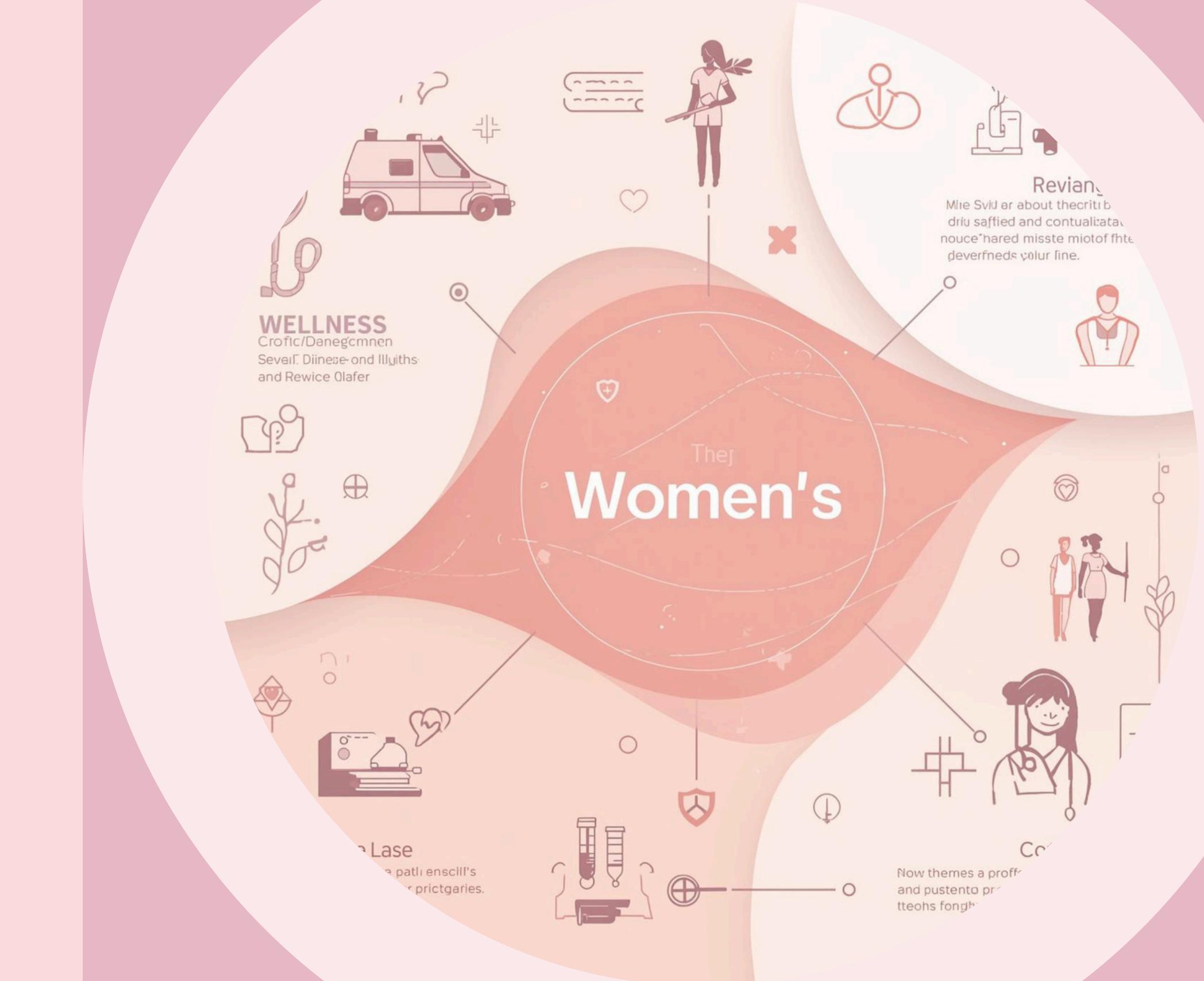


Sugar Bytes



Team Members :

Yomna Ayman Ahmed

Hoda Lotfy Elkassas

Hanaa Sherif Ederis

Merihan Elfeshawy

Farah Sameh Ibrahim

Mariam Madkour

Shaimaa Nasr

Rania Elwan

Supervised by:

Dr_Maged Magdy



⌚ Diabetes Project Analysis

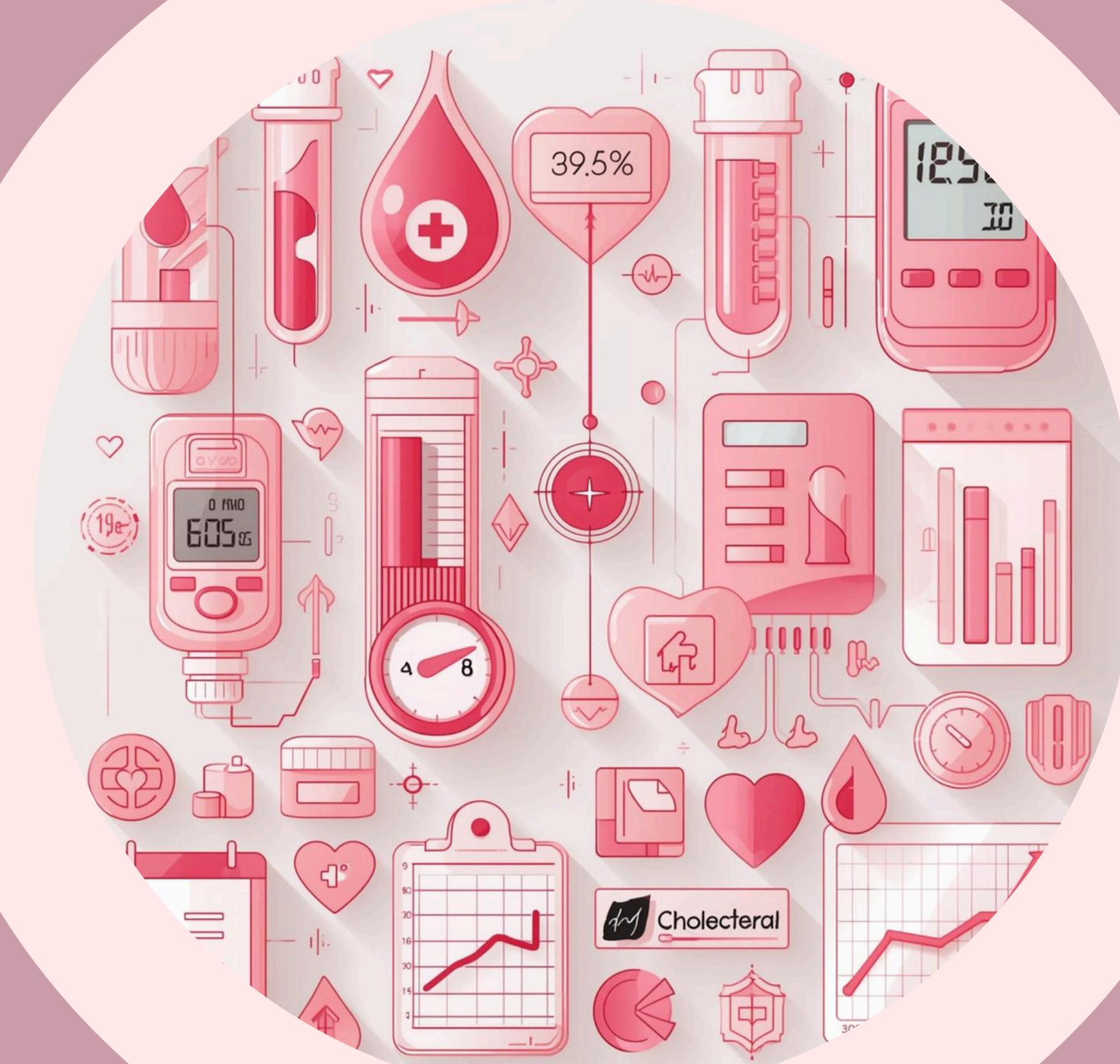
Health analysis overview

Exploring how lifestyle, nutrition, and healthcare factors affect overall health.

The project analyzes data related to diabetes and general health.

It explores how lifestyle factors like diet, alcohol, and healthcare access affect health.

The goal is to identify key patterns that influence wellness.





Objectives

- Analyze the relationship between lifestyle factors and general health.
- Explore how nutrition and alcohol consumption affect well-being.
- Study the impact of healthcare access and demographics on health outcomes.
- Identify key patterns that contribute to diabetes risk.

Raw Dataset Overview

	A	B	C	D	E
1	Diabetes	HighBP	HighChol	CholCheck	BMI
2	0	1	1	1	40
3	0	0	0	0	25
4	0	1	1	1	28
5	0	1	0	1	27
6	0	1	1	1	24
7	0	1	1	1	25
8	0	1	0	1	30
9	0	1	1	1	25
10	1	1	1	1	30
11	0	0	0	1	24
12	1	0	0	1	25
13	0	1	1	1	34
14	0	0	0	1	26
15	1	1	1	1	28
16	0	0	1	1	33
17	0	1	0	1	33
18	0	1	1	1	21
19	1	0	0	1	23

The image below shows a simple of the raw dataset used in this diabetes analysis.

Cleaning Data by the following the next steps:

