Data Representation and

Reporting – D210

Task 1

Western Governor’s University

Performance Assessment

Matthew Morgan

Student ID: 010471280

5/11/2023

A1:

Both data sets are included in the submission

A2:

No directions are needed. The dashboard is available on Tableau Public, and the link is below.

[Link to Tableau Public Dashboard](https://public.tableau.com/app/profile/matthew.morgan8475/viz/D210Task/Story1?publish=yes)

A3:

To navigate the dashboard you can click on one of the 4 cards at the top, or the arrows on the left and right side of the cards. Directions for further navigating the dashboard are provided on the dashboard itself.

B:

<https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=4190bd24-59bf-4d93-b2a7-afff01666204>

C1:

The dashboard I designed compared the patient demographics between the WGU dataset and the the CDC NHANES dataset. The WGU dataset is limited in the information it provides when compared to the CDC dataset. Because of this, I was limited in what visualizations I could provide on the dashboard when comparing the two datasets.

The WGU data set is given with the goal of trying to find ways to reduce patient readmissions. In the data analysis that has been done in previous classes I was able to successfully tie a few variables to patient readmissions, however, most of these factors weren’t applicable to a comparison between the outside dataset chosen.

The CDC dataset is provided through a questionnaire administered to patients by employees and contains a ton of data the needed to be sifted through and cleaned. Even with all that provided data, only a minimal amount was applicable to this project.

Ultimately, the dashboard I provided for this assignment provides a meta-analysis of the patient demographics between the two datasets. When comparing the patient demographics, you can immediately see a large discrepancy between the mostly fictitious WGU data, and the real-world data provided by the CDC.

Admittedly, the dashboard provided doesn’t necessarily address the overarching goal of trying to reduce WGU patient admissions. However, it does provide some insights into other factors that could potentially prove useful. Those factors being general patient demographics such as age, gender, marital status, and how many children are in a family. I also provided visualizations to show how prevalent diseases are for different age groups as well as the rate of those diseases among the two patient populations.

Just looking at the quick snapshot I provided it’s easy to see that there are some vast differences between the two populations. The WGU patients are much more likely to be older, have more children, and are much more likely to be diagnosed with Asthma, Diabetes, High Blood Pressure, or being Overweight.

C2:

The second dataset I used for this assignment was the 2012-2013 CDC National Health and Examination Survey (NHANES) found here, <https://www.kaggle.com/datasets/cdc/national-health-and-nutrition-examination-survey>. This dataset was chosen for a couple of reasons.

The CDC dataset is real data from citizens of the United States. This can help provide context when used in conjunction with the WGU dataset. When initially exploring and analyzing the WGU dataset, it’s easy to find univariate and bivariate stats. But without something to compare it to, drawing conclusions about what’s common or uncommon can’t be explored.

The CDC dataset also provides numerous datapoints that can serve as a direct comparison to the WGU dataset and allow us to glean deeper insights about the WGU patients. These variables include age, gender, number of children, asthma, diabetes, high blood pressure, overweight, and marital status.

Being able to make these direct comparisons and provide some context for the WGU data and patients allows us to make recommendations for the hospital systems that WGU data comes from. Because there is such a greater prevalence of comparable diseases we can make recommendations to provide more services and put more resources into helping patients manage and overcome those diagnoses.

C3:

In the story provided through tableau there are two dashboards which contain visualizations. The first run is an overview of patient demographics, while the second provides a snapshot of patient KPIs.

The first dashboard with patient demographics specifically shows the number of patients by age in 2-year groupings, how many children the patients have, their gender, and their marital status. This provides insights into patients and their living situation. This can be used to determine which dataset contains older or younger people, married or single people, and how many children patients have.

The second dashboard contains patient KPIs. I included the total count of Asthma, Diabetes, High Blood Pressure, and Overweight patients by 5-year age groups. As well as the total percentage of patients diagnosed with those conditions. This can help us see just how prevalent these disease states are in each population. This visualization shows us that the WGU patient population has a much higher occurrence of all four of these conditions.

C4:

I implemented two filters throughout the dashboards that allow for user control of the dashboard. These are Gender and Marital Status. This allows the user complete control over how to look at the different populations. On top of that each visualization can filter the other visualizations within that dataset. For example, if you select a specific age group in the WGU Data, it will filter the other visualizations for the WGU data for that age group.

The Gender filter allows users to filter all the data for Male, Female, and Nonbinary. The Nonbinary designation is only useful for the WGU data as the CDC data didn’t have a nonbinary option.

The martial status filter has five different options including Married, Never Married, Widowed, Divorced, Separated. This allows a user to filter all data on the dashboard for patients who are one of those designations or any combination of those.

