Twitter Sentiments on the Stay-at-home Orders in the United States

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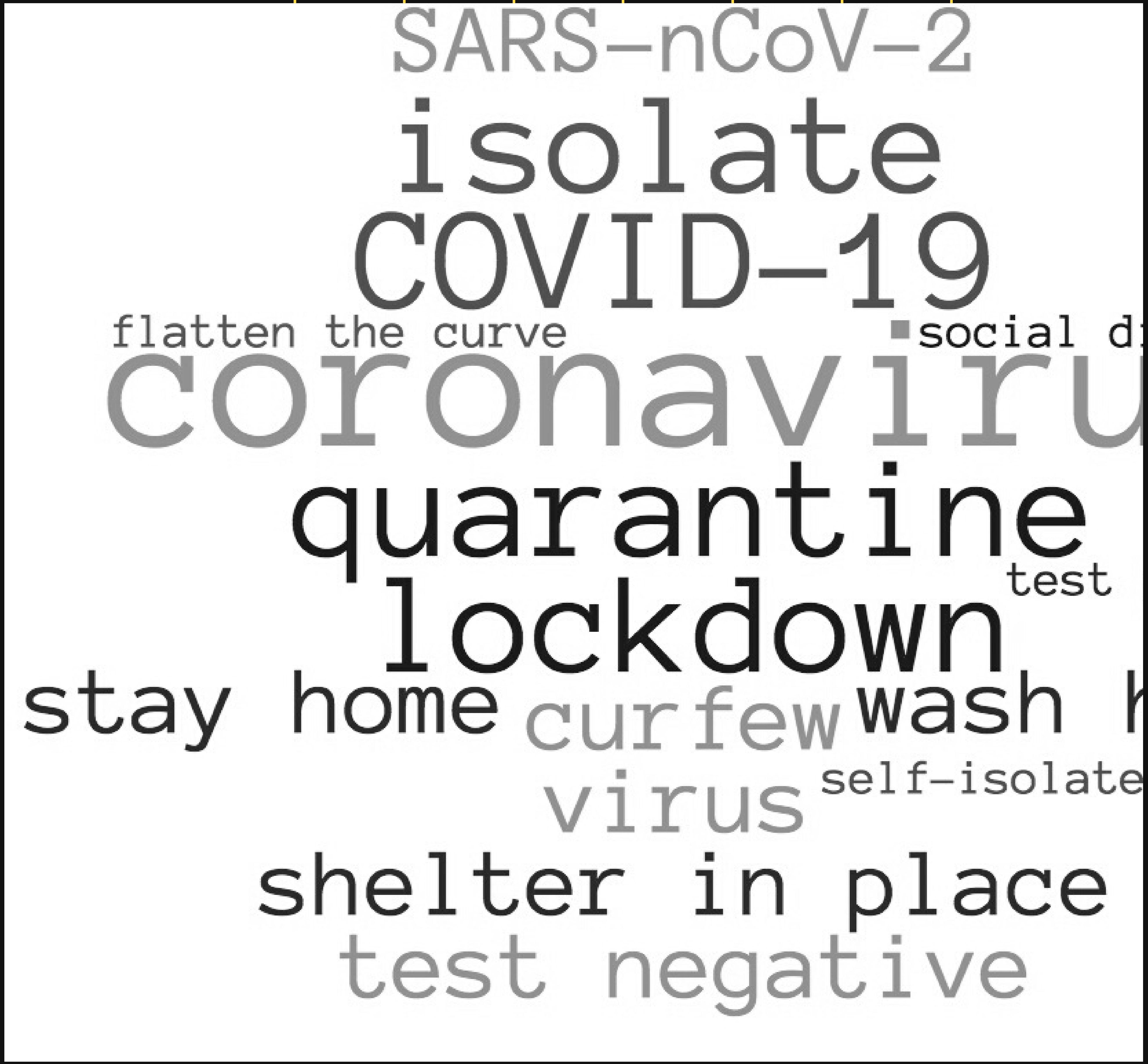
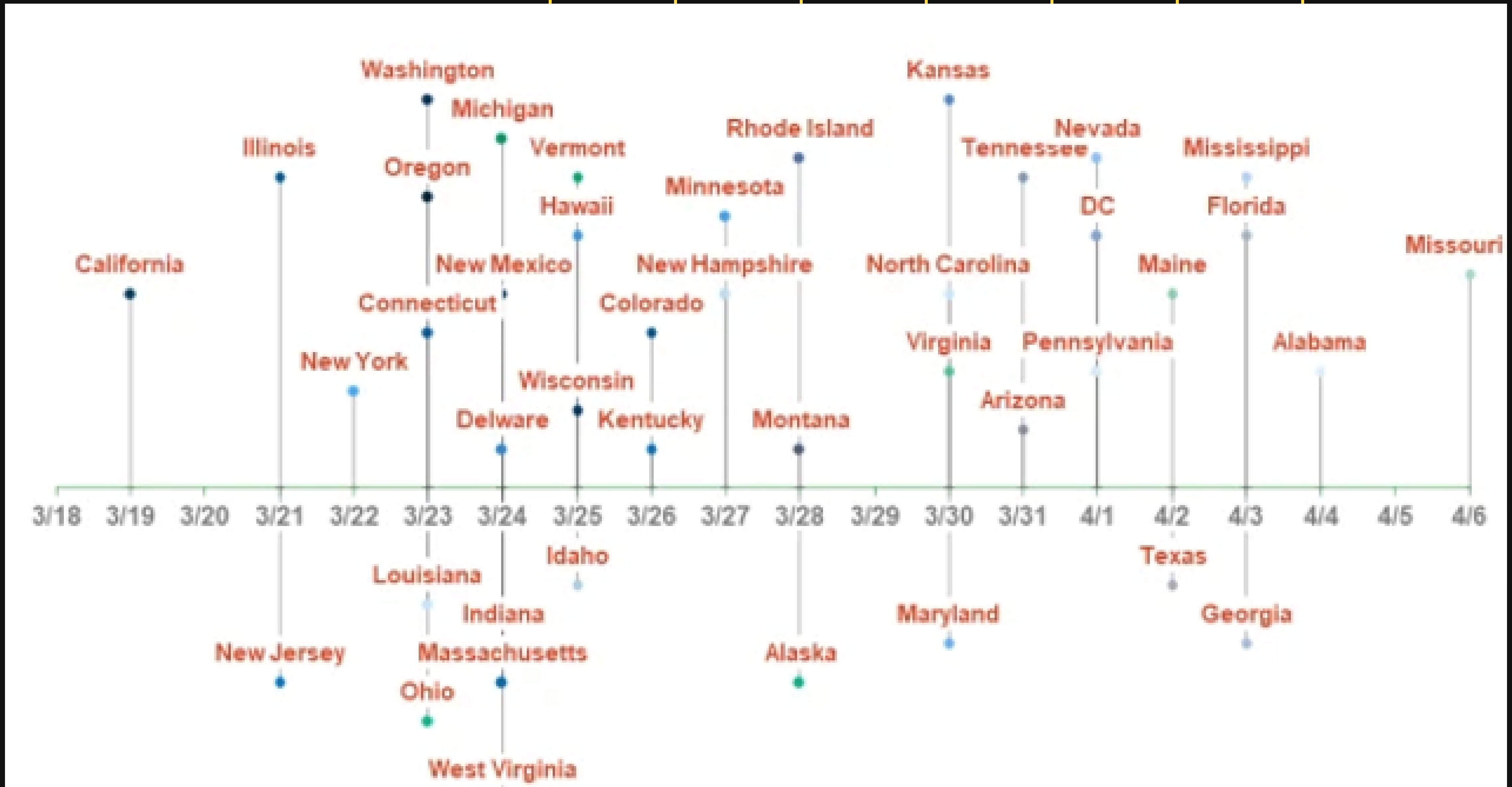
About

