

RAYALASEEMA UNIVERSITY KURNOOL SRI SANKARAS DEGREE COLLEGE

G. Shiva Shankar Hemanth

b.sc(mscs)

21364008010

Heart Diseases Analysis

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Project Title: Heart Diseases Analysis

Team ID : LTVIP2024TMID14100

Team Size : 4

Team Leader : Gujjula Shiva Shankar Hemanth

Team member : Dampetla Damodar Reddy

Team member : Chintakunta Charan

Team member : Chunchula Kranthi Kumar

Heart Disease Analysis

Heart disease (heart disease) is a group of diseases related to cardiovascular diseases, manifested by a violation of the normal functioning of the heart. May be caused by damage to the epicardium, pericardium, myocardium, endocardium, valvular apparatus of the heart, heart vessels.

According to the National Heart, Lung and Blood Institute in Framingham (USA), the most important factors in the development of cardiovascular disease in humans are obesity, sedentary lifestyle and smoking.

In this project we are trying to analyze the Heart disease related data and be able to extract some insights from the data using Business Intelligence tools. To Extract the Insights from the data and put the data in the form of visualizations, Dashboards and Story we employed Tableau tool.

Project Flow

To accomplish this, we have to complete all the activities listed below,

- Define Problem / Problem Understanding
 - Specify the business problem
 - Business requirements
 - Literature Survey
 - Social or Business Impact.
- Data Collection & Extraction from Database
 - Collect the dataset,
 - Storing Data in DB
 - Perform SQL Operations
 - Connect DB with Tableau
- Data Preparation

- Prepare the Data for Visualization
- Data Visualizations
 - No of Unique Visualizations
- Dashboard
 - Responsive and Design of Dashboard
- Story
 - No of Scenes of Story
- Performance Testing
 - Amount of Data Rendered to DB ‘
 - Utilization of Data Filters
 - No of Calculation Fields
 - No of Visualizations/ Graphs
- Web Integration
 - Dashboard and Story embed with UI With Flask

- Project Demonstration & Documentation
 - Record explanation Video for project end to end solution
 - Project Documentation-Step by step project development procedure

Milestone 1: Define Problem / Problem Understanding

Activity 1: Specify the business problem

Refer Project Description

Activity 2: Business requirements

The health care industry produces a huge amount of data. This data is not always made use to the full extent and is often underutilized. Using this huge amount of data, a disease can be detected, predicted or even cured. The business requirements for analyzing the Heart Disease in world include identifying patterns and comparing factors of heart diseases, creating interactive dashboards and reports, identifying areas for improvement, making data-driven decisions, comparing to the current situation and creating forecasting models for future performance. The ultimate goal is to gain insights and improve performance through data visualization techniques.

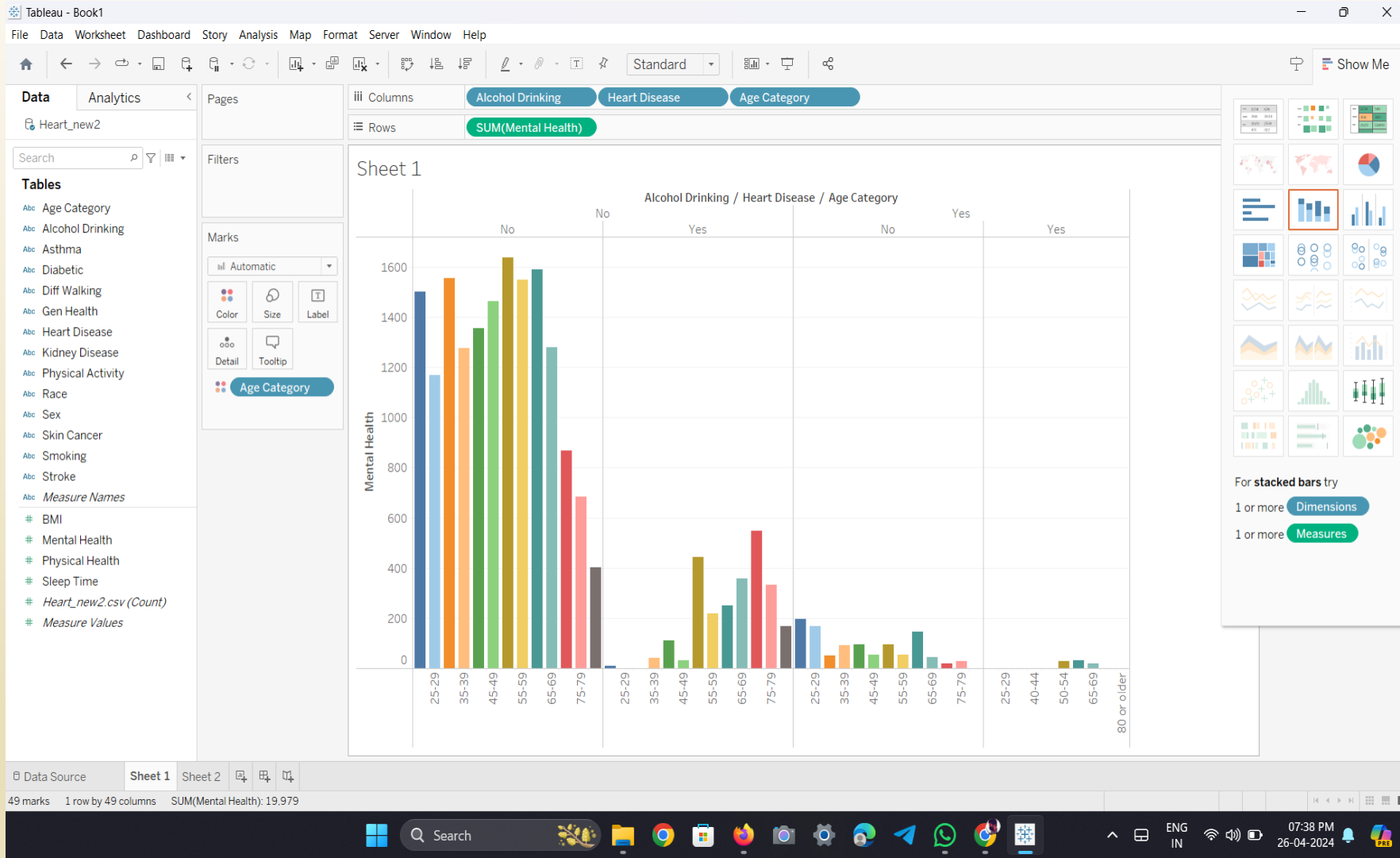
Activity 3: Literature Survey (Student Will Write)

