Executive Report

Patient and Service Utilization Analysis

Overview

This project aims to analyze hospital data to uncover insights on patient conditions, spending patterns, and demographics. The focus is on identifying how medical conditions impact spending, the relationship between age and conditions, and the average treatment costs for specific conditions.
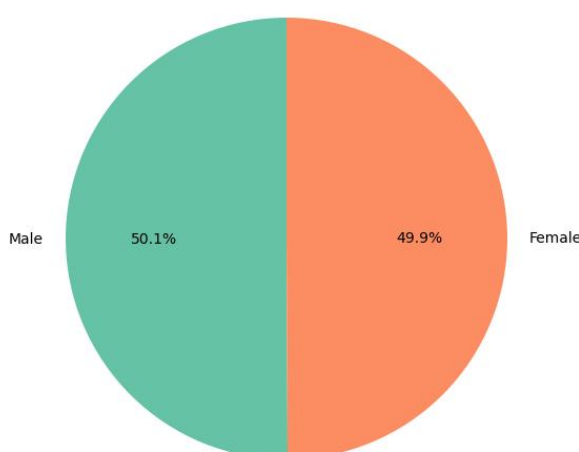
Problem

The hospital data includes patient details, medical conditions, and treatment costs. The challenge is to identify patterns, such as the link between medical conditions and spending, age-related trends, and cost variations across conditions. The goal is to extract insights to optimize services, reduce costs, and enhance patient care.
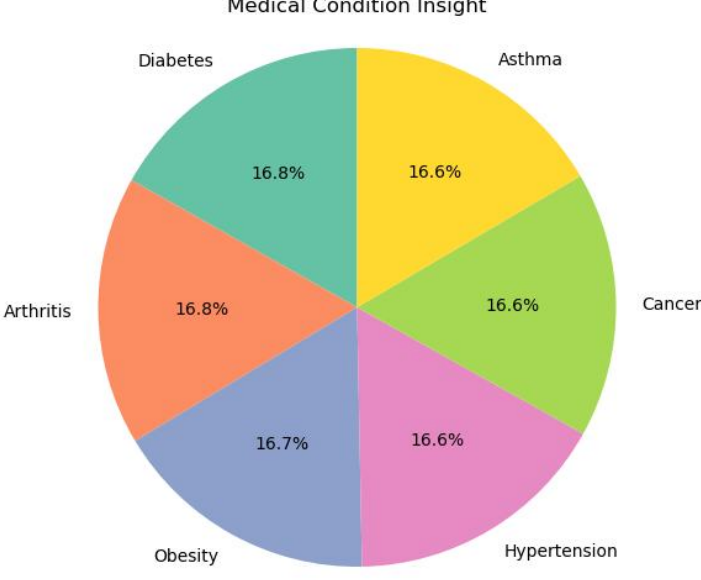
Solution

The solution involves cleaning and analyzing the hospital data to identify key patterns and trends. By developing new features and conducting exploratory analysis, the project aims to uncover insights into spending, medical conditions, and demographics. The findings will be summarized in a concise report with actionable recommendations for improving hospital services and reducing costs.

Gender Ratio

The data reveals a near-equal distribution of male and female patients, indicating a balanced representation of both genders in the hospital records. This suggests that the hospital's patient population is fairly diverse in terms of gender, which may be useful for understanding healthcare trends, treatment patterns, and potential gender-specific medical needs. Such a balanced dataset allows for comprehensive analysis without gender bias, ensuring that any observed patterns or insights are representative of the broader patient demographic.
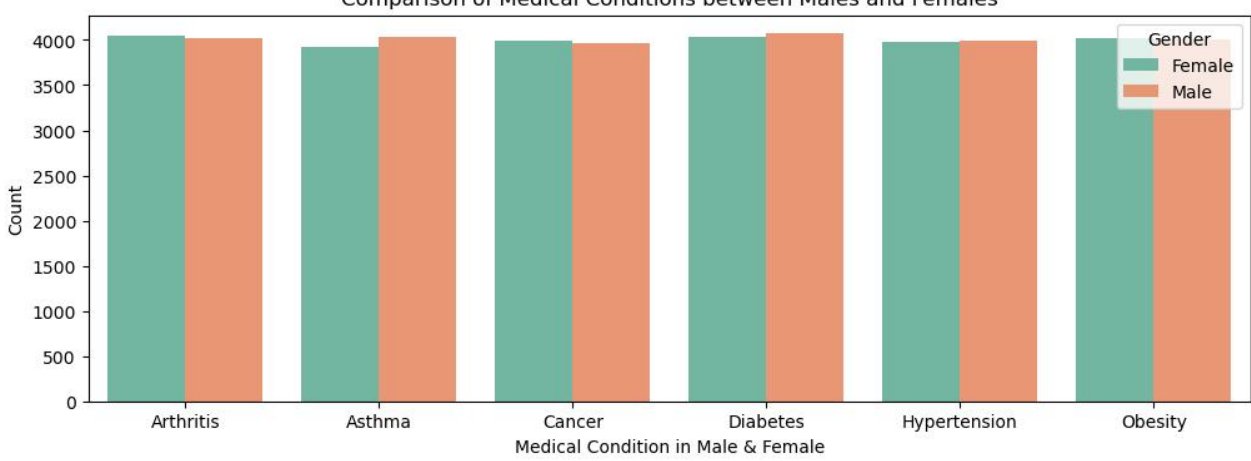

