

# Readmission Rates in Hospitals



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# Background Information

- ▶ A readmission is a subsequent hospital admission in the same or a different hospital within 30 days following an original admission. CMS to reduce payments to hospitals with excess readmissions.
- ▶ Readmissions cause \$41.3 billion annually. Medicare with largest share of total readmissions (55.9 percent)
- ▶ Factors:
  - ▶ Readmission Rates
  - ▶ Diseases - Myocardial Infarction, Pneumonia, Chronic Obstructive Pulmonary
  - ▶ Disease, Hip and Knee Arthroplasty, Heart Failure.
  - ▶ Demographics
  - ▶ Geographic Location
  - ▶ Financial Impact
  - ▶ Quality Indicators

# Objectives

- ❑ **Descriptive** - Evaluate the effect patient demographics, geographic location and quality indicators have on readmission rates.
- ❑ **Predictive** – Construct a model that predicts that predicts the hospital readmission rate experienced by healthcare providers.
- ❑ **Prescriptive** – Recommend potential locations for new hospitals, as well as possible merger and acquisition locations, in order to increase profitability and secure a larger market share.

# Data Variables

## Demographic

- Medicare Beneficiary Age Trend
- Medicare Beneficiary Average Age
- Percent of Female Beneficiary Trend
- Average Percent of Female Beneficiary
- Percent of Male Beneficiary Trend
- Average Percent of Male Beneficiary

## Clinical

- Number of Discharges
- Excess Readmission Ratio
- Predicted Readmission Rate
- Expected Readmission Rate
- Number of Readmissions
- Trend Number of Hospital Readmissions
- Average Number of Hospital Readmissions
- Trend Hospital Readmission Rate
- Average Hospital Readmission Rate

## Financial

- ▶ Trend of IP Actual Cost as Percent of Total Actual Cost
- ▶ IP Actual Cost as Percent of Total Actual Cost
- ▶ Trend IP Per Capita Actual Cost
- ▶ Average IP Per Capita Actual Cost

## Identifier

- County Name
- Zip Code
- State
- Provider Number
- Hospital Name

## Quality

- HCC Score Trend
- Average HCC Trend
- HVBP Total Performance Score
- HCAPHS Base Score
- HCAPHS Consistency Score

