Heart Health Data Analysis

Objectives

- Which age group has the highest chances of getting heart disease
- Relationship between Chest Pain Severity and Heart Disease
- Do male are more prone to heart disease or female?

The Process

- Data Collection
- Data Cleaning
- Data Analysis
- Insights

Data Collection

The Data has been collected in the form of a csv file named “**Heart Disease Data.csv**”.

File contains **Heart Health** data of about 1025 people.

Data Cleaning

Changed the column names to – **Age, Gender, CP, RPB(Diastolic), SC, FBS, RER, MHRA, EIA, Oldpeak, Slope, Flourosopy, Thallium Test, HD**

CP – Chest Pain Severity
RPB(Diastolic) – Resting Blood Pressure
SC – Serum Cholesterol in mg/dl
FBS – Is Fasting Blood Glucose greater than 120mg
RER – Resting Electrocardiographic Results
MHRA – Maximum Heart Rate Achieved
EIA – Exercise Induced Angina

Data Cleaning

Oldpeak - ST depression induced by exercise relative to rest
Slope - the slope of the peak exercise ST segment
Flourosopy – Number of major vessels coloured by flourosopy
Thallium Test – To check how well blood flows to the heart muscles. 0-Normal, 1-fixed defect, 2-reversable defect

Changed value **0** and **1** of **Gender** column to **Male and Female** respectively.

Some columns has **outliers**. Replaced those values with the **median of that column** using Python.

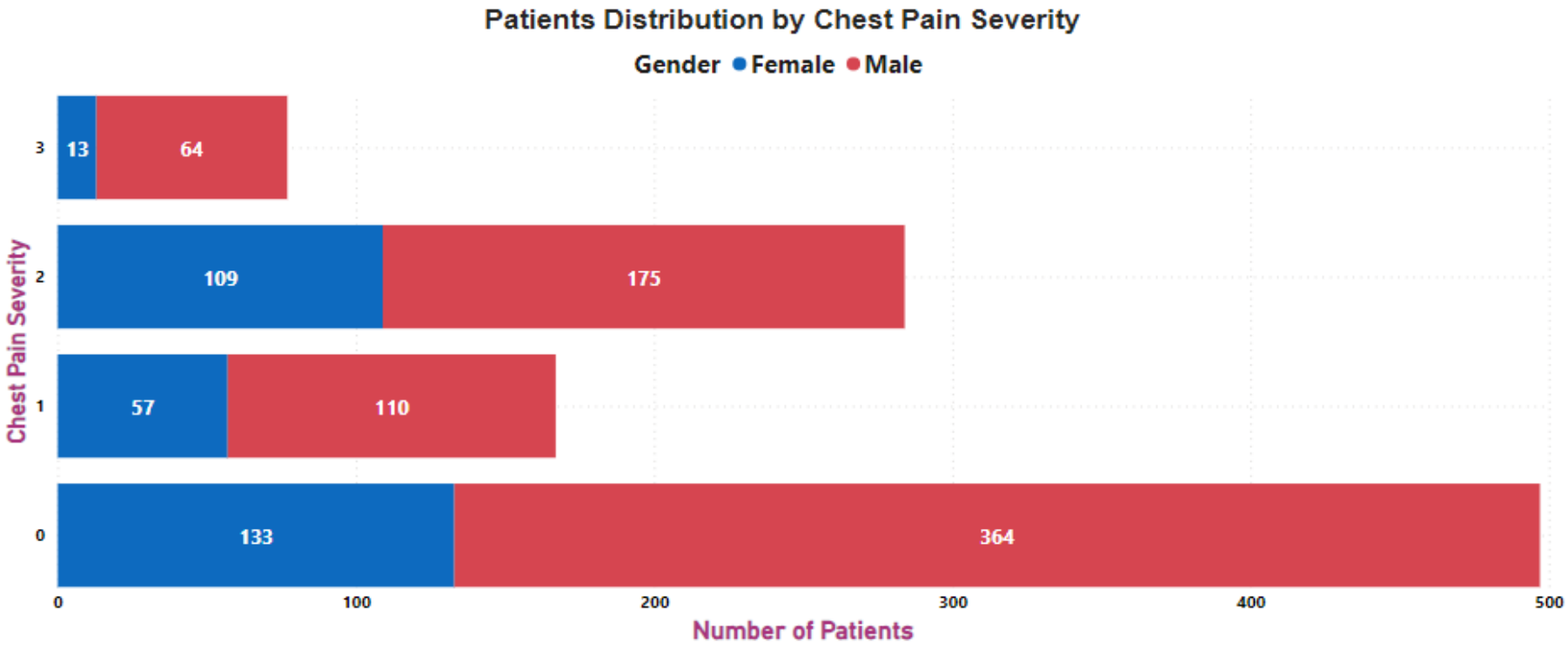
Data Cleaning

Some values of Oldpeak column has value **zero**, which is not possible in practical situation. It is always **greater than zero**. So, replaced those zero values with the **median** of Oldpeak Column.

