Analysis of COVID-19 Trends in the United States

W. Capra Data Analytics Team

April 21, 2020

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Introduction

Across the globe, the COVID-19 pandemic has quickly changed business landscapes across all verticals in unprecedented fashions. Cases and deaths are accelerating, as well as business closures and job losses. In an effort to keep W. Capra, our clients, and other external partners up-to-date on the latest trends across the United States, we publish this report on state-by-state COVID-19 data trends. Our goal is to identify:

- How states' handlings of COVID-19 develop over time
- Which states are approaching "containment," and
- What environmental, regulatory, and cultural factors drive containment

As we look at state-by-state analyses, there are many factors to keep in mind, such as population density, success at social distancing, healthcare networks, lock-down dates, weather, etc. All of these appear to have some effect on the transmission and successful containment of the disease.

Trends we consider to be important indicators as to how the pandemic is affecting states:

- Testing Volume and Capacity: Indicates the accessibility of testing and the state's ability to meet testing demand
- Case Velocity: Number of new cases reported each day
- Death Velocity: Number of new deaths reported each day
- Case Rate: Percentage of tests performed that end in a positive result. Testing rates are skewed towards symptomatic patients due to testing policies.
- Death Rate: Percentage of positive cases that lead to death. This is driven by the performance of healthcare systems and the general health of underlying population.
- Case Acceleration: Change in Case Velocity. If Case Acceleration is positive, a state is reporting a greater number of new cases day over day. If negative, Case Velocity is decreasing, and the state is reporting a lesser number of new cases day over day.
- Death Acceleration: Change in Death Velocity. If Death Acceleration is positive, a state is reporting a greater number of new deaths day over day. If negative, Death Velocity is decreasing, and the state is reporting a lesser number of new deaths day over day.

Disclaimer

The W. Capra Data Analytics Team is comprised of data scientists and analysts. We are not medical professionals nor policy makers. As such, this report is not to be construed as providing guidance. We are data-driven professionals that are interested in seeing how we can leverage data to understand the trajectory of states in the COVID-19 pandemic. As such, we advise that you make your own assessment as to actions to take based on this information. Please carefully consider local laws and follow the advice of medical professionals and policy makers at local and national levels.

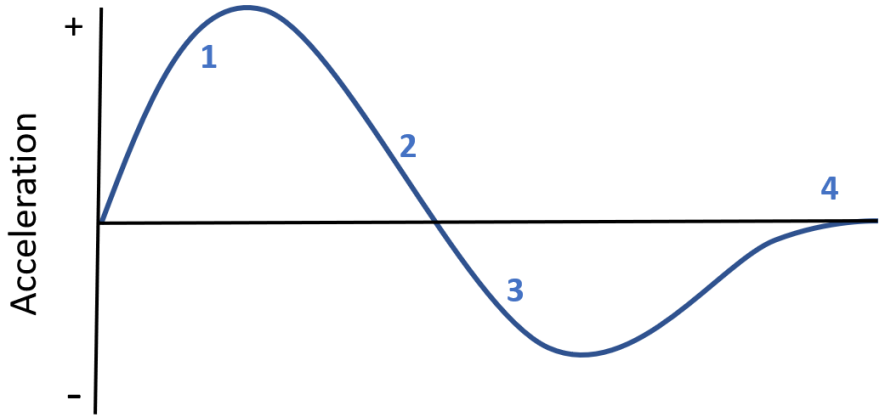
Data Sources

Data has been gathered from the following sources. The most recent observations are from April 21.

- The COVID Tracking Project, https://covidtracking.com/
- New York Times COVID Data, https://github.com/nytimes/covid-19-data
- COVID-19 Community Mobility Reports, Google, https://www.google.com/covid19/mobility/
- Annual Estimates of the Resident Population for Counties in the United States, U.S. Census Bureau, https://www.census.gov/data/datasets/time-series/demo/popest/2010s-counties-total.html#par_textimage_739801612

Benchmarks

We understand that states are experiencing and will pass through various states of their handling of the pandemic. Obviously, positive outcomes for states occur as new daily cases and deaths begin to drop; this is commonly referred to as the "peak" for a particular region. However, we are also interested in tracking the acceleration rates of cases and deaths. We see that consistent reduction in acceleration is an early indicator of positive outcomes. From global trends, we expect velocity and acceleration rates (both new cases and deaths) to follow a trend similar to the one depicted in Figure 1.



Acceleration Curve

- 1 - Exponential Stage: New daily cases and deaths are increasing. Velocity and acceleration are positive.
- 2 - Linear Stage: New daily cases and deaths are flat. Velocity is positive while acceleration is approaching zero.
- 3 - Improvement Stage: New daily cases and deaths are decreasing. Velocity is decreasing while acceleration is negative.
- 4 - Containment Stage: Zero or few new daily cases and deaths. Velocity is near zero, while acceleration is slightly negative or zero.

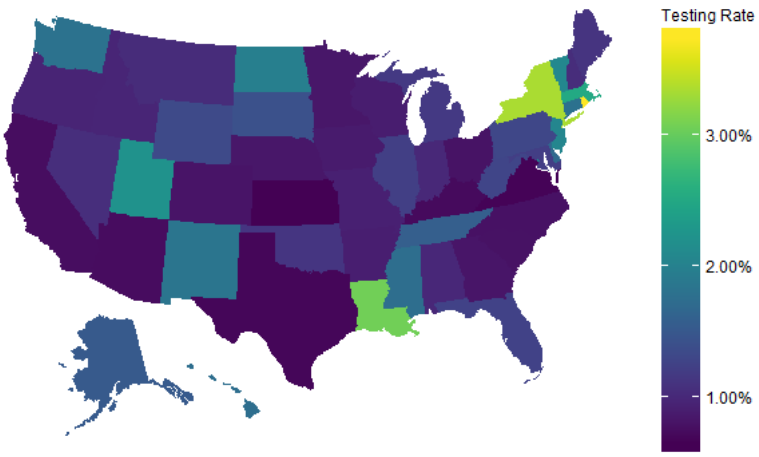
Later in the report we will take a closer look at measuring and ranking accelerations.

Analysis

Testing Across the US

Inconsistent testing data reinforces that testing is still not being performed at the paces desired by most states. The ability to test wide populations quickly will be crucial to not only achieving containment but also maintaining it. Initial decelerations of cases and deaths is good sign; however, until states have the capacity to test people at the appropriate scales, states will continue to be at risk of resurgences in COVID-19 cases/deaths.

Currently, 1.27% of the entire US population has been tested. This is very small from a sampling perspective, but not too far off from the rest of the world. The distribution of these tests is also very unevenly distributed.



Testing Rates

Case and Death Rates Across US

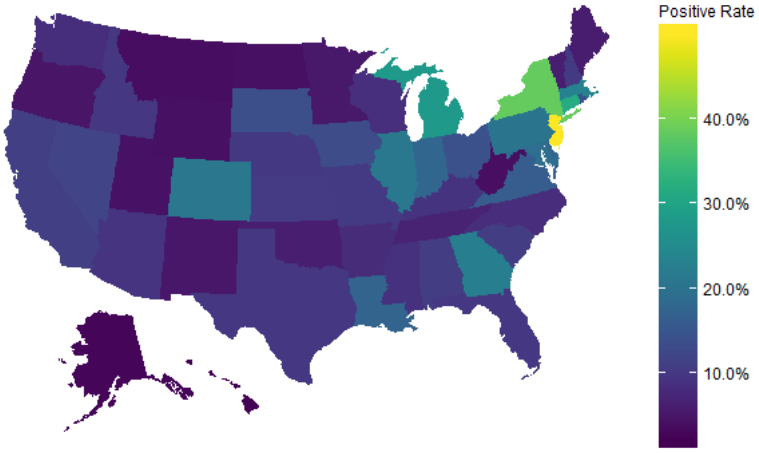
Case Rates

Case rates, or the rate of tests which are positive for COVID-19, vary across the US and reach higher than 40%. A large driver behind this trend is self-quarantine directives: Patients with symptoms are told to stay home as long as the symptoms are manageable. Once severe enough, patients are told to see a doctor and get a test. The true rate is probably much lower, but because we cannot test every individual at this time, this is an unknown.

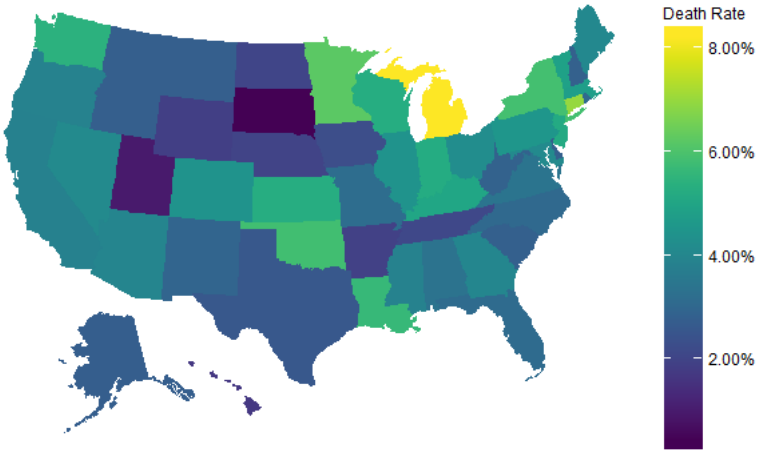
In the heatmap below (Figure 2), we can see that NY and NJ have high positive test rates. This aligns with macro-level trends as this region represents the US "epicenter," where population density is quite high and transmission rates tend to be higher as well. MI sticks out, however. MI has high positive test rates yet low population densities, pointing to poor and inaccessible testing that is only being used for severely ill patients.

Death Rates

Death rates, or the rate of positive cases that result in morbidity, is currently 2.23% for the United States. It tends to be higher for populations with comorbidities and advanced ages. In the heatmap below (Figure 4), there are a few interesting points. WA is higher, but that's mostly due to how COVID-19 had a big impact on older populations. KY, OK, and NY are also rather high, while MI is currently experiencing the highest rate at 8.2%.



Positive Rates



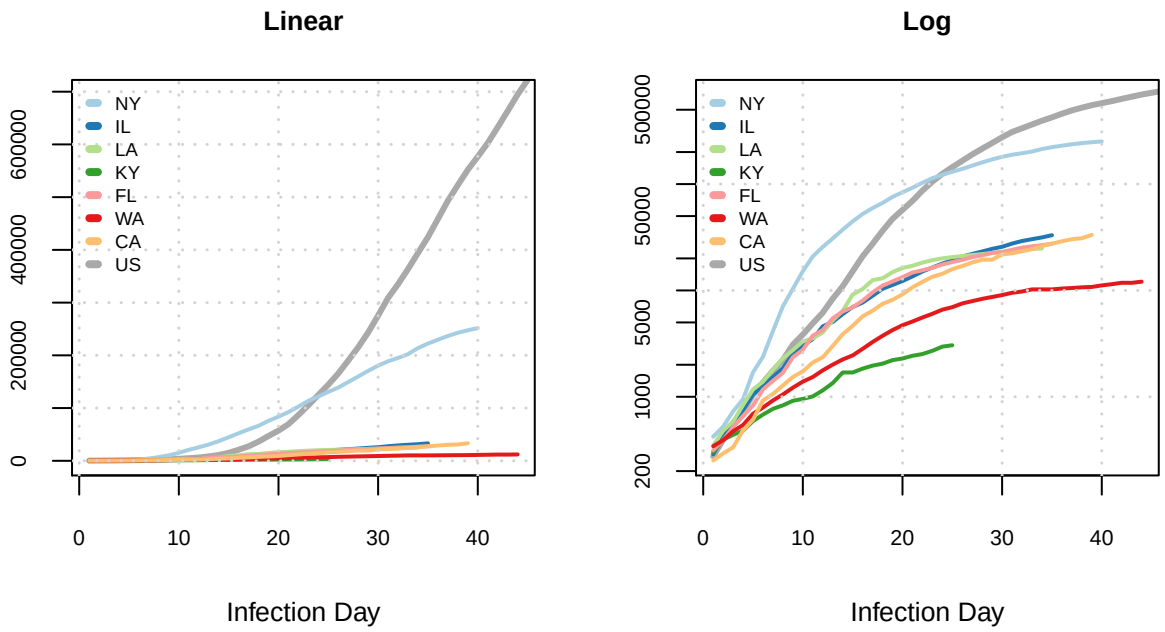
Death Rates

Growth Trends

Although we are still early in the growth curve of the disease (i.e. all states are either in the "Exponential" or "Linear" growth phase), we want to develop a framework for evaluating the severity of the disease and success of treatment among the states. To be able to compare them against each other, we need to look at rates or take a per-capita approach, although looking at total numbers overtime can reveal interesting trends as well. We normalize time among all states by using a baseline "infection day", which equals the first day when the state had reported more than 100 positive cases cumulatively. Because of this, the entire United Sates ("US") total line is sometimes below other states.

Case Growth

The growth of positive cases is directly tied to testing availability, but we can start to see how transmission rates might differ between different states. In Figure 5, you will see the case rates of various states of interest compared to the United States (US). Since infection day, CA and WA have not experienced nearly as much growth in cases as NY. A notable factor in these differences has to do with NY administering more tests per capita (3,176 per 100,000 people) than CA (703) or WA (1,740). The slow growth also points to the successes CA and WA have had in flattening the curve with early implementations of lock-downs and social distancing measures. In fact, WA appears to be reaching its "peak" in Case Velocity. NY and NJ appear to very close to approaching their "peak" in Case Velocity. Not only are new cases in NY and NJ leveling off, but so are state-wide deaths. Please see the Appendix for more information on the current accelerations for these states.



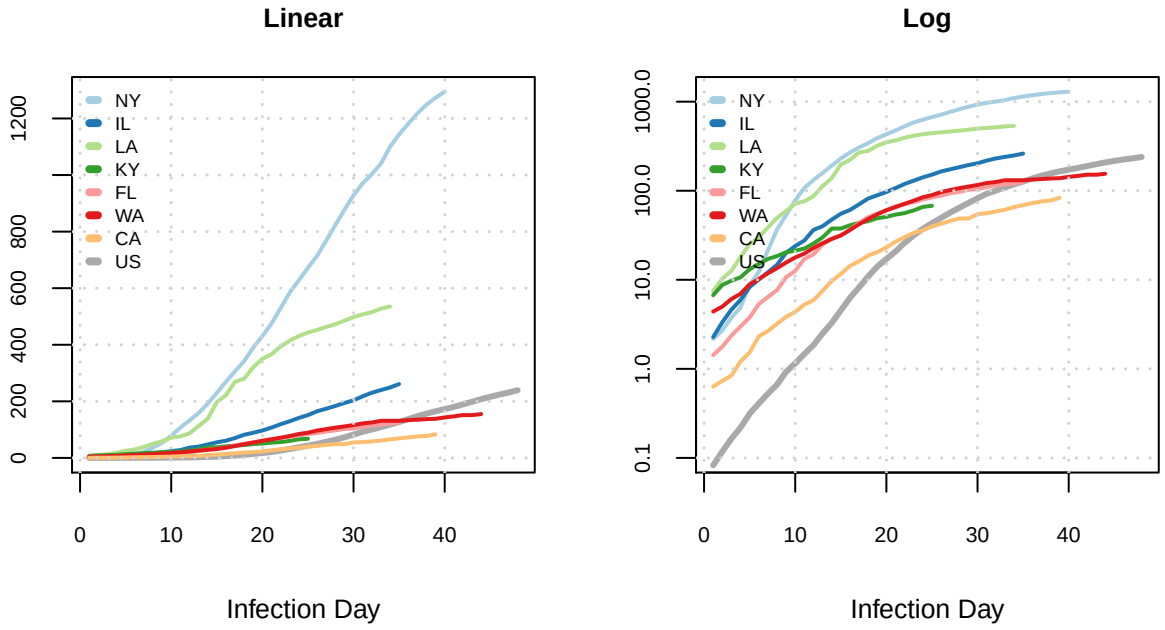
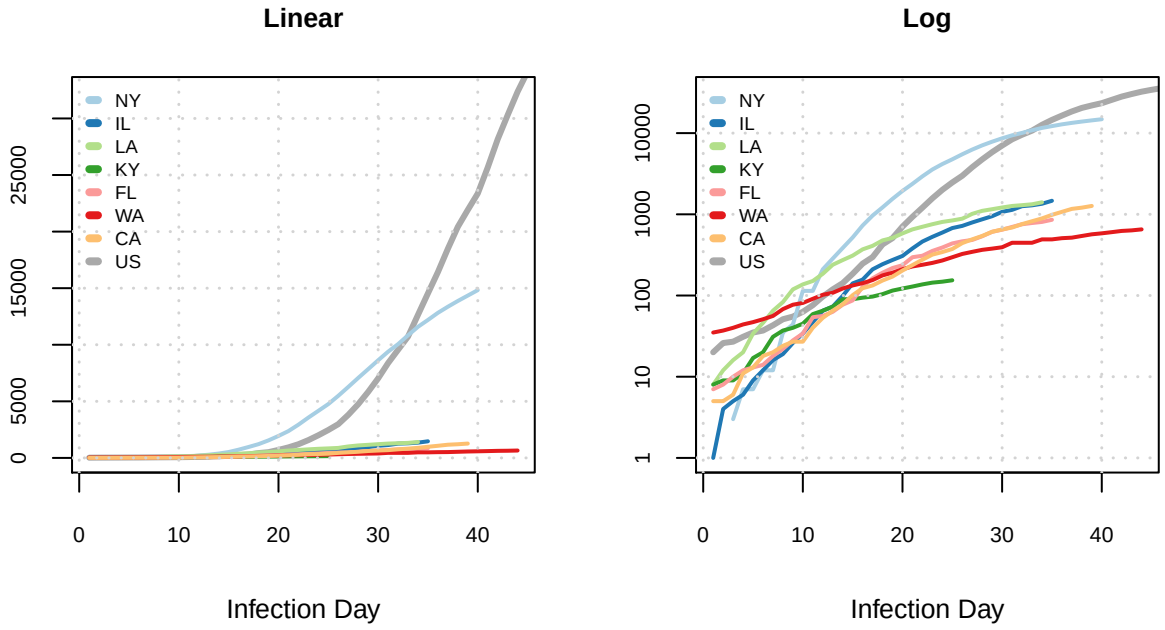


Figure 5: Case Growth

Death Growth

Similarly to cases, we investigate growth in deaths against "infection days". In Figure 6, you will notice that deaths in CA and WA are growing at a much slower rate. This can be attributed to early lock-downs, proper social distancing, and lower population density. Deaths in LA were starting to outpace NY and the US at large due to a spike in the data, but LA deaths have since started to level off. In terms of death rate, KY has performed the worst over the past six days with MI catching up (Figure 6).



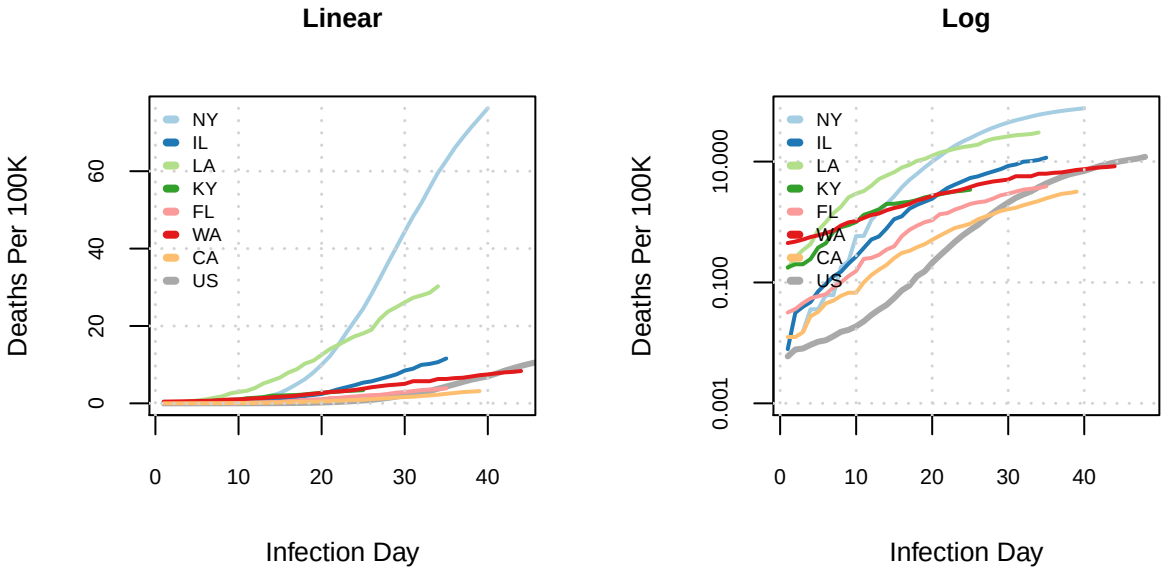


Figure 6: Death Growth

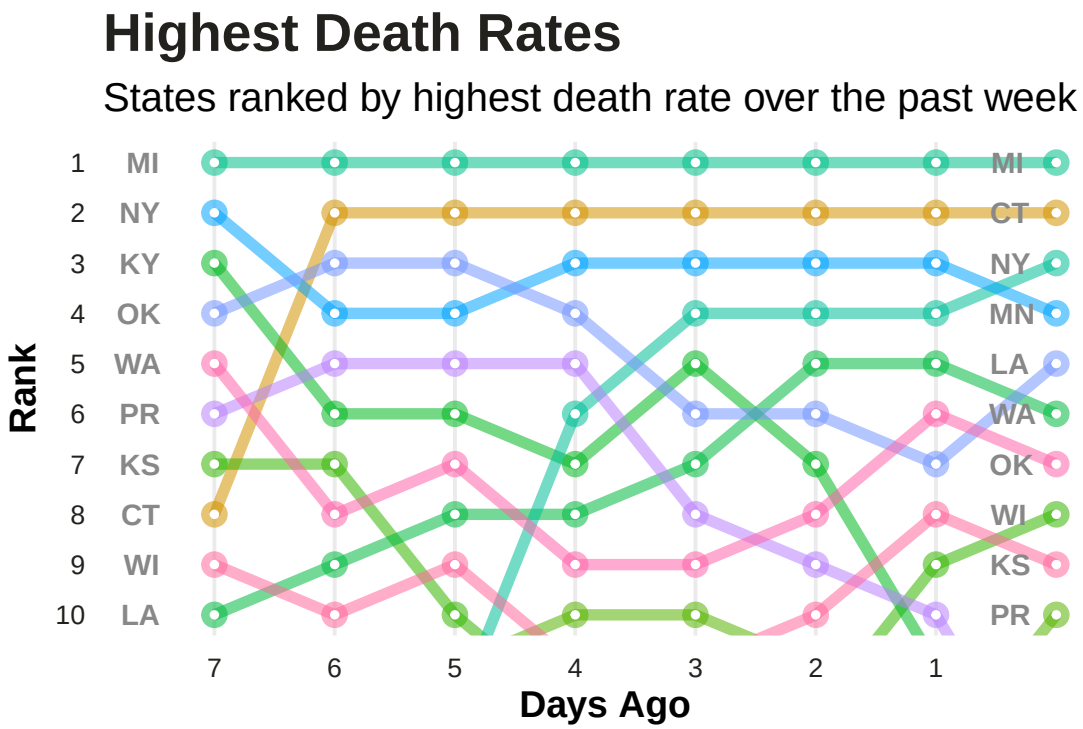


Figure 7: Death Rate Rankings

Measuring Acceleration

The rate at which new observations are growing each day represents the acceleration metrics. We use this to measure states' progressions along the disease growth curve, and these metrics will help flag states that are starting to slow in growth and reverse course towards containment. To measure acceleration, we first need to smooth out the data as reporting on tests, cases, and deaths is not linear. It is common for states to see large daily swings in tests, cases, and velocities that are caused by a variety of unknown forces. To solve for this issue, we apply Weighted Moving Averages ("WMA") velocities and accelerations. The smoothing period for both velocity WMAs and acceleration WMAs is currently set to seven (7) days. This technique gives more weight to recent observations. Here is an example on how the WMA approach changes the trend for NY.

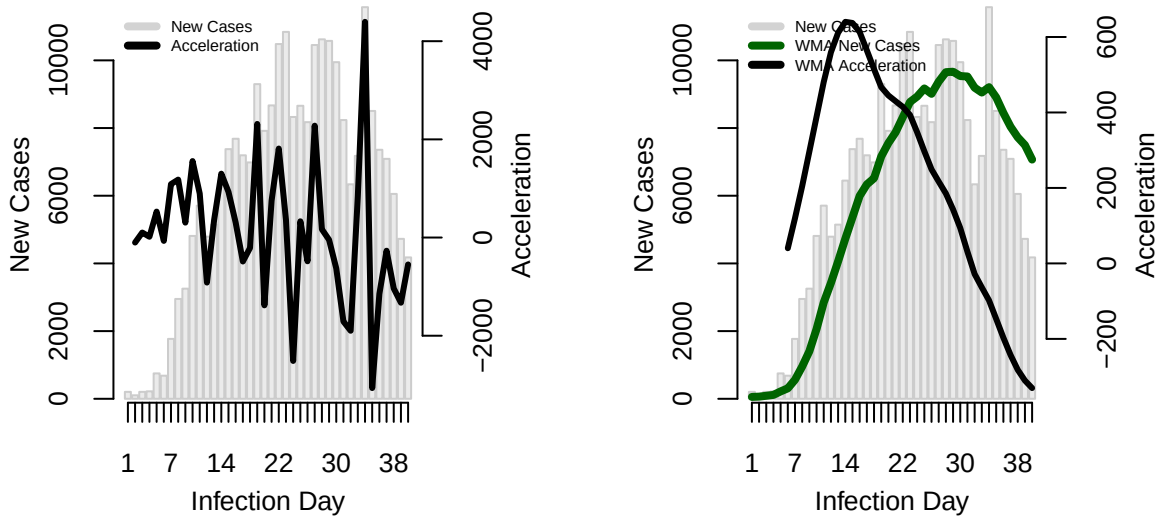
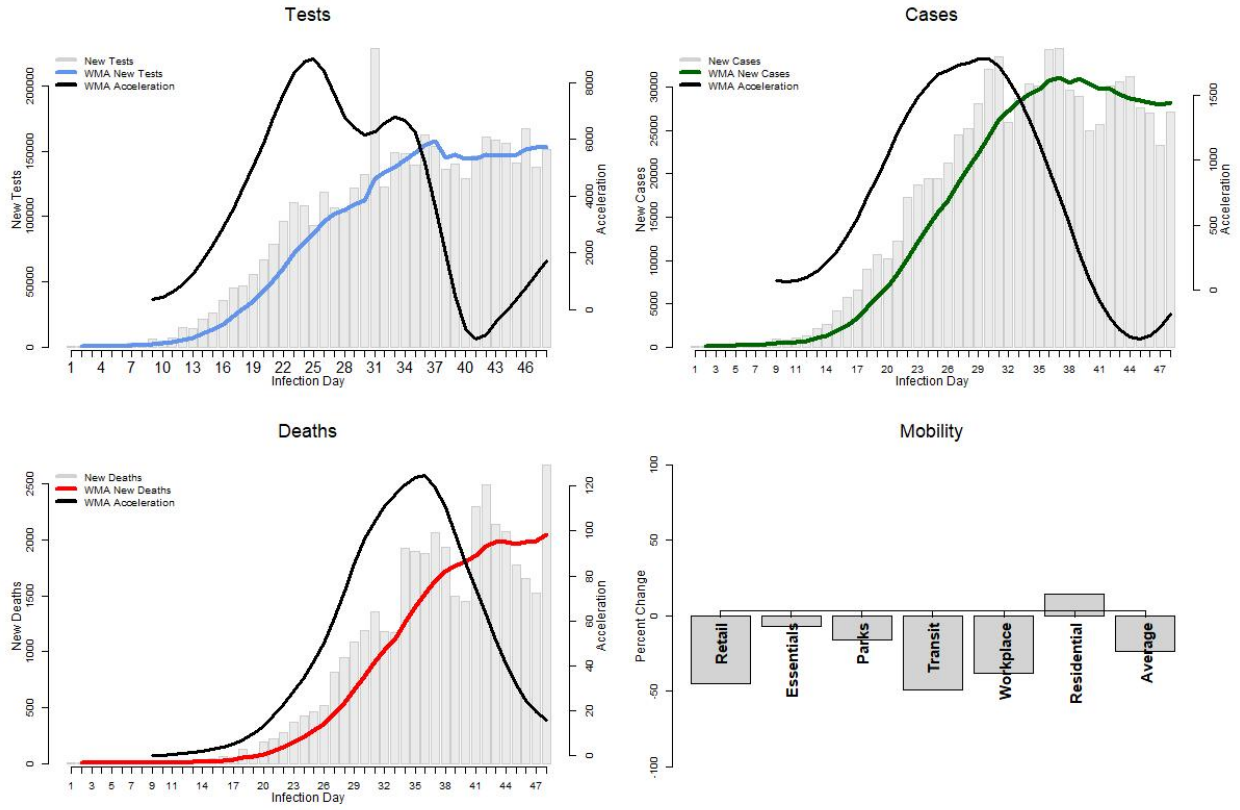


Figure 8: Noisy Data vs. Weighted Moving Average for NY case data

Acceleration in the United States

As a whole, the United States ("US") appears to be peaking in terms of test and case growth, while deaths still accelerating except for many New England states, which are entering the "Improving" phase. Overall, the US appears to be peaking in deaths, and hopefully will continue this trend. Keep in mind, this is only a potential right now. A healthier setup would be if testing was increasing while cases were decelerating like they are. If testing capacity is opening up, hopefully we can start testing patients with less severe symptoms, and eventually asymptomatic individuals as well. Another concern is that we are still hitting higher levels of new deaths. We expect this to follow a similar pattern to cases, but 5-7 days out.

US



State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
US	2020-03-03	4155178	799717	39995	19.2	5	27193	2674

Figure 9: United Sates Acceleration and Mobility Data

Acceleration charts for all states for tests, cases, and deaths can be found in the appendix.

State Comparisons

We now compare the velocity and accelerations of tests, cases, and deaths on a per-capita basis using 100,000 to normalize. The following graphs show the outliers for each category after plotting both the velocity and acceleration of the most recent observation. Velocity is a weighted moving average of new daily observations, while acceleration is the rate of change of the velocity. We have yet to plot the course of these values through time, but when considering the phases of disease spread, we would expect states to follow this path: going from the origin to top-right (Phase 1 of Figure 1), then to top-left as acceleration turns negative (Phase 2 and 3), and back down to the origin as the velocity of new observations shrinks to zero (Phase 4).

Testing

With testing, we can see that it is increasing, but the rate of new tests is starting to fall for many states. ME, RI, and other New England states, however, are starting to ramp up testing.

