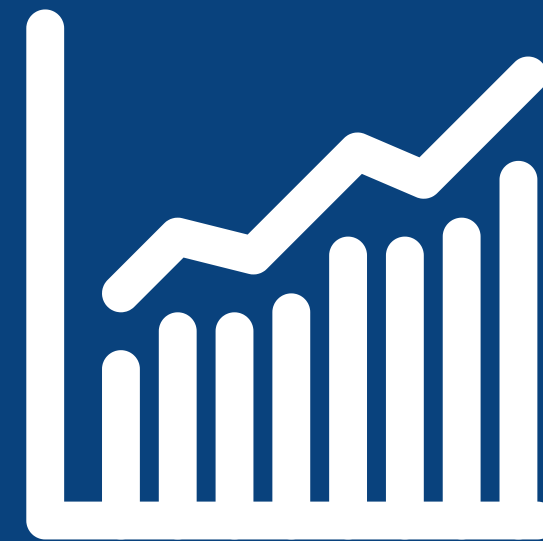


Covid-19 Vaccines:

Analyzing trends in
vaccination volume
and sentiment in
major US cities



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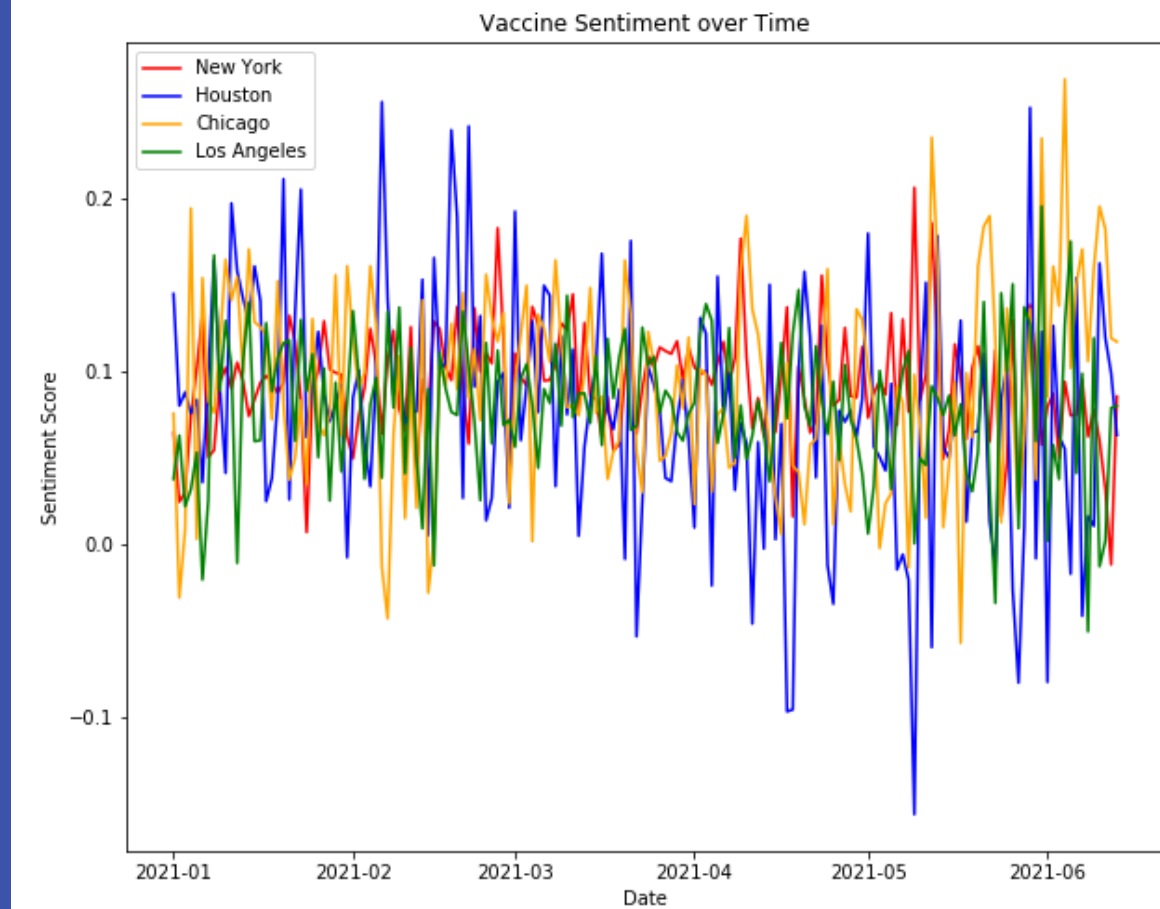
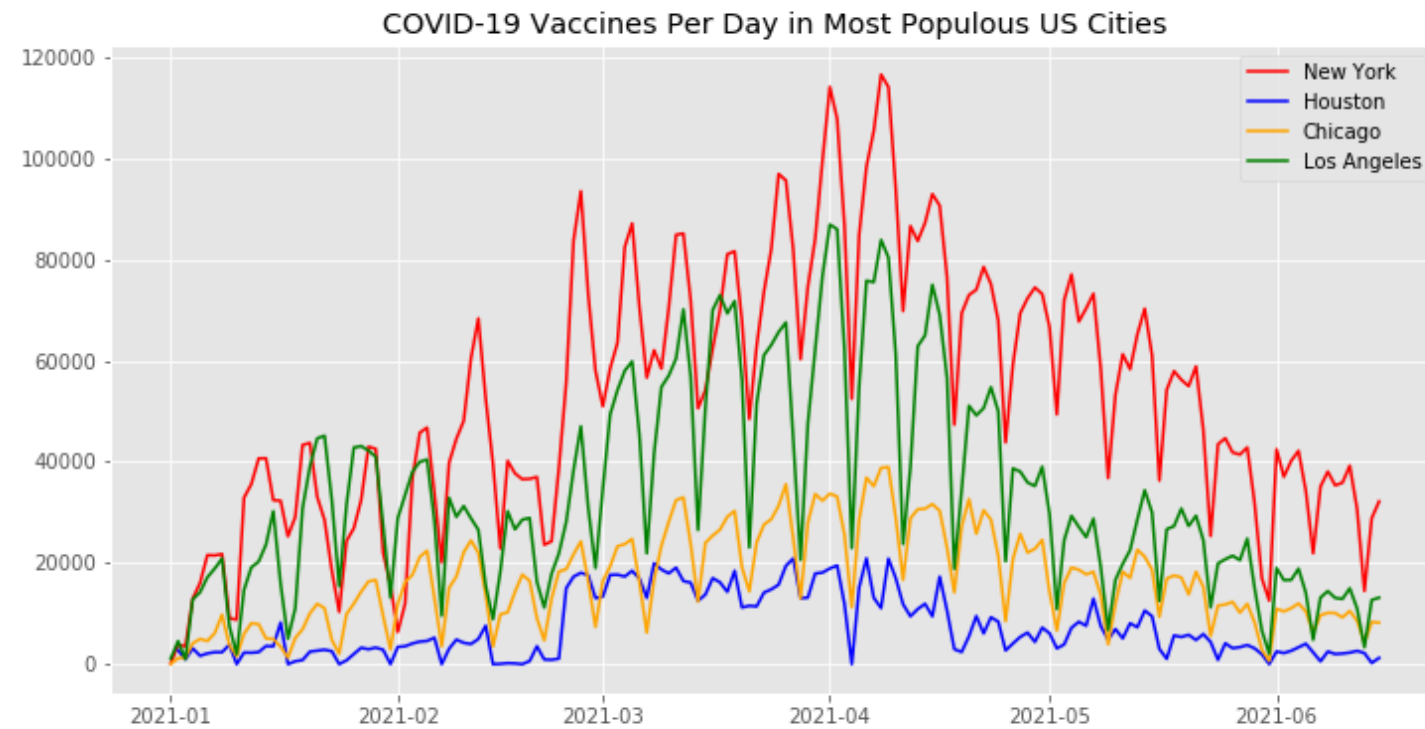
Project Goal