1-Exchange 0&1 with Yes&No

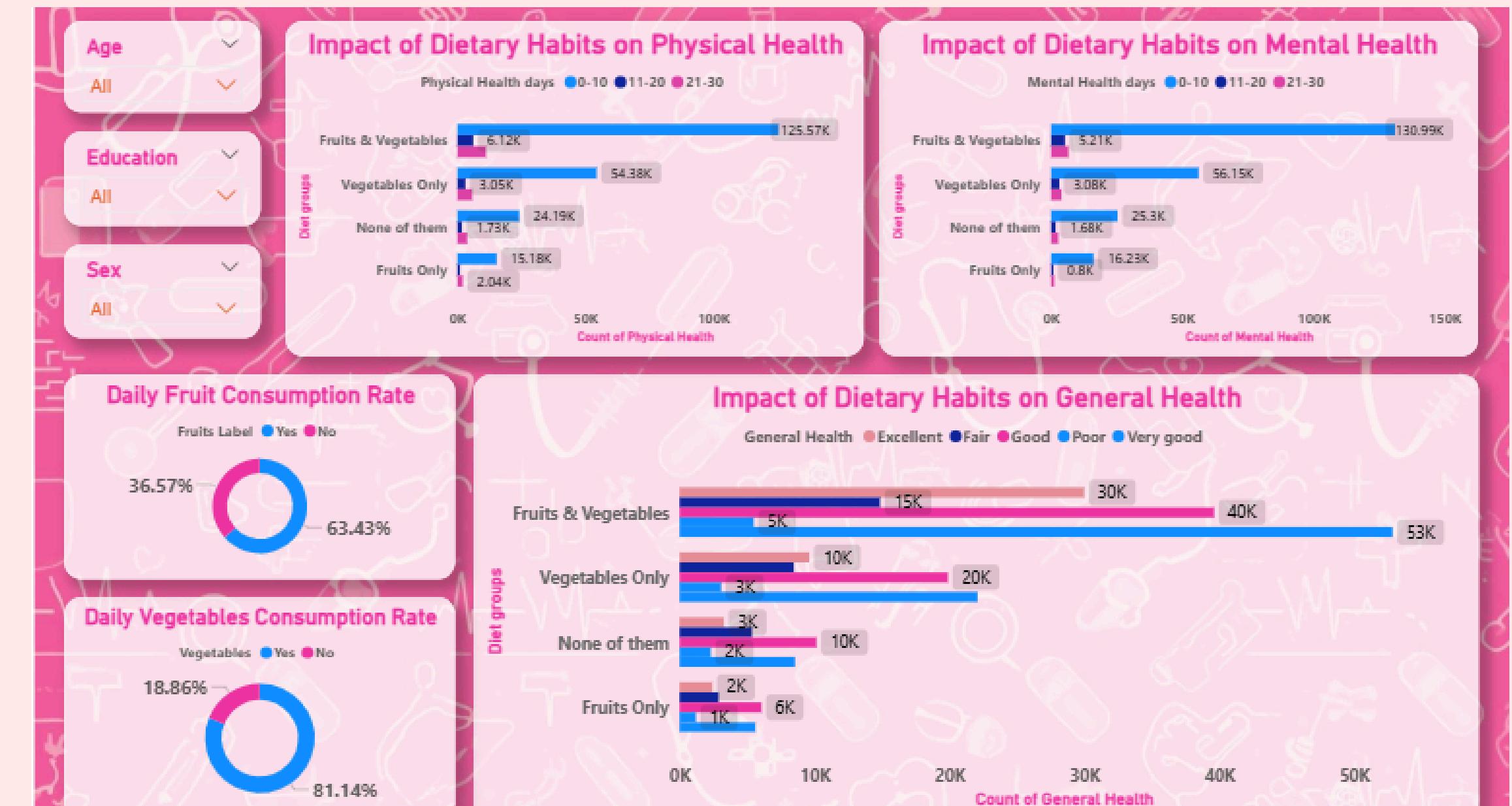
2-Detect data type

3-Grouping some columns which needed

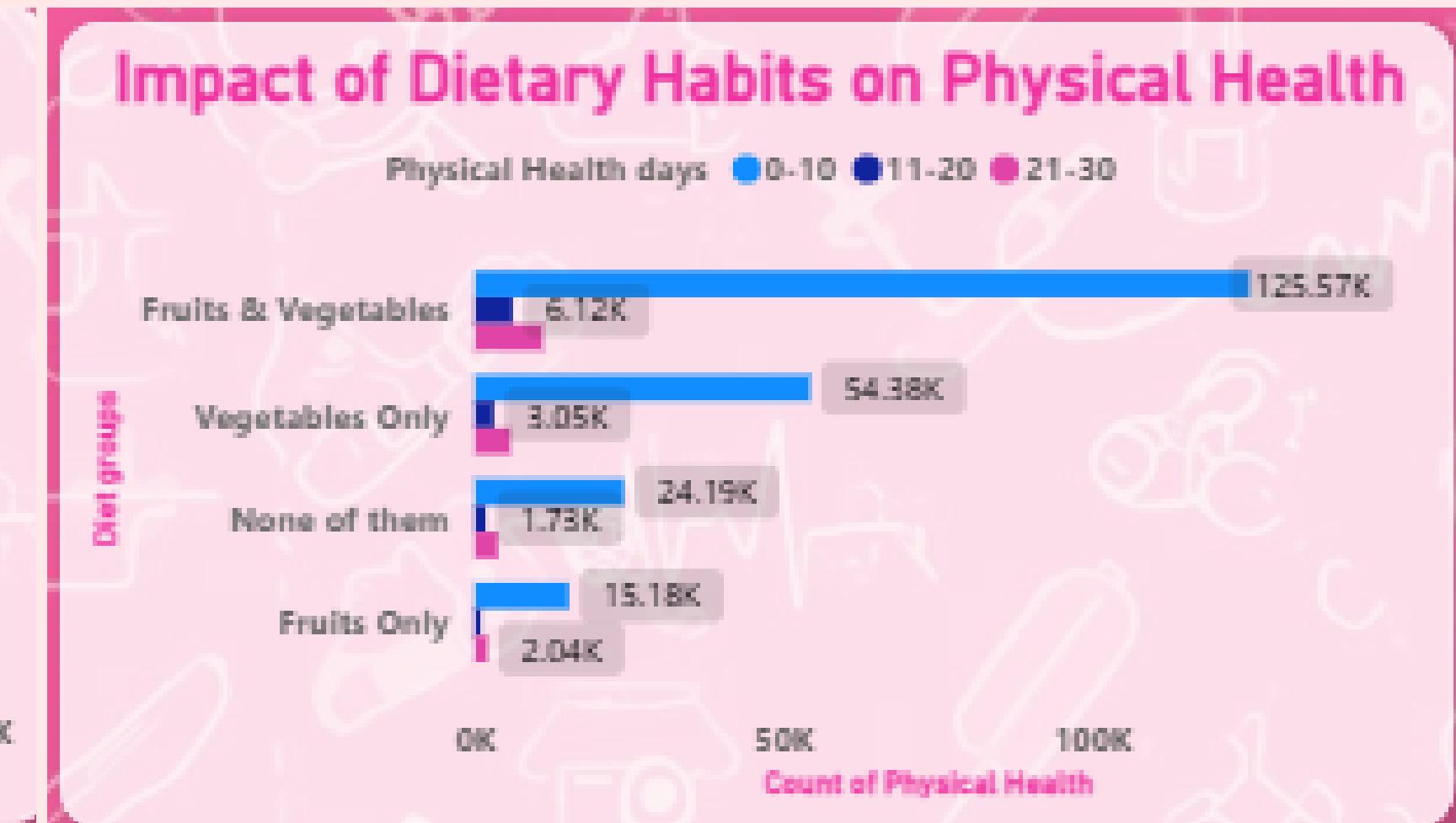
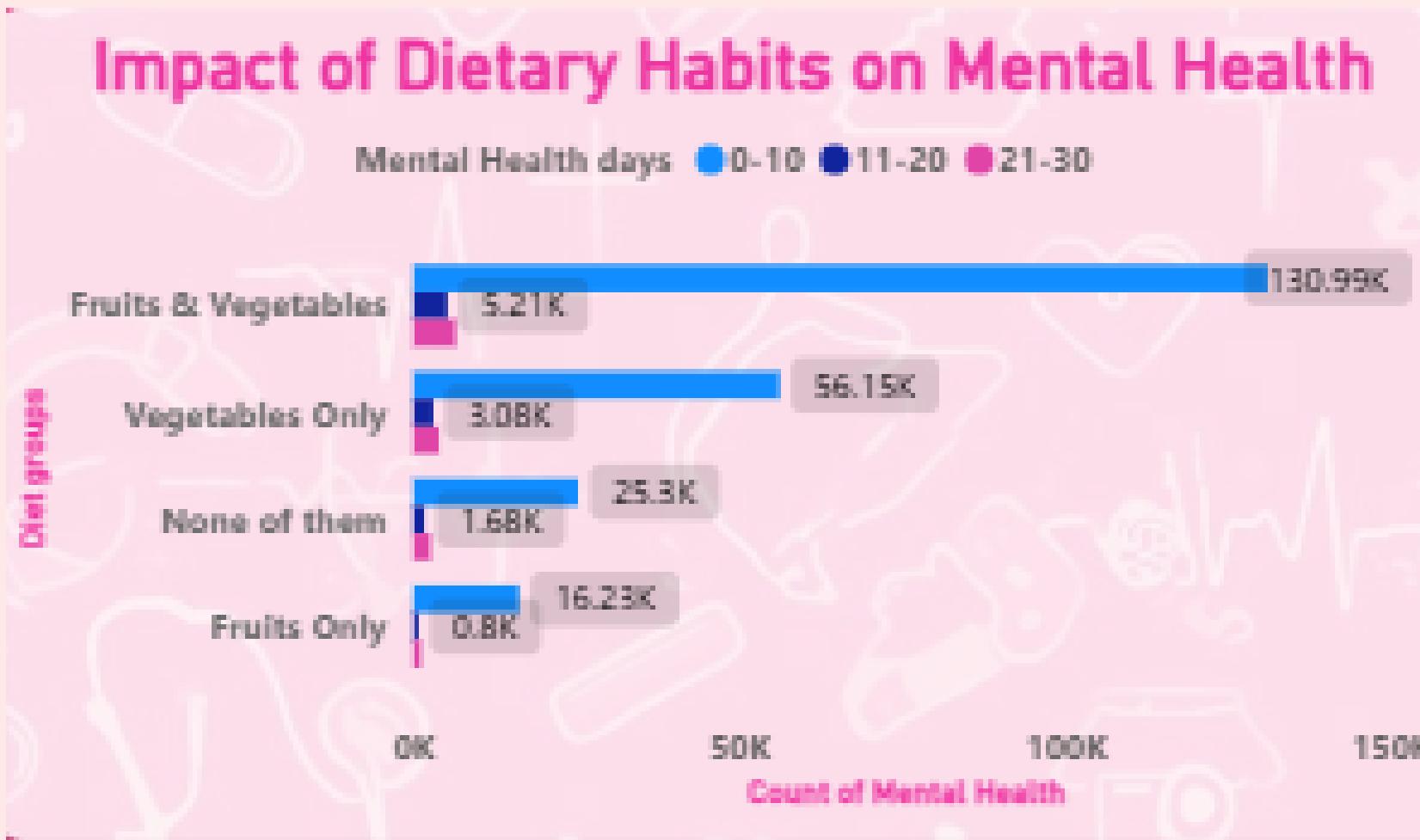
4-Edit columns' names

Dietary Habits & General Health

This slide analyzes how dietary habits influence general, mental, and physical health, while also showing the daily consumption rates of fruits and vegetables.

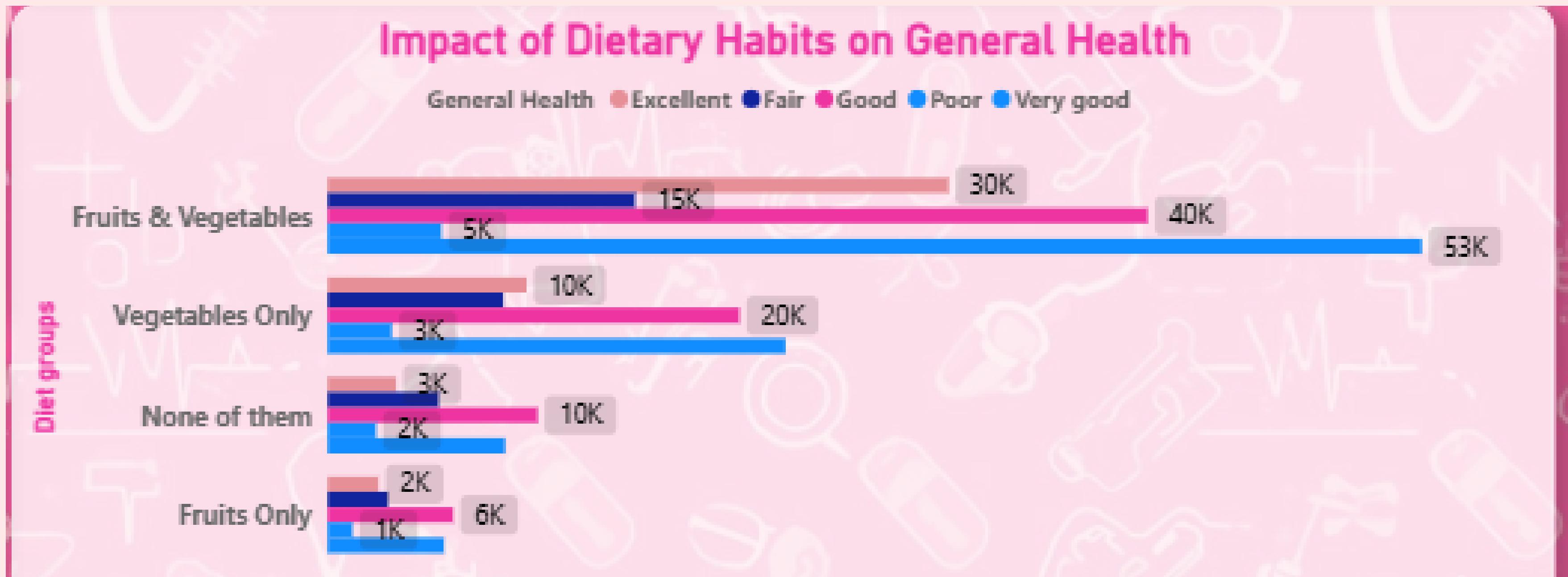


Dietary Habits & General Health



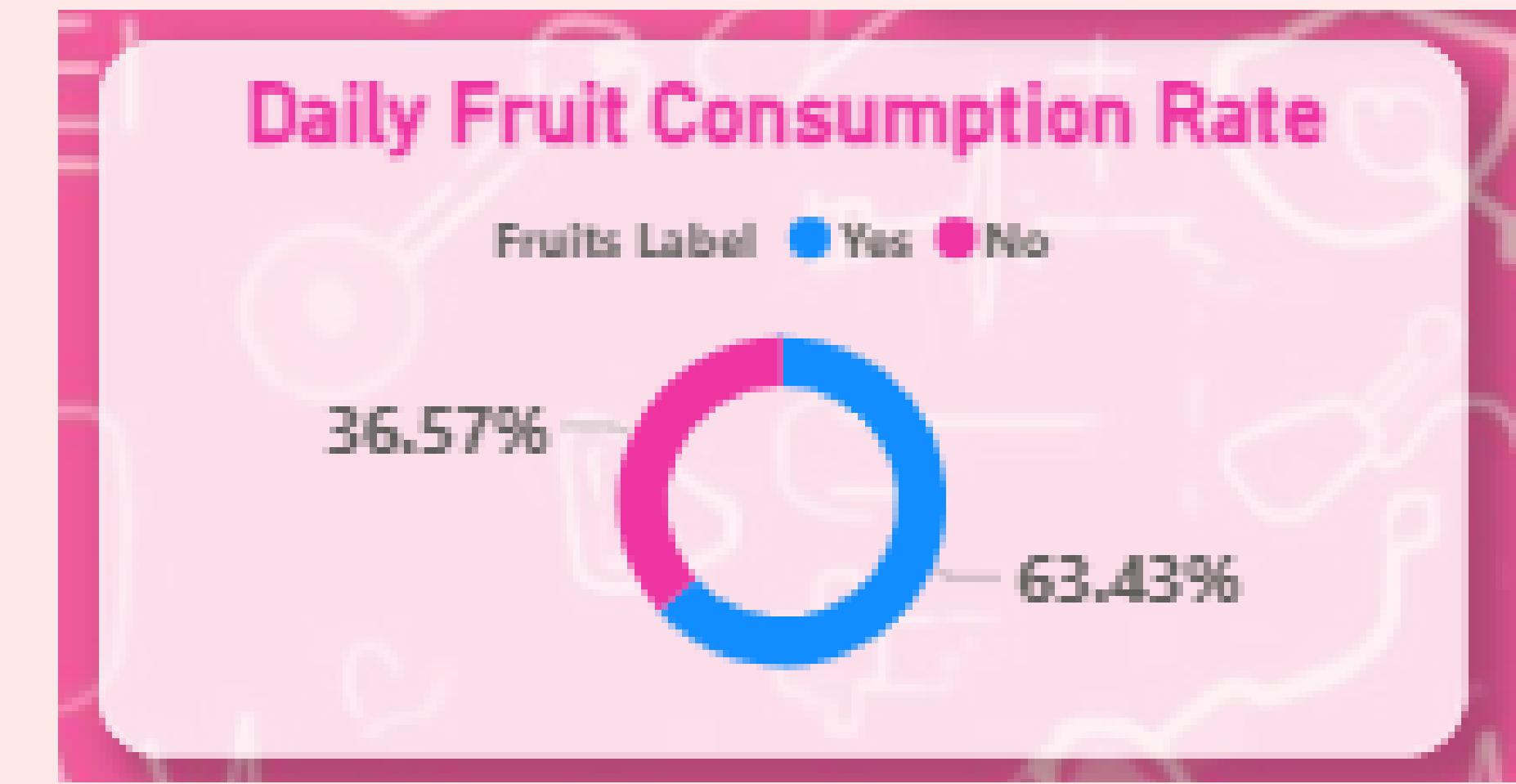
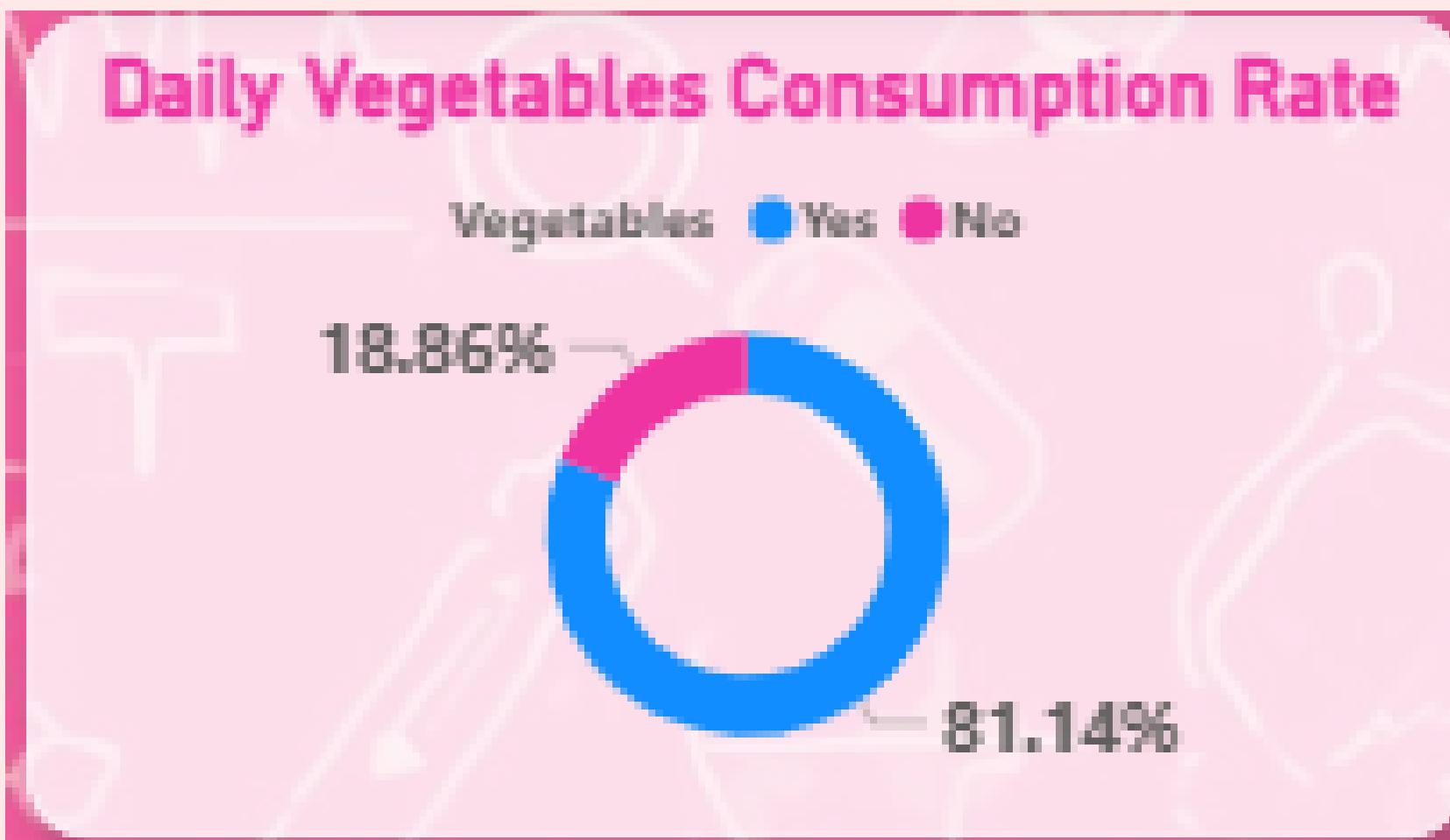
The data clearly indicates that the group consuming both fruits and vegetables has the highest number of people reporting good health, with the fewest days of physical or mental wellness issues. This group overwhelmingly dominates the category of people experiencing only 0-10 poor health days. In contrast, individuals who eat either fruits only or none of these foods at all show a higher frequency of experiencing 21-30 days of poor health. Overall, the charts strongly suggest that a balanced diet rich in both fruits and vegetables is critical for maintaining positive physical and mental well-being.

Dietary Habits & General Health



This chart shows that individuals who consume both fruits and vegetables report the best general health. As dietary quality decreases, so do positive health outcomes, with the lowest ratings in the group that consumes neither.

