

Measure	Desired Change	Yesterday in the U.S.
No. of Tests	Increase	Up 4.2% (Cumulative)
Positive Test Rate	Decline	Steady at 19.5%
No. of Cases	Plateau	Up 4.1%, rate continues to slow
% of Deaths Per Case	Decline	Up slightly to 5.3% (from 5.2%)
No. of Deaths / 1M Pop.	Plateau	Up to 117.9
Recoveries : Deaths	Increase (>1:1)	Up to 1.75

We are tracking the 17 countries (and 20 of the top 23) with the most total coronavirus cases (India, Ireland and Peru - 17th, 18th and 20th in most cases, respectively, recently moved into this top group and, have not yet been included in our dataset). The 20 we are tracking represent 87.5% of all cases in the world. Additionally, we are tracking all fifty U.S. states, the District of Columbia and New York City.

Highlights from Saturday include:

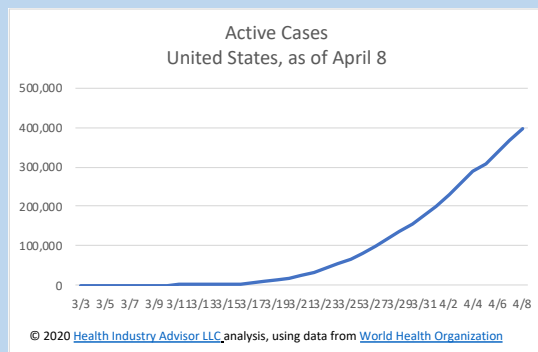
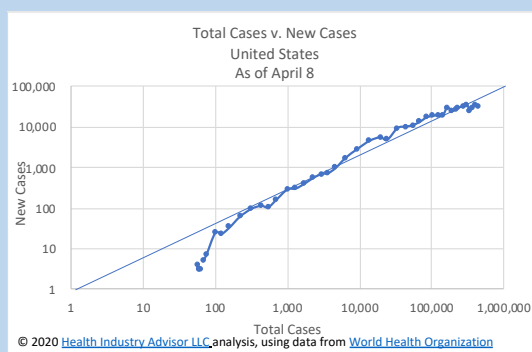
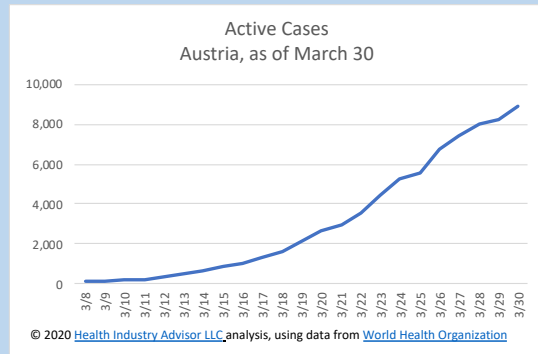
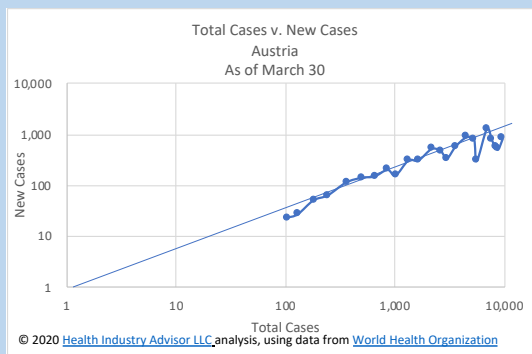
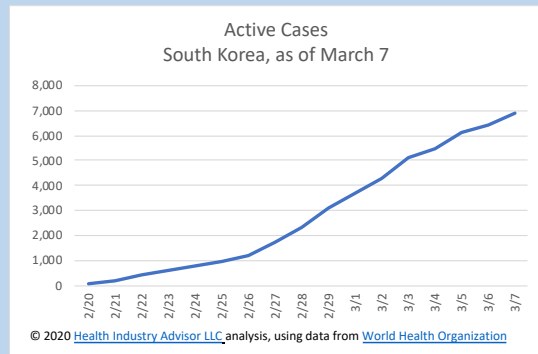
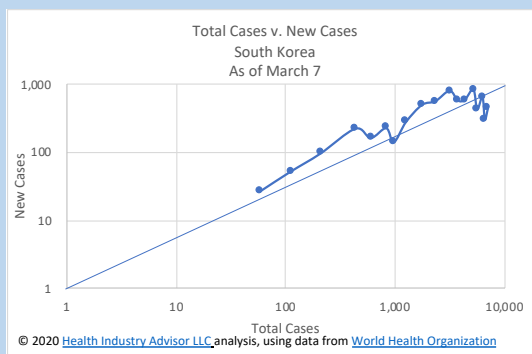
- Recoveries were significant again in the U.S. on Friday at 4,775 - bringing the total number of persons having recovered from the virus to 68,285. Given the [World Health Organization's](#) published guideline of expected recovery time, we continue to anticipate seeing an extended period of accelerating pace of recoveries.
- New testing seems to have plateaued in the U.S, was about 150,000 tests for the 5th consecutive day; the positive test rate is fairly stable at 19.5%. The U.S. dropped to 11th in testing per capita, among the countries we are tracking. Testing rates are at about 2x in Austria, Israel, Italy, Germany, Portugal, Spain and Switzerland as the U.S.
- Total cases are nearly 740,000 in the U.S. Still, case growth is slowing significantly across the U.S, except for South Dakota, which is the only state still experiencing double digit daily growth rates. Thirty two states now have daily growth rates of 5.5% or less.
- Idaho, Tennessee and Wyoming's active cases may have peaked on Thursday. Arkansas, Maine, Michigan, New Mexico, South Carolina, Texas and West Virginia reported their most active cases on Friday and then, fewer on Saturday. Washington's active cases on Saturday exceeded their previous high, recorded on April 11.
- Rhode Island joins New York, New Jersey, Massachusetts and Connecticut with the dubious distinction of having more cases per capita than any of the countries we are tracking.
- Only Nebraska and South Dakota have yet to break the exponential case growth trend in cases. Breaking this trend is a critical early step in containing the virus.
- Using projections from the Institute for Health Metrics and Evaluation (IHME) all except ten states - Arkansas, Iowa, Mississippi, Nebraska, North Dakota, Rhode Island, South Dakota, Utah, Virginia and Wyoming - are now past the date of peak hospital resource needs (total beds, ICU beds, ventilators). These projections assume that current social distancing will continue until infections are minimized and containment implemented.

Exponential Growth Trends

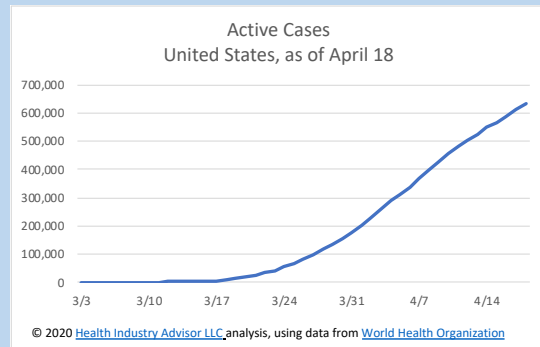
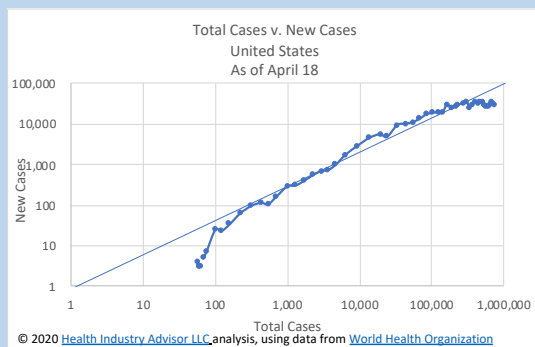
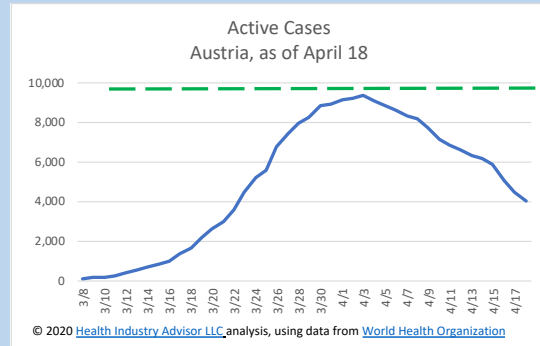
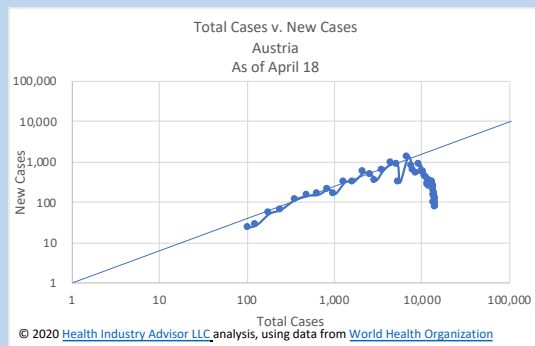
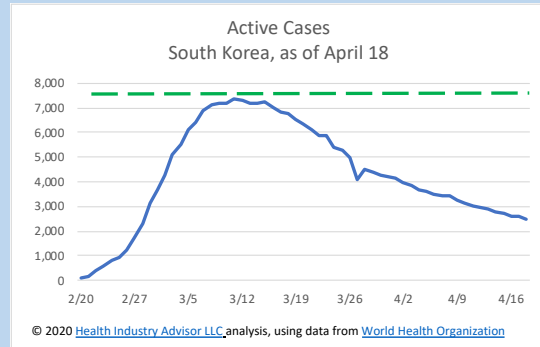
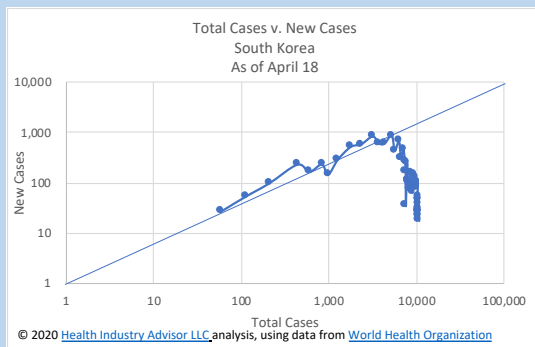
Log-Log Charts Aid In Anticipating Peak Active Cases, Signal That More Occur Soon Across the U.S.

