

# Analysis of Medicare Provider Data

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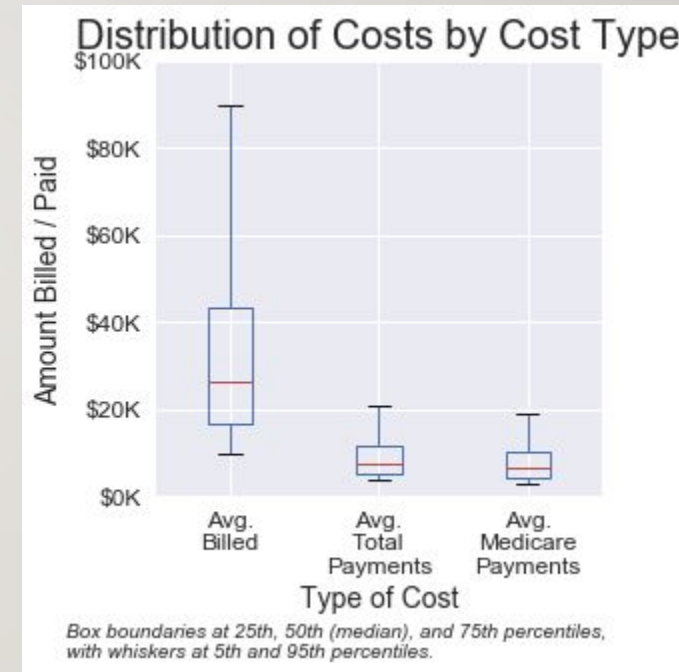
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# Data Overview

- 2011 Medicare inpatient data
- 163K rows (each row: provider-DRG\*)
- 100 DRGs → 16 medical conditions
- Discharge volume (# of patients treated)
- Provider location
- 3 cost types:
  - Billed
  - Total Payments (what the hospital received)
  - Medicare Payments (patients pay the difference)

