

# **NIGERIAN DOCTORS ON THE RUN: EMERGING ISSUES IN THE HEALTHCARE SYSTEM**

## **PROJECT METHODOLOGY**

### **1. Project Overview:**

The issue of Nigerian doctors leaving the country for better opportunities has become a significant concern for the country's healthcare system. This study examines the various factors driving the migration of doctors and the potential negative consequences on the healthcare system. The study finds that poor remuneration, insecurity, and inadequate diagnostic facilities are the primary driving factors for doctors' emigration. The migration of doctors has worsened the already struggling healthcare system, affecting the quality of care provided to patients, especially in rural areas. The study recommends policy solutions such as an upward review of physician remuneration, analysis and prevention of insecurity, and increased funding for the healthcare sector to improve diagnostic infrastructure and retain healthcare professionals. The study highlights the urgent need to address the root causes of the issue and prevent the collapse of Nigeria's healthcare system.

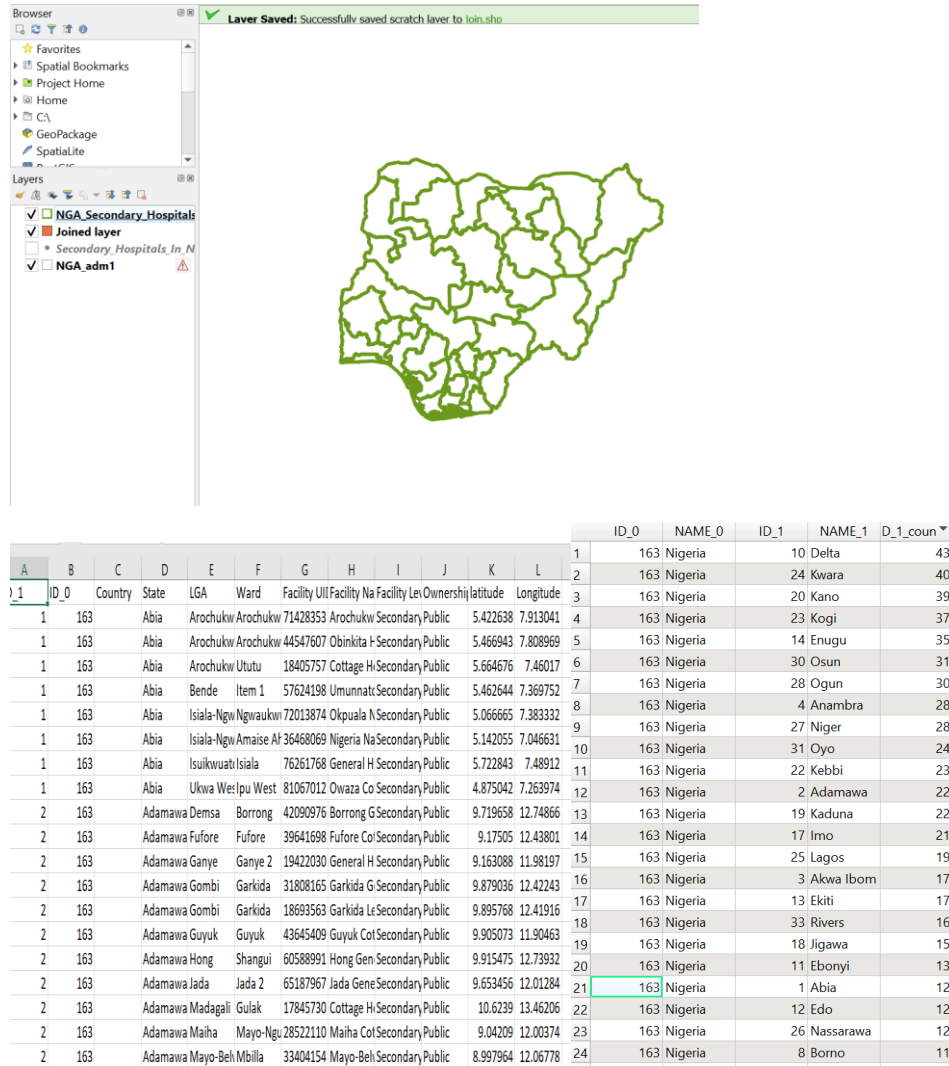
### **2. Tools:**

- QGIS
- RStudio
- Tableau
- Excel

### **3. Process:**

- I. **Step 1:** The project obtained and made use of the following data and shapefile;
  - a) The shapefile of Nigeria
  - b) Available Data on the statistics of doctors, health care professionals and health facilities was sourced from [Nigeria Federal Ministry of health website](#)
  - c) Phone interviews with know medical practitioners in Nigeria and Nigerians in the diaspora ( names withheld due to confidentiality agreement with the parties)

