

Exploring the Healthcare Landscape Through Data Visualization

Created by: - Ranjeet Singh

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1) Introduction: -

The healthcare industry generates vast amounts of data daily, covering a wide range of areas including patient demographics, treatment methods and contains information about hospitals, and billing information.

This dataset includes various information about patients such as name, age, gender, blood group, medical condition and so on. It also covers the details of attending doctors, hospitals, insurance providers, admission types and medical results.

2) Purpose: -

To improve patient care and healthcare delivery by utilizing comprehensive data insights to improve healthcare outcomes and efficiency. To create a data-driven healthcare ecosystem where choices are supported by strong research and discoveries enhancing patient outcomes and optimizing available resources.

3) Mission Statement: -

Mission is to carefully analyse and understand data related to patient demographics, health conditions, methods of treatments, and financial information. By identifying trends and patterns in the healthcare landscape, focus on treatment protocols, reducing costs, and improving patient care quality.

4) Objectives: -

- i. **Enhance financial performance:** - To analyse financial data of billing to identify cost saving opportunities and improve the financial health of healthcare facilities.

Relevant KPI: -

- a. Average billing amount per patient
- b. Cost of treatment per medical condition

- ii. **Improve Patients outcomes:** - To analyse and enhance the effectiveness of treatment methods, thereby improving patient recovery times and overall health outcomes.

Relevant KPI: -

- a. Average patient recovery time
- b. Treatment Success rate

- iii. **Identify Trends Over Time:** - To track changes and trends in healthcare data over the last years. Overall growth of patients in hospitals.

Relevant KPI: -

- a. Patient admission rates

➤ Questions and Answers: -

1. What are the most common medical conditions among patients, and how do they vary by Age group?
 - By analysing the dataset, we can see which medical conditions are common in different age groups. For example, diabetes, hypertension, and cancer are more common in older people, while asthma and some infections are more common in younger people. This information helps us create better prevention and treatment plans for each age group.
2. How do treatment success rates vary across different hospitals and doctors?
 - Highlight top-performing hospitals and doctors.
 - Identify factors contributing to higher success rates, such as specialized training or better resources.
 - Recommend best practices to underperforming hospitals and doctors.
3. What is the average cost of treatment for different medical conditions, and how insurance impact it?
 - Determine the financial burden of different medical conditions.
 - Assess the effectiveness of insurance coverage in reducing patient expenses.
 - Provide recommendations for cost management and insurance policy improvements.

- **Metrics and Key findings: -**

- **Prevalence of Medical Conditions by Age Group: -**

Older patients are more likely to suffer from diabetes, hypertension and cancer, while younger patients are more likely to have asthma and some infections. Do measures and better treatment plans are needed for different age groups.

- **Readmission and Mortality Rates: -**

Higer readmission and mortality rates might indicate areas where post-discharge care and overall treatment effectiveness need improvement. Improve discharge planning and follow-up care to reduce readmission and mortality rates.

- **Resource Utilization: -**

Some hospitals have better resource utilization rates, indicating more efficient use of available resources. Optimizing resources allocation based on best practices from hospitals with high utilization rates to improve operational efficiency.

By focusing on these metrics and key findings, healthcare providers can enhance the patient care experience, and overall health outcomes.