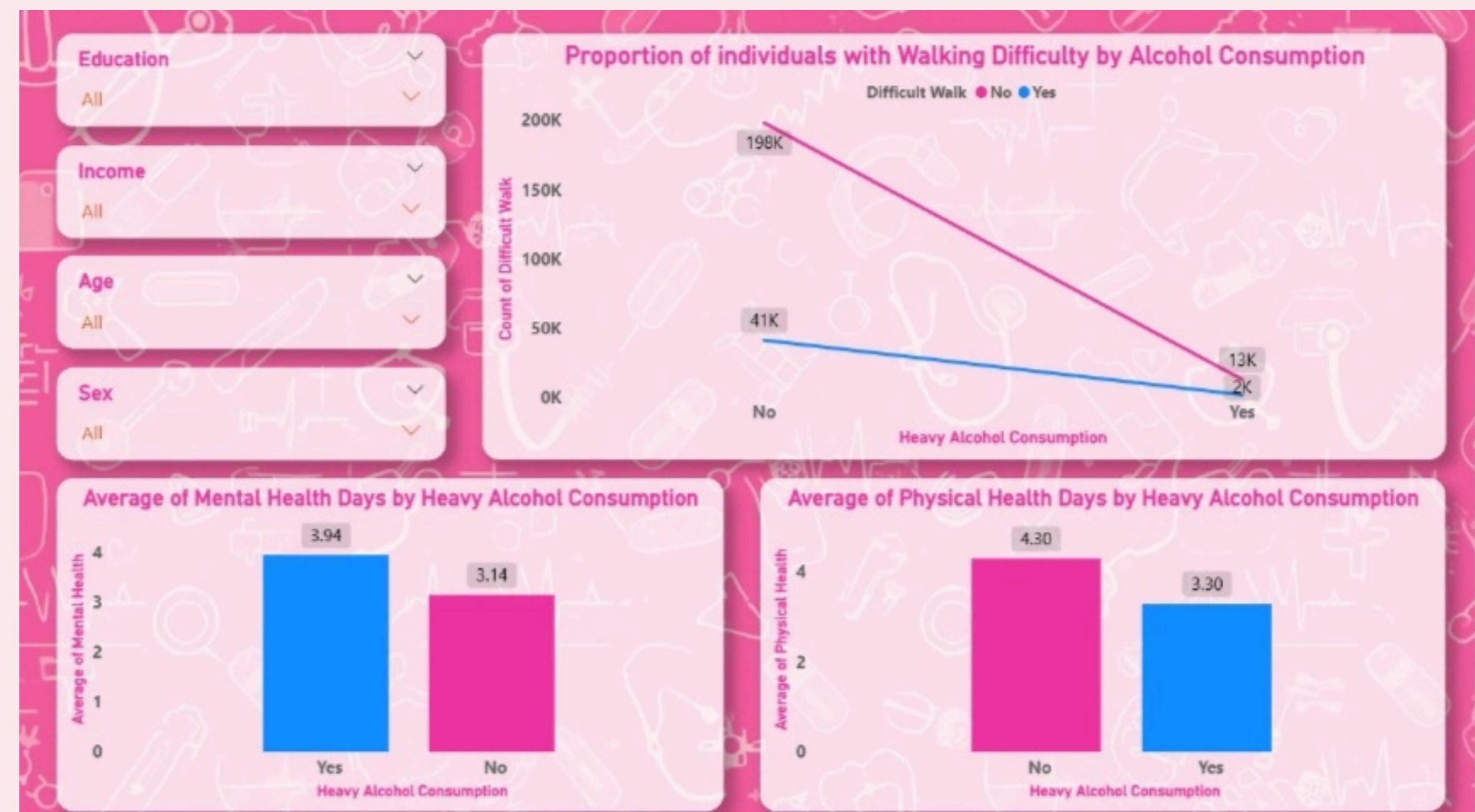
Dietary Habits & General Health



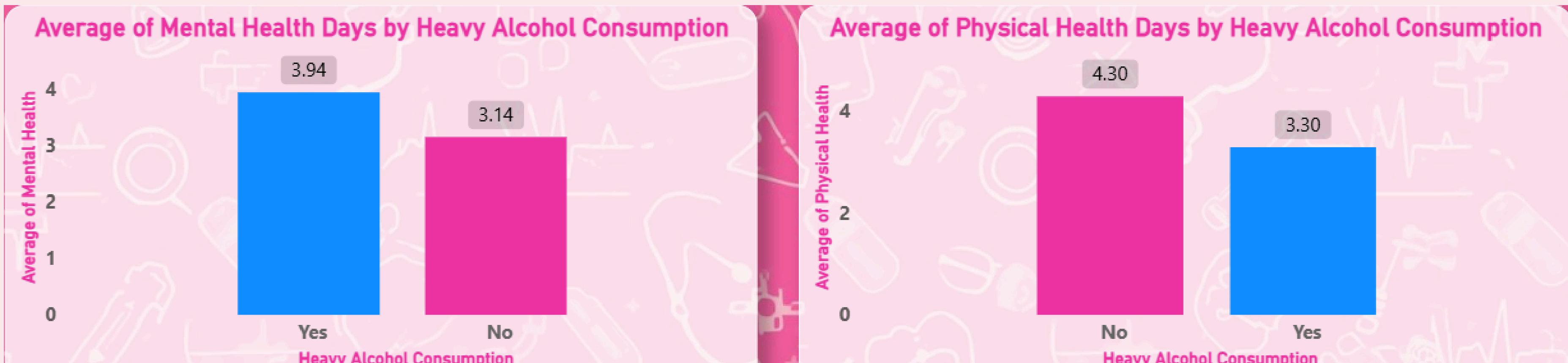
These charts show a mixed result for daily consumption habits. A majority of people (63.43%) report eating fruit daily. Similarly for vegetables, a big majority (81.14%) consuming them on a daily basis.

Alcohol Consumption

This slide highlights the impact of heavy alcohol consumption on health. Heavy drinkers report more poor mental health days and greater walking difficulties, indicating negative effects on well-being. Although they show slightly fewer poor physical health days, this may reflect perception differences. Overall, heavy drinking is linked to worse mental and mobility health.

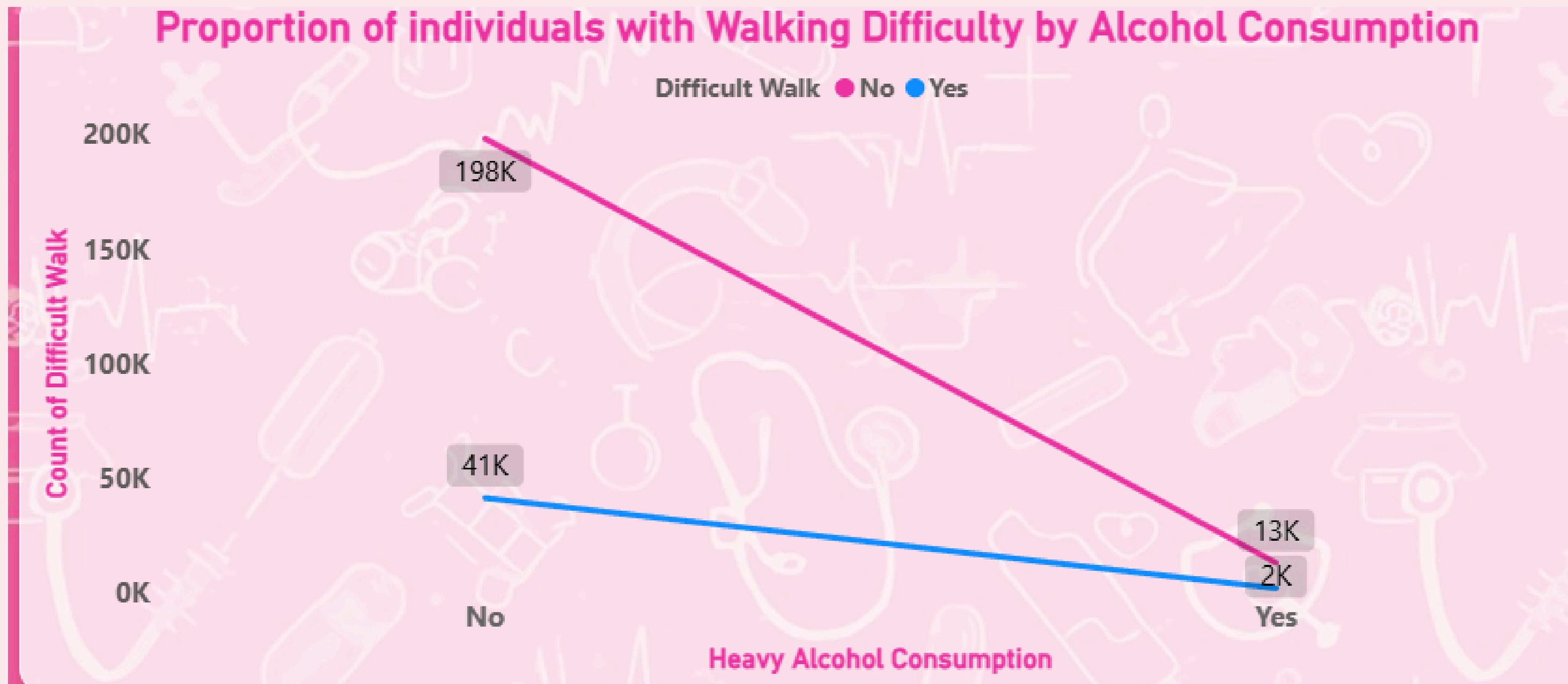


Alcohol Consumption



The charts show contrasting effects of heavy drinking on mental and physical health. Heavy drinkers report more poor mental health days (3.94) compared to non-heavy drinkers (3.14), suggesting that excessive alcohol use may worsen psychological well-being. However, they report fewer poor physical health days (3.30 vs. 4.30), which might reflect perception or lifestyle differences rather than actual better health. Overall, heavy alcohol consumption appears to negatively affect mental health, while its impact on physical health remains less clear and requires further analysis.

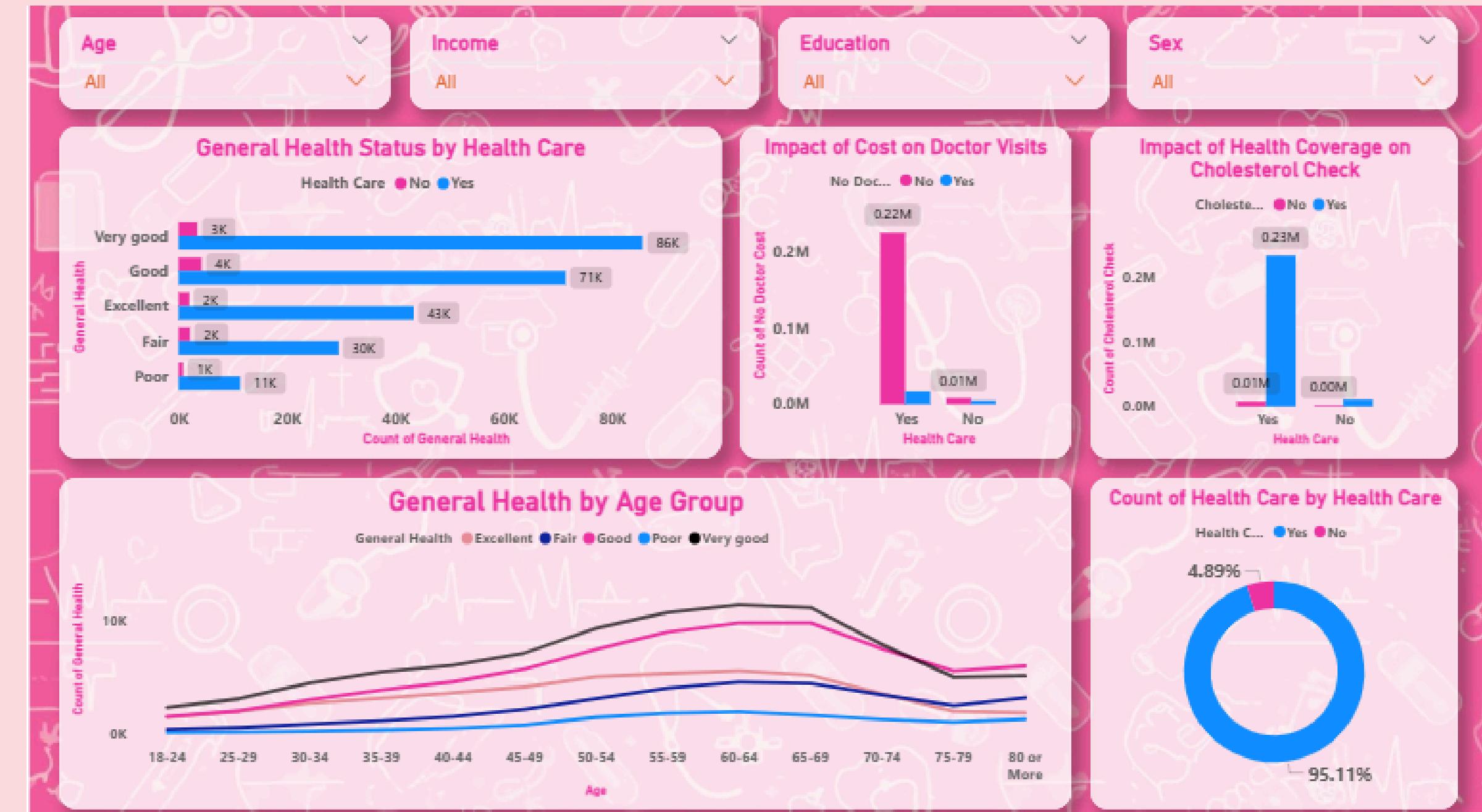
Alcohol Consumption



This visual shows that people who consume alcohol heavily are more likely to have walking difficulties than those who don't. Among non-heavy drinkers, a much higher number report no difficulty walking, while the share of individuals with mobility issues increases noticeably among heavy drinkers. This suggests a negative relationship between alcohol consumption and physical mobility.

Health Care Access Analysis

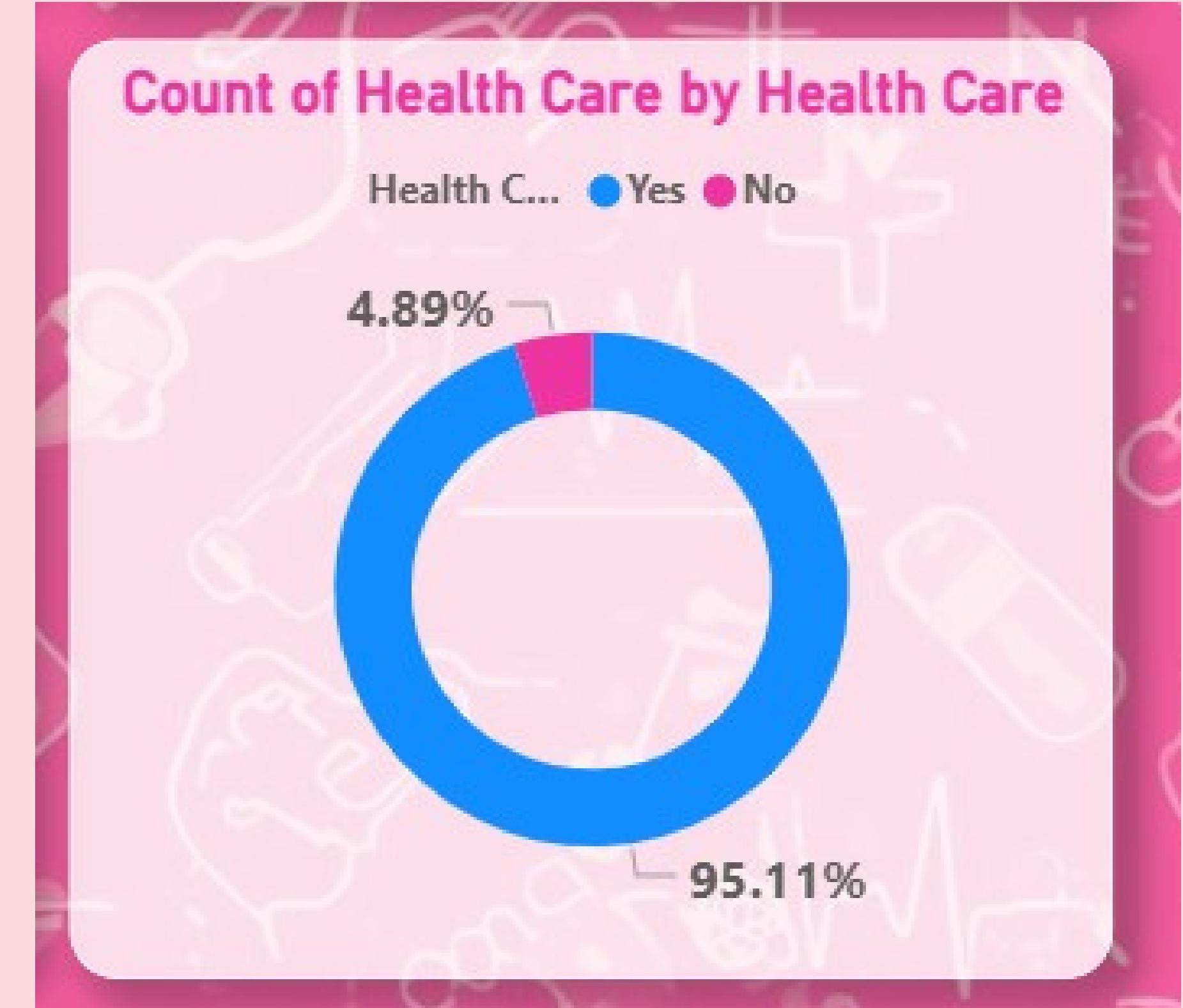
This analysis aims to study individuals' access to healthcare services and its impact on overall health status, doctor visits, and preventive screenings such as cholesterol checks. The data was analyzed based on variables like income, and age to understand differences among groups.



