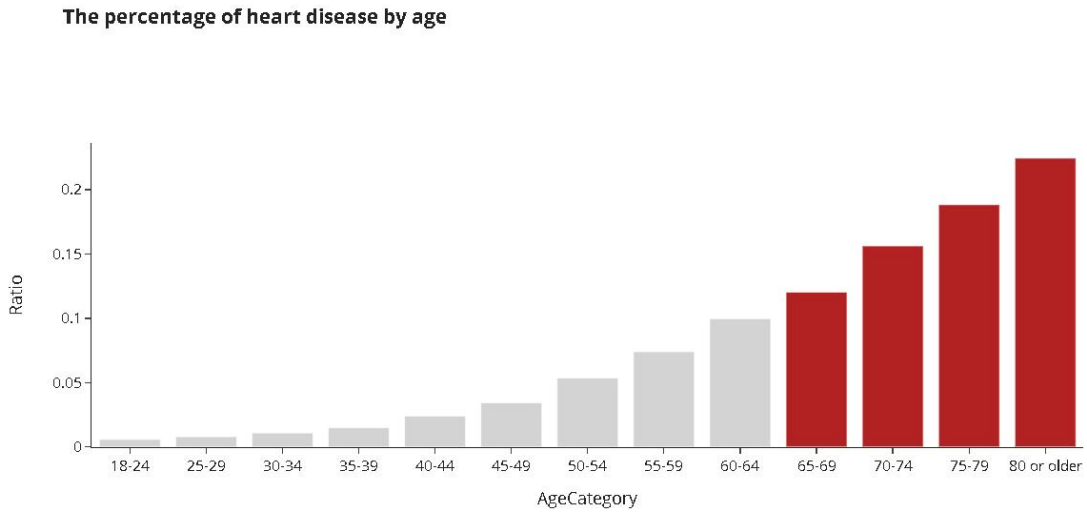
EXPLORATORY DATA ANALYSIS

The exploratory data analysis has been conducted on the dataset, encompassing a comprehensive examination of each individual factor, namely Demography, Lifestyle, Health Condition, and Disease. Each of these factors has been subjected to rigorous analysis to discern the extent to which they influence the presence of heart disease. The research has meticulously delved into these facets, providing insights into their respective impacts on heart disease risk.

