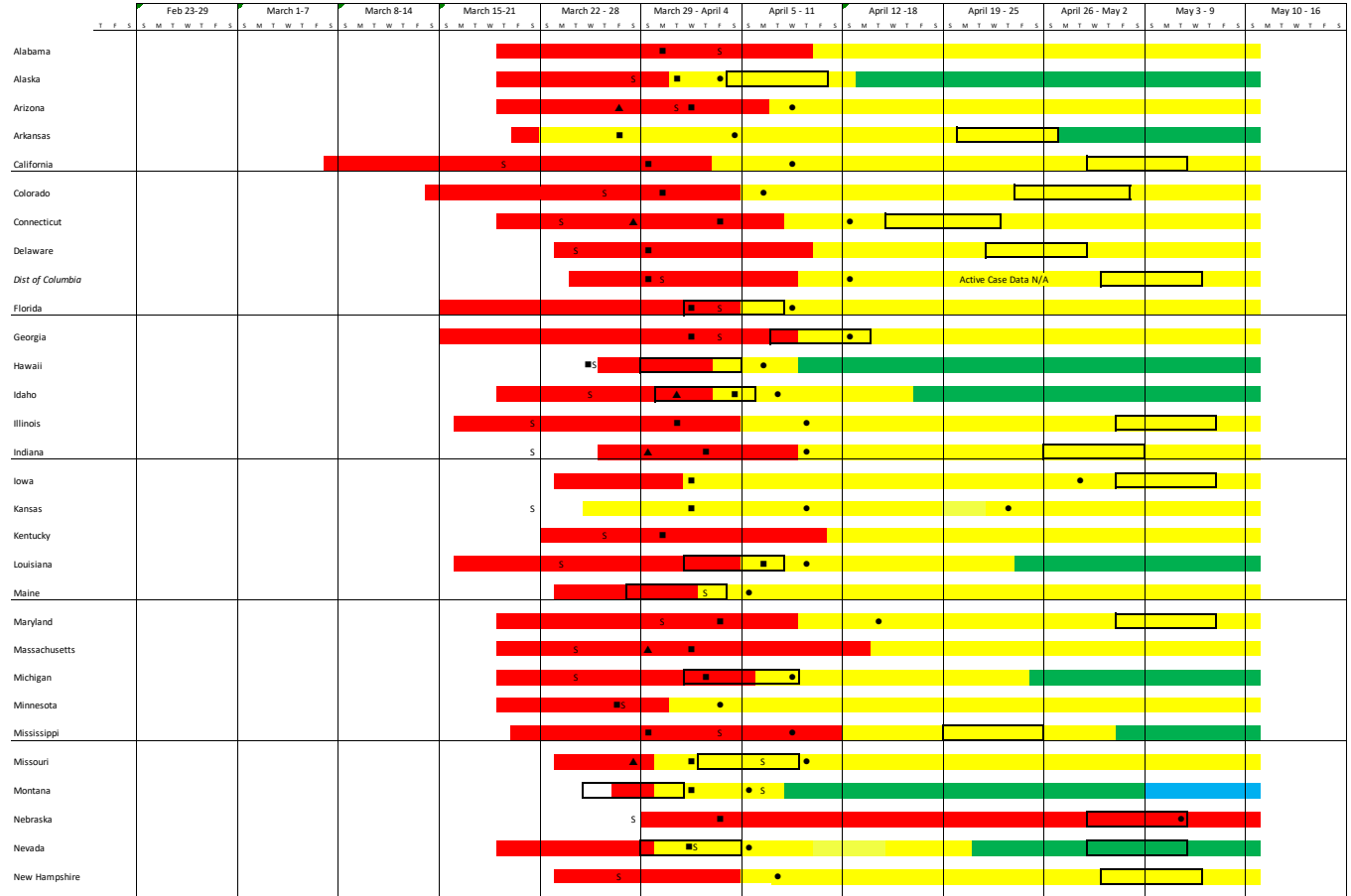
 - States seemingly up-to-date with reporting recoveries
 - States only reporting ~ 1/2 expected recoveries
 - States well-behind in reporting recoveries

VIRUS PROGRESSION: ROADMAP TO RECOVERY

State-by-State Virus Progression – 1 of 2

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



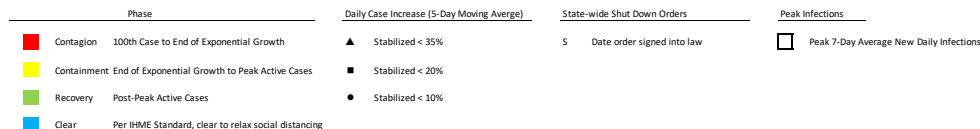
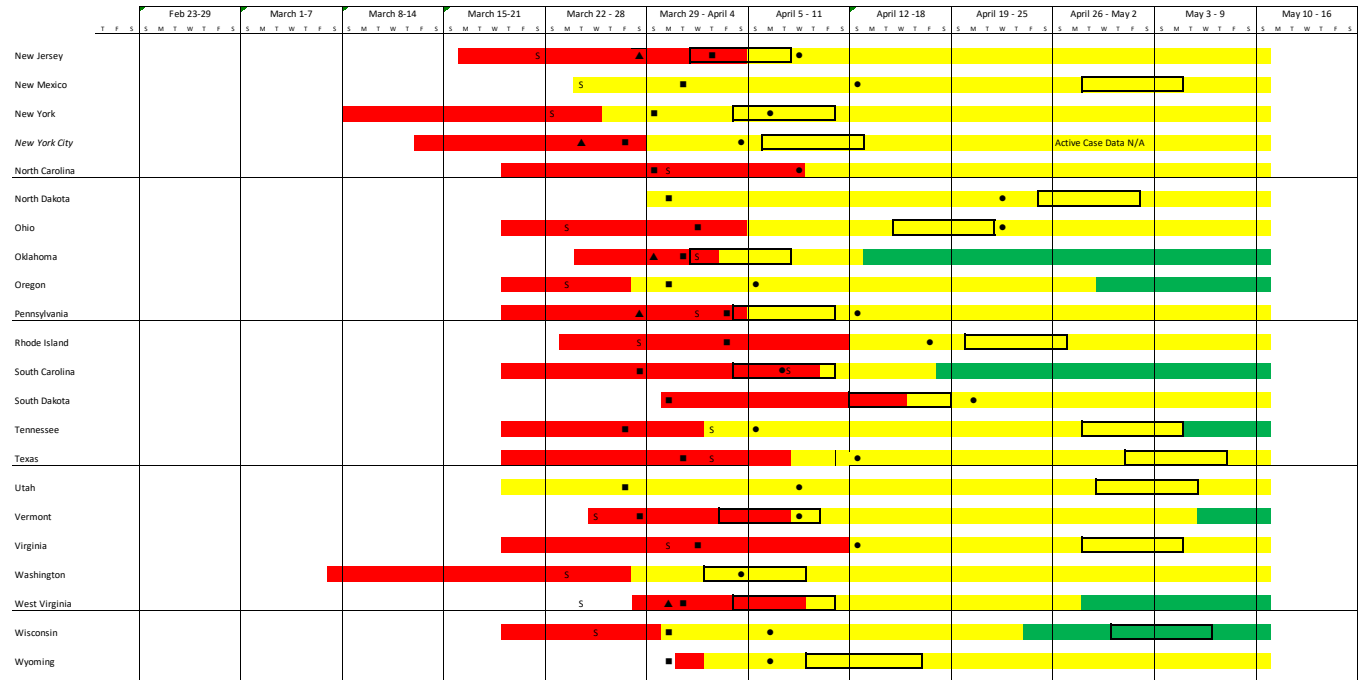
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State-by-State Virus Progression – 2 of 2

