Hospital Emergency Preparedness

For the Next Pandemic

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Agenda

- Context
- Vision
- Dataset
- Data cleaning
- Initial insights
- Next steps

The COVID Pandemic

- Exposed systemic challenges
- Stressed hospital systems
- Shortages in beds, staff, and supplies

The Vision and Impact

- Identify leading indicators and signals of increased demand in advance
- Hospitals, nursing homes, prisons, and urgent care
- Build data driven models to help hospitals implement actionable policies and procedures

Dataset

- Healthdata.gov
- ~80,000 rows, 135 columns
  - Critical staffing shortages
  - Bed utilization
  - Demographics
  - Medications

Data Cleaning

1.

Drop pediatric data

2.

Group into regions

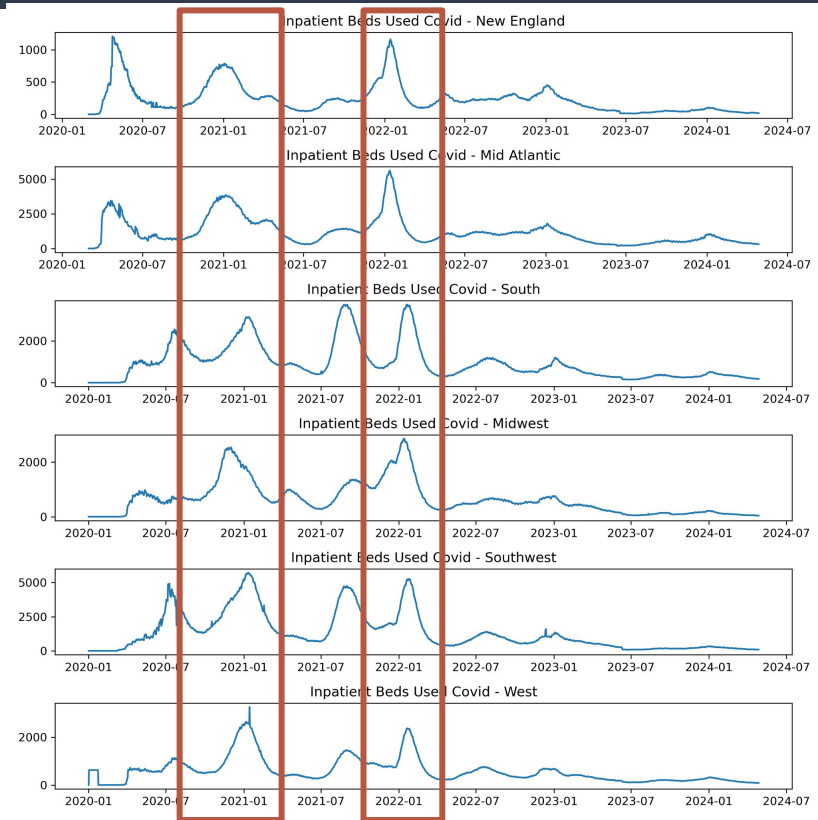
3.

Impute missing values using forward and backward fill

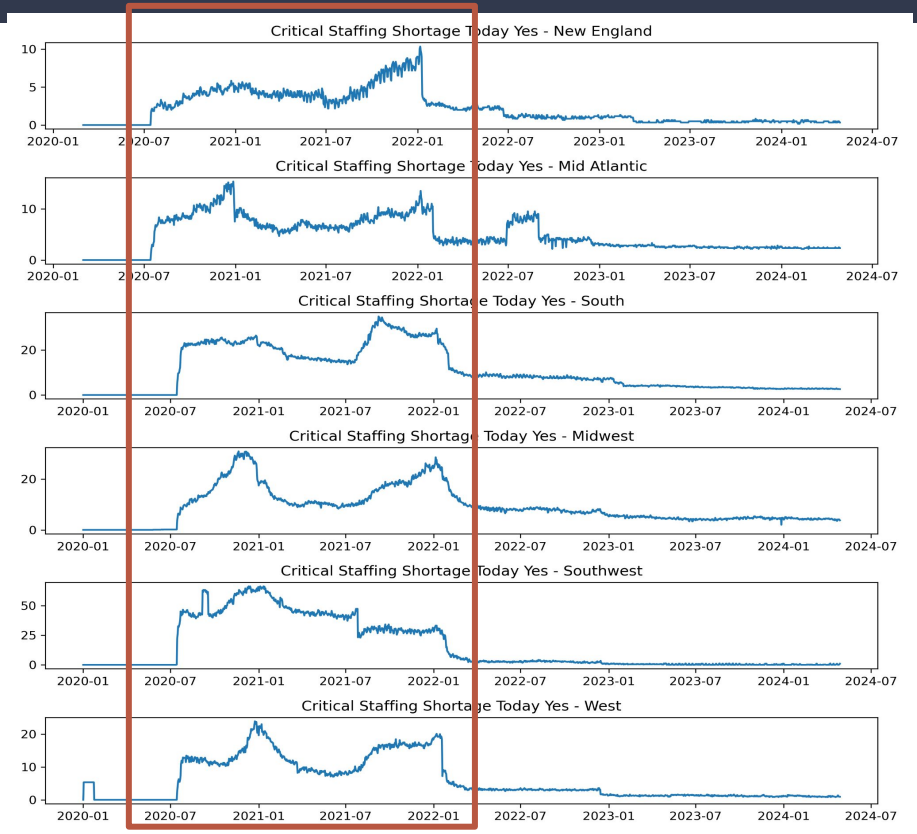
4.

