Early Readmission of Diabetes Patients

Mount Sinai Diabetes Center

Overview

- **Cost of Early Readmission:** $20-25 Billion/year
- **Readmission Rates:** 16-20%
- **Diabetes increases of risk by 17%**
- **Goal:** Cut costs for both hospital and patient by detecting diabetes patients at risk for early readmission

Dataset Overview

- **Diabetes Dataset From 130 US Hospitals (1999-2008) U.C. Irvine Machine Learning Repository**

- **47 Features**
  - Medications, Primary Diagnosis, Change in Meds, Time in Hospital, Hemoglobin, Glucose
  - Race, Gender, Age

- **Limitations**
  - Class Imbalance (9:1)
  - Outdated
  - Not representative (Race)

Methods

Target Classification:

Class 0: Otherwise (Not readmitted & readmitted after 30 days)

Class 1: Patients Readmitted within 30 days of discharge

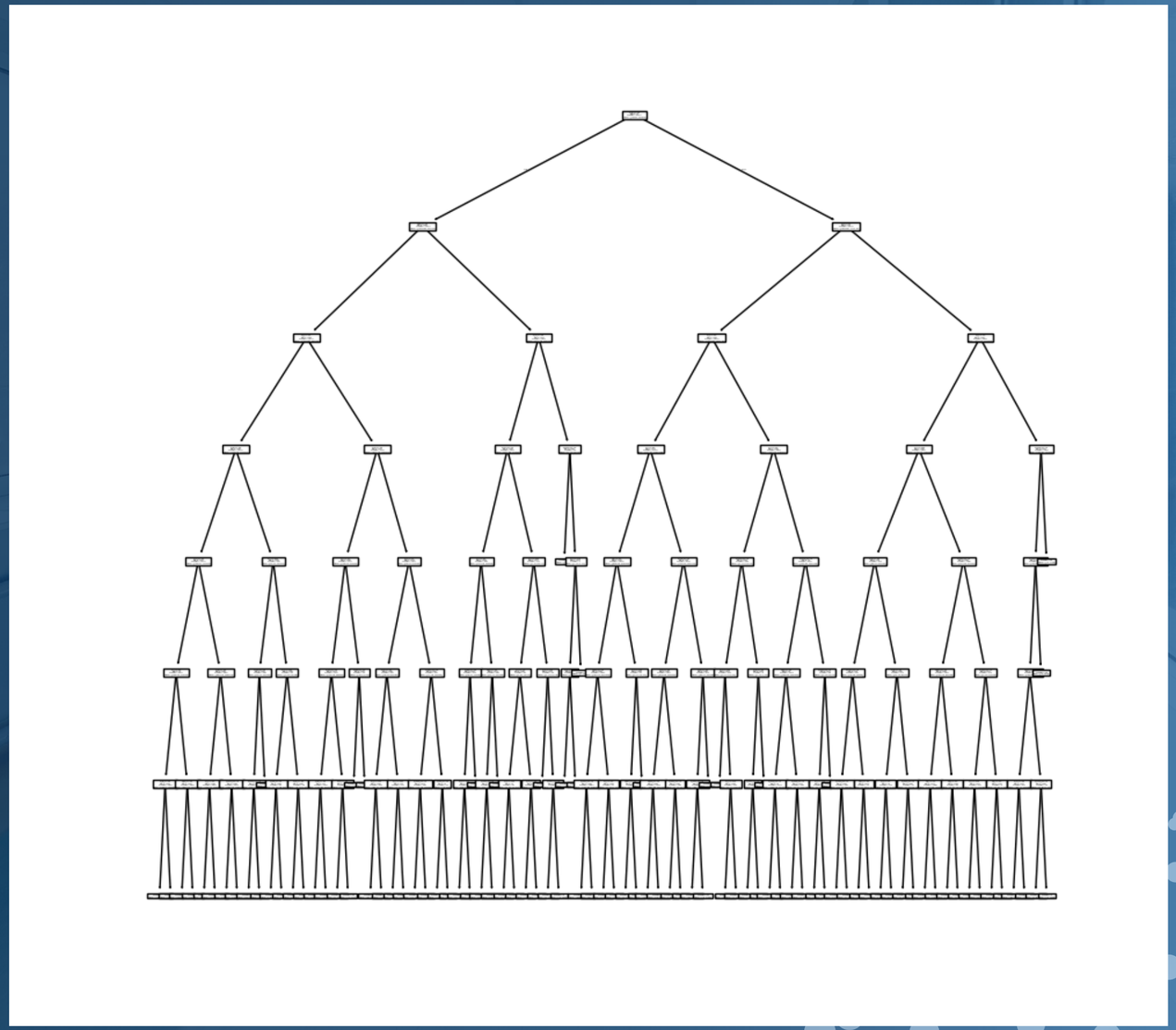
Models:

Logistic Regression, Decision Tree Classifier

Goal:

Predict readmission of diabetes patients within 30 days of discharge

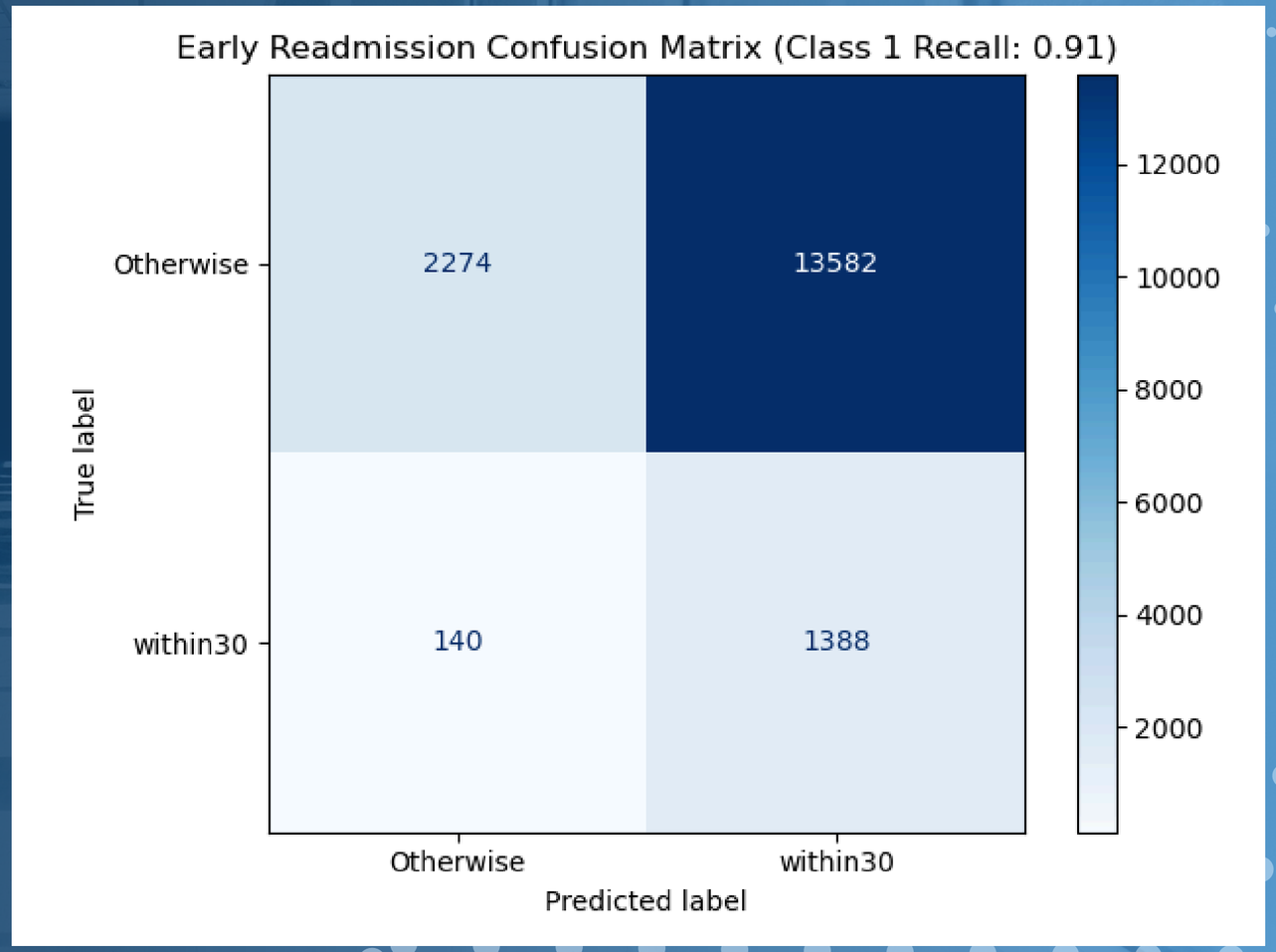
Model Type: Decision Tree Classifier



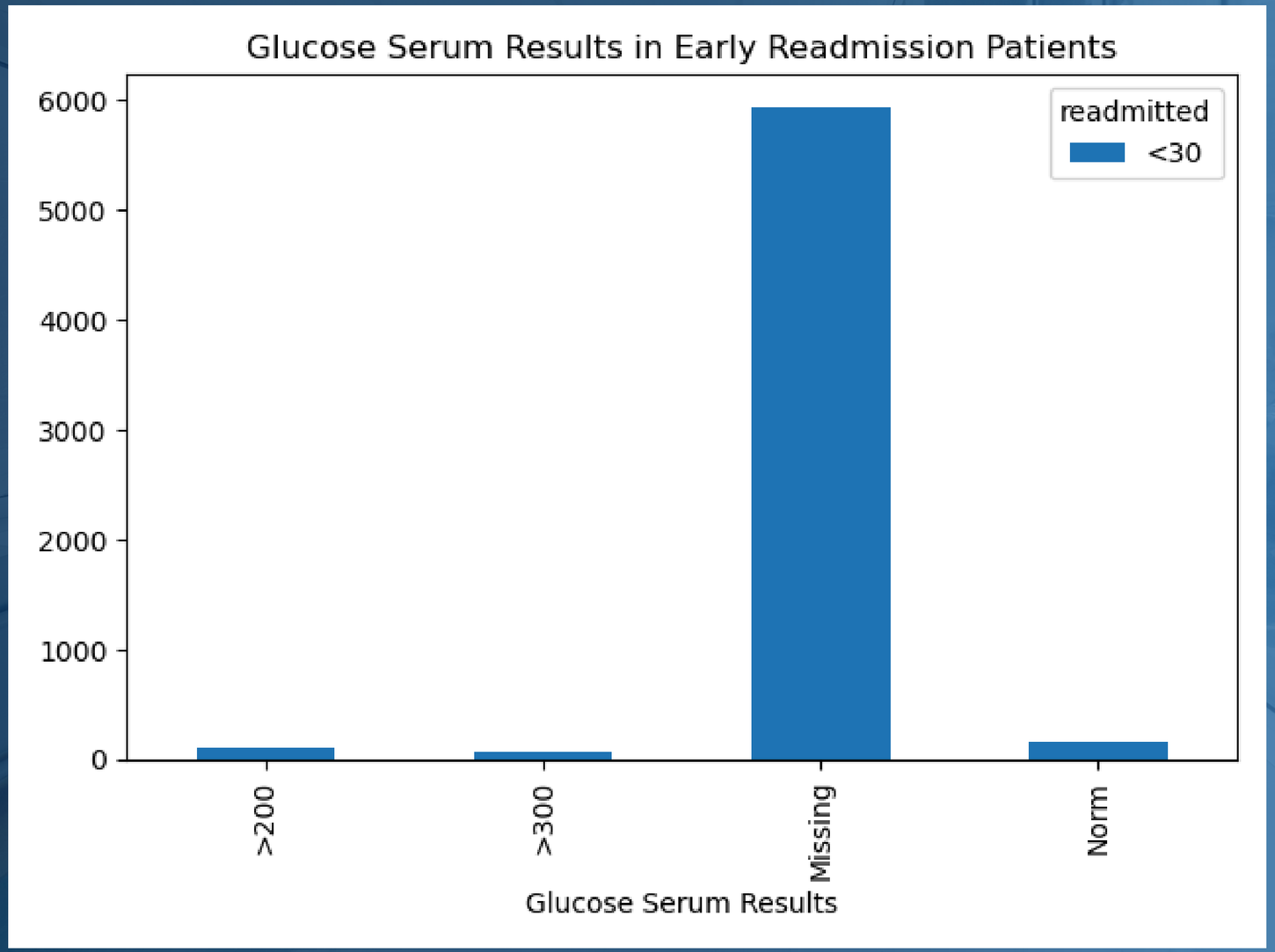
Classifier Evaluation

Recall Score: 91%
Precision: 9%

- **Identifies 91% of early readmission patients**
- **Avg cost of readmision: $15K**
- **Saving $17 million/year for the hospital assuming 10,000 admissions per year**



