

# **HOSPITAL READMISSIONS FOR DIABETIC PATIENTS: AN ANALYSIS OF HISTORICAL DATA AND PROPENSITY MODELING**

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**VISUALIZING & ANALYZING DATA WITH R: METHODS & TOOLS - DAT-5323 - BMBAN1**

**APRIL 8TH, 2023**

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# INTRODUCTION



Diabetes is a disease that affects 11% of the US population every year, which can cause several problems in the health and lifestyle of the patients



The readmission of patients with diabetes can cause problems in the patients' lifestyle, increase healthcare costs and overload the hospital staff.



# BUSINESS PROBLEM

## Readmission of diabetes patients

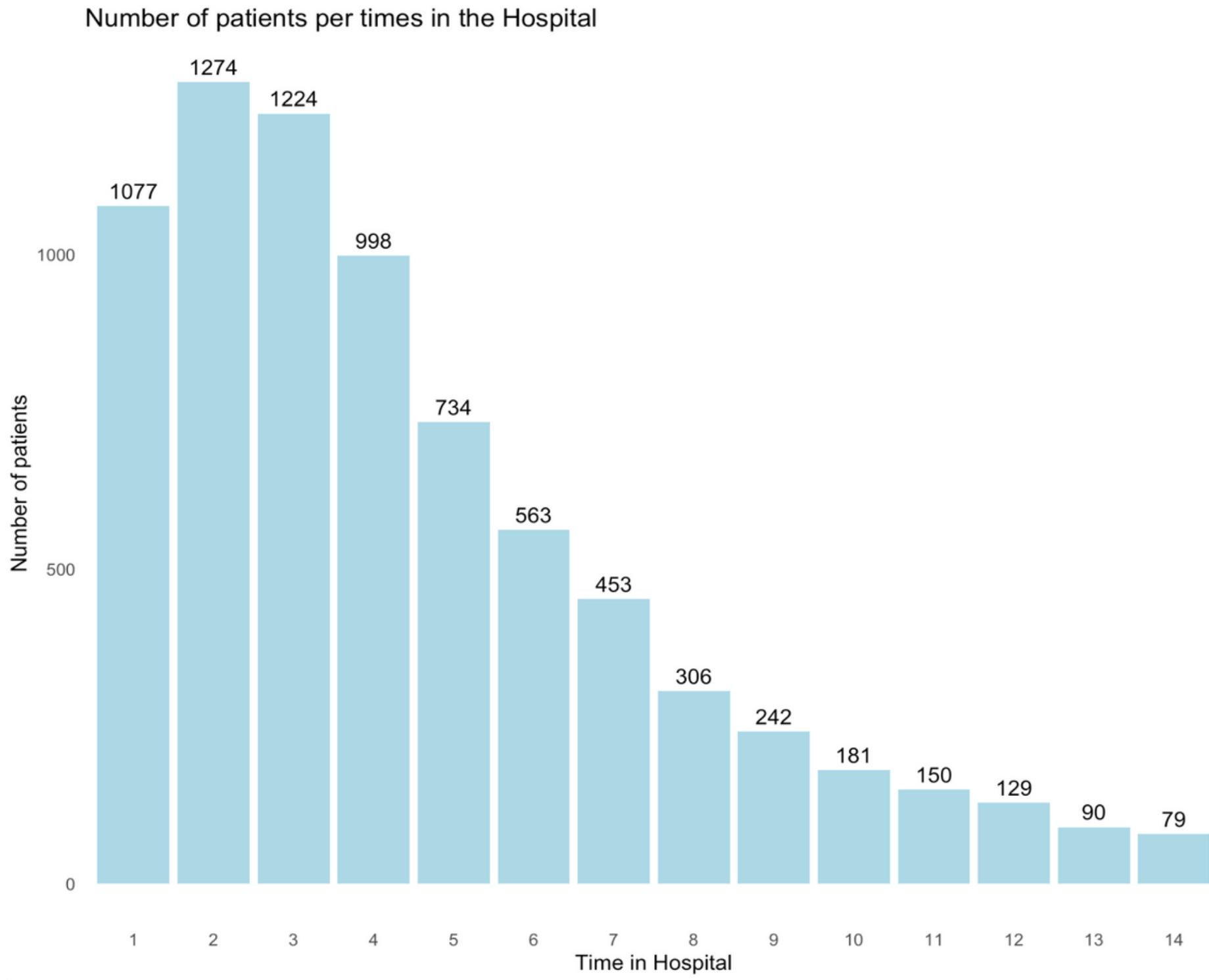
The high rate of hospital readmissions in diabetic patients has a significant impact on patients, hospitals, and healthcare costs.

It analyzed a data set of 7500 diabetic patients, including information related to their medication intake, physician information, demographic information, and hospitalization history, to develop a propensity model to predict the likelihood of readmission for each patient.