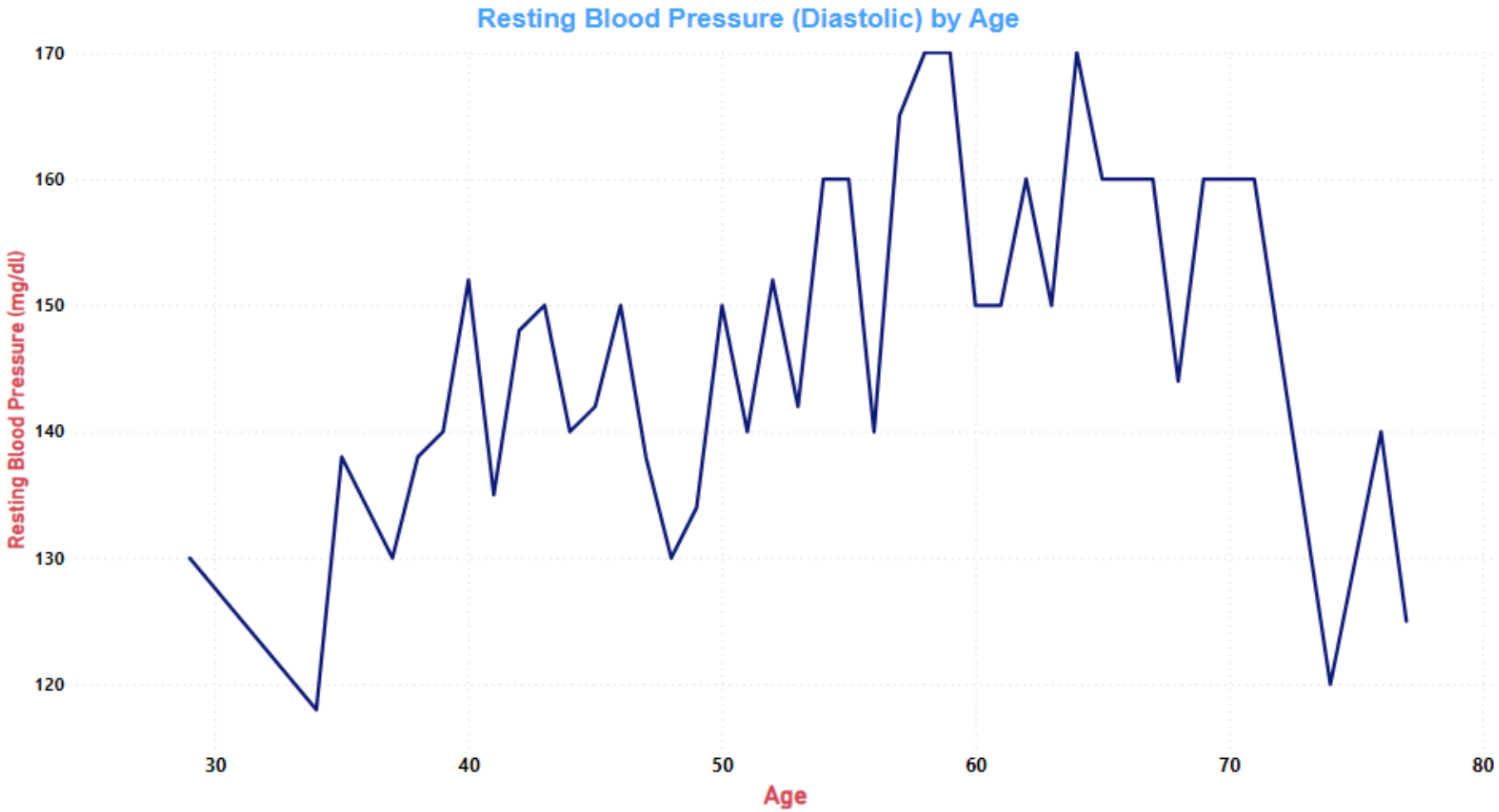
According to dataset metadata, Thallium Test column should only have values **0,1 and 2.** But some rows has value 3, which is incorrect. So, I **replaced all the values of 3 with 2**.