We have been using Log-Log charts of Total v. New Cases to understand when cases no longer grow exponentially. This tends to be a precursor of a coming peak in Active Cases.

Note the similarity in the Log-Log and the Active Case charts for South Korea (as of March 7), Austria (as of March 30), and the United States (as of April 8). These dates were selected as they reflect when each country had recently ceased experiencing exponential case growth (i.e., plot points began running below the diagonal line) yet, active cases were still increasing each day.



Now, look at these same charts for South Korea and Austria, updated through April 18. Note the lines trending almost "due-south" on the log-log charts for both countries, and how their respective Active Cases peaked and began a steady decline thereafter. Our expectation is that the United States – as well as individual states, having similarly broken the exponential growth trend – will similarly soon see peak Active Cases. We seem to be trailing Austria by more than a week and South Korea by more than a month, if not longer, as we "flatten the curve".



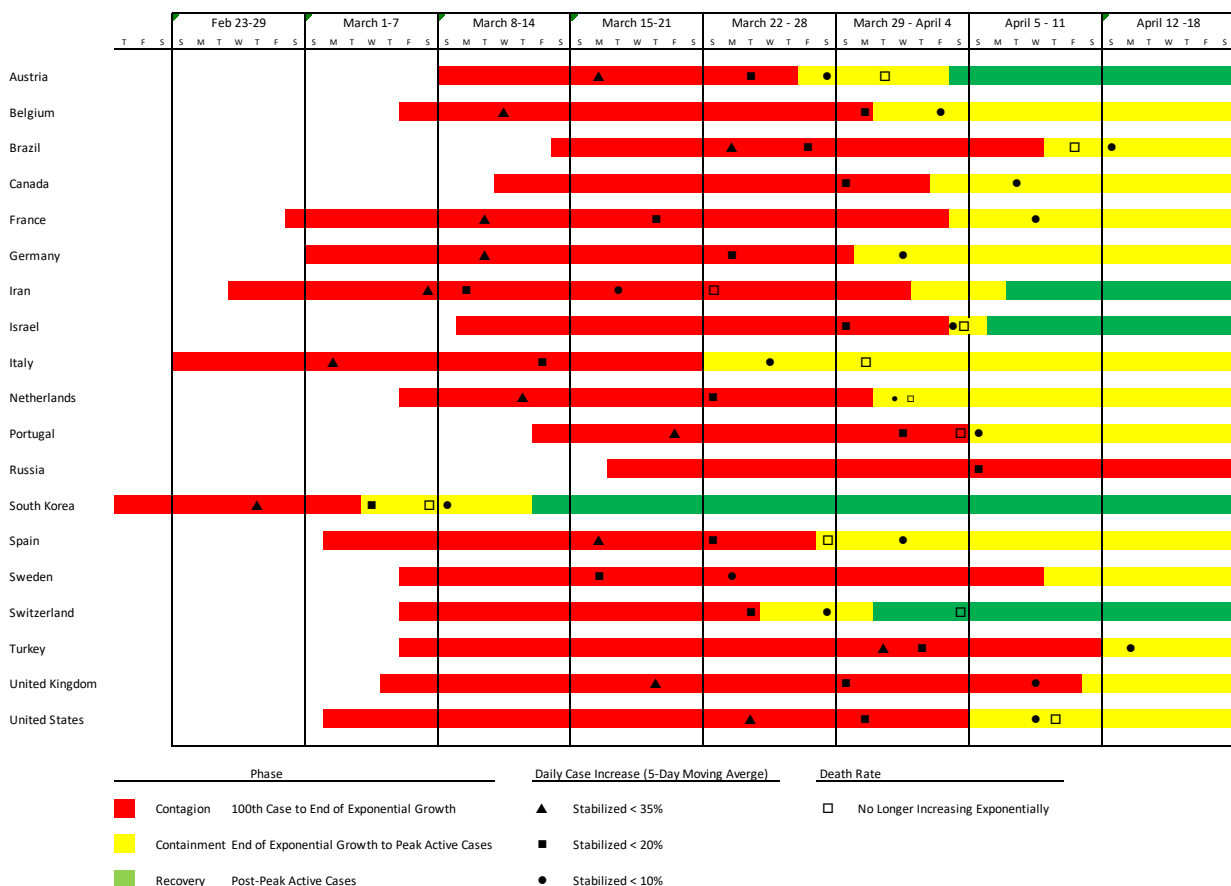
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Virus Progression: Hardest Hit Countries

Hardest-Hit Countries Continue Progressing Toward Containment and Recovery; Only Russia Among These Countries Still Experiencing Exponential Growth

Austria, China (not pictured), Iran, Israel, South Korea and Switzerland are already in Recovery (past peak cases); only Russia is still experiencing exponential case growth.

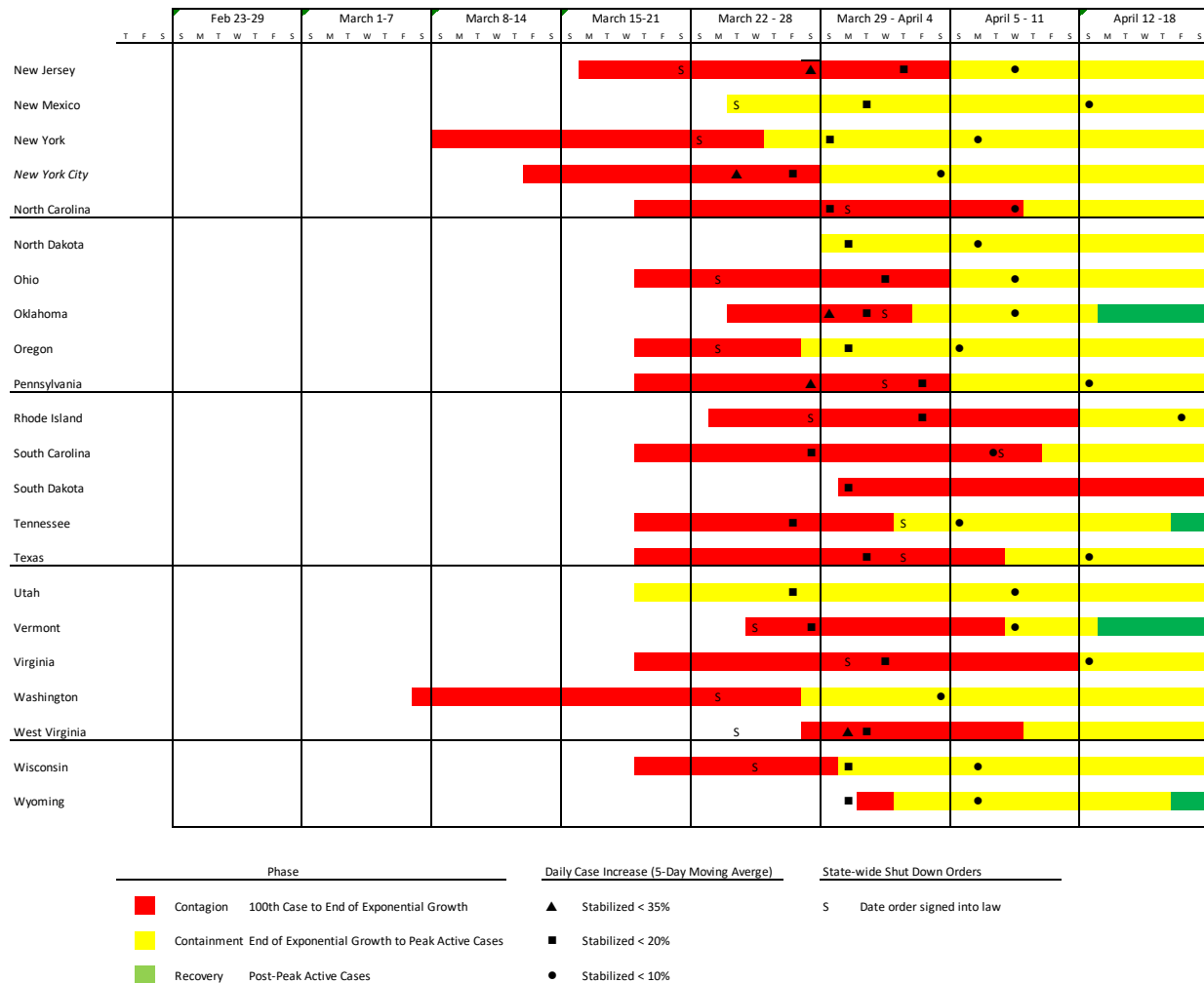
The graphic illustrates in color when the country first recorded 100 total cases (start of the "contagion" phase); when growth stopped following an exponential pattern (start of the "containment" phase); and when peak total cases were recorded (start of the "recovery" phase). It uses symbols to indicate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



