Hospital Readmission Analysis (Advanced Data Acquisition & Tableau Dashboard)

Ashley Traore

Datasets

WGU Dataset:

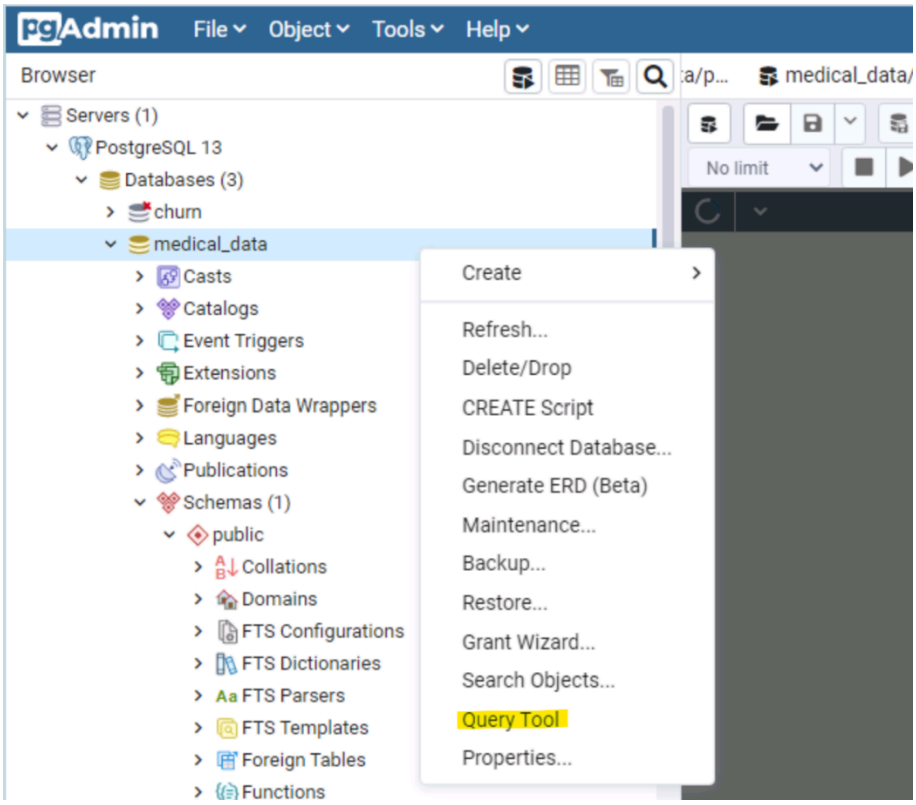
medical_clean.csv

External Dataset: Riyadh Hospital Admissions Dataset (2020–2024)

