



Code
Academy

HEALTH PROJECT

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Content



Data Understanding

Explore and assess the data to gain insights into its quality, structure, and content.



Data Preparation

Clean, transform, and preprocess the data to make it suitable for modeling.



Modeling

Develop and test various machine learning models to find the best solution.



Evaluation

Assess the model's performance and compare it to other potential solutions.

Columns

- *Id*
- *Age*
- *Gender*
- *Height*
- *Weight*
- *Ap-hi*
- *Ap-lo*
- *Cholesterol*
- *Gluc*
- *Smoke*
- *Alco*
- *Active*
- *Cardio*



Columns



Gender

Gender of the individual (1 - female, 2 - male).



Smoke

Whether the individual is a smoker or not (0 - non-smoker, 1 - smoker).

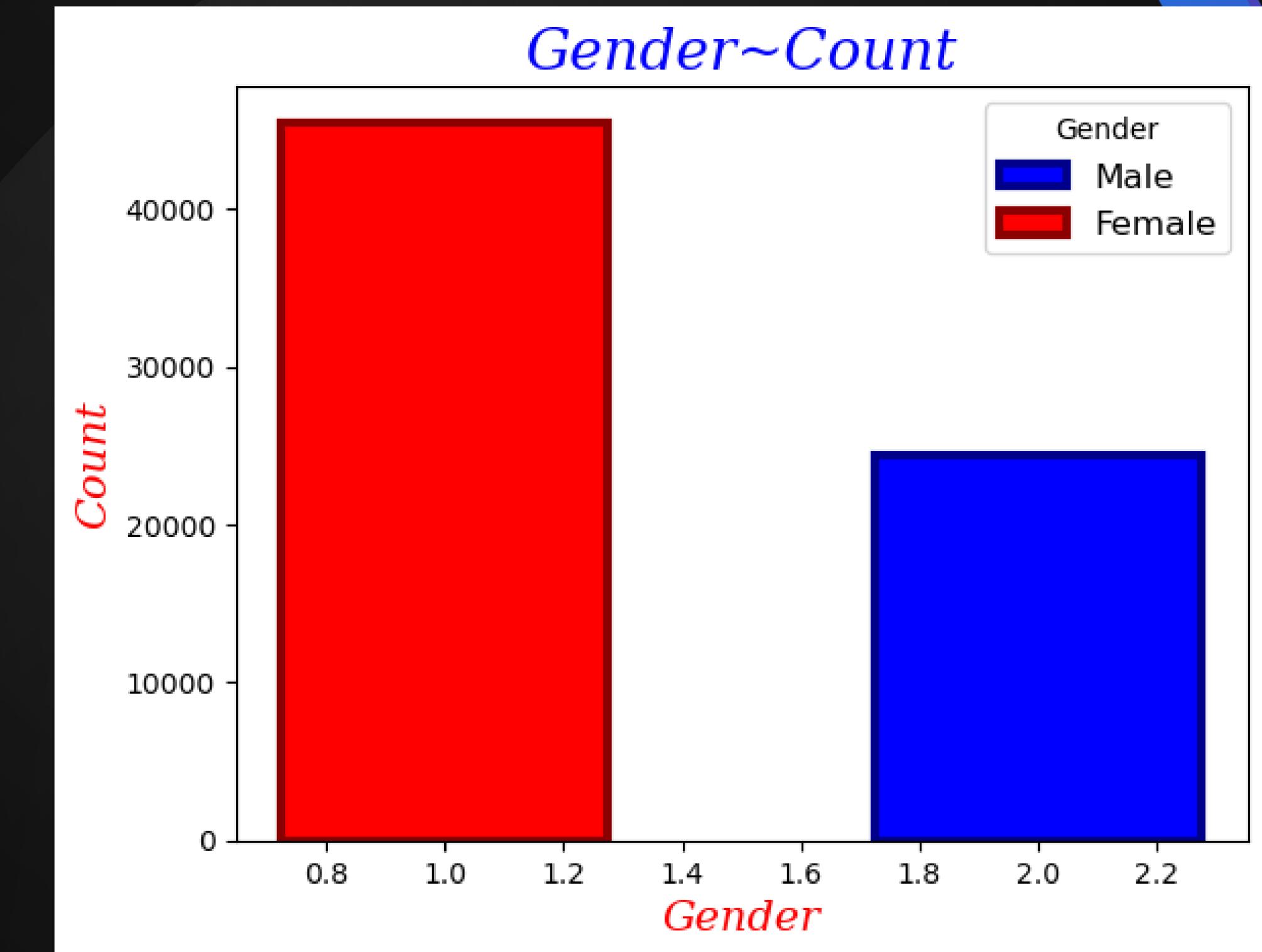


Cigarette

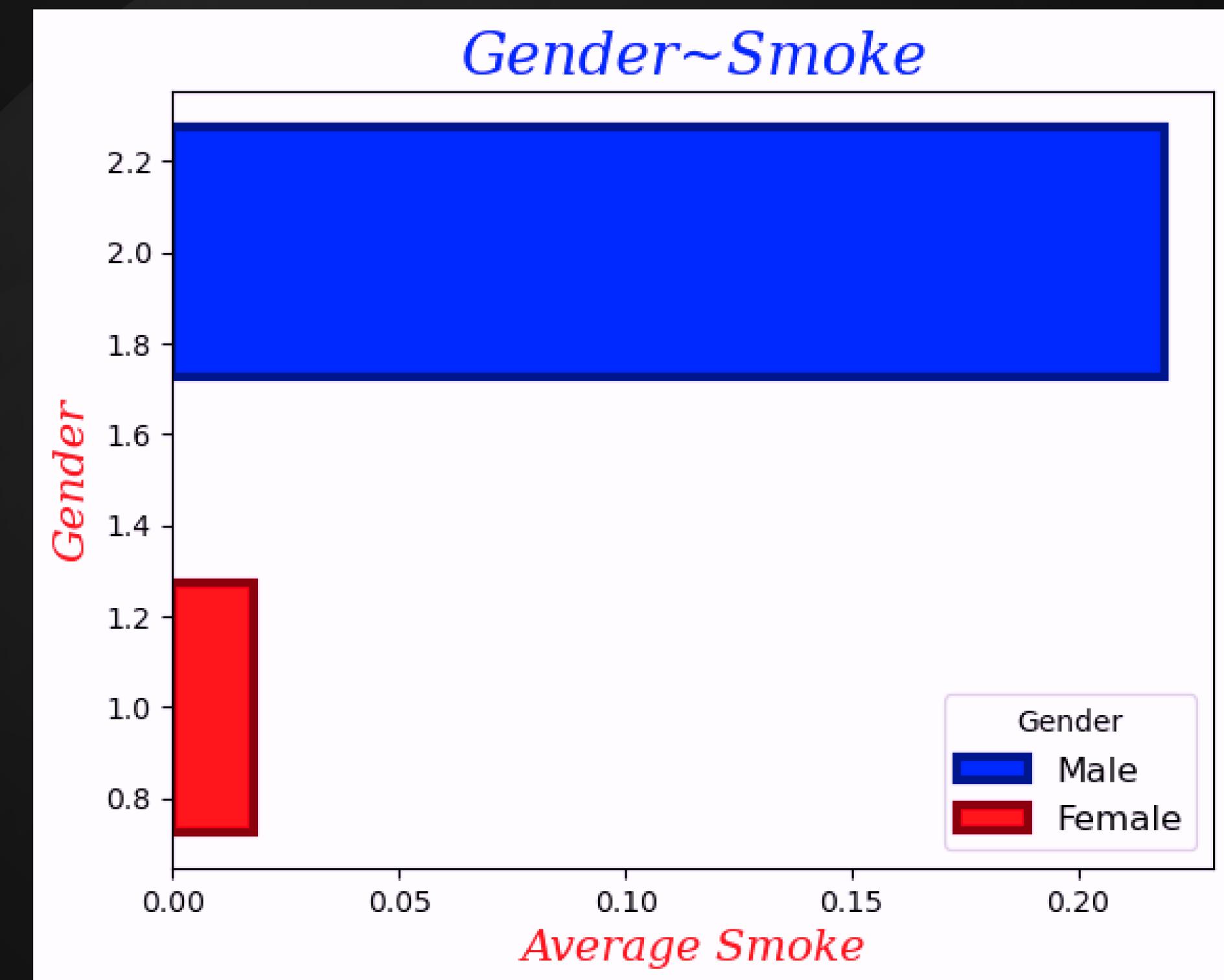
- Cigarette smoking significantly increases the risk of cardiovascular disease by causing atherosclerosis, high blood pressure, reduced oxygen supply, blood clot formation, and damage to blood vessels. Quitting smoking is crucial to reduce this risk and improve overall cardiovascular health.



