

COVID-19 Dashboard

Issue # 51
Friday, May 15, 2020

Day's Highlights

"Strategic Guidance in an Era of Unprecedented Change"

Measure	Desired Change	Yesterday in the U.S.
Number of Tests	Increase	700,000 tests reported on Wednesday and Thursday
Test-Positivity Rate	Decline	6.6% for past 2 days; 7.1% for past 7 days
Number of Cases	Plateau	New Cases down 16.5% week-over-week
Deaths % of Total Cases	Decline	Steady at 6.0%
Number of Deaths / 1M Population	Plateau	262.6
Recoveries : Death	Increase	3.66

- The U.S continued to broaden its testing, with an average of 350,000 the past two days; the test-positive rate was 6.6%. For the week, tests averaged 322,000 per day, with an 7.1% test-positive rate.
- For the past week only 14 states (AZ, CO, CT, DE, IA, IL, KS, MA, MD, MN, NE, PA, SD and VA) and the District of Columbia failed to meet or beat the [World Health Organization](#)'s suggested threshold of 10% or fewer test-positive results. By that measure, the remaining states appear to be adequately testing for the virus.
- Twenty-two states (AR, AS, CA, HI, FL, ID, KY, ME, MO, MT, NC, NH, NV, OK, OR, SC, TX, UT, VT, WA, WV and WY) reported new daily infection rates of 50 or less during the past week
- We are monitoring states that have met criticism for re-opening early, particularly Florida and Georgia. Thus far, both states are showing low test-positive rates and have yet to show any spike in new infection rates.
- The following states have yet to indicate a peak in new daily infection rates: Arizona, Minnesota, North Carolina, South Dakota, Texas and Virginia
- Over the past few days, Canada and Saudi Arabia, as well eight states appear to have passed peak active cases: Connecticut, Florida, Missouri, North Carolina, Ohio, Pennsylvania, Utah and Wyoming. Others may have as well, however, its difficult to ascertain these peaks due to lags and inconsistencies in state reporting of recoveries.
- Tracking the 100 most-populous counties in the US: the Northeast region was hit hardest by the virus, as measured by peak daily infection rates. Each of the hardest-hit counties - Bergen (NJ), Nassau (NY), New York (Bronx, Kings, New York, Queens and Richmond counties), Suffolk (MA), Suffolk (NY) and Westchester (NY) - have seen rapidly declining infection rates over the past several weeks
- Sixteen of the most-populous counties have yet to indicate a peak in new infections. Of these, those with the highest new infection rates: Dallas (TX), DuPage (IL), Fairfax (VA), Hennepin (MN), Lake (IL) and Milwaukee (WI)

COUNTRY-BY-COUNTRY INFORMATION

Countries Included

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- 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
- Since that time, 13 countries have moved ahead of South Korea in total cases
- We continue to track the 30 countries, which still account for 89.8% of total cases worldwide
- Case and death information is sourced from the [World Health Organization](#), which is accessed daily; analysis by Health Industry Advisor LLC

Country-by-Country Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

As of May 14

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	Rank7	New Daily Infections Per 1M Population (5-Day M.A.)	Rank8
USA	1,457,593	(1)	4,404	(5)	86,912	(1)	6.0%	(15)	262.6	(9)	1.6%	(13)	32,166	(13)	71.2	(5)
Austria	16,058	(29)	1,783	(18)	626	(25)	3.9%	(20)	69.5	(16)	0.3%	(25)	38,290	(9)	4.9	(24)
Belgium	54,288	(15)	4,684	(3)	8,903	(7)	16.4%	(1)	768.2	(1)	0.6%	(20)	53,839	(3)	35.4	(12)
Brazil	202,918	(6)	955	(24)	13,993	(6)	6.9%	(11)	65.8	(18)	5.4%	(3)	3,462	(25)	45.2	(10)
Canada	73,401	(14)	1,945	(15)	5,472	(11)	7.5%	(10)	145.0	(11)	1.6%	(11)	31,019	(14)	32.1	(13)
Chile	37,040	(19)	1,938	(16)	368	(26)	1.0%	(27)	19.3	(22)	6.4%	(1)	17,042	(19)	93.1	(3)
China	82,929	(11)	58	(30)	4,633	(12)	5.6%	(16)	3.2	(29)	0.0%	(30)	N/A	N/A	0.0	(30)
Ecuador	30,502	(21)	1,729	(19)	2,338	(17)	7.7%	(9)	132.5	(12)	1.0%	(16)	5,050	(24)	1.7	(27)
France	178,870	(7)	2,740	(11)	27,425	(4)	15.3%	(2)	420.2	(5)	0.2%	(27)	21,219	(15)	8.9	(21)
Germany	174,975	(8)	2,088	(14)	7,928	(8)	4.5%	(17)	94.6	(14)	0.4%	(24)	37,585	(11)	9.5	(20)
India	81,997	(12)	59	(29)	2,649	(16)	3.2%	(21)	1.9	(30)	5.5%	(2)	1,413	(28)	2.7	(26)
Iran	114,533	(10)	1,364	(22)	6,854	(9)	6.0%	(14)	81.6	(15)	1.5%	(14)	7,678	(23)	19.4	(15)
Ireland	23,827	(26)	4,825	(2)	1,506	(21)	6.3%	(12)	305.0	(8)	0.9%	(17)	52,491	(5)	41.7	(11)
Israel	16,579	(27)	1,915	(17)	265	(28)	1.6%	(26)	30.6	(21)	0.2%	(28)	56,258	(2)	3.3	(25)
Italy	223,096	(5)	3,690	(6)	31,368	(3)	14.1%	(4)	518.8	(3)	0.4%	(23)	46,426	(6)	17.1	(17)
Japan	16,120	(28)	127	(28)	697	(24)	4.3%	(18)	5.5	(25)	0.6%	(21)	1,843	(26)	0.7	(28)
Mexico	40,186	(18)	312	(25)	4,220	(13)	10.5%	(7)	32.7	(20)	5.0%	(4)	1,104	(29)	13.9	(19)
Netherlands	43,481	(17)	2,538	(12)	5,590	(10)	12.9%	(5)	326.2	(7)	0.5%	(22)	16,508	(20)	14.2	(18)
Pakistan	35,788	(20)	162	(27)	770	(23)	2.2%	(25)	3.5	(28)	4.5%	(7)	1,501	(27)	7.2	(22)
Peru	80,604	(13)	2,445	(13)	2,267	(19)	2.8%	(22)	68.8	(17)	4.4%	(8)	17,845	(17)	95.7	(2)
Portugal	28,319	(24)	2,777	(10)	1,184	(22)	4.2%	(19)	116.1	(13)	0.7%	(19)	57,090	(1)	22.5	(14)
Russia	252,245	(3)	1,682	(21)	2,305	(18)	0.9%	(28)	15.4	(23)	4.9%	(5)	42,406	(7)	71.5	(4)
Saudi Arabia	46,869	(16)	1,346	(23)	283	(27)	0.6%	(29)	8.1	(24)	4.8%	(6)	13,879	(22)	53.9	(8)
Singapore	26,098	(25)	4,461	(4)	21	(30)	0.1%	(30)	3.6	(27)	3.0%	(9)	14,783	(21)	126.0	(1)
South Korea	10,991	(30)	214	(26)	260	(29)	2.4%	(24)	5.1	(26)	0.3%	(26)	38,372	(8)	0.5	(29)
Spain	272,646	(2)	5,831	(1)	27,321	(5)	10.0%	(8)	584.3	(2)	0.7%	(18)	52,784	(4)	48.2	(9)
Sweden	28,582	(23)	2,830	(9)	3,529	(15)	12.3%	(6)	349.4	(6)	2.0%	(10)	17,590	(18)	56.0	(6)
Switzerland	30,463	(22)	3,557	(7)	1,872	(20)	6.1%	(13)	218.6	(10)	0.1%	(29)	37,954	(10)	5.6	(23)
Turkey	144,749	(9)	1,716	(20)	4,007	(14)	2.8%	(23)	47.5	(19)	1.1%	(15)	17,915	(16)	18.7	(16)
UK	233,151	(4)	3,434	(8)	33,614	(2)	14.4%	(3)	495.2	(4)	1.6%	(12)	32,713	(12)	55.6	(7)

Note: China does not report test volumes

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“Strategic Guidance in an Era of Unprecedented Change”

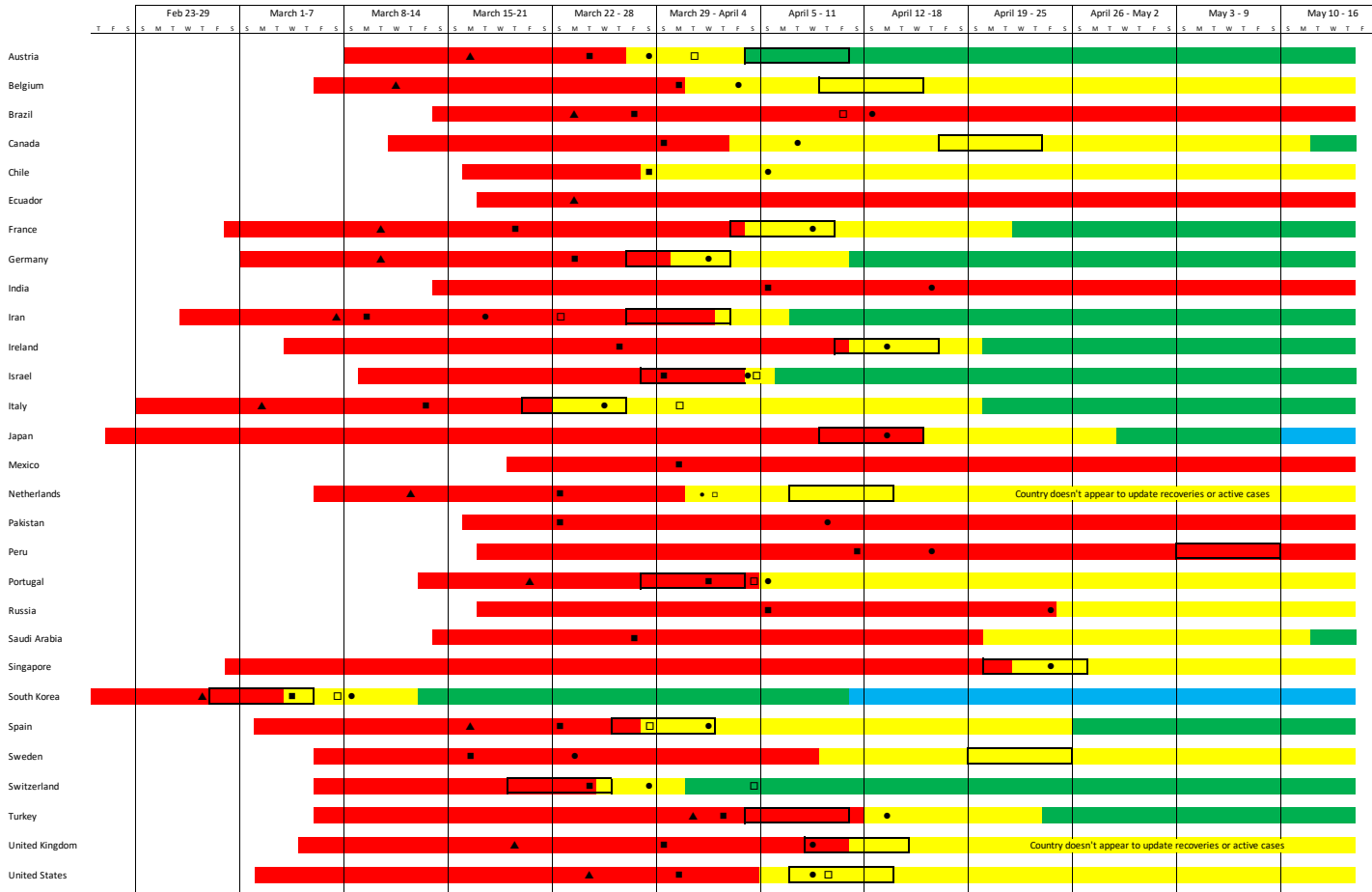
This graphic on the following page illustrates when the country first recorded 100 total cases (start of the “contagion” phase); when growth stopped following an exponential pattern (start of the “containment” phase); and, when peak total cases were recorded (start of the “recovery” phase). It uses symbols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

Legend:

Phase		Daily Case Increase (5-Day Moving Average)	Death Rate
	Contagion 100th Case to End of Exponential Growth	 Stabilized < 35%	 No Longer Increasing Exponentially
	Containment End of Exponential Growth to Peak Active Cases	 Stabilized < 20%	
	Recovery Post-Peak Active Cases	 Stabilized < 10%	<u>Peak Infections</u>
	Clear Per IHME Standard, clear to relax social distancing		 Peak 7-Day Average New Daily Infections

Country-by-Country Virus Progression

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Country-By-Country Listing of Countries By Total Cases

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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. These countries have moved up:

- Bangladesh
- Belarus
- Columbia
- Dominican Republic
- Indonesia
- Kuwait
- Poland
- Qatar
- Philippines
- Romania
- South Africa
- UAE
- Ukraine

The original 30 still account for ~90% of all cases worldwide.

Country		Total Cases	
	14-May	6-May	27-Apr
1 USA	1,457,593	1,263,092	1,010,356
2 Spain	272,646	253,682	229,422
3 Russia	252,245	214,457	199,414
4 UK	233,151	201,101	165,842
5 Italy	223,096	174,191	158,758
6 Brazil	202,918	168,162	157,149
7 France	178,870	165,929	112,261
8 Germany	174,975	131,744	91,472
9 Turkey	144,749	126,611	87,147
10 Iran	114,533	101,650	82,830
11 China	82,929	82,883	66,501
12 India	81,997	63,496	48,500
13 Peru	80,604	54,817	46,687
14 Canada	73,401	52,987	38,245
15 Belgium	54,288	50,781	29,451
16 Saudi Arabia	46,869	41,319	29,164
17 Netherlands	43,481	31,938	28,669
18 Mexico	40,186	30,060	24,070
19 Chile	37,040	29,420	23,240
20 Pakistan	35,788	26,182	19,648
21 Ecuador	30,502	26,025	18,926
22 Switzerland	30,463	23,918	18,811
23 Sweden	28,582	23,214	15,555
24 Portugal	28,319	23,048	15,274
25 Qatar	28,272	22,248	14,677
26 Belarus	26,772	20,198	14,423
27 Singapore	26,098	19,255	13,915
28 Ireland	23,827	17,972	13,813
29 UAE	21,084	16,310	13,614
30 Bangladesh	18,863	15,738	11,902
31 Poland	17,615	15,684	11,339
32 Ukraine	16,847	15,253	11,289
33 Israel	16,579	14,740	11,244
34 Romania	16,247	14,107	10,839
35 Japan	16,120	13,184	10,738
36 Austria	16,058	12,438	
37 Indonesia	16,006	11,719	
38 Colombia	13,610	10,806	
39 South Africa	12,739		
40 Kuwait	11,975		
41 Philippines	11,876		
42 Dominican Republic	11,320		
43 S. Korea	10,991		
Others	239,865	237,023	207,330
World	4,521,989	3,817,382	3,062,515
Total for Countries we track (in bold)		3,461,206	2,798,572
% of World's cases		89.8%	91.4%

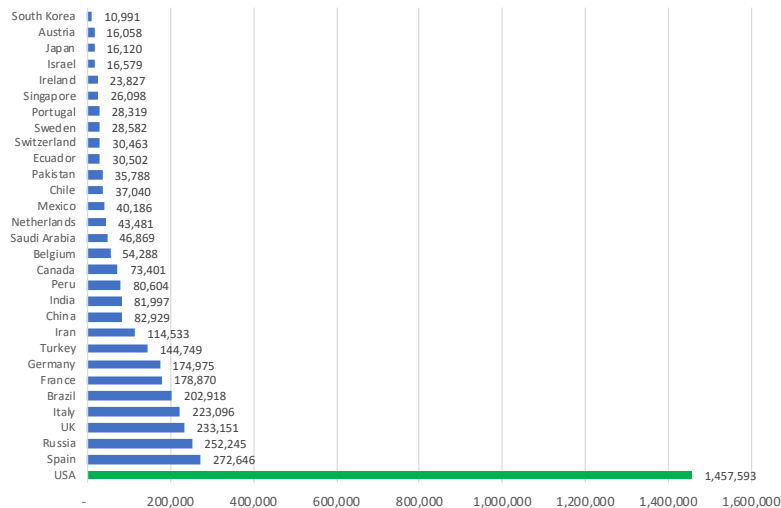
Country-by-Country Cases & Cases Per Capita

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Brazil and Russia are moving up in the ranks of most cases; Austria, Israel, Japan and South Korea are dropping; several Asian, Eastern European and South American countries are moving ahead of them, albeit with relatively low case growth rates.

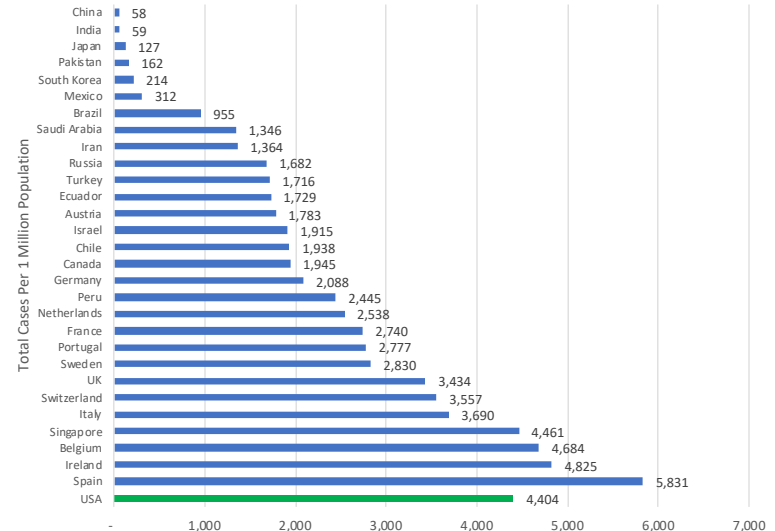
Cases per capita remain the highest in European countries, Singapore and the US.

