Hospital Emergency Preparedness

For the Next Pandemic - Sprint 2

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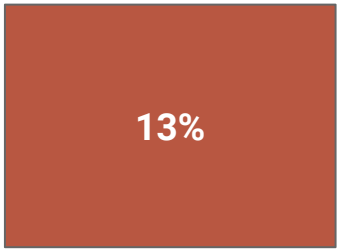
Problem Statement

How can we predict a hospital staffing shortage given past COVID data?

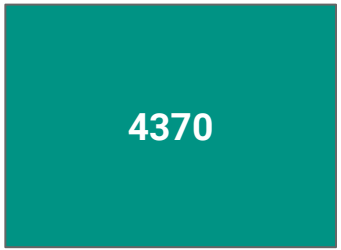
Solution

Employ different machine learning models to find accurate staffing predictions per U.S. region

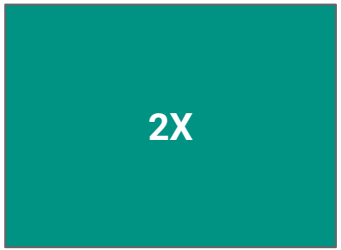
Impact



Odds of patient dying[1]



Lives saved in NY[2]

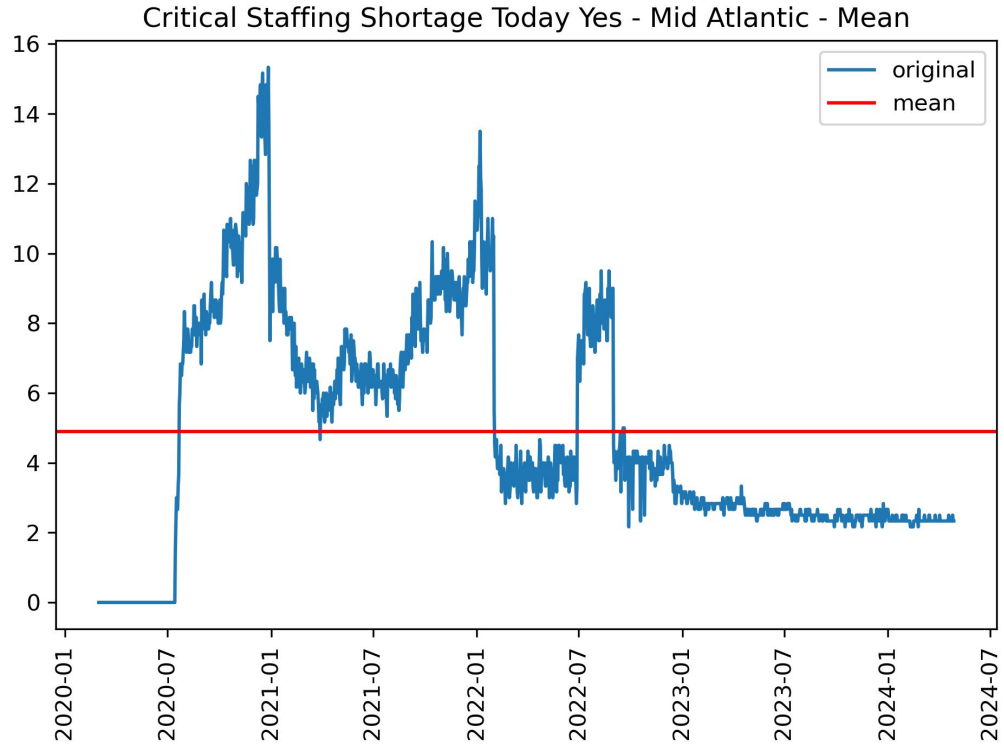


Cost saved due to readmission and length of stay > than hiring additional nurses[3]