- Let's find number of gender.



- Let's find the average cigarette use by gender.



Columns



Alcohol

Whether the individual consumes alcohol or not (0 - non-drinker, 1 - drinker).



Cardio

Presence of cardiovascular disease (0 - no disease, 1 - disease).



Alcohol

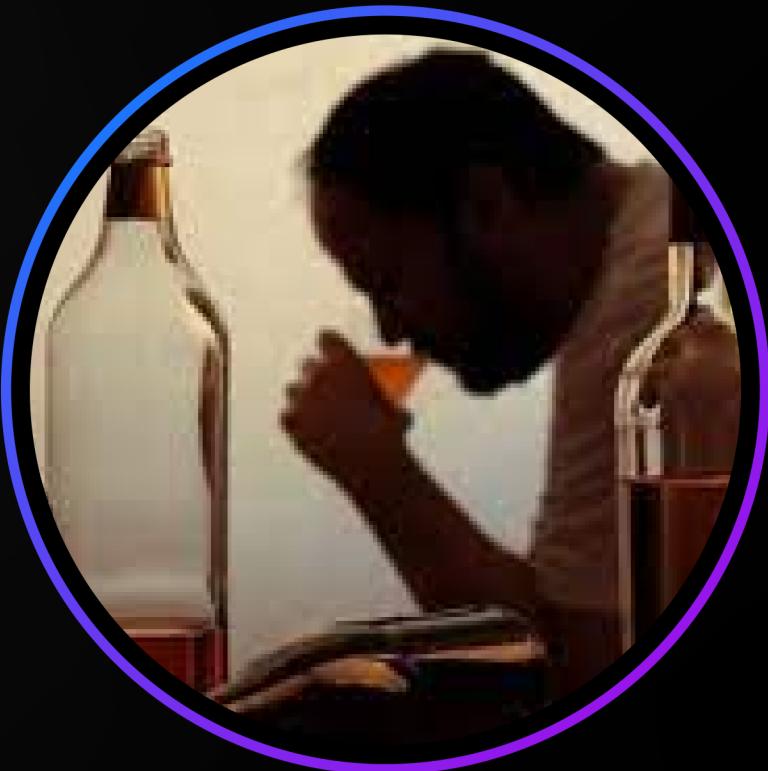
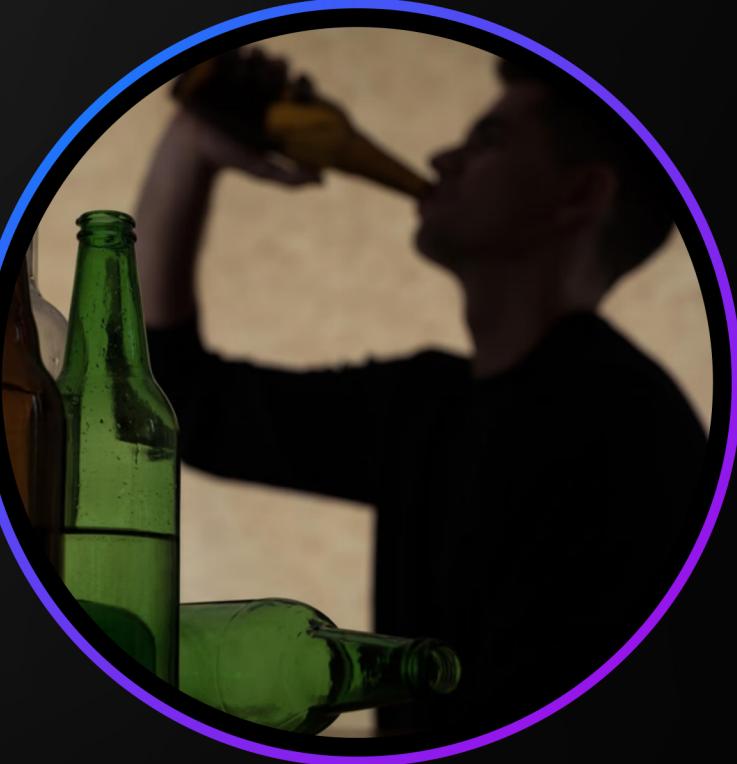
Advantages:

- Moderate alcohol consumption (up to one drink per day for women and up to two drinks per day for men) may offer cardiovascular benefits, including a reduced risk of coronary artery disease, ischemic stroke, and heart failure.

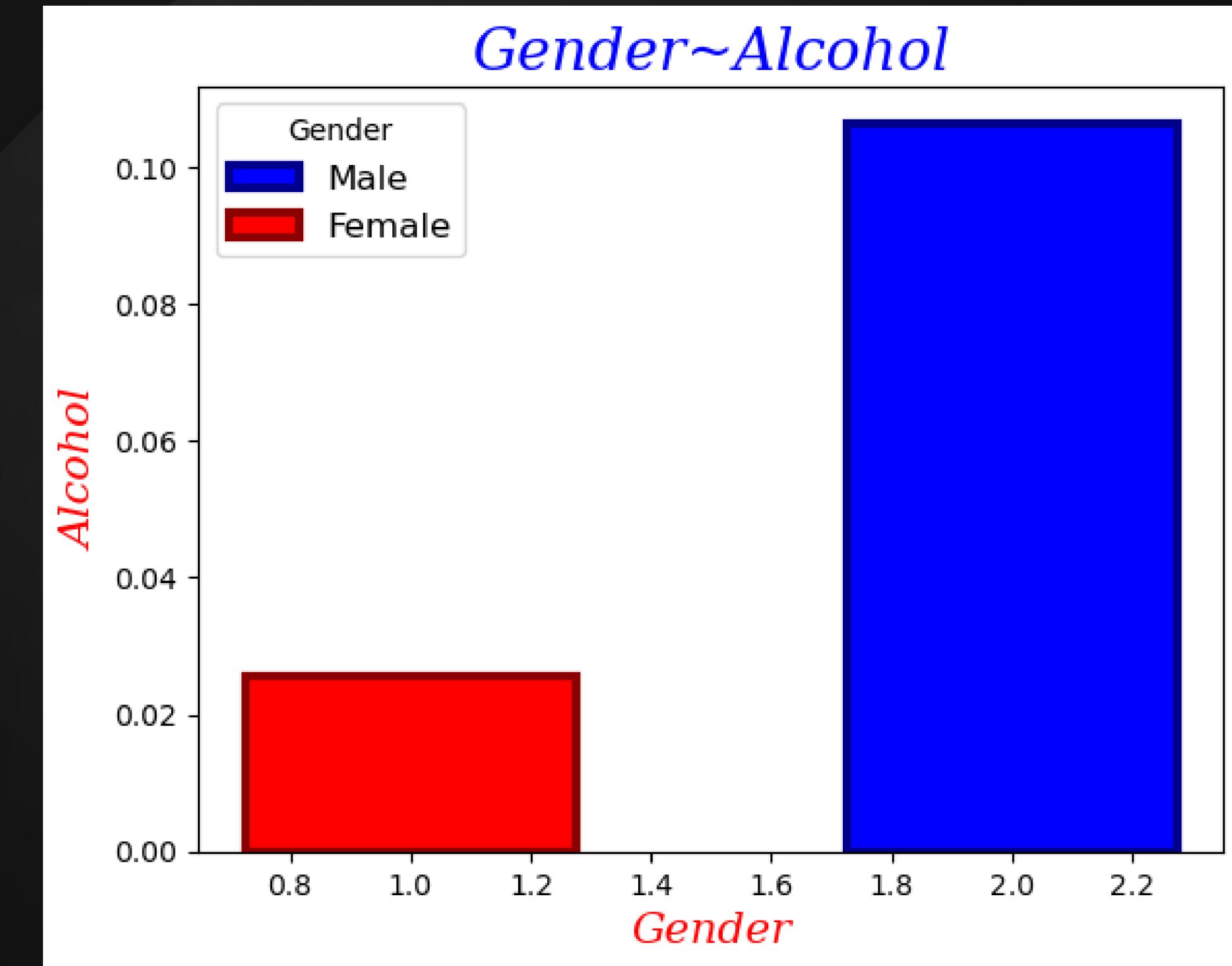


Disadvantages:

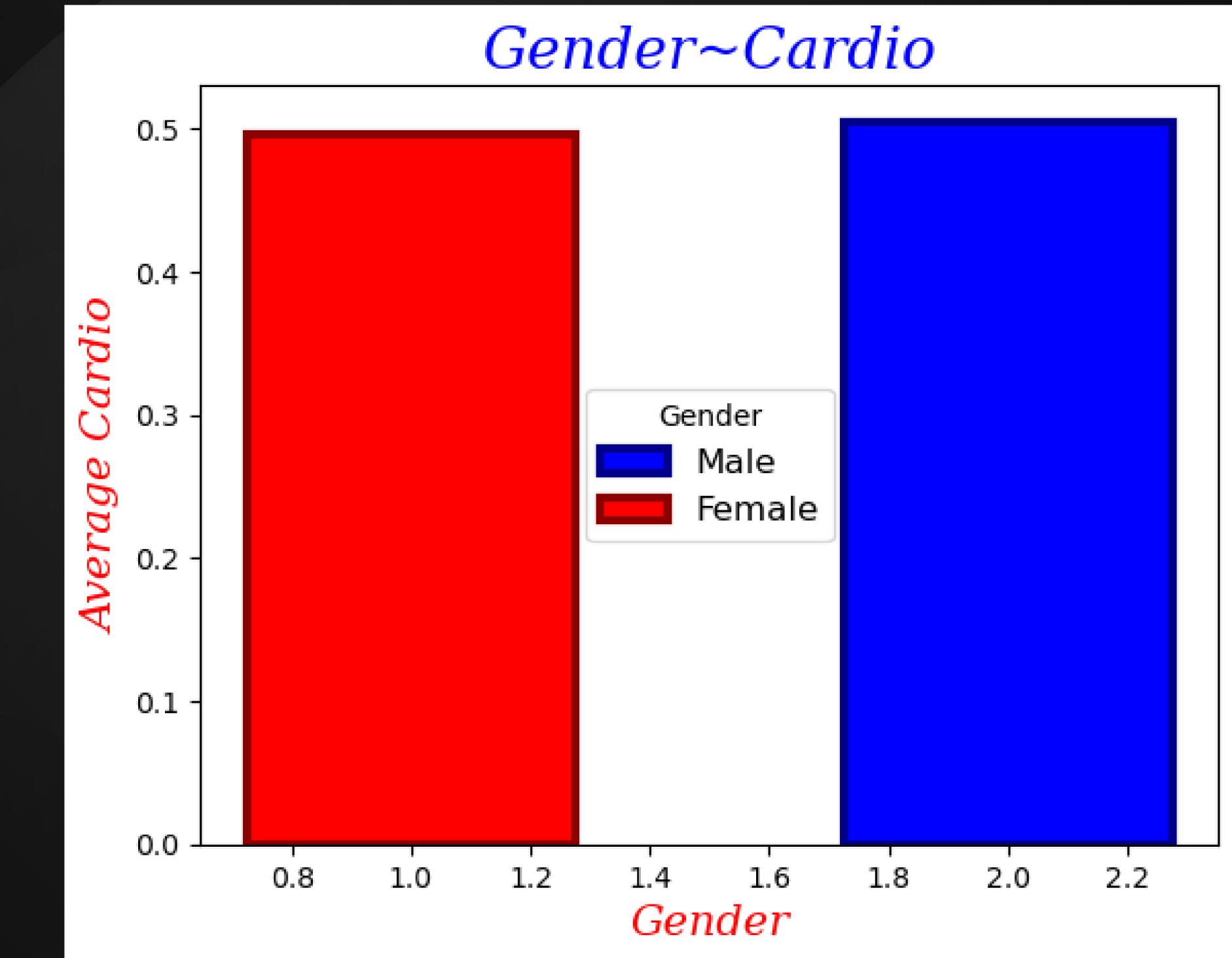
- Excessive alcohol consumption can harm the cardiovascular system, leading to problems such as high blood pressure, alcoholic cardiomyopathy, arrhythmias, and an increased risk of stroke.



- Let's find the average alcohol use by gender



- Let's find the probability of having cardiovascular diseases by gender.

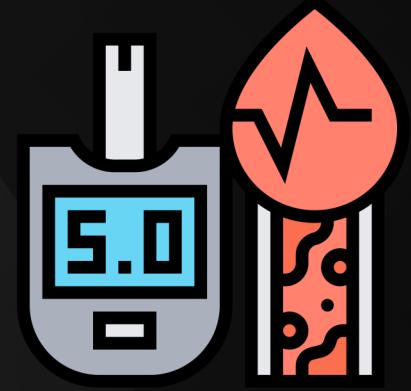


Columns



Active

Level of physical activity of the individual (0 - inactive, 1 - active).



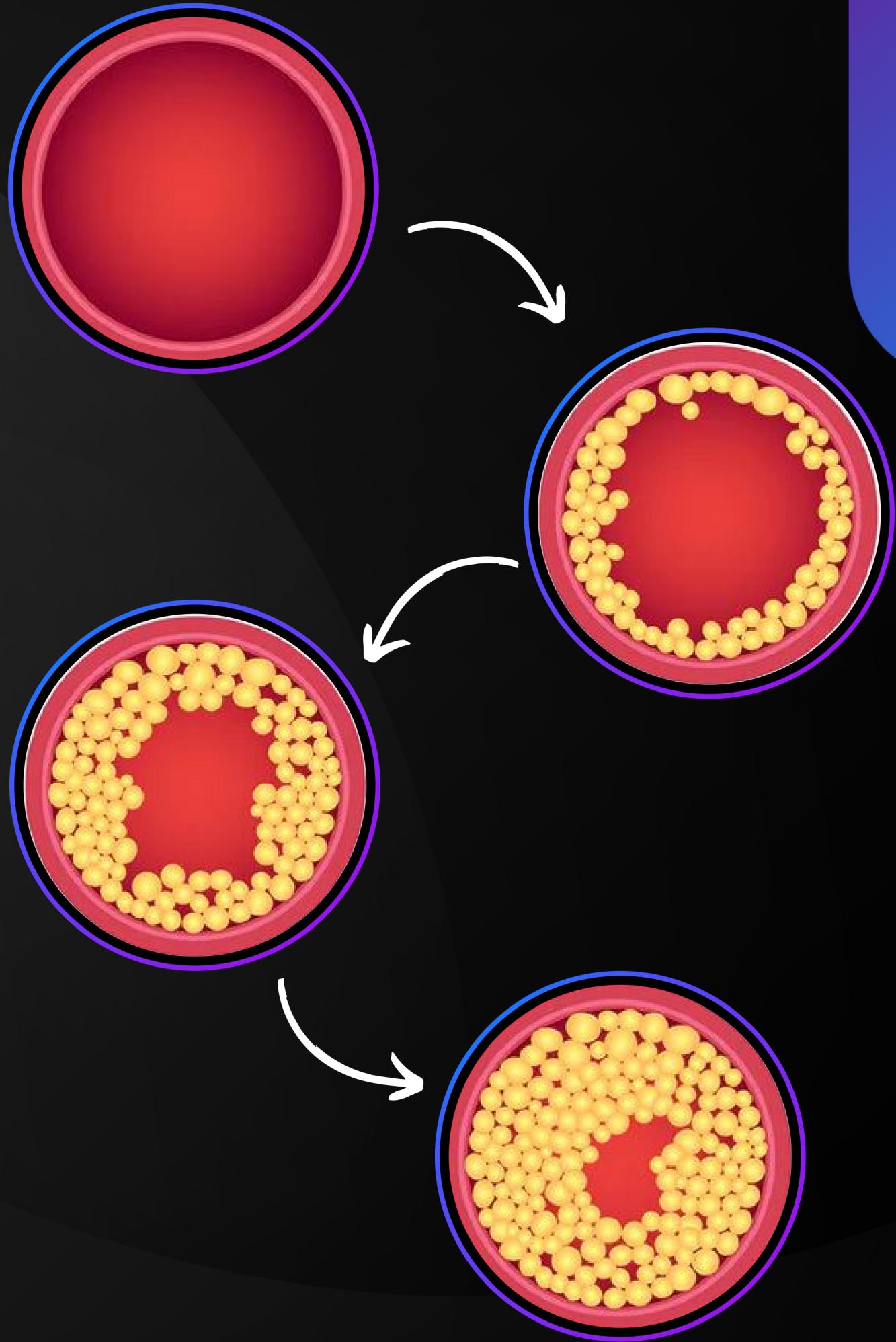
Cholesterol

Cholesterol level of the individual (1 - normal, 2 - above normal, 3 - well above normal).

