NORTH BEACH WATER DISTRICT

William Neal

Final Report

May 15, 2020

EVALUATING THE FINANCIAL IMPACT OF THE 2019 NOVEL CORONAVIRUS LOCKDOWN ON NORTH BEACH WATER DISTRICT

One of the most notable indicators of financial stress on ratepayers of a utility is the percentage of customers who pay their bills late or are in delinquency. Chart 1 shows the percentage of delinquency on a monthly basis for the previous 28 months. As the chart shows, the delinquency rate generally runs between 9 and 11 percent each month. The delinquency rates for March and April do not indicate an increased financial stress on ratepayers.

In accordance with the Governor's March 18 order, the District suspended all service disconnections (lock-offs) in March 2020. Starting in April 2020, late fees have not been charged either. Late fees and lock-off fees generate $5,000 to $6,000 of revenue per month. More important, late fees and lock-offs are effective tools for collecting bills and keeping customers from amassing large debts that are more difficult to pay each month.

Another indicator of financial stress on the ratepayers of a utility is the revenue collected. Chart 2 shows the revenue collected each month as a percentage of budgeted revenue for the year. Chart 2a shows base-rate revenue collected each month as a percentage of budgeted base-rate revenue. Chart 2b shows meter-rate revenue collected each month as a percentage of budgeted meter-rate revenue.

The charts show that the revenue collected in March and April, the first two months of coronavirus lockdown, is well within the normal percentages of revenue collected each month. The revenue collected for March and April does not indicate an increased financial stress on ratepayers.

During times of potential revenue shortfalls, it is prudent to implement austerity measures to preserve reserve funds. Therefore, on March 20, 2020, the District's general manager instructed key employees to curtail discretionary spending and suspend all 2020 capital improvement projects.

SUMMARY

Currently, the data does not indicate an increase in customer financial stress. Current data also suggest that the coronavirus lockdown is contributing to a flattening of the epidemiologic curve. It is reasonable to assume that negative economic impacts from the coronavirus lockdown have been delayed due to aggressive federal economic programs designed to offset the loss of income resulting from the coronavirus lockdown. The federal programs are short-term or stop-gap measures. Therefore, if the coronavirus lockdown is prolonged, negative economic impacts should be expected.

I recommend that the District continue to monitor delinquency rates and revenue collections each month.

I recommend that the District continue with austerity measures until the coronavirus pandemic normalizes.

NORTH WELLFIELD TREATMENT PLANT

The North Wellfield Treatment Plant (Plant) consists of six venturi nozzles, one potassium permanganate saturator with a feed pump, one chlorine reservoir with a feed pump, and four trains, each with one contact tank (Tank) and three filter tanks (Filters).

The Tanks and Filters are made of spun fiberglass with a polyethylene liner manufactured by Pentair. The Tanks and Filters measure 42 inches in diameter by 72 inches in height, with a capacity of 345 gallons.

The filter media (Media) is granular manganese dioxide, manufactured by Clack Corporation. The Media's design maximum filter rate (MFR) is 5 GPM/FT2 (gallons per minute per cubic foot of Media). The Filters contain 9.6 cubic feet of Media each. The design MFR of each Filter is 48 GPM. The Plant has 12 Filters. The Plant design MFR is 576 GPM or 0.830 million gallons (MG) per day. The design backwash rate is 10 GPM/FT2, or 96 GPM per filter.

Each Filter is outfitted with a Fleck 3150 valve (Fleck Valve) manufactured by Pentair. Filter operation programming is through the SCADA system. The SCADA was installed in 2016.

The Plant filters water from the North Wellfield water wells (raw water) and transports the filtered water into three on-site water storage reservoirs.

The raw water exceeds maximum contaminant levels (MCL) for iron, manganese, and arsenic set by the Environmental Protection Agency (EPA). The Plant removes iron, manganese, and arsenic to a point below the MCL.

As the Filter operates in the service mode, it traps and holds particulates (iron, manganese, and arsenic) in the Media. In time, because water's nature is to follow the path of least resistance, the water will cut channels through the Media. As channels or holes in the Media bed form, water begins to flow around rather than through the Media. This process is called "channeling," and it reduces the effectiveness of the Filter.

To prevent channeling and remove contaminant trapped in the Media, regular backwashing is required. This is accomplished by passing water upward through the bed for several minutes at sufficient velocity (96 GPM) to expand the Media bed by 40–60%. Backwashing removes particulates, relieves channeling, and allows trapped gases to escape.

The Plant was built from 2002 to 2004, receiving a major upgrade in 2015–2016. The Tanks, Filters, Media, and Fleck Valves were not included in the 2015–2016 upgrade. Those components are 18 years old. Given that their normal economic life ranges from 30 to 40 years their remaining period of optimal use is between 12 and 22 years. The Fleck Valves have not received any significant maintenance since 2002.

The "backwash" is initiated by the SCADA system when 0.5 million gallons of water have been filtered since the previous backwash. Each Filter backwashes independently and in sequence, starting with Filter 1 of Train 1.

On backwash initiation, the raw water solenoid valve, normally open, is actuated (the valve closes); the backwash supply water solenoid valve, normally closed, is actuated (the valve opens); and the Fleck

Valve moves from “service mode” to “backwash mode” (Cycle 1). The duration of Cycle 1 is controlled by the SCADA system.

On completion of Cycle 1, the Fleck Valve moves from “backwash mode” to “rapid rinse mode” or “filter to waste” (Cycle 2). The duration of Cycle 2 is controlled by the SCADA system.

On completion of Cycle 2, the Fleck Valve moves from “rapid rinse mode” to “service mode”; the backwash supply solenoid valve is deactivated (the valve closes); and the raw water solenoid valve is deactivated (the valve opens). The backwash is complete, and the Filter is back in service. The SCADA system initiates the backwash on the next Filter in sequence.

Currently, Cycle 2 is not functioning as described above. In Cycle 2, the Fleck Valve does not move from “backwash mode” to “rapid rinse mode” as programed. The purpose of the rapid rinse cycle is to rinse away the discolored water resulting from the backwash agitation. For reasons yet to be determined, the Fleck Valve does not reach the “backwash mode.” Because the Filter is not getting a rapid rinse, the discolored water (600–800 gallons) is being sent to the reservoirs after each Filter backwash.

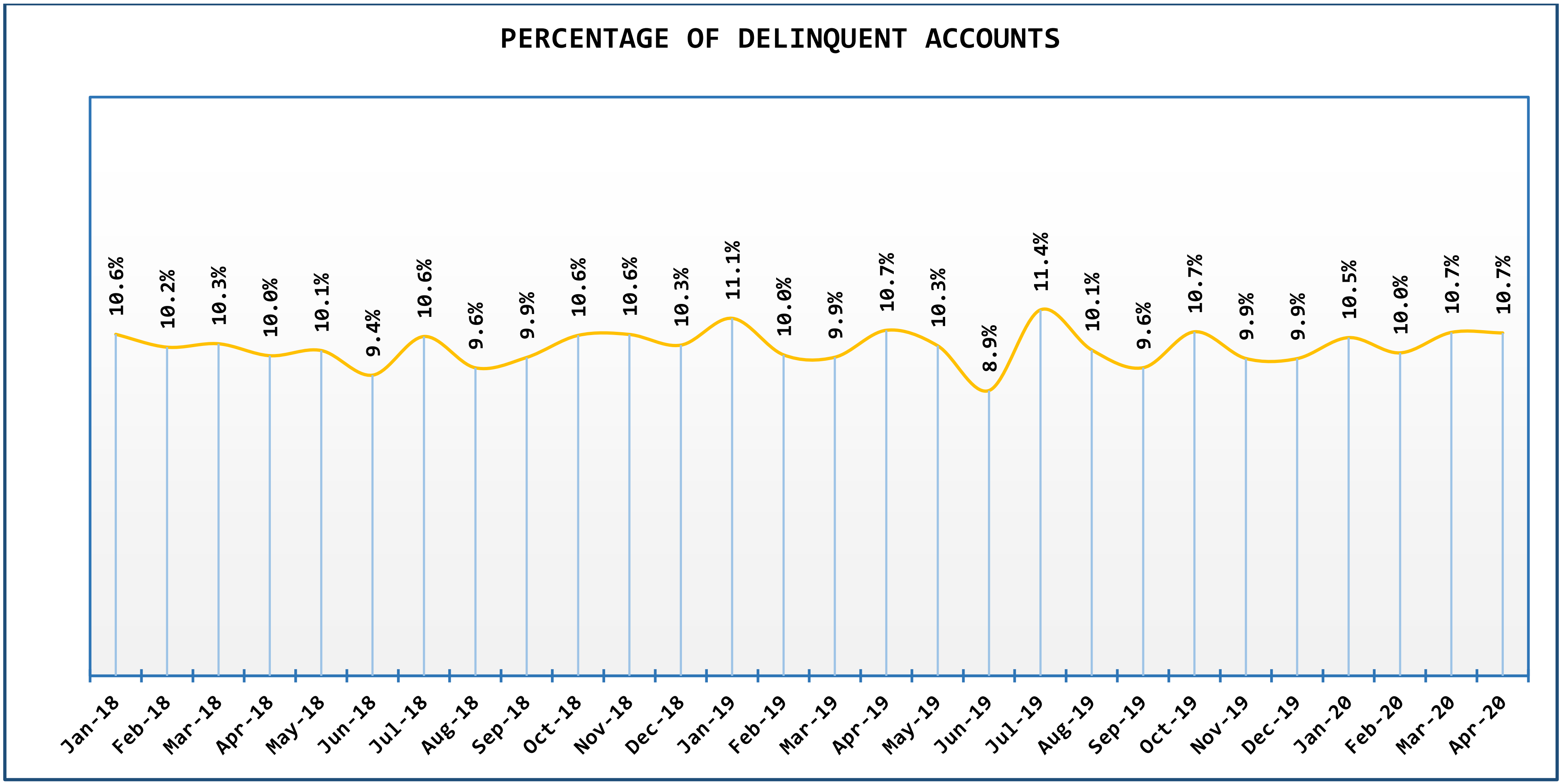
The above described condition is not critical for operations. Water testing indicates that the Filters are removing targeted contaminants adequately. The small amount of discolored water being delivered to the reservoirs is inconsequential to the overall water quality. Correction of the condition should be considered important but not an emergency.