Total Cases By Country
May 14



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Cases Per Capita By Country
May 14



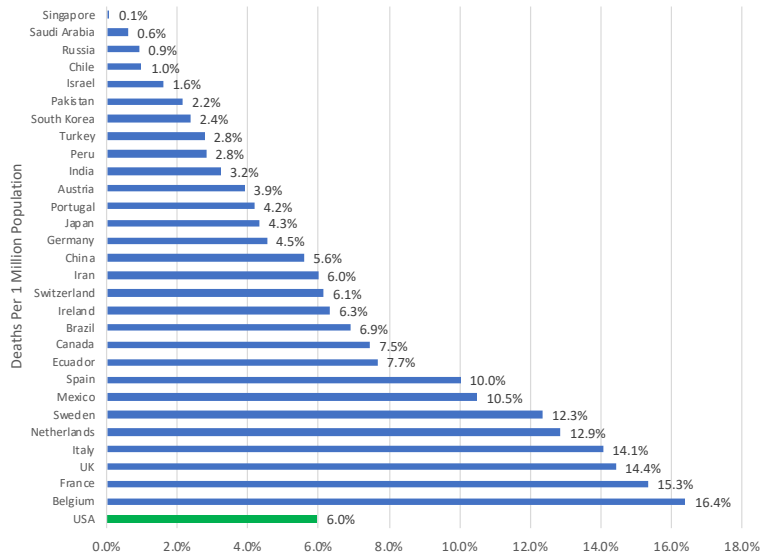
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Deaths Per Cases & Per Capita

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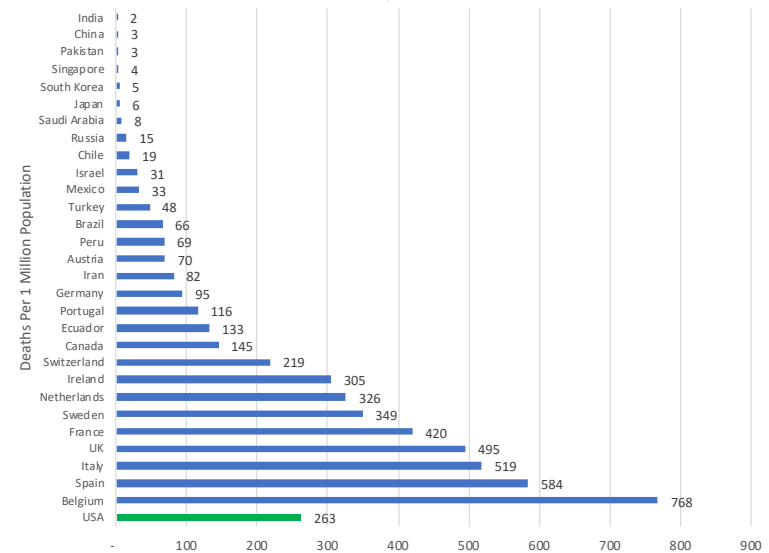
Death rates per case and per capita are the highest in Belgium, France, Italy and the UK. Rates in the US are in the middle of this group of countries

Death Rate By Country
May 14



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Deaths Per Capita By Country
May 14



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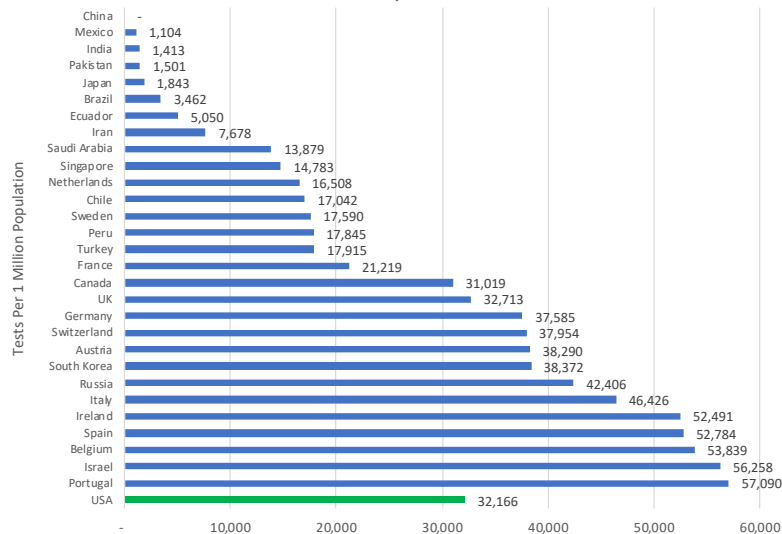
Country-by-Country Tests Per Capita & Case Growth Rate

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Testing per capita varies widely among these countries. The US, while ramping up testing over the past several weeks, still lags that of many European countries.

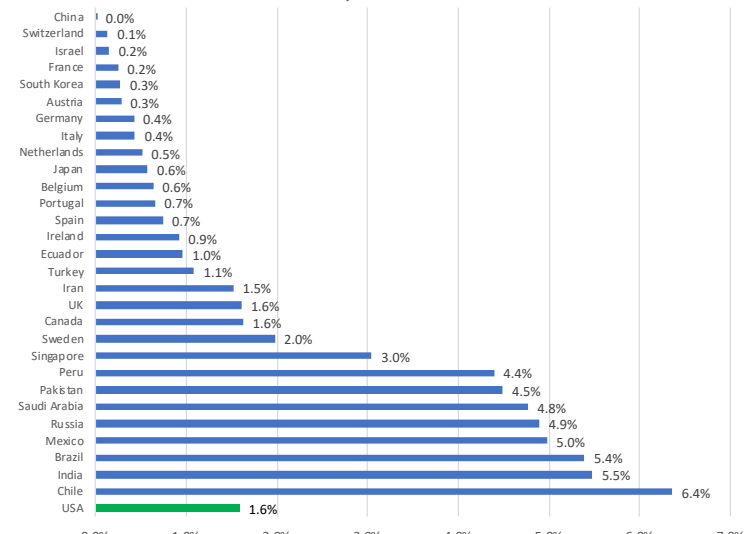
Case growth among the hardest-hit countries has fallen sharply over the past month

Tests Per Capita By Country
May 14



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Daily Case Growth Rate By Country
May 10 - 14



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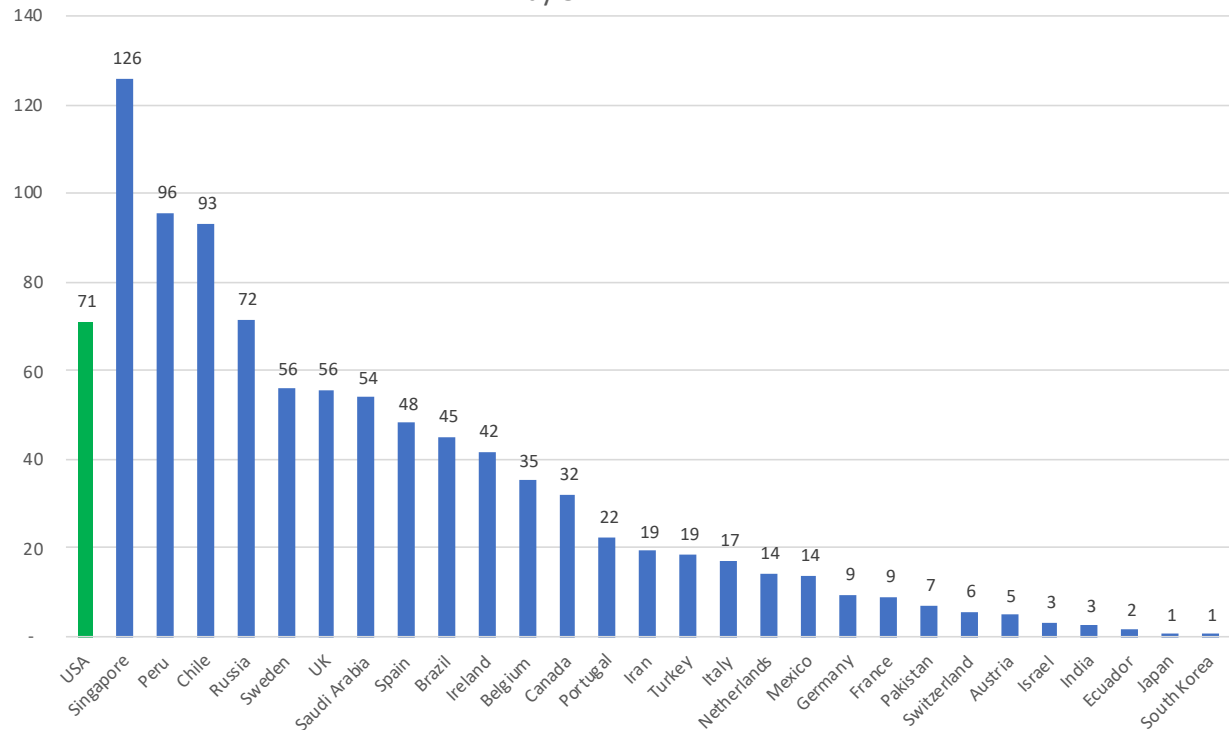
Country-by-Country New Daily Infection Rate

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New daily infection rates are declining in most of the hardest-hit countries. Singapore is high but, declining.

Even in countries with newly-emerging virus-spread - Brazil, India, Mexico and Saudi Arabia - infection rates appear relatively low. Chile and Peru are the exceptions.

New Daily Infection Rates Per 1 Million Population By Country
May 8 - 14



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UNITED STATES & STATE-BY-STATE INFORMATION

State-by-State Comparative Statistics

"Strategic Guidance in an Era of Unprecedented Change"

As of May 14

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	11,101	(26)	2,264.0	(27)	473	(24)	4.3%	(30)	96.5	(25)	2.8%	(12)	781	(31)	59.9	(23)
Alaska	387	(51)	529.0	(49)	10	(50)	2.6%	(42)	13.7	(49)	0.5%	(48)	1,449	(7)	2.5	(49)
Arizona	12,674	(23)	1,741.2	(35)	624	(21)	4.9%	(19)	85.7	(28)	2.9%	(8)	456	(48)	53.6	(28)
Arkansas	4,366	(39)	1,446.7	(42)	98	(40)	2.2%	(46)	32.5	(46)	3.1%	(6)	749	(35)	31.8	(38)
California	74,785	(5)	1,892.7	(34)	3,048	(8)	4.1%	(31)	77.1	(30)	2.3%	(20)	946	(22)	45.3	(33)
Colorado	20,838	(17)	3,618.5	(17)	1,091	(16)	5.2%	(15)	189.5	(14)	1.5%	(37)	575	(44)	61.2	(22)
Connecticut	35,464	(12)	9,947.0	(5)	3,219	(7)	9.1%	(2)	902.9	(3)	1.5%	(38)	1,338	(12)	147.5	(9)
Delaware	7,223	(33)	7,417.6	(7)	260	(34)	3.6%	(36)	267.0	(12)	2.8%	(11)	1,398	(10)	188.4	(4)
District Of Columbia	6,736	(35)	9,544.5	(6)	358	(28)	5.3%	(14)	507.3	(6)	2.0%	(28)	1,446	(8)	219.0	(1)
Florida	43,210	(9)	2,011.9	(32)	1,876	(10)	4.3%	(27)	87.3	(27)	1.6%	(33)	771	(33)	29.1	(39)
Georgia	35,977	(10)	3,388.5	(19)	1,544	(13)	4.3%	(29)	145.4	(16)	2.0%	(27)	923	(24)	59.2	(24)
Hawaii	637	(49)	449.9	(50)	17	(48)	2.7%	(41)	12.0	(51)	0.2%	(50)	337	(49)	0.8	(50)
Idaho	2,351	(43)	1,311.9	(43)	72	(42)	3.1%	(39)	40.2	(43)	1.1%	(45)	228	(50)	13.8	(46)
Illinois	87,937	(3)	6,939.6	(9)	3,928	(6)	4.5%	(23)	310.0	(10)	2.9%	(9)	1,499	(6)	192.4	(3)
Indiana	26,053	(16)	3,869.9	(16)	1,646	(12)	6.3%	(8)	244.5	(13)	1.9%	(30)	752	(34)	75.3	(18)
Iowa	13,675	(21)	4,334.3	(14)	318	(31)	2.3%	(45)	100.8	(24)	3.2%	(4)	1,035	(20)	118.4	(11)
Kansas	7,703	(31)	2,644.1	(21)	189	(36)	2.5%	(43)	64.9	(35)	2.5%	(17)	628	(42)	67.2	(20)
Kentucky	7,225	(32)	1,617.2	(38)	328	(30)	4.5%	(21)	73.4	(32)	2.3%	(19)	1,240	(14)	35.1	(35)
Louisiana	33,489	(13)	7,203.8	(8)	2,417	(9)	7.2%	(4)	519.9	(5)	1.3%	(42)	1,439	(9)	87.2	(15)
Maine	1,565	(45)	1,164.3	(46)	69	(43)	4.4%	(25)	51.3	(39)	2.1%	(24)	25	(51)	25.0	(42)
Maryland	35,903	(11)	5,938.6	(10)	1,866	(11)	5.2%	(17)	308.7	(11)	2.6%	(14)	705	(37)	154.3	(7)
Massachusetts	82,182	(4)	11,825.6	(3)	5,482	(3)	6.7%	(7)	788.8	(4)	1.4%	(40)	1,200	(15)	173.9	(5)
Michigan	49,582	(7)	4,964.7	(11)	4,787	(4)	9.7%	(1)	479.3	(7)	1.2%	(44)	1,271	(13)	56.3	(26)
Minnesota	13,435	(22)	2,382.2	(26)	672	(19)	5.0%	(18)	119.2	(19)	4.5%	(1)	794	(30)	103.1	(14)
Mississippi	10,483	(28)	3,522.3	(18)	480	(23)	4.6%	(20)	161.3	(15)	2.3%	(21)	1,178	(16)	86.3	(16)
Missouri	10,555	(27)	1,719.8	(36)	566	(22)	5.4%	(12)	92.2	(26)	1.5%	(36)	547	(45)	25.0	(41)
Montana	462	(50)	432.3	(51)	16	(49)	3.5%	(37)	15.0	(48)	0.2%	(51)	575	(43)	0.7	(51)
Nebraska	9,416	(29)	4,867.6	(13)	113	(39)	1.2%	(48)	58.4	(37)	2.7%	(13)	1,151	(17)	164.4	(6)
Nevada	6,499	(36)	2,110.0	(30)	339	(29)	5.2%	(16)	110.1	(23)	1.5%	(34)	841	(27)	34.0	(36)
New Hampshire	3,382	(42)	2,487.3	(23)	151	(37)	4.5%	(24)	111.1	(22)	2.4%	(18)	1,089	(19)	56.6	(25)
New Jersey	144,024	(2)	16,214.9	(2)	9,946	(2)	6.9%	(5)	1,119.8	(2)	0.8%	(46)	2,558	(2)	143.4	(9)
New Mexico	5,503	(37)	2,624.4	(22)	242	(35)	4.4%	(26)	115.4	(20)	2.9%	(10)	1,998	(3)	68.8	(19)
New York	353,096	(1)	18,150.7	(1)	27,426	(1)	7.8%	(3)	1,409.8	(1)	0.6%	(47)	1,534	(5)	115.1	(12)
North Carolina	16,996	(19)	1,620.5	(37)	641	(20)	3.8%	(35)	61.1	(36)	3.3%	(3)	653	(41)	47.4	(31)
North Dakota	1,712	(44)	2,246.5	(29)	40	(47)	2.3%	(44)	52.5	(38)	3.2%	(5)	1,758	(4)	63.9	(21)
Ohio	26,367	(15)	2,255.7	(28)	1,537	(14)	5.8%	(9)	131.5	(17)	2.2%	(23)	700	(38)	51.7	(29)
Oklahoma	4,962	(38)	1,254.0	(44)	284	(33)	5.7%	(10)	71.8	(34)	2.0%	(26)	913	(25)	22.8	(43)
Oregon	3,479	(41)	824.8	(47)	137	(38)	3.9%	(32)	32.5	(45)	1.9%	(29)	460	(47)	16.6	(44)
Pennsylvania	63,220	(6)	4,938.3	(12)	4,294	(5)	6.8%	(6)	335.4	(9)	1.5%	(35)	540	(46)	80.5	(17)
Rhode Island	12,016	(24)	11,342.7	(4)	468	(25)	3.9%	(33)	441.8	(8)	1.8%	(31)	2,600	(1)	200.4	(2)
South Carolina	8,189	(30)	1,590.5	(39)	371	(27)	4.5%	(22)	72.1	(33)	1.7%	(32)	695	(39)	29.1	(40)
South Dakota	3,792	(40)	4,286.4	(15)	43	(46)	1.1%	(49)	48.6	(40)	2.2%	(22)	1,027	(21)	143.2	(10)
Tennessee	16,699	(20)	2,443.8	(25)	287	(32)	1.7%	(47)	42.0	(42)	2.5%	(16)	1,380	(11)	54.4	(27)
Texas	44,775	(8)	1,544.2	(40)	1,258	(15)	2.8%	(40)	43.4	(41)	3.0%	(7)	828	(29)	40.5	(34)
Utah	6,749	(34)	2,105.1	(31)	75	(41)	1.1%	(50)	23.4	(47)	2.0%	(25)	1,140	(18)	45.7	(32)
Vermont	932	(47)	1,493.6	(41)	53	(45)	5.7%	(11)	84.9	(29)	0.2%	(49)	928	(23)	3.7	(48)
Virginia	27,813	(14)	3,258.5	(20)	955	(18)	3.4%	(38)	111.9	(21)	3.7%	(2)	731	(36)	104.5	(13)
Washington	18,660	(18)	2,450.5	(24)	993	(17)	5.3%	(13)	130.4	(18)	1.4%	(41)	680	(40)	32.2	(37)
West Virginia	1,434	(46)	802.4	(48)	62	(44)	4.3%	(28)	34.7	(44)	1.3%	(43)	895	(26)	11.0	(47)
Wisconsin	11,275	(25)	1,936.5	(33)	434	(26)	3.8%	(34)	74.5	(31)	2.6%	(15)	776	(32)	50.5	(30)
Wyoming	701	(48)	1,211.2	(45)	7	(51)	1.0%	(51)	12.1	(50)	1.4%	(39)	838	(28)	16.3	(45)
United States	1,457,593		4,403.6		86,912		6.0%		262.6		1.6%		964		71.2	

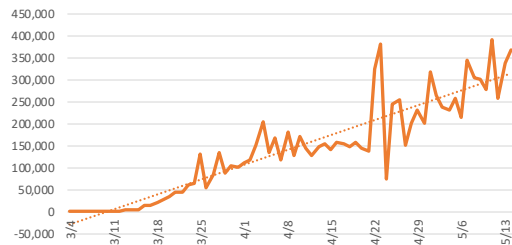
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United States Overall Statistics

"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.

