**Part 1: Interactive Data Dashboard**

A copy of the public dashboard will be provided in the package of files for inspection. A link is listed here as well to reach the public dashboard, [Medical Data By Patient D210-T\_Austin](https://public.tableau.com/views/D210Tableau_17224505521040/Story1?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link).

The page in Tableau includes 3 dashboards, that integrate two different datasets.

* + The medical\_clean dataset provided in the course
  + Patient Records dataset from [Kaggle.com](https://www.kaggle.com/datasets/notnihao/patient-records) (Notnihao, n.d.)

Both datasets as well as step by step instructions are separate attachments that will be provided**.**

**Part 2. Storytelling with Data**

The below link to Panopto provides a video recording of the story of the data.

<https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=742c6854-f76c-42eb-b334-b1c4000e669a>

**Part 3: Reflection Paper**

**C1: Dashboard Alignment with Needs**

As part of the analysis needed for Executive Leaders with XYZ hospital, there have been two datasets broken out into several data representations to aid in decision making. First, the medical\_clean dataset focuses on predicting readmission of patients who have been previously hospitalized. Moving further with the data analysis provided an opportunity to broaden the scope and look at where patients were being treated, co-morbidity factors aligned with costs of hospitalization. The second dataset aligns more with smoking status and BMI of patients. Both datasets provide information around costs of hospitalization. The goal of this data analysis is to help Executive Leaders use healthcare dollars in a way that provides the best patient outcomes.

Working with the two above mentioned datasets, three dashboards were created and are presented in one story page for ease of navigation. Dashboard one is labeled “Information for Executive Leaders” and provides basic information about the datasets such as age of patients and specific characteristics of each dataset that are the overarching factors present in the data. This will allow the Executive Leaders to get a high-level view of patient demographics around age and health issues that were researched. Dashboard two is broken down by region of the United States and gives information on trends about each region such as admission type, gender, and doctor visits while admitted as well as bringing in Age, BMI and smoking status. Dashboard three breaks down the cost of healthcare for patients with the conditions examined in the datasets.

**C2: Justification of Additional Data Set**

The initial data set provided, medical\_clean, gives data on patients and their health conditions as well as type of admission, cost of admission, length of stay and basic demographics. While this data can support and provide information to our Executive Leaders on how to best use the healthcare dollars available, more information is always welcome to aid in decisions.

An additional dataset around patient records that adds some higher level geographical information as well as focusing on two major health issues and their costs for patients adds value to the initial dataset to add in the decision making.

The [patient records](https://www.kaggle.com/datasets/notnihao/patient-records) dataset (Notnihao, n.d.) provides seven variables:

* ID
* Age
* Gender
* BMI
* Smoker
* Region
* Cost

Adding analysis from these variables to highlight two of the major health crisis in the United State, BMI and Smoking, gives our Executive Leaders a way to see not only readmission rates and costs for various co-morbidities but according to Dare, Mackay, and Pell (2015) these are two of the most significant health challenges globally. Executive Leaders will need significant data going forward to address how to best care for patients overall.

**C3: Explanation of Data Representations**

The dashboards provided give several options for data visualization. One visualization which is meaningful in aiding decision making is around the age of patients from the dataset. Looking at various age groups and their health issues can provide meaningful options on if preventive care may be something hospital administrators need to focus on to combat the most significant health issue. After looking at the age/condition data provided on dashboard one, using dashboard two to further dissect the data will provide a region by region view of our healthcare. Systems that are in multiple regions may see that they need one focus in one region and a different focus in another. And finally, dashboard three gets to the meat of the conversation by putting dollars to diseases, so to speak. Seeing if the cost of an average hospital stay based on multiple conditions versus just smoking status gives administrators a wealth of information to then determine how to best care for patients not just today but as patients age.

**C4: Explanation of Interactive Controls**

To work with the visualizations fully provided possible, several interactive controls are provided. If you want to see the number of patients in each age range outlined on the bar as well as the average age of the group, then hover over each bar and a tooltip is provided with information. You can also select one of the age groups on the bottom graph and/or the smoking status on the top graph to see how many patients in each age group fall into each category.

Additionally, dashboard two provides a way to see each of the data points analyzed by a region. This will be useful in seeing how regions compare on smoking status by age, gender, BMI. This visualization is interactable to be used for filtering and highlighting as well. The options for age via a slider bar as well as options to choose a singular smoking status versus all statues.