\*Diagnosis-Related Group

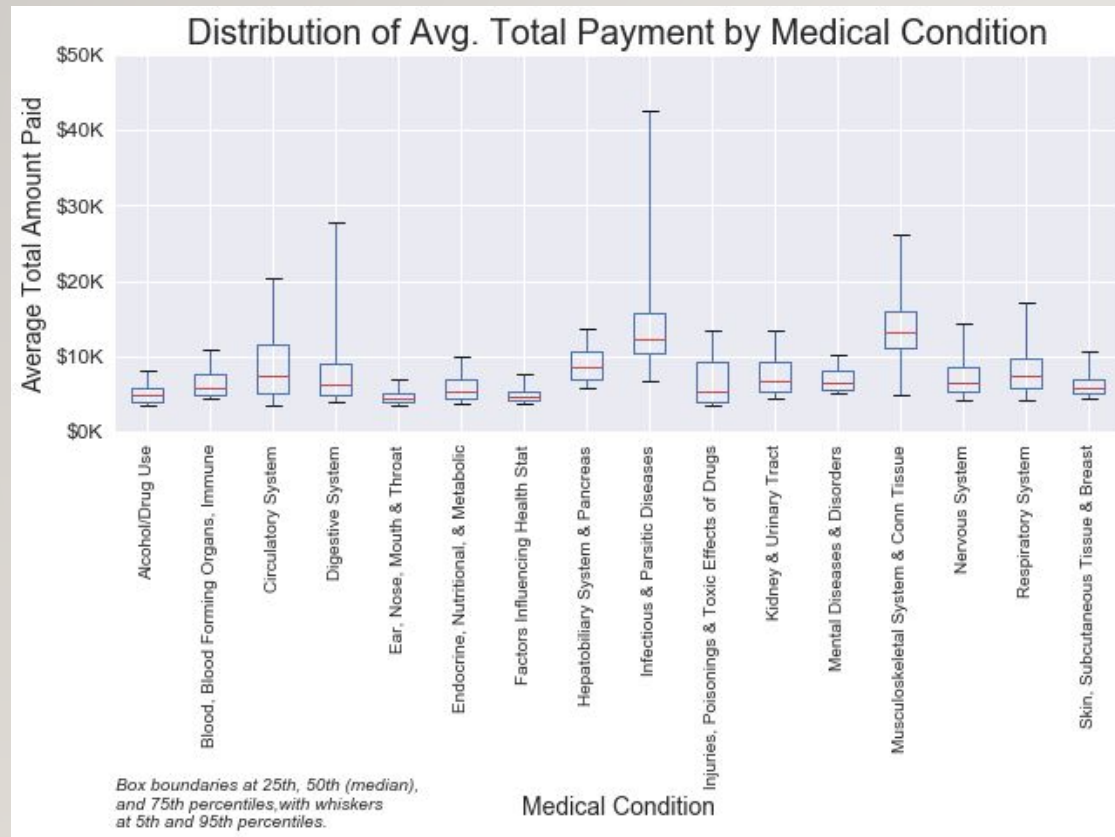


# COSTS BY MEDICAL CONDITION AND GEOGRAPHY

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# How Do Costs Vary by Medical Condition?

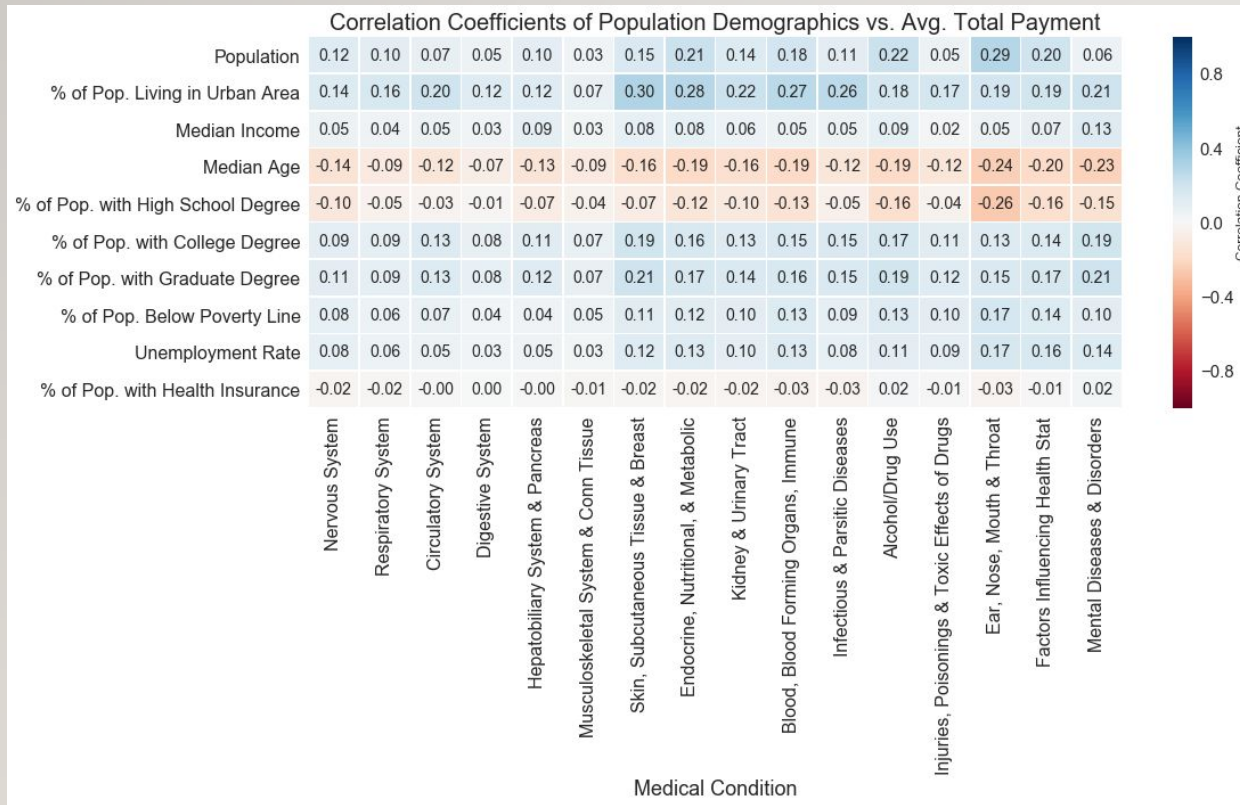


## Themes:

- All conditions have a “long tail” of high-cost cases
- Otherwise, most have limited cost variance
- A few have high variance:
  - Circulatory
  - Digestive
  - Infections & Parasitic Diseases
  - Musculoskeletal System Disorders