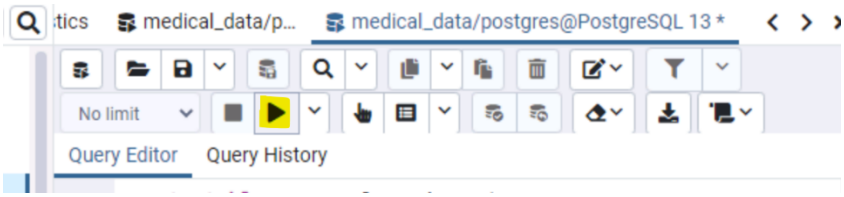
Hospital_Dataset_2022_2024.csv

Steps to display the dashboard in Labs On Demand

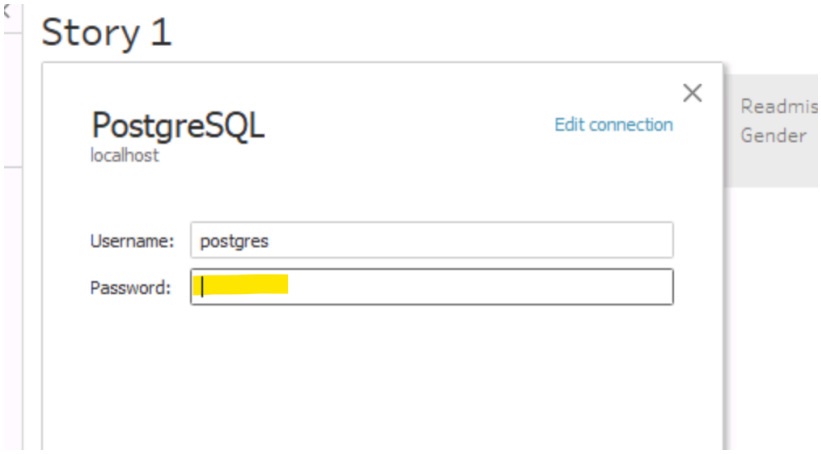
1. Download the project files
    a. Download the "D211 Project Files - Ashley Traore" zip folder onto the Labs On Demand environment.
2. Extract the files
    a. Right-click on the downloaded zip folder and select "Extract All".
    b. Choose the destination folder: C:\Users\LabUser\Downloads, then click Extract.
3. Open PGAdmin and access the database
    a. On the desktop, open the PGAdmin application.
    b. Navigate to the medical_data database using this path:
    Servers → PostgreSQL → Databases → medical_data
    c. Right-click on the medical_data database and select "Query Tool".



4. Run the SQL code
    a. Open the extracted “SQL Code” file from the D211 Project Files folder.
    b. Copy the SQL code from the file.
    c. Return to PostgreSQL, paste the copied SQL into the Query Tool.
    d. Click the Execute button in the top navigation panel to run the query.



5. Open the Tableau dashboard
    a. Locate the extracted Tableau dashboard file “PA D211 - Ashley Traore” in the Downloads folder.
    b. Open the file using Tableau Desktop.
    c. When prompted, enter the password provided by Labs On Demand to access the dashboard.



Navigating the Dashboard

On the main page, access the "Total Readmissions" tab to explore a detailed breakdown of hospital readmission rates. Here, you can select one or multiple hospitals to compare readmission percentages side by side. To further refine the view, toggle the Yes/No box at the top, this will provide a clearer distinction between patients who were readmitted and those who were not.

Navigate to the "Readmission Details - Gender" tab to analyze readmission rates based on gender. This section allows you to compare individual hospitals and observe gender-related trends over time. Use the checkboxes on the left to filter specific hospitals or select all to view overall trends. Additionally, click the Male/Female boxes to focus on readmission rates for each gender separately.

Select the "Readmission Details - Age Group" tab to examine how readmission rates vary across different patient age groups. Identify hospital trends and compare multiple facilities using the toggles on the right. For a more detailed view, select a single hospital or age group to analyze the percentage of readmissions within each age group, displayed dynamically in the bubble chart.

SQL:

```
create table external_patient (
admission_date DATE
,hospital_name VARCHAR NOT NULL
,admission_count INT NOT NULL
,condition_type VARCHAR
,patient_age_group VARCHAR
,patient_gender VARCHAR
,readmission_count INT
,severity_level VARCHAR
,length_of_stay_avg FLOAT
```

```
,seasonal_indicator VARCHAR
,comorbid_conditions_count INT
,primary_diagnosis_code VARCHAR
,daily_medication_dosage VARCHAR
,emergency_visit_count VARCHAR
);

copy public.external_patient (admission_date, hospital_name, admission_count,
condition_type, patient_age_group, patient_gender, readmission_count, severity_level,
length_of_stay_avg, seasonal_indicator, comorbid_conditions_count,
primary_diagnosis_code, daily_medication_dosage, emergency_visit_count) FROM
'C:/Users/LabUser/DOWNLO~1/HOSPIT~1.CSV' DELIMITER ',' CSV HEADER
QUOTE '\"' ESCAPE '"';""

alter table external_patient add id SERIAL PRIMARY KEY;
alter table external_patient ADD Readmis VARCHAR;

update external_patient
SET Readmis = CASE
WHEN admission_count >=1 then 'Yes'
WHEN admission_count <=0 then 'No'
END;
```

The data dictionary emphasizes the negative impact that high readmission rates can have on a hospital. This analysis aims to provide deeper insights into readmission trends in comparison to other hospitals, enabling the audience to identify key areas for improvement in reducing readmissions. For instance, the analysis indicates that female patients, particularly those aged 66 and older, experience higher readmission rates at WGU Hospital compared to other demographics. While increased readmissions are observed across all age groups, the most notable disparity is seen in the 66 and older category. This insight allows the hospital to strategically target the underlying factors contributing to readmissions within this age group and gender, ultimately minimizing the overall negative effects associated with frequent patient readmissions.

