Report

On

Healthcare dataset

(DATA 039 -DATA Architecture)

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INTRODUCTION

In the ever-evolving field of healthcare, efficient data management and analysis are crucial for improving patient outcomes and hospital operations. Leveraging data visualization tools like Power BI can transform raw data into actionable insights. This article presents a comprehensive analysis of healthcare data using a Power BI dashboard, focusing on key performance indicators (KPIs) such as patient stay time, average billing amount, and medical condition count.

MISSION STATEMENT

To leverage healthcare data to enhance patient care, optimize hospital operations, and improve financial management through insightful analysis and strategic decision-making.

PURPOSE

The primary purpose of this dataset is to provide a comprehensive view of patient admissions, treatments, and financial aspects in a healthcare setting. The data aims to support various stakeholders, including healthcare providers, administrators, and researchers, in understanding and improving the quality of care, operational efficiency, and financial performance.

OBJECTIVE

Improve Patient Care:

- Identify trends in medical conditions and treatment outcomes.
- Evaluate the effectiveness of medications and treatments.
- Enhance patient satisfaction and recovery rates through data-driven insights.

Optimize Hospital Operations:

- Analyse admission patterns and room utilization rates.
- Assess doctor performance and workload distribution.
- Streamline hospital processes to reduce wait times and improve patient flow.

Enhance Financial Management:

- Understand the financial impact of different medical conditions and treatments.
- Evaluate the role of insurance providers in covering medical expenses.
- Identify cost-saving opportunities and optimize billing practices.

Support Research and Innovation:

- Provide a rich dataset for academic and clinical research.
- Foster innovation in healthcare practices through data analysis.
- Enable predictive modelling and forecasting for better resource planning.

Ensure Data-Driven Decision Making:

- Empower healthcare administrators with actionable insights.
- Facilitate strategic planning and policy formulation.
- Support evidence-based decision making to enhance overall healthcare delivery.

QUESTIONS

➢ **What is the age distribution of patients?**

Understanding the age distribution can help tailor healthcare services to the predominant age groups.

➢ **Is there a significant difference in stay time across different age groups?**

This can reveal whether certain age groups tend to stay longer, which may indicate more complex healthcare needs.

➢ **Are there differences in the average stay time between male and female patients?**

Identifying gender differences in stay time can help in understanding if certain gender-specific health issues or treatment responses exist.

➢ **How does the average billing amount vary by gender?**

This could highlight potential disparities in healthcare costs between genders.

➢ **What are the billing amounts for different medical conditions?**

This can help in identifying conditions that are more costly to treat and exploring ways to reduce costs.

➢ **What is the average occupancy rate of different room types (e.g., general ward, ICU, private rooms)?**

Understanding room occupancy rates can help in optimizing bed utilization and improving patient flow.

➢ **Are there correlations between the length of stay and patient outcomes?**

Analyzing this can help in understanding if longer stays lead to better or worse patient outcomes.

> **What is the average time taken from patient admission to the start of treatment?**

Reducing this time can improve patient outcomes and satisfaction.

> **What are the most commonly prescribed medications, and how do they correlate with the medical conditions treated?**

- This can provide insights into treatment patterns and potential areas for standardization or improvement.

METRICS AND KPI

1. **Stay Time of Patient**: This KPI measures the average duration (in days) that patients spend in the hospital from admission to discharge. It helps in understanding hospital efficiency and patient turnover.

Average Stay Time = DATEDIFF(healthcare_dataset[Date of Admission],healthcare_dataset[Discharge Date],DAY)

2. **Average Billing Amount**: This KPI indicates the average cost incurred per patient. It is essential for financial planning and identifying cost-saving opportunities.

