MGT230 - Introduction to Database Management Final Project

Dataset Location: Key Indicators of Heart Disease
        https://www.kaggle.com/datasets/kamilpytlak/personal-key-indicators-of-heart-disease
Tableau Public Link: BUS173 Final Project
        https://public.tableau.com/views/BUS173Project/HeartDiseaseDashboard?:language=en-
US&:display_count=n&:origin=viz_share_link
Presentation Video Link: BUS173 Final Presentation
        https://youtu.be/2TJxzpdt_Ew

Introduction:

Many assume heart disease won't affect them during their lives, yet it stands as a prominent cause
of mortality among both men and women in the U.S. According to CDC data, every thirty-four
seconds, a life is claimed by heart disease, underscoring its widespread impact. Despite the
vastness of the world and the sizable U.S. population, the risk of heart disease touches many. This
study scrutinizes data from the CDC to evaluate the probability of heart disease occurrence and
examines various contributing factors to identify any discernible trends or patterns. Utilizing this
data-driven insight, we aim to explore strategies that might lessen personal heart disease risk and
enhance public awareness regarding cardiovascular health risks.

What is the data about?

The dataset focuses on a range of human attributes and behaviors that are potentially influential to
health. It encompasses demographic details (age, race, and gender) to facilitate trend analysis and
boolean variables related to lifestyle choices (smoking, drinking, and physical activity
engagement) that impact health. Additionally, it includes boolean variables on various health
conditions (general health status, asthma, diabetes, heart disease, kidney disease, skin cancer,
mobility challenges, and history of stroke). We also evaluated quantitative data such as Body Mass
Index (BMI), sleep duration, and days affected by poor physical or mental health. This data,
sourced from the U.S. population and compiled by the CDC's Behavioral Risk Factor Surveillance
System, helps us to uncover patterns and information not immediately evident in the raw data.

**What kind of Analysis did you do? - Give Screenshots from Tableau, and explain why you did what you did.**

First, we developed a few calculated fields that provided the totals for positive results for heart disease and then one for the percentage. The composite formula is below:
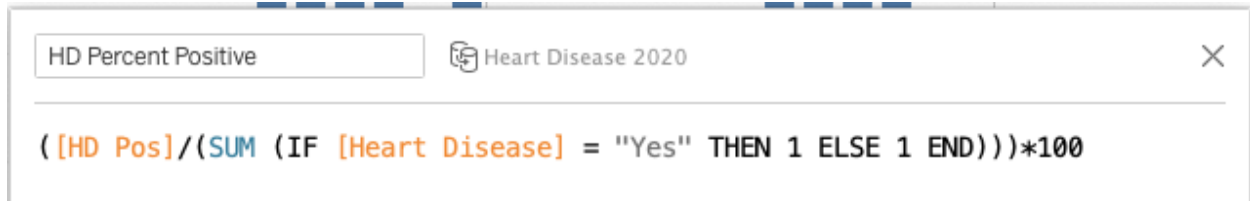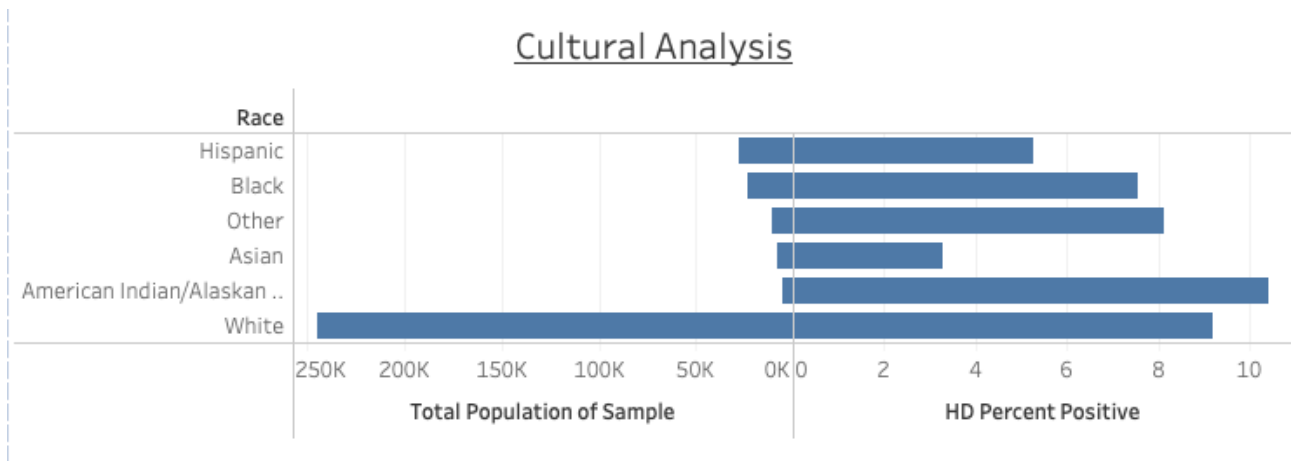