# Do Demographics Impact Cost?



## Analysis:

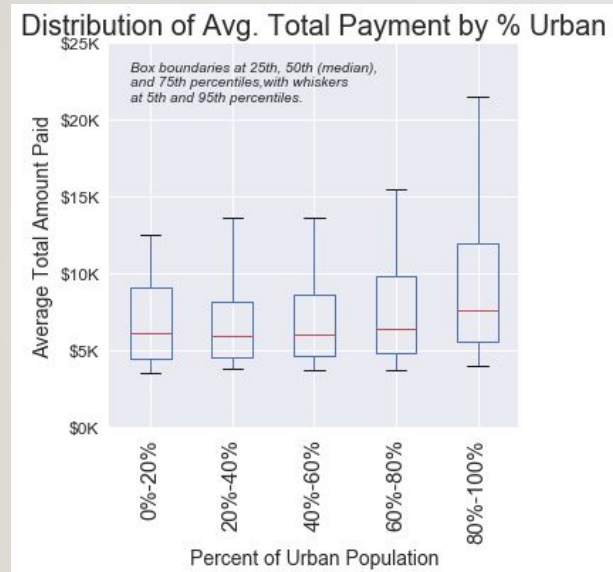
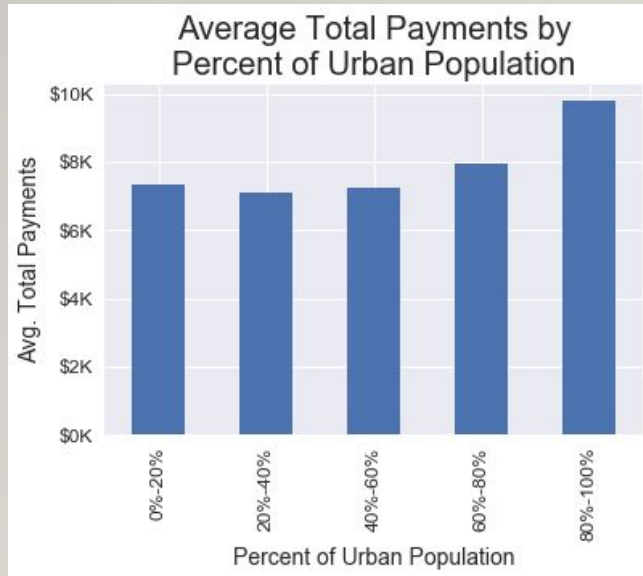
- Demographics by Zip Code
  - Population
  - Urban vs. Rural
  - Income
  - Age
  - Education
  - Poverty
  - Unemployment
  - Health Insurance

- Heatmap of Correlation to Average Total Payment

## Conclusions:

- Minimal cost impact (max corr. coefficient: |0.30| )
- Medical condition also matters little

# Why are Correlations So Low When Avg. Payments Vary So Much?



## Answer

- High payment distribution dominates

## Concluding Hypothesis

- Variation in patient ailments matter much more than demographics

# ECONOMIES OF SCALE IN HEALTHCARE

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# Quick Economics Review

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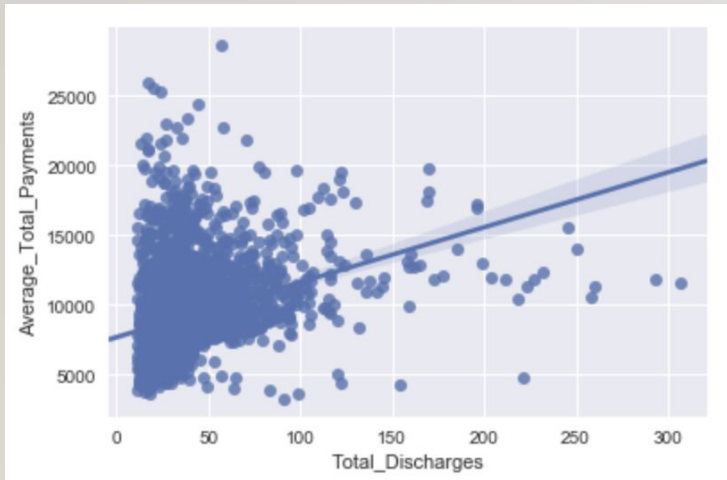
- Economies of scale is when average costs decrease as production increases
- This normally is the result of specialization of labor
  - Each person as one job and learns to do it really well
- Could there be economies of scale in large hospitals?
  - In a small hospital one doctor might have to perform every type of operation
  - In large hospitals, doctors have the ability specialize in one procedure type

