

Predicting Metabolic Syndrome

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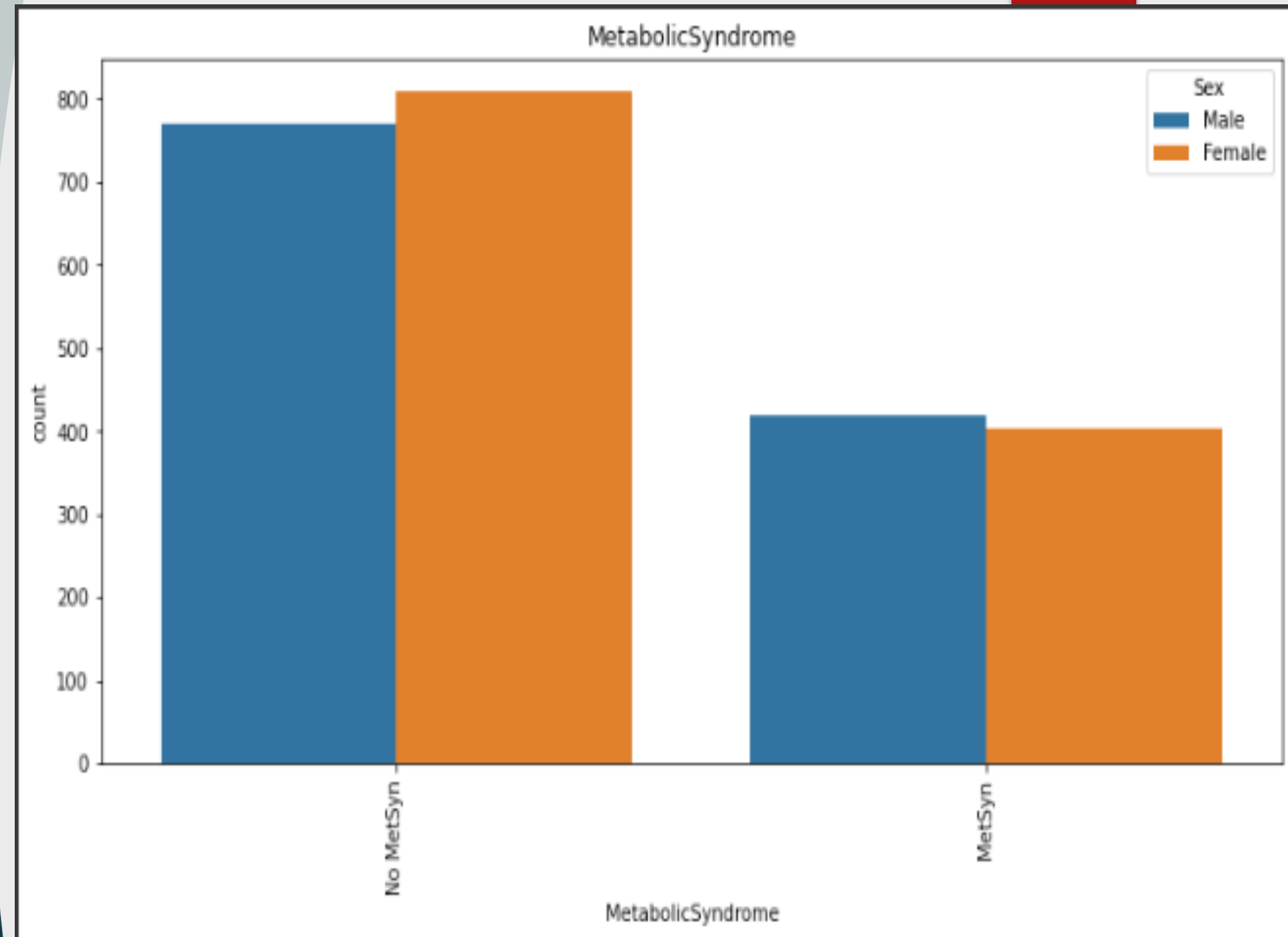
What Is Metabolic Syndrome?