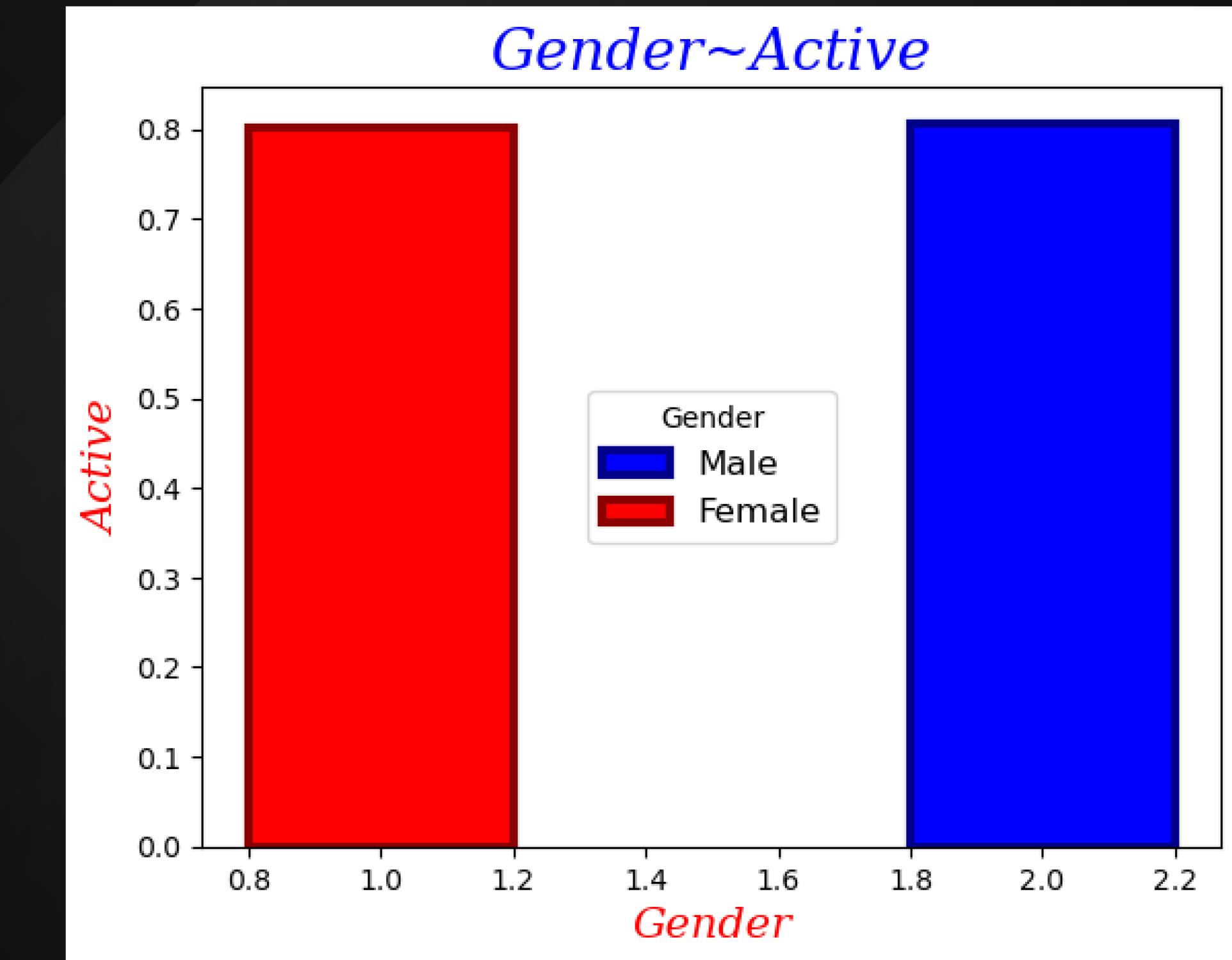


Cholesterol

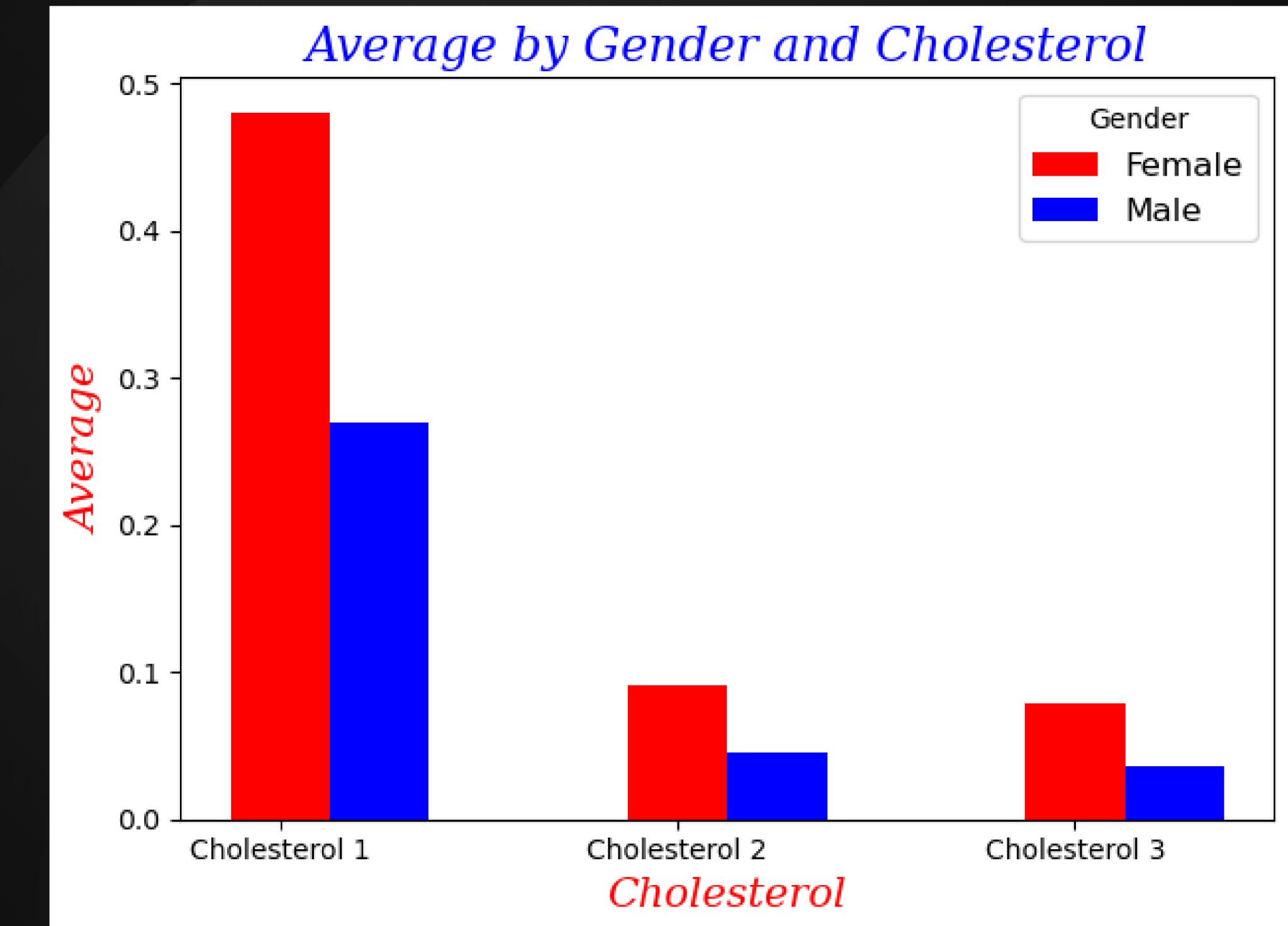
- Cholesterol impacts cardiovascular disease by raising the risk of atherosclerosis and CVD when LDL ("bad") cholesterol is high, while high levels of HDL ("good") cholesterol protect against CVD. Managing cholesterol through a healthy lifestyle is crucial for heart health.



- Let's find level ratio of physical activity by gender.



- Let's find the percentage of people by gender, cholesterol.

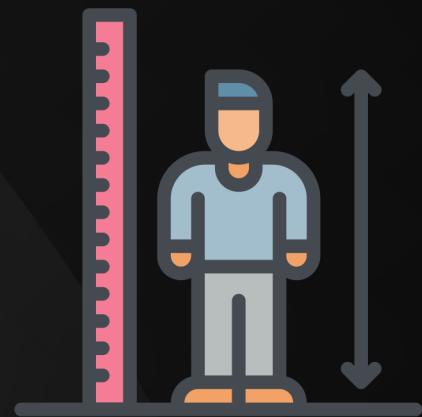


Columns



Age

Age of the individual
in days.