# Results:

## More Operations != Lower Costs

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- After controlling for income level within a Zip code and MDC, Total Discharges was still positively correlated with Total Payments and Total Charges Billed



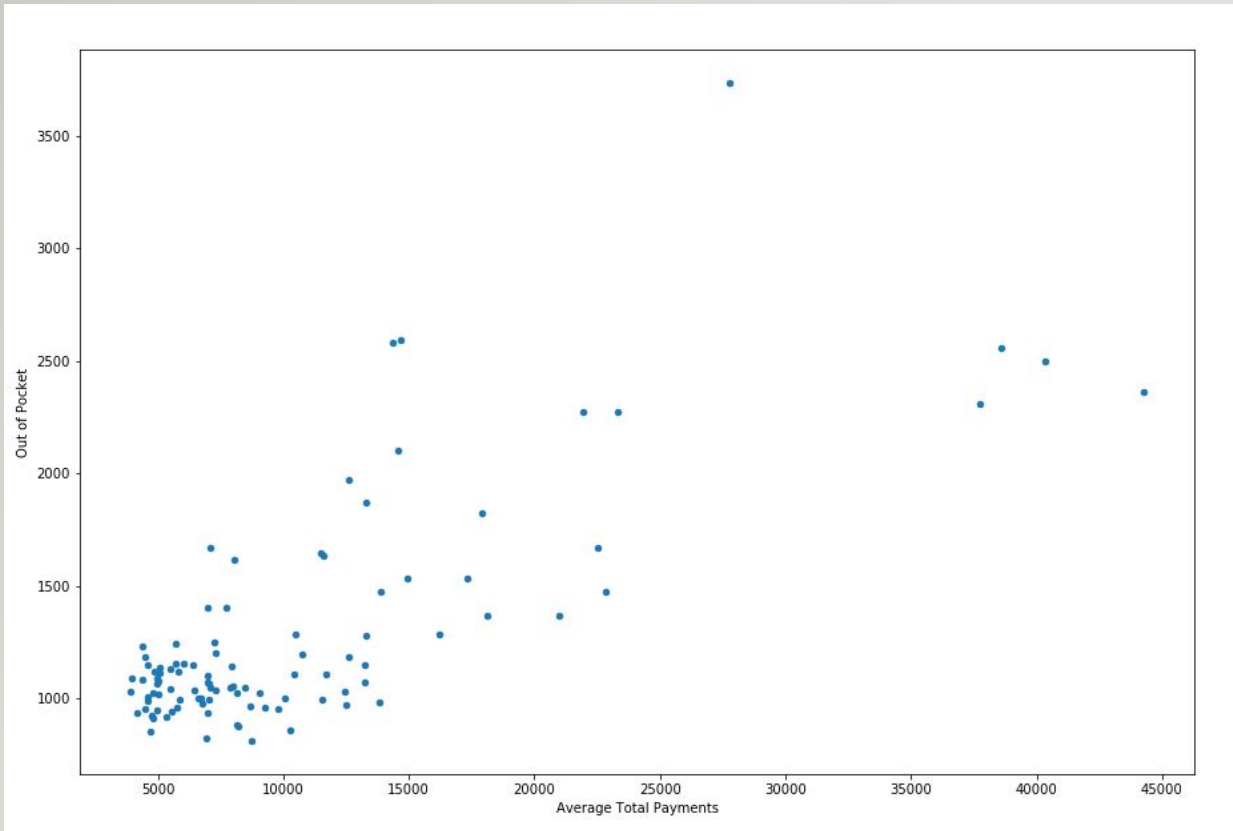
- Our data set doesn't contain any information on outcomes or quality of service.
- It's possible larger/more specialized hospitals charge more for better outcomes, but answer than question is beyond the scope of this analysis

# MEDICAL CONDITION AND PROVIDER COST ANALYSIS

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# What is the difference between Average Medicare Payments and Average Total Payment?