Male & Female Ratio (Percentage)

Medical Conditions
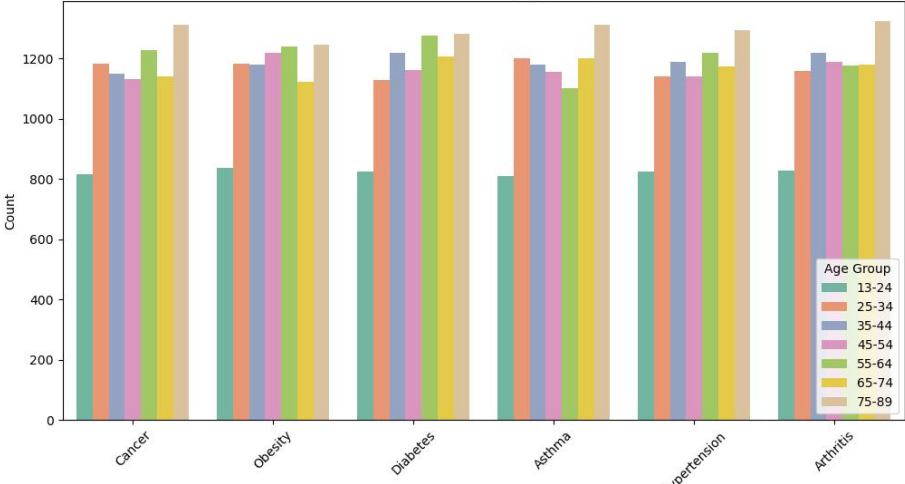

Medical Condition Insight

The data reveals the most prevalent medical conditions, with Diabetes (8,097 cases), Arthritis (8,068 cases), and Obesity (8,025 cases) leading. These chronic conditions, along with Hypertension (7,982 cases), Cancer (7,961 cases), and Asthma (7,960 cases), contribute significantly to healthcare costs and treatment complexity. The high prevalence of chronic conditions highlights the need for focused care, resource planning, and cost management strategies. Identifying these patterns helps in addressing healthcare demands and optimizing patient care.

Medical Condition Gender Wise

Comparison of Medical Conditions between Males and Females
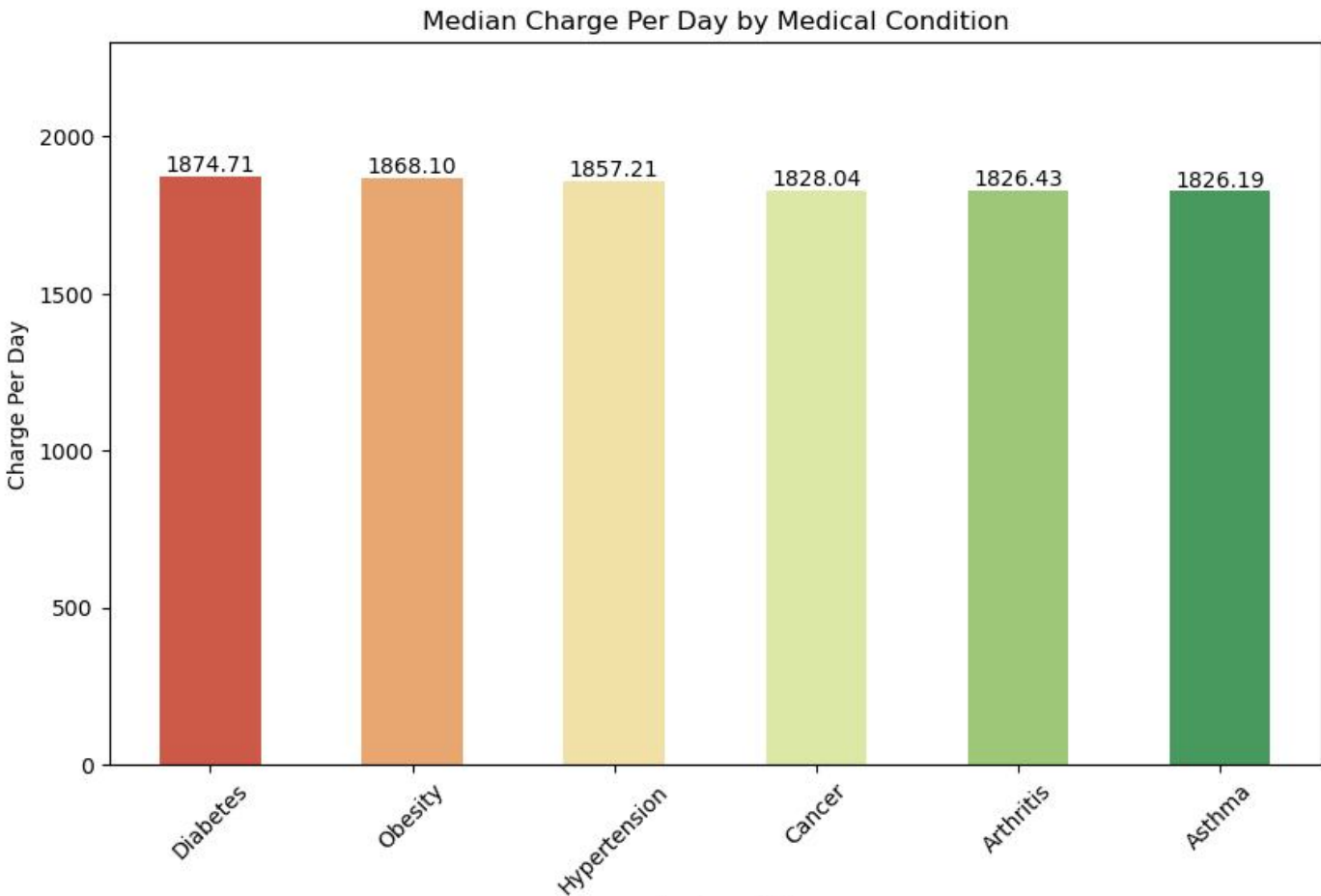
Age Vulnerability