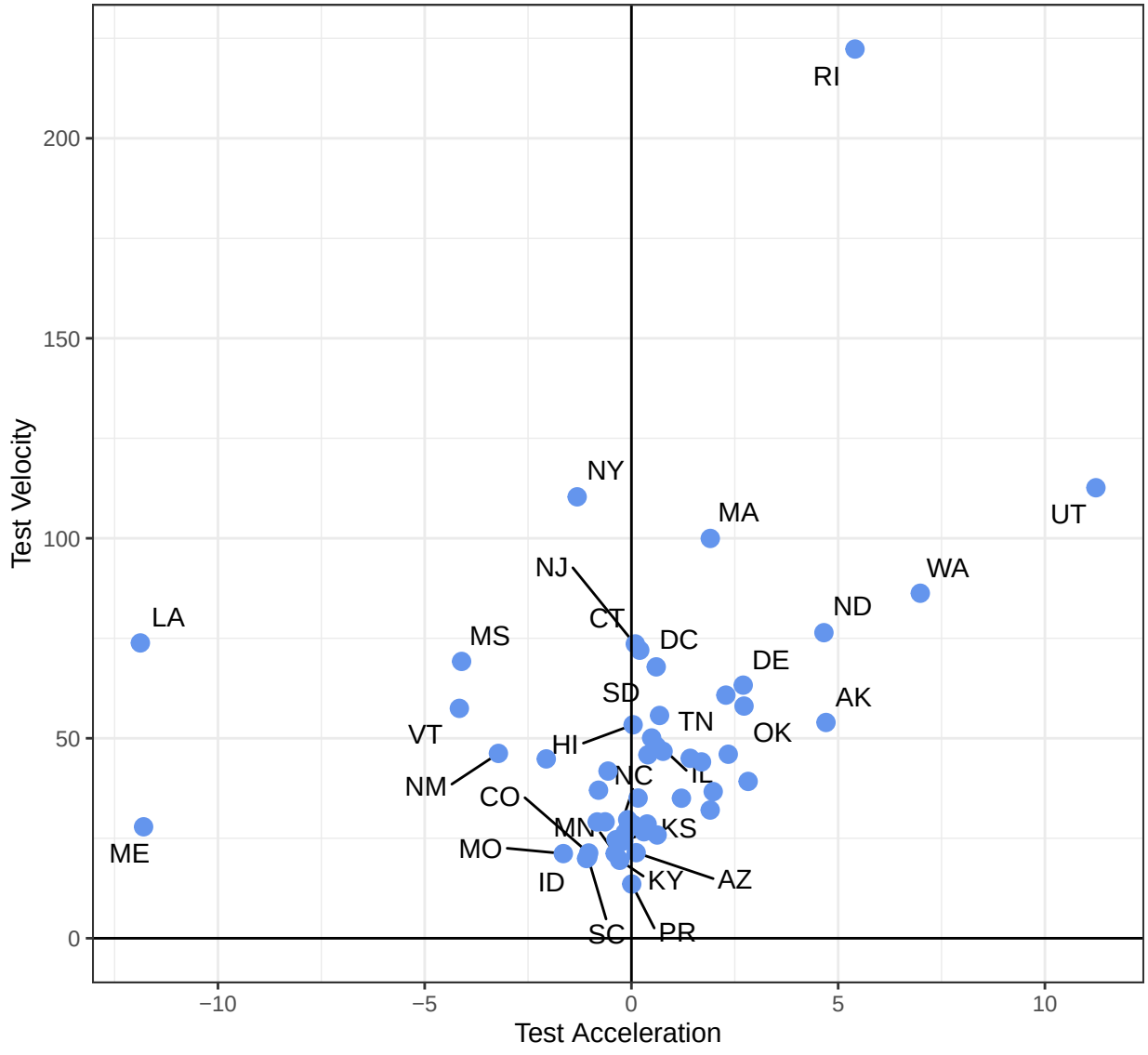


Figure 10: Test Acceleration and Velocity

Cases

For cases, New England stands out as quickly entering an improving phase. We can see many of those states are entering negative acceleration for cases, while a week ago they were going through a period of high acceleration. NJ and NY recently started decelerating, indicating that they are starting to get things under control. LA has a very negative acceleration and small velocity and turned the corner very quickly after some severe case growth.

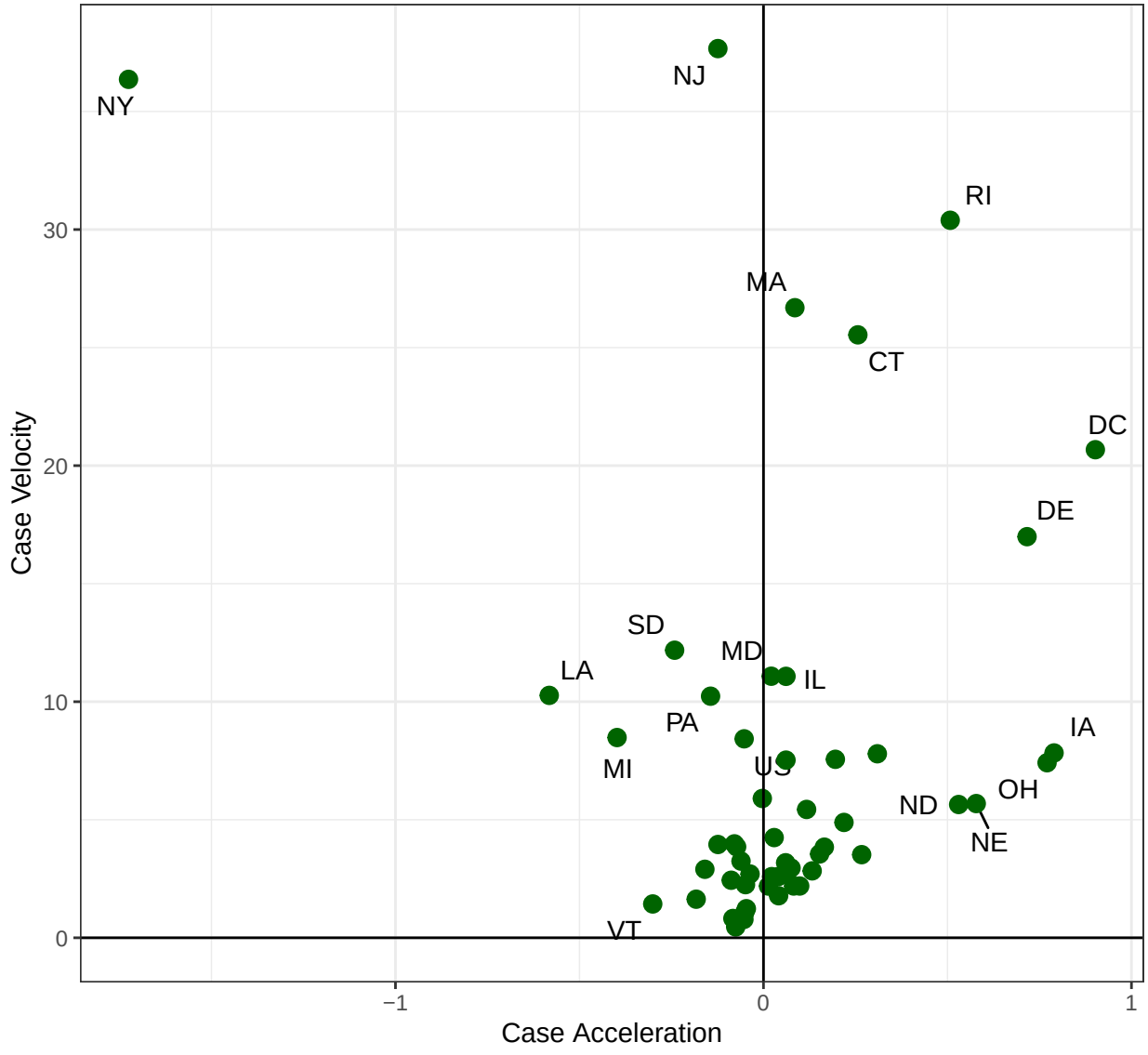


Figure 11: Case Acceleration and Velocity

Deaths

A vast majority of states are still experiencing acceleration in deaths, but NY is experiencing a remarkable slow-down. Even though Case Velocities are dropping, we would expect a peak in Death Velocities to come 5-7 days following peaks in Case Velocities. NJ, CT, MA and RI look to be close behind NY.

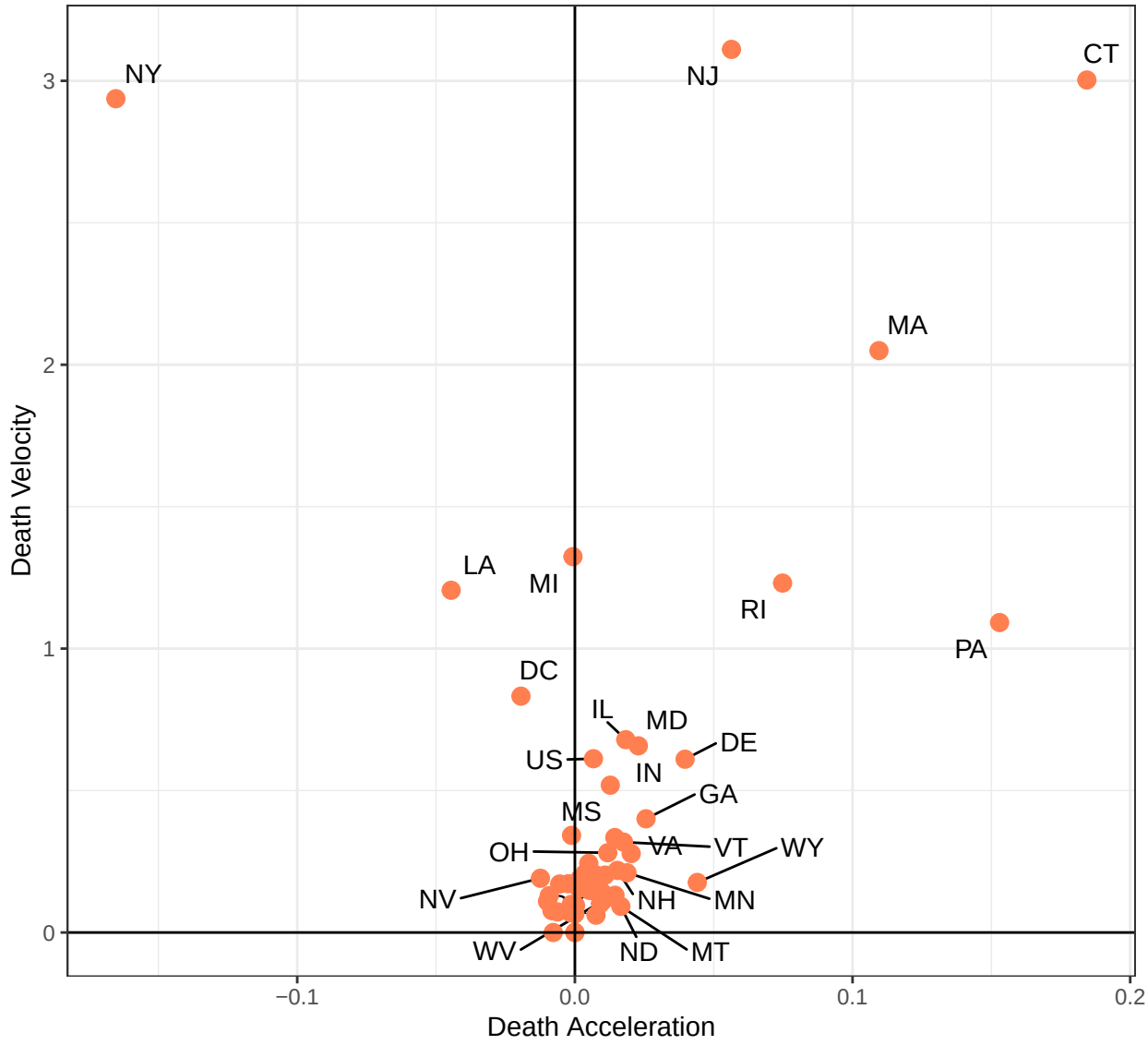


Figure 12: Death Acceleration and Velocity

Here is a second view that measures acceleration over time for select states. We can see the acceleration curve from Figure 1 forming for some states for cases and deaths. NY is a prime example of this as they are getting the spread under control. Testing is rather noisy and doesn't seem to be very predictable for any state.

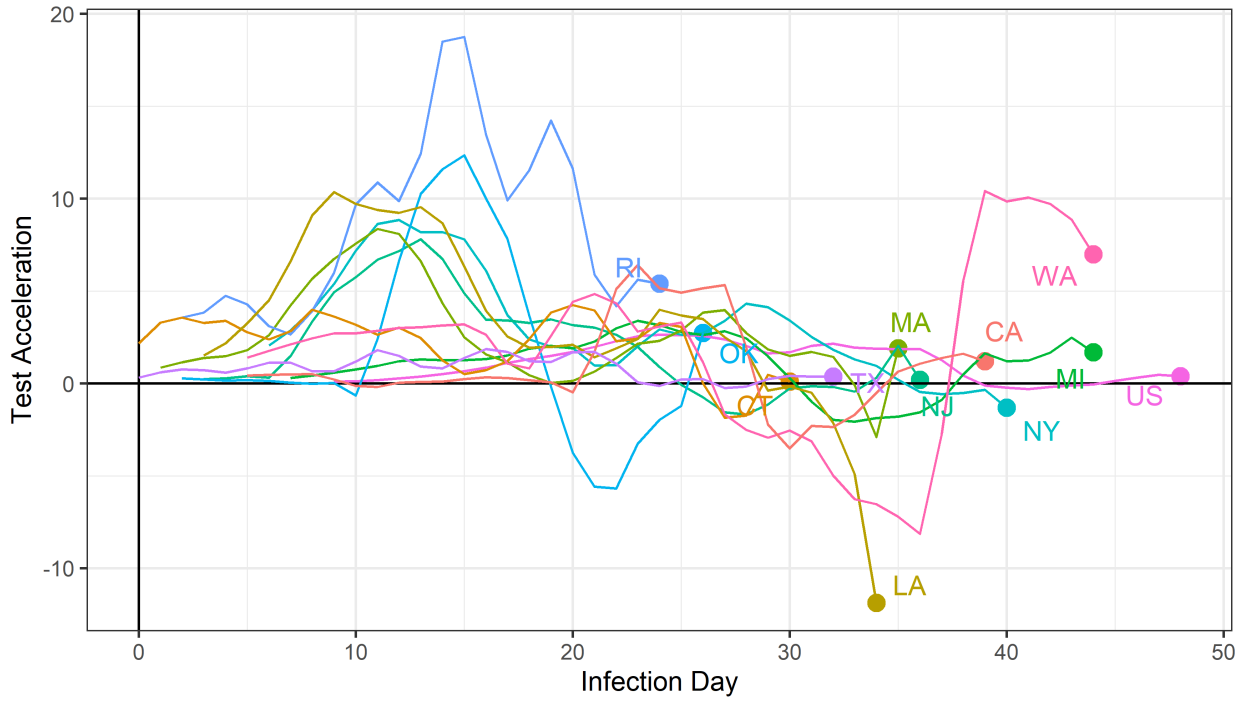


Figure 13: Test Acceleration over Time

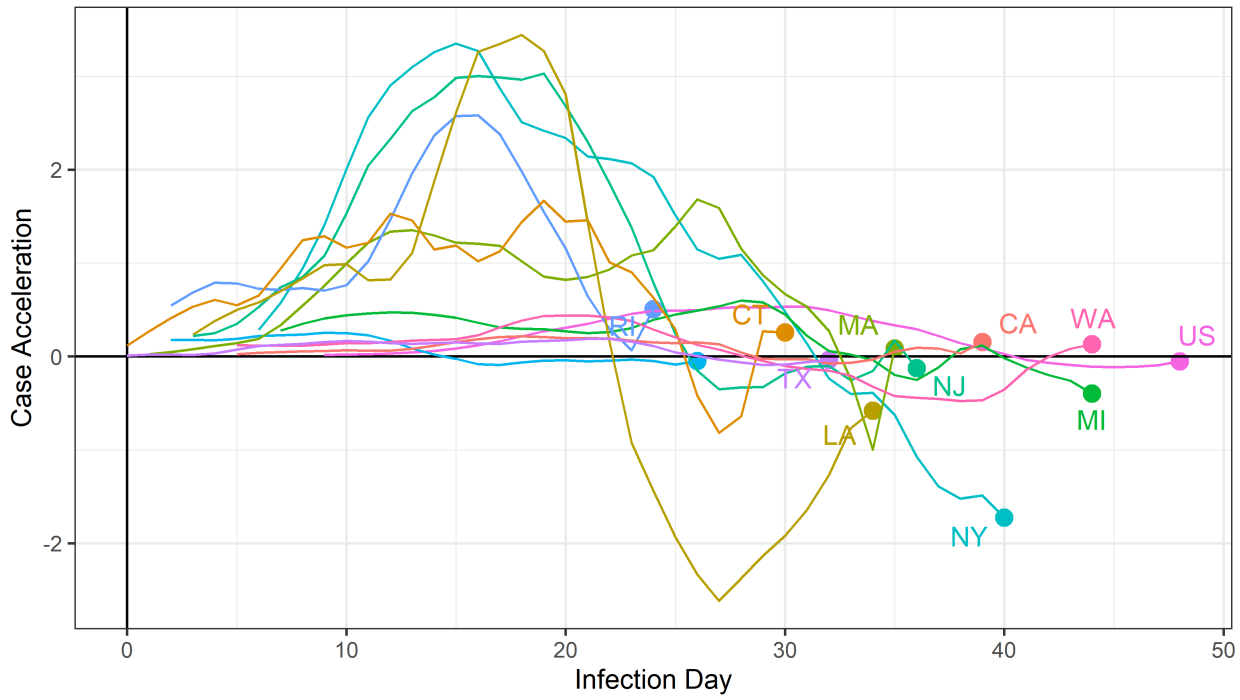


Figure 14: Case Acceleration over Time

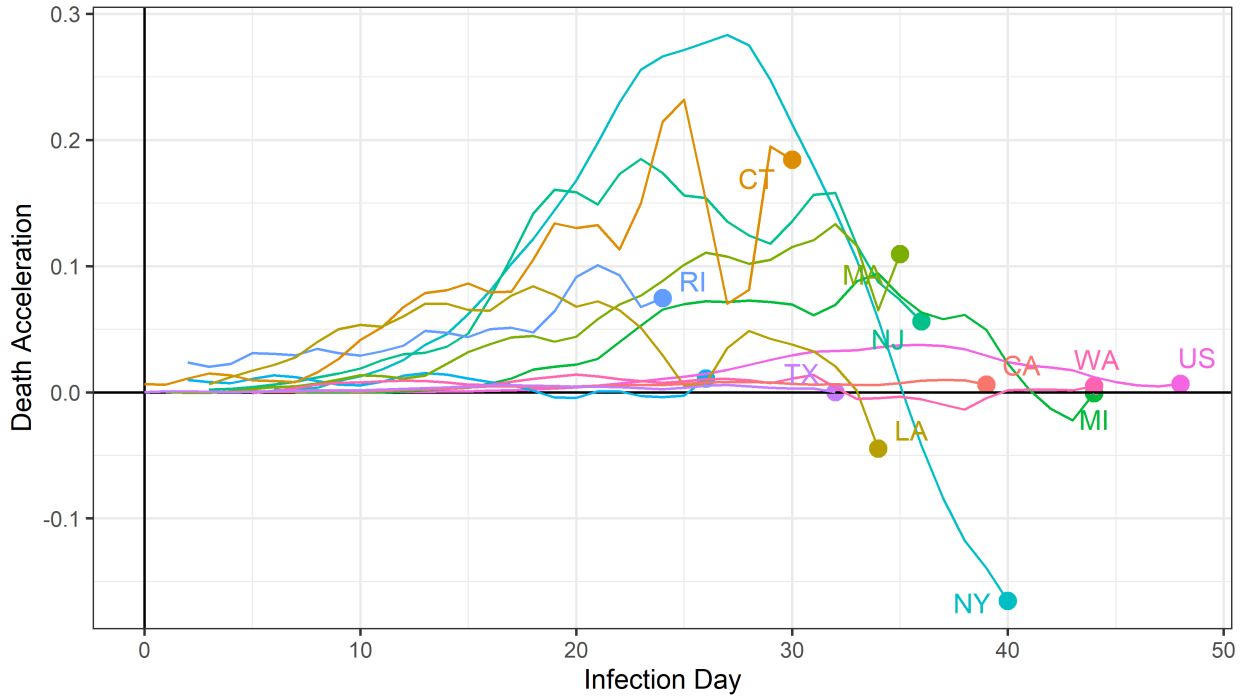


Figure 15: Death Acceleration over Time

We can now assign states to each stage of the acceleration curve using new cases. The main driver for assigning these categories is per-capita WMA acceleration, taking into account the history of acceleration for each state:

- Exponential: Acceleration is positive. If acceleration nearing zero, acceleration must be at maximum (or else is considered "Linear")
- Linear: Acceleration is positive but nearing zero. Acceleration is not at its maximum (or else is considered "Exponential")
- Improving: Acceleration is negative.
- Containment: Acceleration is near zero, is not the minimum or maximum, and must have low velocity (i.e. New Cases have peaked).

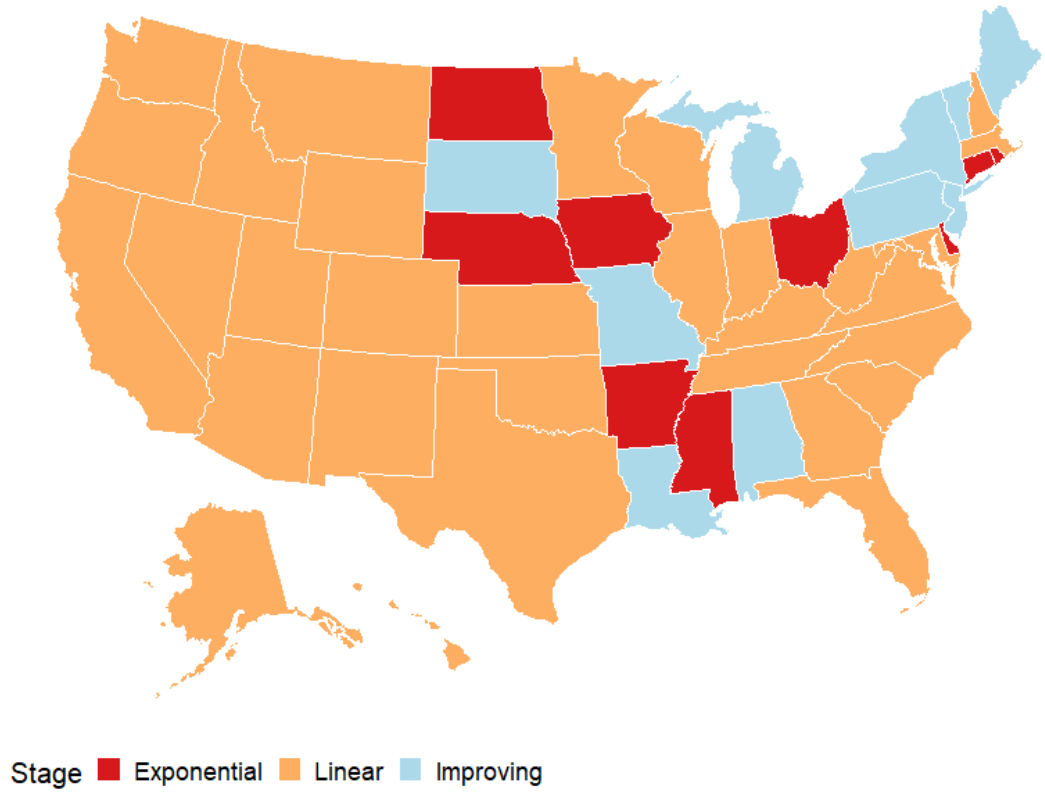


Figure 16: Case Acceleration Phase

County Data

Here is our first look at county data. The table lists the top 25 counties in terms of case load. Unfortunately, we do not have access to testing data yet, so we can only see cases and deaths. NY and NJ are a major portion of this list, while Wayne, MI stands out as having the highest death rate at 8.3%.

Metrics as of 2020-04-21

State	County	Cases	Deaths	Death Rate (%)
NY	New York City	136816	10009	7.3
NY	Nassau	30677	1638	5.3
NY	Suffolk	27662	887	3.2
NY	Westchester	24306	867	3.6
IL	Cook	22101	915	4.1
MI	Wayne	13912	1148	8.3
CA	Los Angeles	13816	617	4.5
NJ	Bergen	13011	787	6.0
NJ	Hudson	11150	492	4.4
NJ	Essex	10729	751	7.0
NJ	Union	9972	387	3.9
FL	Miami-Dade	9656	223	2.3
PA	Philadelphia	9553	370	3.9
NY	Rockland	9457	286	3.0

State	County	Cases	Deaths	Death Rate (%)
MA	Middlesex	9253	402	4.3
NJ	Passaic	8479	263	3.1
NJ	Middlesex	8346	345	4.1
CT	Fairfield	8320	512	6.2
MA	Suffolk	8314	263	3.2
NY	Orange	6497	169	2.6
MI	Oakland	6178	479	7.8
LA	Orleans	6148	339	5.5
LA	Jefferson	5761	286	5.0
MA	Essex	5296	225	4.2
WA	King	5295	362	6.8

Conclusions

- Overall, the United States has reached an initial "peak" in New Case Velocity and New Case Acceleration has turned negative. Despite concern in Testing Velocity reaching a plateau, New Death Acceleration has been dropping across the US for the past week - signaling a positive trend across the country.
- Early indications from New Case Velocity and Acceleration following the initial US "peak" are that the deceleration of new cases will take place over a much longer period of time than the rapid acceleration of new cases that led to the "peak." In simpler terms, it appears that the recovery following the initial "peak" will take significantly longer than the duration of the Exponential Growth and Linear Growth stages. This trend is in line with what other countries across the world experienced with COVID-19.
- In terms of new cases, the majority of states are currently either in Stage 1 (Exponential Growth) or Stage 2 (Linear Growth). Several starts have entered or are soon to enter Stage 3 (Improving), as their New Case Accelerations have fallen below zero.
- Although some states appear to be entering Stage 3 (Improving) according to New Case Accelerations, falling Testing Velocities in these states may be falsely indicating improvement in New Cases. An example of such a state is Florida.
- Reduced mobility caused by lockdowns and social distancing measures continues to be strongly correlated with deceleration of new cases.
- Louisiana represents an outlier in that it encountered both a rapid acceleration AND a rapid deceleration of new cases within a short period of time. We hypothesize that this may have been caused by a short, high-impact infection event, such as Mardi Gras celebrations
- California and Washington are experiencing remarkable early success in flattening the curve, with slower growth rates per-capita in cases and deaths. However, they are assigned to the Linear phase as case acceleration is slightly positive. We will be monitoring this trend closely to see how it develops over time.

Next Steps

Here are some future developments for this report:

- Assign Stage labels to counties

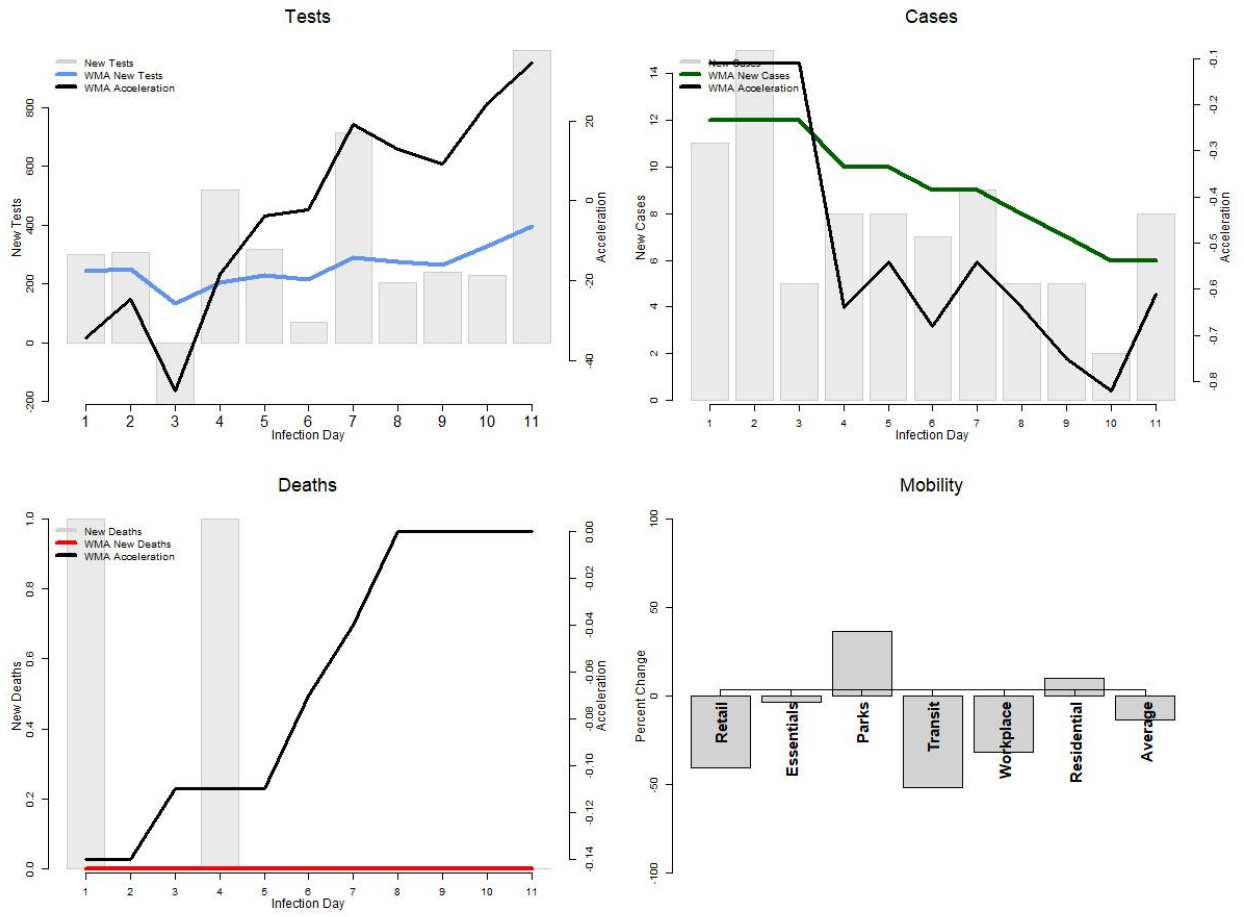
- Predict future velocities and accelerations using simple exponential smoothing and regression techniques
- Cluster states in terms of "success" (with success defined by those reaching containment) and measure variable importance
- Ingest and model weather data, including temperature and humidity

Appendix

State Data

The following graphs show how new tests, cases, and deaths are changing from day to day. They are smoothed using a Weighted Moving Averaged of 7 days for the velocity and 7 days for the acceleration. The fourth plot shows change in mobility from pre-COVID to today. This data expresses how movement in each state have decreased or increased post-COVID. In general, traffic is down across the board except for the Parks and Residential categories. Finally, we show the most recent cumulative and differenced data for each state.