Stay-at-home orders were one of the controversial interventions to curb the spread of COVID-19 in the United States (US).



About



The stay-at-home orders, implemented in 43 (out of 51) states and territories between 7 March to 30 June 2020, impacted the lives of individuals and communities and accelerated the heavy usage of online social networking sites.

TWITTER INSIGHT

About

Twitter sentiment analysis can provide valuable insight into public health emergency response measures and allow for better formulation and timing of future public health measures to be released in response to future public health emergencies.

Objective

The purpose of the study was to evaluate how stay-at-home orders affect Twitter sentiment in the US. We particularly focused on vulnerable groups, including elderly groups, rural people, and low-income groups.

RURAL VS URBAN

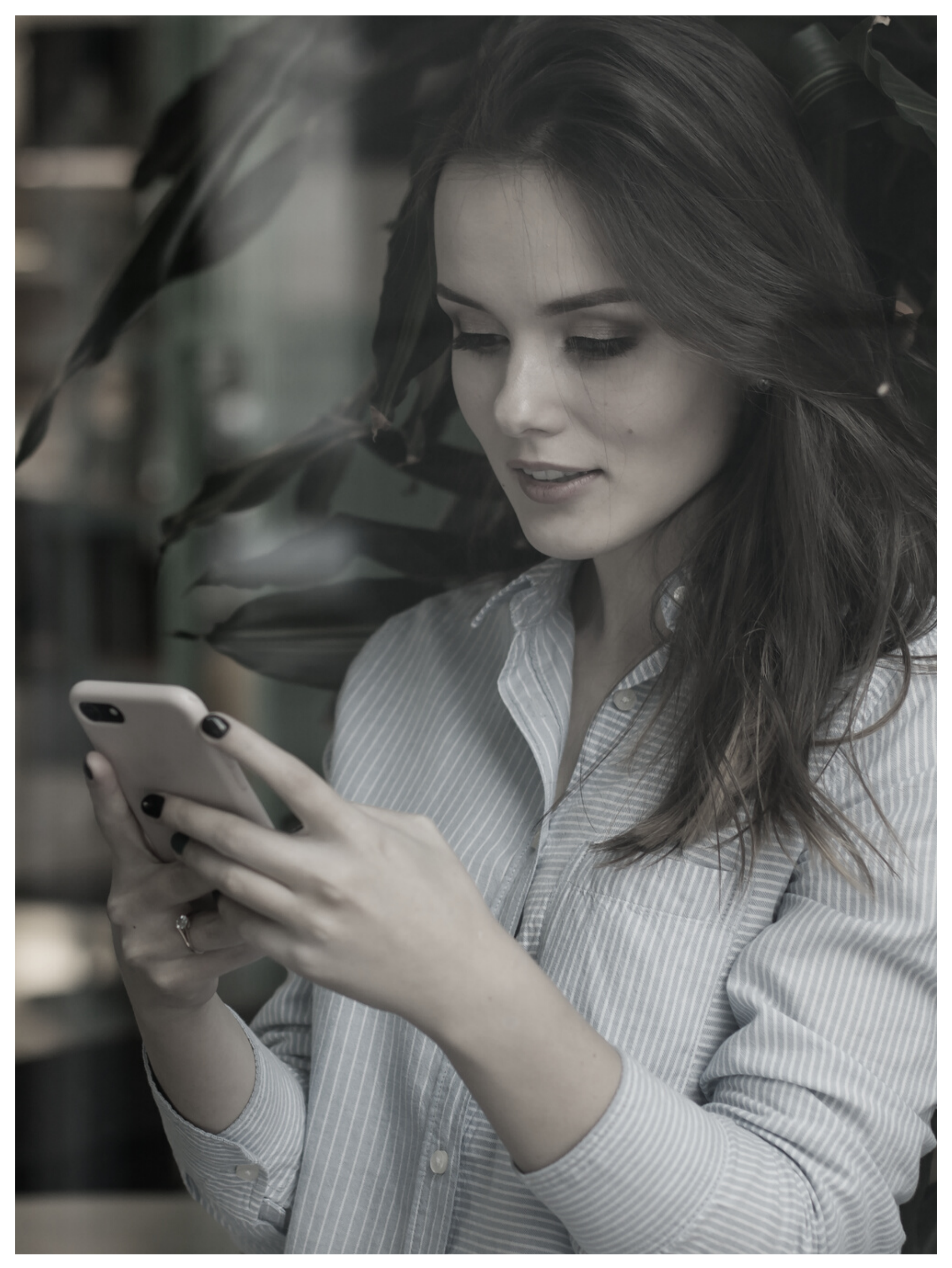
ELDERLY

LOW INCOME

Data: Twitter sentiment geographical index (TSGI)