- II. **Step 2:** I proceeded to do some data cleaning and exploration on both excel and QGIS. The shapefile was simplified and the attribute table was rid of unnecessary layers. I made use of QGIS in creating a count field using the calculate field option. This was done after establishing a join with the excel file containing the data of secondary hospitals.



- III. **Step 3:** I switched to RStudio to generate the map of secondary hospitals . First, I made sure to load all necessary libraries, the shapefile of Nigeria secondary hospitals which I created in QGIS from the previous step and set the ncesaary geographic reference system to UTM Zone 32N.

```
install.packages("leaflet", "leaflet.providers", "tidyverse", "sf")
library(leaflet)
library(leaflet.providers)
library(tidyverse)
library(readxl)
library(sf)

# Set working directory to the same as this R file.
# Read in the shapefile
Sec_Hospital <- st_read("NGA_Secondary_Hospitals.shp")
```

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# I should have corrected the name of the count field. It is currently
# last_name_, but I can use dplyr to rename the column!
Sec_Hospital <- Sec_Hospital %>% rename(Hosp_count = ID_1_count)
Sec_Hospital <- Sec_Hospital %>% rename(State = NAME_1)

# convert Sec_Hospital to UTM zone 32N (for example)
st_crs(Sec_Hospital)
Sec_Hospital <- st_transform(Sec_Hospital, crs = 32632)

m <- leaflet() %>%
  setView(8.6753, 9.081999, 6) %>%
  addTiles() %>%
  addPolygons(data = Sec_Hospital, color = "red", fill = NA, weight = 2)
m
```

- The boundaries of Nigeria were plotted and ColorBrewer was loaded. I did some renaming work using “dplyr” to rename some of the columns.

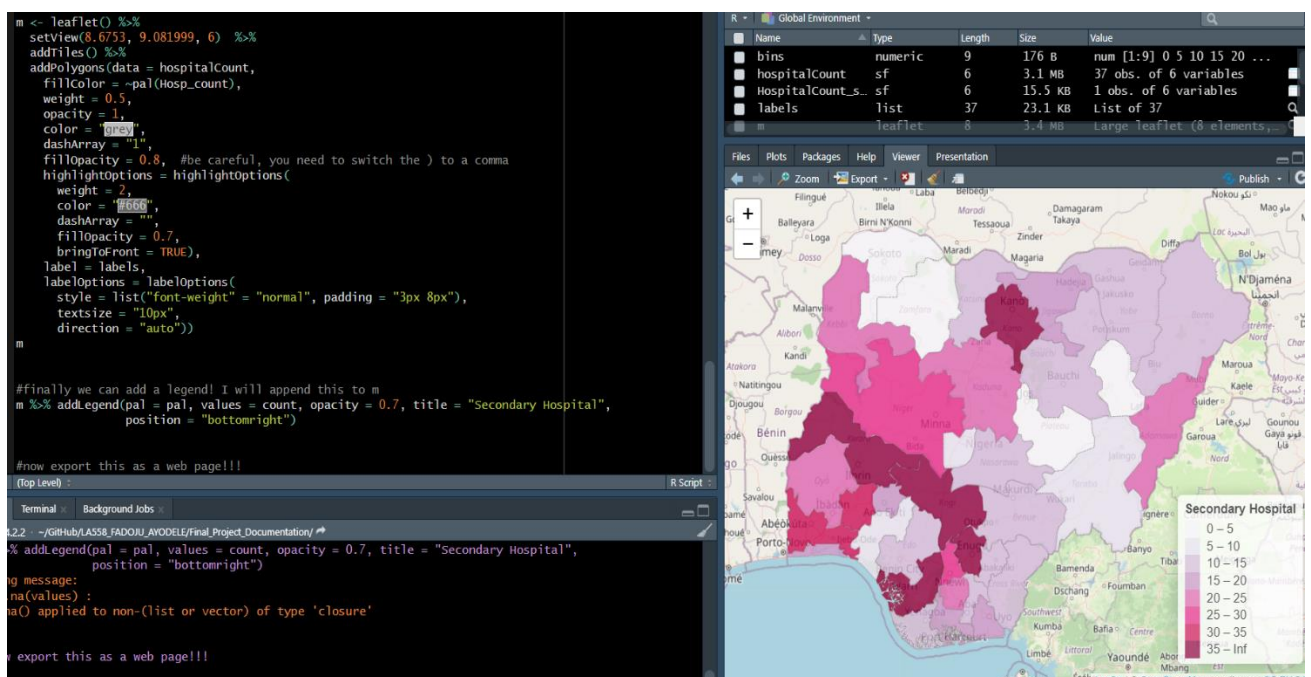
```
# Select the color scheme from Color Brewer
library("RColorBrewer") #I think either Leaflet or tidyverse loads this for you
display.brewer.all()

