HEART DISEASE ANALYSIS

Define Problem/Problem Understanding

Define Problem Statement: Visualizing and Predicting Heart Diseases with an Interactive Dashboard

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 disease, 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.

Literature Survey: A literature study is necessary for a project that uses an interactive dashboard to visualize and forecast heart illness. It covers pertinent studies on data visualization for heart disease, predictive modeling, interactive dashboard design, and user experience in healthcare applications. In order to guide the creation and use of a successful heart disease prediction dashboard, the survey attempts to uncover best practices, predictive models, visualization strategies, and ethical considerations from previous research and initiatives.

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.

Data Collection and Extraction from Database

Downloading the Dataset: Heart_new2 dataset is downloaded for making visualizations.

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.

3. 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.

4. 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.

5. 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.

6. PhysicalHealth - how many days in a month did you feel poor physical health.

7. MentalHealth - how many days in a month did you feel poor mental health.

8. DiffWalking - difficulty climbing stairs.

9. Sex - gender of a person.

10. AgeCategory - age category of the subjects.

11. Race- Race is a complex social construct that categorizes people into distinct groups based on certain physical and genetic characteristics

12. Diabetic – Person suffering from Diabetes

13. PhysicalActivity - adults who reported doing physical activity or exercise during the past 30 days other than their regular job

14. GenHealth - well-being.

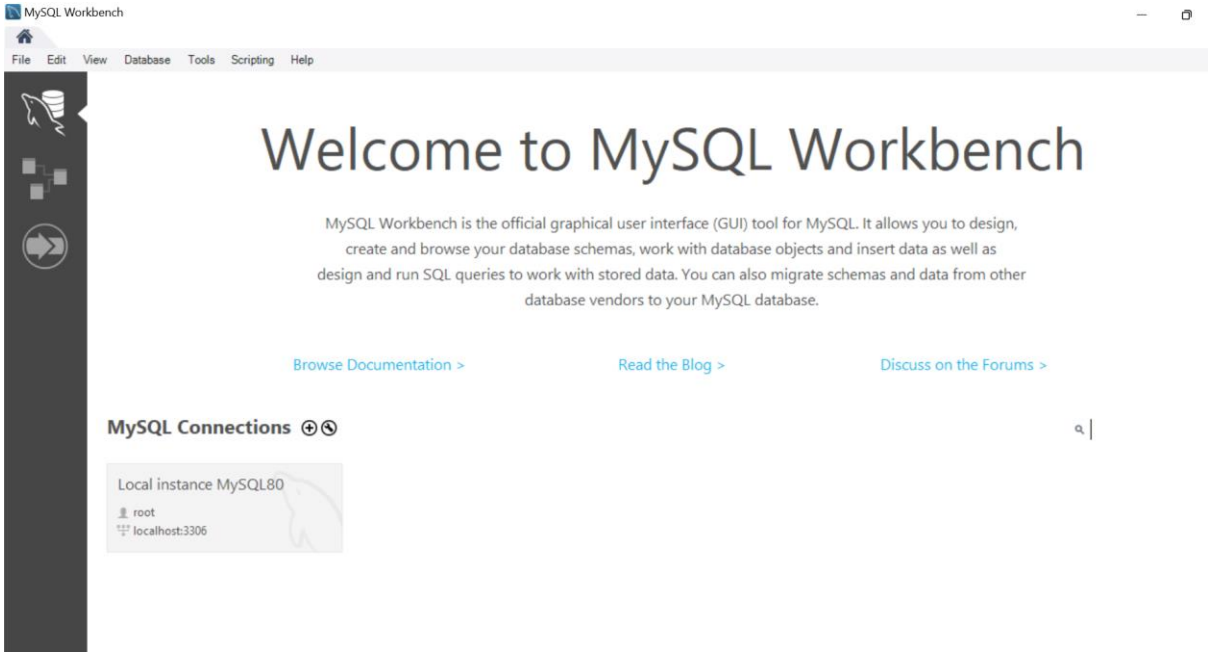
15. SleepTime - number of hours of sleep.

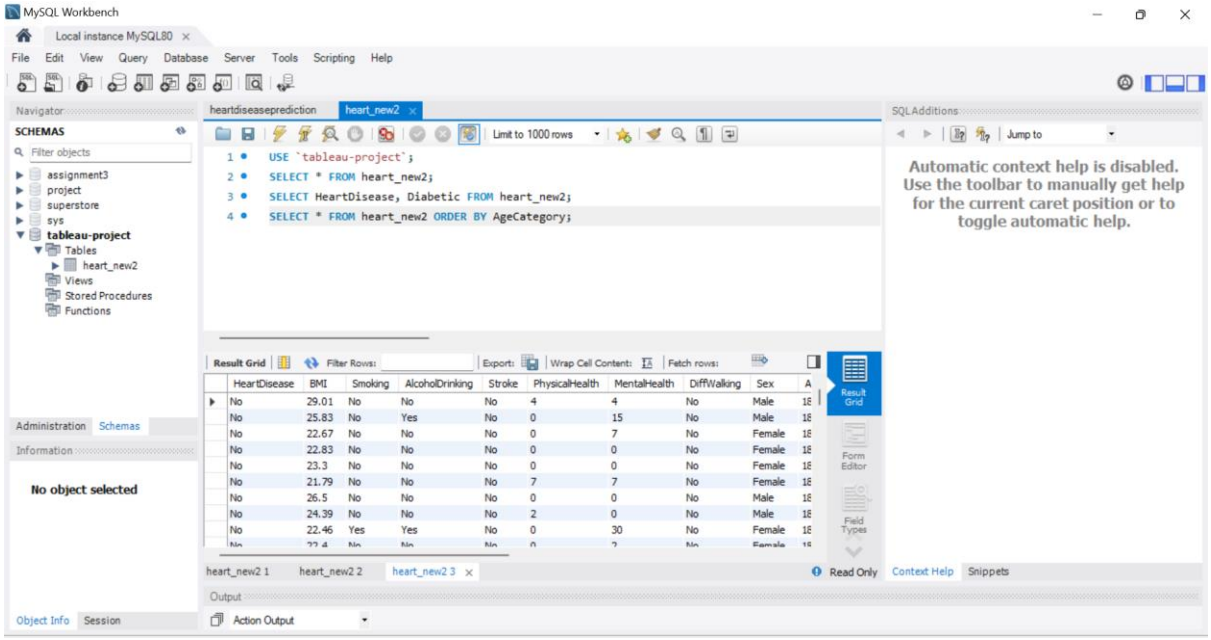
16. Asthma- Asthma is a chronic respiratory condition due to breathing Issue

17. KidneyDisease – Disease related to Kidney

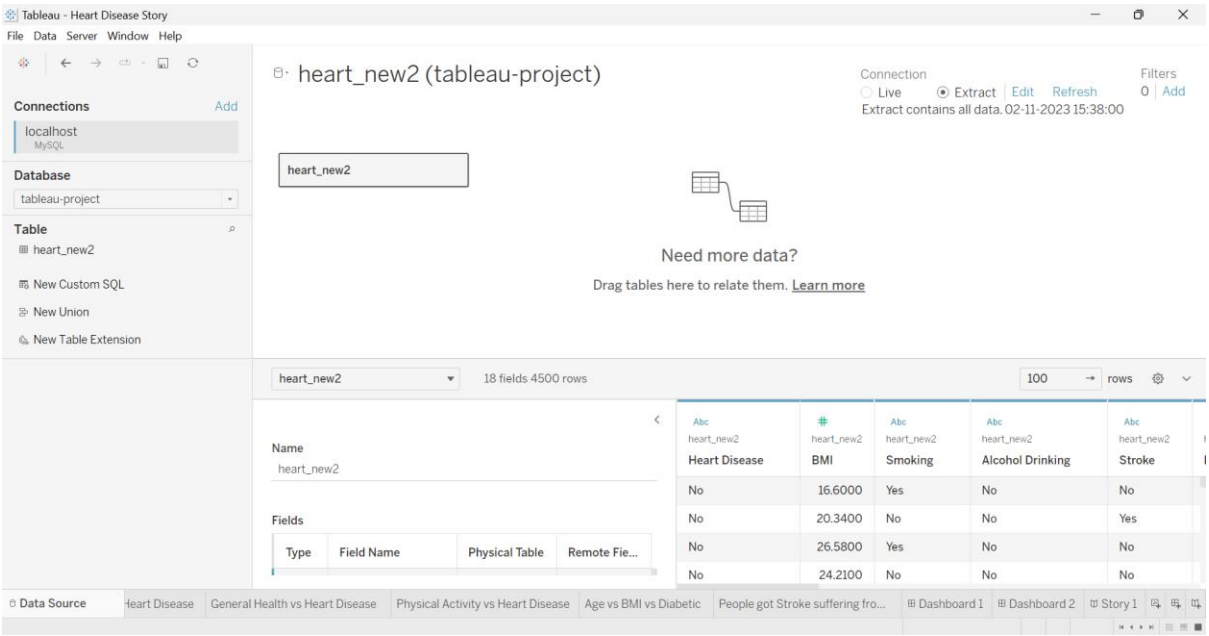
18. Skin Cancer – People suffering from Skin Cancer

