Jonah Turner

INFO 4907

15th October, 2020

Coronavirus Spread in Nebraska

Initial Questions

Local officials in my state of Nebraska have voiced concerning over rising COVID-19 cases. On August 24th, the city of Omaha – by far the largest city in Nebraska by population – enacted an indoor mask mandate similar to those in other areas of the country. What are the current directions in positivity rates and hospitalization rates in Nebraska? Does the mask mandate enacted on the 24th of August have any affect on the data?

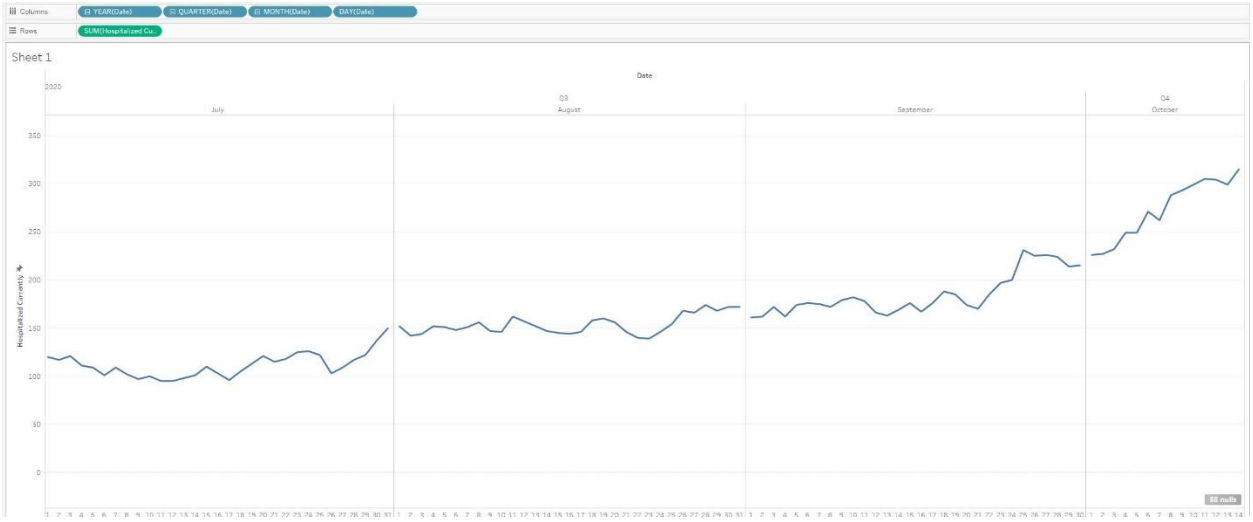
Data Preparation

My dataset was sourced from The COVID Tracking Project. They form datasets for every country nationwide that are up-to-date and in an accessible format. I imported the dataset into Tableau to view it and make any necessary changes. Because of the data Nebraska reports, many variables in the dataset contained only null values, as Nebraska does not report on ICU numbers or several other metrics collected by The COVID Tracking Project. I used Tableau to remove the null variables from the working dataset to make selecting variables for visualization easier.

