DSCI 5360

DATA VISUALIZATION FOR ANALYTICS

PROJECT REPORT

on

Hospital's Discharge Data

<u>By</u>

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Introduction: My project has the visualization of patient discharge data from 30 hospitals that are in Indiana, USA. I have visualized the data of a number of patients who got discharged from all the hospitals across the years 2016 to 2020 and discharged patients data in the aspect of gender, discharges from each hospital, and discharges as per age group. I have also visualized the patient's bill payments through different categories.

Data Set: I have obtained data set from my connection who works for Hospital. However, data has been fudged for their safety. Below is the attachment of the dataset and this is in .csv format.

Hospital_dataset.cs
v

This dataset contains the following columns:

- (MSDRG).(By Product Line).(Product Line)- This field indicates the business service line. Ex: Cardiology, orthopedics, etc.
- (Hospital).(Name)- Indicates the Hospital Name
- (Discharge Date).(By Calendar).(Calendar Year Name)- This field indicates the patient's discharge year
- (Discharge Date).(By Calendar).(Month Name)- This field indicates the patients discharge month
- (Age Range).(Age Ranges)- This field indicates the Age ranges which have been grouped within the dataset itself.
- (Payer).(Payer)- This field indicates the patient's payment of bills through various categories
- Sex- This field indicates the gender of the patient
- (Measures).(Discharges)- This field indicates the number of patients discharged.

Analysis:

The Visualization methods I used for my analysis are:
- Table chart
- Bar chart
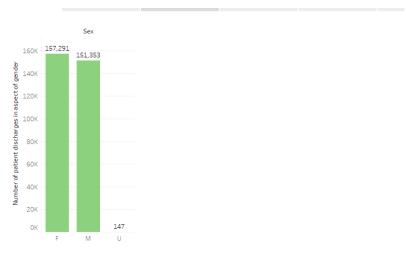- Bubble chart
- Line chart

Story Analysis:

1. How many patients got discharged from all hospitals each Year?

   The Table chart below shows the number of patients discharged from all thirty hospitals in all the years. For instance, in the year 2016, 74893 patients have been discharged from all the hospitals in Indiana. In the year 2017, 75027 patients have been discharged from all the hospitals. From this visualization, we can analyze that in the year 2017, a greater number of patients were discharged.

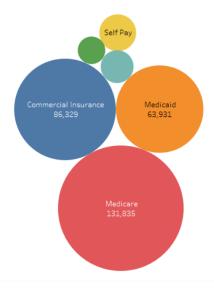| Total Discharge Numbers in Year	
Year of Date	
2016	74,893
2017	75,027
2018	72,366
2019	69,425
2020	17,080

2. How many patients in the aspect of gender have been discharged across all hospitals each year?

Below is the bar graph which shows the number of patients discharged in the aspect of gender. It is evident from the visualization that the maximum number of patients discharged are Female.
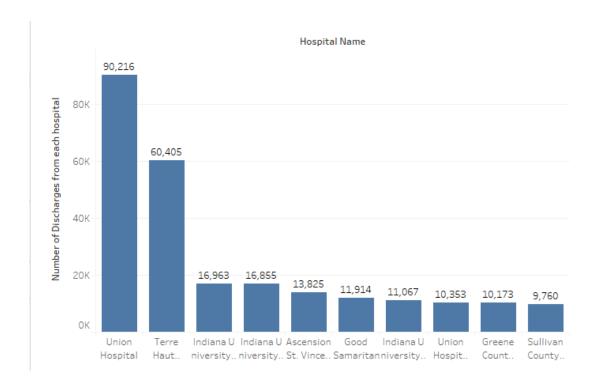

3. How many patients have paid their bills through various categories?
Below bubble chart visualizes that a higher number of patients paid their hospital bills through Medicare.

