

EXPLORATORY DATA ANALYSIS OF HEALTH AND DEMOGRAPHIC DATA RELATED TO HEART DISEASE

Identifying Common Traits
Leading to Heart Disease

P R E S E N T E D B Y : B A S A V A R A J P U J A R I



Introduction to the Dataset

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Dataset Overview:

- The dataset contains health and demographic information collected from individuals to analyze factors associated with heart disease.
- Variables include demographic data (age, gender, education, income) and health-related factors (BMI, mental health, physical health, smoking status, etc.).

Objective of the Analysis:

- The dataset contains health and demographic information collected from individuals to analyze factors associated with heart disease.
- Variables include demographic data (age, gender, education, income) and health-related factors (BMI, mental health, physical health, smoking status, etc.).

Importance:

- Understanding the relationships between health conditions and demographics can help target prevention efforts and improve healthcare outcomes.



Objectives of the Analysis

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Conduct Univariate Analysis:

- Analyze the distribution of individual health-related variables.
- Identify key factors and prevalence rates of health conditions related to heart disease.

Conduct Bivariate Analysis:

- Explore relationships between heart disease and other health variables (e.g., BMI, blood pressure, cholesterol).
- Assess correlations between continuous variables to identify significant associations.



Objectives of the Analysis

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Derive Actionable Insights:

- Extract insights that can guide public health initiatives and awareness campaigns.
- Understand demographic patterns in heart disease prevalence to tailor interventions effectively.

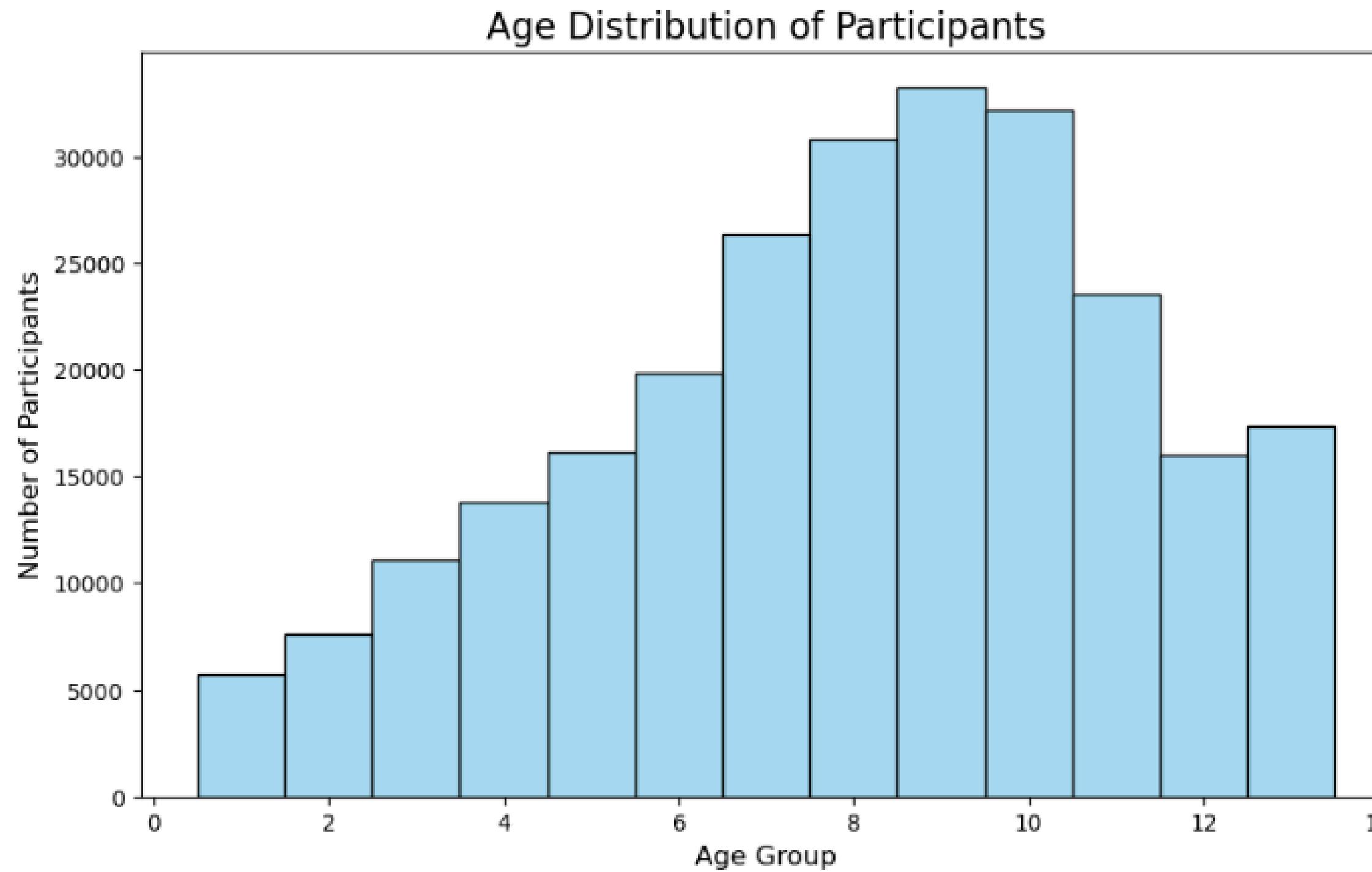
Make Recommendations:

Provide evidence-based recommendations for healthcare providers, policymakers, and community health programs.



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Key Findings from Univariate Analysis

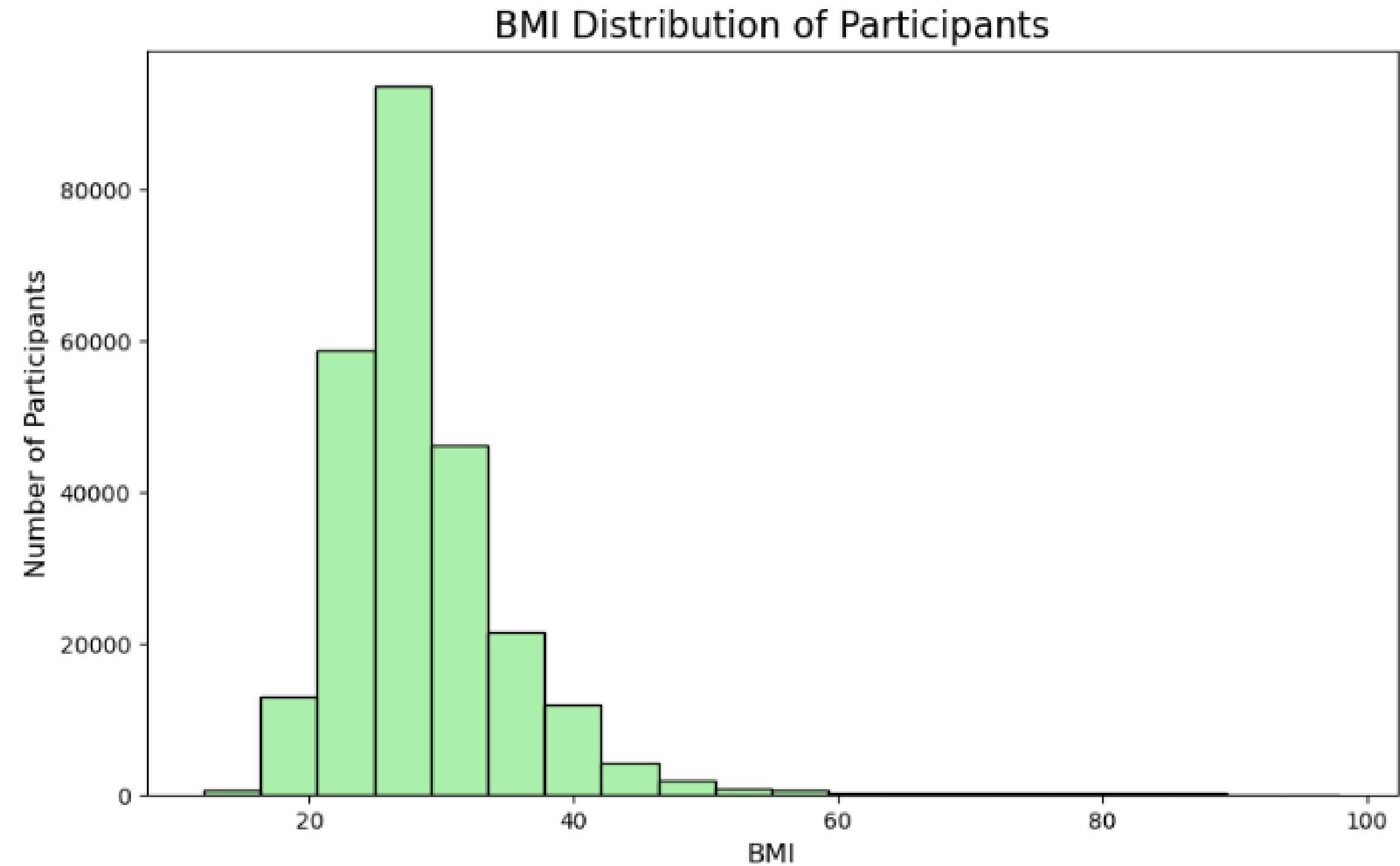


Age Groups:

