**D210 Task 1**

**Reflection Paper**

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Representation and Reporting-D210

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# 1. Explain how the purpose and function of your dashboard align with the needs outlined in the data dictionary associated with your chosen data set.

The scenario for the medical data set states that I have been "asked to build a data dashboard to enable executive leaders to explore the data, identify trends, and compare key metrics" for a hospital chain to evaluate patient data for readmission insights. The dashboard I created includes the 10,000 patient files from the hospital chain and 2018 readmission data from the Centers for Medicare and Medicaid Services (CMS). It allows the user to explore the readmission rate by state, age, gender, length of stay, medical conditions, and total charges. The CMS national data provide rates for comparison by age, gender, and state.

At the top of the dashboard, there is a summary of our patient data by the number of patients, the number of those patients readmitted, the readmission overall rate, and the rate by gender and age group. All these statistics update with filter selection throughout the dashboard. If a user selects diabetes, the numbers show only patients with yes in the diabetes field. CMS data by overall rate, gender, and age are to the right of the hospital data for comparison and will filter by state. Four visualizations represent the readmission data for the initial length of stay (LOS), total charge, medical conditions, and state. Using this information, users can look for trends and patterns of readmitted patients and see how the hospital chain is measuring up against other hospitals.

# 2. Explain how the variables in the additional data set enhance the insights that can be drawn from the data set you chose from the provided options.

CMS maintains statistics for all hospitals in the United States. The data set I choose lists readmission rates for each state broken down into age groups and gender (CMS, n.d.). Comparing rates matched for the state, age, and gender provides insight into our hospital chain's performance compared to other hospitals.

# 3. Explain two different data representations from your dashboard and how executive leaders can use them to support decision-making.

One of my visualizations is a bar graph of the length of stay (LOS) for patients with a line graph superimposed showing readmission rates as the LOS changes. As users select filters, it changes to reflect the choices. For instance, a user can look at the rate by LOS for all females aged 65-74 with diabetes. This allows users to identify the demographics of patients with higher LOS and readmission rates. This information supports efforts to develop protocols and management plans for patients with a higher risk of readmission.

A second visualization shows a scatter plot of LOS and total charges with the dots shaded by readmission. It reveals a positive linear relationship between LOS and total charges as well as correlation at the higher end of both with readmission. It also adjusts with all filters. It demonstrates the additional cost of higher LOS and readmitted patients and further supports decision-making by showing the opportunity to reduce costs with reduced LOS and readmission.

# 4. Explain two interactive controls in your dashboard and how each enables the user to modify the presentation of the data.

One type of interactive control in my dashboard is the ability to filter by clicking on any of the visualizations to filter all the other visualizations as well as the KPI display. The map, for instance, will change all outputs to data for one state when the user clicks on a state.

A second interactive control is drop-down lists to filter for medical conditions. They filter all visualizations and the KPI display, as well. The user can choose yes, no, or all for each medical condition in any combination. For example, diabetics with high blood pressure or diabetics without high blood pressure.

# 5. Describe how you built your dashboard to be accessible for individuals with colorblindness

To make my dashboard accessible for color blindness, I choose the color-blind tableau palette. I then used an online simulator to evaluate it for all forms of color-blindness (Colblindor, 2016).

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

I made a bar graph with the count of patients for each of the eleven medical conditions included in the data set and colored them by readmission. It clearly shows no difference in readmission rate by the medical condition. There is no predictive value in the current data set's medical history entries. One of the recommendations I make is to explore more insightful medical history to add to data collection that might improve prediction accuracy.

I also incorporated a set of bar graphs that shows rates by gender and age groups for both our data and the CMS data. It demonstrates how our readmission rates are twice the CMS rates. It drives home the need for reducing our readmission rates and demonstrates no significate difference in our rates among the age and gender groupings.

**7. Explain how you used audience analysis to adapt the message in your presentation.**

Since the audience was my data peers and not the stakeholders, I first discussed what hospital readmissions are and how they impact the stakeholders. After defining readmissions, I gave a brief overview of the CMS reimbursement reduction program and its implications. I started the data review with a comparison of our rates with CMS to illustrate the urgent need to reduce readmissions as our rates are at least twice as high across states, gender, and age. Next, I presented our data and pointed out the lack of correlation of any of the current data categories with readmission except for LOS and total charge. Finally, I made recommendations on how to collaborate with the stakeholders to improve data collection to enhance our ability to use data to support their efforts to reduce readmissions (Nussbaumer, 2015).

**8.  Describe how you designed your presentation for universal access by all audiences.**

After making my presentation I ran my visuals through the color-blind simulator. I also used as large of a font as was practical as well as providing digital copies for participants to use on their own devices. For blind participants, I made a point to thoroughly explain each visual. In a real-life scenario, had there been a hearing-impaired member of the team, I would inquire from our employer about providing a sign langue interpreter. The Panopto video also can add captioning after recording (Bugstahler, 2022).

**9.  Explain two elements of effective storytelling that you implemented in your presentation and how *each* element was intended to engage the audience.**

One element I used was including pictures of patients in medical settings to give context to my technical audience of the medical reality of what was at stake with the numbers we were discussing. A picture of a patient that appeared to be in serious condition represents readmissions and a happy patient with a family member leaving the hospital represents improved patient outcomes. I included a story of a hypothetical patient who had developed pneumonia two weeks after being discharged from the hospital after his hip surgery. I wanted to create an image in the mind of the audience connecting the data to a human being that would be motivational. They could picture themselves or their loved ones in the same situation.

Another element I used was to choose the most effective visualizations. When comparing data from the two sources I color-coded our results in orange and CMS in blue to easily differentiate the source. I converted four tables from the dashboard into bar graphs to contrast the differences more explicitly. The scale of the charts was uniform and zero-baselined to factually represent the data (Nussbaumer, 2015).

**References**

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