

Classifying Patients Likely to Readmit

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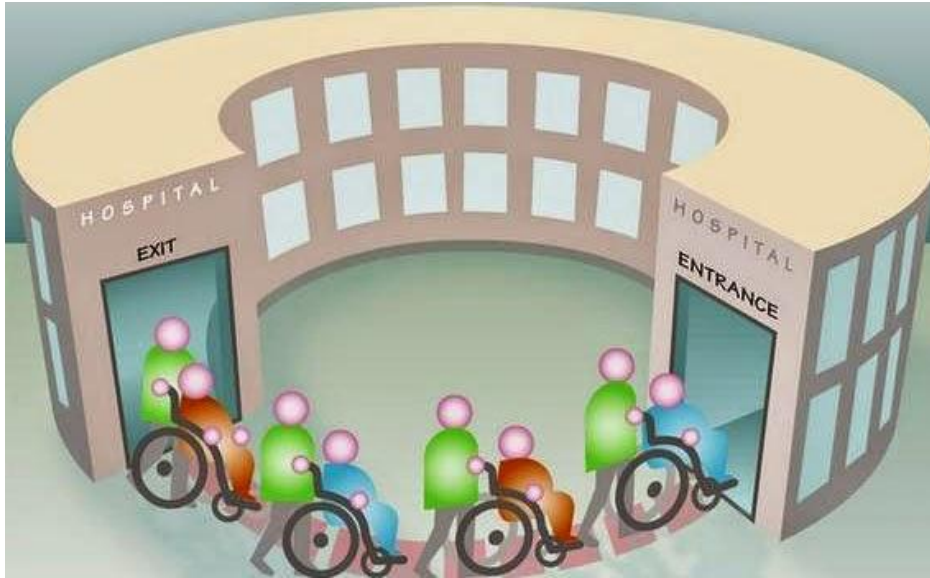
Agenda

- Business Problem
- Databases
- Model
- Conclusions

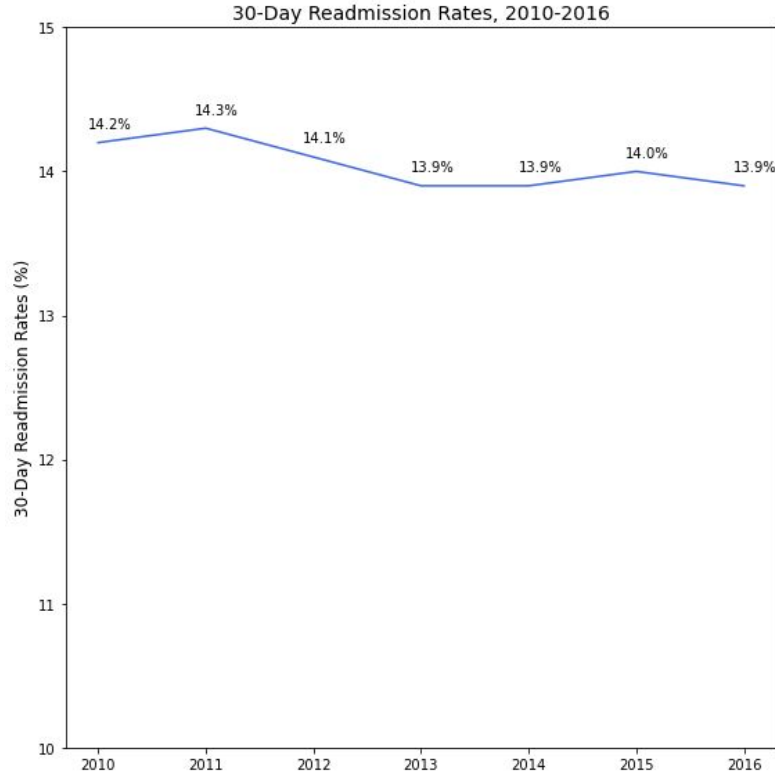
1 | Business Problem

Business Problem

- How can we accurately determine members/patients who are likely to be readmitted within 30-days of discharge?