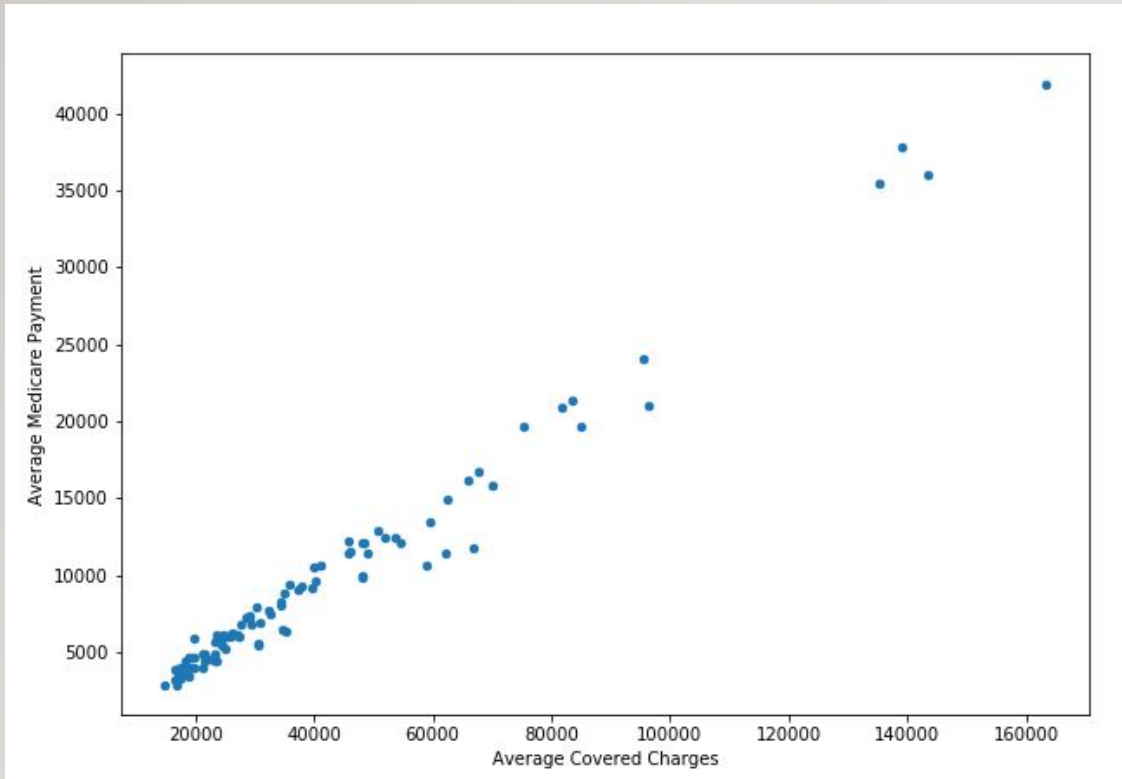


- Difference between Average Medicare Payment and Average Total Payment yields the copayment and deductible expenses (out-of-pocket costs)
- Average out-of-pocket costs is \$1,284.25
- Positive correlation: as Average Total Payment increases, out-of-pocket expenses also increase. This can be due variable out of expenses for certain medical conditions.



