

CARDIOVASCULAR DISEASE

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CARDIOVASCULAR DISEASE (CVD)

Leading Cause of Death

- 17.9 million lives each year.

Risk Factors

- Tobacco use
- Unhealthy diet
- Physical inactivity
- Excessive alcohol consumption
- High blood pressure

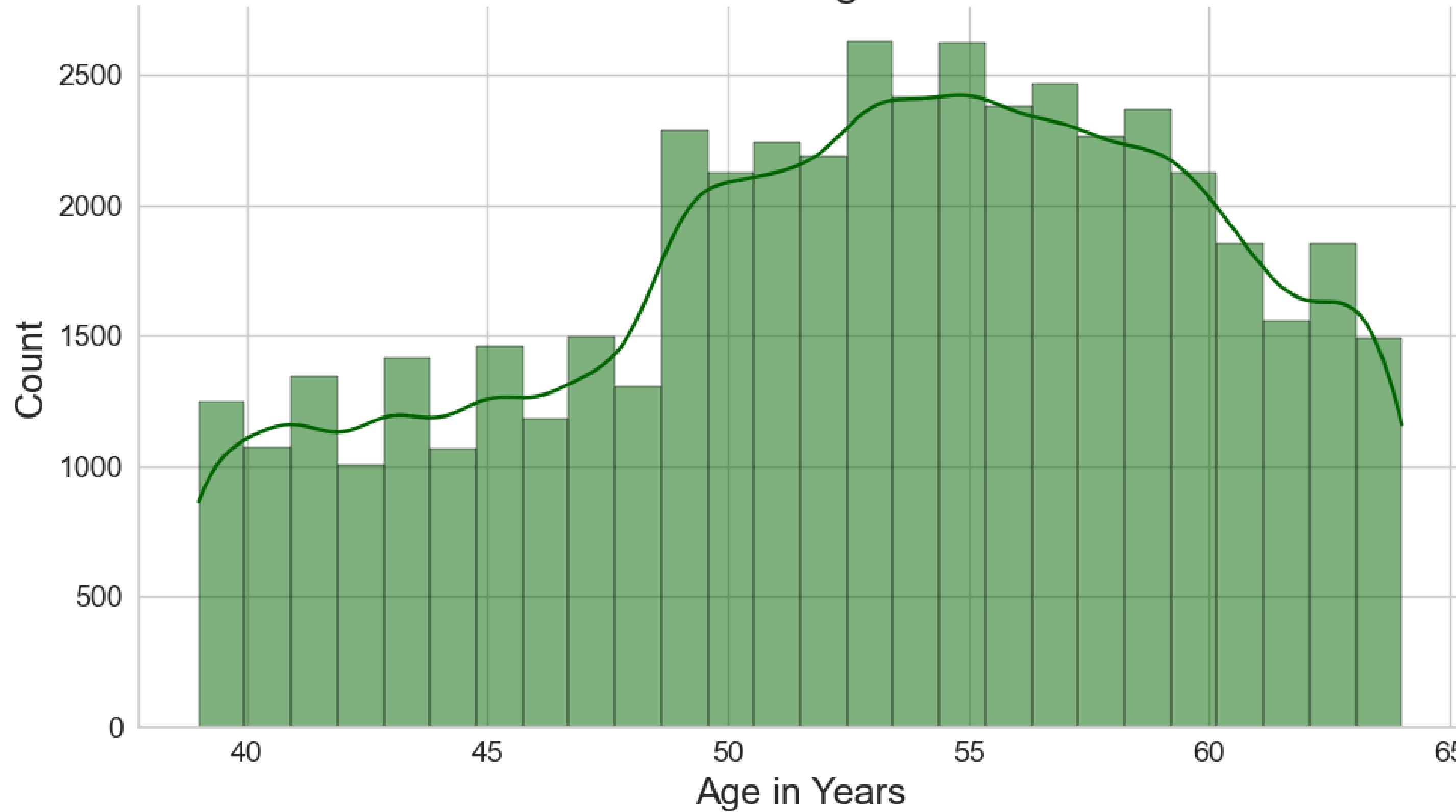
Economic Impact

- \$863 Billion Global Cost (2022)
- \$1,044 Billion by 2030

What Are The Biggest Risk Factors
According to the Data?