New Daily Tests - US



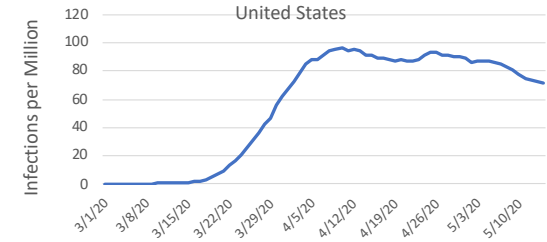
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Test-Positive Rate



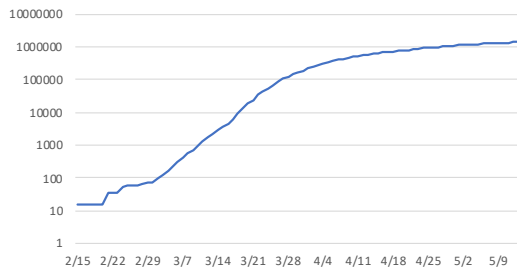
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New Daily Infections Per 1M
7-Day Moving Average
United States



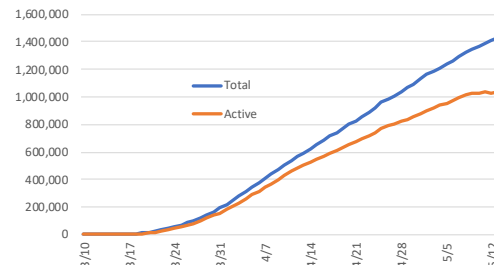
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Total Cases Log Scale - US



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Cases - US



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Deaths Per Case - US

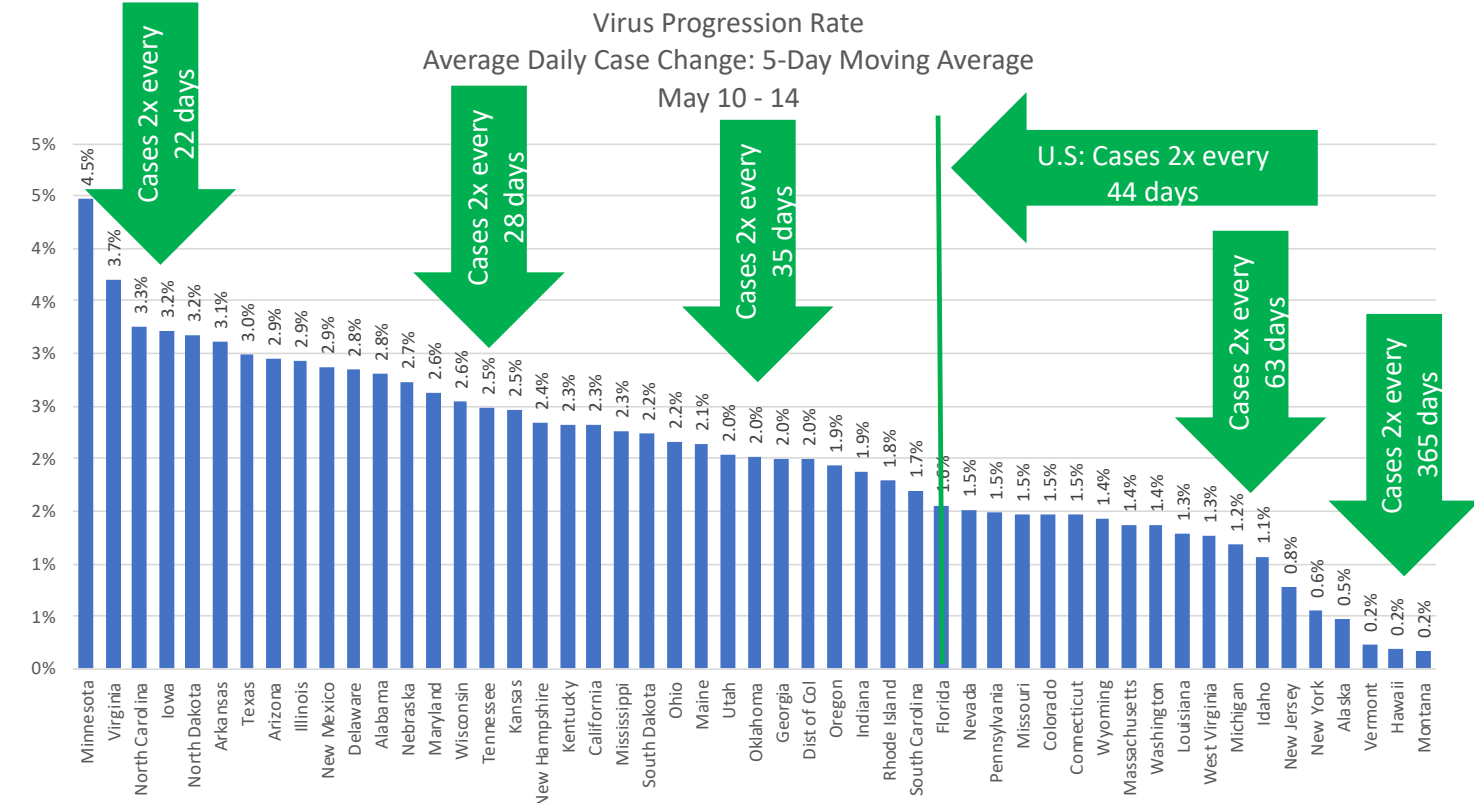


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Average Daily Case Growth

"Strategic Guidance in an Era of Unprecedented Change"

Just 1 month ago, cases in every state were doubling every 1 – 3 weeks.
Now, they would take 3 weeks to more than 1 year to double

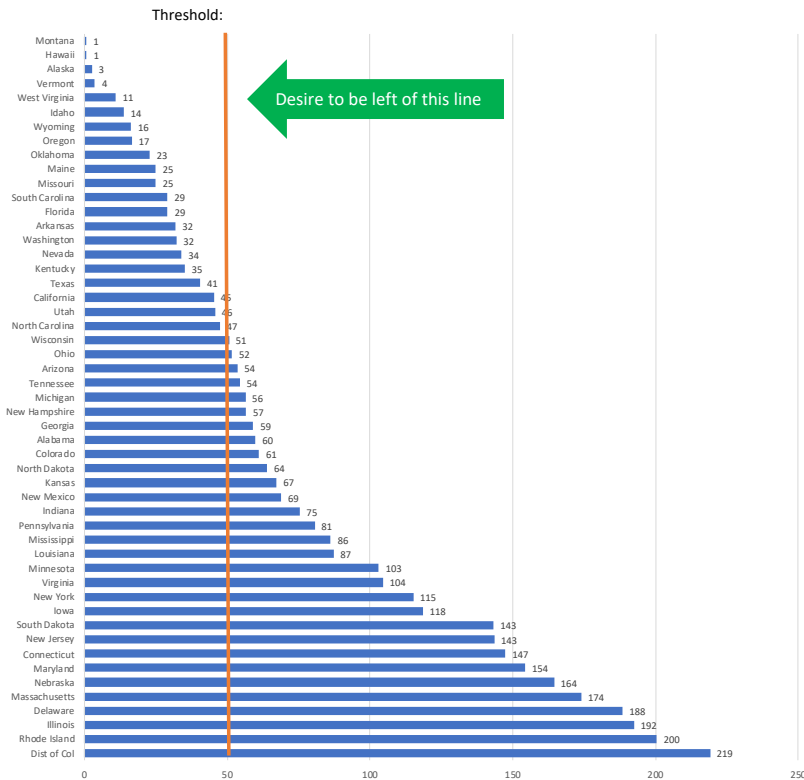


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State-by-State New Daily Infections & Tests Per Capita

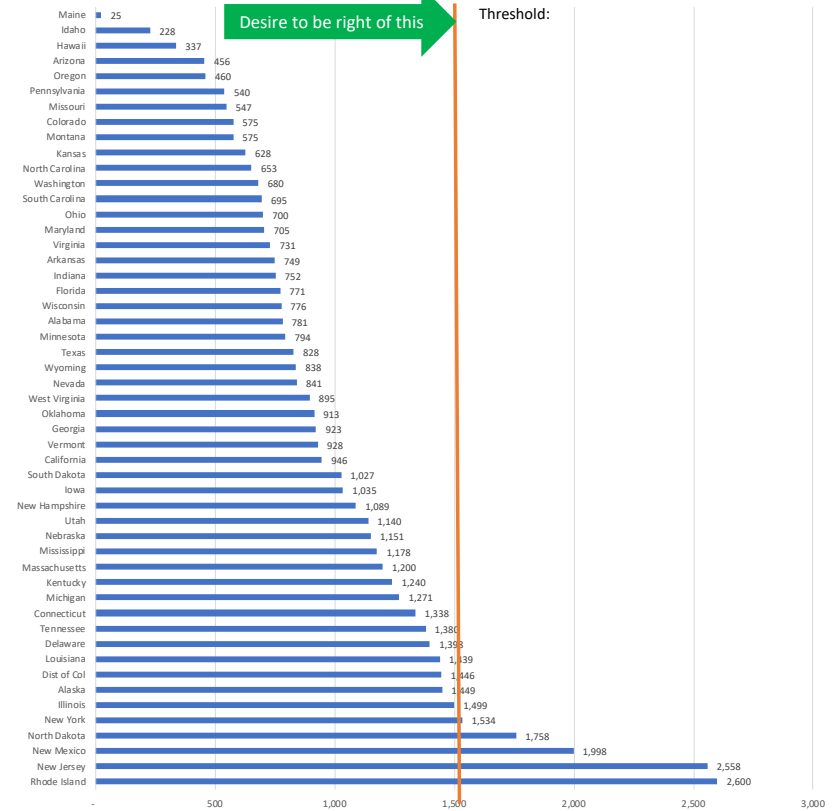
"Strategic Guidance in an Era of Unprecedented Change"

New Daily Infections Per 1 Million Population
By State
May 8 - 14



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Daily Tests Per 1 Million Population
By State
May 8 - 14

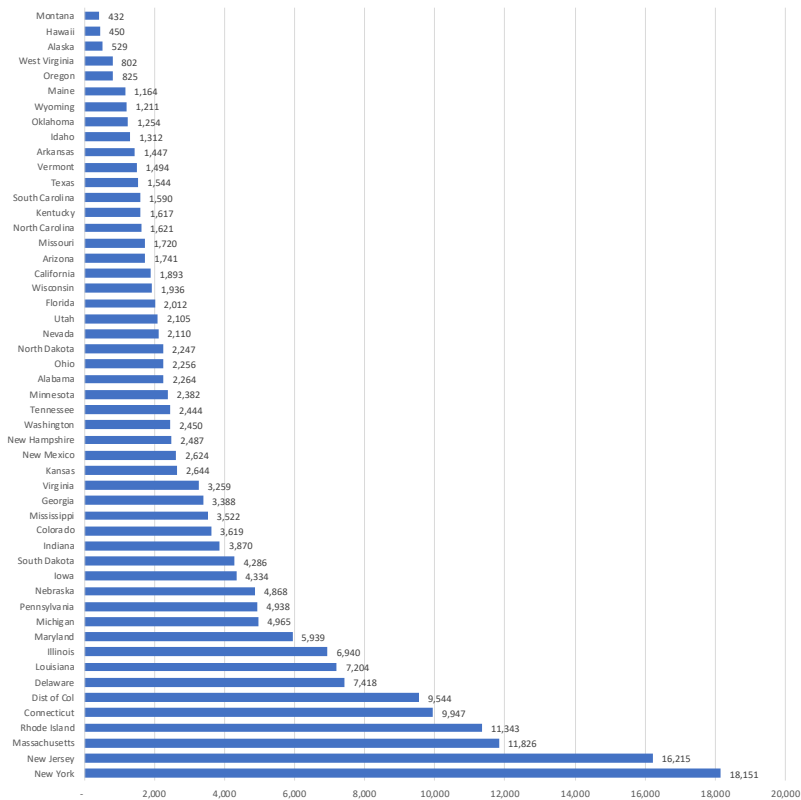


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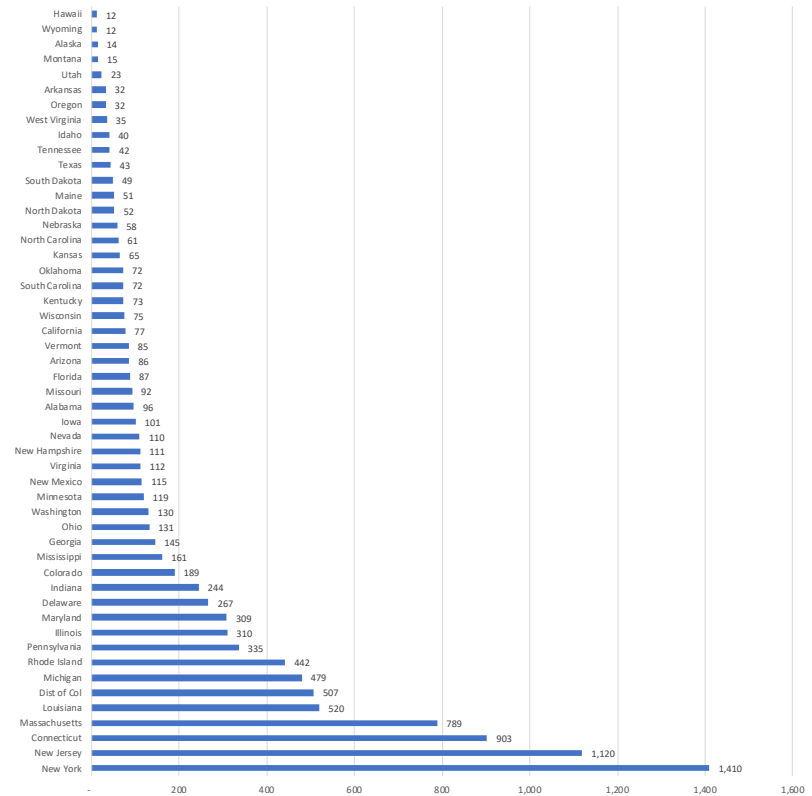
State-by-State Cases & Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

Total Cases Per 1 Million Population
By State
As of May 14



Deaths Per 1 Million Population
By State
As of May 14



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Which States Are Performing Sufficient Tests?

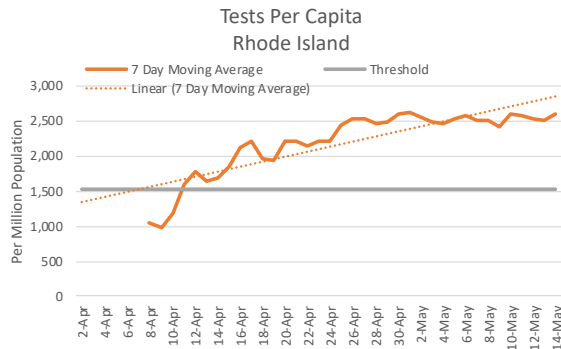
"Strategic Guidance in an Era of Unprecedented Change"

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 13 states and the District of Columbia effectively met this guideline for the past week.

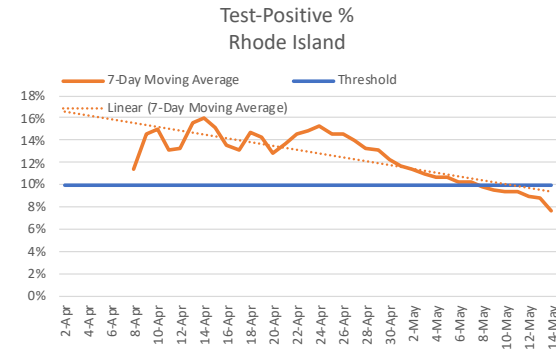


"Strategic Guidance in an Era of Unprecedented Change"

What sufficient testing looks like: high volume of tests, with low test-positive rates . . .

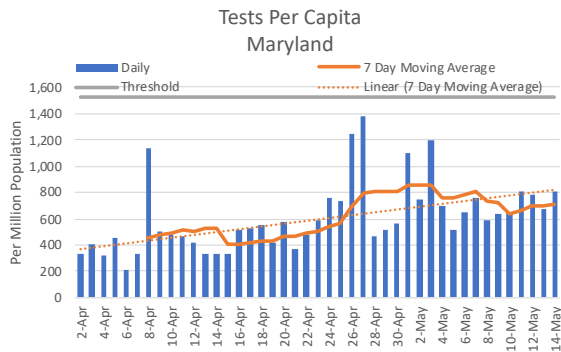


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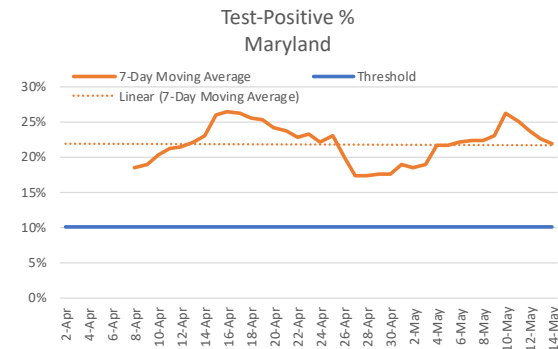


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What insufficient testing looks like: low volume of tests, with high test-positive rates . . .



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STATE-BY-STATE READINESS FOR RELAXING RESTRICTIONS

Readiness For Relaxing Restrictions

“Strategic Guidance in an Era of Unprecedented Change”

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

"Strategic Guidance in an Era of Unprecedented Change"

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

May 14

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 2nd following page

Change in "Hospital Resources" due to IHME raising projections in light of relaxed social distancing

May 12

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 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

Legend:

	Tests per Capita	Direction	Test-Positive Rate	Direction	New Daily Infection Rate	Direction	Baseline	Direction	Hospital Resources
Time period	per 1M Average last 2 weeks	last 14 days v prior 2 weeks	last 7 days	last 14 days v prior 2 weeks	per 1M last 7 days	last 14 days v prior 2 weeks	CDC Baseline by region	last 14 days v prior 2 weeks	As of 4/26
	>3,850		<=2%		<10				<45% of Peak
	1520 - 3,850		2-10%		10-50				45-60% of Peak
	1,501 - 3,850		10-14%		50-100				60-75% of Peak
	501 - 1,500		14-18%		100-150				75-85% of peak
	<750		>18%		>150				>85% of Peak or Pre-Peak
		Up		Down		Down by 40%	Below Baseline	Down	
						Down by 10%		N/A	
		Down		Up		Down <10% or Up	Above Baseline	Up	

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Sources:

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

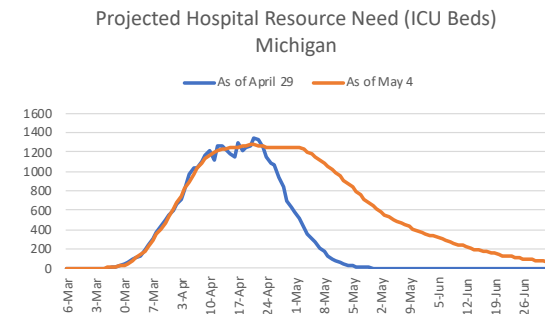
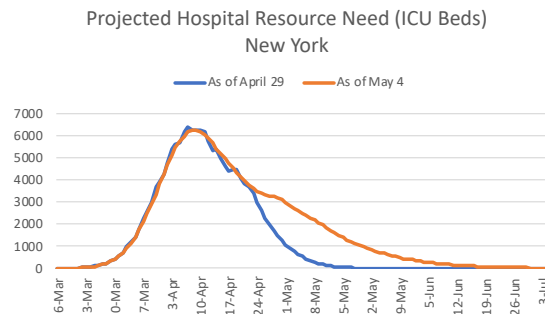
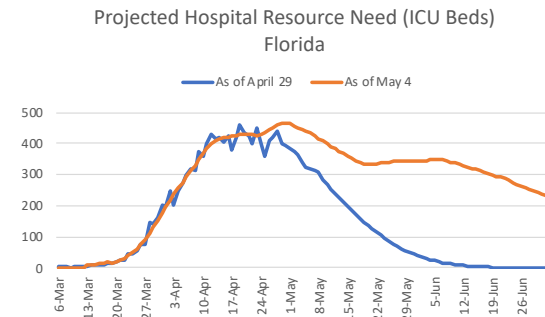
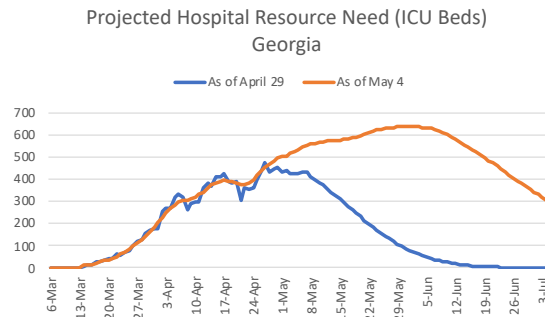
Infection rate data from World Health Organization (worldometer.info), accessed March 21-May 2, 2020

Impact of Relaxing Social Distancing

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:

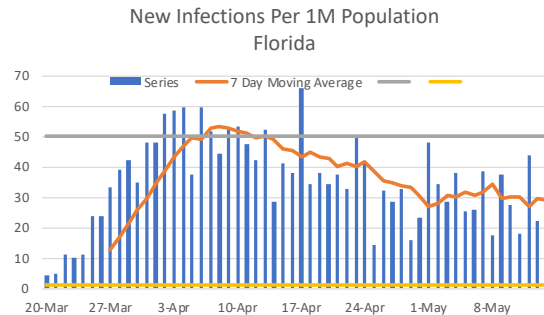


Note: ICU beds were selected as representative of the three metrics that IHME uses: total beds, ICU beds and ventilators. HIA does not vouch for the accuracy of these projections; in our limited experience, they seem to over-state actual needs.