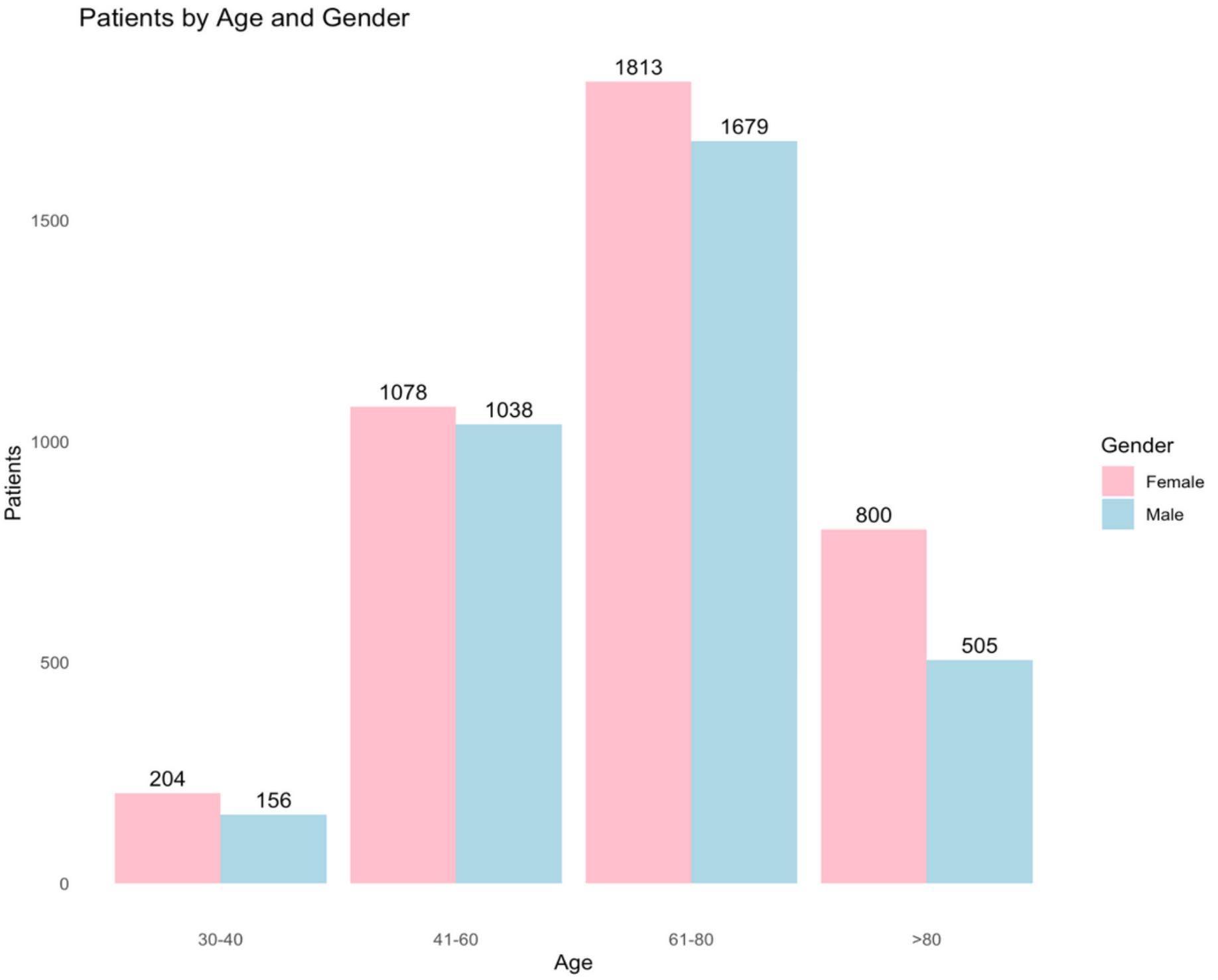
# DATA ANALYSIS & EDA



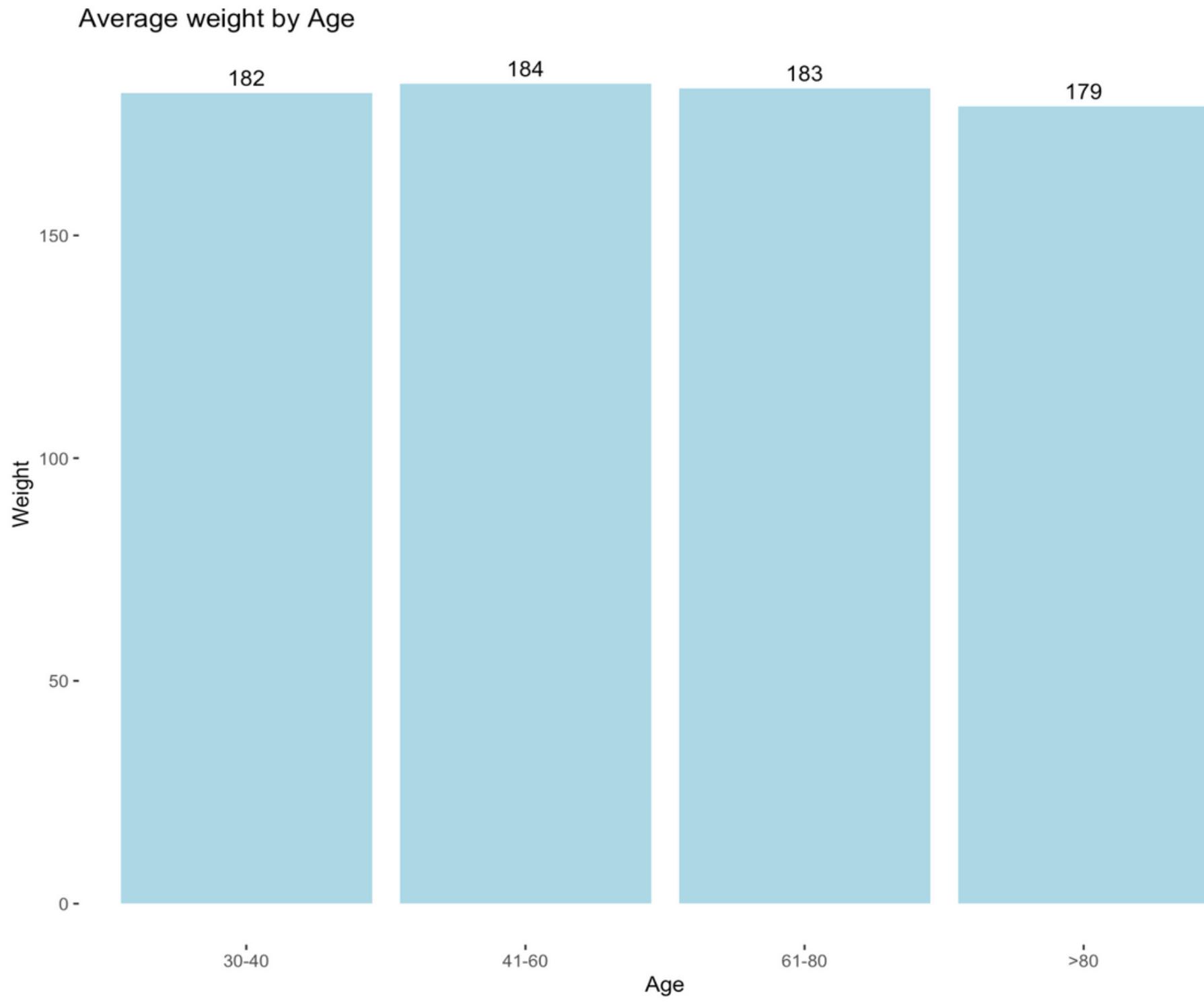
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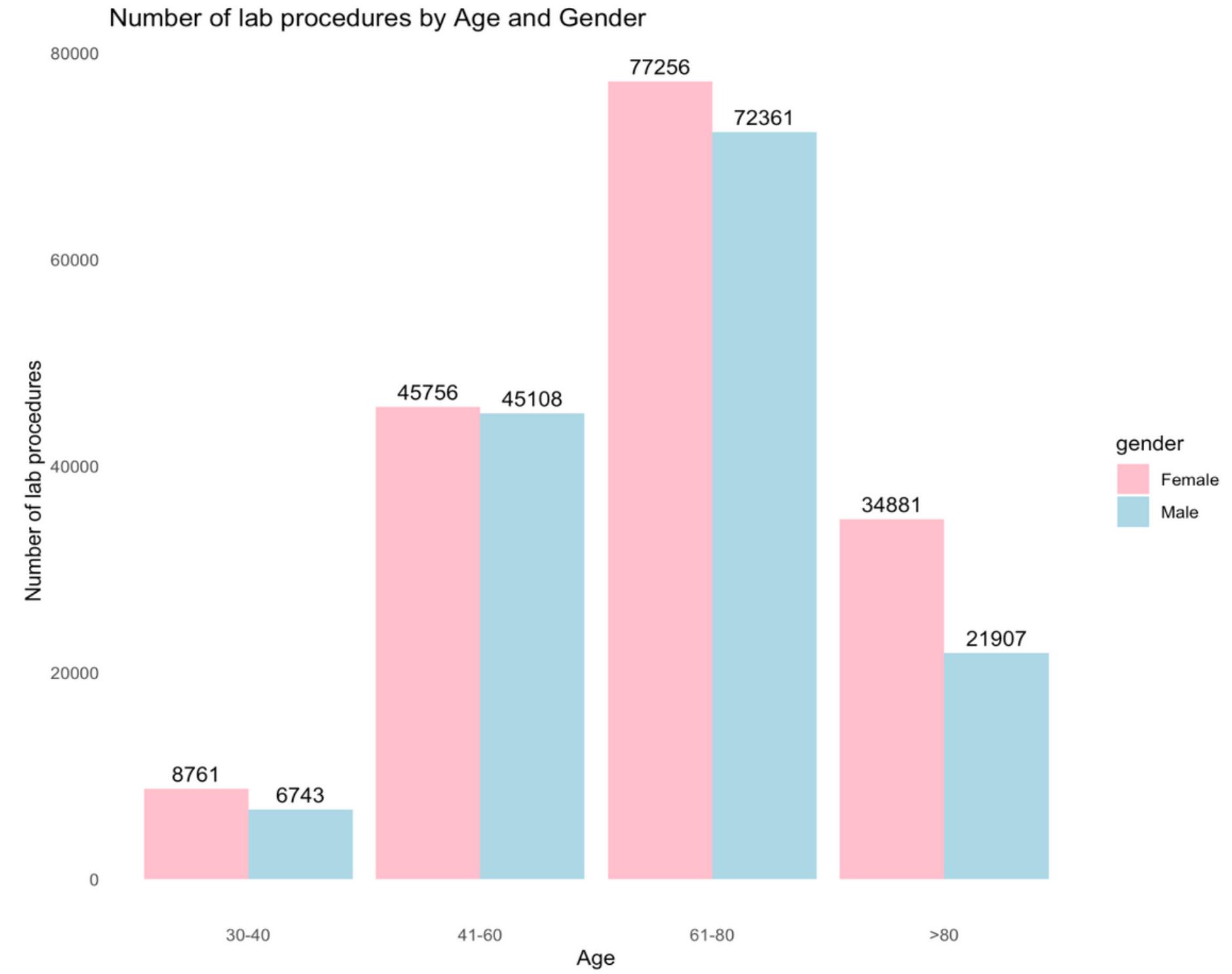
# DATA ANALYSIS & EDA