bins <- c(0, 5, 10, 15, 20, 25, 30, 35, Inf)
pal <- colorBin("PuRd", domain = hospitalCount$Hosp_count, bins = bins)

m <- leaflet() %>%
  setView(8.6753, 9.081999, 6) %>%
  addTiles() %>%
  addPolygons(data = hospitalCount,
    fillColor = ~pal(Hosp_count),
    weight = 0.5,
    opacity = 1,
    color = "red",
    dashArray = "1",
    fillOpacity = 0.8)
m
```

```
# Add interaction
m <- leaflet() %>%
  setView(8.6753, 9.08199, 6) %>%
  addTiles() %>%
  addPolygons(data = hospitalCount,
    fillColor = ~pal(Hosp_count),
    weight = 0.5,
    opacity = 1,
    color = "red",
    dashArray = "1",
    fillOpacity = 0.8, #be careful, you need to switch the ) to a comma
    highlightOptions = highlightOptions(
      weight = 2,
      color = "#666",
      dashArray = "",
      fillOpacity = 0.7,
      bringToFront = TRUE)
  )
m
```

- Using the code in the above screenshot , I plotted a choropleth map using the latitude and longitudes and added an interactive function for the map.



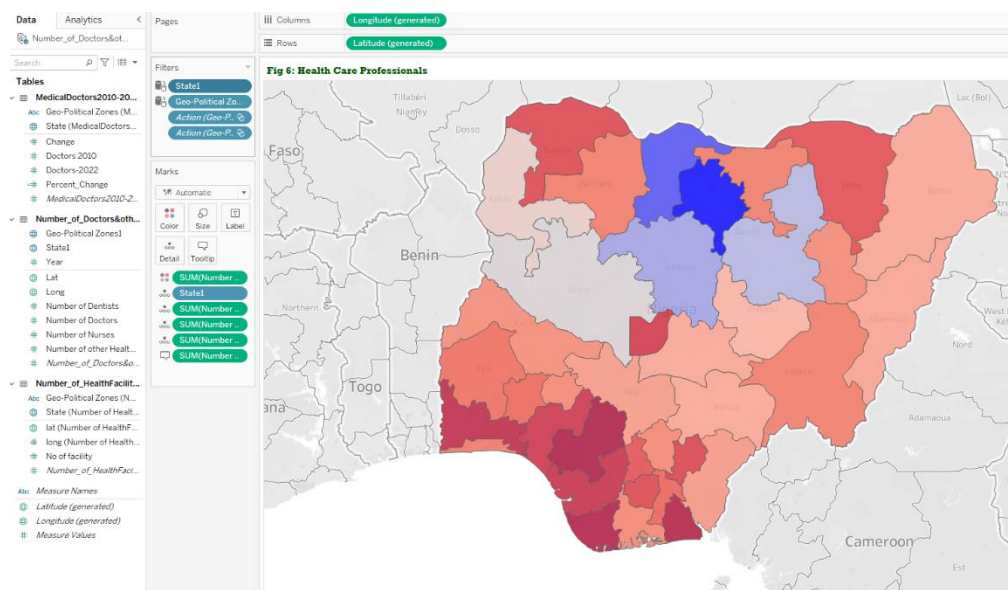
- I added a legend for the map as shown above and plotted the map.