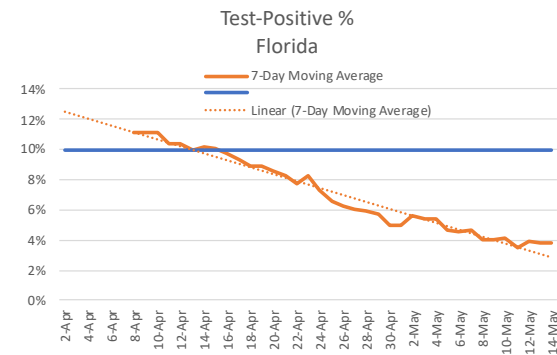
State-By-State Impact of Relaxing Restrictions

"Strategic Guidance in an Era of Unprecedented Change"

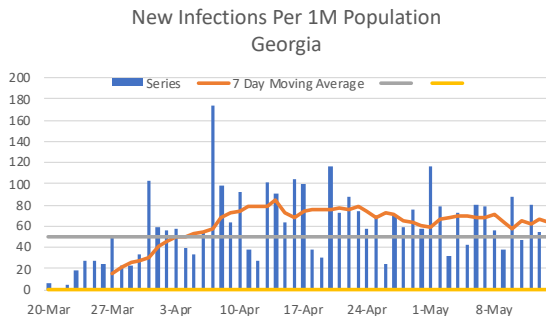
With several states re-opening, we are monitoring testing and infection rates to determine if, when and how much impact relaxation has on renewed spread of the virus. Here, we focus on Florida and Georgia. *We don't observe any meaningful change yet in new infection rates – which are relatively low in both states.*



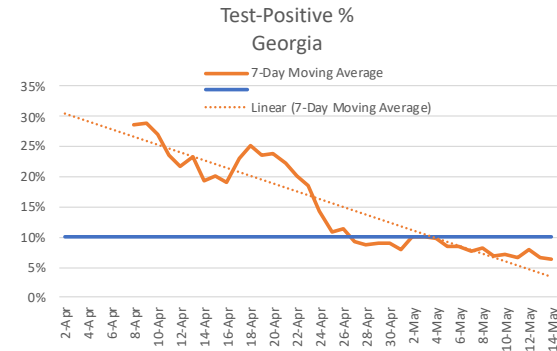
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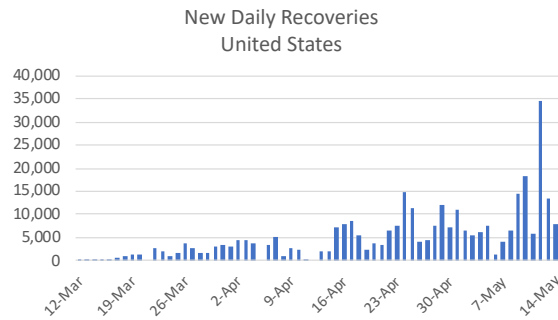


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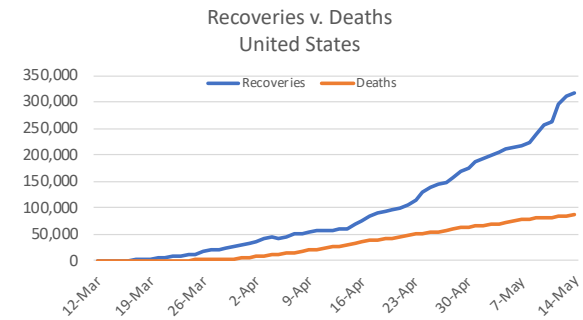
UNDER-REPORTED RECOVERIES? POSSIBLE LAG IN STATE REPORTING

United States Recoveries

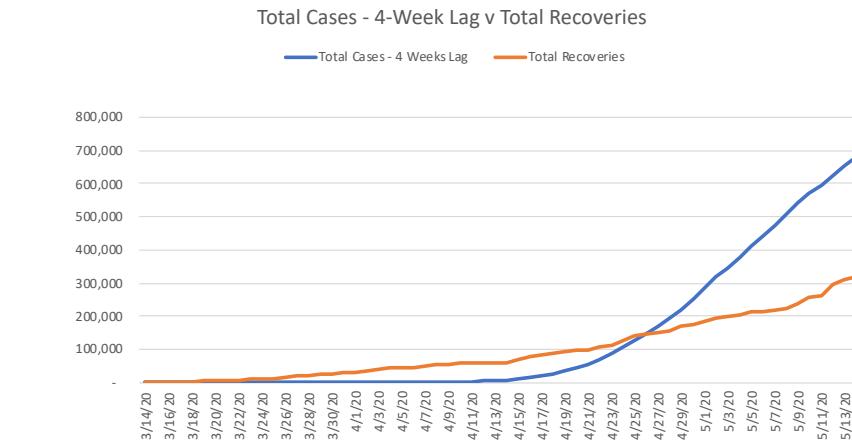
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"Strategic Guidance in an Era of Unprecedented Change"

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 ~225-290k

As of May 14

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

State	Recoveries	Expected Recoveries	
		Low	High
Alabama	20	3,523	3,964
Alaska	339	240	270
Arizona	70	3,387	3,811
Arkansas	3,277	1,296	1,458
California	12,595	22,107	24,871
Colorado	695	6,940	7,808
Connecticut	6,264	12,707	14,296
Delaware	3,080	1,660	1,868
District Of Columbia	966	1,880	2,115
Florida	7,379	18,672	21,006
Georgia	340	13,094	14,731
Hawaii	564	433	487
Idaho	1,379	1,287	1,448
Illinois	1,830	20,586	23,160
Indiana	1,869	7,634	8,588
Iowa	6,231	1,713	1,927
Kansas	1,857	1,282	1,443
Kentucky	2,712	1,943	2,186
Louisiana	22,608	18,026	20,279
Maine	958	637	716
Maryland	2,456	8,627	9,706
Massachusetts	27,812	25,745	28,963
Michigan	22,686	23,410	26,337
Minnesota	9,136	1,530	1,721
Mississippi	6,268	2,899	3,262
Missouri	2,654	4,142	4,660

State	Recoveries	Expected Recoveries	
		Low	High
Montana	431	332	374
Nebraska	22	853	959
Nevada	4,197	2,657	2,989
New Hampshire	1,247	969	1,090
New Jersey	3,231	60,254	67,785
New Mexico	1,576	1,278	1,437
New York	60,115	180,958	203,578
North Carolina	9,115	4,486	5,047
North Dakota	1,007	314	354
Ohio	4,168	6,731	7,573
Oklahoma	3,660	1,886	2,121
Oregon	1,406	1,389	1,562
Pennsylvania	6,506	22,188	24,962
Rhode Island	886	3,070	3,454
South Carolina	4,881	3,145	3,538
South Dakota	2,437	1,049	1,180
Tennessee	8,881	5,010	5,636
Texas	24,515	13,310	14,974
Utah	3,566	2,146	2,415
Vermont	792	614	691
Virginia	3,678	5,511	6,200
Washington	4,412	8,827	9,931
West Virginia	813	591	665
Wisconsin	5,673	3,100	3,488
Wyoming	480	321	361
United States	318,027	542,056	609,813

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

VIRUS PROGRESSION: ROADMAP TO RECOVERY

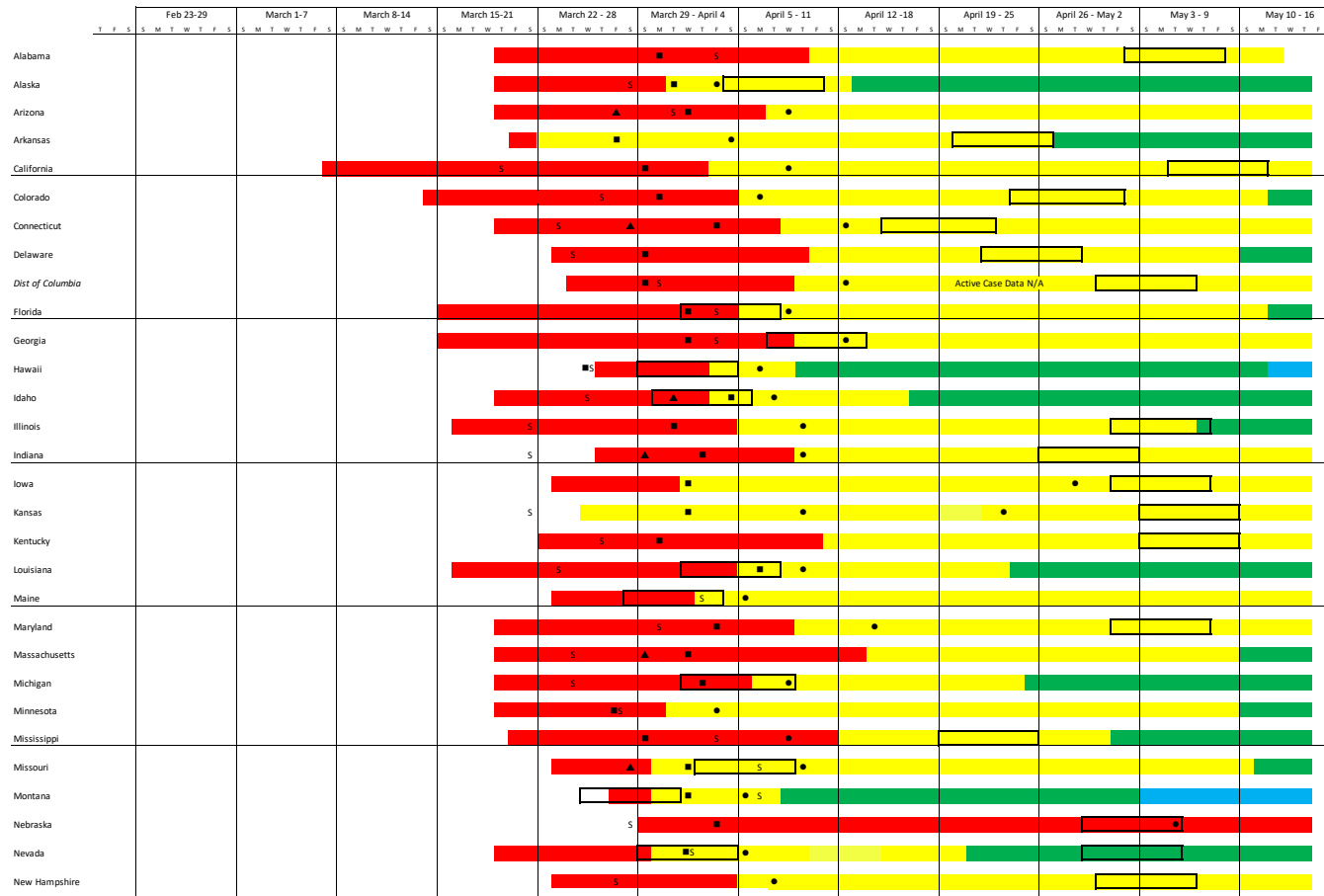
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The graphic on the following two pages illustrates when the state first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and, when peak total cases were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

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

State-by-State Virus Progression – 1 of 2

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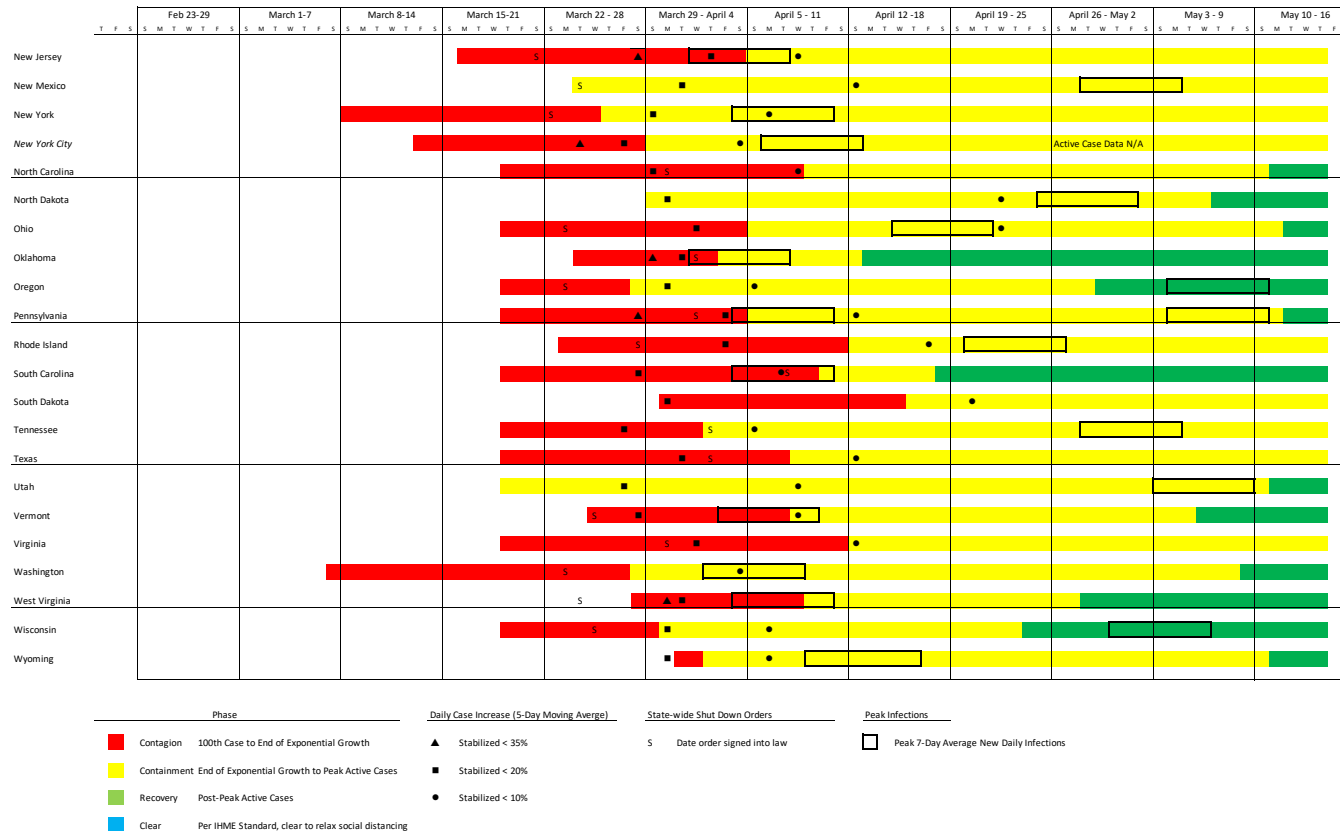


Legend on following page

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State-by-State Virus Progression – 2 of 2

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STATE TEST, INFECTION AND CASE TRENDS

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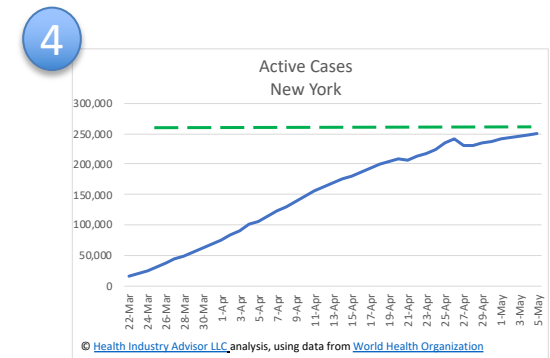
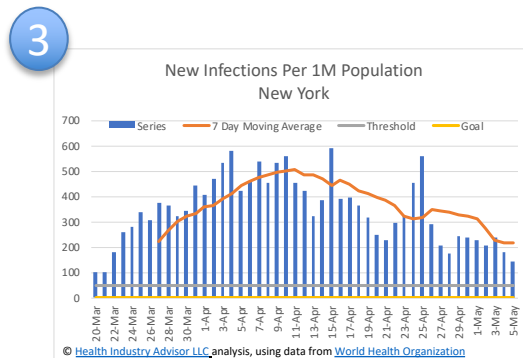
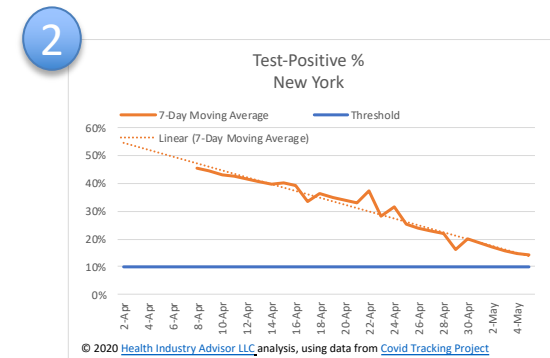
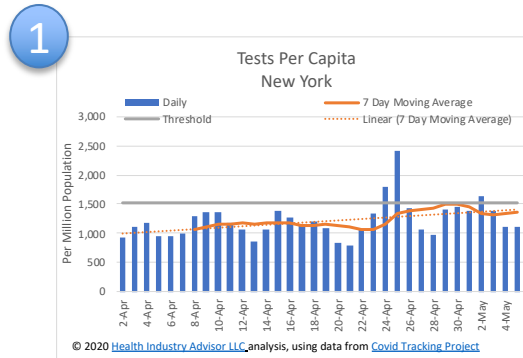
On Mondays, Wednesday and Fridays we provide graphics relevant to judging how far a state (or the District of Columbia) has progressed against the virus. Seventeen states (or, sixteen and D.C.) are provided at a time. Today, we provide:

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

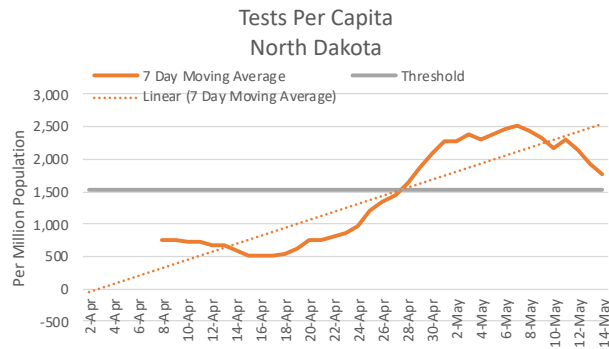
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How to "read" these charts:

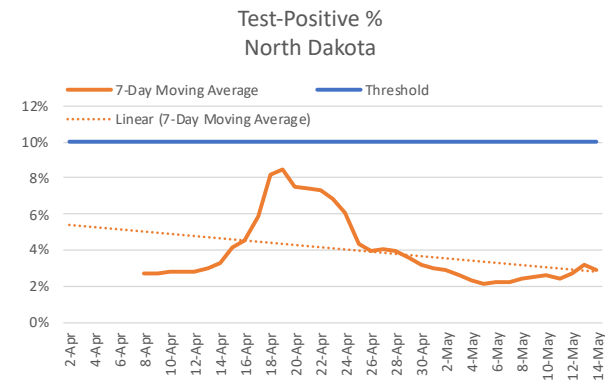
- Chart 1 – Desire to see tests per capita:
 - Above the threshold
 - Increasing or stable
- Chart 2 - Desire to see Test-Positive %:
 - Below the threshold
 - Declining or stable
- Chart 3 - Desire to see New Infections Per Capita:
 - Below the threshold
 - Declining or stable
- Chart 4 - Desire to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



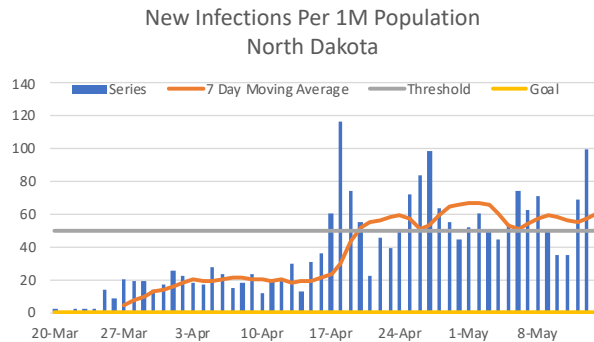
"Strategic Guidance in an Era of Unprecedented Change"



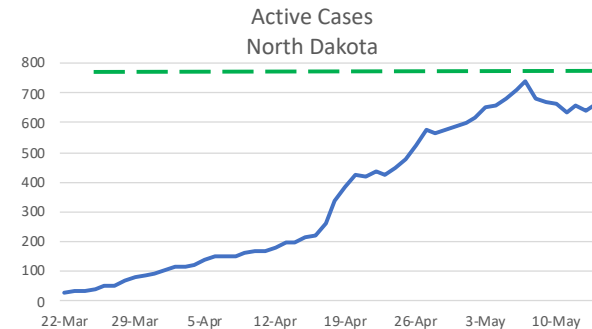
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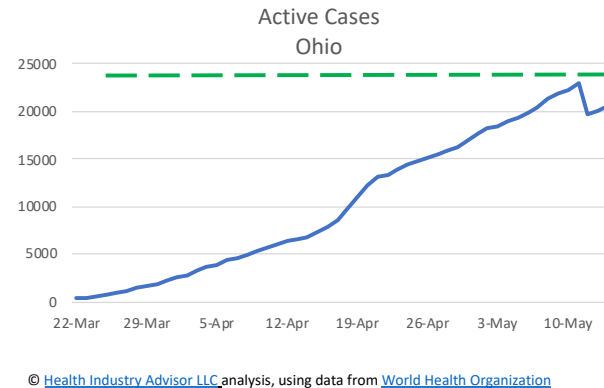
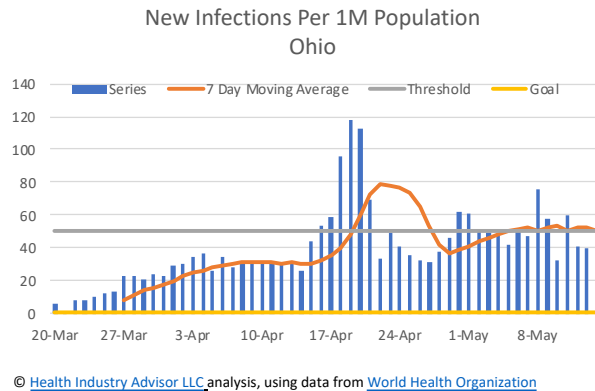
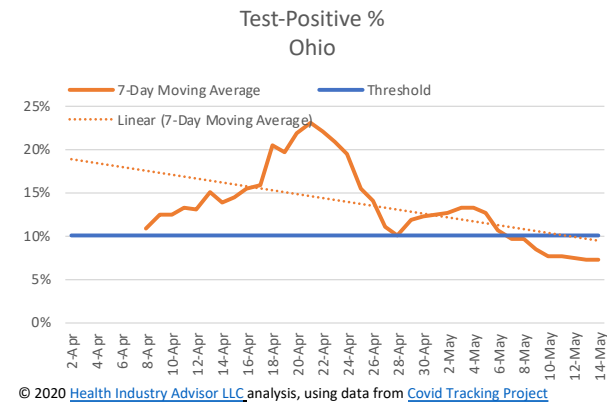
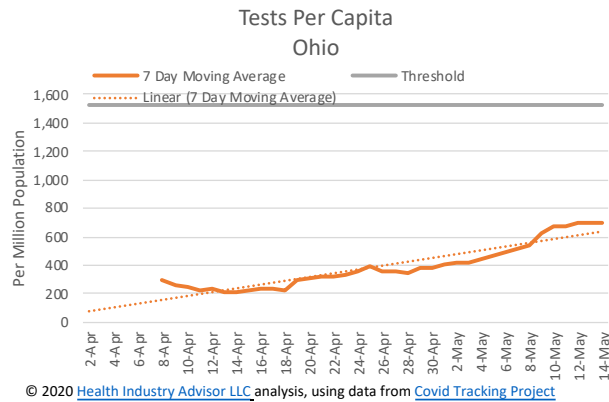


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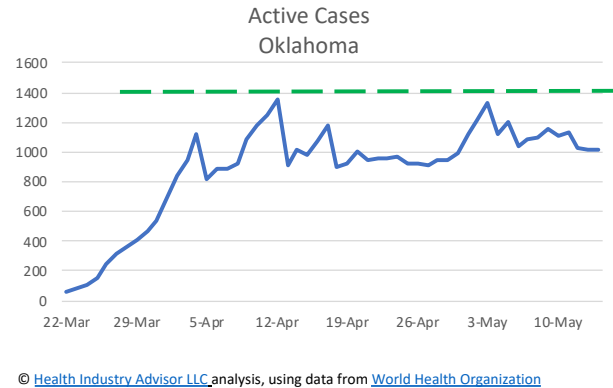
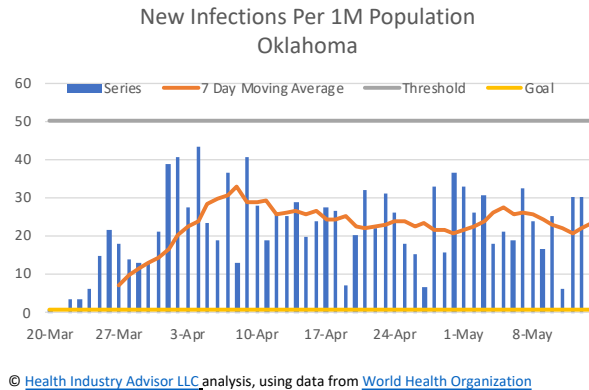
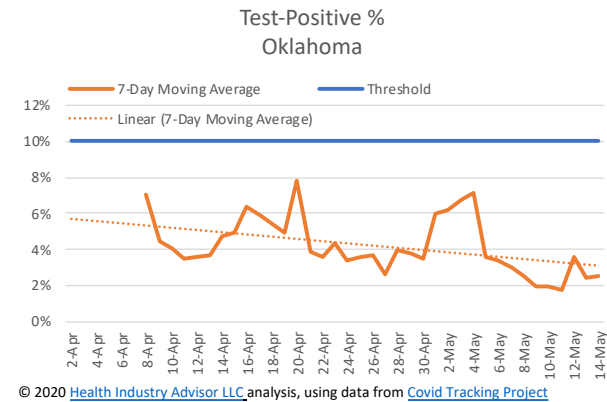
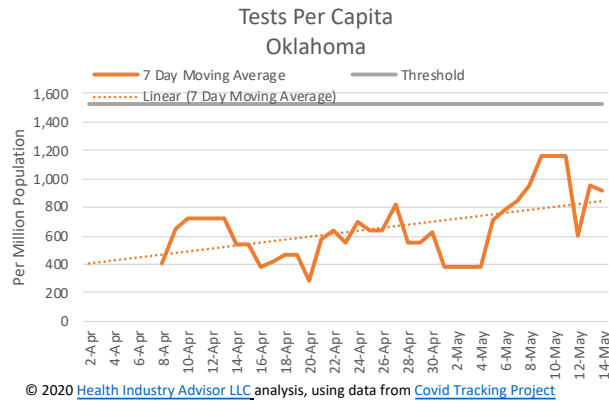
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"Strategic Guidance in an Era of Unprecedented Change"

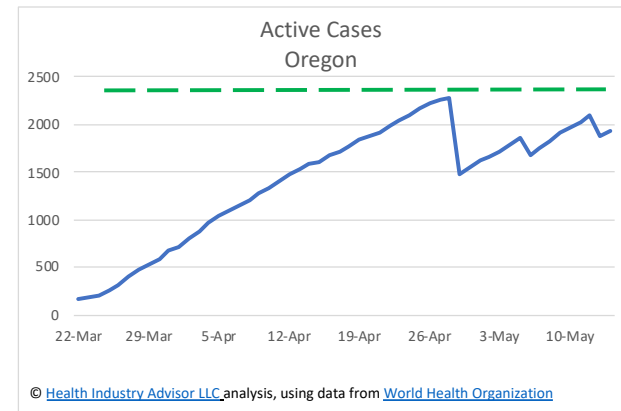
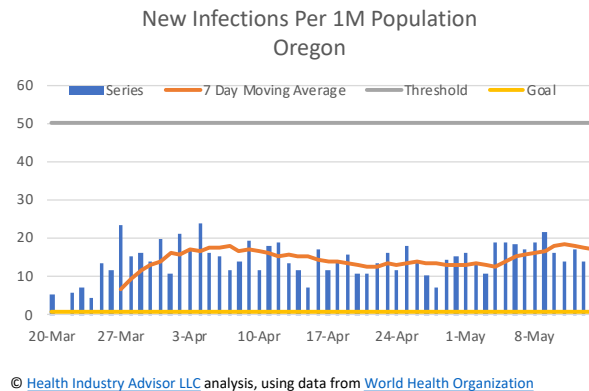
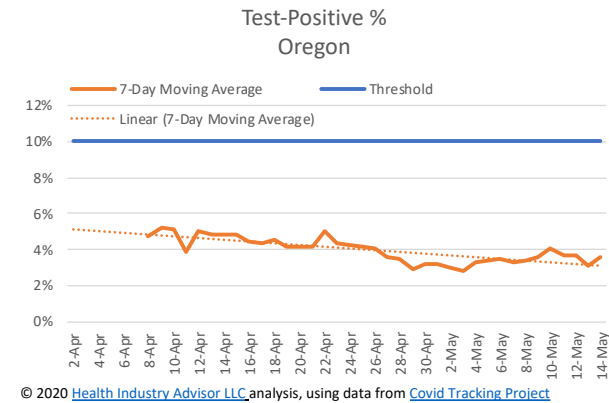
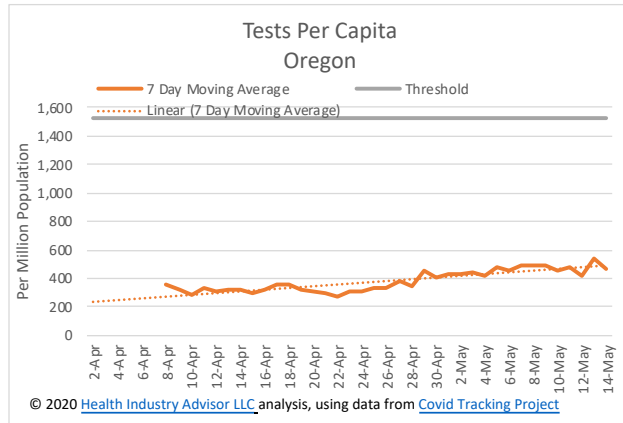


State-by-State Test, New Daily Infection and Active Case Trends

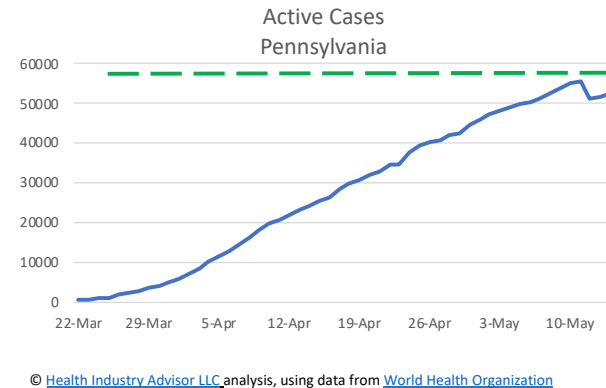
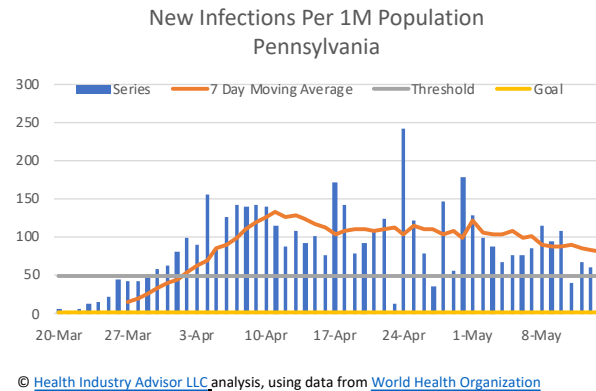
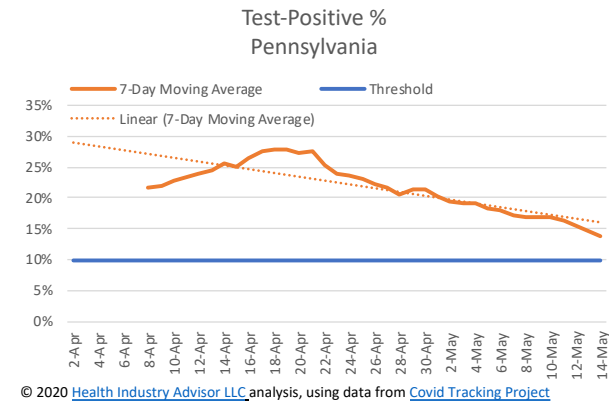
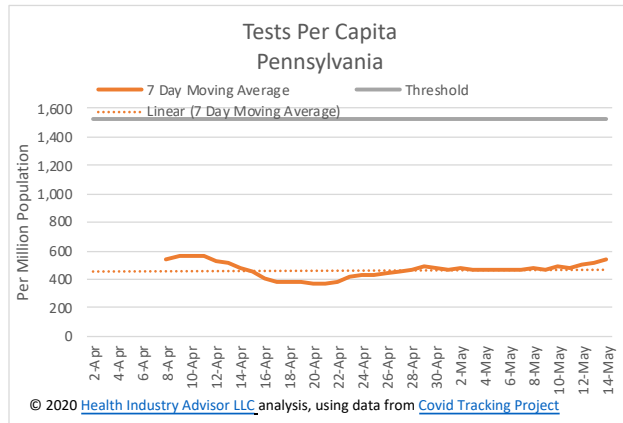
"Strategic Guidance in an Era of Unprecedented Change"