Average Billing Amount = AVERAGE (' healthcare_dataset '[Billing Amount])

3.Readmission Rate: The percentage of patients readmitted to the hospital within 30 days of discharge. This KPI helps in evaluating the quality of care and discharge processes.

```
readmission =
VAR CurrentPatient = 'healthcare_dataset'[patientid]
VAR CurrentDischarge = 'healthcare_dataset'[Discharge Date]
RETURN
IF(
   COUNTROWS(
     FILTER(
       'healthcare_dataset',
       'healthcare_dataset'[patientid] = CurrentPatient &&
               'healthcare_dataset'[Date of Admission] >
CurrentDischarge &&
         DATEDIFF(CurrentDischarge, 'healthcare_dataset'[Date
of Admission], DAY) <= 30
       )
   ) > 0,
   TRUE,
   FALSE
)
```

1.Average Billing Amount

- **Value**: 25.62K
- **Insight**: The average billing amount per patient is $25,620. This is a crucial financial metric that helps the hospital management understand the average cost of patient care. It can be used for budgeting, financial planning, and identifying areas where cost-saving measures can be implemented.

2. Sum of Stay Duration

- **Value**: 284K
- **Insight**: The total sum of stay duration for all patients is 284,000 days. This metric provides an aggregate view of hospital utilization and can help in assessing the overall patient load on the hospital's resources. High values may indicate a need for more efficient discharge planning or additional resources.

3.Patients by Gender

Total Patients By Gender

Gender	Count of Medical Condition
Male	9140
Female	9216
Total	18356

- **Insight**:
  - ○ Female: 9,216
  - ○ Male: 9,140
  - ○ The distribution of patients by gender is almost equal, with a slight female majority. This gender distribution can influence hospital resource planning and patient care strategies.

4.Count Results by Medication

Count Results by Medication
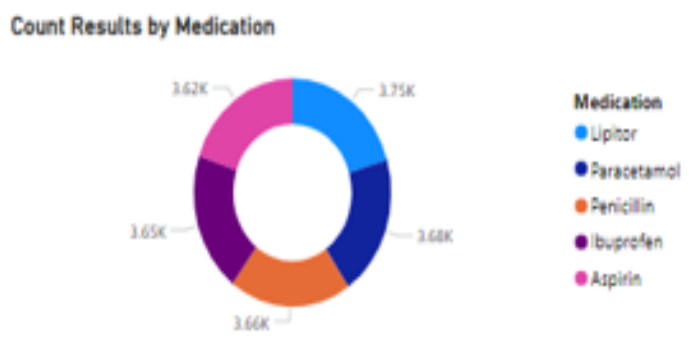
- **Insight**:
  - ○ Lipitor: 3.75K (20.41%)
  - ○ Paracetamol: 3.68K (20.05%)
  - ○ Penicillin: 3.66K (19.94%)
  - ○ Ibuprofen: 3.65K (19.86%)
  - ○ Aspirin: 3.62K (19.74%)
  - ○ The usage of medications is evenly distributed, with each medication accounting for approximately 20% of the total. This indicates a balanced prescription pattern across different medications.

5. Count of Hospital and First Age Group by Month

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Count of Hospital and First Age Group by Month
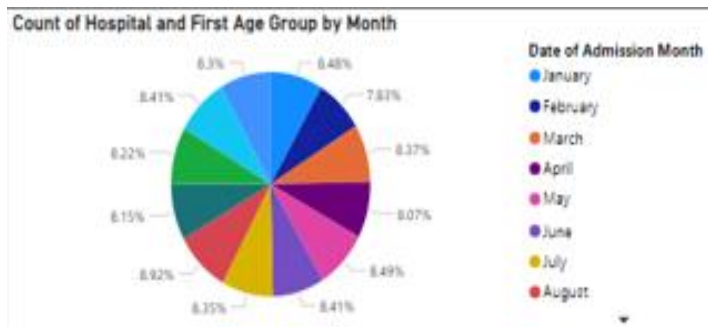
- **Insight**:
  - ○ The patient admissions are relatively evenly distributed across the months, with each month accounting for about 8% of the total admissions. This suggests a consistent patient admission rate throughout the year, without significant seasonal variations.