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# REGRESSION MODEL

RANDOM  
FOREST MODEL

Accuracy 62.84%

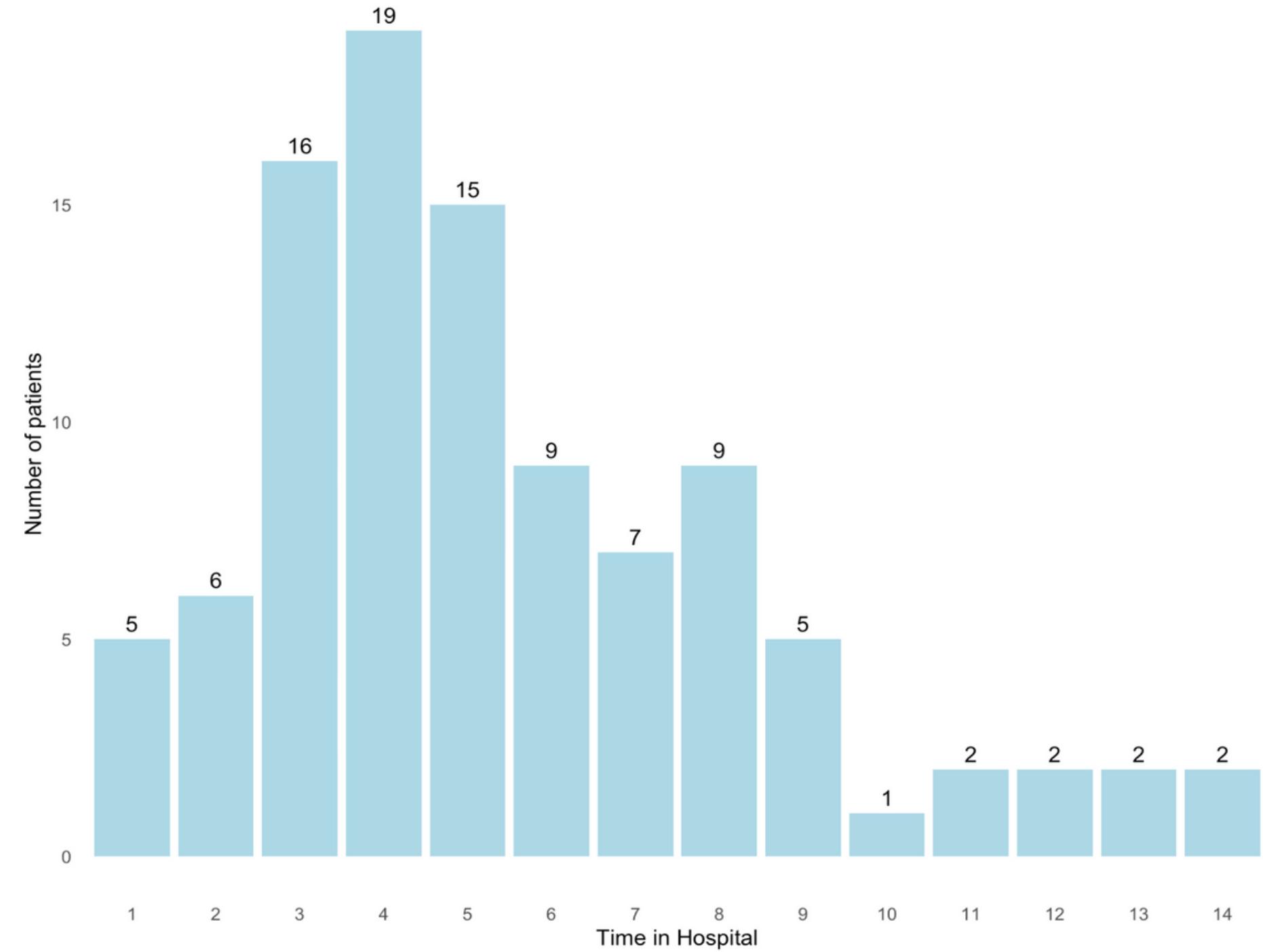
LOGISTIC  
REGRESSION  
MODEL

Accuracy 66%

# **IDENTIFICATION OF THE TOP 100 PATIENTS THAT HAVE A HIGHER PROBABILITY OF BEING READMITTED**

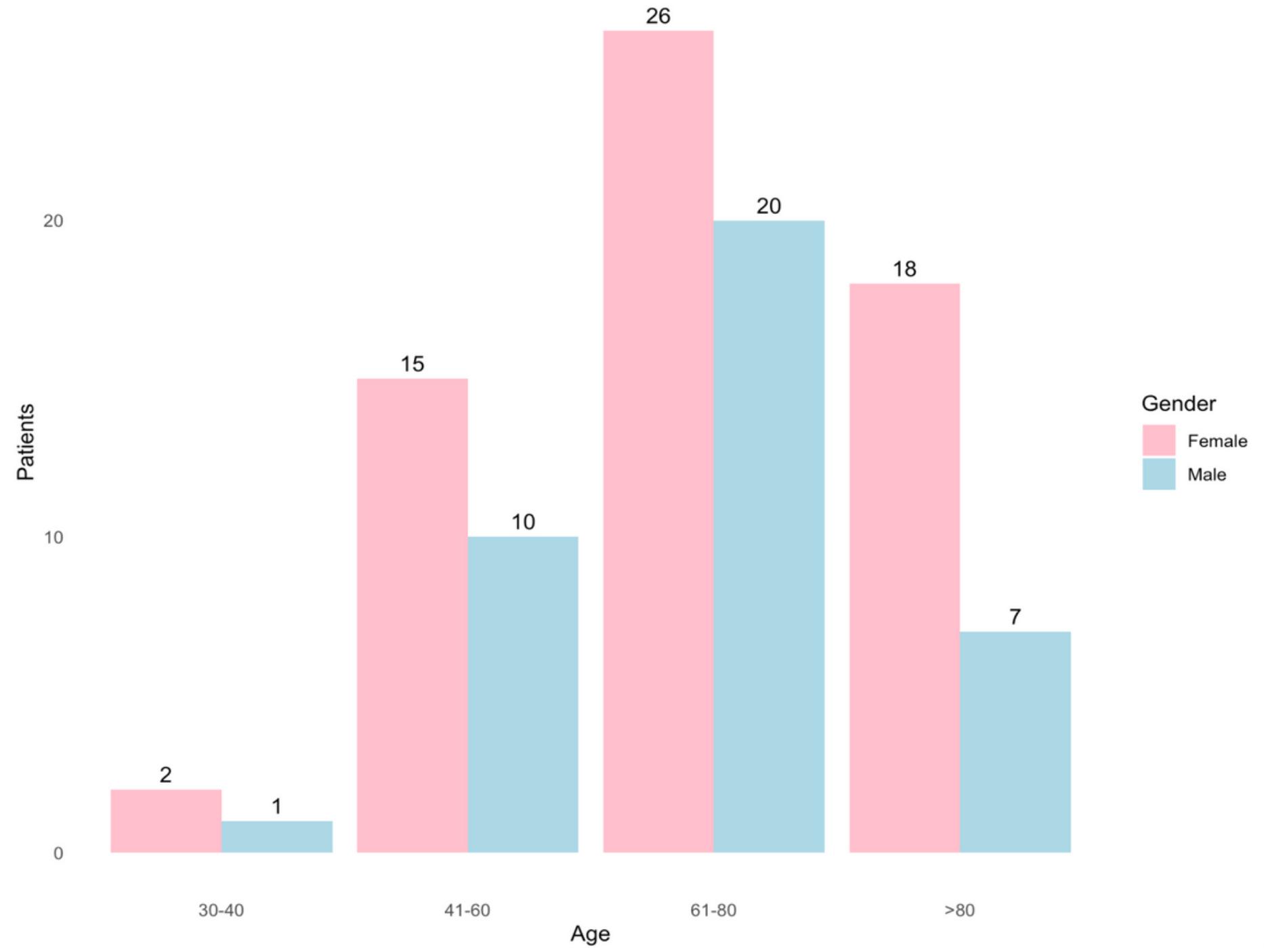