Ran Lasso regression on scaled data to get features

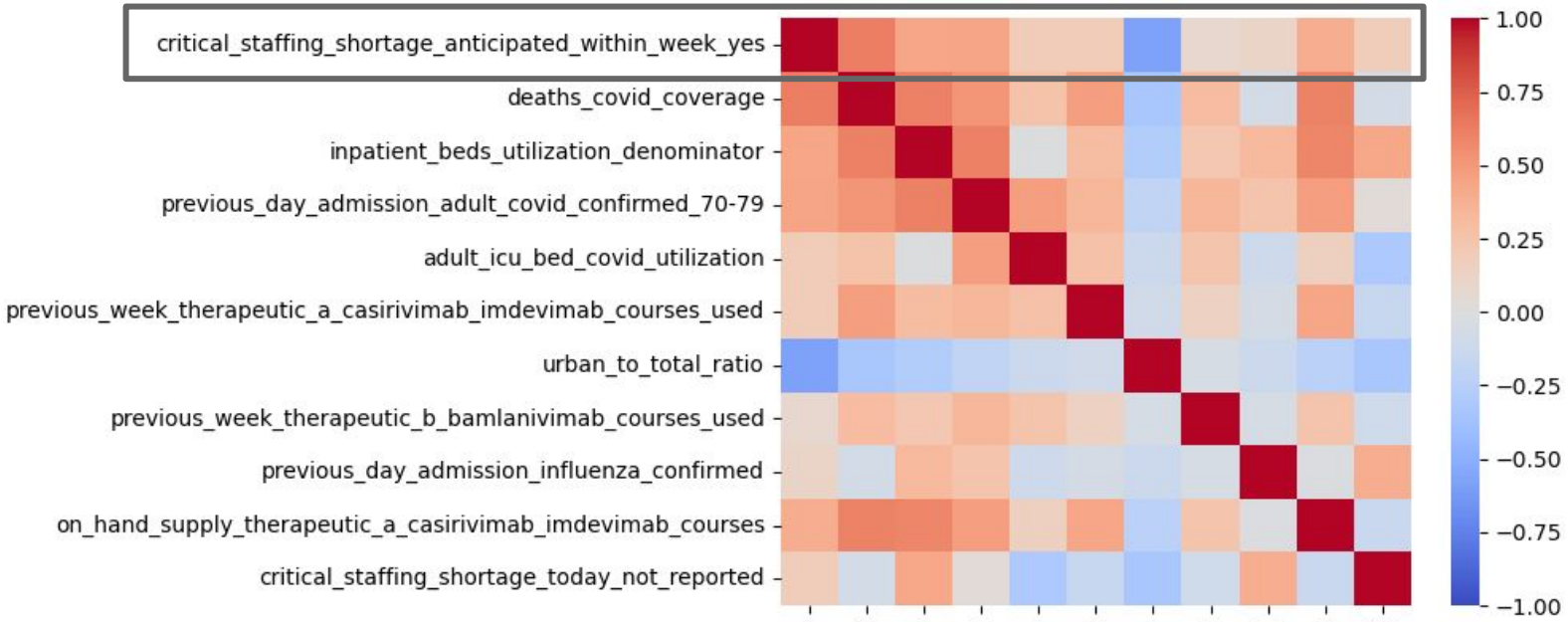
Similar Peaks - Inpatient Beds



Staffing Shortages



Correlations of Selected Features



Initial Linear Regression

- What is my baseline?
- Overfitting?

Region	Accuracy
New England	96%
Mid Atlantic	92%
South	97%
Midwest	96%
Southwest	99%
West	97%

Next Steps

- Time series analysis with SARIMAX or Facebook Prophet
- Different feature selection using sklearn or decision tree
- More analysis on urban to total population being affected