A literature survey for the Heart disease analysis would involve researching and reviewing previous studies, articles, and reports on the topic. This could include information on the methods and techniques used for analyzing heart disease, as well as the results and conclusions of these studies. A comprehensive literature survey should include peer-reviewed journals, scientific databases (e.g., PubMed, Scopus), conference proceedings, and authoritative sources in the field of cardiovascular medicine. The survey should encompass a range of studies, including clinical trials, observational studies, systematic reviews, and meta-analyses, to provide a comprehensive overview of the current knowledge landscape in the field of heart disease.

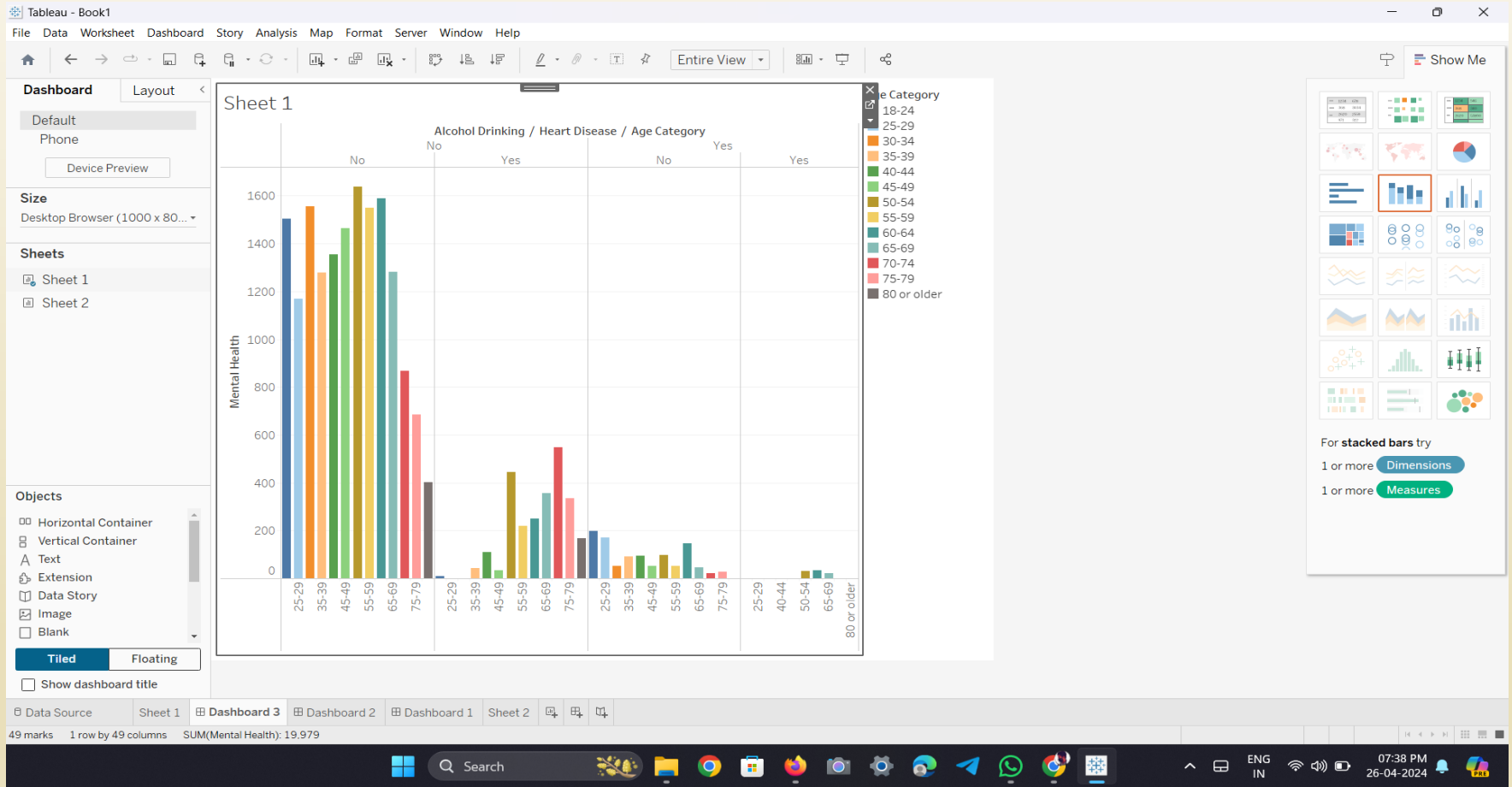
Activity 4: Social or Business Impact.

