

GITHUB PORTFOLIO

Vital Signs Diagnosis Data

E-REPORT

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BI120L - CON29
Data Science

VITAL SIGNS

E REPORT

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BI120L

INTRODUCTION

Analysis of vital signs and physiological indicators (e.g., blood pressure, glucose, cholesterol, BMI) concerning demographic and lifestyle factors.

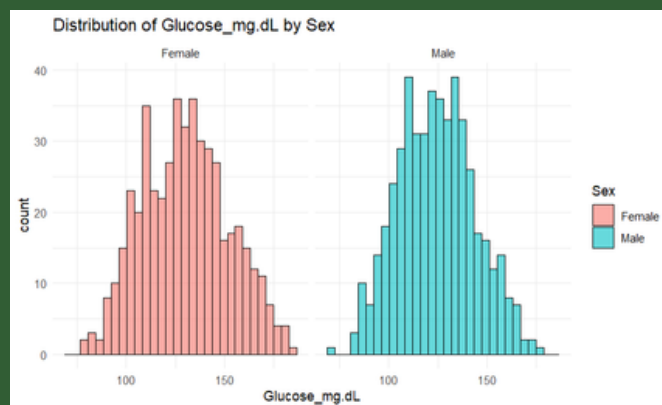
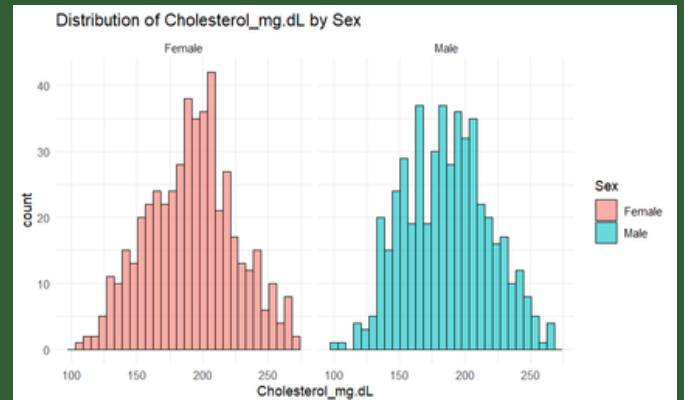
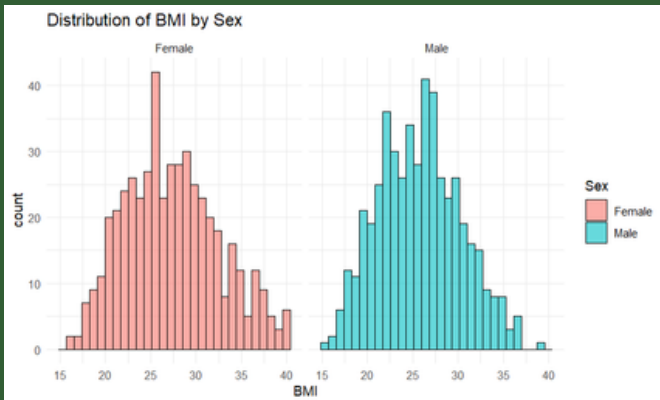
METHODS USED FOR ANALYSIS

- Data Preprocessing:
 - Converted key variables to numeric/factor.
 - Removed biologically implausible BMI values (≤ 10).
 - Applied IQR-based outlier removal (BMI, Glucose, Cholesterol).
- Statistical Methods:
 - Descriptive statistics: `summary()` and `describe()`.
 - Visualizations: Histograms, bar plots, box plots, scatter plots.
 - T-test: Welch Two Sample t-test for glucose by sex.
 - Correlation analysis: Pearson's r and `corrplot`.