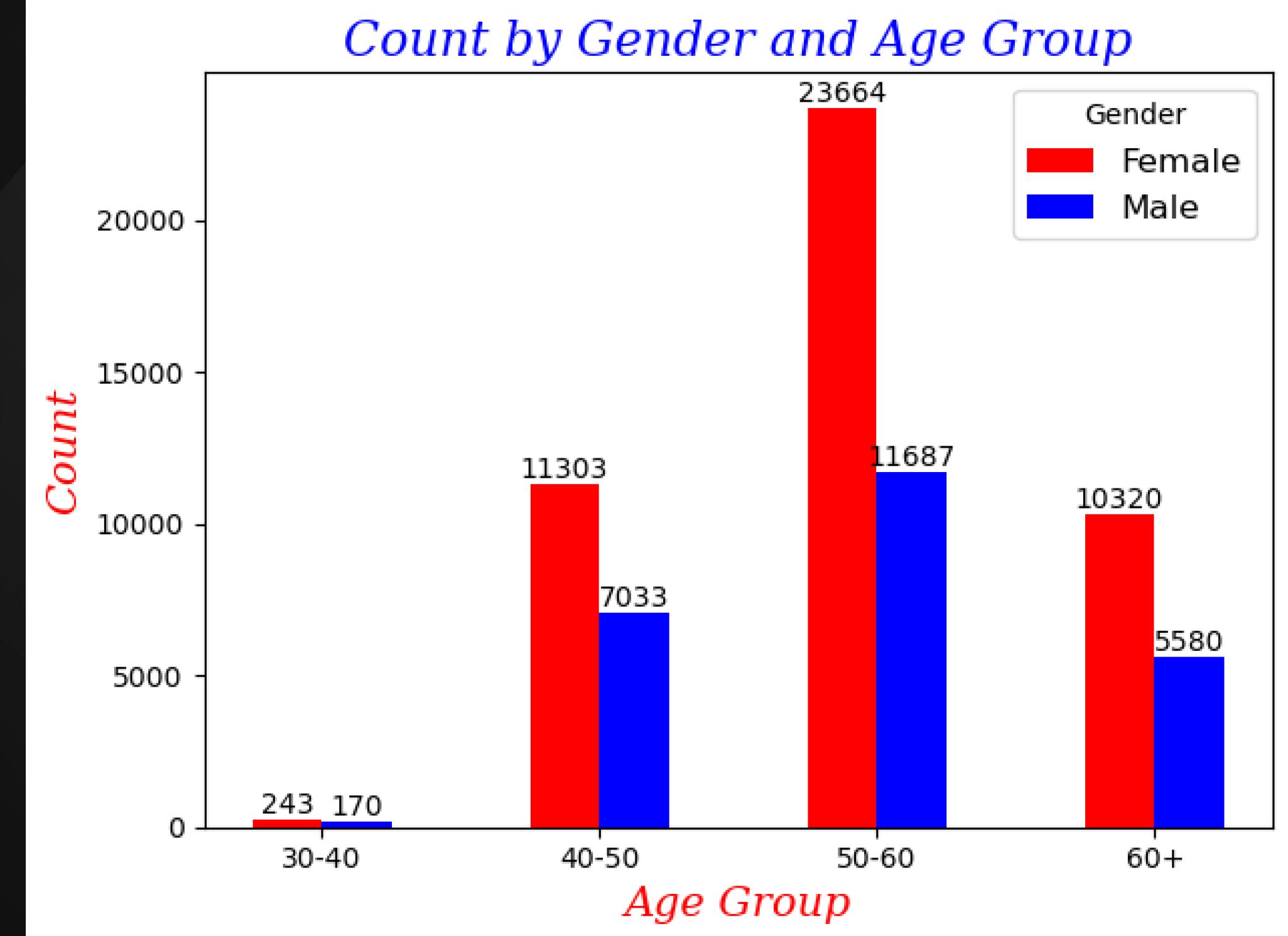


Height

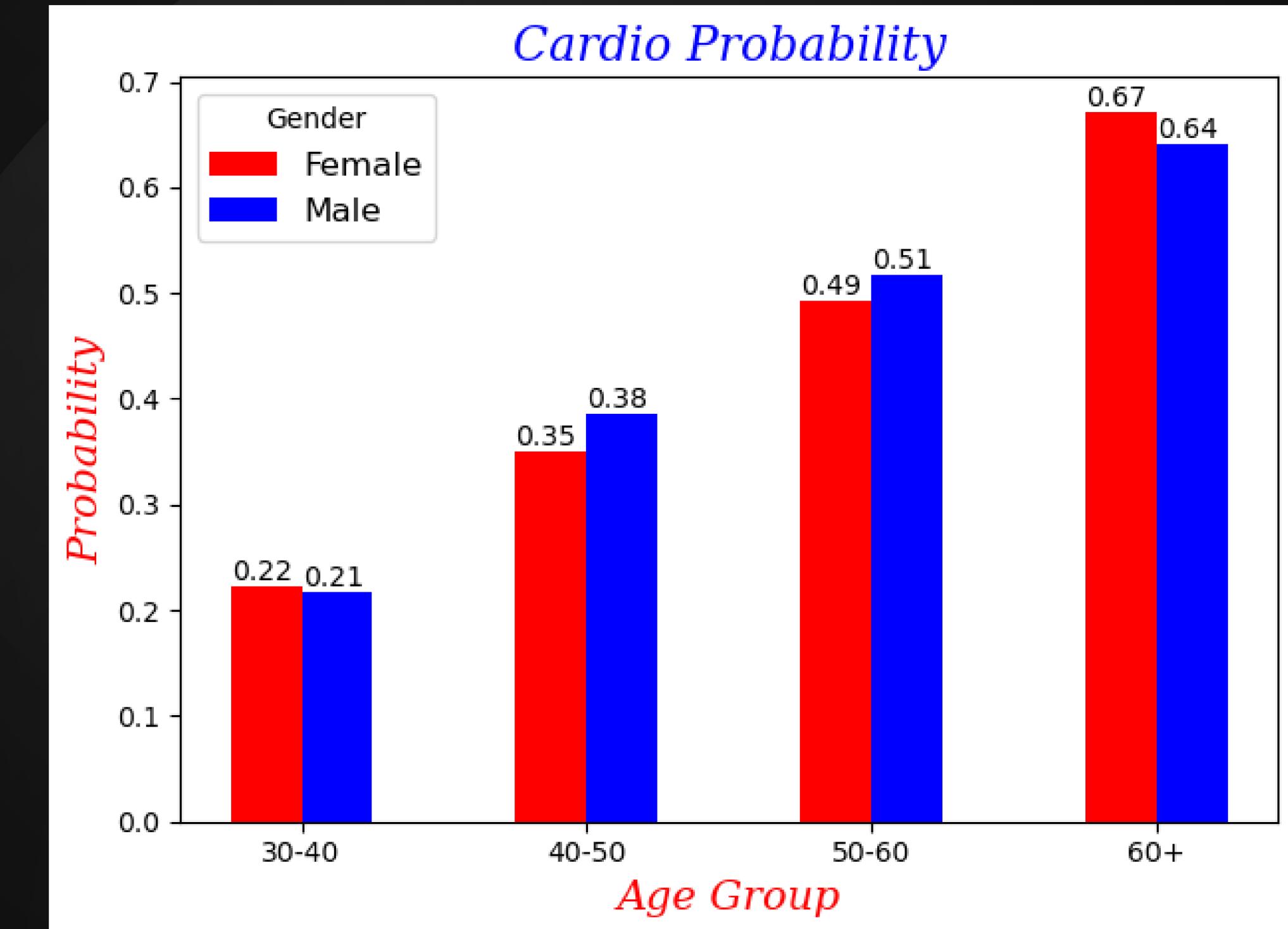
Height of the
individual in
centimeters.