Additionally, we create one to establish the Sleep to BMI ratio, providing a metric that could indicate additional risk.

With these we were able to determine the impact heart disease had on the population based on a number of x variables shown following.

Gender and Age Analysis
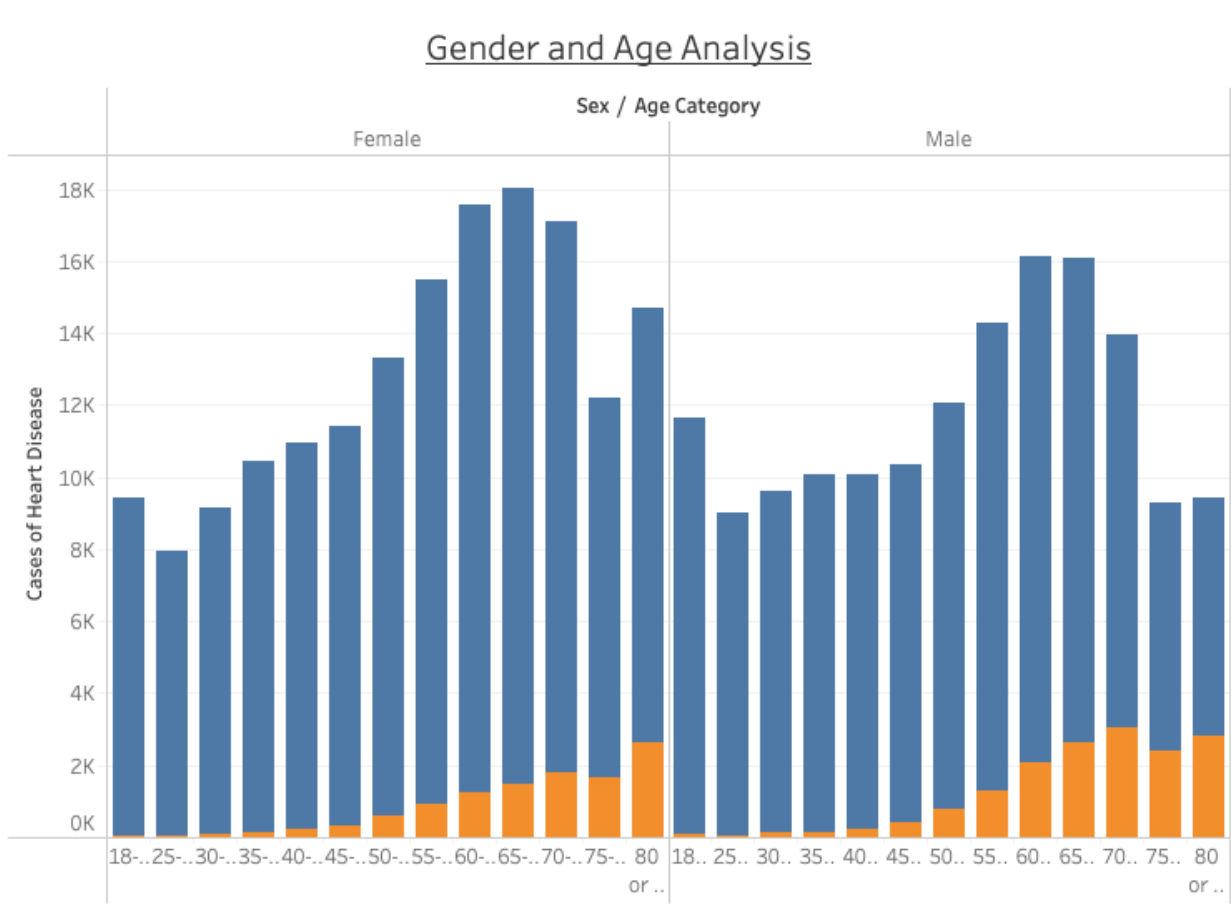
This analysis was to determine how heart disease impacts the genders and age groups.