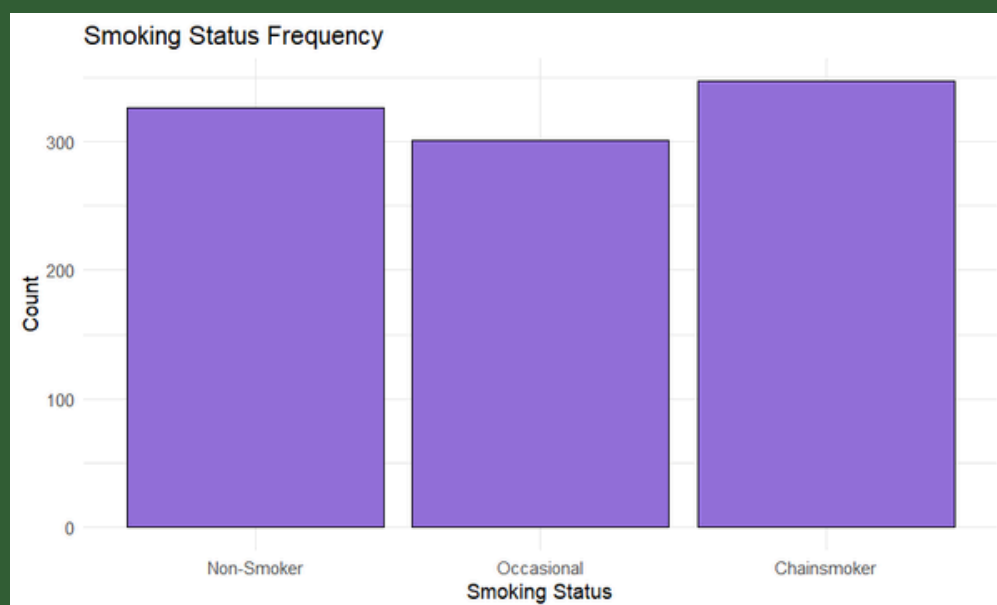
KEY RESULTS AND FIGURES

- T-test (Table 2):
 - Significant difference in glucose:
 - Females = 130.20 mg/dL, Males = 124.23 mg/dL
 - $p = 8.19e-06$, 95% CI: [3.36, 8.58]
- Correlation Matrix (Figure 12):
 - Strongest correlations:
 - BMI & Glucose: 0.97
 - SBP & Hypertension: 0.89
 - Heart Rate & Stress: 0.82

FIGURES

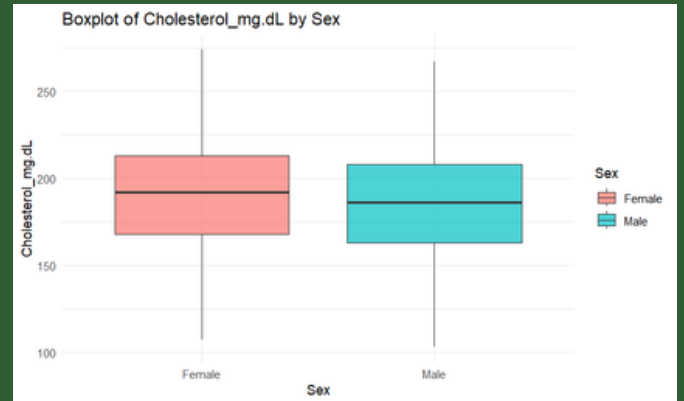
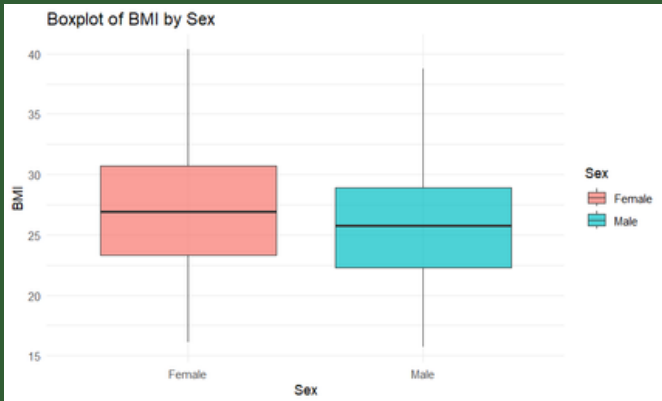


Histograms (Figures 1–3):
Near-normal distributions for BMI, Glucose, and
Cholesterol by sex.