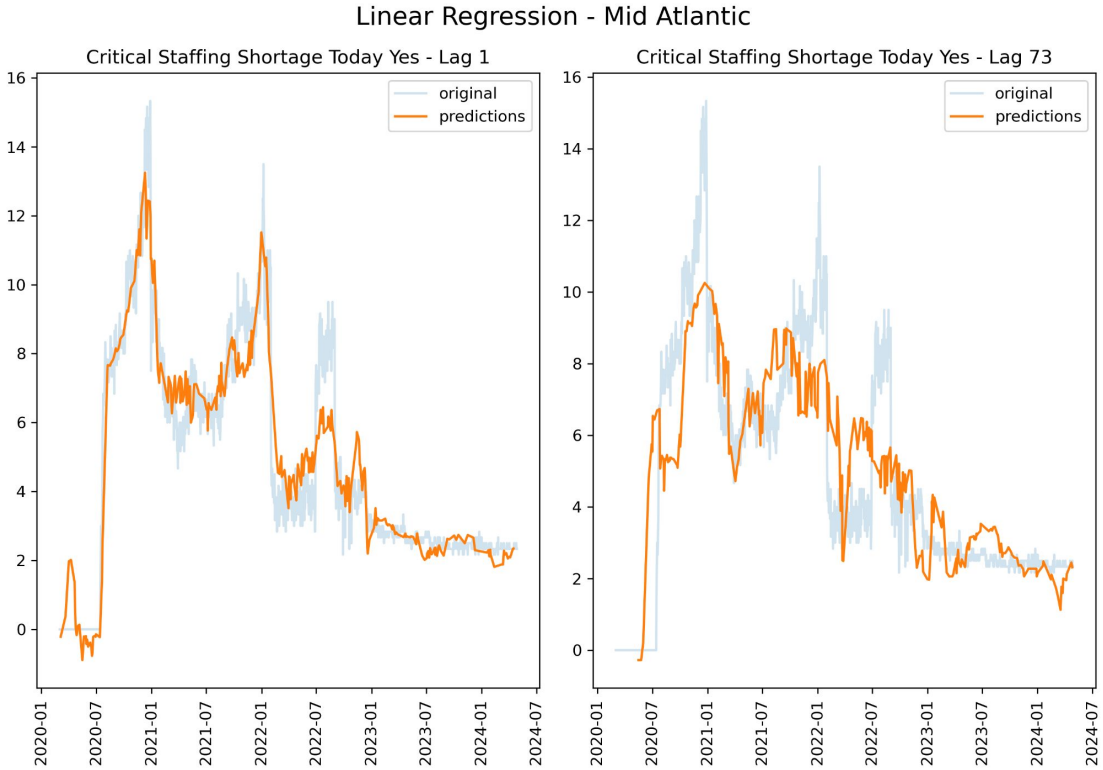
Mid Atlantic Case Study

- Same dataset ~80,000 rows and 135 columns
- Grouped by region
- Regional features selected with Lasso regression
- Analyzed various lags of selected features for each model