Storing Data in DB and Perform SQL Operations:





Connect DB with Tableau:

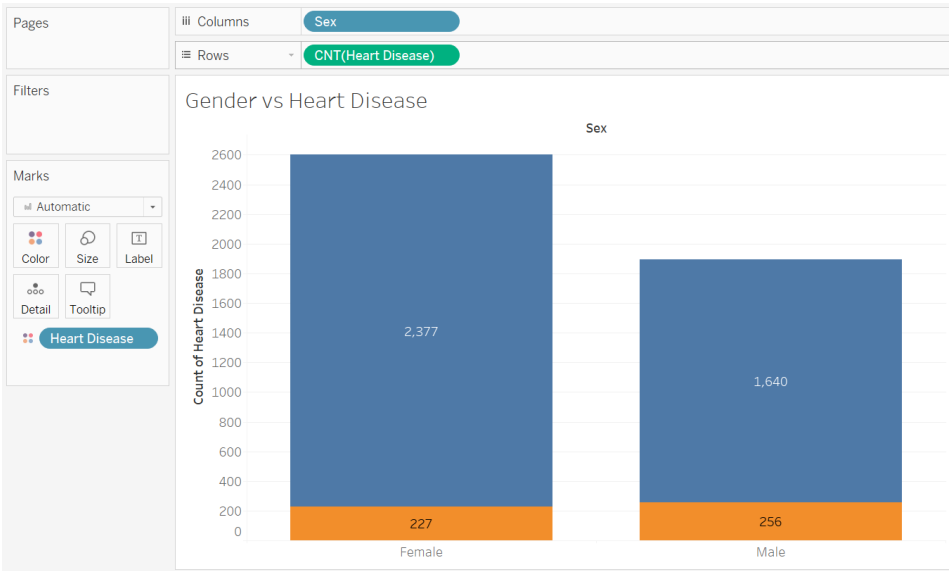


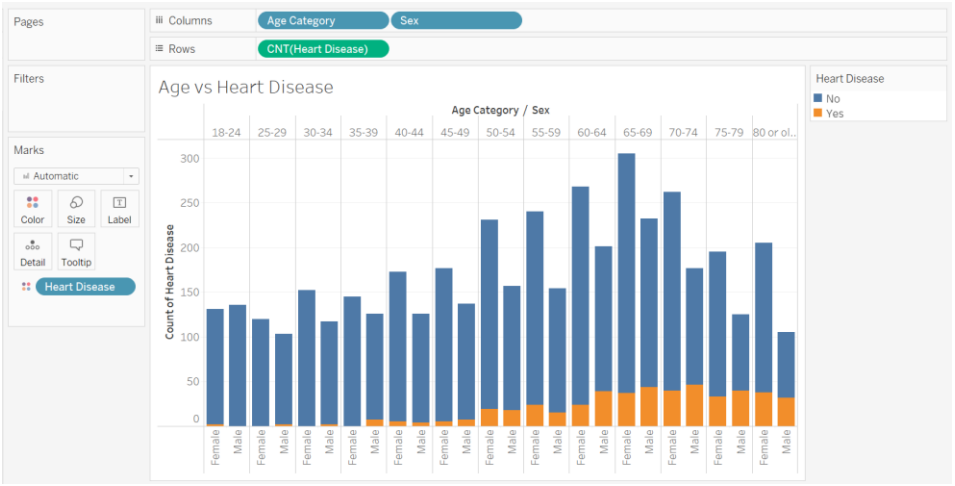
Data Preparation

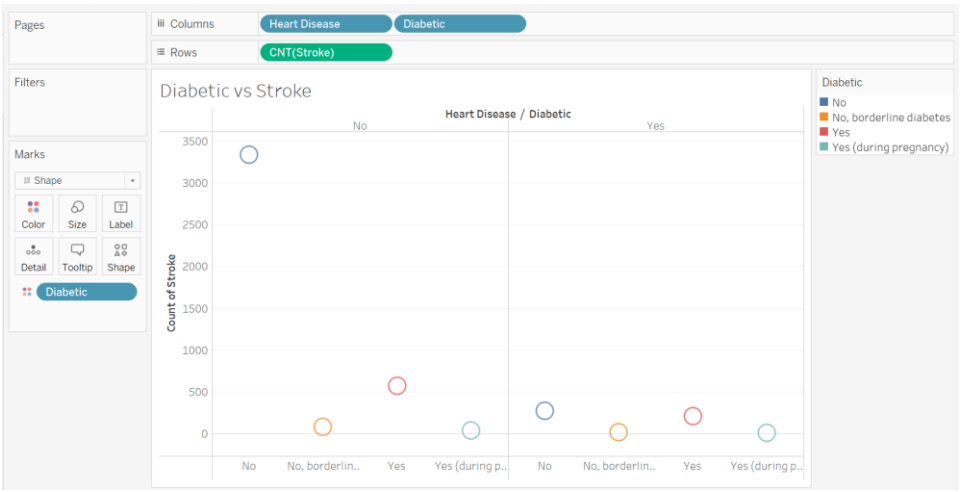
Prepare the Data for Visualization: Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets 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.

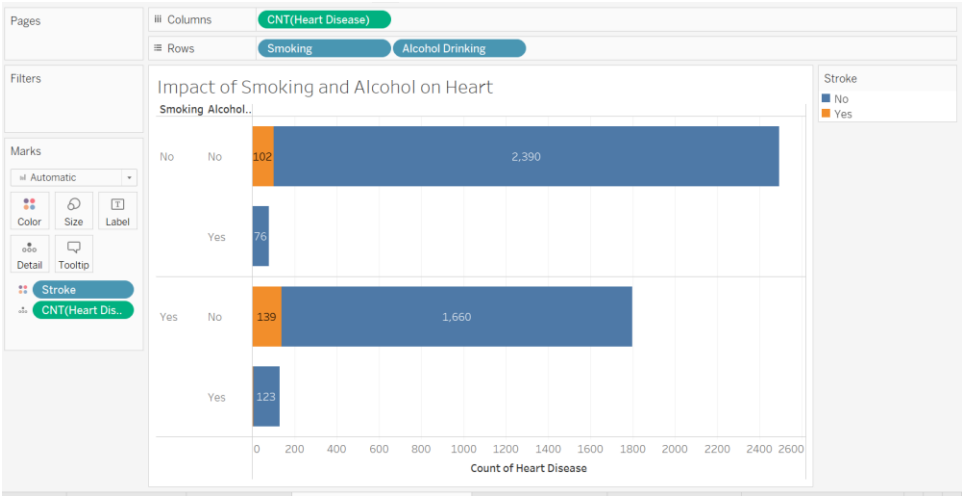
Data Visualization

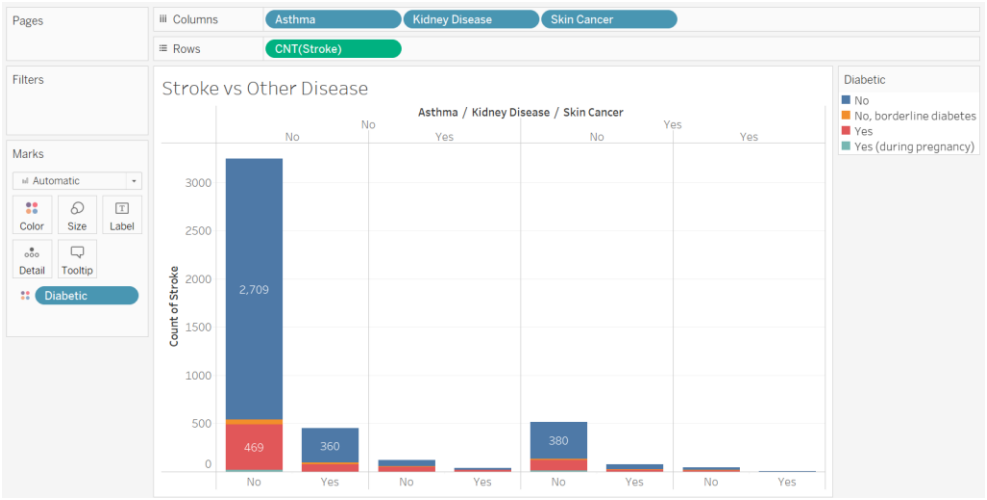
No of Unique Visualizations: There are 10 unique visualizations.

