PowerBI Data Analysis Project: Pop Healthcare

Project Overview

This PowerBI project is designed to analyze healthcare data, specifically focusing on patients diagnosed with a variety of health conditions such as viral infections, flu, malaria, typhoid, pneumonia, and fractures. The goal is to visualize and derive insights from data that includes patient information, bed occupancy, doctor feedback, and billing details. The final output is a dynamic PowerBI dashboard that provides a comprehensive view of hospital performance and patient care.

Key Objectives

1. Track patient data related to diagnoses and healthcare usage.
2. Monitor bed occupancy trends in different hospital wards.
3. Visualize doctor feedback volume.
4. Analyze patient billing and health insurance coverage.
5. Provide interactive data analysis using PowerBI to drive better decision-making in healthcare management.

Data Analysis Scope

1. Data Collection and Preparation

- **Data Sources**: Data will include patient records with the following key fields:
    - Diagnosis Type (e.g., Viral Infection, Flu, Malaria, etc.)
    - Admit Date and Discharge Date
    - Bed Type (Private, General, ICU)
    - Feedback volume per doctor
    - Follow-Up Date
    - Bill Amount
    - Health Insurance Details

- **Data Cleaning**: Remove any inconsistencies or missing data, ensuring accurate analysis.
- **Data Transformation**: Standardize the format (dates, diagnosis types) and make sure data fields are well-structured for analysis.

2. Dashboard Structure and Visualizations

- The dashboard will be structured to provide an easy-to-navigate overview of patient statistics, bed usage, doctor performance, and billing information.

a. Date Range Filter (Admit and Discharge Dates)

- A date range filter will allow users to select a specific period based on admit and discharge dates, enabling a focused analysis on a particular time frame.
- This filter will dynamically update all visualizations on the dashboard.

b. Billing and Health Insurance Overview

- **Visualization Type**: Line Chart
- **Data**:
    - Billing Amount trends over time.
    - Health insurance coverage statistics.
- **Purpose**: To show how billing amounts change over time, understand the impact of insurance coverage, and detect patterns in patient payment behavior.
- **Insights**: Track billing patterns, peak admission periods, and insurance contribution.

c. Bed Occupancy Analysis

- **Visualization Type**: Bar Chart
- **Data**:
    - Bed occupancy segmented by bed types (Private, General, ICU).
- **Purpose**: To monitor hospital resource usage and occupancy levels, ensuring optimal resource allocation.
- **Insights**: Identify peak occupancy periods, understand the distribution of patients across different bed types, and detect trends in ICU or general bed usage.

d. Feedback Volume per Doctor

- **Visualization Type**: Donut Chart
- **Data**:
    - Volume of feedback given per doctor.
- **Purpose**: Evaluate the quality of care provided by different doctors based on feedback volume.
- **Insights**: Highlight top-performing doctors, identify areas for improvement in patient care, and monitor trends in doctor performance based on feedback.

e. Diagnosis Types Breakdown

- **Visualization Type**: Funnel Chart
- **Data**:
    - Types of diagnoses for patients (e.g., Viral Infection, Flu, Malaria, etc.)
- **Purpose**: To analyze the distribution of illnesses among patients and see which conditions are most common.
- **Insights**: Determine the prevalence of each diagnosis, monitor changes over time, and identify healthcare trends.

3. Data Insights and Analysis

a. Patient Health Analysis

- Use PowerBI to drill down into patient data:
    - What are the most common health conditions?
    - How do different illnesses impact bed occupancy?
    - Are certain conditions more likely to require ICU beds?

b. Bed Management and Hospital Resources

- Analyze bed occupancy trends to improve hospital management.
- Provide insights for resource allocation based on bed usage (Private, General, ICU).

c. Doctor Feedback Analysis

- Evaluate feedback trends per doctor to ensure high-quality patient care.

- Use the donut chart to easily identify which doctors have high or low feedback volumes.

d. Financial and Insurance Insights

- Visualize billing trends and insurance involvement over time.
- Gain insights into the financial health of the healthcare institution.

Project Execution Steps

1. Data Preparation

- Collect raw data.
- Clean and format data.
- Upload data into PowerBI.

2. Data Modeling

- Establish relationships between tables (e.g., Patient, Diagnosis, Billing, Feedback).
- Create calculated fields if necessary (e.g., Total Cost = Bill Amount - Insurance Coverage).

3. Visualization Creation

- Use PowerBI to create interactive visuals for each data point:
    - Line Chart for billing trends.
    - Bar Chart for bed occupancy.
    - Donut Chart for feedback per doctor.
    - Funnel Chart for breakdown of diagnoses.

4. Dashboard Integration

- Combine all visuals into a cohesive dashboard.
- Ensure filters and interactions work seamlessly.
- Test the dashboard for accuracy and usability.

5. Final Review and Insights Presentation

- Review data insights and ensure they meet project objectives.
- Document key findings and recommendations based on the data.
- Prepare a presentation or report highlighting the main insights for stakeholders.

Expected Outcomes

1. A **fully interactive PowerBI Dashboard** that can filter data based on date ranges, allowing focused analysis.
2. Insights into patient diagnosis trends and common illnesses.
3. Analysis of bed occupancy, helping hospital staff manage resources effectively.
4. Evaluation of doctor performance using feedback data.
5. Overview of hospital billing trends and insurance coverage, providing a financial snapshot of patient care.

Conclusion

This Pop Healthcare PowerBI project offers a detailed overview of hospital data, empowering healthcare administrators to make data-driven decisions. By visualizing key metrics, this project aims to optimize resource usage, improve patient care, and enhance financial planning. The interactive dashboard will serve as a valuable tool for hospital management and healthcare professionals to better understand patient dynamics and hospital performance.