Visualization

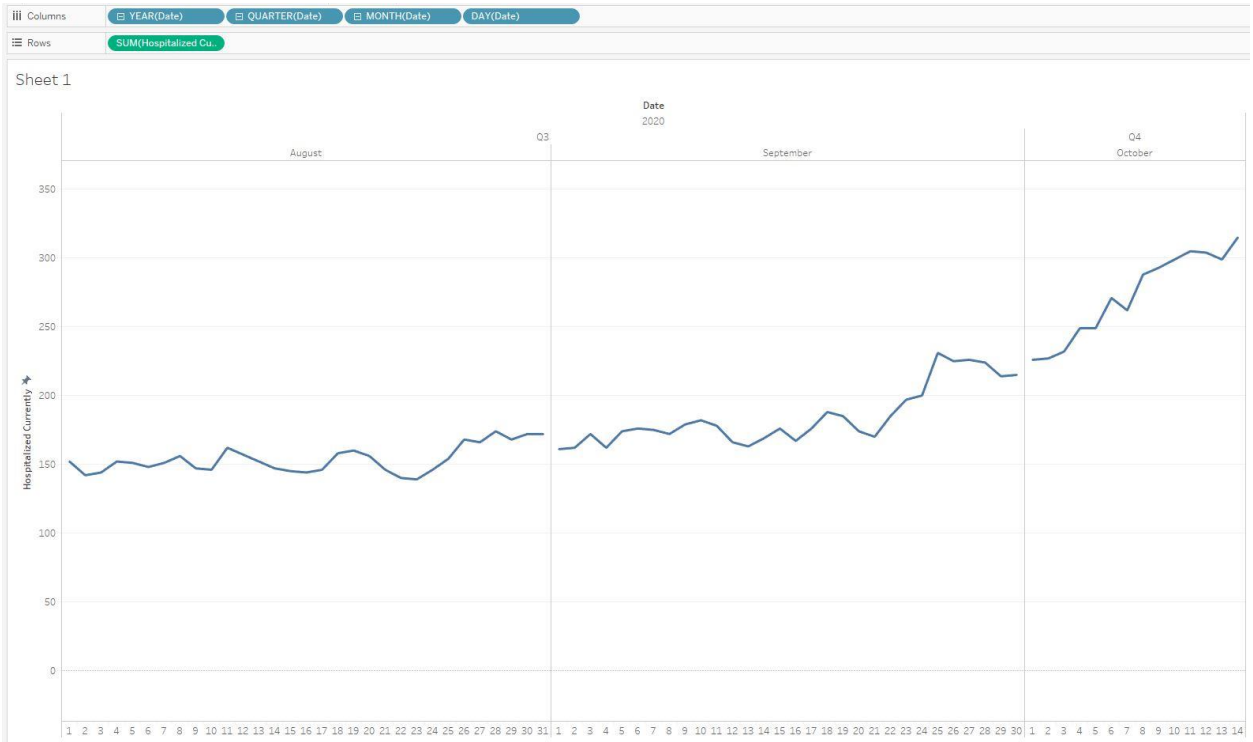
In trying to visualize the hospitalizations in Nebraska, I realize that the dataset includes data from as early as March of this year. Nebraska was fared relatively well at the beginning of the pandemic and is only now experiencing its largest increase in cases, so I will restrict the data to include only the most recent months. Starting in August will show the spread well, as Nebraska's lowest number of cases was in August.

Here is the graph that encouraged me to shorten the view of my dataset.



This graph of hospitalizations – which could be scrolled leftward to view earlier months – is too wide to view easily.

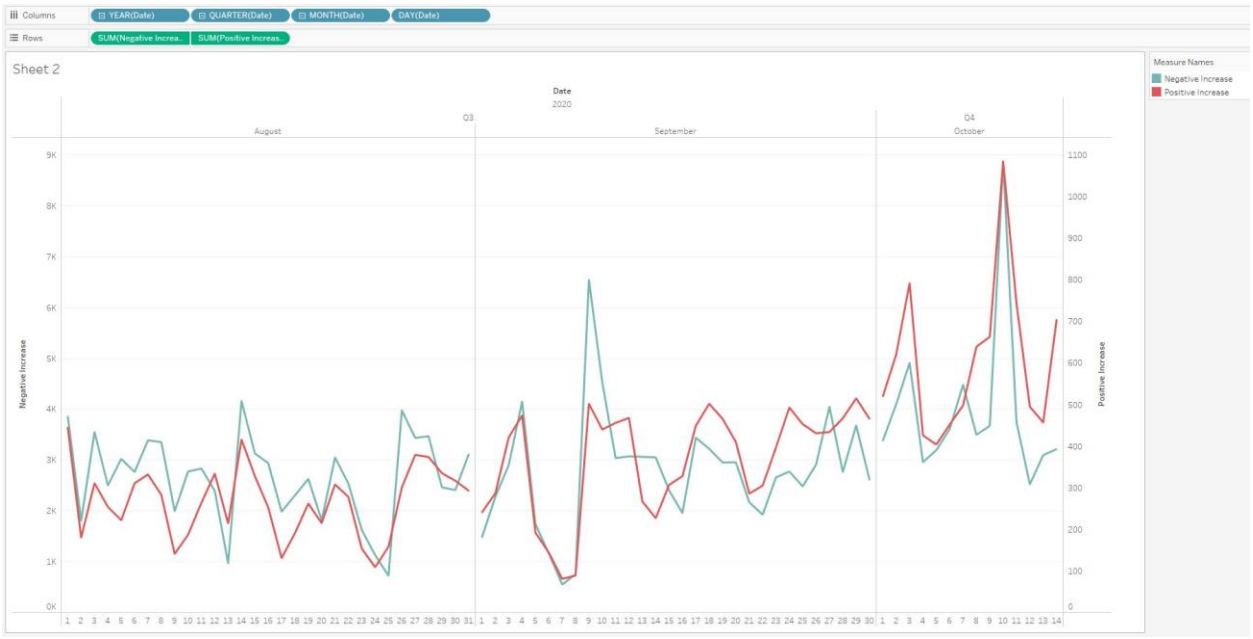
The following graph, with dates filtered to include only August, September, and October, is more effective at visualizing the data.



