METHODOLOGY

The SARS-CoV2 data was accessed Nigeria Centre for Disease Control (ncdc)’s site while population data was accessed on [www.worldometer.com](http://www.worldometer.com). The data were organized in a Microsoft excel file/spreadsheet. Various formulae were enter into excel to calculate new fields. R 4.0.3 software (R Core Team, 2020) was used for the statistical analysis. The R packages used are naijR (Ordu, 2020), maps (Deckmyn et al., 2018), mapdata (Becker & Wilks, 2018), readxl (Wickham & Jennifer Bryan, 2019), ggplot2 (Kassambara, 2019), dplyr (Hadley et al., 2020), scatterpie (Guangchuang, 2020), ggmap (Kahle & Hadley Wickham, 2013), and mapproj (McIlroy et al., 2020) .

The various R packages (libraries) were loaded and the SARS-CoV2 data file. The file format was then changed to data frame. The raw data and the R script for the analysis can be accessed at <https://github.com/Yinkaokoh/SARS-CoV2_Nigeria_Project_2020.git>

VISUALIZATIONS OF THE COLLECTE DATA

To see the distribution of SARS-CoV2 across Nigeria, we conducted a spatial analysis across the states using the available data. Figure 1 shows the reported cases across the states. However, we felt there is need to take population of each State into consideration to get a better of picture of SARS-CoV2 distribution in Nigeria. Figure 2 shows the number of persons infected per one million of population tested while Figure 3 shows this in percentage i.e the number of persons infected per 100 persons in the different States



Figure 1: Distribution of reported SARS-CoV2 cases in Nigeria.



Figure 2: Number of person infected per one million population



Figure 3: Number of persons infected per 100 persons in the different States in Nigeria.

However, it is possible that the number tests conducted contributes to this pattern of spread as there was no mass testing rather only suspected patients and those who had contacts with them are tested, and the proportion of this tests in with respect to population will play major role in the spread pattern. Figure 4 shows the numbers of tests conducted while Figure 5 shows the number of persons tested per 100 of population.



Figure 4: Number of SARS-CoV2 tests conducted in the different States.



Figure 5: The number of persons screened for SARS-CoV2 per 100 persons in Nigeria.

There is need to know the number of positive tests out every 100 tests conducted. The might help predict the number of persons that might be actually infected with SARS-CoV2, since there are no resources for mass screening. Figure 6 shows the number of positive tests out of every 100 persons screened.



Figure 6: Number of positive tests out of every 100 persons screened for SARS-CoV2.

Access to SARS-CoV2 virus sequence is inevitable for SARS-CoV2 research. We therefore assessed the total number of sequences, and the percentage of the positive sequences submitted to GISAID; and these are presented in Figures 7 and 8.



Figure 7: The number of sequences submitted to GISAID from Nigeria.



Figure 8: Percentage of positive SARS-CoV2 sequences submitted on GISAID.



Figure 9: SARS-CoV2 trend in Nigeria and Ghana during the lockdown.

Reference

Auguie, B. (2017). *gridExtra: Miscellaneous Functions for “Grid” Graphics. R package version 2.3.* https://cran.r-project.org/package=gridExtra.

Becker, R. A., & Wilks, A. R. (2018). *mapdata: Extra Map Databases* (R package version 2.3.0). https://cran.r-project.org/package=mapdata

Deckmyn, A. B., Wilks, A. R., Ray Brownrigg, T., Homas, P. M., & Deckmyn, A. (2018). *maps: Draw Geographical Maps* (R package version 3.3.0). https://cran.r-project.org/package=maps

Erich, N. (2014). *RColorBrewer: ColorBrewer Palettes* (R package version 1.1-2). https://cran.r-project.org/package=RColorBrewer

Guangchuang, Y. (2020). *scatterpie: Scatter Pie Plot* (R package version 0.1.5). https://cran.r-project.org/package=scatterpie

Hadley, W., Romain, F., Lionel, H., & Kirill, M. (2020). *dplyr: A Grammar of Data Manipulation, R package version 0.8.5.* (0.8.5). https://cran.r-project.org/package=dplyr

Kahle, D., & Hadley Wickham. (2013). ggmap: Spatial Visualization with ggplot2. *The R Journal*, *5*(1), 144–161. https://journal.r-project.org/archive/2013-1/kahle-wickham.pdf

Kassambara, A. (2019). *ggcorrplot: Visualization of a Correlation Matrix using “ggplot2”. R package version 0.1.3.* https://cran.r-project.org/package=ggcorrplot

Kassambara, A. (2020). *ggpubr: “ggplot2” Based Publication Ready Plots. R package version 0.4.0.* https://cran.r-project.org/package=ggpubr

McIlroy, D., Brownrigg, R., Thomas, P. M., & Bivand, R. (2020). *mapproj: Map Projections*. https://cran.r-project.org/package=mapproj

Ordu, V. (2020). *naijR: Operations to Ease Data Analyses Specific to Nigeria* (R package version 0.1.4). https://cran.r-project.org/package=naijR

Peter DeWitt. (2020). *qwraps2: Quick Wraps 2* (R package version 0.5.0). https://cran.r-project.org/package=qwraps2

R Core Team. (2020). *R: A Language and Environment for Statistical Computing* (4.0.0.). R Foundation for Statistical Computing, Vienna, Austria. https://www.r-project.org.

Roger, B., & Nicholas, L.-K. (2020). *maptools: Tools for Handling Spatial Objects* (1.0-2). https://cran.r-project.org/package=maptools

Wickham, H., & Jennifer Bryan. (2019). *readxl: Read Excel Files* (R package version 1.3.1). https://cran.r-project.org/package=readxl

Wickham, H., & Lionel Henry. (2020). *tidyr: Tidy Messy Data* (R package version 1.0.2). https://cran.r-project.org/package=tidyr