Health Care Access Analysis

Count of Health Care by Health Care

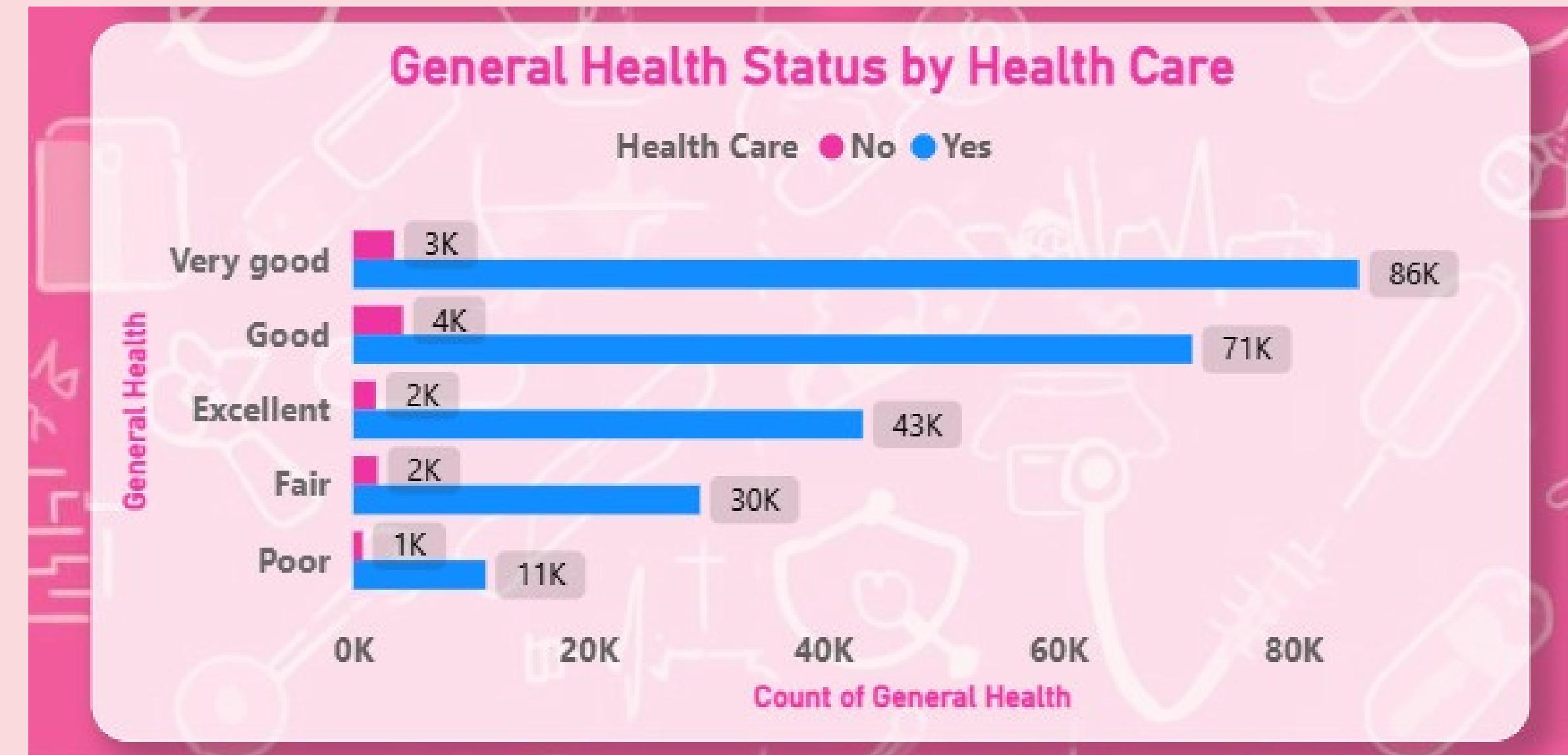
- 95.11% of individuals have health coverage, while 4.89% do not.
- This reflects a high prevalence of health coverage among participants.



Health Care Access Analysis

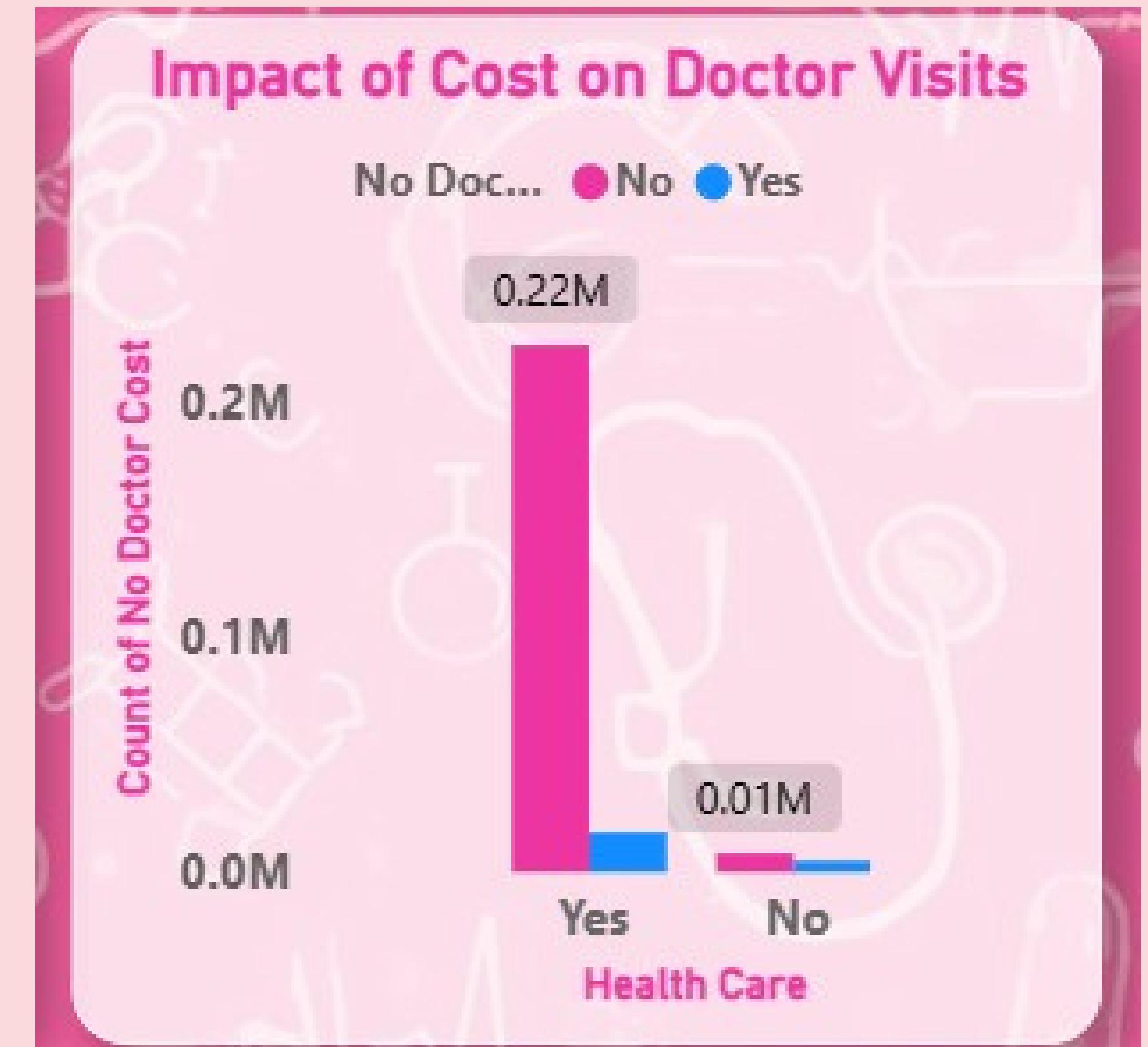
General Health Status by Health Care

- Individuals with health coverage reported higher levels of “Very Good” and “Good” health.
- Uninsured individuals mostly rated their health as “Fair” or “Poor”.
- This confirms that healthcare coverage has a positive effect on overall well-being.



Health Care Access Analysis

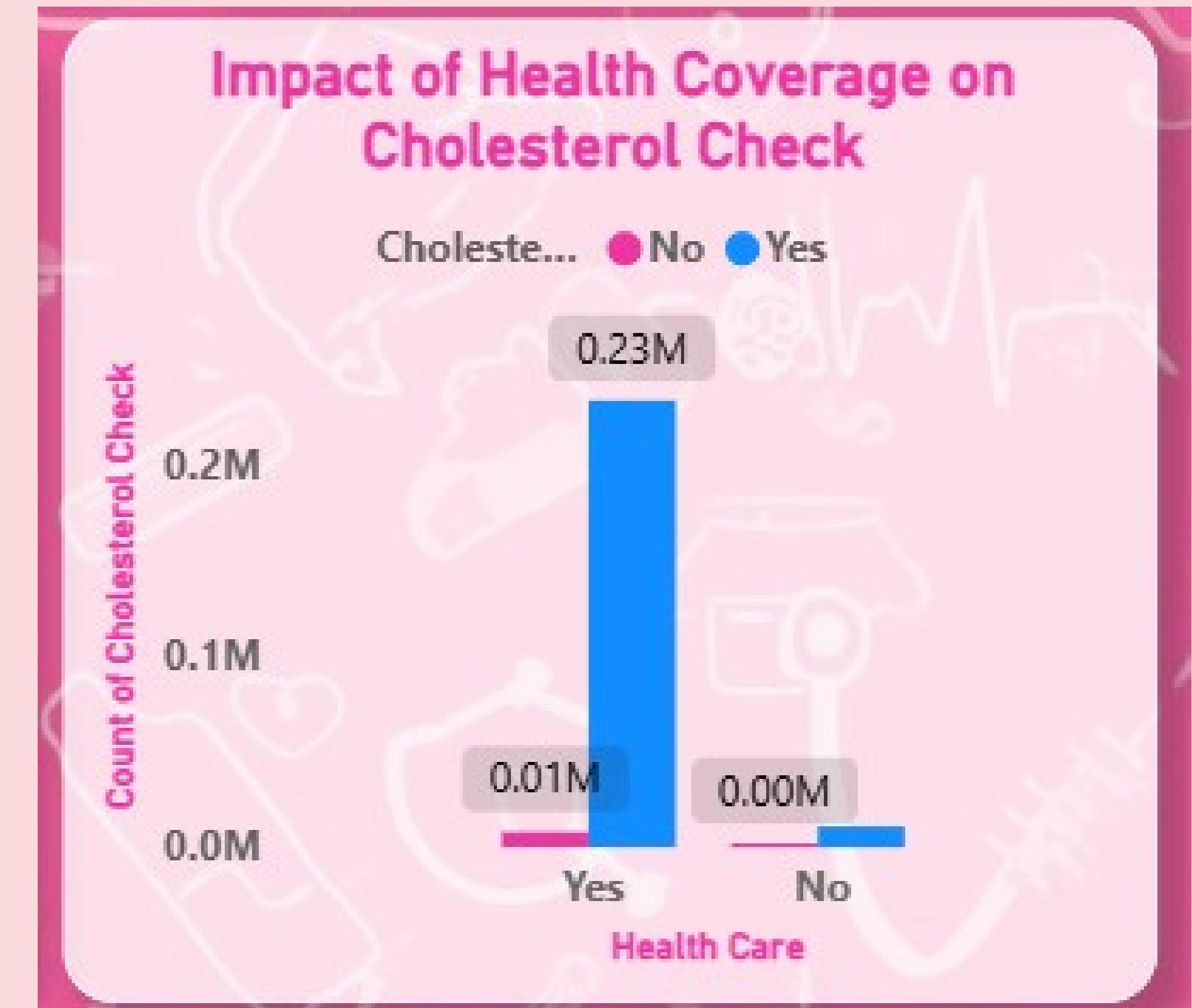
- The light blue (Yes) bars represent individuals who were prevented from visiting a doctor due to cost.
- The colour pink (No) bars represent those who were not prevented by cost.
- Most people were not stopped by cost, showing that cost is not a major barrier for most, especially those with insurance.
- However, uninsured individuals are relatively more affected by financial constraints.



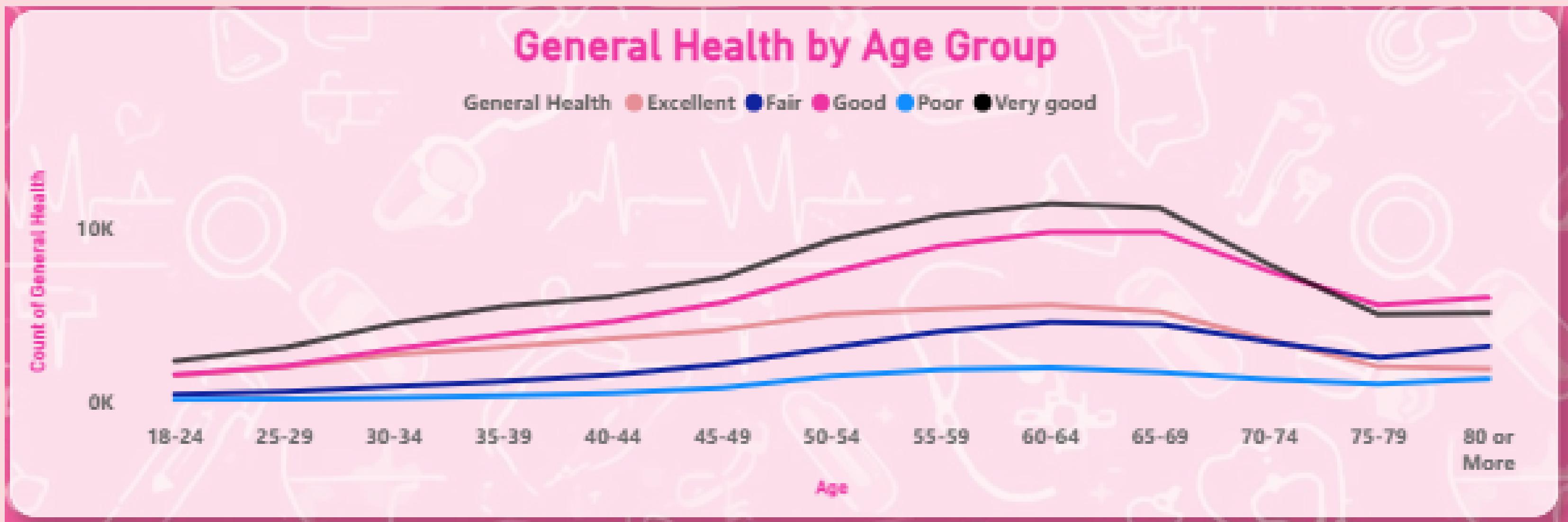
Health Care Access Analysis

Impact of Health Coverage on Cholesterol Check

- People with health coverage underwent cholesterol checks at a much higher rate (about 0.23M) than uninsured individuals.
- This suggests that health insurance promotes regular preventive testing.



Health Care Access Analysis



General Health by Age Group

- The 60–64 age group shows the highest percentages of “Very Good” and “Good” health ratings.
- After this age, general health gradually declines as age increases.
- This indicates an inverse relationship between age and overall health, where older adults tend to have poorer health compared to younger ones.

