ANALYZING U.S HOSPITAL CAPACITY AND ADMISSIONS (2020 - 2024)

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INTRODUCTION

Questions

How did U.S. hospital systems manage capacity across states during the pandemic?
What patterns were seen in reporting, occupancy, and hospital admissions?

Purpose

Find trends in ICU usage, reporting consistency, and hospital resources

Who benefits?

- Public Health Agencies
- Hospitals and Healthcare systems
- Emergency Planners or Policy Makers

METHODOLOGY

Data Source:
Centers for Disease Control and Prevention (CDC)

Unit of Analysis:

- Weekly reports per state or hospital system
- % ICU occupancy, adult/pediatric admissions, bed availability, etc.

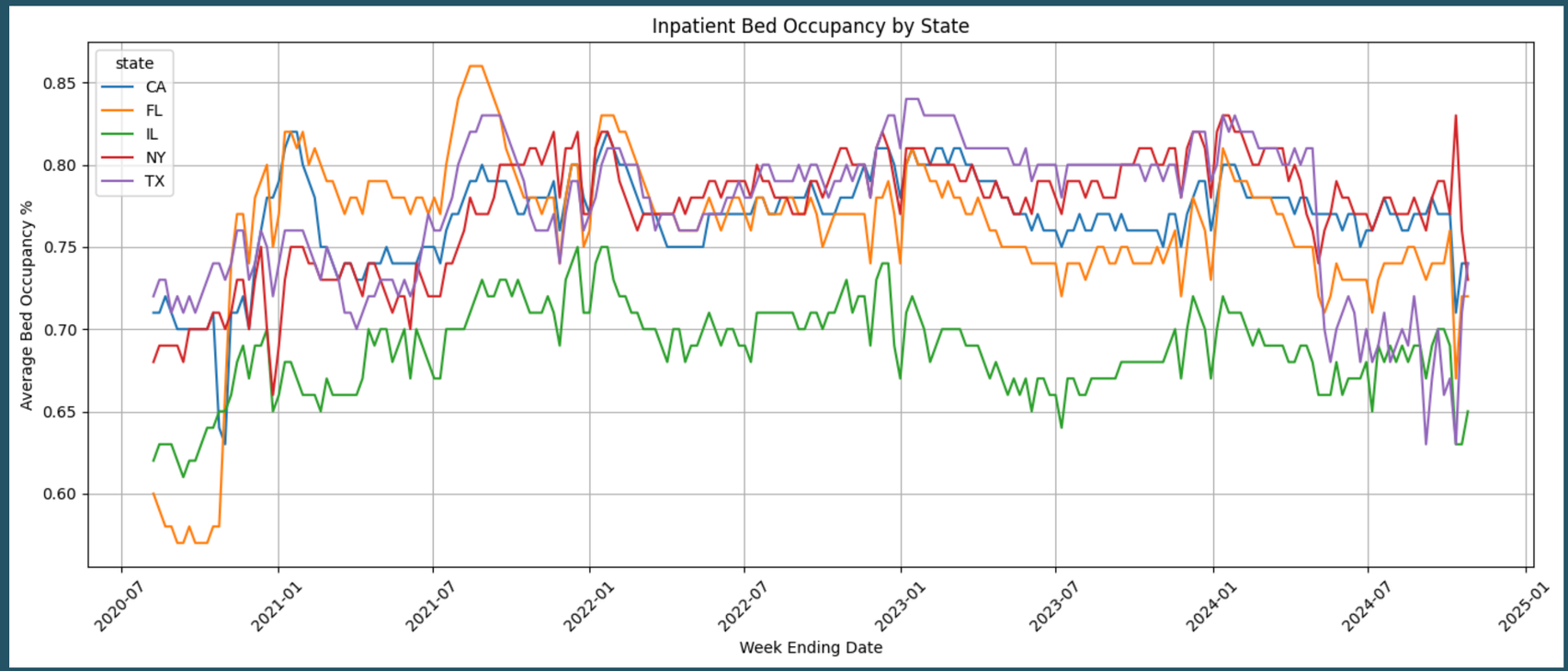
Tools Used:

- Jupyter Notebook
- Python libraries: pandas, matplotlib, and seaborn

INSIGHT #1
BED OCCUPANCY OVER TIME

Insight:

Inpatient bed occupancy changed across states, peaking during COVID-19 surges.