Uncover and analyze trends around vaccinations, and leverage insights to convince more people to get vaccinated

- After an initial success, the US has seen stagnation in vaccination rates in certain regions and has not met goals
- The Delta variant strain of Covid-19 is spreading, increasing infections in low-vaccination areas
- Many parts of the country are working to combat vaccine hesitancy and misinformation



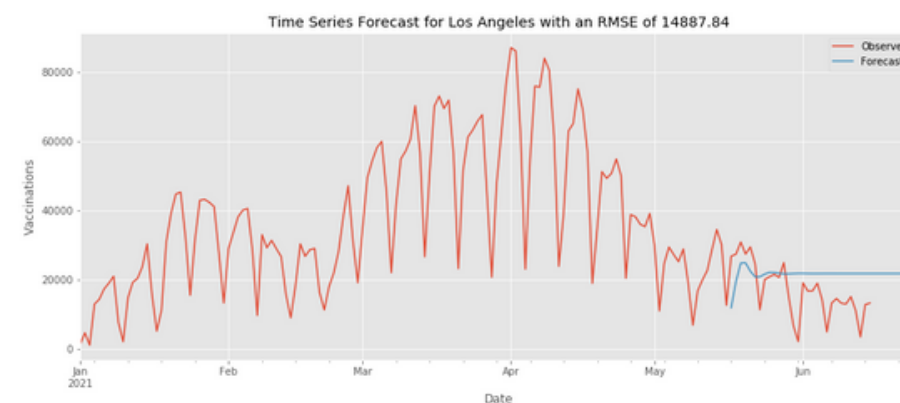
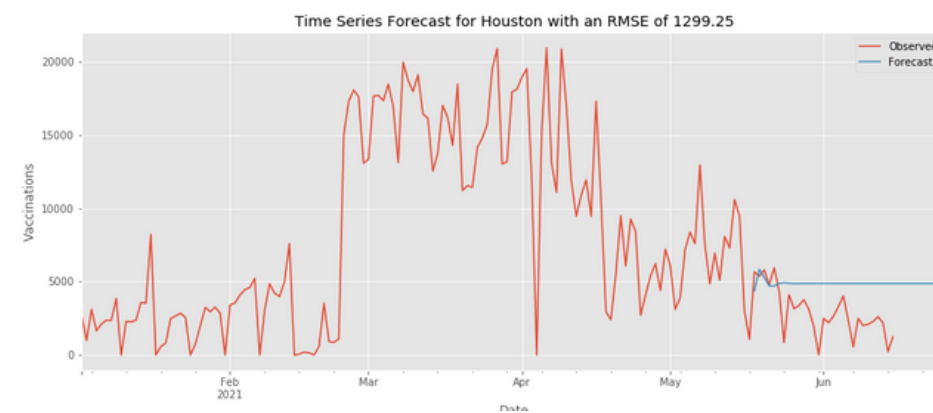
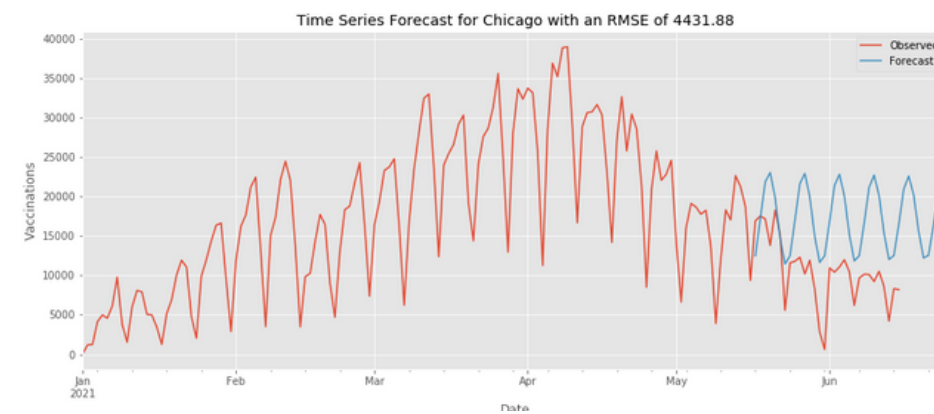
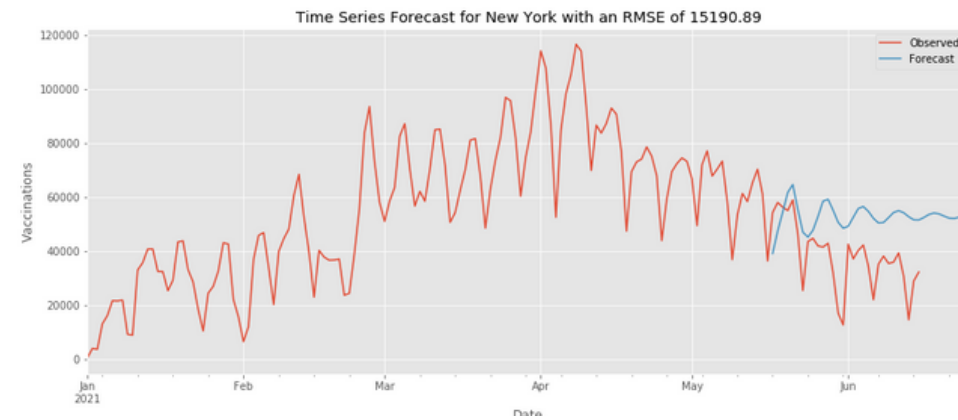
Methodology