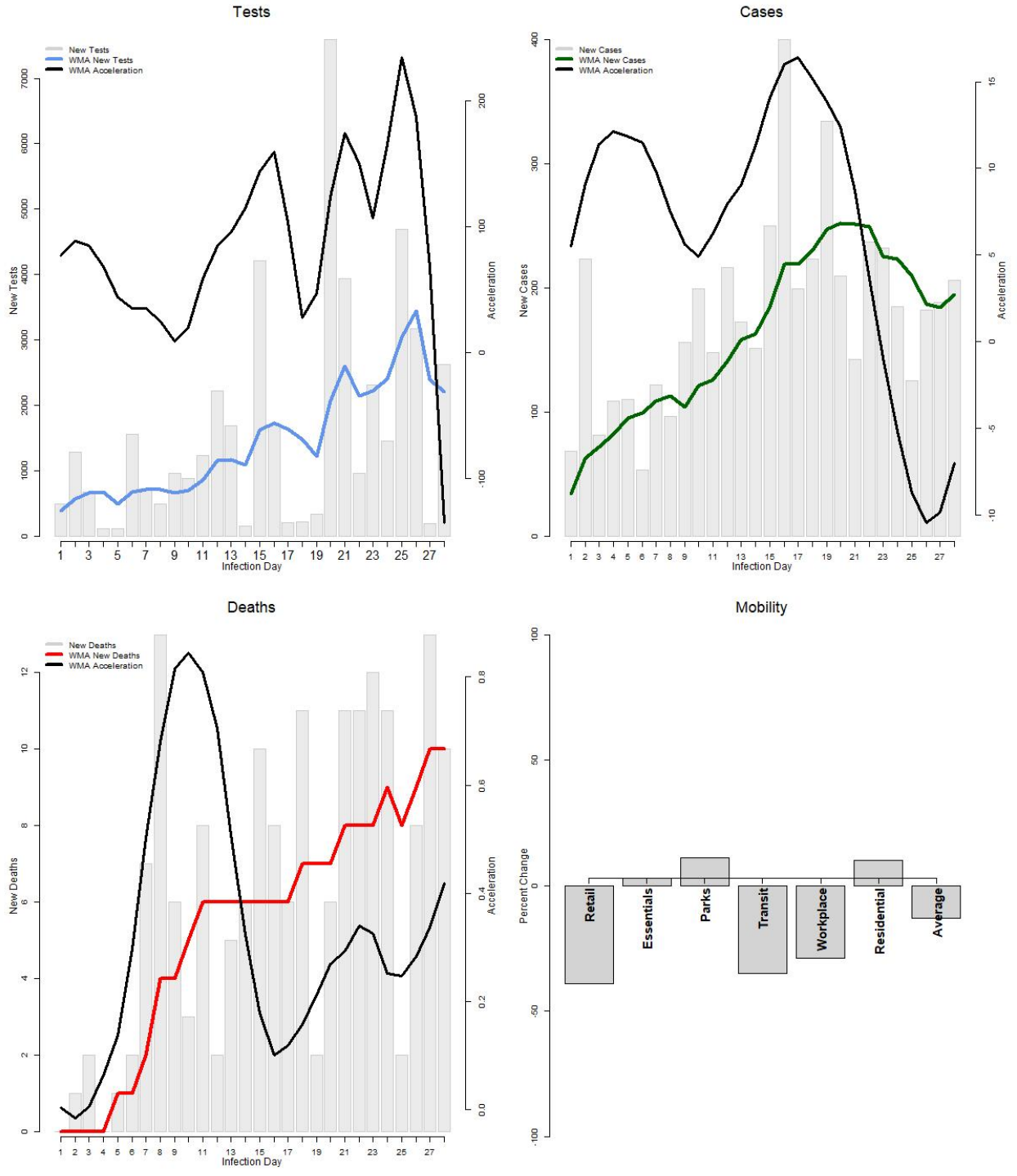
AK



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
AK	2020-04-09	11119	329	9	3	2.7	8	0

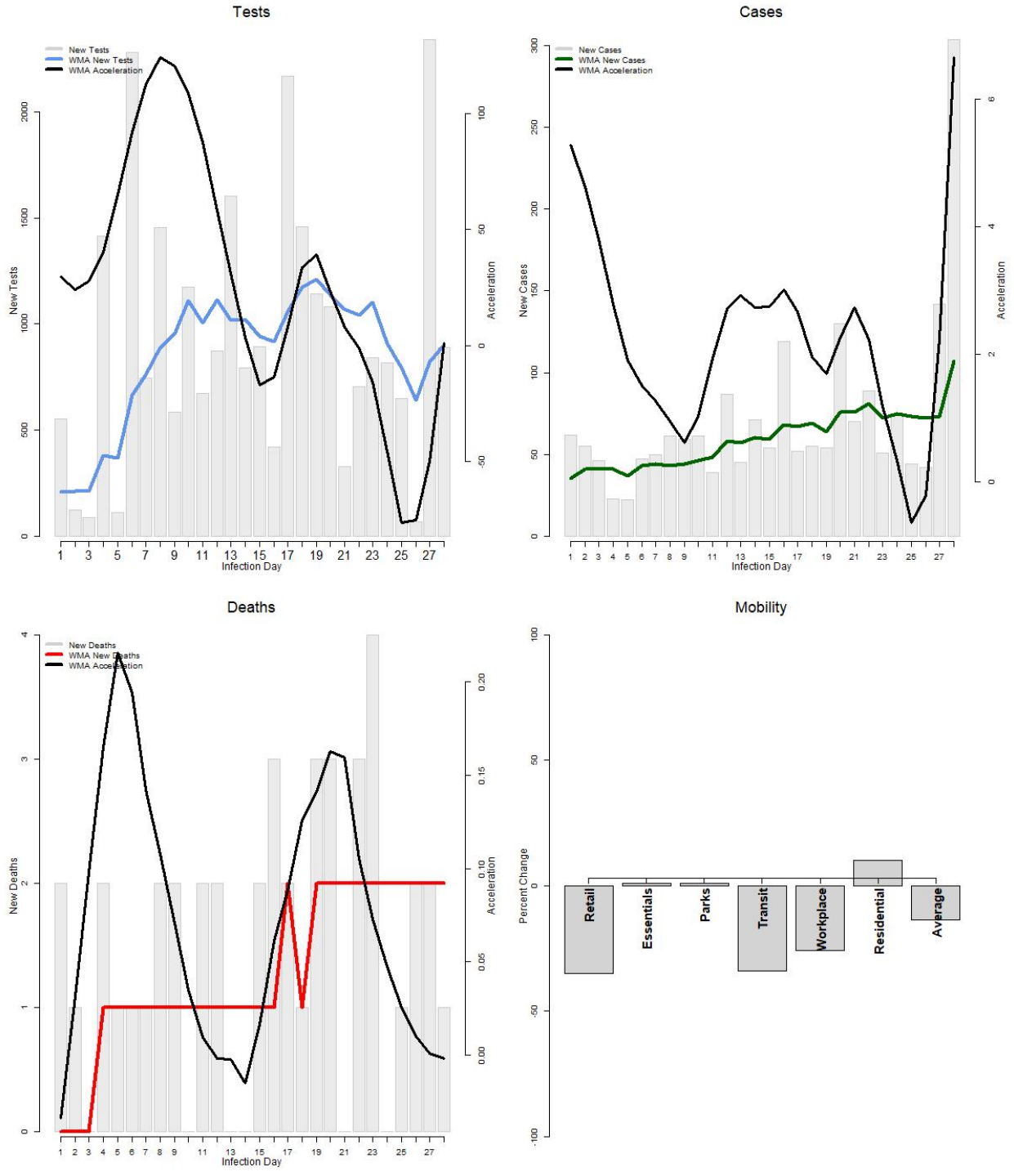
AL



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
AL	2020-03-23	48526	5231	177	10.8	3.4	206	10

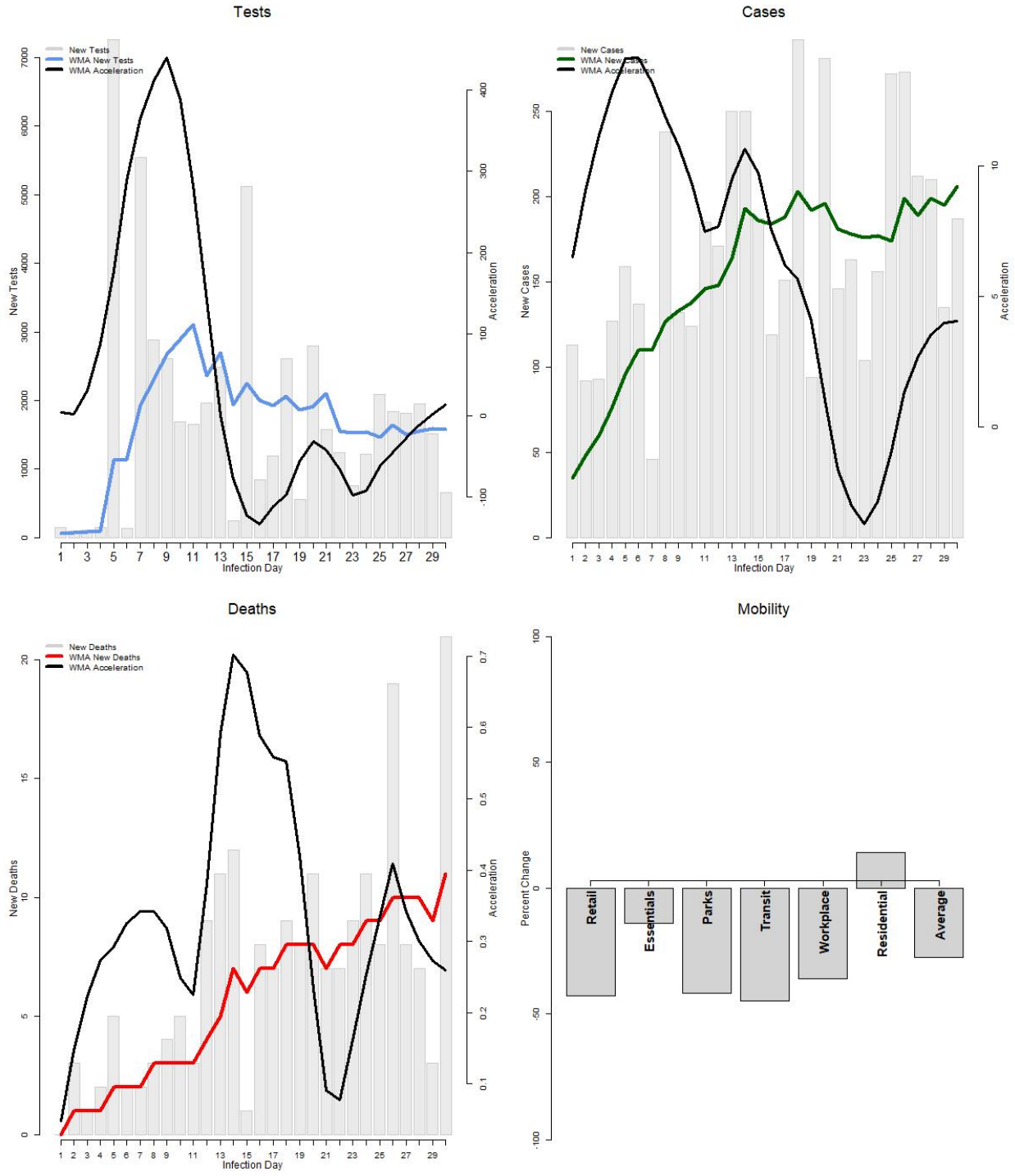
AR



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
AR	2020-03-23	27441	2227	43	8.1	1.9	304	1

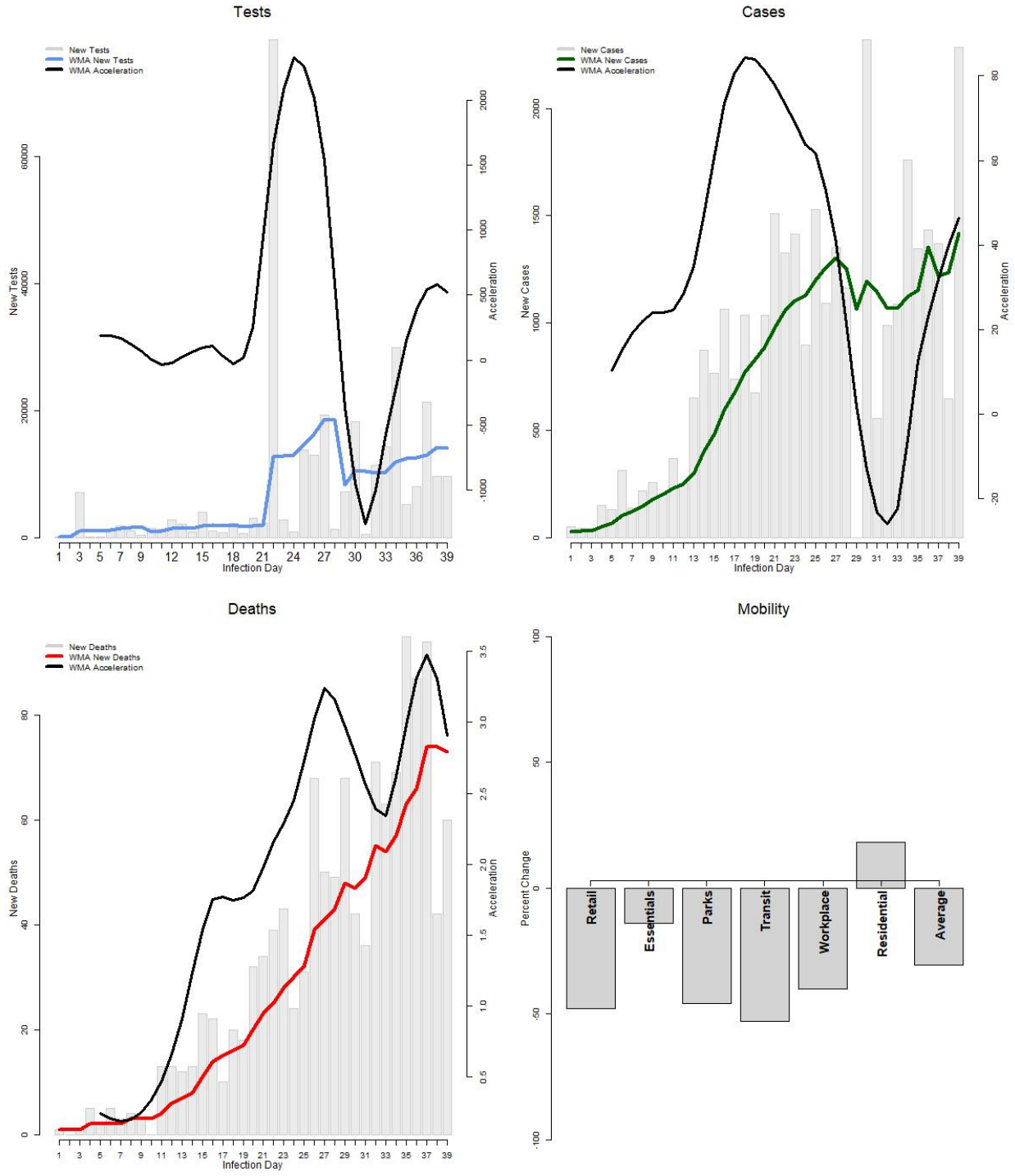
AZ



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
AZ	2020-03-21	55152	5251	208	9.5	4	187	21

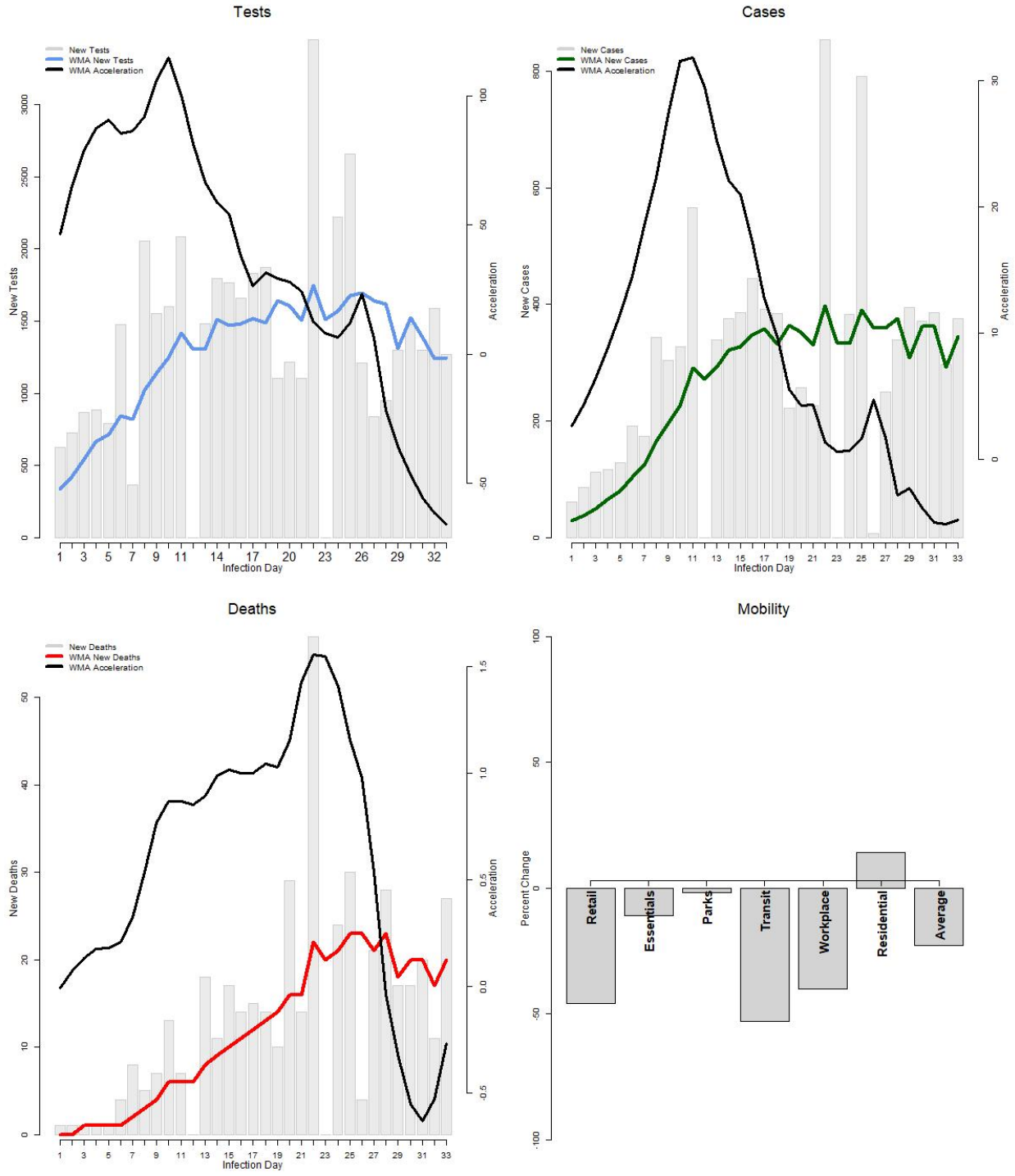
CA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
CA	2020-03-12	300100	33261	1268	11.1	3.8	2283	60

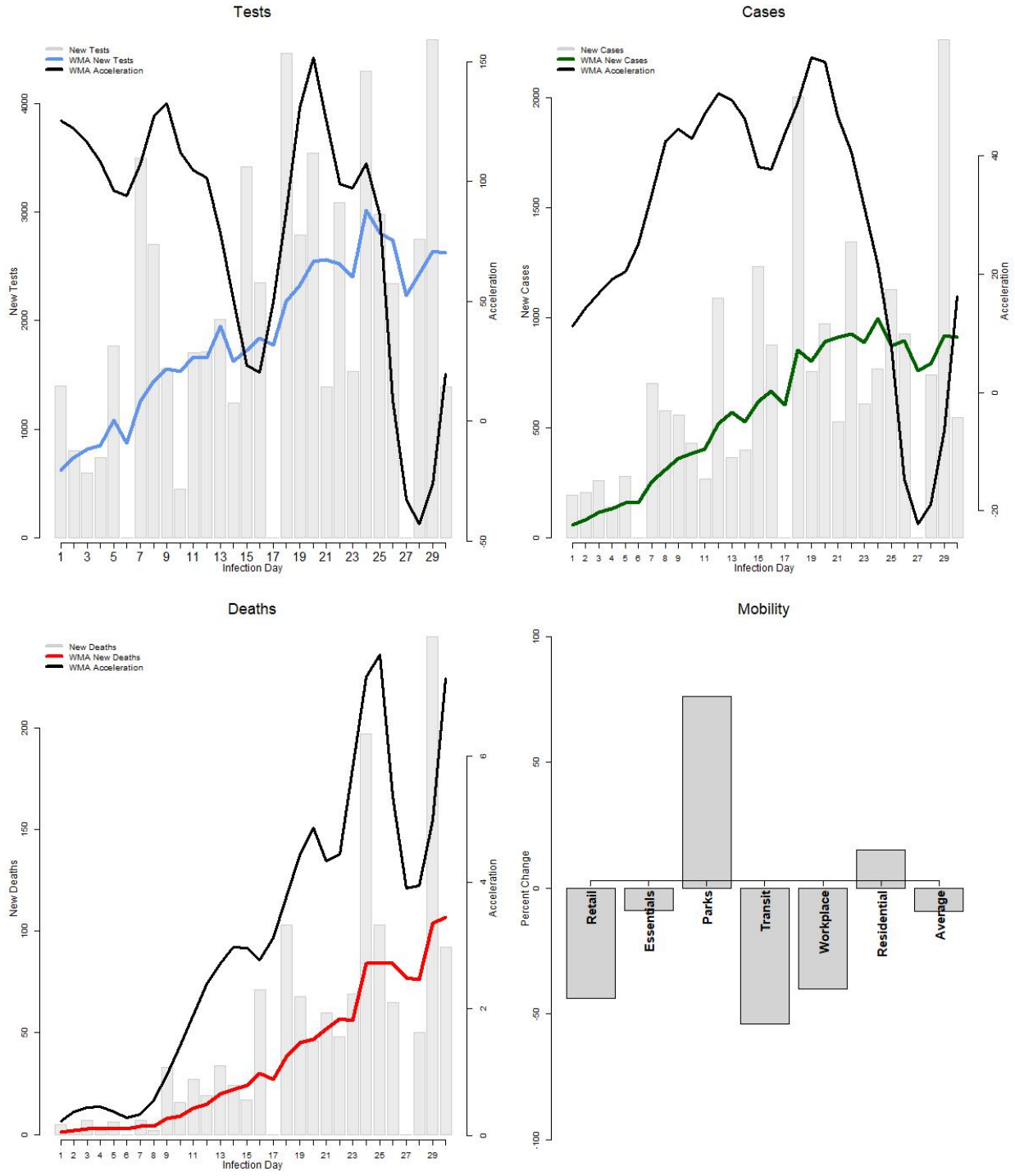
CO



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
CO	2020-03-18	47466	10106	449	21.3	4.4	376	27

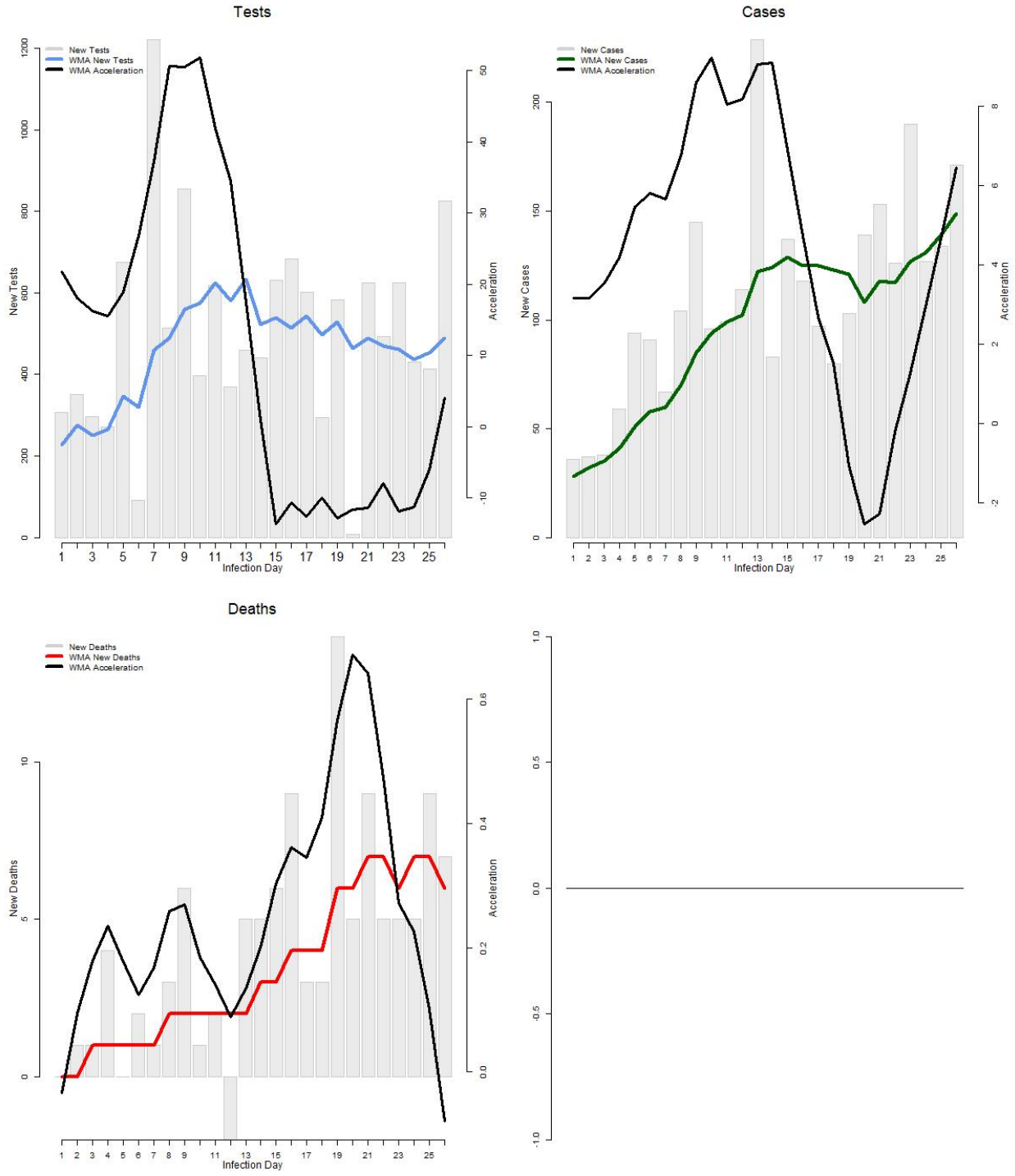
CT



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
CT	2020-03-21	64192	20360	1423	31.7	7	545	92

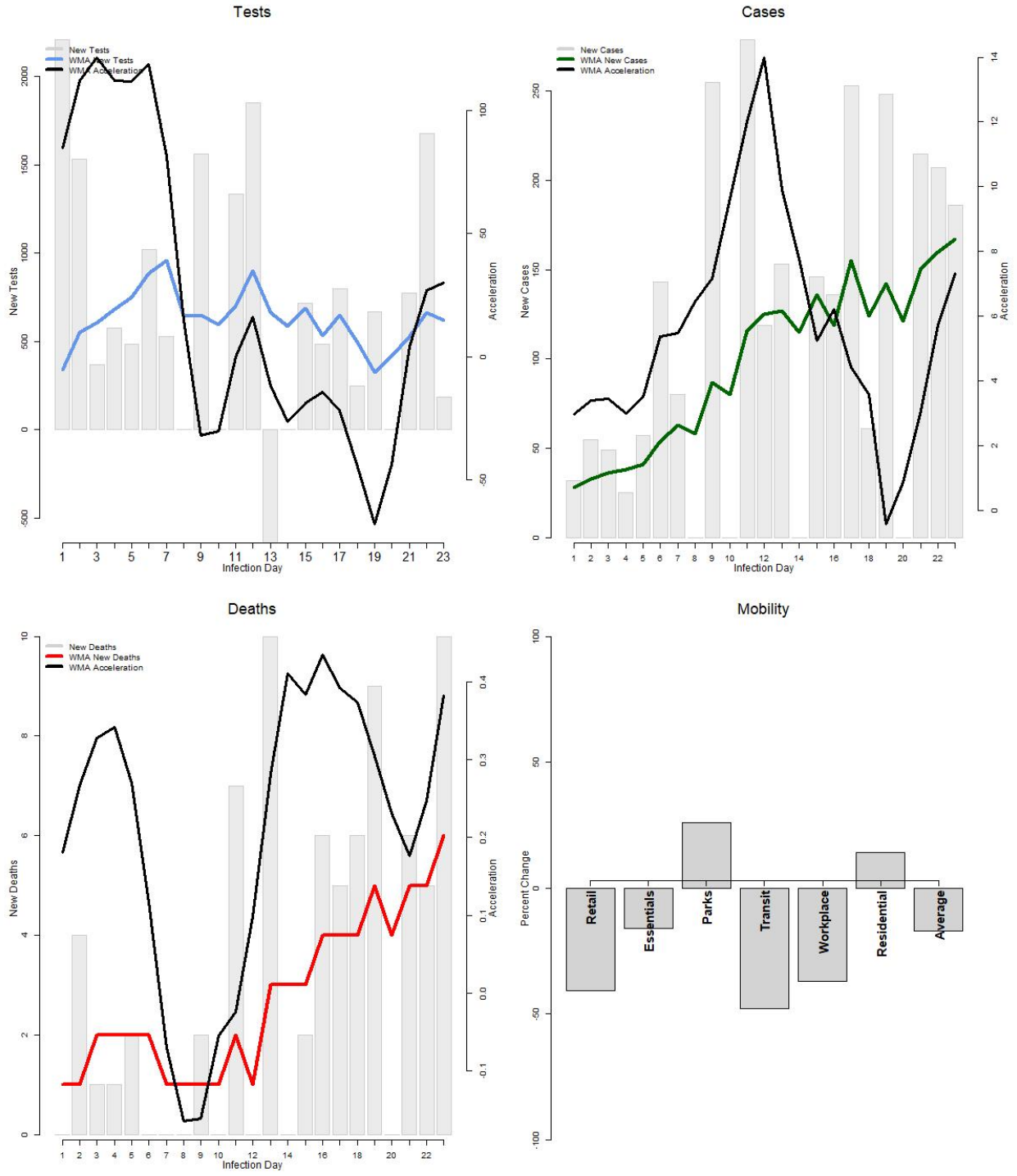
DC



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
DC	2020-03-25	14939	3098	112	20.7	3.6	171	7

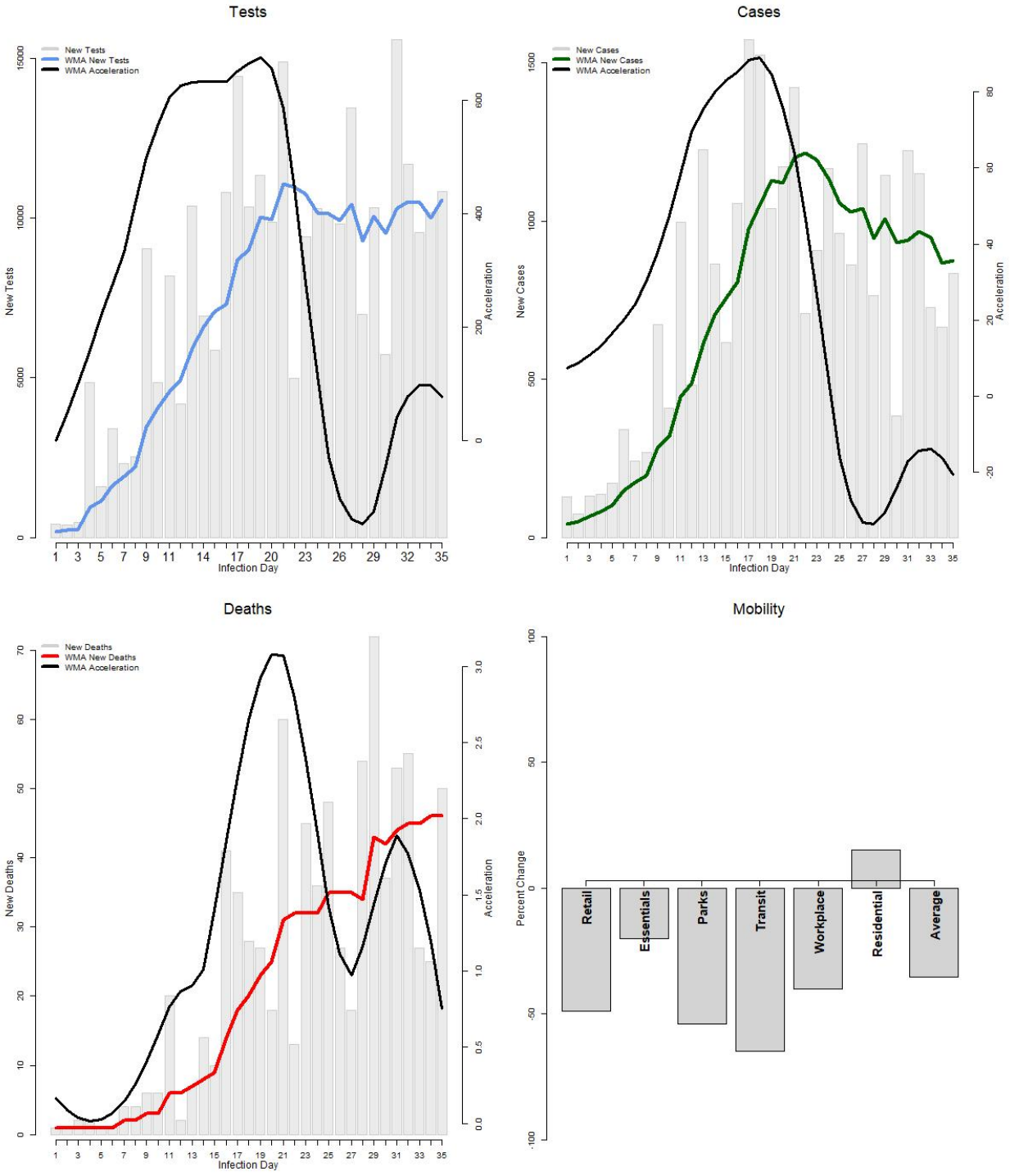
DE



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
DE	2020-03-28	16656	2931	82	17.6	2.8	186	10