The Majority of U.S. States are in Containment and Well on Their Way Toward Recovery

[illegible]

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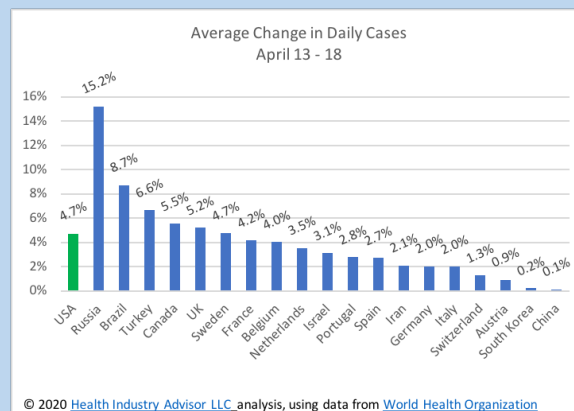
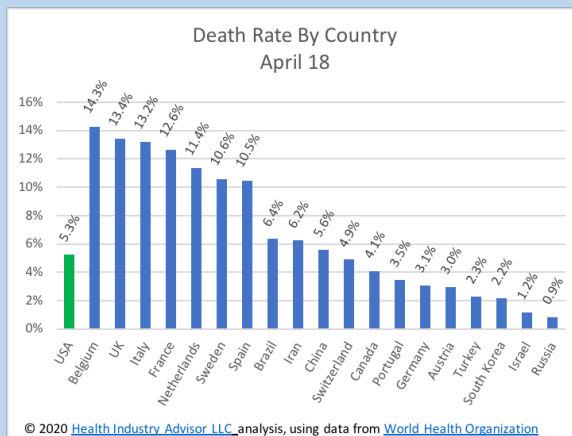
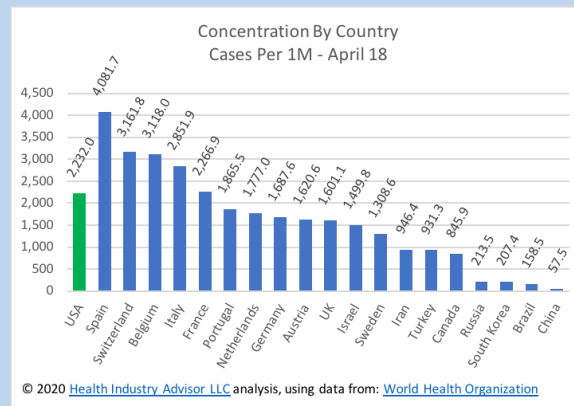
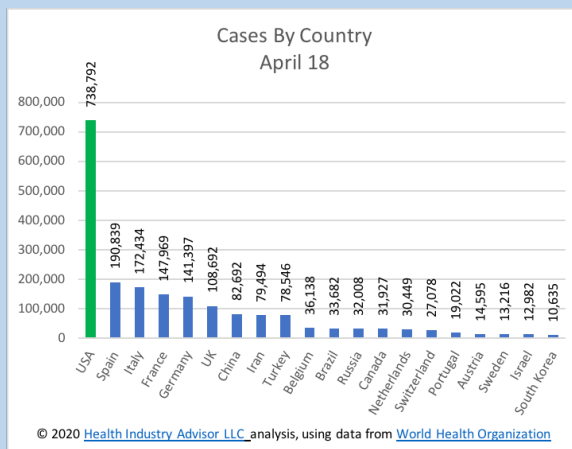


Global Statistics

The U.S Far Outpaces the World In Total Cases, is Now 5th in Cases Per Capita (Surpassing France Yesterday) and 11th in Death Rate. Case Growth is Falling In All of the Hardest-Hit Countries, Except Russia

Case growth continues to decline in most of the countries hardest-hit at during the first wave of virus spread. Russia continues to grow cases more quickly than most and Brazil appears to be having a resurgence in cases. India, Ireland and Peru are moving up the ranks of cases, now at 17th, 18th and 20th, respectively.

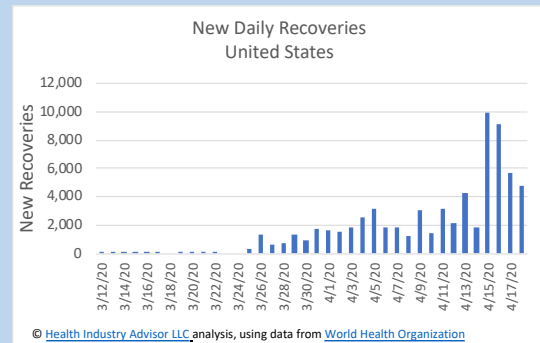
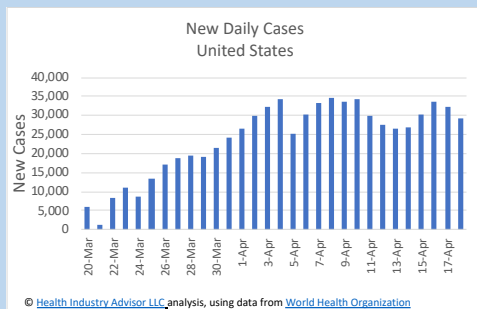
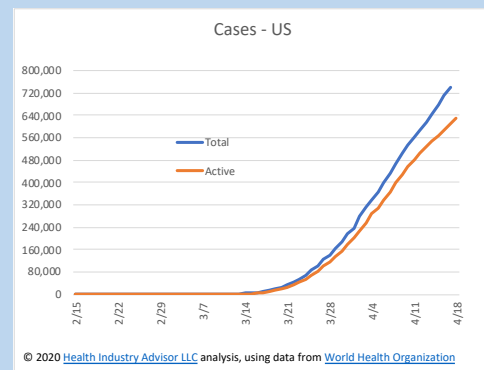
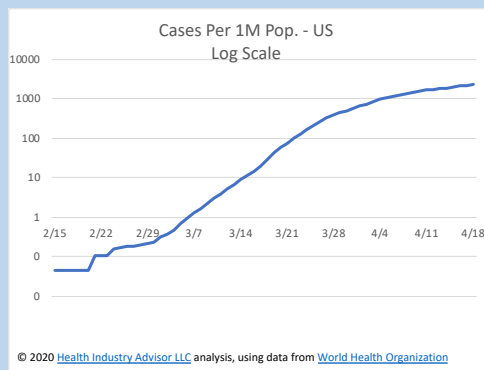
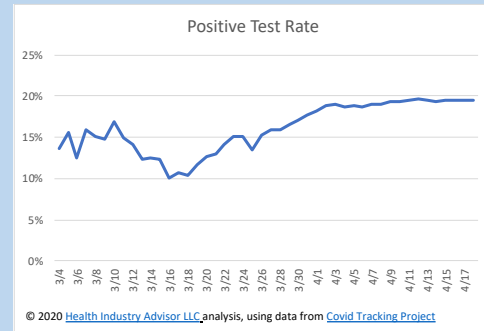
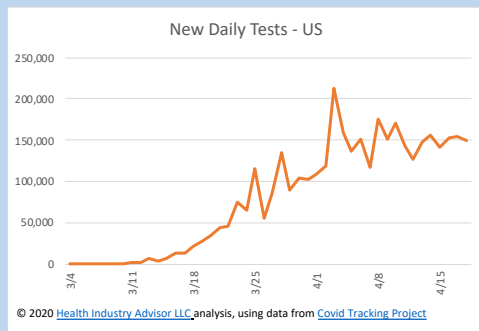
With China's announcement during the week of significantly more deaths from the virus, their death rate moved higher than that of the U.S.



Cases and Death Rates in the U.S.

Case Growth, Testing and the Positive Test % Have Begun to Plateau in the U.S.; Recoveries Are Increasing, Resulting In Active Cases Starting to Fall off From Total Cases

Cases in the U.S. are no longer growing at an exponential rate; active cases, however, have yet to peak. As infected persons begin to recover, active cases are beginning to separate from total cases.