- Tweets were scraped and tagged with sentiment
- Vaccine data gathered from city government health departments
- Time series models used ARIMA modeling
- Correlation analysis between vaccinations and social media sentiment
- Topic modeling using unsupervised learning - LDA model

Findings: Vaccination Trends & Modeling

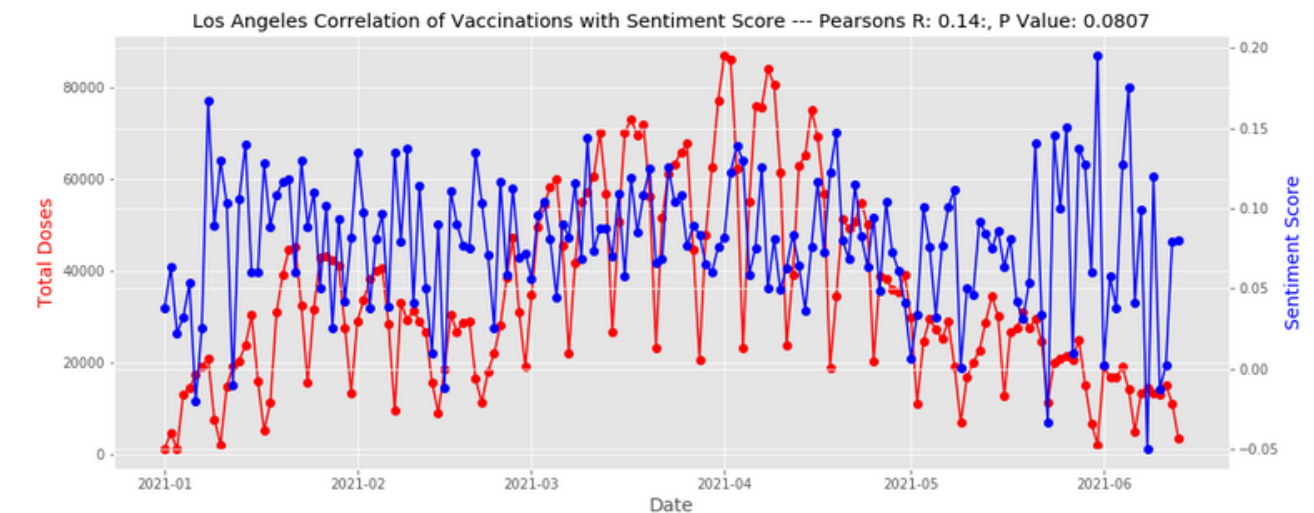
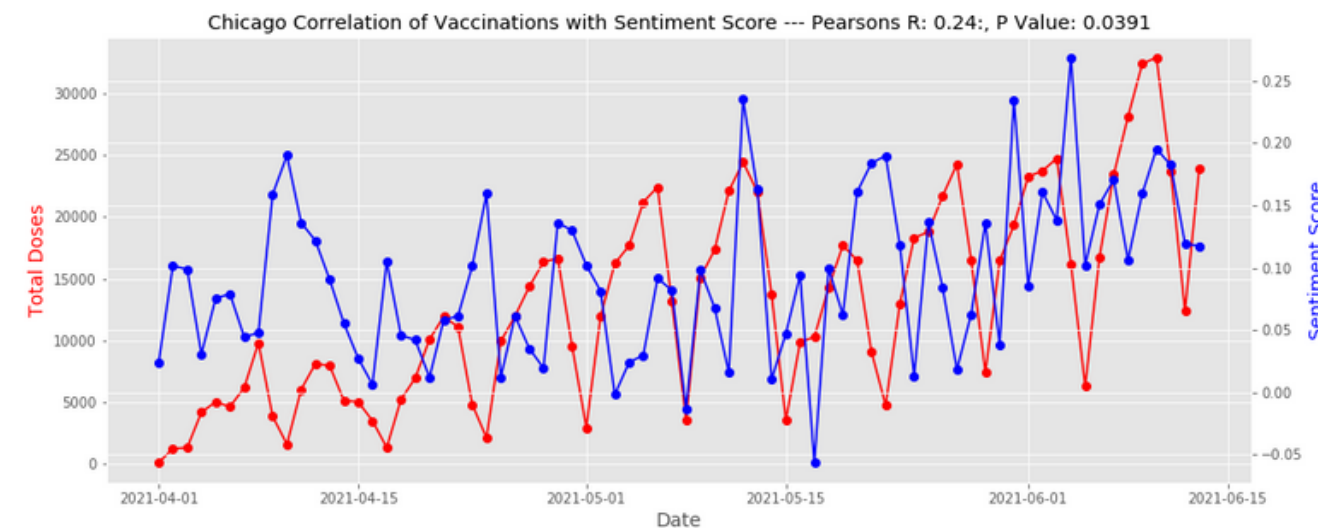
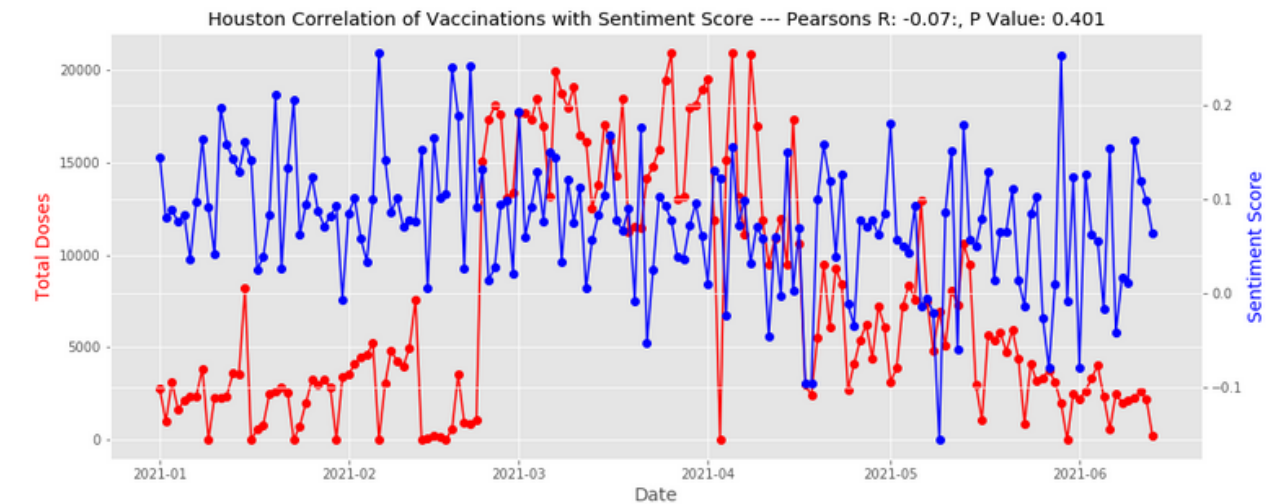
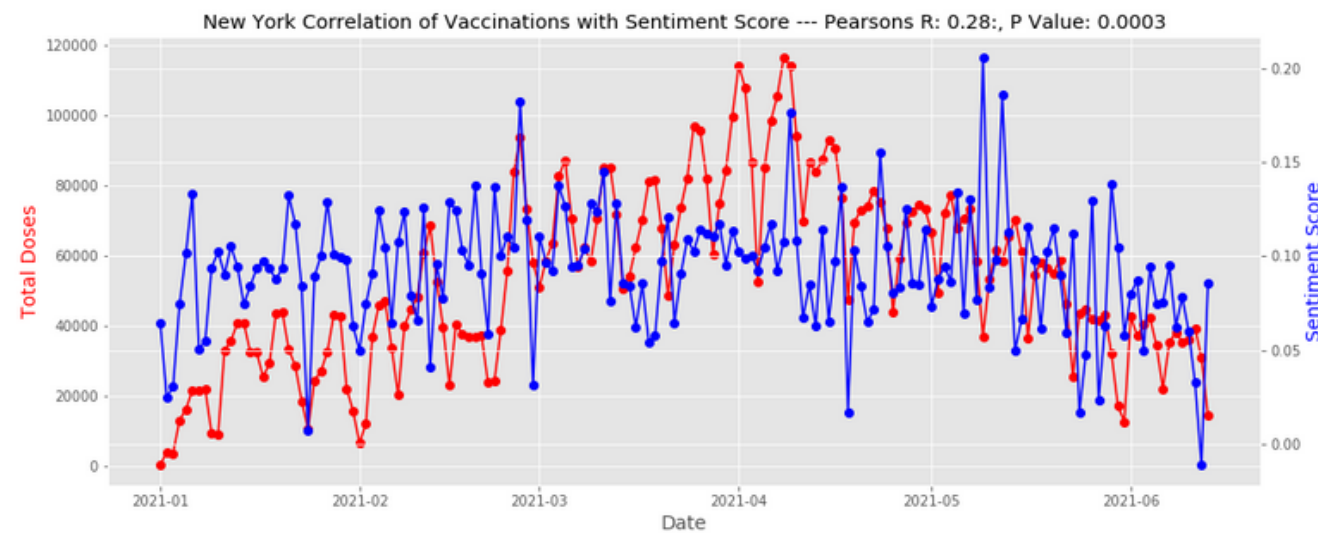
Where is the most help needed?