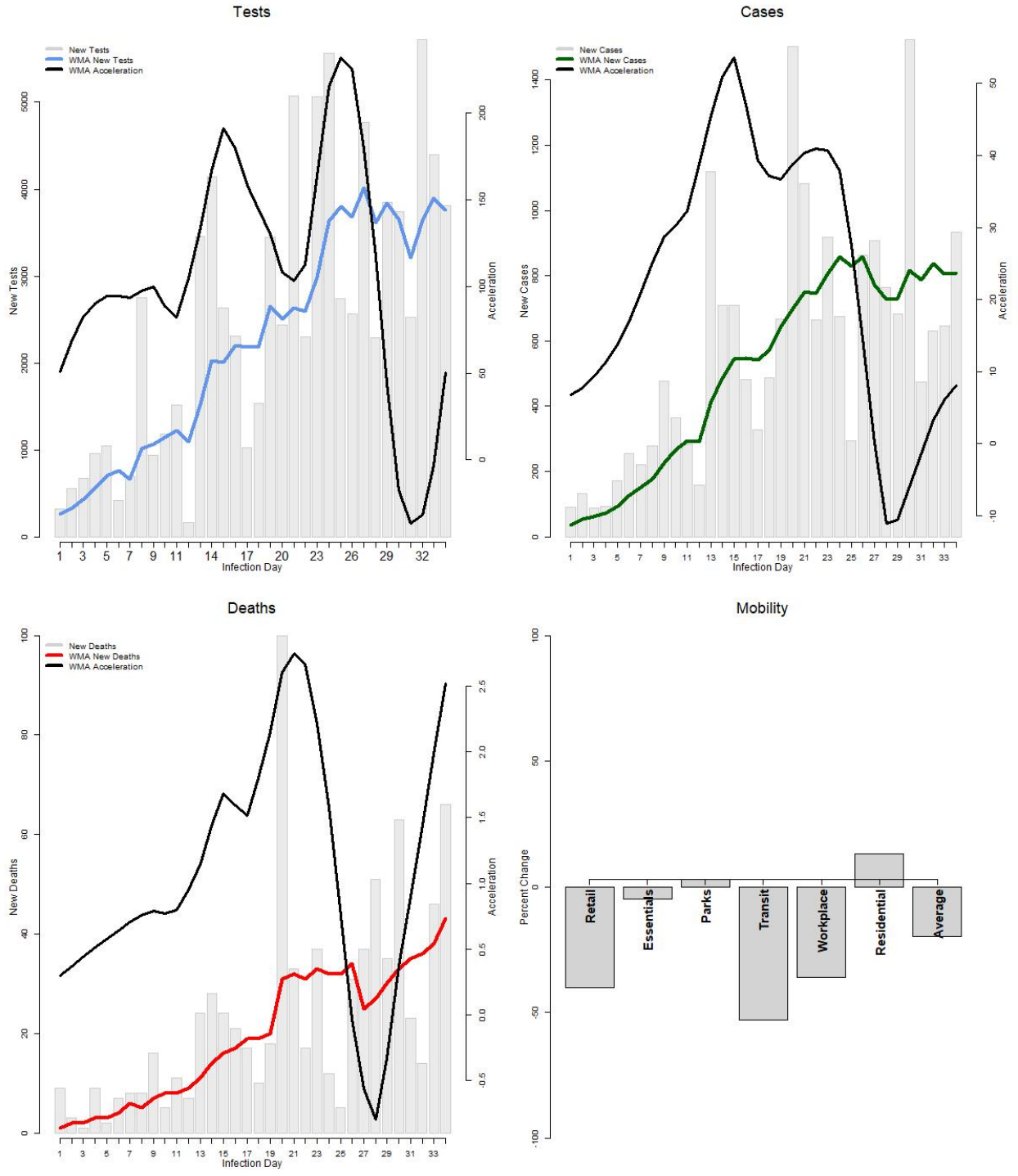
FL



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
FL	2020-03-16	277059	27495	856	9.9	3.1	835	50

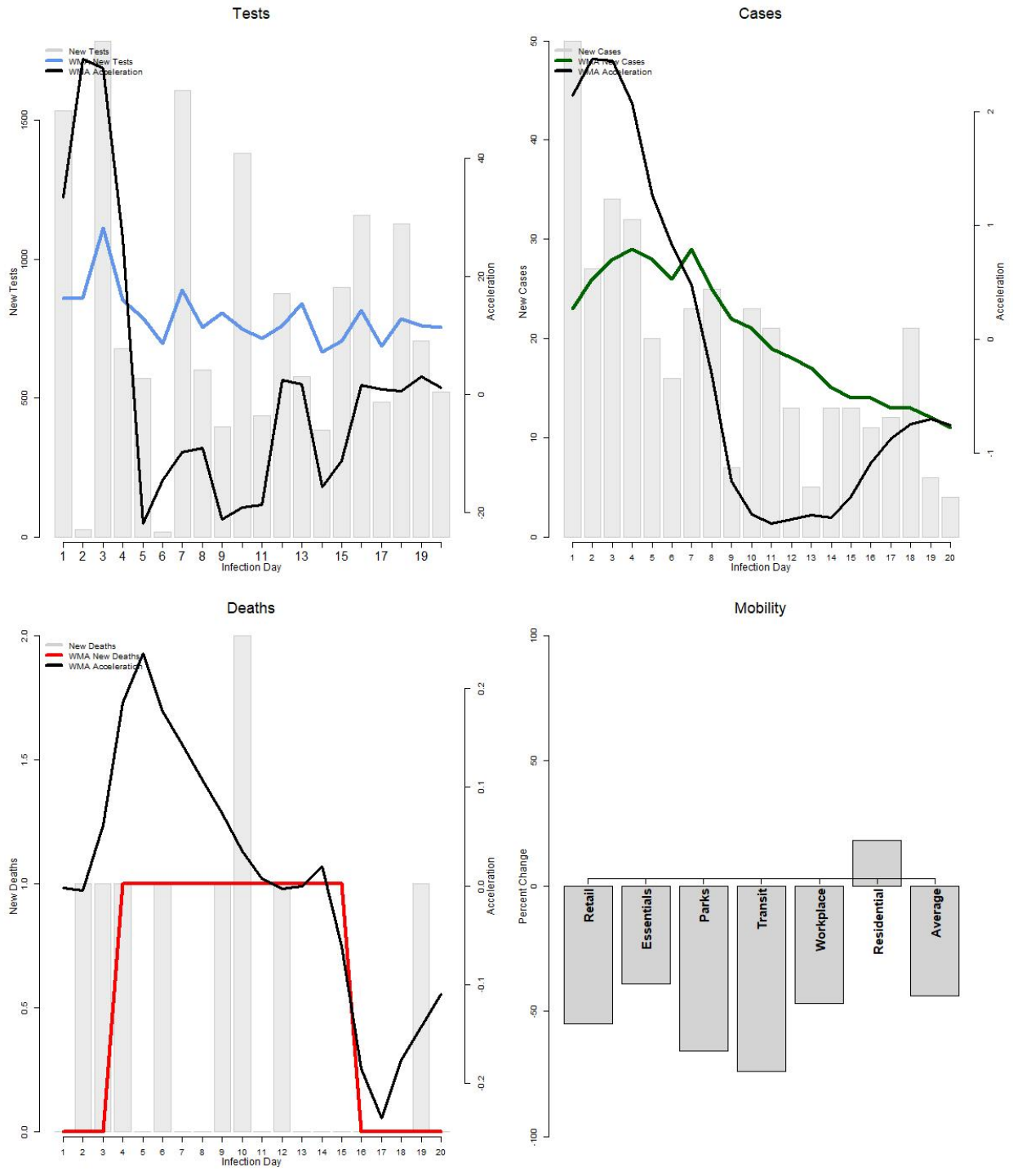
GA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
GA	2020-03-17	88140	19881	799	22.6	4	934	66

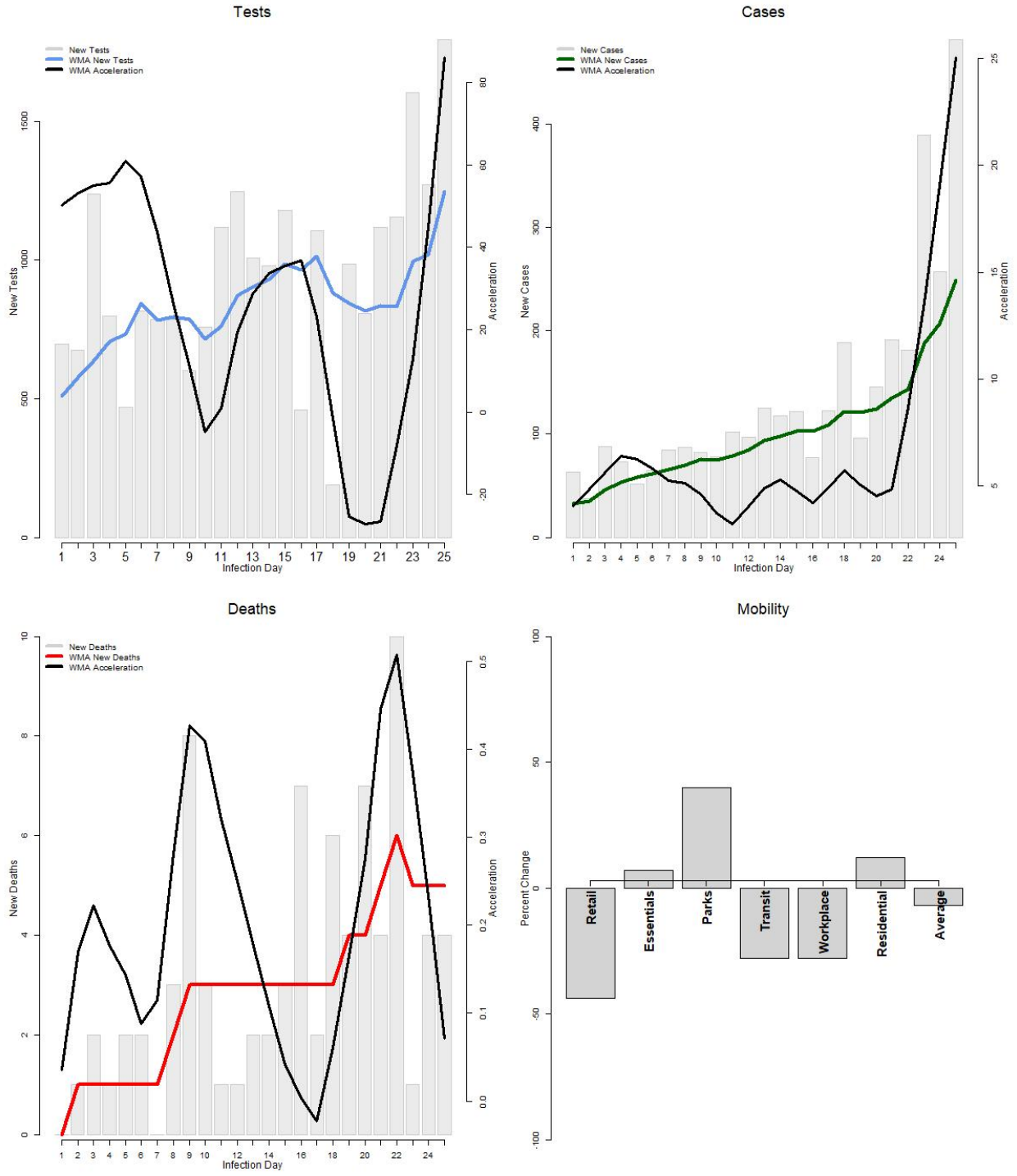
HI



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
HI	2020-03-31	24696	584	10	2.4	1.7	4	0

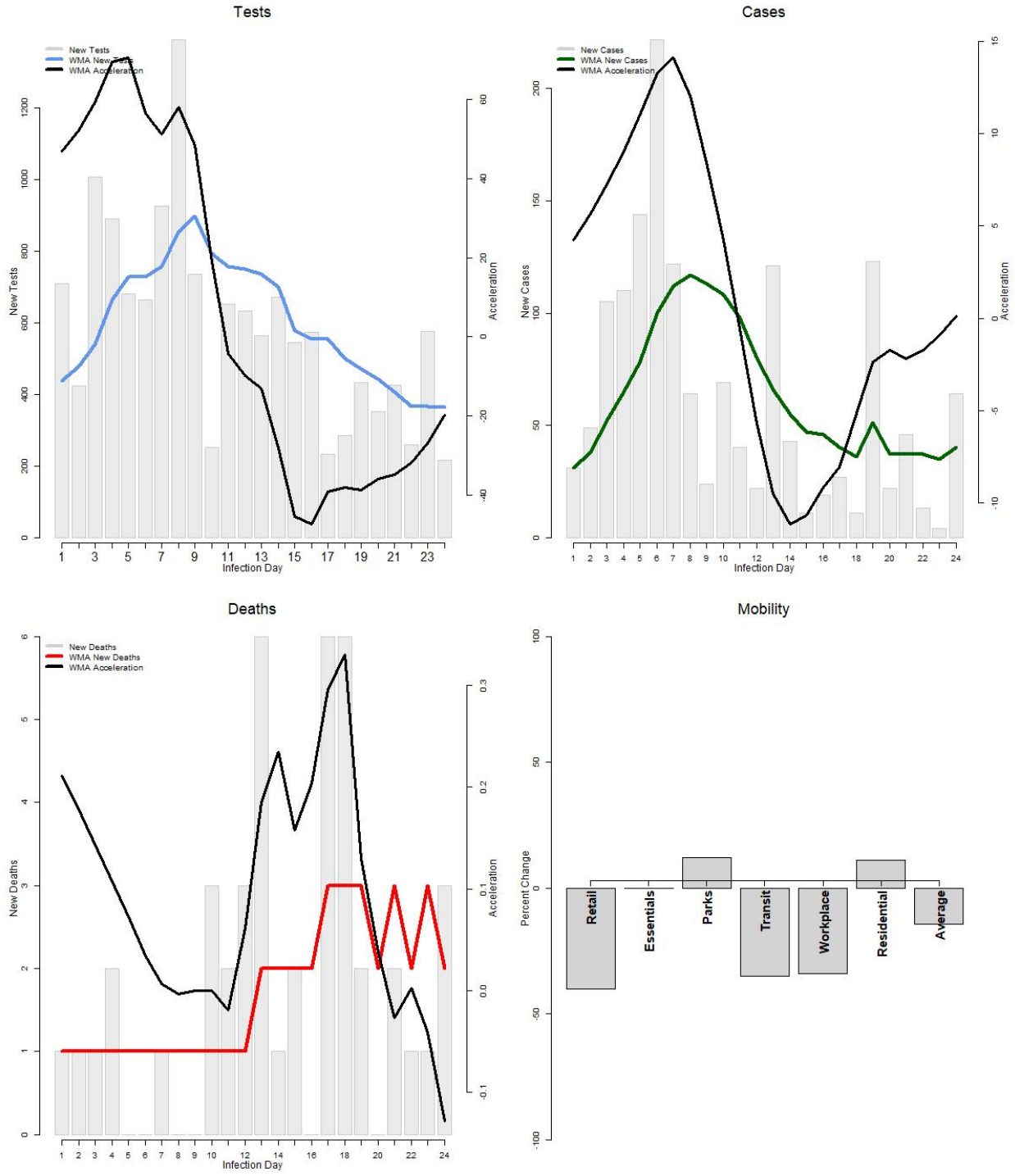
IA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
IA	2020-03-26	27615	3641	83	13.2	2.3	482	4

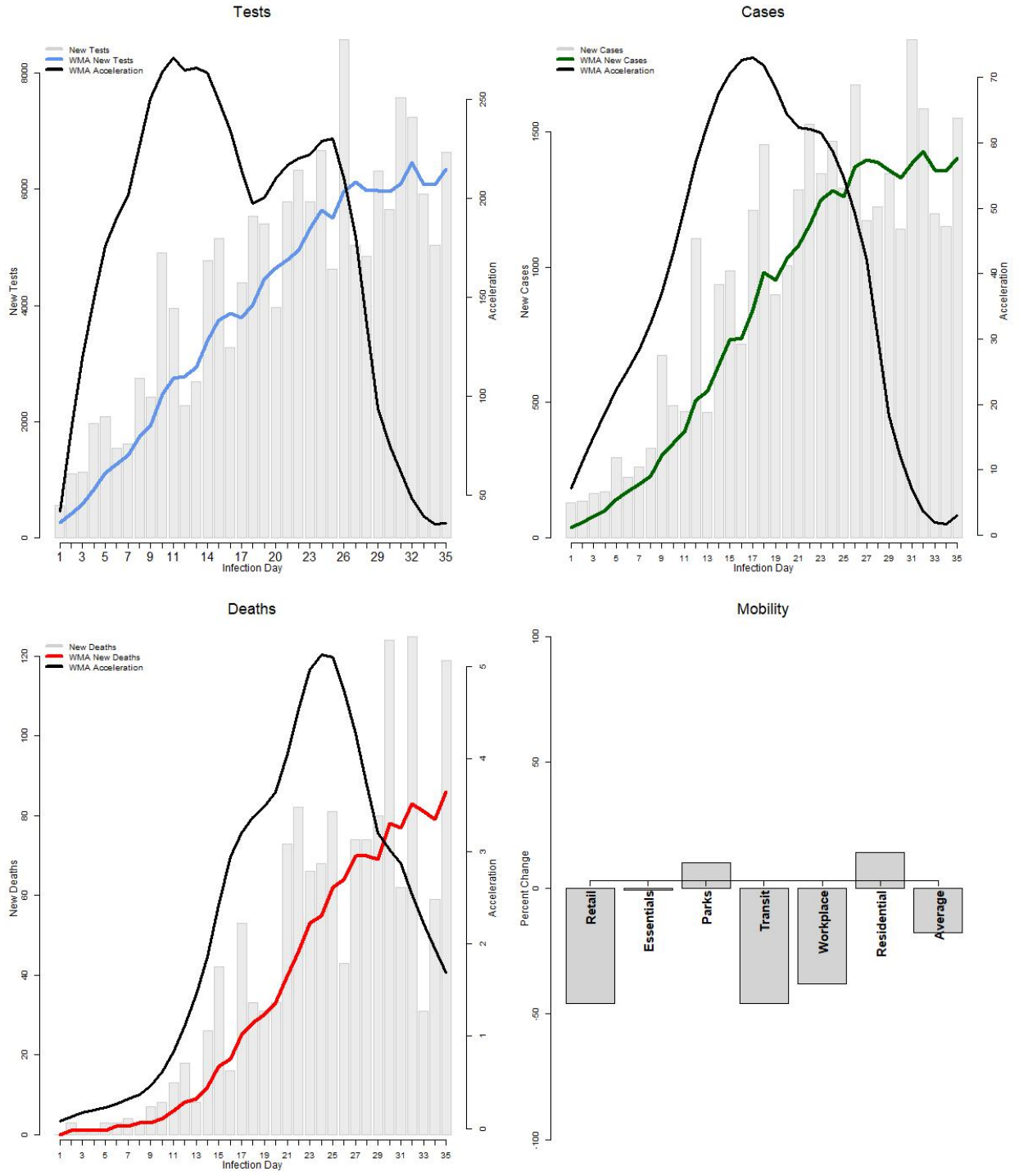
ID



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
ID	2020-03-27	17660	1736	48	9.8	2.8	64	3

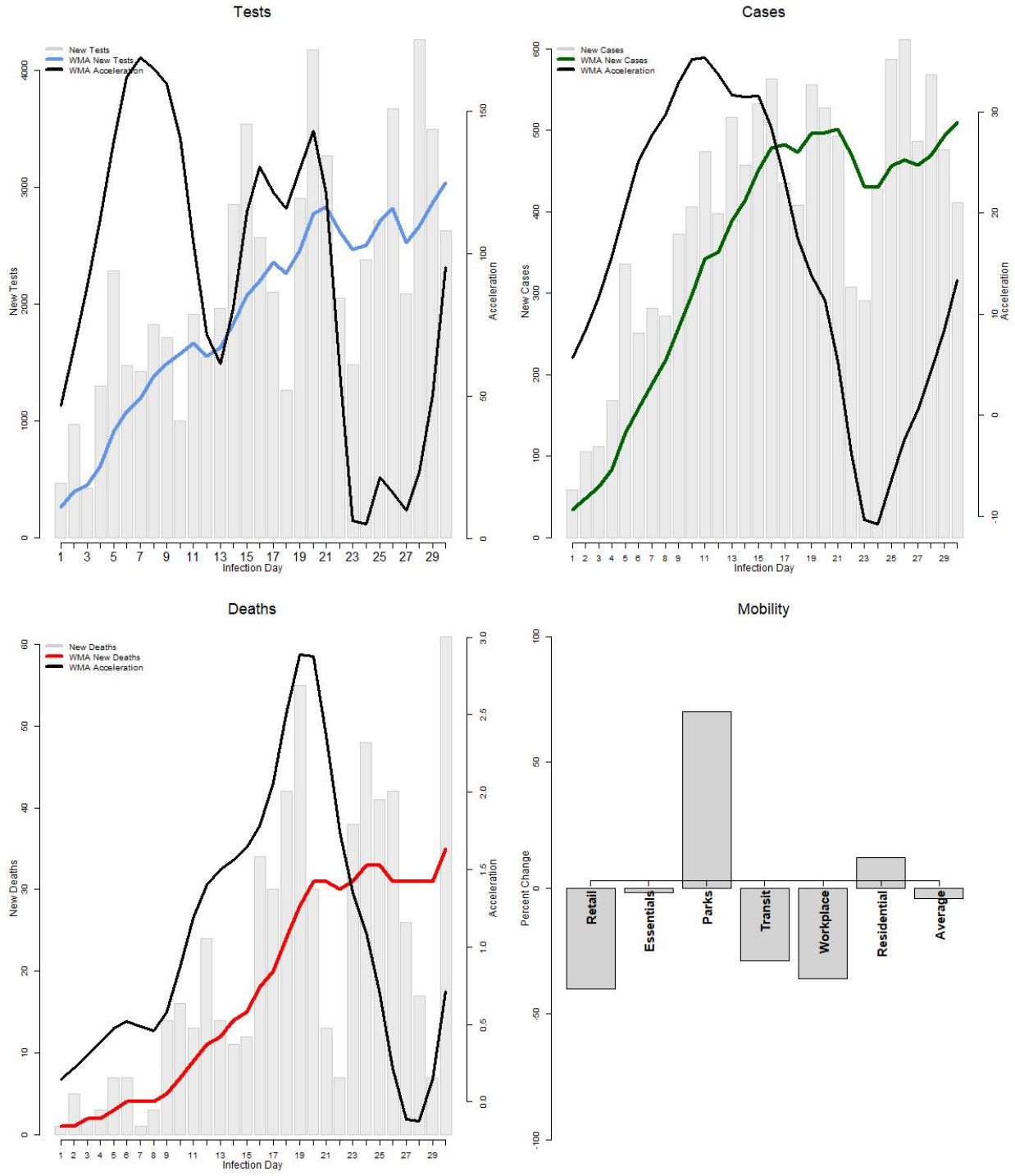
IL



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
IL	2020-03-16	154997	33059	1468	21.3	4.4	1551	119

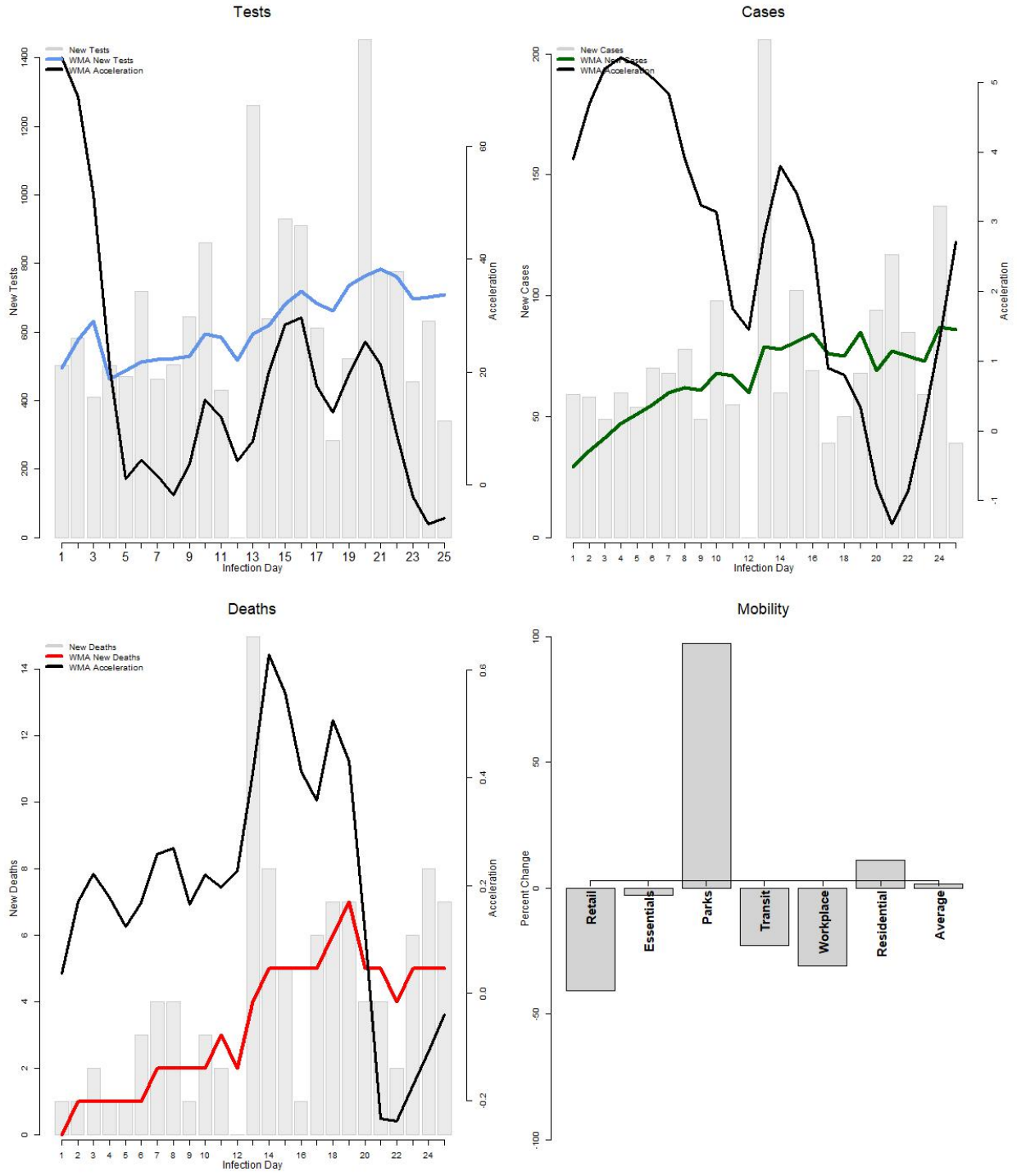
IN



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
IN	2020-03-21	67264	12097	630	18	5.2	411	61

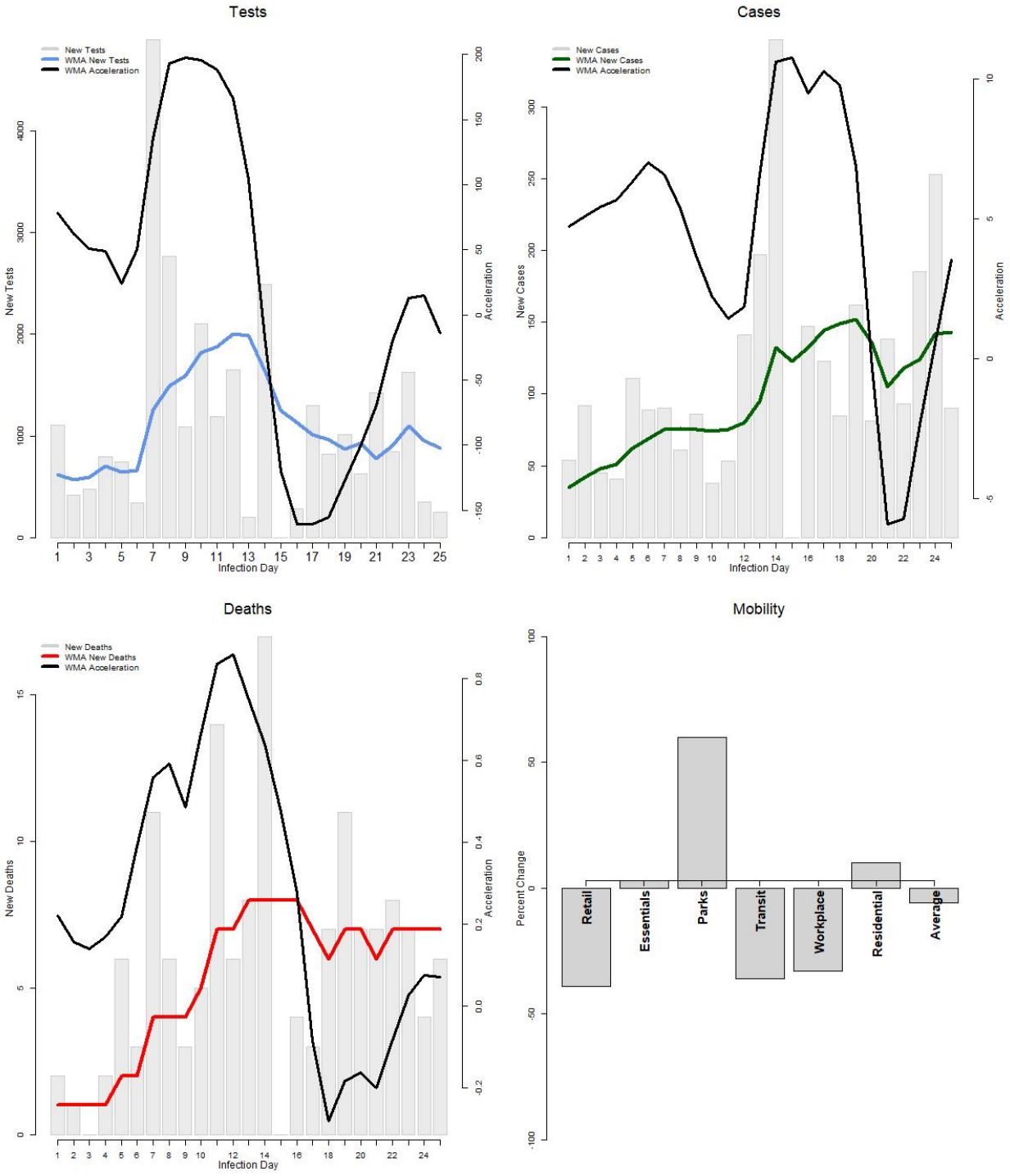
KS



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
KS	2020-03-26	19101	2025	107	10.6	5.3	39	7