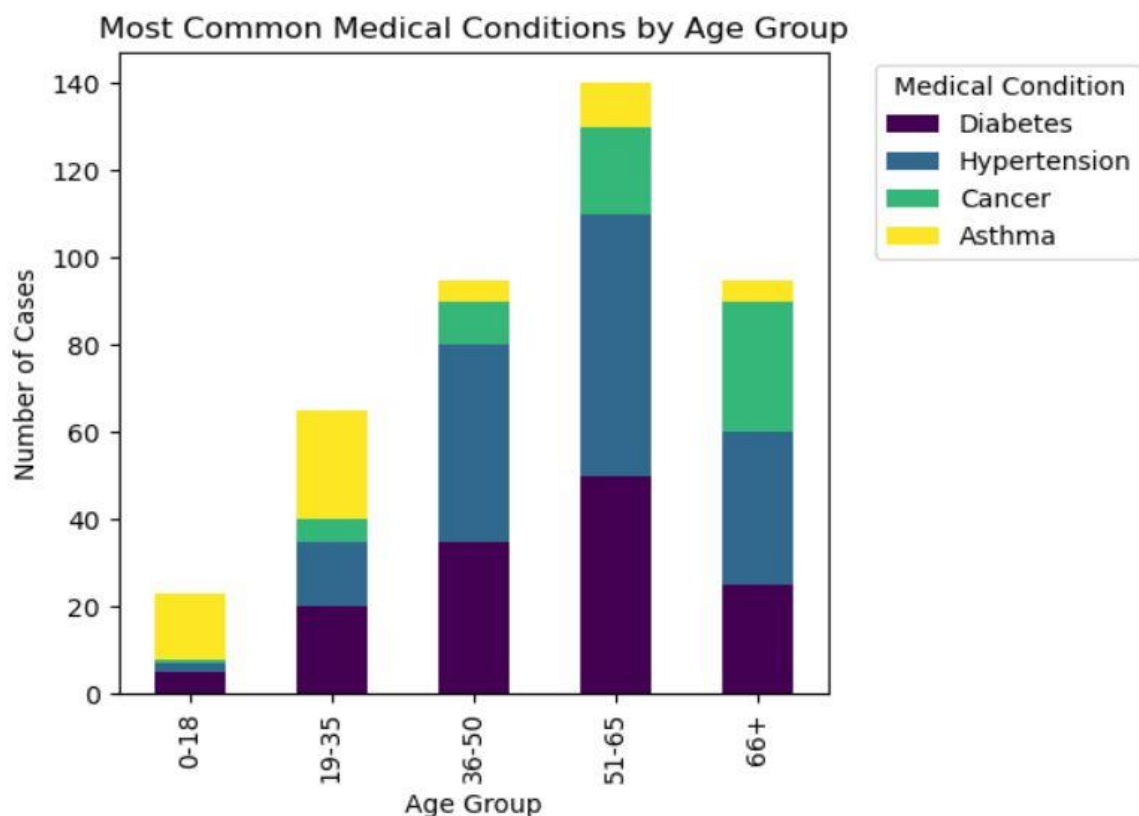
■ Visualizations of Data by using Power BI

Most Common Medical Conditions by Age Group: -

According to the age group, the age range 51-65 has the highest prevalence of diabetes and hypertension, followed by the 66+ age group. This implies that older persons are more likely to develop certain illness, underscoring the significance of developing age specific healthcare plans.

Trends in Asthma and Cancer: -

Cancer seems to be prevalent in many age groups, but it is more obvious in those between the ages of 51 and 65. While asthma is more common in younger age groups (0-18 and 19-35), its frequency decline with advancing years.