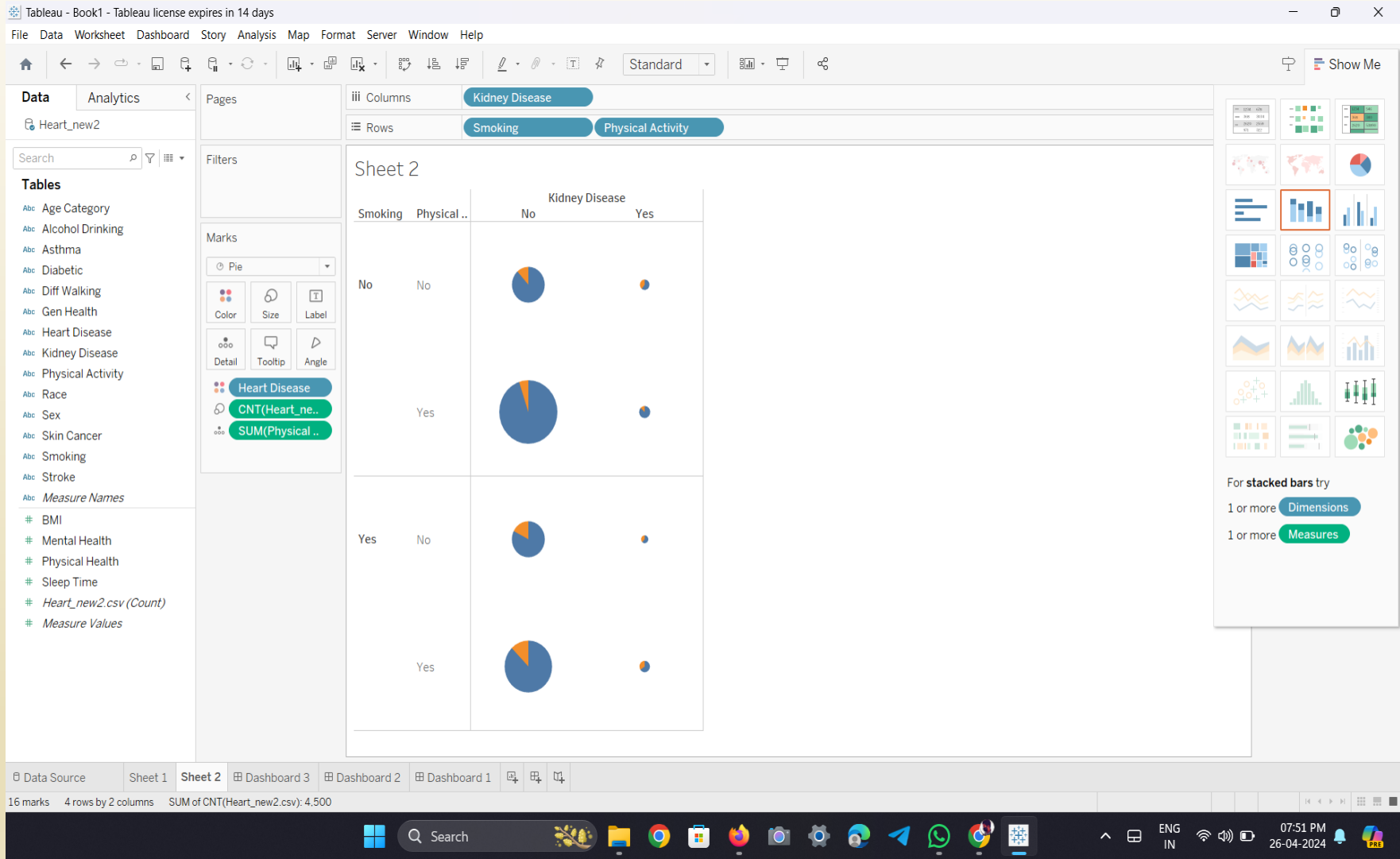
Social Impact- Analyzing heart disease has profound social impacts, ranging from individual-level health outcomes to community empowerment and public health initiatives. By promoting awareness, prevention, equitable healthcare access, and research advancements, heart disease analysis plays a crucial role in improving the well-being of individuals and society as a whole.