- The patterns of vaccinations are proving difficult to capture for each city to make accurate predictions
- The New York and Chicago ARIMA models capture periodicity to a certain extent
- Forecasts predict the lowest vaccine amounts per day in Houston at only 5k, with Chicago and LA closer to the same range, and New York continuing to lead

Findings: Correlation Analysis

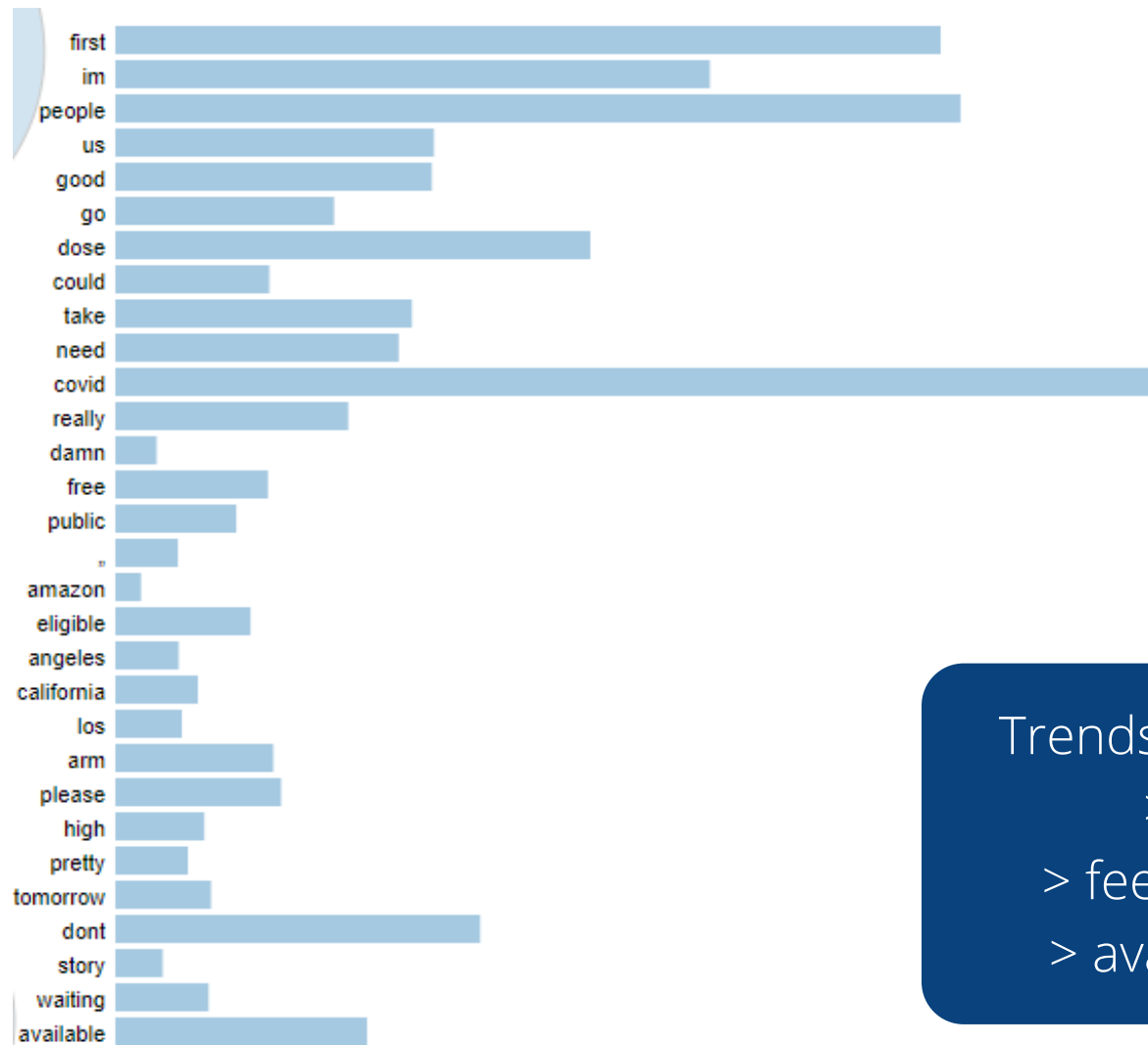
Do social media and vaccine data show a relationship?