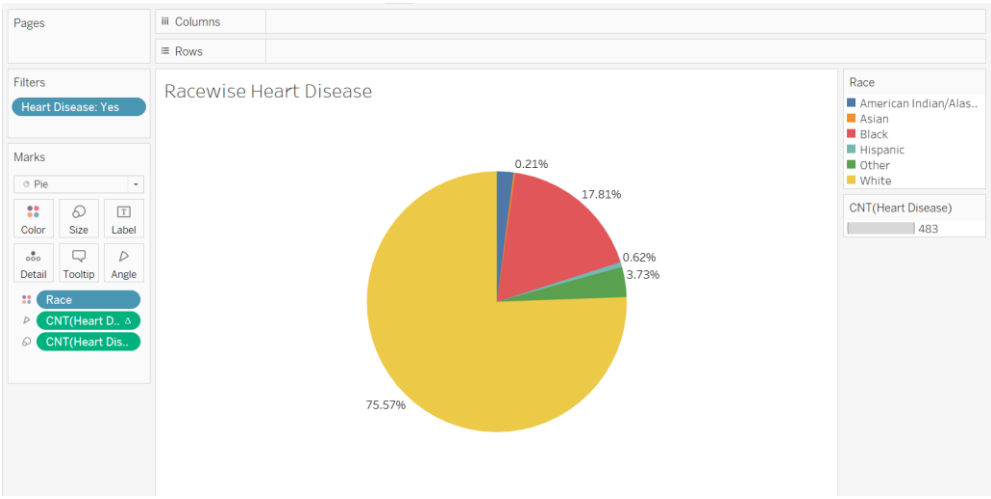


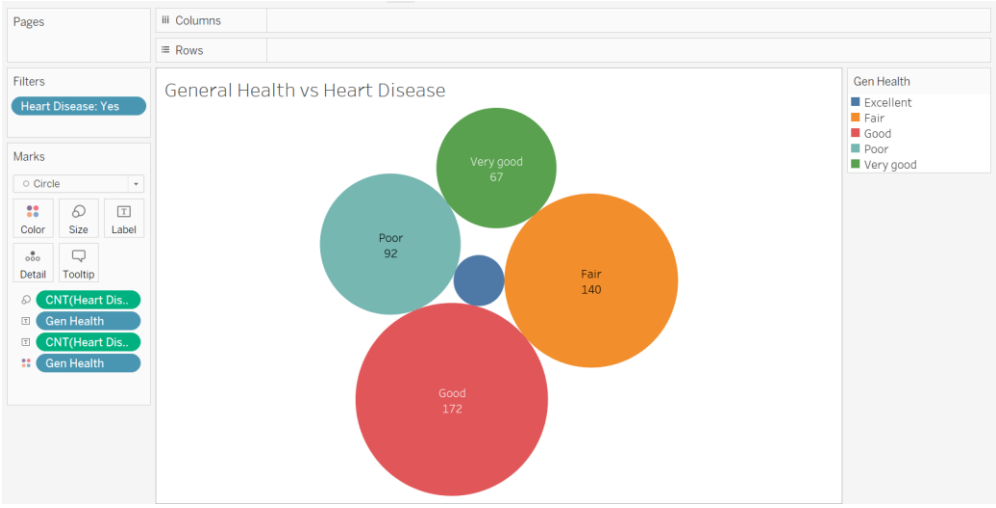

Pages
Columns
Age Category
Sex
Rows
CNT(Heart Disease)
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Heart Disease
Age vs Heart Disease
Age Category / Sex
18-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or ol..
Count of Heart Disease
300
250
200
150
100
50
0
Female
Male
Heart Disease
No
Yes

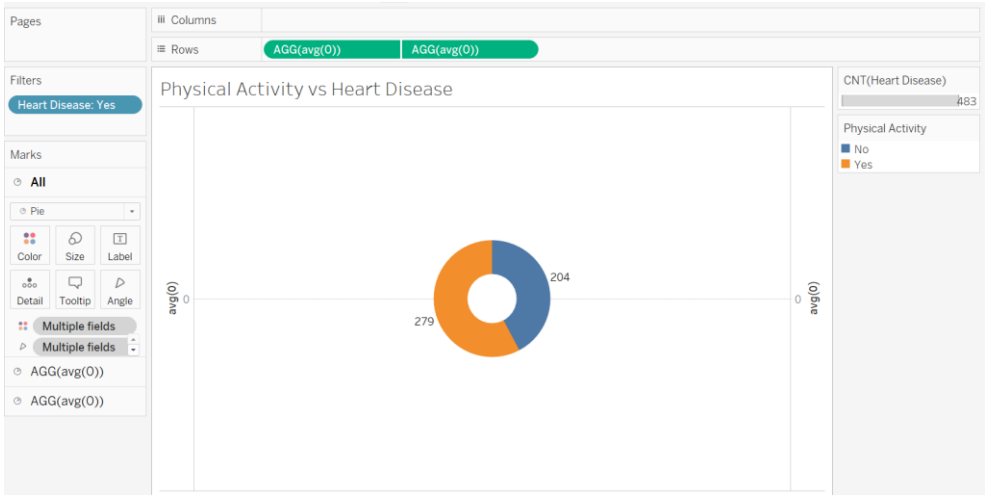

Pages
Columns
Heart Disease
Diabetic
Rows
CNT(Stroke)
Filters
Marks
Shape
Color
Size
Label
Detail
Tooltip
Shape
Diabetic
Diabetic vs Stroke
Heart Disease / Diabetic
No
Yes
Count of Stroke
3500
3000
2500
2000
1500
1000
500
0
No
No, borderlin..
Yes
Yes (during p..
Diabetic
No
No, borderline diabetes
Yes
Yes (during pregnancy)

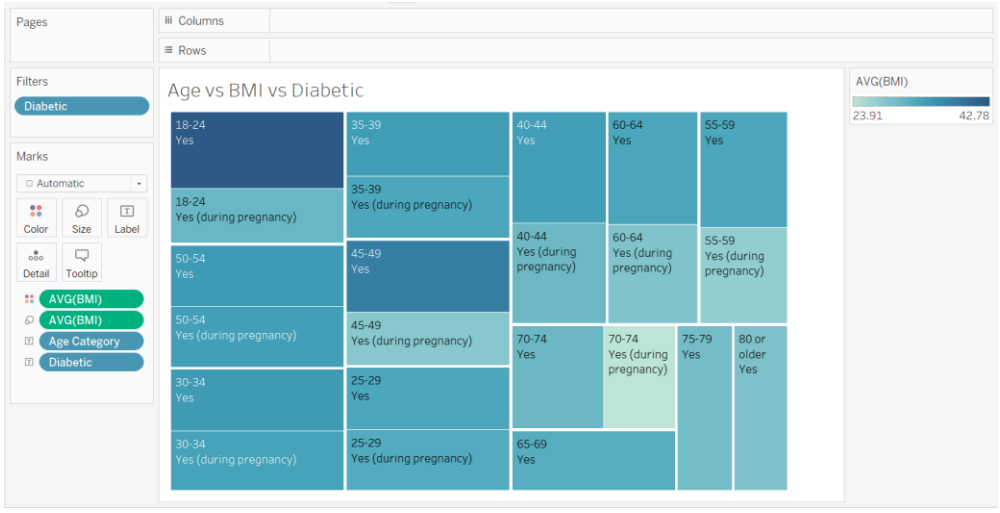

Pages
Columns
CNT(Heart Disease)
Rows
Smoking
Alcohol Drinking
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Stroke
CNT(Heart Dis..
Impact of Smoking and Alcohol on Heart
Smoking
Alcohol..
No
No
102
2,390
Yes
76
Yes
No
139
1,660
Yes
123
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Count of Heart Disease
Stroke
No
Yes

