Dashboard Installation and Navigation Instructions

Medical Data Dashboard

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D210, Representation and Reporting

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Note: These instructions assume you are running Mac OS and have a fully functioning installation of Tableau Public on your machine. If you do not have Tableau Public installed, please click here to download and install Tableau Public. *A subscription to Tableau Public may be required.*

Part I. Download Data

Note: Downloading the data is optional as the required data files are included within this directory.

1. Visit this link and click on Medical Data and Dictionary Files to download the medical_clean.csv file from the WGU repository.
2. Visit this link and click on Download full dataset to download the CMS (Center for Medicare & Medicaid Services) HRRP (Hospital Readmissions Reduction Program) data.

Part II. Data Cleaning and Preprocessing

1. Open the medical_data_dashboard directory.
2. Run the clean_data.py script to clean the datasets.

Note: Two files titled "medical_data_clean.csv" and "readm_clean.csv" will be created inside the "medical_data_dashboard" directory.

Part III. Import Data into Tableau

1. Open Tableau Public on your computer.
2. On the left sidebar, click on Connect to Data.
3. Select Text File from the popup menu.
4. Navigate to the medical_data_dashboard directory, select medical_data_clean.csv, and click Open. Once the data has been imported into Tableau, you will be on the Data Source tab.
5. On the left sidebar, long-click and drag the readm_clean.csv file into the blank area on the top center of the screen. You should see an orange line connecting your meadical_data_clean.csv and readm_clean.csv files.

6. On the lower left of the screen, beside your data table, you should see State = State (readm_clean.csv). That means your data tables have been related, and you are ready to create worksheets.

Part IV. Create Calculated Fields

Before we begin adding data to our visualizations, we will need to create additional variables/calculations that will assist us in relating select variables to each other.

1. Click on Analysis on the menu bar and select Create Calculated Field
2. Erase Calculation 1 from the text box.
3. Type the Title into the title box and Text into the textbox from the table below, then click OK.
4. Repeat Steps 1 to 3 for each row.

Title	**Text**
Age Groups	IF [Age] >= 18 AND [Age] <= 24 THEN "18 - 24" ELSEIF [Age] >= 25 AND [Age] <= 34 THEN "25 - 34" ELSEIF [Age] >= 35 AND [Age] <= 44 THEN "35 - 44" ELSEIF [Age] >= 45 AND [Age] <= 54 THEN "45 - 54" ELSEIF [Age] >= 55 AND [Age] <= 64 THEN "55 - 64" ELSEIF [Age] >= 65 THEN "65+" END
Income Groups	IF [Income] < 25000 THEN '$0 - $24K' ELSEIF [Income] >= 25000 AND [Income] < 50000 THEN '$25K - $49K' ELSEIF [Income] >= 50000 AND [Income] < 75000 THEN '$50K - $74K' ELSEIF [Income] >= 75000 AND [Income] < 100000 THEN '$75K - $99K' ELSEIF [Income] >= 100000 AND [Income] < 125000 THEN '$100K - $124K' ELSEIF [Income] >= 125000 THEN '$125K+' END
Readmission Labels	IF [Readmissions] = 1 THEN 'Readmitted' ELSE 'Not Readmitted' END