Data Analysis

1025	54	312	713
Number of Patients	Avg Age	No. of Females	No. of Males



Data Analysis

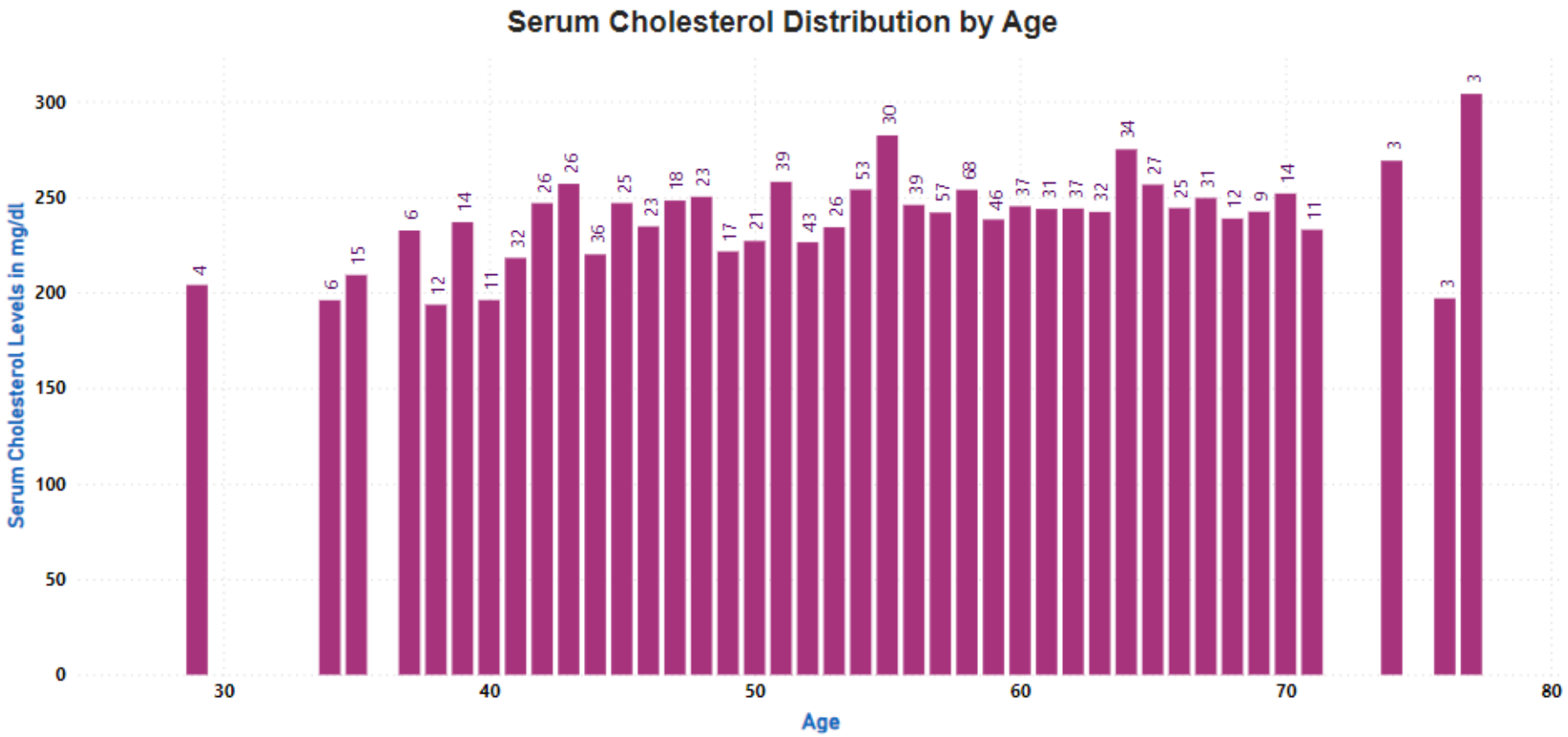


Data Analysis

853

Number of Patients having SC Value > 200mg/dl

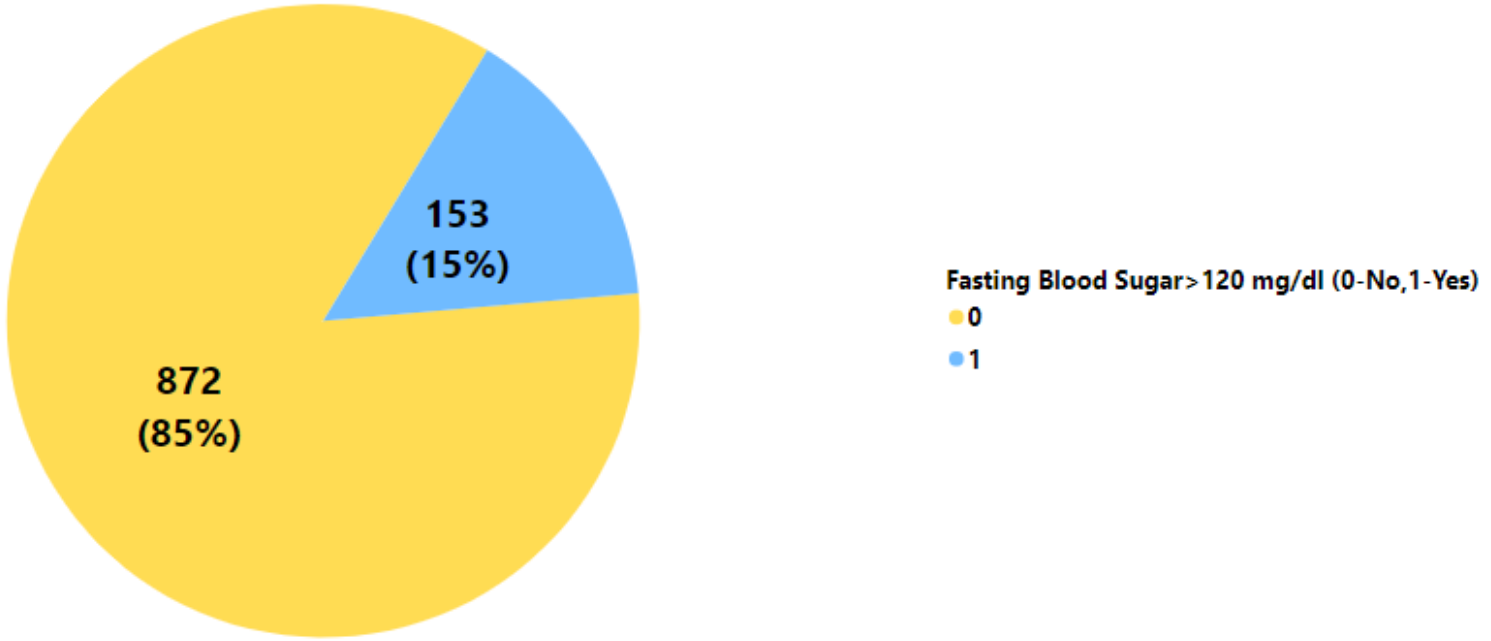
Select all	Female	Male



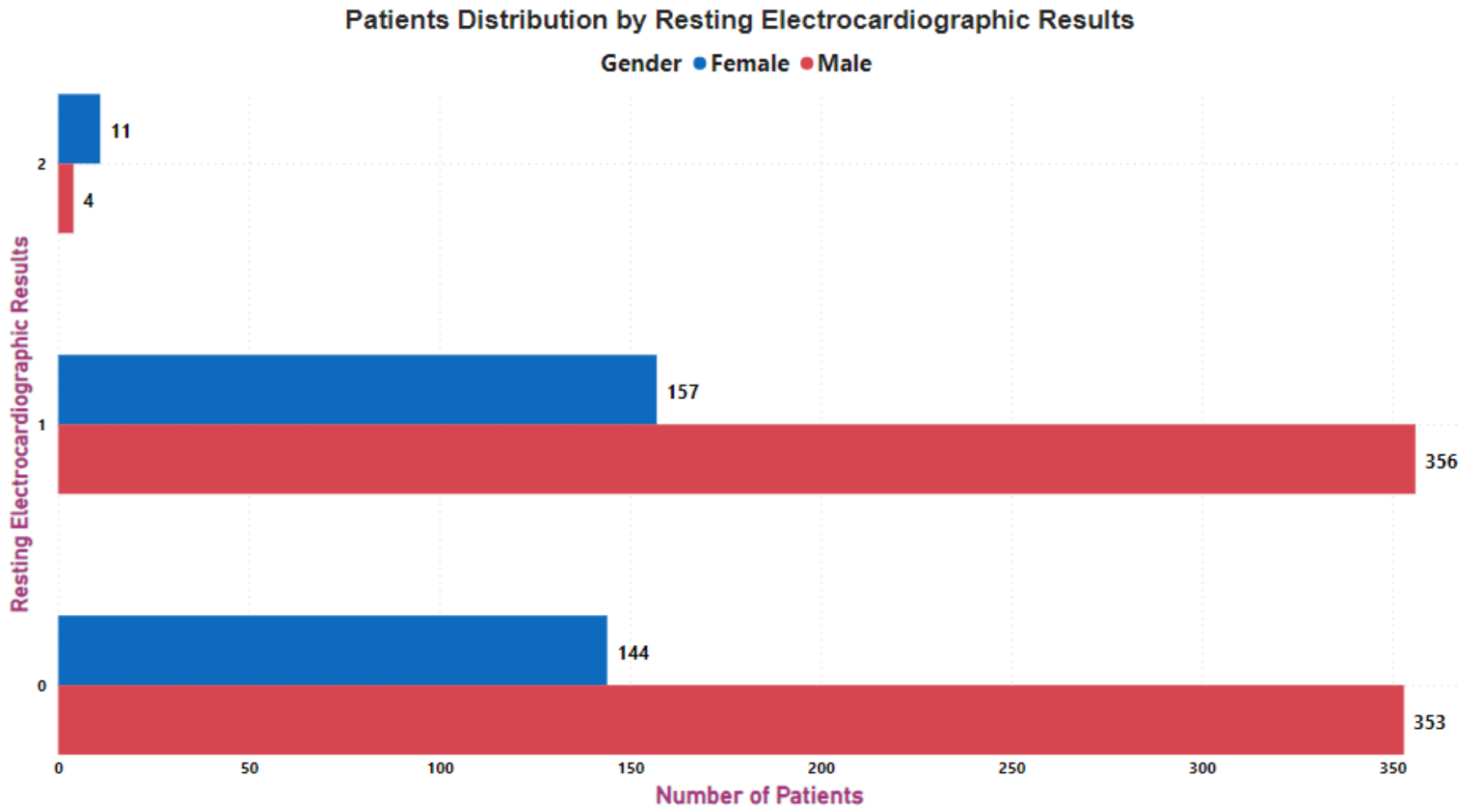
Data Analysis

Select all	Female	Male

Patients Distribution by Fasting Blood Sugar (>120ml/dl)