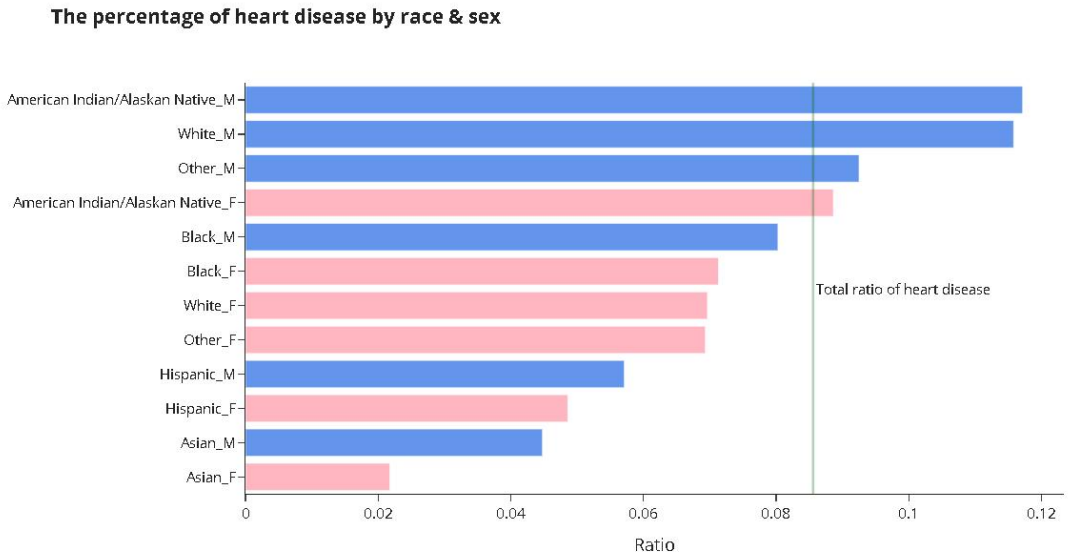
Age

In the context of cardiovascular disease, research indicates that the prevalence of heart disease tends to increase as individuals age. According to recent studies, adults aged 65 and older are more likely to suffer from cardiovascular disease compared to younger individuals. In fact, it has been observed that the aging and elderly population is particularly susceptible to cardiovascular problems, with age being identified as an independent risk factor. Additionally, statistics from 2019 reveal that the prevalence of heart disease increases with age, with adults aged 55-64 and 65 and older experiencing higher rates of heart disease compared to younger age groups. In fact, approximately 67.32% of the heart disease population is distributed among individuals aged 65 and above, further emphasizing the impact of age on the development of cardiovascular disease.



Sex and race

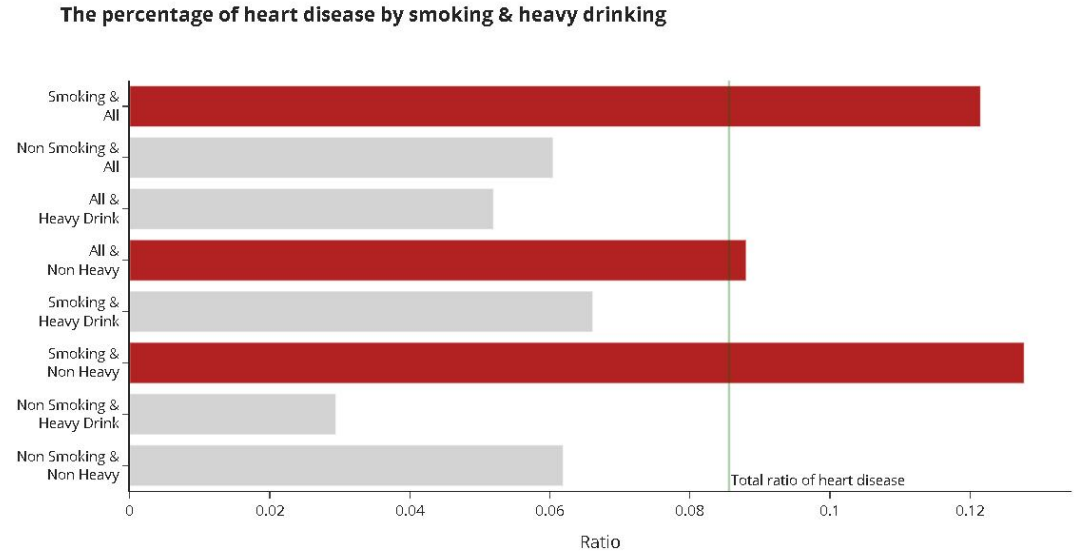
Evident from the trends, heart disease exhibits a higher incidence among males, with a percentage of 10.59%, compared to females at 6.72%. When considering race, American Indian/Alaskan Native and White populations have the highest heart disease percentages, with 10.18% and 9.19%, respectively. In contrast, the lowest incidence rate is observed among Asians, with a ratio of 0.0337. This data emphasizes the importance of acknowledging gender and racial disparities in heart disease epidemiology for tailored preventive and healthcare strategies.