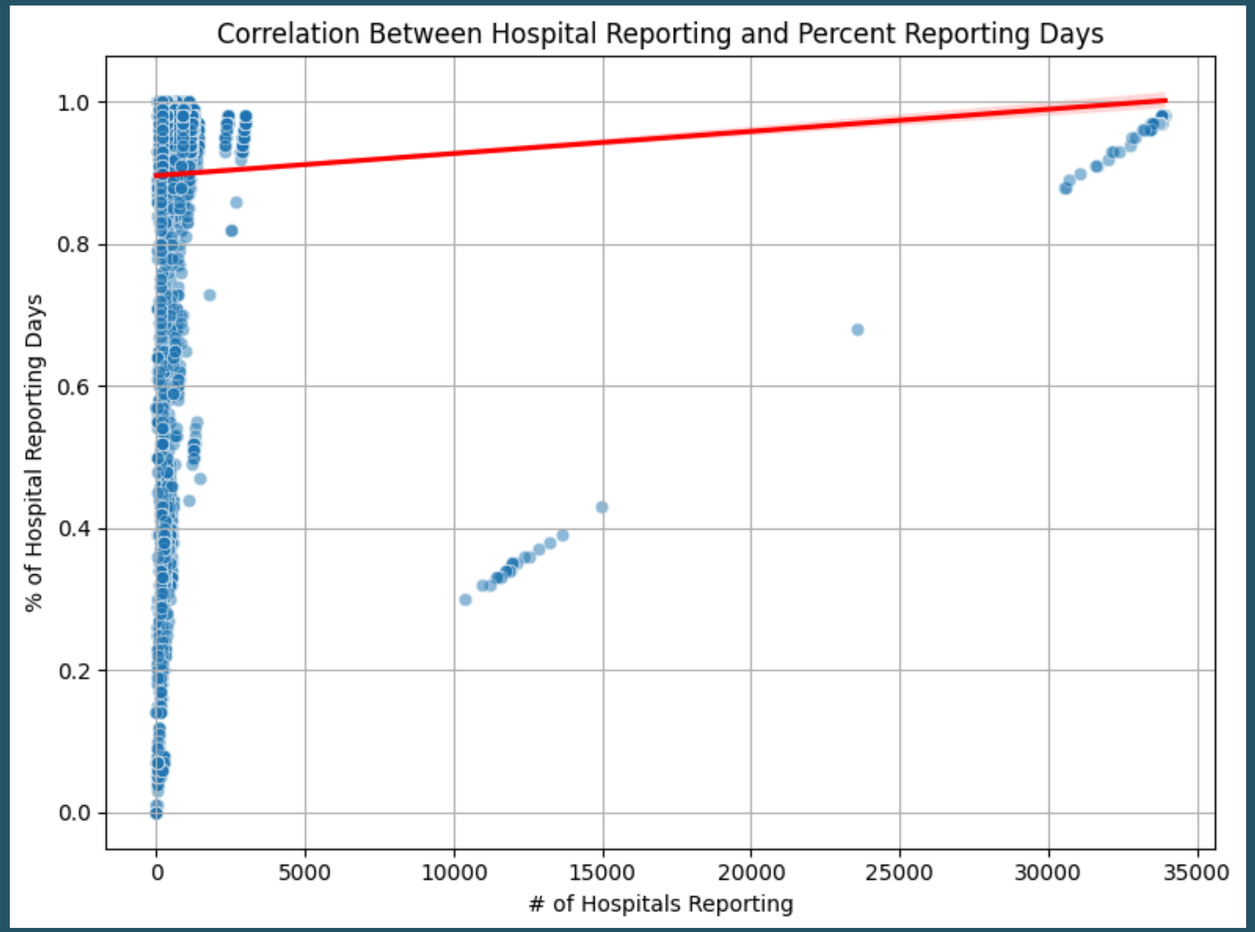
Conclusion:

Clear spikes in hospital use show the surges, showing the need for capacity planning

INSIGHT #2
REPORTING CONSISTENCY

Insight:

States with fewer hospitals or stressed systems showed lower reporting consistency