**IV. Step 4:** In Tableau, I joined the tables to form multiple connections among my data. This becomes really important when carrying out filter operations on the map to make it quite interactive.

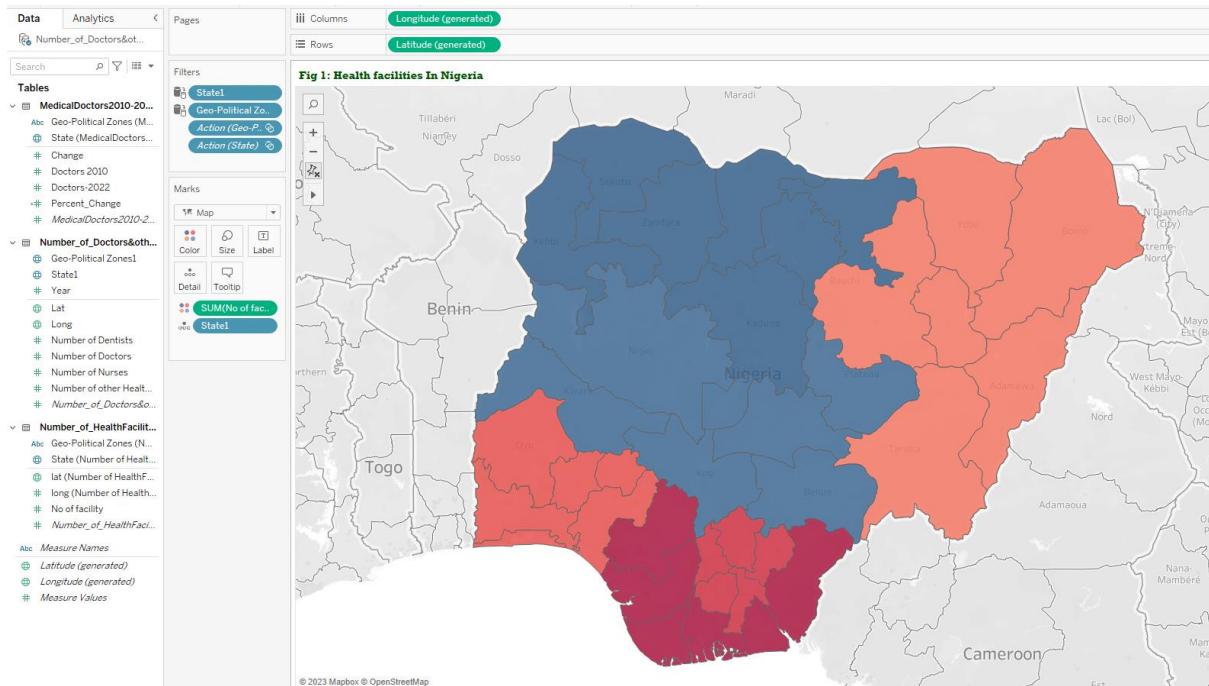
The screenshot shows the Tableau interface. On the left, the 'Connections' pane lists three text files: 'Number\_of\_Doctors\_Nigeria', 'MedicalDoctors2010-2022', and 'Number\_of\_HealthFacilities\_Nigeria'. The 'Files' pane shows the selected file 'Number\_of\_Doctors\_Nigeria.csv'. The main view displays a data preview for 'Number\_of\_Doctors&othe...'. The preview table has 9 fields and 37 rows. The fields are: Name, State1, Geo-Political Zones1, Number of Doctors, Number of Dentists, Number of Nurses, Number of other Health per..., and two columns for 'Number of Doctors' and 'Number of HealthFacilities'.

Name	State1	Geo-Political Zones1	Number of Doctors	Number of Dentists	Number of Nurses	Number of other Health per...	Number of Doctors	Number of HealthFacilities
Abia	South-Eastern							
Adamawa	North-Eastern							
Akwa-Ibom	South-South							
