

Data Analysis on Heart Disease Dataset

MYSQL

Scope of Project

1. What is the distribution of age among individuals in the dataset?

- This question aims to understand the age demographics of the individuals in the dataset, which can provide insights on the presence of heart disease across different age groups.

2. How does the incidence of heart disease vary between genders?

- By analyzing the distribution of heart disease cases among different sexes, we can identify any potential gender-based disparities in heart disease commonness.

3. What are the predominant types of chest pain experienced by individuals with heart disease?

- Understanding the distribution of chest pain types among individuals diagnosed with heart disease can help in characterizing the symptoms associated with the condition.

4. Are there any correlations between resting blood pressure, serum cholesterol, and the presence of heart disease?

- Exploring the relationships between physiological indicators like resting blood pressure and serum cholesterol levels and the presence of heart disease can provide insights into potential risk factors.

5. How do maximum heart rate and exercise-induced angina relate to the likelihood of heart disease?

- Exploring the relationship between the maximum heart rate achieved during exercise and the presence of exercise-induced angina can provide valuable insights into the impact of heart disease on physical strain.

Columns Overview

| Index | Attribute | Code | Description | Data Type | Normal Values | Reference |
|-------|---------------------|---------------------|--|-----------|---|--|
| 1 | Age | age | Age of the individual in years. | Numeric | N/A | N/A |
| 2 | Sex | sex | Gender of the individual. | Binary | 0: Female 1: Male | N/A |
| 3 | Chest Pain Type | Chest pain type | Type of chest pain experienced by the individual. | Nominal | 1: Typical angina 2: Atypical angina 3: Non-anginal pain 4: Asymptomatic | N/A |
| 4 | Resting BP | Resting bps | Resting blood pressure of the individual in mm Hg at hospital admission. | Numeric | Normal: < 120/80 mm Hg | American Heart Association |
| 5 | Cholesterol | Cholesterol | Serum cholesterol level of the individual in mg/dl. | Numeric | Optimal: 150 mg/dl | American Heart Association |
| 6 | Fasting Blood Sugar | Fasting blood sugar | Indicates if fasting blood sugar level is > 120 mg/dl. | Binary | Normal: < 100 mg/dl | Mayo Clinic |
| 7 | Resting ECG | Resting ecg | Results of resting electrocardiogram (ECG). | Nominal | Normal: 0 Abnormal: 1, 2 | American Heart Association |
| 8 | Max Heart Rate | Max heart rate | Highest heart rate achieved by the individual during exercise. | Numeric | Varies by age and fitness level | Mayo Clinic |
| 9 | Exercise Angina | Exercise angina | Indicates if the individual experienced angina induced by exercise. | Binary | N/A | N/A |
| 10 | ST peak | ST peak | Value of ST depression induced by exercise relative to rest. | Numeric | N/A | N/A |
| 11 | ST Slope | ST slope | Describes the slope of the peak exercise ST segment. | Nominal | 0: Upsloping 1: Flat 2: Down sloping | N/A |
| 12 | Class | target | Presence of heart disease in the individual. | Binary | 0: Absence 1: Presence | N/A |

Description of Nominal Attributes

| Attribute | Description |
|---|---|
| Sex | 1 = male 0 = female |
| Chest Pain Type | -- Value 1: typical angina -- Value 2: atypical angina -- Value 3: non-anginal pain -- Value 4: asymptomatic |
| Fasting Blood sugar | (fasting blood sugar > 120 mg/dl) 1 = true 0 = false |
| Resting electrocardiogram results | -- Value 0: normal -- Value 1: having ST-T wave abnormality (T wave inversions and/or ST elevation or depression of > 0.05 mV) -- Value 2: showing probable or definite left ventricular hypertrophy by Estes' criteria |
| Exercise induced angina | 1 = yes 0 = no |
| The slope of the peak exercise ST segment | -- Value 1: upsloping -- Value 2: flat -- Value 3: down sloping |
| class | 1 = heart disease 0 = Normal |

Chest Pain Type

■ Value 1: Typical angina

This is the common type of chest pain you might hear about with heart issues. It usually happens during physical activity or stress and goes away with rest or medication. It feels like pressure or tightness in the chest.

■ Value 2: Atypical angina

This chest pain is less predictable. It can happen at any time, not just during exercise or stress, and it might not go away with rest or medication. The pain can vary in how it feels and how long it lasts.

■ Value 3: Non-anginal pain

This type of chest pain isn't related to the heart. It could be caused by other things like digestive issues, muscle problems, or other non-heart-related conditions. The pain feels different and isn't linked to physical activity.

■ Value 4: Asymptomatic

The individual doesn't have any chest pain at all.

Resting Electrocardiogram Results

■ Value 0: Normal

The heart's electrical activity looks normal. There are no signs of problems in the heart's rhythm or structure.

■ Value 1: Having ST-T wave abnormality

The ECG shows some unusual patterns in the heart's electrical activity. This could mean there is a problem with the heart, such as reduced blood flow to the heart muscle. These patterns are called "ST-T wave abnormalities."

■ Value 2: Showing probable or definite left ventricular hypertrophy by Estes' criteria

The ECG suggests that the left side of the heart is thicker and larger than normal. This condition is called "left ventricular hypertrophy" and it can happen when the heart has to work harder than usual, like in high blood pressure. "Estes' criteria" are a set of guidelines doctors use to identify this condition based on the ECG results.

The Slope of the Peak Exercise ST Segment

This attribute describes the shape of a specific part of the heart's electrical activity during an exercise test.

■ Value 1: Upsloping

The line goes upwards. This is usually the least concerning and can be normal. It might not indicate any serious heart problems.

■ Value 2: Flat

The line is flat. This could mean there's a moderate risk of heart issues. It's something that doctors will look at more closely to decide if further tests are needed.

■ Value 3: Down sloping

The line goes downwards. This is more concerning and often suggests a higher risk of heart problems. It indicates that there might be a significant issue with blood flow to the heart during exercise.

These descriptions help doctors determine if there are potential heart problems based on how the heart responds to physical activity.