**Visualization explanation for Step 2**

This plot clearly includes the changes in the derivative function of the rate of infection through the change points and the red lines. The prophet API internally calculates the derivatives for these curves, finds the change points and plots them using the red lines. In the case of Oklahoma, OK, we observe that there are predominantly 4 change points where the rate of infection derivative function changes. If we had data regarding masking enforcement, we would've added this information to the graph to understand and visualize if there is any trend. Given that we didn't, we used the CDC information we found before and added this to the plot to clearly visualize if there are any relationships between these CDC guidelines and Oklahoma, OK rate of infection.

The visualization was created using the Facebook Prophet library, it shows the timeseries rate of COVID infection from March 2020 to November 2021. This figure uses positive infection cases from the state of Oklahoma, OK that was originally in a cumulative form, this was later transformed to daily new cases feature and furthermore smoothed using a 7-window moving average, that help us remove weekly trends. This daily new cases data is shown in a timeseries to understand if there are any trends and moments where there are clear changes of rate of change. On the x-axis we observe the date in chronological order and in the y-axis, we have # of new cases. The black dots are the observed data points, the red line represents the changepoint trend line, the vertical intermittent red lines represent detected changepoints and then the red, yellow, and green in the background represents the no mandate, mandate partially lifted and mandate present status in each point of time respectively.

We use this plot to understand if there are any clear relationships between the trend changepoints and masking mandates. If there is, we would expect to observe that enforcing masking would affect the trend and we would view an identified changepoint. As an example, we can observe this occur in the plot between Jan 2021 and May 2021, where we observe that the start and end of having the mandate present is associated with the decreasing trend of new cases.