In February of 2020, The Treatment Plant Operator discovered that the backwash flow rate was significantly lower than the 10 GPM/FT2 design rate (3.5 GPM/FT2). A valve on the backwash supply line was partially closed and damaged. Inadequate backwash rates will decrease the treatment efficacy of the media. In time, the Filters will no longer remove contaminants and the media can become fouled beyond correction. This condition may be traced back to work on the booster station in late 2019 or may go back to the 2016 treatment plant upgrades. The damaged valve has been replaced, the backwash supply line has been upgraded, and measures are being taken to thoroughly clean the media. Considering the Filters were effectively removing contaminants when the problem was discovered in February, it is unlikely the condition existed for a long time or that the media was irreparably harmed.

SUMMARY

Many of the components in the Plant are nearing 20 years of service. With appropriate operation and maintenance, those components should have a minimum 30-year economic life expectancy. Therefore, I recommend that the Plant be evaluated by a professional engineer to estimate its remaining economic life expectancy. In addition, the engineer should evaluate the efficacy of the filtration media’s ability to remove iron, manganese and arsenic. The engineer’s evaluation should also include recommendations for operation and maintenance procedures to extend its economic life expectancy and help the Plant achieve its highest treatment efficacy and measures to increase efficacy of arsenic removal.

CHART 1


PERCENTAGE OF DELINQUENT ACCOUNTS
10.6%
10.2%
10.3%
10.0%
10.1%
9.4%
10.6%
9.6%
9.9%
10.6%
10.6%
10.3%
11.1%
10.0%
9.9%
10.7%
10.3%
8.9%
11.4%
10.1%
9.6%
10.7%
9.9%
9.9%
10.5%
10.0%
10.7%
10.7%
Jan-18
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
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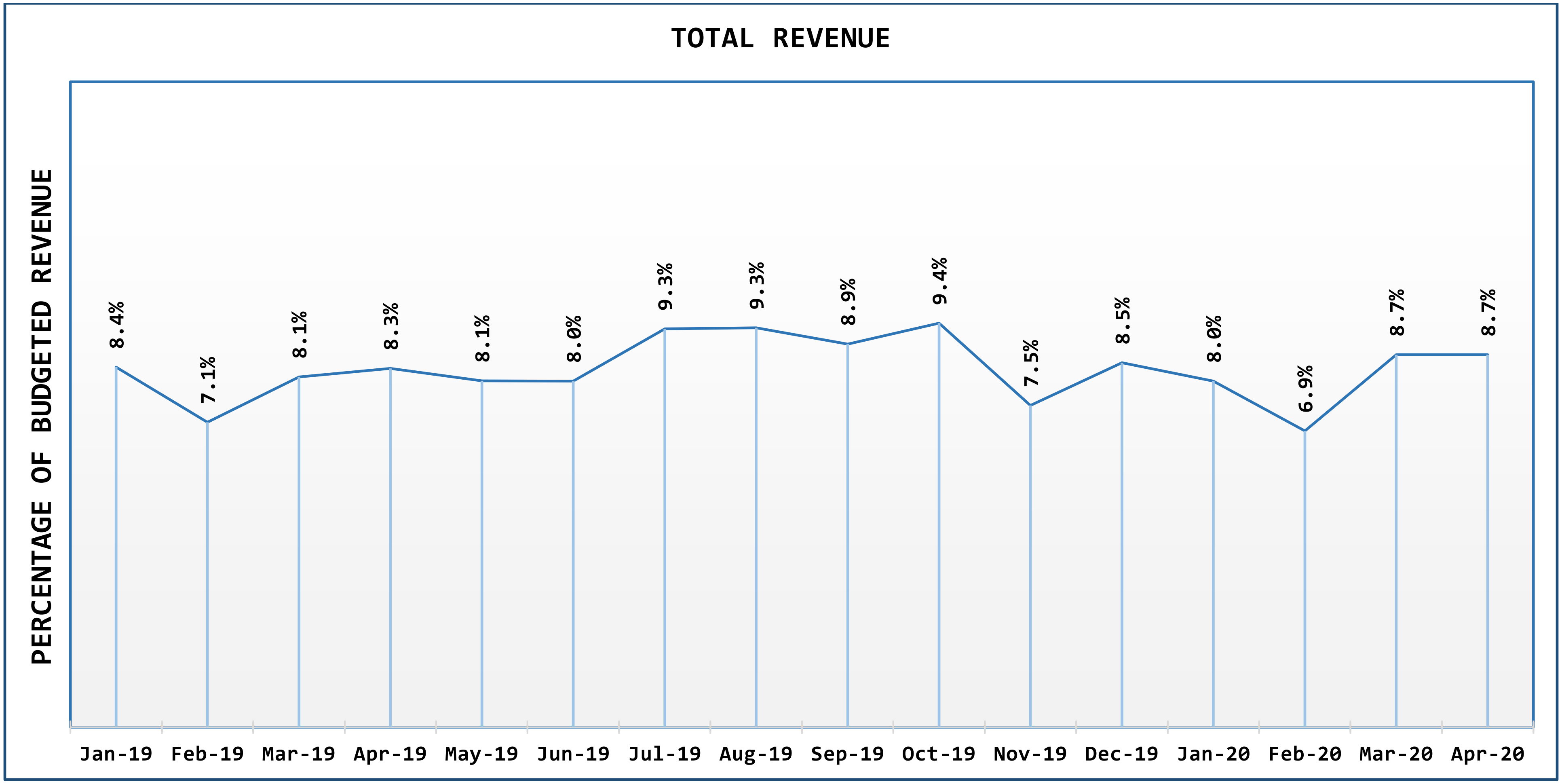
Feb-20
Mar-20
Apr-20

CHART 2


TOTAL REVENUE
PERCENTAGE OF BUDGETED REVENUE
8.4%
7.1%
8.1%
8.3%
8.1%
8.0%
9.3%
9.3%
8.9%
9.4%
7.5%
8.5%
8.0%
6.9%
8.7%
8.7%
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
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Nov-19
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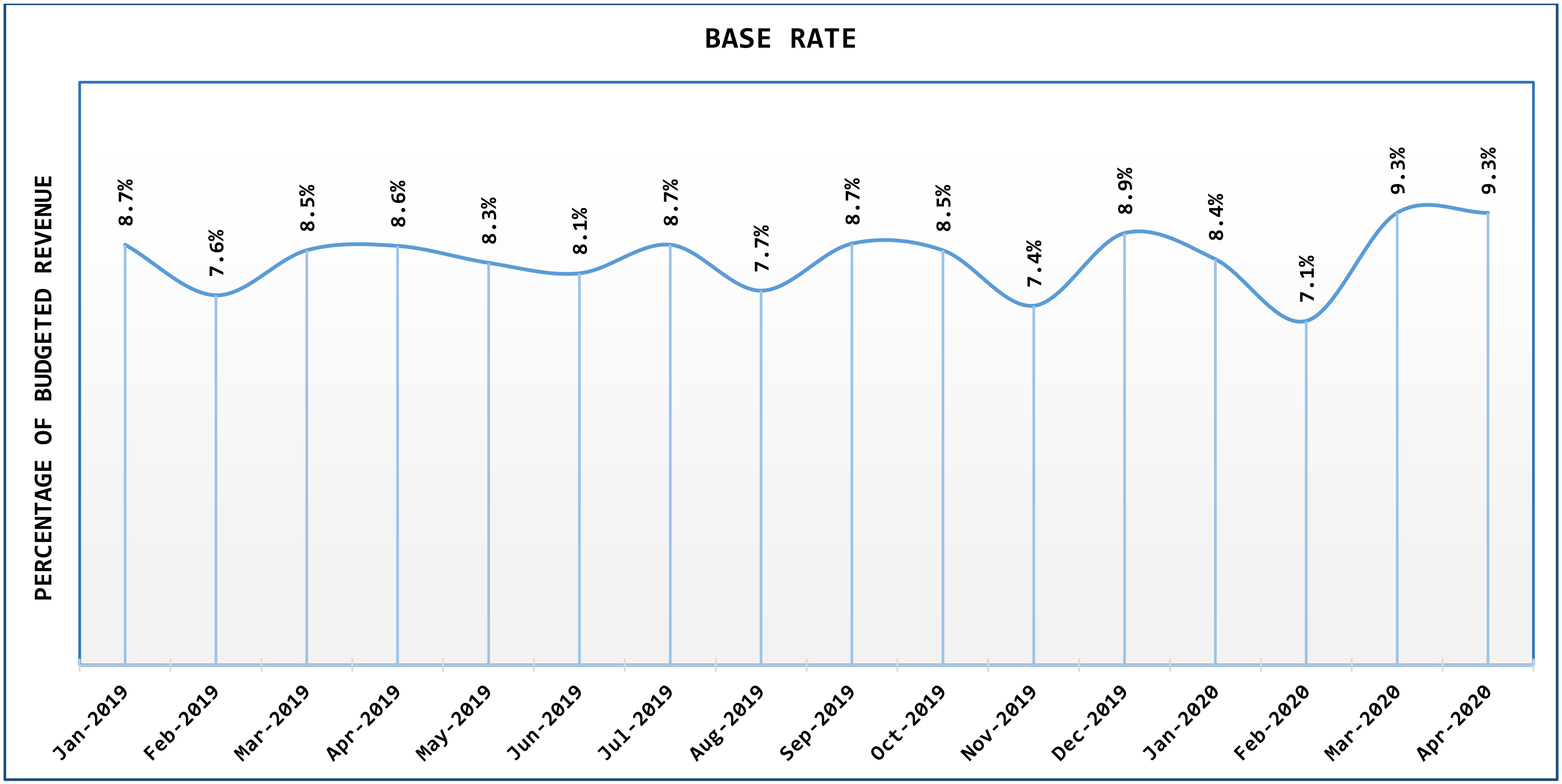
Feb-20
Mar-20
Apr-20