Readmissions are costly problems that can be avoided



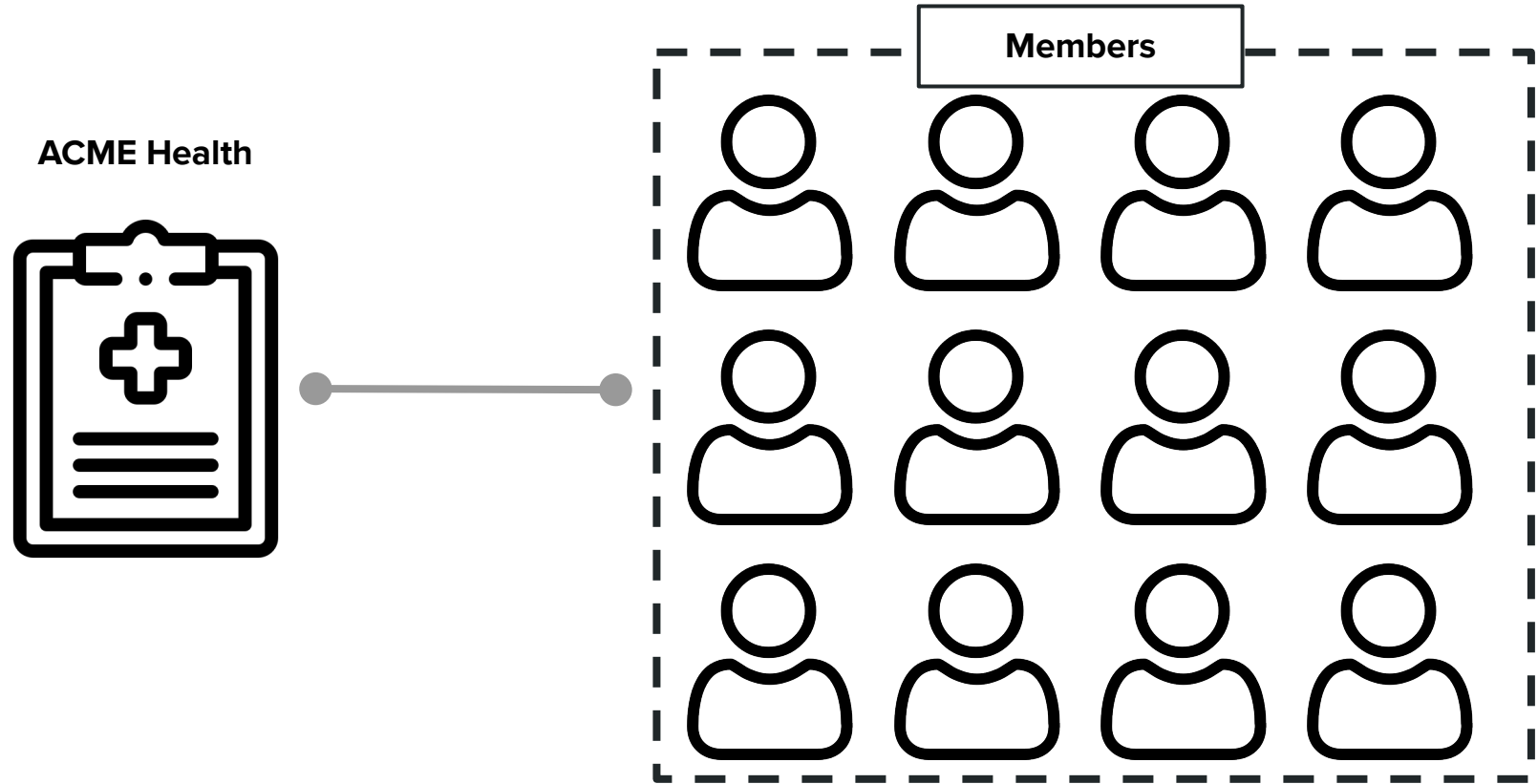
Avg 30-Day