Cultural Analysis

Race	Total Population of Sample	HD Percent Positive

This model was to test a hypothesis that non-white americans were more likely to be diagnosed with heart disease.

Sleep/BMI Analysis

Gen Health
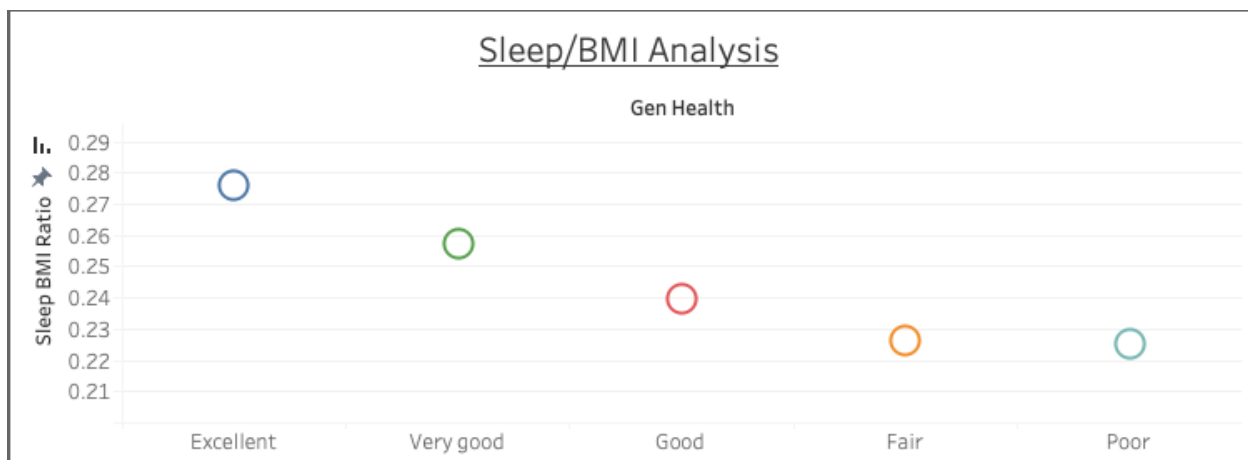
This model is to demonstrate the sleep BMI ratio (larger metric is indicative of a healthier person, 7hr sleep/22 BMI = .32, 5hrs sleep/35 BMI = .14) against the individuals assessment of their health quality.