Baseline Model – Mean

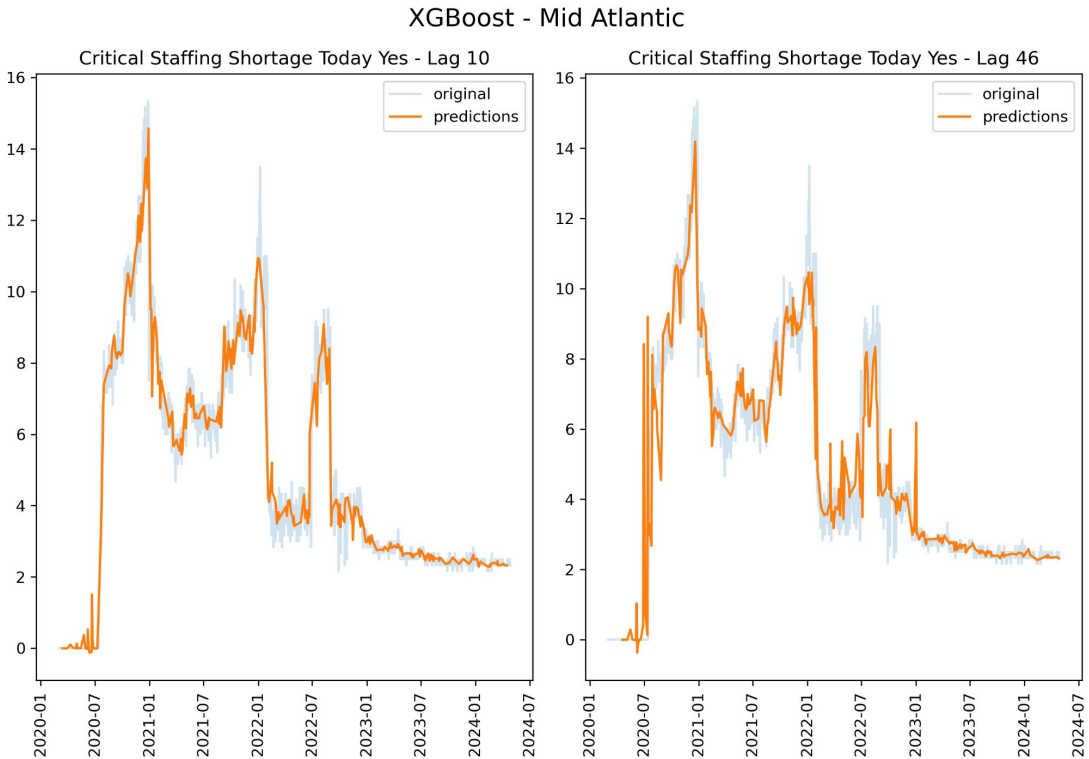


Linear Regression vs XGBoost vs Neural Network



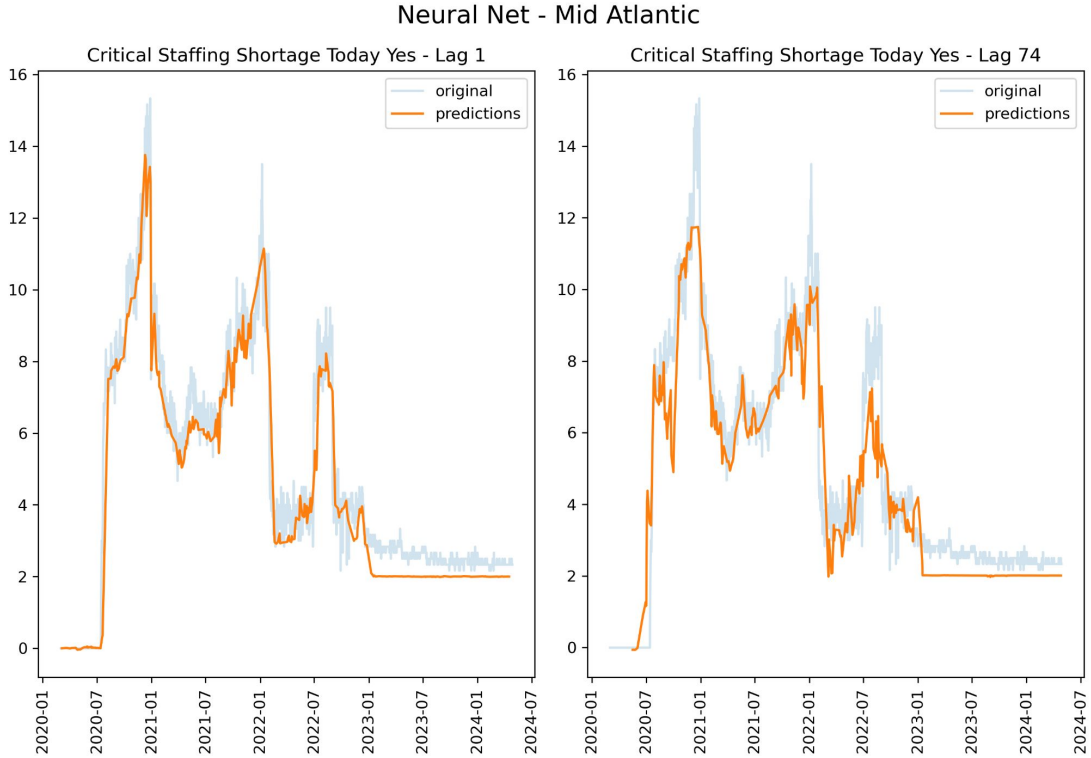
Lag	R^2
1	92%
73	56%

