

Western Governors University

D210 - Representation and Reporting

Krista Moik

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Part 1: Interactive Data Dashboard

Please see the attached Tableau dashboard titled: KMoikD210 Representation

Please also see the following link to the Tableau dashboard:

https://public.tableau.com/app/profile/krista.moik1597/viz/D210-Representation_17092230318320/Story1

A1: Data Sets

For this task, I used the WGU provided medical_clean data set and a 3rd party data set obtained via Kaggle: Hospital Admissions Data: Two Year Hospital Admissions and Discharge Data from Hero DMC Heart Institute (Sahani, 2022). While the datasets are not necessarily an apples-to-apples comparison, they have enough data and variables to satisfactorily complete this assignment.

I made sure both datasets were cleaned and reduced them to the variables I would be using in Tableau. Please see the attached ipynb and PDF documents titled: KMoikD210WGUcode and KMoikD210DMCcode.

The variables I will be using are Age, Area, Gender, Initial days, and Initial admission

Please see the attached CSV files of my final two datasets titled: KMoikD210_WGUmedical and KMoikD210_DMC for the WGU and 3rd party datasets used in this task. The attached CSV titled Original DMC data is the original dataset, prior to any cleaning or reductions.

A2. Installation Instructions

To maintain accessibility, my Tableau dashboard is available on Tableau Public, so viewers are not required to download or purchase any software to see or use the dashboard. Viewers do not need to install or purchase any software; they just need to click on the below provided link.

Here is the link to view the dashboard:

https://public.tableau.com/app/profile/krista.moik1597/viz/D210-Representation_17092230318320/Story1

A3. Navigation Instructions

Once the dashboard has loaded in Tableau, you will see an introduction page. This page provides information on what the dashboard is for, who created it, the datasets being used, and which variables we will be using Tableau to analyze and visualize.

Underneath the title section of the dashboard are captions with arrows. Once the introduction screen has been viewed, please use the right arrow button to scroll to the next story points, or pages.

The next story point is Review of Area and Hospital Admission. The top visualizations are using the DMC dataset, and the bottom visualizations are using the WGU dataset. On the left side of the page, there are 2 bar charts. The top chart shows how many Urban and Rural patients there are in the DMC dataset. The bottom chart shows how many patients live in an Urban, Suburban, and Rural area in the WGU dataset.

On the right-side top and bottom there are 2 Gantt charts. The top chart compares the number of initial days patients were admitted for based on admission type: Emergency or Operation from the DMC dataset. The bottom chart compares the number of initial days a patient was admitted for each admission type: Emergency, Observation, and Elective. There are 3 charts between the Gantt charts. The top ones provide a count of each admission type in the DMC and WGU data. The third chart below them provides the average number of days patients were admitted for at DMC and WGU. Looking at these visualizations, we can see that the DMC data set has more Urban patients, whereas WGU has an almost even distribution across area types. We can also see that as a whole, WGU patients were admitted for more days than DMC patients.

The third story point is titled Comparison of Area Demographics Using Calculations. This story point is laid out the same as the previous with DMC dataset visualizations on top left and WGU dataset visualizations on the bottom left. The top bar chart calculated the percentage of DMC patients that were admitted as emergency or operation per area the patient resided in – Urban and Rural. The bottom bar chart calculated the percentage of WGU patients that were admitted as emergency, observation, and elective per area the patient resided in – Urban, Suburban, and Rural. To the right of the DMC chart, there is a count of the number of patients in each area type in each dataset. By breaking down the percentage of patients per area by type of admission we can see that patients from DMC and WGU are almost evenly distributed for emergency and operation patients in urban and rural areas for the DMC patients, and Emergency, Observation, and Elective admissions for Urban, Suburban, and Rural areas for WGU patients. Understanding these demographics can provide real-world insights into staffing needs and even possibilities of satellite locations.

The fourth page is titled Gender Comparison of Emergency Admission Patients with Age and Initial Days. This story point is laid out the same as the previous with DMC dataset visualizations on top and WGU dataset visualizations on the bottom. The top plot is an interactive plot that breaks down the DMC emergency patients by gender (male and female) to compare ages and the number of initial days the patient was admitted for by area (urban and rural). The filter on the right of the plot allows users to filter by both Gender and Area to see how the data changes. The bottom plot is an interactive plot showing the breakdown of WGU emergency patients by gender (male, female, and nonbinary) to compare ages and the number of initial days the patient was admitted for by area (urban, suburban, and rural). The filter on the right of the plots allows users to filter by both Gender and Area to see how the data changes. Using the filters to change the different variables to see how the data changes and find insights we might not otherwise have seen.

The fifth story point is Additional Key Metrics to Observe. This story point is laid out the same as the previous with DMC dataset visualizations on top and WGU dataset visualizations on the bottom. The top scatterplot compares the age of DMC patients with the number of days they were admitted for. The bottom scatterplot compares the age of WGU patients with the number of days they were admitted for. Between the 2 plots, there is a chart that provides the average age of DMC and WGU patients. There are sliders for both plots that allow viewers to change the age and initial days to get a better look at

specific data points. Understanding relationships between patient age and admission days provides real-world usefulness to help determine staffing and equipment needs.

The final story point is my conclusion, which consists of a text box.

