D210 – Representation and Reporting

Performance Assessment – NAM3 Task 1: Data Dashboard and Storytelling

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April 2025

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D210: Representation and Reporting – TASK1

Part 1: Interactive Data Dashboard

A1. See the attached interactive Tableau dashboard: **Medical_MR_Dashboard.twbx and link** Medical_Dashboard

A2. See attached *both* data sets: (1)WGU: final_medical_clean.csv (2) External: final_NHANES_clean.csv

1. WGU Medical Readmission Dataset – This dataset contains demographic and diagnostic information from over 10,000 patients, focused on identifying patterns associated with hospital readmissions. The dataset is used in a simulated healthcare setting as part of WGU's data analytics curriculum.

2. Kaggle: CDC/NHANES Dataset– A nationally representative dataset with approximately 6,113 patients, capturing demographic and health condition data across the U.S. population. The National Health and Nutrition Examination Survey (NHANES) is a program of studies designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. The NHANES interview includes demographic, socioeconomic, dietary, and health-related questions. The examination consists of medical, dental, and physiological measurements and laboratory tests administered by highly trained medical personnel.

A3.

No installation is required. Users or evaluators can access the dashboard by opening the provided link or by this Medical_Dashboard in any modern web browser, such as Google Chrome and Safari. This enhances accessibility, eliminating the need for complex technical steps or costly software. Whether someone wants to follow the narrative I present or explore the data independently, the dashboard is easy to use and widely available.

A4.

Accessing the dashboard is easy—click the provided link Medical_Dashboard and open it in any modern web browser. The interface includes three labeled sections at the top, functioning like tabs to help you navigate the story efficiently. Here's how each of the three sections works and what kind of data you'll find inside:

1. **Understanding Our Patients**

This interactive dashboard highlights patient demographics within the WGU Hospital System, compared to national CDC data (NHANES).

What You'll See:

•Gender Distribution: The WGU dataset includes 10,000 patients, with a nearly even gender split—about 48% male, 50% female, and 2% nonbinary. The CDC dataset includes ~6,100 patients, with a slightly higher percentage of females (52%).
•Marital Status: WGU has a more evenly distributed marital profile, with all categories (divorced, married, never married, etc.) represented in the 1,900–2,000 range. The CDC data shows a heavier tilt toward "married" patients (~2,965).
•Number of Children: Most WGU patients have 0–2 children. The CDC data shows a sharper drop-off in families with 3+ children.
•Age Distribution: Patients range from age 19 to 80. Use the age slider below the age chart to focus on specific age ranges and see how that affects all demographic charts.

How to Interact:

•Use filters in the lower right to explore by age, gender, or marital status.
•Click directly on visuals (e.g., "Female" in the pie chart) to isolate data and update all views accordingly.
•Clicking the same item again will reset the filter.

2. **Health Condition KPIs**

This dashboard compares severe health conditions in the WGU and CDC datasets, including:
•Stroke
•High Blood Pressure
•Overweight/Obesity

What You'll See:

•Each KPI shows diagnosis rates, while adjacent heatmaps display raw patient counts by age group.
•For instance, stroke cases spike in older age brackets, with WGU patients aged 80 showing over 100 stroke cases—compared to much lower numbers in CDC data.

•WGU reports a 150% higher total patient volume than the CDC (~10,000 vs. ~6,100), contributing to higher condition counts but also reflecting differences in population characteristics.

Filters:
•Top-right controls let you filter by age, gender, and marital status to explore subgroup trends.

3. **Summary**
This tab provides a non-interactive summary of key findings and recommended actions based on my patient demographics and health conditions analysis.

Part 2: Storytelling with Data

B. **Please see link** https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=a3029b97-843f-46e1-ad97-b2c50113de7d

Part 3: Reflection Paper

C1. Explain how the purpose and function of your dashboard align with the needs outlined in the data dictionary associated with your chosen data set.

My dashboard aims to help compare and analyze medical or health population trends between CDC and WGU medical datasets, focusing on understanding how demographic characteristics relate to key health conditions. It is designed to provide clear visual insights into **gender** distribution, **age**, **marital** status, and **household structure** and how these factors align with conditions such as **stroke**, **high blood** pressure, and **overweight** rates.

The dashboard includes interactive charts and filters, allowing users to explore patterns by age group, gender, and marital status, making it easier to identify high-risk groups or unusual trends (e.g., higher stroke rates in the WGU population). This aligns with the data dictionary definitions, where fields like **Age**, **Gender**, **Marital**, and health conditions (**Stroke**, **High Blood**, and **Overweight**) are clearly outlined in terms of their meaning and use. For example, the data dictionary specifies age in numeric values and gender as categorical (e.g., Male, Female, Nonbinary), which the dashboard accurately reflects through filters and color-coded visualizations.