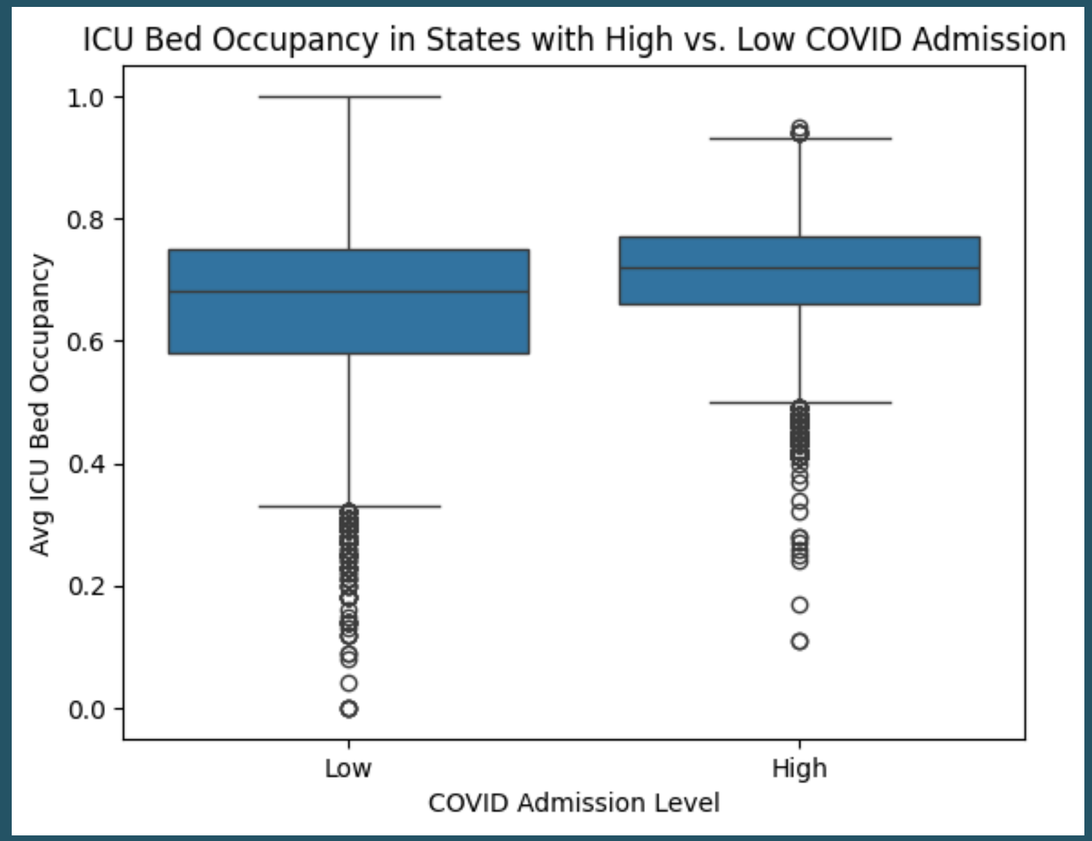


Conclusion:

Improved reporting is important for accurate decision making during crises

INSIGHT #3
ICU STRAIN AND COVID LEVELS

Insight: States with higher COVID admissions had higher ICU Occupancy

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High admission states:
 ['AL', 'AZ', 'CA', 'CO', 'FL', 'GA', 'IL', 'IN', 'KY', 'LA', 'MA', 'M
D', 'MI', 'MN', 'MO', 'NC', 'NJ', 'NY', 'OH', 'OK', 'PA', 'SC', 'TN',
'TX', 'USA', 'VA', 'WA', 'WI']
Low admission states:
 ['AK', 'AR', 'AS', 'CT', 'DC', 'DE', 'GU', 'HI', 'IA', 'ID', 'KS', 'M
E', 'MP', 'MS', 'MT', 'ND', 'NE', 'NH', 'NM', 'NV', 'OR', 'PR', 'RI',
'SD', 'UT', 'VI', 'VT', 'WV', 'WY']
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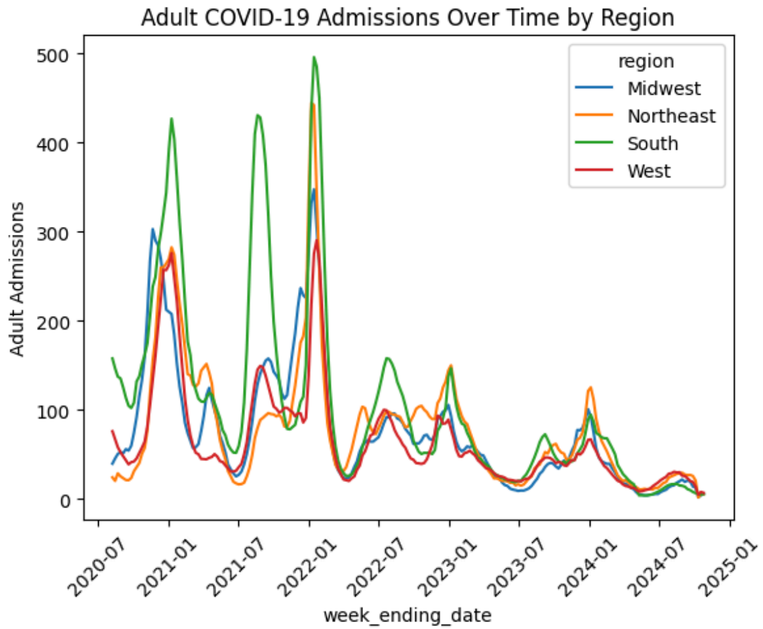
Conclusion:

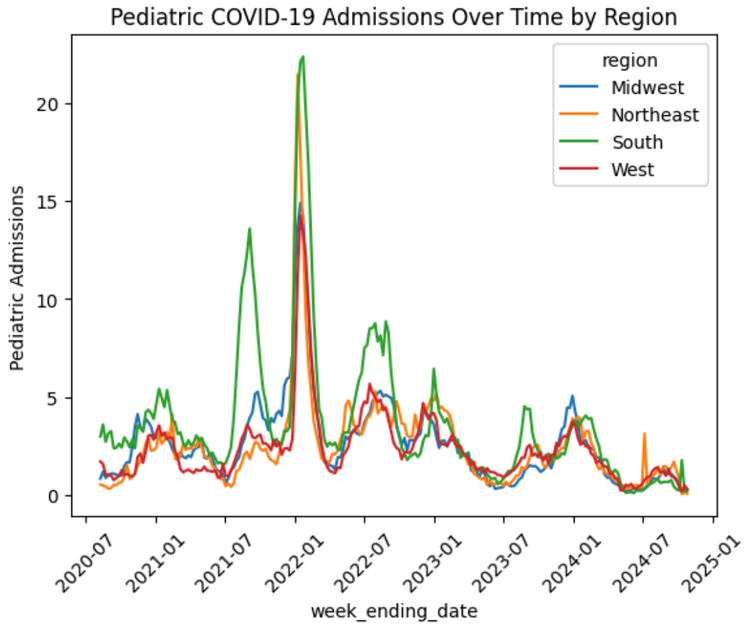
Burdens on ICUs strongly correlated with the severity of the pandemic

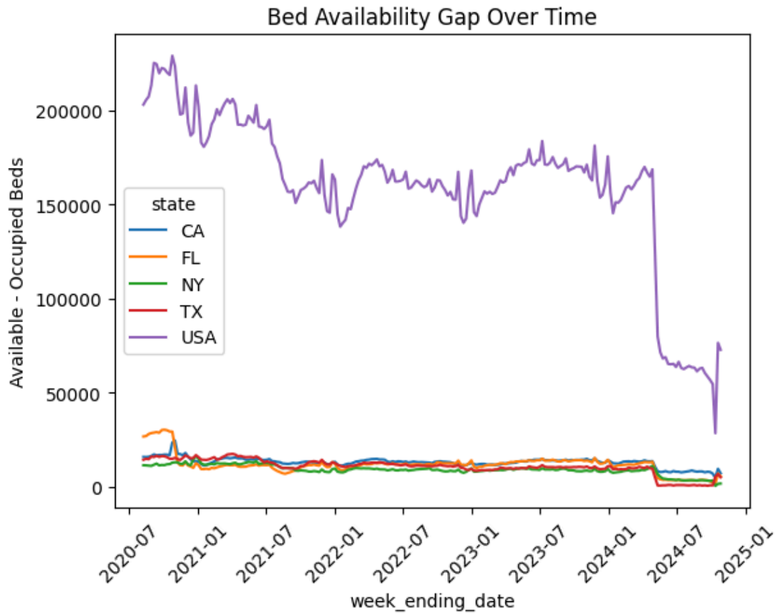
FUTURE WORK

- Include vaccine coverage and mortality data
- Investigate staffing shortages and resource issues
- Make a predictive model to help predict future hospital strains

APPENDIX







Dataset info:

https://data.cdc.gov/Public-Health-Surveillance/Weekly-United-States-Hospitalization-Metrics-by-Ju/aemt-mg7g/about_data

Notes:

Data cleaning:

Removed incomplete weekly records

Aggregated by state and categorized COVID admission levels as high or low

Methods:

ICU strain calculated as a percentage of adult occupancy

COVID admissions was separated by percentile split

Thank You

For your attention