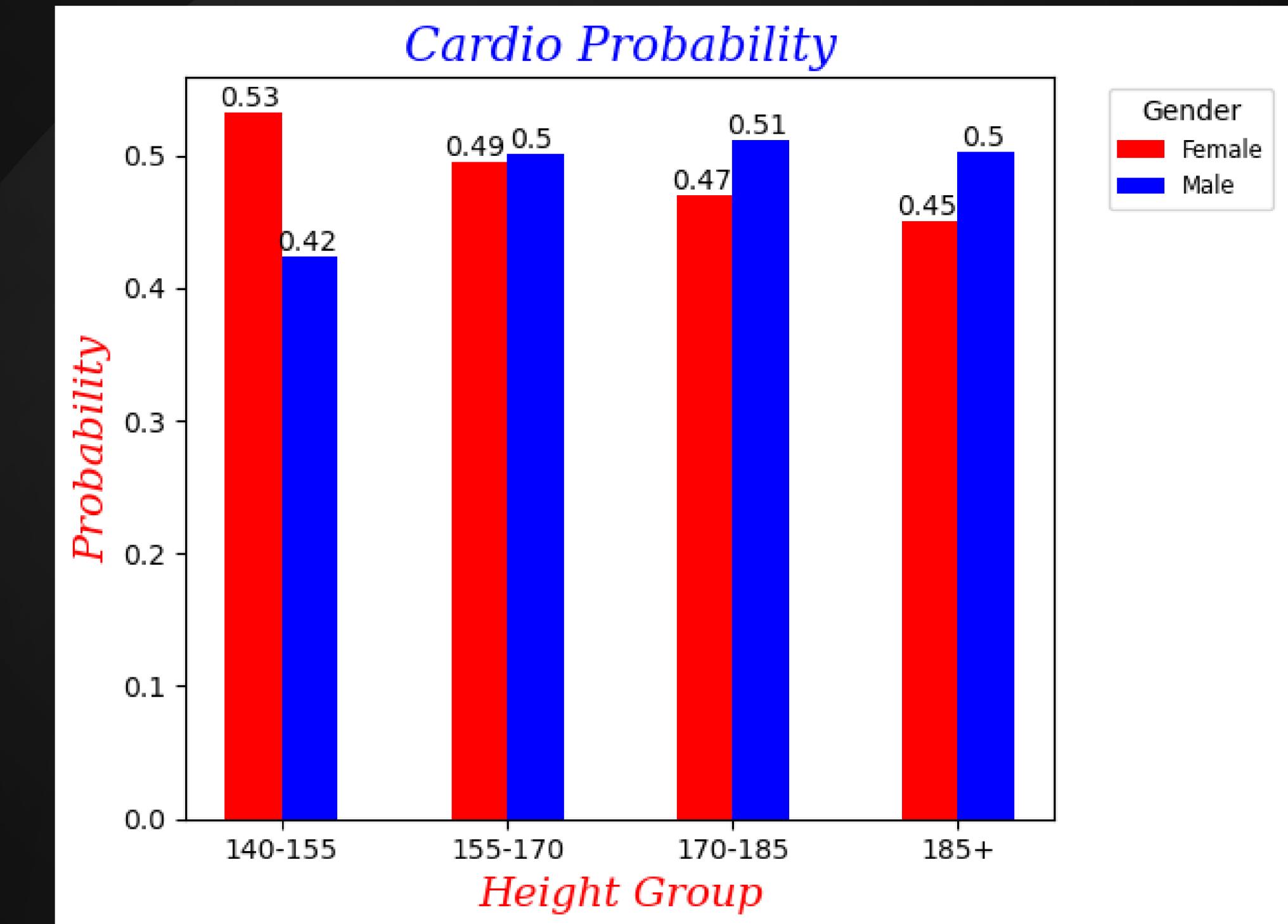
- Let's find the number of human by age group , gender.



- Let's find the probability of cardiovascular disease by age group , gender.



- Let's find the probability of cardiovascular disease by height group , gender.



Columns



Weight

Weight of the individual in kilograms.



Gluc

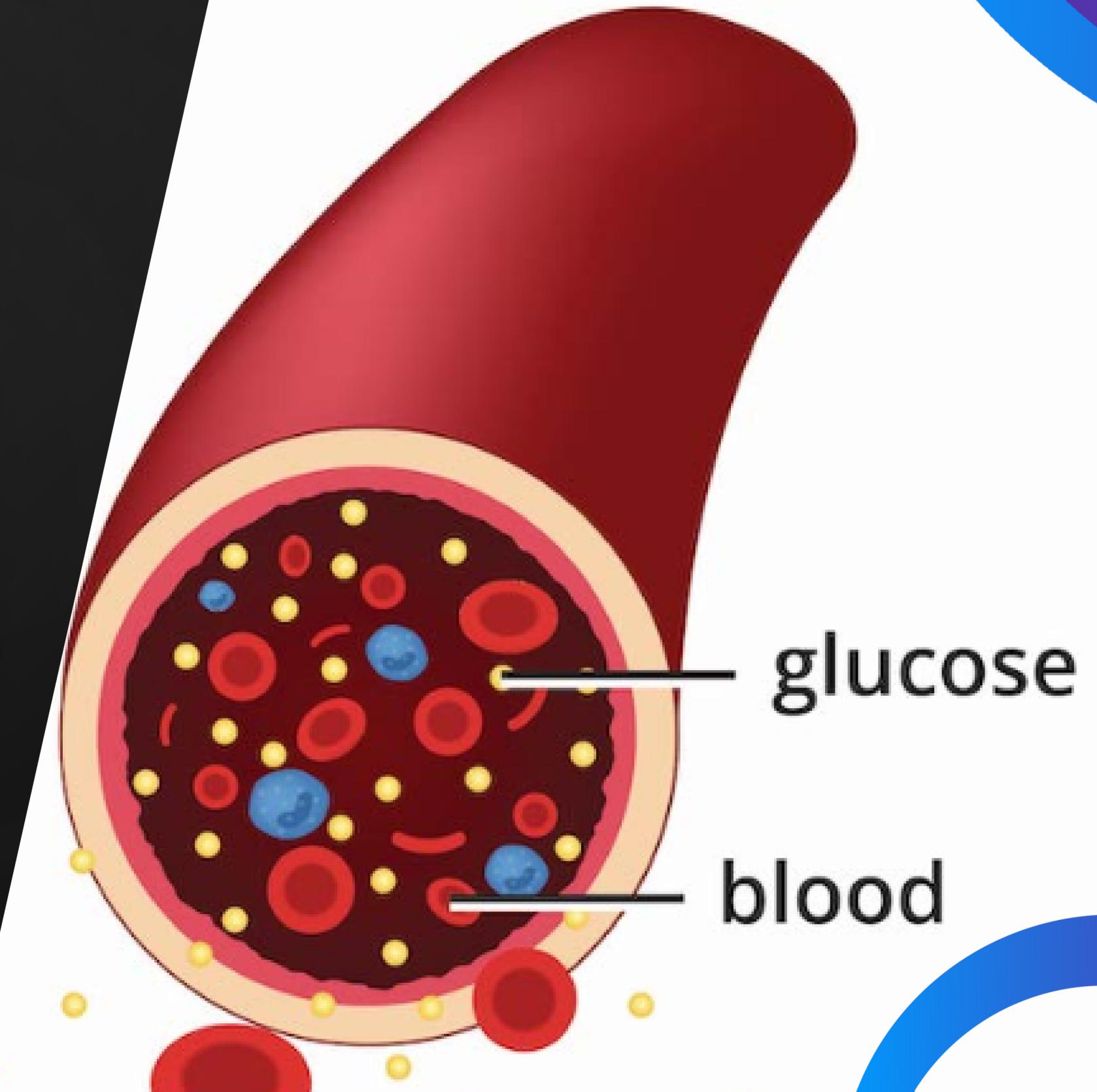
Glucose level of the individual (1 - normal, 2 - above normal, 3 - well above normal).