**Higher prevalence of heart disease observed in individuals aged 45-65.
Common age groups range from 8 to 10.**

Key Findings from Univariate Analysis

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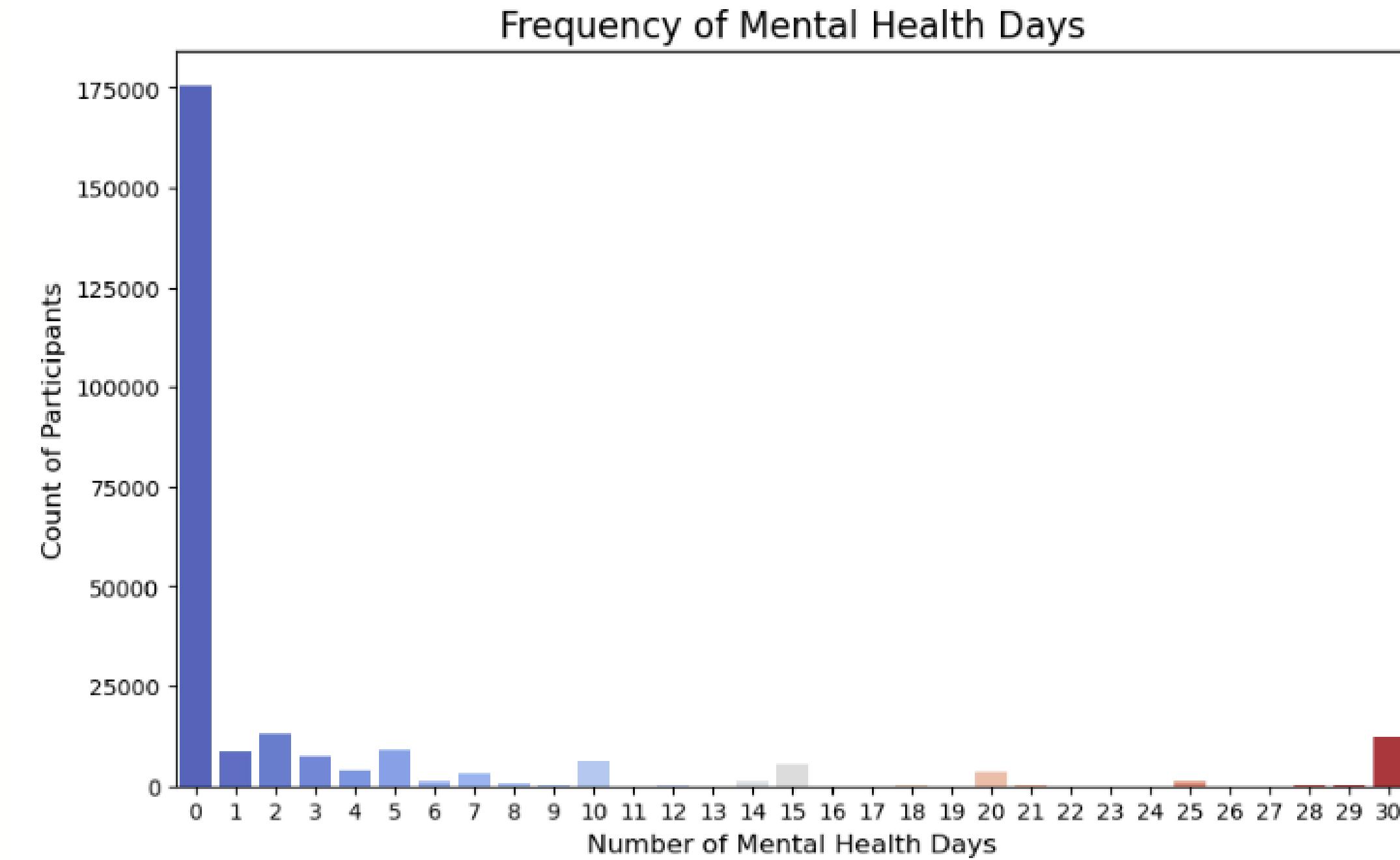


Body Mass Index (BMI):

Significant proportion of individuals with a high BMI in the range of 22 to 33.

Key Findings from Univariate Analysis

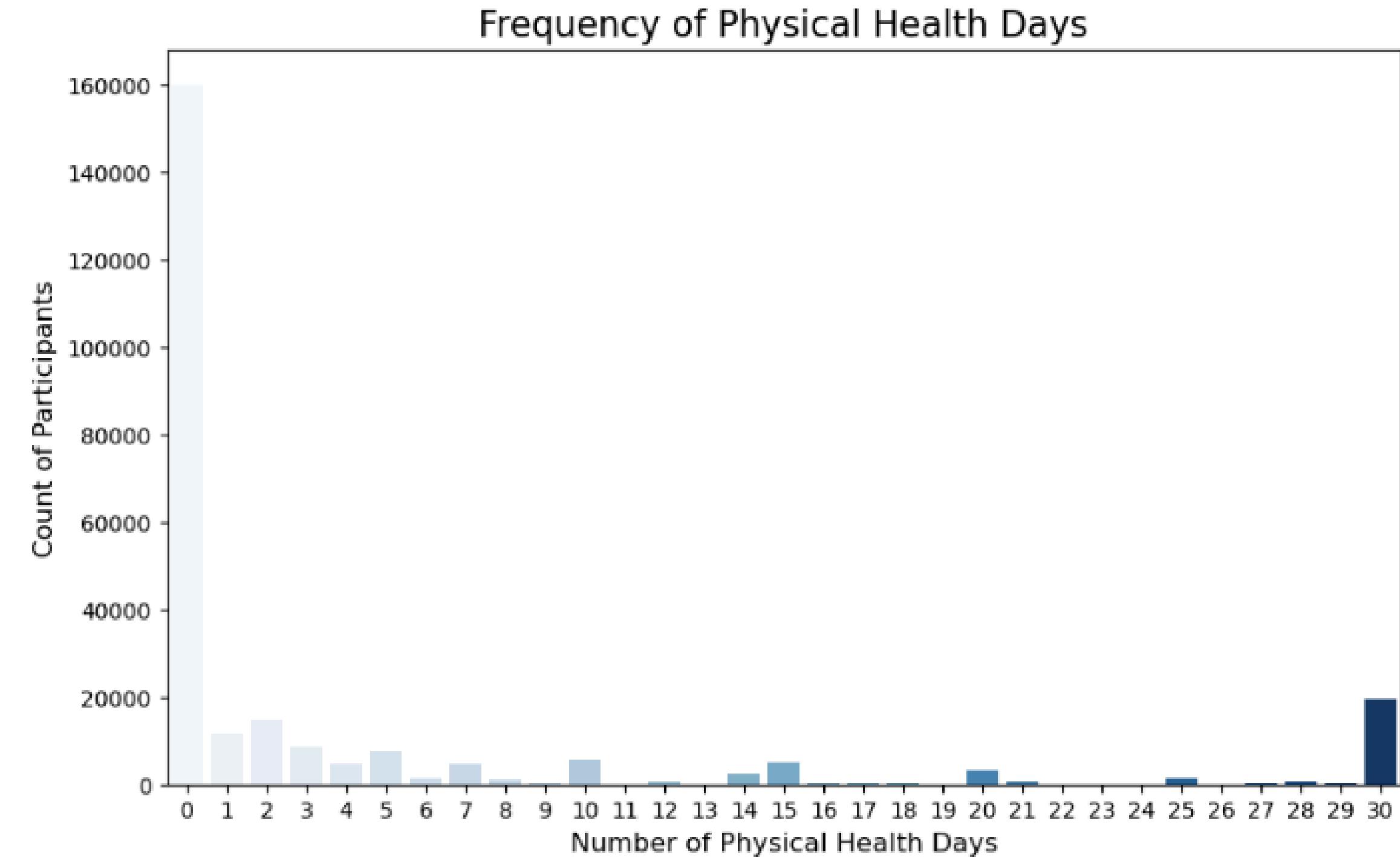
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Mental Health Days:

Majority reported 0 mental health days, suggesting potential mental health challenges.