CHART 2a



BASE RATE
PERCENTAGE OF BUDGETED REVENUE
8.7%
7.6%
8.5%
8.6%
8.3%
8.1%
8.7%
7.7%
8.7%
8.5%
7.4%
8.9%
8.4%
7.1%
9.3%
9.3%
Jan-2019
Feb-2019
Mar-2019
Apr-2019
May-2019
Jun-2019
Jul-2019
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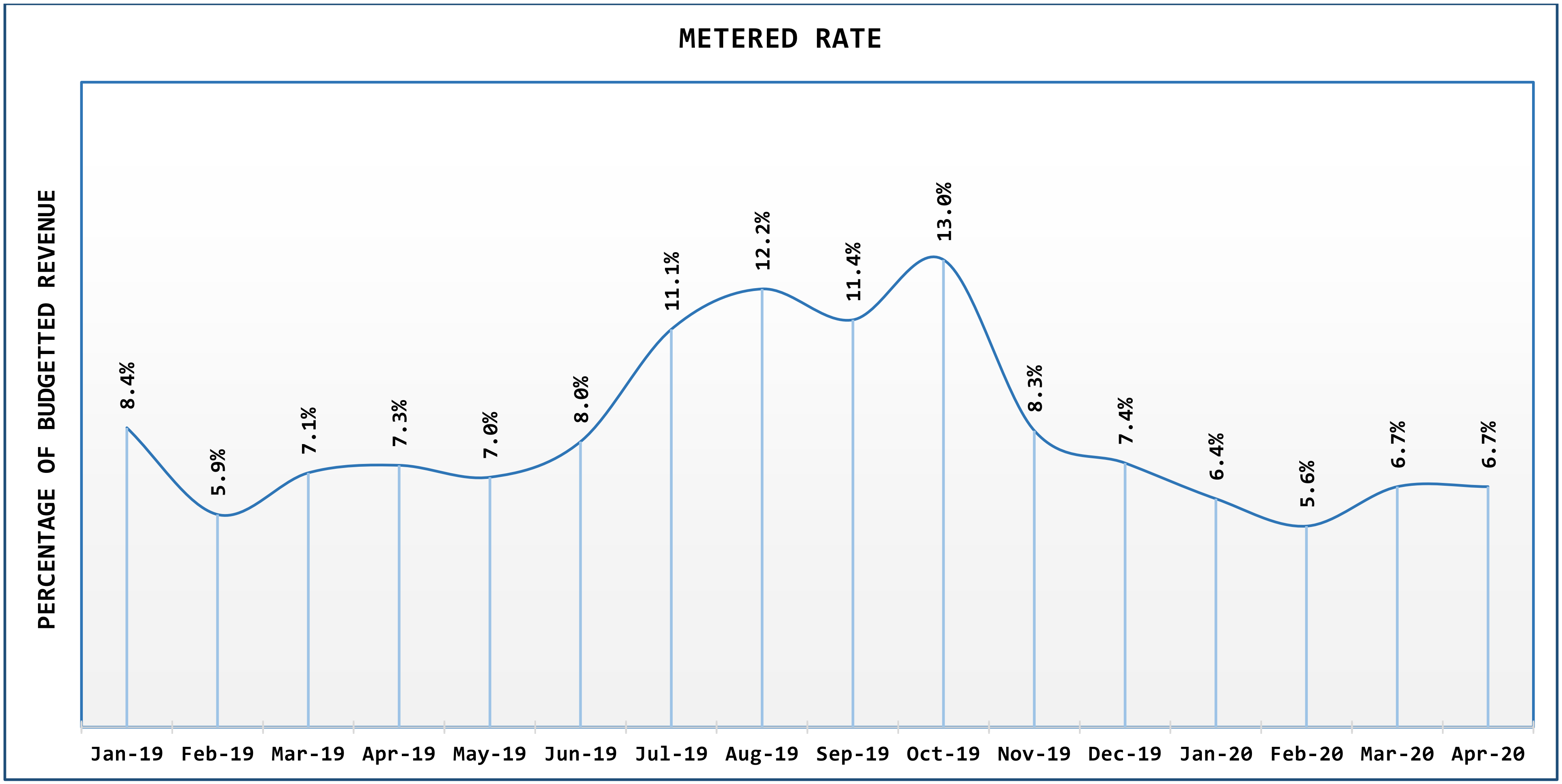
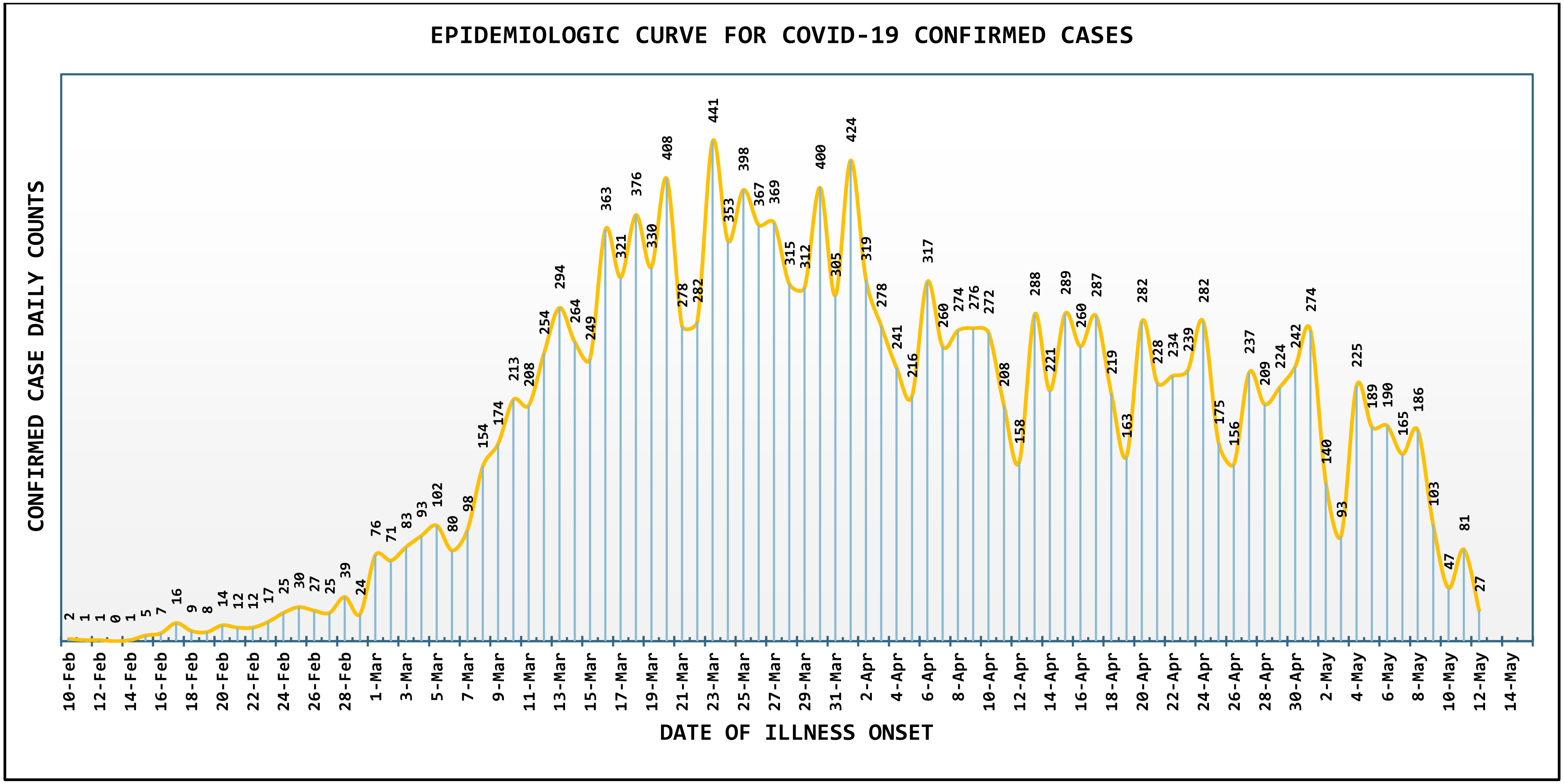
Oct-2019
Nov-2019
Dec-2019
Jan-2020
Feb-2020
Mar-2020
Apr-2020