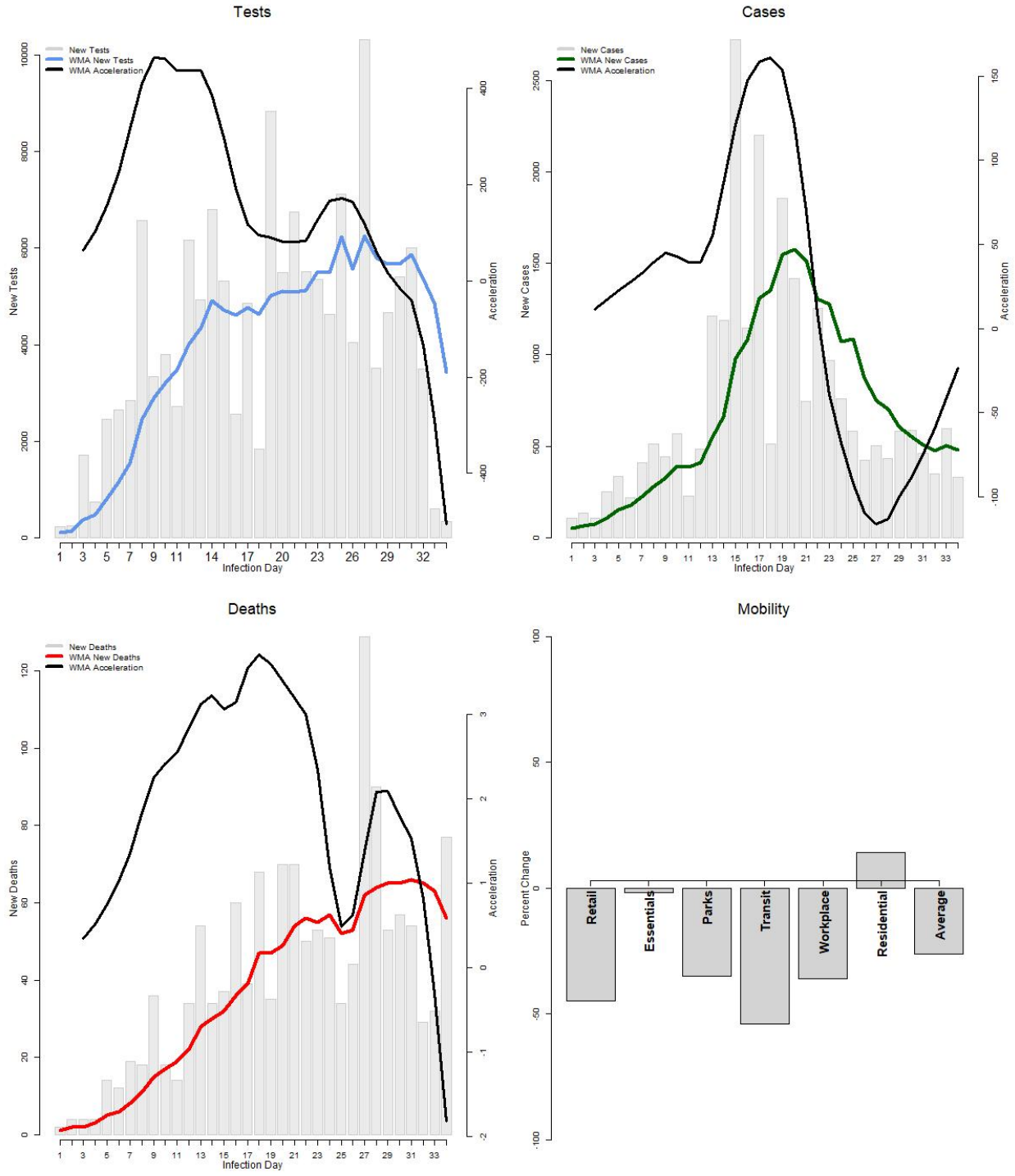
KY



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
KY	2020-03-26	32820	3050	154	9.3	5	90	6

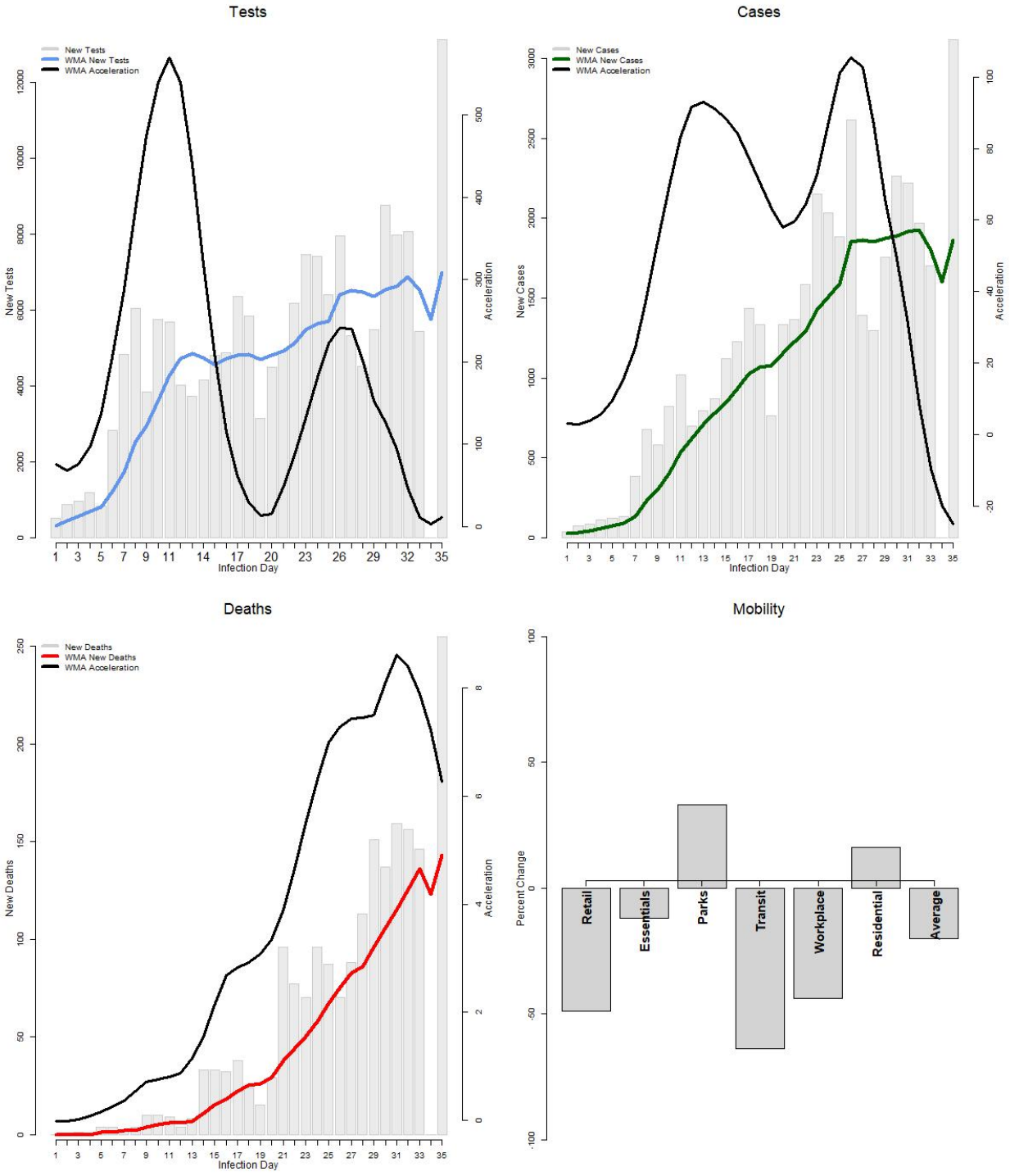
LA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
LA	2020-03-17	142430	24854	1405	17.4	5.7	331	77

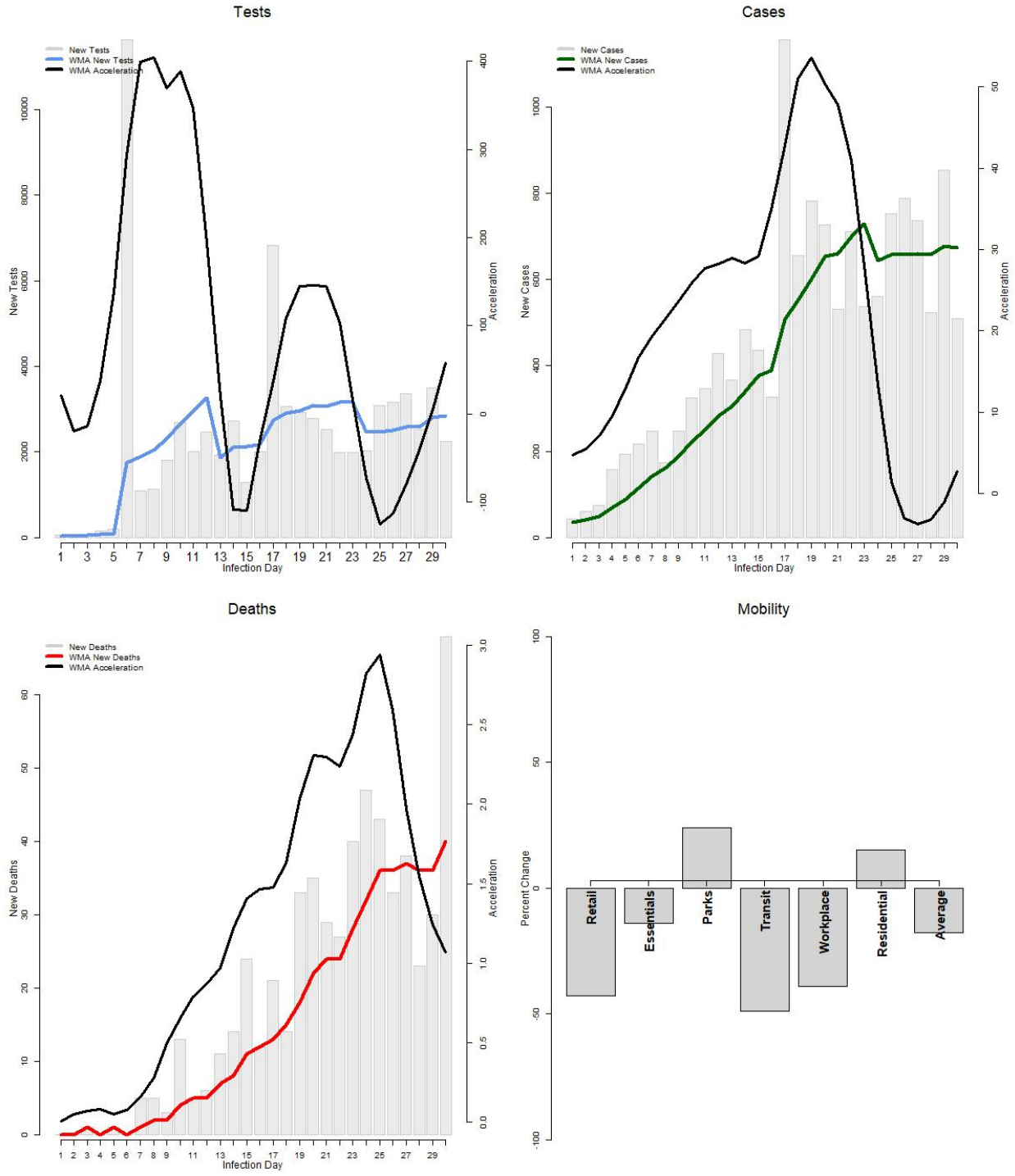
MA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MA	2020-03-16	175372	41199	1961	23.5	4.8	3122	255

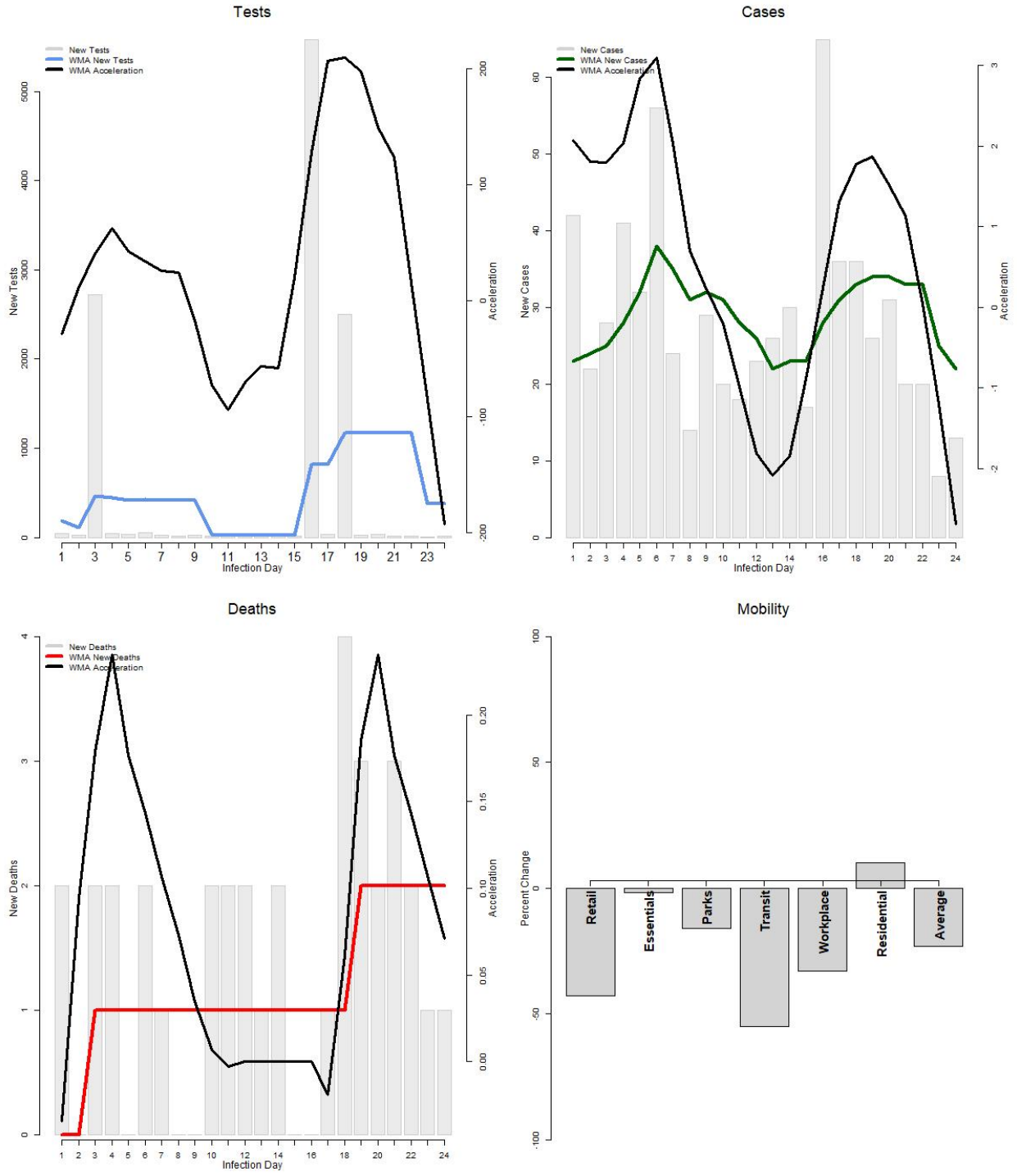
MD



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MD	2020-03-21	73635	14193	584	19.3	4.1	509	68

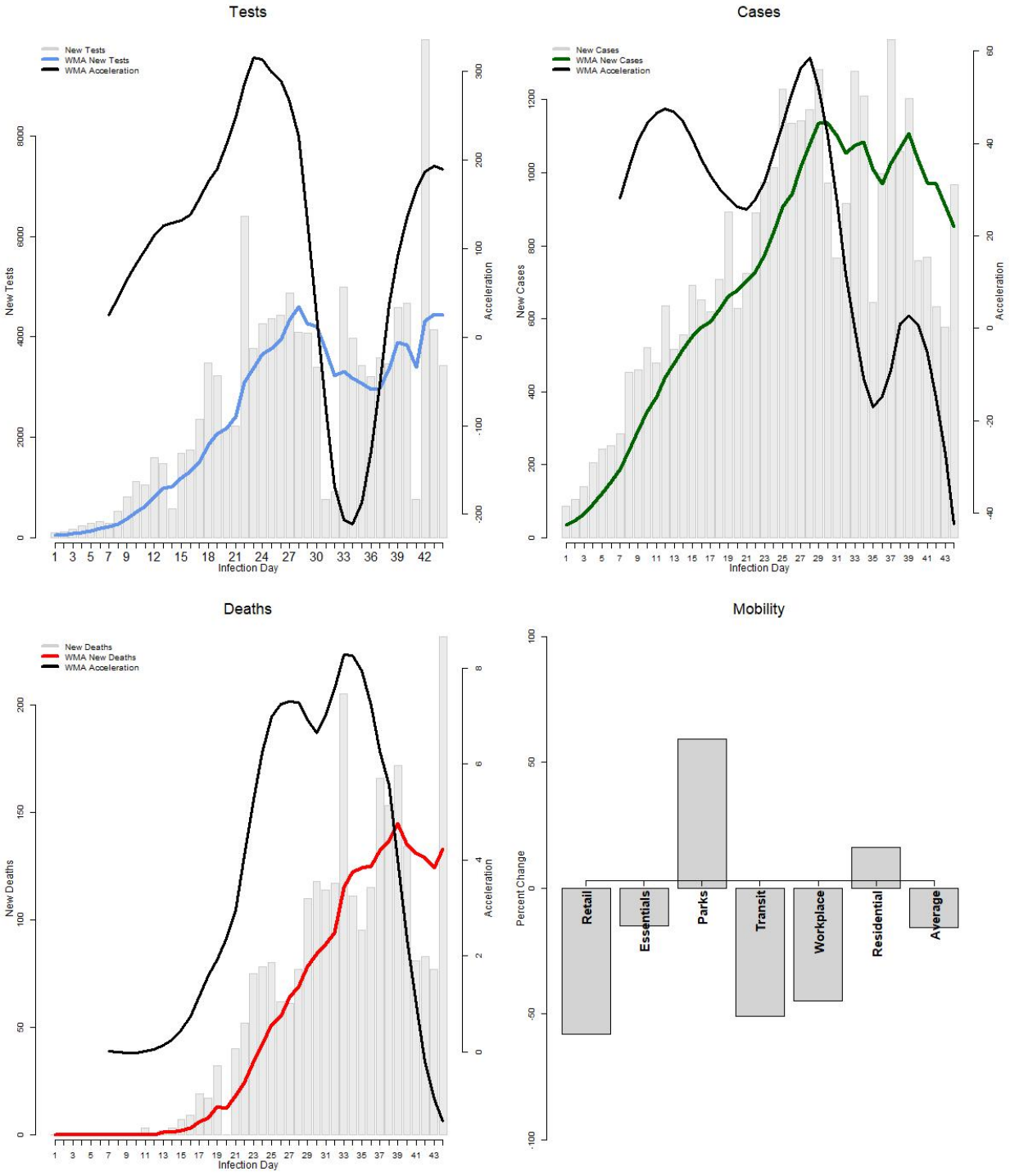
ME



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
ME	2020-03-27	14964	888	36	5.9	4.1	13	1

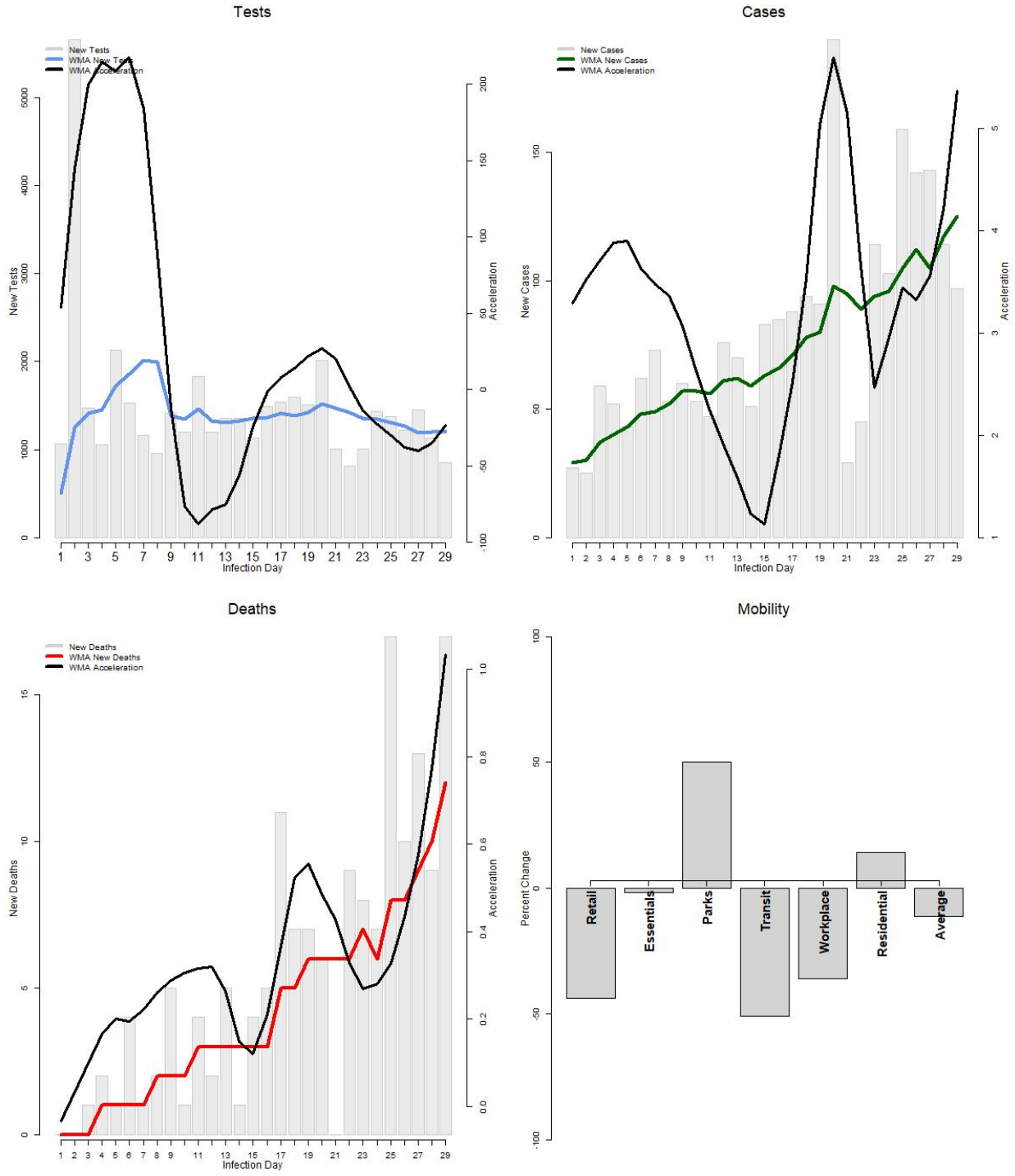
MI



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MI	2020-03-07	117226	32967	2700	28.1	8.2	967	232

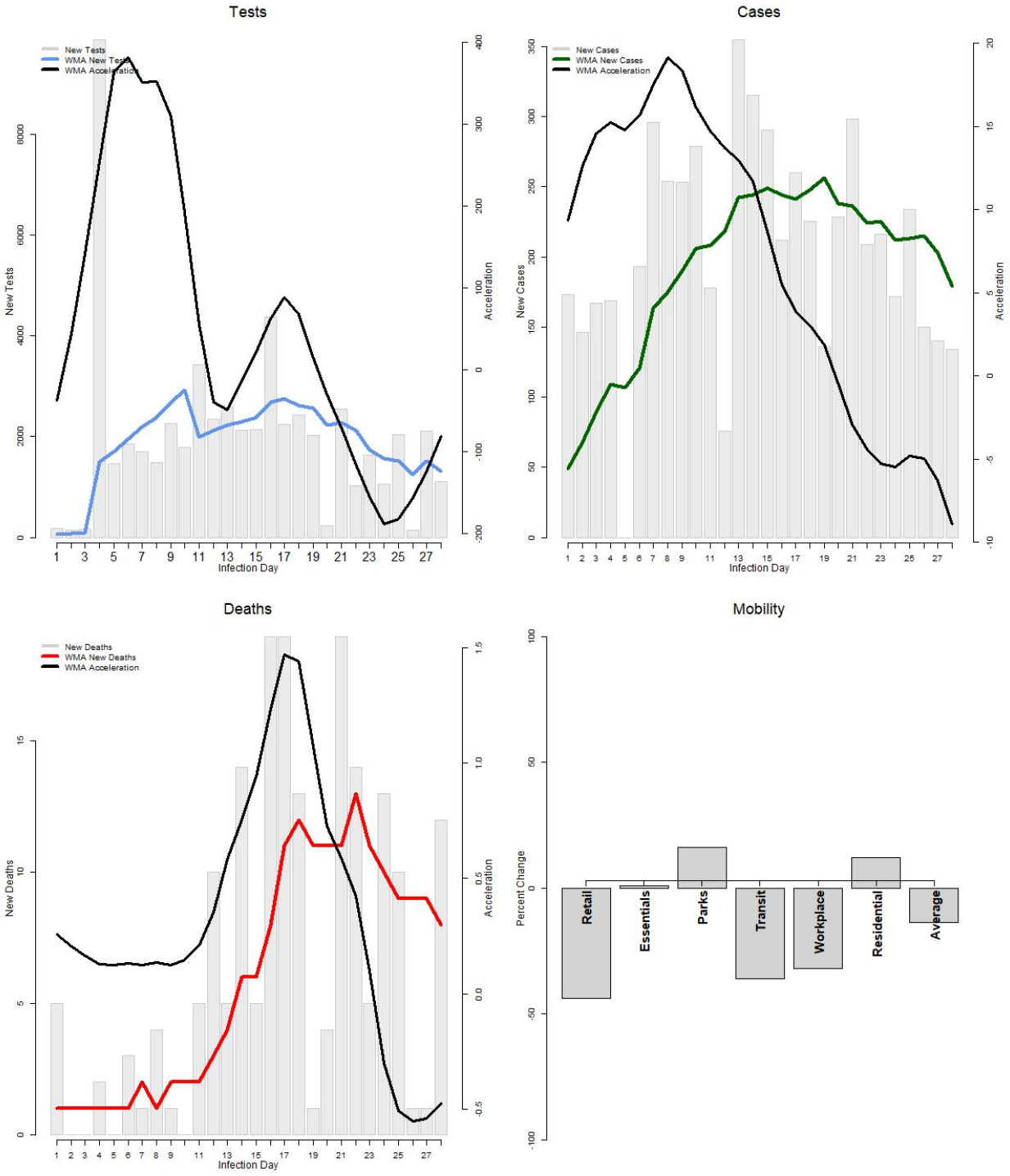
MN



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MN	2020-03-22	47697	2567	160	5.4	6.2	97	17

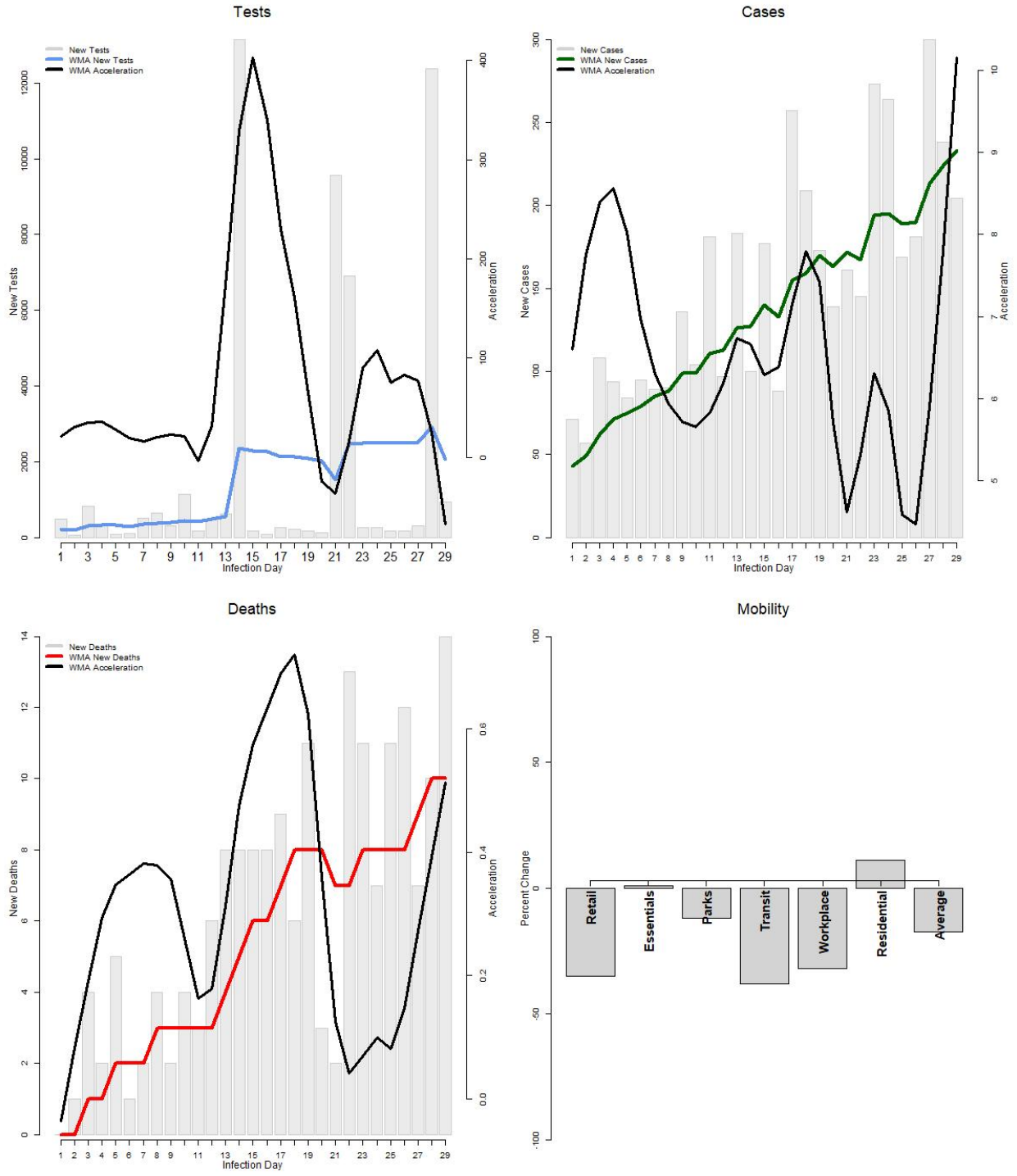
MO



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MO	2020-03-23	57120	5941	189	10.4	3.2	134	12

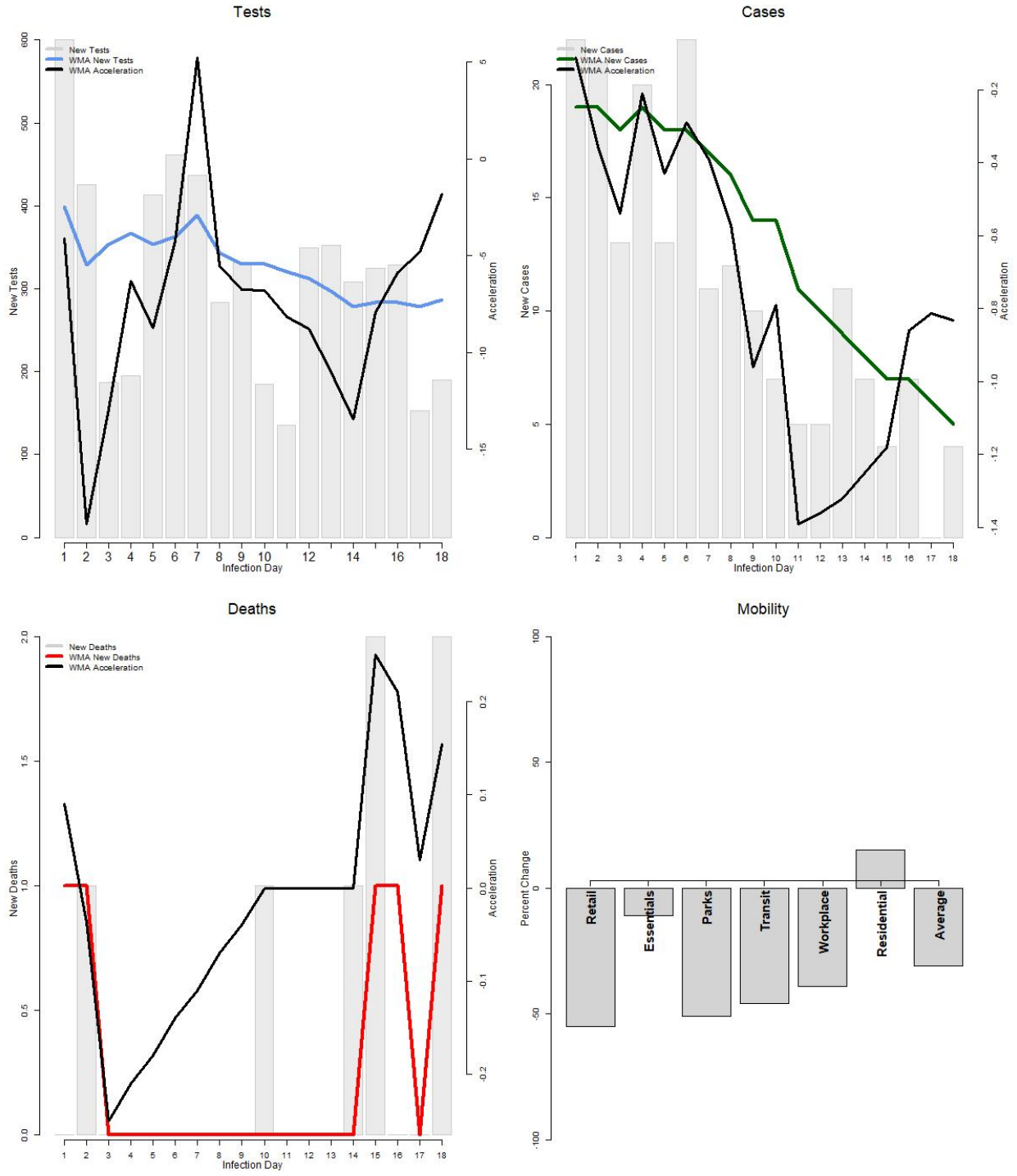
MS



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MS	2020-03-22	52364	4716	183	9	3.9	204	14

