PROJECT:

Heart Diseases Visualizations Using Tableau

Category: Data Analytics

Skills Required:

Exploratory Data Analysis, MySQL, Databases, Tableau

Team leader : DUBASULA JAGADEESH

Team members : 1) Godadi Leela madhuri

2) Dupana Ramya

3)Chandaka Surya kumari

4)Gandham Jagadish Reddy

Project Description:

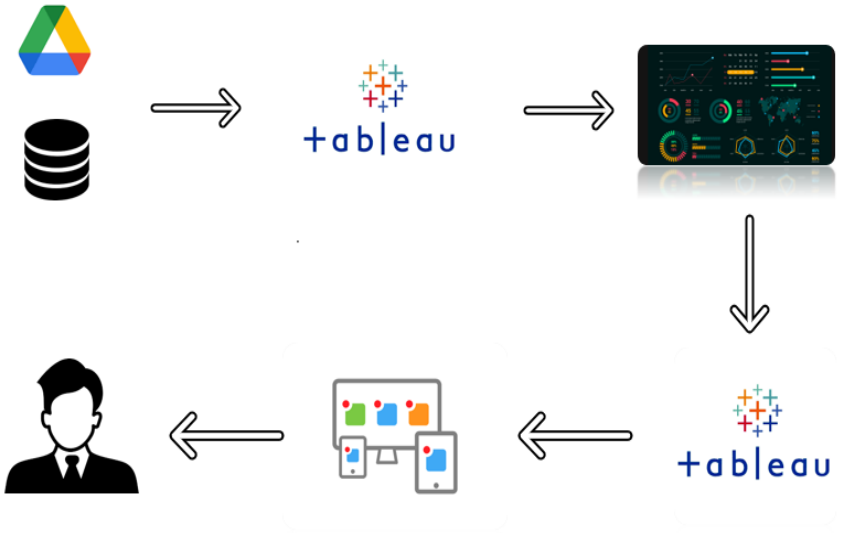
Heart Disease Analysis

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 analysis the Heart disease related data and 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.

Technical Architecture:



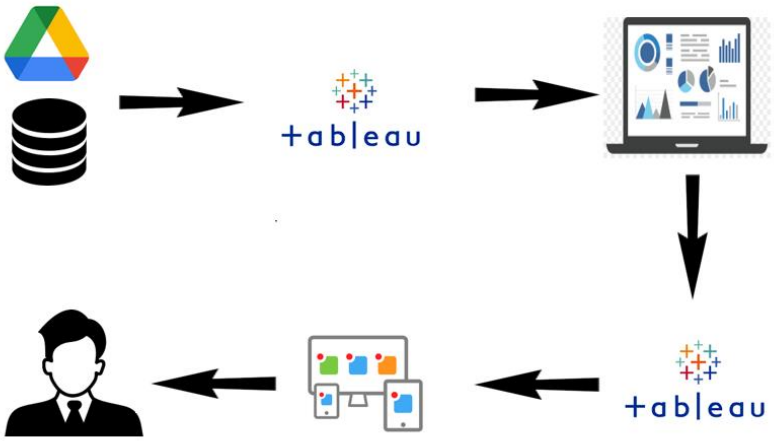
Project Flow

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

Technical Architecture:



Pre-Requisites

For Completing this project these are some of the prerequisites needed

- A system with a minimum 4GB RAM and 128GB Hard Disk
- Good Internet Connection
- Google Drive / Any of the Database Server with Management Studio
- MySQL:

- **SQL Server Management Studio:**
- **Tableau Desktop:**
- Tableau Public Account: https://public.tableau.com/app/discover
- Html, CSS or Bootstrap

Prior-Knowledge

To Complete this project, one must understand the below concepts and able to work with the tools

- **Data Visualization:**
- **Univariate, Bi- Variate and Multi-Variate Analysis**
- **Chart Types:**
- **Tableau:**
- **Business Intelligence**:

Project Objectives

By the end of this project, you will:

- Able to Connect Tableau with different data sources
- Know fundamental concepts and techniques used for Data Visualization.

- Gain a broad understanding about data and different types of charts.
- Have knowledge of developing Visualizations, Dashboards and Story.
- Able to Integrate the developed dashboard and story with the web application

Project Flow

- Users can create multiple analysis graphs/charts.
- Using the analysed chart creation of Dashboard is done.
- Saving and Visualizing the final dashboard in the personal Tableau public profile.
- To accomplish this, we have to complete all the activities and tasks listed below
- Working with the Dataset
- Understand the Dataset
- Loading the Dataset
- Visualizations of Suicides in India (2001-2012)
- Problem Statement 1: Why Are Suicides Happening?
- Problem Statement 2: Suicides Per Year (Forecasting)
- Problem Statement 3: Classification on basis of age group
- Problem Statement 4: State-wise suicide counts for different reasons

Data Collection

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, and evaluate outcomes and generate insights from the data.