I now have an accurate depiction of hospitalizations. It is clear that hospitalizations are increasing significantly in October, but this increase would be better viewed in relation to the increase in positive cases as well.

This graph gives more insight into the increase in hospitalizations. Hospitalizations are rising almost directly with positive cases. Hospitalizations are usually a lagging indicator, with positive cases rising days earlier. With the two being related so closely in the data, it could suggest that positive cases are not being accurately counted due to a lack of sufficient testing or the disease presenting in patients as asymptomatic.

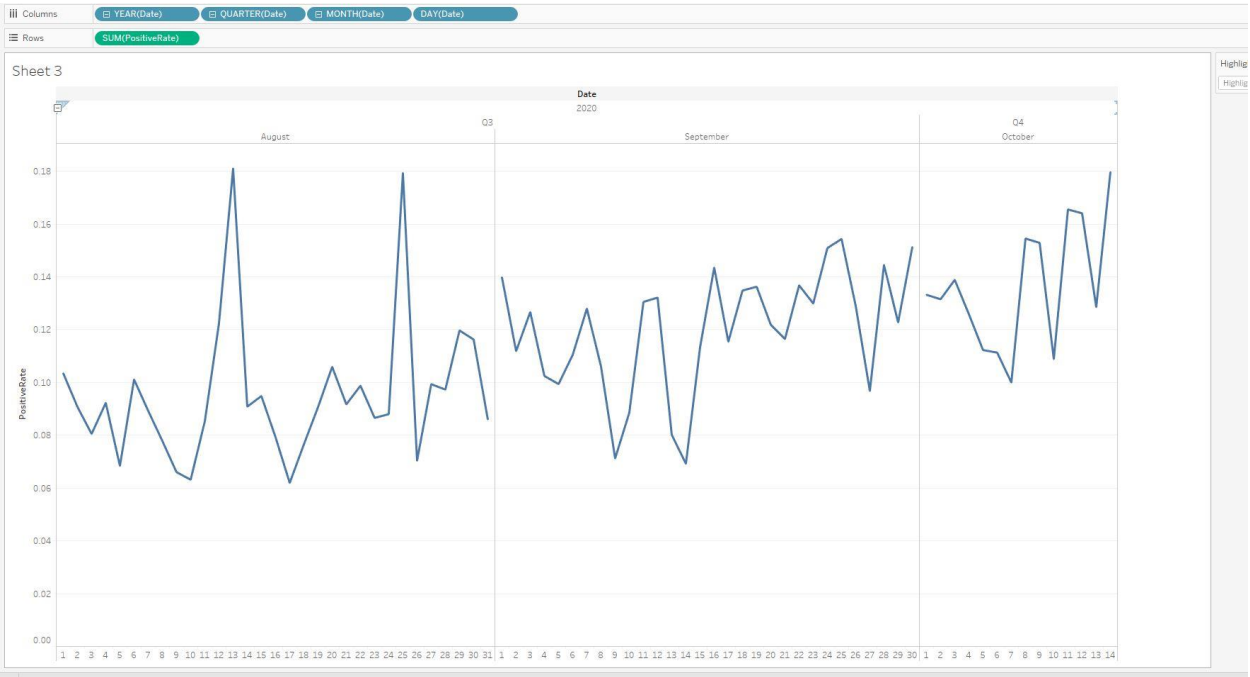
Trends in positive tests are also useful in analyzing the spread of COVID-19. I will use the same date restrictions on this data as I did with the hospitalization data to keep the visualizations consistent.