Key Findings from Univariate Analysis

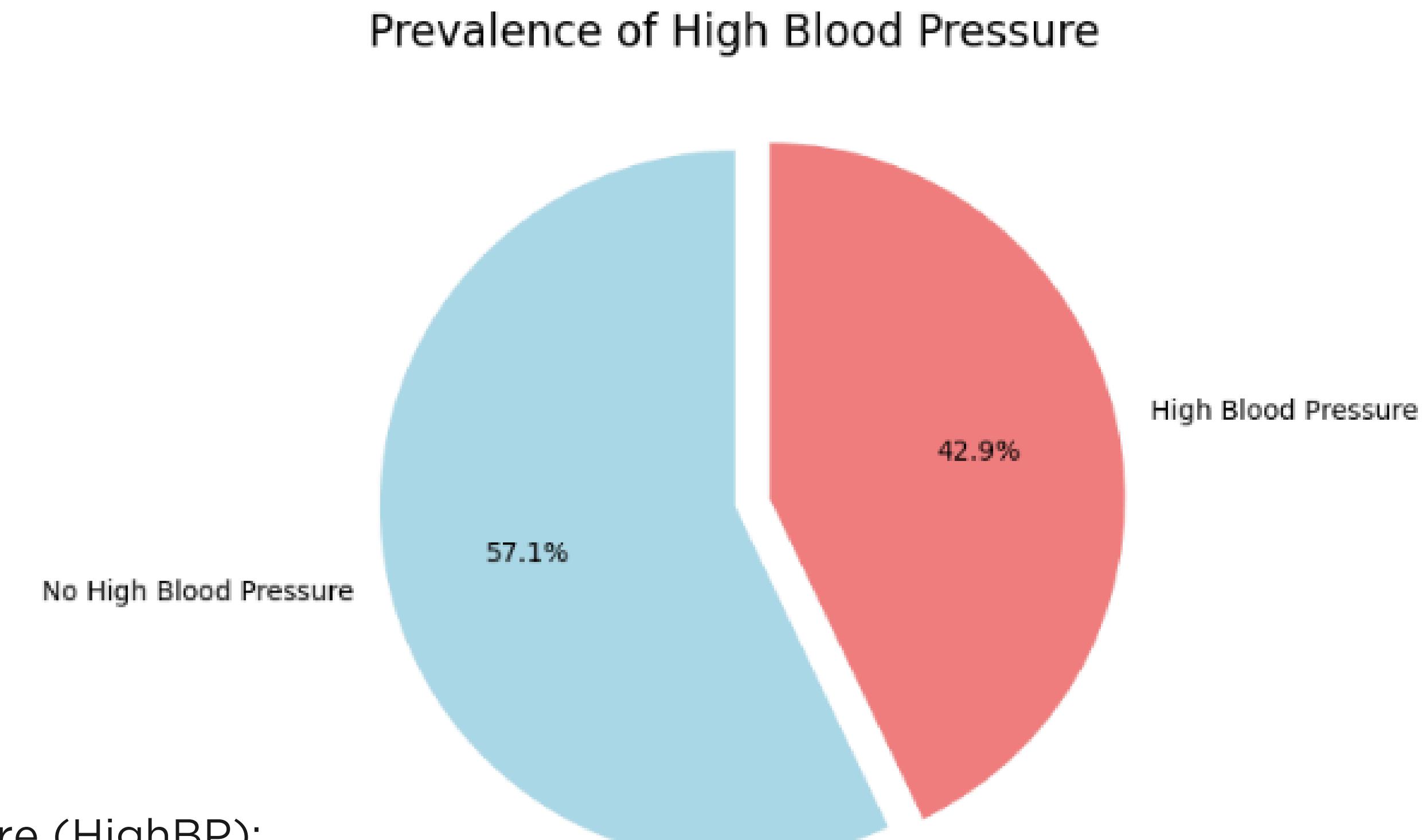


Physical Health Days:

- **Similar to mental health, most individuals reported 0 physical health days, indicating a lack of chronic physical health issues.**

Key Findings from Univariate Analysis

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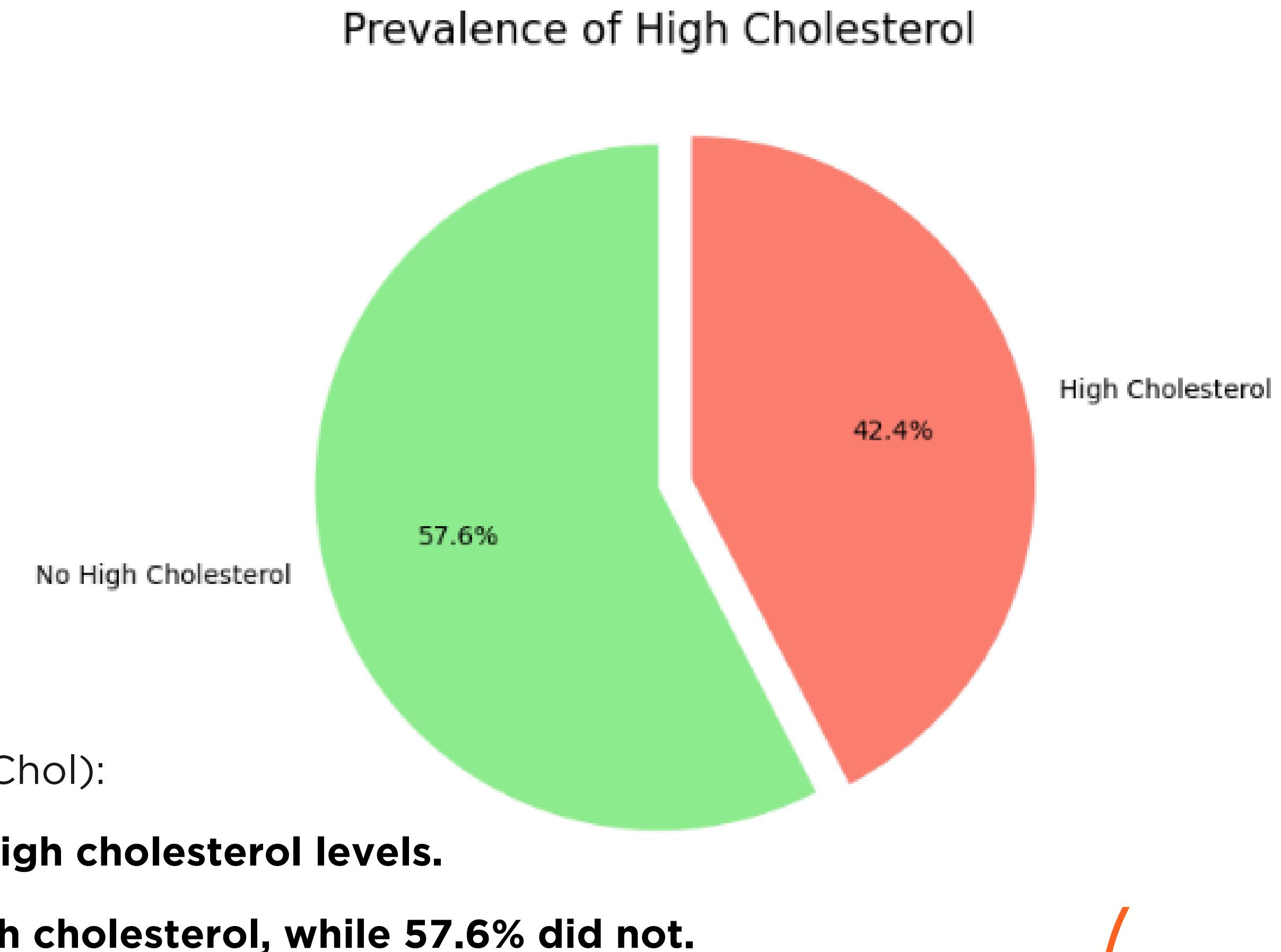
High Blood Pressure (HighBP):

Prevalence shows 0 as the most frequent value.

42.9% of individuals reported high blood pressure, while 57.1% did not.