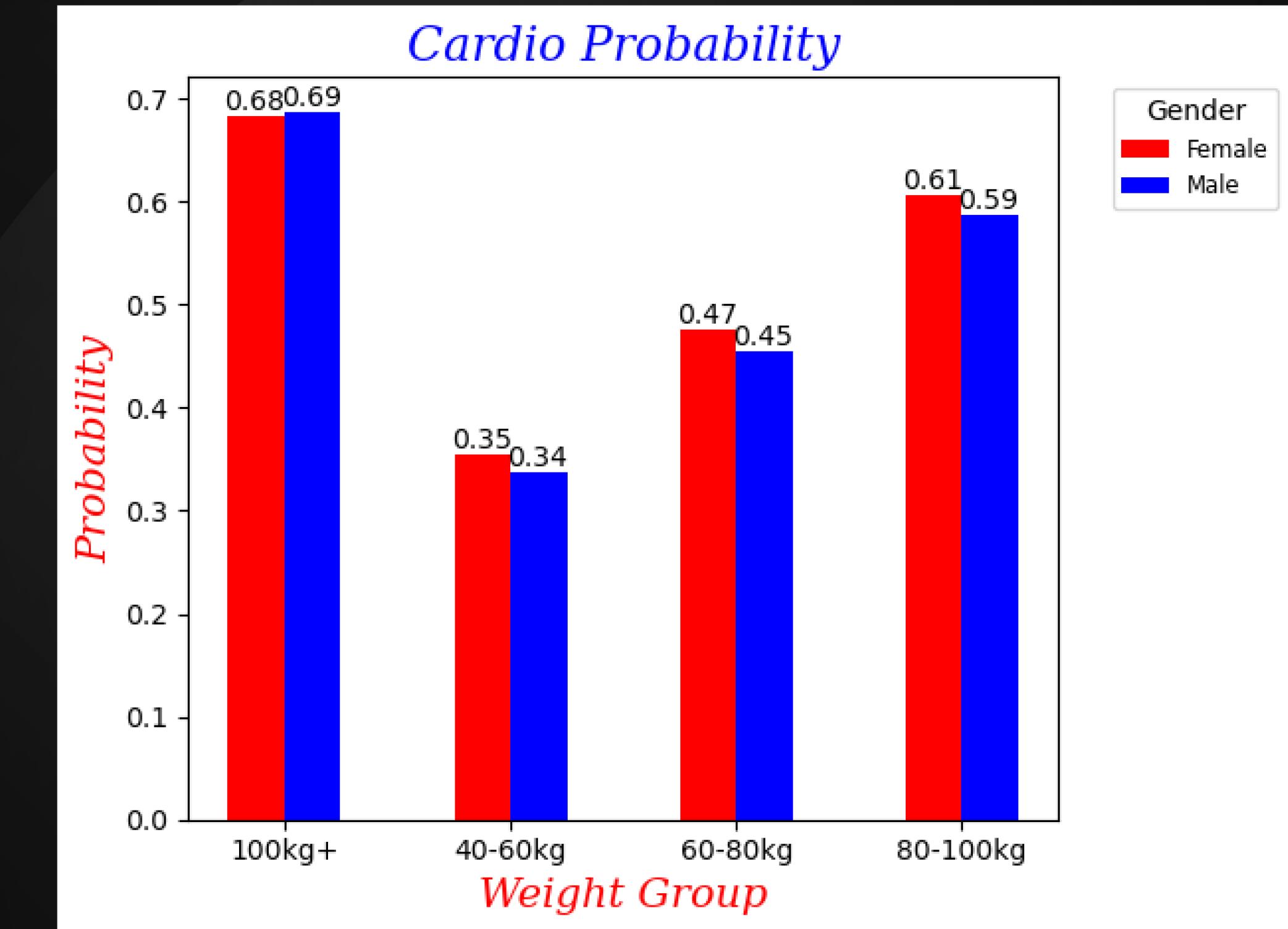
High blood glucose

Impact Glucose

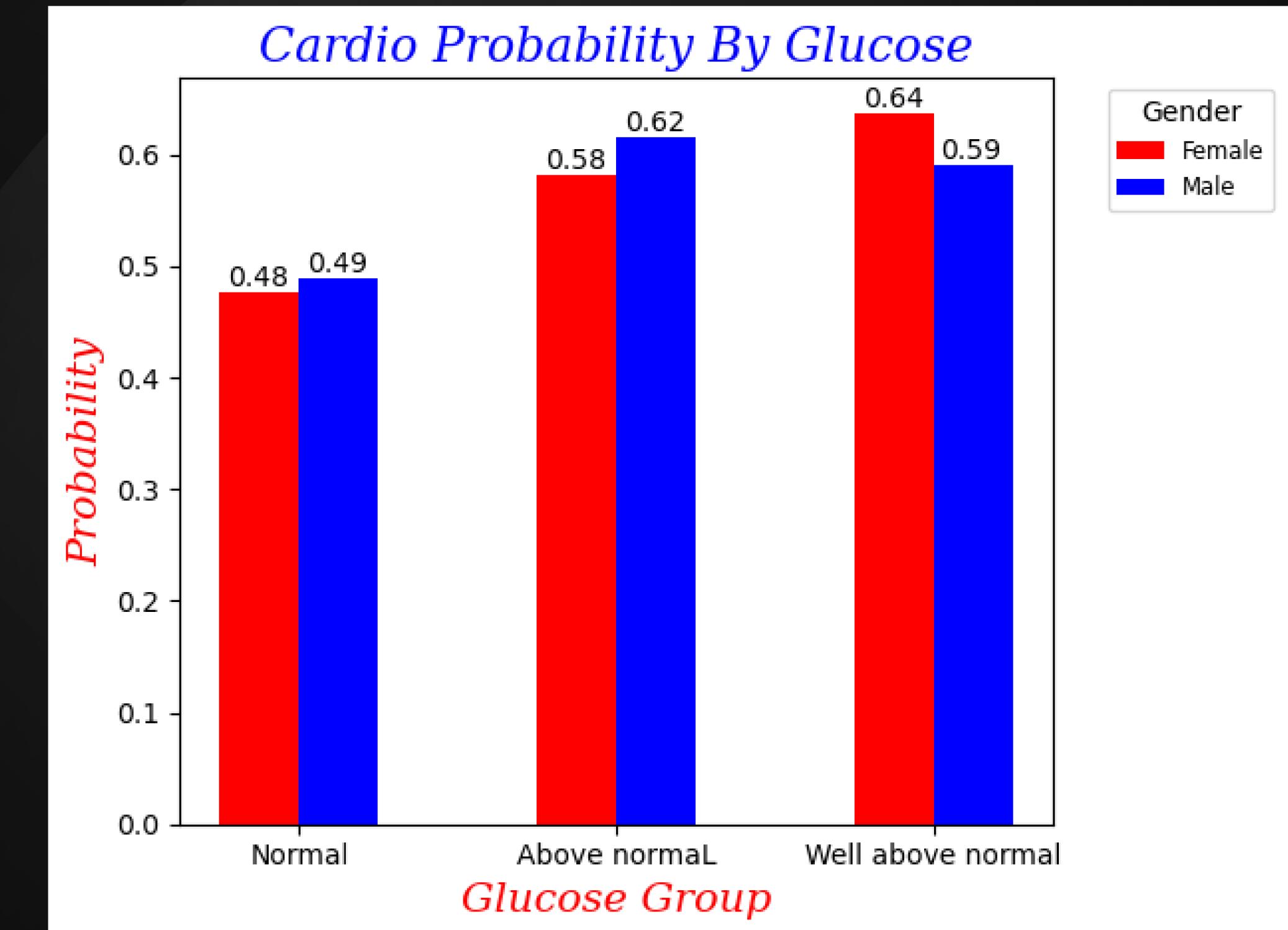
- Elevated glucose levels, often seen in diabetes, can have a significant impact on cardiovascular health. It increases the risk of cardiovascular diseases such as heart disease and stroke.



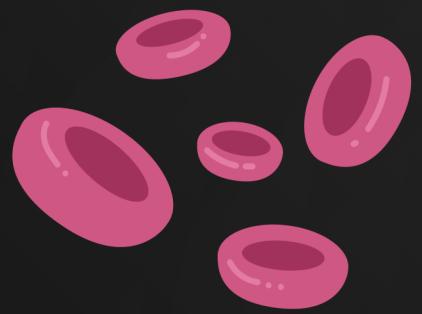
- Let's find the probability of cardiovascular disease by weight group , gender.



- Let's find the probability of cardiovascular disease by glucose group , gender.



Columns



Ap_hi

Systolic blood pressure, which is the higher value measured during the heart's contraction.



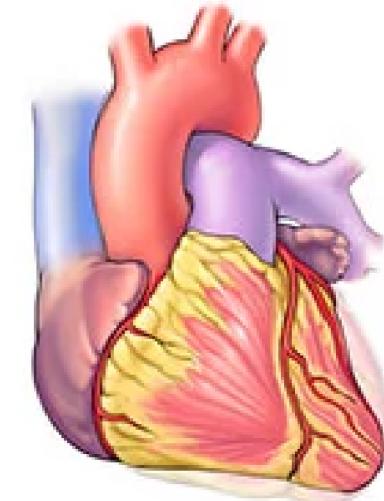
Ap_lo

Diastolic blood pressure, which is the lower value measured during the heart's relaxation.



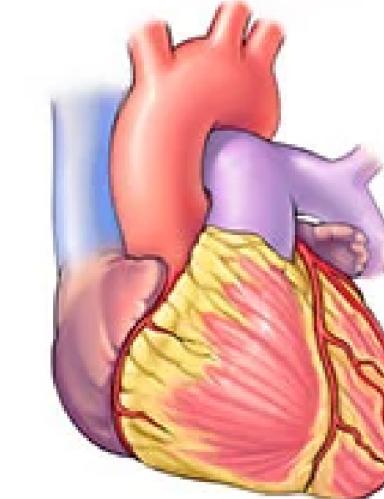
Systolic/Diastolic blood pressure

- Elevated systolic blood pressure (SBP) and diastolic blood pressure (DBP) are both significant risk factors for cardiovascular disease. High SBP increases the risk of heart disease, stroke, and organ damage, while high DBP is associated with heart disease, stroke, and hypertensive crises.



≥ 130

≥ 80



Systolic number
is when the
heart contracts

Diastolic number
is when the
heart rests



Cleveland
Clinic



SBP>DBP?

SBP

- During each cardiac cycle, the heart contracts and pumps blood into the arteries, leading to a peak pressure known as the systolic blood pressure. This represents the maximum pressure exerted on the arterial walls when the heart is contracting.