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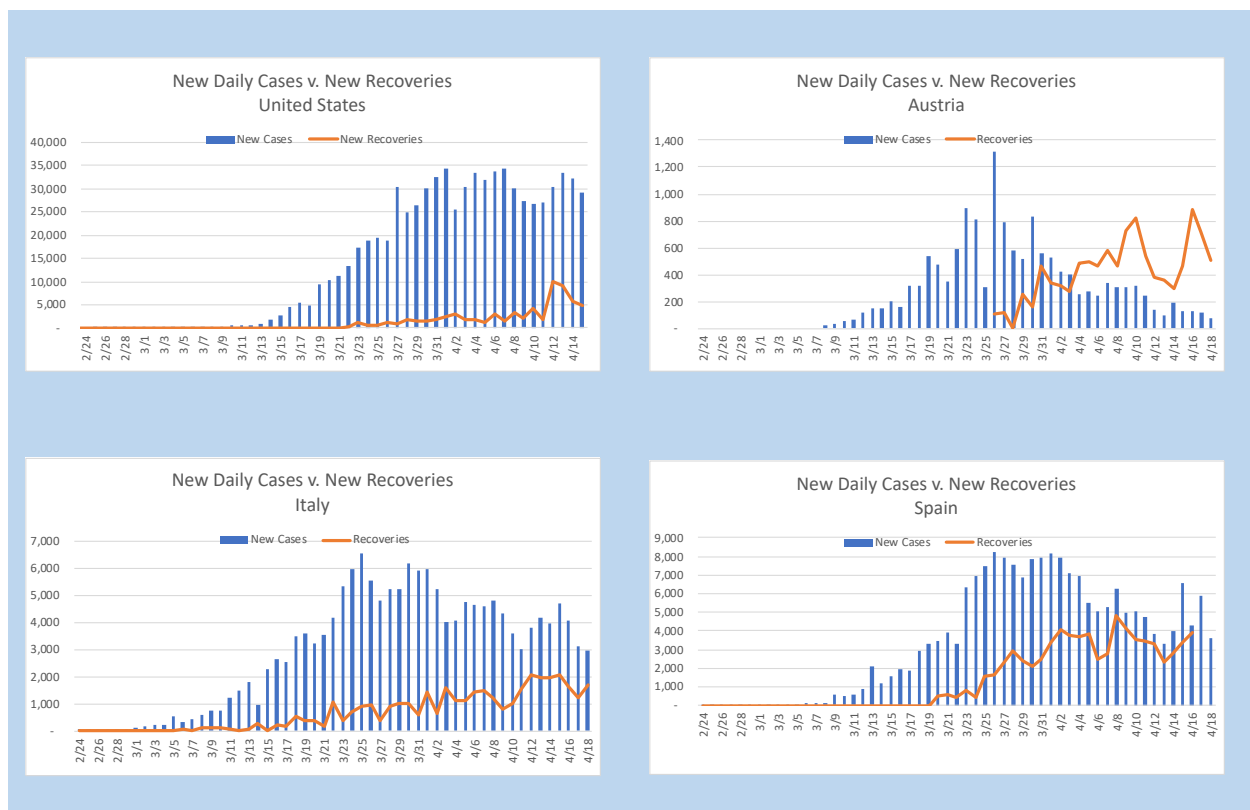
Recovery Rates

Recovery Rates From the Coronavirus Are Showing Signs of Accelerating in the U.S.

Another strong day of recoveries from the virus in the U.S. Recoveries are averaging in excess of 7,300 the past four days, compared to just over 2,000 each day the preceding 3 weeks.

According to a [World Health Organization report](#), recoveries from the coronavirus should occur in about 2 weeks for mild cases, 3-6 weeks for severe or critical cases. Given that we would expect to see a 2-4 week lag between the pattern for new cases and that for new recoveries. This would suggest that the U.S. should soon see an acceleration in recoveries, although it hasn't become fully apparent yet..

Actual patterns for the United States, Austria, Italy and Spain are shown below.



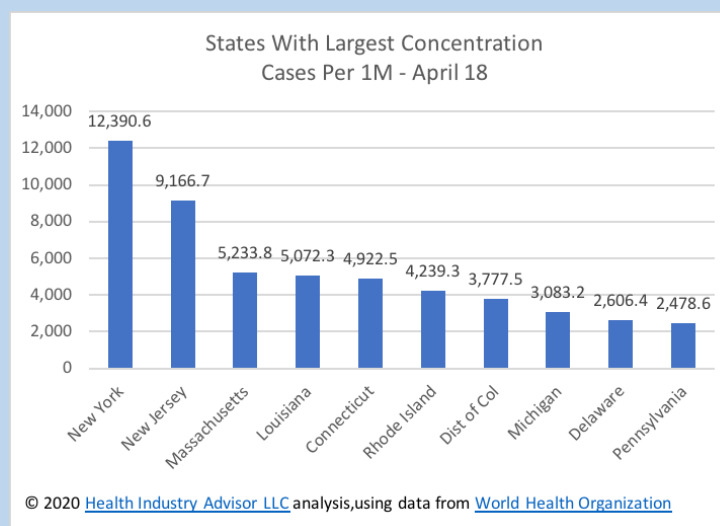
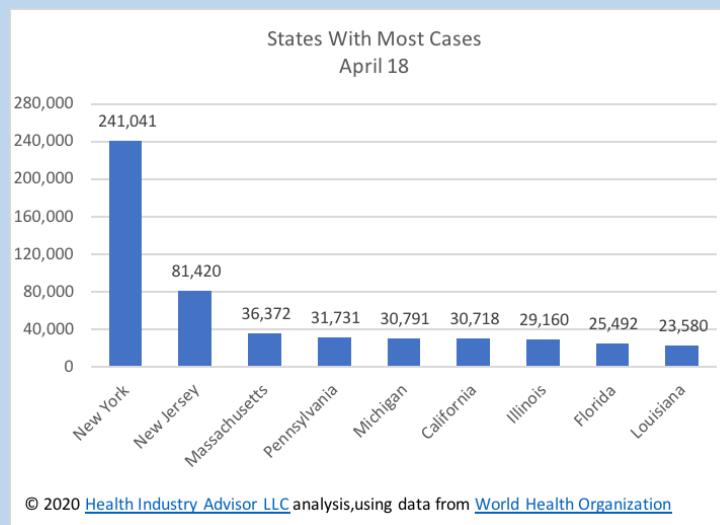
Hardest-Hit States

New York Has Experienced Far More Coronavirus Cases, and More Cases Per Capita Than Any State

New York, which now has more than 2240,000 cases, represent 32.6% of all coronavirus cases in the U.S.; the top ten states account 71.7% of all cases, (down from 75.5% Friday) and 82.6% of all deaths (down from 87.0% Friday). New York by itself accounts for 45.3% of the deaths in the U.S. (down from 49.5% Friday).

Cases per capita in New York, New Jersey, Louisiana Massachusetts, Connecticut and , as of yesterday, Rhode Island are greater than any of the hardest-hit countries in the world.

Michigan has the highest death rate (7.5%), followed by New York (7.3%), Connecticut (6.2%), and Oklahoma (5.4%).

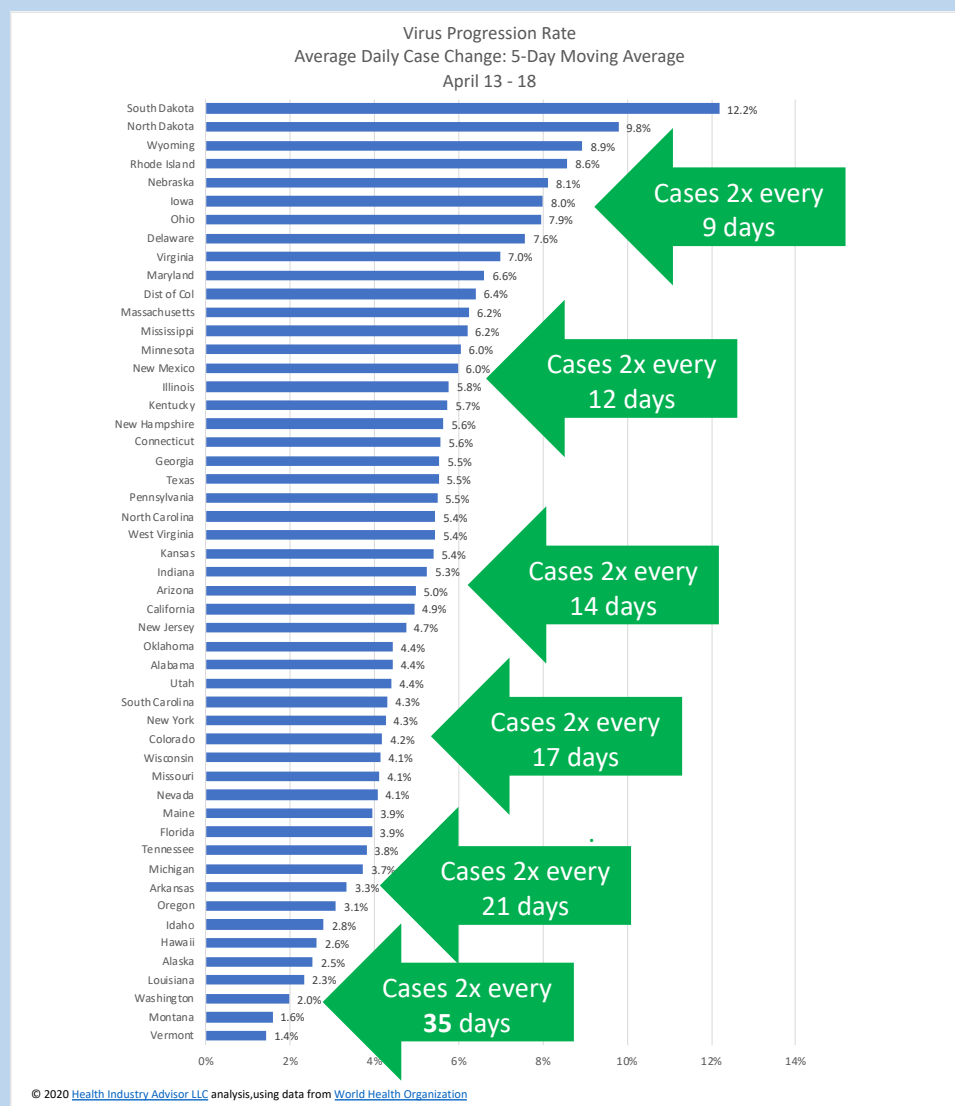


Daily Case Growth Rates By State

Case Growth Rates Continue to Fall Dramatically Across the U.S.