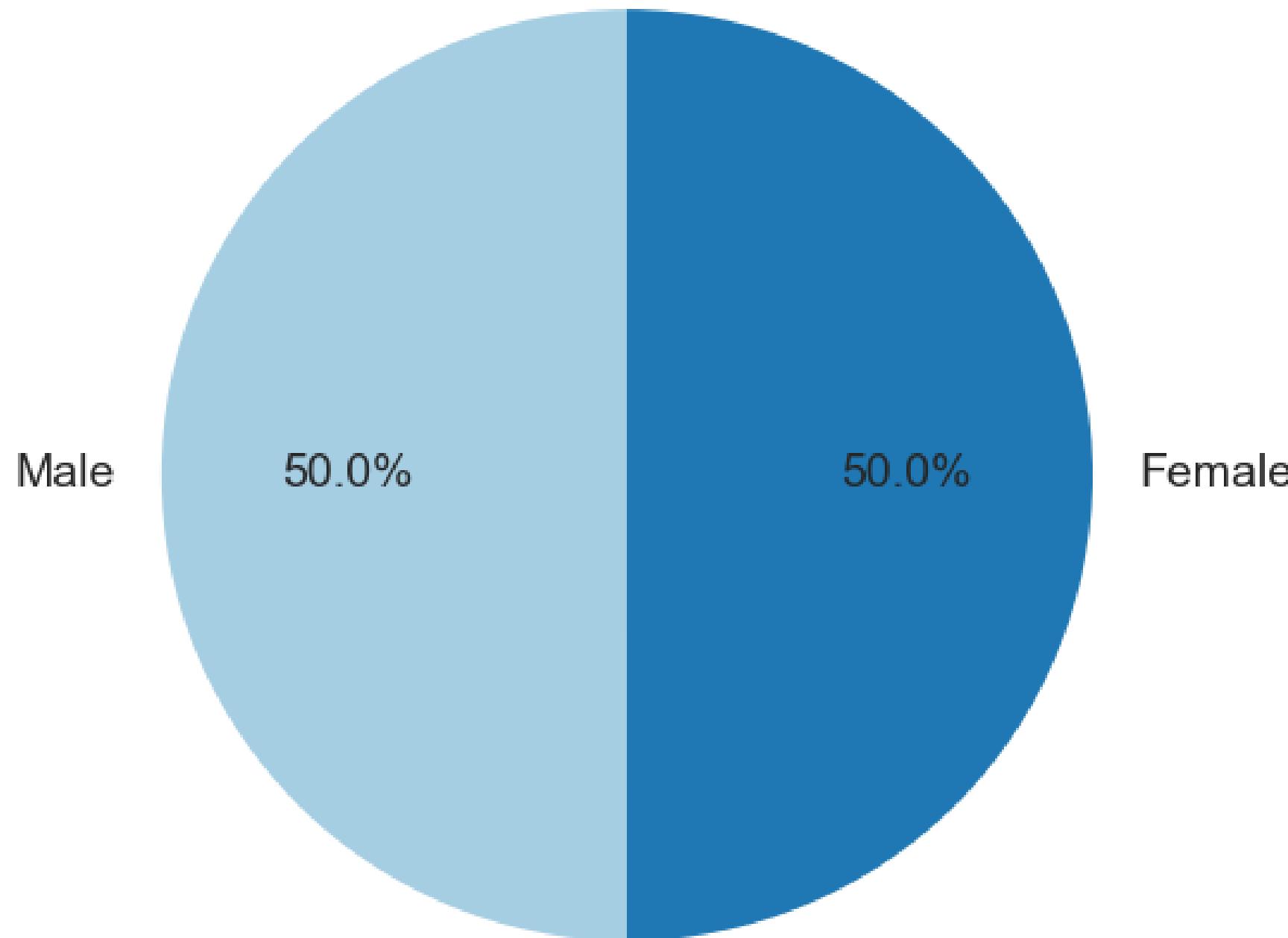
LET'S EXPLORE THE DATA

Distribution of Age with KDE

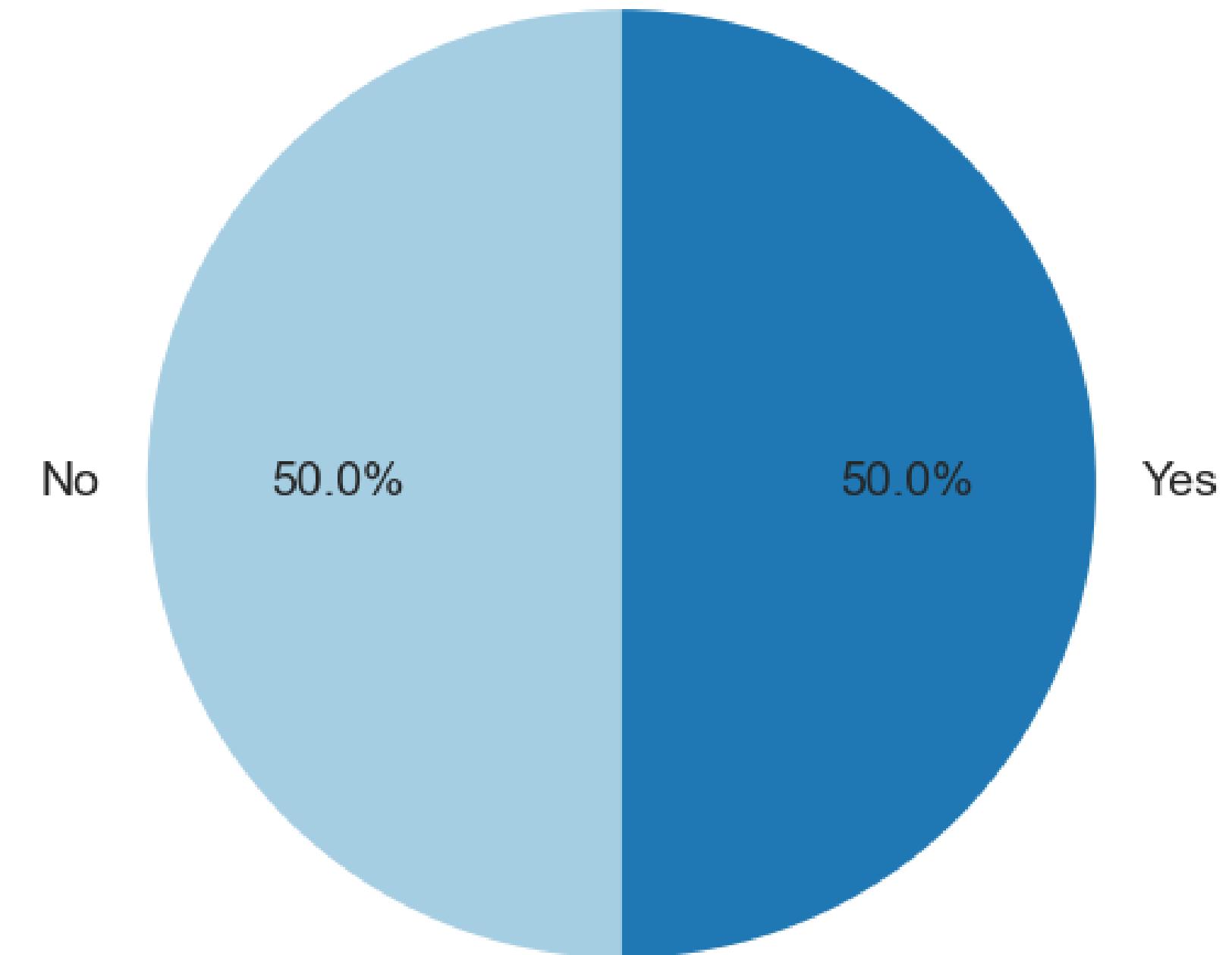


AGE & CVD

Male to Female Ratio

