ECON 490 RESEARCH PRESENTATION

COVID-19 VACCINES ON SOCIAL MEDIA AND INOCULATION RATE

A Sentiment Analysis and Modelling

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Since the Global Pandemic

COVID-19 UPENDED THE WORLD

- An international public health emergency that spread to 200 countries and territories.
- Has immeasurable negative impacts on public health, economies, trade, and society.

SOCIAL MEDIA CONNECTS US

- With social distancing, the social media brings us together during the pandemic.
- People receive COVID-19 related information primarily from social media.

VACCINE AS THE MAIN EXIT STRATEGY

- Governments are working on establishing herd immunity with COVID-19 vaccines.
- Discussions of COVID-19 vaccines on social media may influence vaccination decisions.

Research Question:

Whether the discussion of the COVID-19 vaccines on social media influences the inoculation rate?

By answering the research question:

Governments can know whether the propaganda of COVID-19 vaccines on social media is an effective strategy to encourage people to receive vaccinations, thus can help to allocate resources wisely and avoid misuses of time and money.

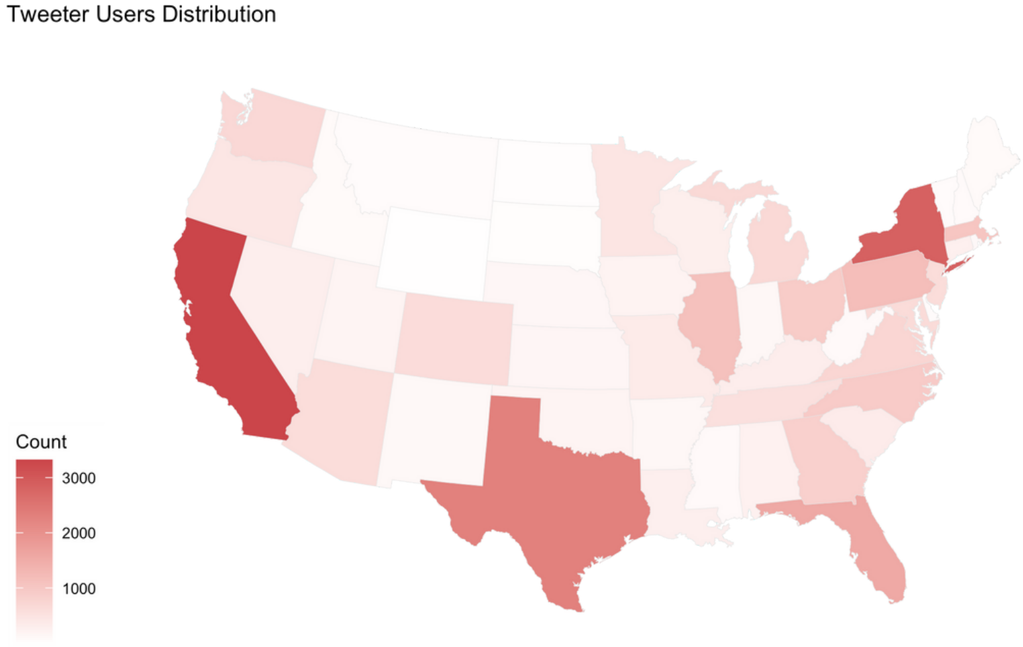
Techniques

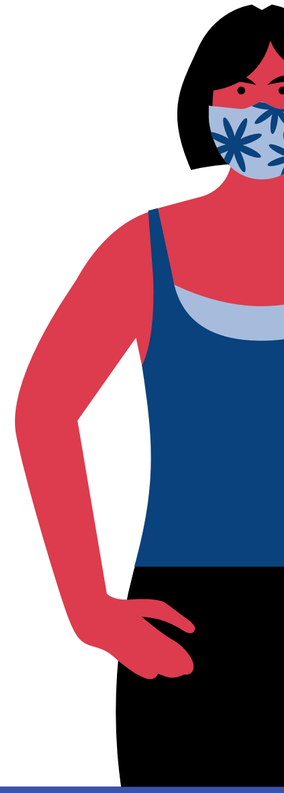
1. Sentiment Analysis

- Performing sentiment analysis to find the general attitude of users in the US towards the COVID-19 vaccines on Twitter using tweets posts data under the hashtag #CovidVaccine.
- Presenting the attitudes as numeric sentiment scores for each tweet and finding its correlation with vaccination rates by fitting a model.