Only South Dakota continues to show daily case increases (5-day moving average) of > 10%. The rate is so low in Louisiana, Montana, Vermont and Washington that it would take a month now for cases to double, in Alaska, Arkansas, Hawaii, Idaho and Oregon, it would take about 3 weeks.

The rate for the U.S. overall is down to 4.7%. At that rate, cases double every 15 days.



State-By State Statistics and Rankings.

New York Continues To Experience the Most Cases, Cases Per Capita and Deaths

This table provided statistics and ranking of each of the 50 states and the District of Columbia.

As of April 18

State	Total Cases	Rank	Cases per 1M Population	Rank	Deaths	Rank	Death Rate	Rank	5-day Moving Average Case Growth Rate	Rank	Tests per 1M Population	Rank
Alabama	4,723	(22)	963.3	(24)	147	(25)	3.1%	(30)	4.4%	(31)	8,744	(34)
Alaska	314	(51)	429.2	(48)	9	(48)	2.9%	(36)	2.5%	(47)	13,074	(17)
Arizona	4,719	(23)	648.3	(39)	177	(22)	3.8%	(24)	5.0%	(27)	7,348	(43)
Arkansas	1,739	(39)	576.2	(45)	38	(40)	2.2%	(43)	3.3%	(43)	8,072	(37)
California	30,718	(6)	777.4	(33)	1,147	(7)	3.7%	(25)	4.9%	(28)	6,294	(49)
Colorado	9,433	(17)	1,638.0	(15)	411	(17)	4.4%	(15)	4.2%	(35)	8,065	(38)
Connecticut	17,550	(12)	4,922.5	(5)	1,086	(9)	6.2%	(3)	5.6%	(19)	16,254	(13)
Delaware	2,538	(33)	2,606.4	(9)	67	(36)	2.6%	(39)	7.6%	(8)	15,581	(14)
District Of Columbia	2,666	(31)	3,777.5	(7)	91	(32)	3.4%	(27)	6.4%	(11)	19,384	(7)
Florida	25,492	(8)	1,186.9	(20)	748	(10)	2.9%	(34)	3.9%	(40)	12,292	(21)
Georgia	17,841	(11)	1,680.4	(14)	677	(11)	3.8%	(21)	5.5%	(20)	7,206	(46)
Hawaii	574	(47)	405.4	(49)	9	(48)	1.6%	(48)	2.6%	(46)	16,608	(12)
Idaho	1,668	(40)	930.8	(26)	44	(38)	2.6%	(40)	2.8%	(45)	9,588	(30)
Illinois	29,160	(7)	2,301.2	(11)	1,259	(6)	4.3%	(16)	5.8%	(16)	10,717	(26)
Indiana	10,641	(15)	1,580.6	(16)	545	(13)	5.1%	(9)	5.3%	(26)	8,569	(35)
Iowa	2,513	(34)	796.5	(32)	74	(34)	2.9%	(33)	8.0%	(6)	7,325	(44)
Kansas	1,790	(38)	614.4	(42)	86	(33)	4.8%	(12)	5.4%	(25)	6,077	(51)
Kentucky	2,707	(30)	605.9	(44)	144	(27)	5.3%	(7)	5.7%	(17)	7,258	(45)
Louisiana	23,580	(9)	5,072.3	(4)	1,267	(5)	5.4%	(6)	2.3%	(48)	29,591	(3)
Maine	847	(44)	630.1	(41)	32	(42)	3.8%	(22)	3.9%	(39)	11,197	(23)
Maryland	12,308	(13)	2,035.8	(12)	463	(15)	3.8%	(23)	6.6%	(10)	10,889	(24)
Massachusetts	36,372	(3)	5,233.8	(3)	1,560	(4)	4.3%	(17)	6.2%	(12)	22,958	(4)
Michigan	30,791	(5)	3,083.2	(8)	2,308	(3)	7.5%	(1)	3.7%	(42)	10,280	(27)
Minnesota	2,213	(35)	392.4	(51)	121	(30)	5.5%	(4)	6.0%	(14)	8,027	(39)
Mississippi	3,974	(27)	1,335.3	(18)	152	(23)	3.8%	(20)	6.2%	(13)	12,970	(18)
Missouri	5,517	(21)	898.9	(28)	184	(21)	3.3%	(28)	4.1%	(37)	8,789	(33)
Montana	426	(49)	398.6	(50)	10	(46)	2.3%	(42)	1.6%	(50)	10,146	(28)
Nebraska	1,287	(43)	665.3	(37)	28	(43)	2.2%	(45)	8.1%	(5)	7,692	(41)
Nevada	3,626	(28)	1,177.2	(21)	151	(24)	4.2%	(18)	4.1%	(38)	12,301	(20)
New Hampshire	1,342	(42)	987.0	(23)	38	(40)	2.8%	(37)	5.6%	(18)	9,991	(29)
New Jersey	81,420	(2)	9,166.7	(2)	4,070	(2)	5.0%	(11)	4.7%	(29)	18,496	(9)
New Mexico	1,798	(37)	857.5	(30)	53	(37)	2.9%	(32)	6.0%	(15)	17,507	(10)
New York	241,041	(1)	12,390.6	(1)	17,671	(1)	7.3%	(2)	4.3%	(34)	30,407	(2)
North Carolina	6,366	(20)	607.0	(43)	185	(20)	2.9%	(35)	5.4%	(23)	7,504	(42)
North Dakota	528	(48)	692.9	(36)	9	(48)	1.7%	(47)	9.8%	(2)	17,233	(11)
Ohio	10,222	(16)	874.5	(29)	451	(16)	4.4%	(14)	7.9%	(7)	7,141	(47)
Oklahoma	2,570	(32)	649.5	(38)	139	(28)	5.4%	(5)	4.4%	(30)	9,070	(32)
Oregon	1,844	(36)	437.2	(47)	72	(35)	3.9%	(19)	3.1%	(44)	9,207	(31)
Pennsylvania	31,731	(4)	2,478.6	(10)	1,102	(8)	3.5%	(26)	5.5%	(22)	12,037	(22)
Rhode Island	4,491	(24)	4,239.3	(6)	137	(29)	3.1%	(31)	8.6%	(4)	31,067	(1)
South Carolina	4,246	(25)	824.7	(31)	119	(31)	2.8%	(38)	4.3%	(33)	7,836	(40)
South Dakota	1,542	(41)	1,743.0	(13)	7	(50)	0.5%	(51)	12.2%	(1)	13,491	(16)
Tennessee	6,762	(19)	989.6	(22)	145	(26)	2.1%	(46)	3.8%	(41)	13,620	(15)
Texas	18,679	(10)	644.2	(40)	469	(14)	2.5%	(41)	5.5%	(21)	6,320	(48)
Utah	2,931	(29)	914.2	(27)	25	(44)	0.9%	(49)	4.4%	(32)	19,684	(6)
Vermont	803	(46)	1,286.9	(19)	38	(40)	4.7%	(13)	1.4%	(51)	20,106	(5)
Virginia	8,053	(18)	943.5	(25)	258	(18)	3.2%	(29)	7.0%	(9)	6,172	(50)
Washington	11,802	(14)	1,549.9	(17)	624	(12)	5.3%	(8)	2.0%	(49)	18,604	(8)
West Virginia	825	(45)	461.6	(46)	18	(45)	2.2%	(44)	5.4%	(24)	10,822	(25)
Wisconsin	4,199	(26)	721.2	(35)	211	(19)	5.0%	(10)	4.1%	(36)	8,335	(36)
Wyoming	422	(50)	729.1	(34)	2	(51)	0.5%	(50)	8.9%	(3)	12,512	(19)
United States	738,792		2,250.4		39,014		5.3%		4.7%		11,245	

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Opening Up America Again

The President Released His Guidelines For Getting the Country Moving

On Thursday, April 16, 2020, President Trump released his guidelines for three phases of [Opening Up America Again](#). Each state governor, however, retains the authority to determine how and when to open their states, based on the unique circumstances of their respective states.

The President outlined a staged approach, based on the state meeting certain “gating” criteria:

- Symptoms
 - Downward trajectory of influenza-like illness (ILI) reported within a 14-day period, and
 - Downward trajectory of COVID-19 syndromic cases reported within a 14-day period
- Cases
 - Downward trajectory of documented cases reported within a 14-day period, or
 - Downward trajectory of positive tests as a percent of total tests within a 14-day period (flat or increasing volume of tests)
- Hospitals
 - Treat all patients without crisis care, and
 - Robust testing program in place for at-risk healthcare workers, including emergency antibody testing

Whether these criteria will be applied is ultimately a state-by-state decision, and will be subject to other considerations (including political ones.) Therefore, no certainty can be provided as to how closely these state-by-state decisions will follow the guidelines suggested.