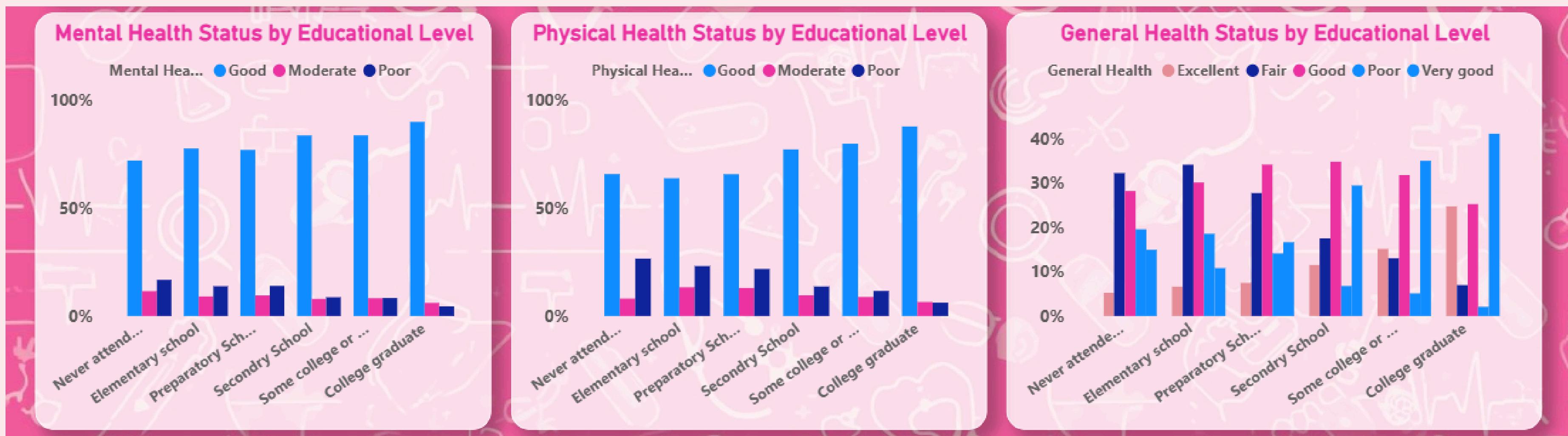
The effect of Educational Level on Different Health Factors

The following charts shows the effect of educational level on different Health Factors

As General / Mental / Physical health , alcohol consumption , heavy smoking habit and ability to afford doctor cost

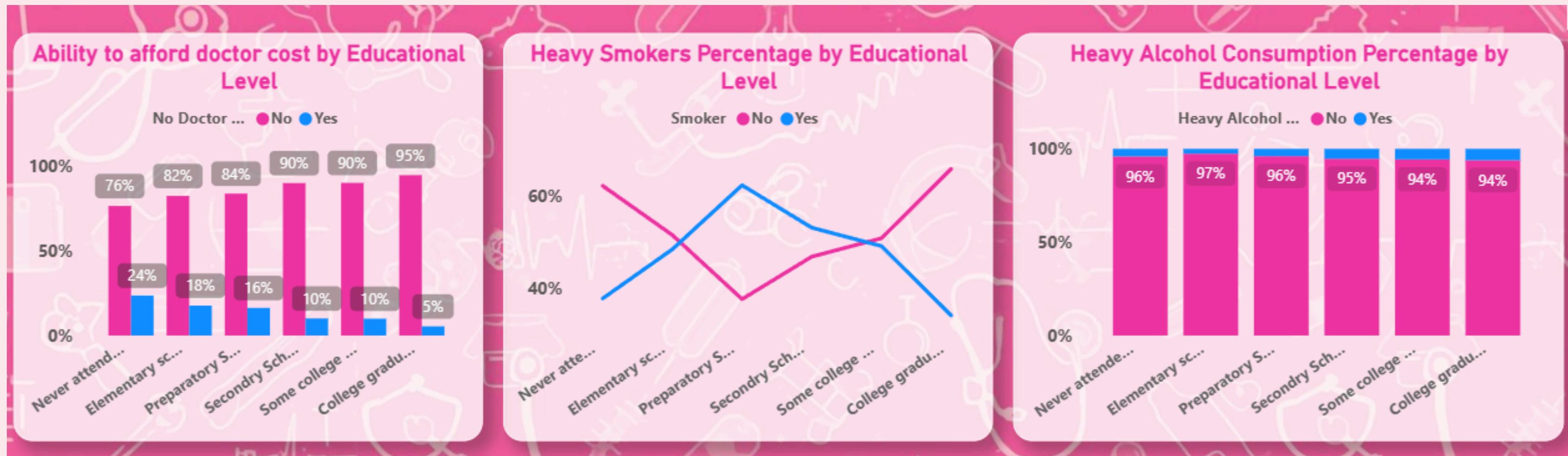


The effect of Educational Level on Different Health Factors



As educational level increases, individuals tend to experience improvements in general, mental, and physical health. Higher education is often associated with better health literacy, greater access to healthcare resources and healthier lifestyle choices. People with more education are more likely to understand preventive care, manage chronic conditions effectively, and seek timely medical attention. This positive correlation reflects how education empowers individuals to make informed decisions that support overall well-being.

The effect of Educational Level on Different Health Factors



As educational level increases, people tend to have better access to healthcare and lower rates of smoking, which reflects a positive impact of education on physical and mental health.

However, alcohol consumption appears unaffected by education, indicating that some health behaviors may require different interventions beyond education

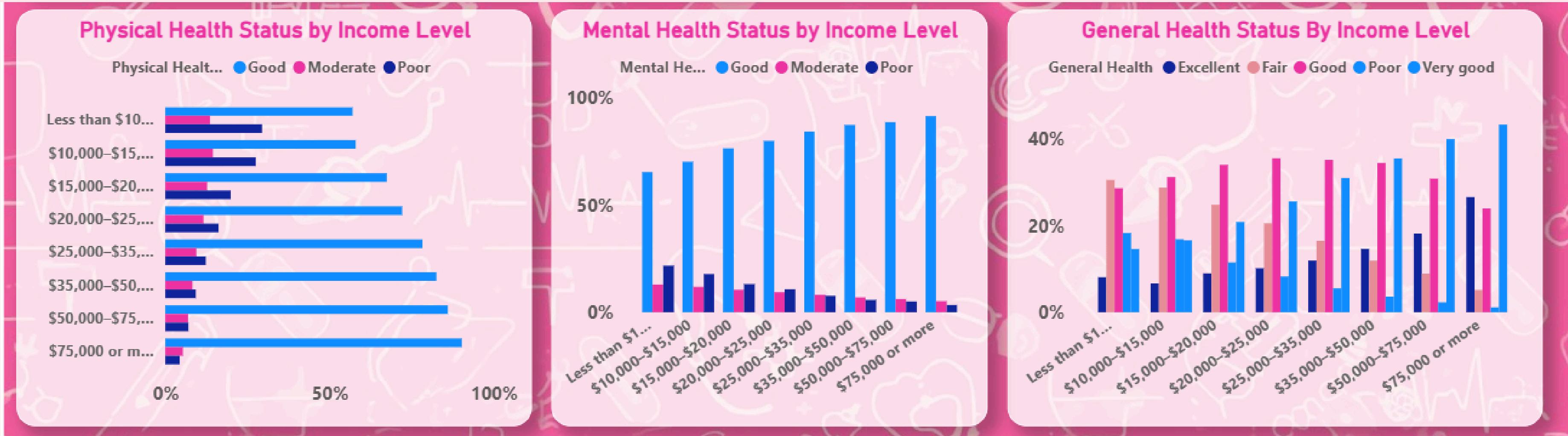
The effect of Income Level on Different Health Factors

The following charts shows the effect of Income level on different Health Factors

As General / Mental / Physical health , alcohol consumption , heavy smoking habit and ability to afford doctor cost

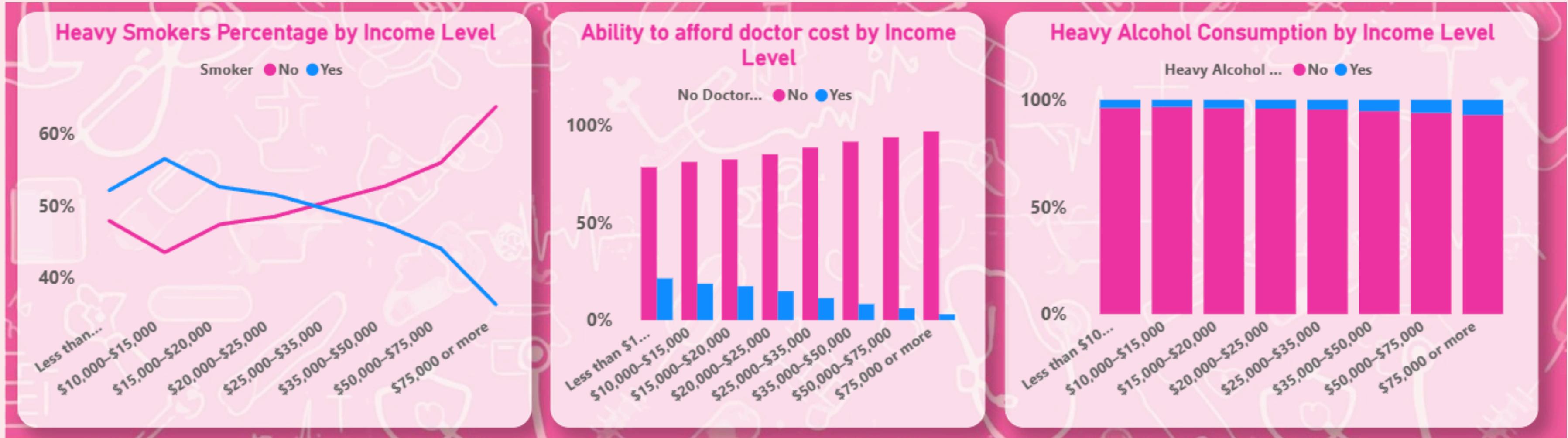


The effect of Income Level on Different Health Factors



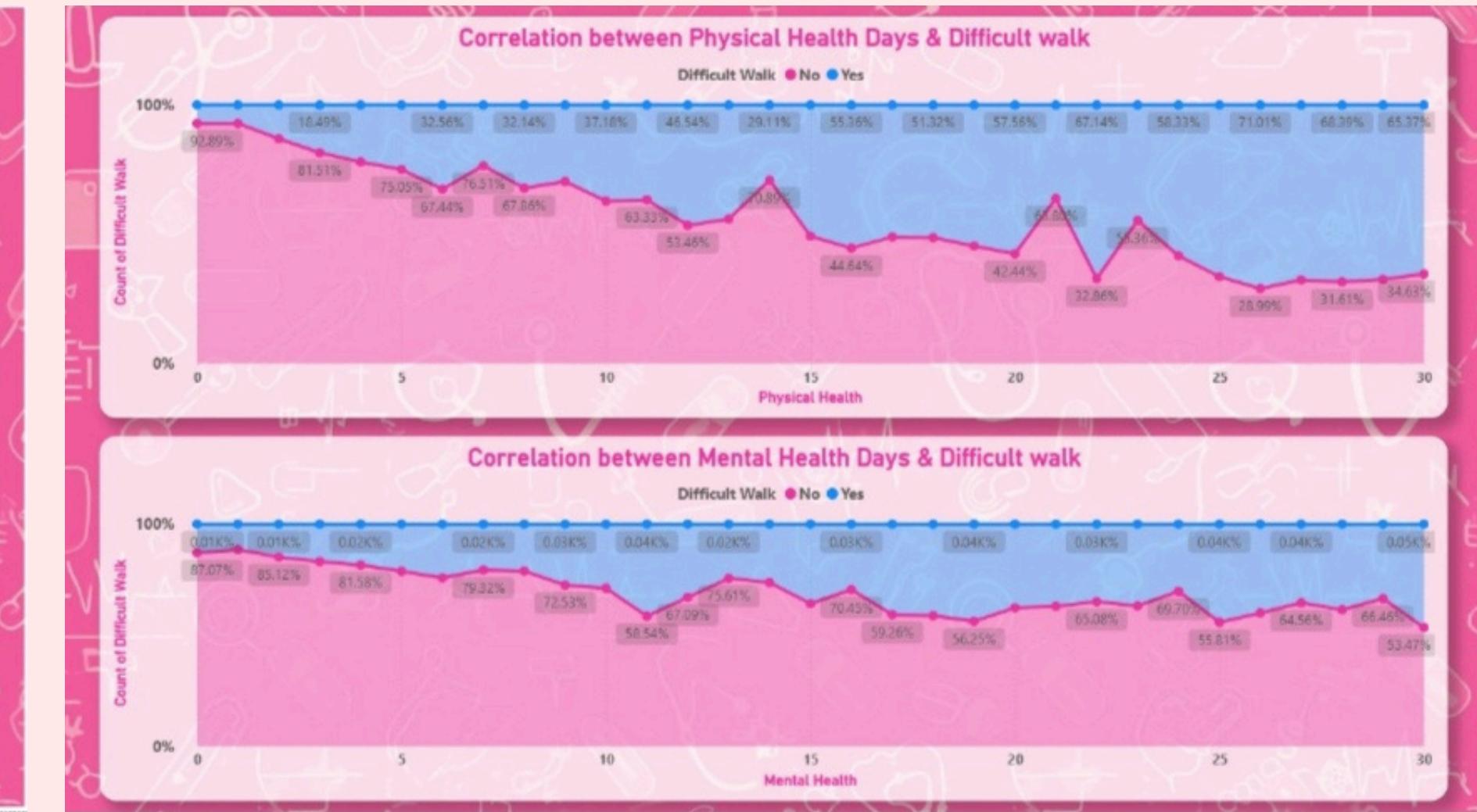
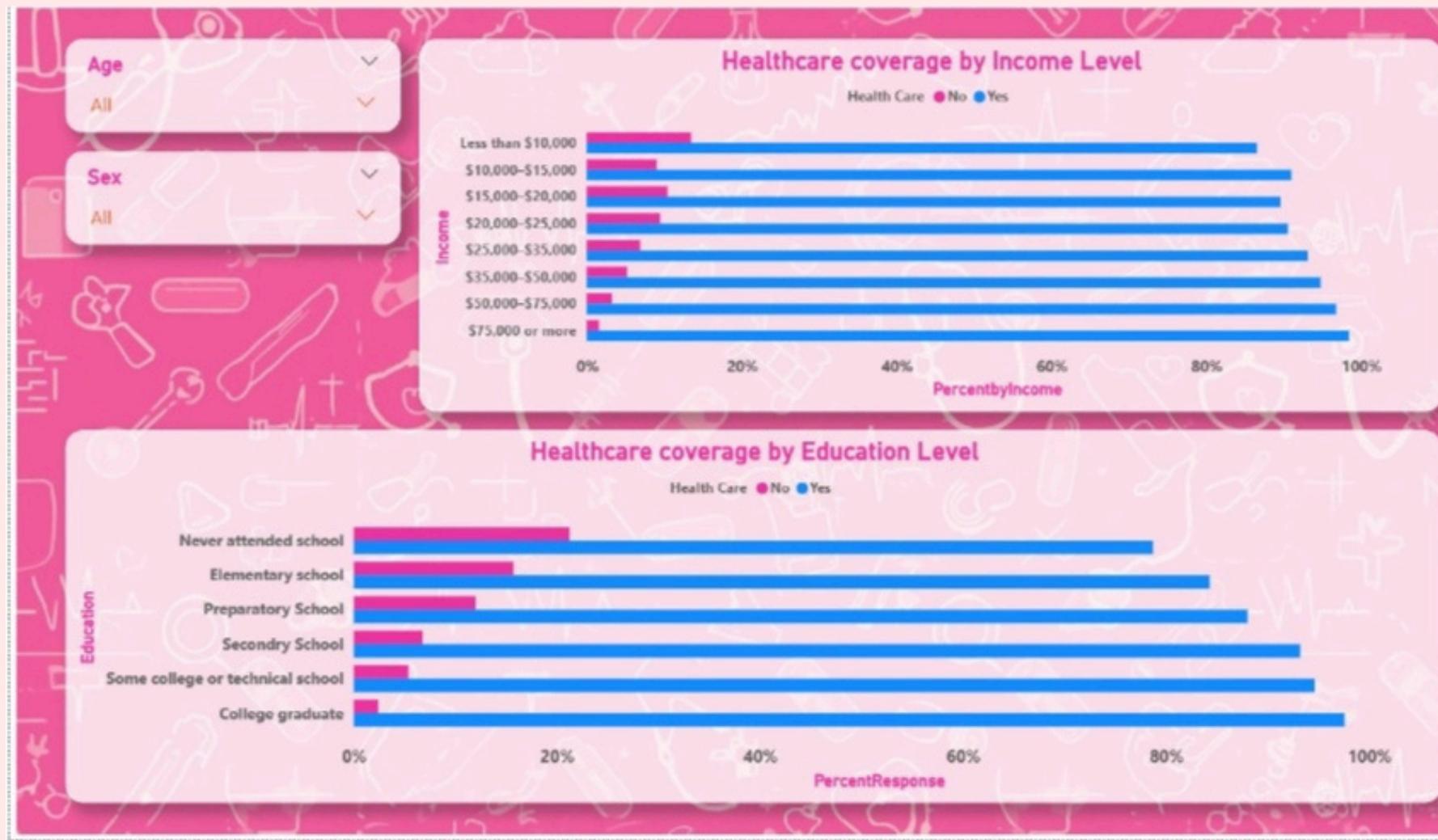
Higher income is consistently associated with better physical, mental, and general health. Financial resources appear to play a critical role in enabling healthier lifestyles and reducing health disparities.