Readmission Costs:
\$14K¹



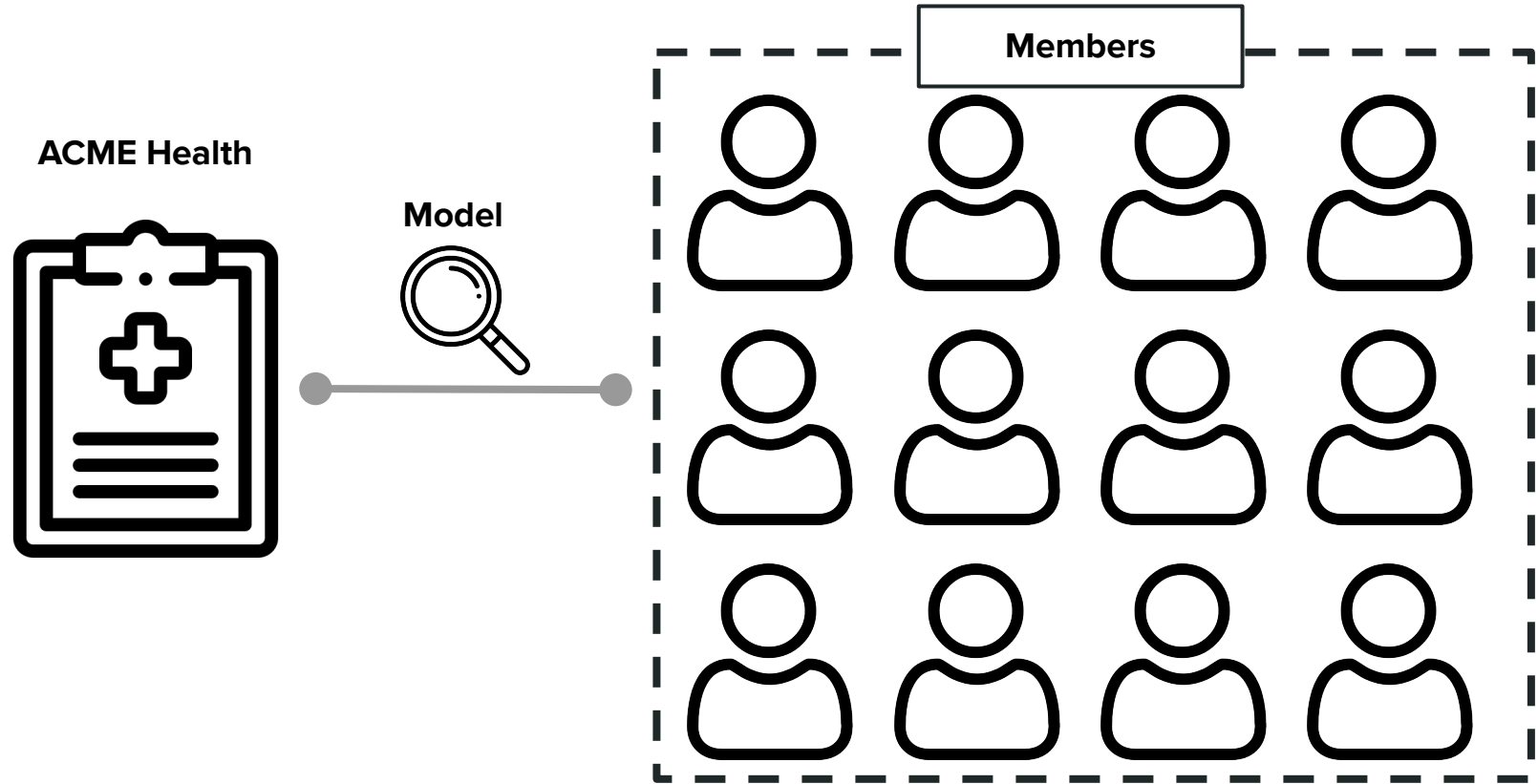
~27%² of 30-Day
Readmissions Are
Preventable