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



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STATE TEST, INFECTION AND CASE TRENDS

"Strategic Guidance in an Era of Unprecedented Change"

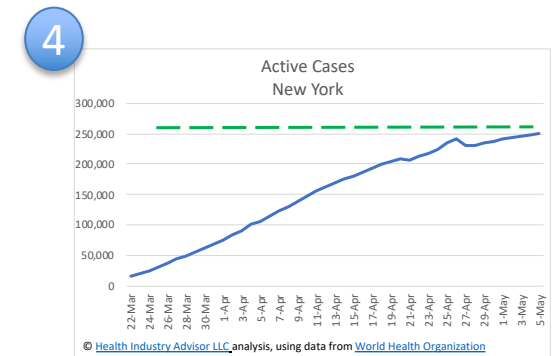
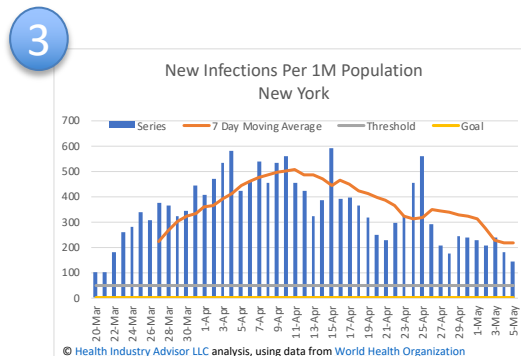
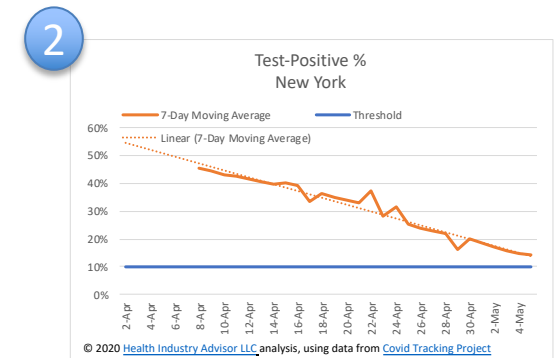
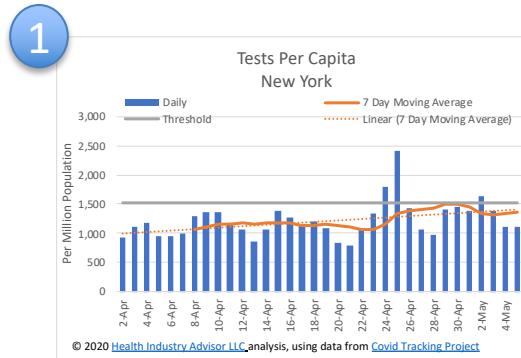
On Mondays, Wednesday and Fridays we provide graphics relevant to judging how far a state (or the District of Columbia) has progressed against the virus. Seventeen states (or, sixteen and D.C.) are presented at a time. Today, we provide:

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

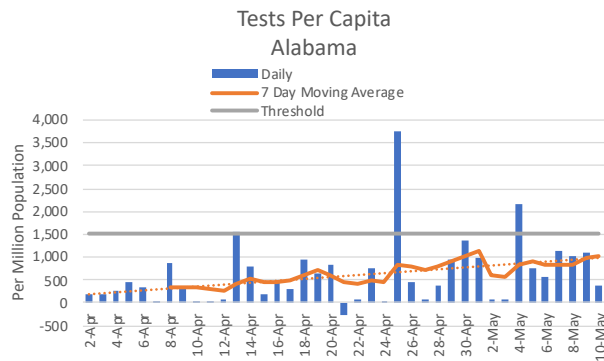
"Strategic Guidance in an Era of Unprecedented Change"

How to "read" these charts:

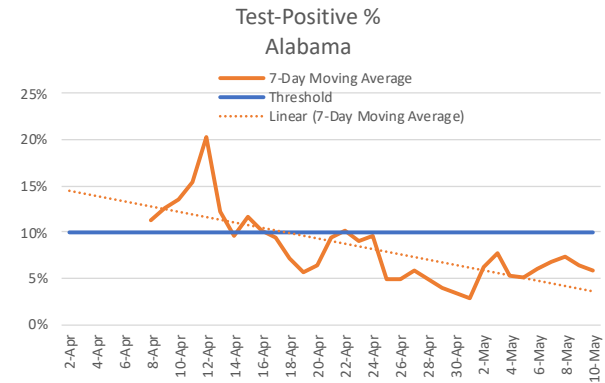
- Chart 1 – Desire to see tests per capita:
 - Above the threshold
 - Increasing or stable
- Chart 2 - Desire to see Test-Positive %:
 - Below the threshold
 - Declining or stable
- Chart 3 - Desire to see New Infections Per Capita:
 - Below the threshold
 - Declining or stable
- Chart 4 - Desire to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



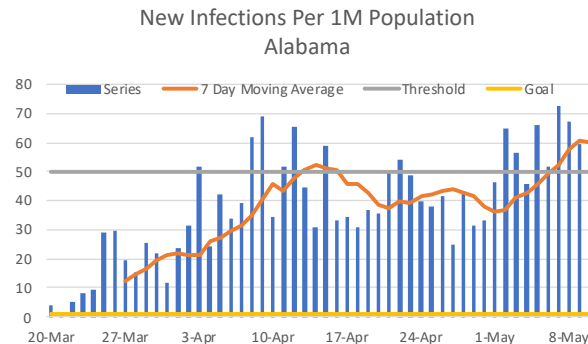
"Strategic Guidance in an Era of Unprecedented Change"



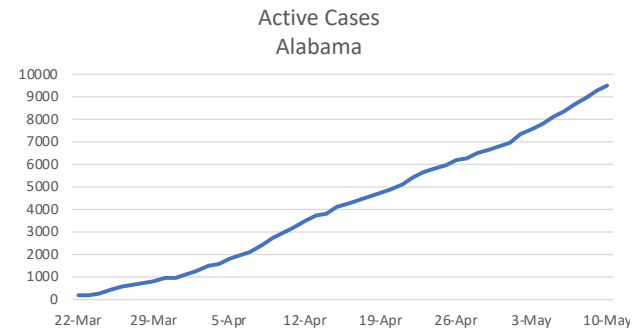
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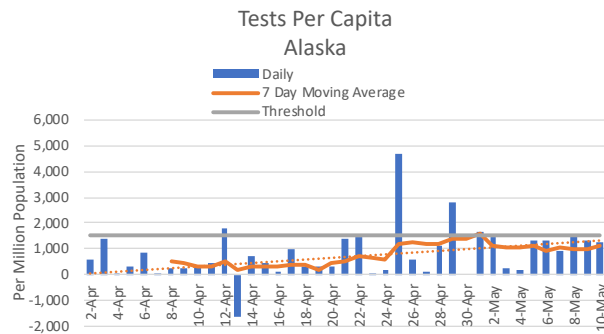


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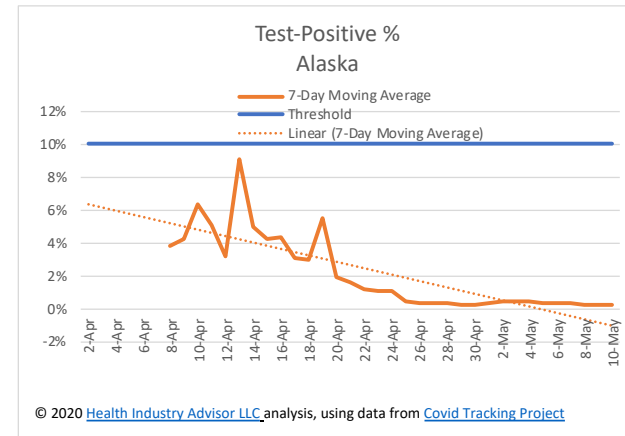