# DATA ANALYSIS & EDA

Number of patients per times in the Hospital



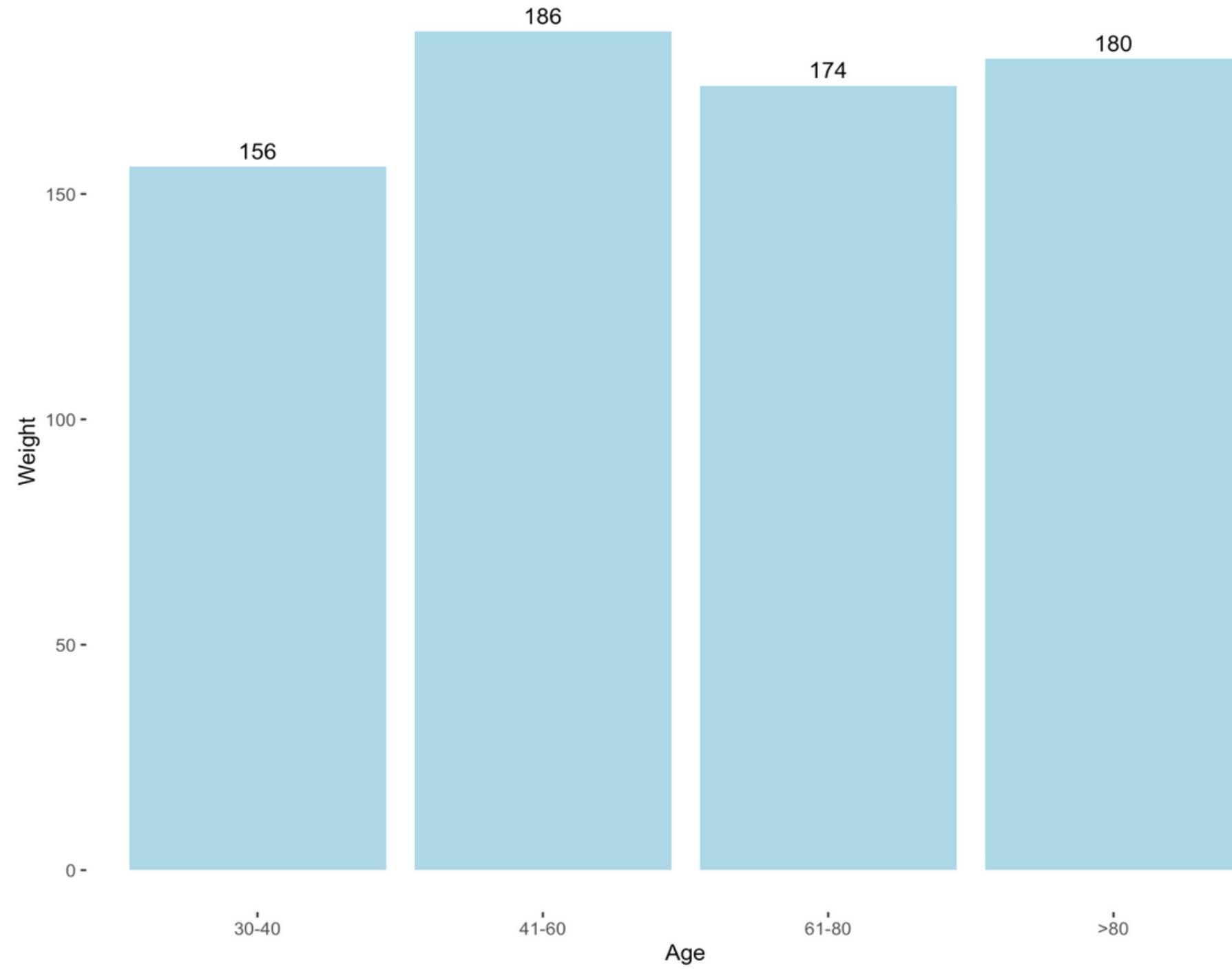
# DATA ANALYSIS & EDA

Patients by Age and Gender

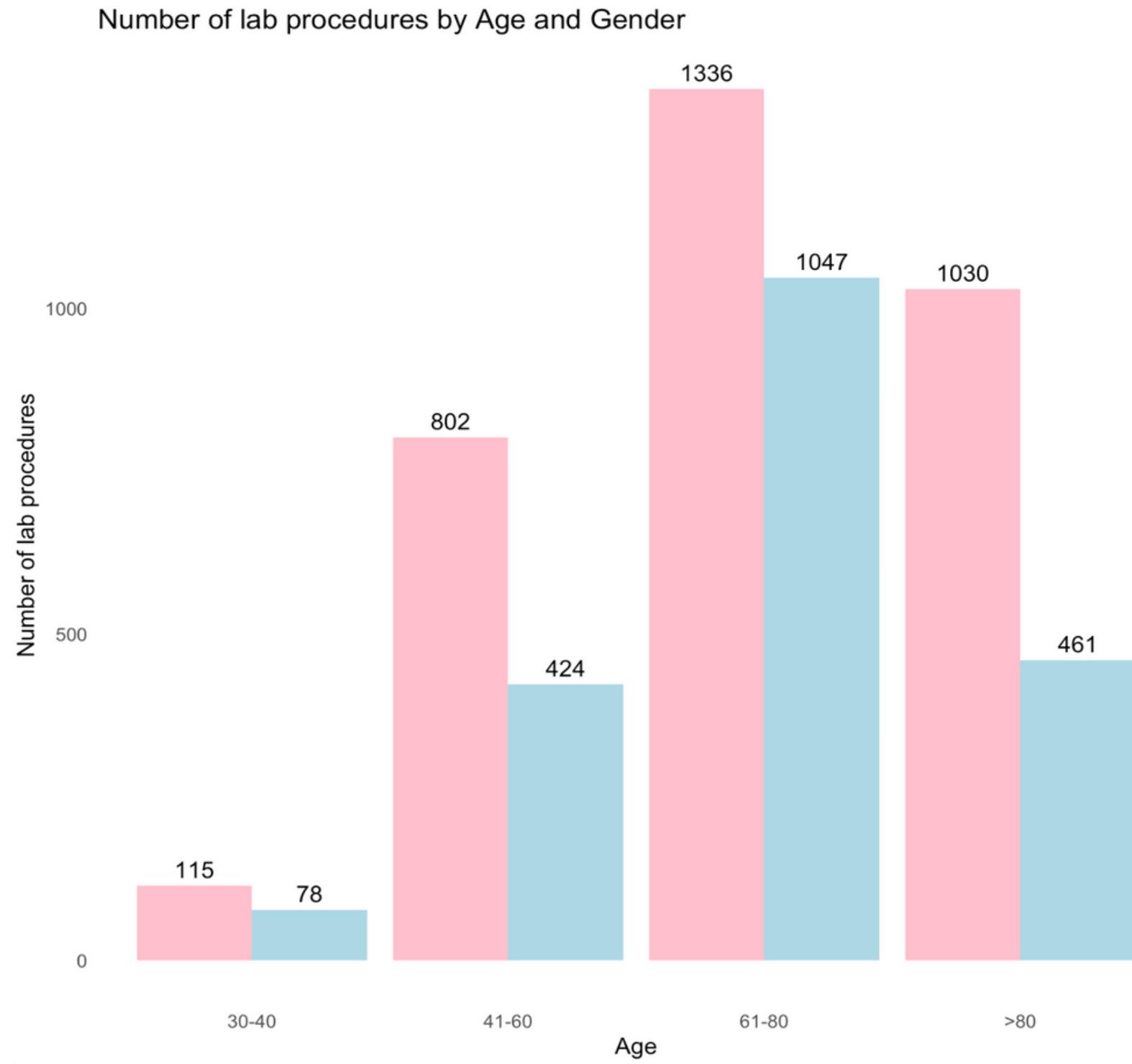


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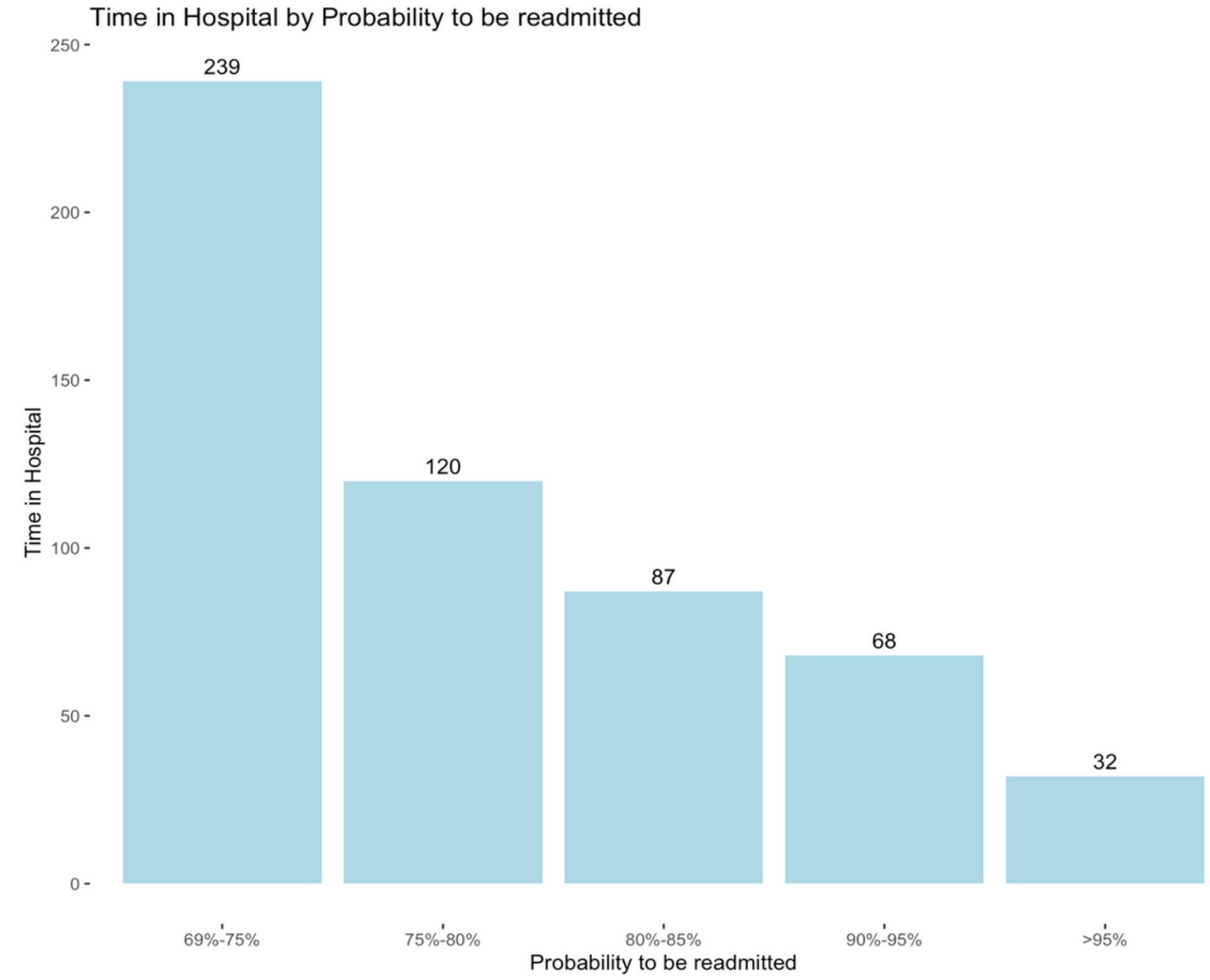
Weight by Age