LINK:
https://drive.google.com/file/d/190Qmq27LeZZ_nWricP3Obl7ys_5otEsp/view?usp=sharing

Working With Dataset

Understand The Data

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.

Loading The Dataset

Before you can build a view and analyze your data, you must first connect Tableau to your data. Tableau supports connecting to a wide variety of data, stored in a variety of places.

The data might be stored on your computer in a spreadsheet or a text file, or in a big data, relational, or cube (multidimensional) database on a server in your enterprise.

In our case, we will be using a spreadsheet or text file for making our analysis. Watch the video for understanding the connection of the dataset in Tableau.

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.

Visualizations Of Suicides In India (2001-2012)

Using the Suicides in India 2001-2012 dataset, we plan to create a dashboard showing the facts about suicides which we're not able to understand by just the numbers. These visualisations help us to get a better understanding of the data in a single look, as well as, is easily understandable to a layman.

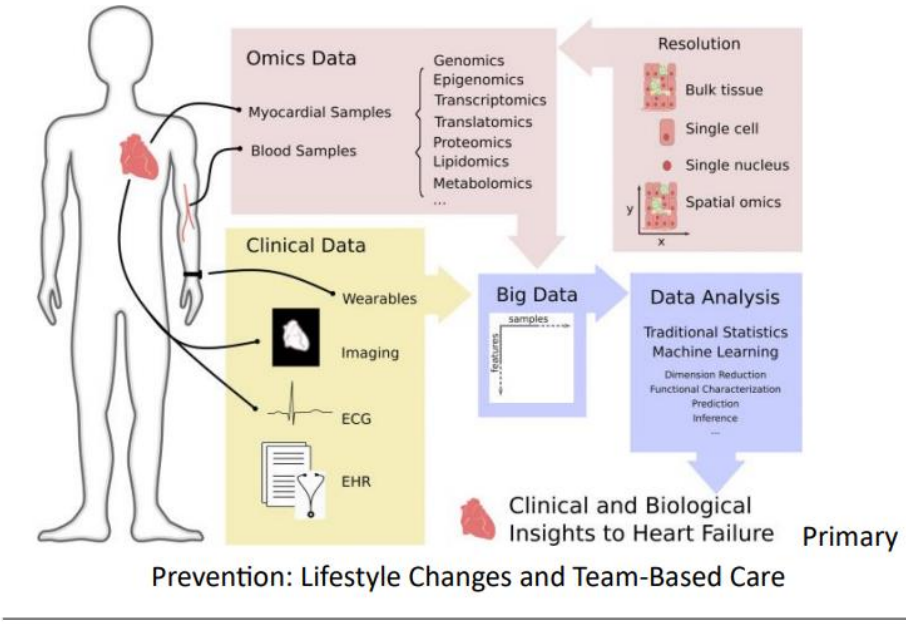
Reasons Behind Suicides Happening In India (2001 - 2012)

For visualizing the above, we will require the following data

- Type_Code

- Total
- Gender

-



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From this data, we will be plotting a “Side by Side Bars” to see the comparison b/w males and females as well as the plot the total no of suicides (all years combined) vs reason of suicide.

Refer to the video below to create the visualization for the above statement.