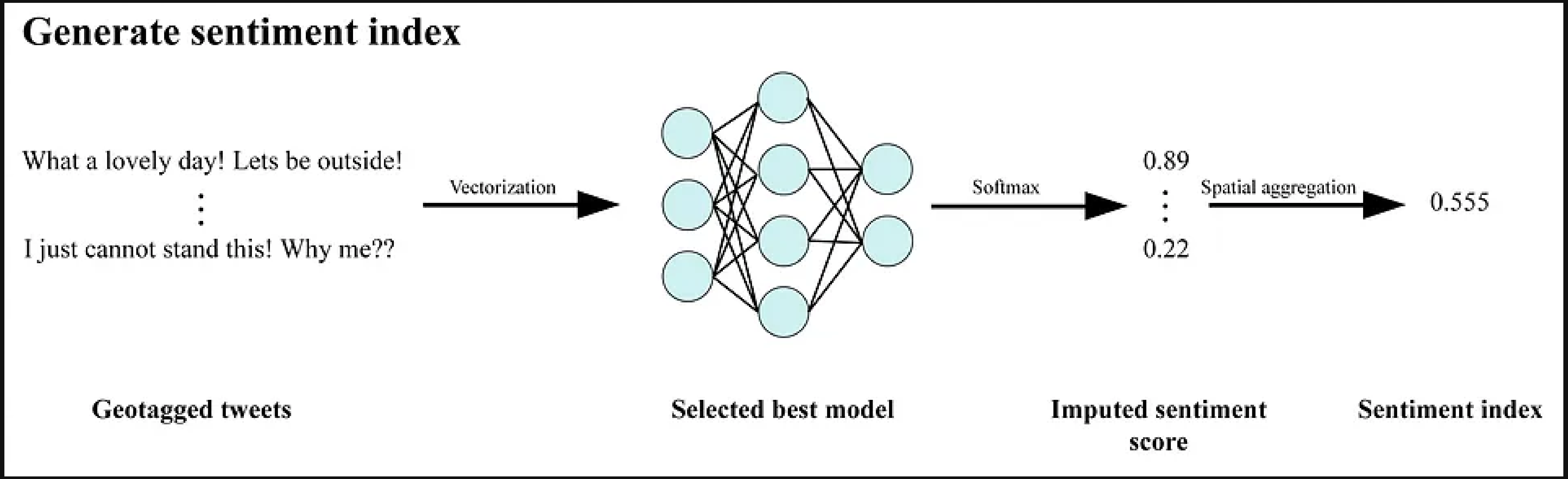
- A proxy for subjective well-being
- applying natural language processing techniques
- a comprehensive archive of 10 billion geotagged tweets
- spanning time, geography, and 104 languages maintained (by the Center of Geographic Analysis at Harvard University)

Data: Twitter sentiment geographical index (TSGI)



- Country, State/Province, and County/City level in 164 countries
- Daily sentiment scores in 10 year coverage (2012 to 2022)
- 83% sentiment classification accuracy by using neural network model

Data: Twitter sentiment geographical index (TSGI)



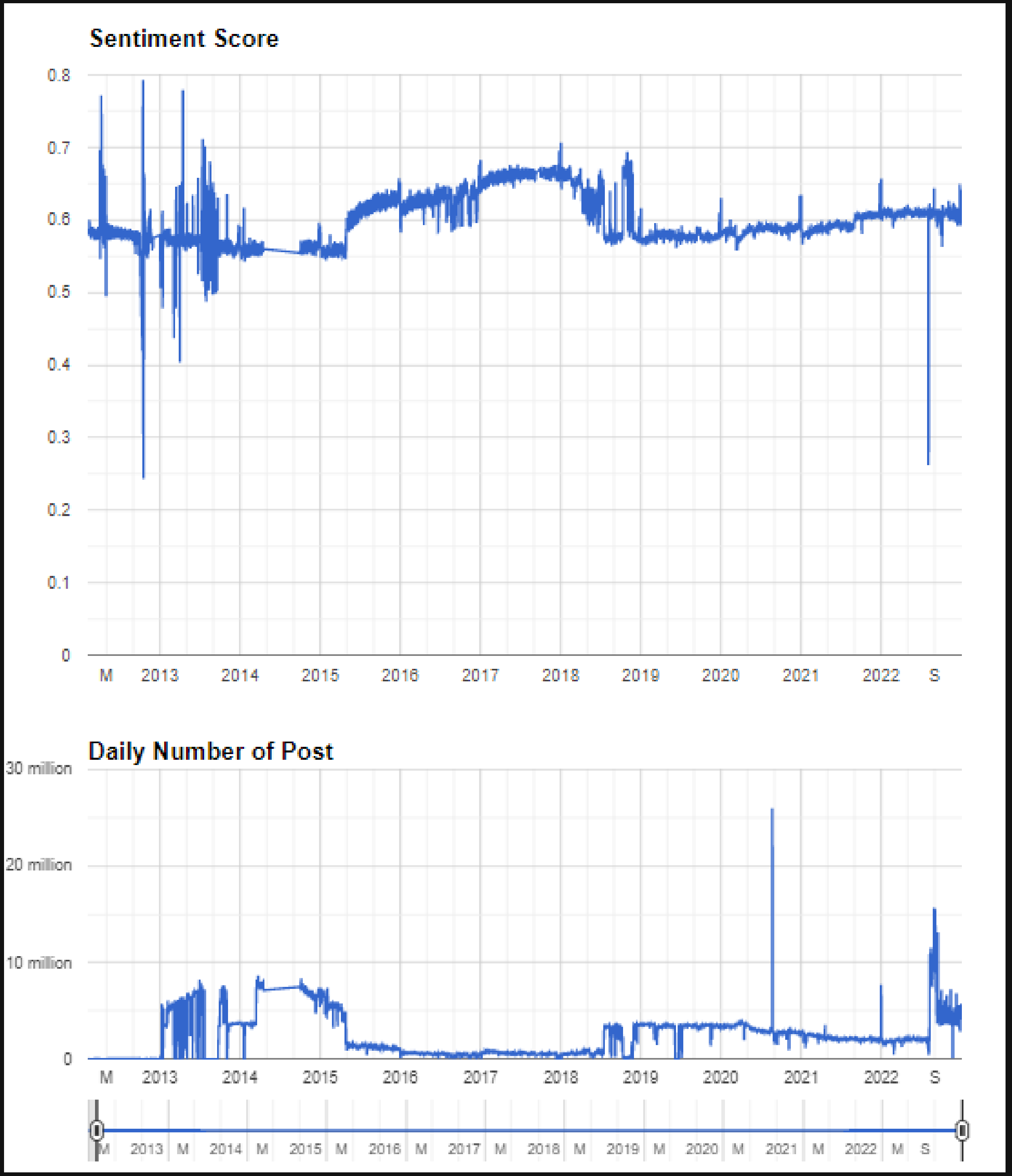
The sentiment index for global geotagged tweets was made in the following steps:

1. They vectorized the text into a 768 dimensions vector.
2. They fed the vector into a trained neural classifier to get the single sentiment score.
3. They aggregated the scores in different administrative areas to represent the local subjective well-being.