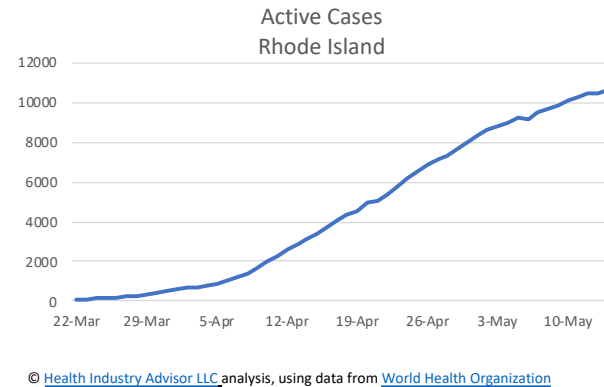
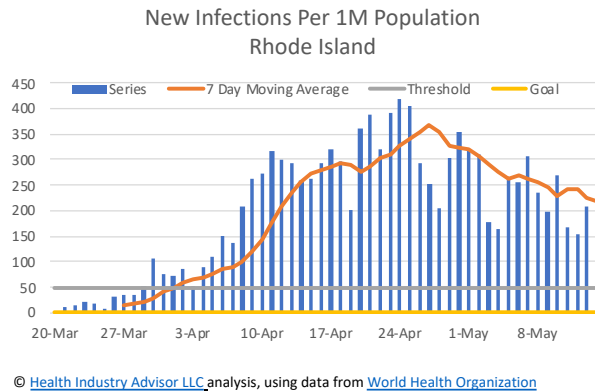
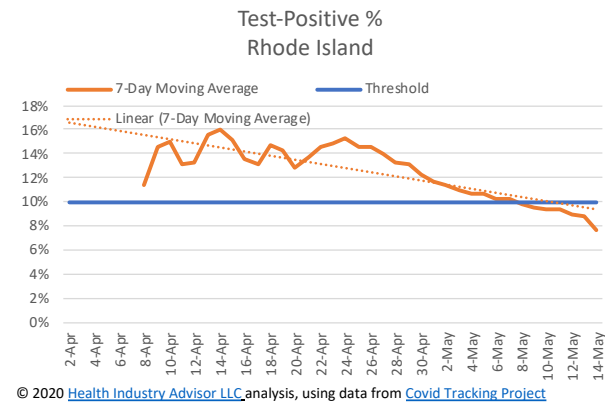
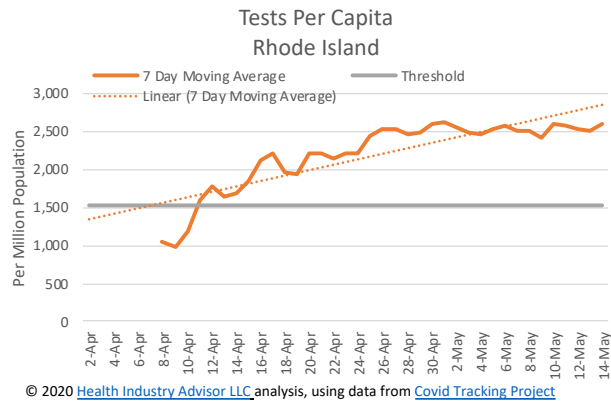
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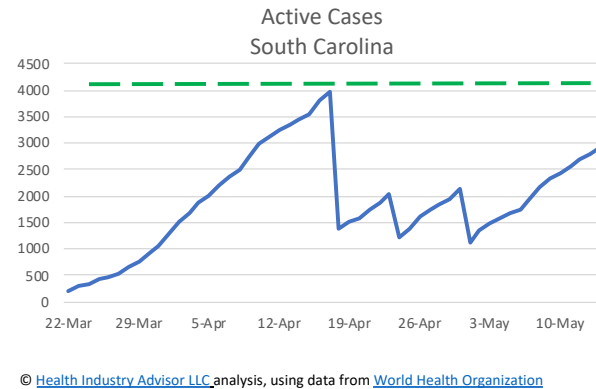
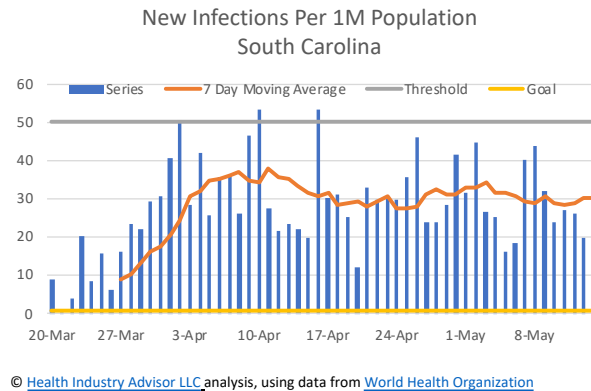
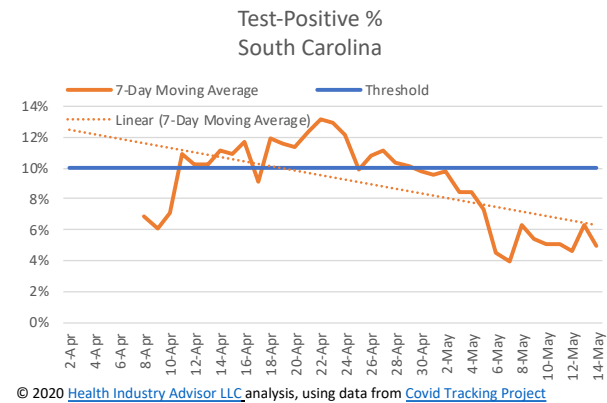
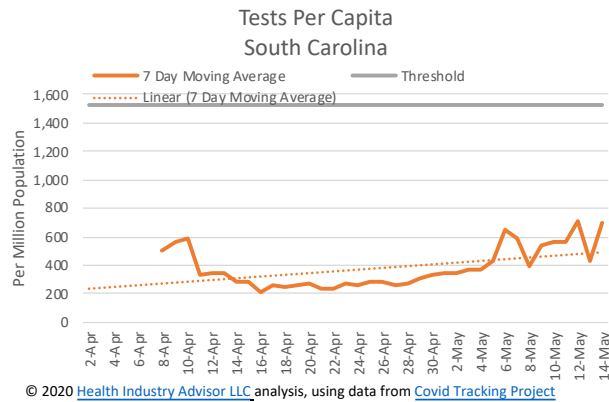
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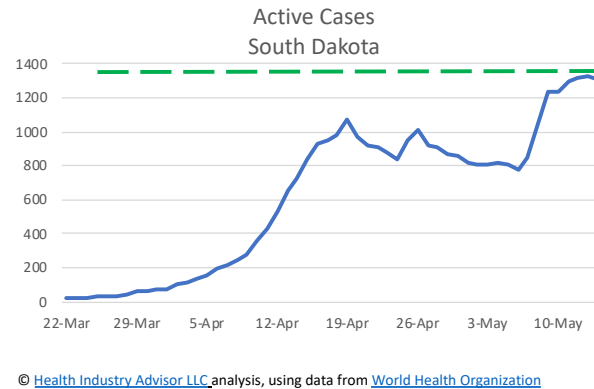
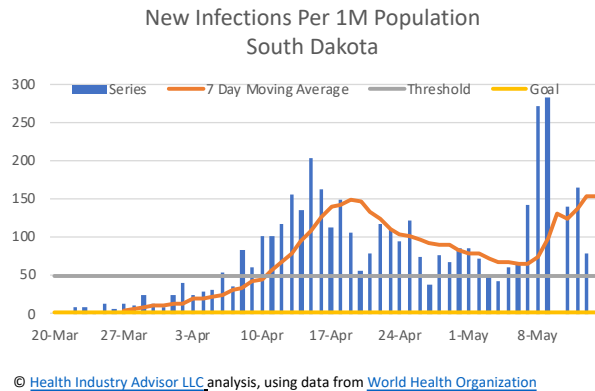
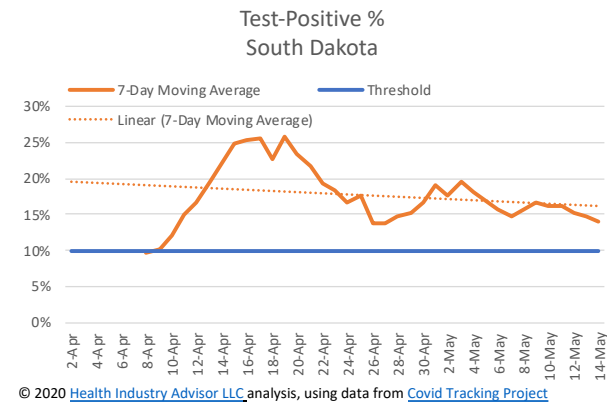
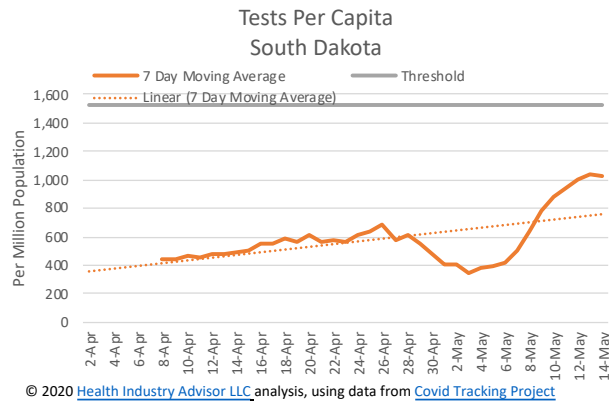
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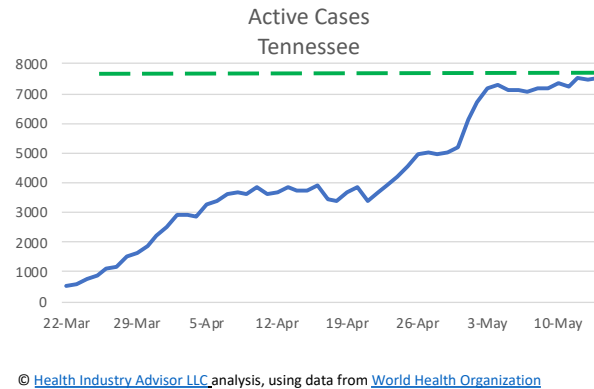
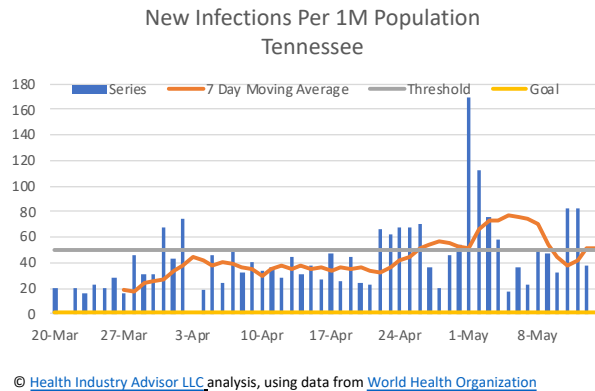
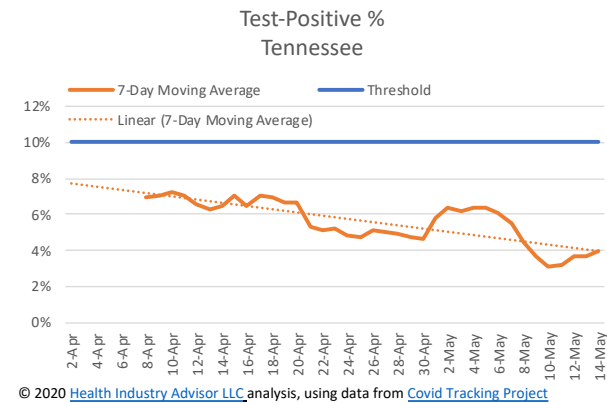
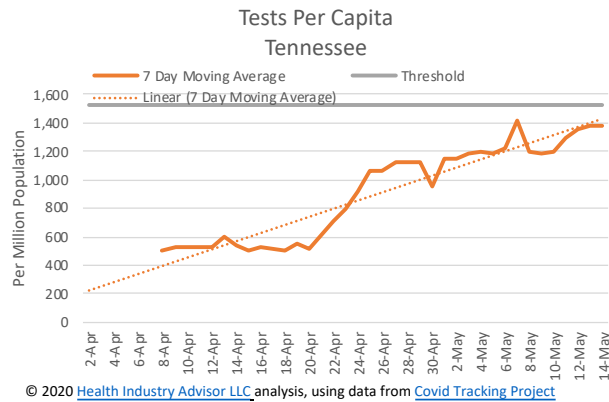
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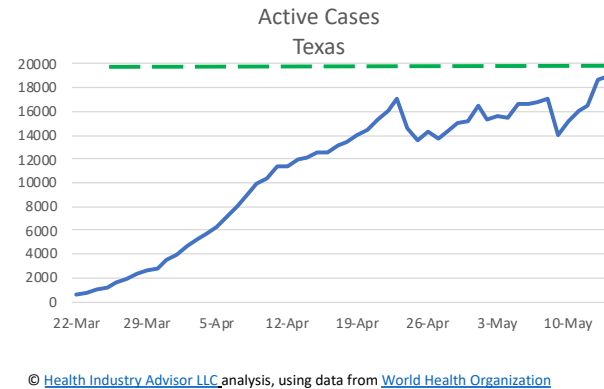
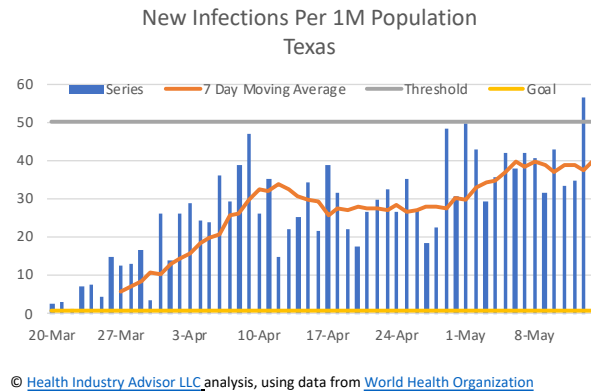
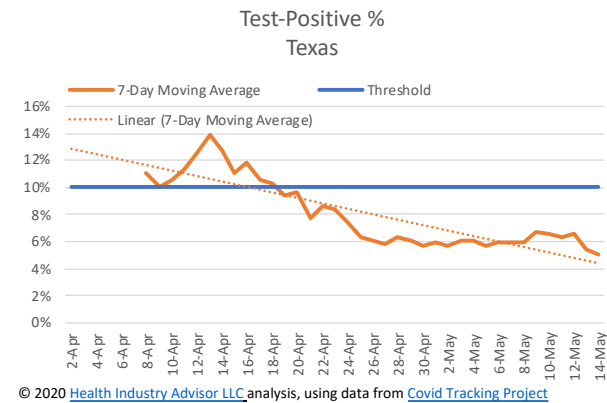
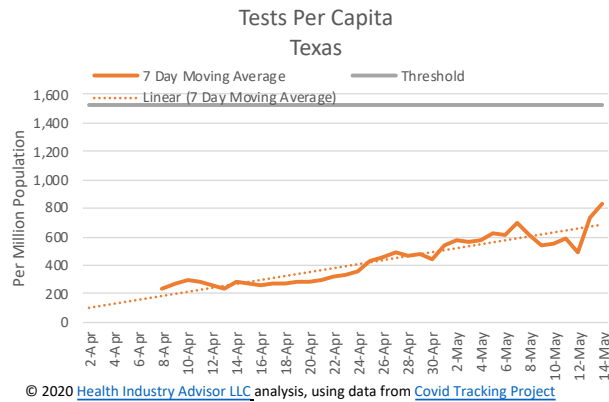
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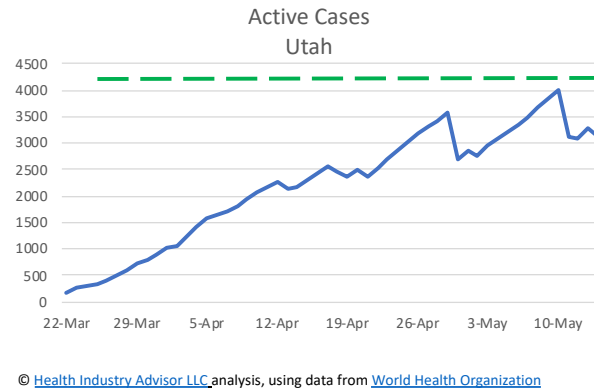
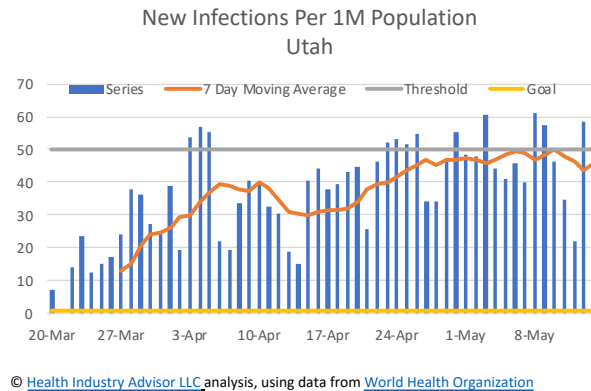
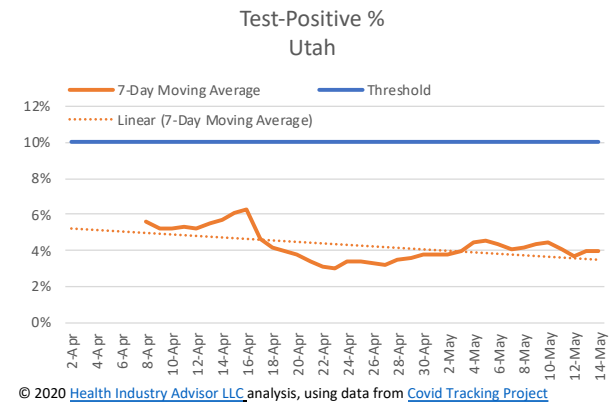
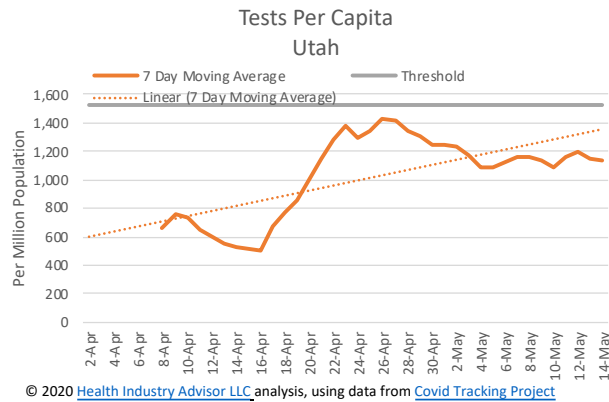
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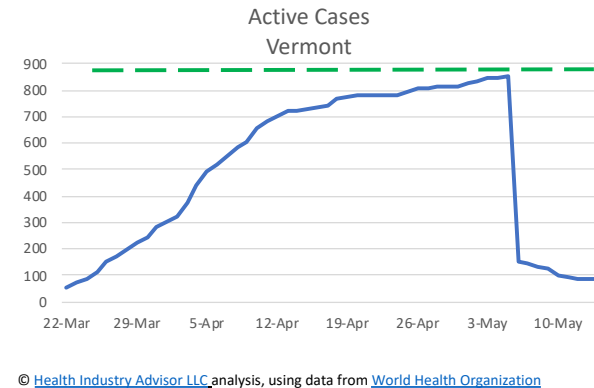
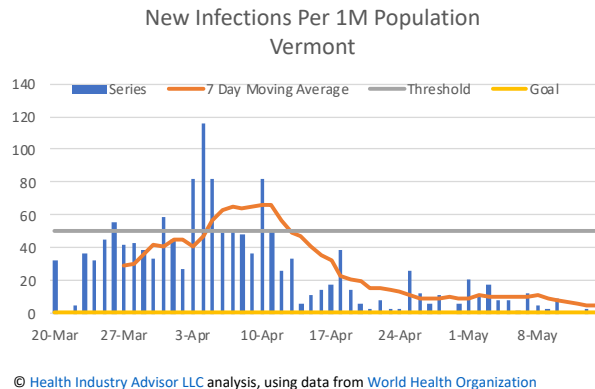
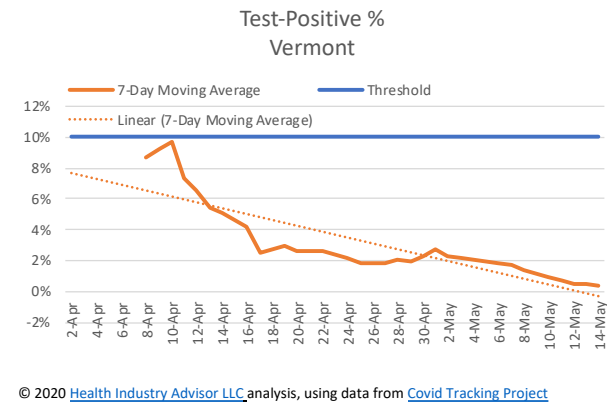
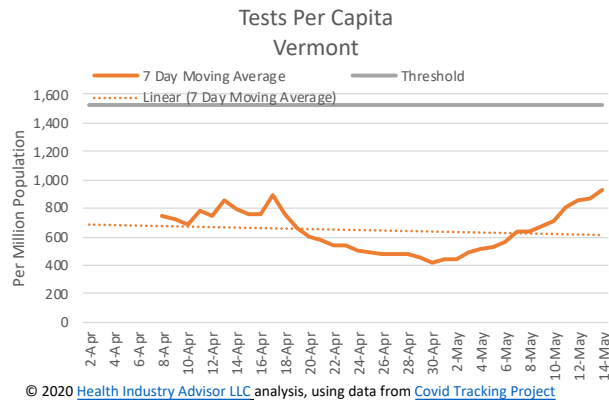
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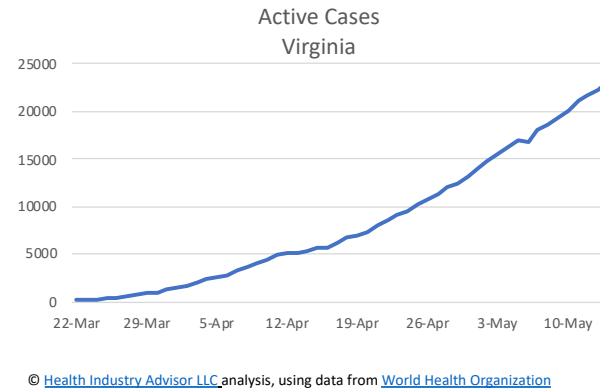
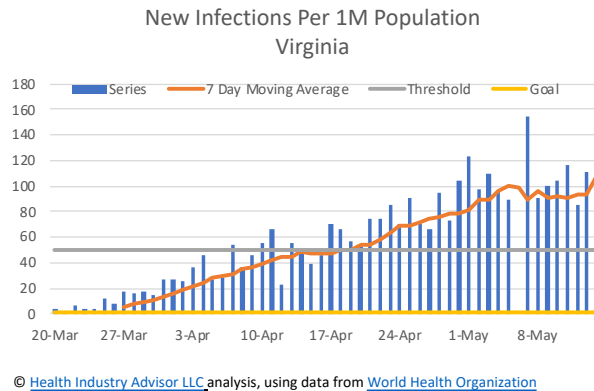
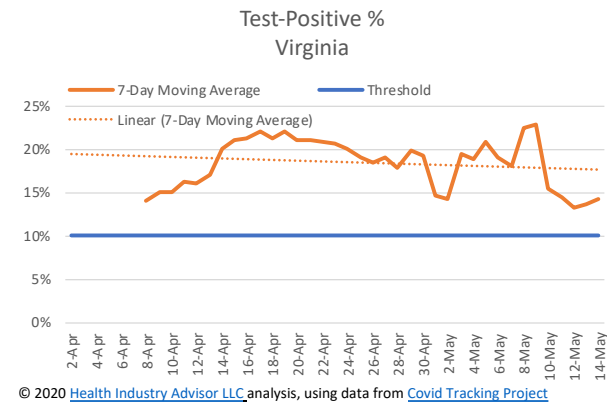
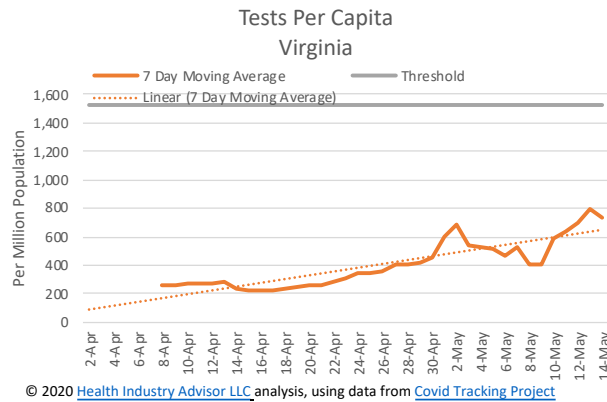
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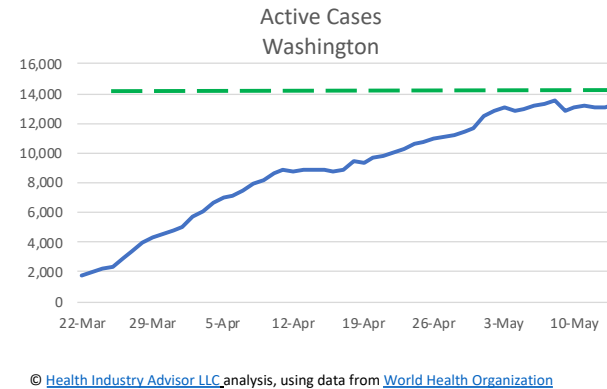
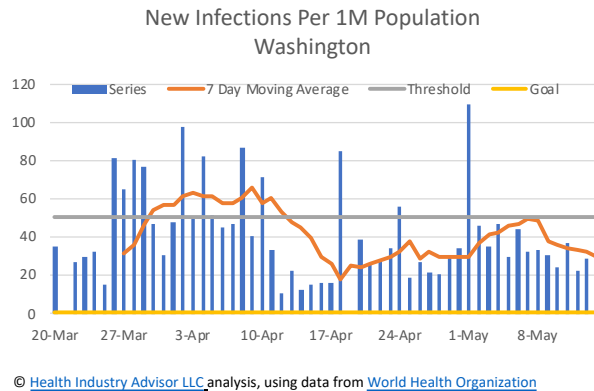
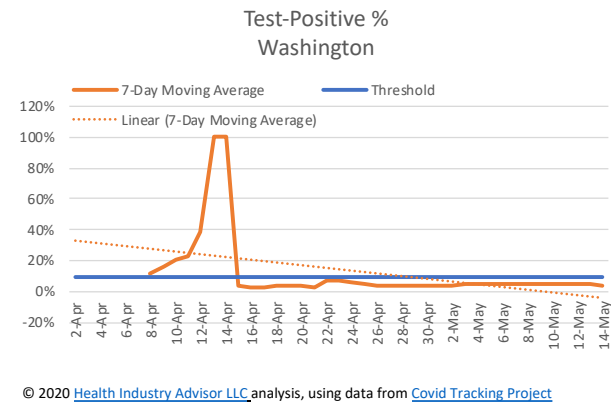
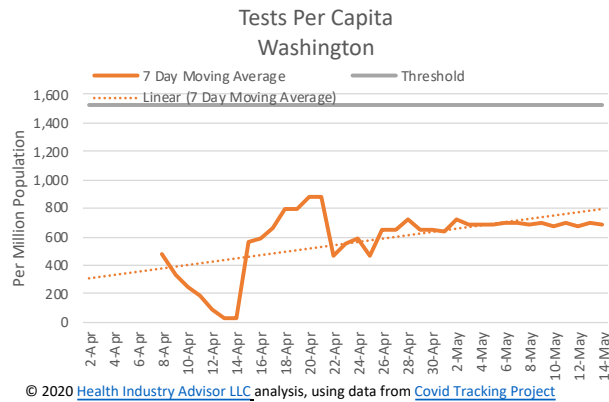