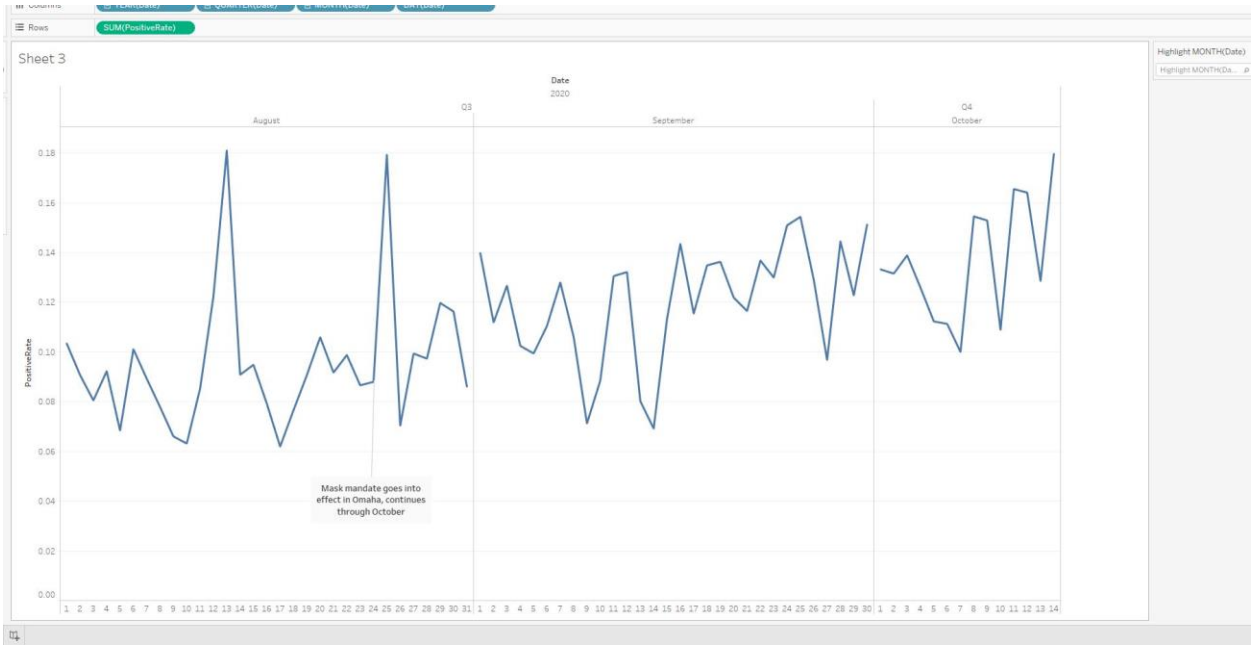
This is a graph of the number of both positive and negative tests reported each day. While it is not impossible to extract conclusions from this visualization, a more helpful visualization – and one that is more commonly used – is the test positivity and negativity rate each day.

This calculation is not included in the dataset, but it is easy to implement in tableau. I created positivity and negativity rates by dividing the positive results and negative results by total results.