4. How many Patients got discharged from the top ten hospitals across different years?

Below bar chart visualizes the number of patient discharges from the top ten hospitals. For this we have used **Rank** Functionality and filters for years, hospital names and departments have been added in every visualization. In this visualization, 30 hospitals and 30 medical departments like Neurology, Nephrology, Gynecology, etc. have been considered.
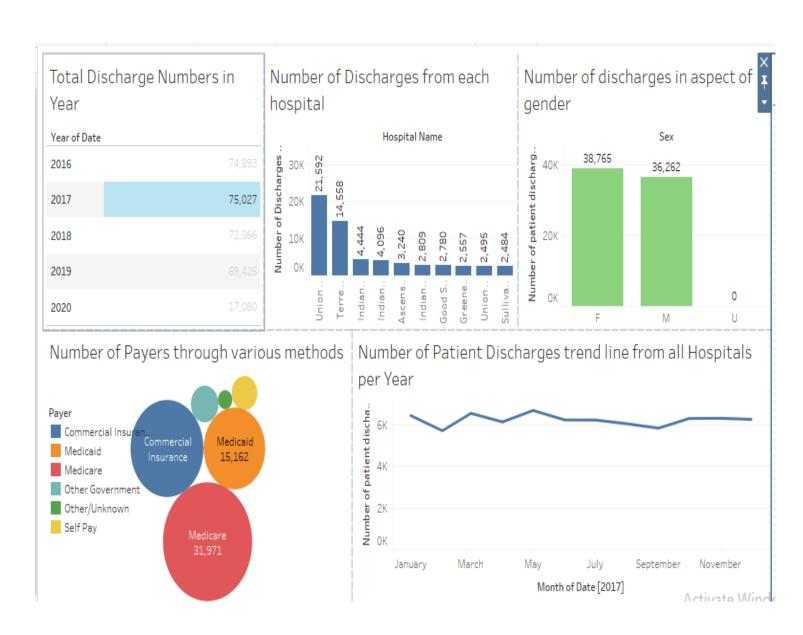

5. How many patients of different age groups got discharged from different hospitals across different years?

Below bar chart visualizes the patients who got discharged from different hospitals within different age groups. For instance, Union Hospital discharged 20992 patients in the age group of 55-6
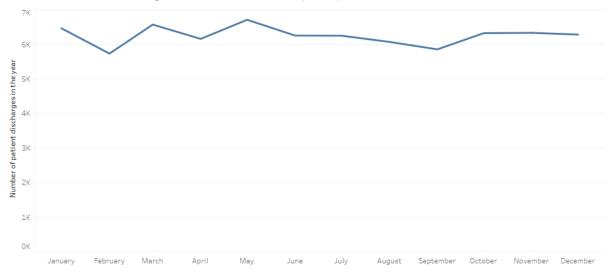
Dashboard: Below is the Dashboard I have created for the hospital data, where which shows the number of patients discharged each year from all 30 hospitals. One sheet in visualization shows the Number of patients discharges from each hospital in years and other sheets in the dashboard show the Number of patients discharges in the aspect of gender and how they have paid their bills in different categories. I have created a visualization of a line graph that gives the trend of patient data over time. I have used **action filters** in the dashboard which allows us to perform deep-level analysis by selecting the data of our interest. Action filters dynamically change all the other charts on the dashboard as per the filters. The trend line sheet is of the line graph and the gender of patients has been visualized as a bar graph and payment of bills through different categories has been visualized as a Bubble chart. Total Discharge Numbers in a year from all hospitals have been visualized using a Table chart and Total Discharge Numbers in a year from each hospital have been visualized using a Bar graph. All visualizations have been combined in a dashboard for relevant managerial decision-making.

Below is the trendline graph which shows the trend of patients discharges as per the selected data in dashboard.

Number of Patient Discharges trend line from all Hospitals per Year

Business Implications: This Analysis will help the customers to analyze the performance of all thirty hospitals in each business service line within the market. It also helps hospitals to take decisive actions based on performance. For example, we can see that Union Hospital is performing well in the cardiology business service line compared to other hospitals. Whereas Terre Haute regional hospital is performing well in the business service line of psychiatry. In terms of gender, Females are higher in the number discharged from all thirty hospitals rather than males. In terms of bill payments, most of the payments were paid through medical care.

Conclusion: I have analyzed year versus hospitals discharge data performance, the number of patients in aspect of gender discharged from various hospitals, number of patients who paid their bills through different payers. Also, I have analyzed the performance of various hospitals in terms of different business service lines. From this visualization, hospitals as an organization can take better steps to improve overall performance. This dashboard is event-driven whereby selecting data on any of the visualization, it dynamically displays the data related to the event. This dashboard helps organizations to analyze the hospital's discharge data very efficiently and effectively. For the line graph visualization sheet, the date calculated field has been created to visualize data of the month on columns.