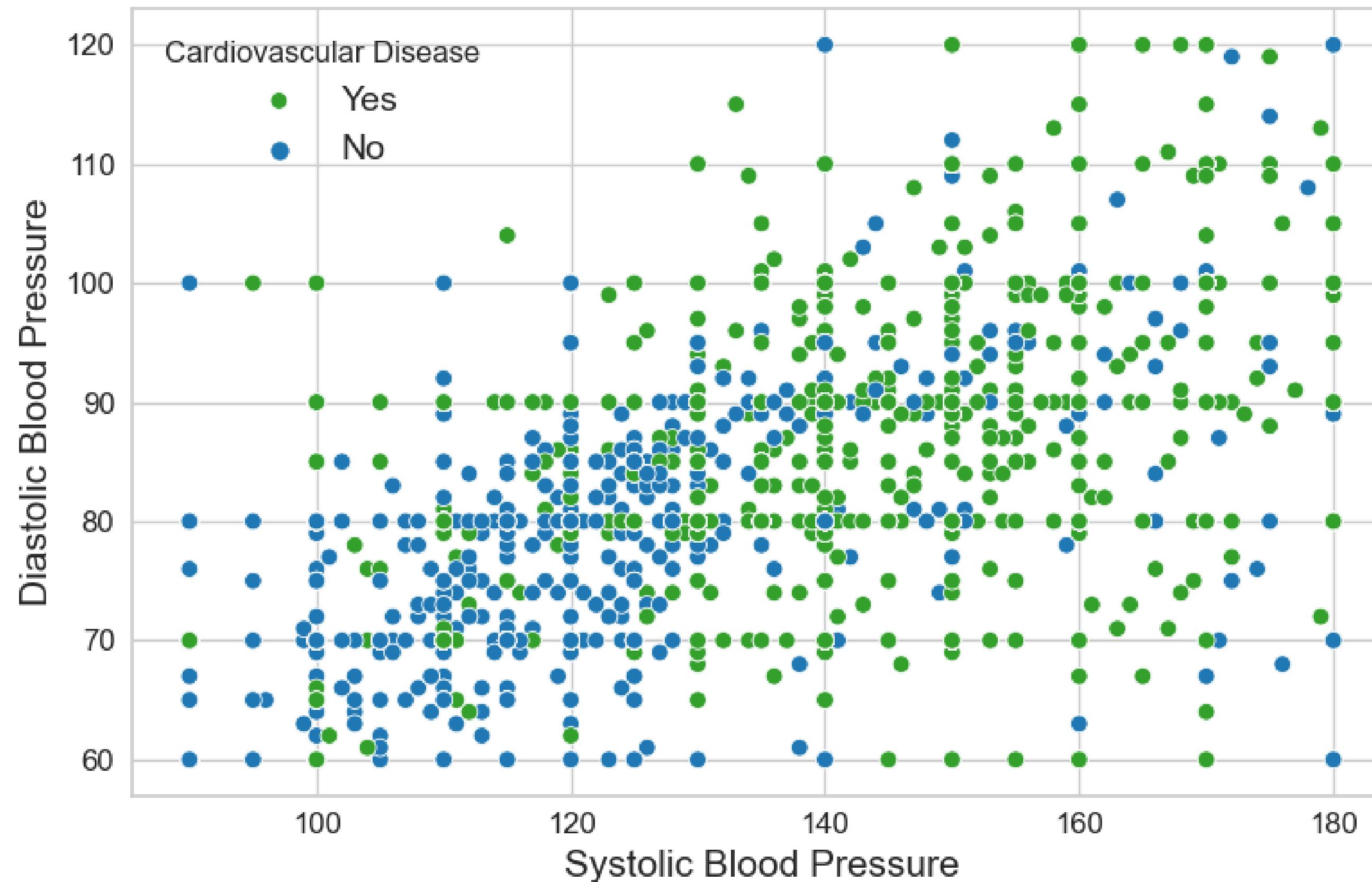


Cardiovascular Disease

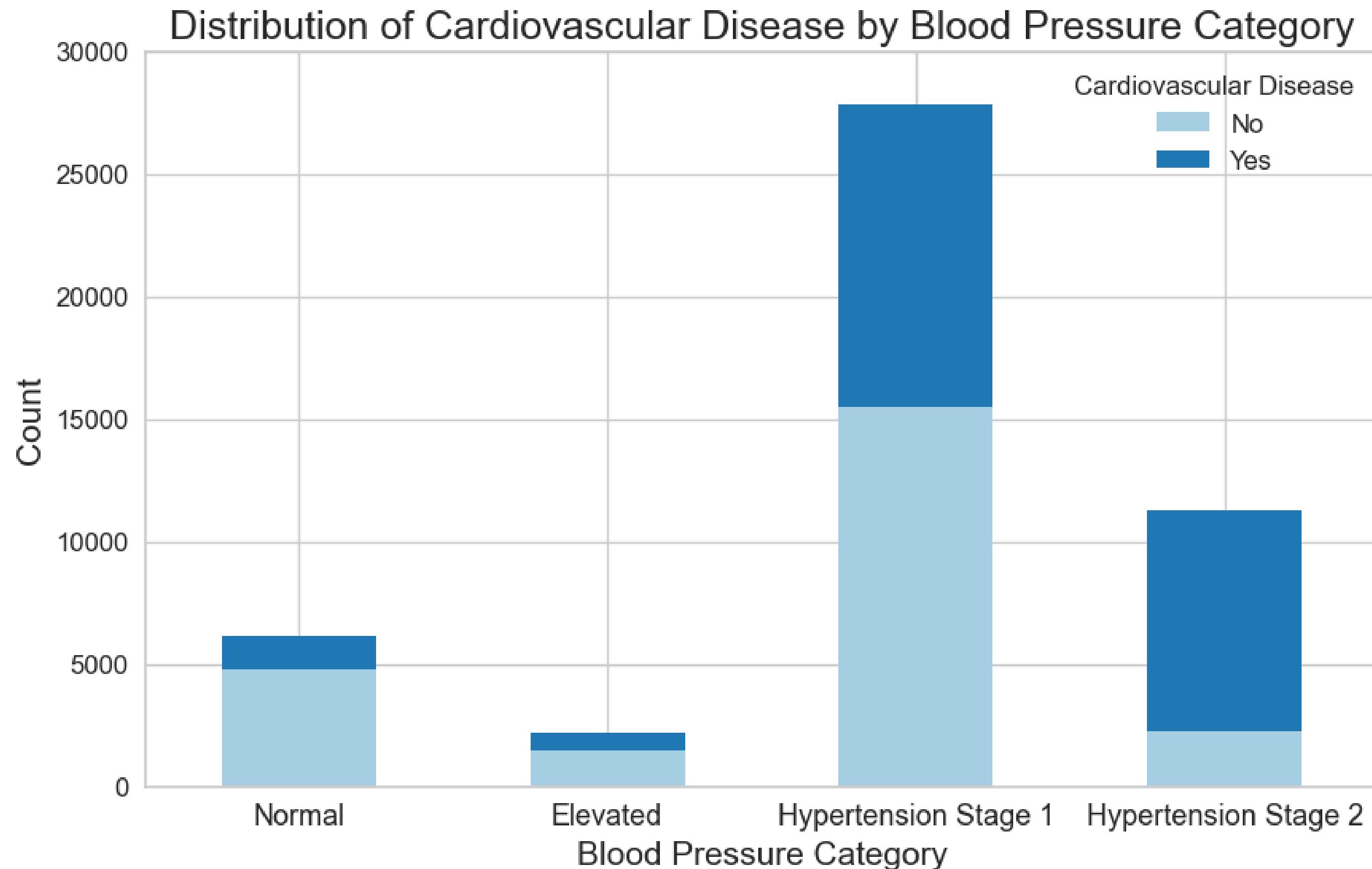


BP VS CVD

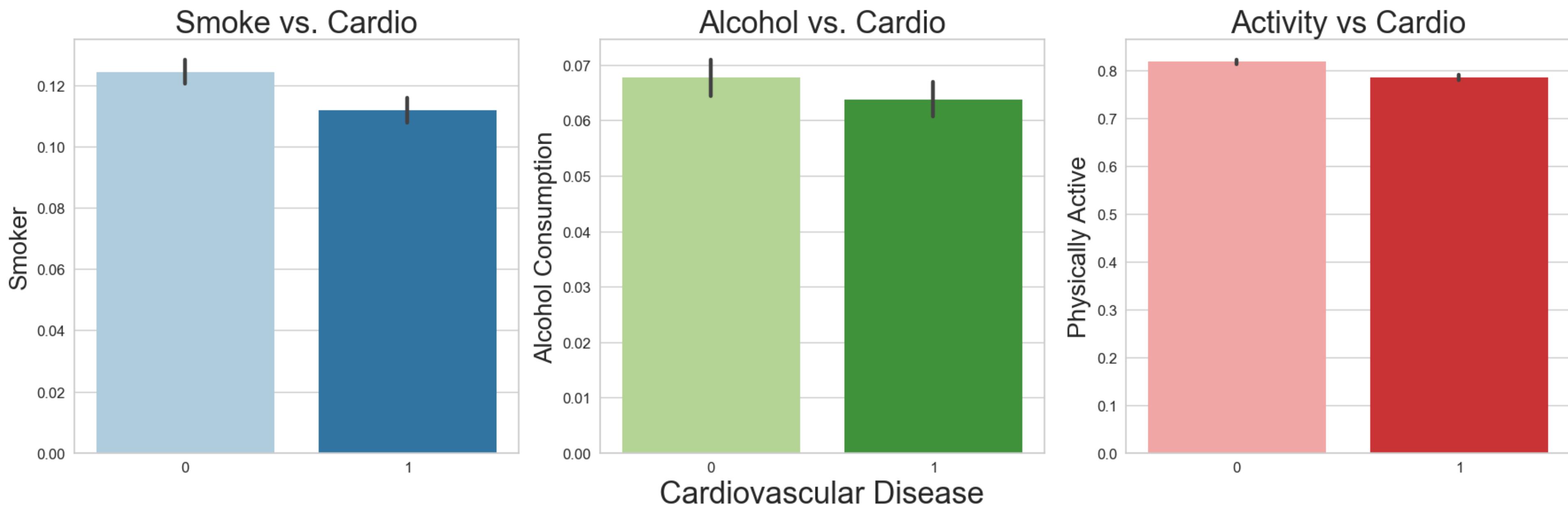
Blood Pressure vs Cardiovascular Disease