These considerations notwithstanding, the following pages are intended to paint a picture of how closely each state is tracking toward the guidelines suggested by the President and the CDC.

Beginning today, we will produce a one-page summary of key measures for 5 states per day. We will begin with those states with the most total cases: in order – New York, New Jersey, Massachusetts, Pennsylvania and Michigan. Tomorrow, we will do the next five in order, repeating until we have covered each state.

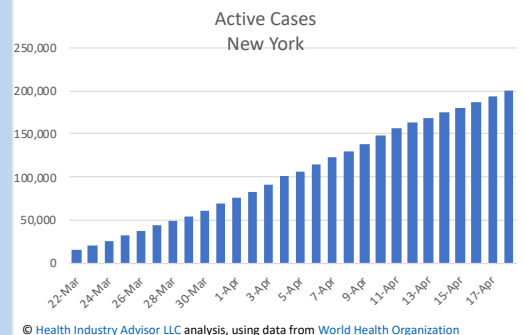
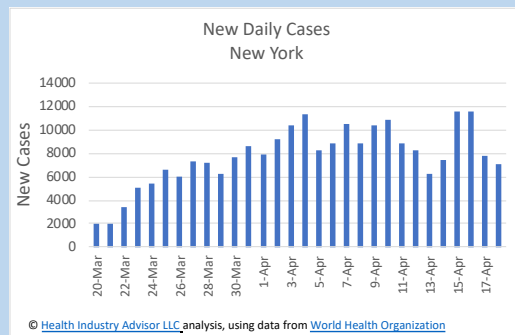
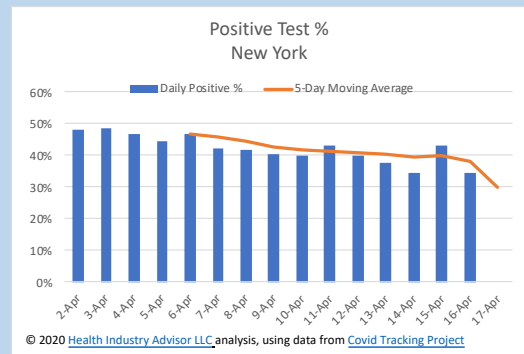
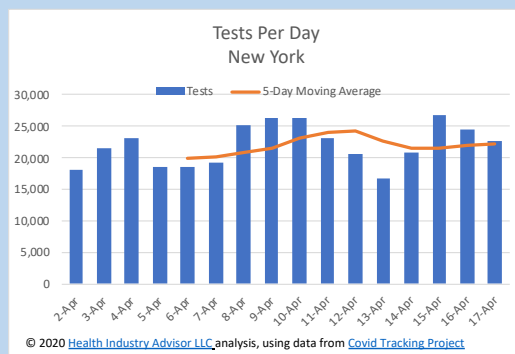
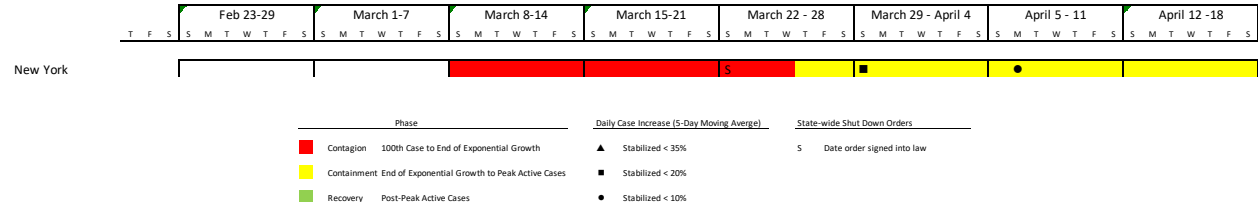
On these pages, we show:

- Our Virus Progression chart for the state, indicating 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)
- Tests per day, and a 5-day moving average (given the provision for flat or increasing test volume)
- Positive test %, daily and 5-day moving average
- New cases per day, to show trends in newly reported cases
- Active cases per day, to indicate how infections are trending
- % of Visits for Influenza-Like Illness (ILI) from [CDC.gov](https://www.cdc.gov), indicating the trajectory of these illness per the criteria above
- Projected Hospital Resource Needs from [Covid19.Health data.org](https://covid19.healthdata.org), indicating how these needs are trending

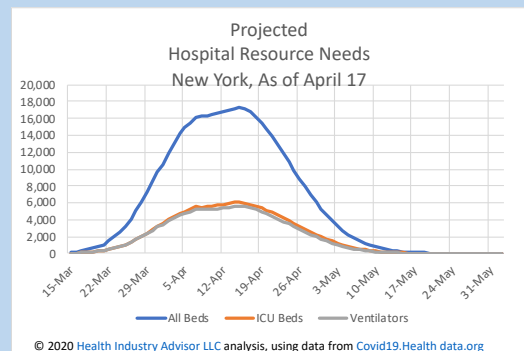
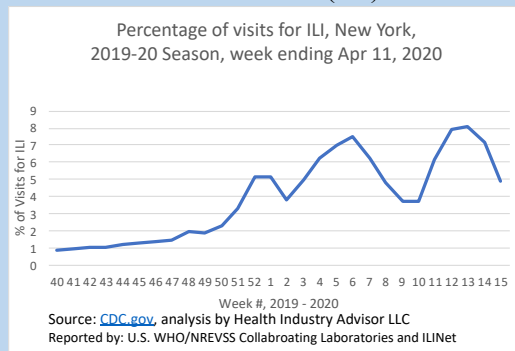
Note: these measures are not necessarily those that will be used by the states, however, they could serve as useful proxies. **Still, no one should rely on any of the following for a determination of what actions each state will take, and when.**

New York

Timeline



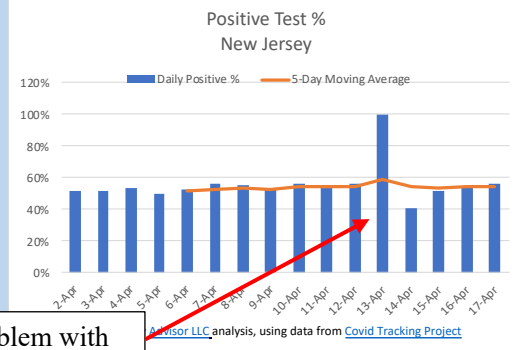
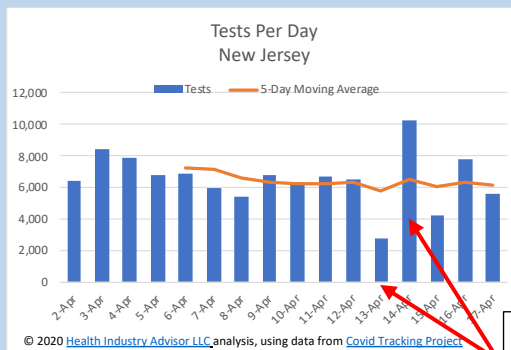
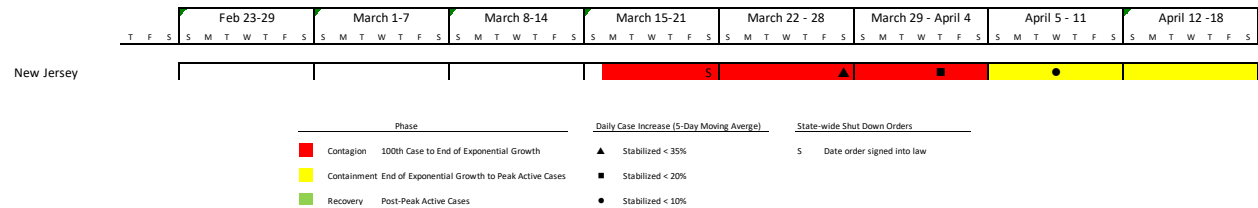
Influenza Like Illness (ILI) Trend



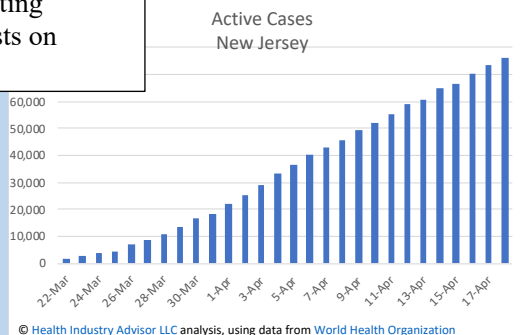
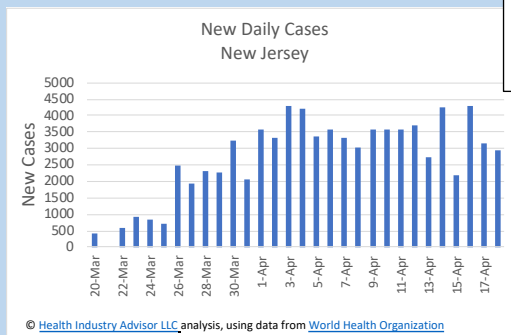
Information throughout the Dashboard is provided as a courtesy, based on data from the above-named sources. HIA has no responsibility for the accuracy and updating of any data. Sources: worldometers.info; covidtracking.com, <https://covid19.healthdata.org/united-states-of-america>, and nyc.gov. Graphics depict data as of the date in the header.