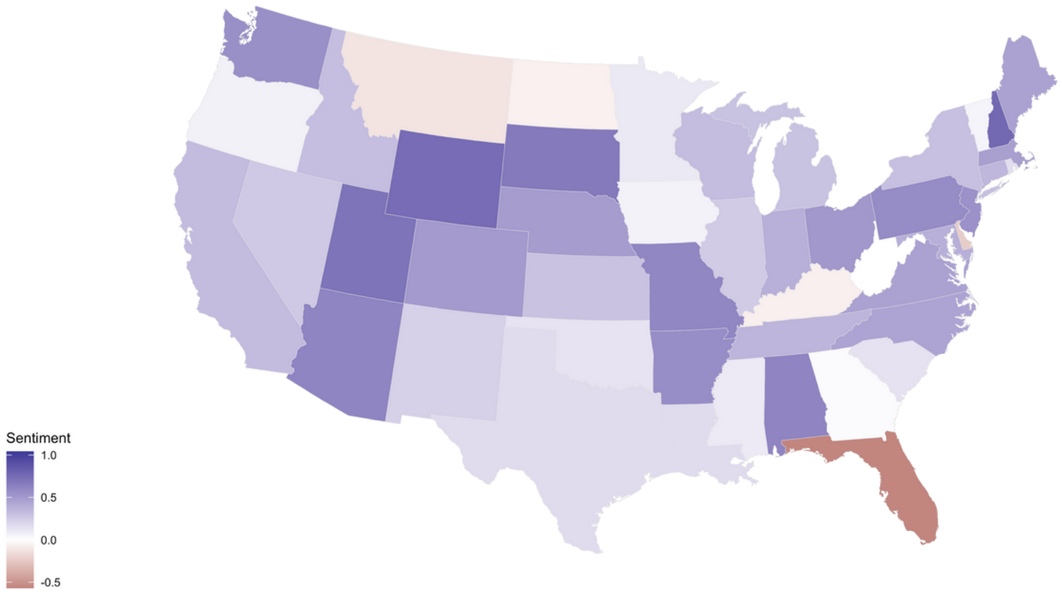
2. Regression

Using the sentiment scores computed before, fit in a regression model with COVID-19 data (cases, deaths, etc.) as covariates and the vaccination rates as the reponse to find the correlation between social media attitudes and vaccination rates.