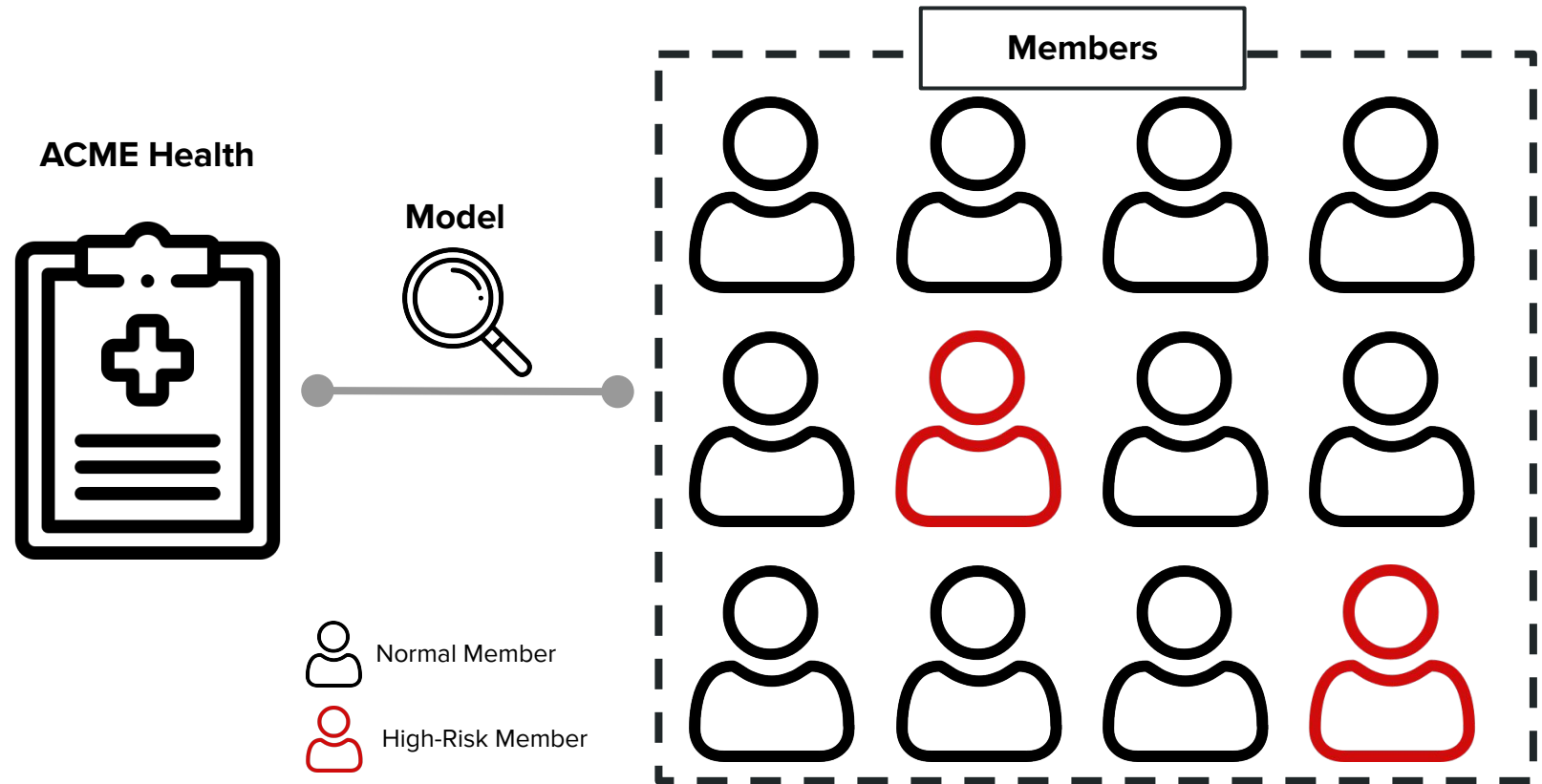
ACME Health can utilize the model to identify members who are high risk of readmitting within 30 days after discharge



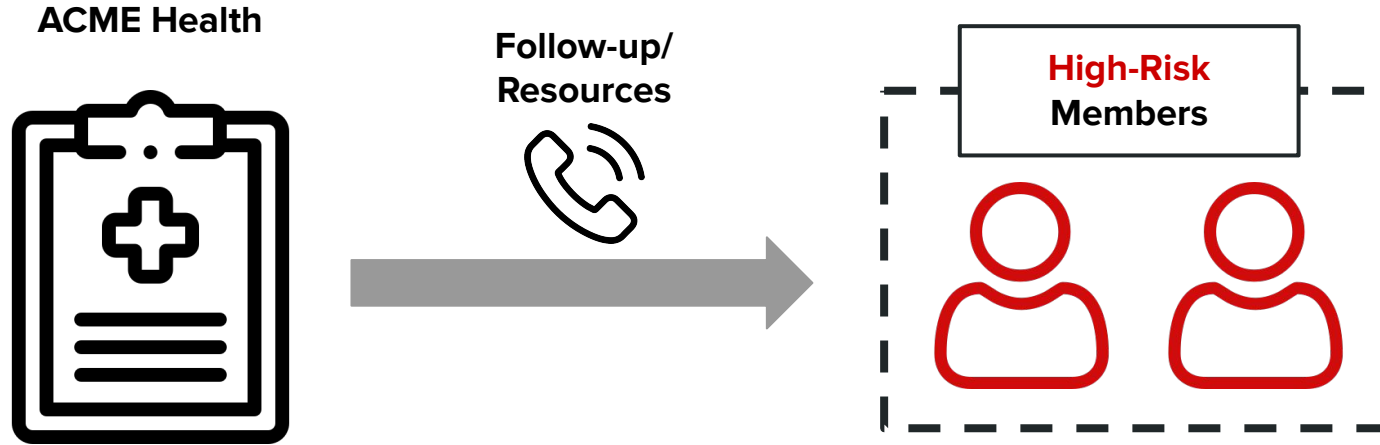
ACME Health can utilize the model to identify members who are high risk of readmitting within 30 days after discharge