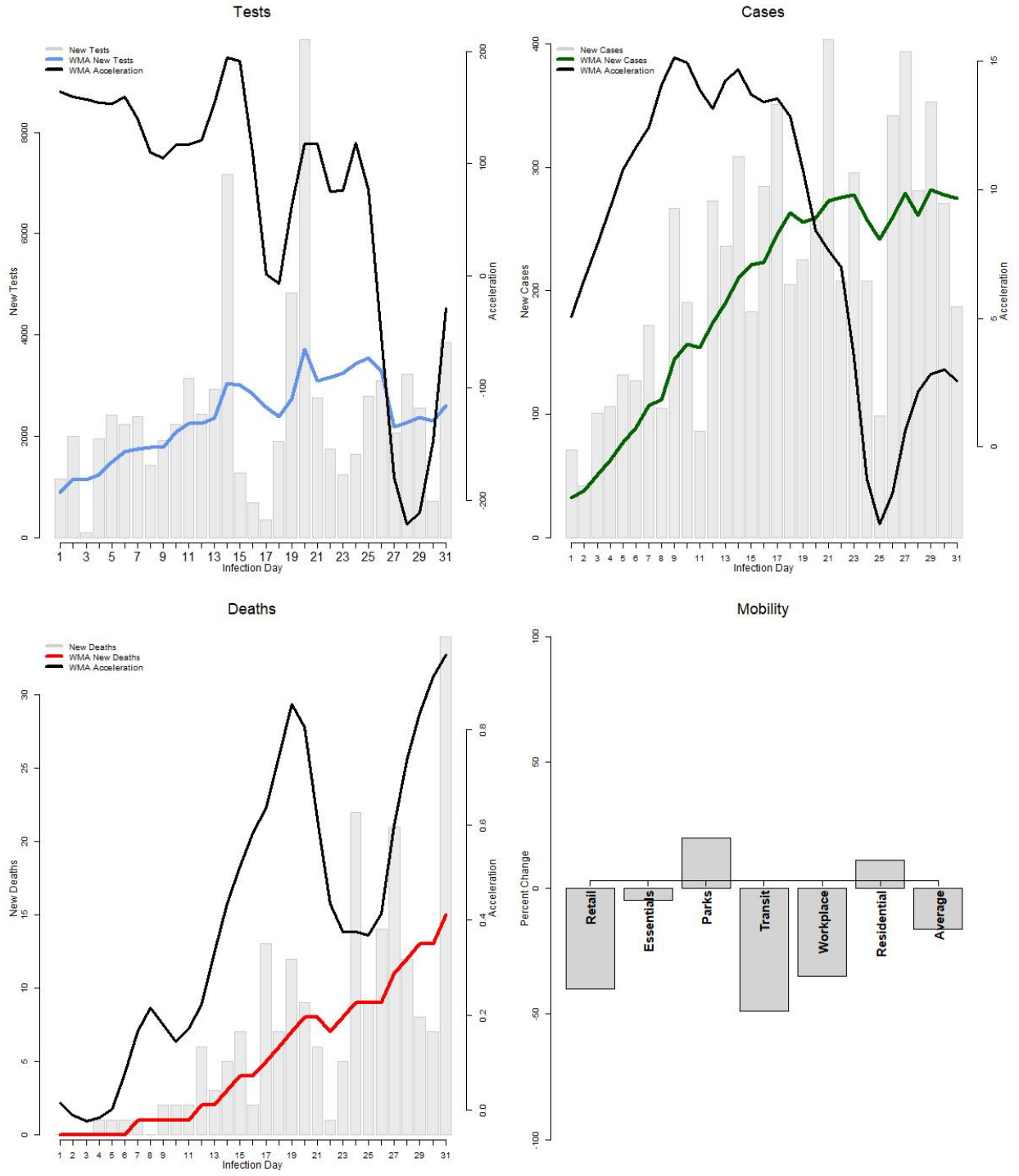
MT



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
MT	2020-04-02	11241	437	12	3.9	2.7	4	2

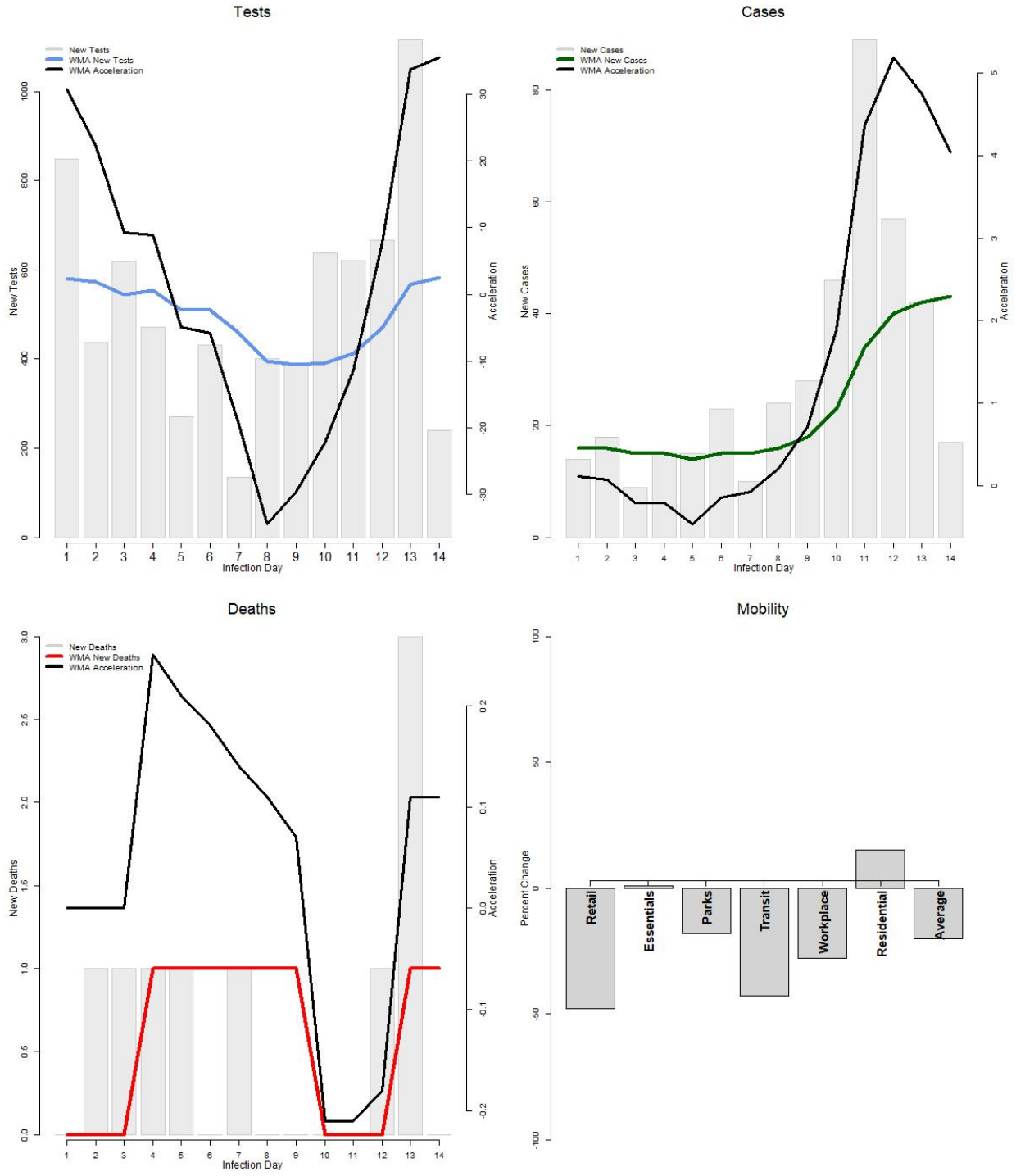
NC



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NC	2020-03-20	83331	6951	213	8.3	3.1	187	34

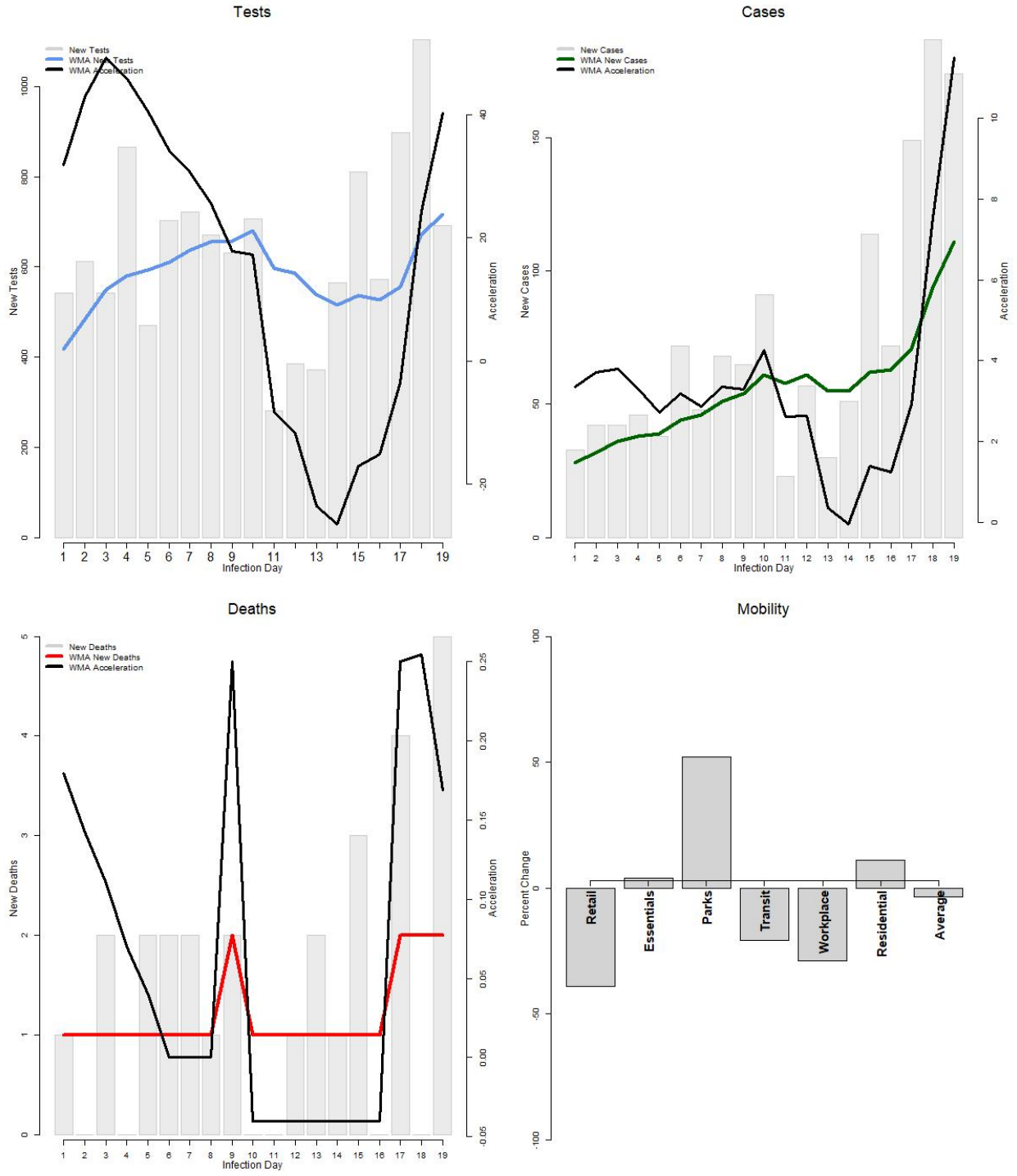
ND



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
ND	2020-04-06	14987	644	13	4.3	2	17	0

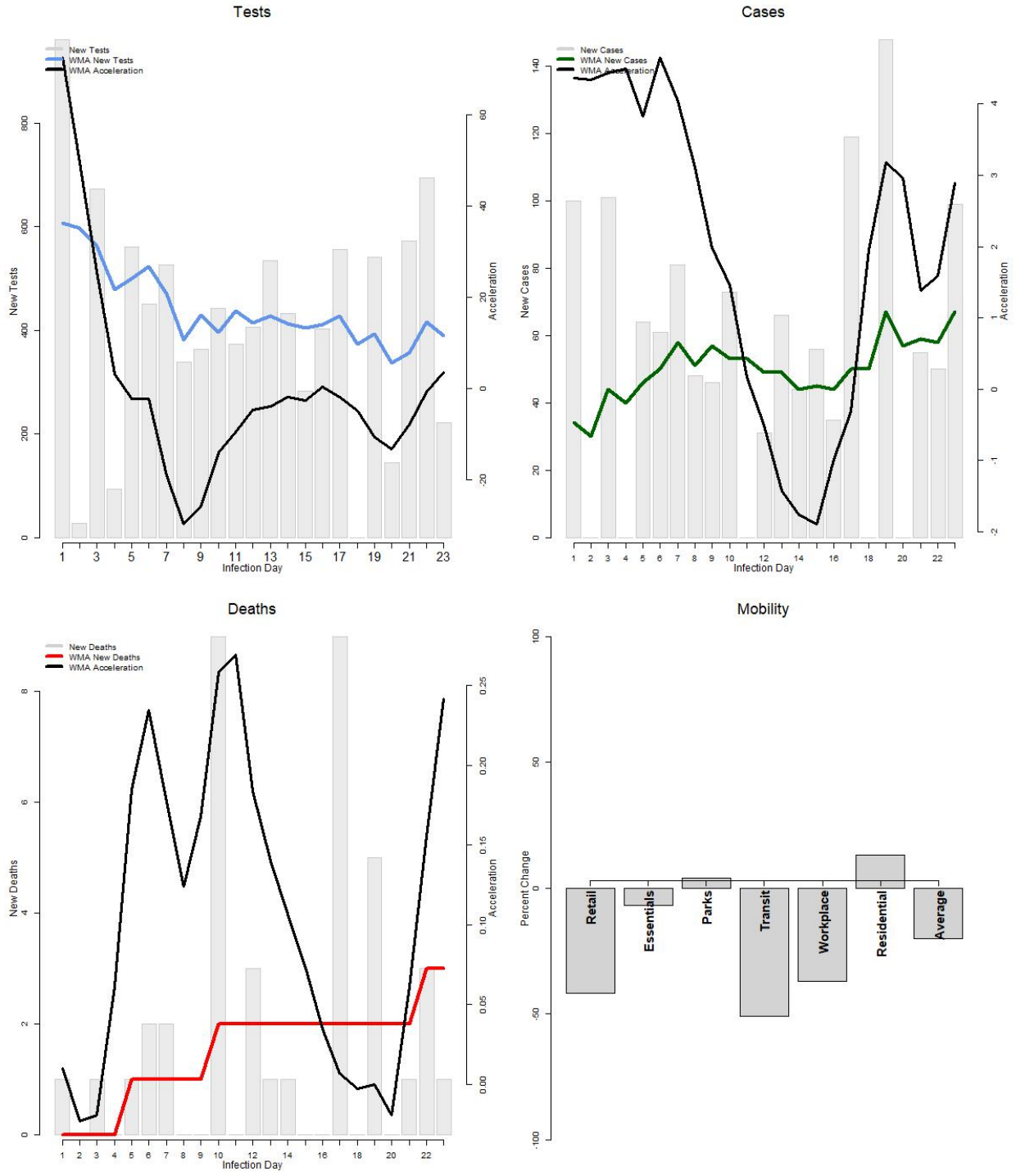
NE



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NE	2020-04-01	16372	1648	33	10.1	2	174	5

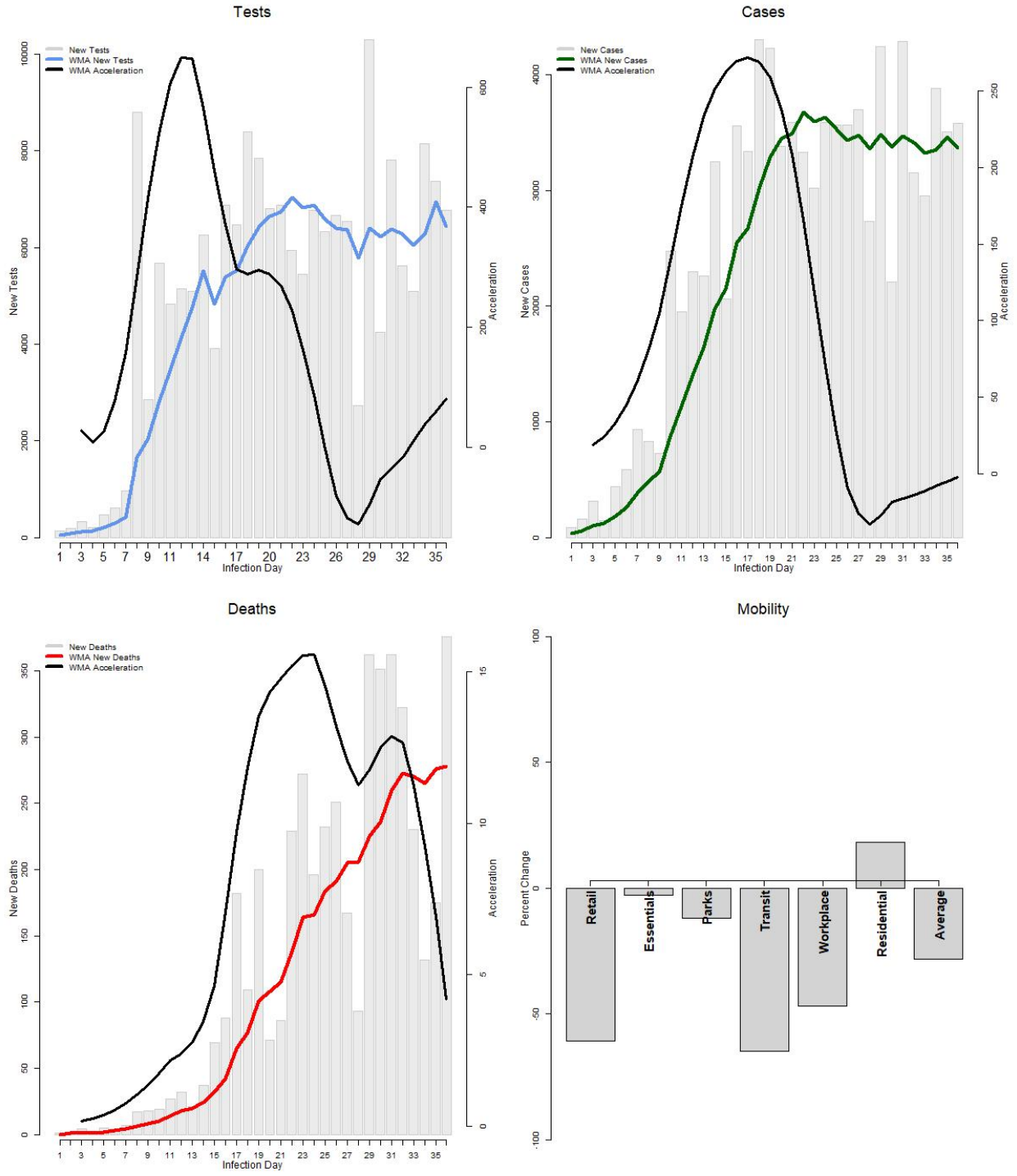
NH



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NH	2020-03-28	14339	1491	42	10.4	2.8	99	1

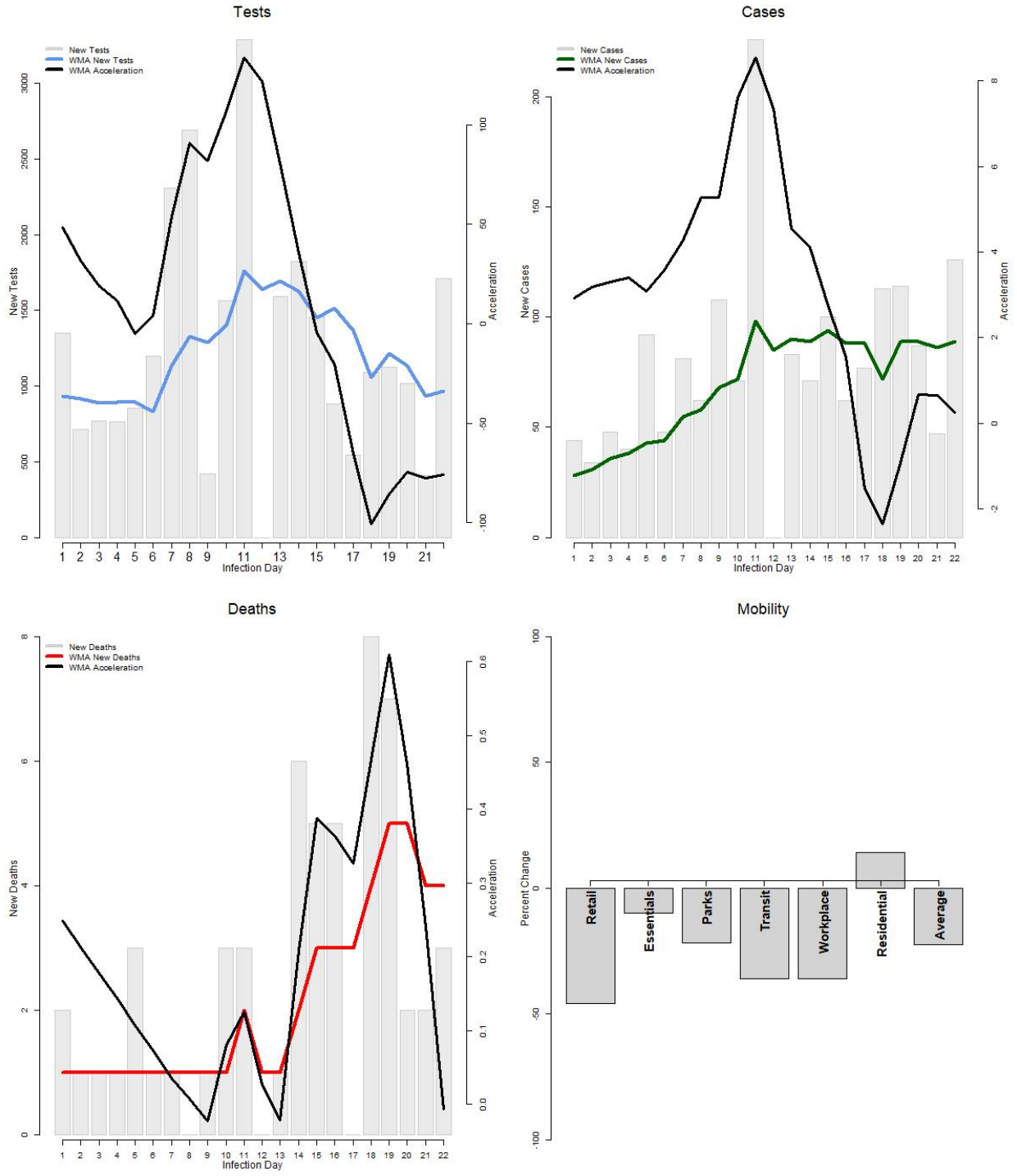
NJ



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NJ	2020-03-15	184826	92387	4753	50	5.1	3581	376

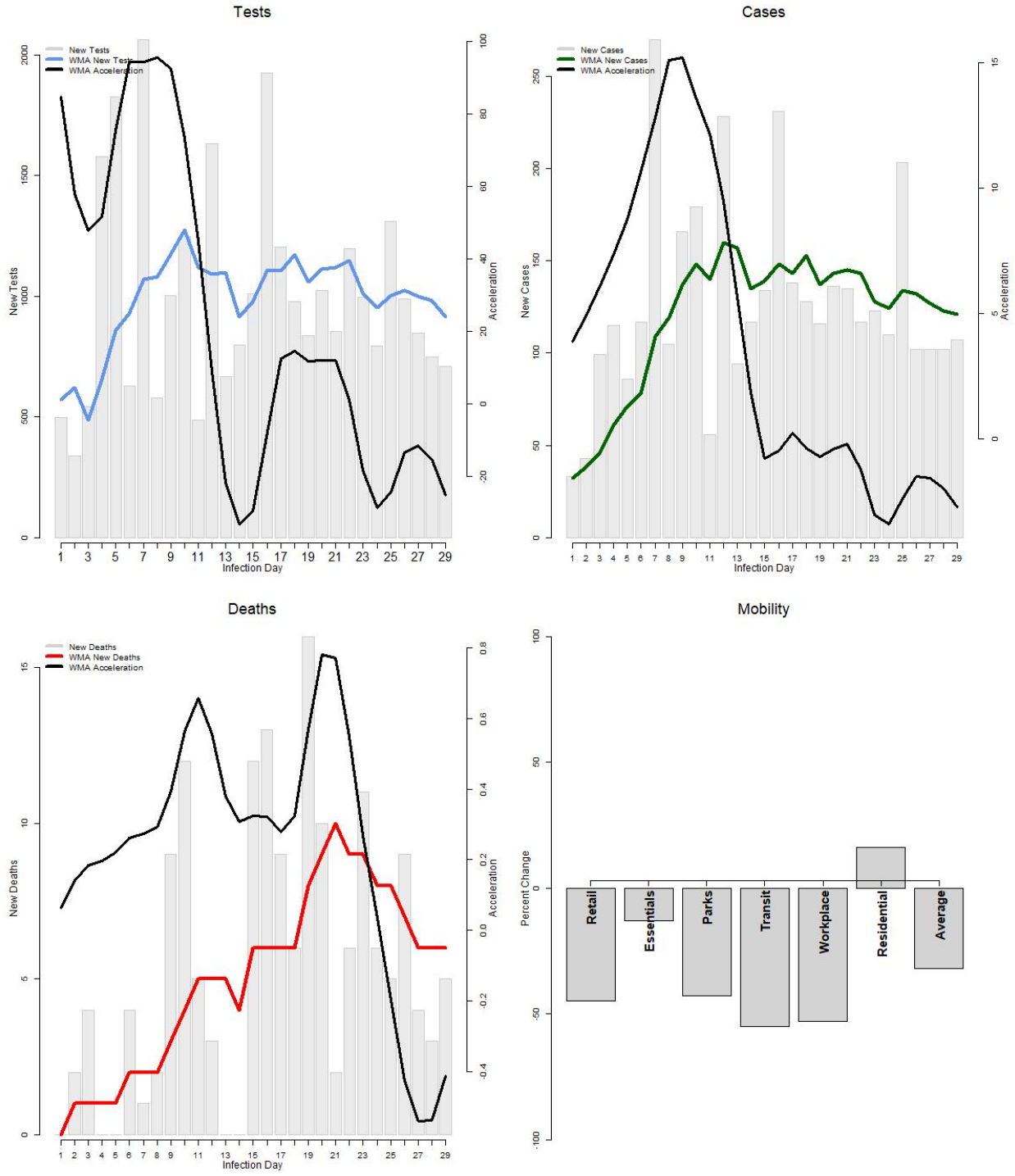
NM



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NM	2020-03-29	38755	1971	58	5.1	2.9	126	3

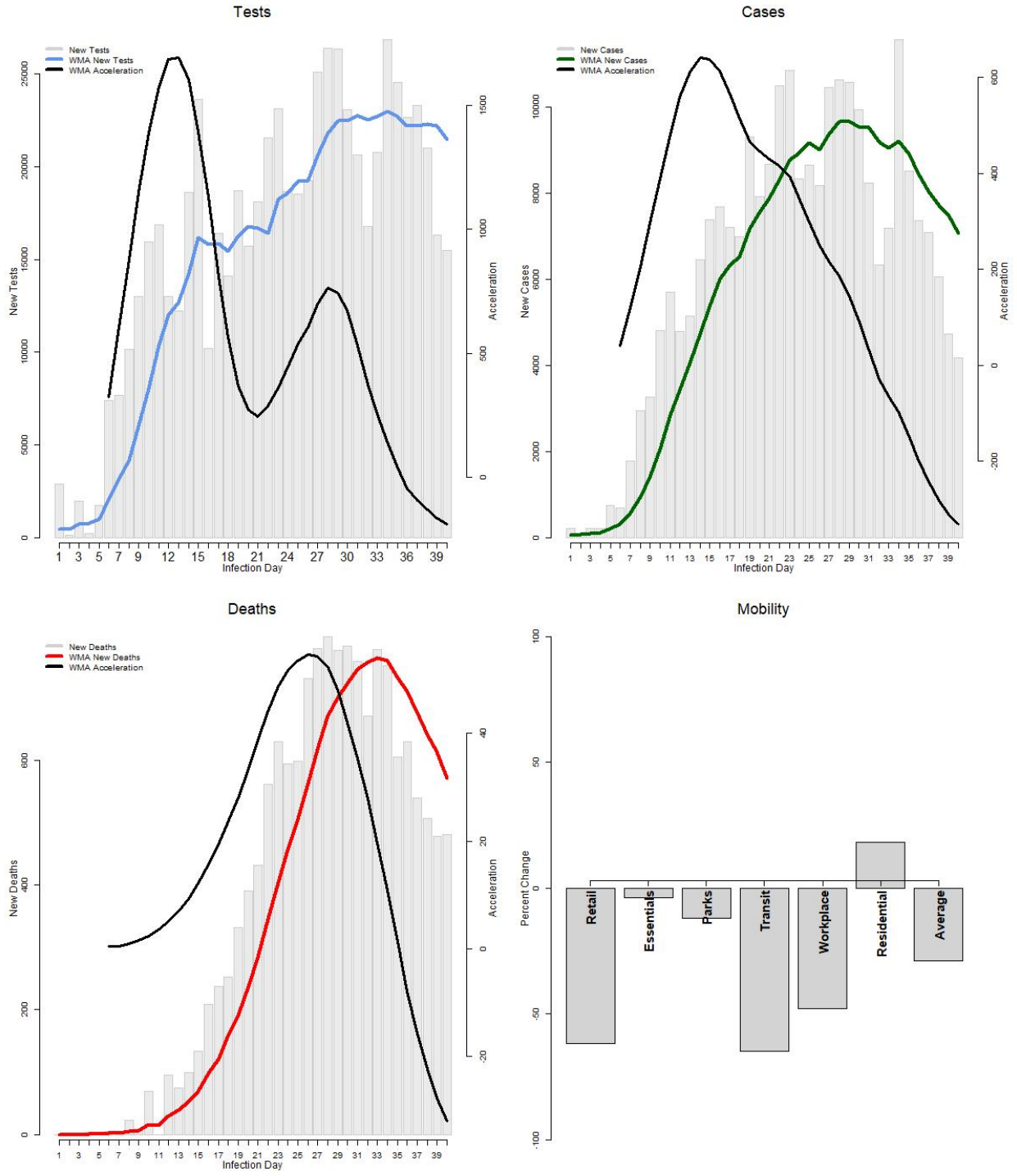
NV



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NV	2020-03-22	33055	3937	163	11.9	4.1	107	5