Age Group Wise Classification

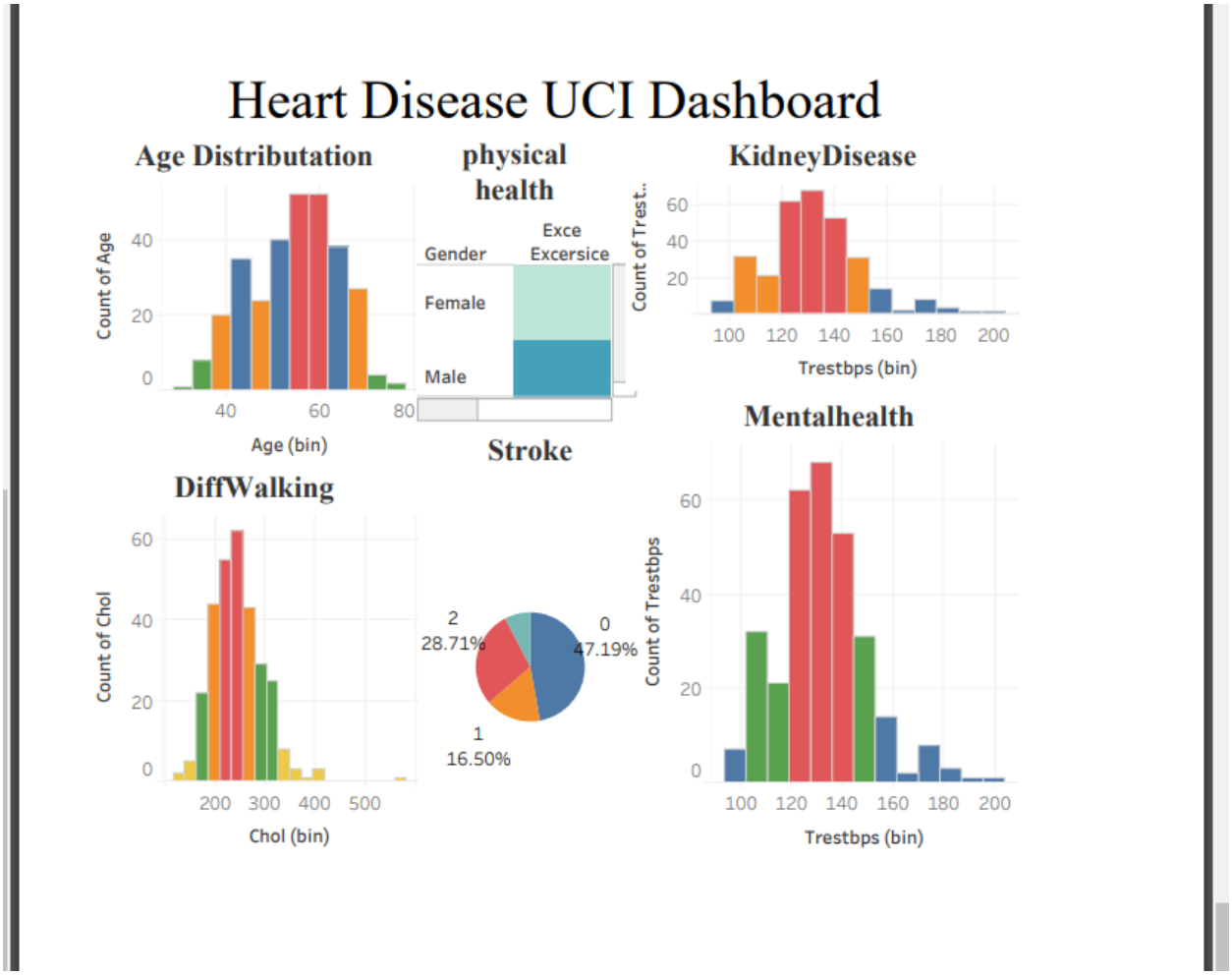
In this milestone, we will analyze age-wise suicide analysis


1 in 4 deaths in India occurs due to heart disease, but you can prevent it with a proper lifestyle & heart-healthy diet.

have the correct age group values, so they were given a trivial value [0-100+], so we had to remove that column due to which the data got a little biased, but it was still good enough for our visualisation. Problems like these are very common and a data visualization is considered good only if they are plotted to keep these problems in mind and to avoid such things. The visualisation answers the question, which age groups need more mentoring and taken care of so as to decrease the majority of cases.

