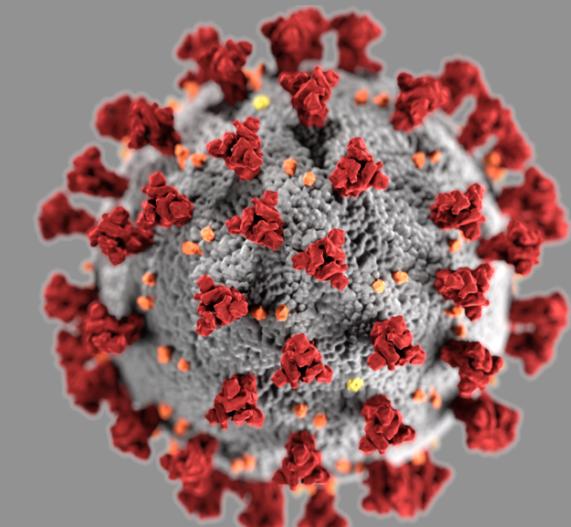


# Covid-19's Effect on the Food Supply Chain

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## Summary:

The world is now experiencing the worst pandemic since the Spanish flu of 1918. The Covid-19 pandemic has triggered substantial economic and social impacts across the globe. We have analyzed the effect of Covid-19 on the US food production output.

## Dataset:

We obtained our datasets from the United States Department of Agriculture and The Covid-19 Tracking Project.

The food dataset was aggregated via API per food group, and included weekly to monthly production totals for every State in the USA for 2019 and 2020. We limited our analysis to the major food groups of Eggs, Milk, and slaughtered livestock (sheep, hogs, cows). It included 1.7 million data points.

The Covid-19 dataset was downloaded as a CSV file and contained daily records of new infections and deaths for every State starting from February 2020. We used Covid deaths for our analysis instead of infections to eliminate false results and to better gauge impact. It included over 20,000 data points.

## Approach:

Our team utilized Tableau charts and D3 interactive visualizations to depict a point in time and over time affect across every state.

We used R-squared values obtained by using linear regression analysis to observe the correlation at the state level between Covid-19 deaths and change in a specific food category production output. When two datasets have a R-Squared value over .3, those datasets are deemed as correlated.

We also used scatterplots to observe the effect of Covid-19 on a national scale across all food groups. The use of accurate and trustworthy datasets, the novel nature of our topic combination and data analysis makes our approach unique.

## Evaluation:

We evaluated our results by observing various Point in time, choropleth, normalization graphs, as well as interactive over time graphs to observe production impact as the Covid-19 Pandemic spreads.

After observing our D3 visualization (Fig 1) and our scatterplots (Fig 3), we noticed a huge impact on production during the first wave of the Pandemic, but returned back to normal as time progressed, and initial panic and lockdowns were eased.

This led to us narrowing our analysis (Fig 2) to the first wave of infections to see the real impact of the pandemic across all food groups.

With our results, we were able to observe a noticeable impact on production output due to Covid-19 during the first wave of the pandemic.