# Data Description

Target  
Variable

Independent  
Variable

Variables  
Created

Readmission Rate

Pneumonia

Average

Acute Myocardial  
Infarction

Trend

Chronic Obstructive  
Pulmonary Disease

Hip and Knee  
Arthroplasty

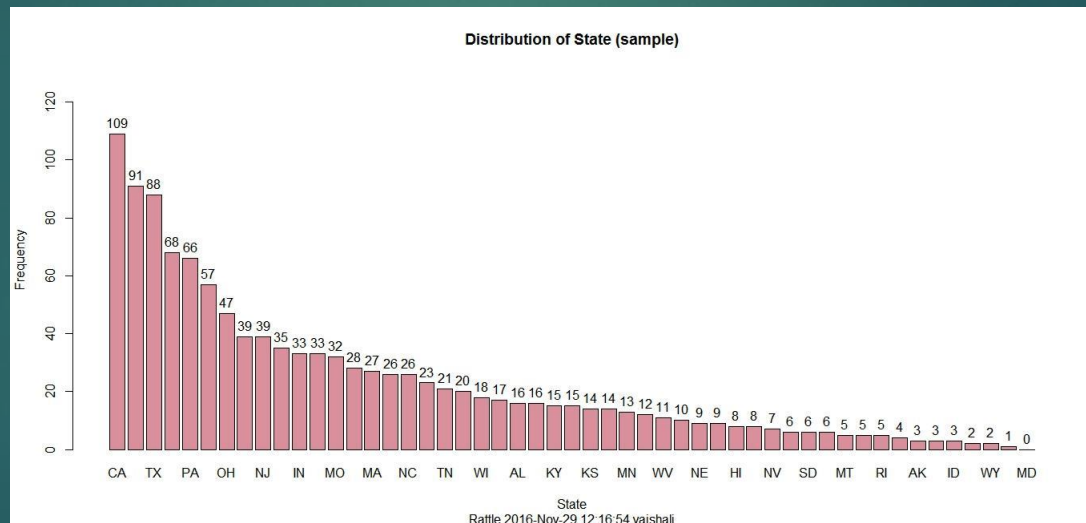
Heart Failure

# Data Cleaning Process

- ▶ Eliminated all missing data and data labelled “N/A”
- ▶ Grouped into Categorical, Identifier, and Target variables
- ▶ Removed all variables that were not statistically significant based on T – scores and P - scores
- ▶ Eliminated variables that did not have a correlation that did not have a strong correlation
- ▶ Evaluated the dataset for risk using validation data

# Acute Myocardial infarction

- ▶ In U.S. 785,000 new patients with MI annually.<sup>2</sup> with 51,300 readmissions; causing \$693 million (42.6% <sup>2</sup>).
- ▶ 9% increases nurse's workload for each additional patient.<sup>1</sup>
- ▶ 6% lower readmissions with good care in a hospital.<sup>1</sup>

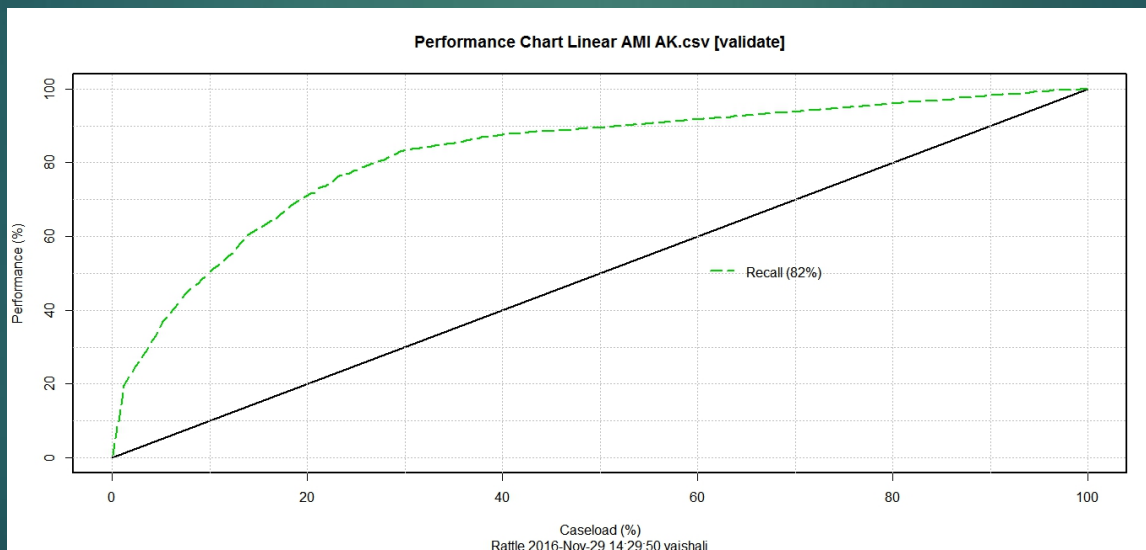
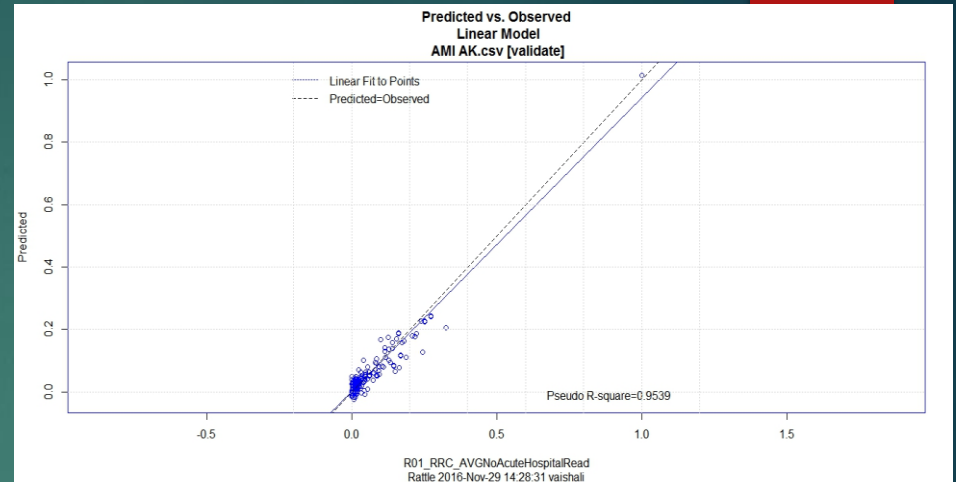