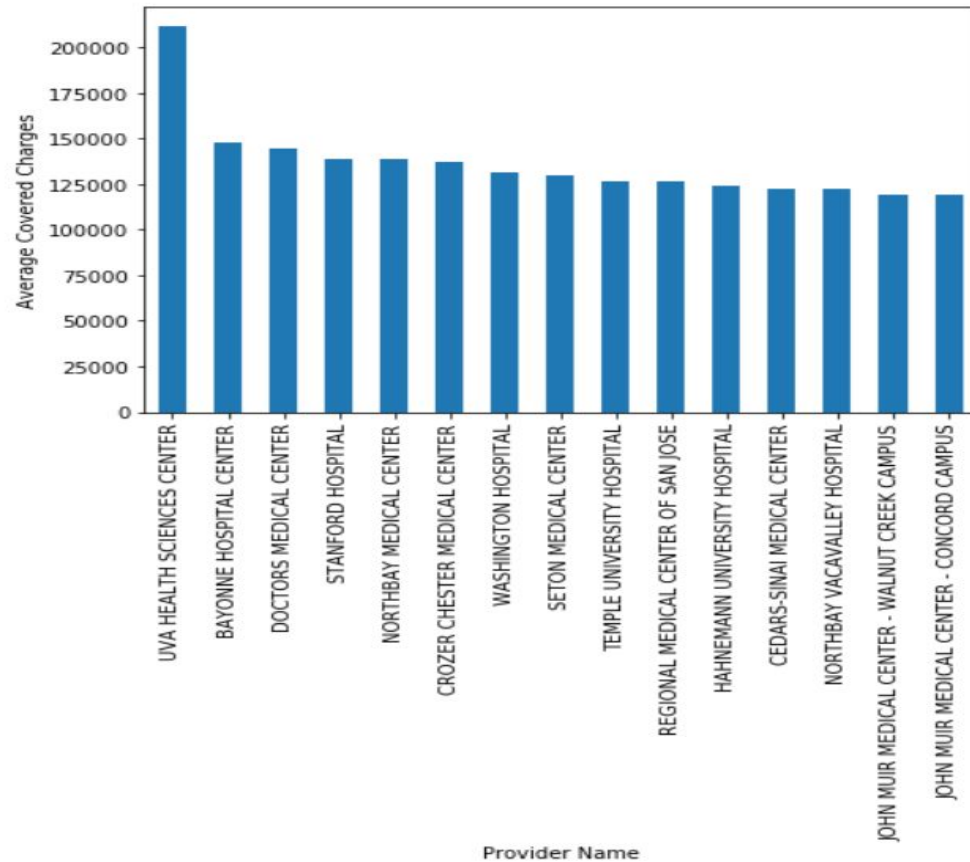
# What is the difference between Average Medicare Payments and Average Covered Charges?

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- Relationship between the Average Medicare payment and Average Covered Charges is tightly correlated
- Percent of medicare payment to covered charges is approximately 23%
- Since Medicare reimbursement is only 23%, Medicare is not considered to be an attractive option for hospital providers

# Which providers charge the highest amount of Average Covered Charges?



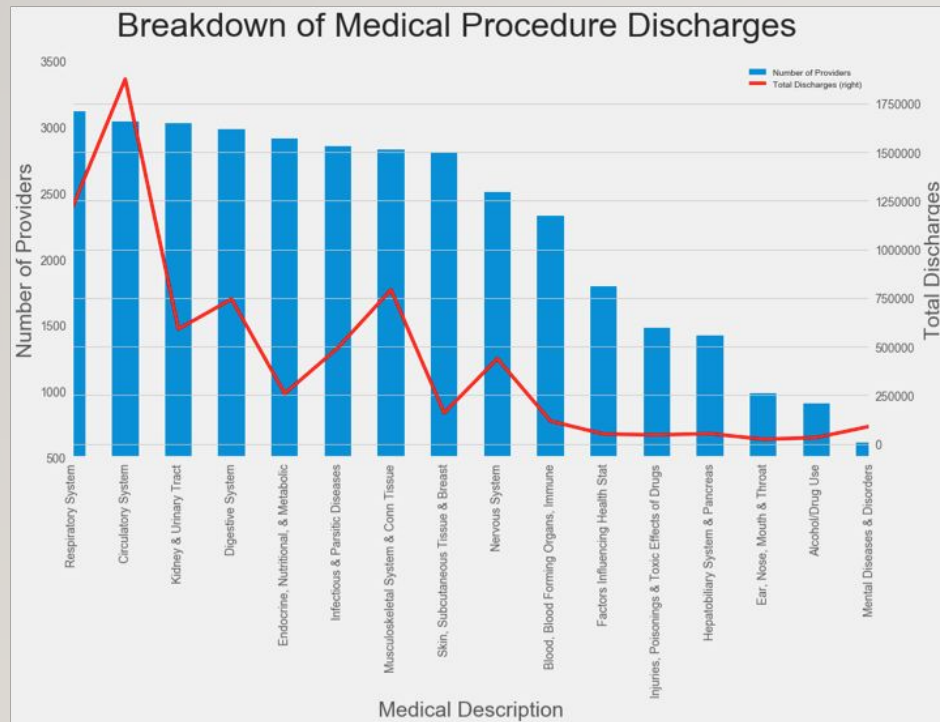
- Average Covered Charges are the provider's charges based on its own cost structure so it can be subjective
- Top 15 most expensive average providers are predominantly large university research hospitals and/or well branded hospitals.
- A provider's reputation and status can translate to more expensive services!