BP CATEGORIES

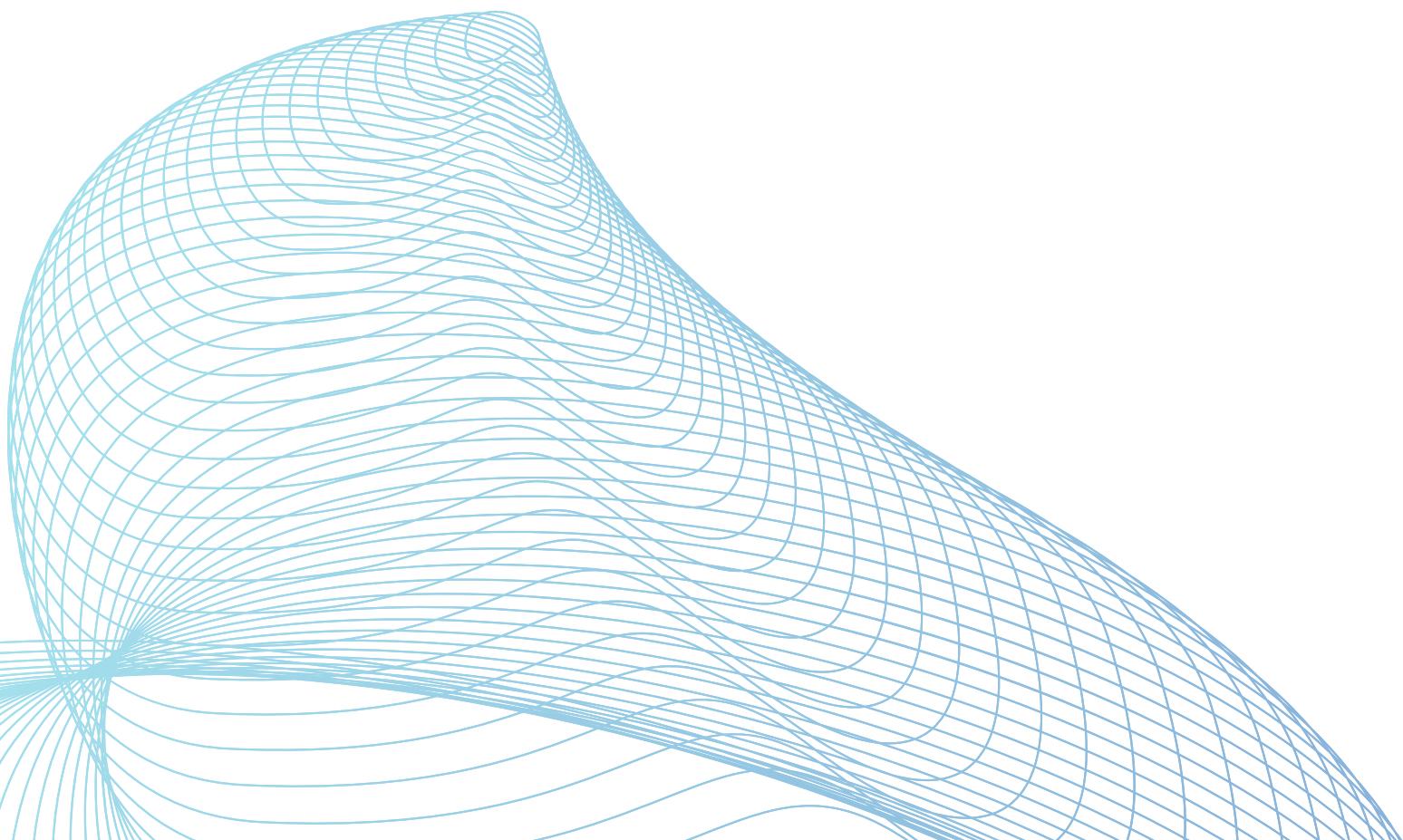


WHAT DO WE MAKE OF THIS?

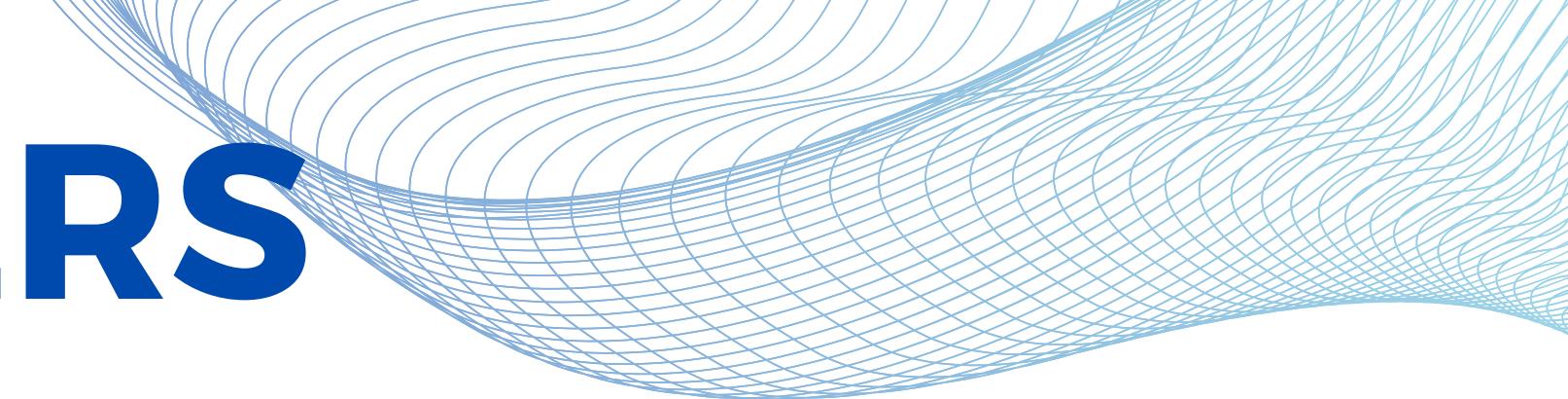


KMEANS CLUSTERING

CAN WE FIND MORE TRENDS?