Key Findings from Univariate Analysis

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Key Findings from Univariate Analysis

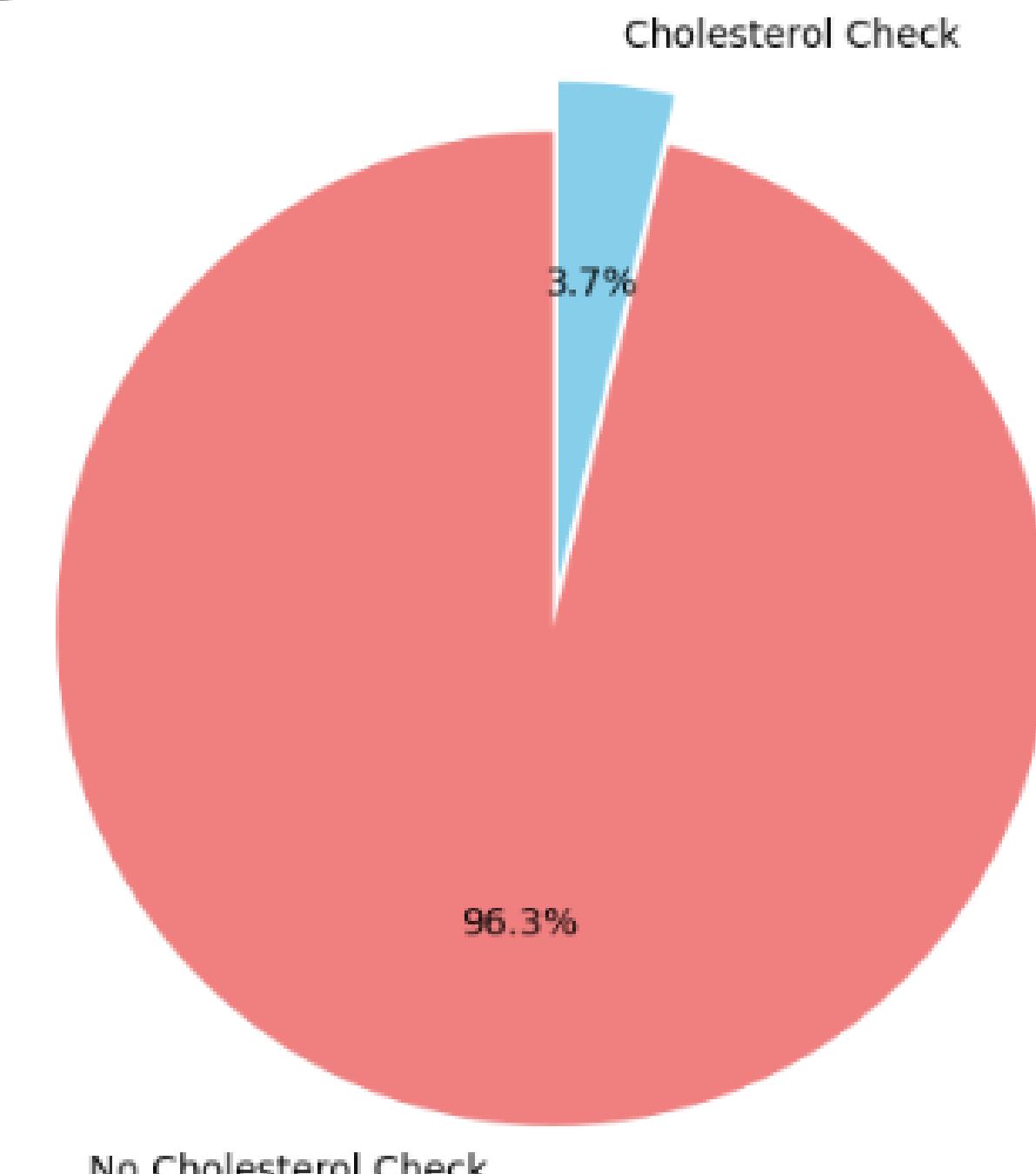
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Cholesterol Check:

High prevalence of individuals had undergone cholesterol checks, indicating proactive health monitoring.