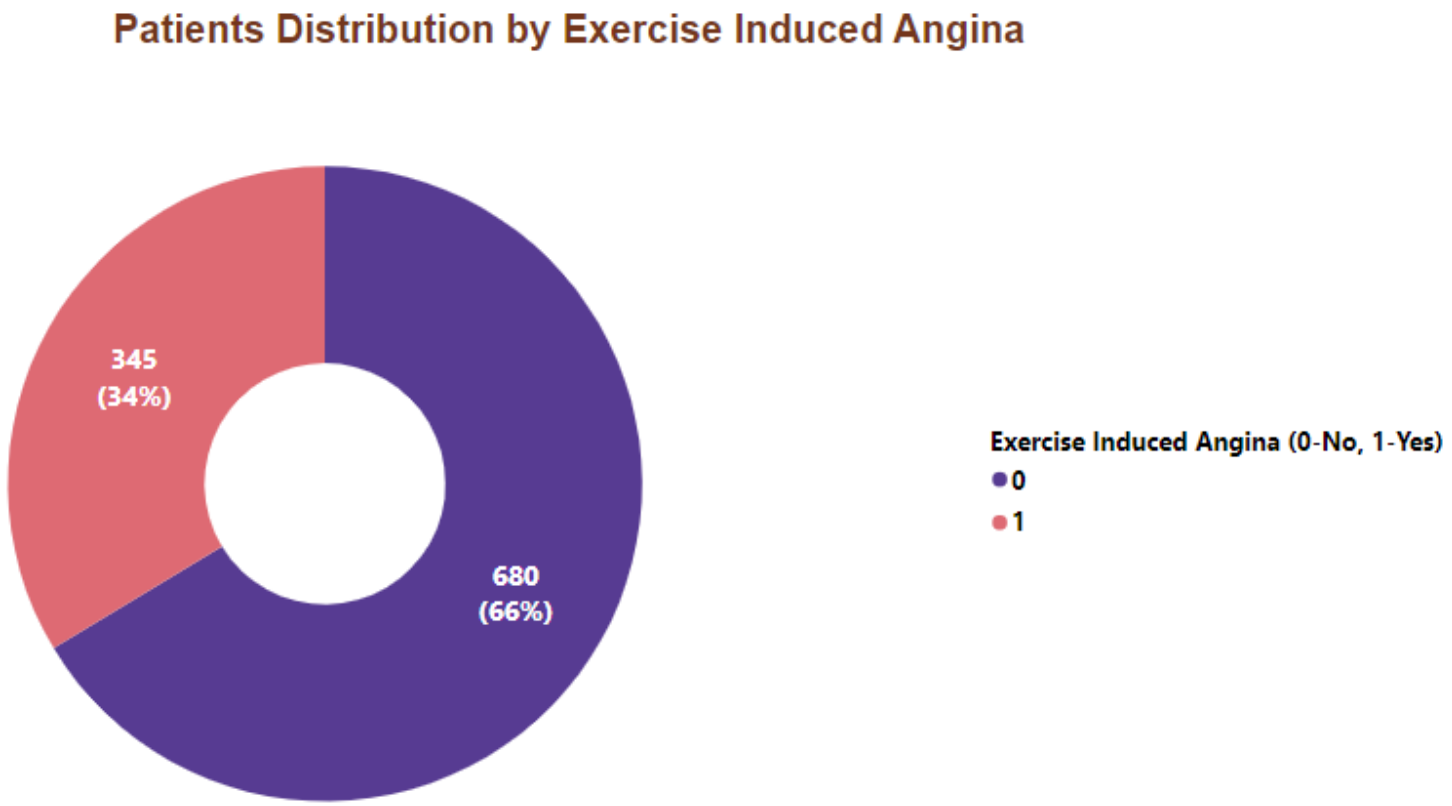


Data Analysis

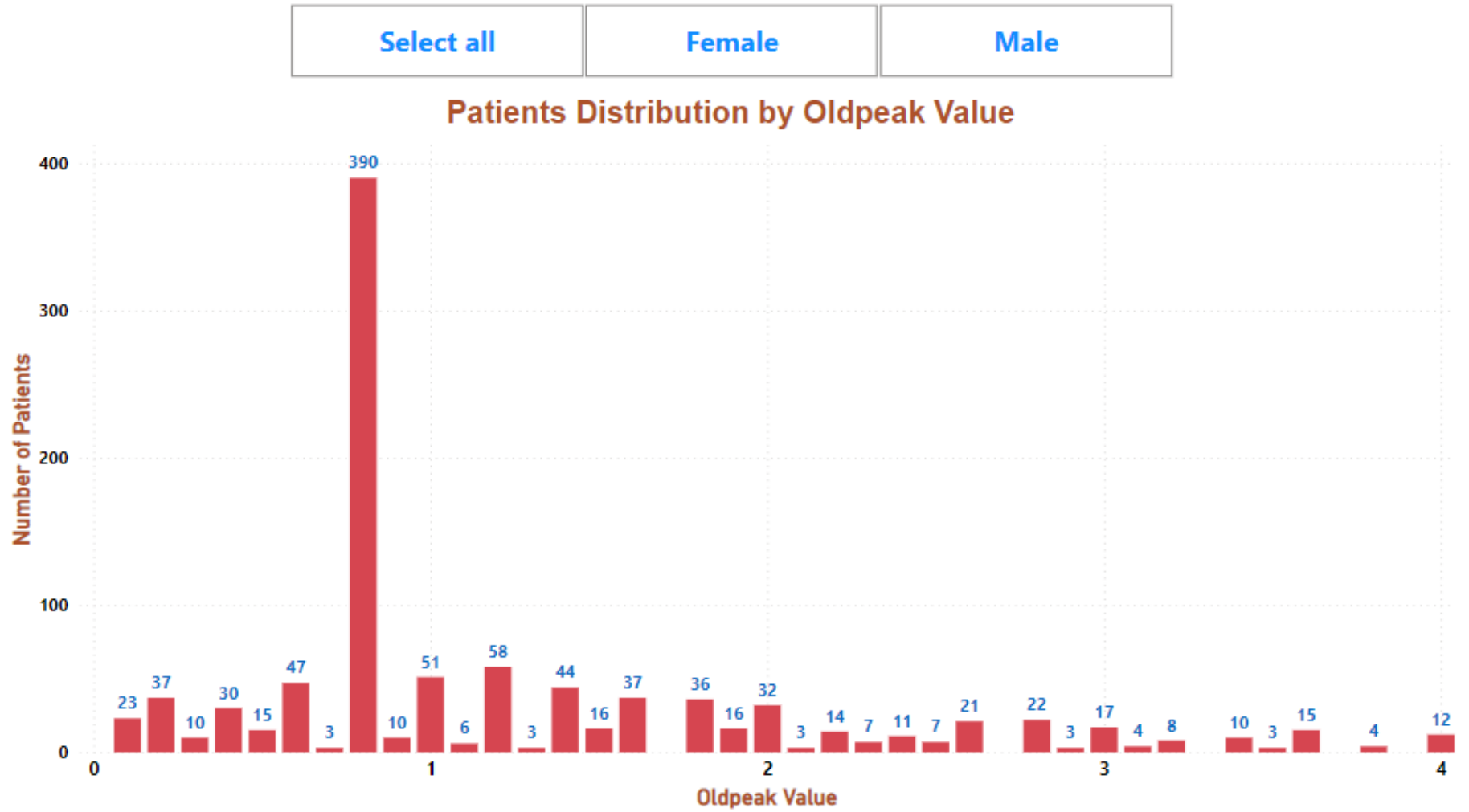


Data Analysis

Select all	Female	Male

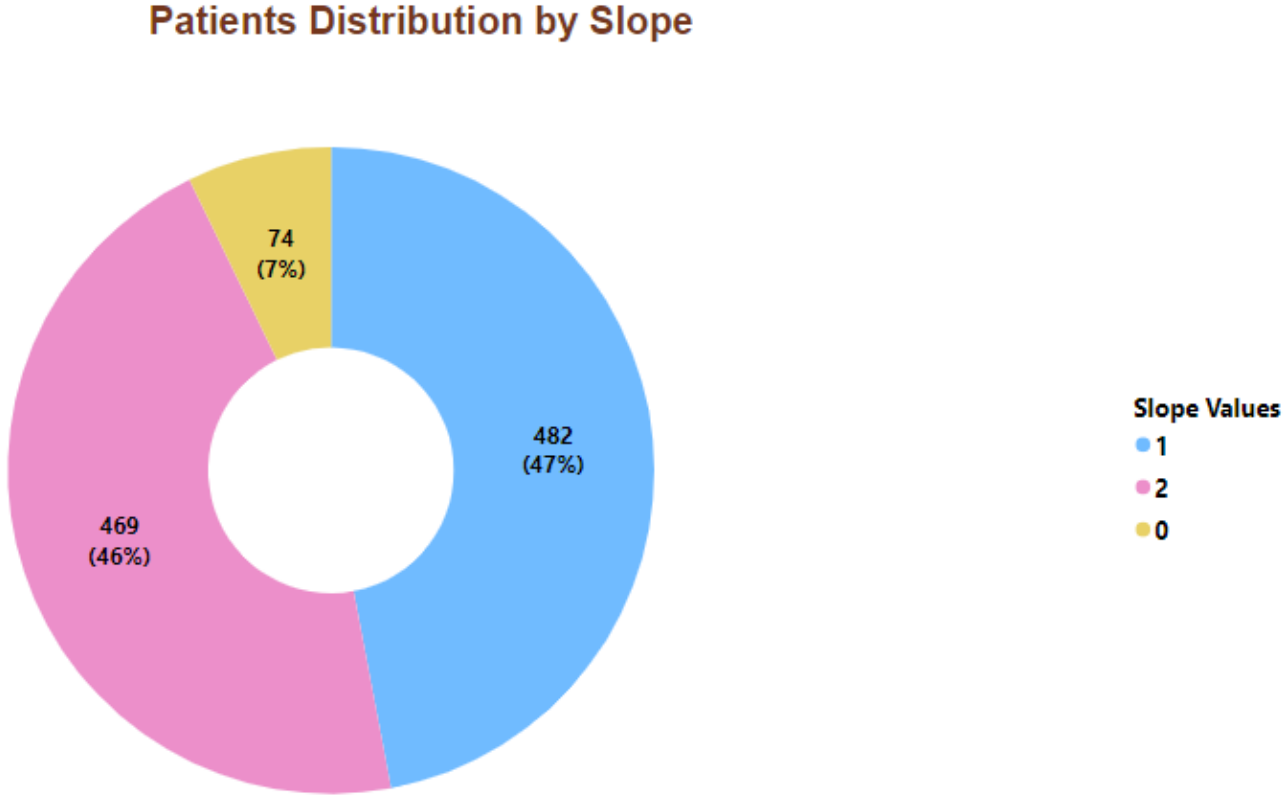


Data Analysis

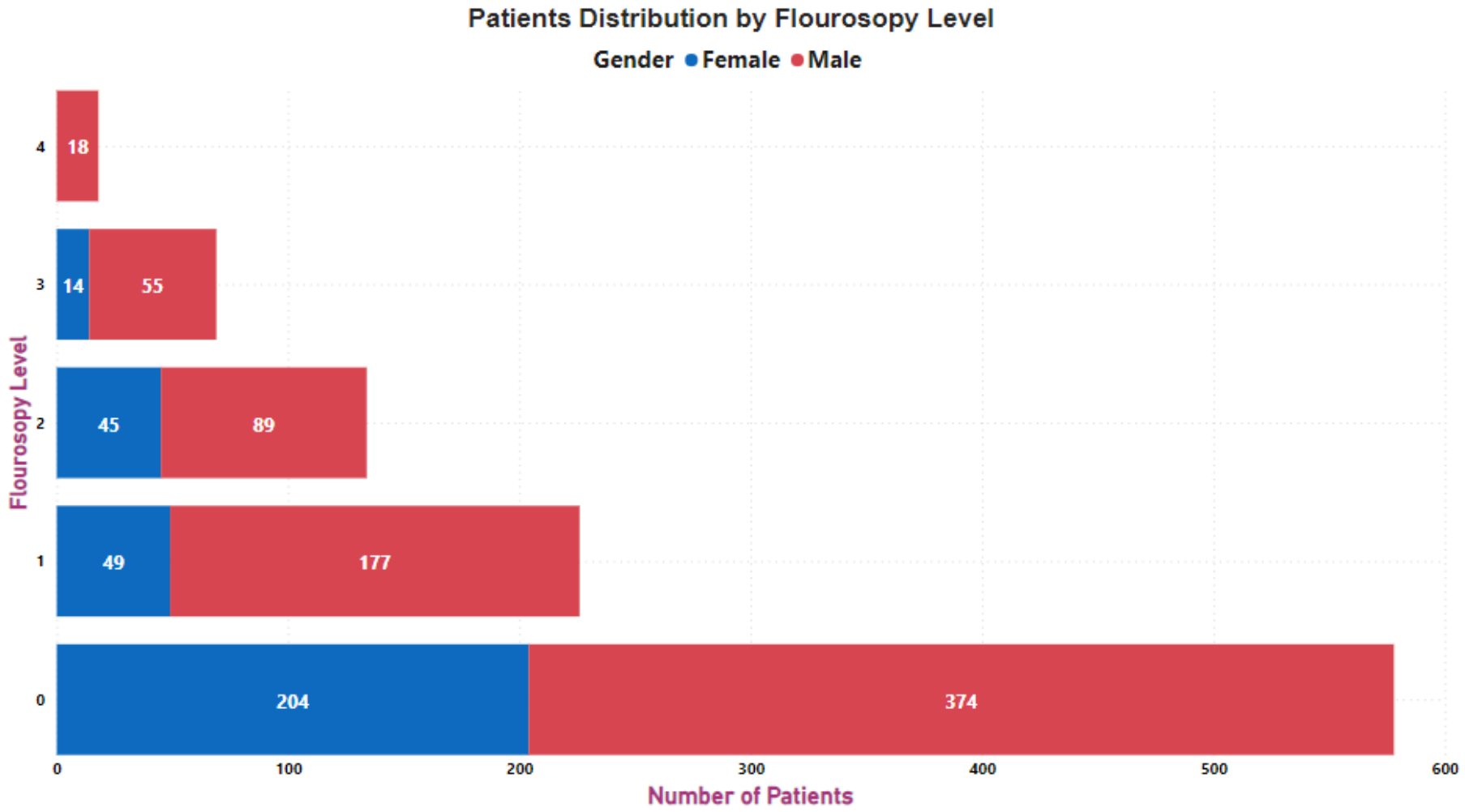


Data Analysis

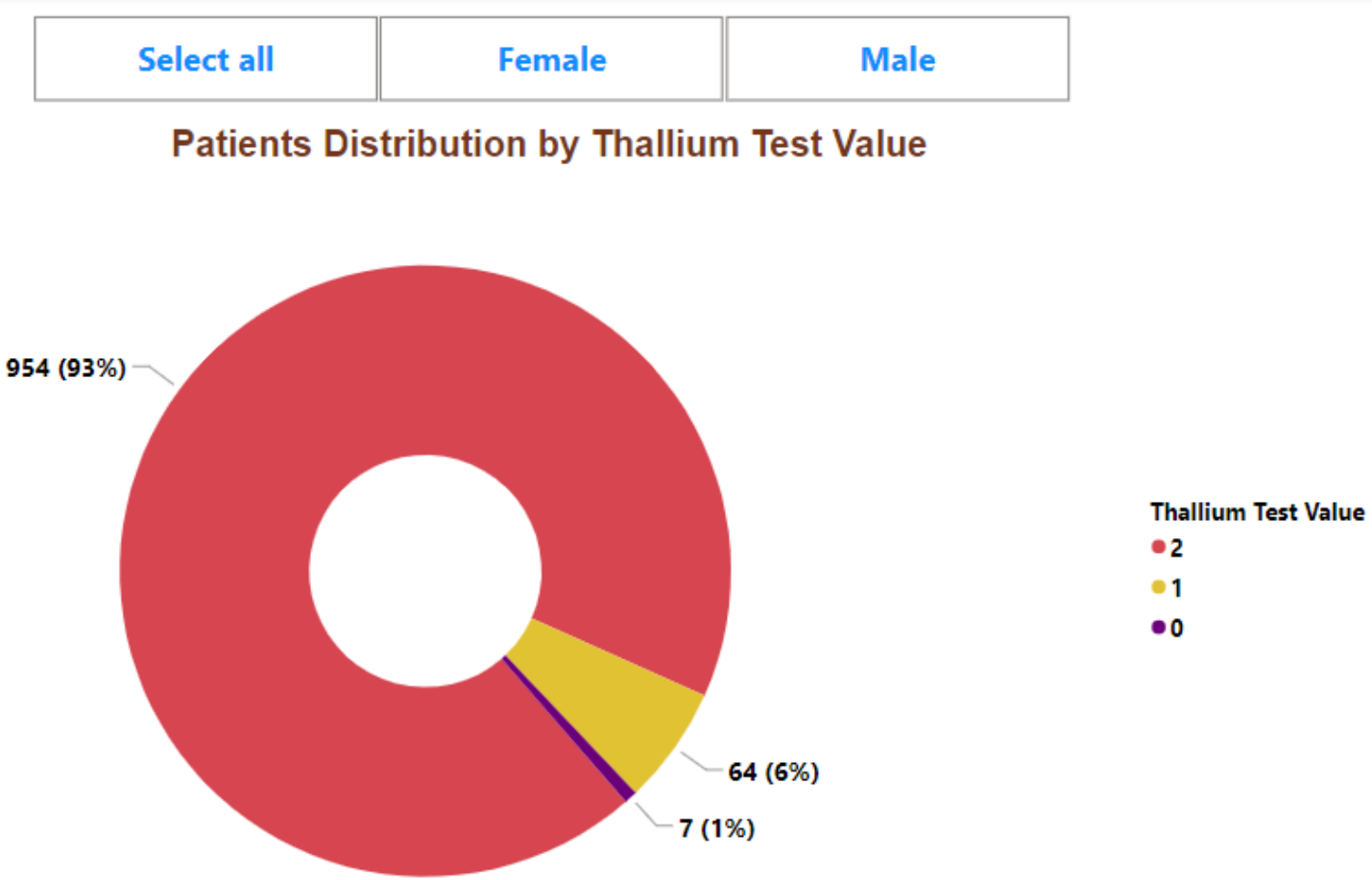
Select all	Female	Male



Data Analysis



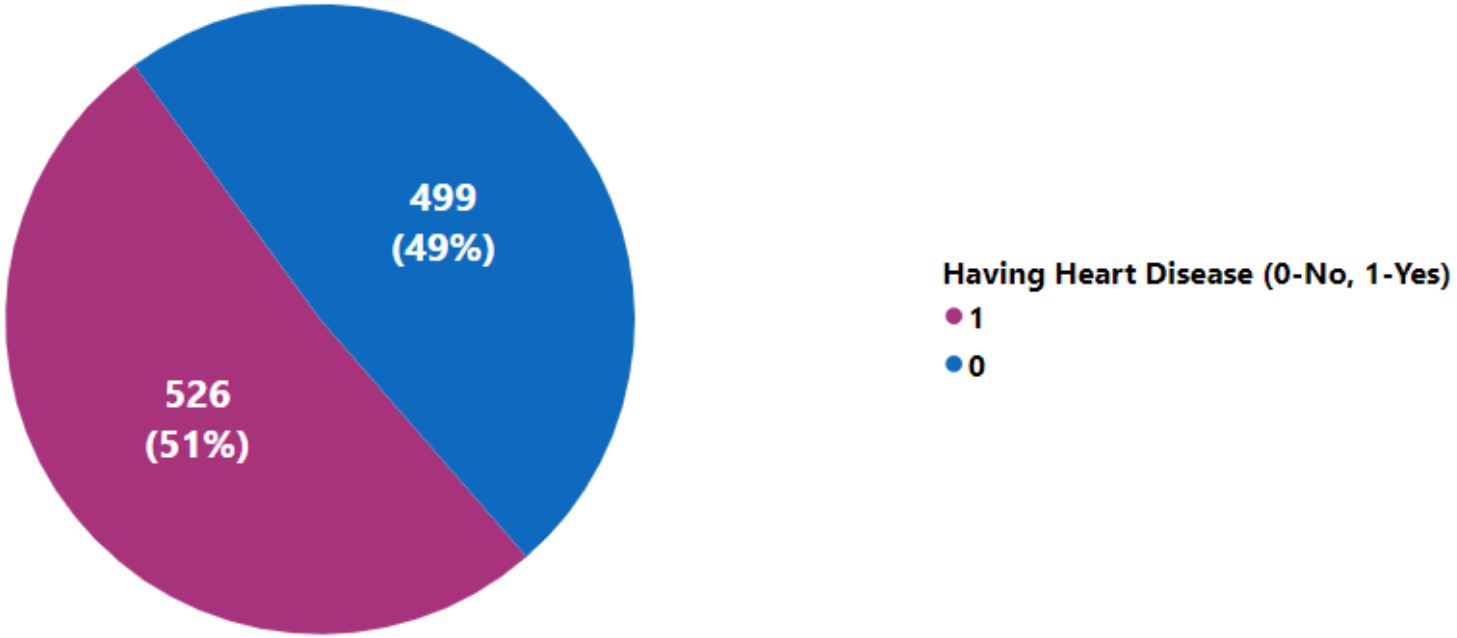
Data Analysis



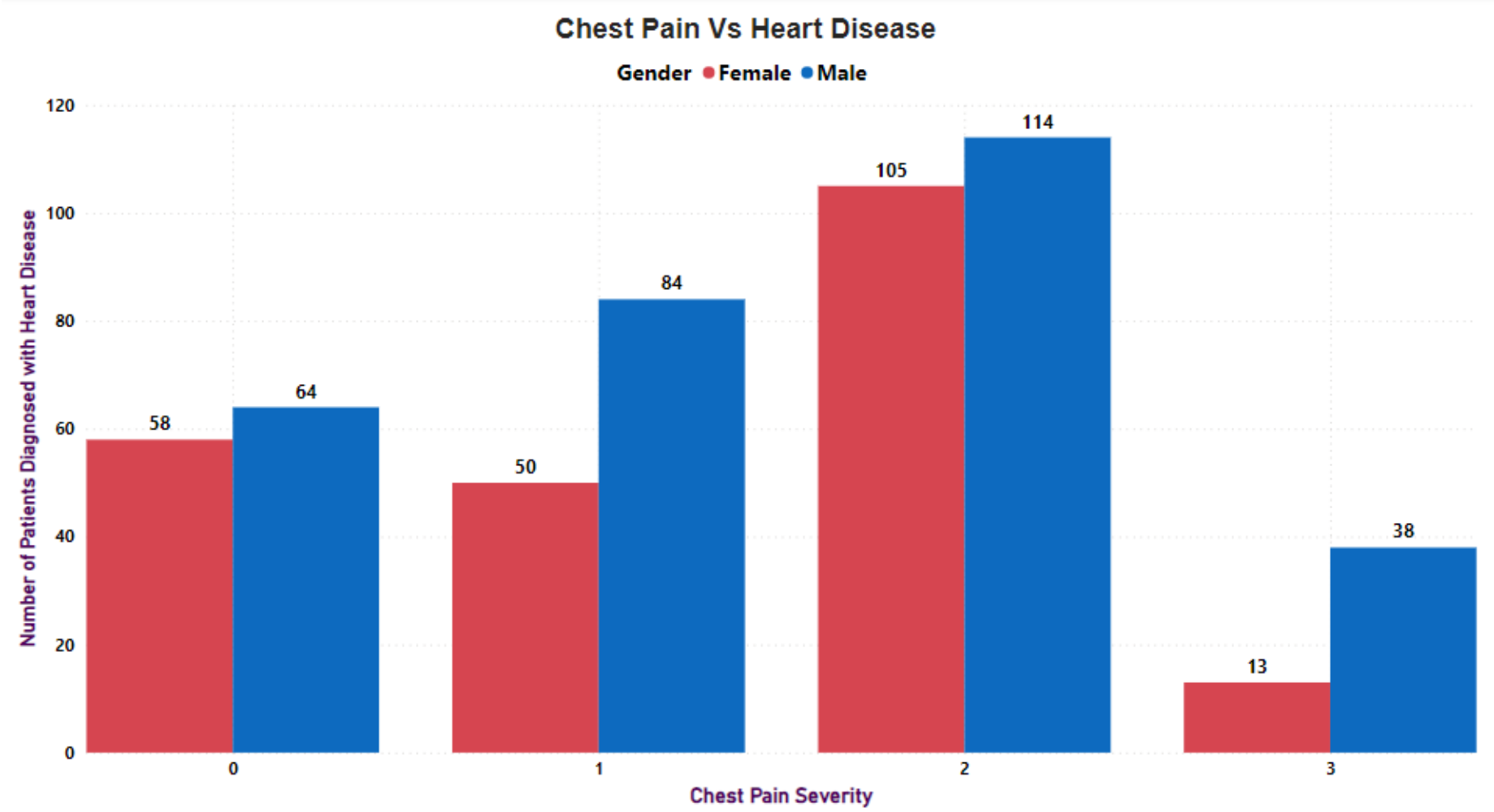
Data Analysis

Select all	Female	Male

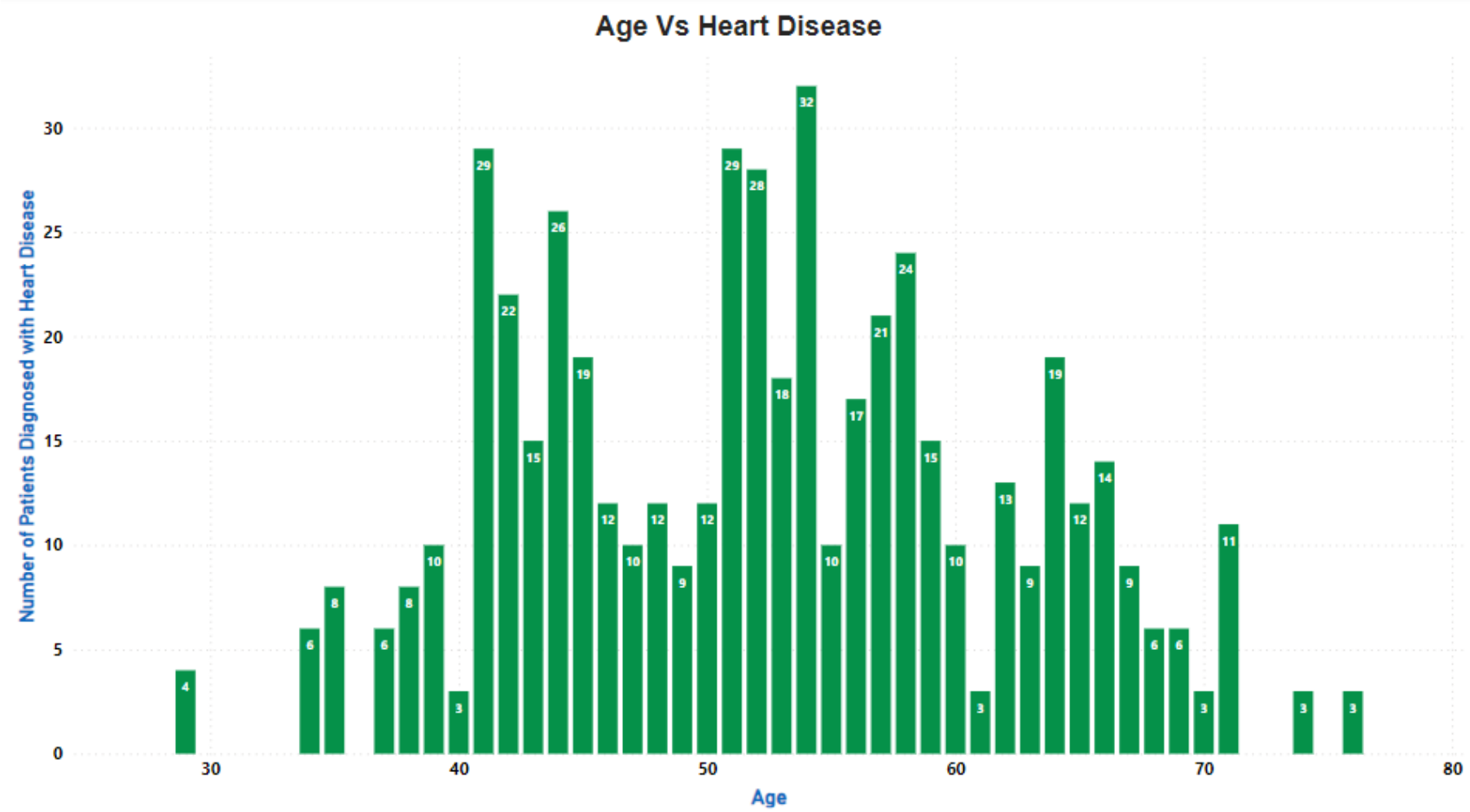
Patients Having Heart Disease



Data Analysis



Data Analysis



Insights