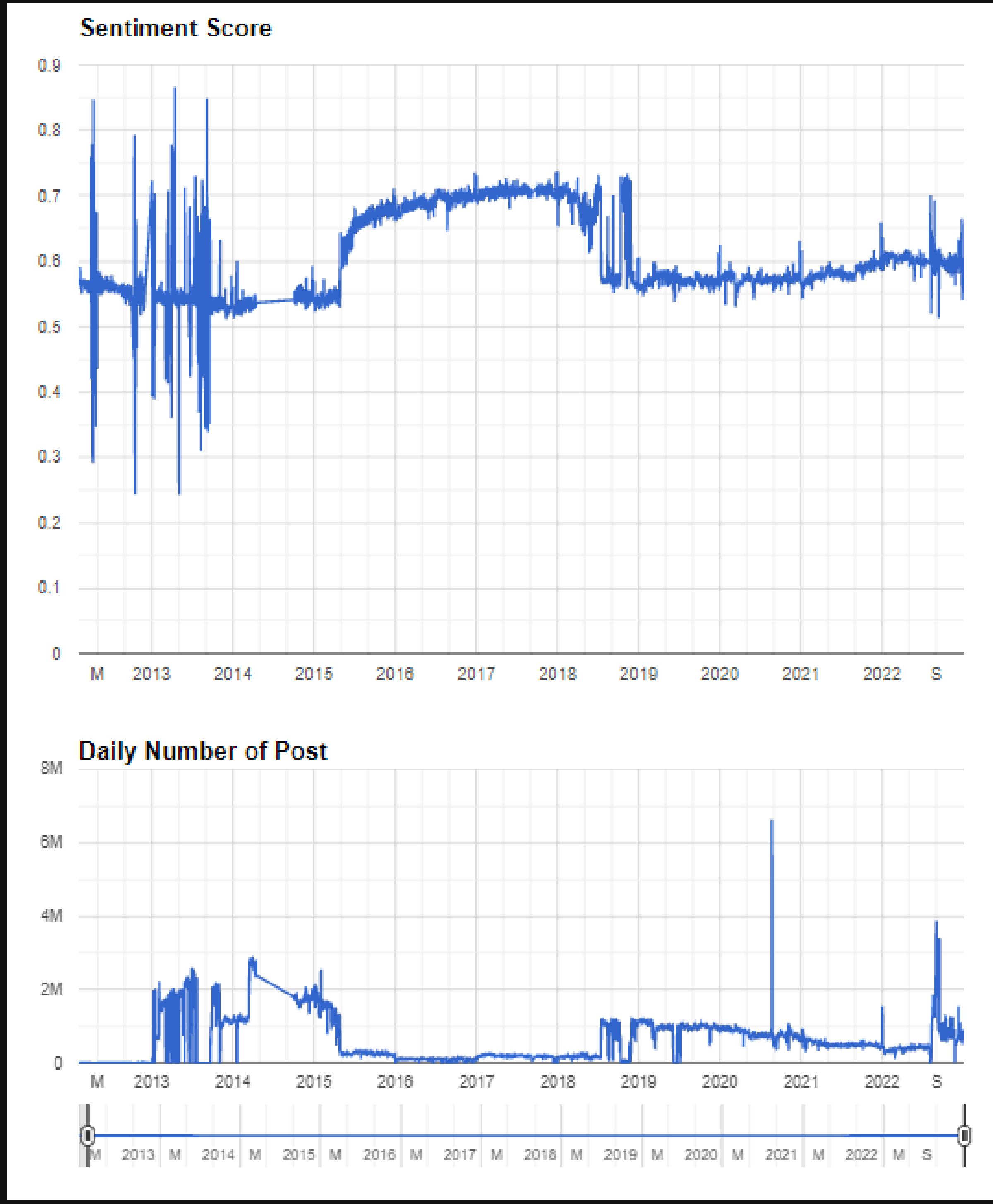
Picture source: https://gis.harvard.edu/twitter-sentiment-geographical-index-tsgi-dataset-global-high-frequency-dataset-monitoring

Data: Twitter sentiment geographical index (TSGI)