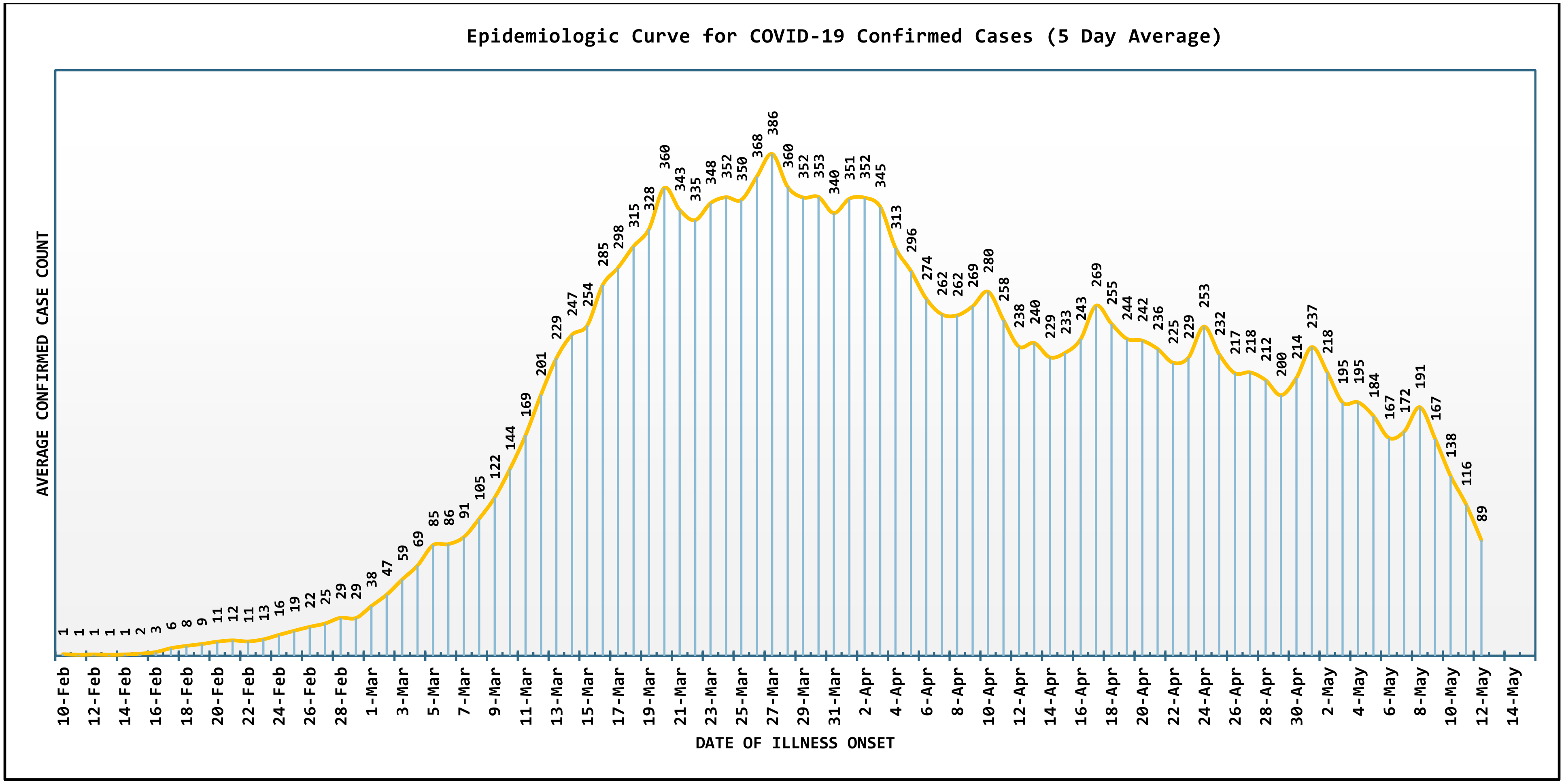
CHART 2b


METERED RATE
PERCENTAGE OF BUDGETTED REVENUE
8.4%
5.9%
7.1%
7.3%
7.0%
8.0%
11.1%
12.2%
11.4%
13.0%
8.3%
7.4%
6.4%
5.6%
6.7%
6.7%
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20

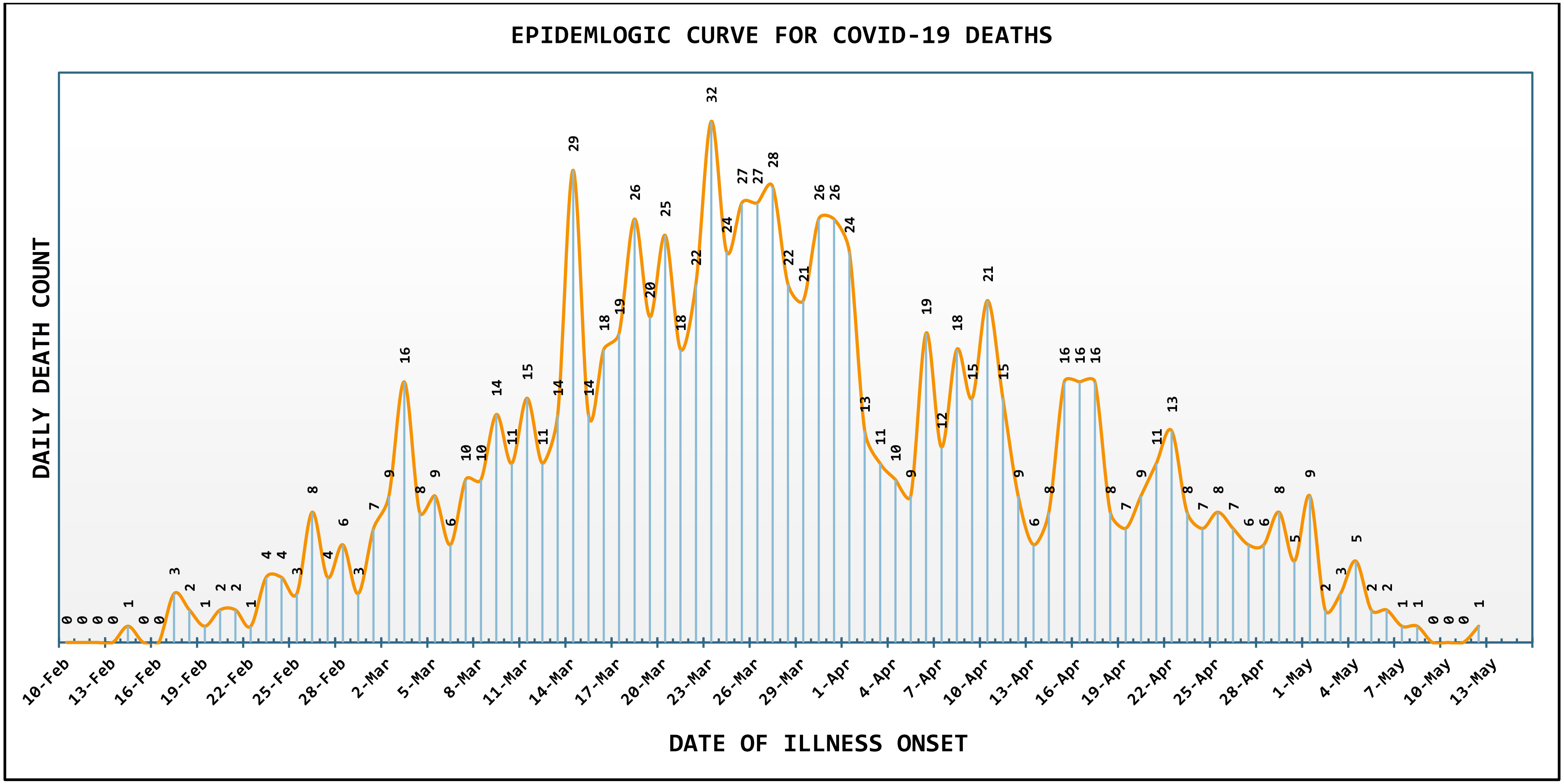
The charts below show the progression of the COVID-19 outbreak in Washington State over time. These charts are epidemiologic charts (curves). Epidemiologic charts tract infections and deaths by the date of illness onset which is the date the person began to feel sick. When epidemiologist's talk about "flattening the curve" they are referring to the epidemiologic curve. The last five days of data is incomplete and subject to significant increases.



The chart below is the same data as the chart above. The data is represented as an average of the previous 5 days. The purpose of this chart is to eliminate daily undulations in data to provide better represent the data peaks and trending. The last five days of data is incomplete and subject to significant increases.



The charts below show the progression of the COVID-19 outbreak in Washington State over time. These charts are epidemiologic charts (curves). Epidemiologic charts tract infections and deaths by the date of illness onset which is the date the person began to feel sick. When epidemiologist's talk about "flattening the curve" they are referring to the epidemiologic curve. The last five days of data is incomplete and subject to significant increases.