ACME Health can utilize the model to identify members who are high risk of readmitting within 30 days after discharge



After identifying the high-risk members, AMCE Health can perform additional follow-ups and allocate more resources to these members



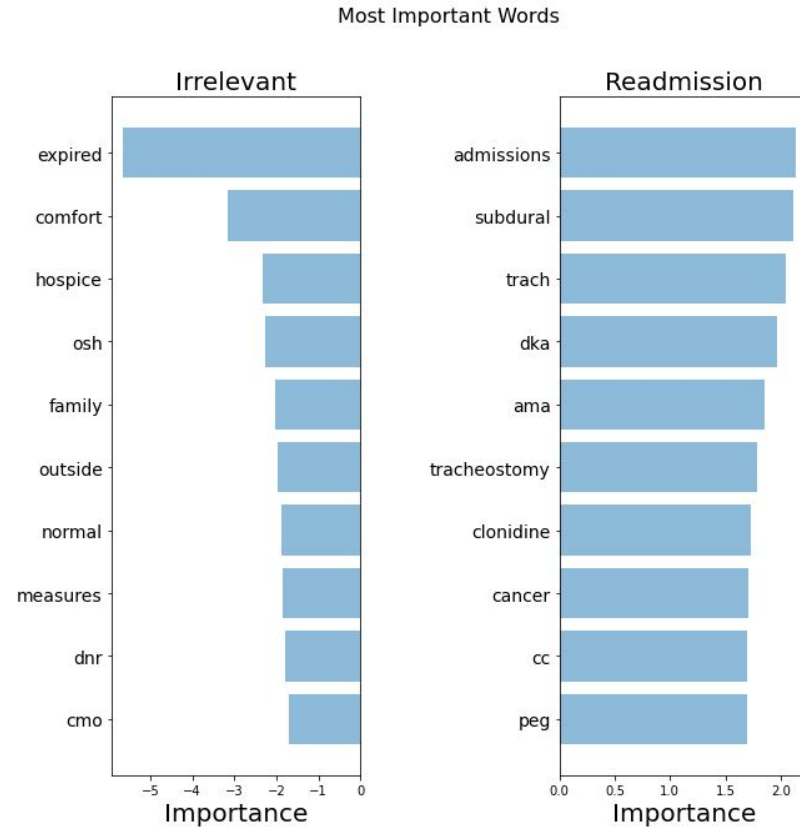
2 | Databases

Dataset used:

~60K patient admission claims, including discharge notes, from ICU units in a medical center located in Boston