- ▶ A group of conditions that occur together, increasing your risk of heart disease, stroke, type 2 diabetes and other serious health conditions.
- ▶ Having just one or two symptoms does not indicate the development of metabolic syndrome.
- ▶ About 1 in 3 adults in the United States have it.
- ▶ Also known as insulin resistance syndrome.

Problem Statement

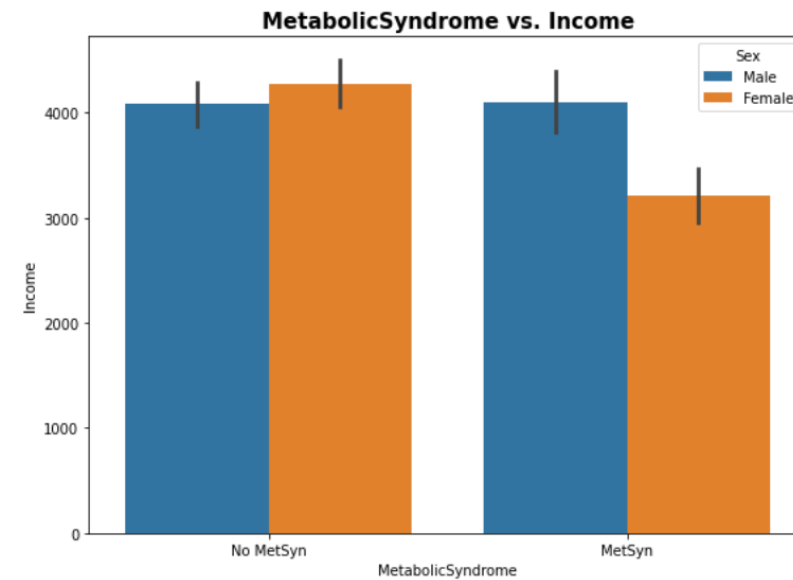
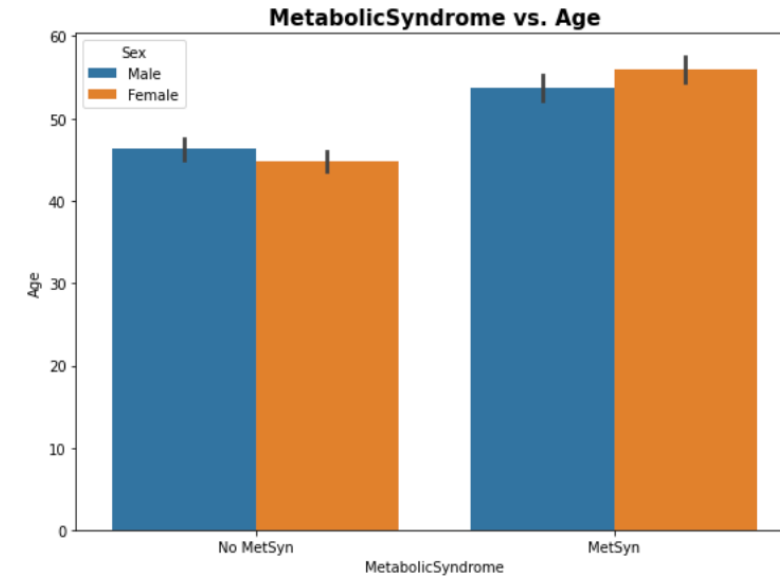
- ▶ To diagnose early and provide the best care, different health and demographic factors are used to create a machine learning model to predict whether a patient has developed metabolic syndrome.