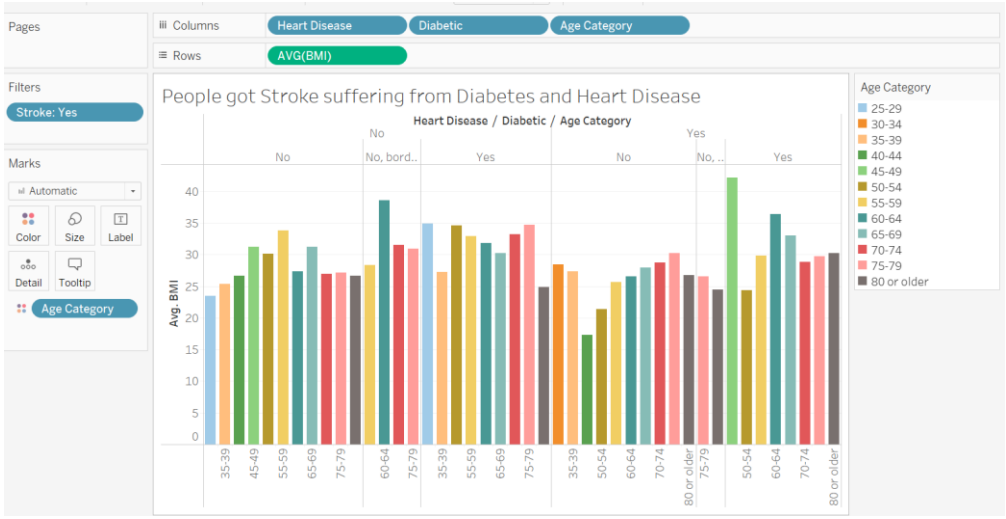

Pages
Columns
Asthma
Kidney Disease
Skin Cancer
Rows
CNT(Stroke)
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Diabetic
Stroke vs Other Disease
Asthma / Kidney Disease / Skin Cancer
No
Yes
Count of Stroke
3000
2500
2000
1500
1000
500
0
2,709
469
360
380
Diabetic
No
No, borderline diabetes
Yes
Yes (during pregnancy)


Pages
Columns
Rows
Filters
Heart Disease: Yes
Marks
Pie
Color
Size
Label
Detail
Tooltip
Angle
Race
CNT(Heart D..
CNT(Heart Dis..
Racewise Heart Disease
0.21%
17.81%
0.62%
3.73%
75.57%
Race
American Indian/Alas..
Asian
Black
Hispanic
Other
White
CNT(Heart Disease)
483


Pages
Columns
Rows
Filters
Heart Disease: Yes
Marks
Circle
Color
Size
Label
Detail
Tooltip
CNT(Heart Dis..
Gen Health
CNT(Heart Dis..
Gen Health
General Health vs Heart Disease
Very good
67
Poor
92
Fair
140
Good
172
Gen Health
Excellent
Fair
Good
Poor
Very good



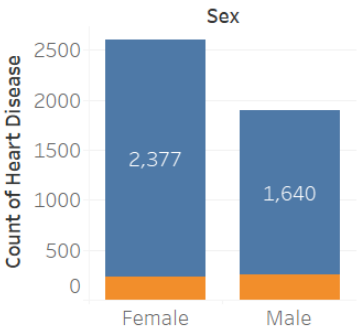




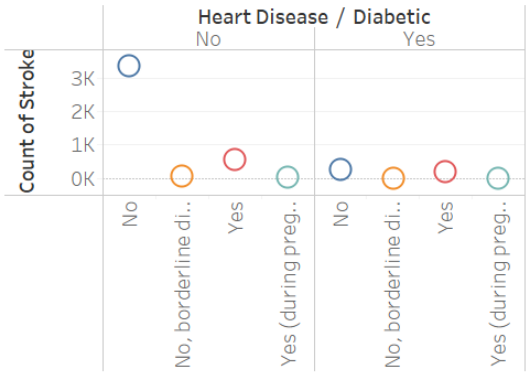
Dashboard

Responsive and Design of Dashboard:

Gender vs Heart Disease



Diabetic vs Stroke



Heart Disease
- No
- Yes

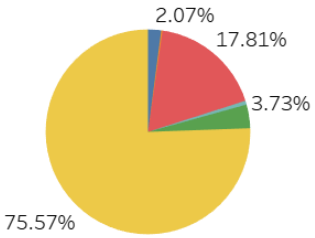
Diabetic
- No
- No, borderli..
- Yes
- Yes (during ..

Race
- American In..
- Asian
- Black
- Hispanic
- Other
- White

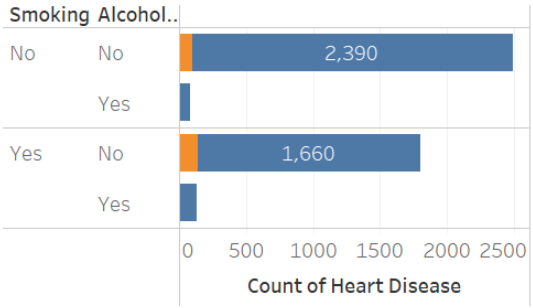
Count of Heart D..
483

Stroke
- No
- Yes

Racewise Heart Disease

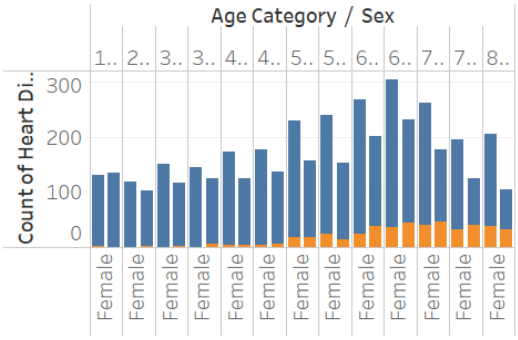


Impact of Smoking and Alcohol on Heart



Next

Age vs Heart Disease



General Health vs Heart Disease

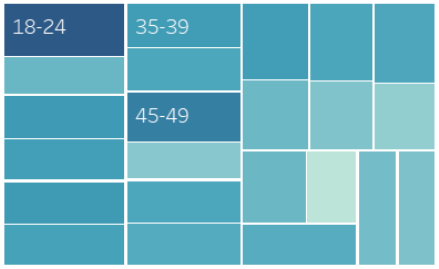
Heart Disease
- No
- Yes

Gen Health
- Excellent
- Fair
- Good
- Poor
- Very good

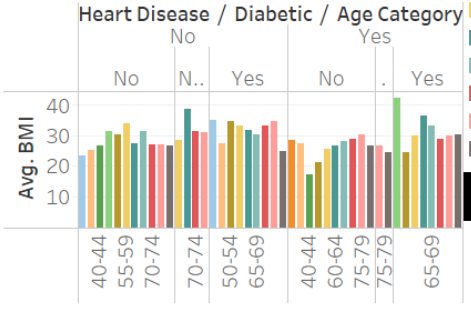
Avg. BMI
23.91 42.78

Age Category
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80 or older

Age vs BMI vs Diabetic



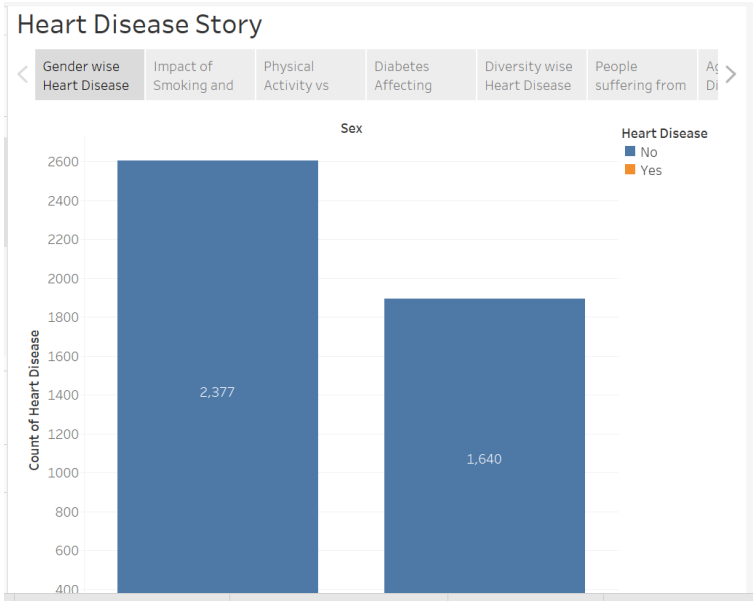
People got Stroke suffering from Diabetes and Heart Disease