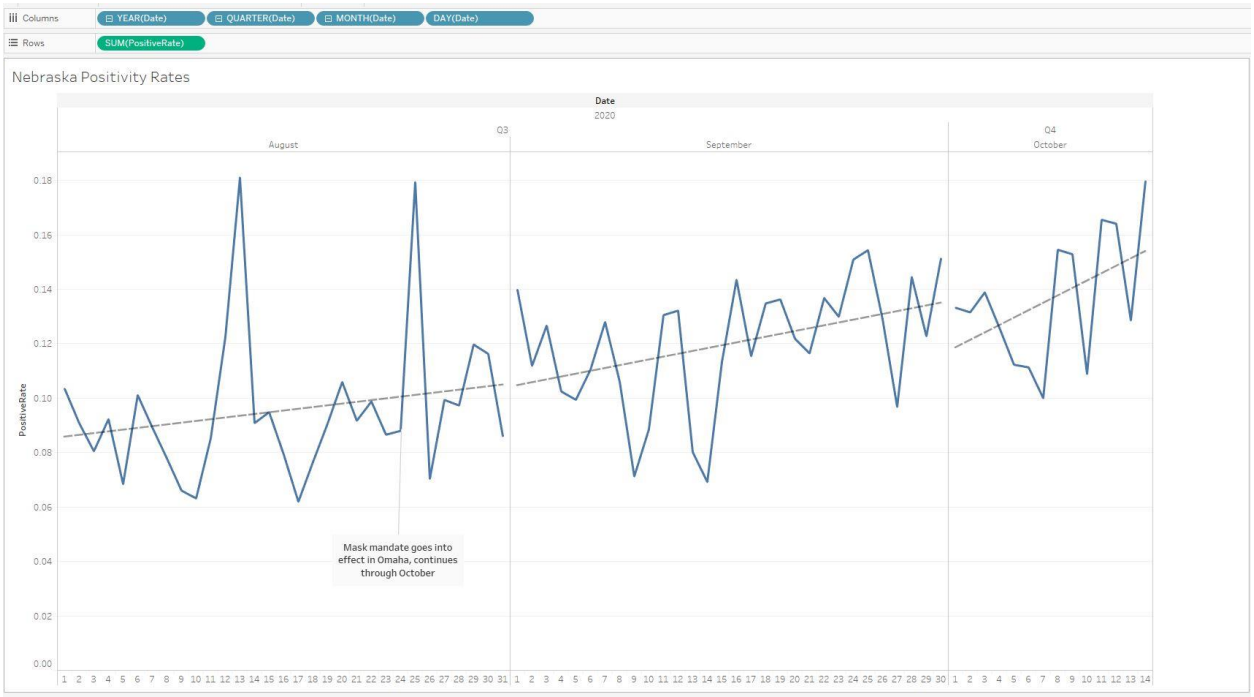
This graph shows both the positivity and negativity rates of tests conducted each day. This is a more useful measurement than raw number of tests, but to have both lines presented is redundant. Positivity rates and negativity rates will always be directly linked, as negativity rate is the complement of positivity. The visualization will be served by removing the negativity rate, only keeping the positivity.