New Jersey

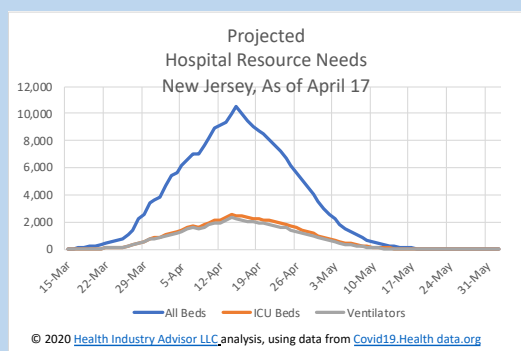
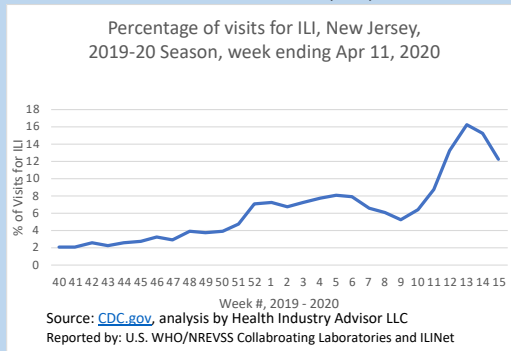
Timeline



A clear problem with single data points - a lag in reporting negative tests on 4/13?

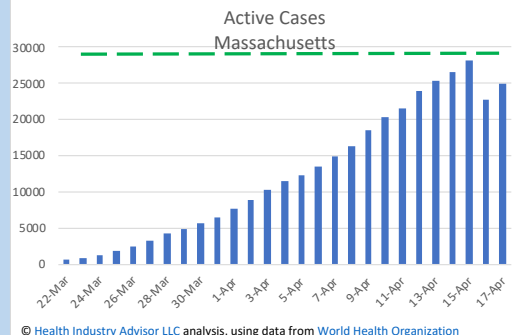
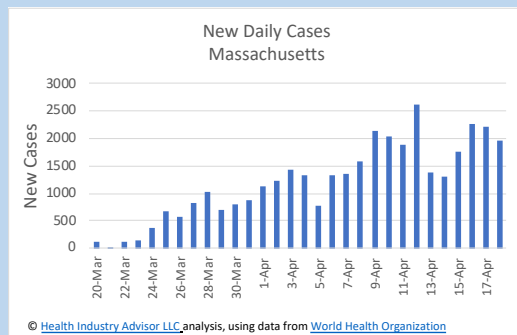
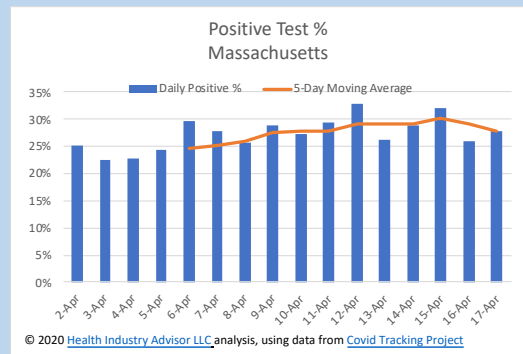
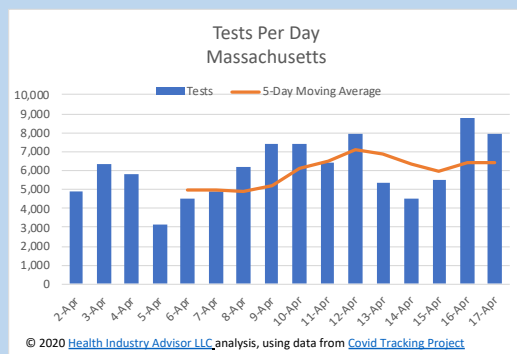
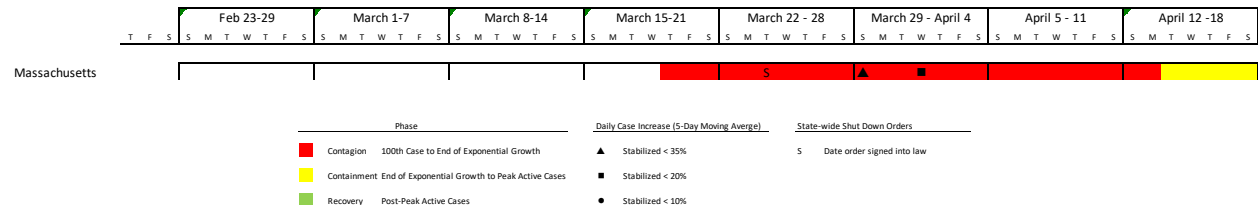


Influenza Like Illness (ILI) Trend

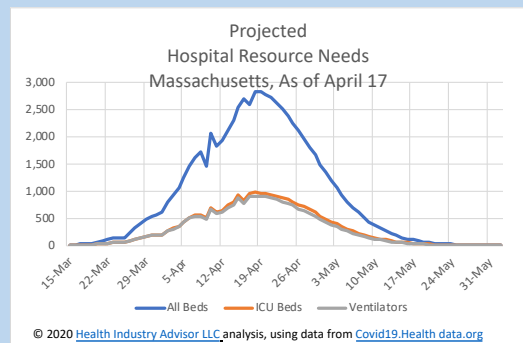
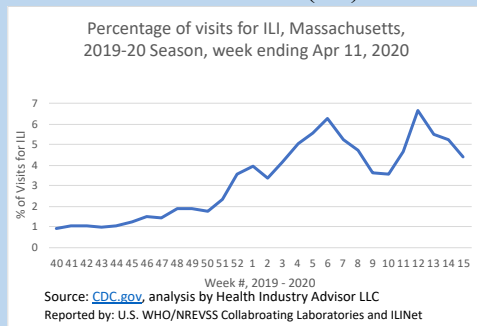


Massachusetts

Timeline

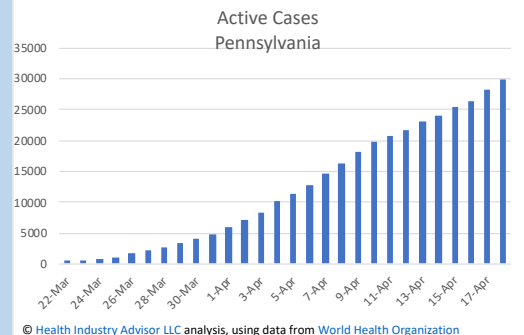
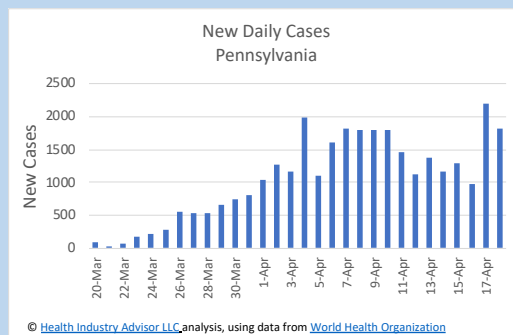
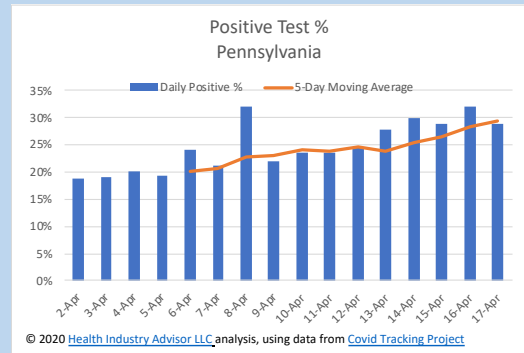
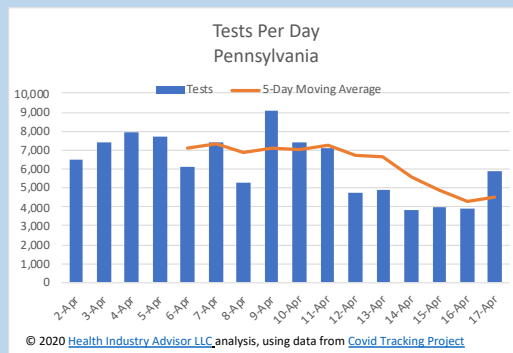
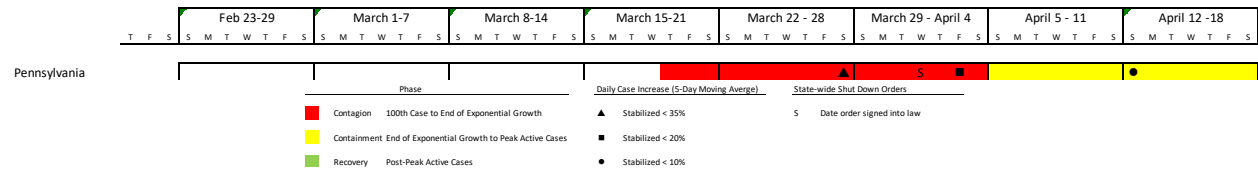