CLUSTERS



Healthy Females

- **97% Females**
- Good blood pressure
- Normal cholesterol
- Normal glucose
- Don't smoke or drink
- Normal BMI
- **29 % CVD**

Healthy Males

- **98% Males**
- Elevated blood pressure
- Normal cholesterol
- Normal glucose
- Some smoke
- Few drink
- Normal BMI
- **35 % CVD**

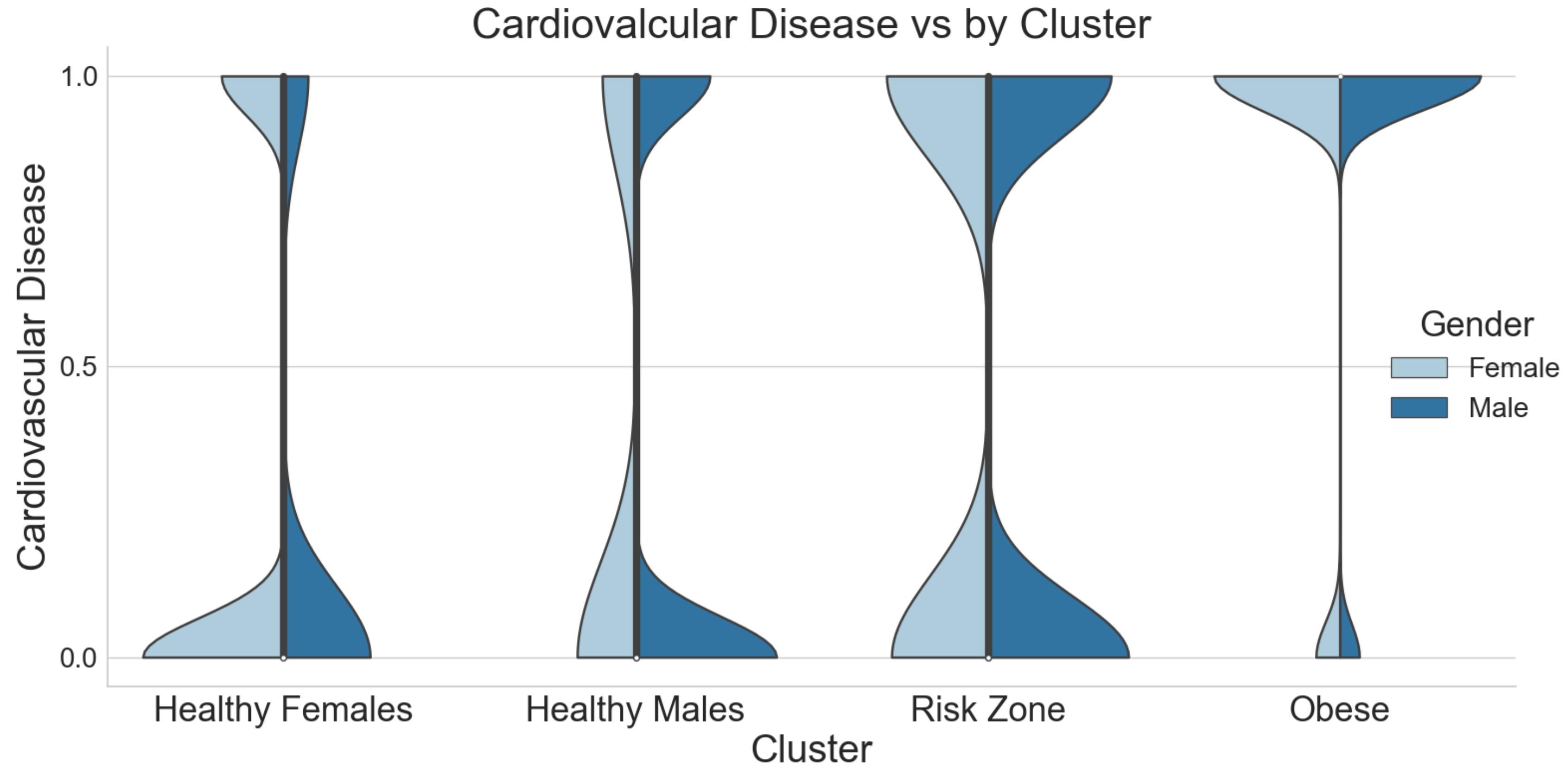
Risk Zone

- Mostly Males
- High blood pressure
- **55 % Smoke**
- **All Drink**
- Slightly high BMI
- **47 % CVD**

Obese

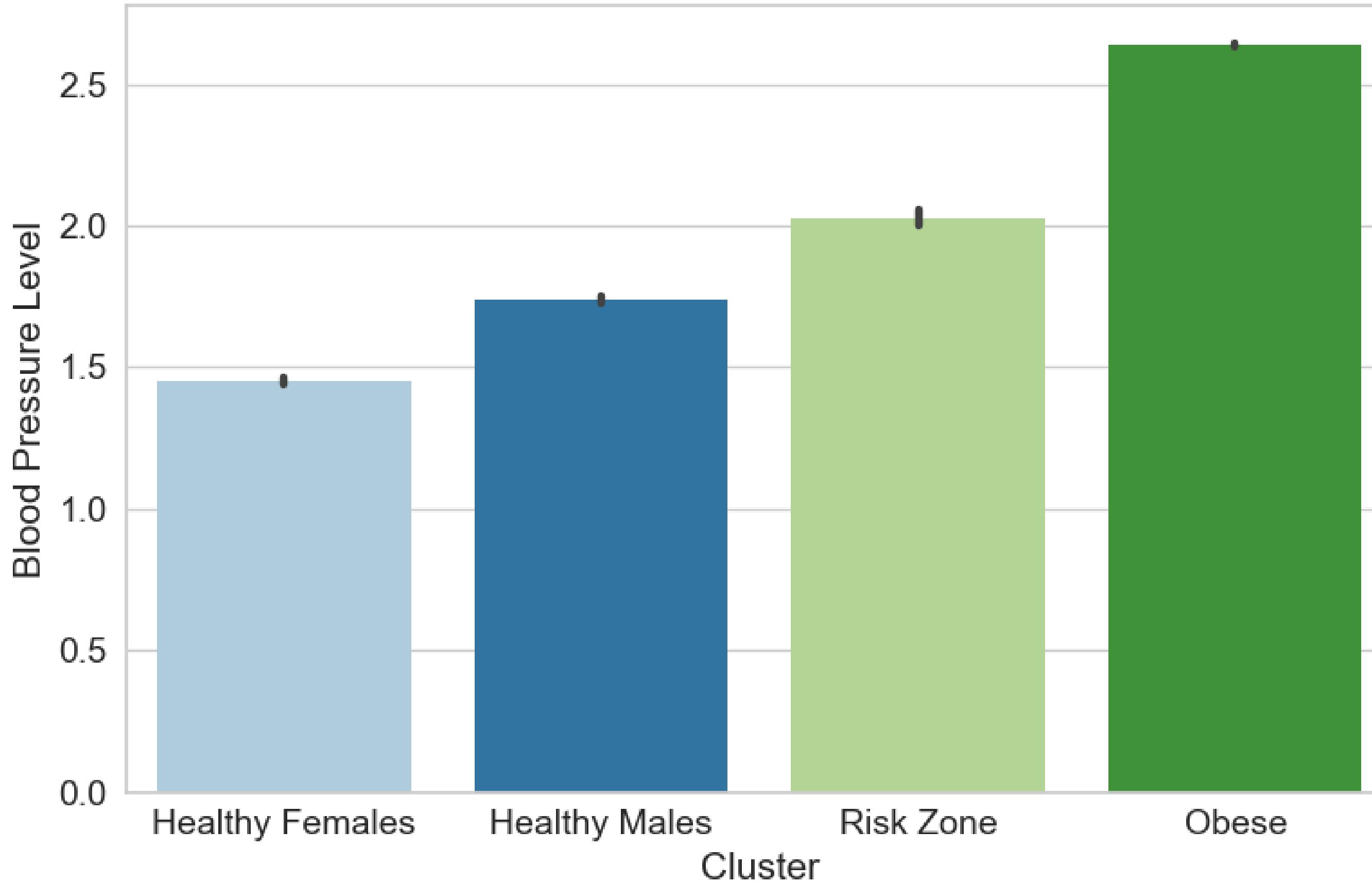
- Very high blood pressure
- Bad cholesterol
- Bad glucose
- **Obese BMI > 30**
- **86 % CVD**