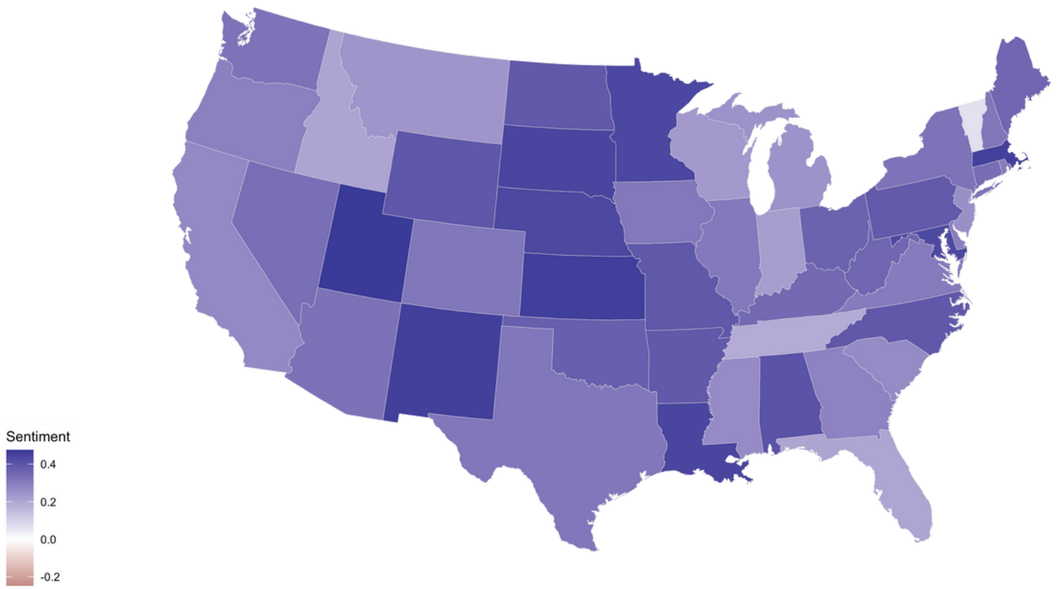




Sentiment Before Vaccination

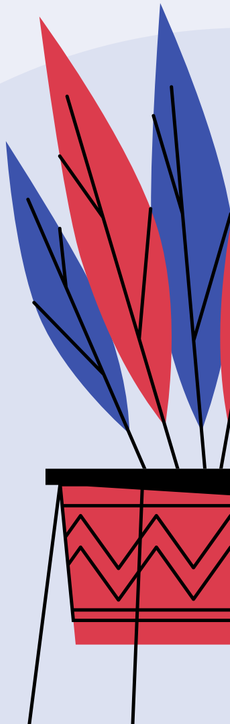


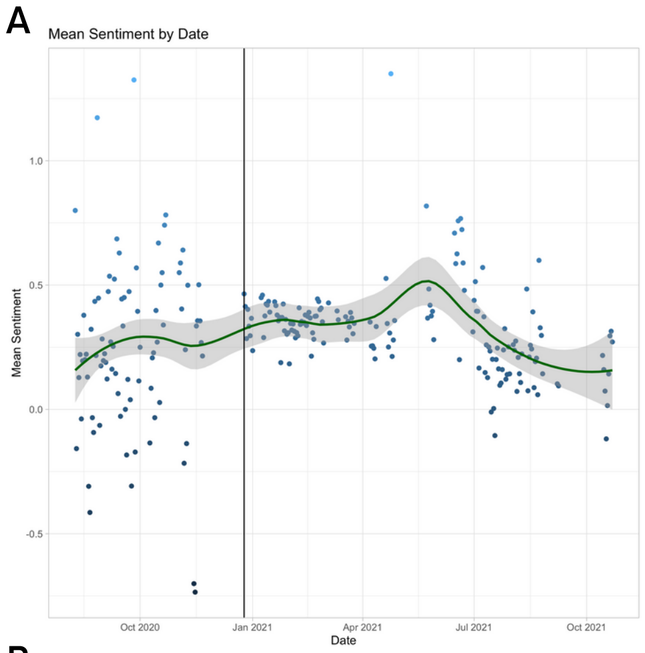
Sentiment After Vaccination

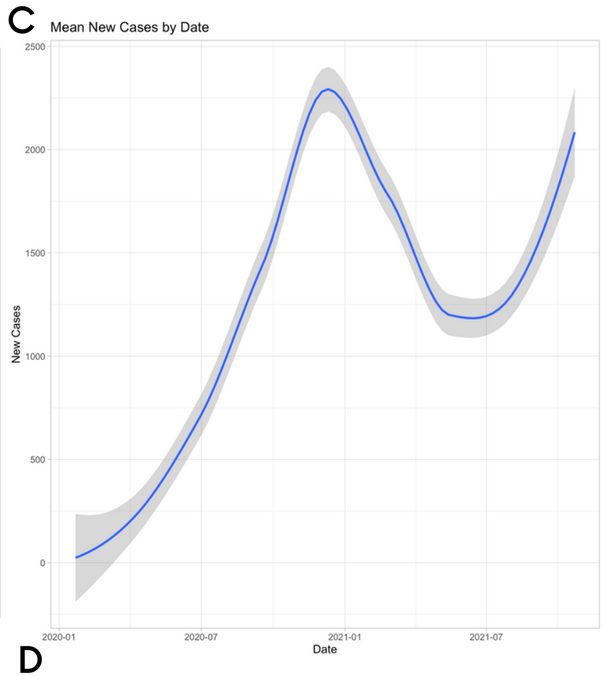


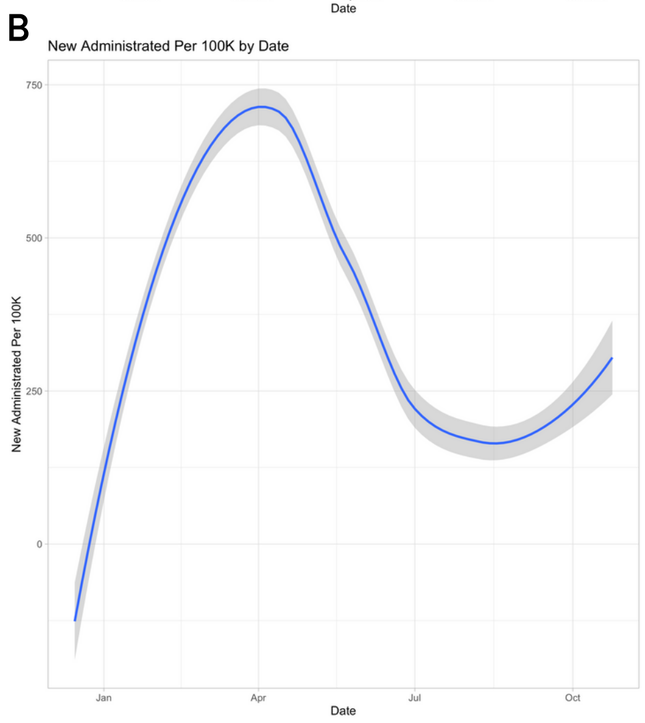
Attitudes by State Before and After Vaccination

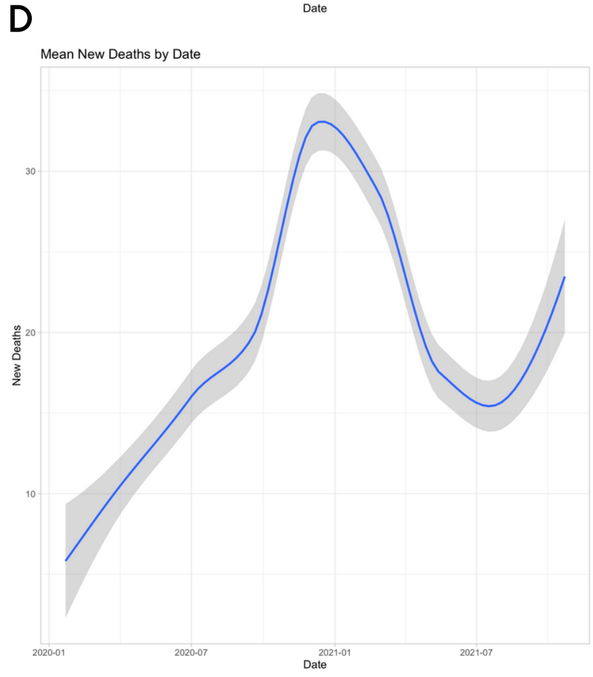
- Before mass vaccination, users in Florida, Delaware, North Dakota, Montana, and Kentucky are more skeptical about COVID-19 vaccines.
- After vaccination, users generally be more positive towards the vaccine.
- Users in the center US usually be more positive towards the vaccine than users in other regions.
- The influence of vaccine tweets may vary between different States.











Attitudes Trend

- Before mass vaccination, there was a positive trend towards the COVID-19 vaccine.
- After mass vaccination, the positive trend continued to grow but dropped suddenly after May 2021.
- Interestingly, there are also spikes of new cases and death after May 2021, which suggest that the number of new cases and death may negatively influence people's attitudes towards the vaccine.
- There is a decline in the daily number of vaccines administrated per 100K population after May 2021, which may be explained by the drop of users' attitudes on Twitter.

Expected Findings

- Based on the preliminary results, I expect a positive correlation between Twitter users' attitudes towards the COVID-19 vaccine and the inoculation rates.
- The number of new cases and deaths may negatively influence people's attitudes towards vaccines, thus affecting the inoculation rate.
- There might be an interaction effect between the States the user located and the users' attitude that can collectively influence the inoculation rates.

THANK YOU!

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