World



United States



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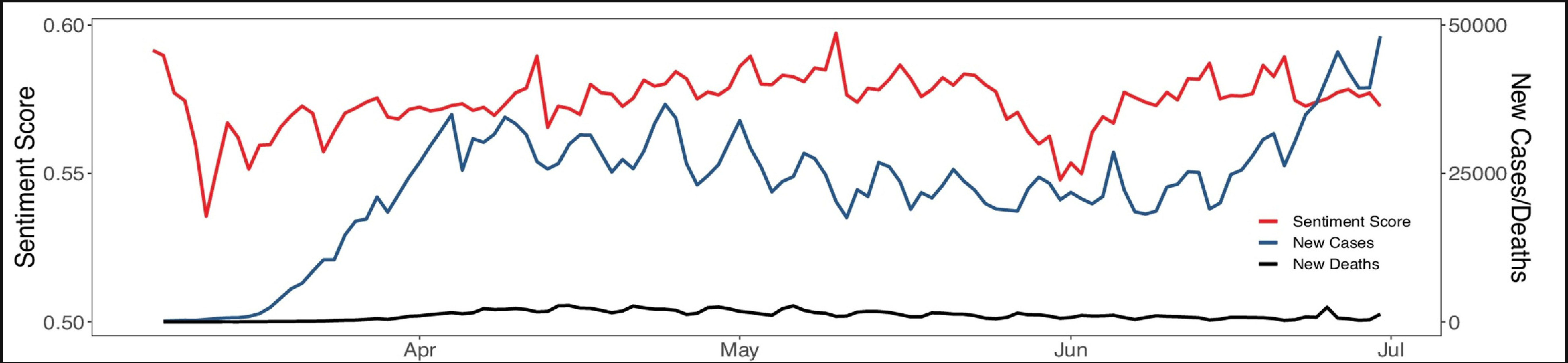
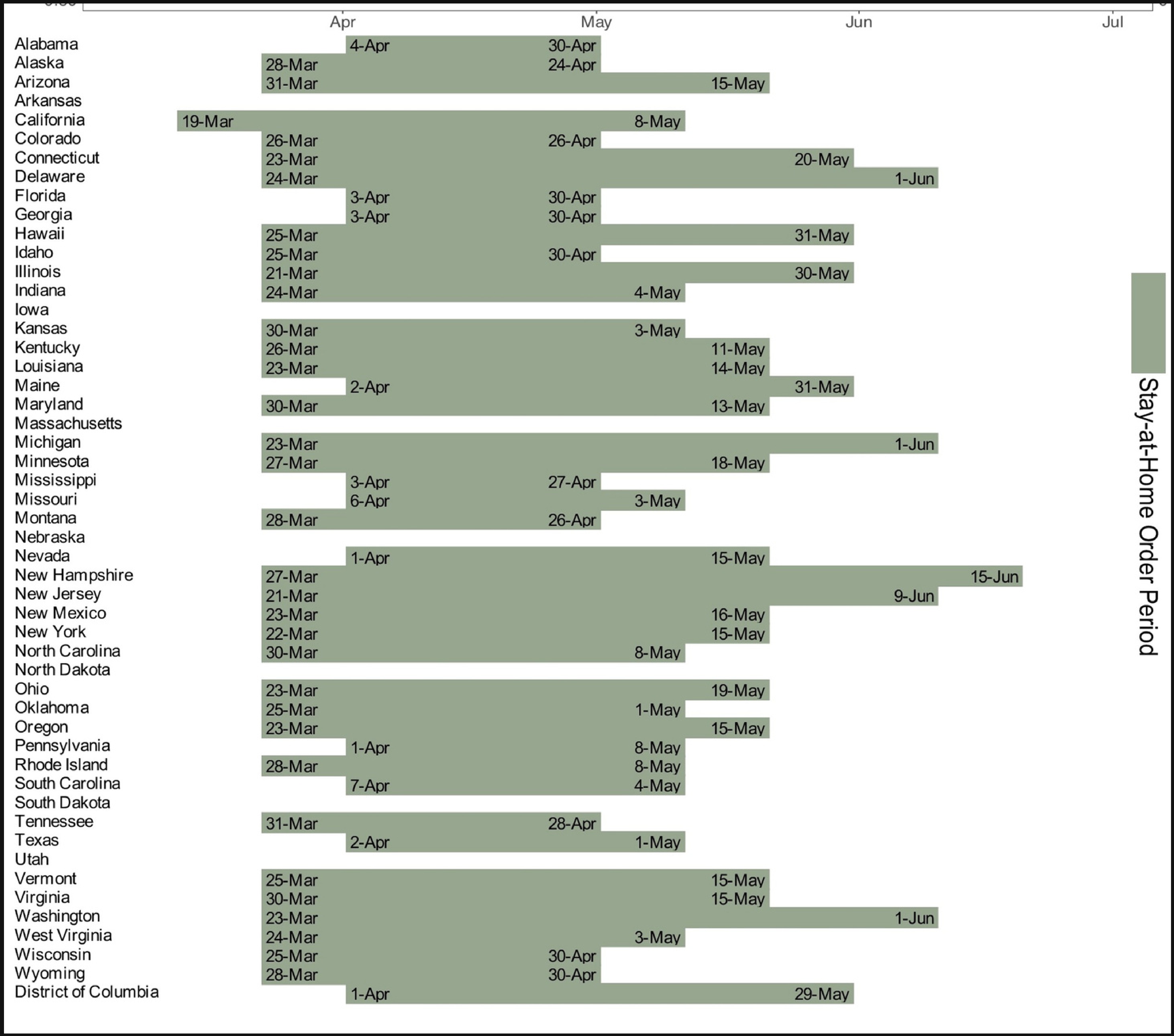
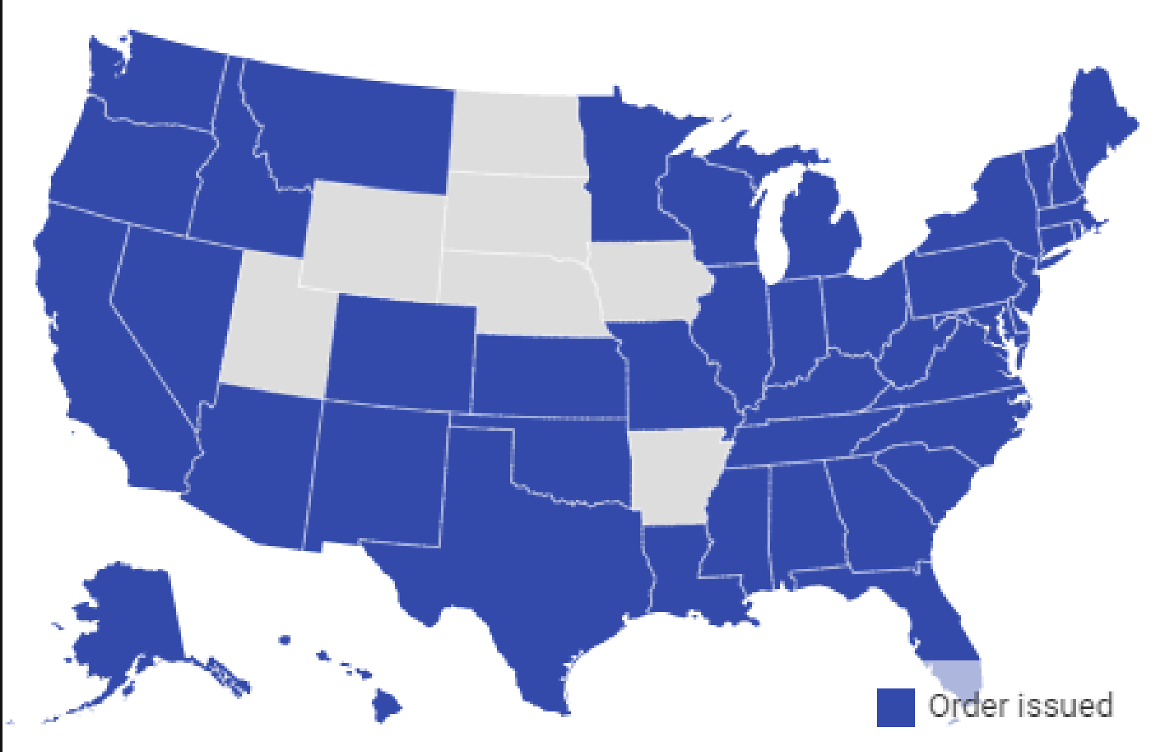
Preliminary results: Sentiment score vs. New cases/deaths