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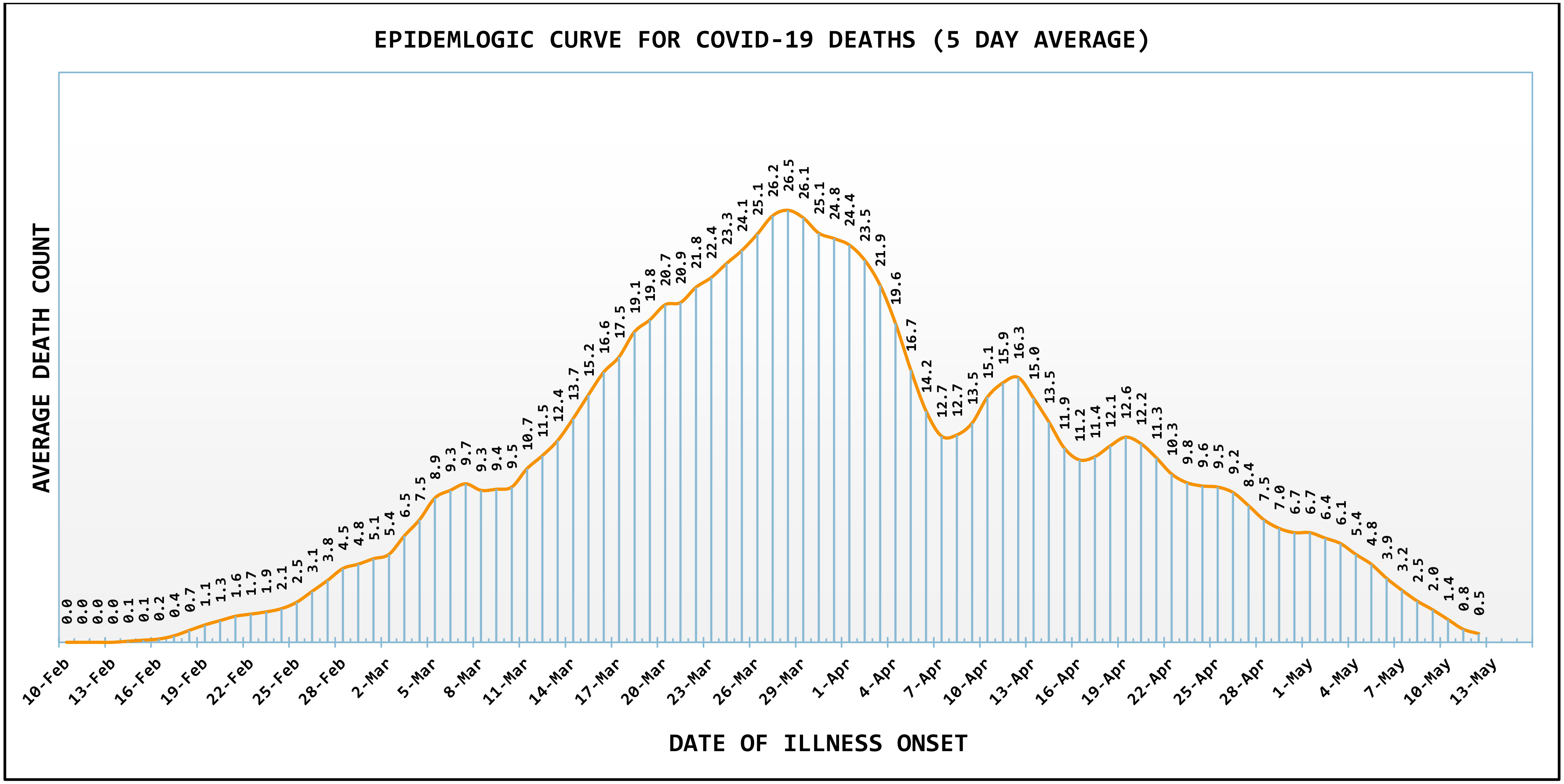
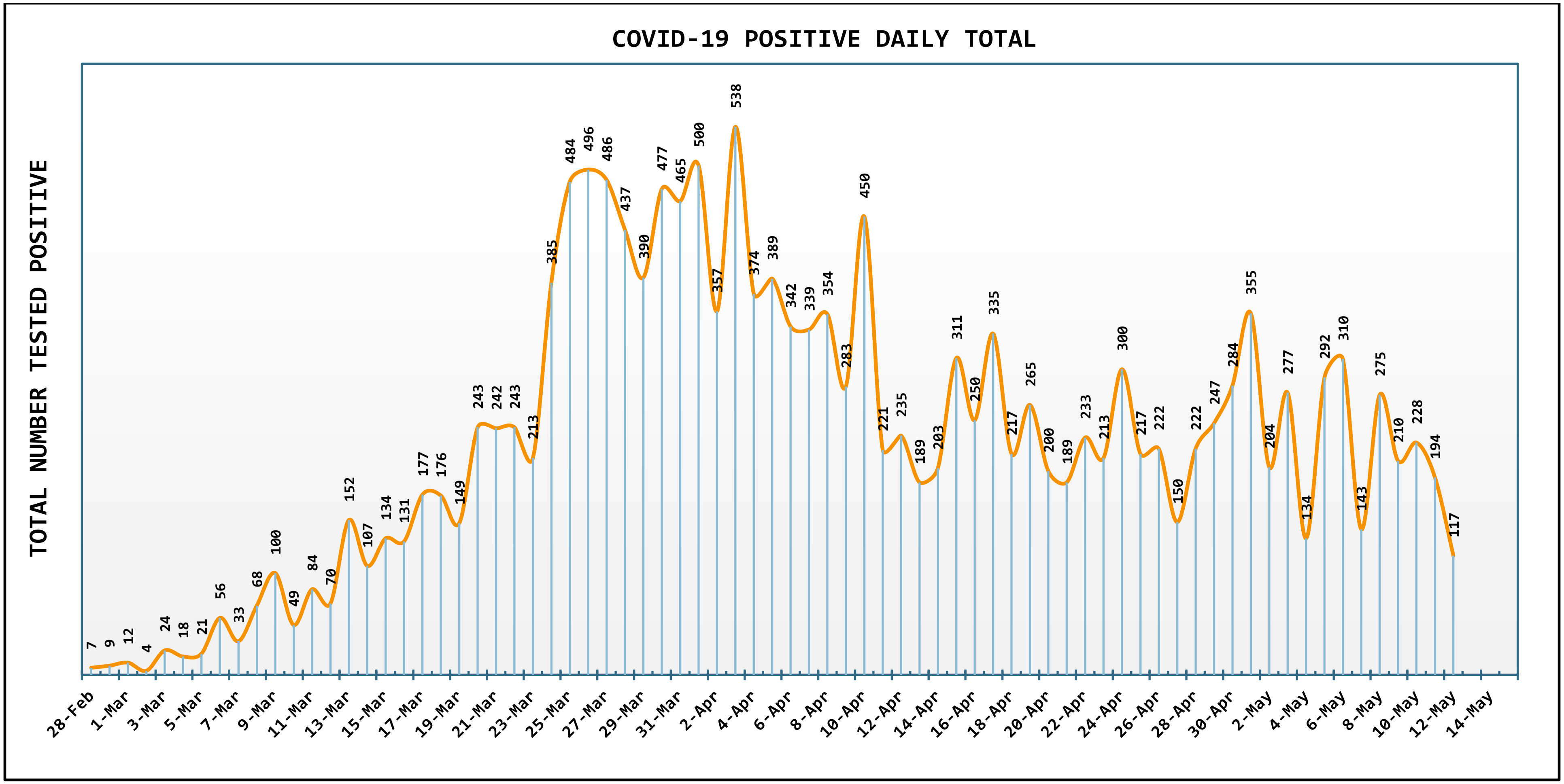


The charts below show the progression of the COVID-19 outbreak in Washington State over time. These charts show the total number of people who tested positive for COVID-19 each day since January 21, 2020, the first recorded case of COVID-19 in Washington State. The chart begins on February 28, 2020, when community transmission was first reported in Washington State. The date reflects the day cases were reported which is usually several days after symptoms started. Washington State has seen a rapid increase in COVID-19 cases through March 2020. The increase is due to both community transmission and expanded testing. The last five days of data is incomplete and subject to significant increases.