- **3.7% of individuals reported having a cholesterol check.**

Percentage of Individuals Who Had a Cholesterol Check

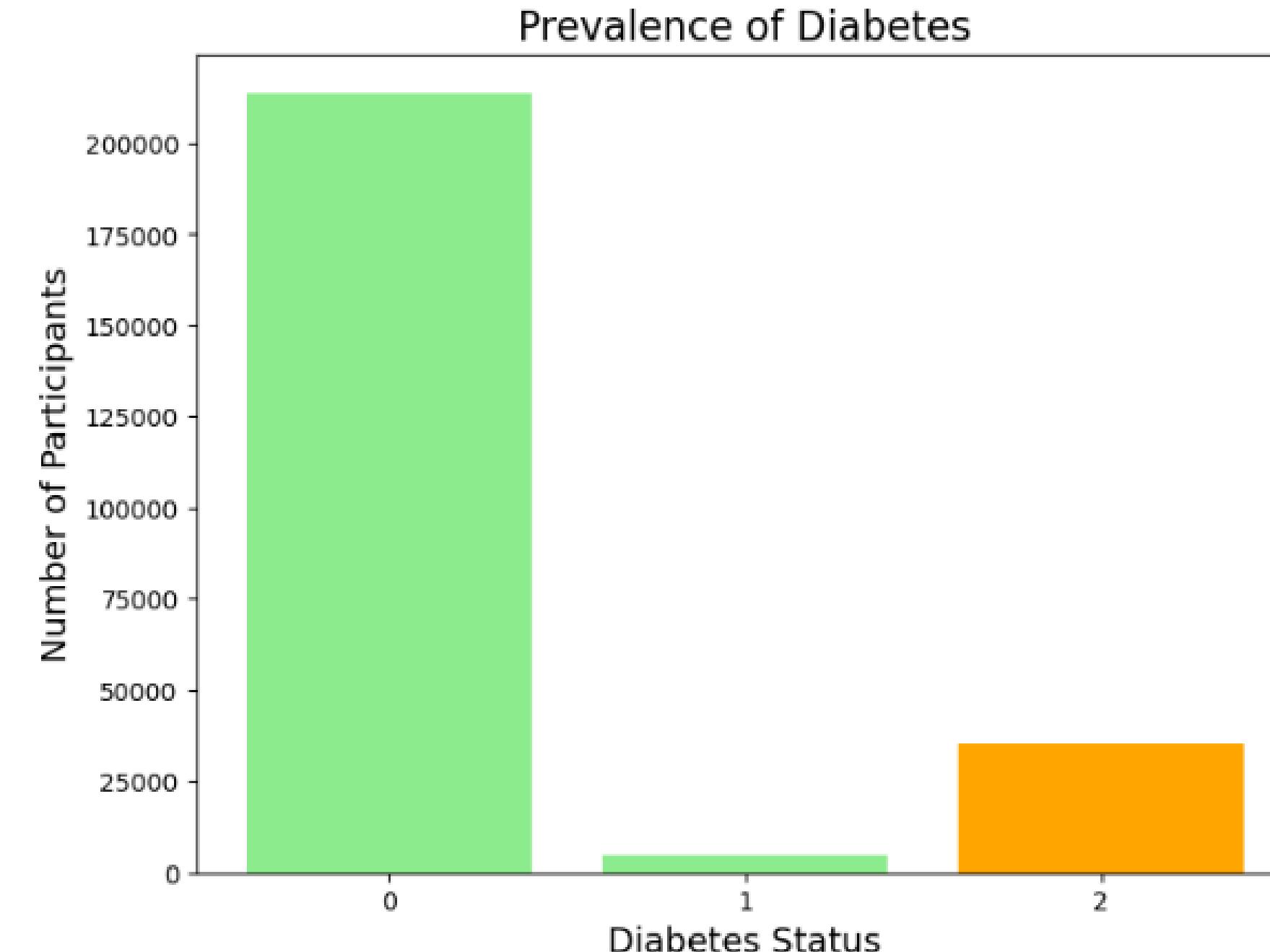


Key Findings from Univariate Analysis

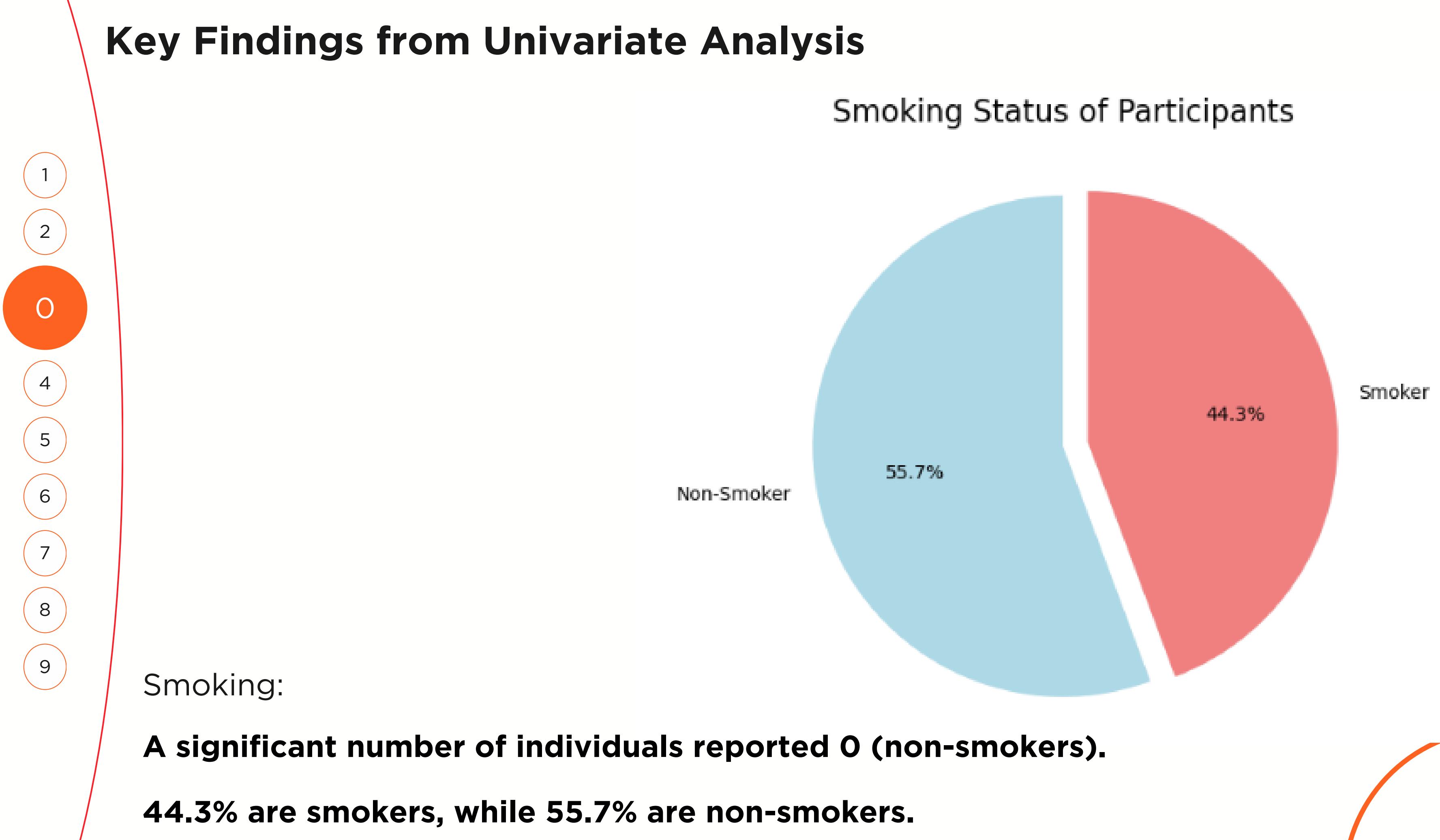
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Diabetes:

Majority indicated 0 (no diabetes), reflecting a relatively low prevalence of diabetes in the population.

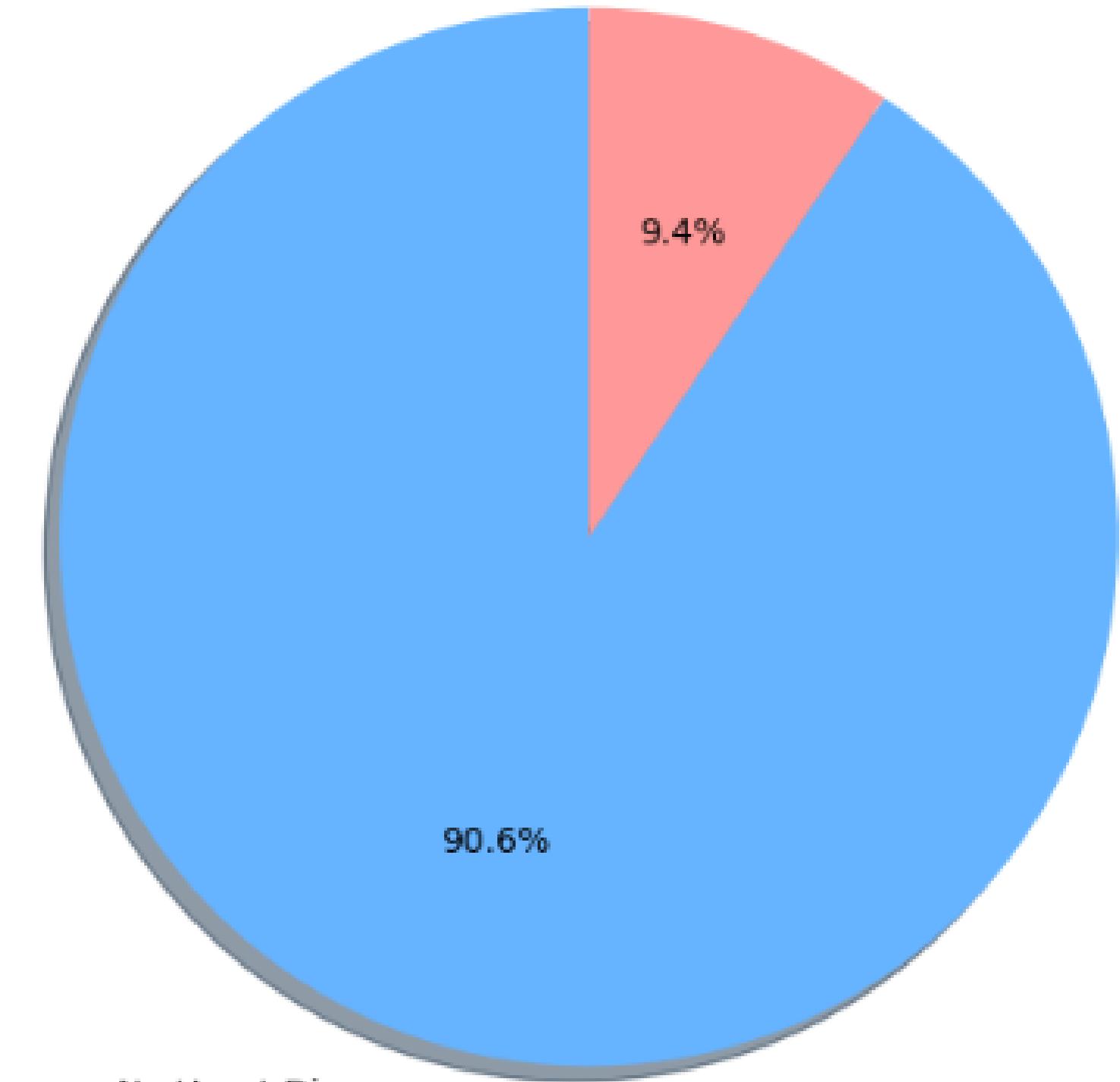


Key Findings from Univariate Analysis



Key Findings from Univariate Analysis

Proportion of Heart Disease Cases



Heart Disease Distribution:

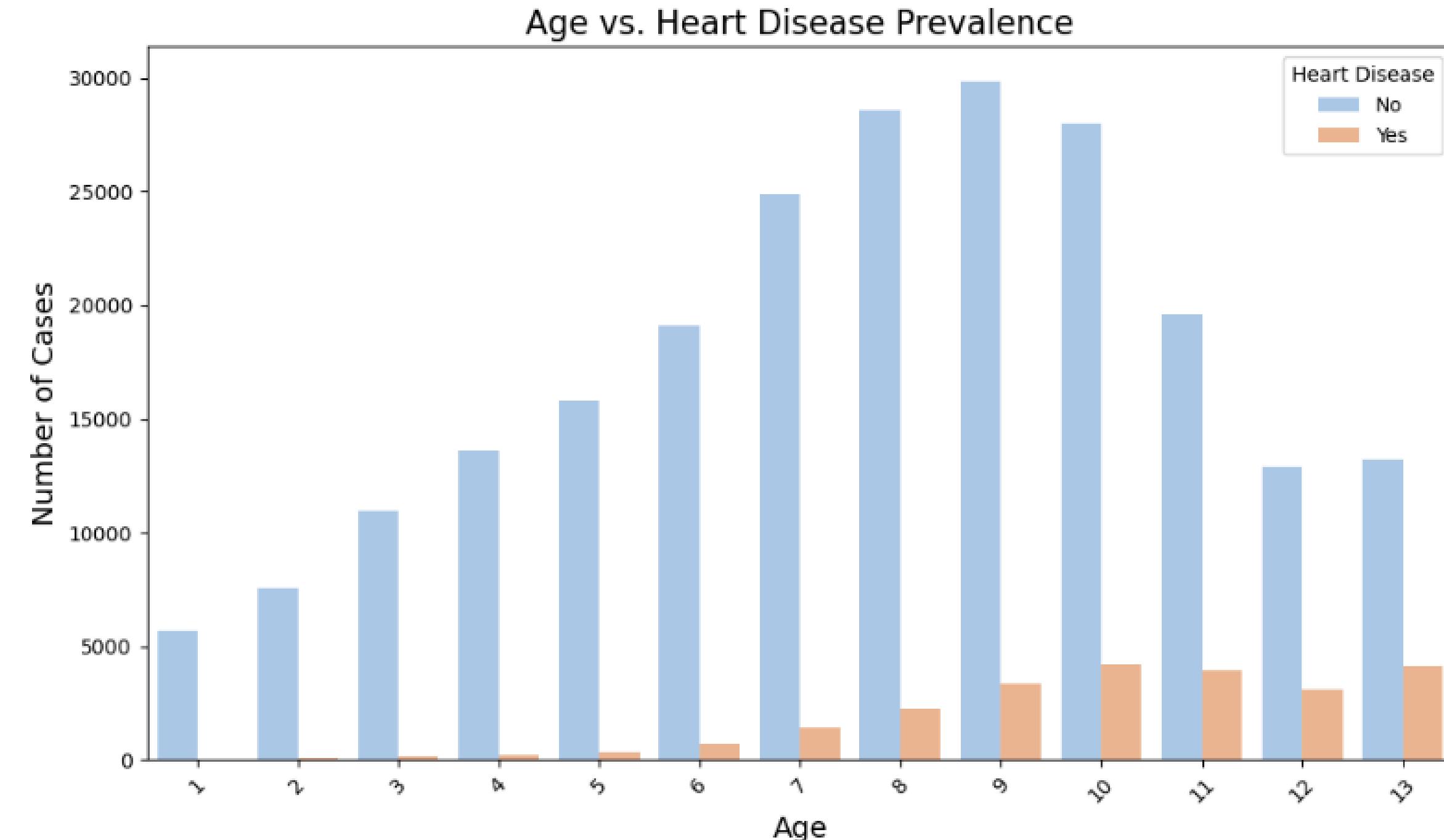
chart shows that 90.6% of individuals do not have heart disease, while 9.4% do, highlighting the relatively low prevalence of the condition in this dataset.

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Key Findings from Bivariate Analysis

A. Explore Relationships with Heart Disease

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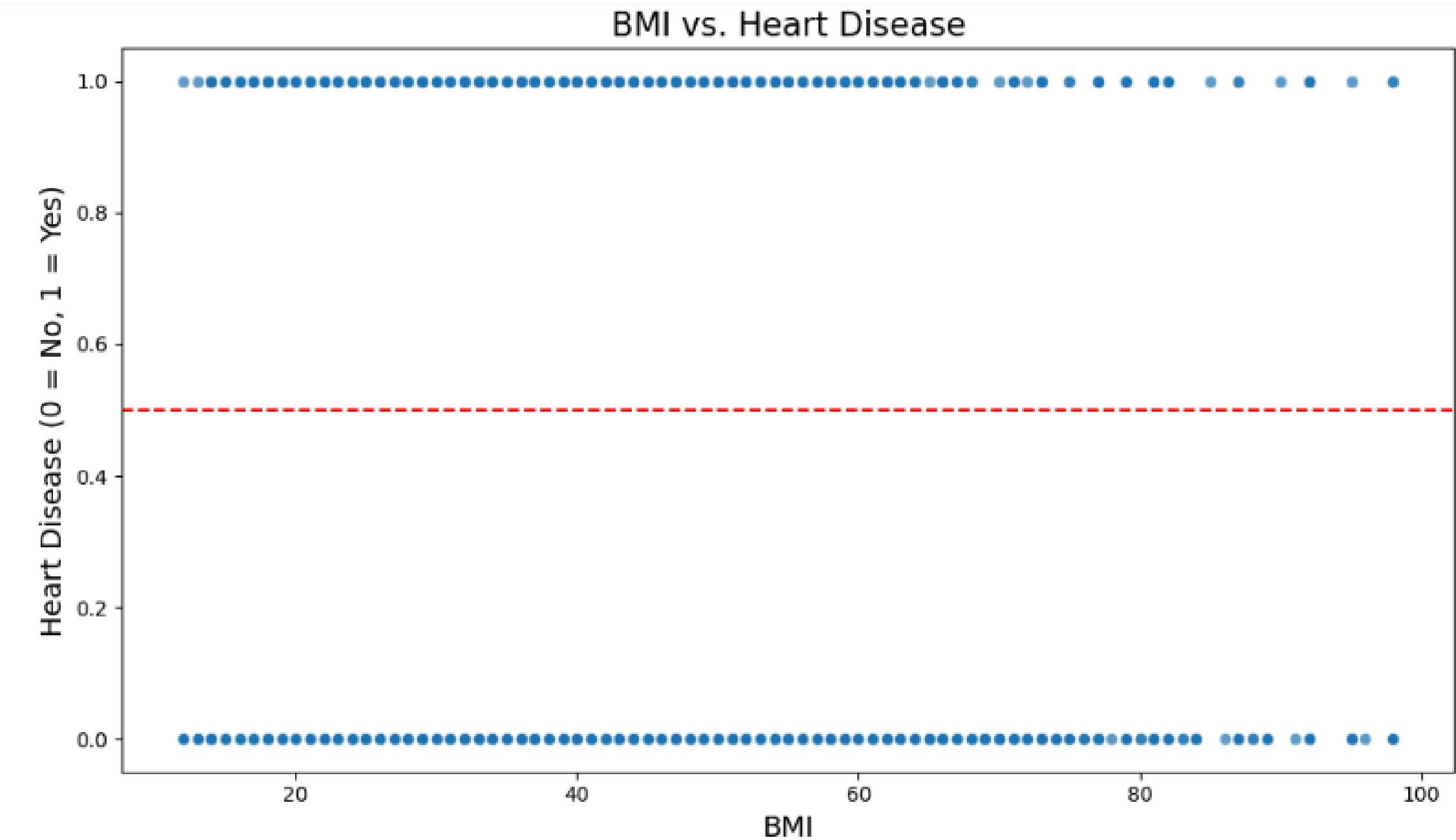
Age vs. Heart Disease:

The analysis reveals that the age groups 9, 10, and 11 show a significantly higher prevalence of heart disease, indicating that older individuals are more at risk