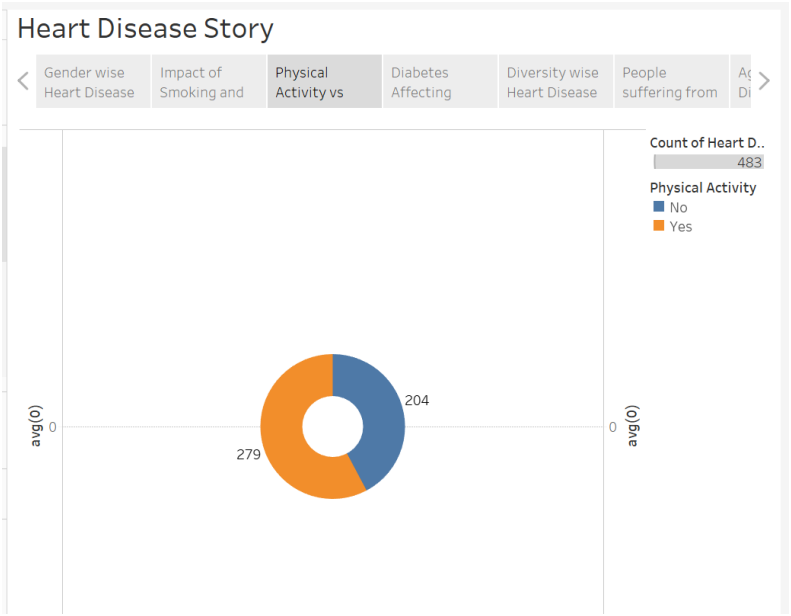


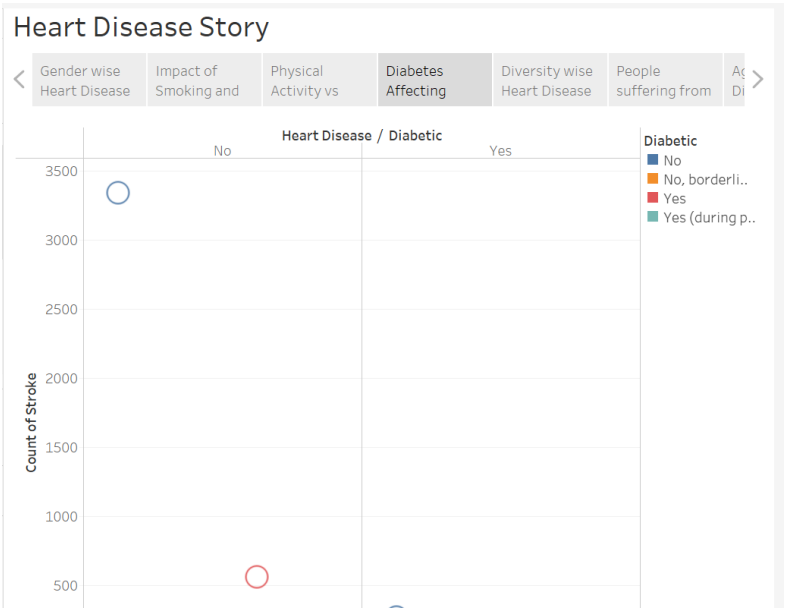
Previous

Story

No of scenes of Story: Total 8 unique scenes of story.

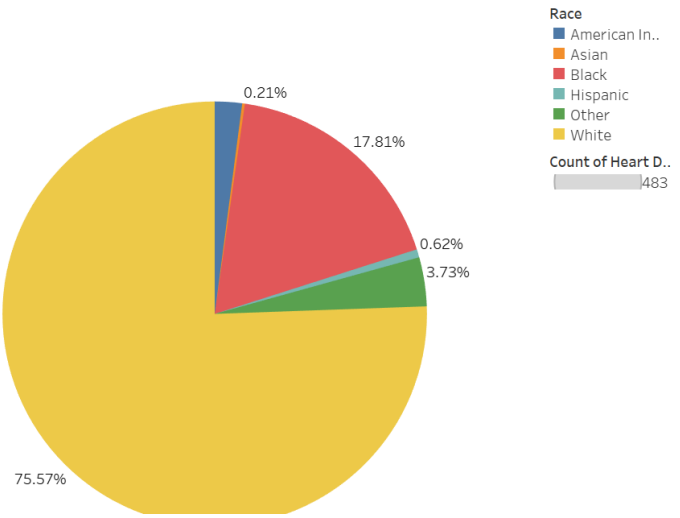



Heart Disease Story
Gender wise Heart Disease
Impact of Smoking and
Physical Activity vs
Diabetes Affecting
Diversity wise Heart Disease
People suffering from
Count of Heart D..
483
Physical Activity
No
Yes
avg(0)
0
204
279
0
avg(0)


Heart Disease Story
Gender wise Heart Disease
Impact of Smoking and
Physical Activity vs
Diabetes Affecting
Diversity wise Heart Disease
People suffering from
Heart Disease / Diabetic
No
Yes
Diabetic
No
No, borderli..
Yes
Yes (during p..
Count of Stroke
3500
3000
2500
2000
1500
1000
500

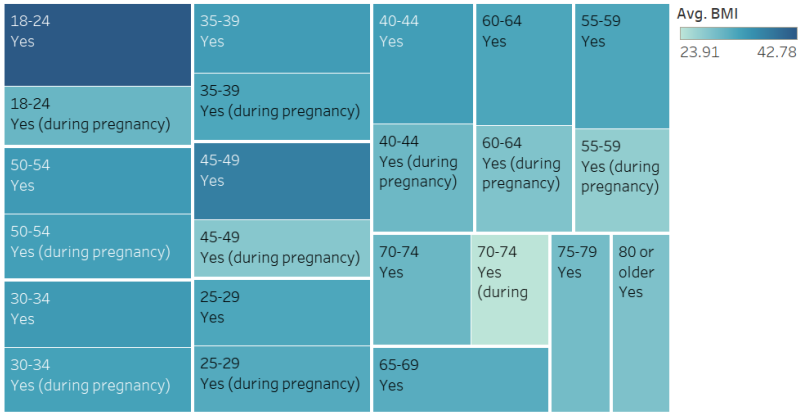
Heart Disease Story

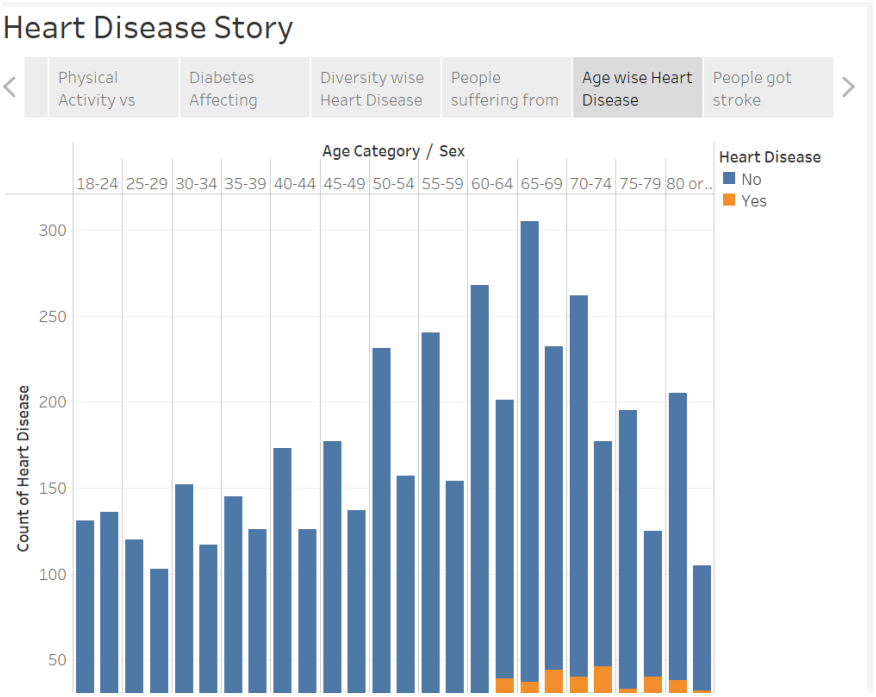
Gender wise Heart Disease | Impact of Smoking and | Physical Activity vs | Diabetes Affecting | Diversity wise Heart Disease | People suffering from | Ag Di

