Heart Disease Inequality Analysis Report

# Introduction

Heart disease remains one of the leading causes of mortality globally. However, not all populations are equally affected. Social determinants such as access to healthcare, income, education, and lifestyle choices significantly influence the prevalence of heart disease. This project aims to uncover these inequalities using real-world behavioral health surveillance data.

# Methods

The dataset used in this study originates from a health surveillance system that tracks behavioral risk factors. The dataset was cleaned by removing duplicates, capping extreme BMI values (between 18 and 50), and categorizing continuous variables such as BMI and age into groups. Two major themes were analyzed to explore disparities in heart disease occurrence:  
  
1. Lifestyle Factors – smoking, physical activity, alcohol consumption, and BMI.  
2. Access to Care – availability of healthcare coverage, cost-related care delays, cholesterol checks, education level, and income group.

# Key Insights: Lifestyle Factors

- Smoking: A higher percentage of individuals who smoke reported heart disease compared to non-smokers, indicating a strong correlation between tobacco use and cardiovascular risk.  
- Physical Activity: Individuals who engage in physical activity had a notably lower rate of heart disease, highlighting the protective effect of regular exercise.  
- Heavy Alcohol Consumption: While the heart disease percentage difference was less dramatic, heavy alcohol consumers still reported slightly higher rates than non-heavy drinkers.  
- BMI Category: Individuals in the obese category had the highest proportion of heart disease cases, confirming the risk associated with higher body weight.

# Key Insights: Access to Care

- Any Healthcare Coverage: Individuals with no healthcare coverage showed a significantly higher rate of heart disease, suggesting that access to regular healthcare services may aid in prevention or early detection.  
- Cost Barrier (NoDocbcCost): People who reported being unable to see a doctor due to cost had a noticeably higher rate of heart disease, highlighting the impact of financial barriers on health outcomes.  
- Cholesterol Check: Those who had not undergone a cholesterol check in the past five years had higher rates of heart disease, demonstrating the importance of preventive screening.  
- Education: A clear downward trend in heart disease prevalence was seen with increasing education levels. People with less than a high school education had the highest rates.  
- Income: Heart disease prevalence was higher in the lower income brackets, further confirming that economic disadvantage is a risk factor.

# Conclusion

This analysis shows that heart disease is not just a result of biological or genetic factors—it is deeply intertwined with socioeconomic and behavioral elements. Individuals from lower income and education groups, those without health coverage, and those with unhealthy lifestyle choices are more vulnerable. These insights underscore the need for policy-level interventions to reduce these health disparities and improve preventive care outreach, especially in underserved communities.