Anambra	South-Eastern							
Bauchi	North-Eastern							
Bayelsa	South-South							
Benue	North-Central							
Borno	North-Eastern							
Cross River	South-South							

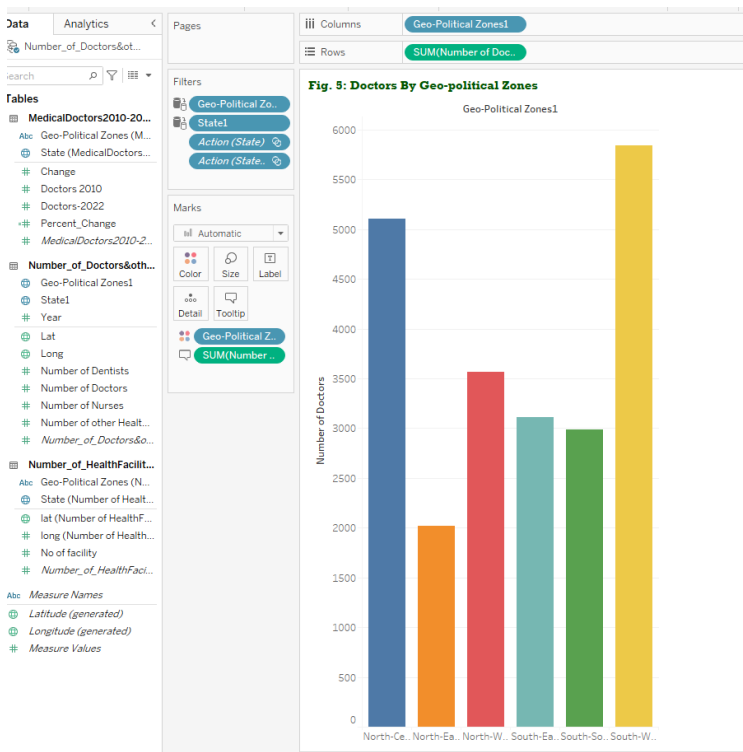
➤ I then made use of details, tooltip in the marks option to create a map. Followed by making states and geo-political zones a filter. I made sure to apply it to all sheets using the same datasource.



- Number of doctors, nurses, health professionals were used as details and tooltips.

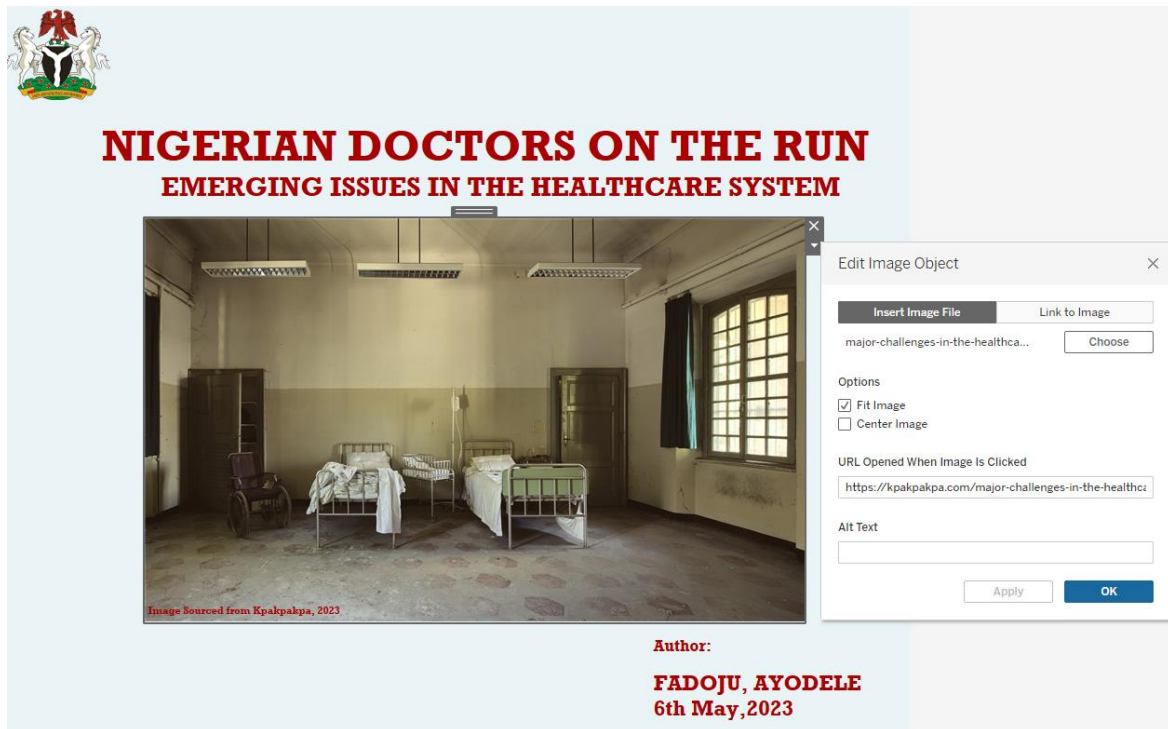


- I created a bar chart that shows specifically the most recent and available number of doctors practicing within Nigeria. I made use to of Filter to ensure that it is interactive with other maps.

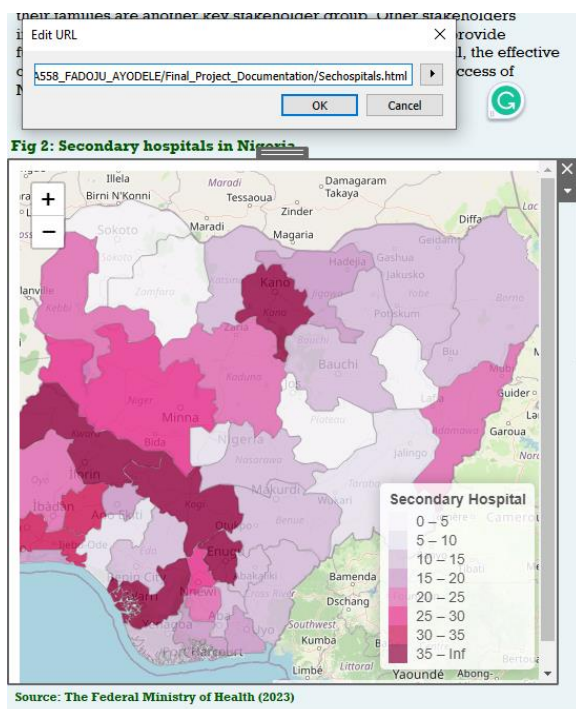




- V. **Step 5:** I created dashboards to present visuals, text for the project. I started with a cover page showing the title and an image embedded with the link to the site it was sourced from.



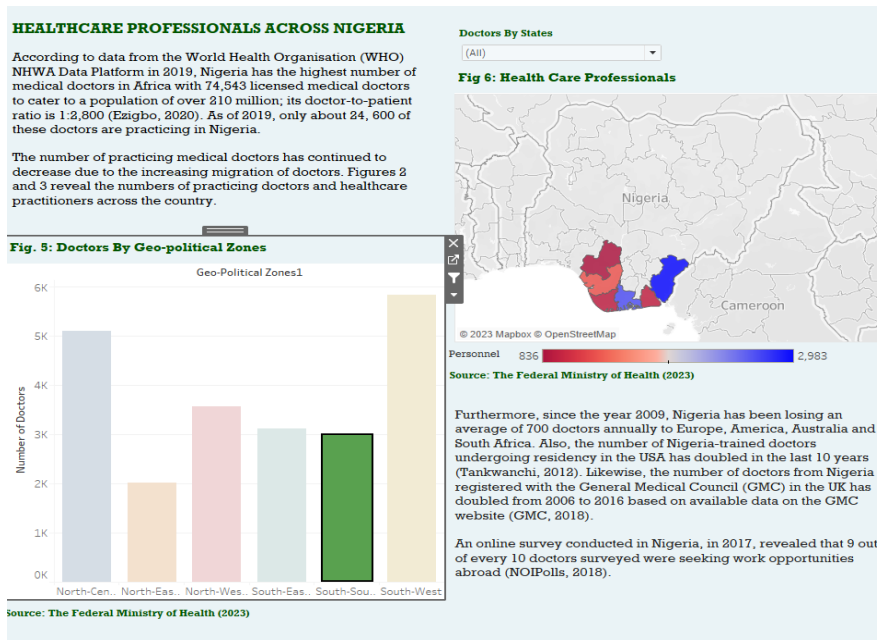