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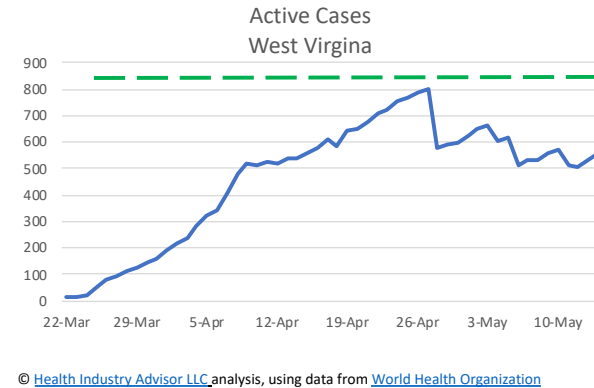
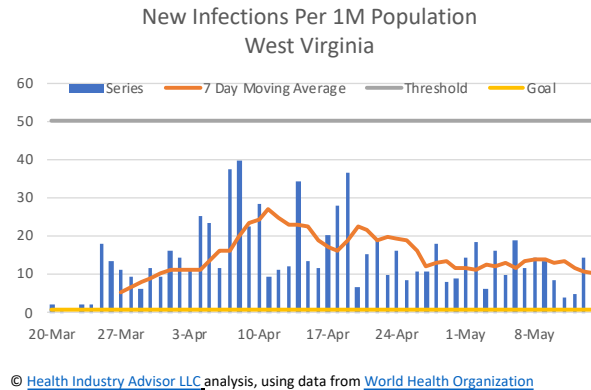
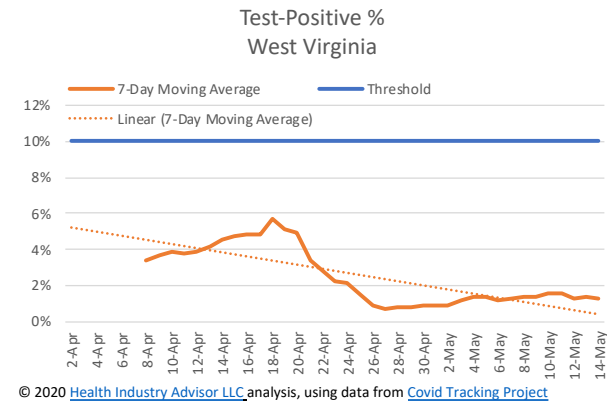
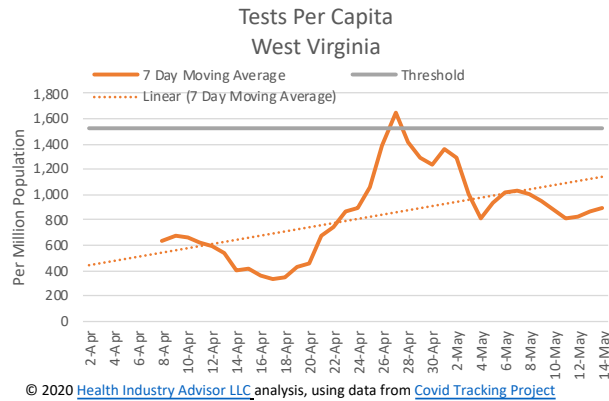
State-by-State Test, New Daily Infection and Active Case Trends

"Strategic Guidance in an Era of Unprecedented Change"



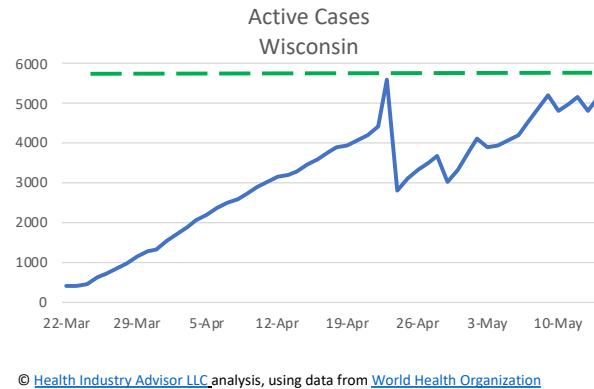
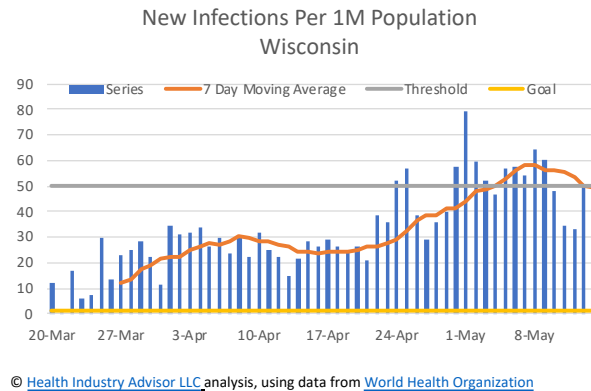
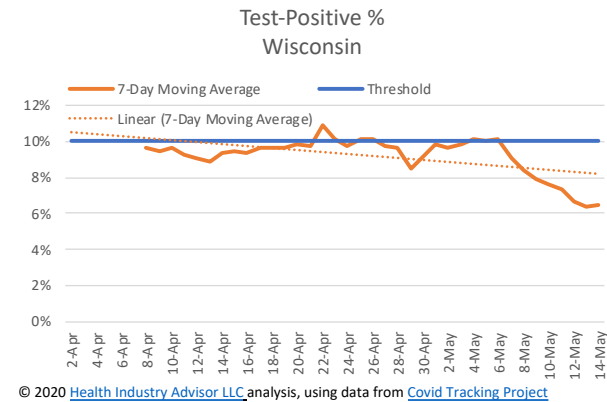
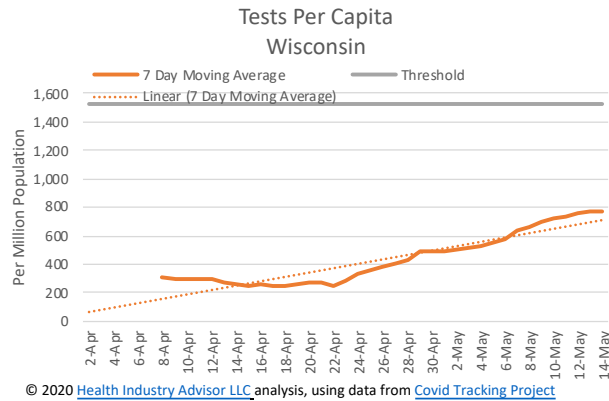
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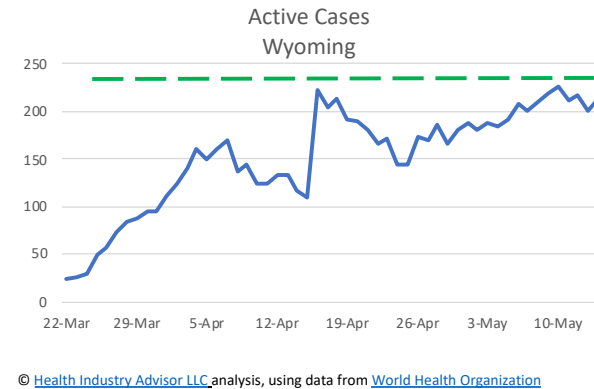
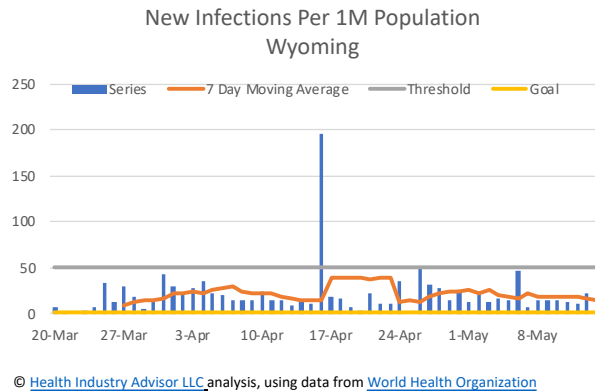
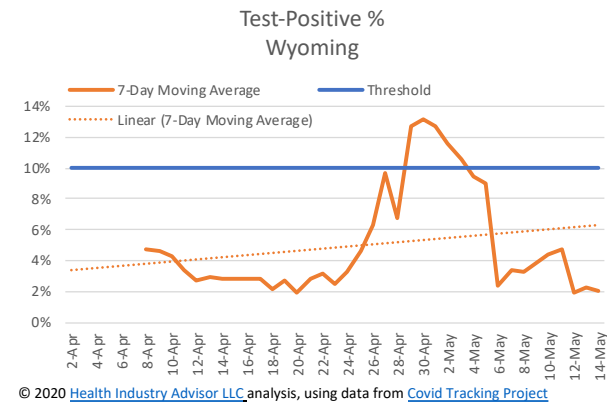
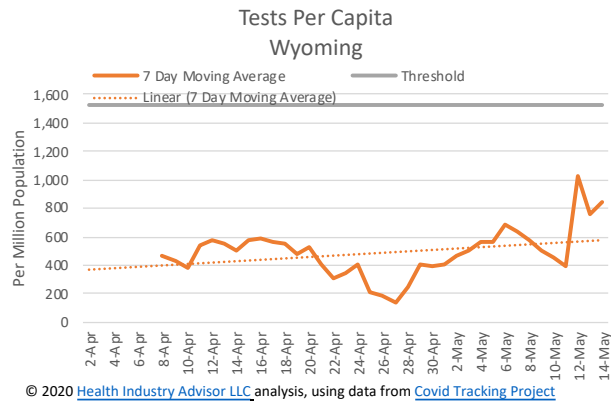
State-by-State Test, New Daily Infection and Active Case Trends

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

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U.S. COUNTY-BY-COUNTY INFORMATION

- On the following pages, case and death information¹ is presented for the 100 most populous counties in the United States
 - New York case and death information are reported on a combined basis for Bronx, Kings, New York, Queens and Richmond counties
 - St. Louis City is reported as a distinct entity from St. Louis County
 - Dane County (Madison), Wisconsin and Washtenaw County (Ann Arbor), Michigan are included for professional-interest reasons
- Population information is the 2019 official estimate from the US Census Bureau²

1. Data from [The New York Times](#), based on reports from state and local health agencies. Accessed May 10-12, 2020

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

U.S. County-By-County Infection and Deaths Rates: Most Populous Counties

"Strategic Guidance in an Era of Unprecedented Change"

As of May 13

Largest 25



County	County seat	2019 Est. Population - Millions	Total Cases	Total Deaths	Cases / 1M	New Cases / 1M 7- Day M.A.	Deaths / 1M	Deaths / Case
Los Angeles, CA	Los Angeles	10.04	34,428	1,659	3,429	82	165	4.8%
New York, NY	Includes: Bronx, Kings, New York and Richmond Counties	8.34	192,394	19,815	23,078	148	2,377	10.3%
Cook, IL	Chicago	5.15	56,406	2,589	10,952	270	503	4.6%
Harris, TX	Houston	4.71	8,621	188	1,829	42	40	2.2%
Maricopa, AZ	Phoenix	4.49	6,341	281	1,414	38	63	4.4%
San Diego, CA	San Diego	3.34	5,341	217	1,600	41	65	4.1%
Orange, CA	Santa Ana	3.18	3,843	80	1,210	36	25	2.1%
Miami-Dade, FL	Miami	2.72	14,467	518	5,325	58	191	3.6%
Dallas, TX	Dallas	2.64	6,602	153	2,505	94	58	2.3%
Riverside, CA	Riverside	2.47	5,343	238	2,163	39	96	4.5%
Clark, NV	Las Vegas	2.27	5,045	275	2,226	36	121	5.5%
King, WA	Seattle	2.25	7,540	516	3,347	49	229	6.8%
San Bernardino, CA	San Bernardino	2.18	3,153	138	1,446	47	63	4.4%
Tarrant, TX	Fort Worth	2.10	4,076	114	1,939	86	54	2.8%
Bexar, TX	San Antonio	2.00	1,976	58	986	15	29	2.9%
Broward, FL	Fort Lauderdale	1.95	5,998	267	3,072	33	137	4.5%
Santa Clara, CA	San Jose	1.93	2,364	134	1,226	7	70	5.7%
Wayne, MI	Detroit	1.75	18,389	2,156	10,512	67	1,232	11.7%
Alameda, CA	Oakland	1.67	2,199	80	1,316	27	48	3.6%
Middlesex, MA	Lowell and Cambridge	1.61	18,201	1,282	11,293	166	795	7.0%
Philadelphia, PA	Philadelphia	1.58	18,779	986	11,855	188	622	5.3%
Sacramento, CA	Sacramento	1.55	1,182	52	762	5	34	4.4%
Palm Beach, FL	West Palm Beach	1.50	4,174	254	2,789	66	170	6.1%
Suffolk, NY	Riverhead	1.48	37,305	1,729	25,264	170	1,171	4.6%
Hillsborough, FL	Tampa	1.47	1,494	44	1,015	16	30	2.9%

1. Data from [The New York Times](#), based on reports from state and local health agencies. Accessed May 10-12, 2020

2. 2019 Official estimated population. "Annual Estimates of the Resident Population for Counties in the United States: April 1, 2010 to July 1, 2019 (CO-EST2019-ANNRES)", Source: U.S. Census Bureau, Population Division, Release Date: March 2020. Accessed May 12-14, 2020

3. Case and death information for New York includes the following counties: Bronx, Kings, New York, Queens and Richmond

U.S. County-By-County Most Populous Counties: Sort By Most Cases

"Strategic Guidance in an Era of Unprecedented Change"

