Healthcare provider (Hospital)

**Dataset overview**

The hospital dataset is a comprehensive collection of information that includes key variables such as patient demographics, diagnoses, procedures performed, length of stay, and patient satisfaction scores. Additionally, it captures information about healthcare providers, including the number of doctors, their specialties, and patient-to-doctor ratios. Financial metrics, such as billing amounts, is also integral to understand the economic health of the institution.

**Patients**

* **Patient ID:** An integer identifier for each patient.
* **Patient Name:** Text containing the names of the patients.
* **Gender:** Categorical data indicating the gender of the patients (Male or Female).
* **Age:** Integer values representing the ages of the patients, ranging from 18 to 79 years.
* **City ID:** An integer representing the city associated with each patient.
* **Race:** Categorical data representing the race of the patients (e.g., Black, Asian, Hispanic).

**Visits**

* **Date of Visit:** The date when the patient visited (e.g., "1/1/2024").
* **Patient ID:** A unique identifier for each patient.
* **Provider ID:** A unique identifier for the healthcare provider.
* **Department ID:** A unique identifier for the department where the patient was treated.
* **Diagnosis ID:** A unique identifier for the diagnosis given to the patient.
* **Procedure ID:** A unique identifier for the procedure performed.
* **Insurance ID:** A unique identifier for the insurance provider.
* **Service Type:** Indicates whether the visit was "Outpatient" or "Inpatient."
* **Treatment Cost:** The cost of the treatment provided.
* **Medication Cost:** The cost of the medication prescribed.
* **Follow-Up Visit Date:** The date scheduled for a follow-up visit (if applicable).
* **Patient Satisfaction Score:** A score representing the patient's satisfaction with the visit.
* **Referral Source:** The source of the referral (e.g., "Self-Referral," "Physician Referral").
* **Emergency Visit:** Indicates whether the visit was an emergency ("Yes" or "No").
* **Payment Status:** Indicates whether the payment was "Paid" or another status.
* **Discharge Date:** The date the patient was discharged (if applicable).
* **Admitted Date:** The date the patient was admitted (if applicable).
* **Room Type:** The type of room assigned to the patient (if applicable).
* **Insurance Coverage:** The amount covered by insurance.
* **Room Charges (daily rate):** The daily rate charged for the room (if applicable).

**Providers**

* **Provider ID:** A unique identifier for each healthcare provider.
* **Provider Name:** The name of the healthcare provider (e.g., "Dr. Olu Abisola").
* **Gender:** The gender of the provider (e.g., "Male" or "Female").
* **Nationality:** The nationality of the provider (e.g., "Nigerian," "European").
* **Age:** The age of the provider.
* **Image:** A URL link to an image associated with the provider.

**Cities**

* **City ID:** A unique identifier for each city.
* **City:** The name of the city (e.g., "Sheffield," "Edinburgh").
* **State:** The state or region where the city is located (e.g., "Wales," "England").

**Departments**

* **Department ID**: A numerical identifier for each department.
* **Department**: The name of the department.

**Insurance**

* **Insurance ID**: A numerical identifier for each insurance provider.
* **Insurance Provider**: The name of the insurance provider.

**Diagnoses**

* **Diagnosis ID:** Contains integer values, with a range from 1 to 5.
* **Diagnosis:** Contains text descriptions of different diagnoses.

**Procedures**

* **Procedure ID:** An integer identifier for each medical procedure.
  + - * **Procedure:** Text descriptions of the procedures.

**Storyboard**

**Objective**:  
The dashboard is designed to provide hospital administrators with a comprehensive overview of patient admissions, doctor workload, and billing information. It aims to help hospital management monitor operations, optimize resource allocation, and improve financial management.

**Audience**:  
Primary users are hospital administrators, department heads, and financial officers. They require a high-level summary with the ability to drill down into specific details for informed decision-making.