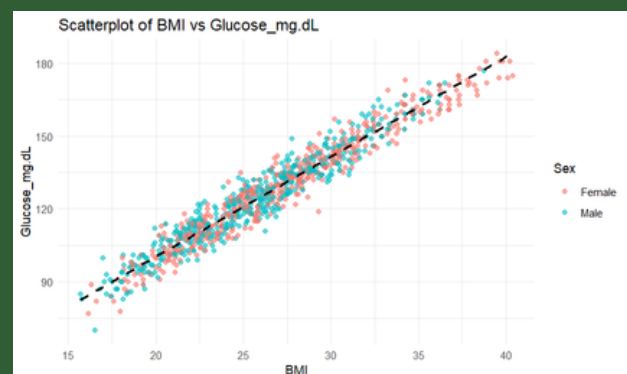
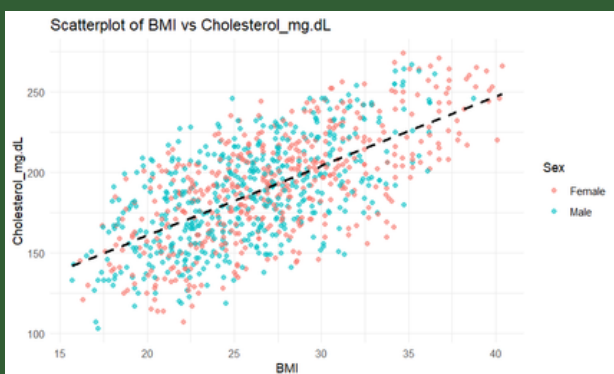
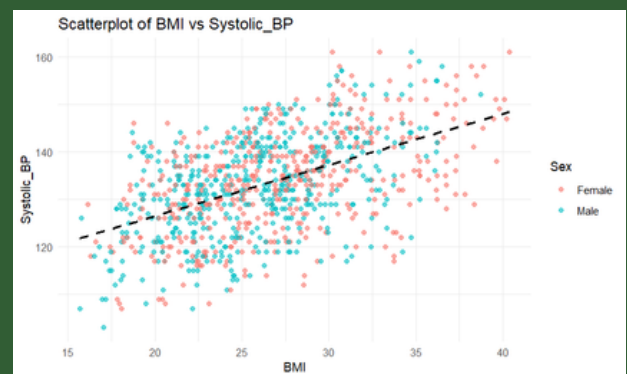
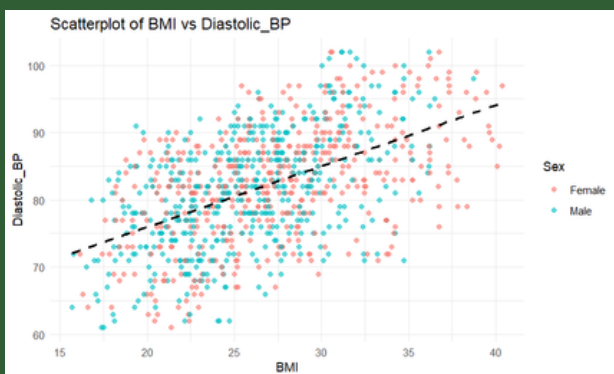


Smoking Status (Figure 4):
Chainsmokers most common (347), followed by non-smokers (326).

FIGURES



Box Plots (Figures 5–7):
Females had higher median glucose.



Scatter Plots (Figures 8–11):
BMI positively correlated with SBP, DBP, Glucose, and Cholesterol.

INTERPRETATION AND BRIEF CONCLUSION

Findings supported both hypotheses:

- Females had significantly higher glucose levels than males.
- BMI showed strong positive correlations with key health markers (glucose, BP, cholesterol).

Additional Insights:

- Age and stress influenced several health indicators.
- Heart rate is inversely related to physical activity and sleep.

Limitations:

Cross-sectional design limits causal inference.

- Some missing data; generalizability may be limited.

Recommendations:

- Explore causes of sex differences in glucose.
- Use BMI as a screening tool.
- Apply multivariate models and imputation techniques in future studies.