Part 2: Storytelling with Data

B. Panopto Storytelling with Data

The link for my Panopto video recording is:

<https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=d5deba04-c015-4467-ad13-b125014b1721>

Part 3: Reflection Paper

C1. Dashboard Alignment

Part of the needs outlined in the WGU-provided Data Dictionary is to identify trends and key metrics in order to provide actionable business insights. The dashboards included in my Tableau story analyze via comparison and visualization key metrics in order for me to provide insight into the data that can be used to make data-driven decisions. By comparing WGU patient information with DMC patient information, we can see where we are exceeding or falling short in certain areas. By understanding what a provider is doing well and what needs to be improved, data-driven decision-making can assist providers in making better decisions to improve experiences, increase profits, and meet other business goals.

C2. Additional Data Set Insights

By comparing similar metrics showing patient demographics and comparing it with admission types and days, I can gain insight to see how WGU compares with another provider and can see where WGU is doing well or where improvements may be needed. By visualizing the data, we can spot trends we might not otherwise see or know exist.

C3. Decision-Making Support

On the Review of Area and Hospital Admission story point, I created a chart that compares the counts of admission types. The DMC data set shows that emergency admission was over 3 times more common than operation admission. The WGU data shows that emergency admission was almost twice as high as admission rates for both elective and observation admission types. Additionally, the average number of initial days a patient was admitted for at WGU was over 34 days. In comparison, the average number of initial days a patient was admitted for at DMC was over 7 days, almost 1/5 as many initial days as WGU patients. This indicates that WGU may need to reconsider how the admission type is determined and what can be done to reduce the number of initial days a patient is admitted for.

C4. Interactive Controls

On the fourth story point titled Gender Comparison of Emergency Admission Patients with Age, Area, and Initial Days, the filter boxes on the right of each plot allows users to filter with which gender(s) is shown along with which area(s) to get a different view of how age and initial days are affected. On the fifth story point, Additional Key Metrics to Observe, there are 2 sliders on each plot to change the initial days and/or ages shows to get a better understanding of how the two datasets compare as well as how those variables compare with each other.

C5. Colorblindness

In order to make my dashboards colorblind-friendly, I used the Color-Blind palette provided within Tableau, which focused on using blues and oranges instead of red and greens (Tableau). I also made a point to use the same palette to maintain consistency and readability throughout the story.

C6. Data Representations

Explain how two data representations in your presentation support the story you wanted to tell.

On the fourth story point titled Gender Comparison of Emergency Admission Patients with Age, Area, and Initial Days, the scatterplots of the DMC and WGU can be manipulated to compare the Initial Days of admission with Area, Gender, and Age. By trying different filters, it becomes clear that WGU emergency admission patients, especially those in rural areas, are admitted for more days than DMC patients. The scatterplot clearly show that DMC has a higher density of patients with fewer initial days, indicating they are admitted for less days more often than WGU patients.

Additionally, on the fifth story point Additional Key Metrics to Observe, it is clear that WGU has more older patients than DMC as the plot is far denser across all ages. The scatterplots also show that WGU patients appear to be admitted for more days across almost all ages compared to DMC patients.

C7. Audience Analysis

With the data dictionary in mind, I tailored my presentation to what I believed the audience, hospital executives, would be interested in – learning more about the patients in order to improve processes, become more efficient, and eventually reduce costs/increase profits. I focused on the patient as it is the main unknown a provider faces. A provider can control the caliber of doctors and staff they employ, purchase the most high-tech equipment, and always have plenty of hospital beds available, but what they cannot control is what kind of patient, illness, injury, disease, etc. that walks in their door. Thus, I tailored my presentation to hospital executives to provide insights into past patients and how we can use that data moving forward to improve hospital processes.

C8. Universal Access

Not only did I maintain accessibility in terms of my color choices, but I also maintained accessibility via the medium. I chose to publish my dashboards and story via Tableau Public which allows free access to all users, whereas Tableau Desktop requires a paid subscription that may not be affordable to all viewers. Additionally, I chose to use clear, concise language in my text and visualizations with any abbreviations explained so anyone can view the data and understand what is being presented. I was also conscious of the colors used in terms of maintaining consistency to improve ease of understanding.

C9. Effective Storytelling

Two elements of effective storytelling that I used in my presentation were introduce the plot and present a conflict. Using advice from the LinkedIn learning course from Doug Rose, I used a variation of overcoming the monster plot-type to frame the story and personal anecdotes in presenting the conflict to gain the audience's interest (Rose 2017). By using these 2 elements together, I made a connection with the audience to get their attention and keep them engaged for the data I would be presenting to them.

D. Sources

Sahani, Ashish. (2022). *Hospital Admissions Data: Two Year Hospital Admissions and Discharge Data from Hero DMC Heart Institute*. Kaggle.

<https://www.kaggle.com/datasets/ashishsahani/hospital-admissions-data>

Tableau. (2016). *5 Tips on Designing Colorblind-Friendly Visualizations*. Tableau.

<https://www.tableau.com/blog/examining-data-viz-rules-dont-use-red-green-together>

Rose, D. (2017). *Learning Data Science: Tell Stories with Data*. LinkedIn Learning.

<https://www.linkedin.com/learning/learning-data-science-tell-stories-with-data/welcome?resume=false&u=2045532>

E. Professional Communication