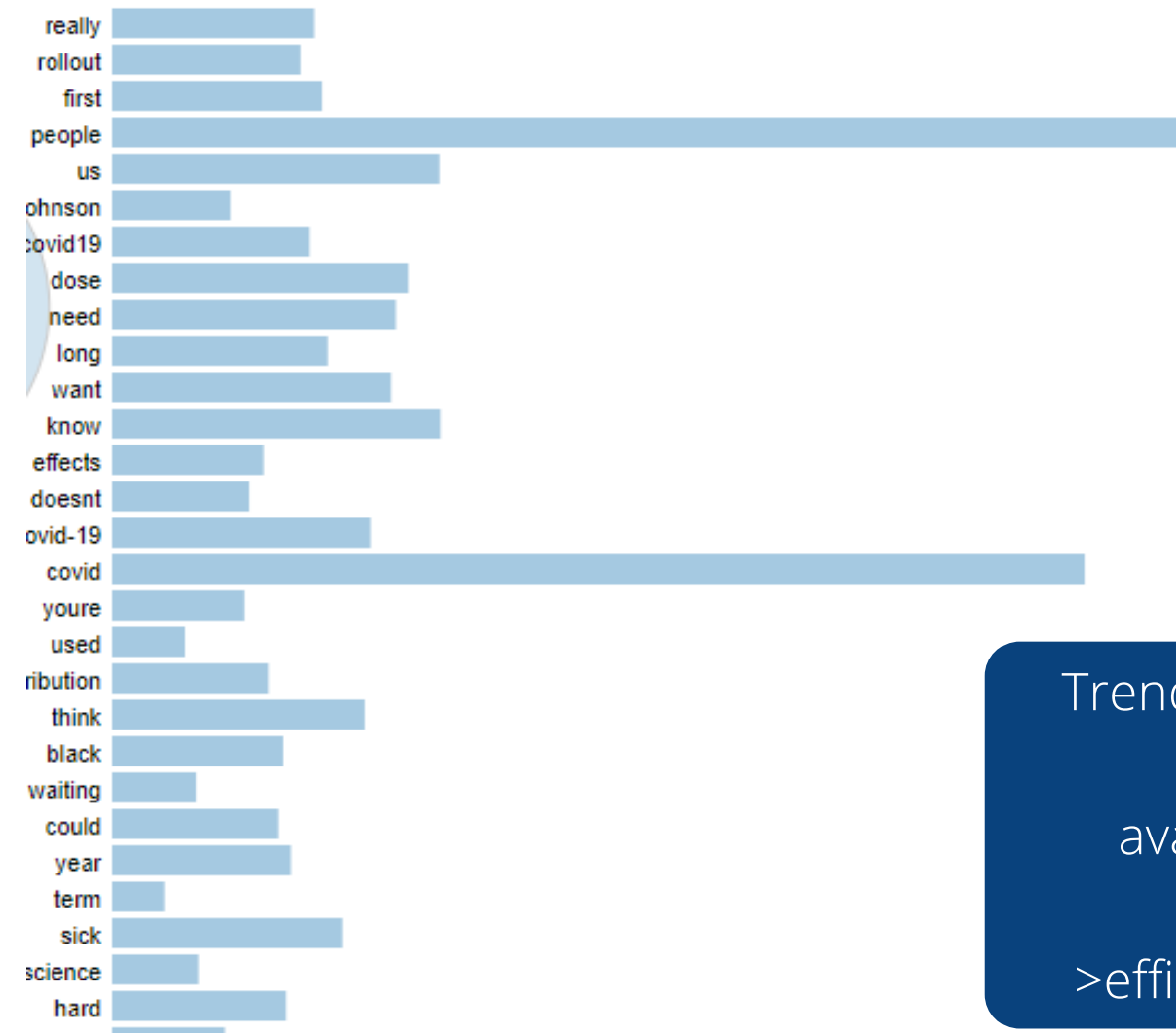
There is a different relationship between social media conversation around vaccines and vaccines administered over time for each city. New York shows the highest correlation, and Chicago shows correlation at a 90 day lag. LA also shows some positive correlation until the end of the timeframe. Houston does not show a clear relationship.

Findings: Social Media Conversation

What trends can be found in negative and positive conversation around vaccines?



Trends in positive tweets :
> excitement
> feeling good/healthy
> availability, eligibility



Trends in negative tweets:
> difficulty with
availability/appointments
/logisitcs
>efficacy and side effects

In all topic groupings, there were many common themes, but people were having different experiences with them.

There were also regional themes that stood out.



City Specific topics:

New York: doses recieved, cuomo, masks, die

LA: safe, new

Chicago: effects, efficacy

Houston: free, mask

Conclusions



While social media sentiment does show a correlation to vaccinations administered in some areas, it's not strong enough to be conclusive on a generalizable scale



When looking to develop messaging to encourage vaccination, pursue alternate channels and explore how they affect people's actions

Time series models helped explained trends in vaccination, but data was not strong enough to forecast accurately



Continue to gather data and monitor patterns; explore extraneous factors that could help inform model

Topic clustering uncovered positive and negative topics of conversation that can help shape pro-vaccination messaging



Use results to build location-specific thought starters, while continuing to experiment with text processing methods

Thank you!

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