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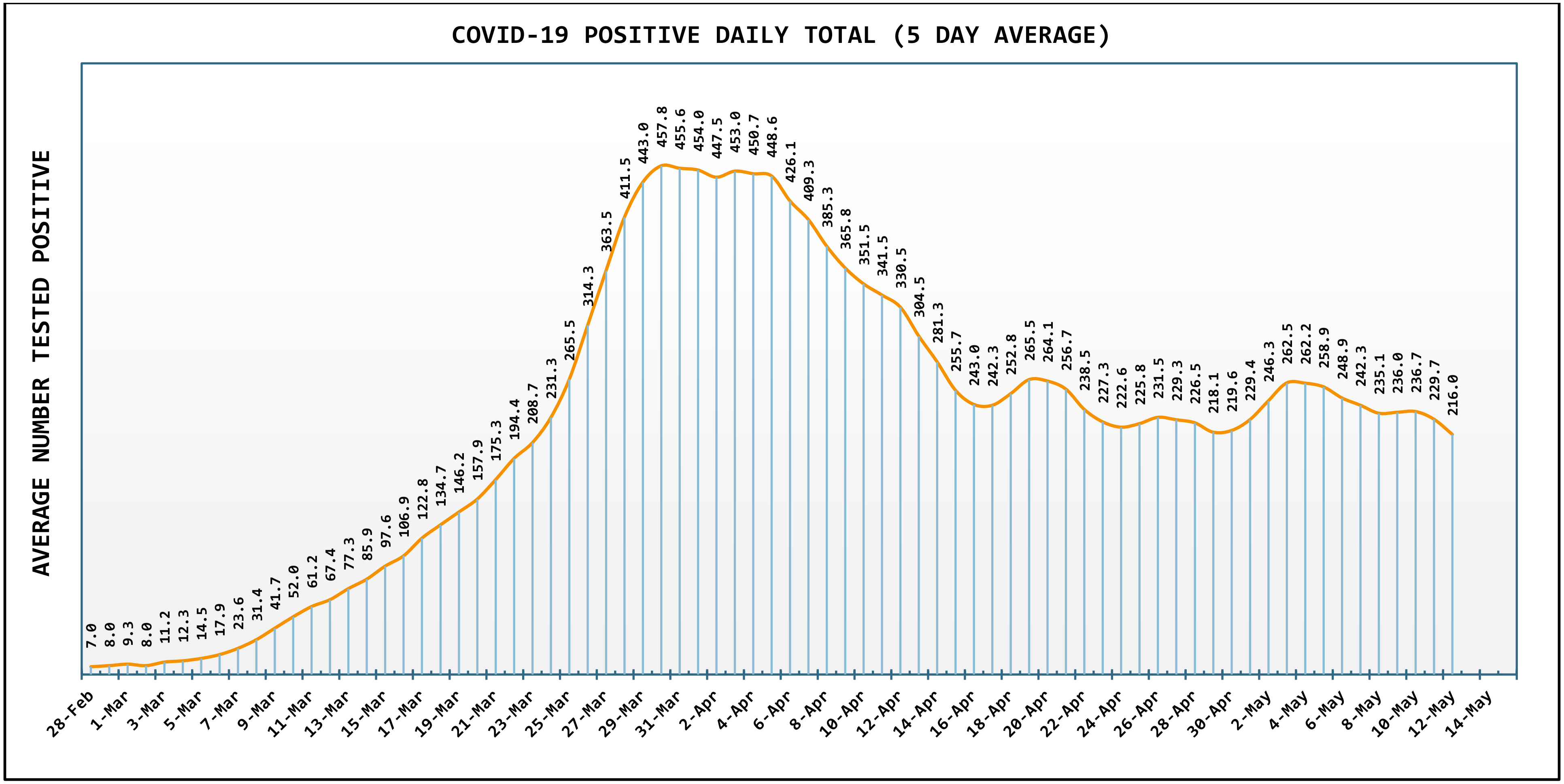
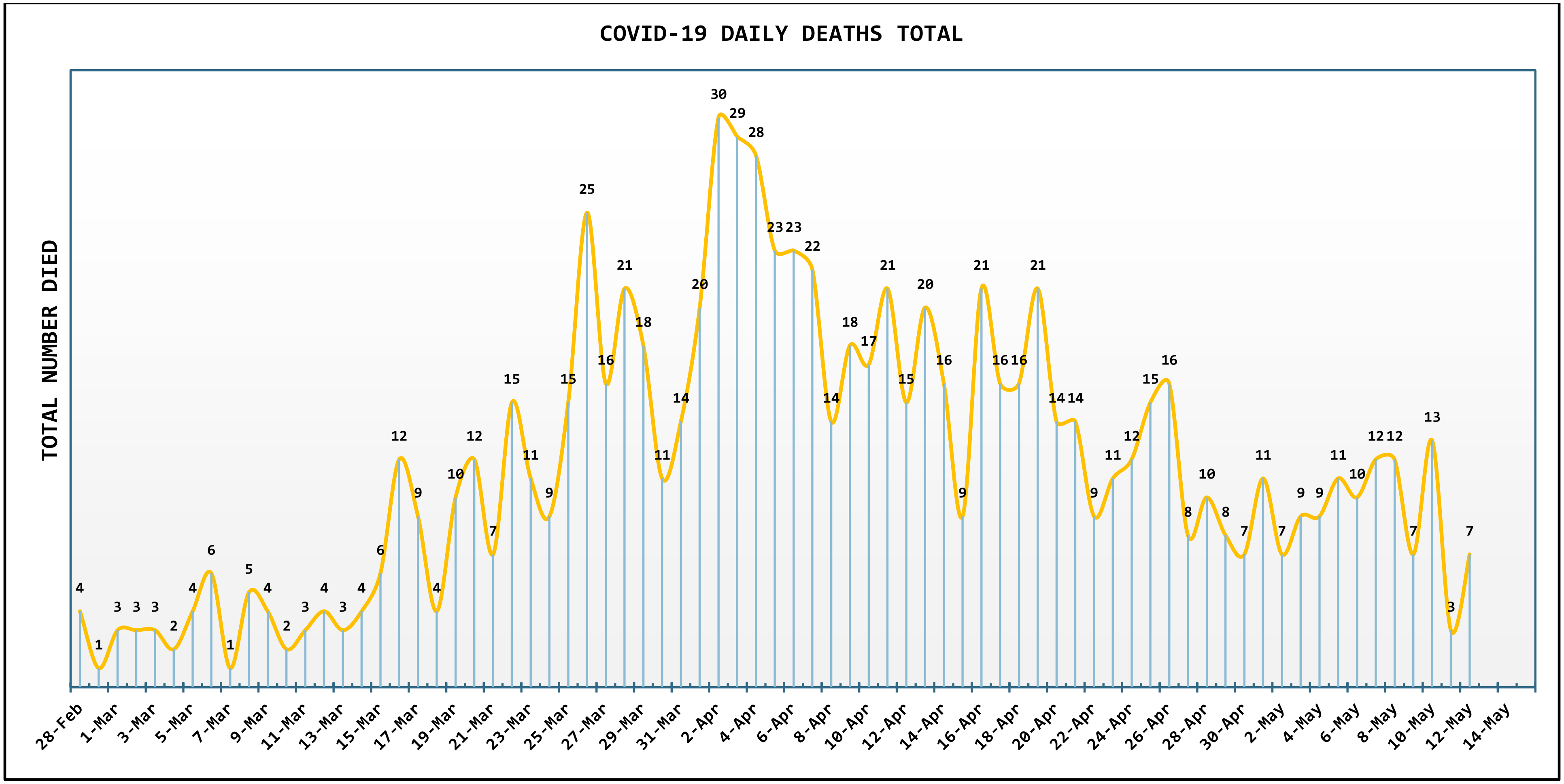


The charts below show the progression of the COVID-19 outbreak in Washington State over time. These charts show the total number of people who died of COVID-19 each day in Washington State. The chart begins on February 28, 2020, when community transmission was first reported in Washington State. The date reflects the day deaths occurred. The last five days of data is incomplete and subject to increases.