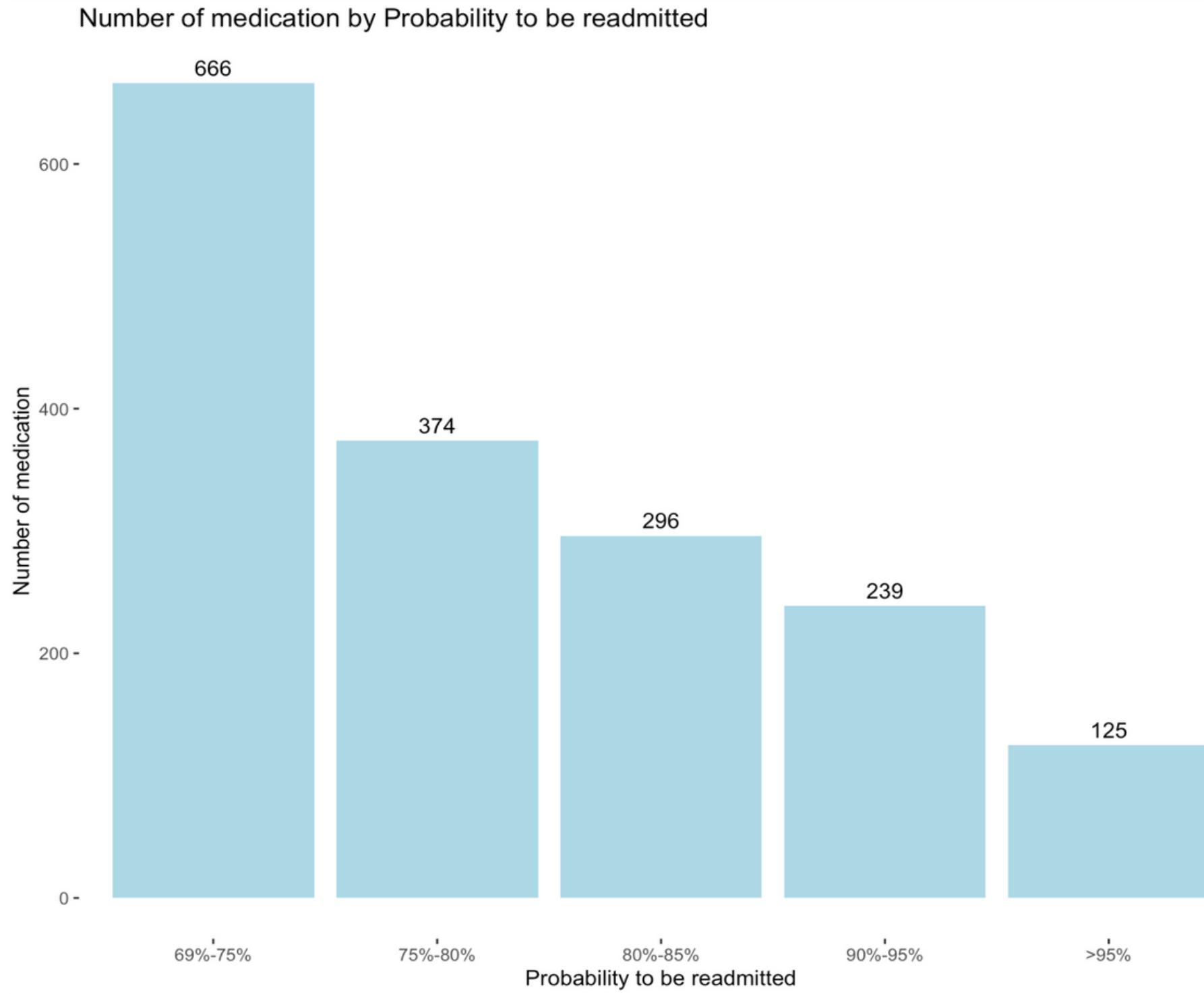
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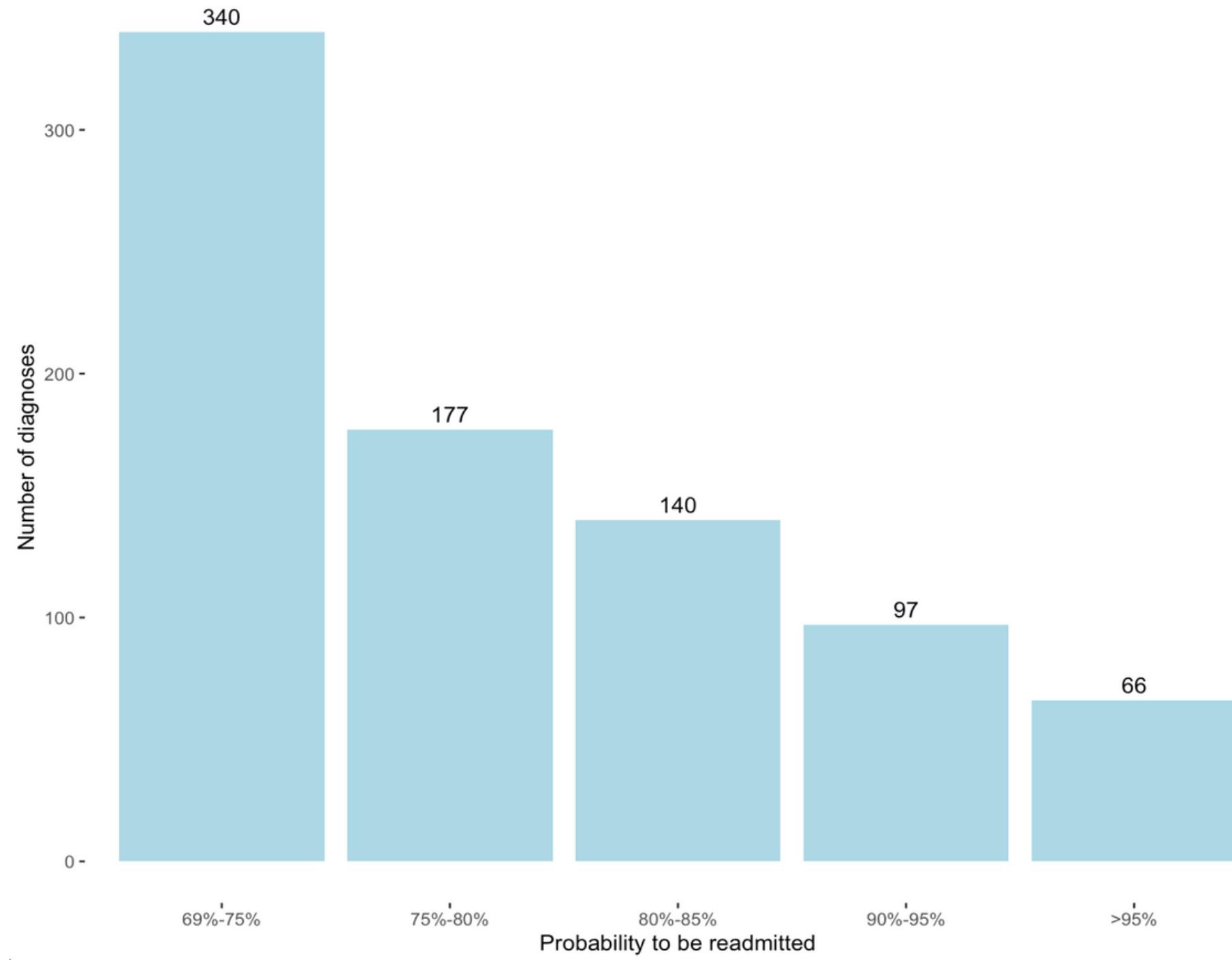