LIFESTYLE

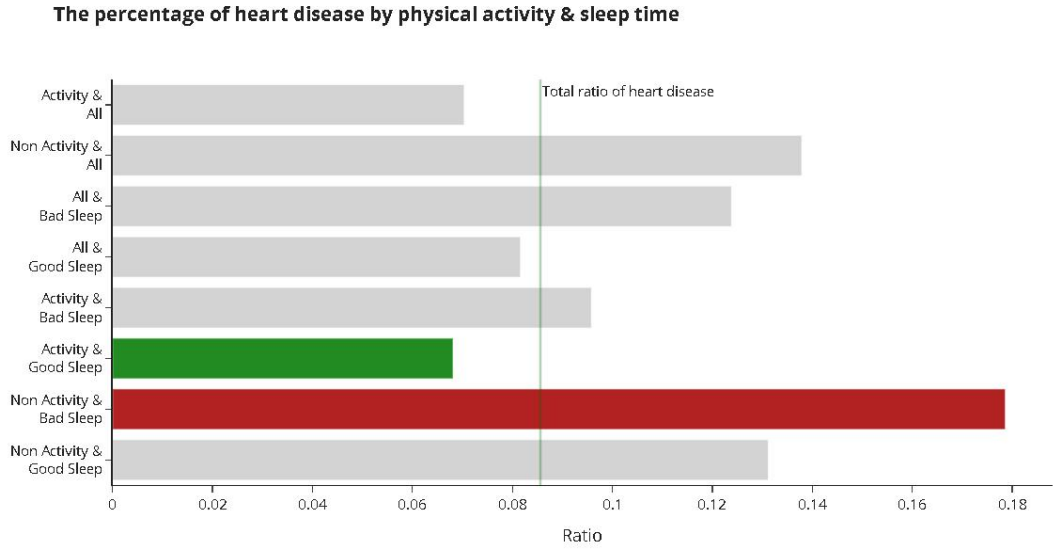
Smoking and Alcohol consumption

Smoking is identified as a more significant contributing factor to heart disease than alcohol consumption. Specifically, 12.15% of heart patients are complete smokers, and an additional 12.77% of patients are smokers who do not engage in heavy drinking. This data underscores the prominent role of smoking in the development of heart disease.

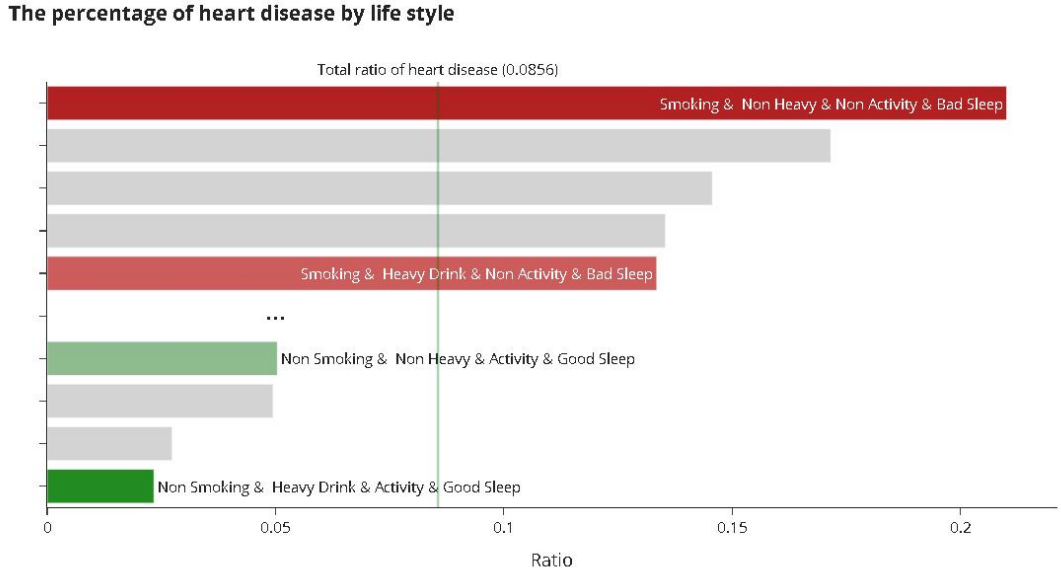


Physical activity and sleep time

Upon examination of the graph, the observed rates of heart disease within each group align with these expectations. Notably, the group characterized by insufficient physical activity and inadequate sleep exhibits a heart disease rate of 17.86%, while those who are physically active and enjoy sufficient sleep have a significantly lower heart disease rate of only 6.8%. This data underscores the positive impact of physical activity and adequate sleep on heart disease prevention.