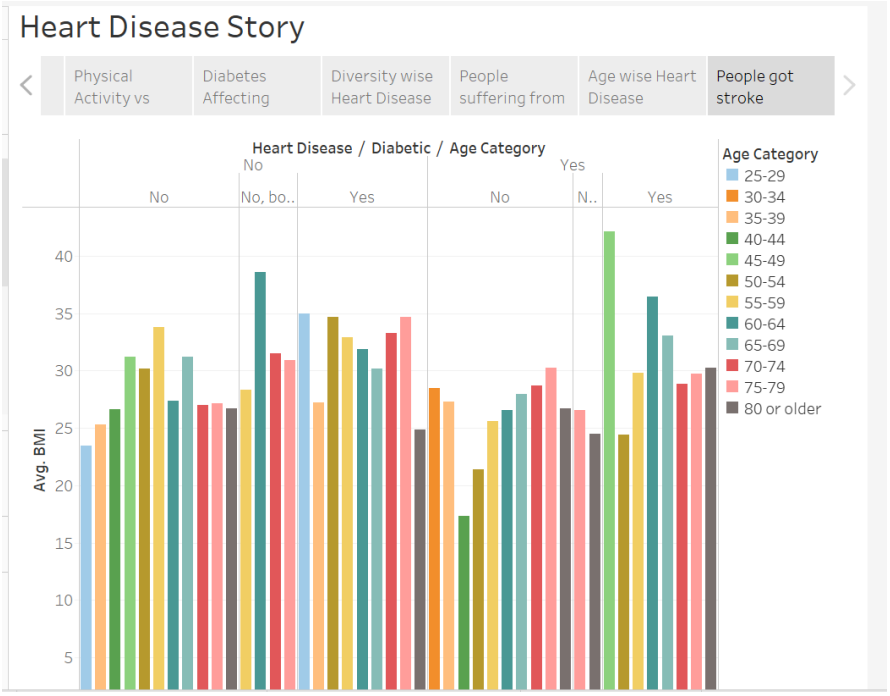


Heart Disease Story

Gender wise Heart Disease | Impact of Smoking and | Physical Activity vs | Diabetes Affecting | Diversity wise Heart Disease | People suffering from | Ag Di

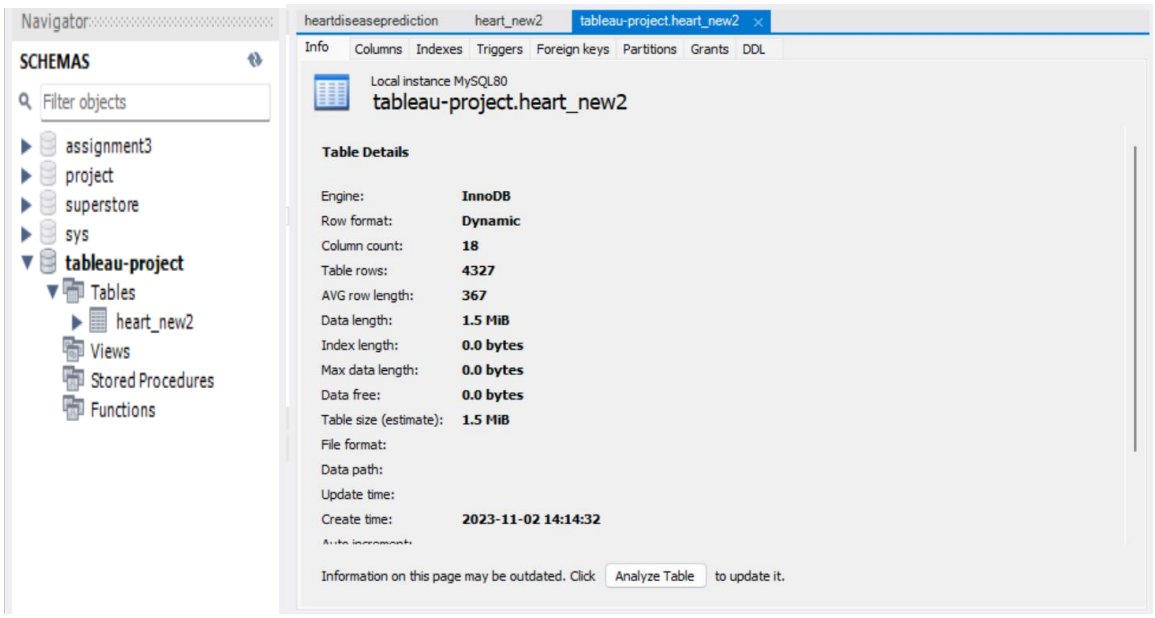




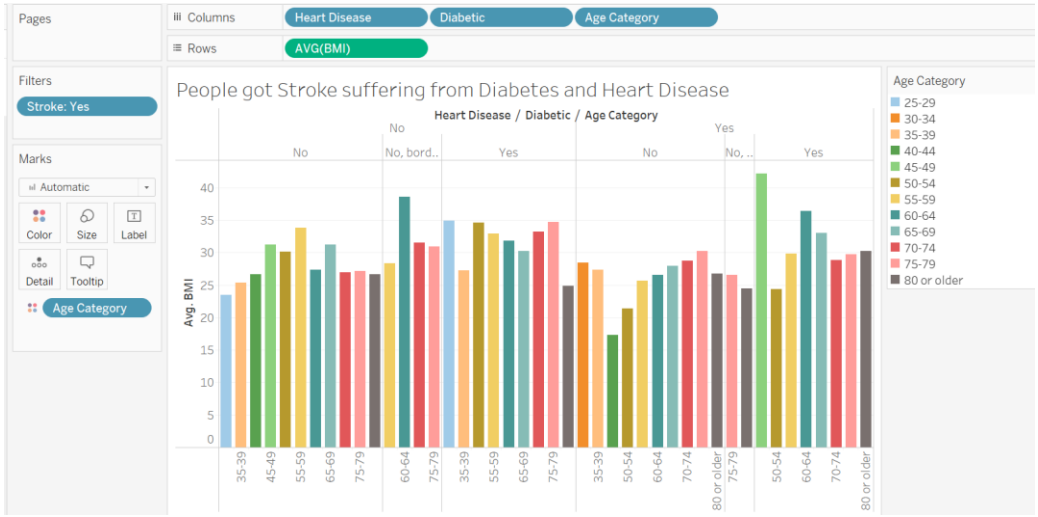


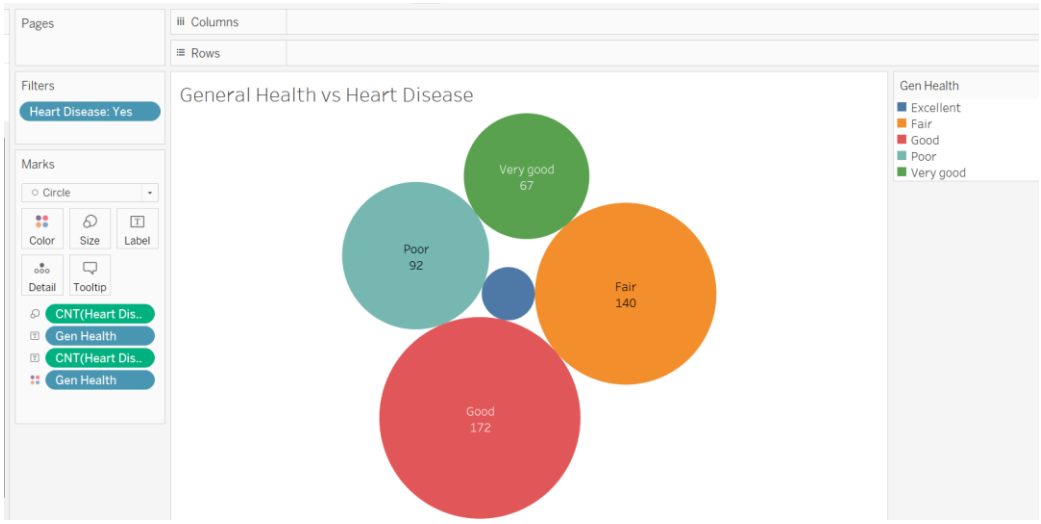
Performance Testing

Amount of Data Rendered to DB:



Utilization of Data Filters:



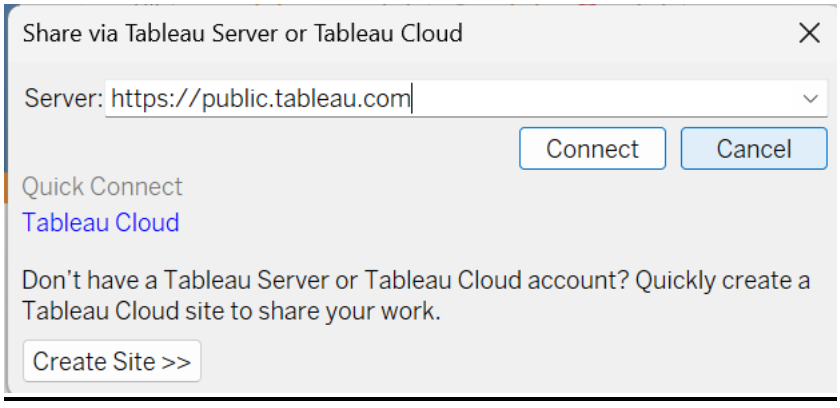


No of Calculation Fields: In this analysis we have not created any new column using calculation filed as data found in dataset was clean and sufficient for analysis.

No of Visualizations/ Graphs:

1. Gender wise Heart Disease
2. Age wise Heart Disease
3. People Suffering from Diabetic and Stroke
4. Impact of Smoking and alcohol drinking on heart disease
5. Other Diseases vs Stroke
6. Race wise Heart disease
7. General Health vs Heart Disease
8. Physical activity vs heart disease
9. Age and BMI vs Heart disease
10. People got stroke suffering from Diabetes and Heart disease

Web Integration



Embed Dashboard and Story with Flask:

Welcome

Home About Dashboard Story Contact Get Started

Heart Disease Analysis

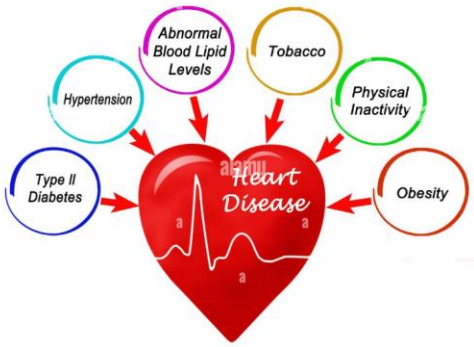
Get Started →

Import favorites | Dell | You are signed in as... | Gmail | YouTube | Maps

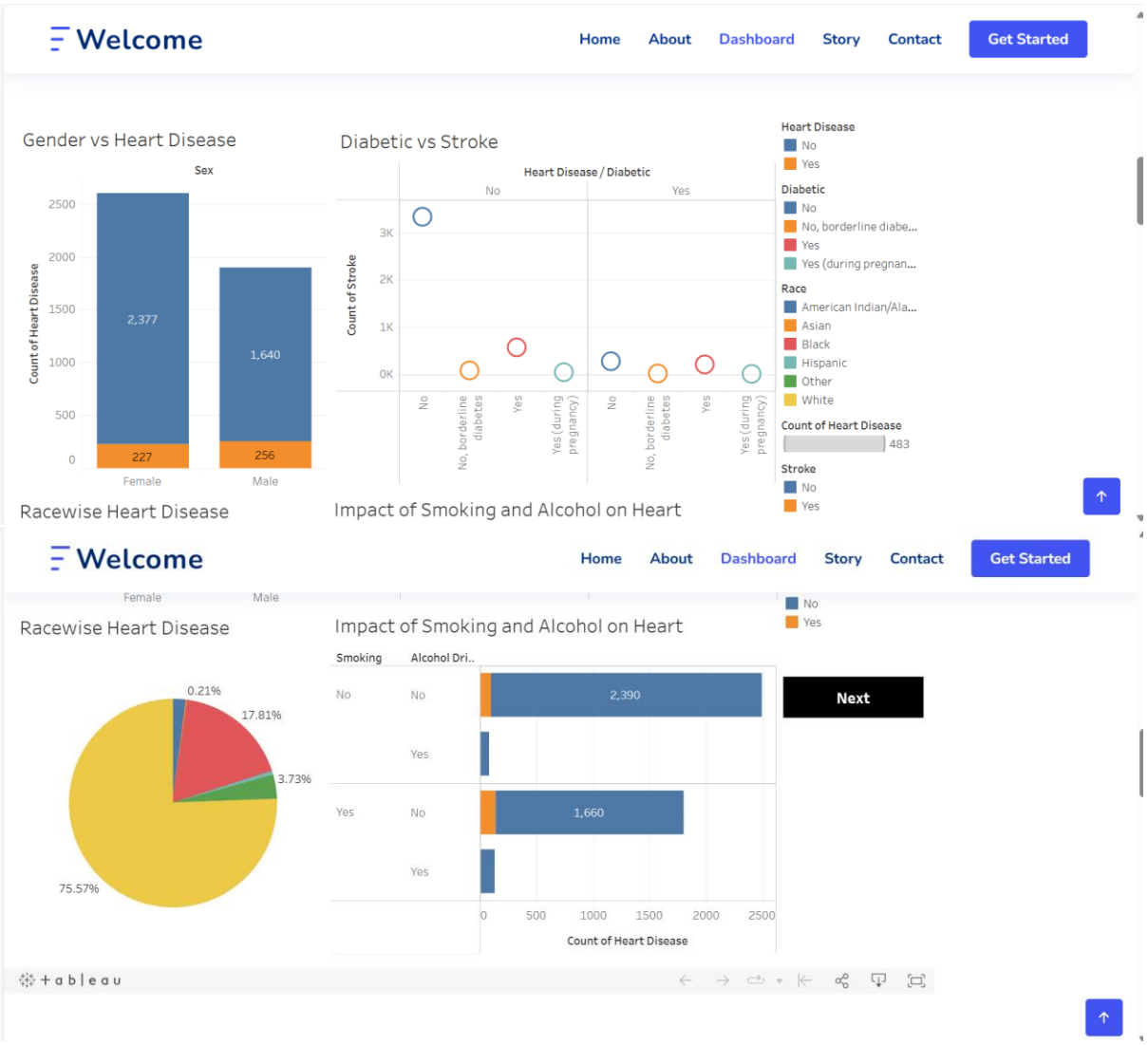
Welcome

Home About Dashboard Story Contact Get Started

Heart disease(heart disease) is a group of diseases related to cardio vascular diseases, manifested by a violation of the normal functioning of the heart. May be caused by damage to the epicardium, 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 cardio vascular disease in humans are abesity, sedentary lifestyle and smoking.



alamy
www.alamy.com


Welcome
Home
About
Dashboard
Story
Contact
Get Started
Gender vs Heart Disease
Sex
Count of Heart Disease
2,377
1,640
227
256
Female
Male
Diabetic vs Stroke
Heart Disease / Diabetic
No
Yes
Count of Stroke
No, borderline diabetes
Yes (during pregnancy)
Heart Disease
Diabetic
Race
American Indian/Ala...
Asian
Black
Hispanic
Other
White
Count of Heart Disease
483
Stroke
Racewise Heart Disease
Impact of Smoking and Alcohol on Heart