2.McHugh et al "Hospital Nursing and 30-Day Readmissions...Pneumonia." *Medical care*. 2013;51(1):52-59.

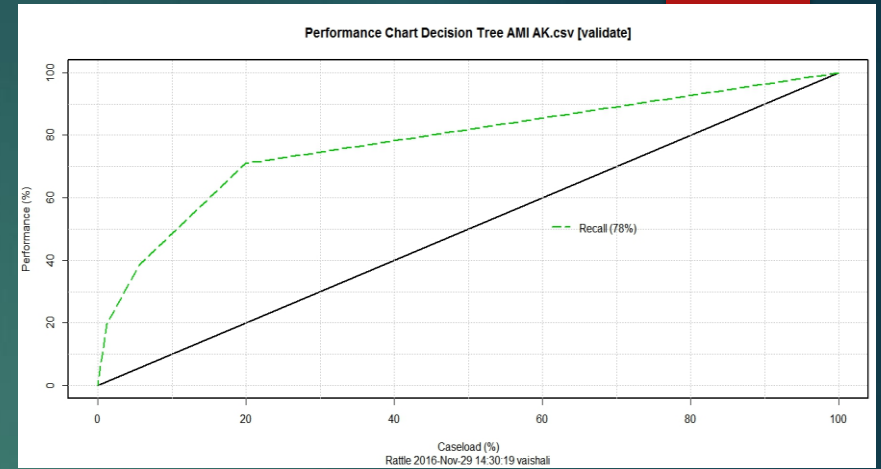
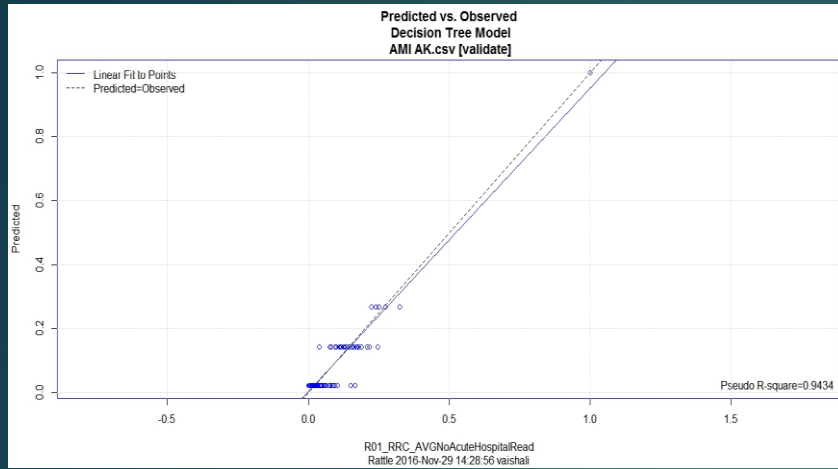
1.Dunlay SM et al "Thirty Day ...Community Study". *Annals of internal medicine*. 2012;157(1):11-18.