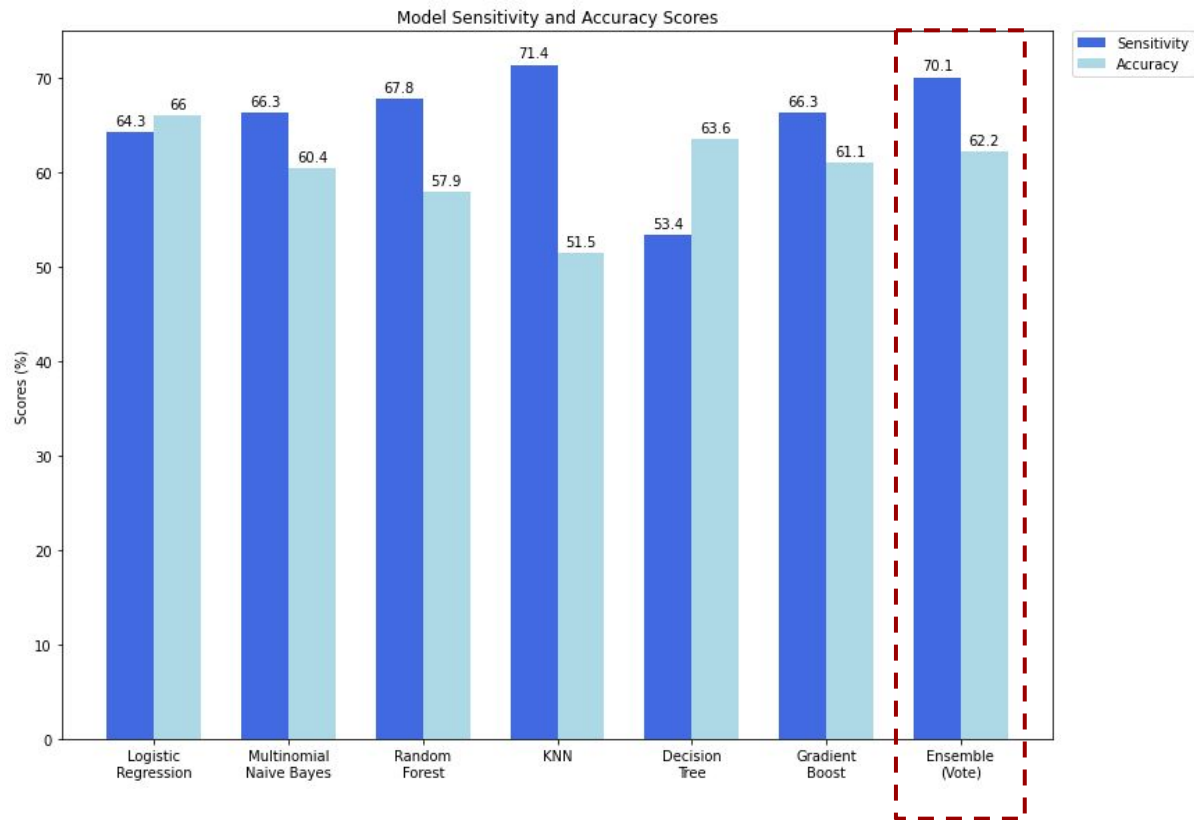


The most important words that indicate readmission include subdural, diabetic ketoacidosis (DKA), tracheostomy, and cancer



3 | Modeling

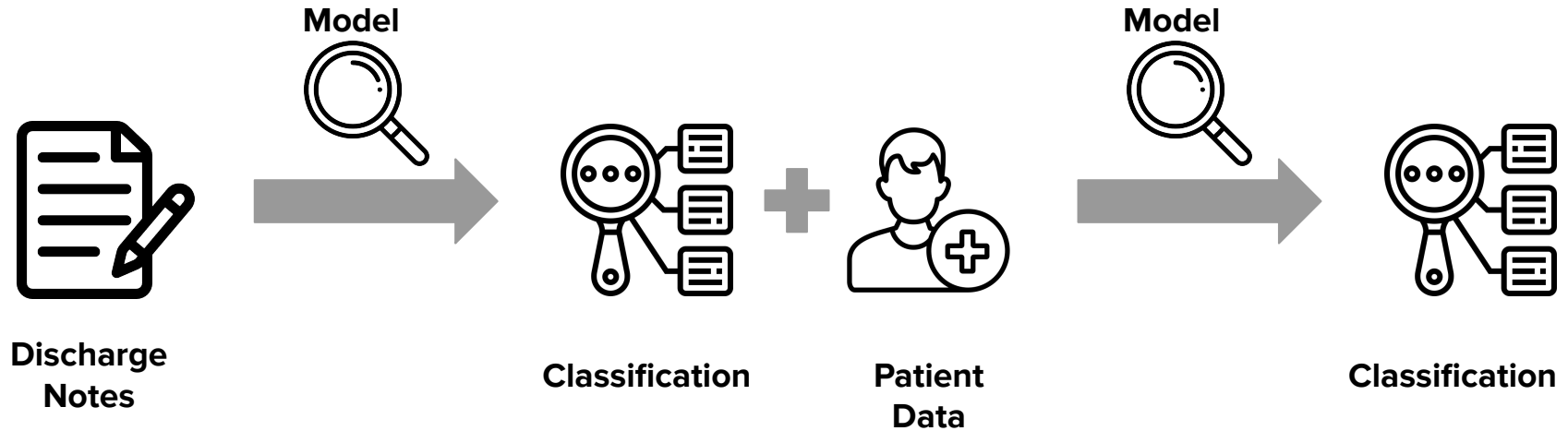
The best model based only on discharge notes had a sensitivity of 70% and accuracy of 62%