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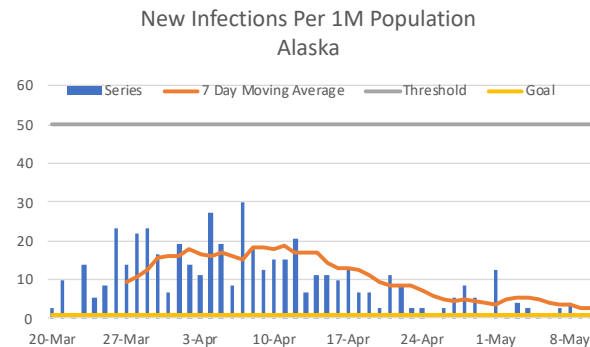
"Strategic Guidance in an Era of Unprecedented Change"



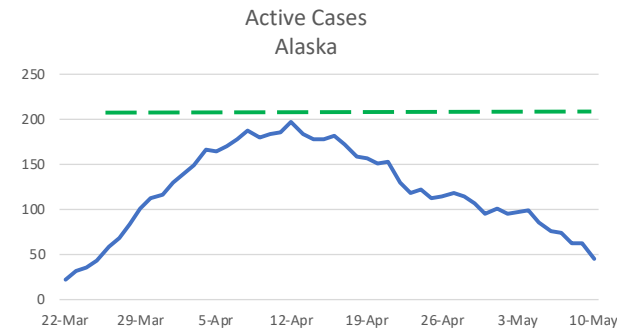
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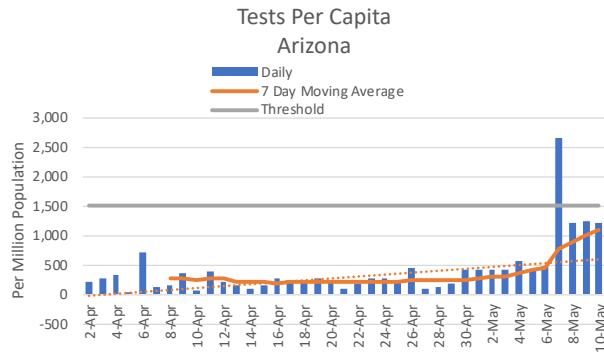
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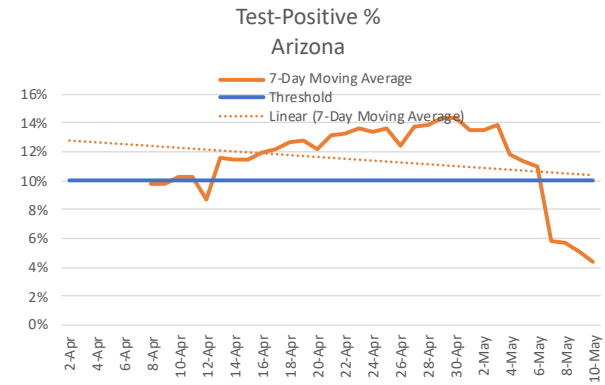
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State-by-State Test, New Daily Infection and Active Case Trends

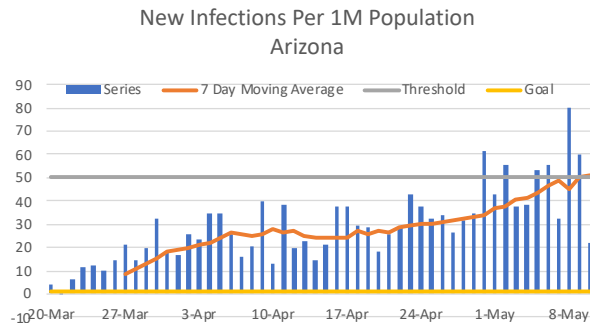
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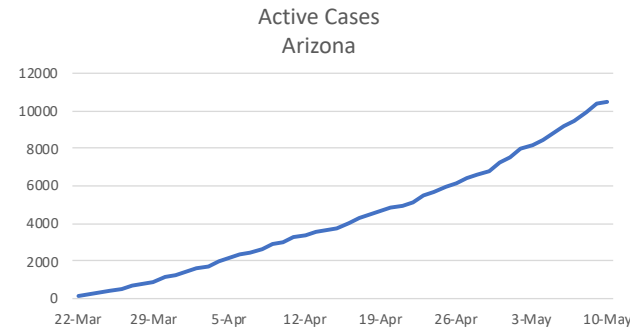
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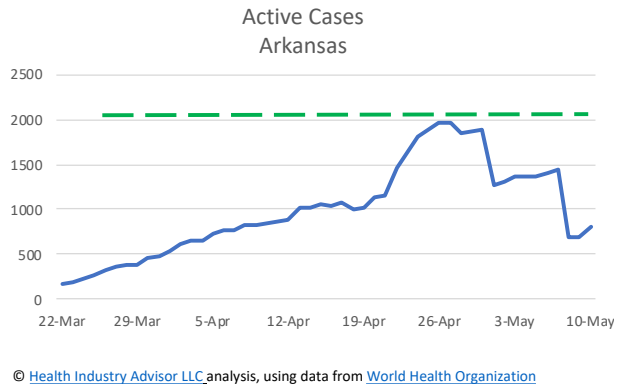
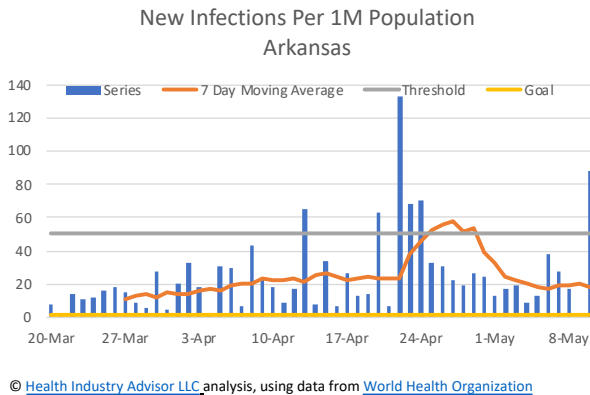
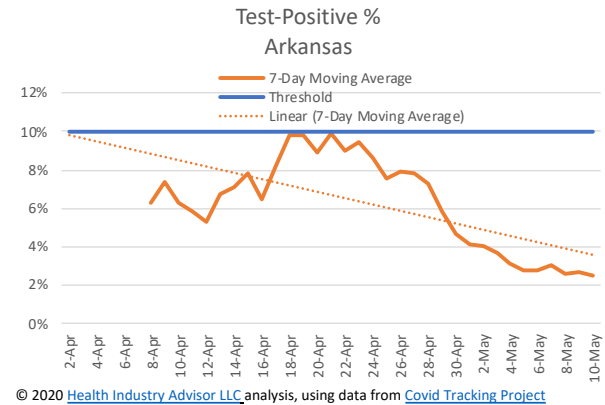
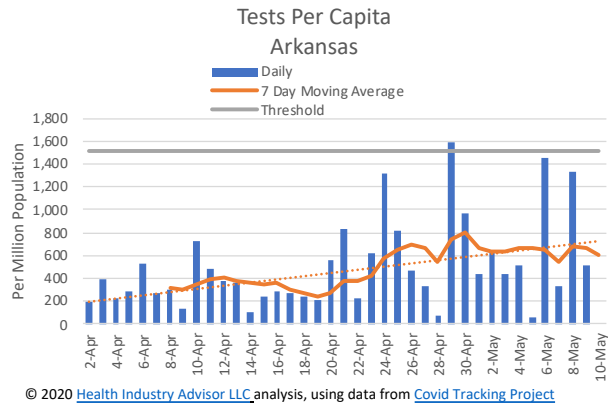
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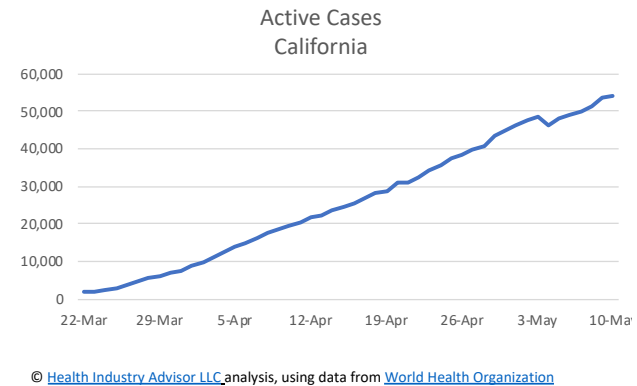
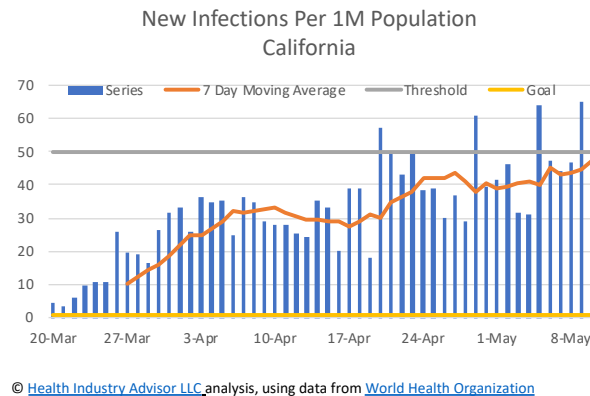
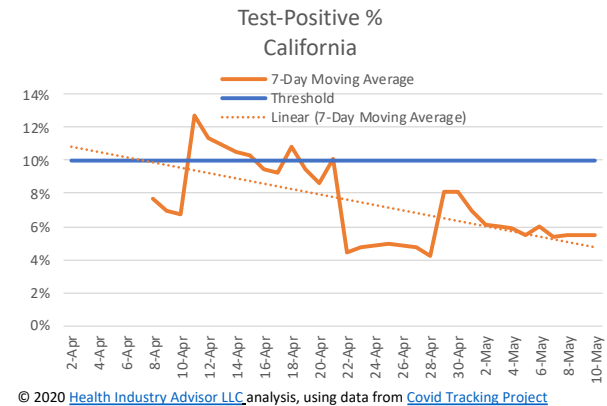
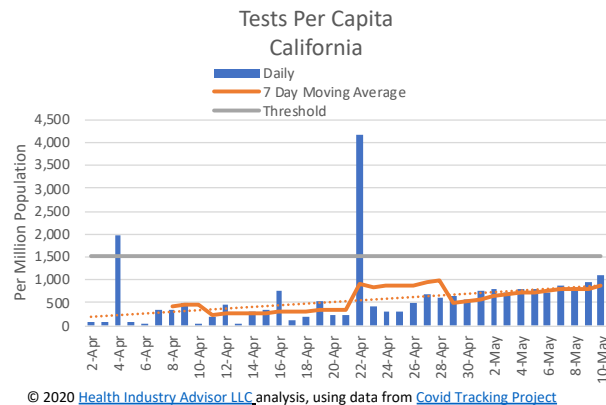
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State-by-State Test, New Daily Infection and Active Case Trends