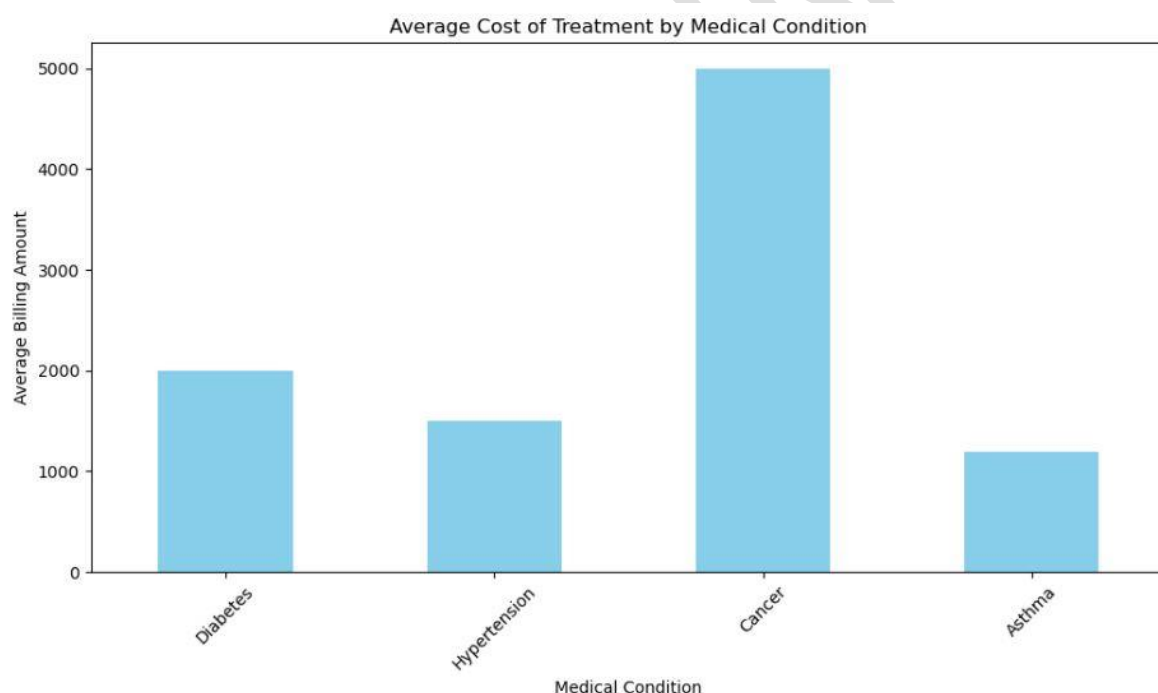


- **Average Cost of Treatment by Medical Condition**

High cost of Cancer treatment: - The graph shows that the average cost of treatment for cancer is significantly higher than for other medical conditions, reaching around \$5000.

Lower Cost of Treating Hypertension and Asthma: -

The average costs for treating hypertension and asthma are relatively lower, at around \$1000 and \$1200 respectively.

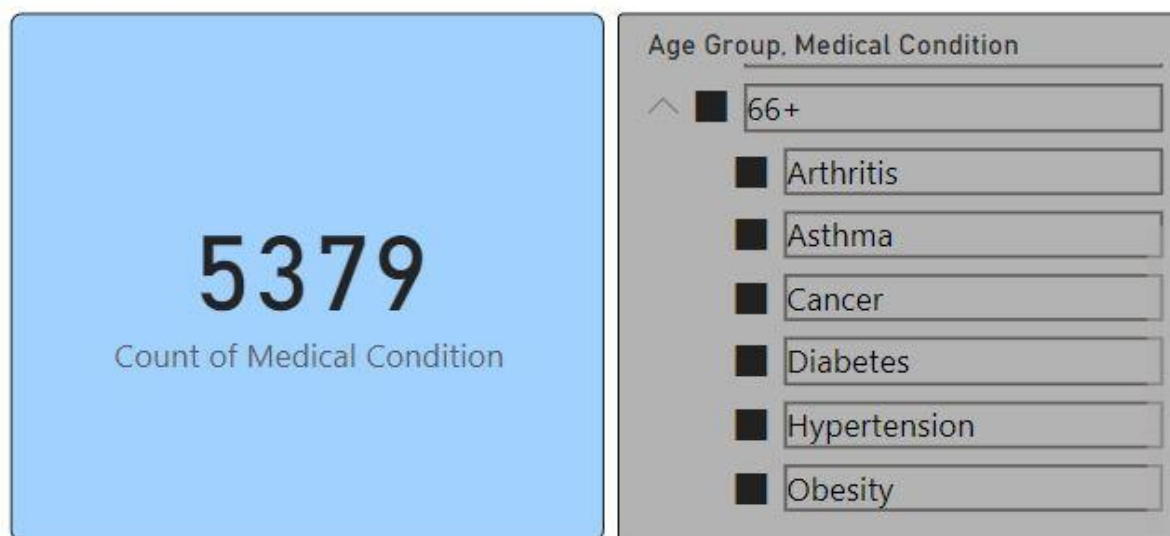


These insights highlight the significant cost disparities between different medical conditions, with cancer treatments being the most expensive and conditions like hypertension and asthma being relatively more affordable.