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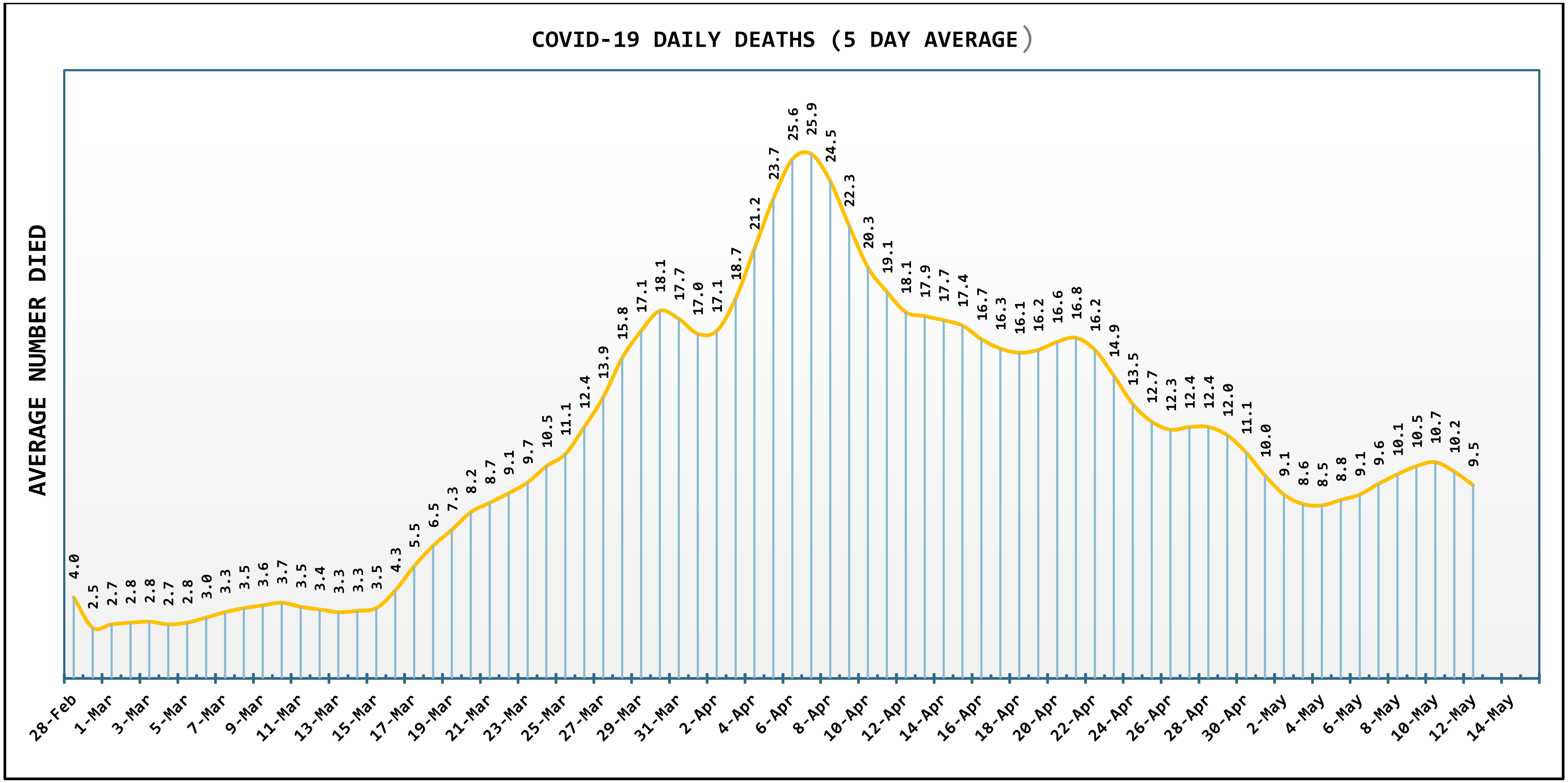
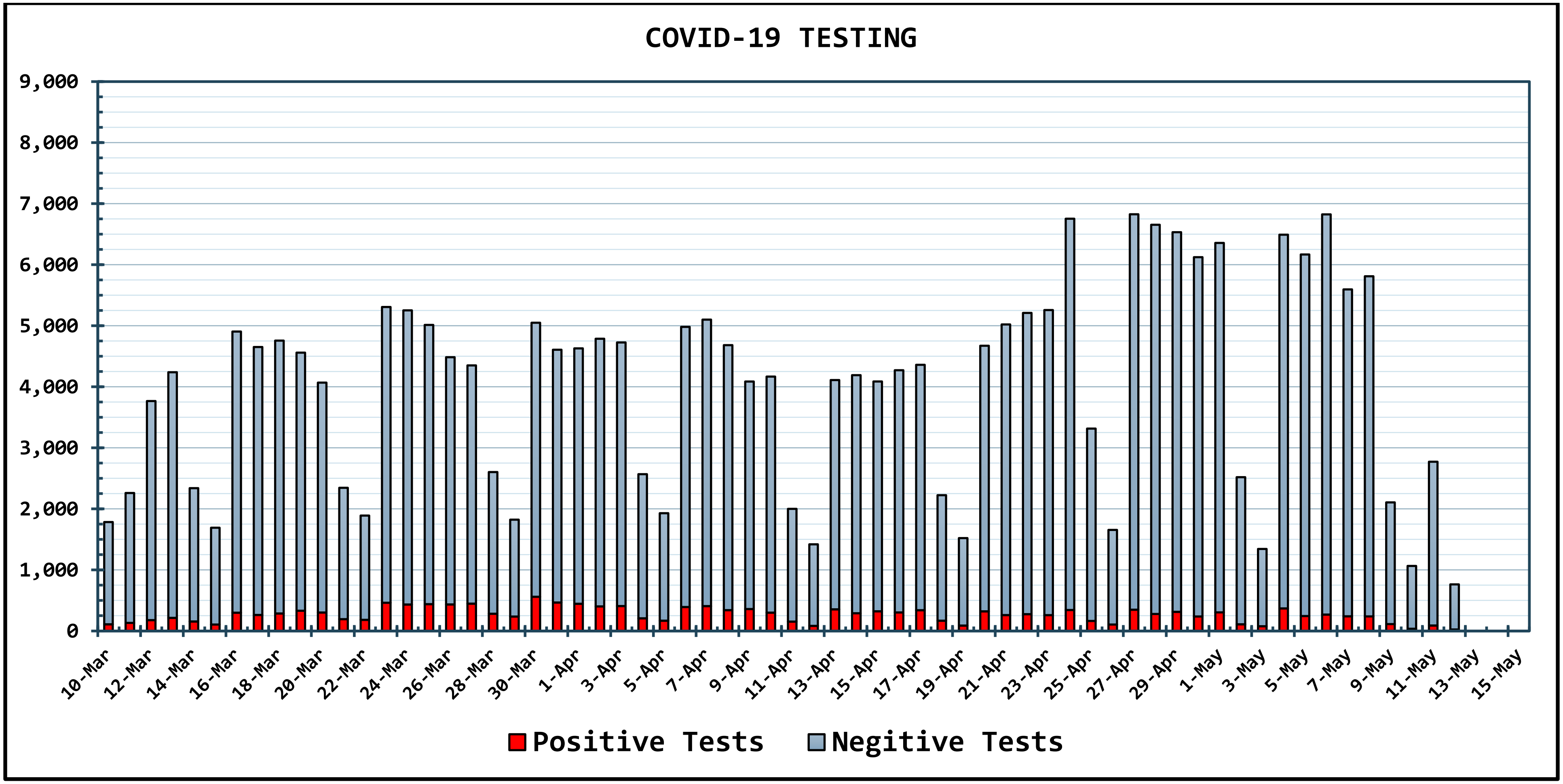
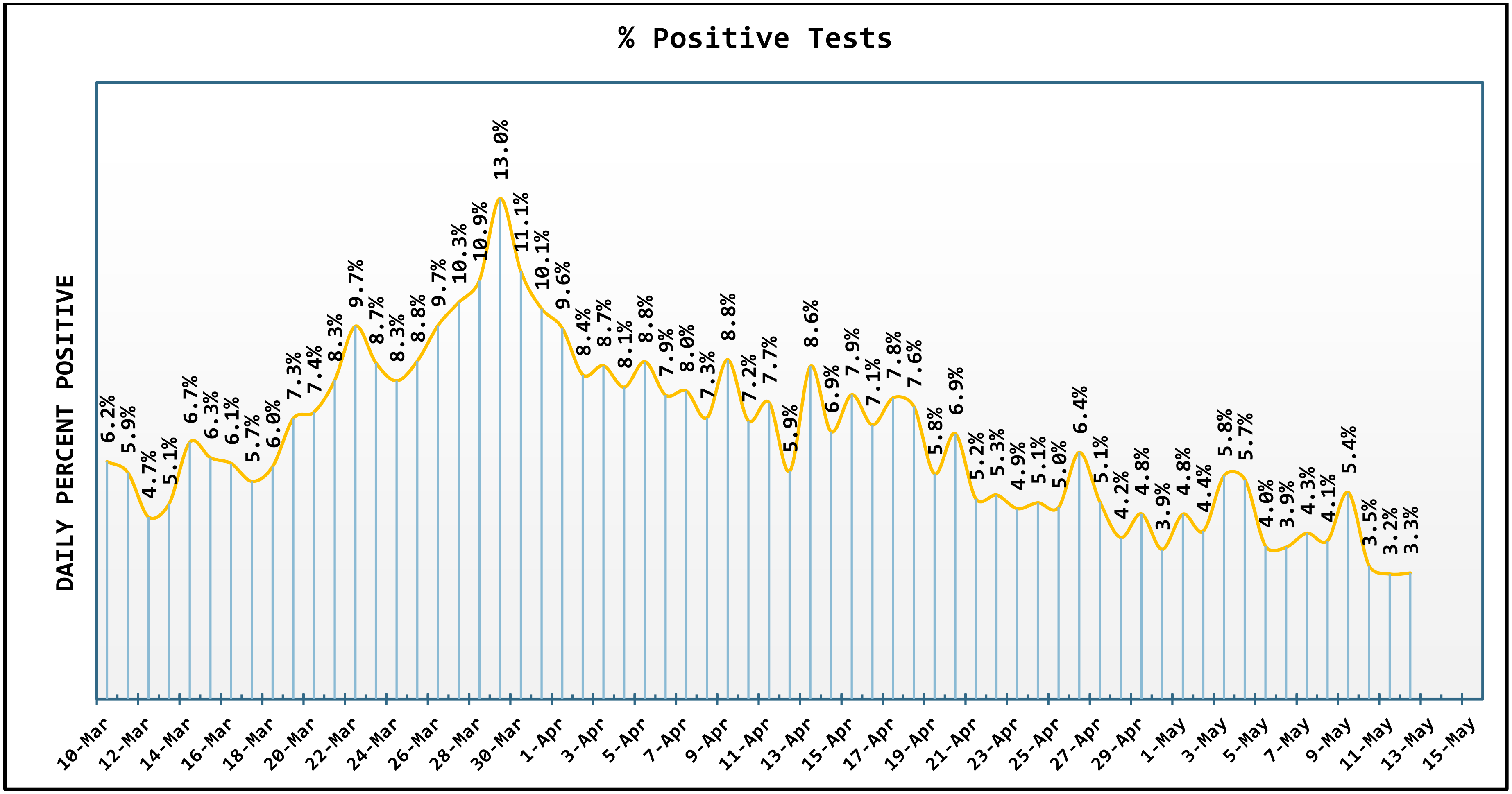


The charts below show the progression of the COVID-19 outbreak in Washington State over time. These charts show the total number of people who tested positive for COVID-19 and the total number of people who tested negative for COVID-19 each day in Washington State. The chart begins on March 10, 2020. Testing for COVID-19 has been steadily increasing in Washington State. Starting in late March, drive through testing became available in some communities. For more information on testing for COVID-19, visit the Department of Health's *COVID-19 testing webpage*. The last five days of data is incomplete and subject to increases.



The chart below uses the same data as the chart above. The data represents the percentage of people who tested positive each day. The last five days of data is incomplete and subject to increases.