Metabolic Syndrome



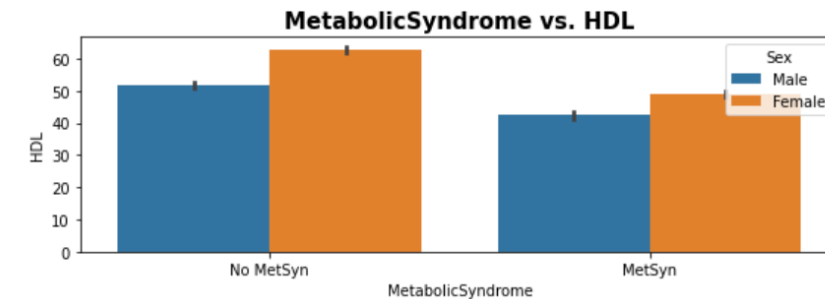
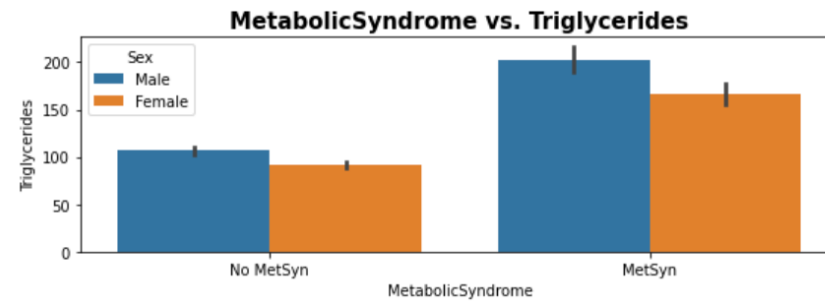
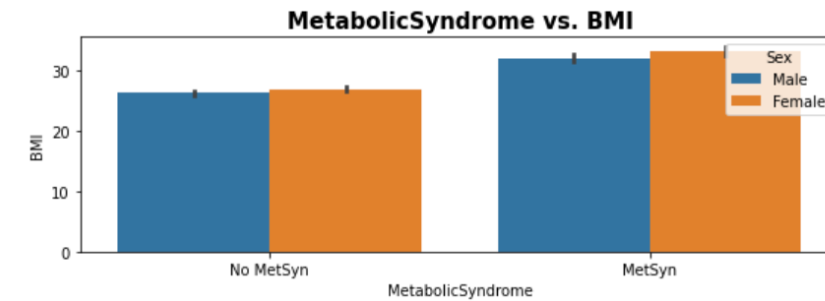
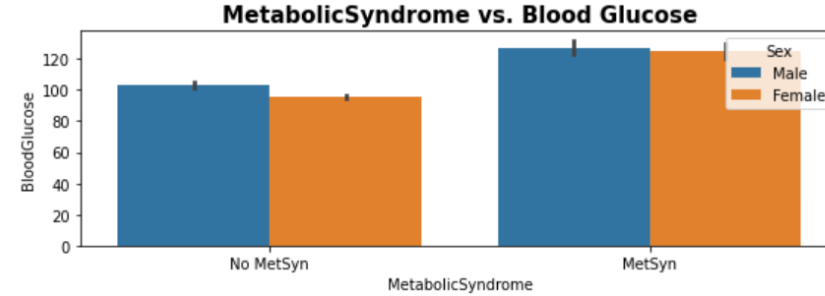
Demographics

Metabolic Syndrome based on Demographic Factors for Males and Females



Key Health Risks

Metabolic Syndrome Based on Risk Factors for Males and Females



Strengths

- ▶ Accurate predictions can lead to early diagnosis.
- ▶ Treatment plan can be implemented to decrease risk in developing more severe health conditions.

Limitations

- ▶ Models could not exceed 82% accuracy.
- ▶ There is an imbalance in the data.

Recommendations and Next Steps

- ▶ The first steps to improve model would be to add columns to the data using feature engineering to compare the health metrics with the normal ranges. I would also account for the class imbalance. Then tune and run the models again to try to obtain better prediction results.
- ▶ For a positive diagnosis, lifestyle changes are required to decrease the potential risks of developing more severe health conditions.
- ▶ Medication may need to be prescribed to assist in controlling certain health factors (i.e. blood sugar, blood pressure, triglycerides).

References

- ▶ <https://www.mayoclinic.org/diseases-conditions/metabolic-syndrome/symptoms-causes/syc-20351916>
- ▶ <https://www.nhlbi.nih.gov/health/metabolic-syndrome>
- ▶ <https://data.world/informatics-edu/metabolic-syndrome-prediction>