C5:

To ensure that my dashboard is accessible to individuals with colorblindness I made sure to choose the color-blind pallet within tableau for the pie charts and histograms. Other than that, everything else was kept on a grey scale color palette. I carefully chose colors within the color-blind palette to provide enough contrast so it’s accessible by any color-blind users.

C6:

The two visualizations I want to focus on are within the patient demographics dashboard. The first one being patient age and the second being the distribution of marital status. When building visualizations for these datasets these were two of the first things that jumped out at me.

The WGU dataset does not include any minors, while the CDC dataset does. However, the CDC dataset considers anyone over the age of 80 as 80, whereas the WGU dataset does not. When look at the patient age visualization it’s clear that the WGU patient base is much older than a general patient population would be based on the CDC data. Because there is such a large skew towards older patients this can help decision makers to allocate appropriate resources for geriatric services and care.

The distribution of marital status between the WGU and CDC datasets jumped out to me as well. In the WGU dataset that’s an even distribution between the five unique martial status choices available. Whereas in the CDC dataset almost half of those surveyed were married, and the other half was a combination of the other four variables on the dataset. This is another way in which we look at the uniqueness of the WGU patient population and the challenges faced by the hospital system for improving patient outcomes.

Overall, the focus is that the WGU dataset on its own doesn’t tell us much. However, when compared to the CDC dataset we can see the specific problems that WGU patients face at large. The WGU patient population is unique and not anywhere near the “average” now that we can compare them to a different dataset.

C7:

According to the WGU data dictionary supplied with the assignment the audience consists of two people and one group. Those people are the Senior Vice President of Hospital Operations (SVP) , the Vice President of Research (VP) , and a panel of Regional Vice Presidents (Regional VPs).

The SVP oversees operations across all hospital locations, is responsible for developing new initiatives to improve patient outcomes based on observed trends and is interested in patient outcomes based on demographics. My dashboard is targeted for the SVP so show the demographics of patients we are dealing with and how they are disproportionately older, have more children, and have more adverse health conditions. I am sure the SVP would have a great interest in knowing that we have an atypical patient population and will want to start working on initiatives to help these patients receive better outcomes.

The VP oversees research initiatives to identify patterns in patient care and drive improvements in patient outcomes through strategic initiatives. This lends itself very well to the KPIs that I put together on the dashboard. The VP can begin research on why our patients have disproportionate health conditions as well as ways to improve their outcomes in the hospital system.

The Panel of Regional VPs consists of every Regional VP across the organization, and each is responsible for executing policies and managing operations in conjunction with the SVP. This makes the patient demographics dashboard especially important for this group. Because they are responsible for executing policies it would be assumed that they would be in control of resource allocation at each hospital. Armed with this knowledge they can help shift resources to help the large population of patients who are affected by the conditions mentioned.

All in all, the dashboard and story presented was designed with these people and groups in mind to help the health system strategize how to allocate resources to help patients and start researching how they can help this population of patients the best.

C8:

There is universal access to this presentation for a couple of reasons. The main reason is that the dashboard is available on Tableau Public. This makes it to that anyone with the link can access it. There is no need to use any software, extract a bunch of files into a directory to rebuild the dashboard, or follow any instructions. I also covered in C5 how the dashboard is viewable by color-blind users as I used Tableau’s color-blind specific color palettes.

C9:

I found a great resource on effective data storytelling from Microsoft’s documentation for PowerBI (Power BI Team, 2023). As stated in their documentation there are three primary elements of storytelling in data: narrative, visuals, and data. When exploring the data and deciding what story I wanted to tell with the data I tried to focus on the main conclusion that the WGU patients are not typical when compared to the CDC data which should represent an average American population. The narrative I tried to focus on is that WGU patients are facing many obstacles in their pathway to recovery and good health.

Regarding visuals, I tried to create a few different styles of visualizations to get comfortable with the software as well as provide an approachable dashboard for anyone to see the narrative that I’m focused on. I feel that the variety and layout of the visuals makes it easy to see a snapshot of the patients that WGU has in their dataset.

Finally, the data is really the nuts and bolts of this whole assignment. The basic visualizations were necessary because the data was simple. Because of this, there wasn’t much data analysis to be done. However, there was a lot of data to compare. The data drove all the decisions behind the narrative and visualization portion to effective storytelling. If it wasn’t for my previous assignments where I learned EDA, data cleaning, and data acquisition I would have had a very hard time figuring out where to go on this assignment.

D:

Team, Power BI. “What Is Data Storytelling and Data Storytelling Examples: Microsoft Power Bi.” *What Is Data Storytelling and Data Storytelling Examples | Microsoft Power BI*, 2023, powerbi.microsoft.com/en-us/data-storytelling/.