## Interactive D3 visualization of Covid-19 Deaths and specific Food Category production over time

COVID-19 Death & Food Production in 2020 in the United States

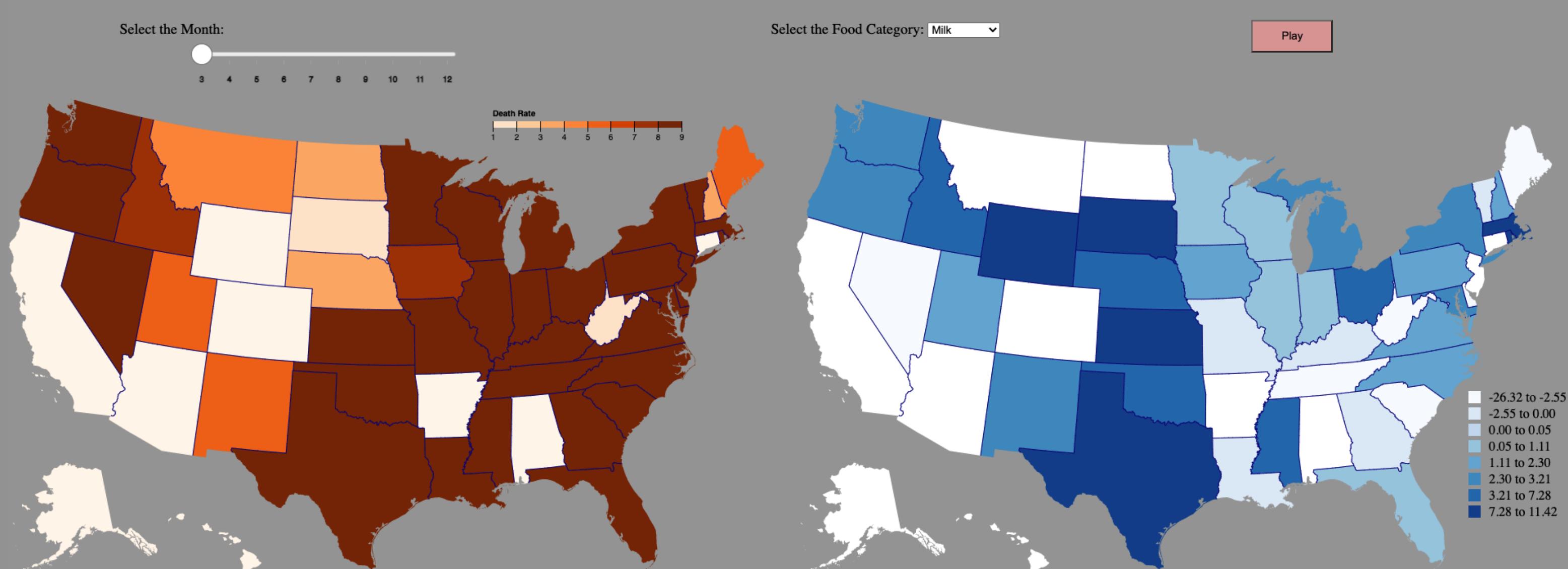


Fig 1: The interactive visualization allows the user to select a food category, a specific month, or play a timelapse of Covid-19 Deaths and Change in Production Rates