Region	CASE [State] WHEN 'Alabama' THEN 'South' WHEN 'Alaska' THEN 'West' WHEN 'Arizona' THEN 'West' WHEN 'Arkansas' THEN 'South' WHEN 'California' THEN 'West' WHEN 'Colorado' THEN 'West' WHEN 'Connecticut' THEN 'Northeast' WHEN 'Delaware' THEN 'Northeast' WHEN 'Florida' THEN 'South' WHEN 'Georgia' THEN 'South' WHEN 'Hawaii' THEN 'West' WHEN 'Idaho' THEN 'West' WHEN 'Illinois' THEN 'Midwest' WHEN 'Indiana' THEN 'Midwest' WHEN 'Iowa' THEN 'Midwest' WHEN 'Kansas' THEN 'Midwest' WHEN 'Kentucky' THEN 'South' WHEN 'Louisiana' THEN 'South' WHEN 'Maine' THEN 'Northeast' WHEN 'Maryland' THEN 'Northeast' WHEN 'Massachusetts' THEN 'Northeast' WHEN 'Michigan' THEN 'Midwest' WHEN 'Minnesota' THEN 'Midwest' WHEN 'Mississippi' THEN 'South' WHEN 'Missouri' THEN 'Midwest' WHEN 'Montana' THEN 'West' WHEN 'Nebraska' THEN 'Midwest' WHEN 'Nevada' THEN 'West' WHEN 'New Hampshire' THEN 'Northeast' WHEN 'New Jersey' THEN 'Northeast' WHEN 'New Mexico' THEN 'West' WHEN 'New York' THEN 'Northeast' WHEN 'North Carolina' THEN 'South' WHEN 'North Dakota' THEN 'Midwest' WHEN 'Ohio' THEN 'Midwest' WHEN 'Oklahoma' THEN 'South' WHEN 'Oregon' THEN 'West' WHEN 'Pennsylvania' THEN 'Northeast' WHEN 'Rhode Island' THEN 'Northeast' WHEN 'South Carolina' THEN 'South' WHEN 'South Dakota' THEN 'Midwest' WHEN 'Tennessee' THEN 'South' WHEN 'Texas' THEN 'South' WHEN 'Utah' THEN 'West' WHEN 'Vermont' THEN 'Northeast' WHEN 'Virginia' THEN 'South' WHEN 'Washington' THEN 'West' WHEN 'West Virginia' THEN 'South' WHEN 'Wisconsin' THEN 'Midwest' WHEN 'Wyoming' THEN 'West' WHEN 'Puerto Rico' THEN 'South' WHEN 'District of Columbia' THEN 'Northeast' END

Elective Admissions	IF [Initial admin] = 'Elective Admission' THEN 1 ELSE 0 END
Emergency Admissions	IF [Initial admin] = 'Emergency Admission' THEN 1 ELSE 0 END
Observation Admissions	IF [Initial admin] = 'Observation Admission' THEN 1 ELSE 0 END
Readmission PV	[Expected Re Admis] - [Readmissions]
Avg Expected Readmissions	[Avg Annual Admissions] * ([Avg Expected Readmission Rate]/100)
Comp Expected Readmission Rate	SUM([Avg Expected Readmissions])/SUM([Avg Annual Admissions])
Comp Readmission Rate	SUM([Avg Annual Readmissions])/SUM([Avg Annual Admissions])
Expected Readmission Rate	SUM([Expected Re Admis])/SUM([Admissions])
NTC Admissions	SUM([Admissions])/SUM([Avg Annual Admissions])
NTC Color	IF [NTC] >= 0 THEN 'Blue' ELSE 'Orange' END
NTC Readmissions	SUM([Readmissions])/SUM([Avg Annual Readmissions])
NTCE	(SUM([Avg Expected Readmissions])/SUM([Avg Annual Admissions])) - [Expected Readmission Rate]
NTCE Color	IF [NTCE] >= 0 THEN 'Blue' ELSE 'Orange' END
NTCE Readmissions	SUM([Expected Re Admis])/SUM([Avg Expected Readmissions])
PV Color	IF [Readmission Rate PV] >= 0 THEN 'Blue' ELSE 'Orange' END
Readmission Rate	SUM([Readmissions])/SUM([Admissions])
Readmission Rate PV	[Expected Readmission Rate] - [Readmission Rate]
State Color	IF [Readmission Rate] > [Comp Readmission Rate] THEN 'Blue' ELSE 'Orange' END