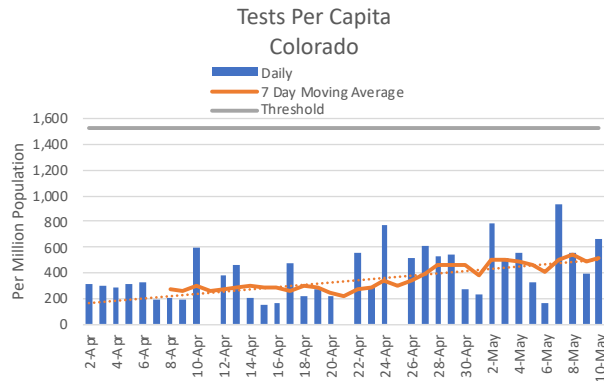
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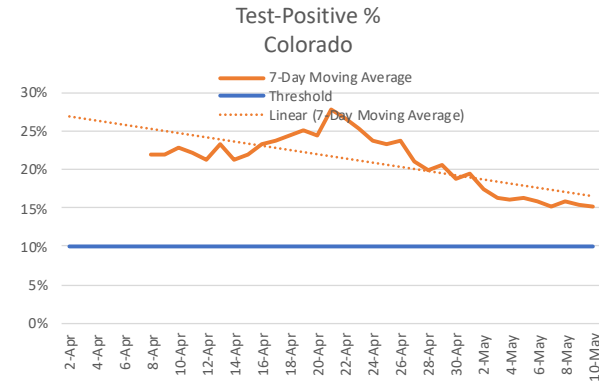
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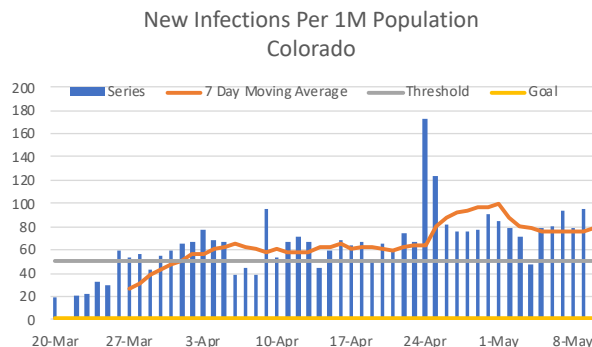
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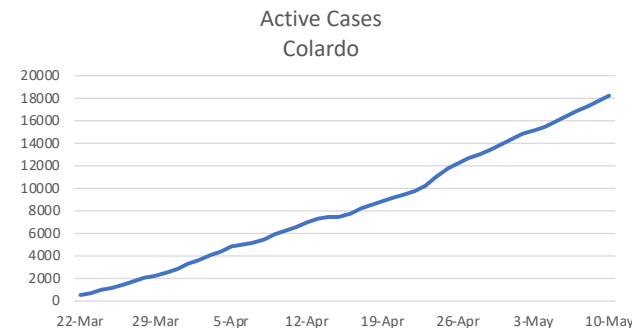
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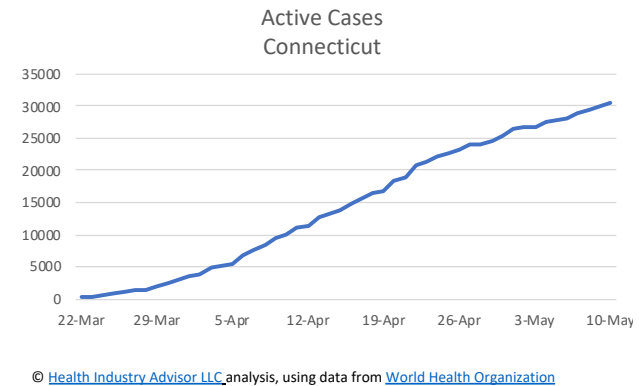
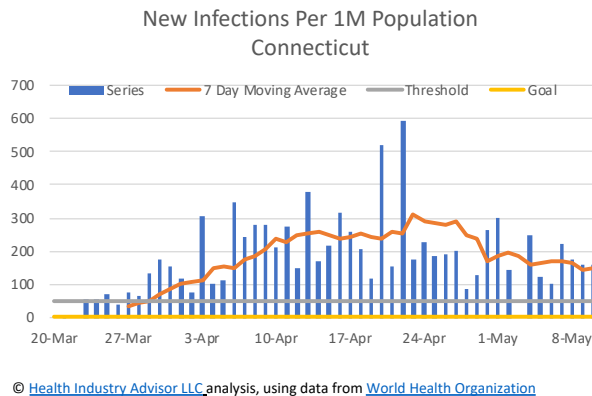
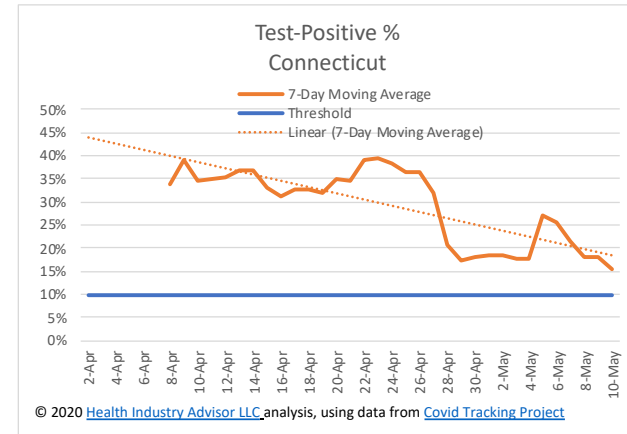
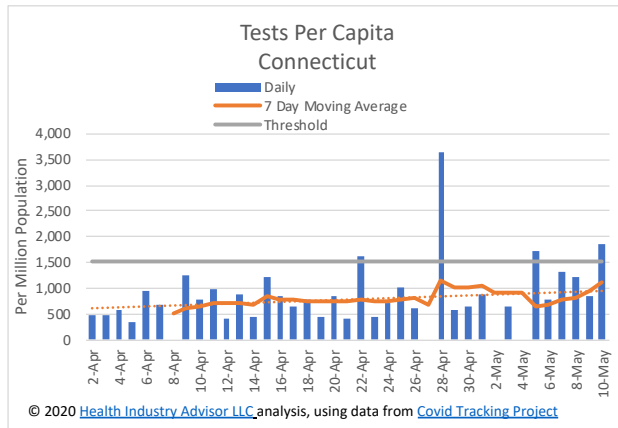