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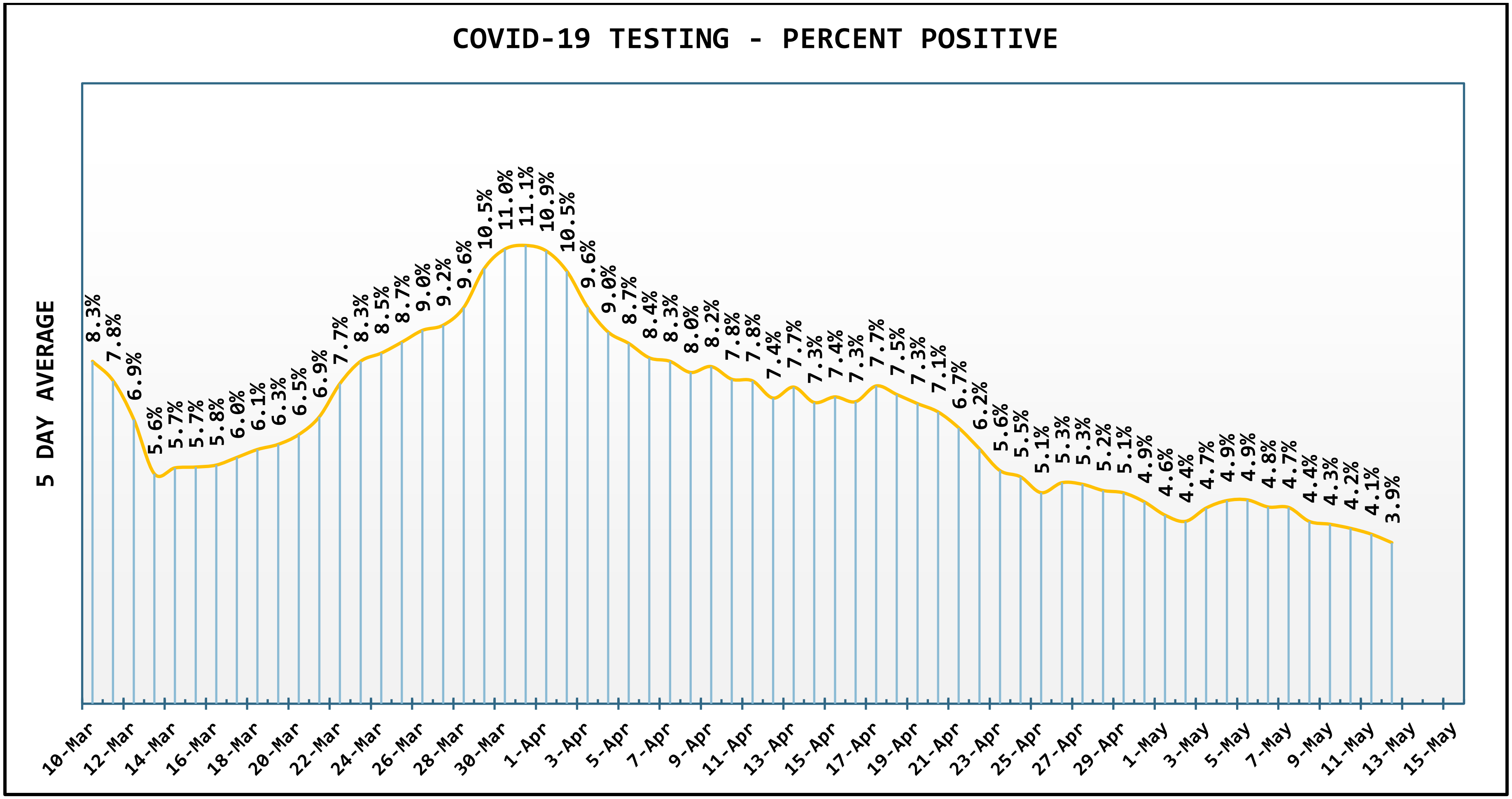
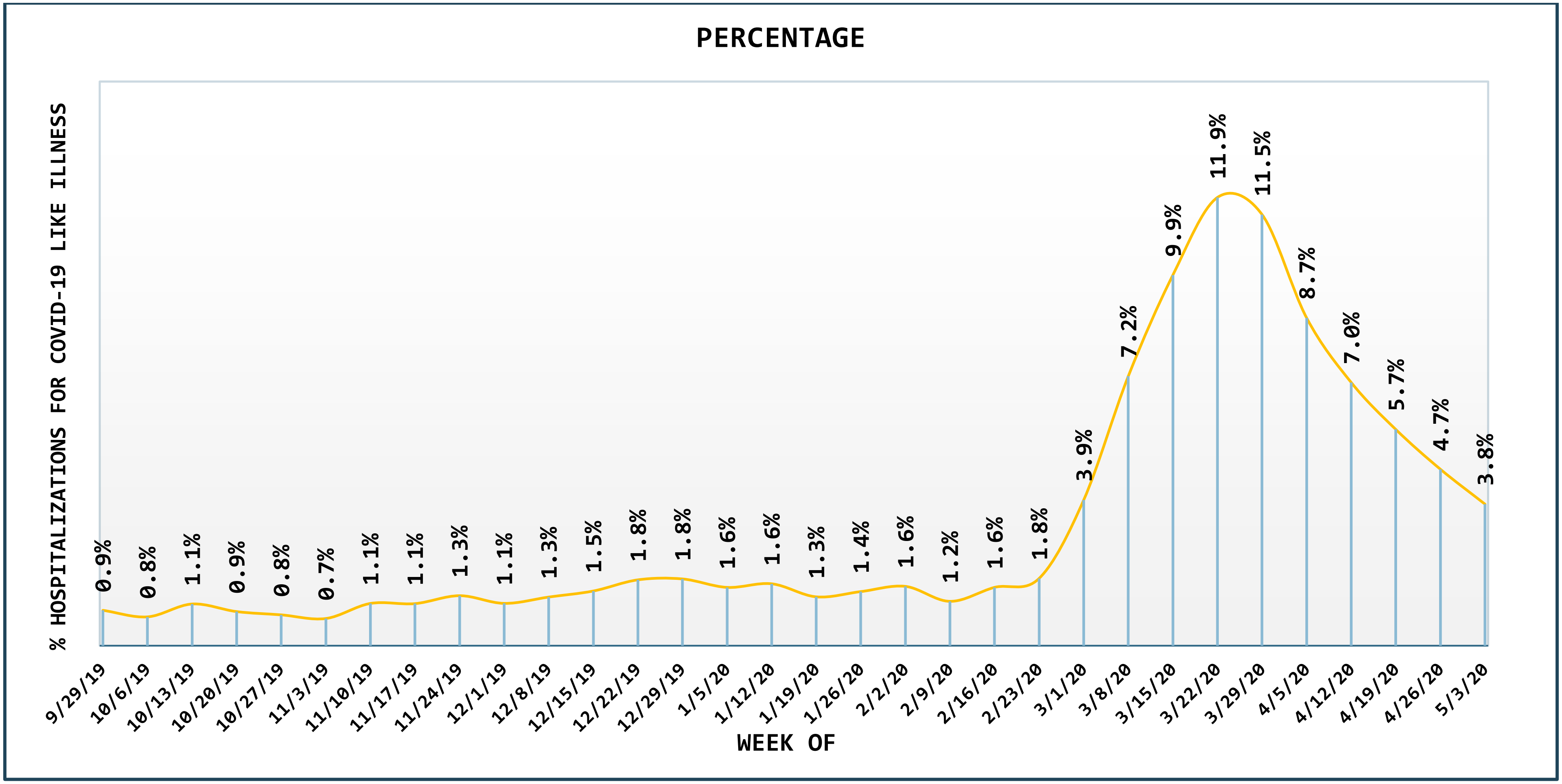
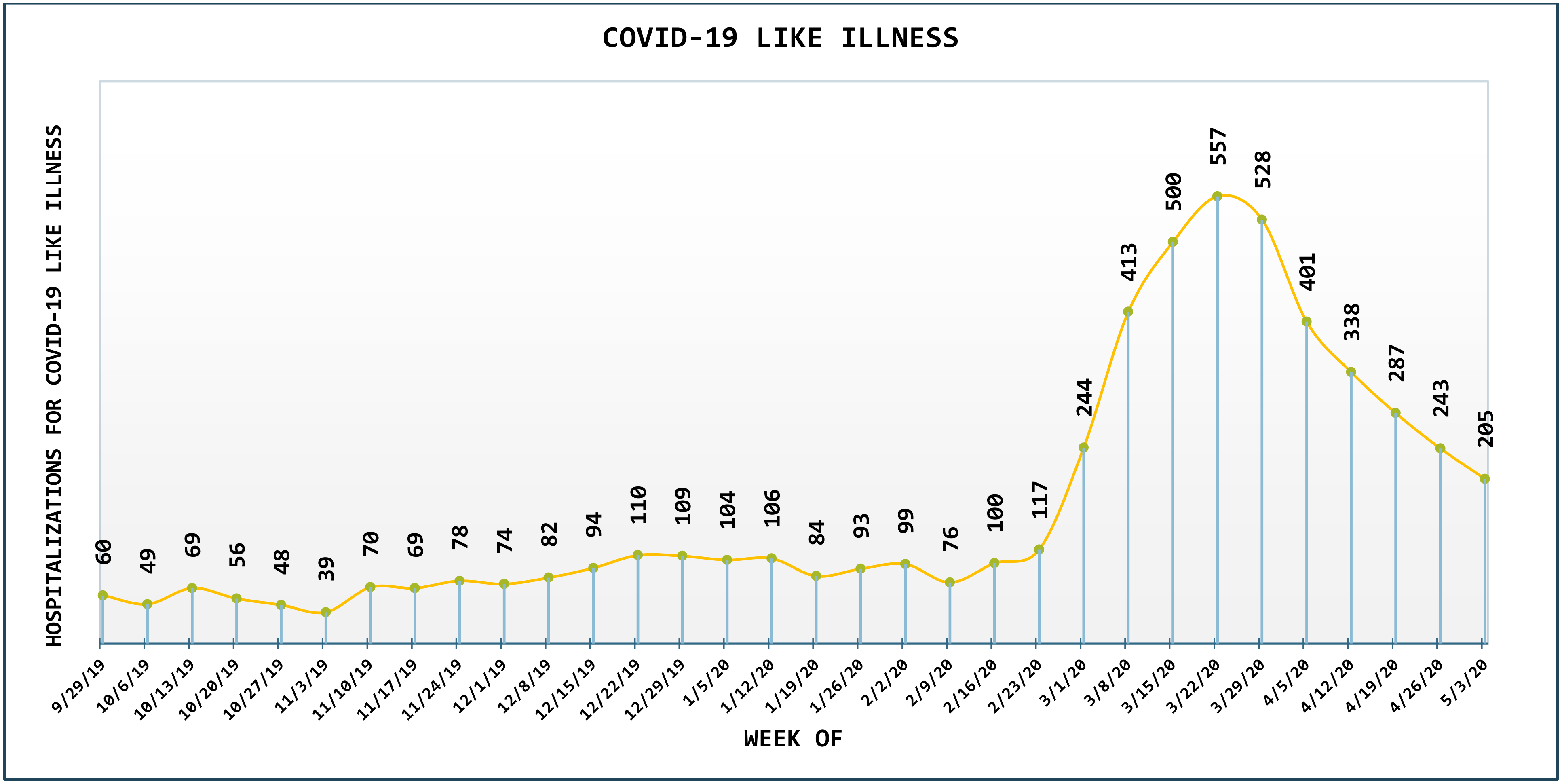


The chart below shows the percent of emergency inpatient hospital admissions with complaints of COVID-19 like symptoms (COVID-19 like illness (CLI)). These symptoms are common in COVID-19 cases and many other illnesses. The last week of data is incomplete and subject to change.



The chart below shows the number of emergency inpatient hospital admissions with complaints of COVID-19 like symptoms (COVID-19 like illness (CLI)). These symptoms are common in COVID-19 cases and many other illnesses. The last week of data is incomplete and subject to change.



The chart below shows the number of inpatient hospital admissions. The last week of data is incomplete and subject to change.