Patients aged 75-89 are more likely to develop Cancer, Asthma, Hypertension, and Arthritis. Obesity and Diabetes are more common in the 55-64 and 75-89 age groups.
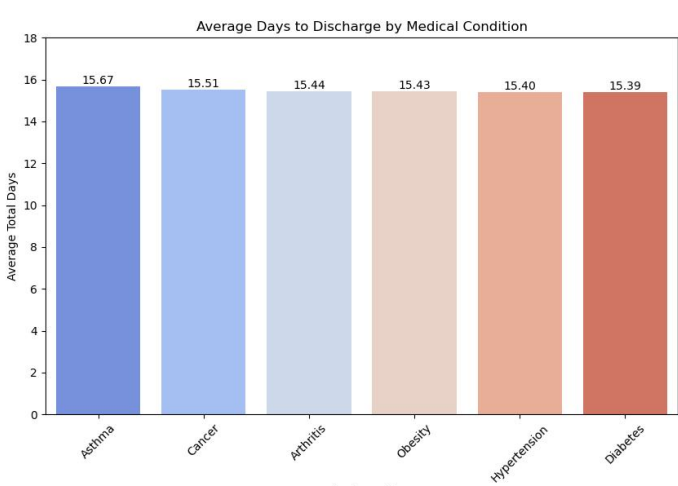

Medical Condition by Age Group

Hospital Charges for Medical Conditions: Cost Variation Analysis

Median Charge Per Day by Medical Condition

Diabetes	Obesity	Hypertension	Cancer	Arthritis	Asthma
1874.71	1868.10	1857.21	1828.04	1826.43	1826.19

Hospitals charge varying amounts for the same medical condition, leading to differences in treatment costs across institutions. In this analysis, we examined the per-day median cost for each medical condition to understand these cost variations.

Among the conditions analyzed, Diabetes emerged as the most expensive, with the highest per-day median cost compared to other conditions. This highlights the significant financial burden associated with managing chronic conditions like diabetes, which often require long-term care, regular monitoring, and medication. The variation in treatment costs underscores the need for a deeper understanding of hospital billing practices and cost management strategies for different medical conditions.

Average Discharge Time

Average Days to Discharge by Medical Condition

The analysis shows that average discharge times are consistent across patients, suggesting similar hospital stay durations. This likely reflects efficient patient management and hospital protocols, though further analysis may reveal subtle influencing factors.

Average Discharge Time

The table provides an example output of the top 5 hospitals with their total income and the number of patients attended:

Hospital	Billing Amount	Number of Patients
Johnson PLC	1,063,023	33
Smith PLC	1,022,696	35
LLC Smith	1,014,266	39
Ltd Smith	981,700	34
Smith Ltd	952,624	33

Analysis:
- Johnson PLC has the highest income at 1,063,023 and attended 33 patients.
- Smith PLC follows with a total billing amount of 1,022,696 and attended 35 patients.
- The number of patients attended varies slightly, but each hospital is performing well in terms of income and patient load.

Insights:
- Higher billing does not always correlate directly with the number of patients; it may indicate higher charges per patient.
- Analyzing this data could help in understanding hospital efficiency, service quality, or types of medical conditions they handle that contribute to higher billing.