Linear Regression vs XGBoost vs Neural Network



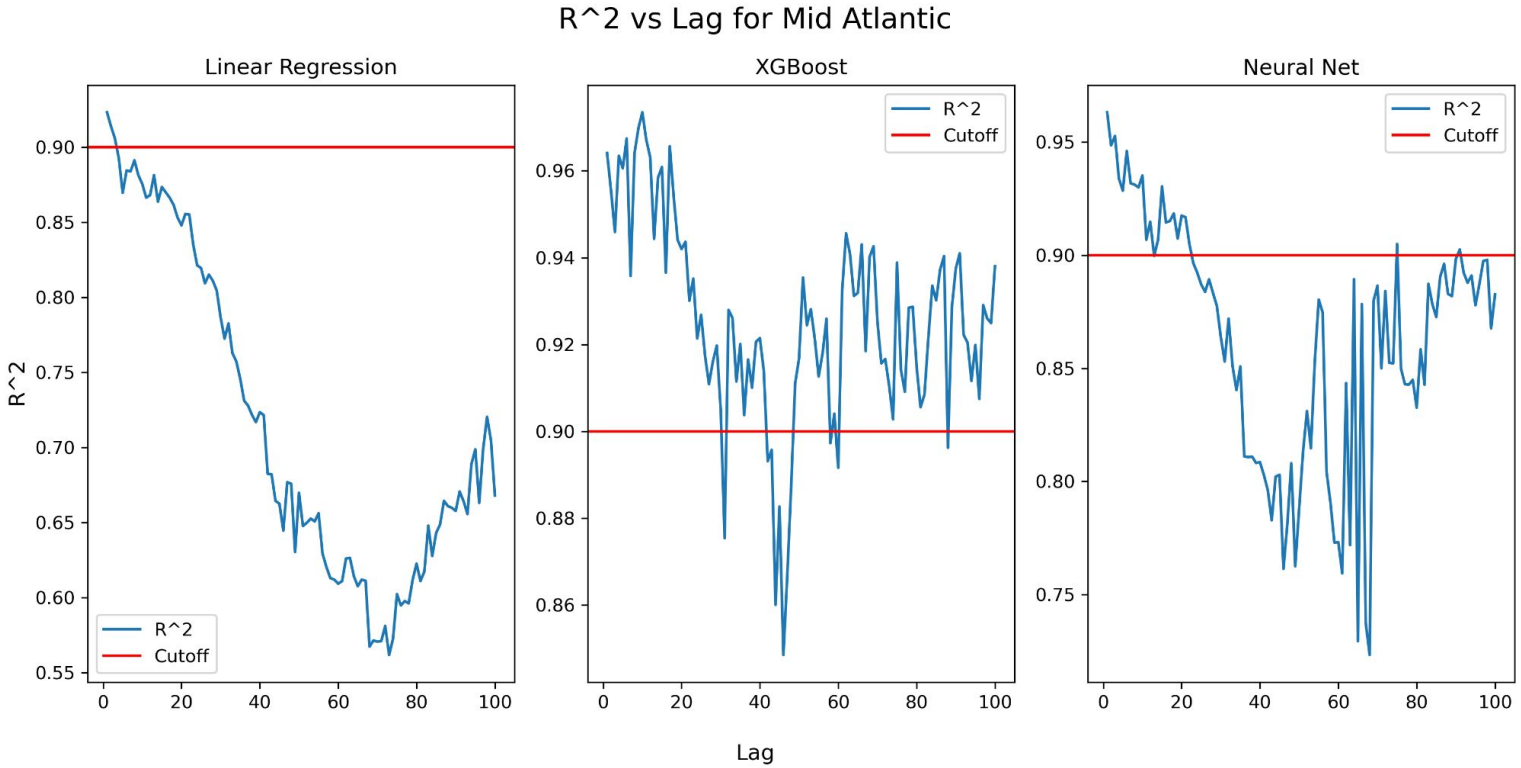
Lag	R^2
10	97%
46	85%

Linear Regression vs XGBoost vs Neural Network

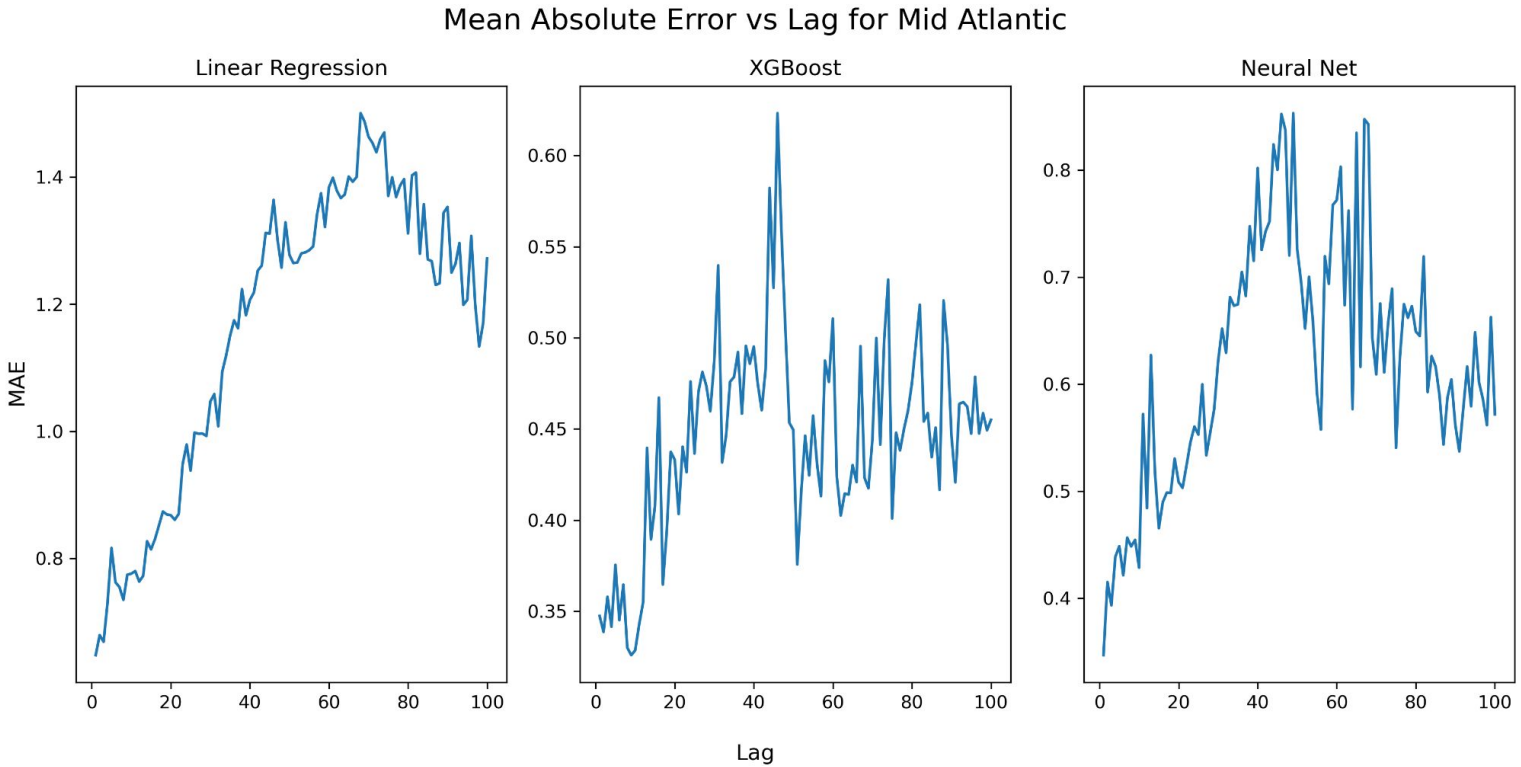


Lag	R^2
1	96%
74	85%

Linear Regression vs XGBoost vs Neural Network R^2



Linear Regression vs XGBoost vs Neural Network Mean Absolute Error



Next Steps

- Summarize findings
- Streamlit app
- Expand project post bootcamp