- I went ahead to create other dashboards visuals with images and maps. In one of the visuals, i inserted my map created in RStudio into tableau using a link I obtained from my GitHub webpage.



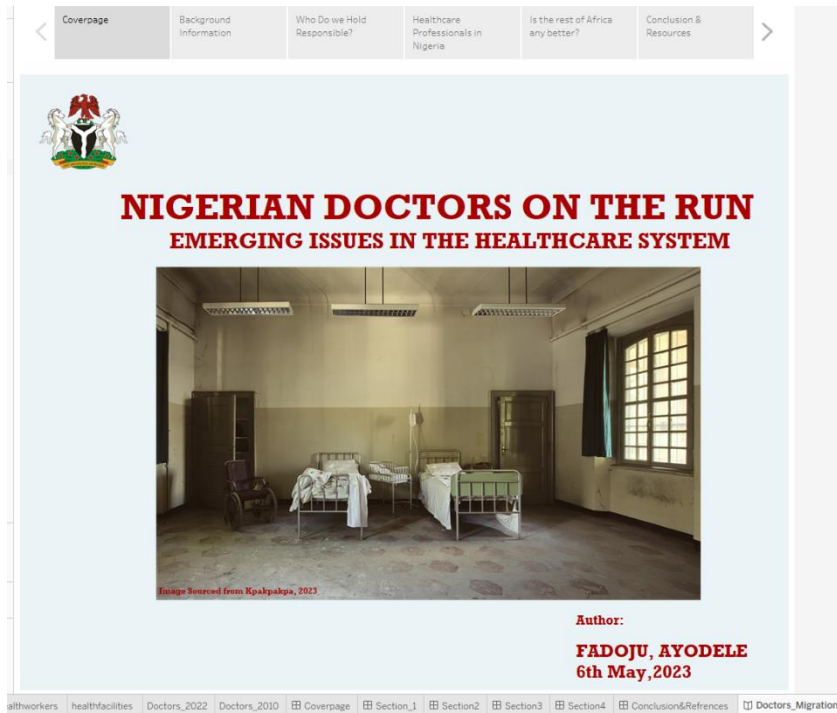
## Final Project Documentation

- 5- Project Proposal
- 6- READ ME: Project Process
- 7- Final Project
- **Choropleth Map- Secondary\_Hospitals**

- One of the dashboards I created had the option of using a filter and is interactive with the map. I used both the chart and the map as a filter. Click the more options button on the map or chart and select use as a filter.



- I used the story option to create a story for my various dashboards, I extracted and save it to tableau public to get link to share my work.



**THANKS!**

You can find my Code in RStudio [here](#) and my Tableau project [here](#)



## Resources:

Ezigbo, O. (2020): Population of Doctors in Nigeria Hits 74,543. *This Day*. Retrieved from <https://www.thisdaylive.com/index.php/2020/03/04/population-of-doctors-in-nigeria-hits-74543/#>

GMC. (2018): The medical register over time. Retrieved 18/02/2019, from General Medical Council, UK. <https://data.gmc-uk.org/gmcdata/home/#/reports/The%20Register/Stats/report>

Kpakpakpa (2023): <https://kpakpakpa.com/major-challenges-in-the-healthcare-sector-in-nigeria/>

Mustard Insights (2022): [African Countries With The Highest Number of Doctors \(mustardinsights.com\)](https://mustardinsights.com/african-countries-with-the-highest-number-of-doctors/)

NOIPolls (2018): <https://noi-polls.com/wp-content/uploads/2019/06/Emigration-of-Doctors-Press-Release-July-2018-Survey-Report.pdf>

Pharmaccess (2018): <https://www.pharmaccess.org/wp-content/uploads/2018/01/The-healthcare-system-in-Nigeria.pdf>

Tankwanchi, S. (2012): *Doctors beyond borders: Data trends and medical migration dynamics from Sub-Saharan Africa to the United States (Doctoral Dissertation)*. (Doctor of Philosophy), Vanderbilt University, Nashville.

The Guardian (2020): <https://guardian.ng/news/uks-new-migration-visa-lures-nigerian-doctors/>

The Federal Ministry of Health (2023): <https://hfr.health.gov.ng/>

WHO. (2019): Global Health Observatory Data Repository. Retrieved from <http://apps.who.int/gho/data/node.country.country-NG>