Dashboard

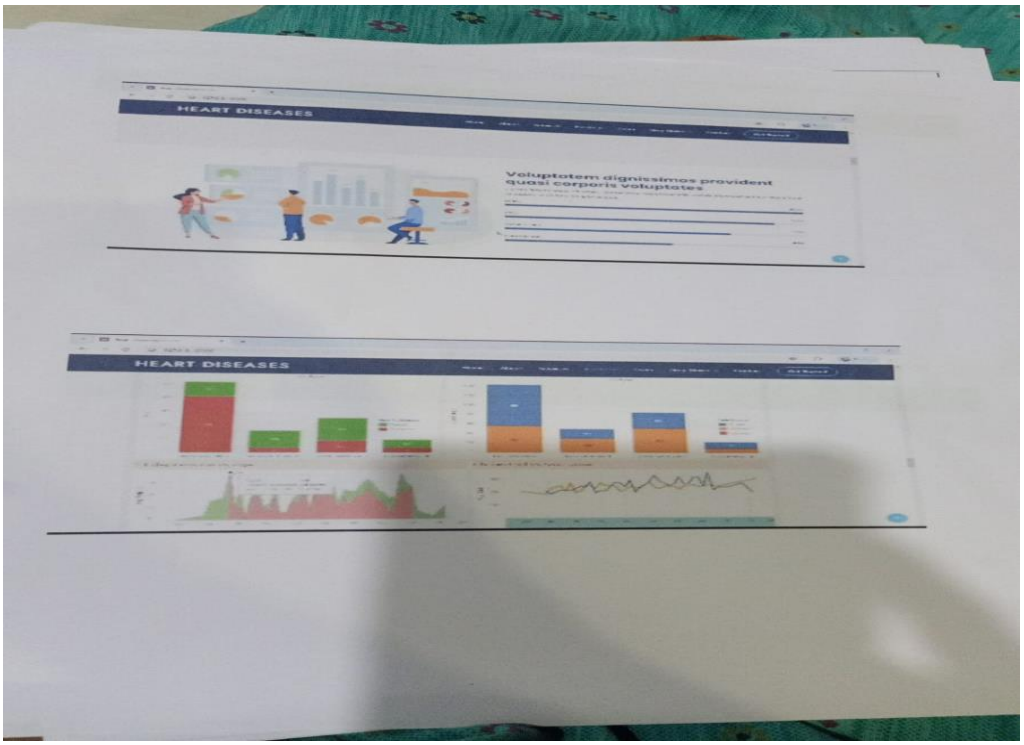
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of 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.



Story

A data story is a way of presenting data and analysis in a narrative format, with the goal of making 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 in a logical and systematic

way, 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.

