

Heart Health Data Report

This report analyzes three important heart health indicators from the dataset — **cholesterol levels (chol)**, **resting blood pressure (trestbps)**, and **maximum heart rate achieved (thalach)**. All analysis and visuals in this report are based on the dataset obtained from: [Kaggle - Heart Disease Prediction](#)

1. Average Measurements - Cholesterol: 246.26 mg/dl - Resting blood pressure: 131.62 mmHg - Maximum heart rate: 149.65 bpm

2. Highest Recorded Values - Cholesterol: 564 mg/dl - Resting blood pressure: 200 mmHg - Maximum heart rate: 202 bpm

3. Lowest Recorded Values - Cholesterol: 126 mg/dl - Resting blood pressure: 94 mmHg - Maximum heart rate: 71 bpm

4. Summary Insights The dataset contains 303 records with no missing values. Cholesterol and blood pressure show a wide range of variation, with cholesterol reaching up to 564 mg/dl and blood pressure up to 200 mmHg. Boxplots indicate the presence of several high-value outliers for both cholesterol and blood pressure.

5. Statistical Findings - T-test shows a significant difference in cholesterol between males and females ($t = -3.50$, $p = 0.0005$). - Shapiro-Wilk test suggests that cholesterol and heart rate data are not normally distributed. - ANOVA indicates cholesterol does not vary significantly by chest pain type ($p = 0.6037$). - Heart rate shows a strong difference between people with and without heart disease ($t = 8.07$, $p = 0.0000$). - Confidence intervals: Cholesterol between 240.40–252.12, Blood pressure between 129.64–133.61.

6. Visual Analysis Histograms (plots/histograms.png) reveal the distribution shapes, and boxplots (plots/boxplots.png) highlight outliers.

Conclusion This analysis highlights key trends, differences between groups, and the presence of extreme values. These findings provide a solid base for deeper medical or predictive modeling work.