DBP

- On the other hand, during the resting phase of the cardiac cycle when the heart is relaxed and refilling with blood, the pressure in the arteries decreases, resulting in a lower pressure known as the diastolic blood pressure. It represents the minimum pressure in the arterial system.

Mean Arterial Pressure

- Mean Arterial Pressure (MAP) is a measure of the average blood pressure in the arteries during a cardiac cycle. It represents the perfusion pressure that ensures adequate blood flow to the organs and tissues.
- The formula to calculate Mean Arterial Pressure (MAP) is:

$$\text{MAP} = \text{DBP} + \frac{1}{3} * (\text{SBP} - \text{DBP})$$



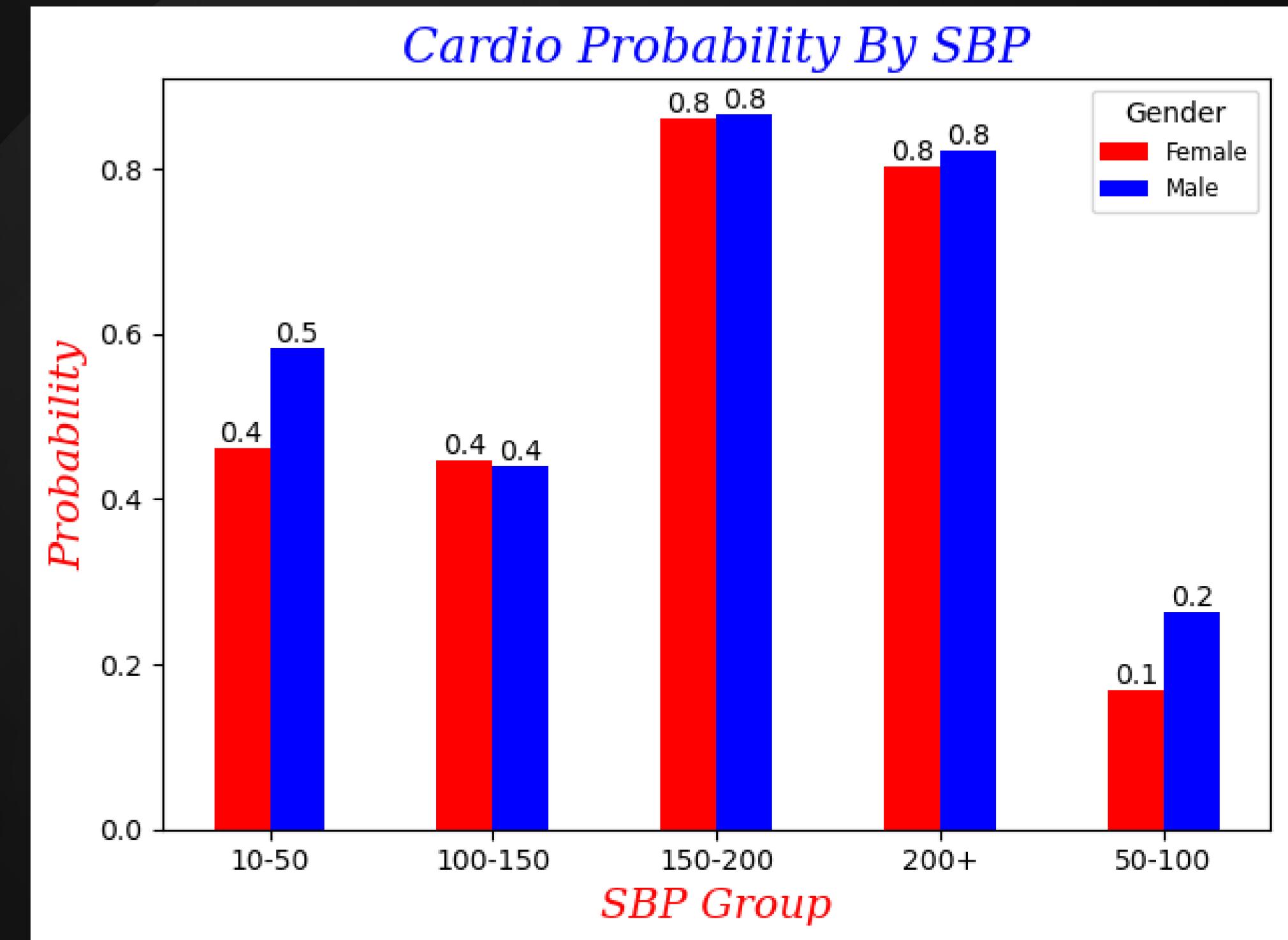
Note:

Systolic/Diastolic blood pressure

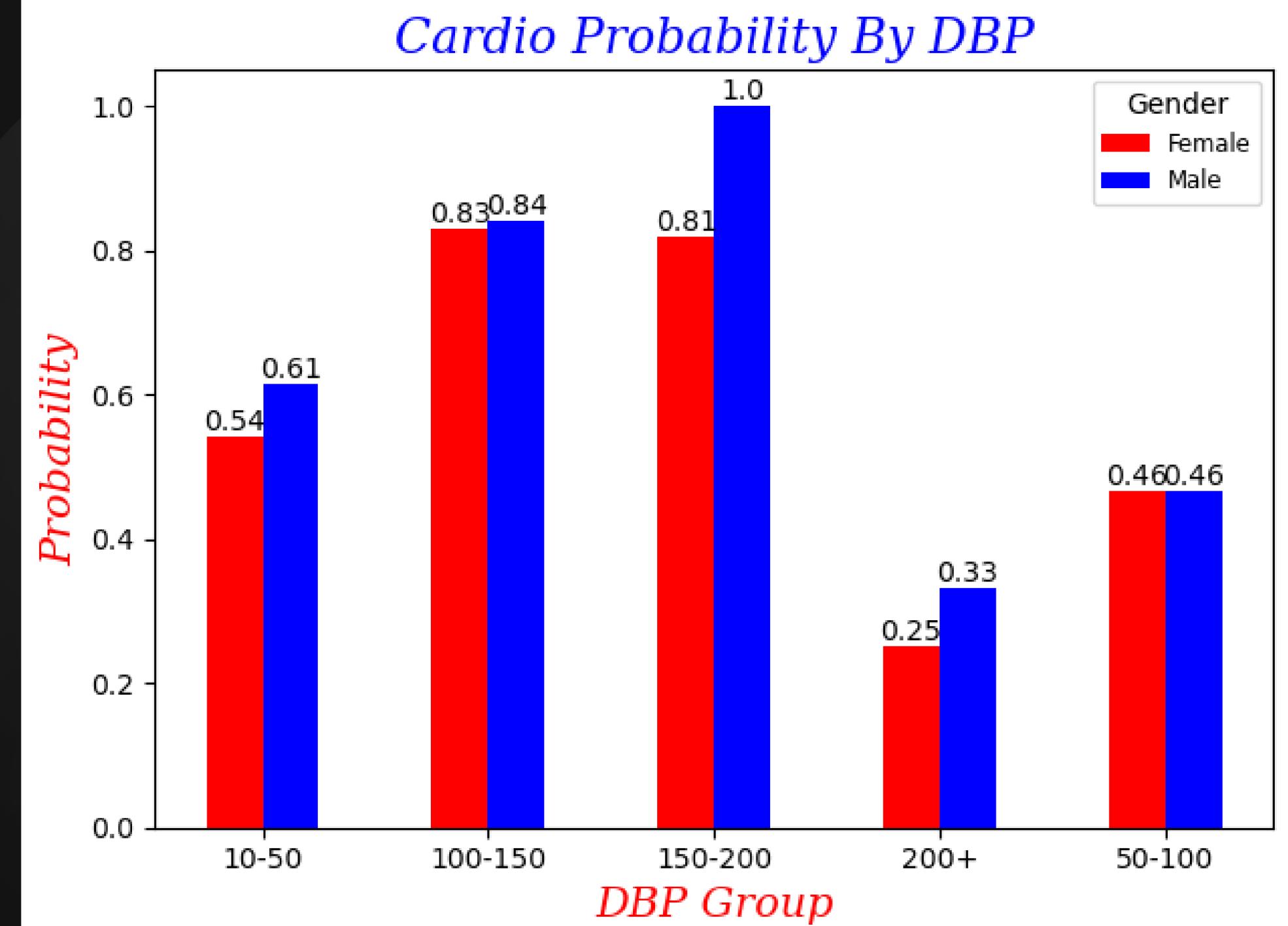
No, a systolic blood pressure (SBP) value of -100 is not a valid or realistic measurement. Blood pressure values are always positive numbers because they represent the force exerted by the blood against the walls of the arteries.



- Let's find the probability of cardiovascular disease by SBP group , gender.



- Let's find the probability of cardiovascular disease by DBP group , gender.





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THANK YOU

For watching this presentation



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