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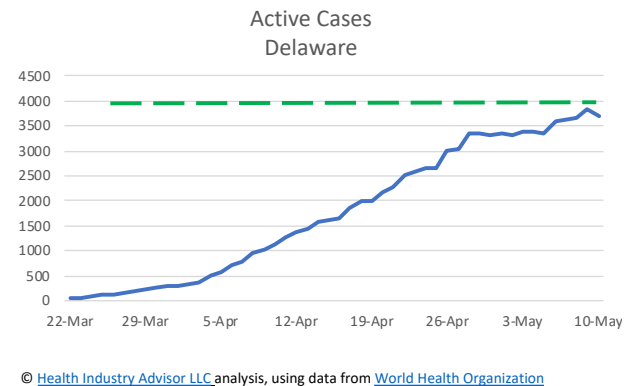
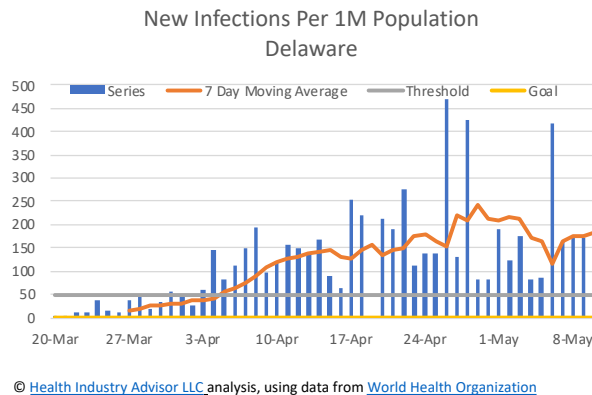
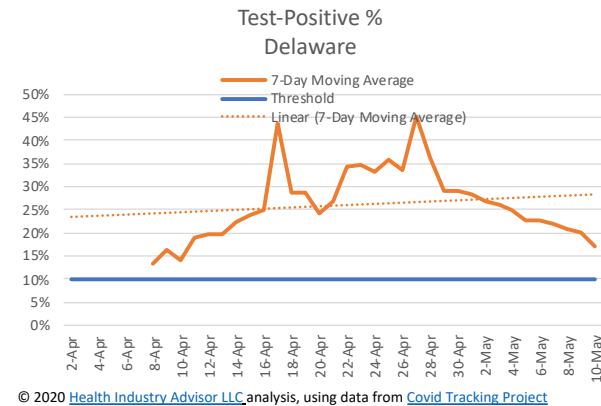
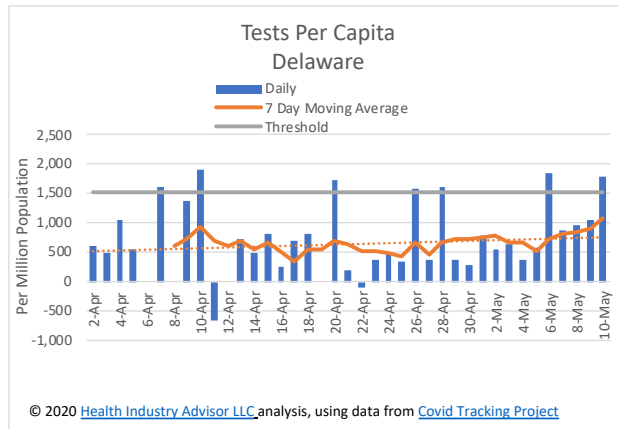