Part V. Create Visualizations

1. Geographic Worksheets

A. Performance Map

1. On the lower left, right-click on Sheet 1, select Rename, type States, and press Return.
2. Scroll down on the left sidebar and drag Latitude (generated) to the Rows bar on the top center of the screen and Longitude (generated) to the Columns bar.
3. Drag the Readmission Rate to the Marks container and drop it on Color.
4. Click Color, then Edit Colors in the Marks container. From the dropdown, select Orange-Blue Diverging, select Reversed, and click OK.
5. Drag the State to the Marks container and drop it on Detail.
6. Drag the variables below into the Marks container, drop them on Detail, hold down the command key to select each variable, right-click, hover over Measure, and select Sum.
    - Admissions
    - Readmissions
    - Elective Admissions
    - Emergency Admissions
    - Observation Admissions
    - Avg Annual Admissions
    - Avg Annual Readmissions
7. Drag the variables below into the Marks container, drop them on Detail, hold down the command key to select each variable, right-click, hover over Measure, and select Average.
    - Initial Days
    - Doc Visits

- VitD levels
- vitD supp
- Population

8. Click on Tooltip in the Marks container, erase all content in the textbox, paste the content below, and click OK.

```
State:   <State>
Avg. Population*:          <AVG(Population)>
Admissions:      <SUM(Admissions)>
Readmissions:  <SUM(Readmissions)>
Readmission Rate:        <AGG(Readmission Rate)>

Admission Type
Elective Admissions:      <SUM(Elective Admissions)>
Emergency Admissions:<SUM(Emergency Admissions)>
Observation Admissions:           <SUM(Observation Admissions)>

Patient Statistics
Avg. Days Admitted:      <AVG(Initial days)>
Avg. Doctor Visits:         <AVG(Doc visits)>
Avg. Vitamin D Levels:   <AVG(VitD levels)>
Avg. Vitamin D Supplements:     <AVG(vitD supp)>

* Avg. Population reflects the average population
   within a mile radius of the patient based on census
 data.
```

9. Drag and drop the variables below into the Filters container, hold down the command key to select each variable, right-click, and select Show Filter.
    - Region
    - State
    - County
10. On the left-hand side, hover over the Region filter, click the dropdown arrow, and select Single Value (list). Repeat this step for State and County.
11. Hover over the State filter, click the dropdown arrow, and select Only Relevant Values. Repeat this step for County.

B. Performance by County

1. On the lower tab bar, click New Worksheet, right-click on the new worksheet's tab, select Rename, type Counties, and press Return.
2. Drag the County onto the Detail in the Marks container.
3. Drag the Readmission Rate onto the Size in the Marks container.
4. Drag the Readmission Rate onto the Color in the Marks container.
5. Click Color, and Edit Colors on the Marks container. Select Orange-Blue Diverging from the dropdown, select Reversed, and click OK.
6. Drag the variables below into the Marks container, drop them on Detail, hold down the command key to select each variable, right-click, hover over Measure, and select Sum.
    - Admissions
    - Readmissions
    - Elective Admissions
    - Emergency Admissions
    - Observation Admissions
7. Drag the variables below into the Marks container, drop them on Detail, hold down the command key to select each variable, right-click, hover over Measure, and select Average.
    - Initial Days
    - Doc Visits
    - VitD levels
    - vitD sup
    - Population
8. Click on Tooltip in the Marks container, erase all content in the textbox, paste the content below, and click OK.

```
County: <County>
Avg. Population*:          <AVG(Population)>
Admissions:      <SUM(Admissions)>
Readmissions:  <SUM(Readmissions)>
```

Readmission Rate: <AGG(Readmission Rate)>

Admission Type
Elective Admissions: <SUM(Elective Admissions)>
Emergency Admissions: <SUM(Emergency Admissions)>
Observation Admissions: <SUM(Observation Admissions)>

Patient Statistics
Avg. Days Admitted: <AVG(Initial days)>
Avg. Doctor Visits: <AVG(Doc visits)>
Avg. Vitamin D Levels: <AVG(VitD levels)>
Avg. Vitamin D Supplements: <AVG(vitD supp)>

* Avg. Population reflects the average population within a mile radius of the patient based on census data.