## Tableau Charts - R-Squared values for the Milk dataset for 2020 and the first infection/lockdown wave (Apr-Aug 2020)

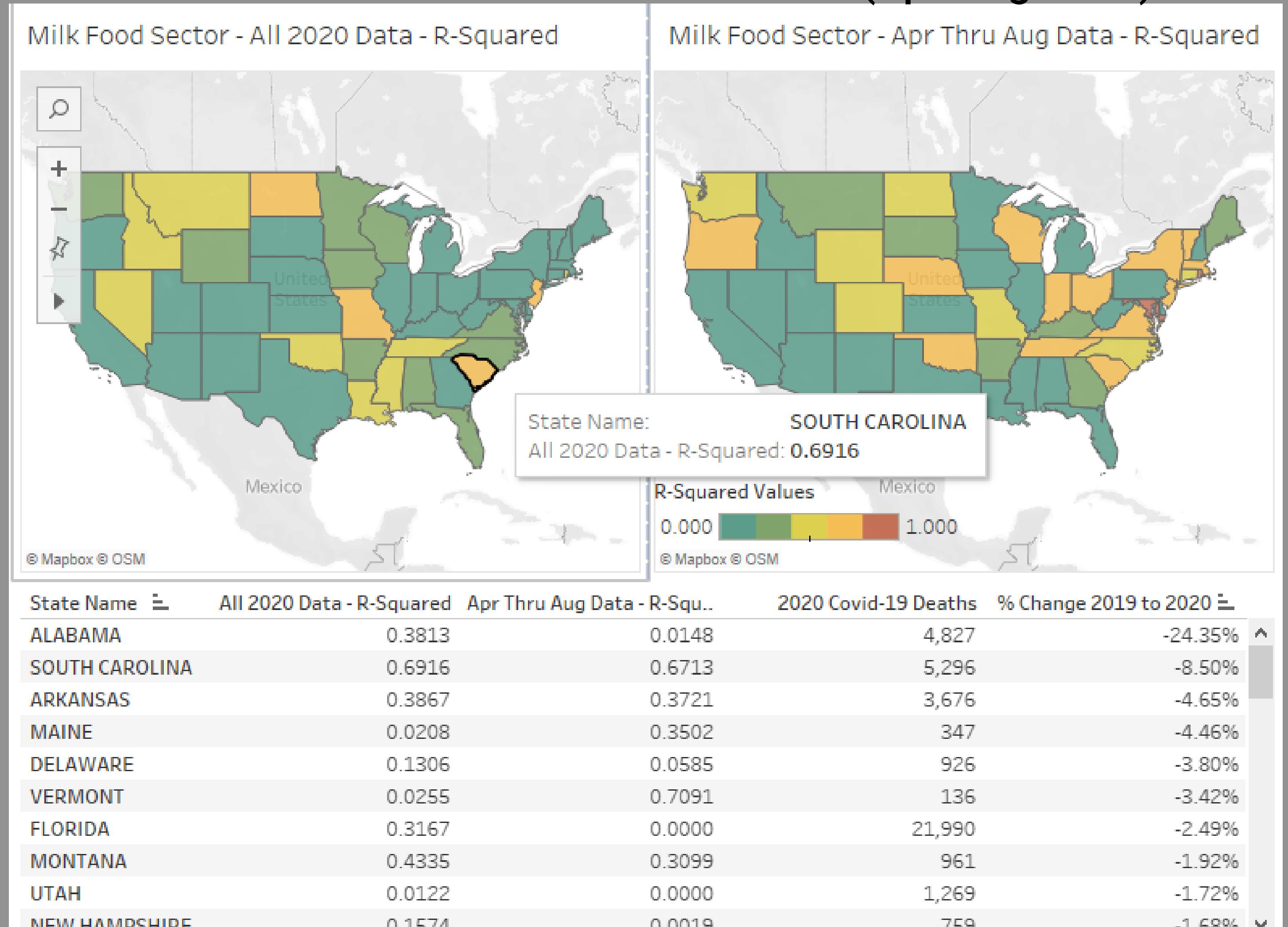
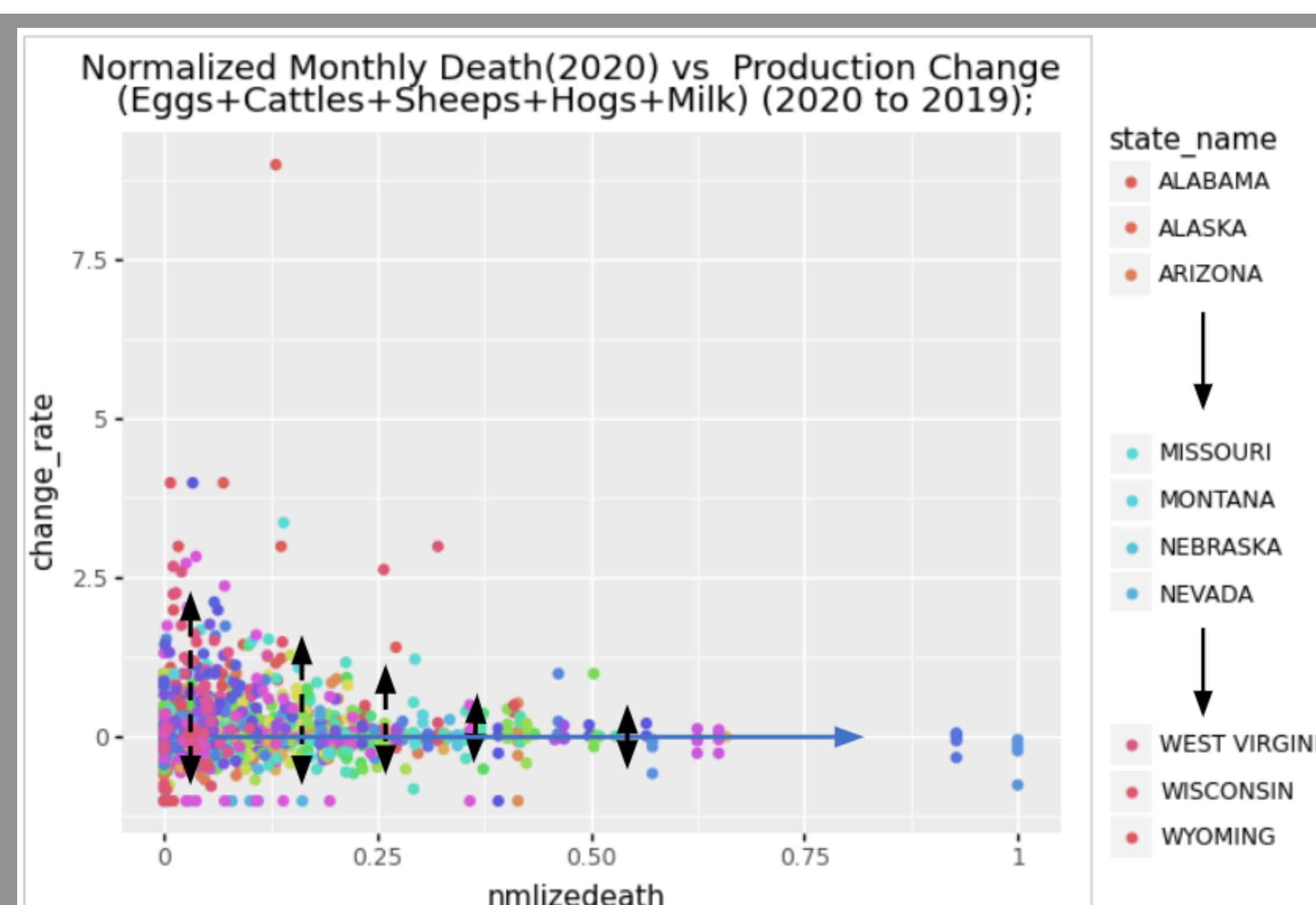


Fig 2: R-squared value is derived from Linear Regression analysis. Higher values indicate higher correlation between the two datasets. Values over .3 indicate high correlation of Covid-19 Deaths and Production values.



## Change in Production vs Normalized Covid-19 Monthly Deaths

Fig 3: You can observe as the normalized death values increase, the change in production stabilizes. At very low deaths, you can see the greatest variance as some states locked down, while others were unaffected.