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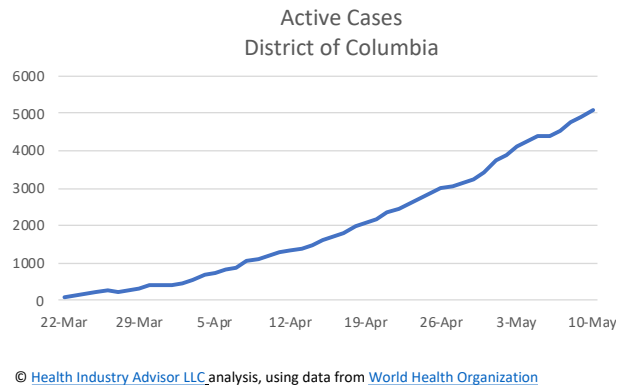
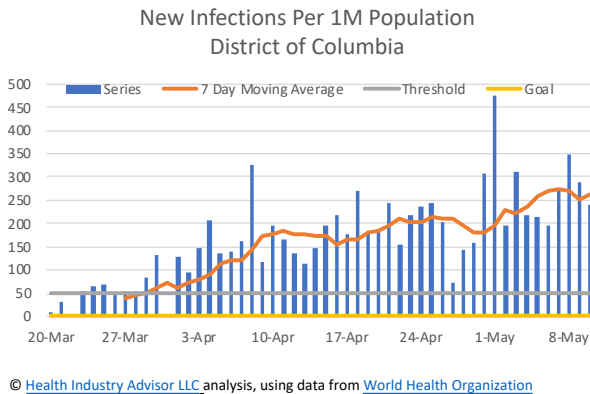
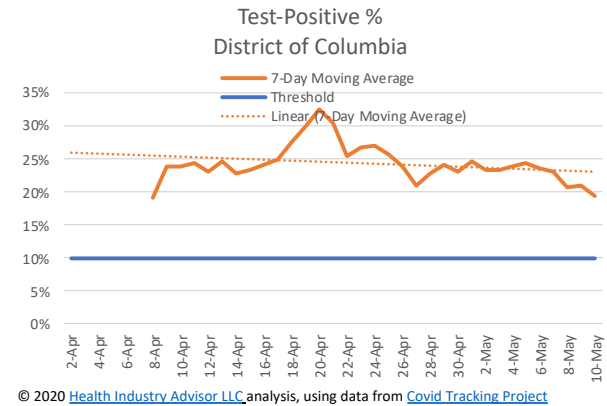
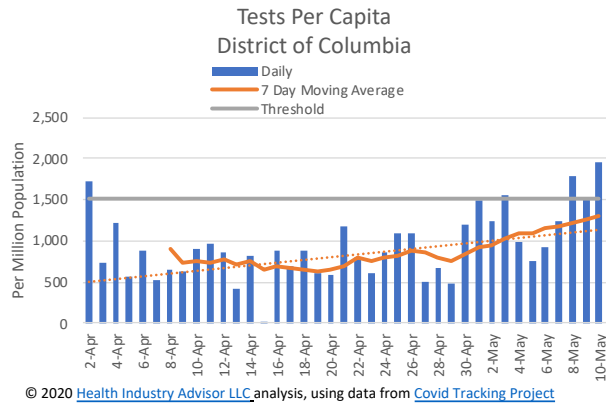
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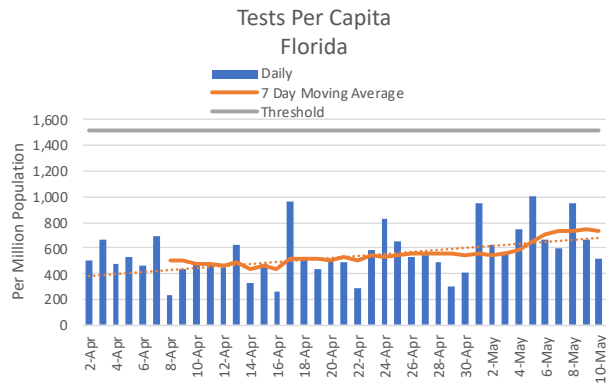
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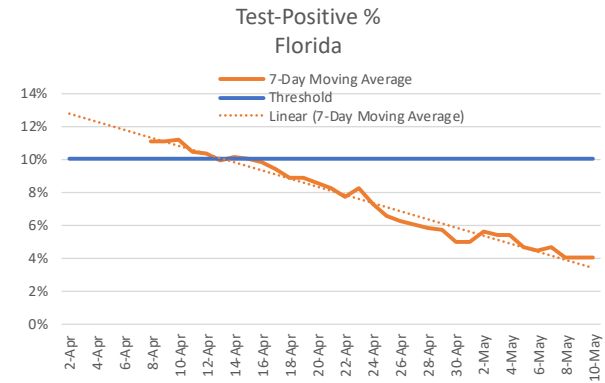
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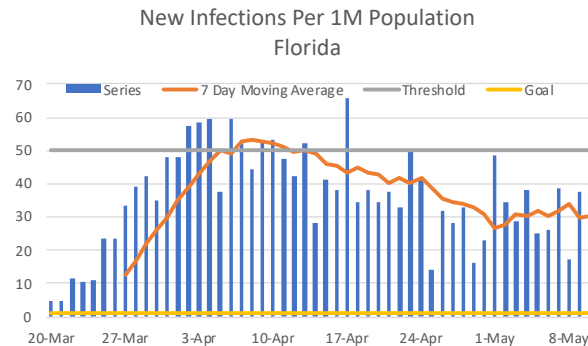
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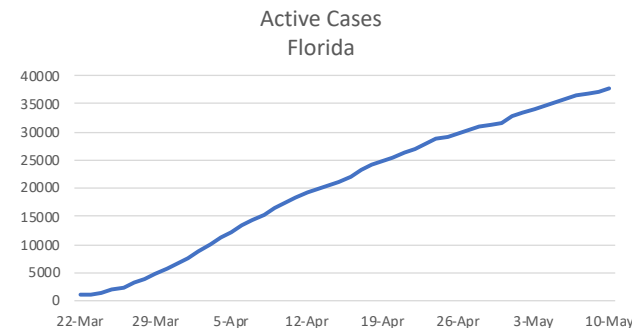
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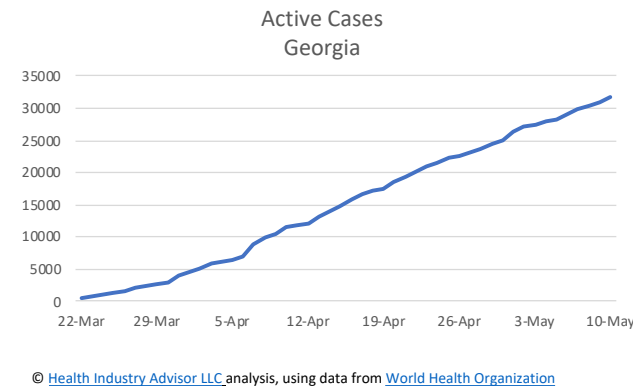
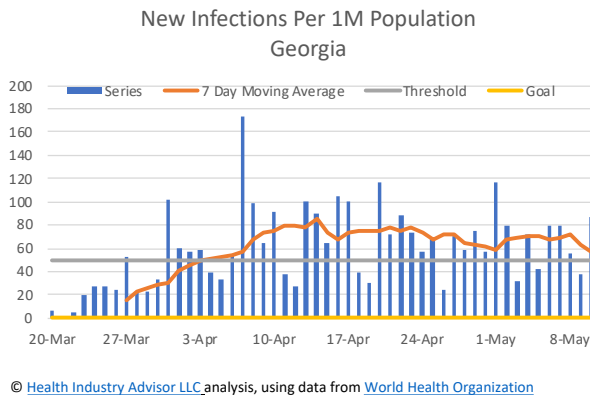
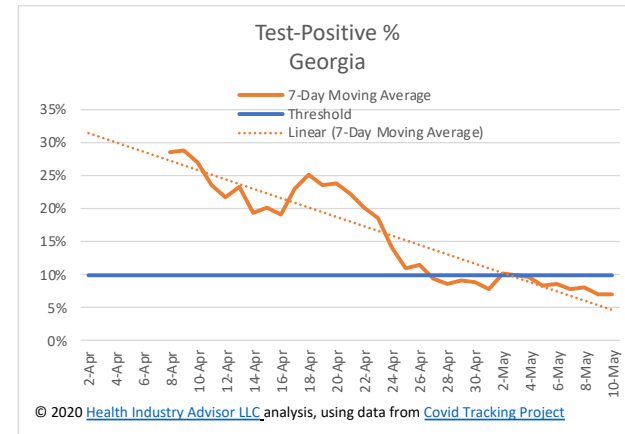
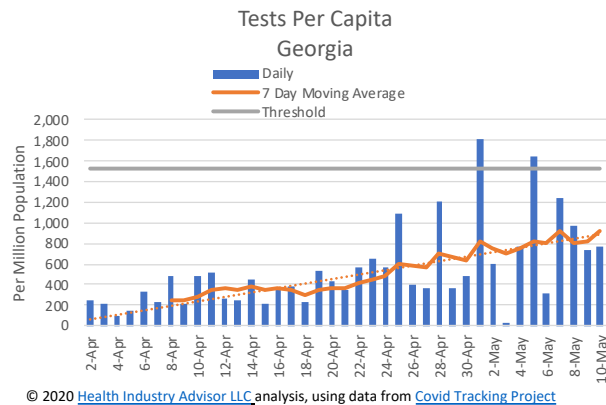


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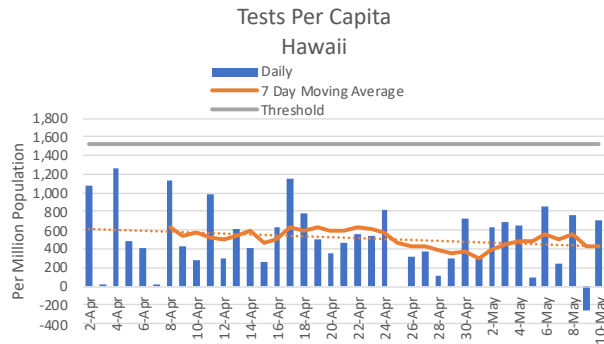