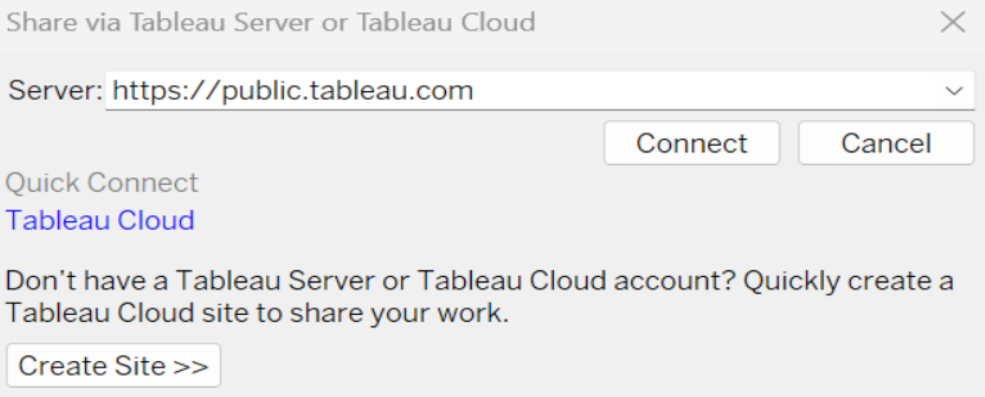


Publishing And Web Integration

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

Publishing Dashboard and Reports To Tableau Public

Step 1: Go to Dashboard/story, click on the share button on the top ribbon

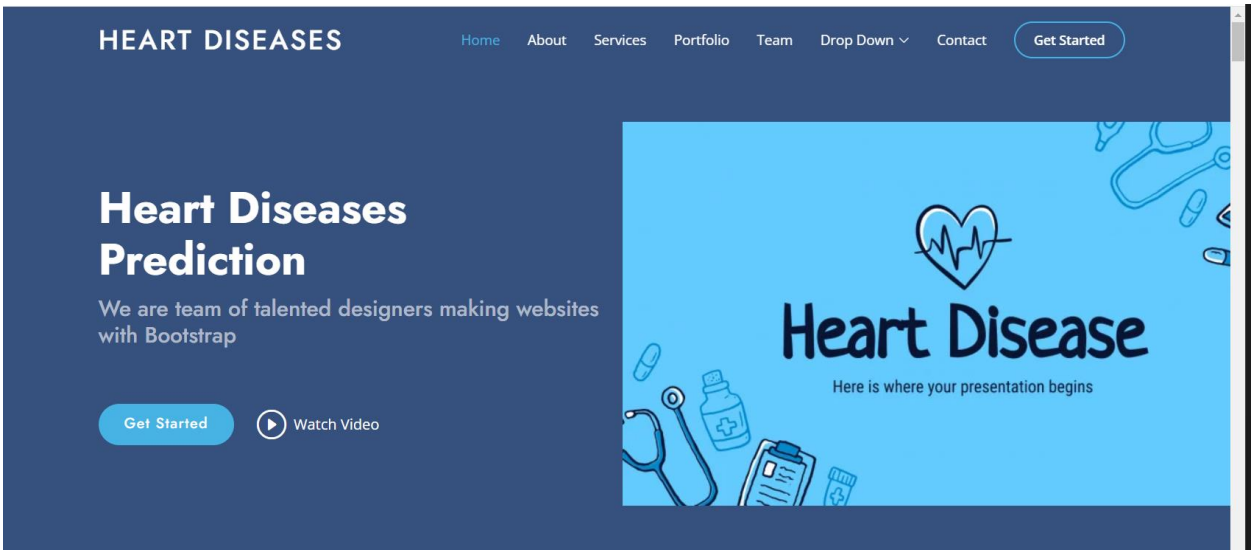


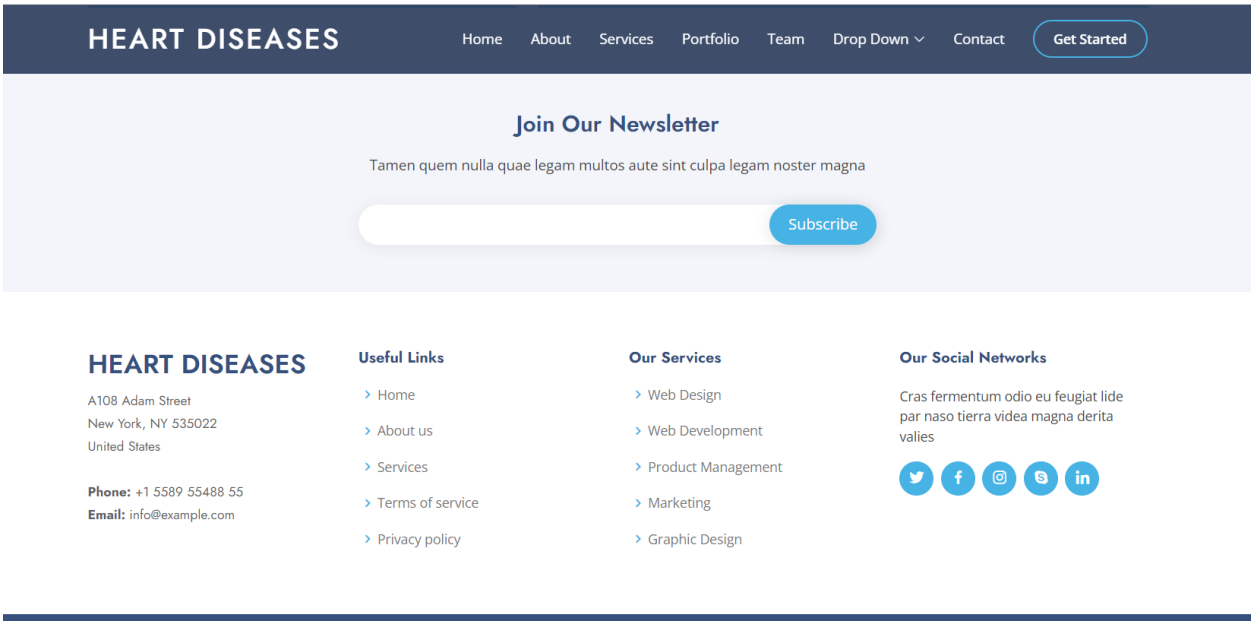
Step 2: Once you click on connect it will ask you for the tableau public username and password

Once you login into your tableau public using the credentials, the particular visualization will be published into the tableau public

Note: While publishing the visualization to the public, the respective sheet will get published when you click on the share option.