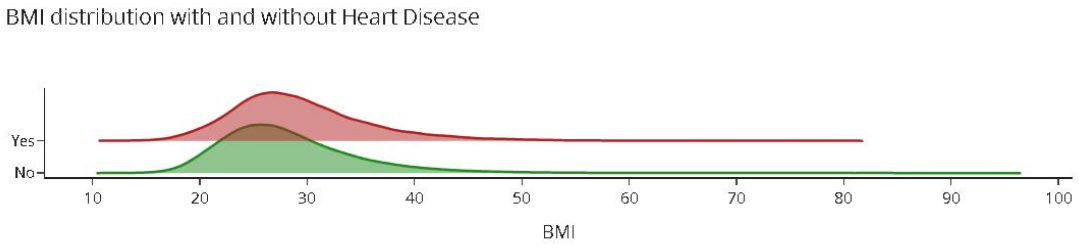
Upon comprehensive analysis, it becomes evident that the interplay of factors such as smoking, alcohol consumption, physical activity, and sleep duration significantly impacts the risk of heart disease. Individuals exhibiting a combination of smoking, inactivity, and poor sleep habits experience a markedly elevated heart disease incidence of 21%, surpassing the overall heart disease prevalence of 8.56%. In contrast, individuals who do not smoke, engage in physical activity, and maintain good sleep habits demonstrate a notably lower heart disease rate of 2.33%.



Health factors

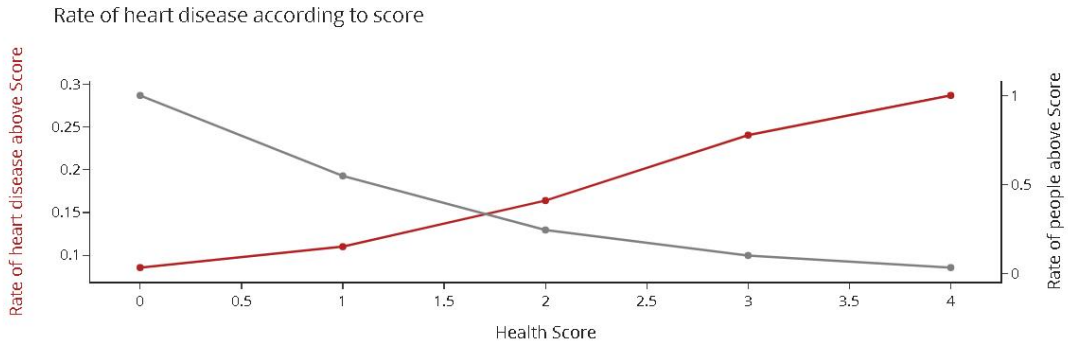
BMI

The analysis of BMI distribution reveals that there is no substantial difference between heart disease patients and non-heart disease individuals. The median BMI of heart disease patients shows only a slight elevation compared to that of individuals without heart disease.



Physical health, Mental health, General health and Difficulty in walking

The health factors are related to each other so for the bad case it is given as 1 point and for good case it is given 0 point. The graph shows the rate of heart disease for specific scores. If the score is 4 then it is seen that the person heart disease is about 28.67%. It is seen as a trend that the rate of heart disease patients increases with the increase in score. It is also seen people with less score are less prone to heart disease.



Disease

Under analysis, the impact of various diseases on heart disease risk is assessed, including Stroke, Kidney Disease, Diabetes, Asthma, and Skin Cancer. The following charts illustrate heart disease rates concerning the presence or absence of these diseases. Across all cases, individuals with any of these diseases show a higher heart disease rate compared to the overall average. Notably, the group with both Stroke and Kidney Disease exhibits a significantly elevated heart disease rate. Particularly, individuals who have experienced strokes face a high heart disease rate of 36.24%. These findings emphasize the substantial influence of these disease factors on heart disease risk.