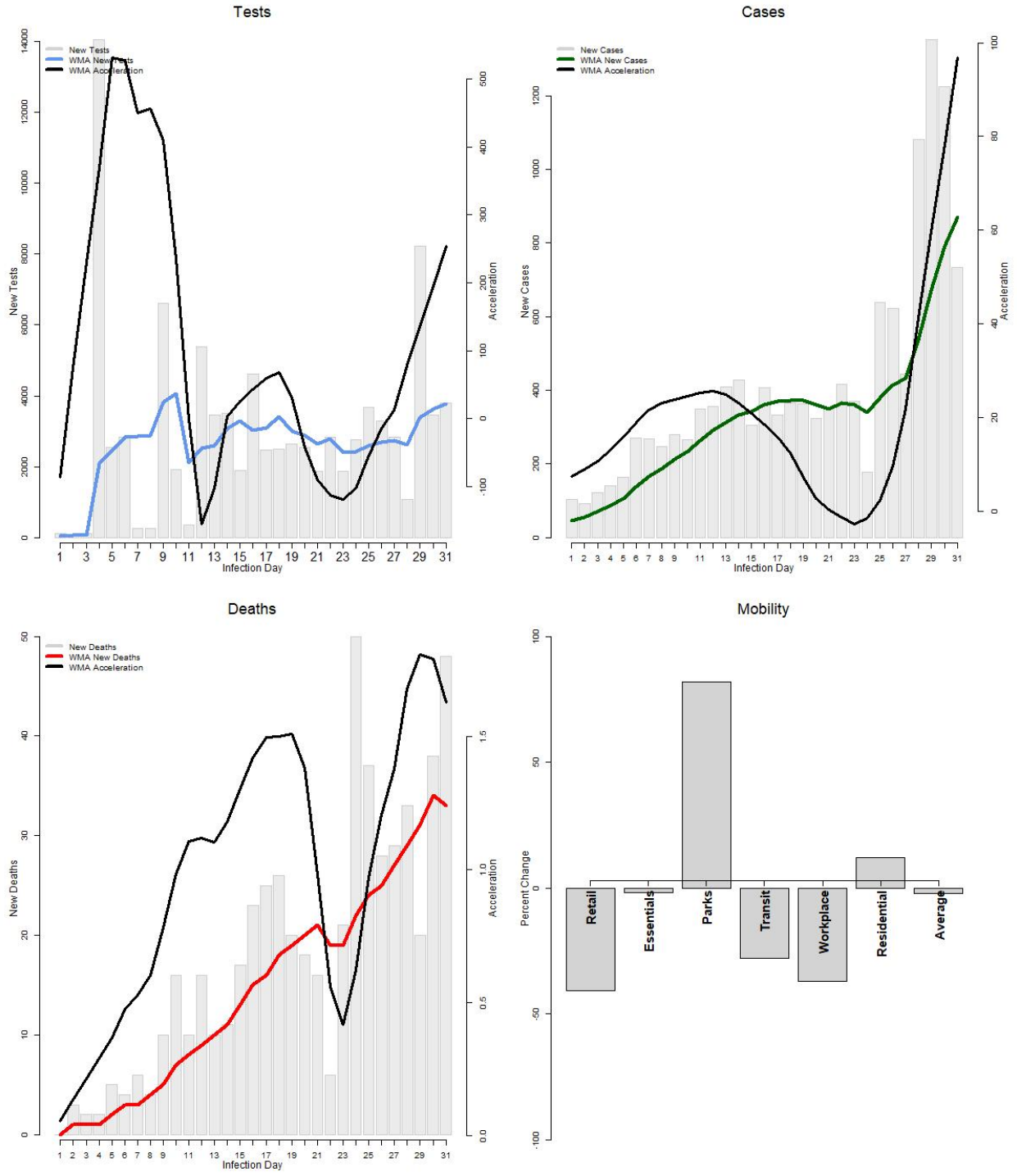
NY



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
NY	2020-03-11	649325	251690	14828	38.8	5.9	4178	481

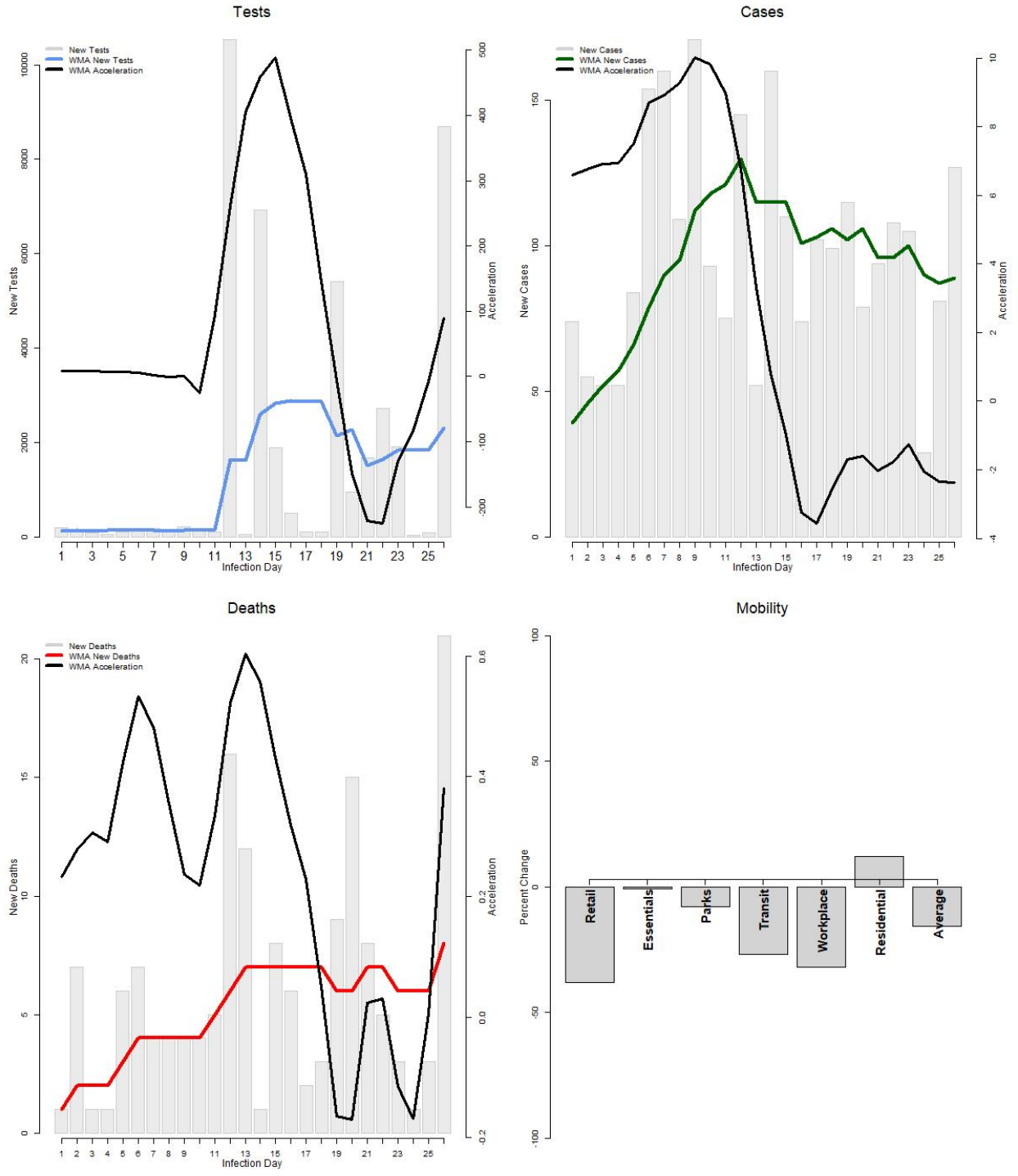
OH



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
OH	2020-03-20	94239	13250	557	14.1	4.2	734	48

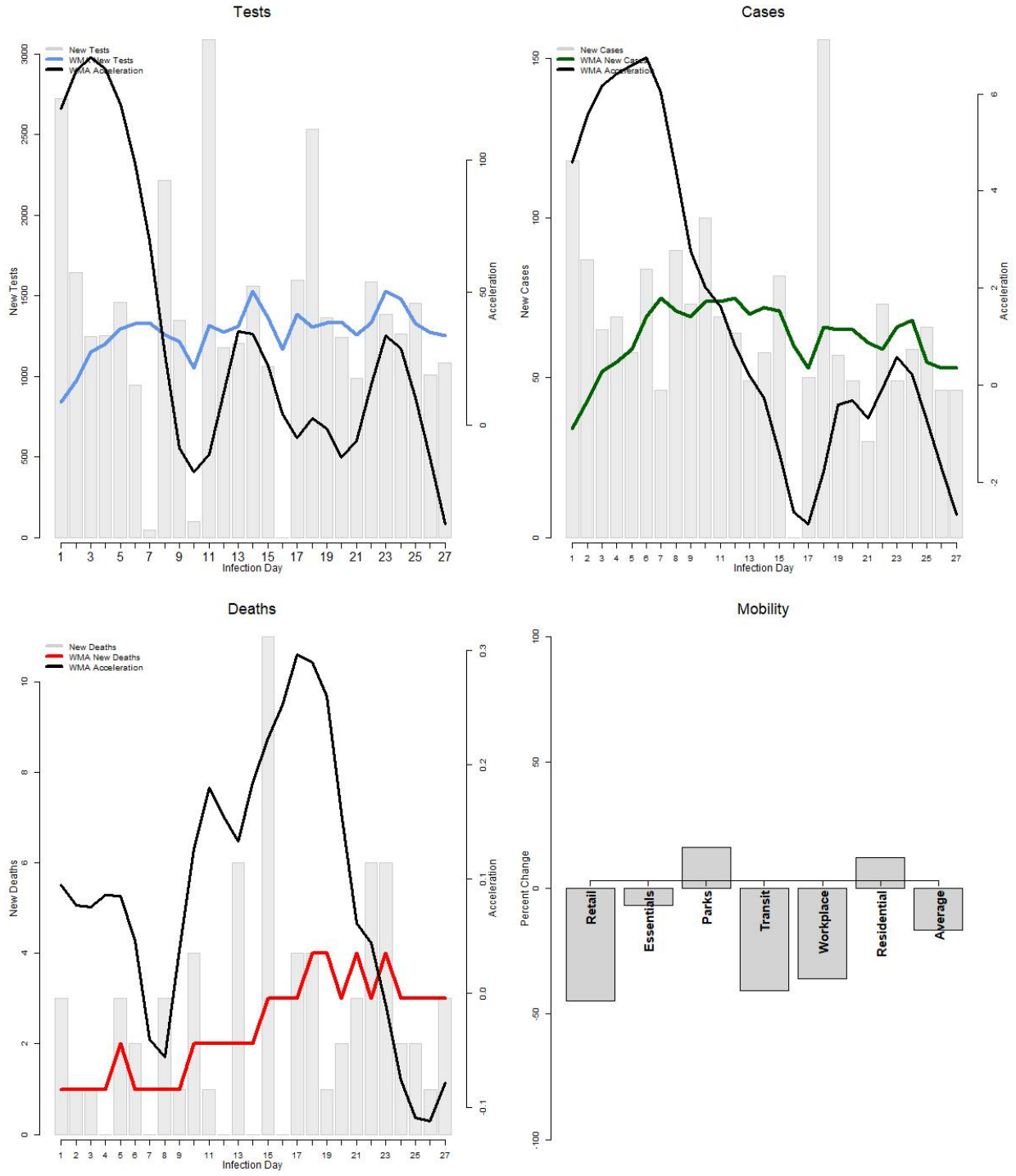
OK



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
OK	2020-03-25	44344	2807	164	6.3	5.8	127	21

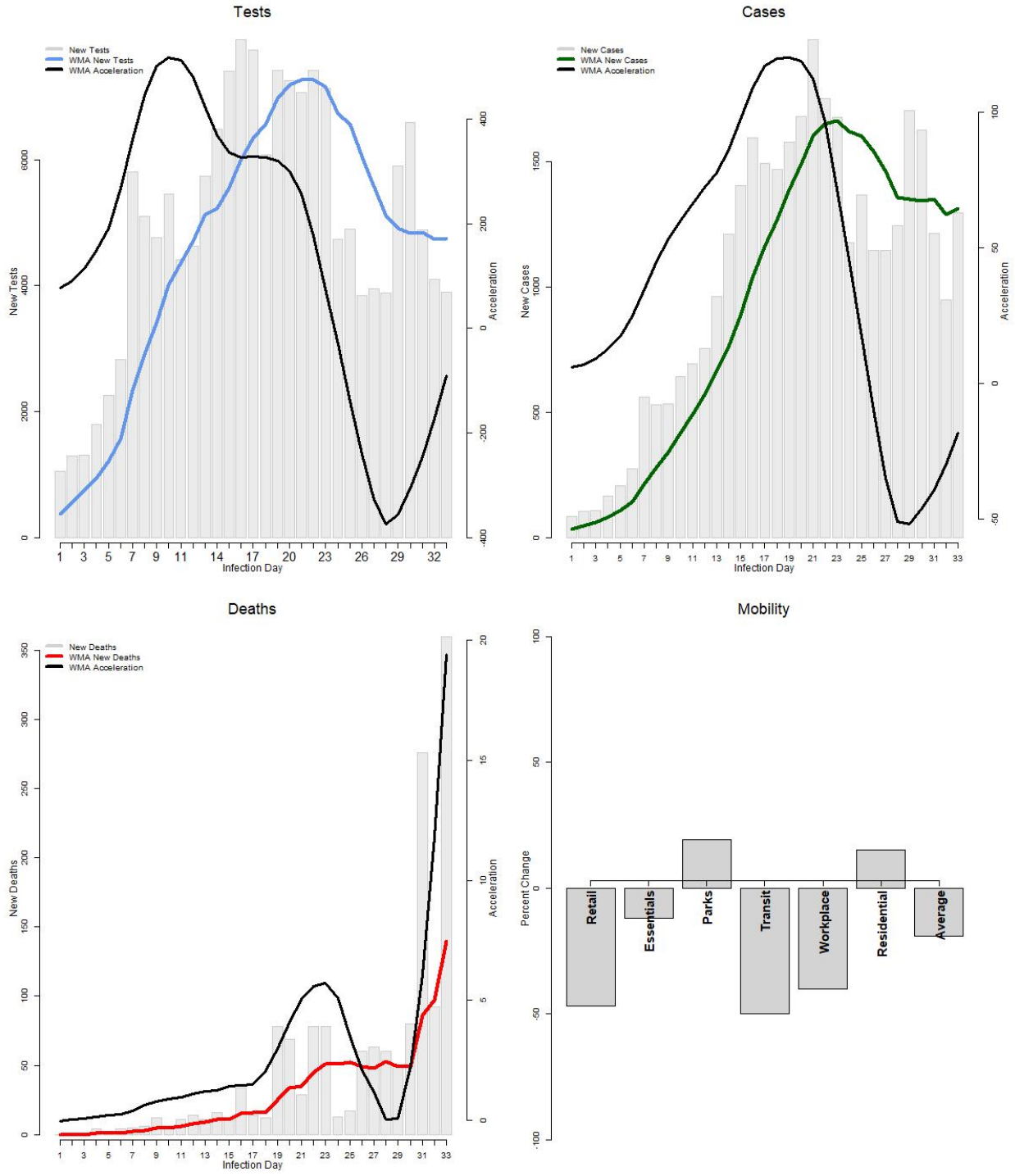
OR



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
OR	2020-03-24	41128	2002	78	4.9	3.9	46	3

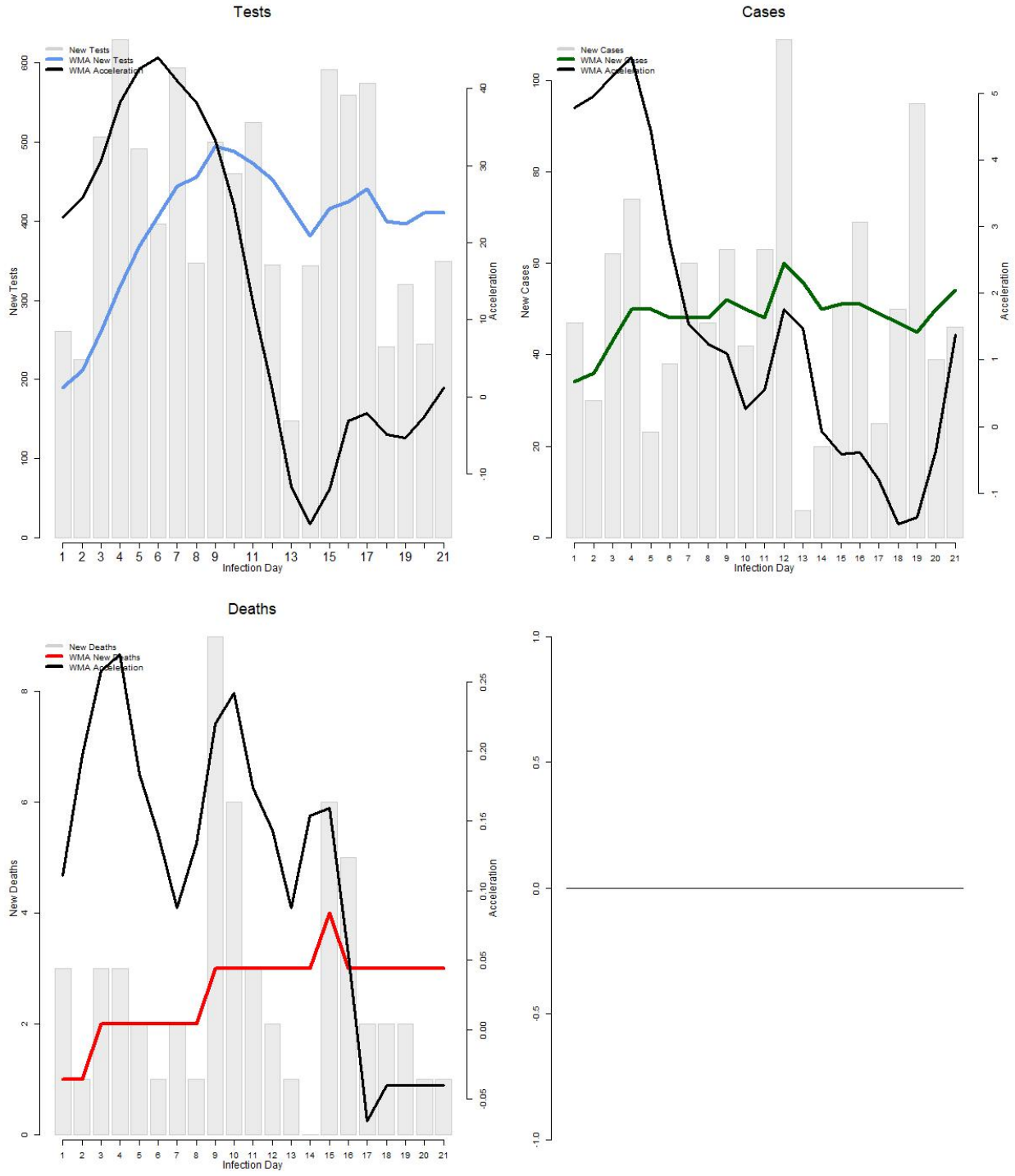
PA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
PA	2020-03-18	166851	34528	1564	20.7	4.5	1296	360

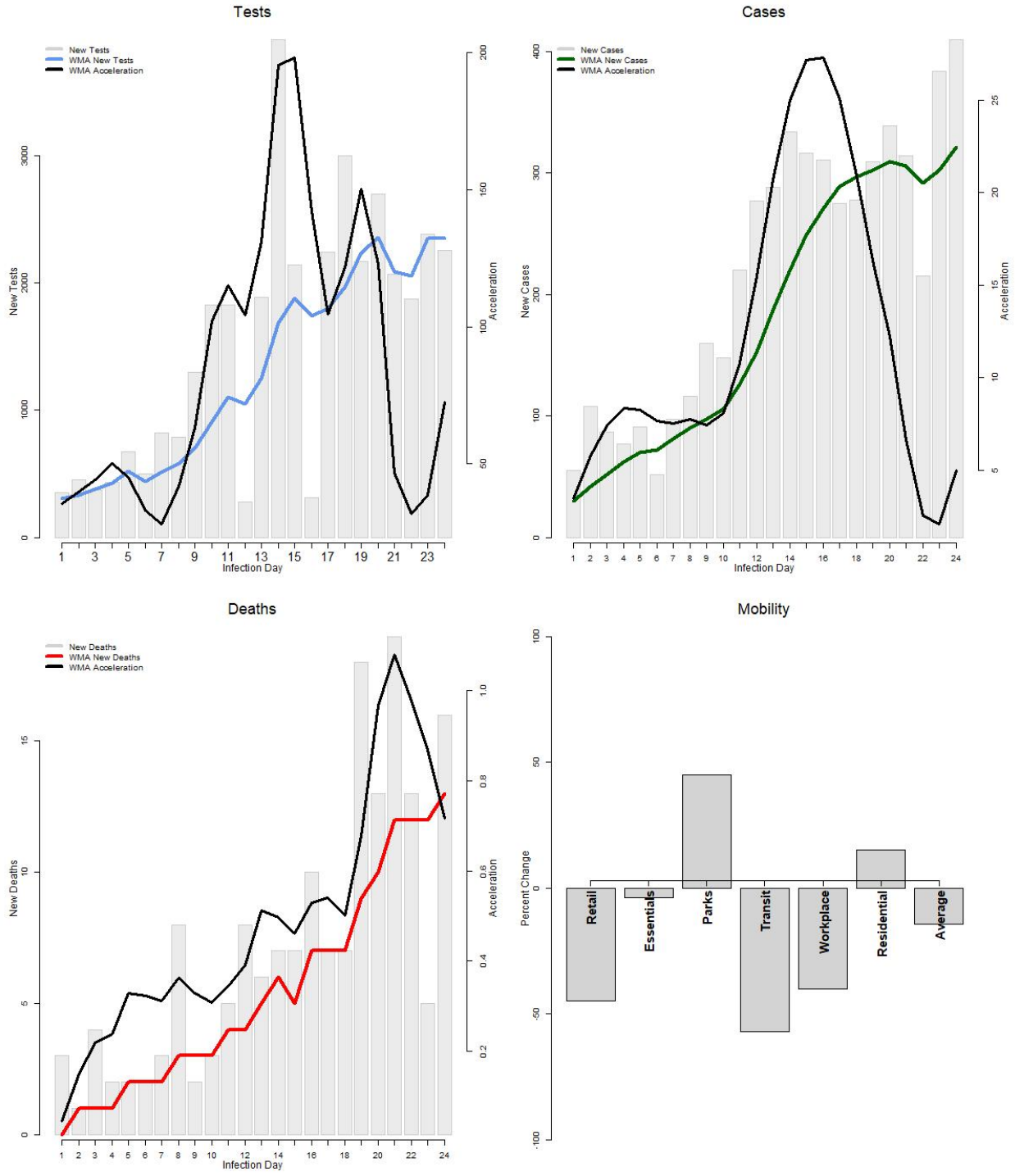
PR



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
PR	2020-03-30	10087	1298	64	12.9	4.9	46	1

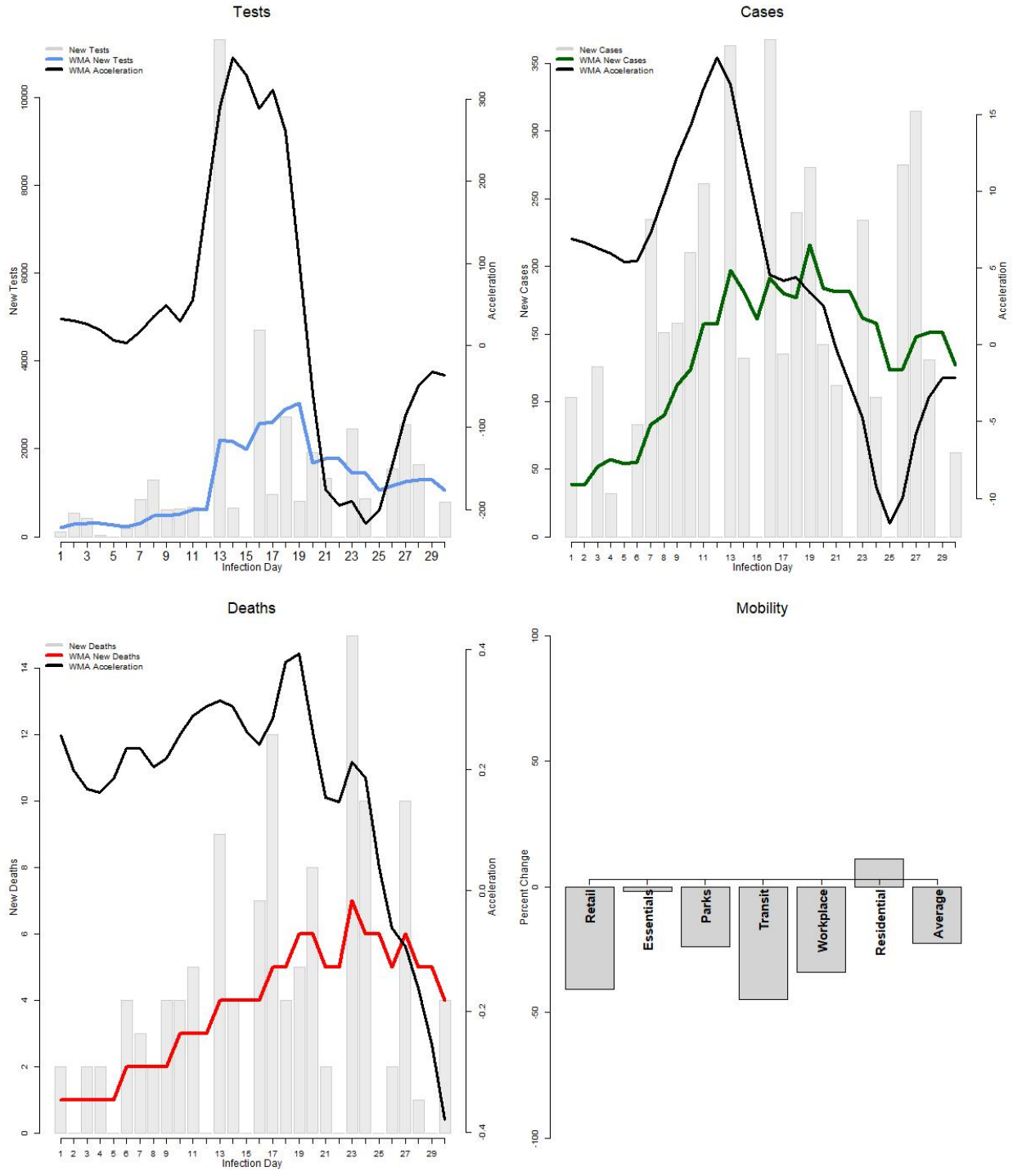
RI



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
RI	2020-03-27	39333	5500	171	14	3.1	410	16

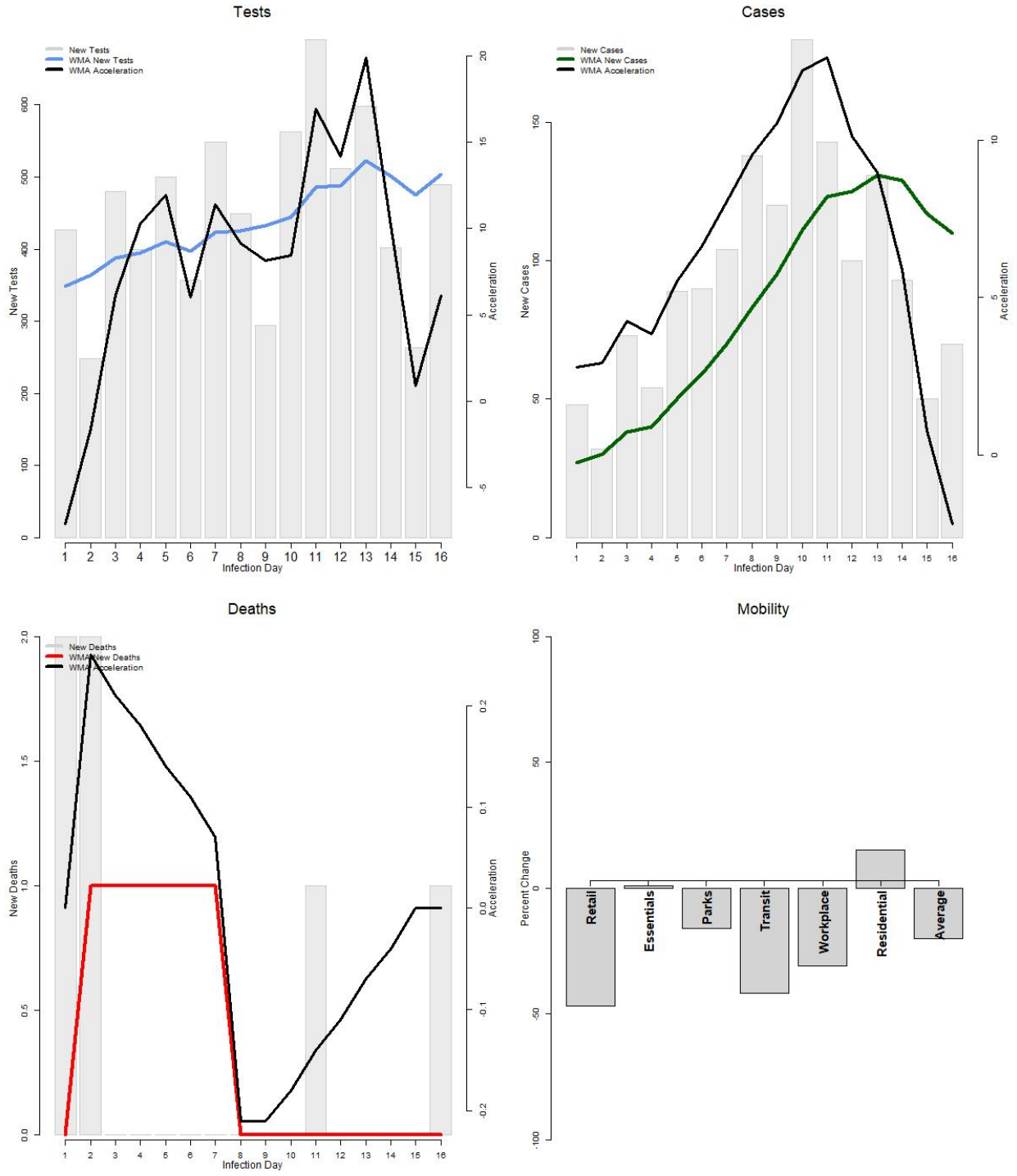
SC



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
SC	2020-03-21	41277	4439	124	10.8	2.8	62	4

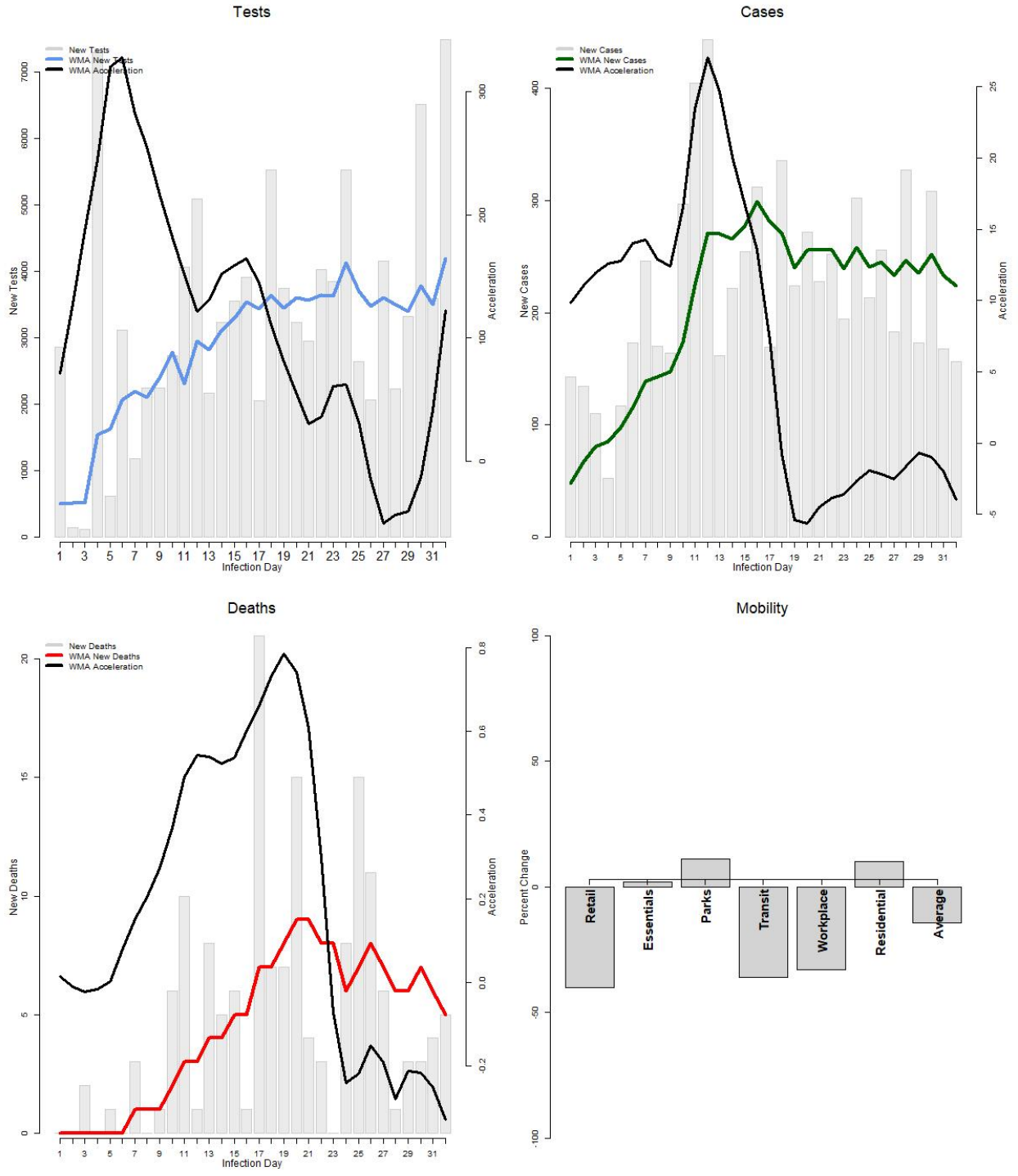
SD



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
SD	2020-04-04	12815	1755	8	13.7	0.5	70	1