6. **Count of Readmission by year**
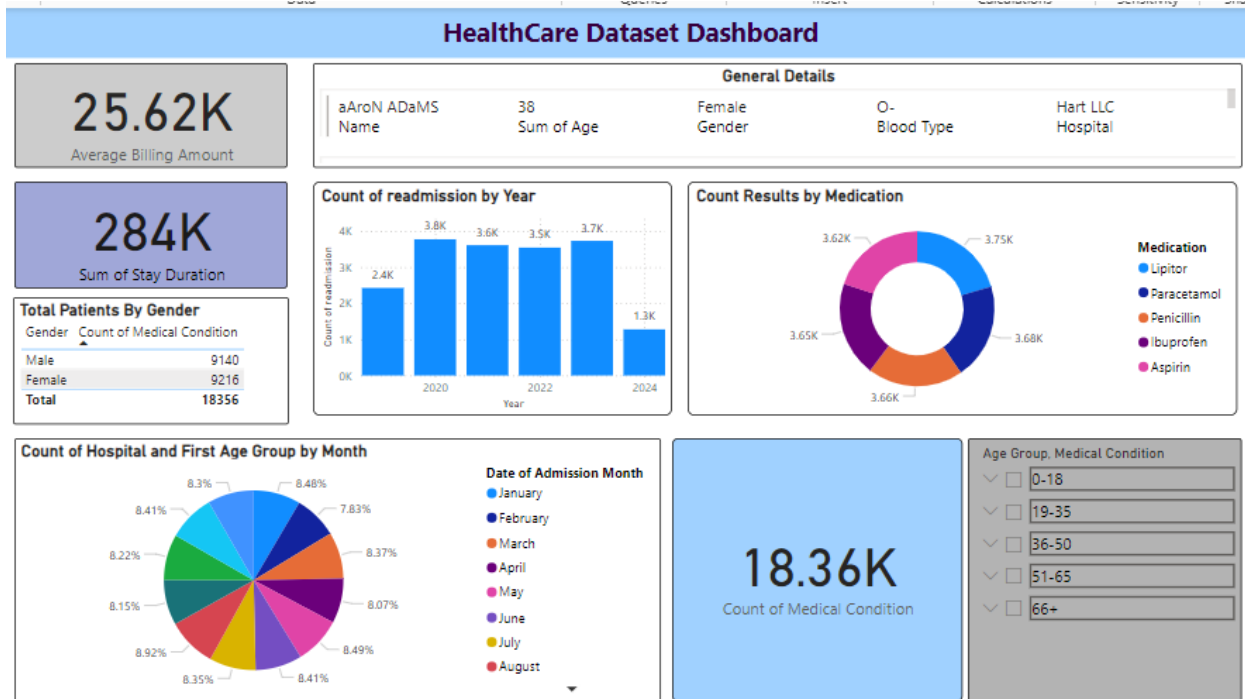

Count of readmission by Year
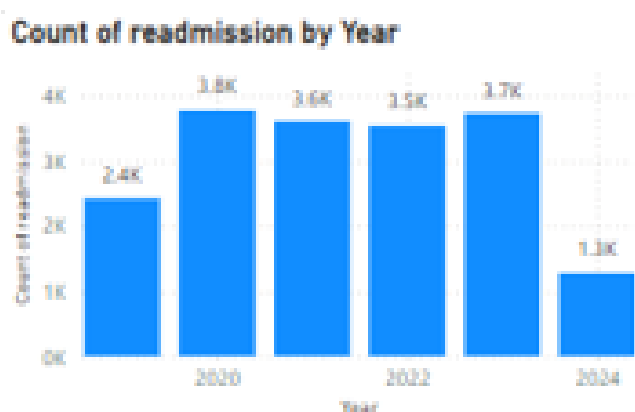
- **Insights**

  2021 Peak: Highest readmission count suggests potential factors like increased patient intake or healthcare issues.

  Downward Trend Post-2021: Indicates possible improvements in patient care, follow-up protocols, or other effective interventions reducing readmissions.

DASHBOARD

Conclusion

The Power BI dashboard has provided valuable insights into patient data, highlighting critical areas of hospital operations and patient care. By understanding the average stay time, billing amounts, and prevalent medical conditions, healthcare administrators can make informed decisions to enhance efficiency and patient outcomes. Continuous monitoring and analysis of these KPIs will support ongoing improvements in hospital management and patient services.