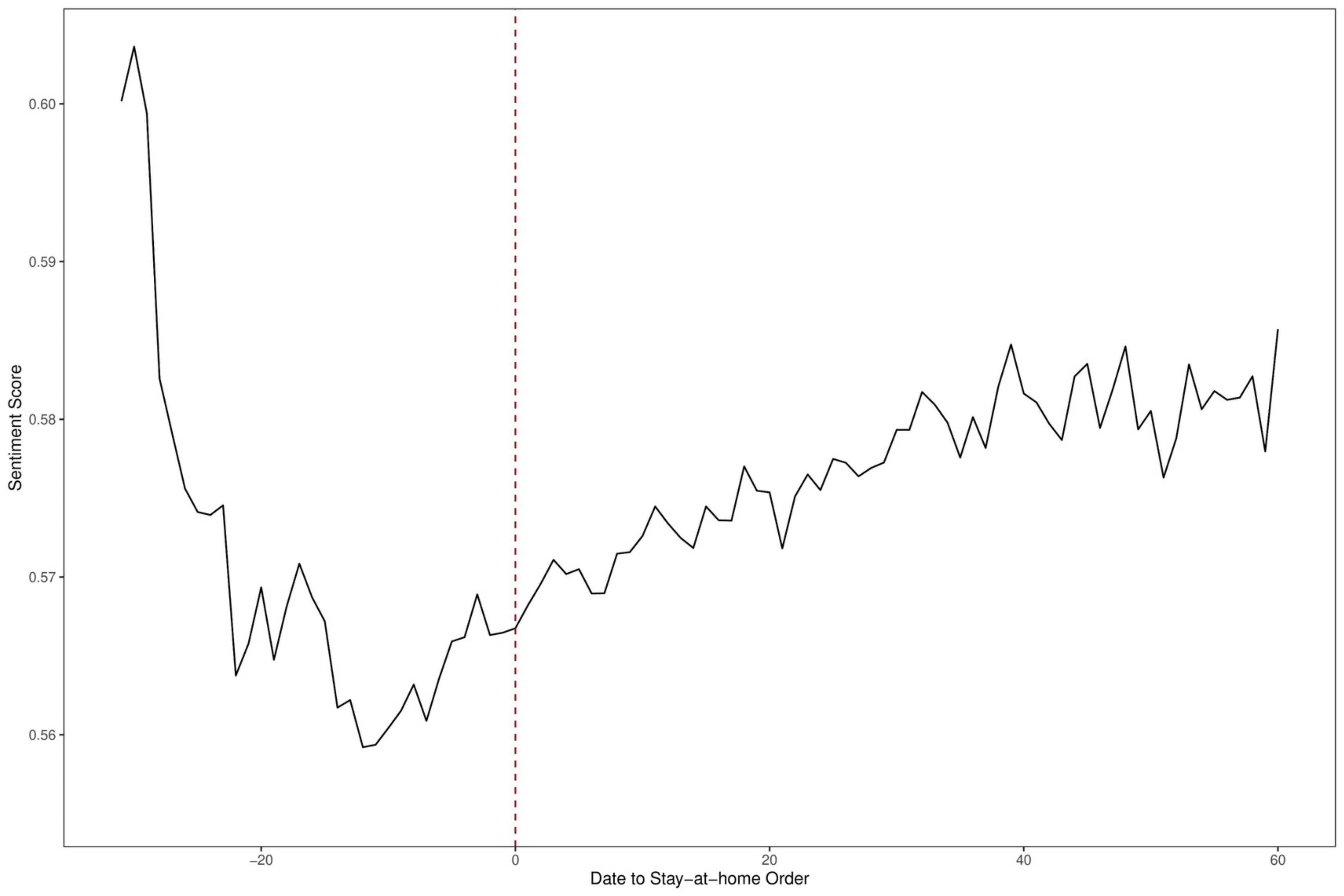


Stay-at-home related policy timeline

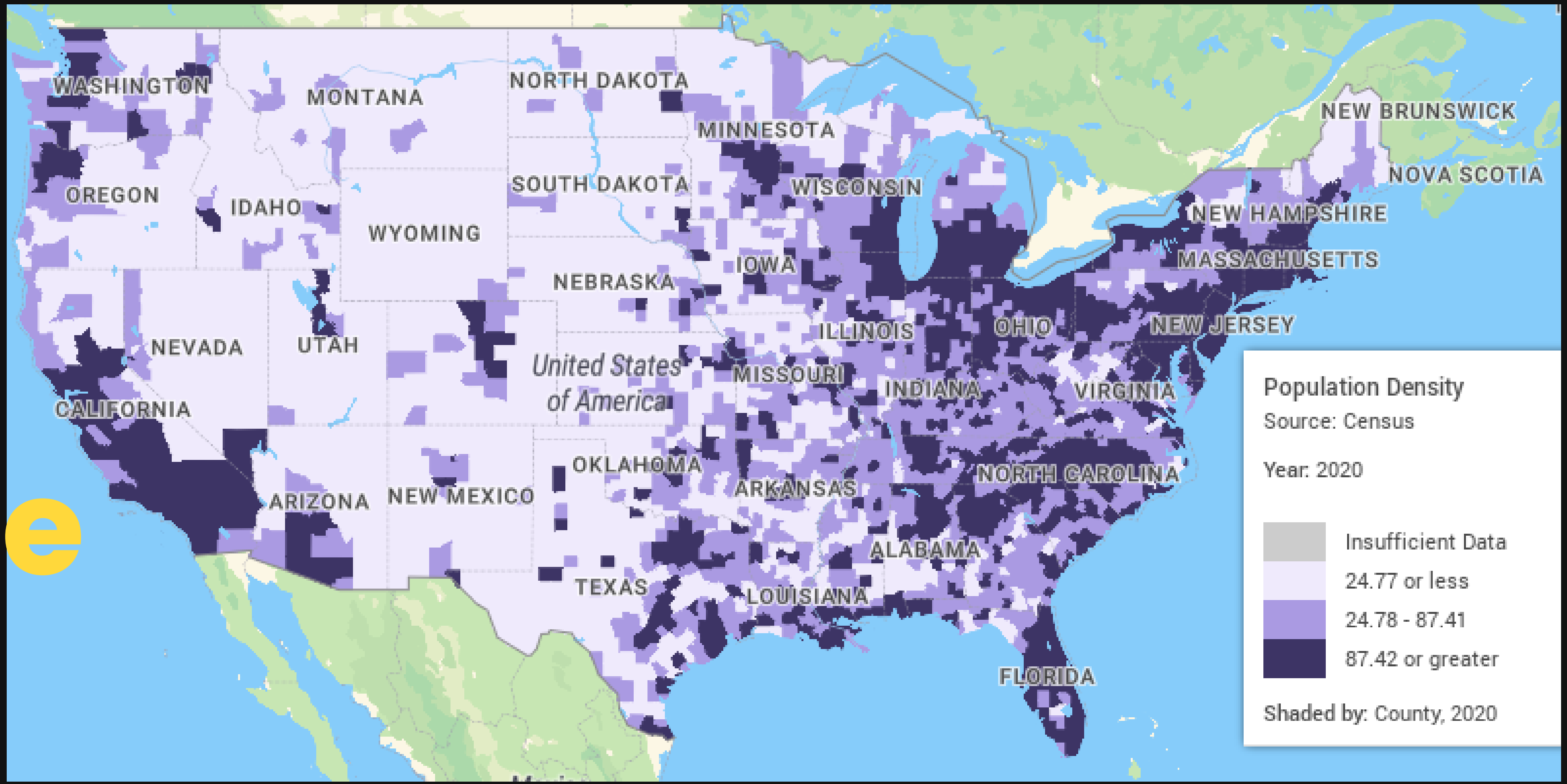