CVD FOR CLUSTERS



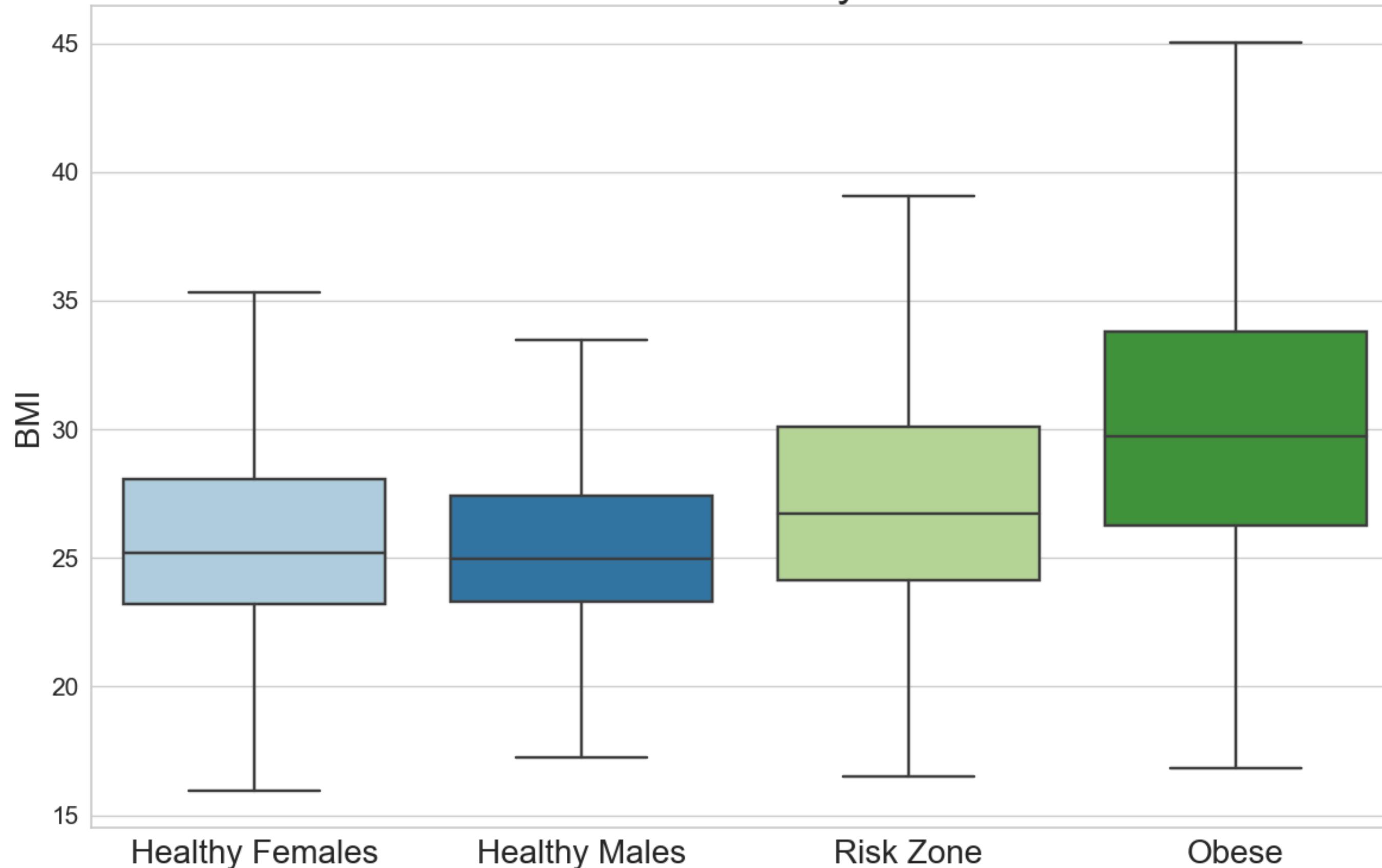
BP FOR CLUSTERS

Blood Pressure by Cluster

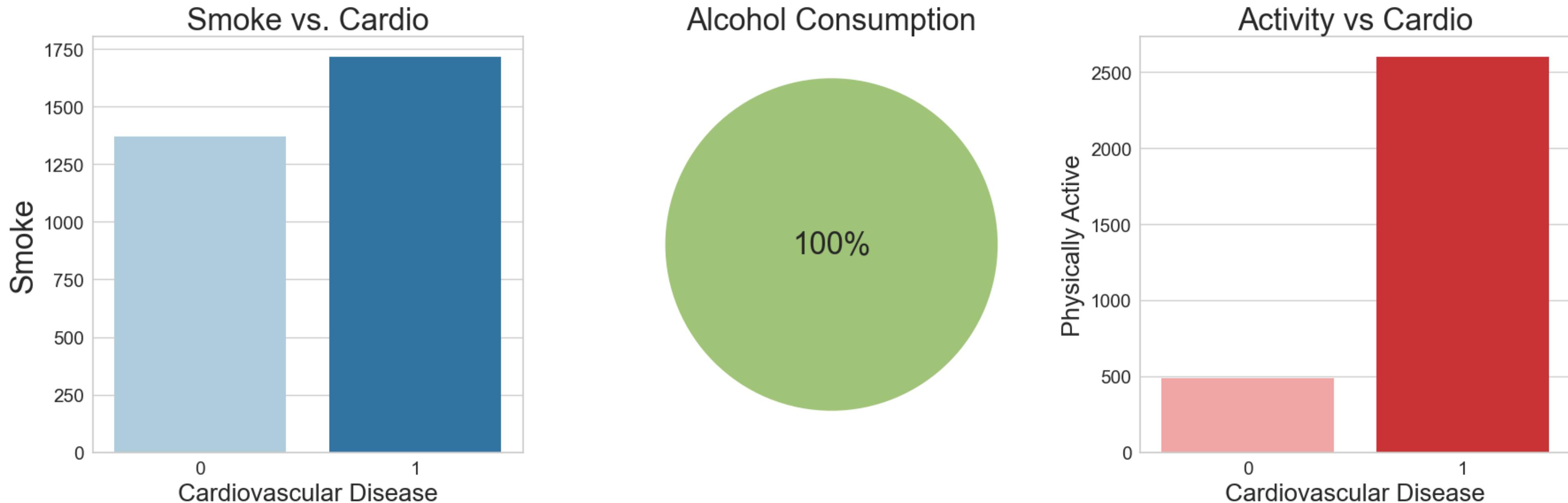