Readmission Indicators: Measuring Glucose



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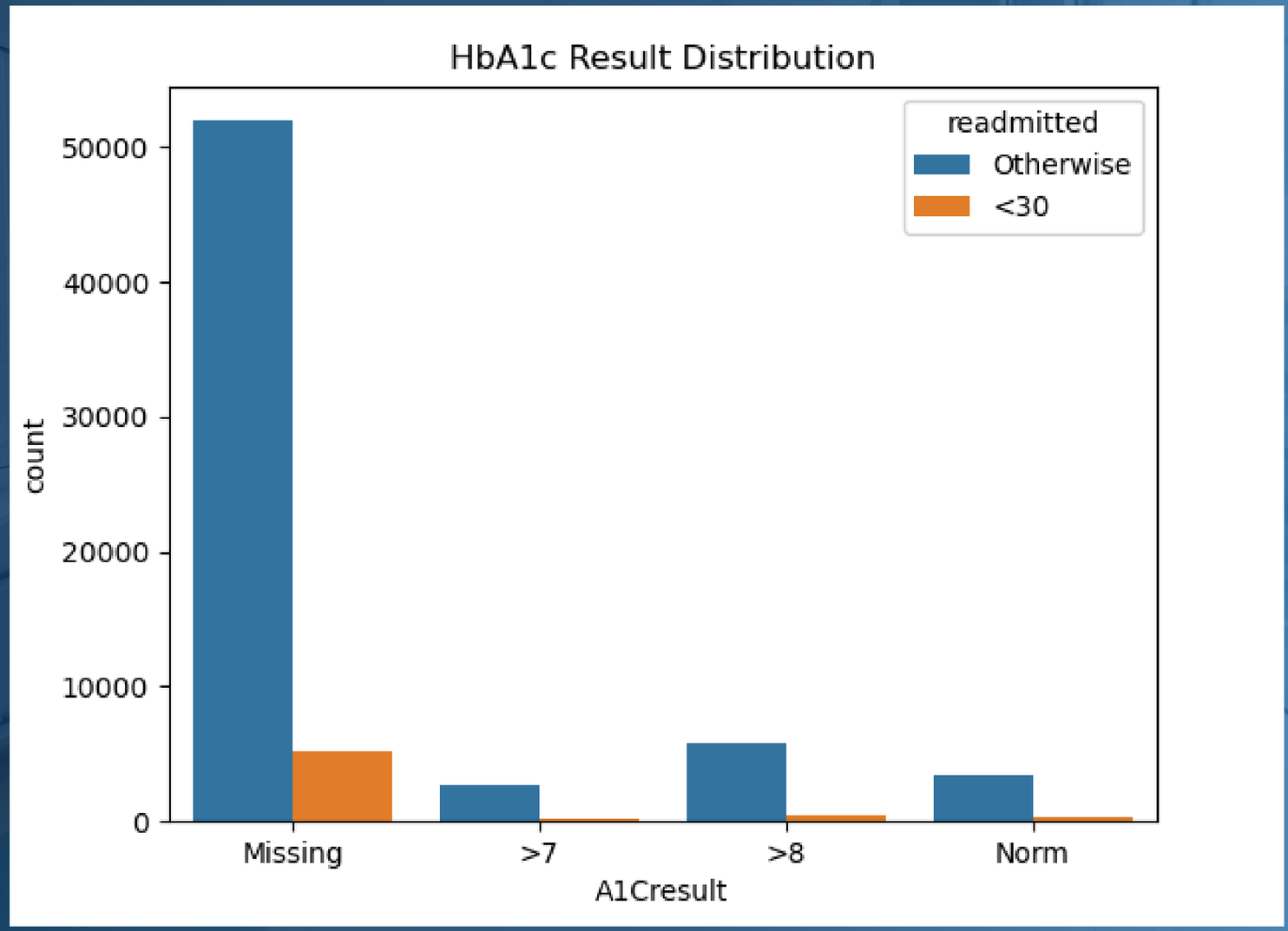
Readmission Indicators: Measuring HbA1C



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Recommendations

- Improve quality of care for diabetes patients
- Establish a formalized protocol for hyperglycemia management in non-ICU floors
- Measure Hemoglobin A1C and Glucose in diabetes patients
  - Useful predictors of readmission
  - Strong indicators of treatment efficacy

Next Steps

- Collect more recent data from more hospitals
- Collect more representative data inclusive of minority populations
- Continue research into predictors of readmission for non-diabetes patients