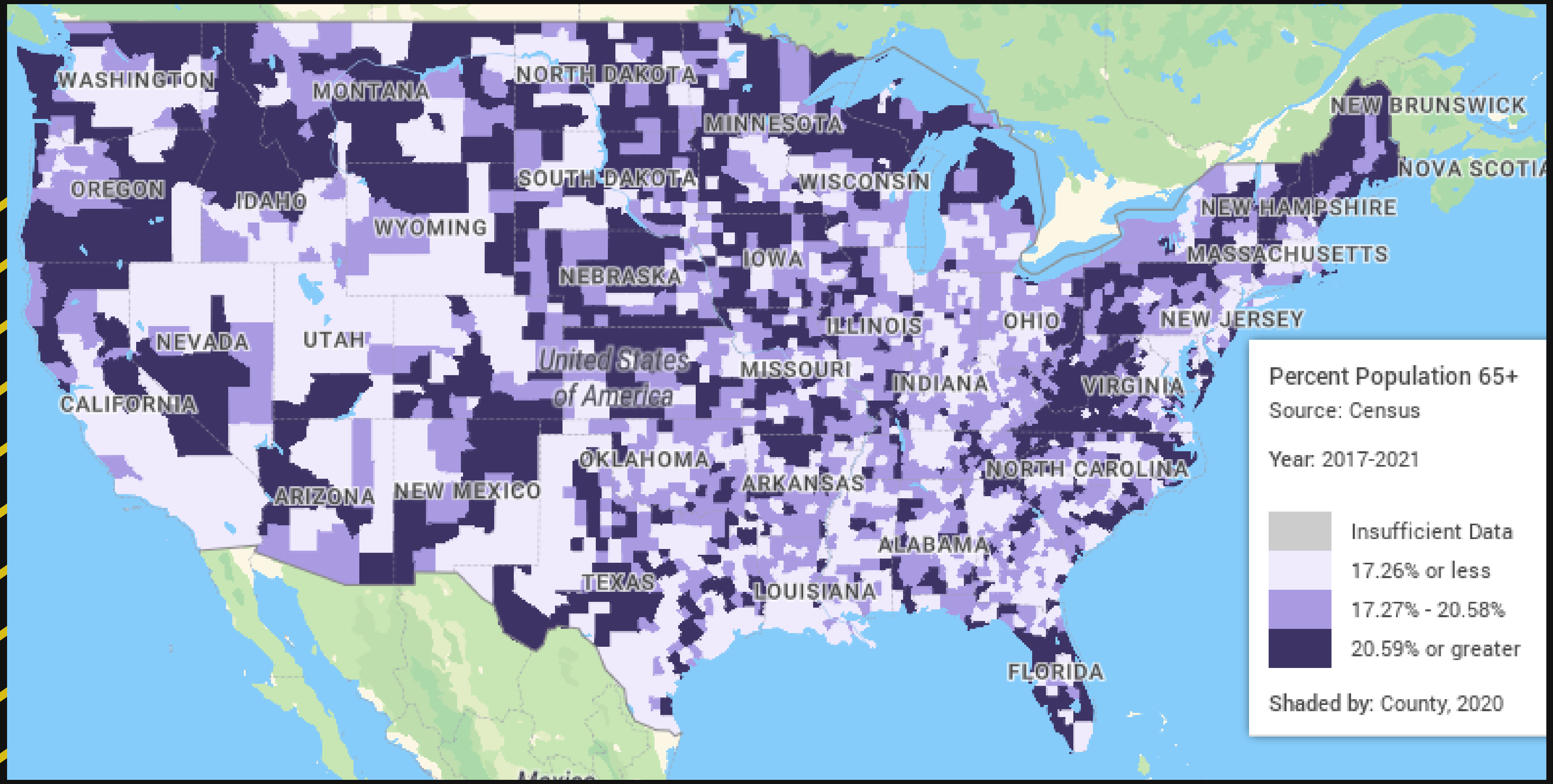


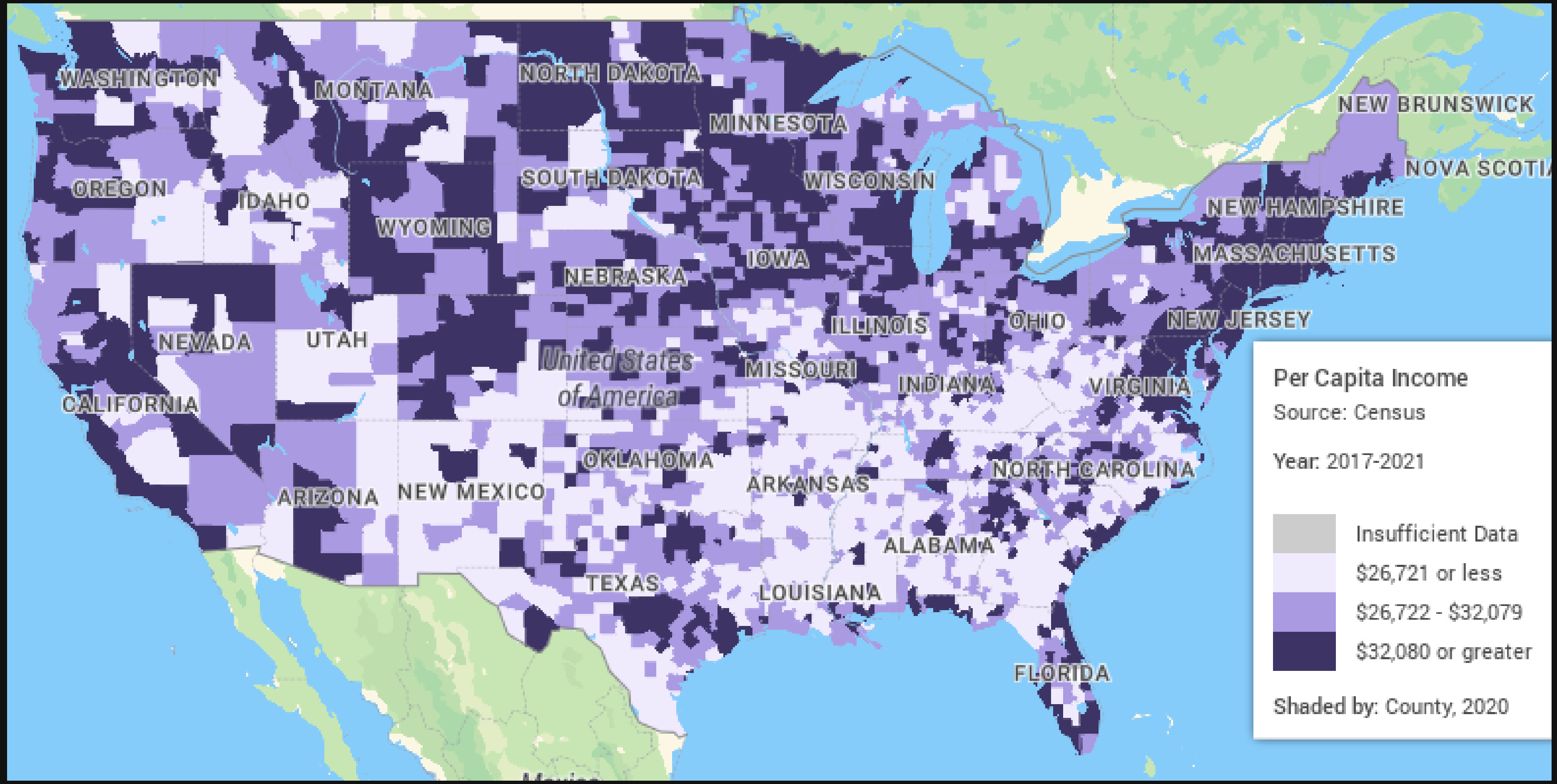
Sentiment scores before and after the stay-at-home orders