Sleep Analysis

Sleep Time
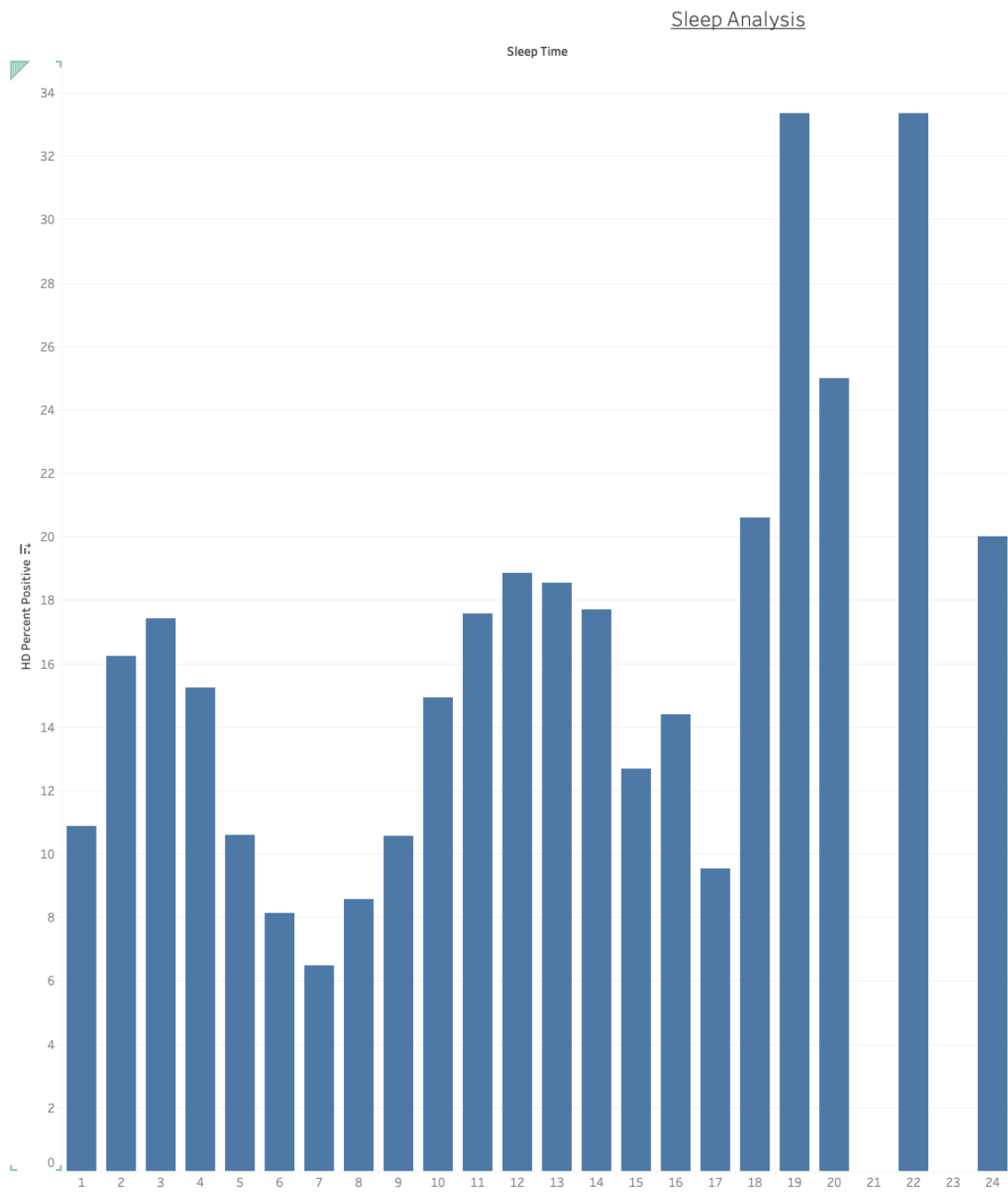
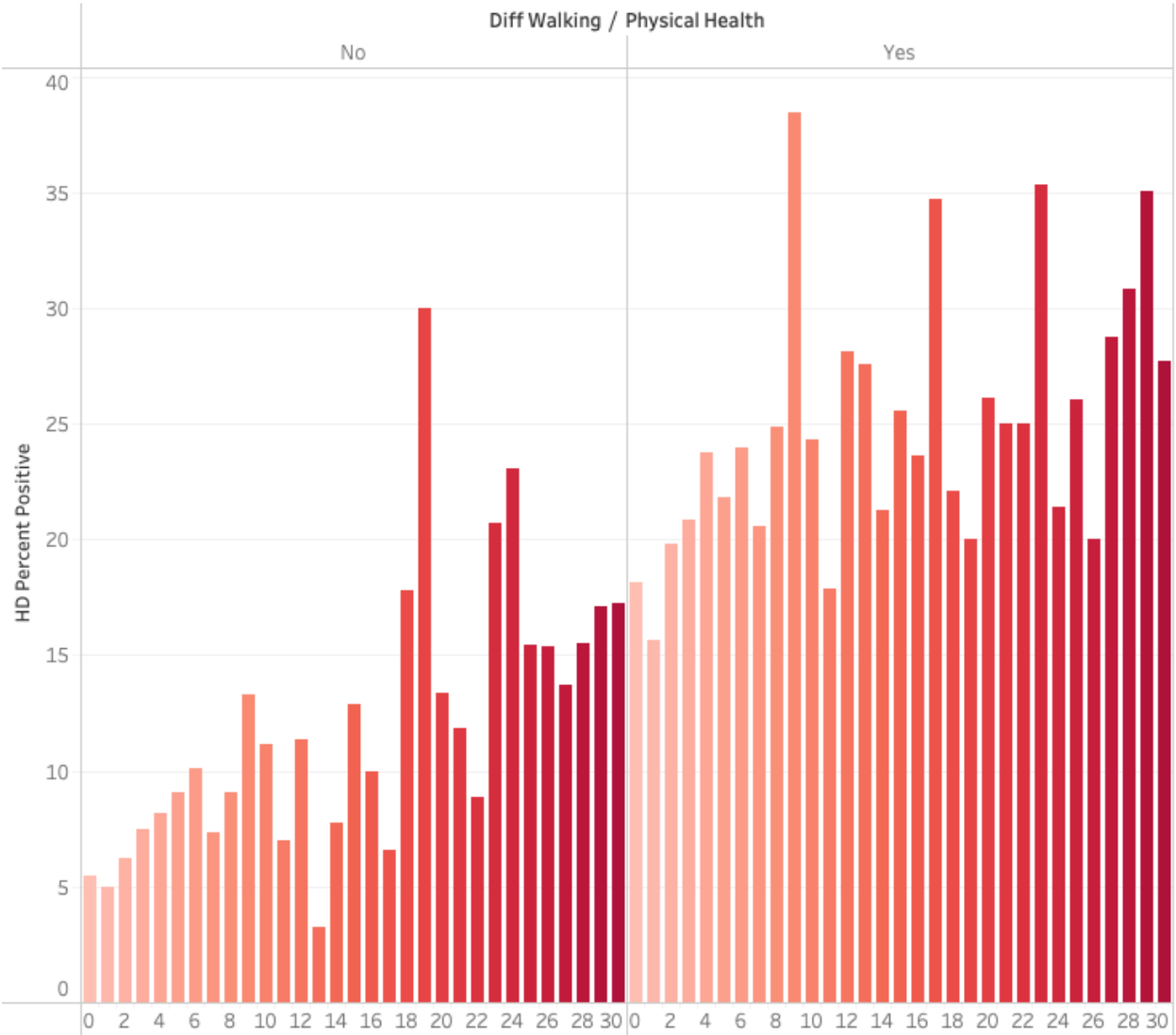This model was to confirm long held beliefs that sleep volume has an impact on Heart Disease risk.