Key Findings from Bivariate Analysis

B. Visualize Correlations Between Variables

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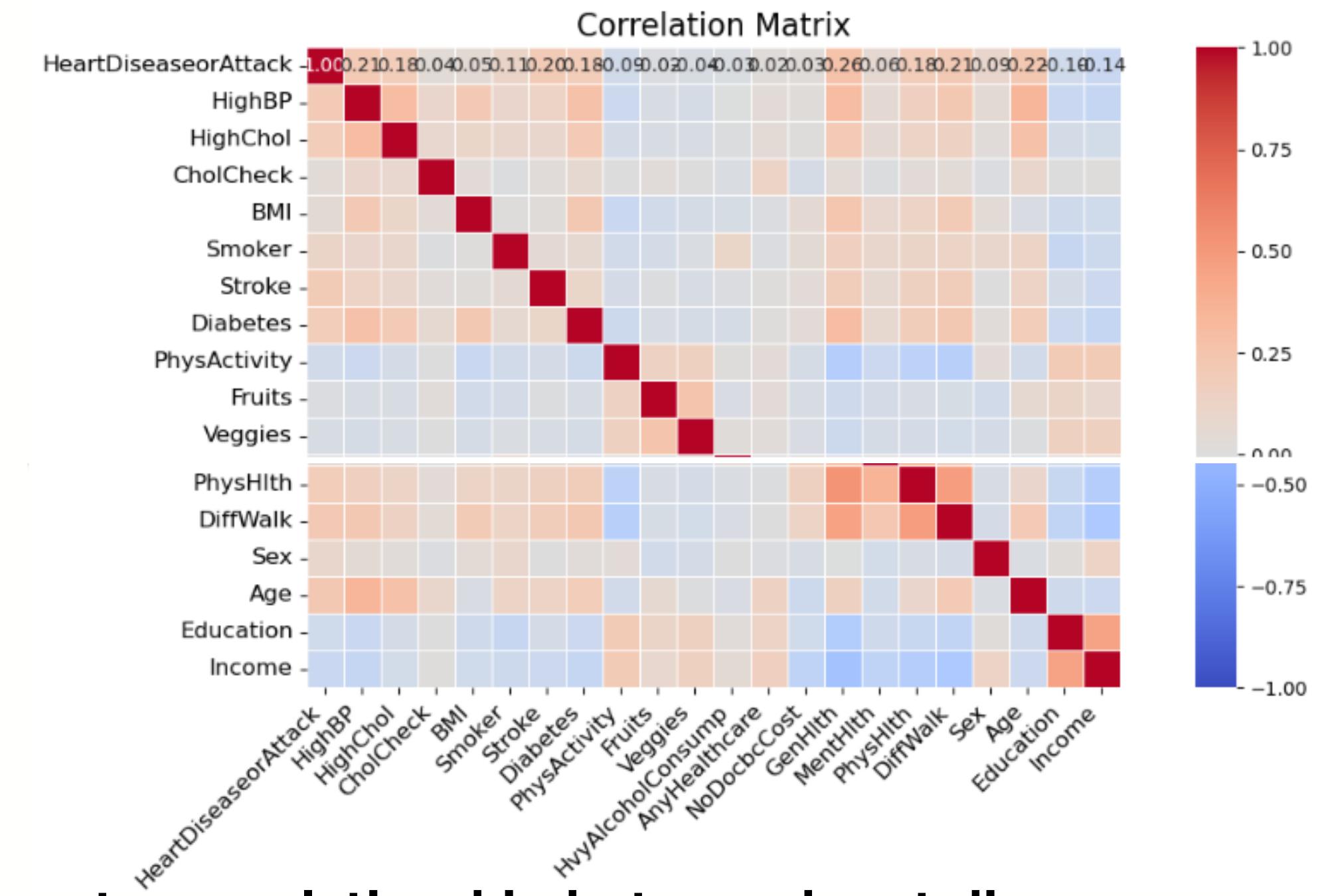
BMI vs. Heart Disease

There is a clear trend where an increase in Body Mass Index (BMI) correlates with a rise in heart disease cases, highlighting the impact of obesity on cardiovascular health.

Key Findings from Bivariate Analysis

B. Visualize Correlations Between Variables

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The correlation matrix indicates a strong relationship between heart disease and several factors, including high blood pressure (HighBP), high cholesterol (HighChol), BMI, cholesterol checks (CholCheck), smoking status, and stroke. This suggests that these variables are closely associated with the likelihood of heart disease.

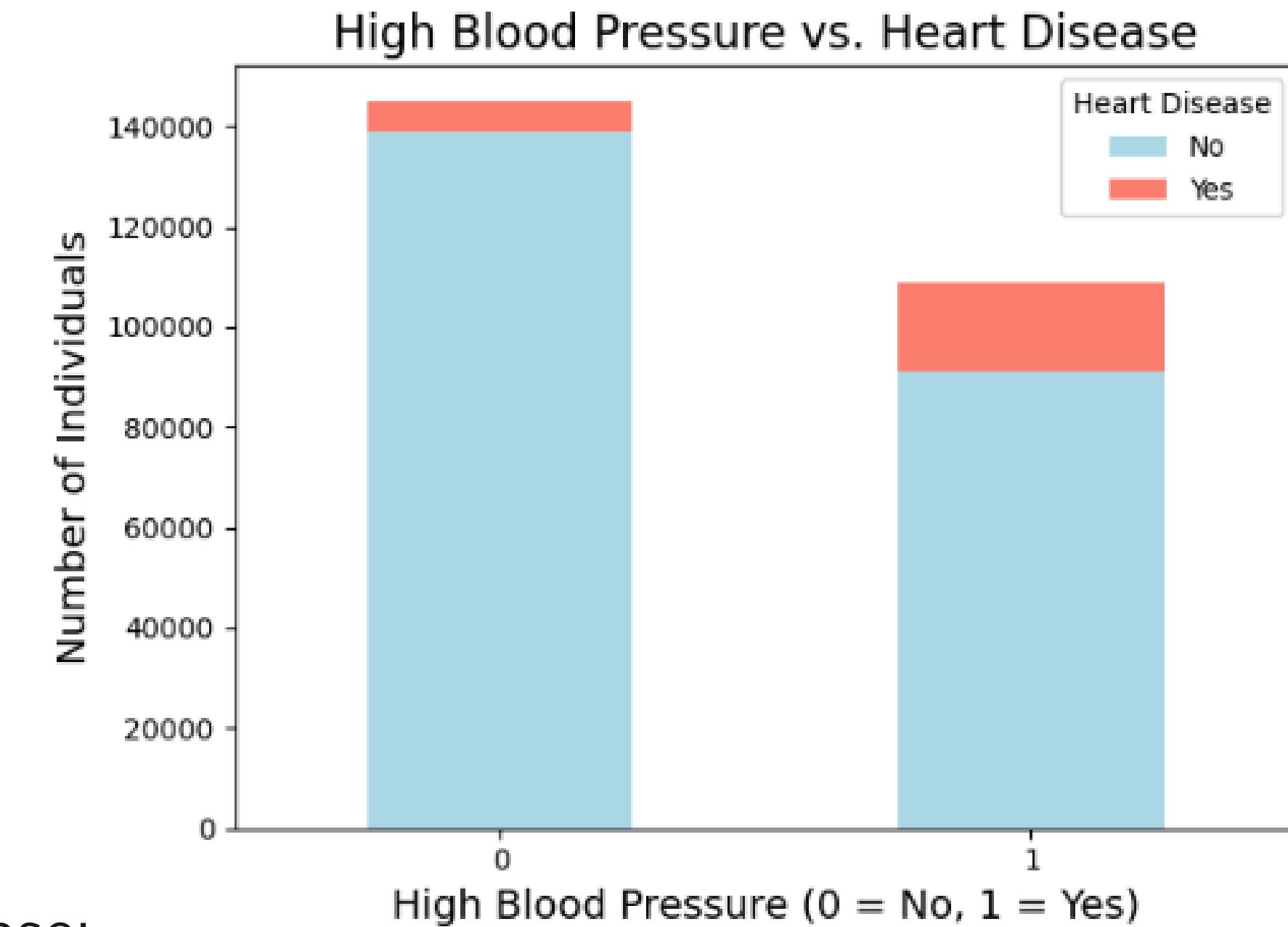
Key Findings from Bivariate Analysis

C. Compare Heart Disease Across Demographic Groups

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High Blood Pressure vs. Heart Disease:

The data shows that individuals with high blood pressure (1 = Yes) have a notably higher incidence of heart disease, underscoring the importance of hypertension management.