Additionally, the health KPIs are displayed with calculated percentage rates based on the counts in the dataset, aligning with the metric definitions described in the data dictionary. This ensures that the dashboard not only visualizes the data but does so in a way that honors the dataset's structure and intended use.

C2. 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.

The primary dataset I used was the medical data provided by WGU. This file includes detailed patient-level information such as **age**, **gender**, **marital** status, **number of children** in the household, and diagnoses related to **stroke**, **high blood**, and overweight. This dataset allowed for in-depth analysis of a specific patient population, offering insight into demographic and health condition trends within the WGU data scope.

To enhance this analysis, I integrated an additional dataset from the CDC. While the CDC or NHANES datasets from 2013-2014 included similar variables, they represented a broader, national-level population. I could contextualize the WGU medical data and identify notable differences by comparing these two datasets. For example, stroke and overweight rates were significantly higher in the WGU dataset, which may indicate unique risk factors or care gaps in that population.

Additionally, the CDC dataset provided a useful external benchmark to validate trends or highlight outliers. Comparing demographic breakdowns—such as gender, age groups, and marital status—between the two sources added depth to the analysis, making it easier to spot patterns or disparities. Without the CDC data, these insights wouldn't have been as apparent.

In summary, the CDC dataset enriched the dashboard by adding a comparative layer, helping to reveal strengths, weaknesses, and areas for further investigation in the WGU's medical dataset or patient population.

C3. Explain two different data representations from your dashboard and how executive leaders can use them to support decision-making.

Two distinct data representations from the dashboard—located in the "Understanding Our Patients" and "Health Condition KPIs" tabs—offer valuable insights that can inform executive-level decision-making.

The first representation in the "Understanding Our Patients" tab is a side-by-side pie chart comparing gender distribution across the CDC and WGU datasets. This visualization allows leaders to identify demographic patterns and recognize the inclusion of nonbinary individuals in WGU's data, which is absent in the national dataset. This inclusive data collection can guide executive decisions around equity in care delivery, ensuring that programs and policies are responsive to the full spectrum of gender identities in the patient population.

The second representation, located in the "Health Condition KPIs" tab, is a diagnosis heatmap that displays the count of patients diagnosed with specific health conditions (e.g., stroke, obesity, hypertension), segmented by age group and dataset. This visual enables leaders to pinpoint age ranges where critical conditions are most prevalent, especially compared to national benchmarks. For example, a significantly higher stroke rate among WGU patients aged 70–80 may prompt the organization to implement targeted screening or preventive care initiatives for older adults.

Together, these visualizations equip executive leaders with the demographic and clinical context necessary to allocate resources more effectively, develop inclusive health programs, and set strategic priorities based on population needs.

C4. Explain two interactive controls in your dashboard and how *each* enables the user to modify the presentation of the data.

One interactive control in my dashboard is a slider filter for age. This allows users to narrow the dataset to a specific age group—for example, viewing only patients between 18 and 80. By adjusting the age range, users can observe how health conditions like stroke or overweight vary across life stages. This helps executive leaders identify which age groups may be most at risk and tailor preventive care or wellness initiatives accordingly.

Another interactive control is a filter for gender. Users can select from male, female, or nonbinary options to filter all visuals in the dashboard based on gender identity. This control helps uncover differences in health outcomes between genders, enabling data-driven decisions around gender-specific health programs or resources.

Another control is a dataset toggle button that allows users to switch between the WGU medical and CDC datasets. This comparison tool enables users to instantly change the context of the charts and view how the same health conditions differ between the internal WGU data and the national CDC data. It enhances the dashboard's flexibility and allows executive leaders to benchmark WGU trends against broader population statistics.

C5. Describe how you built your dashboard to be accessible for individuals with colorblindness.

To ensure my dashboard is accessible for colorblind individuals, I intentionally used colorblind-friendly palettes that rely on high contrast and distinguishable hues rather than red-green or other problematic combinations. I avoided using color as the sole means of conveying information and included labels, icons, and tooltips to reinforce meaning where color is used.

Additionally, I tested my visualizations using a colorblind simulator to preview how they would appear to users with different types of color vision deficiency. This helped ensure that all key insights and comparisons would remain visible and interpretable regardless of color perception.

During this process, I used 5 Tips on Designing Colorblind-Friendly Visualizations, Color Brewer 2.0, and How To Use Color Blind Friendly Palettes in Your Design as helpful resources. They provide pre-made,

colorblind-safe palettes designed explicitly for data visualizations. They also allow filtering by colorblind safety, print-friendly formats, and screen readability.