## Out of 34 Variables – 8 were selected

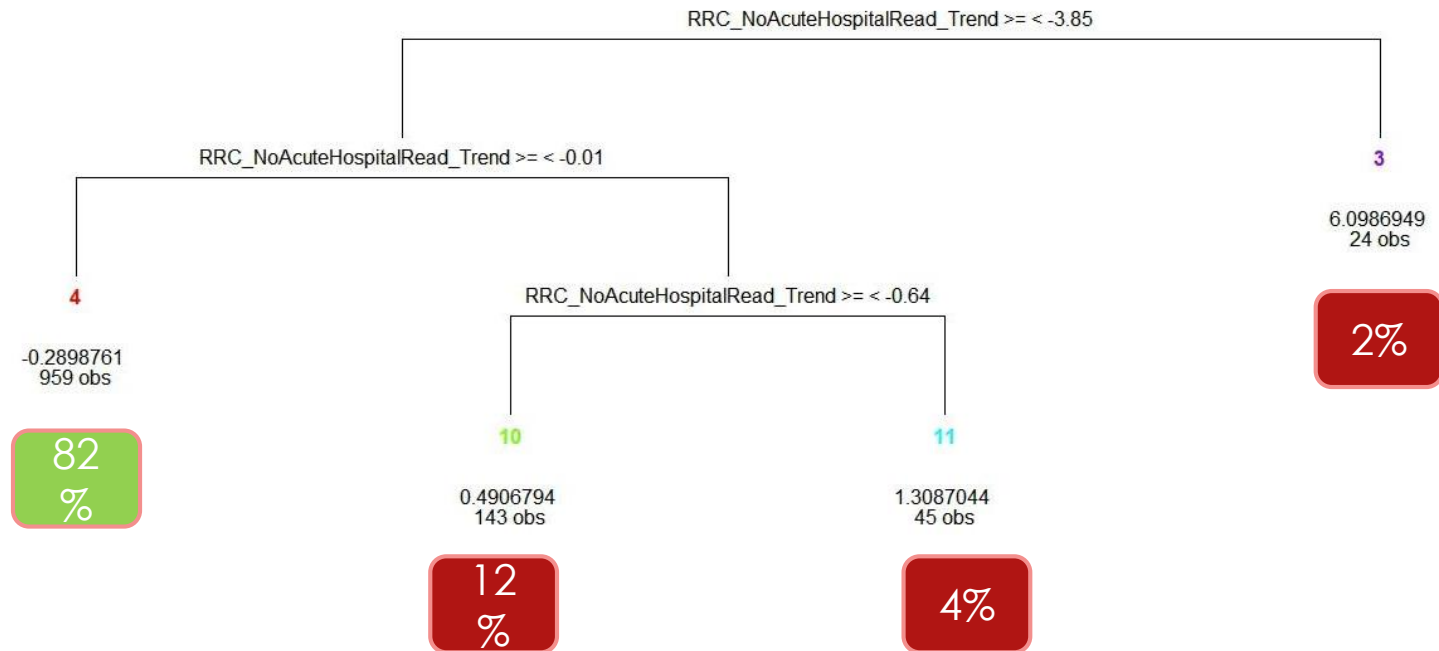
- No. of Acute Hospital Readmissions Trend
- Medicare Beneficiary Average Age
- Average HCC Score
- In Patient (IP) Actual Cost Percentage TCA
- Average IP Per Capita Actual Cost
- Average IP Per User Actual Cost
- Average Hospital Readmission Rate
- HVBP Total Performance Score \*







### Decision Tree AMI AK.csv \$ RRC\_AVGNoAcuteHospitalRead



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# Suggestions

- ▶ Identifying conditions contributing the most to the total number of readmissions and related costs may aid healthcare stakeholders in deciding which conditions to target to maximize quality improvement and cost-reduction efforts.
- ▶ For AML- important indicators -the Trends for No. of hospital Readmission in recent years can be looked to predict