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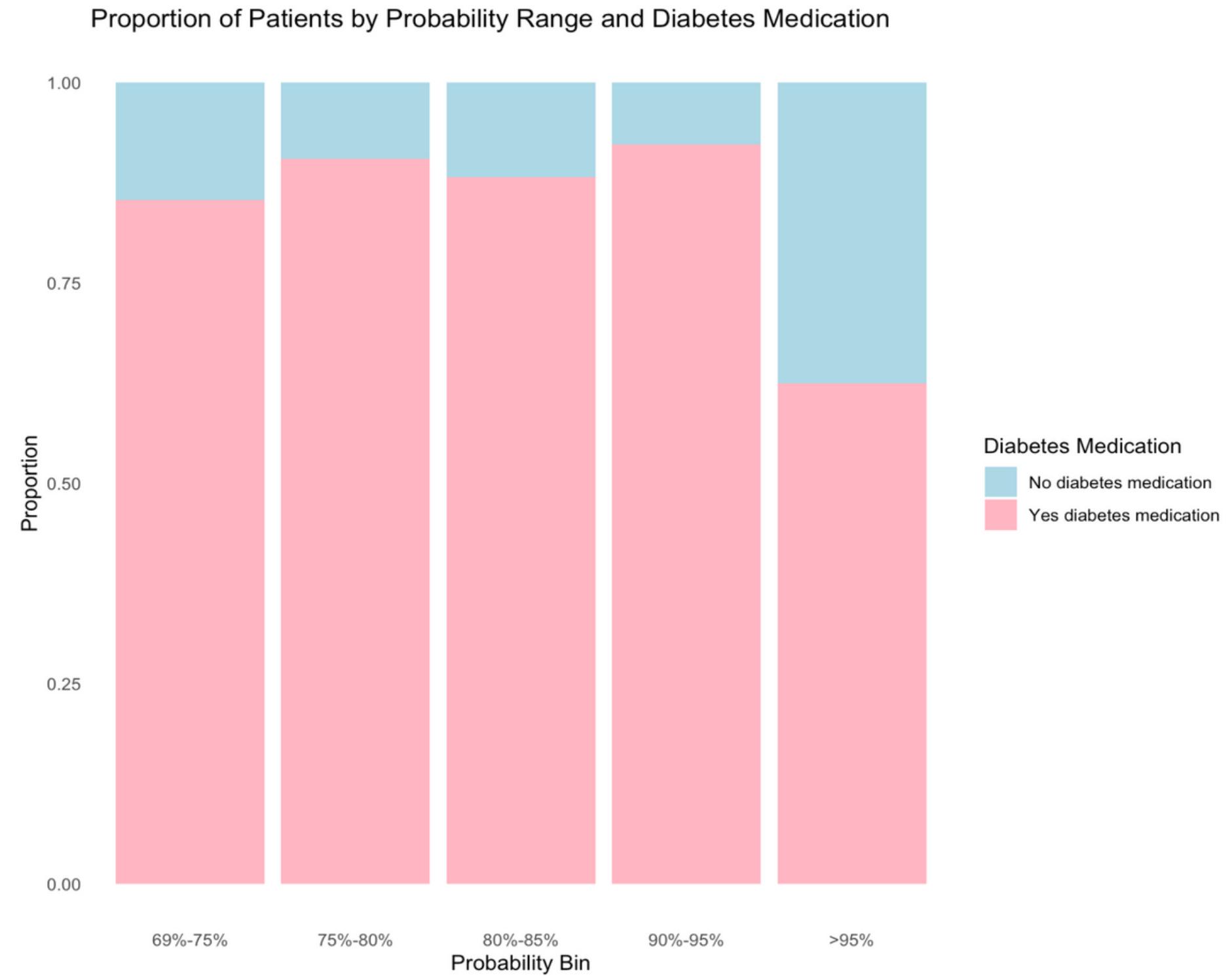
Number of diagnoses by Probability to be readmitted