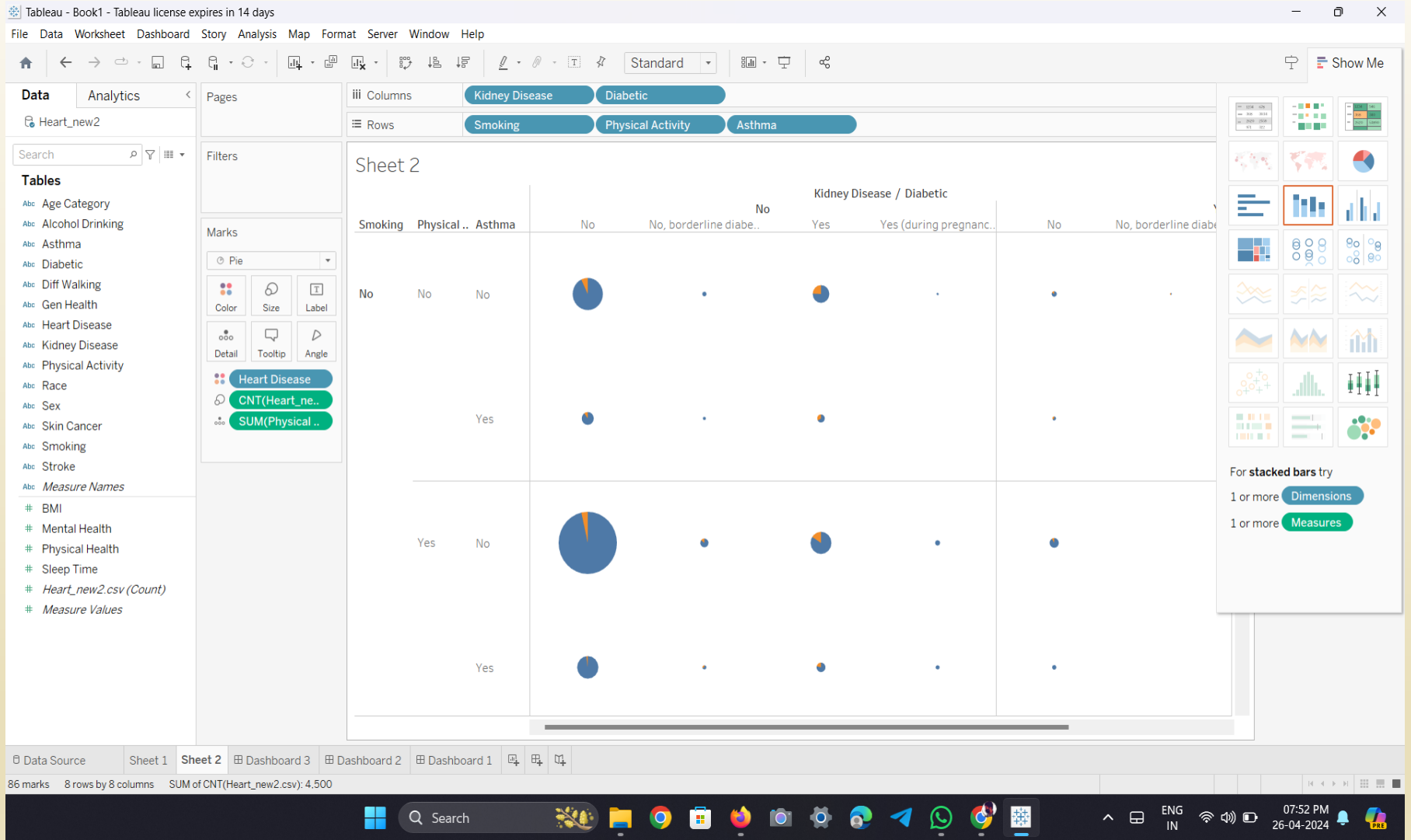
Business Model/Impact: Analyzing heart disease has substantial business impacts across various sectors, including healthcare, medical technology, pharmaceuticals, digital health, insurance, research, workplace wellness, and consumer products. It creates market opportunities, drives innovation, and influences policy and advocacy efforts in the fight against heart disease.