The effect of Income Level on Different Health Factors



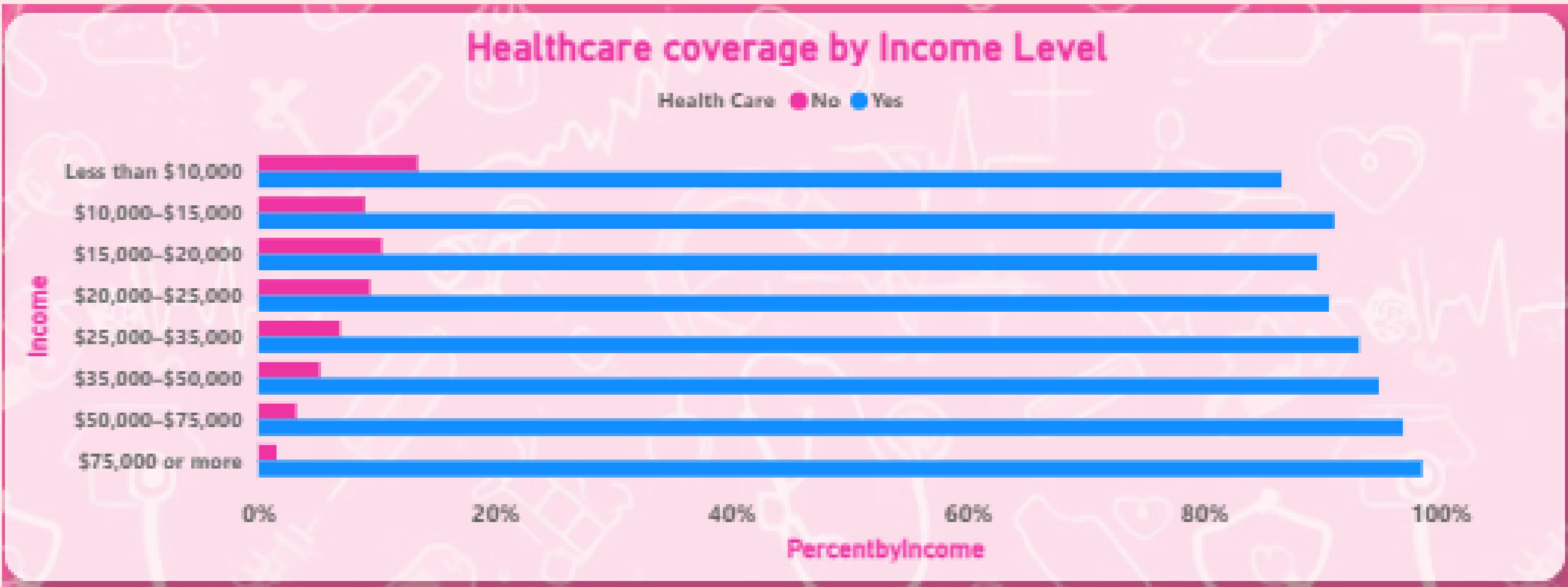
These visuals highlight that higher income is associated with healthier behaviors and better access to care, especially in terms of smoking and medical affordability. However, alcohol consumption appears unaffected by income, indicating that some health risks persist across socioeconomic boundaries.

Correlation Analysis



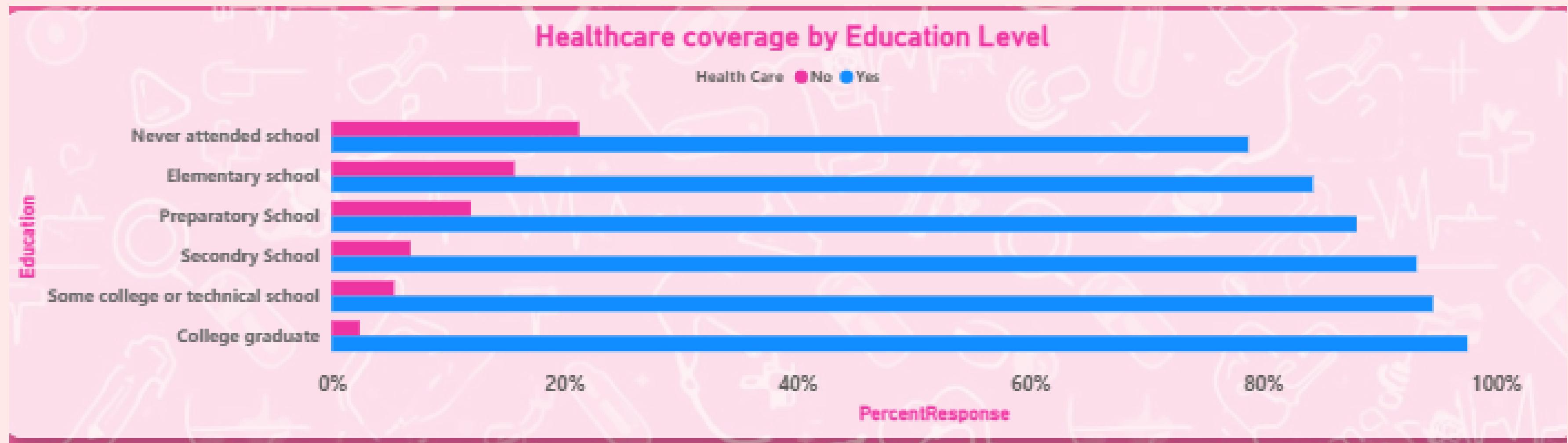
These slides examines the connection between socioeconomic factors like income and education on healthcare access, and the relationship between mental and physical health.

Correlation Analysis



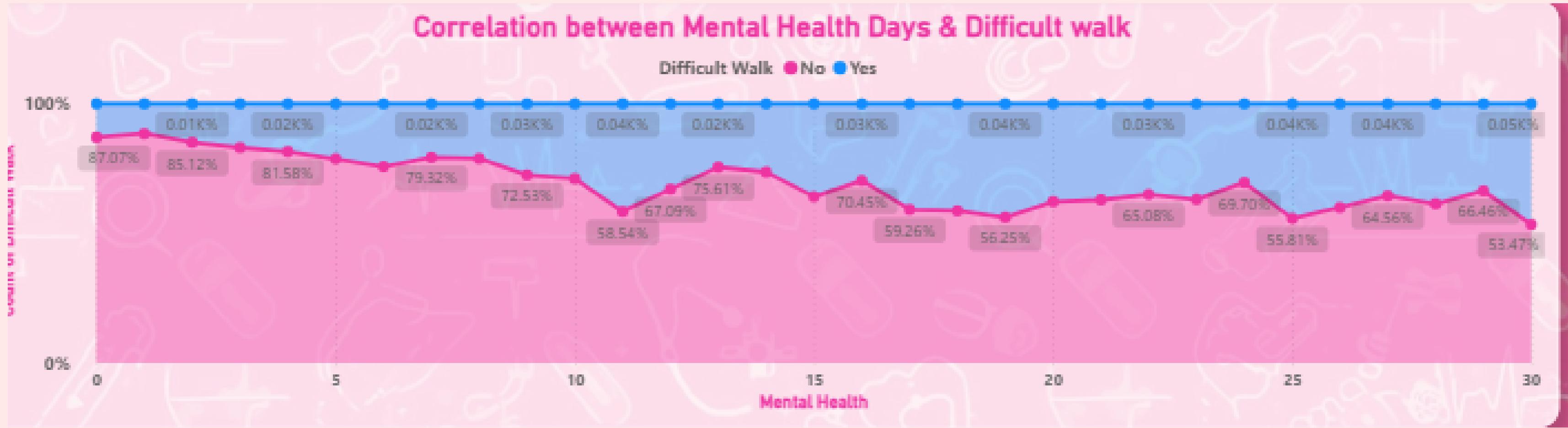
This chart clearly shows that higher income levels are associated with better healthcare coverage. The wealthiest group has the most comprehensive access, while coverage decreases significantly for lower-income individuals.

Correlation Analysis



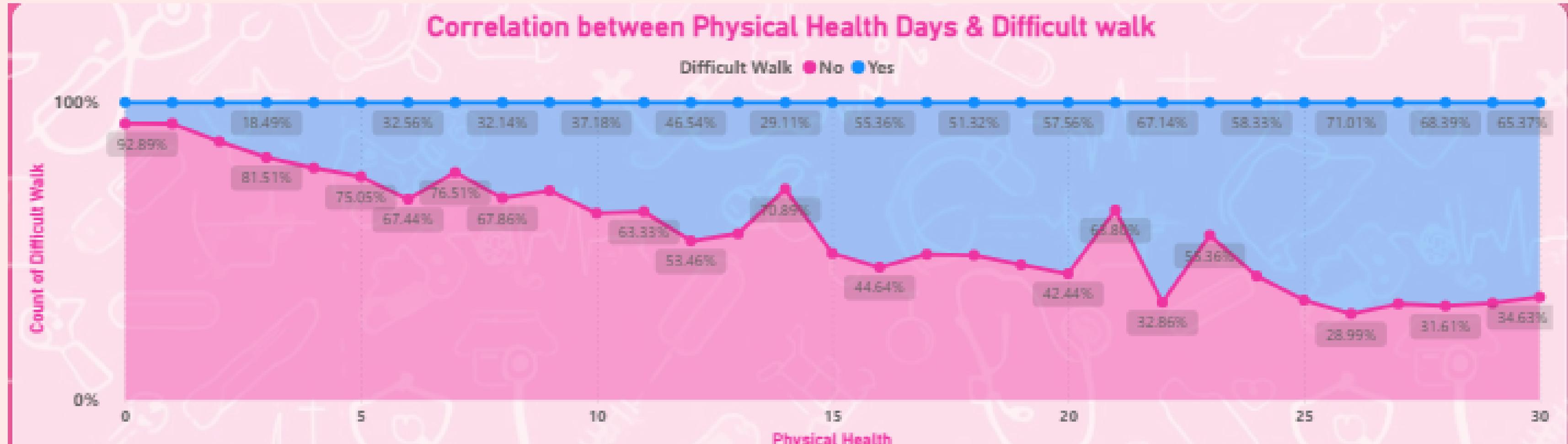
Similar to income, education plays a key role in healthcare access. College graduates have the highest rate of coverage, which declines with lower levels of education, underscoring the impact of socioeconomic status on health equity.

Correlation Analysis



This line chart explores the link between mental health and physical mobility. It shows the total count of individuals who report difficulty walking (Count of DiffWalk) based on the number of poor mental health days (MentHlth) they experienced. The clear upward trend suggests a strong positive association, indicating that a higher frequency of poor mental health days is linked to a greater number of people experiencing walking difficulties.

Correlation Analysis

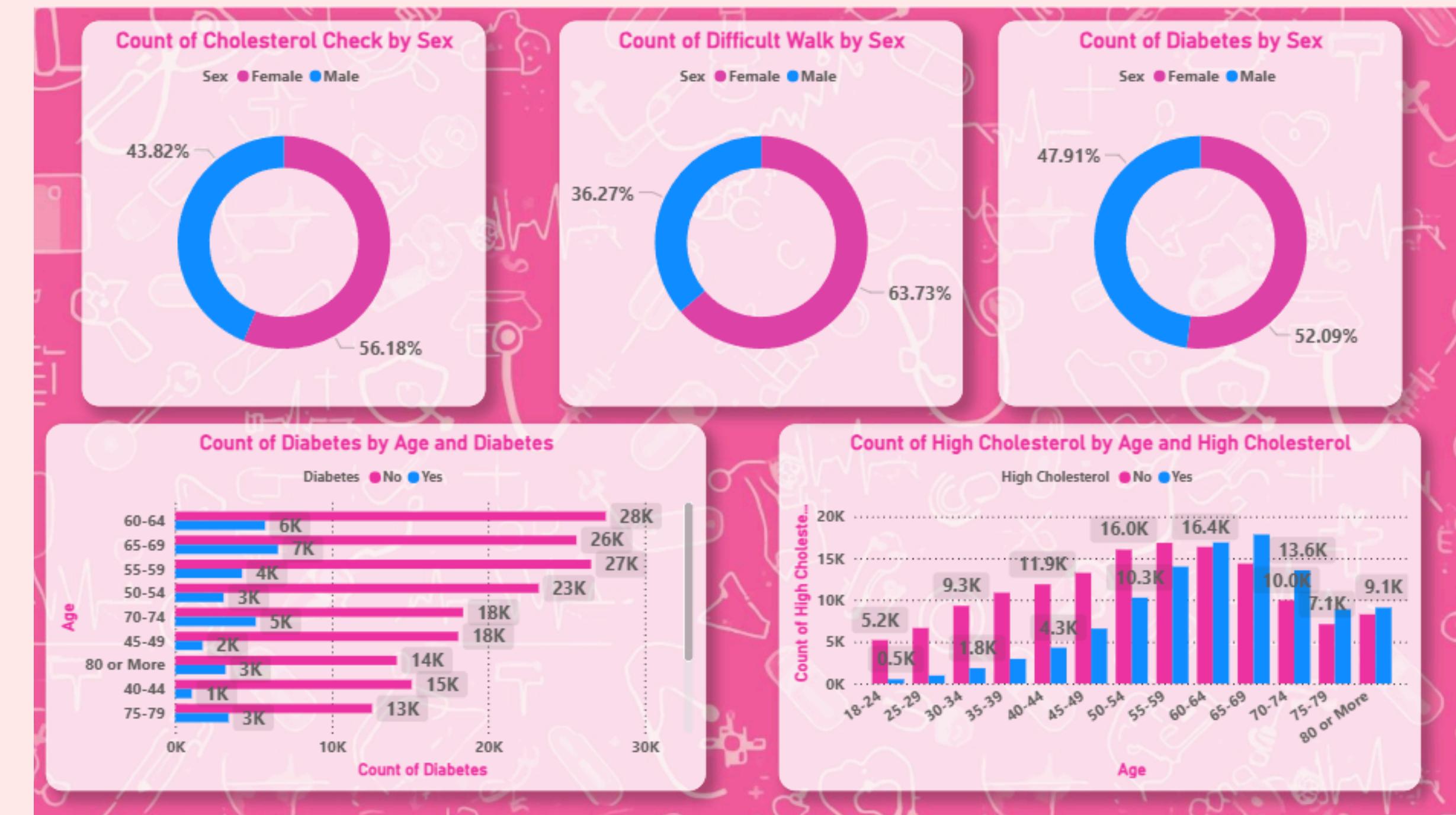


This line chart visualizes the relationship between chronic physical illness and mobility issues. It plots the total number of people who report difficulty walking (Count of DiffWalk) for each corresponding number of poor physical health days (PhysHlth). The distinct upward trend demonstrates a strong positive relationship: as the number of days with poor physical health increases, the number of individuals reporting difficulty walking also rises significantly.

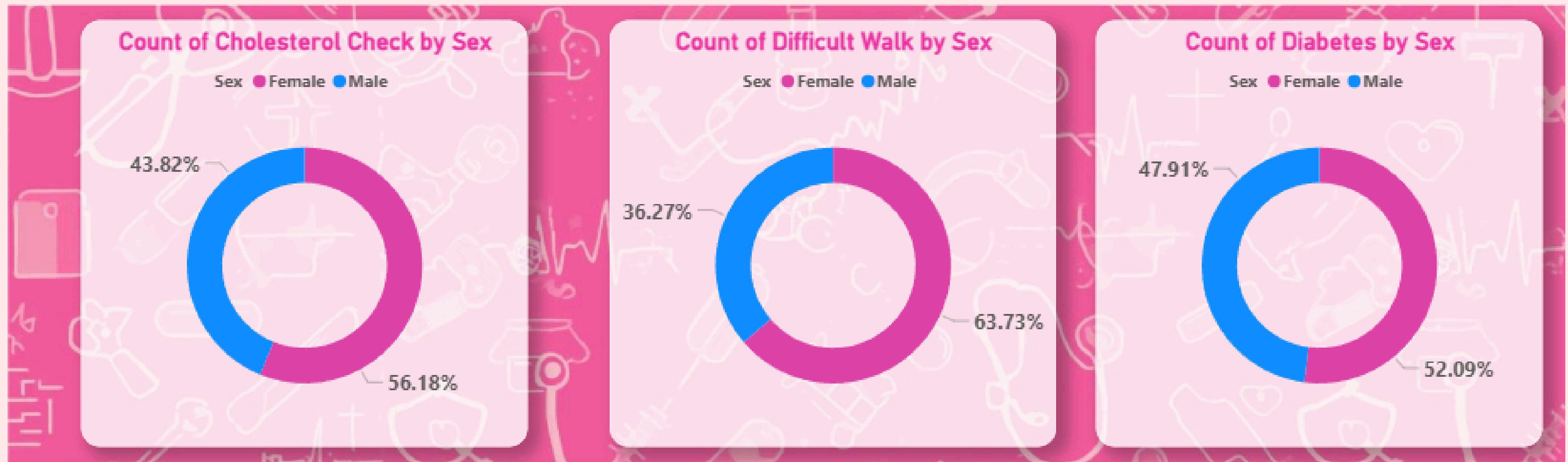
Diabetes Analysis: The effect of Age and Gender on Cholesterol and Diabetes

These visuals suggest that age is a major factor in developing diabetes and high cholesterol, while women are more likely to report walking difficulties and have high cholesterol.

Health interventions may need to be age-targeted and gender-sensitive to be most effective.