# INSIGHTS AND RECOMMENDATIONS

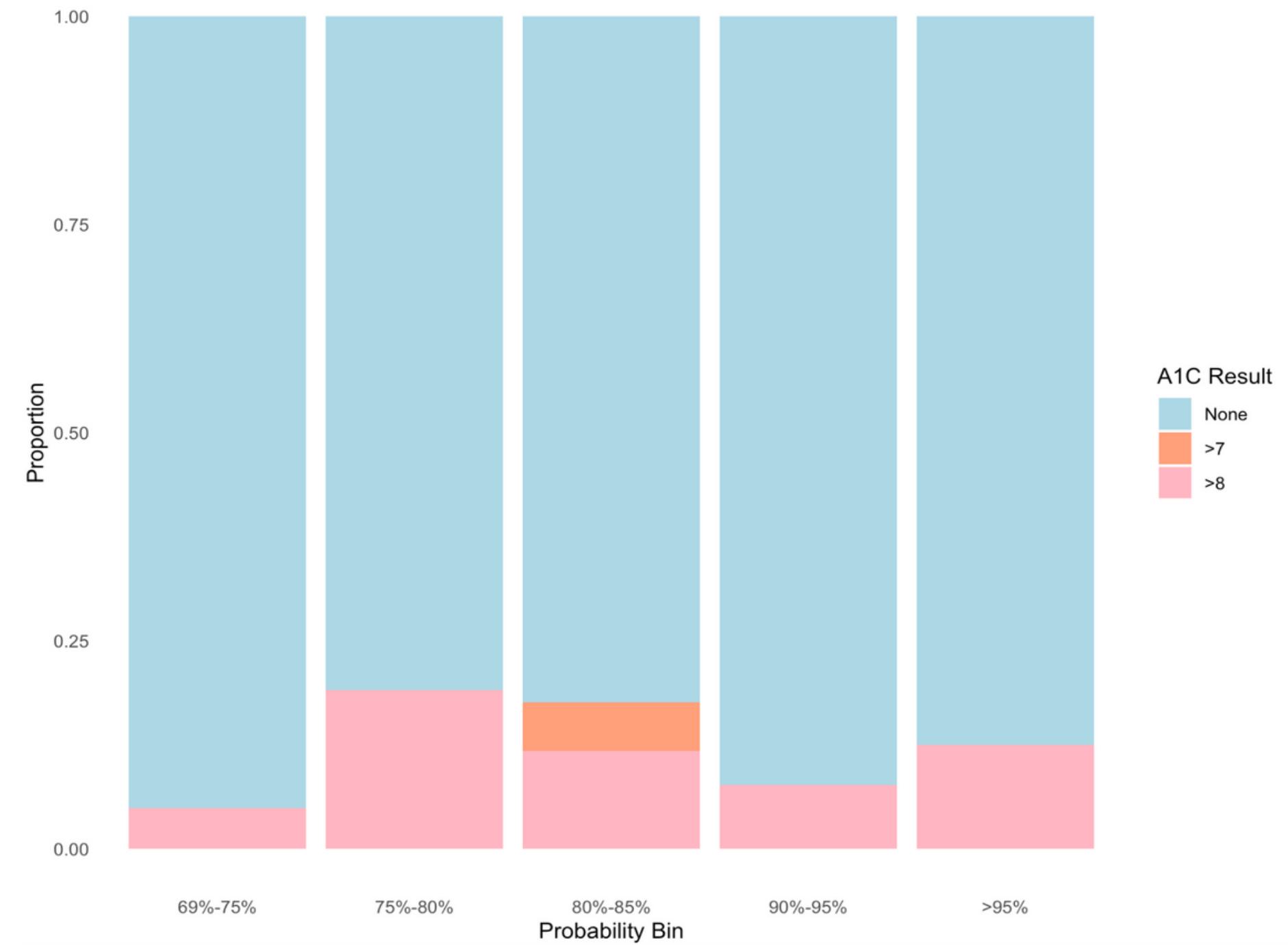


# INSIGHTS AND RECOMMENDATIONS

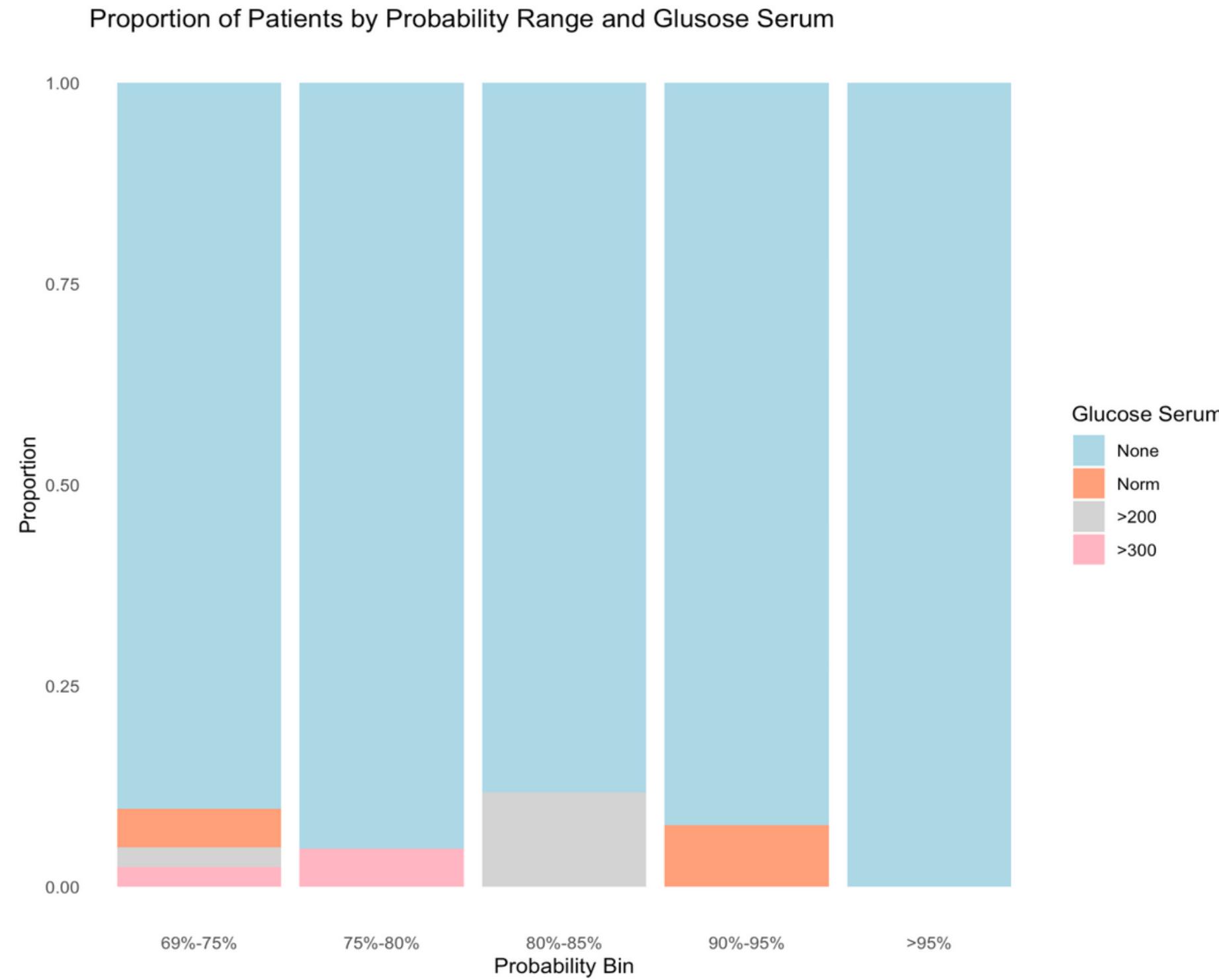


# INSIGHTS AND RECOMMENDATIONS

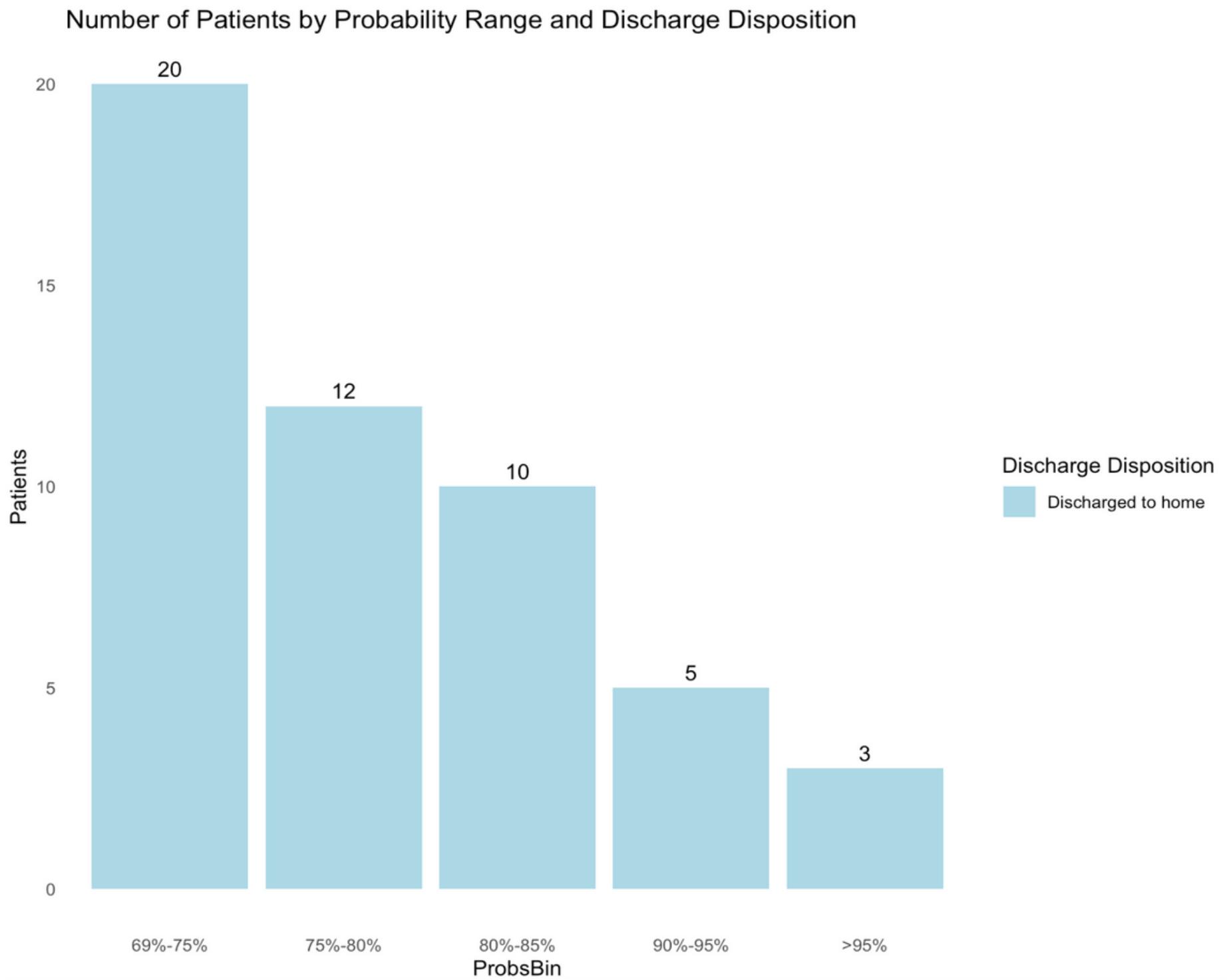
Proportion of Patients by Probability Range and A1C Results



# INSIGHTS AND RECOMMENDATIONS



# INSIGHTS AND RECOMMENDATIONS

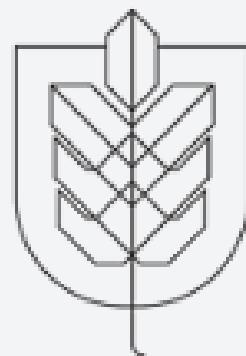


# CONCLUSION

The analysis provided valuable insights that contribute to understanding readmissions in diabetic patients, as well as a model that can accurately predict the likelihood of readmission for each patient.

Providing reminders to the patients, so they do not forget to do the necessary tests and sending the patients to other facilities instead of home, would provide better control of the activities in the hospital and reduce the chances of being readmitted.





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# THANK YOU!

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