Welcome
Home
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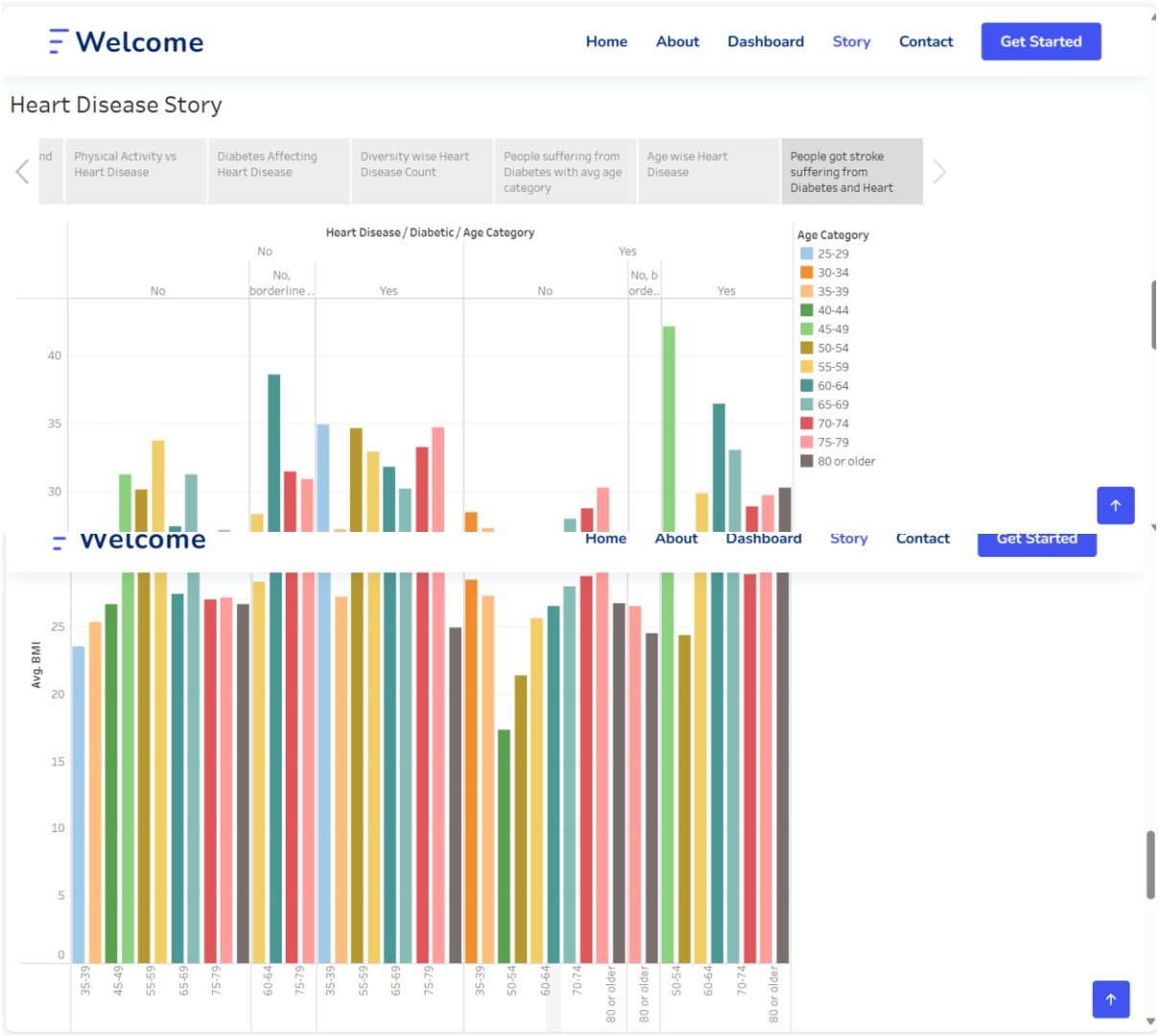
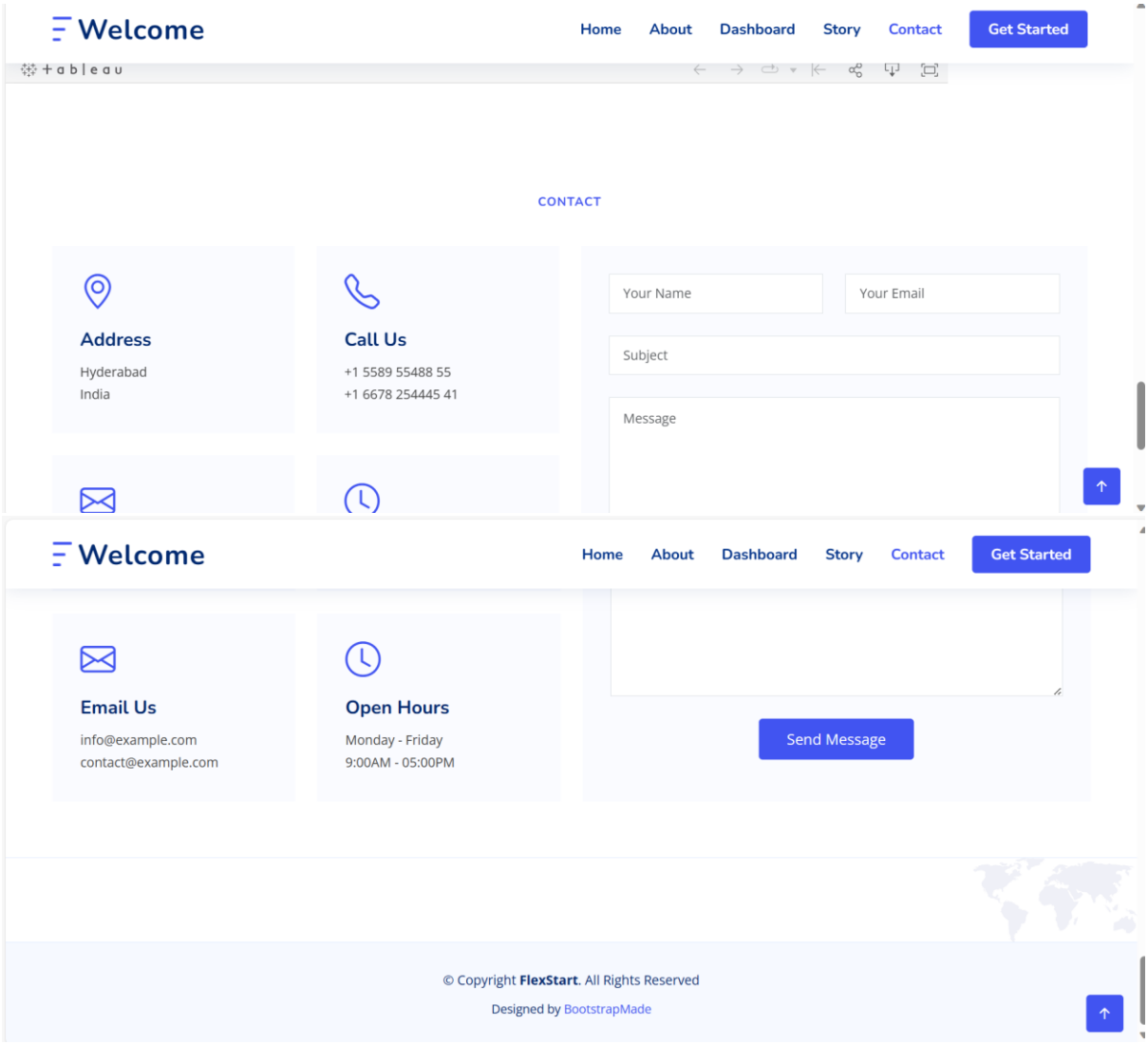
Dashboard
Story
Contact
Get Started
Racewise Heart Disease
0.21%
17.81%
3.73%
75.57%
Impact of Smoking and Alcohol on Heart
Smoking
Alcohol Dri..
2,390
1,660
Count of Heart Disease
Next
+ableau


Welcome
Home
About
Dashboard
Story
Contact
Get Started
Heart Disease Story
nd
Physical Activity vs Heart Disease
Diabetes Affecting Heart Disease
Diversity wise Heart Disease Count
People suffering from Diabetes with avg age category
Age wise Heart Disease
People got stroke suffering from Diabetes and Heart
Heart Disease / Diabetic / Age Category
No
Yes
No
No, borderline ..
Yes
No
No, b orde..
Yes
40
35
30
Age Category
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or older
Welcome
Home
About
Dashboard
Story
Contact
Get Started
Avg. BMI
25
20
15
10
5
0
35-39
45-49
55-59
65-69
75-79
60-64
75-79
35-39
55-59
65-69
75-79
35-39
50-54
60-64
70-74
80 or older
80 or older
50-54
60-64
70-74
80 or older



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