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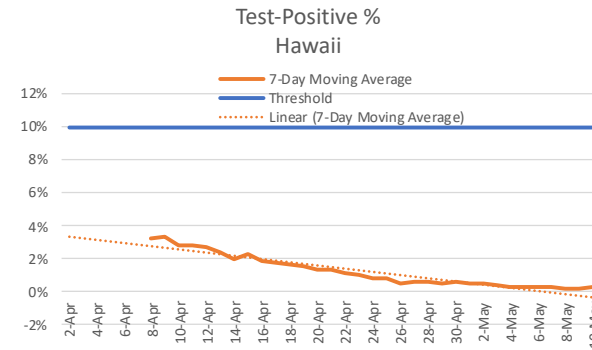
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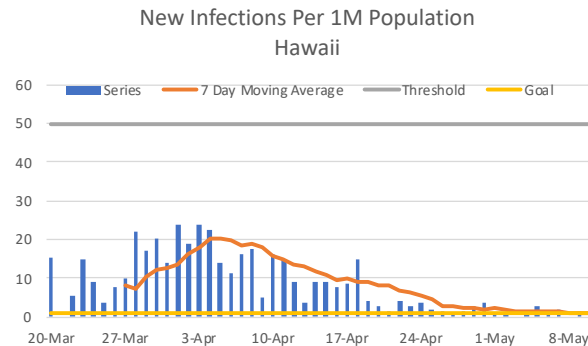
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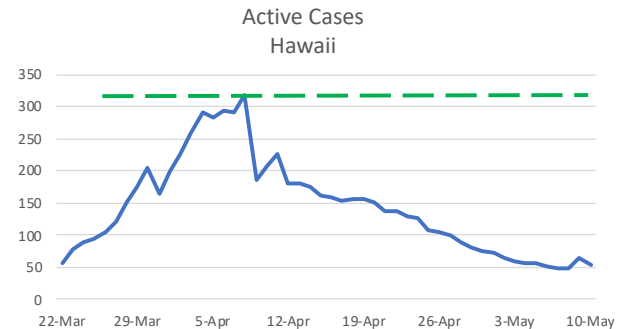
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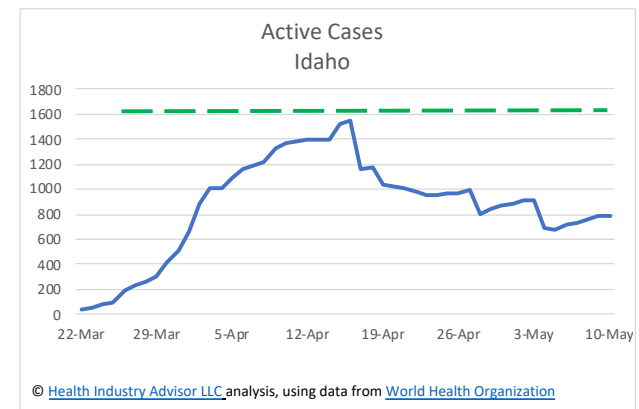
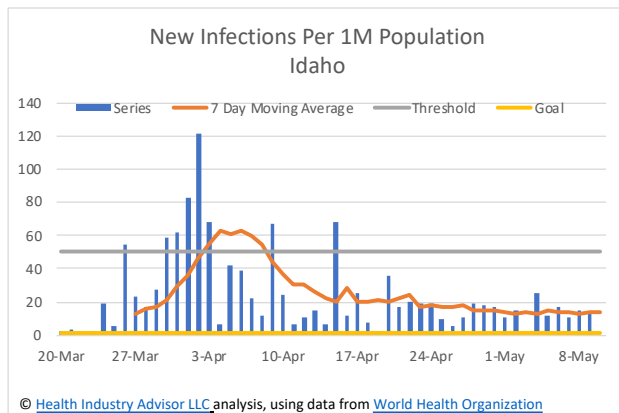
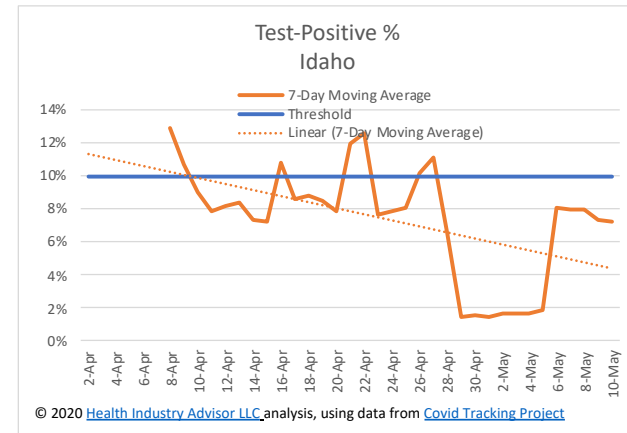
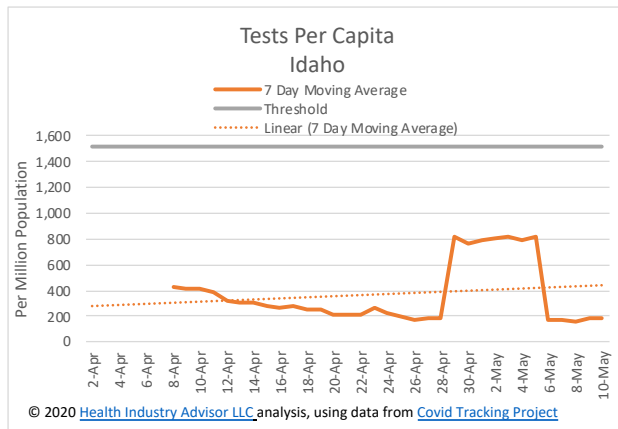


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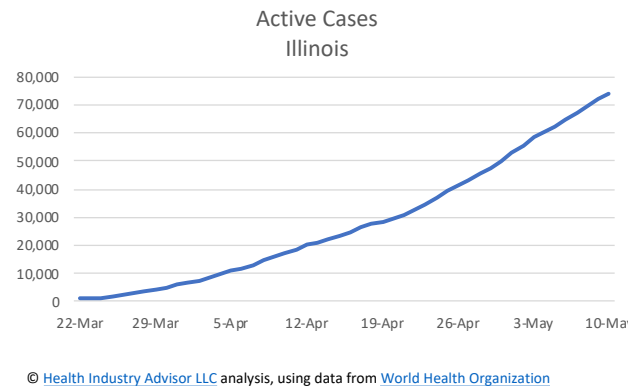
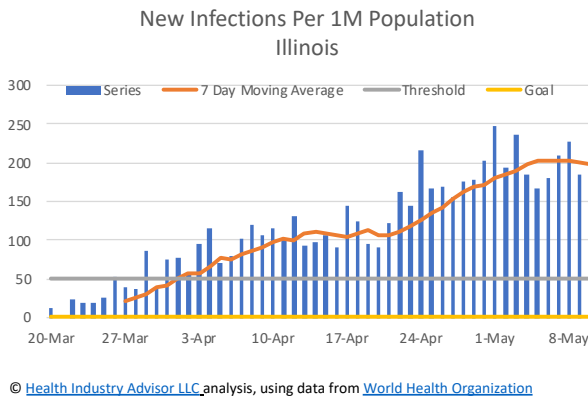
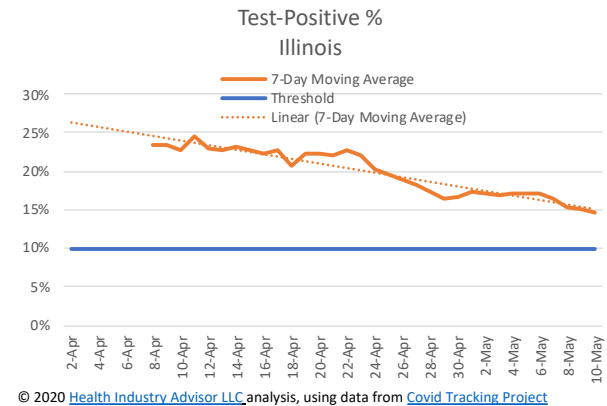
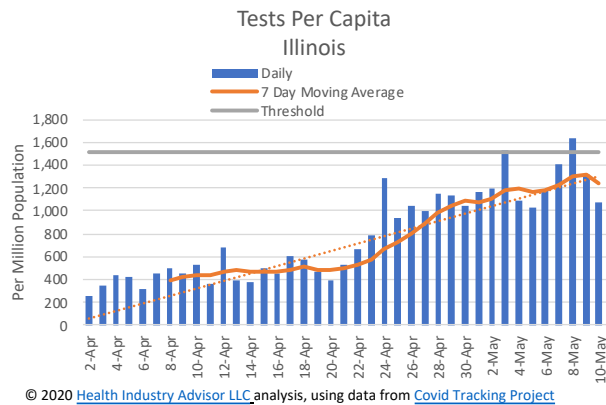