9. On the left-hand side, hover over the Color legend, click the dropdown arrow, and select Hide Card.

* Variance is the calculated difference between Medica General's expected (predicted) and actual readmission rates.
* Network to Comp (NTC) Score is the calculated difference between the national comparative hospitals' and Medica General's readmission rate.
* Network to Comp Expected (NTCE) Score is the calculated difference between the national comparative hospitals' and Medica General's expected readmission rate.

2. Metrics Worksheets

A. National Performance Tracking

1. Create a new worksheet and rename it National Readmission Rates.
2. Drag the variables below onto the Rows bar.
    - Readmission Rate
    - Expected Readmission Rate
    - Comp Readmission Rate
    - Comp Expected Readmission Rate

3. Click the Show Me drop-down on the top right and select the horizontal bar graph.
4. Click the Analysis drop-down from the Menu bar and select Swap Rows and Columns.
5. On the bottom of the left sidebar, drag Measure Values onto Color in the Marks Container.
6. Click Color, Edit Colors, Orange-Blue Diverging, check the Reversed checkbox, and click OK.
7. Hide the color legend from the right sidebar.
8. Right-click on the graph's y-axis and select Edit Axis.
9. Type Readmission Rate into the Title field and click the X to close the popup.
10. Right-click on the graph’s y-axis and select Format.
11. Click the Numbers dropdown, select Percentage, and set Decimal Places to zero.
12. Click the Label button in the Marks container and check the Show mark labels checkbox.

B. Regional Performance Tracking

1. Right-click the National Readmission Rates tab, select Duplicate and rename it Regional Readmission Rates.
2. Drag Region onto the Columns bar and set it before Measure Names.

C. National KPIs

1. Create a new worksheet and rename it National KPIs.
2. Drag the variables below onto the Rows bar.
    - NTC
    - NTCE
    - Readmission PV
3. Repeat Steps 3 and 4 from National Performance Tracking.
4. Drag Measure Names onto Color in the Marks Container.

5. Click Color, Edit Colors, select Color Blind from the dropdown, and click OK.
6. Hide the color legend from the right sidebar.
7. Right-click on the graph's y-axis and select Format.
8. Click the Numbers dropdown, select Percentage, and set Decimal Places to zero.
9. Click the Label button in the Marks container and check the Show mark labels checkbox.

D. Regional KPIs

1. Repeat Steps 1 and 2 from Regional Performance Tracking for the National KPIs worksheet and rename it Regional KPIs.

E. Metrics Calculations

1. Create a new worksheet and rename it Calculations.
2. Double-click on the empty space in the Marks container, paste the text below into the empty field, and press Return.

```
'Hover here for metric calculation methods.'
```

3. Click Tooltip in the Marks container, paste the text bowl into the textbox, and click OK.

3. Demographics Worksheets

A. Medical Conditions

1. Create a new worksheet and rename it Medical Conditions.
2. Drag the variables below onto the Rows bar and set their Measure to Average.
    - Allergic rhinitis
    - Anxiety
    - Arthritis

- Asthma
- Back Pain
- Diabetes
- High Blood
- Hyperlipidemia
- Overweight
- Reflux esophagitis
- Stroke

3. Repeat Steps 3 to 7 from National Performance Tracking.
4. Drag Readmission Labels onto the Filters container.
5. Click the Use all radio button and click OK.
6. Select Worksheet on the Menu bar and click Show Caption.
7. Paste the text below into the caption.

Note: Patients may have more than one medical condition.

B. Initial Services

1. Create a new worksheet and rename it Initial Services.
2. Drag Admissions onto the Columns bar.
3. Right-click on Admissions, hover over Quick Table Calculation, and select Percent of Total.
4. Drag Services onto the Rows bar.
5. Drag Admissions onto Color.
6. Show the caption and paste the text below into it.

Note: Patients may have received more services, but only the primary service is reported.

7. Click Color, Edit Colors, Orange-Blue Diverging, Reversed, and OK.

C. Complication Risk

1. Duplicate the Initial Services worksheet and rename it Complication Risk.
2. Replace Service in the Rows bar with the Complication Risk variable.