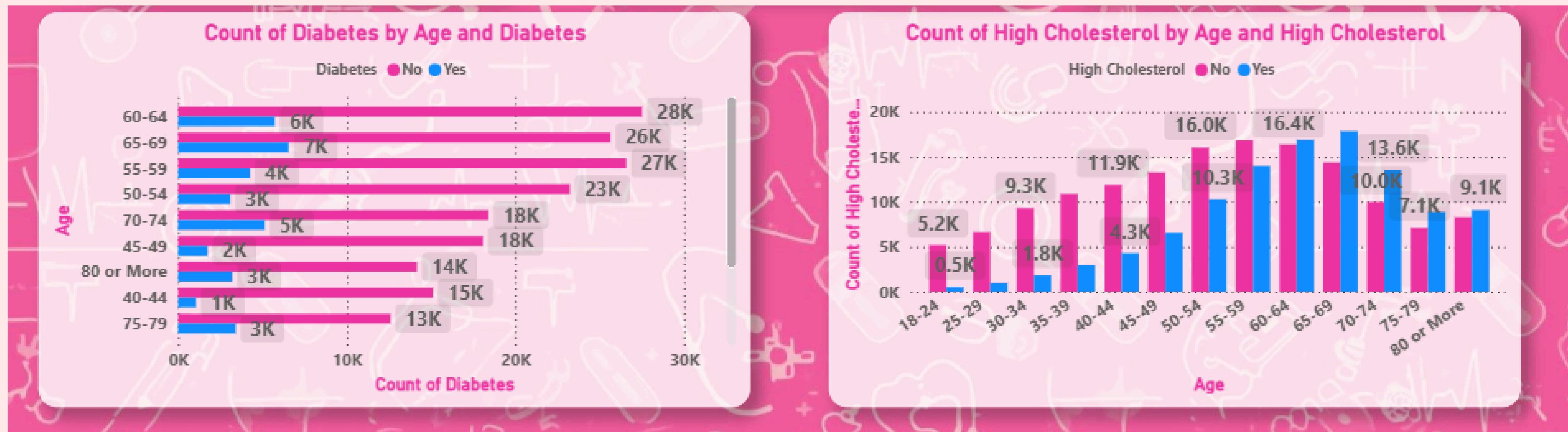


The effect of Sex on High Cholesterol, Walk Difficulty and Diabetes



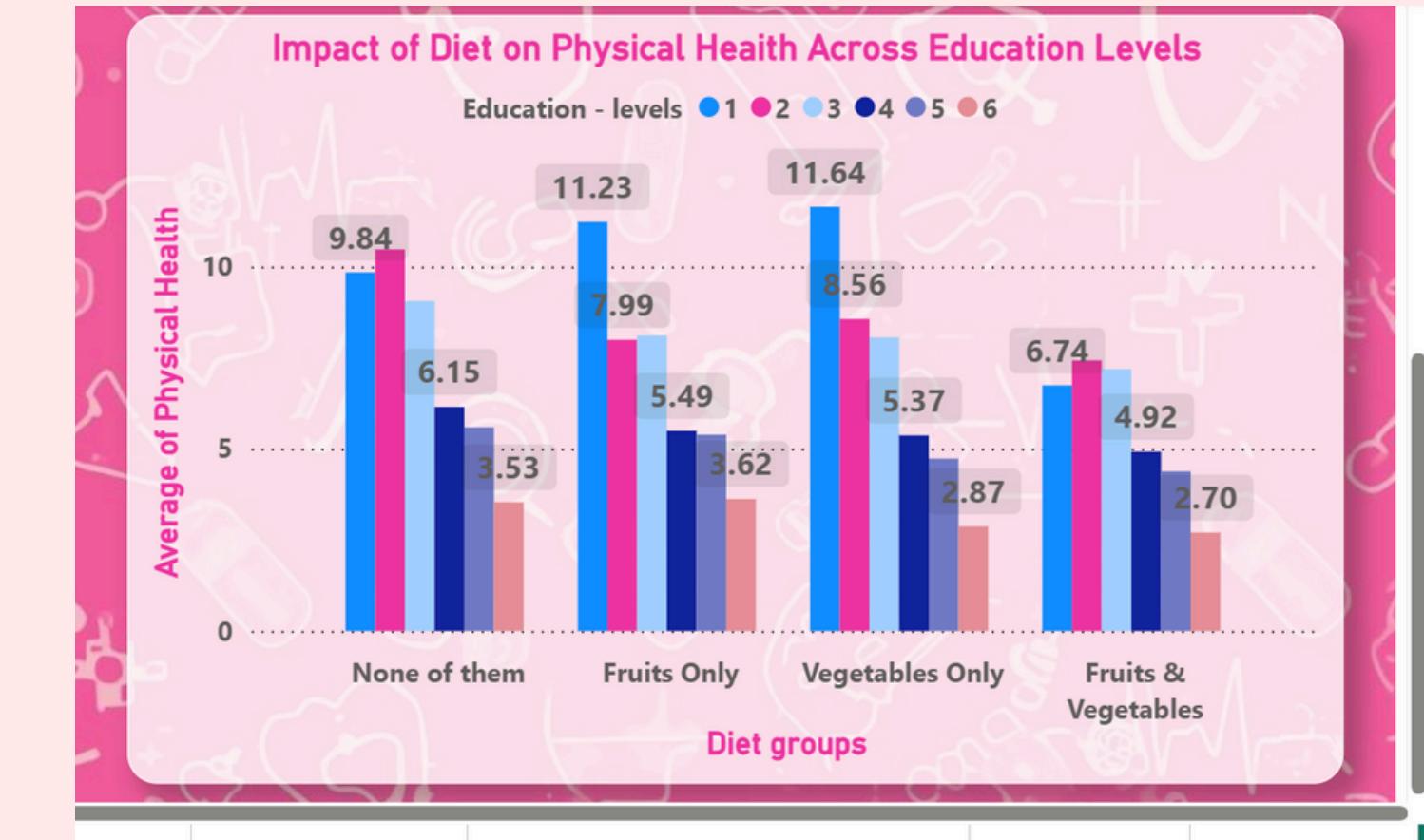
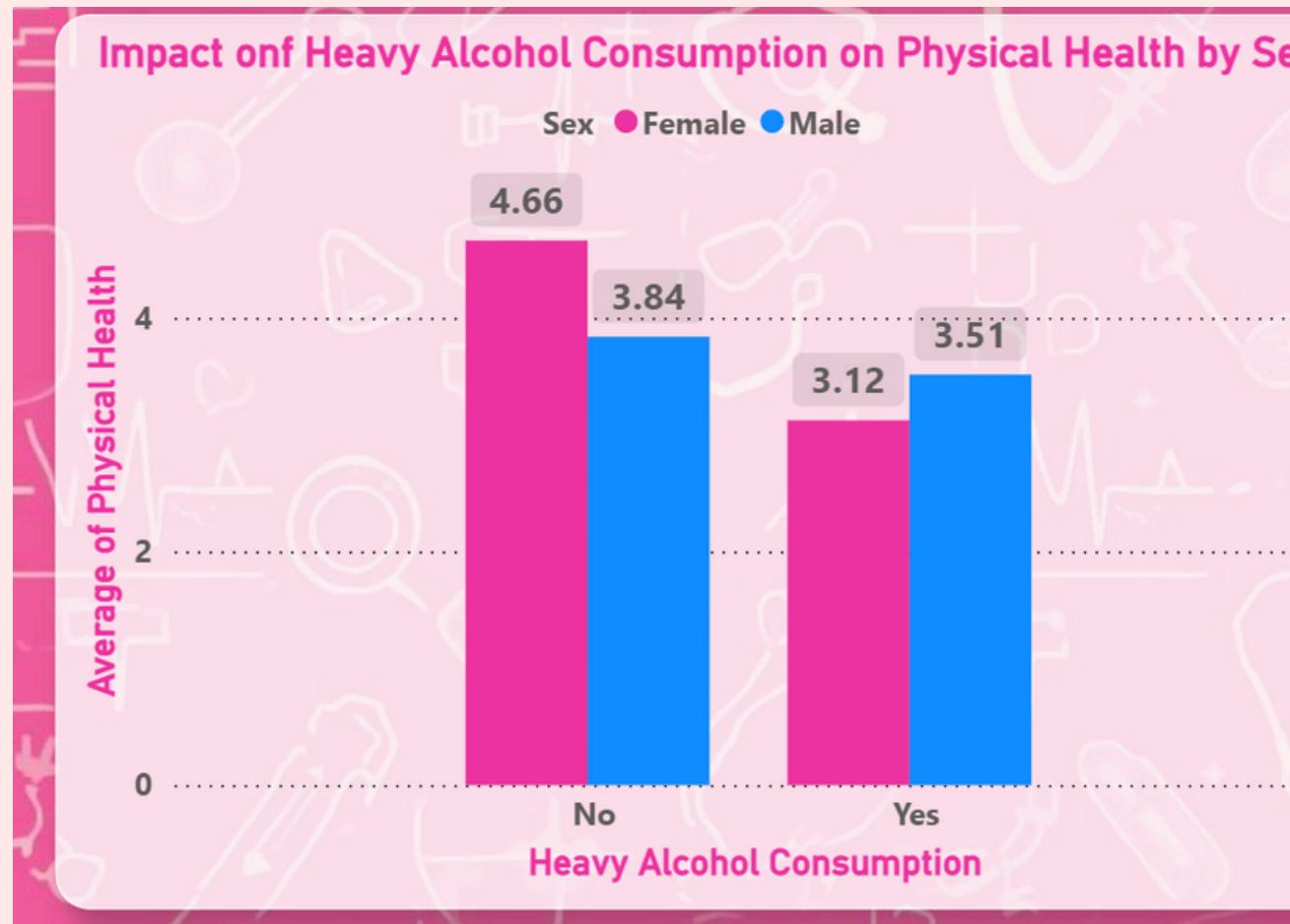
Diabetes affects both sexes similarly, with only a slight female majority, while women are more likely to report walking difficulty and have high cholesterol.

The effect of Sex on High Cholesterol, Walk Difficulty and Diabetes



- The First chart shows a strong age-related trend, where diabetes becomes more prevalent in older populations.
- In the Second chart, although most people still fall in the “No” category, the “Yes” counts steadily increase, indicating that age is a major factor in cholesterol elevation.

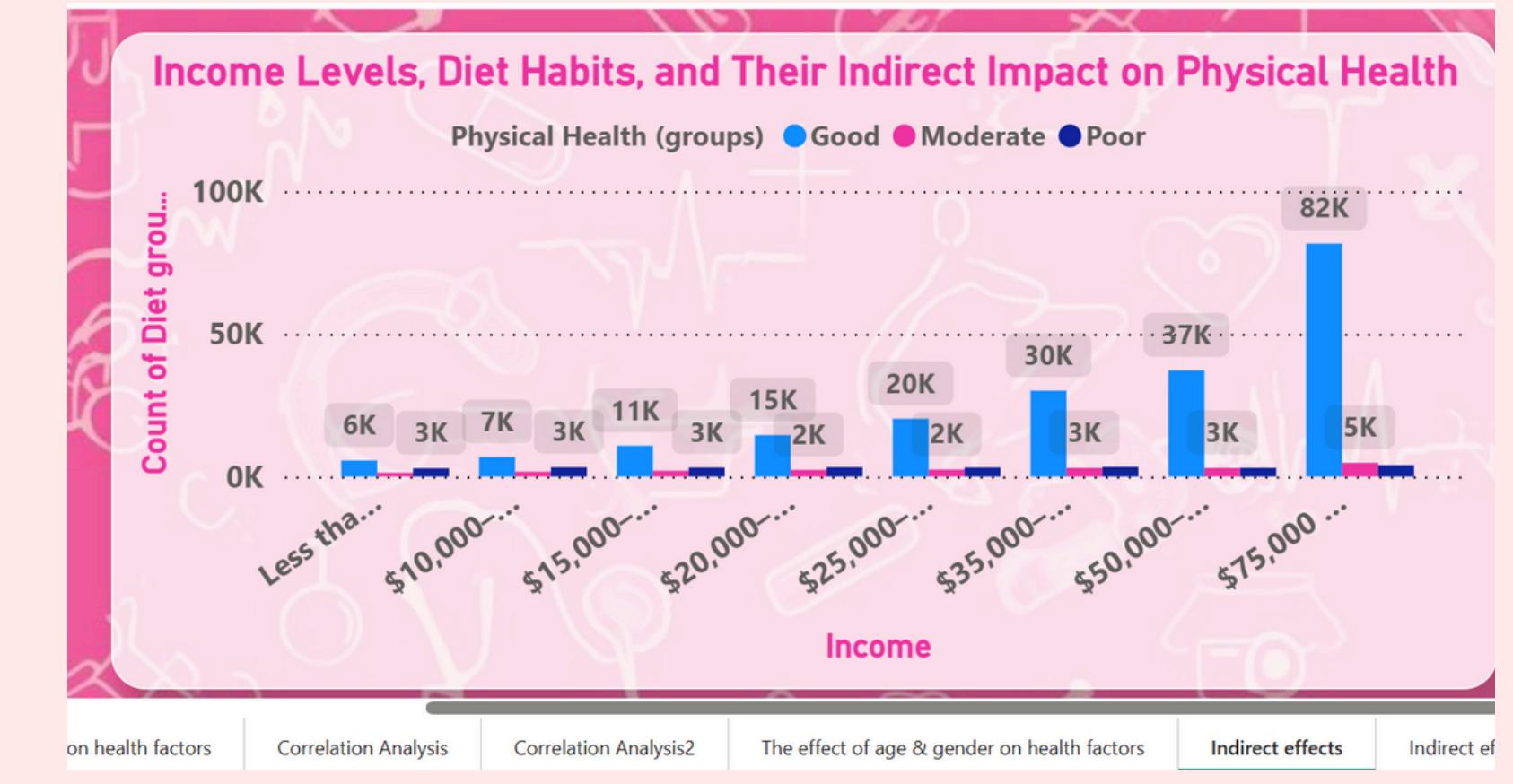
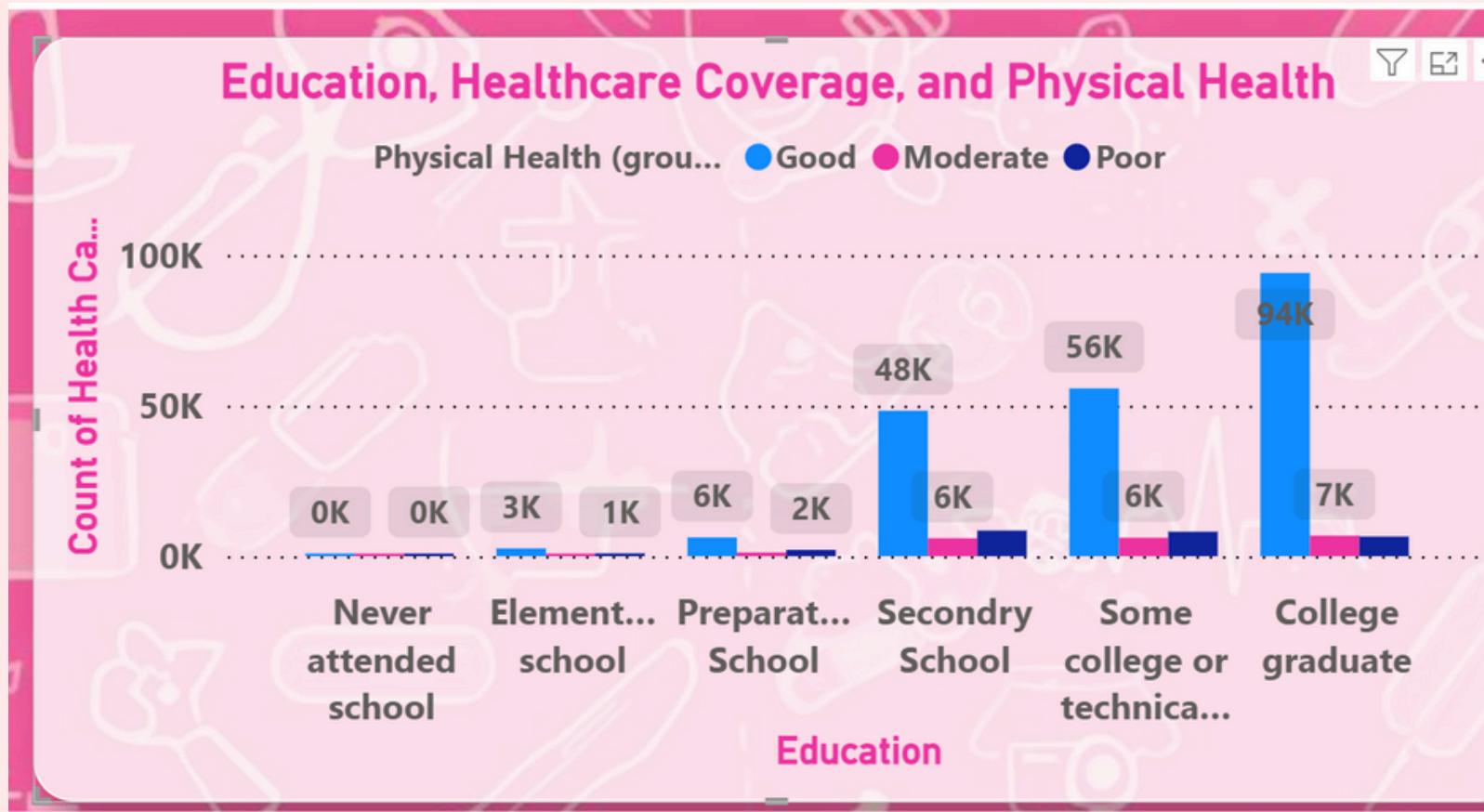
Indirect Effects



Compares the impact of heavy alcohol consumption on physical health between males and females.

