HEART FAILURE HEALTHCARE DASHBOARD: TABLEAU”

PROJECT REPORT

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INTRODUCTION

Heart failure is a serious chronic condition where the heart muscle is unable to pump blood effectively, leading to insufficient oxygen supply to the body's organs. This condition can develop due to various underlying health issues, including coronary artery disease, high blood pressure, and previous heart attacks. Heart failure often results in symptoms such as fatigue, shortness of breath, and fluid retention.

The growing prevalence of heart failure globally underscores the importance of early diagnosis and effective management. Early intervention can significantly improve patient outcomes, reduce hospital readmissions, and enhance the quality of life for affected individuals. However, heart failure remains a leading cause of morbidity and mortality worldwide, emphasizing the need for continuous research and data analysis.

This project aims to develop a Tableau dashboard to analyze heart failure data, helping medical professionals and researchers understand key factors influencing patient survival. The topic was chosen due to the increasing global burden of heart disease and the need for data-driven insights to improve patient care and early intervention strategies.

ABSTRACT

This project presents a comprehensive Tableau dashboard designed to visualize heart failure patient data. The dashboard includes key metrics such as survival status based on age, sex, diabetes, smoking, and other clinical parameters. The primary goal is to identify patterns and correlations that may aid healthcare professionals in better understanding heart failure risk factors and improving patient outcomes.

The analysis uses a dataset containing key attributes of Heart Failure. The **dependent variable** in this study is the **Death Event**, while the **independent variables** include key metrics of heart failures.

OBJECTIVE

The objective of this analysis is to:

- Identify patterns and correlations between **clinical factors** and **patient survival**.
- Visualize data for better decision-making and understanding of heart failure.
- Develop a user-friendly Tableau dashboard to facilitate real-time analysis for medical research.

DATA ANALYSIS

I. PROCEDURE

- **Data Import:** The dataset was imported as a CSV file into Tableau.
- **Data Transformation:**
  - Data types were adjusted where necessary.
  - Missing values were handled appropriately.
- **Dashboard Creation:**
  - Various charts were created including pie charts, histograms, and scatter plots.
  - Filters for sex and death events were added for interactive exploration.
  - Calculated fields were used to derive survival rates and ratios.

II. ABOUT DATASET

This Dataset is collected from **Kaggle.** The dataset contains information on heart failure patients with attributes such as age, gender, clinical measurements, and survival status. Below is a brief description of the columns present in datasets:

- **Age:** Patient age
- **Sex:** Gender of the patient
- **Creatinine Phosphokinase**: Level of enzyme in the blood

- **Ejection Fraction:** Percentage of blood leaving the heart per beat
- **Serum Creatinine:** Blood creatinine level
- **Serum Sodium:** Sodium level in the blood
- **Diabetes, Anaemia, Smoking:** Health conditions as binary indicators
- **Death Event:** Survival status

III. METHODOLOGY

- **Tools Used:** Tableau Desktop
- **Process:**
  - Importing data
  - Creating calculated fields for ratios and binary outcomes
  - Applying filters and slicers
  - Designing interactive visualizations (pie charts, histograms, box plots)

IV. DATA INTERPRETATION

The analysis focuses on identifying the relationship between the **dependent variable** and **several independent variables**.

- **Dependent Variable:** Survival Status (Death Event)
- **Independent Variables:** Age, Sex, Anaemia, Diabetes, Smoking, Serum Sodium, Ejection Fraction, etc.

V. DATA VIZUALIZATION

(Source: Tableau)

Key Performance Indicators (KPIs):

- Total Individuals
- Total Deaths
- Total Males
- Total Females
- Average age

Slicers:

- Sex
- Death Event

PROJECT INSIGHTS

- Total Individuals are **299** where **64.8%** are males and **35.1%** are females.
- The average age of individuals who suffer from heart failure is **60 years**.
- Patients with lower ejection fraction tend to have higher mortality rates.
- Males show a slightly higher death rate compared to females.
- Diabetes and smoking status influence survival rates moderately.
- Age is a significant factor, with older patients showing a higher risk of death.

SUGGESTION

- Implement targeted awareness campaigns focusing on older adults and males who are at higher risk.
- Encourage regular health screenings for early detection, especially for individuals with diabetes and a history of smoking.
- Promote lifestyle modifications, including smoking cessation programs and dietary improvements.
- Provide enhanced monitoring and early intervention for patients with low ejection fraction.
- Expand the dataset for further research and validation of findings.
- Incorporate predictive models using machine learning for improved risk stratification.

CONCLUSION

The Heart Failure Dashboard developed in Tableau has successfully provided a comprehensive analysis of heart failure patient data. By integrating key clinical variables such as age, sex, diabetes, smoking habits, and critical health measurements, the dashboard helps visualize survival patterns effectively. The insights derived from this project highlight the importance of early diagnosis and risk factor management in reducing mortality rates among heart failure patients. The project underscores how data visualization can play a crucial role in healthcare decision-making, offering a foundation for preventive strategies and more personalized treatment plans. The results from this dashboard can contribute to improving healthcare outcomes, emphasizing the value of continuous research and data-driven decision-making in heart failure management.

DATASET LINK