D. Gender

1. Create a new worksheet and rename it Gender.
2. Drag Gender onto Color.
3. Select Color and Edit Colors to set the palette to Color Blind.
4. Drag Gender onto Label, set the Measure to Count, and create a Quick Table Calculation using the Percent of Total.
5. Drag Gender onto Label.
6. Drag Gender onto Size and set the Measure to Count.
7. Select Pie from the dropdown menu in the Marks container.
8. Hide the Color legend from the right sidebar.

E. Marital Status

1. Create a new worksheet and rename it Marital Status.
2. Repeat Steps 2 to 8 from Gender using the Marital variable.

F. Dependents

1. Create a new worksheet and rename it Dependents.
2. Repeat Steps 2 to 8 from Gender using the Children variable.

G. Age

1. Create a new worksheet and rename it Age.
2. Drag Age Groups onto Color.
3. Select Color and Edit Colors to set the palette to Color Blind.
4. Drag Age onto Size and set the Measure to Count.
5. Drag Age onto Label, set the Measure to Count, and create a Quick Table Calculation using the Percent of Total.
6. Drag Age Groups onto Label.
7. Select Pie from the dropdown menu in the Marks container.

H. Income

1. Create a new worksheet and rename it Income.
2. Drag Income Groups onto Color.
3. Select Color and Edit Colors to set the palette to Color Blind.
4. Drag Income onto Size and set the Measure to Count.
5. Drag Income onto Label, set the Measure to Count, and create a Quick Table Calculation using the Percent of Total.
6. Drag Income Groups onto Label.
7. Select Pie from the dropdown menu in the Marks container.