# MEDICAL CONDITION COVERAGE BY PROVIDER AND GEOGRAPHY

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# Number of Providers vs. Medical Condition

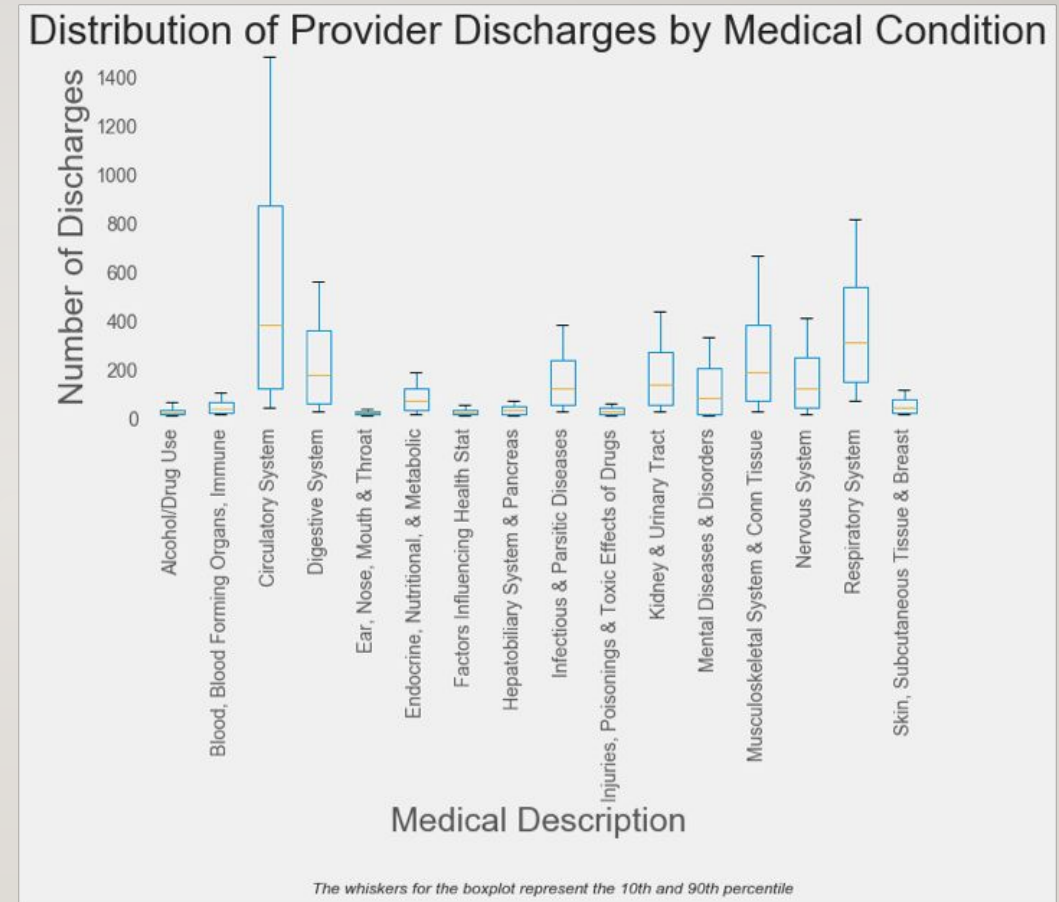


- Positive Correlation between Number of Providers and Total Discharges (0.66)
- Highest number of discharges and providers
  - Respiratory and Circulatory system conditions
- Surprising findings for Nervous system conditions