Influenza Like Illness (ILI) Trend

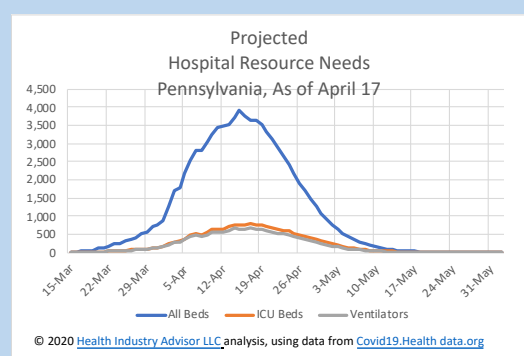
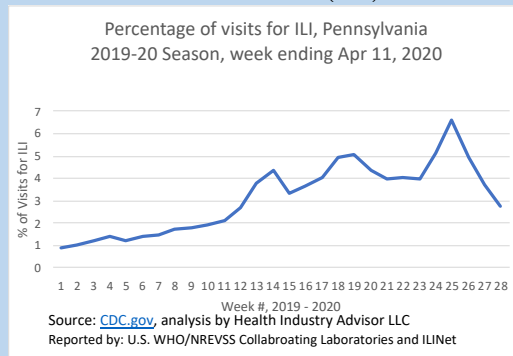


Pennsylvania

Timeline

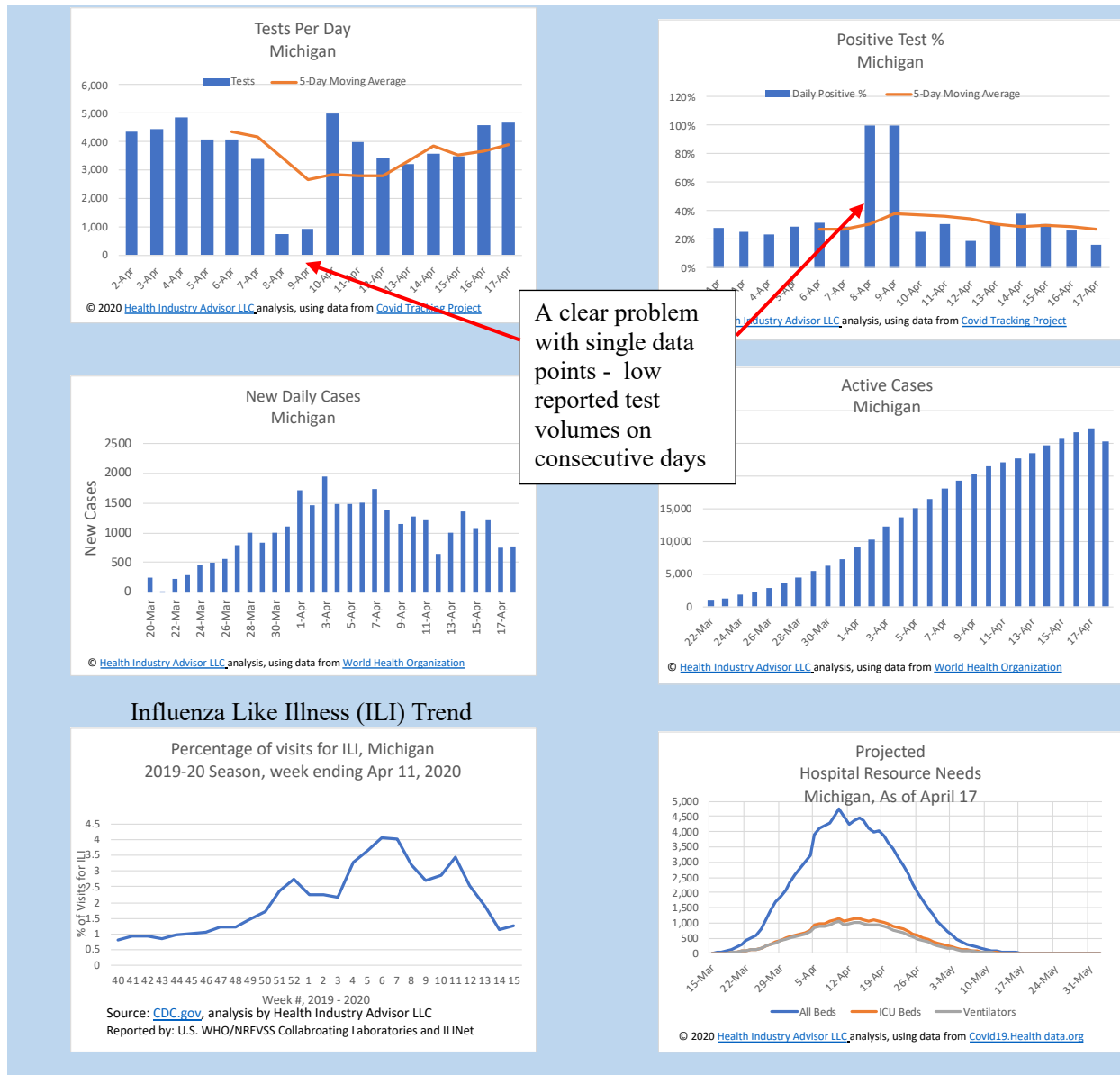
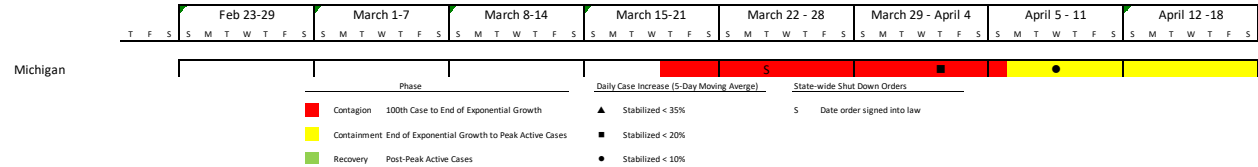


Influenza Like Illness (ILI) Trend

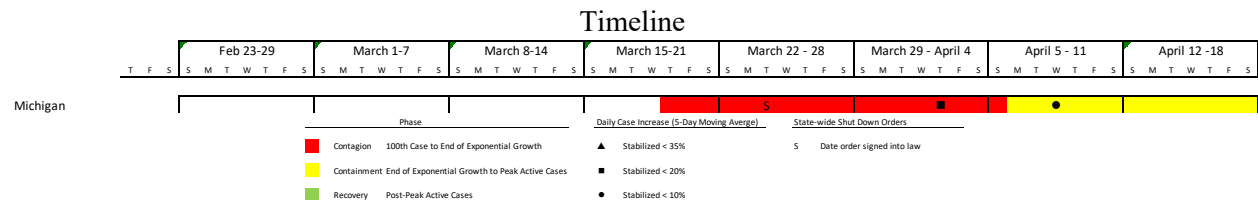


Michigan

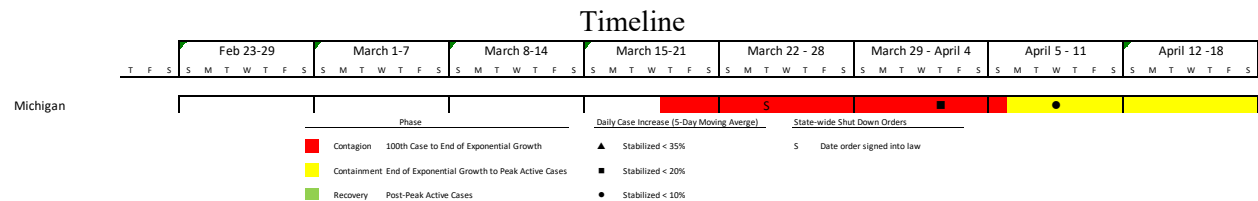
Timeline



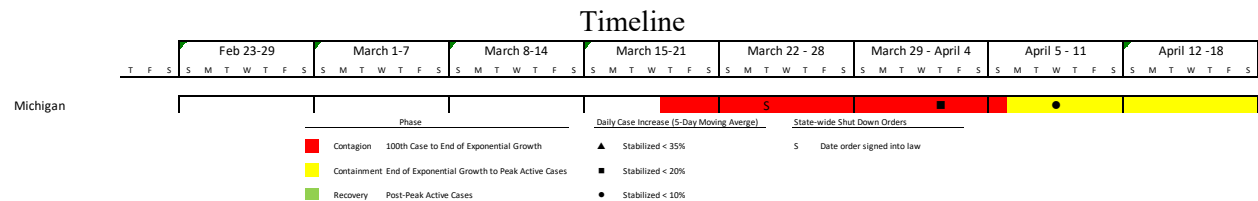
California



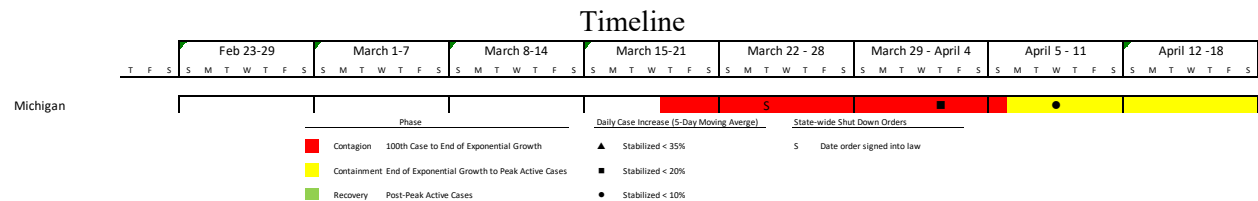
Illinois



Florida



Louisiana



Texas