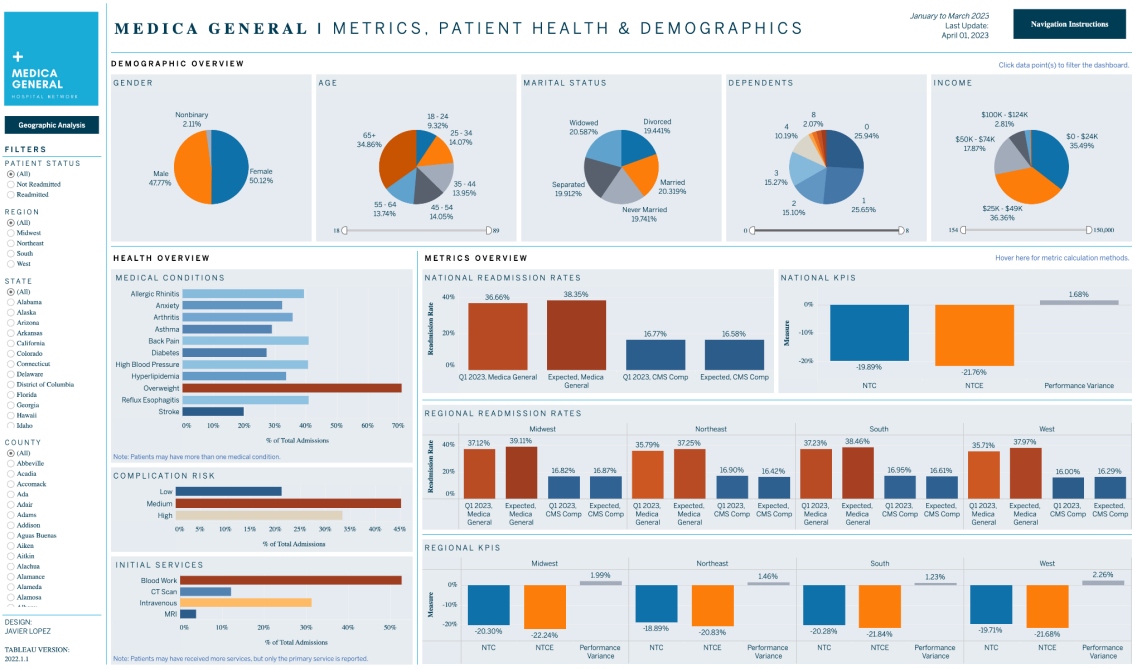
Part VI. Build the Dashboard

1. Click New Dashboard on the bottom right of the screen.
2. Click the dropdown below Size, select Fixed Size, and enter the best size for your screen. Recommended size: 2013px Width x 1168px Height.
3. Select Floating in the Object container on the bottom left of the screen.
4. Drag Image onto the blank space, select Choose, and select the Medica_General_Logo.png file.
5. Type Logo into the Alternate Text field and click OK.
6. Position the logo image on the top left of the dashboard.
7. Select Tiled in the Object container and drag Horizontal onto the dashboard.
8. Drag States onto the Horizontal container and drag Counties beside it.
9. Set the filter container to the left of the dashboard below the logo.
10. Drag Blank from Objects into the filters container and set it to the logo size.
11. Hover over the Horizontal container, click the dropdown arrow, and select Floating.
12. Position the container in the desired area of the dashboard.
13. Hover over the Horizontal container, and click Show/Hide Button.
14. Hover over the Show/Hide button and select Edit Button.
15. Select Text Button as the Button Style, set the button settings to your liking, and click OK.

16. Position the button in the desired area of the dashboard.
17. Press and hold the Option key while clicking the button to hide the States/Counties horizontal container.
18. Drag a new Horizontal container onto the dashboard.
19. Drag Gender, Age, Marital Status, Dependents, and Income sheets from the Sheets container on the sidebar into the Horizontal container.
20. Continue dragging vertical and horizontal containers onto the dashboard to achieve the desired layout. Containers may go inside each other, and Text may be used to create necessary titles. If necessary, use Image to choose the Vertical_Divider.png or Horizontal_Divider.png to visually section parts of the dashboard.
21. Once you have dragged all Sheets onto the dashboard and have positioned them to your liking, ensure that Readmitted Labels, Region, State, and County are the only filters on the dashboard. (If any filters accidentally made their way into the dashboard, you may right-click on them to remove them.)
22. Click the visualization for each sheet listed below and click the filter icon. This will filter the dashboard based on selections from that visualization.
    - Gender
    - Age
    - Marital Status
    - Dependents
    - Income
    - Medical Conditions
    - Complication Risk
    - Initial Services
    - States
    - Counties
23. Click the dropdown arrow on each filter below, select Apply to Worksheets and Selected Worksheets, and ensure all checkboxes are checked. Click OK.
    - Region
    - State

- County

24. Click the dropdown arrow on each filter below and select Only Relevant Values.
    - Region
    - State
    - County
25. Click the dropdown arrow on the Readmitted Labels filter, select Edit Title, and rename it Patient Status.
26. Click the dropdown arrow on the Patient Status filter, select Apply to Worksheets and Selected Worksheets, and ensure the below sheets are unchecked. Click OK.
    - National Readmission Rates
    - Nation KPIs
    - Regional Readmission Rates
    - Regional KPIs
27. Once the dashboard is to your satisfaction, the last step is to save it onto Tableau Public.



Note: After saving the dashboard, Tableau Public will open it on your browser. For quick access to the dashboard, ensure to bookmark it on your browser, as the link is not likely to change. Dashboards are best viewed in Full-Screen mode.

Part VII. Dashboard Navigation Instructions

Note: For navigation instructions directly on the dashboard, click the Navigation Instructions button on the top right of the dashboard. To hide the navigation instructions, click the button again.

To access the dashboard, please click here.

1. **Demographic Analysis Button**

   Click the Demographic Analysis button to view a map and county breakdown of the network and patient data.

2. **Filters**

   Click any radio button on the left sidebar to filter the dashboard. The filters will alter the view on the entire dashboard, including the Demographic Analysis.

3. **Graphs and Charts**

   Click any data point on graphs or charts to filter the dashboard by the specific variable. This will also filter the Demographic Analysis view.

4. **Demographic Sliders**

   Slide any of the sliders below the pie charts to filter the data.

5. **Resetting Filters**

   To reset all filters at once, simply reload the webpage. To remove a single filter, click *All* on the left sidebar filter or click the selected data point to unselect it.