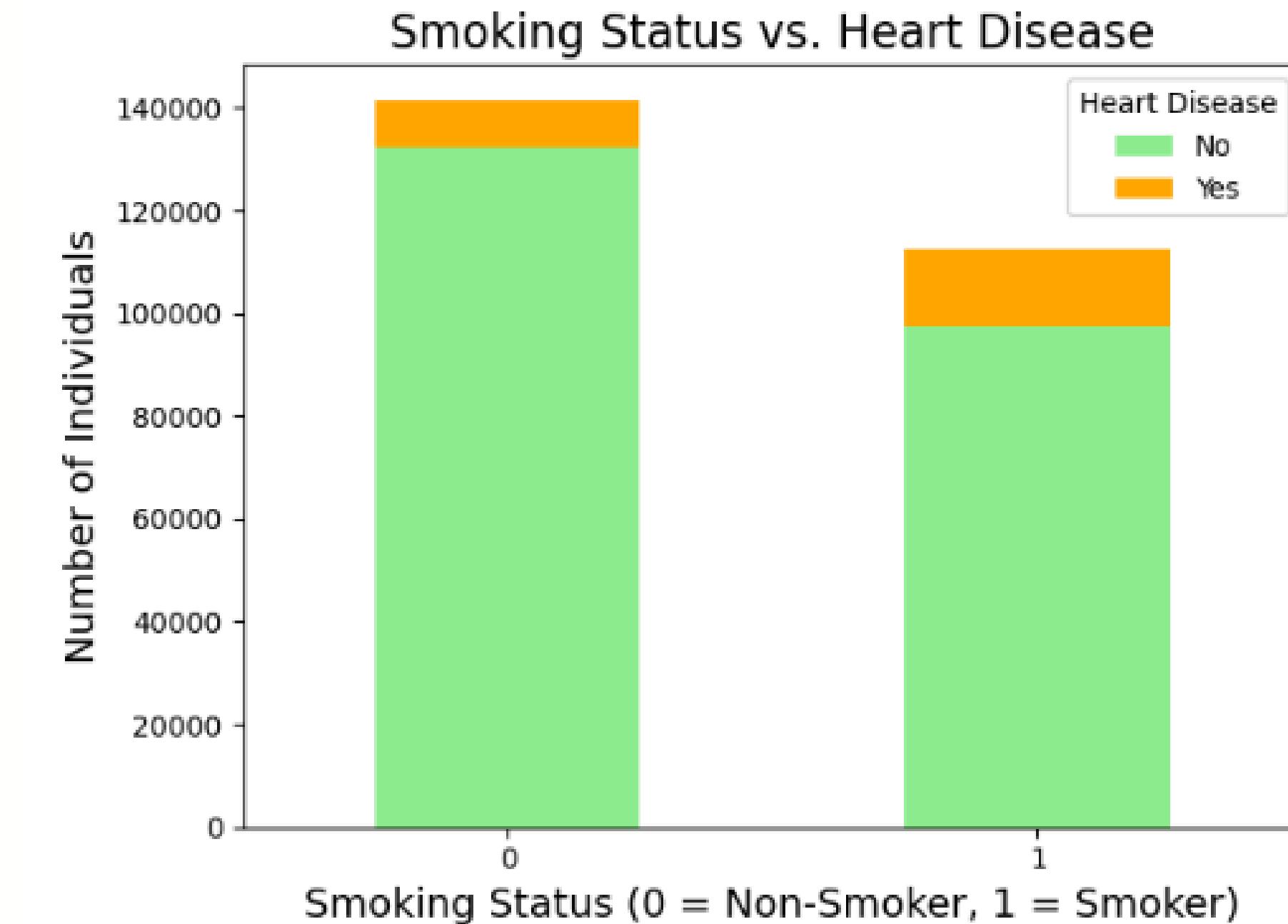


Key Findings from Bivariate Analysis

C. Compare Heart Disease Across Demographic Groups

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Smoking Status vs. Heart Disease



Similarly, those identified as smokers (1 = Yes) also exhibit a higher prevalence of heart disease, emphasizing the detrimental effects of smoking on cardiovascular health.

Actionable Insights

Key Findings from Univariate Analysis

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- Age Groups:
 - Insight: Target health education and intervention programs towards individuals aged 45-65, as they exhibit a higher prevalence of heart disease.
 - Action: Develop community outreach initiatives focused on cardiovascular health for this age demographic.
- Body Mass Index (BMI):
 - Insight: A significant proportion of individuals with a high BMI were identified, indicating obesity as a health risk.
 - Action: Implement weight management and nutritional programs aimed at reducing BMI among the population.
- Mental Health Days:
 - Insight: Many individuals reported zero mental health days, indicating potential underlying mental health challenges.
 - Action: Increase access to mental health resources and promote awareness about mental health support services.
- Physical Health Days:
 - Insight: Similar to mental health, most individuals reported zero physical health days, suggesting a lack of chronic physical health issues.
 - Action: Encourage regular health screenings and promote physical activity to enhance overall health and wellness.
- High Blood Pressure (HighBP):
 - Insight: The prevalence of high blood pressure is notable (42.9%), indicating a need for hypertension management.
 - Action: Create awareness campaigns about the risks of high blood pressure and promote regular check-ups.

Actionable Insights

Key Findings from Univariate Analysis

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- High Cholesterol (HighChol):
 - Insight: High cholesterol levels are also prevalent (42.4%).
 - Action: Promote dietary changes and cholesterol screenings as part of preventive health measures.
- Cholesterol Check:
 - Insight: A high percentage of individuals have undergone cholesterol checks (3.7%).
 - Action: Reinforce the importance of regular health check-ups and screenings in community health programs.
- Diabetes:
 - Insight: The majority of individuals indicated no diabetes, suggesting a lower prevalence.
 - Action: Continue promoting healthy lifestyles to maintain low diabetes rates in the community.
- Smoking:
 - Insight: A significant number of individuals reported being non-smokers, indicating low smoking prevalence (55.7%).
 - Action: Maintain anti-smoking campaigns to protect and further reduce smoking rates.
- Heart Disease Distribution:
 - Insight: 90.6% of individuals do not have heart disease, highlighting positive health outcomes.
 - Action: Strengthen preventive measures to sustain low heart disease prevalence and encourage regular health screenings.

Actionable Insights

Key Findings from Bivariate Analysis

- 1 • Explore Relationships with Heart Disease (Age vs. Heart Disease):
 - Insight: Older age groups are more susceptible to heart disease.
 - Action: Tailor health interventions and screening programs for older adults to reduce heart disease risk.
- 2 • Visualize Correlations Between Variables (BMI vs. Heart Disease):
 - Insight: Increased BMI correlates with higher heart disease rates.
 - Action: Develop and promote programs focused on weight loss and healthy living to combat obesity.
- 3 • Correlation Matrix:
 - Insight: Strong correlations exist between heart disease and various risk factors such as HighBP, HighChol, and smoking.
 - Action: Create integrated health initiatives targeting these risk factors collectively to reduce heart disease prevalence.
- 4 • Compare Heart Disease Across Demographic Groups:
 - High Blood Pressure vs. Heart Disease:
 - Insight: High blood pressure significantly increases the risk of heart disease.
 - Action: Implement community screenings and education on managing blood pressure.
 - Smoking Status vs. Heart Disease:
 - Insight: Smokers have a higher risk of heart disease.
 - Action: Enhance smoking cessation programs and support systems to help individuals quit smoking.
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Recommendations

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- 1. Targeted Health Interventions
- Age-Specific Programs: Develop targeted health programs for individuals aged 45-65, focusing on cardiovascular health education, regular screenings, and lifestyle modification.
- 2. Weight Management Initiatives
- BMI Reduction Programs: Implement community initiatives promoting healthy eating and physical activity to help individuals achieve and maintain a healthy BMI. Collaborate with local gyms and nutritionists for workshops.
- 3. Mental Health Support
- Mental Health Resources: Increase access to mental health services and create awareness campaigns about mental health issues. Consider offering mental health days as part of workplace wellness programs.
- 4. Regular Health Screenings
- Preventive Health Check-ups: Encourage regular health screenings, particularly for high blood pressure and cholesterol levels. Partner with local healthcare providers for community health fairs that offer free or low-cost screenings.
- 5. Cholesterol and Blood Pressure Management
- Educational Workshops: Organize workshops on managing cholesterol and blood pressure through diet, exercise, and medication adherence. Distribute educational materials to the community to raise awareness.

Recommendations

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- 6. Diabetes Prevention Programs
- Healthy Lifestyle Promotion: Continue to promote healthy lifestyles to maintain low diabetes prevalence. Develop programs focused on nutrition education and physical activity for at-risk populations.
- 7. Anti-Smoking Campaigns
- Smoking Cessation Support: Enhance smoking cessation programs by providing resources, counseling, and support groups. Collaborate with local organizations to promote awareness about the dangers of smoking.
- 8. Integrated Health Initiatives
- Holistic Health Approaches: Create integrated health initiatives that address multiple risk factors for heart disease, such as high blood pressure, high cholesterol, and smoking. Develop a community task force to coordinate these efforts.
- 9. Data-Driven Decision Making
- Continuous Monitoring: Establish a system for continuous monitoring and evaluation of health outcomes related to heart disease and its risk factors. Use data analytics to inform future health initiatives and policy decisions.
- 10. Community Engagement and Outreach
- Stakeholder Collaboration: Foster collaboration among healthcare providers, community organizations, and local governments to maximize the impact of health initiatives. Engage community members in health decision-making processes to enhance program relevance and effectiveness.

Conclusion

- 1 • Key Takeaways
- 2 • Understanding Prevalence:
 - The analysis revealed a relatively low prevalence of heart disease in the population, with significant findings regarding age groups, BMI, and lifestyle factors.
- 3 • Impact of Demographic Variables:
 - Age and BMI were strongly correlated with heart disease risk. The data suggests targeted interventions are necessary for individuals in higher-risk demographics.
- 4 • Lifestyle Factors Matter:
 - High blood pressure, high cholesterol, and smoking status are critical factors influencing heart disease. Community programs focusing on these areas can lead to better health outcomes.
- 5 • Data-Driven Insights:
 - The findings from both univariate and bivariate analyses highlight the importance of utilizing data analytics in public health strategies. Insights gathered can inform effective interventions.
- C • Recommendations for Action:
 - Implementing targeted health programs, promoting preventive health screenings, and enhancing lifestyle change initiatives are essential steps toward reducing heart disease prevalence.
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Thank you

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