BMI FOR CLUSTERS

BMI Distribution by Cluster

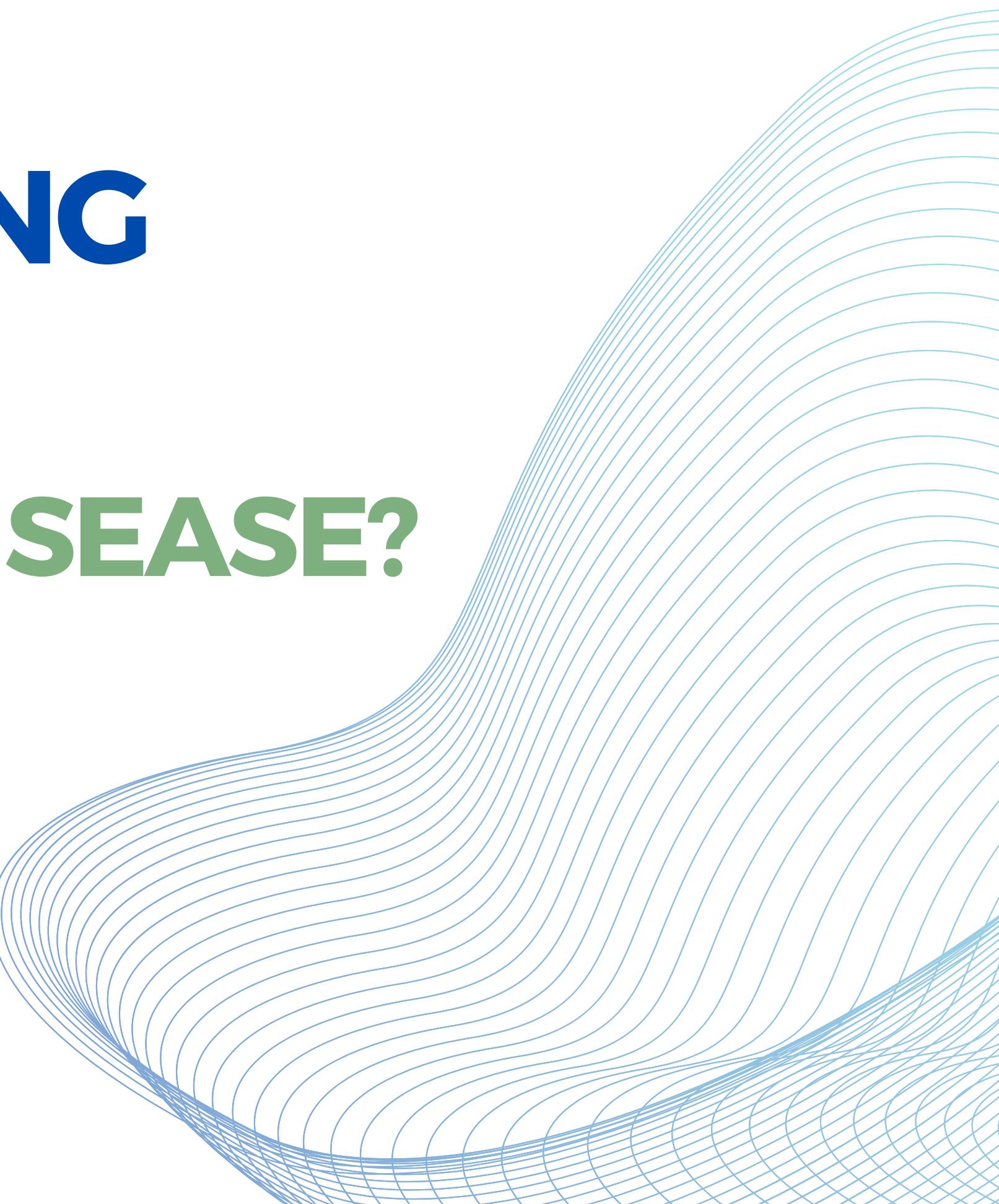
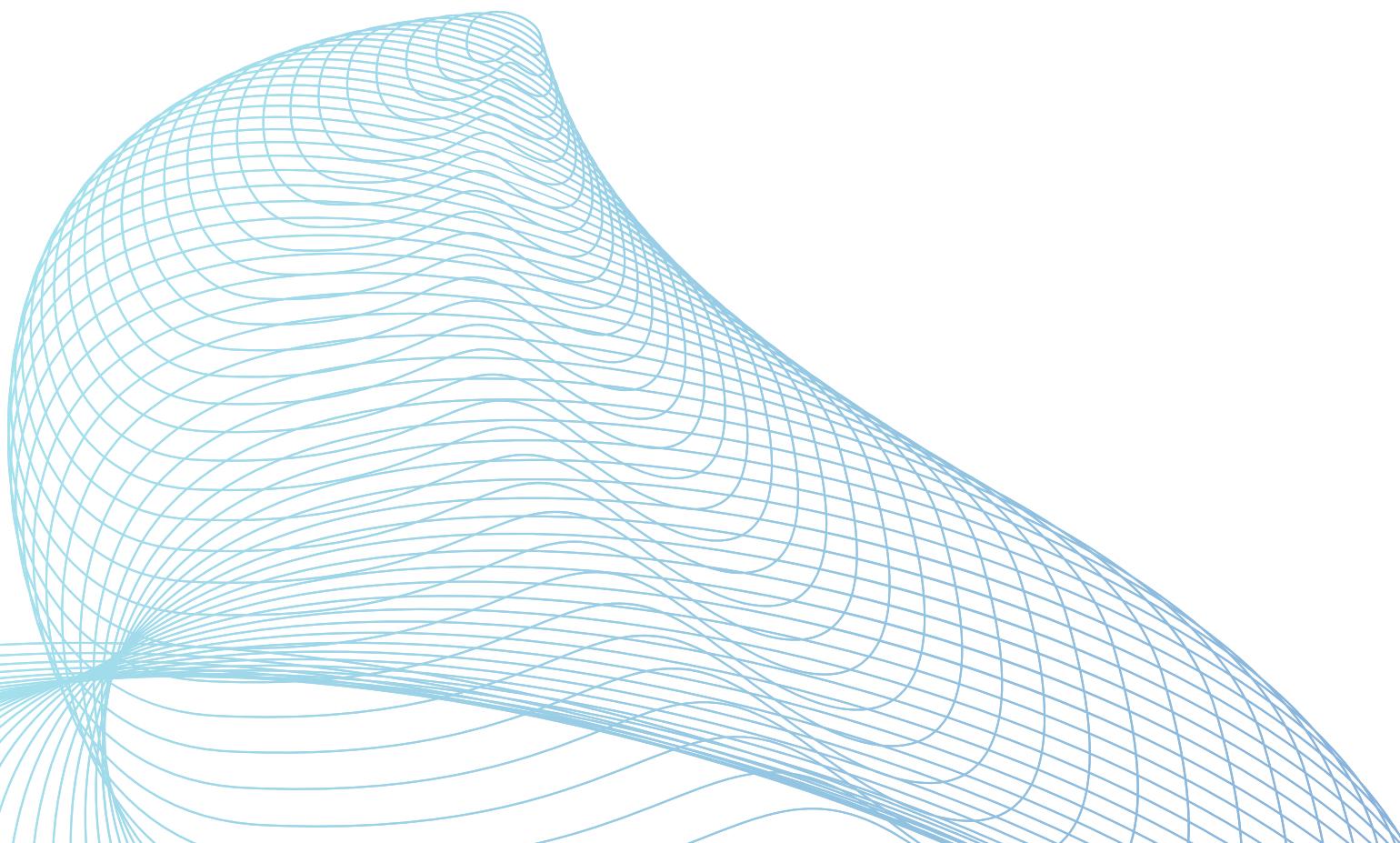