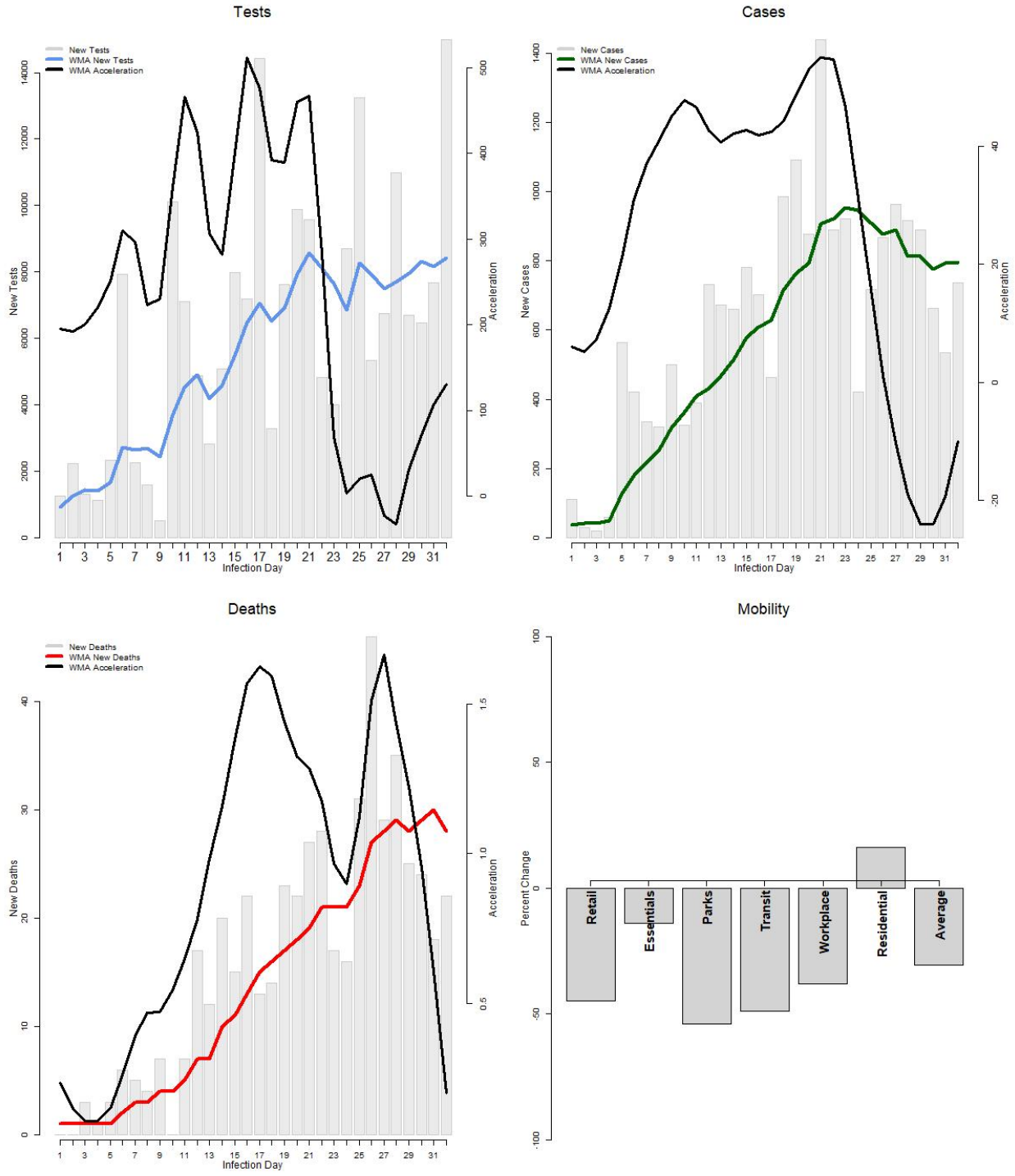
TN



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
TN	2020-03-19	108182	7394	157	6.8	2.1	156	5

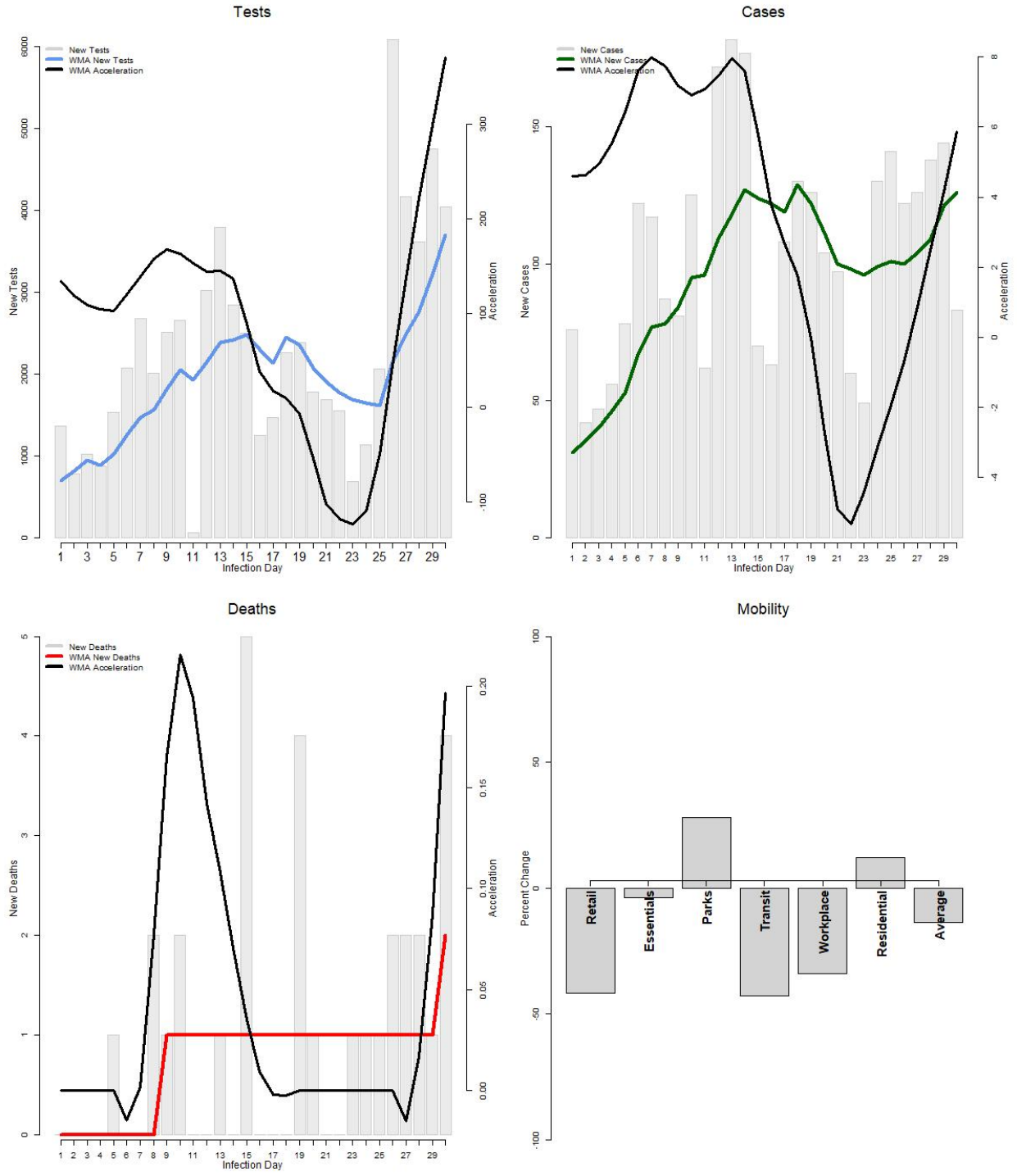
TX



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
TX	2020-03-19	205399	20196	517	9.8	2.6	738	22

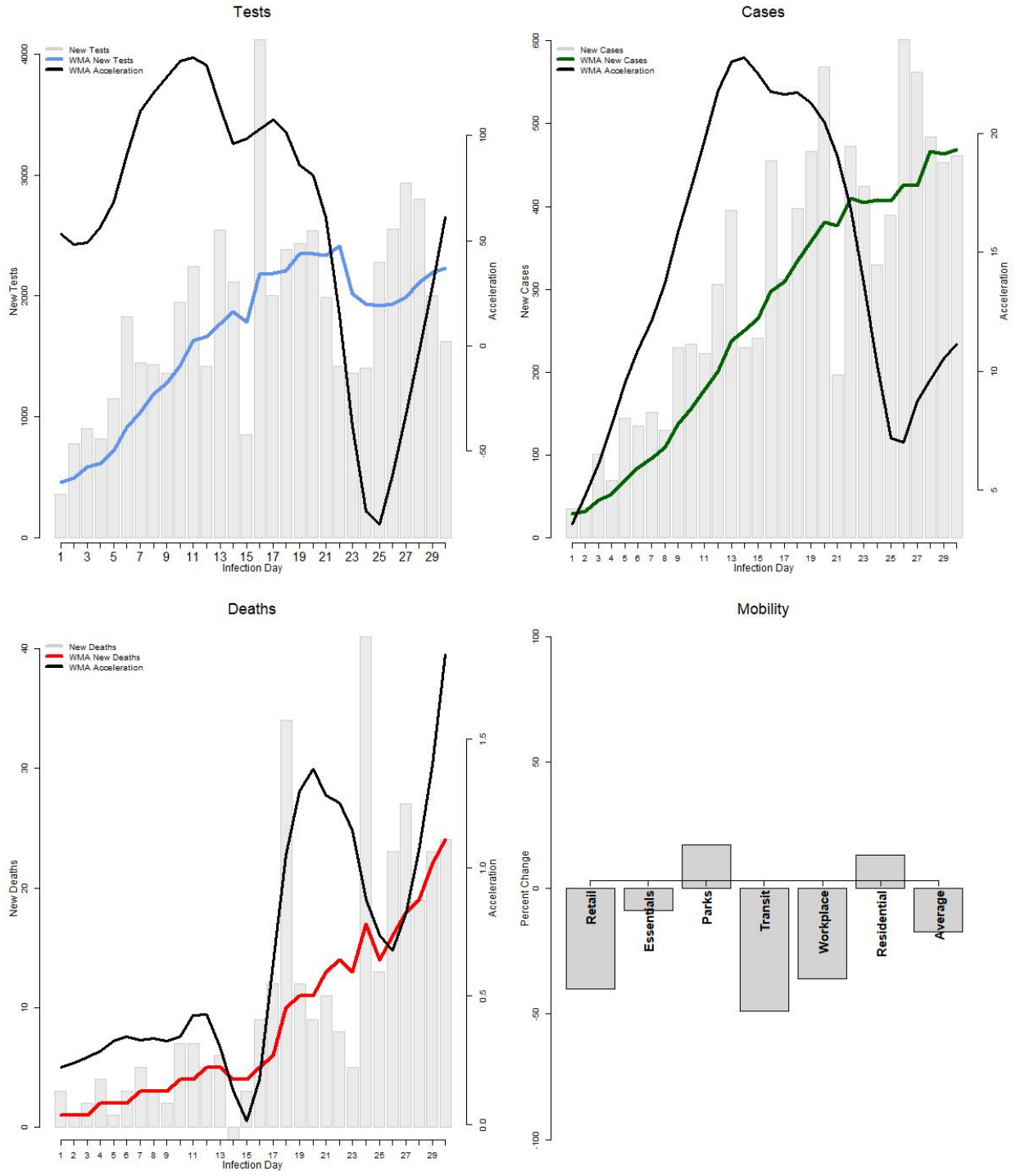
UT



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
UT	2020-03-21	72358	3296	32	4.6	1	83	4

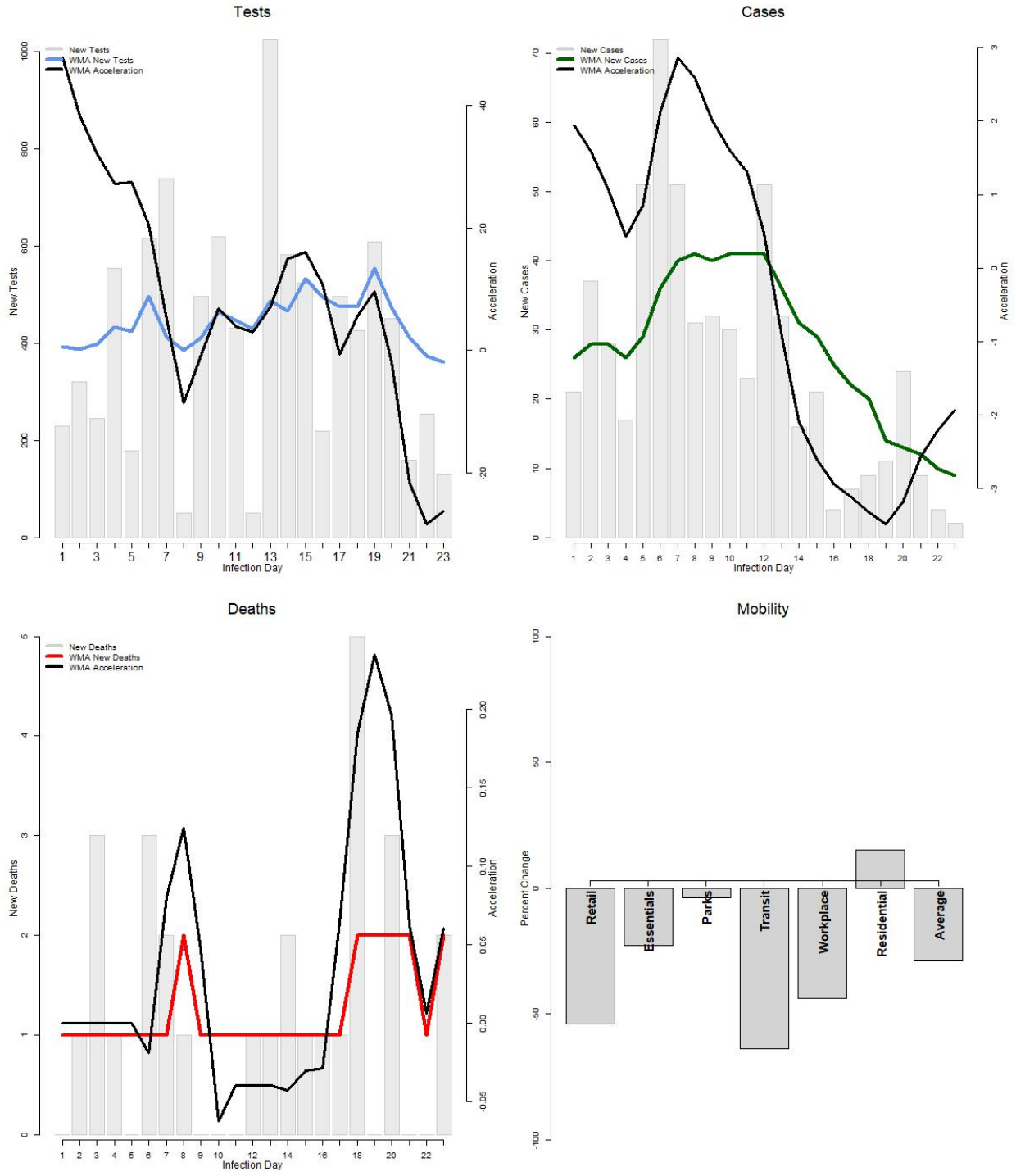
VA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
VA	2020-03-21	58354	9451	324	16.2	3.4	461	24

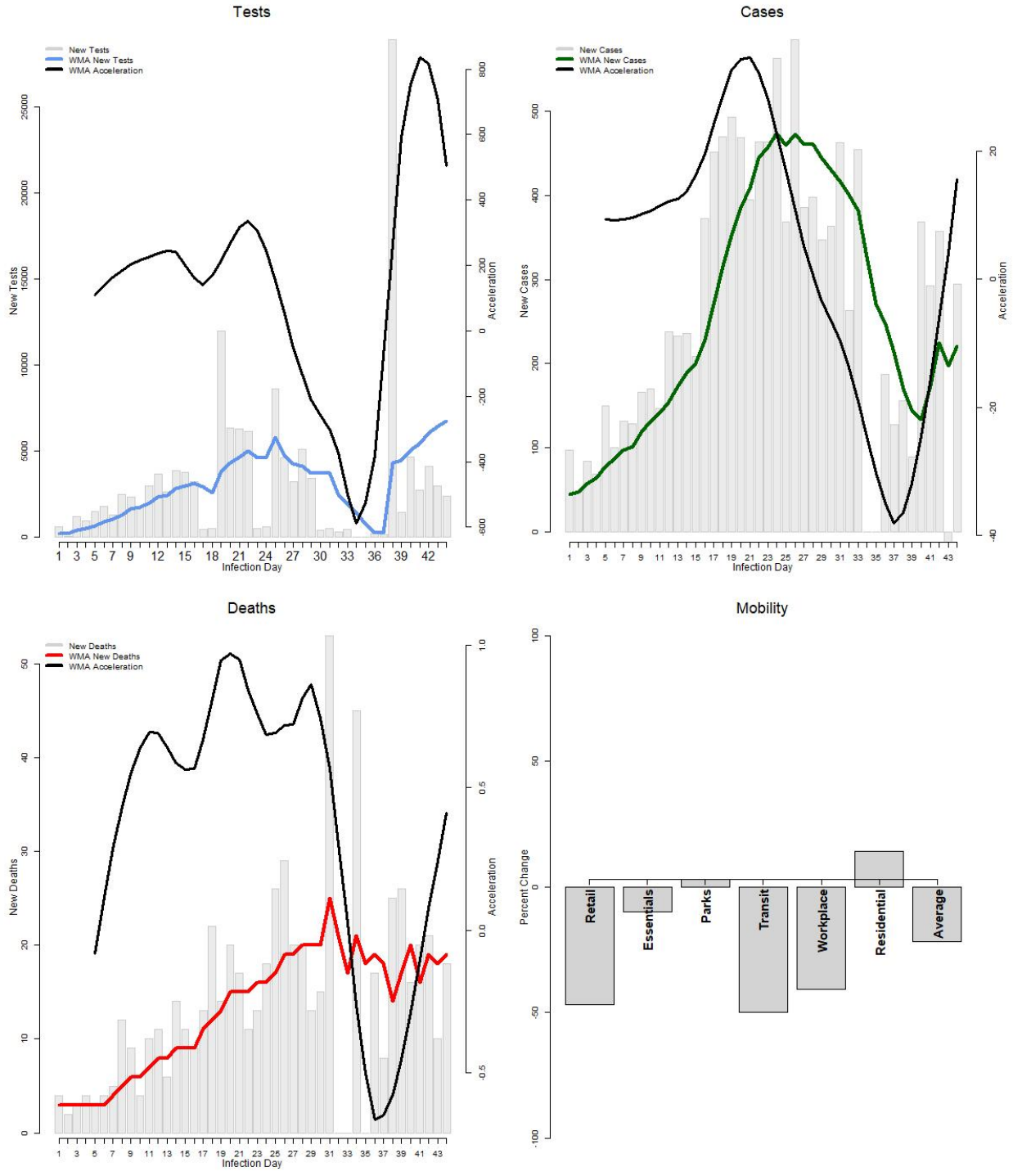
VT



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
VT	2020-03-28	13111	818	40	6.2	4.9	2	2

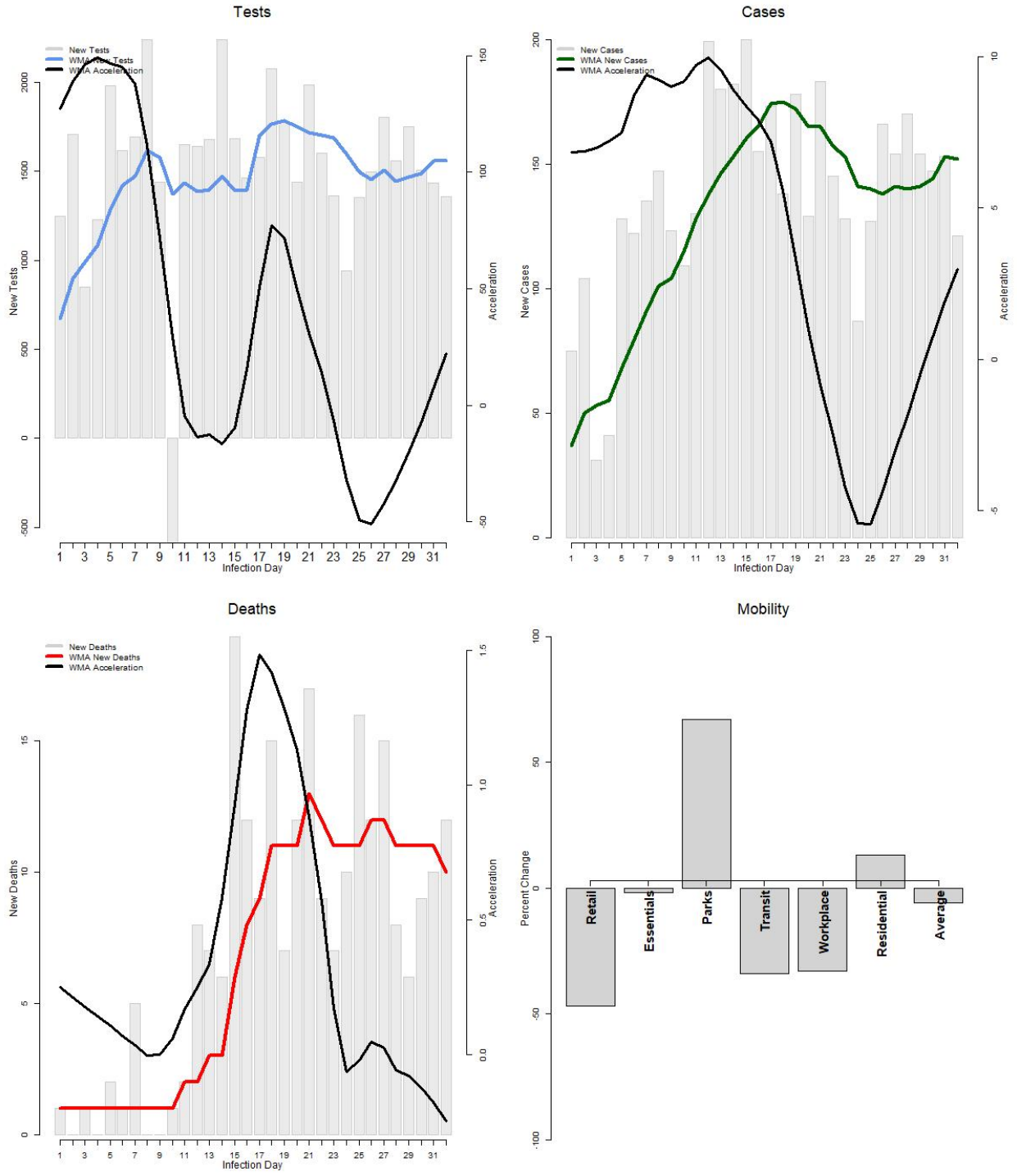
WA



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
WA	2020-03-07	141011	12085	652	8.6	5.4	295	18

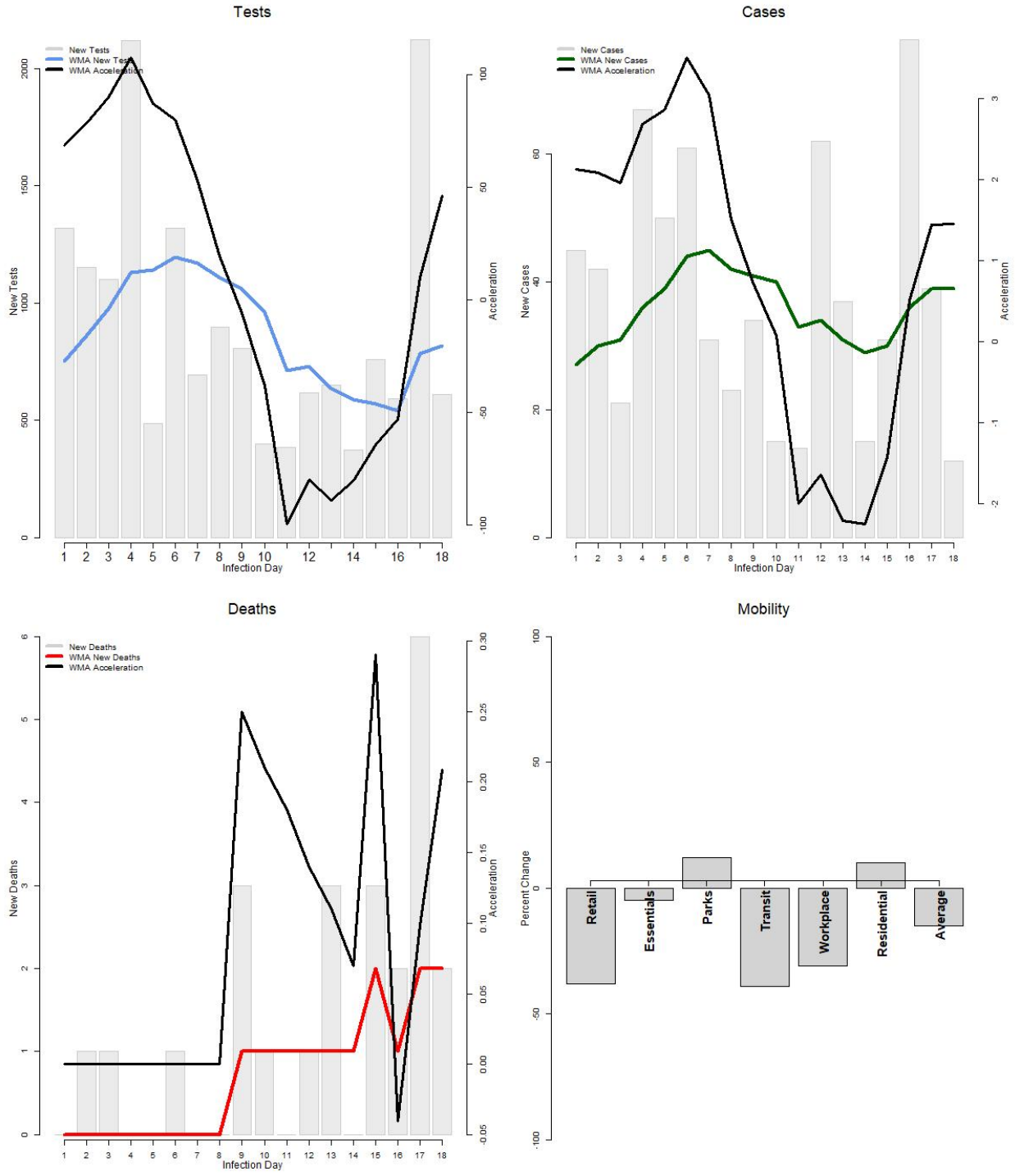
WI



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
WI	2020-03-19	52461	4620	242	8.8	5.2	121	12

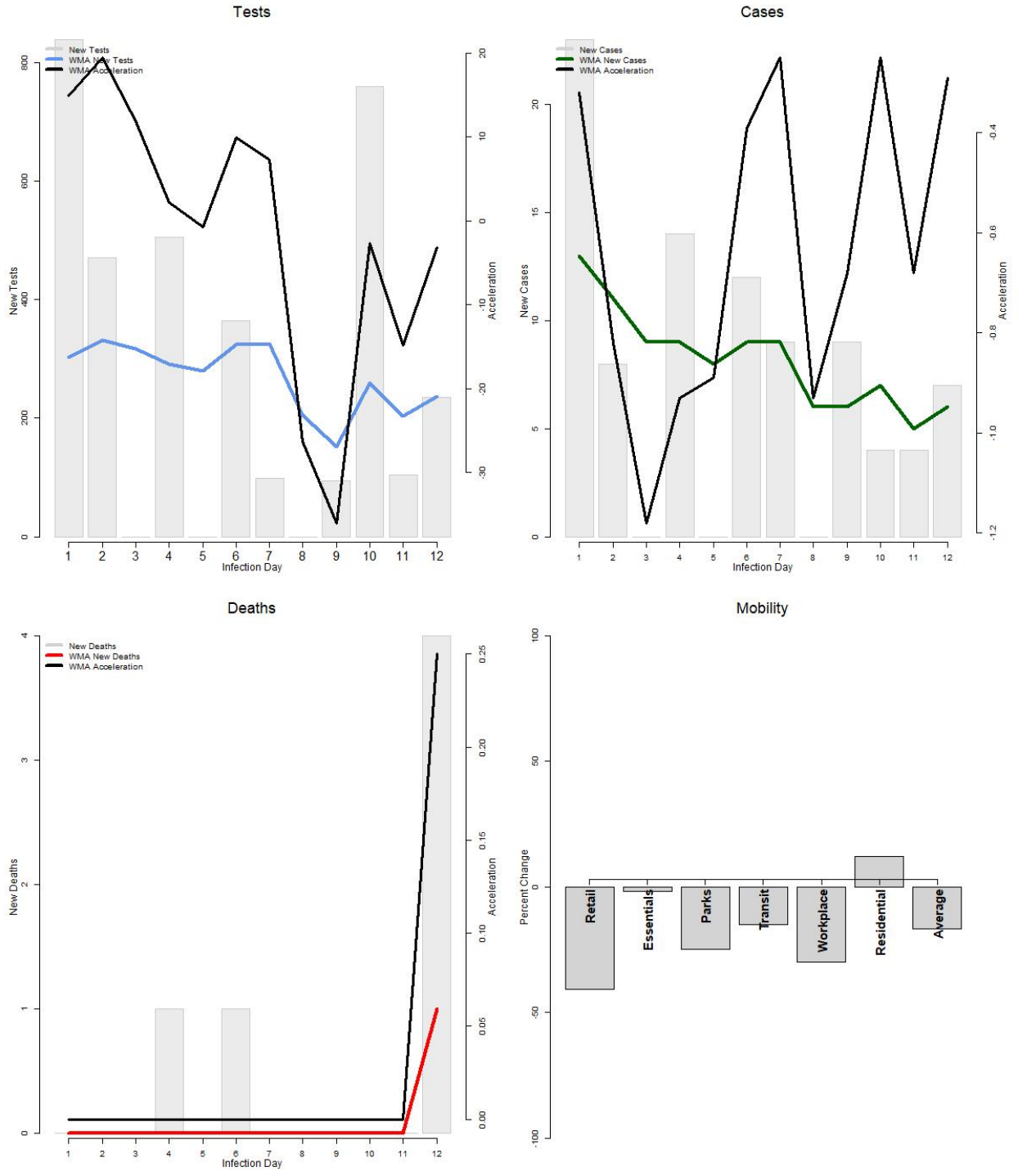
WV



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
WV	2020-04-02	22763	914	26	4	2.8	12	2

WY



Metrics as of 2020-04-21

State	Infected Date	Tests	Positive	Deaths	Pos Rate (%)	Death Rate (%)	New Cases	New Deaths
WY	2020-04-08	7621	320	6	4.2	1.9	7	4