C6. Explain how two data representations in your presentation support the story you wanted to tell.

Two data representations in my presentation are significant in supporting the narrative of demographic awareness and health condition disparities within the WGU's medical and CDC datasets.

The first is the gender distribution pie chart from the "Understanding Our Patients" dashboard. This visualization illustrates the representation of male, female, and nonbinary patients in both the WGU and CDC datasets. It emphasizes WGU's inclusive data practices and highlights demographic differences that may influence delivering healthcare services. This directly supports the story I wanted to tell about the importance of understanding who our patients are—not just in terms of medical conditions but also in terms of identity and representation.

The second is the diagnosis heatmap from the "Health Condition KPIs" tab, which visualizes the number of patients with stroke, obesity, and high blood, broken down by age group and dataset. This chart supports the broader narrative of identifying urgent health risks and population-specific vulnerabilities. By visually comparing WGU's higher incidence rates—especially among older age groups—with national benchmarks, the dashboard reinforces the need for targeted intervention strategies. Together, these visualizations create a compelling story about who the patients are and what health challenges they face, laying the groundwork for data-informed action.

C7. Explain how you used audience analysis to adapt the message in your presentation.

I conducted an audience analysis to understand better the priorities of executive healthcare leaders, who are the primary audience for this presentation. I recognized that this group values clear insights, data-driven comparisons, and actionable trends that can inform strategic decisions about health programs and resource allocation.

To adapt my message, I focused on presenting high-level findings from the WGU medical dataset and CDC dataset in a way that highlights patterns and potential areas of concern—such as elevated stroke and overweight rates in specific populations. I used simple, clean visuals, limited technical jargon, and included key takeaways on each slide to keep the message focused and relevant.

Additionally, I emphasized comparisons that would matter to leadership, such as how WGU data aligns with national trends. This approach made the story more relatable and practical for decision-makers who need quick, reliable insights to guide policy or program development.

C8. Describe how you designed your presentation for universal access by *all* audiences.
I designed my presentation in the Tableau dashboard with universal access in mind, ensuring that it could be easily understood and navigated by a wide range of audiences, including those with varying levels of data literacy and accessibility needs.

To support visual accessibility, I used colorblind-friendly palettes and avoided using color alone to convey meaning. I incorporated labels, tooltips, and text overlays to ensure all key information is readable. I also chose high-contrast text and background combinations for clarity and legibility.

I kept the layout intuitive for users unfamiliar with data dashboards. I used simple chart types (bar charts, pie charts, stacked charts with heat maps, and labeled KPIs) and included clear titles and captions to explain each visual. Interactive controls like filters for age and gender were clearly labeled and easy to use, making the experience inclusive for non-technical users.

In addition, I published the dashboard via Tableau Public, making it accessible online without requiring a login or subscription. This open access ensures that stakeholders and the general public can explore the data insights freely and at their own pace. Click link Medical_Dashboard

C9. Explain two elements of effective storytelling that you implemented in your presentation and how *each* element was intended to engage the audience.

One element of compelling storytelling I used in my presentation was a clear narrative structure—beginning with a question**: "Are the health patterns in the WGU population reflective of national trends?"** This helped guide the audience through the analysis by setting up a problem, exploring the data, and arriving at a conclusion. It kept the audience engaged by creating a sense of purpose and progression throughout the presentation.
A second element I used was visual storytelling through comparisons. I designed side-by-side charts comparing key metrics like stroke and overweight rates between the WGU and CDC datasets. This allowed the audience to immediately see patterns without interpreting complex numbers. By pairing data with brief, meaningful takeaways, I made the story more accessible and impactful for decision-makers.

These storytelling elements were intended to present information and connect with the audience's need for clarity and actionable insight.

D.

1. External Dataset by Kaggle: CDC / National Health and Nutrition Examination Survey (NHANES datasets from 2013-2014
   https://www.kaggle.com/datasets/cdc/national-health-and-nutrition-examination-survey

2. Guide to Colorblind Friendly Dashboard:
   a. How To Use Color Blind Friendly Palettes in Your Design: https://venngage.com/blog/color-blind-friendly-palette/
   b. 5 Tips on Designing Colorblind-Friendly Visualizations,
   c. Color Brewer 2.0,

3. I used this class to help me with my storytelling.
   Doug Rose, Feb. 19, 2017 - Learning Data Science: Tell Stories With Data Define a story
   https://www.linkedin.com/learning/learning-data-science-tell-stories-with-data/define-a-story?resume=false&u=2045532

E.