As of May 13

Highest 25



County	County seat	2019 Est. Population - Millions	Total Cases	Total Deaths	Cases / 1M	New Cases / 1M 7- Day M.A.	Deaths / 1M	Deaths / Case
New York, NY	Includes: Bronx, Kings, New York and Richmond Counties	8.34	192,394	19,815	23,078	148	2,377	10.3%
Cook, IL	Chicago	5.15	56,406	2,589	10,952	270	503	4.6%
Nassau, NY	Mineola	1.36	38,587	2,468	28,437	130	1,819	6.4%
Suffolk, NY	Riverhead	1.48	37,305	1,729	25,264	170	1,171	4.6%
Los Angeles, CA	Los Angeles	10.04	34,428	1,659	3,429	82	165	4.8%
Westchester, NY	White Plains	0.97	31,610	1,368	32,672	175	1,414	4.3%
Philadelphia, PA	Philadelphia	1.58	18,779	986	11,855	188	622	5.3%
Wayne, MI	Detroit	1.75	18,389	2,156	10,512	67	1,232	11.7%
Middlesex, MA	Lowell and Cambridge	1.61	18,201	1,282	11,293	166	795	7.0%
Bergen, NJ	Hackensack	0.93	17,150	1,409	18,397	97	1,511	8.2%
Hudson, NJ	Jersey City	0.67	17,035	1,007	25,335	178	1,498	5.9%
Essex, NJ	Newark	0.80	15,749	1,471	19,712	143	1,841	9.3%
Suffolk, MA	Boston	0.80	15,587	749	19,389	197	932	4.8%
Miami-Dade, FL	Miami	2.72	14,467	518	5,325	58	191	3.6%
Middlesex, NJ	New Brunswick	0.83	14,241	819	17,261	171	993	5.8%
Fairfield, CT	Bridgeport	0.94	13,636	1,068	14,455	179	1,132	7.8%
Essex, MA	Salem and Lawrence	0.79	11,703	704	14,832	246	892	6.0%
Prince George's, MD	Upper Marlboro	0.91	10,091	389	11,097	305	428	3.9%
New Haven, CT	New Haven	0.85	9,570	745	11,196	192	872	7.8%
Harris, TX	Houston	4.71	8,621	188	1,829	42	40	2.2%
Worcester, MA	Worcester	0.83	8,241	489	9,921	215	589	5.9%
Oakland, MI	Pontiac	1.26	7,830	874	6,226	29	695	11.2%
Marion, IN	Indianapolis	0.96	7,779	473	8,065	147	490	6.1%
Hartford, CT	Hartford	0.89	7,732	963	8,671	193	1,080	12.5%
King, WA	Seattle	2.25	7,540	516	3,347	49	229	6.8%

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County	County seat	2019 Est. Population - Millions	Total Cases	Total Deaths	Cases / 1M	New Cases / 1M 7- Day M.A.	Deaths / 1M	Deaths / Case
Westchester, NY	White Plains	0.97	31,610	1,368	32,672	175	1,414	4.3%
Nassau, NY	Mineola	1.36	38,587	2,468	28,437	130	1,819	6.4%
Hudson, NJ	Jersey City	0.67	17,035	1,007	25,335	178	1,498	5.9%
Suffolk, NY	Riverhead	1.48	37,305	1,729	25,264	170	1,171	4.6%
New York, NY	Includes: Bronx, Kings, New York and Richmond Counties	8.34	192,394	19,815	23,078	148	2,377	10.3%
Essex, NJ	Newark	0.80	15,749	1,471	19,712	143	1,841	9.3%
Suffolk, MA	Boston	0.80	15,587	749	19,389	197	932	4.8%
Bergen, NJ	Hackensack	0.93	17,150	1,409	18,397	97	1,511	8.2%
Middlesex, NJ	New Brunswick	0.83	14,241	819	17,261	171	993	5.8%
Essex, MA	Salem and Lawrence	0.79	11,703	704	14,832	246	892	6.0%
Fairfield, CT	Bridgeport	0.94	13,636	1,068	14,455	179	1,132	7.8%
Philadelphia, PA	Philadelphia	1.58	18,779	986	11,855	188	622	5.3%
Middlesex, MA	Lowell and Cambridge	1.61	18,201	1,282	11,293	166	795	7.0%
New Haven, CT	New Haven	0.85	9,570	745	11,196	192	872	7.8%
Prince George's, MD	Upper Marlboro	0.91	10,091	389	11,097	305	428	3.9%
Cook, IL	Chicago	5.15	56,406	2,589	10,952	270	503	4.6%
Wayne, MI	Detroit	1.75	18,389	2,156	10,512	67	1,232	11.7%
Norfolk, MA	Dedham	0.71	7,129	676	10,087	105	956	9.5%
Worcester, MA	Worcester	0.83	8,241	489	9,921	215	589	5.9%
Hartford, CT	Hartford	0.89	7,732	963	8,671	193	1,080	12.5%
Lake, IL	Waukegan	0.70	5,758	194	8,267	252	279	3.4%
Marion, IN	Indianapolis	0.96	7,779	473	8,065	147	490	6.1%
Macomb, MI	Mount Clemens	0.87	6,137	717	7,022	50	820	11.7%
Montgomery, MD	Rockville	1.05	7,319	422	6,966	204	402	5.8%
Montgomery, PA	Norristown	0.83	5,513	556	6,635	118	669	10.1%

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U.S. County-By-County Most Populous Counties: Sort By New Daily Infection Rate – Past 7 Days

“Strategic Guidance in an Era of Unprecedented Change”

As of May 13

Highest 25



County	County seat	2019 Est. Population - Millions	Total Cases	Total Deaths	Cases / 1M	New Cases / 1M 7- Day M.A.	Deaths / 1M	Deaths / Case
Prince George's, MD	Upper Marlboro	0.91	10,091	389	11,097	305	428	3.9%
Cook, IL	Chicago	5.15	56,406	2,589	10,952	270	503	4.6%
Lake, IL	Waukegan	0.70	5,758	194	8,267	252	279	3.4%
Essex, MA	Salem and Lawrence	0.79	11,703	704	14,832	246	892	6.0%
Fairfax, VA	Fairfax	1.15	6,666	262	5,809	228	228	3.9%
Worcester, MA	Worcester	0.83	8,241	489	9,921	215	589	5.9%
Montgomery, MD	Rockville	1.05	7,319	422	6,966	204	402	5.8%
Suffolk, MA	Boston	0.80	15,587	749	19,389	197	932	4.8%
Hartford, CT	Hartford	0.89	7,732	963	8,671	193	1,080	12.5%
New Haven, CT	New Haven	0.85	9,570	745	11,196	192	872	7.8%
Philadelphia, PA	Philadelphia	1.58	18,779	986	11,855	188	622	5.3%
DuPage, IL	Wheaton	0.92	5,244	271	5,682	184	294	5.2%
Fairfield, CT	Bridgeport	0.94	13,636	1,068	14,455	179	1,132	7.8%
Hudson, NJ	Jersey City	0.67	17,035	1,007	25,335	178	1,498	5.9%
Westchester, NY	White Plains	0.97	31,610	1,368	32,672	175	1,414	4.3%
Middlesex, NJ	New Brunswick	0.83	14,241	819	17,261	171	993	5.8%
Suffolk, NY	Riverhead	1.48	37,305	1,729	25,264	170	1,171	4.6%
Middlesex, MA	Lowell and Cambridge	1.61	18,201	1,282	11,293	166	795	7.0%
New York, NY	Includes: Bronx, Kings, New York and Richmond Counties	8.34	192,394	19,815	23,078	148	2,377	10.3%
Marion, IN	Indianapolis	0.96	7,779	473	8,065	147	490	6.1%
Hennepin, MN	Minneapolis	1.27	4,033	412	3,186	143	325	10.2%
Essex, NJ	Newark	0.80	15,749	1,471	19,712	143	1,841	9.3%
Will, IL	Joliet	0.69	3,973	214	5,752	133	310	5.4%
Nassau, NY	Mineola	1.36	38,587	2,468	28,437	130	1,819	6.4%
Montgomery, PA	Norristown	0.83	5,513	556	6,635	118	669	10.1%

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U.S. County-By-County Most Populous Counties: Sort By New Daily Infection Rate – Past 7 Days

“Strategic Guidance in an Era of Unprecedented Change”

As of May 13

Lowest 25



County	County seat	2019 Est. Population - Millions	Total Cases	Total Deaths	Cases / 1M	New Cases / 1M 7- Day M.A.	Deaths / 1M	Deaths / Case
Honolulu HI	Honolulu	0.97	414	11	425	1	11	2.7%
Sacramento, CA	Sacramento	1.55	1,182	52	762	5	34	4.4%
Santa Clara, CA	San Jose	1.93	2,364	134	1,226	7	70	5.7%
Jackson, MO	Independence and Kansas City	0.70	402	16	572	8	23	4.0%
Hidalgo, TX	Edinburg	0.87	409	10	471	9	12	2.4%
Orange, FL	Orlando	1.39	1,552	35	1,114	10	25	2.3%
San Joaquin, CA	Stockton	0.76	638	31	837	11	41	4.9%
Contra Costa, CA	Martinez	1.15	1,080	33	936	12	29	3.1%
Dane, WI	Madison	0.55	491	22	898	12	40	4.5%
Bexar, TX	San Antonio	2.00	1,976	58	986	15	29	2.9%
Hillsborough, FL	Tampa	1.47	1,494	44	1,015	16	30	2.9%
Allegheny, PA	Pittsburgh	1.22	1,545	139	1,271	18	114	9.0%
Pinellas, FL	Clearwater	0.97	923	63	947	18	65	6.8%
Duval, FL	Jacksonville	0.96	1,199	32	1,252	18	33	2.7%
Wake, NC	Raleigh	1.11	1,080	25	971	18	22	2.3%
Collin, TX	McKinney	1.03	980	30	947	19	29	3.1%
Ventura, CA	Ventura	0.85	725	24	857	20	28	3.3%
Pierce, WA	Tacoma	0.90	1,736	63	1,918	22	70	3.6%
Multnomah, OR	Portland	0.81	921	53	1,133	22	65	5.8%
Denton, TX	Denton	0.89	989	25	1,115	23	28	2.5%
El Paso, CO	Colorado Springs	0.72	1,175	81	1,631	24	112	6.9%
Polk, FL	Bartow	0.72	687	36	948	24	50	5.2%
Oklahoma, OK	Oklahoma City	0.80	1,007	43	1,263	25	54	4.3%
Alameda, CA	Oakland	1.67	2,199	80	1,316	27	48	3.6%
Lee, FL	Fort Myers	0.77	1,331	70	1,727	29	91	5.3%

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U.S. County-By-County Most Populous Counties: Sort By Deaths Per Capita

"Strategic Guidance in an Era of Unprecedented Change"

As of May 13

Highest 25



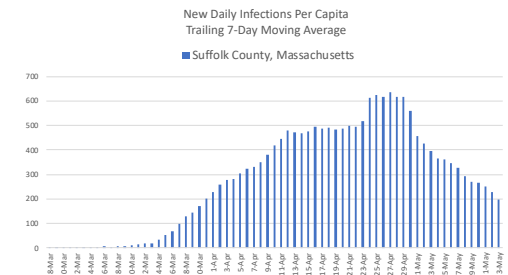
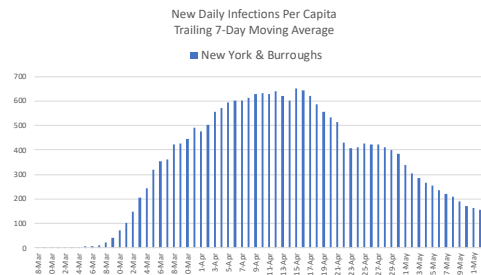
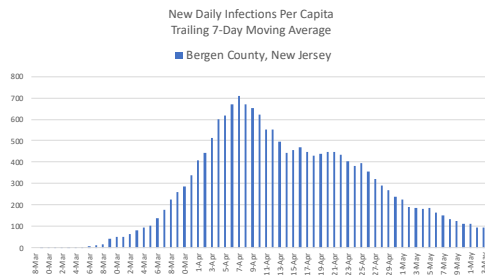
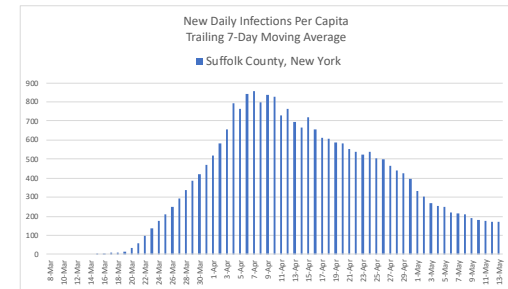
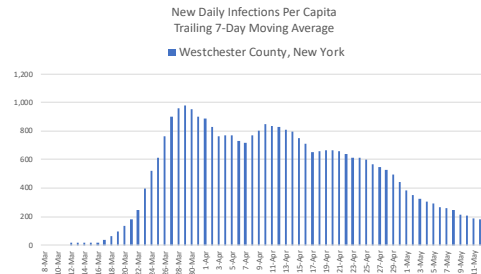
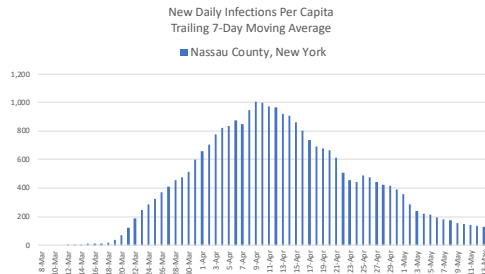
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Essex, NJ	Newark	0.80	15,749	1,471	19,712	143	1,841	9.3%
Nassau, NY	Mineola	1.36	38,587	2,468	28,437	130	1,819	6.4%
Bergen, NJ	Hackensack	0.93	17,150	1,409	18,397	97	1,511	8.2%
Hudson, NJ	Jersey City	0.67	17,035	1,007	25,335	178	1,498	5.9%
Westchester, NY	White Plains	0.97	31,610	1,368	32,672	175	1,414	4.3%
Wayne, MI	Detroit	1.75	18,389	2,156	10,512	67	1,232	11.7%
Suffolk, NY	Riverhead	1.48	37,305	1,729	25,264	170	1,171	4.6%
Fairfield, CT	Bridgeport	0.94	13,636	1,068	14,455	179	1,132	7.8%
Hartford, CT	Hartford	0.89	7,732	963	8,671	193	1,080	12.5%
Middlesex, NJ	New Brunswick	0.83	14,241	819	17,261	171	993	5.8%
Norfolk, MA	Dedham	0.71	7,129	676	10,087	105	956	9.5%
Suffolk, MA	Boston	0.80	15,587	749	19,389	197	932	4.8%
Essex, MA	Salem and Lawrence	0.79	11,703	704	14,832	246	892	6.0%
New Haven, CT	New Haven	0.85	9,570	745	11,196	192	872	7.8%
Macomb, MI	Mount Clemens	0.87	6,137	717	7,022	50	820	11.7%
Middlesex, MA	Lowell and Cambridge	1.61	18,201	1,282	11,293	166	795	7.0%
Oakland, MI	Pontiac	1.26	7,830	874	6,226	29	695	11.2%
Montgomery, PA	Norristown	0.83	5,513	556	6,635	118	669	10.1%
Philadelphia, PA	Philadelphia	1.58	18,779	986	11,855	188	622	5.3%
Worcester, MA	Worcester	0.83	8,241	489	9,921	215	589	5.9%
Cook, IL	Chicago	5.15	56,406	2,589	10,952	270	503	4.6%
Marion, IN	Indianapolis	0.96	7,779	473	8,065	147	490	6.1%
Erie, NY	Buffalo	0.92	4,606	402	5,014	93	438	8.7%
Prince George's, MD	Upper Marlboro	0.91	10,091	389	11,097	305	428	3.9%

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U.S. County-By-County Most Populous Counties: Highest Peak New Daily Infection Rate

“Strategic Guidance in an Era of Unprecedented Change”

The counties that experienced the highest peak daily infection rates - each in the Northeast Region - have seen this rate decline significantly from the peak . . .



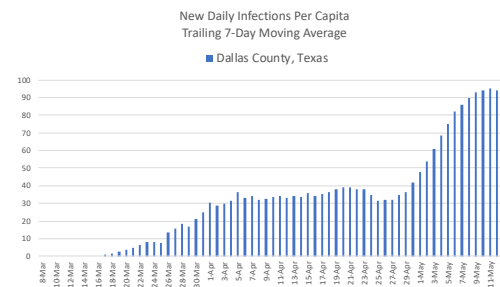
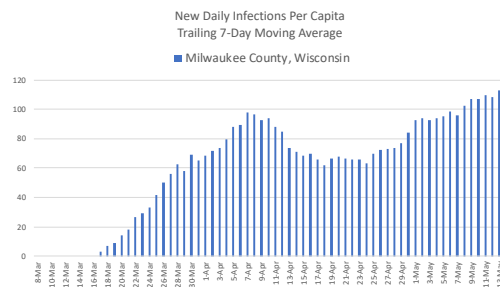
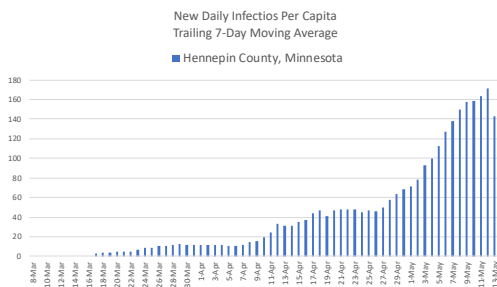
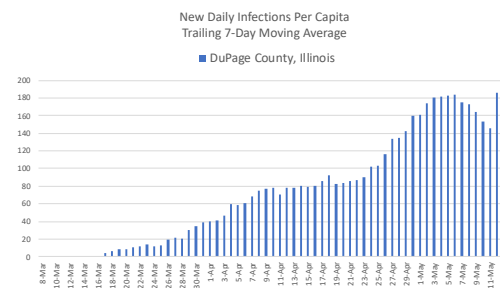
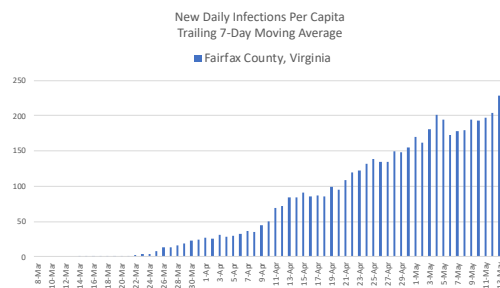
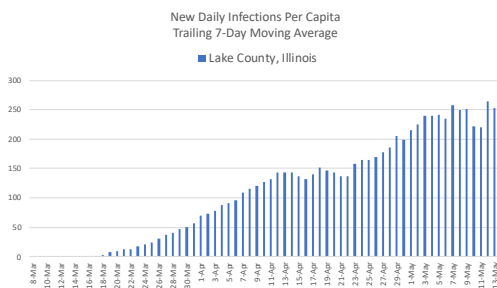
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U.S. County-By-County

Most Populous Counties: Those That Haven't Yet Reached Peaked New Infections

"Strategic Guidance in an Era of Unprecedented Change"

Sixteen counties have yet to find a peak in highest peak daily infection rates. These six depicted below - four in the Midwest - have the highest current rate of new infections . . .



1. Data from [The New York Times](#), based on reports from state and local health agencies. Accessed May 10-12, 2020
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