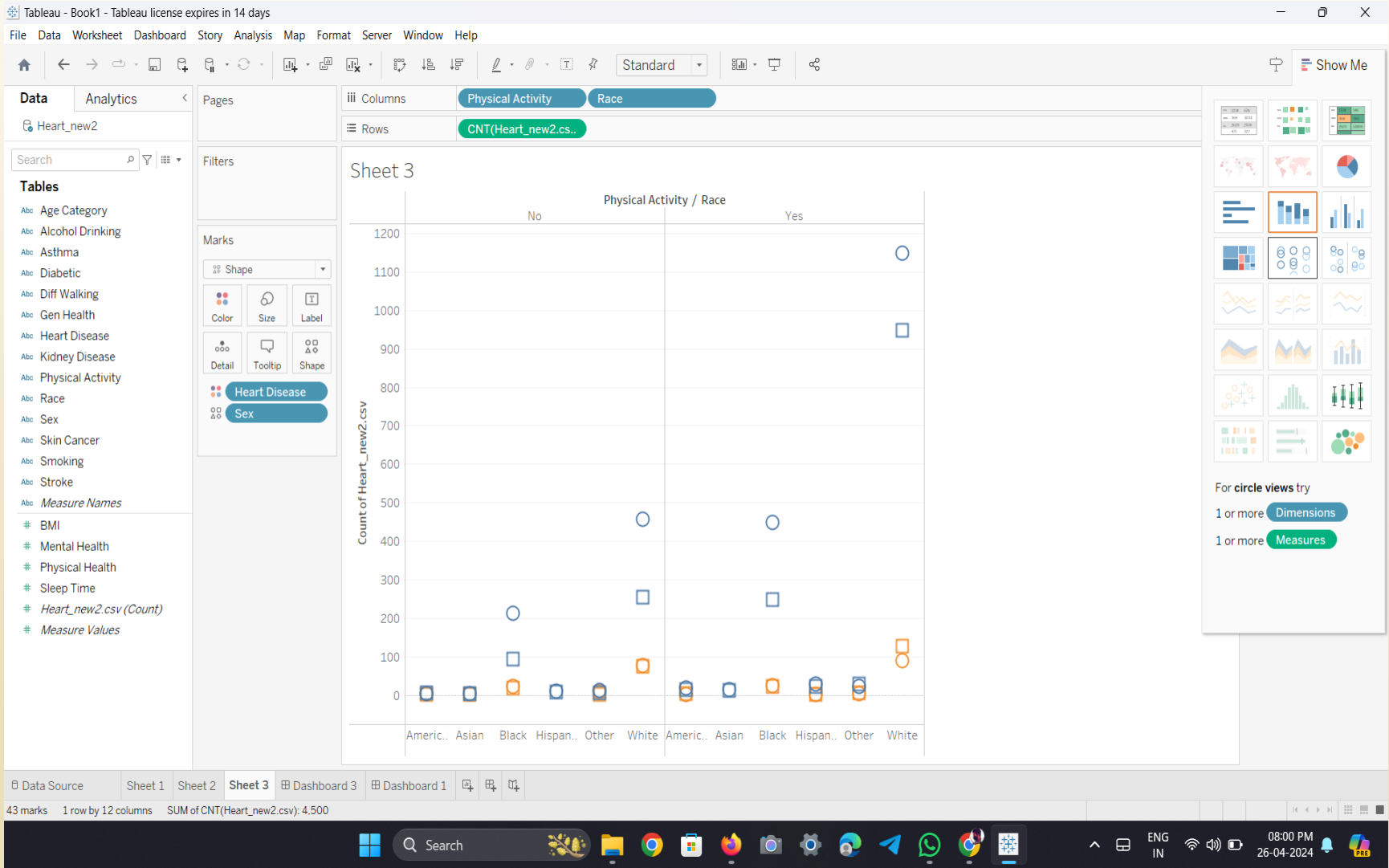


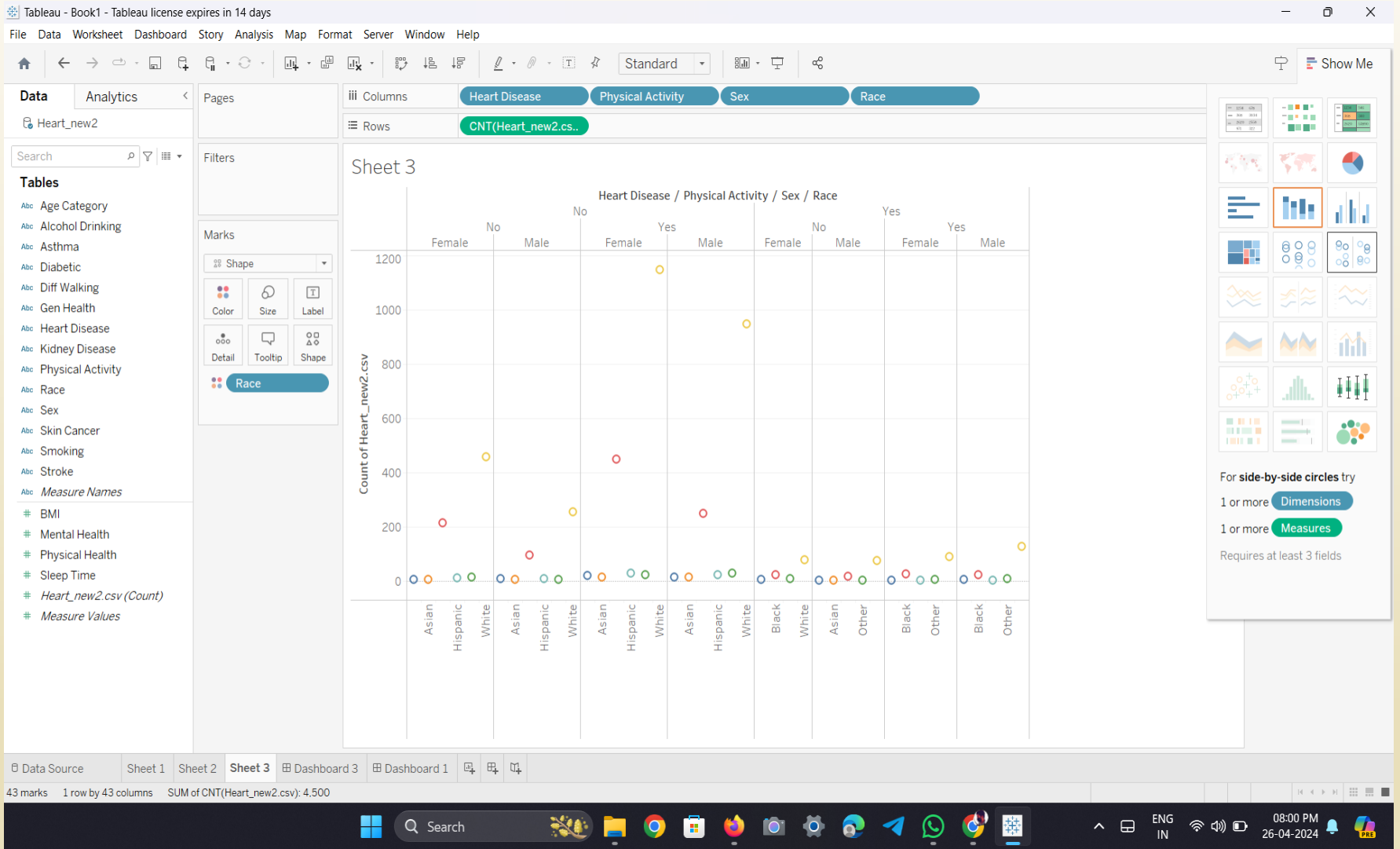
Dashboard 1



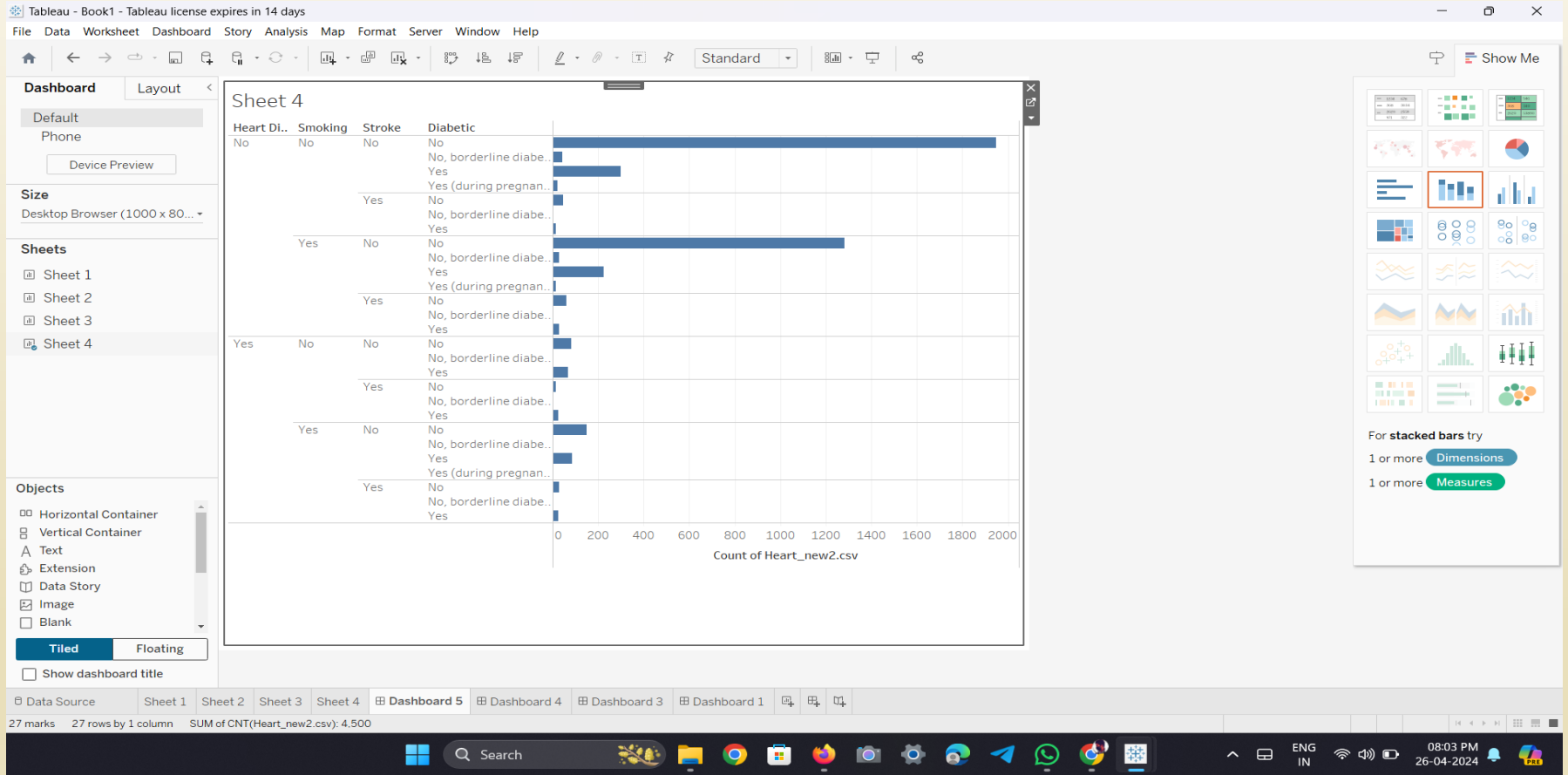


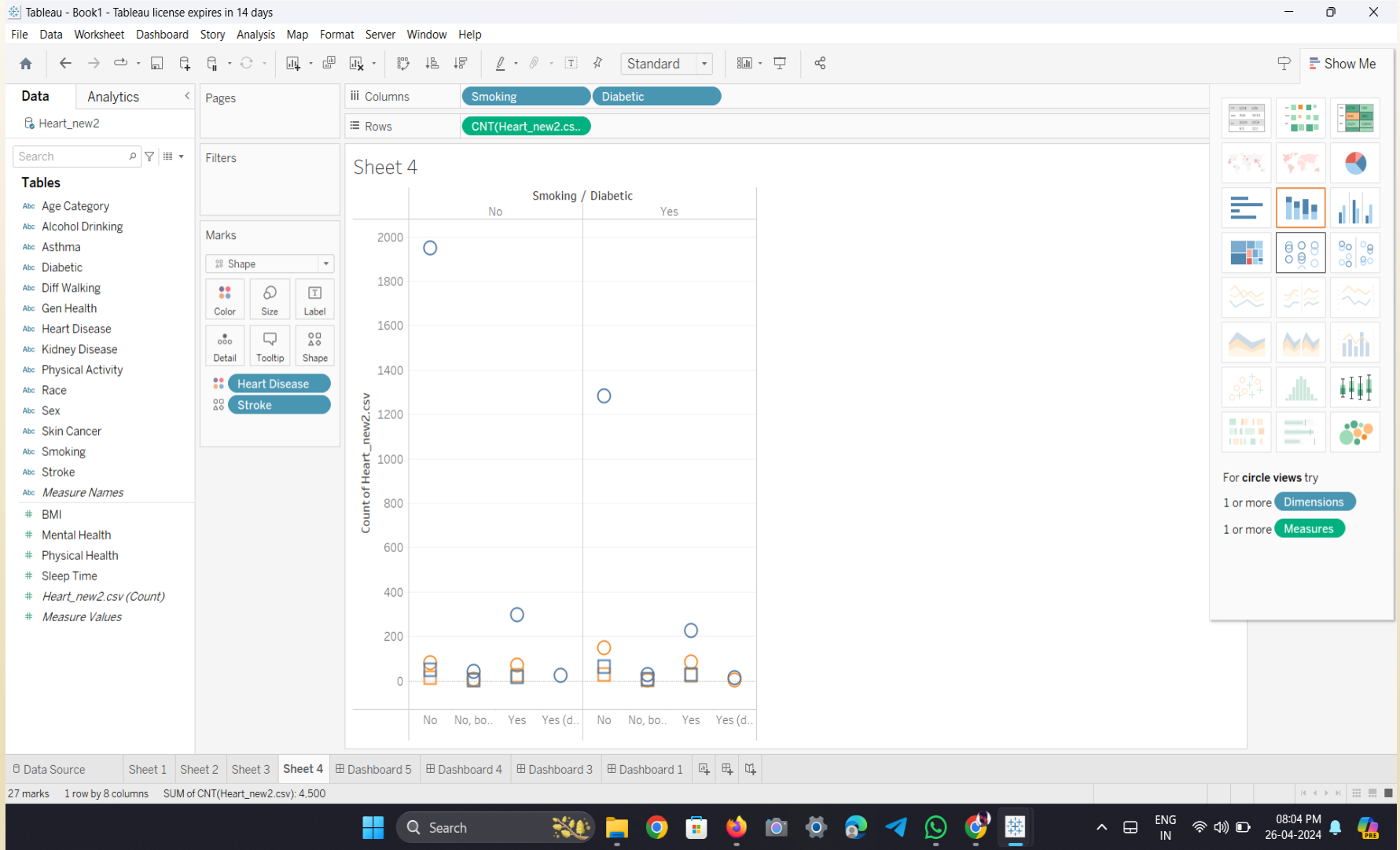






Dashboard 2





Milestone 2: Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, evaluate outcomes and generate insights from the data.

Activity 1: Downloading the dataset

Please use the link to download the dataset: [Link](#)

Activity 1.1: Understand the data

Data contains all the meta information regarding the columns described in the CSV files

Column Description of the Dataset:

1. HeartDisease - target trait.
2. BMI – A value that allows you to assess the degree of correspondence between a person's mass and his height, and thereby indirectly judge whether the mass is insufficient, normal or excessive. It is important in determining the indications for the need for treatment.