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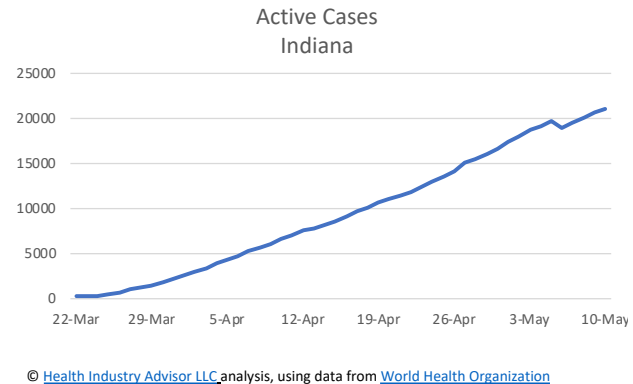
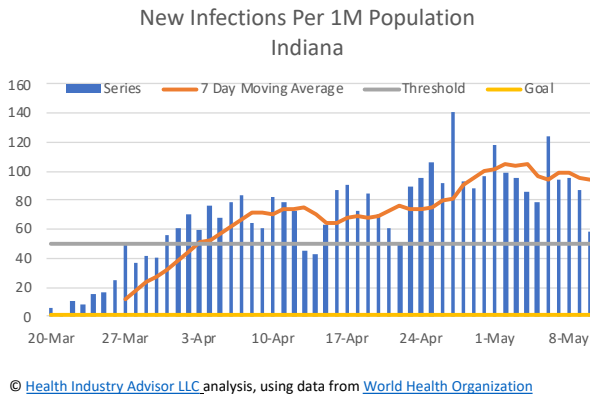
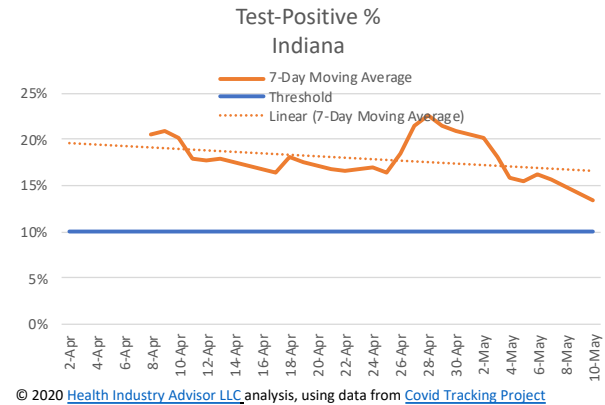
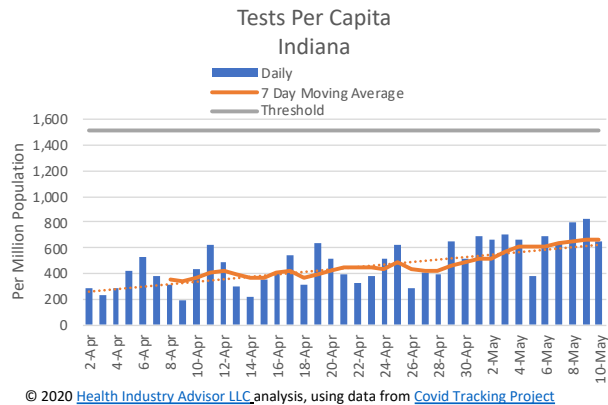


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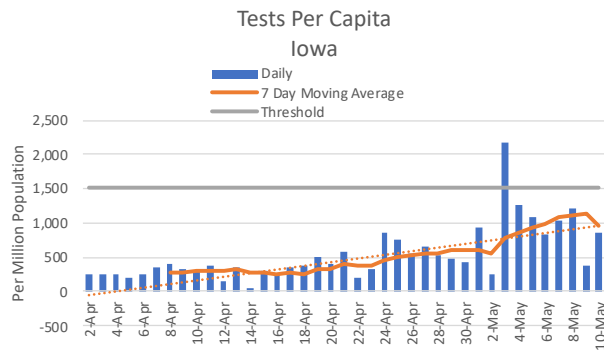
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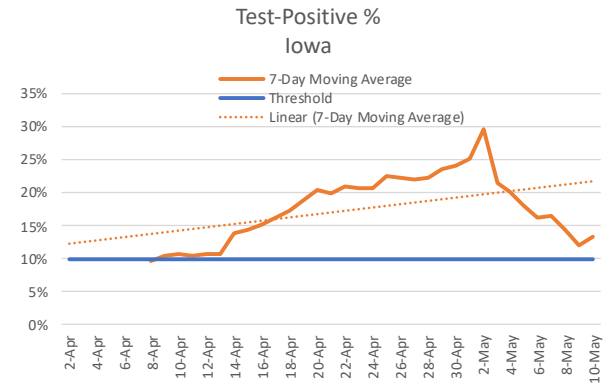


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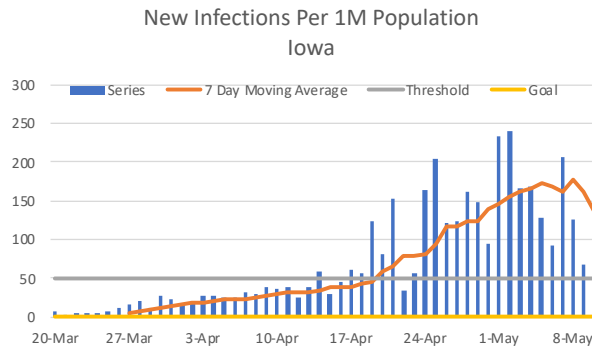
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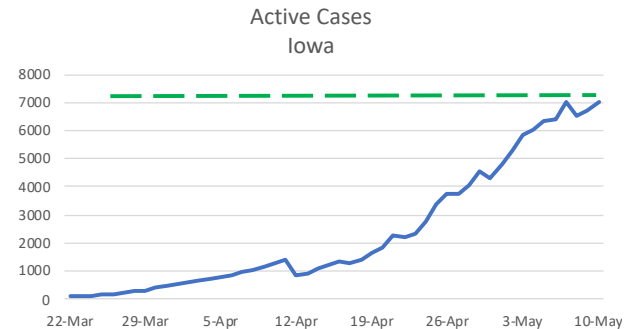
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