RISK ZONE - 47% CVD



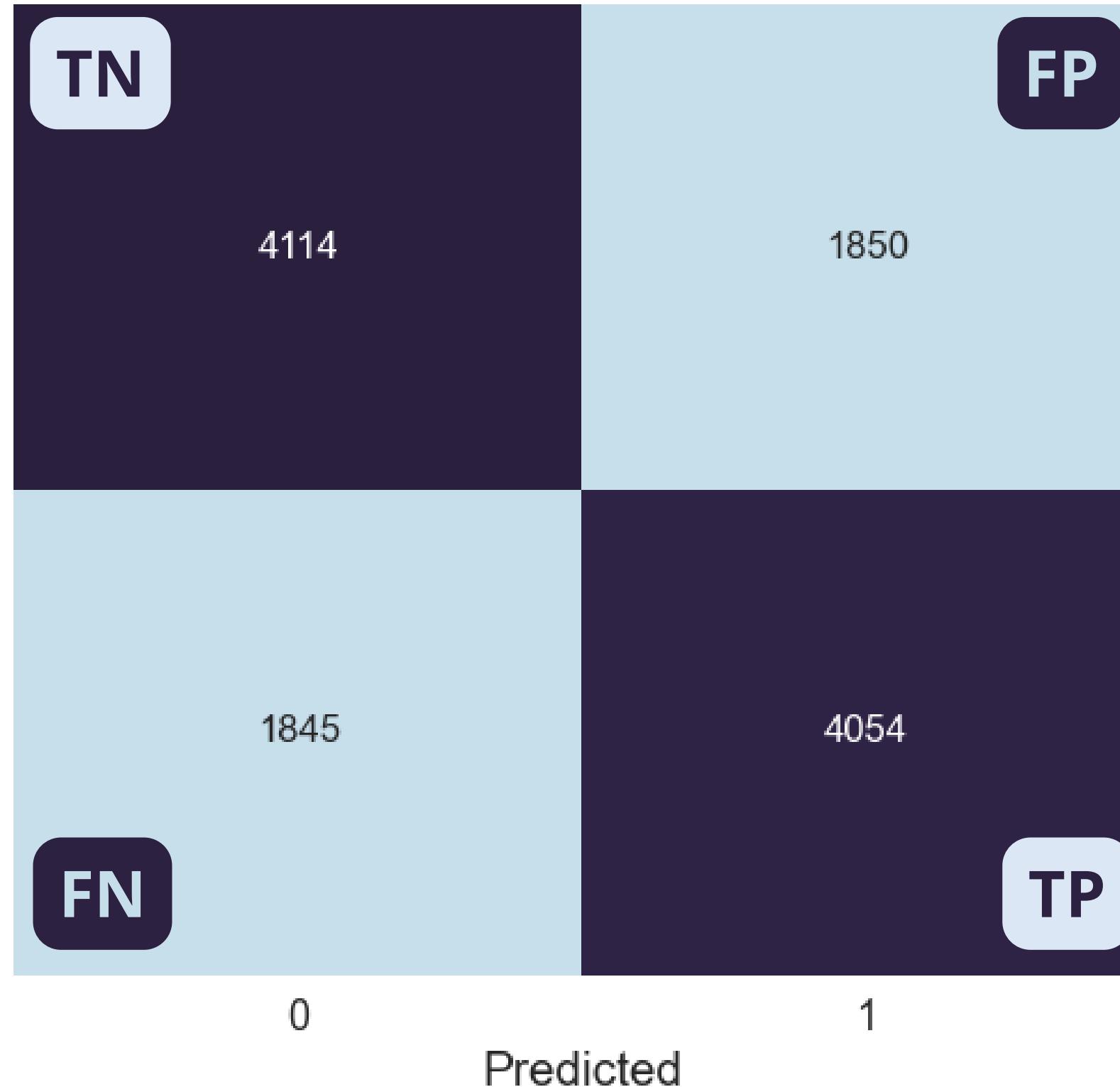
SUPERVISED MACHINE LEARNING

**CAN WE PREDICT
CARDIOVASCULAR DISEASE?**



TEST DATA

Test Data Confusion Matrix



Does this Save Costs?

- €282 Billion - Each Year in EU*
- 447 M People in EU
- TN = €0
- TP = €630*
- FP = €315**
- FN = €750

*Economic burden of cardiovascular diseases in the European Union

**Heart Failure: The Hidden Cost of Late Diagnosis

CALCULATIONS

Operational costs = $(4054*630)+(1845*750)+(1850*315)$

Operational costs = €4520520

Cost per person = $4520520 / 11863$ people in Test

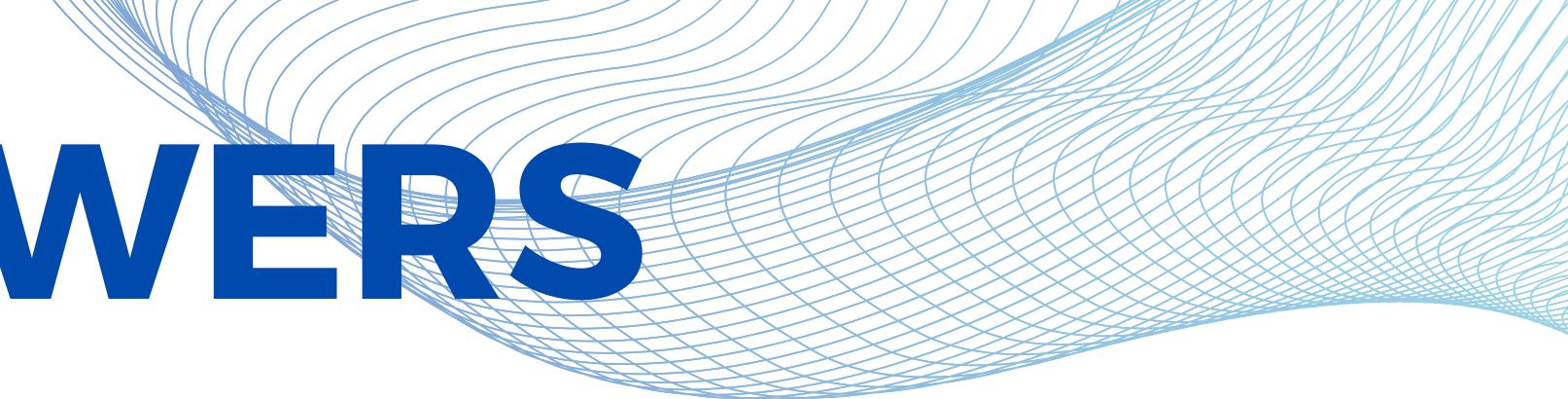
Cost per person = 380€

Total = $380 * 447M$

Total = €170B

Total €170B < Target €282B

FINAL ANSWERS



**What Are The Biggest Risk Factors
According to the Data?**

Obesity & High blood pressure

**Better understanding of Data
collection**

Drinking (6%) & Physical activity (80%)

Avoid smoking

Drink in moderation

Balanced diet

Regular Checkups

THANK YOU !