1. Smoking : It is a major risk factor for cardiovascular disease. When smoke from a cigarette is inhaled, the reaction of the cardiovascular system immediately follows: within one minute, the heart rate begins to rise, increasing by 30% within ten minutes of smoking. The bad habit also increases blood pressure, fibrinogen and platelet levels, making blood clots more likely.
2. AlcoholDrinking - alcohol causes not only temporary disturbances in the functioning of the heart, but also permanent ones. Heart pain after alcohol is not the only health problem associated with alcohol consumption.
3. Stroke - Ischemic stroke occurs 4 times more often than hemorrhagic. One of the leading causes of this suffering is heart disease, which impairs its functioning, as a result of which the blood flow in the arteries is disturbed and the blood supply to the brain is reduced. Another cause of stroke in heart disease is thromboembolism, when clots form in the cavities of the heart (most often with heart failure) - blood clots.
4. PhysicalHealth - how many days in a month did you feel poor physical health.
5. MentalHealth - how many days in a month did you feel poor mental health.
6. DiffWalking - difficulty climbing stairs.
7. Sex - gender of a person.

1. AgeCategory - age category of the subjects.
2. Race- Race is a complex social construct that categorizes people into distinct groups based on certain physical and genetic characteristics
3. Diabetic – Person suffering from Diabetes
4. PhysicalActivity - adults who reported doing physical activity or exercise during the past 30 days other than their regular job
5. GenHealth - well-being.
6. SleepTime - number of hours of sleep.
7. Asthma- Asthma is a chronic respiratory condition due to breathing Issue
8. KidneyDisease – Disease related to Kidney
9. Skin Cancer – People suffering from Skin Cancer

Milestone 3: Data Preparation

Activity 1: Prepare the Data for Visualization

. Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency. Since the data is already cleaned we can move to visualization.

Milestone 4: Data Visualization

Data visualization is the process of creating graphical representations of data to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance and efficiency of banks include bar charts, line charts, heat maps, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and customer demographics, workload, resource allocation and location of banks.

Milestone 5: Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Milestone 6: Story

A data story is a way of presenting data and analysis in a narrative format, intending to make the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis logically and systematically, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

Milestone 7: Performance Testing

Activity 1: Amount of Data Rendered to DB

- The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data.
- Open the MySQL Workbench, go to the database then click to expand the tables, select the table and click on (i) button to get the information related to table such as column count, table rows etc.

Milestone 8: Web integration

Publishing helps us to track and monitor key performance metrics and to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.