Smoking and Drinking Analysis
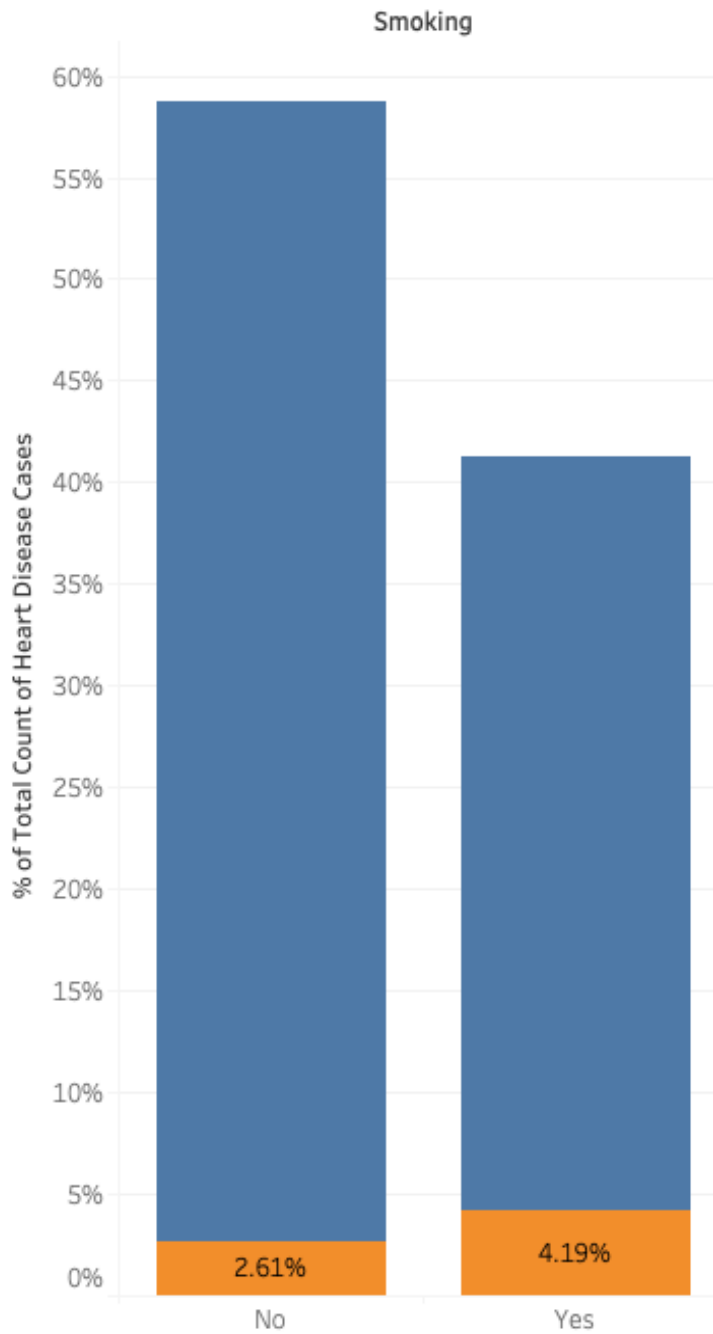
Smoking

We knew smoking increases your risk of heart disease, but wanted to see how drinking affected that outcome.

Difficulty Walking/Phy. Health Analysis

This model was developed to test how having difficulty walking would affect one's outcome for heart disease risk.

What did you find? - Actionable Intelligence like hidden meanings, trends, etc.:

As noted by the CDC, heart disease is a predominant cause of mortality for both sexes in the U.S. Our age and gender-specific analysis revealed a consistent rise in heart disease incidence with advancing age. This trend, while expected due to the natural decline in bodily functions over time, is interestingly similar across both genders. For every female diagnosed with heart disease, there is an equivalent number of males affected. Notably, the risk escalates for men as they age, especially past 75, when their numbers significantly drop.

Lifestyle choices such as smoking and alcohol consumption significantly influence heart disease risk. Non-smokers and non-drinkers have a markedly lower risk of developing heart disease compared to those engaged in these habits. Contrary to some beliefs, our findings suggest that drinking may significantly heighten heart disease risk, even more than smoking alone. Nonetheless, it's important to acknowledge that genetic predisposition, BMI, and psychological well-being are also crucial factors.

Mental health has a considerable impact on daily living. Comparing the mental states of those who abstain from alcohol with those who consume it, it's evident that non-drinkers have better mental health. Similarly, sleep and health are interconnected; inadequate sleep correlates with poorer health, as reflected by lower BMI values. While individual sleep requirements vary, a baseline amount is essential for maintaining good health.

Physical fitness, particularly the ability to walk without difficulty, emerges as a strong indicator of heart health. Those who maintain active lifestyles and mobility show a lower prevalence of heart disease compared to peers with mobility issues. This trend is age- and gender-independent, highlighting that regular physical activity is beneficial at any stage of life. Younger individuals with greater mobility exhibit fewer instances of heart disease, but as age increases and mobility decreases, so does the incidence of heart disease.

Our analysis allows us to understand these trends better and offer targeted recommendations to reduce heart disease rates across the U.S.

What can you do with this intelligence?

Having examined the data and interpreted the visualizations, what steps can we take forward? We should apply the insights from the identified trends to propose measures that could lessen the incidence of heart disease. Our analysis points to age as a primary factor, yet it's the combination with sedentary lifestyles that exacerbates the risk. We advocate for daily physical activity, such as walking, to help reduce heart disease prevalence.

Additionally, our study sheds light on the consumption of substances like alcohol and tobacco. While it's widely recognized that neither smoking nor heavy drinking is conducive to good health, our research suggests that even moderate use may not be entirely risk-free. However, complete abstinence from smoking and drinking can significantly diminish the risk of developing heart disease. The data strongly suggest that avoiding alcohol is particularly beneficial, as it seems to double the risk of heart disease when compared to smoking alone. The recommendation here is clear: for optimal health, both smoking and drinking should be avoided.

These factors are among the most significant contributors to heart disease in the U.S. Although there may be other underlying factors, the advice provided here is actionable immediately. There are additional strategies that could contribute to reducing heart disease rates, but the suggestions derived from our data models and visual analysis represent foundational steps to decrease the likelihood of this disease's occurrence.