And on dashboard three, there are data points provided in graphical form around the cost of medical issues and how these health factors can stack up to an enormous of amount of resources used if patients aren’t fully treated on their initial hospitalization.

**C5: Colorblindness & Accessibility**

To ensure that stakeholders with visual impairments such as colorblindness are able to see the richness of the data visually, Mol (2023) states in their article “Painting with Inclusivity: Color Choices in Tableau for Addressing Colour Blindness” that using the Tableau built-in color-blind palette providers the needed color combinations for this. Being able to not only see the numbers but use the colors to visualize the amount of people that are smokers or have a higher BMI quickly can be invaluable.

**C6: Data Representations & Data Story**

Two data visualizations that support the story that I wanted to present in my data analysis are smoking and how it affects our healthcare dollars as well as how BMI and other co morbidity factors along with smoking contribute to the cost to a patient for their hospital stay. Looking at patients in each age group in the co morbidly graph and then seeing how many patients in the Smoking/BMI graph fall in the same range and if they are smokers or not tells a story of our nation and our peoples health.

Seeing data around each region of the country and how they compare by gender on smoking status in relation to BMI is an invaluable way of seeing whether the executive team needs to adjust how resources are allocated around the country. Seeing that the Northwest region has a significantly lower BMI across all age groups and smoking statuses than the Southeast identifies that there may be ways to bring down the instance of overweight health issues by targeting that region with more education around smoking. On dashboard two selecting the region and seeing the difference in BMI numbers and/or smoking status gives our SVP as well as our Regional VPs a way to discuss how each region is doing and what one region may be doing that another isn’t to curb the skyrocketing costs to patients around their health issues.

On dashboard three our Vice President of Research can see how reducing the number of co-morbidity factors can help lower the cost for healthcare as well as how initiatives around smoking cessation are working overall based on cost of hospital stay.

**C7: Audience Analysis**

Targeting specific visualizations to each or multiple parts of our executive team can help overall in the needed crossover of data between all stakeholders. Ko and Chang (2017) state that data visualizations are an intuitive way for users to easily read and understand data. It can help improve the quality of policies or services by presenting an integrated view and evidence for making healthcare decisions they go on to add.

Providing each set of users not only data they can easily ingest but also visualizations that can be shared above and below them to help all parties understand how urgent the changes to make will be to healthcare.

**C8: Universal Access**

Along with the considerations described in section C5 for colorblind users, this data story provides an easy way for users to see and share information. Using Tableau public allows for less cost on the hospital in terms of licensing for Tableau as well as portability of the data to any location that has internet access.

**C9: Elements of Effective Storytelling**

Today’s world runs on numbers, however, just seeing numbers doesn’t resonate with everyone. Ginsberg (2024) states that since data is at the heart of business operations and decision making, storytelling with data visualizations provides a more engaging way to convey that boring numbers driven information.

Taking that one step further, Mannon (2018) stated that data isn’t memorable on it’s on, people remember 5% of statistics but 63% of the story if it is told visually. That is a huge difference and speaks volumes to the elements of effective storytelling.

The data, narratives, and visuals all combine to weave a story with the numbers that provides insight, supporting facts and helps to define next steps also according to Mannon (2018). Just as with a good book, you don’t need the pictures to see what is occurring, an effective story in Tableau allows you to not have to gloss over pages and pages of statistics to get the answers you seek.

**D1: Source References**

Dare, S., Mackay, D. F., & Pell, J. P. (2015). Relationship between smoking and obesity: A cross-sectional study of 499,504 middle-aged adults in the UK general population. *PLOS Medicine, 12*(4), e1001794. <https://doi.org/10.1371/journal.pmed.1001794>

Ginsberg, C. (2024, June 6). The importance of storytelling in data visualization. *Noble Desktop*. <https://www.nobledesktop.com/classes-near-me/blog/storytelling-in-data-visualization>

Ko, I., & Chang, H. (2017). Interactive visualization of healthcare data using Tableau. *Healthcare Informatics Research, 23*(4), 349-354. <https://doi.org/10.4258/hir.2017.23.4.349>

Mannon, N. (2018, May 29). Persuasive storytelling with data visualization. *Blast Analytics*. <https://www.blastanalytics.com/blog/persuasive-storytelling-with-data-visualization>

Notnihao. (n.d.). Patient records [Data set]. Kaggle. Retrieved August 2, 2024, from <https://www.kaggle.com/datasets/notnihao/patient-records>