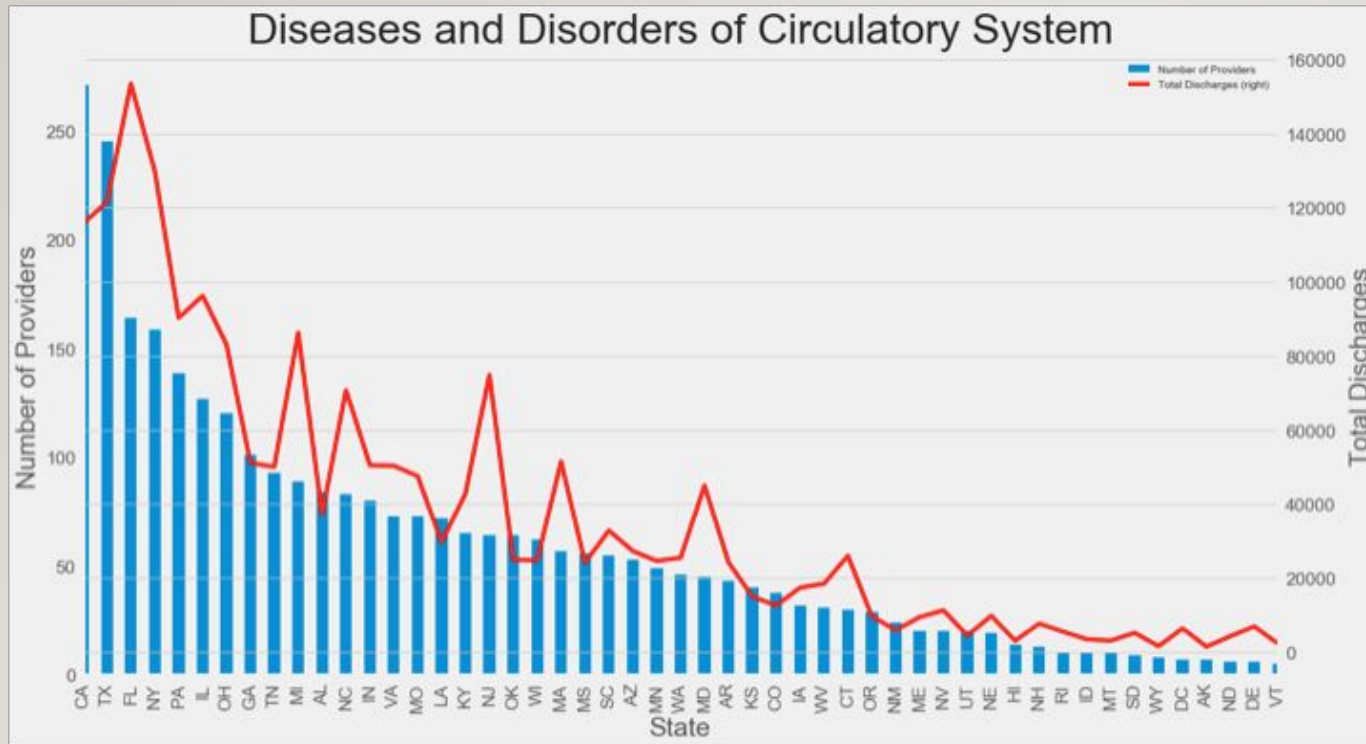


# How do Discharges by Condition Vary Among Providers?

- Wide range of Circulatory System condition discharges across all providers.
  - 75<sup>th</sup> percentile of discharges exceeds the maximum number of discharges of nearly all other conditions!
- Conclusion:
  - Circulatory System conditions most prevalent across the country



# Circulatory System Discharges - By State



- Florida owns the highest number of discharges in the country
  - Makes sense....or does it?
- California is home to 1.6 million more Medicare beneficiaries than Florida
  - What is going on in Florida??
- Speculation for lower numbers in California
  - Lower population density → Less accessibility?
  - Geographical factors?
  - More outpatient discharges for this condition in California?

# How Easy is it to Find the Right Provider?

Density of Providers and Average MDC Coverage per Provider



- How does the density of providers compare to the avg. number of conditions covered per provider?
  - Negative correlation
- Required care for Medicare beneficiaries may not always be easy to find
  1. Many providers in-state → less conditions covered
  2. Many conditions covered in-state → less provider options.



# TOOL DEMO

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