Vulnerable groups

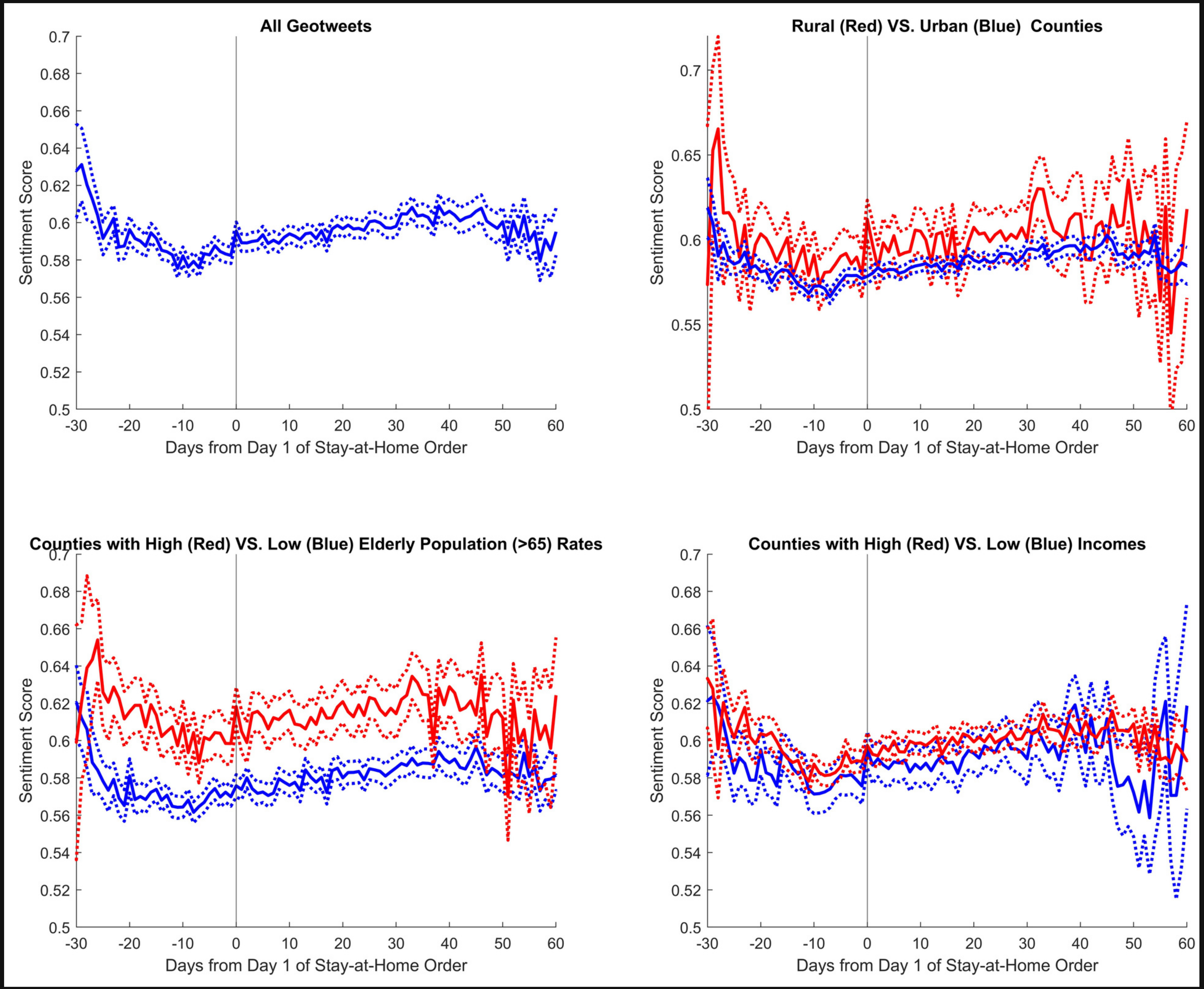






Picture source: Policymap.com

Sentiment scores among vulnerable groups



Summary

- Stay-at-home orders received a positive response and contributed to an improvement in Twitter sentiments.
- However, counties faced more significant difficulties in an urban (versus rural) setting, with a lower concentration of elderly individuals, or lower incomes during the pandemic.
- This study offers a sociological perspective, informed by large-scale Twitter data, for monitoring changes in public opinion, evaluating the impact of social events, and understanding the disaster management of pandemic shocks.

Next Steps

Methodology

- The difference in differences (DID) regression model
- Topic modeling

Research topics

- Natural disasters (e.g., hurricanes)
- The efficiency of policies (stay-at-home orders in the US vs lockdowns in China)

Thank You!

Contact me for more questions.

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