- Total number of patients are **1025** out of which **312** are females and **713** are males.
- The average age of patients is **54**.
- **48.5%** of patients (13% females and 35.5% males) don't have any kind of Chest Pain.
- Only **7.5%** patients (77 patients – 13 females and 64 males) have very severe Chest Pain.
- Most of the patients between the **age of 55 and 65** have the highest Resting Blood Pressure (Diastolic value) which is **greater than 150mg/dl**. This shows they are more prone to High Blood Pressure.

Insights

- A total of **853** patients (267 females and 586 males), approx. **83%** patients have Serum Cholesterol(SC) Value **greater than 200mg/dl**, which increases the risk of Cardiovascular Diseases.
- Only **15%** patients (42 females and 111 males) have Fasting Blood Sugar levels **greater than 120mg/dl.** This indicates that they are either **prediabetics or have Type-2 Diabetes.**
- Only **1.5%** patients (11 females and 4 males) have Resting Electrocardiographic value of 2, which indicates **signs of Heart Attack.**
- **48.5%** patients don't have any kind of cardiac abnormalities.
- **Male patients** have good Resting Electrocardiographic Results as compared to **female patients.**

Insights

- **34%** of the patients (74 females and 271 males) have Exercise Induced Angina which means **they feel chest pain due to the insufficient blood flow** to the heart muscle during physical exercise.

- **390** patients have Oldpeak value of **0.8**, which is not severe but have moderate level of **ischemia** (reduced blood flow to the heart).

- **47%** patients have normal slope value of 1 as compared to 46% patients who have slope value of 2. But **7%** patients have a slope value of 0, which shows more **severe ischemia or coronary artery diseases.**

- **18** patients (**all male**) have flourosopy level of 4, which is very **critical** and requires immediate action. **56%** of the patients have flourosopy value of 0, which indicate their heart works fine.

Insights

- Around **93%** patients have Thallium Test value of **2**, which shows **decreased blood flow to the heart or even a scar tissue** in that region.
- Approximately **21%** patients (105 females and 114 males) having Chest pain Severity of **2**, got diagnosed with Heart Disease. From the chart also we can see that **males are more prone to heart diseases.**
- **51%** (**almost half**) of the patients are diagnosed with Heart Disease.
- Patients within the age range of **40-45 and 50-60** have shown the signs of Heart Disease.

Thank you