- **Count of Medical Conditions for Age Group 66+**

High Prevalence of Chronic Condition: - The count of 5379 medical conditions for the age group 66+ indicates a high prevalence of chronic conditions such as arthritis, cancer, hypertension, and obesity among the elderly population.

The healthcare department should focus on managing these chronic conditions through regular monitoring, medication management, and lifestyle interventions to improve the quality of life for the elderly.



Focusing on chronic disease management and targeted healthcare programs can lead to better health outcomes and improved quality of life for older adults.

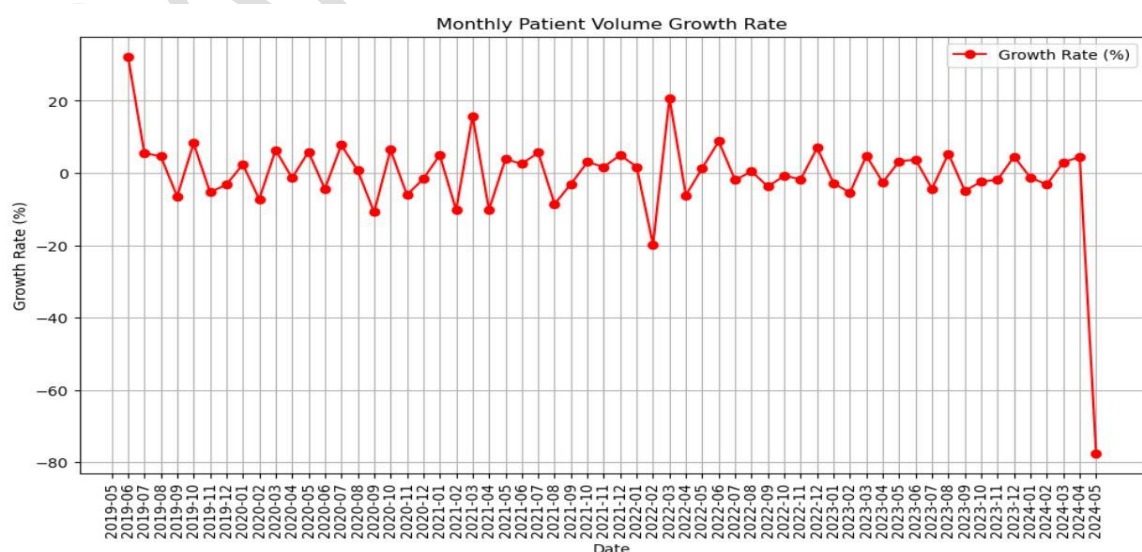
■ Monthly Patient Volume Growth Rate

Fluctuating Growth Rates: - The chart shows significant fluctuations in the monthly patient volume growth rates, with several peaks and troughs over the observed period.