**KPIs**

**Overview:**

* **Total number of patients:** To monitor the hospital’s operation
* **Median of patients’ satisfaction rate**: To monitor the hospital’s operation
* **Average Length of stay:** To Identify Areas for Improvement
* **Number of visits over months:** To identify certain times of the year that may see higher or lower patient volumes
* **Patient Follow-Up Rate:** To measure the percentage of patients who receive follow-up care after an initial consultation
* **Number of patients by service type**: To manage the hospital resources effectively
* **Number of patients for each doctor:** To measure a doctor’s workload
* **Number of patients by city and state:** To understand patient population characteristics.
* **Top Department:** To manage the hospital resources effectively
* **Top Diagnosis:** To manage the hospital resources effectively
* **Top procedure:** To manage the hospital resources effectively
* **Top Doctor:** To manage the hospital resources effectively

**Patients:**

**To distribute the staff and resources effectively**

* Number of patients by department
* Number of patients by diagnose
* Number of patients by procedures
* Number of patients by room type
* Number of patients by gender
* Number of patients by age group

**Satisfaction**

**To show area of improvements**

* Avg satisfaction rate by Procedure
* Avg satisfaction rate by department
* Avg satisfaction rate by Provider name

**Billing information:**

**To reveal trends in revenue generation and highlight areas where the hospital is most profitable.**

* Total Billing amount
* Total Medication cost
* Total room charges
* Total insurance cover
* Total Out-of-Pocket Payments: To help gauge patient burden and the effectiveness of coverage provided by insurers.
* Billing amount by year
* Billing amount by quarter
* Billing amount by department
* Biling amount by procedure
* Biling amount by service type
* Payment status

**Insights**

| **KPI** | **Insight** | **Recommendation** |
| --- | --- | --- |
| **Follow-Up Rate** | The follow-up rate is **50.14%**, meaning about half of the patients return for follow-up care. This could indicate that the other half might be lost to follow-up, which might impact continuity of care and health outcomes. | Focus on increasing follow-up rates, potentially through reminders or more active patient engagement. |
| **Patient Numbers per Doctor** | The top-performing doctor in terms of patient volume is **Dr. Sade Kikiola.** | Balance the workload among doctors |
| **Patient Number by Month** | There is a decline in patient numbers over time. | Explore the causes behind the steady decline in monthly patient numbers. It could be seasonal, or it might require operational changes. |
| **Number of Patients by Department** | **Cardiology** has the highest number of patients, followed closely by **General Surgery** | The high number of hypertension cases aligns with the dominance of the Cardiology department so there may be opportunities to provide additional resources or preventive care programs focusing on cardiovascular health. |
| **Number of Patients by Diagnosis** | **Hypertension** is the most common diagnosis |
| **Number of Patients by Procedure** | The most frequently performed procedure is **X-Ray**, followed by **CT scan**). | Ensure that these machines are well-maintained and properly staffed |
| **Number of Patients by Age Group** | The highest number of patients falls within the **20-40** age group, closely followed by the **40-60** and **60-80** age groups | consider expanding services tailored to chronic conditions or lifestyle-related diseases prevalent in this group. |
| **Avg Satisfaction Rate by Procedure** | The CT Scan procedure has the lowest satisfaction rate. | investigate why CT scan has the lowest satisfaction rate. |
| **Avg Satisfaction Rate by Department** | Cardiology and General Surgery share the lowest rate. | As the top-performing Departments in terms of patient volume are **Cardiology and General Surgery, it is recommended to focus on** effectively manage the hospital resources |
| **Avg Satisfaction Rate by Provider Name** | Dr. Sade Kikiola has the lowest satisfaction rate. | As the top-performing doctor in terms of patient volume is **Dr. Sade Kikiola, it is recommended to** Balance the workload among doctors to maintain appropriate satisfaction rate. |
| **Total Billing by Quarter** | There is a sharp decline in billing from Q1 to Q4, with Q1 being the most profitable and Q4 the least. | As there is a decline in patient numbers over time, it is recommended to consider marketing campaigns, offering special services. |
| **Payment status** | A significant portion (nearly 40%) of payments is still pending. | Implement stronger follow-up processes for outstanding payments, such as reminders, offering flexible payment plans, or reviewing insurance claim processing delays |