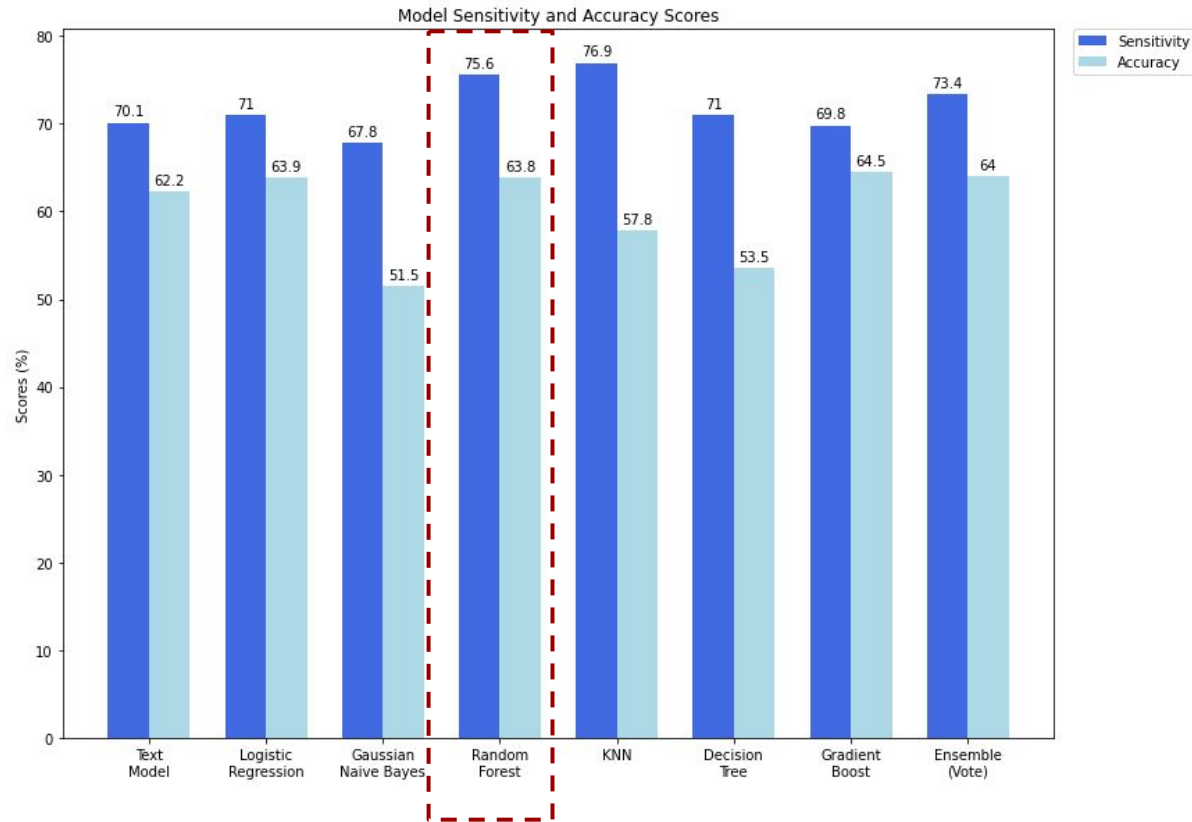
Ensemble (Vote) Model:

- Sensitivity: 70%
- Accuracy: 62%

The results from the discharge notes were merged with other patient data and inputted into models for further analysis



The best model based discharge notes and additional patient data features had a sensitivity of 76% and accuracy of 64%



Random Forest Model:

- Sensitivity: 76%
- Accuracy: 64%

4 | Conclusion

Summary

- Model based on discharge notes only:
 - Sensitivity: 70%
 - Accuracy: 62%
- Model based on discharge notes and additional patient data features
 - Sensitivity: 76%
 - Accuracy: 64%
- Require additional model fine tuning and data before model can be implemented

Next Steps...

- Obtain data beyond ICU
 - Obtain data from other large health systems
 - Run additional models such as neural networks
 - Review any other patient data features that can improve model performance
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Thank you!
Any questions?

GitHub Repository: https://github.com/arthursjkim/hospital_readmissions_nlp



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