Integrating In Web With Embedded Code





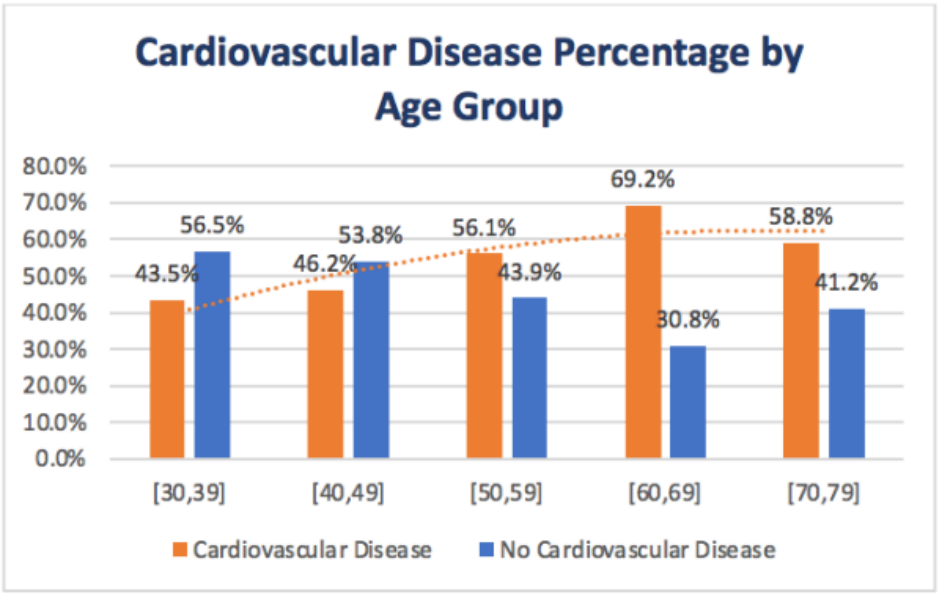
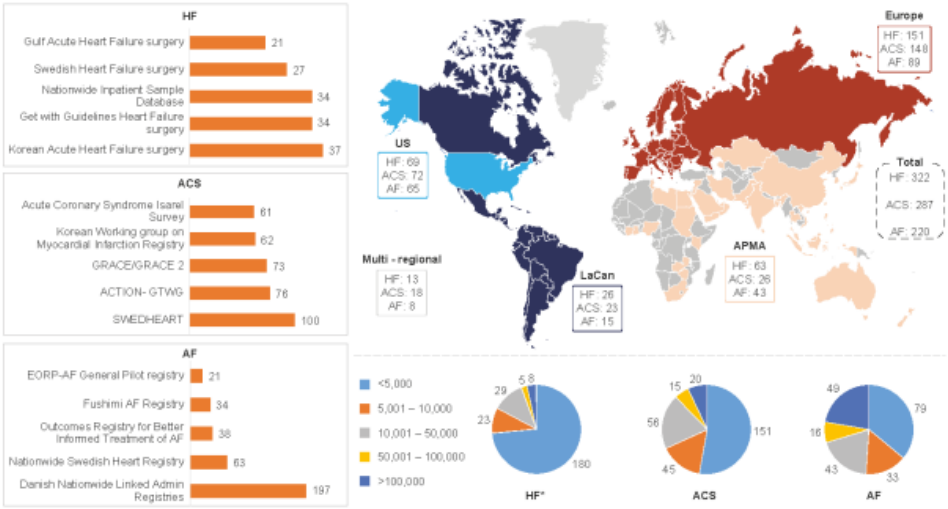

Cardiovascular Disease Percentage by Age Group
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
43.5%
56.5%
46.2%
53.8%
56.1%
43.9%
69.2%
30.8%
58.8%
41.2%
[30,39]
[40,49]
[50,59]
[60,69]
[70,79]
Cardiovascular Disease
No Cardiovascular Disease

Figure 3


HF
Gulf Acute Heart Failure surgery 21
Swedish Heart Failure surgery 27
Nationwide Inpatient Sample Database 34
Get with Guidelines Heart Failure surgery 34
Korean Acute Heart Failure surgery 37
ACS
Acute Coronary Syndrome Israel Survey 61
Korean Working group on Myocardial Infarction Registry 62
GRACE/GRACE 2 73
ACTION- GTWG 76
SWEDHEART 100
AF
EORP-AF General Pilot registry 21
Fushimi AF Registry 34
Outcomes Registry for Better Informed Treatment of AF 38
Nationwide Swedish Heart Registry 63
Danish Nationwide Linked Admin Registries 197
Europe
HF: 151
ACS: 148
AF: 89
US
HF: 69
ACS: 72
AF: 65
Total
HF: 322
ACS: 287
AF: 220
APMA
HF: 63
ACS: 26
AF: 43
Multi - regional
HF: 13
ACS: 18
AF: 8
LaCan
HF: 26
ACS: 23
AF: 15
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5,001 – 10,000
10,001 – 50,000
50,001 – 100,000
>100,000
29
5.8
23
180
HF*
15
20
56
151
45
ACS
49
79
16
43
33
AF