Tests if healthcare coverage mediates the effect of education on physical health.

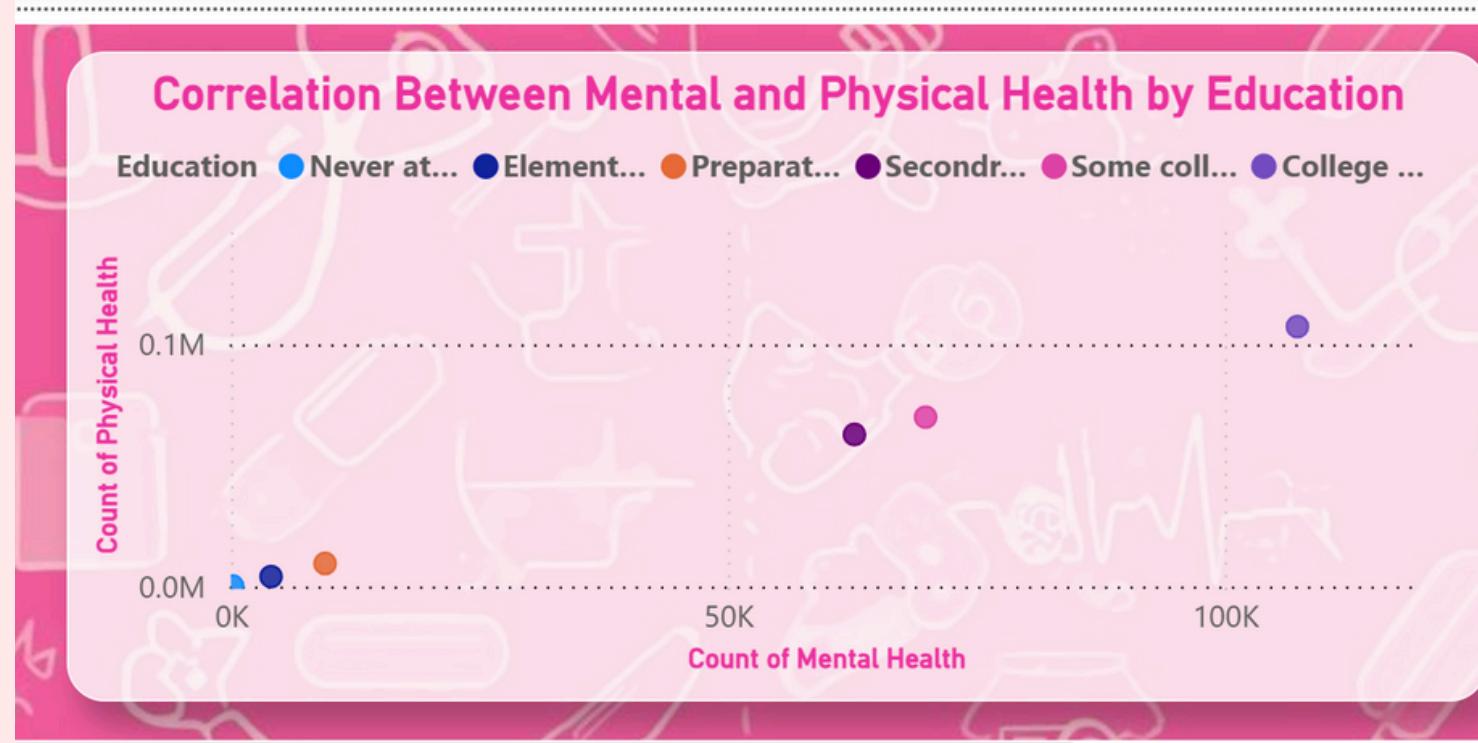
Indirect Effects



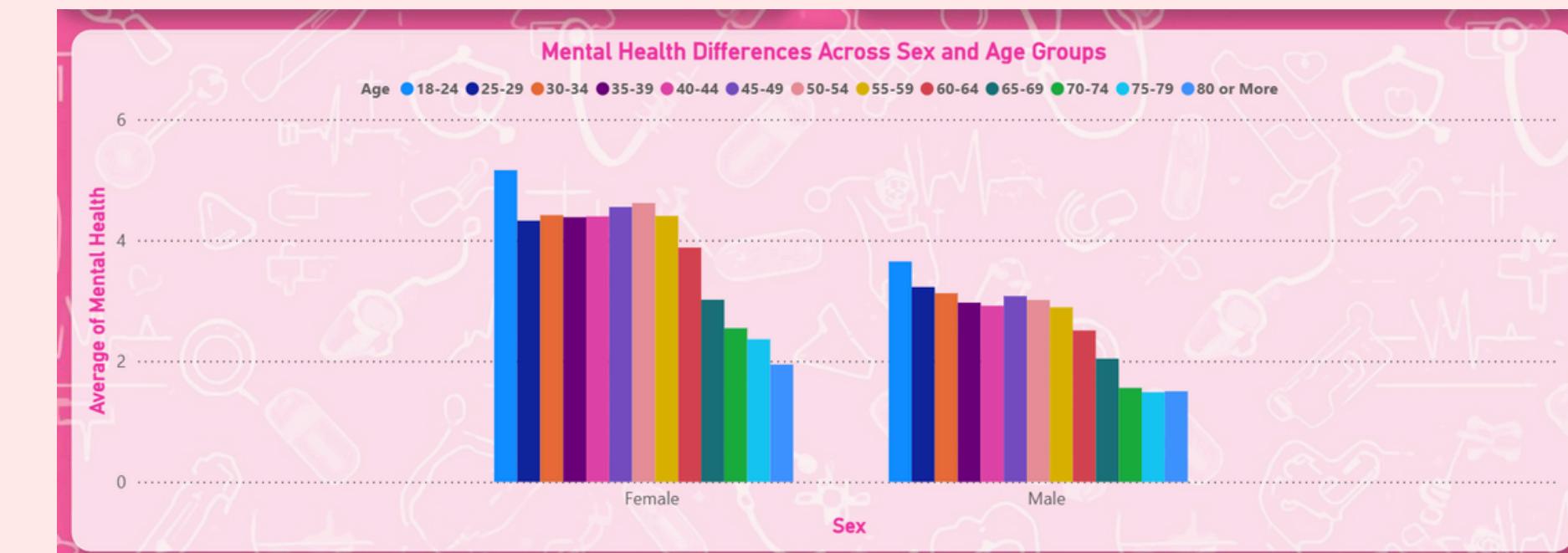
Shows how diet affects physical health across education levels using a clustered column chart.

Analyzes if diet mediates the relationship between income and physical health.

Indirect Effects



Scatter chart showing the relationship between mental and physical health, with legend by sex or education.



Compares mental health by sex and age groups using a clustered or stacked column chart.

AI chatbot linked to Data

Filters

Select Age Range: 13

Select Gender: Female Male

Select Smoker Status: 1 0

Ask a Question

Choose a question:

- How does fruit consumption affect mental health?
- Is there a link between income and insurance coverage?
- Do people with higher

Diabetes Dataset Explorer

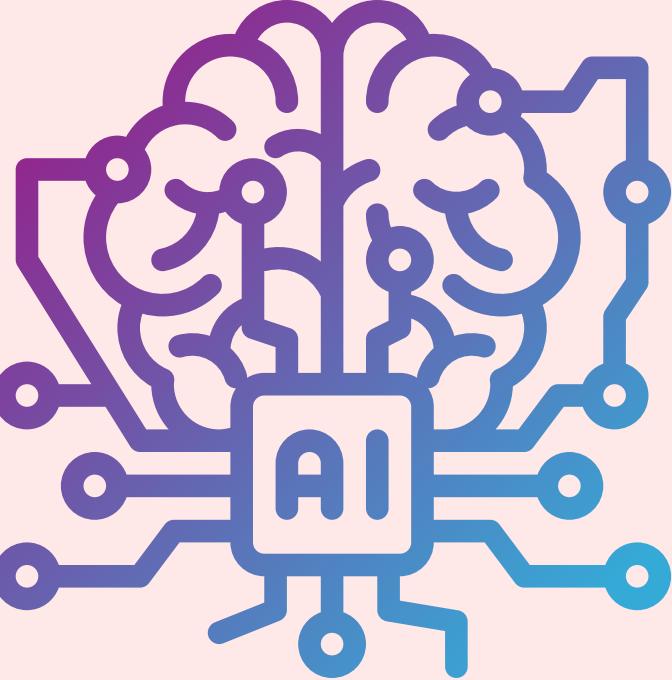
Ask Questions About Diabetes Dataset

Type your own question below:

Get Answer

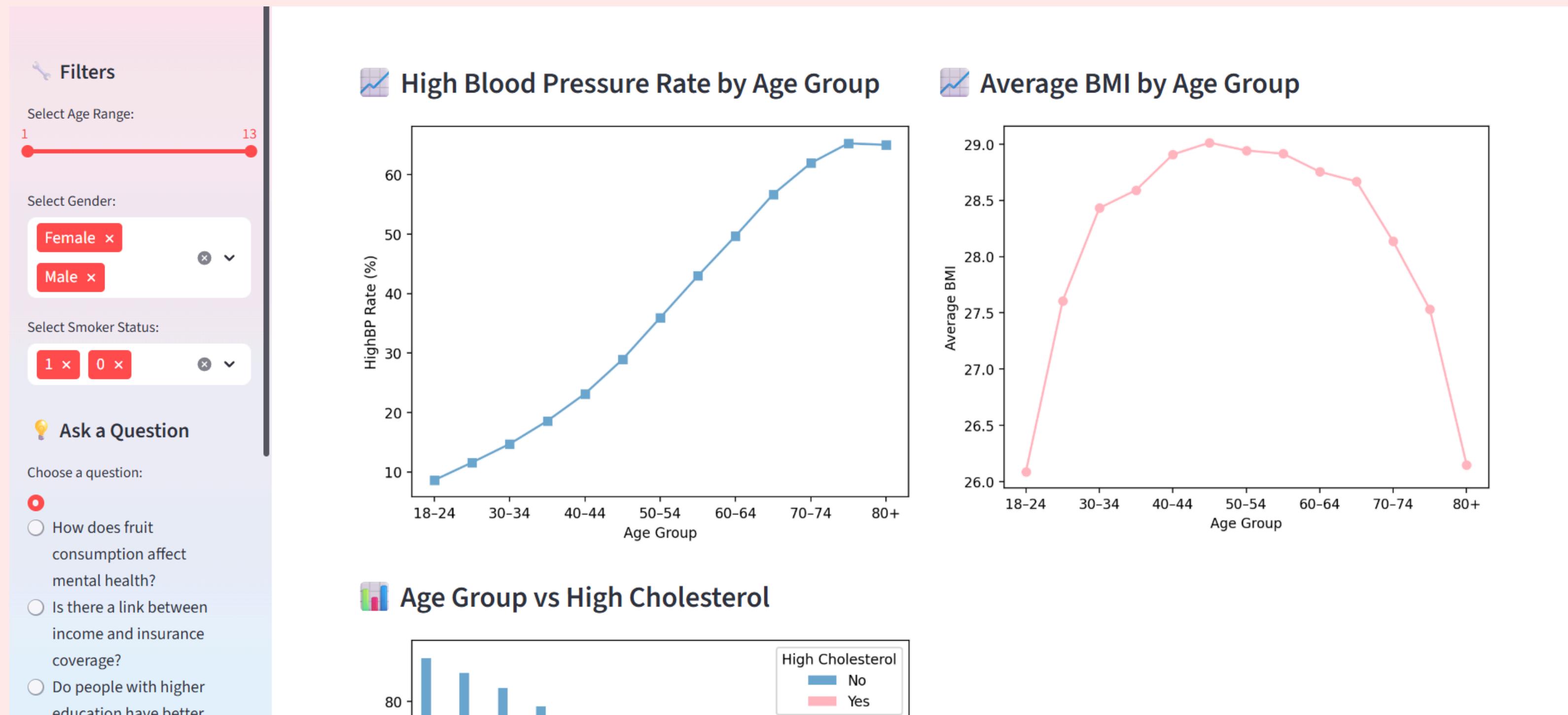
Interactive Diabetes Dashboard

Filter data, visualize charts, and ask AI-powered questions



Designed an AI chatbot Linked to the data that answers user's questions written in the text box or selected from the sidebar , in addition to interactive dashboard showing important insights

AI chatbot linked to Data



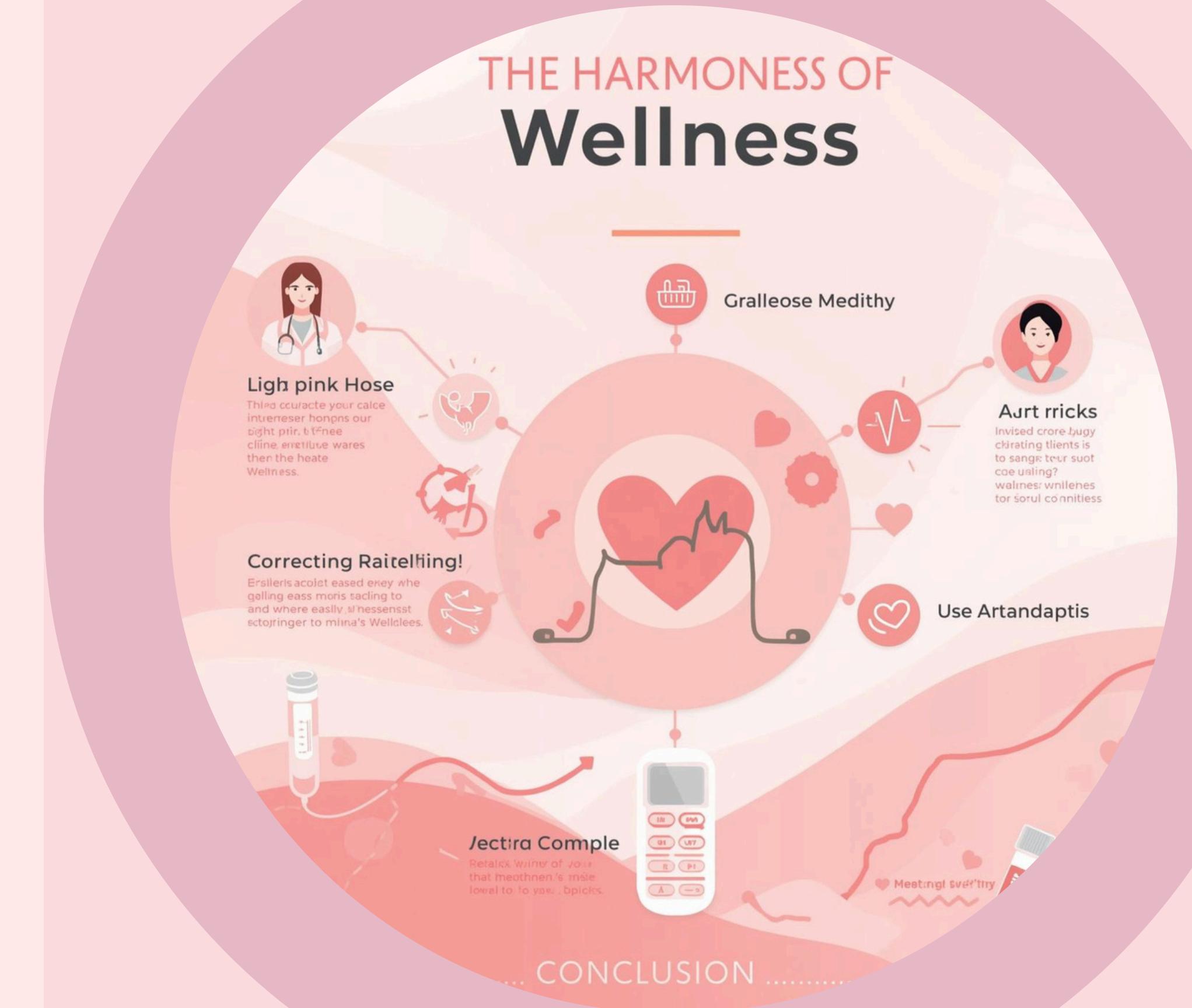
By using Python, Streamlit and Gemeni ai model , the dataset is analyzed and the questions are answered.
The visuals and charts are made using Matplotlib and Seaborn

Conclusion

This project analyzed different health, lifestyle, and demographic factors related to diabetes.

The findings show that physical activity, diet, BMI, and access to healthcare play a major role in influencing overall health and diabetes risk.

The analysis highlights the importance of encouraging healthy habits and improving healthcare access to help reduce the prevalence of diabetes.



Thanks for your
attention!