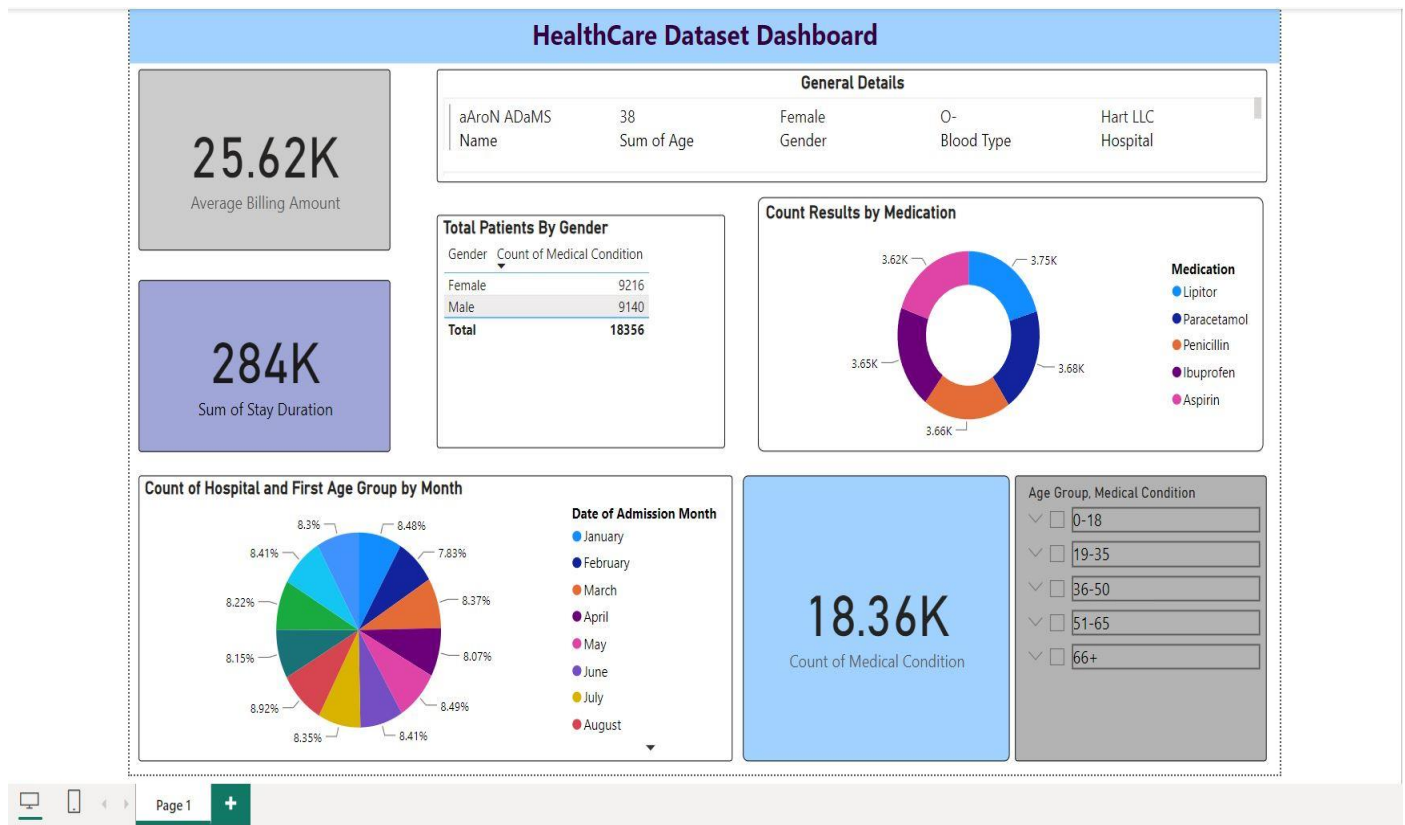
Understanding these underlying factors can help in resource planning and management to ensure that hospitals are adequately staffed and equipped during periods of high patient volume.

Recent Decline in Growth Rate: - Towards the end of the chart, there is a noticeable sharp decline in the growth rate, dropping to almost -80% in the most recent month.

This drastic decrease could indicate a significant issue such as a decrease in hospital admissions, potential operational disruptions, or changes in patient behaviour, and identify the cause, such as evaluating external factors like policy changes, economic conditions. Immediate actions may be required to address and mitigate the impact of this decline on hospital operations and patient care.



Here is the dashboard which shows different insights of the healthcare dataset: -



SUMMARY: -

- This healthcare dataset is a valuable resource for understanding and improving various aspects of patient care, hospital operations, and financial management.
- By leveraging detailed patient, treatment, and financial data, stakeholders can make informed decisions that enhance the quality of care, operational efficiency, and financial sustainability.

THANK YOU