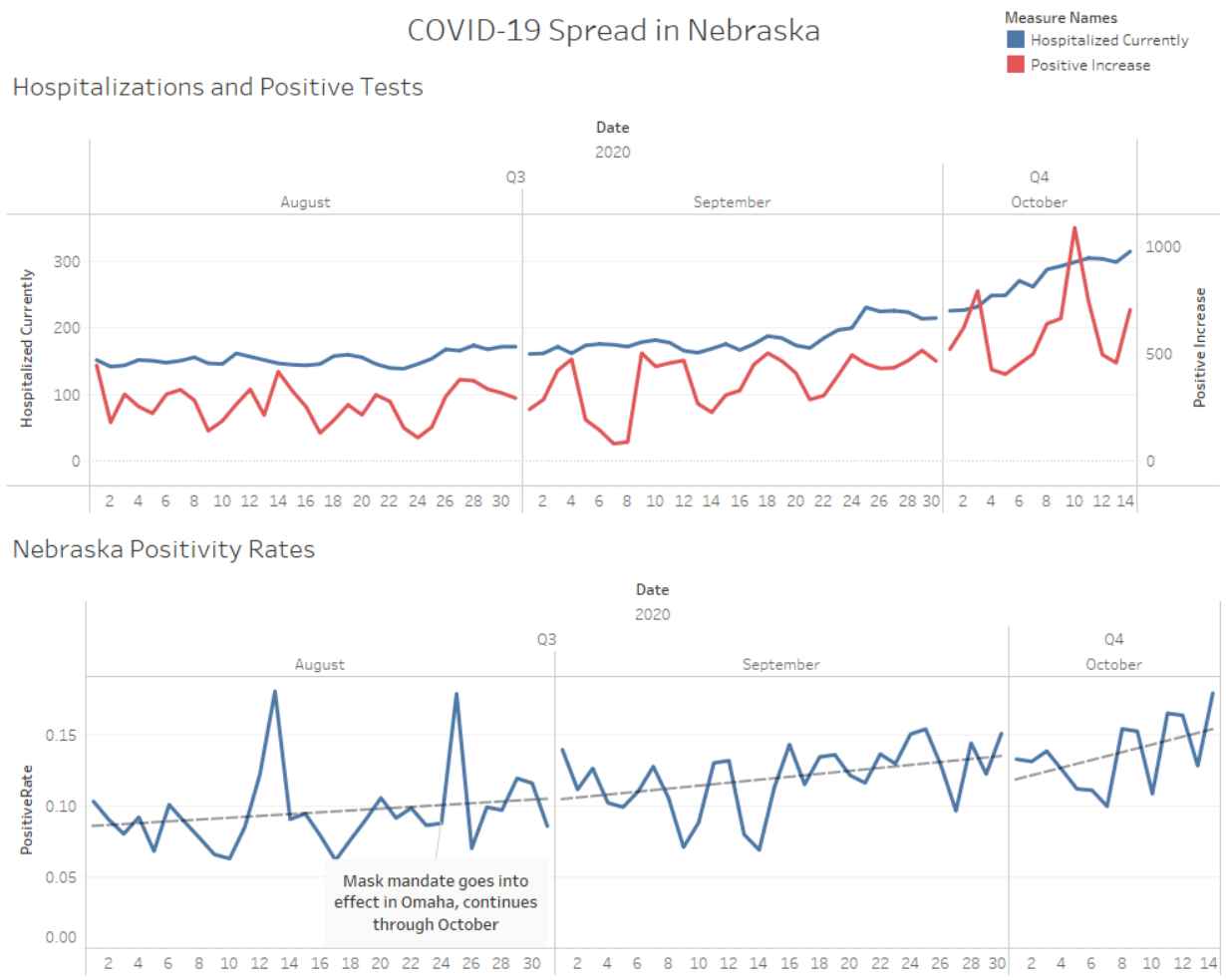
I will now use this graph to see if there is any substantial change in positivity rate – the leading indicator of spread – as an effect of the mask mandate in Nebraska's largest and most heavily impacted city. That mandate took effect August 24th, so I will provide an annotation on the visualization to make analyzing the change in positivity rate easier.



The instability of this graph makes analyzing the data more difficult than it needs to be. By adding trend lines to the data, the shape of the data will become more clear, and it will be easier to examine the effects of the mask mandate.



With both visualizations created, placing them in one dashboard makes analysis more convenient and allows for conclusions drawn from both visualizations simultaneously.



It is important to note why positive tests are viewed in the first chart as a count and in the second chart as a rate. When viewed alone, positivity rate is more useful than count of positive tests, as it controls for increases in testing. When viewed with another count however, like current hospitalizations, it is more useful to view this variable in a count. It is impossible to get hospitalizations as an accurate rate, as there are almost certainly positive cases which are not reported in the data. By viewing both variables by count, it is more clear that hospitalizations are rising in tandem and slightly outstripping positive cases, suggesting that positive cases may have been underreported before the increase of the lagging indicator.

Summary of Analysis

Hospitalizations are increasing significantly in Nebraska and are at their highest level since the COVID-19 pandemic began. They are increasing with positive cases, but, as a lagging indicator, they should be increasing after positive cases begin to increase. This suggests that the testing of positive cases was undercounted in September and may still be. Positivity rate is also increasing and has been increasing every month since August. The rate of increase is

significantly higher in October, showing a worsening of the spread of the pandemic in Nebraska. The mask mandate in Omaha may have had an effect, but the effect is not apparent in statewide data, even though Omaha is by far the most heavily impacted area of the state. Data that would help to further observe the effects of the mask mandate would relate to disease spread in areas where masks are more and less common. Data on the rate of transmission in schools or businesses compared to personal gatherings would provide strong evidence for or against the mask mandate.