Business Intelligence Tool

The business intelligence tool selected for this project was Tableau, chosen for its ability to simplify data analysis and visualization. Tableau makes it easy to turn raw data into interactive visuals, helping businesses make well-informed decisions. It connects seamlessly to various data sources, allowing users to explore trends and patterns in real time. With its intuitive

drag-and-drop functionality, learning and building dashboards is straightforward. Its interactive features, automation, and capacity to handle large datasets make it ideal for tracking key metrics and uncovering valuable insights. It streamlines complex data and makes it accessible for better decision-making.

Steps to prepare the data for analysis

1. Created a New Table – Designed a table with the necessary fields and constraints to store the external dataset from Kaggle.
2. Loaded the Dataset – Imported the data into the newly created table using the COPY statement.
3. Cleaned and Standardized the Data – Established a unique primary key for each patient to maintain data integrity. Created a calculated column to indicate patient readmission status (yes/no), ensuring alignment with the WGU medical dataset for easier analysis.
4. Additional Data Cleaning in Tableau – After uniting the tables in Tableau, I standardized key fields, including age group and hospital name, to enhance consistency across datasets.

Steps to build the Tableau dashboard

1. Connected to the Database – Established a connection to the PostgreSQL database and loaded the patient and external_patient tables.
2. Joined/Union the Data – To streamline the data, the tables were united within the data source tab in Tableau to create a single dataset for analysis.
3. Cleaned & Standardized the Data – Prepared the dataset by standardizing key fields, including hospital, gender, readmission status, and age group, to maintain consistency across the dataset.
4. Created Visualizations – Developed multiple visualizations, beginning with an overview of total readmission statistics, followed by readmission rates segmented by gender and age group. Throughout this process, I prioritized readability and accessibility, incorporating color choices to accommodate colorblind users.
5. Built Dashboards – Designed three interactive dashboards, integrating filters to allow users to dynamically explore the data.
6. Constructed a Tableau Story –To present the insights in a cohesive and structured manner, I built a Tableau story that organizes the dashboards in a clear, logical sequence.
7. Tested & Refined – Conducted testing to ensure all components function seamlessly and offer an intuitive user experience.

Results

The results of the data analysis provided valuable insights into WGU Hospital's readmission patterns, reinforcing the purpose and function of the dashboard as a tool for identifying areas of improvement. While the hospital's overall readmission rate of 36.69% is lower compared to competing hospitals, a more detailed examination revealed notable differences. Specifically, female patients experience a significantly higher readmission rate at 50.18%, surpassing that of other hospitals. Additionally, readmission rates across all age groups at WGU Hospital remain elevated, with the most pronounced difference seen in patients aged 66 and older.

The dashboard was designed not only to present overarching statistics but also to offer a deeper analysis of patient demographics to pinpoint areas requiring targeted interventions. By visualizing these trends, the dashboard aids stakeholders in recognizing which patient groups are most affected, allowing for data-driven decisions that enhance patient care and reduce readmissions. The data dictionary highlights the challenges associated with high readmission rates, supporting the need for strategic improvements. Ultimately, the dashboard serves as a comprehensive analytical tool, enabling hospital administrators to focus on the most impactful areas for improving healthcare outcomes.

Limitations

This data analysis has some limitations to consider. It is limited by the available dataset and may not account for external factors such as variations in hospital protocols, patient demographics, or regional healthcare accessibility. Additionally, while WGU Hospital is compared to other facilities, differences in hospital size, specialties, and patient populations can impact readmission rates, making direct comparisons less precise.

Sources

Copy. PostgreSQL Documentation. (2025, May 8). https://www.postgresql.org/docs/current/sql-copy.html

Max. (2023, February 22). How to union in Tableau: 5 steps to create Tableau Union. Max Kimball. https://maxkimball.com/how-to-union-in-tableau