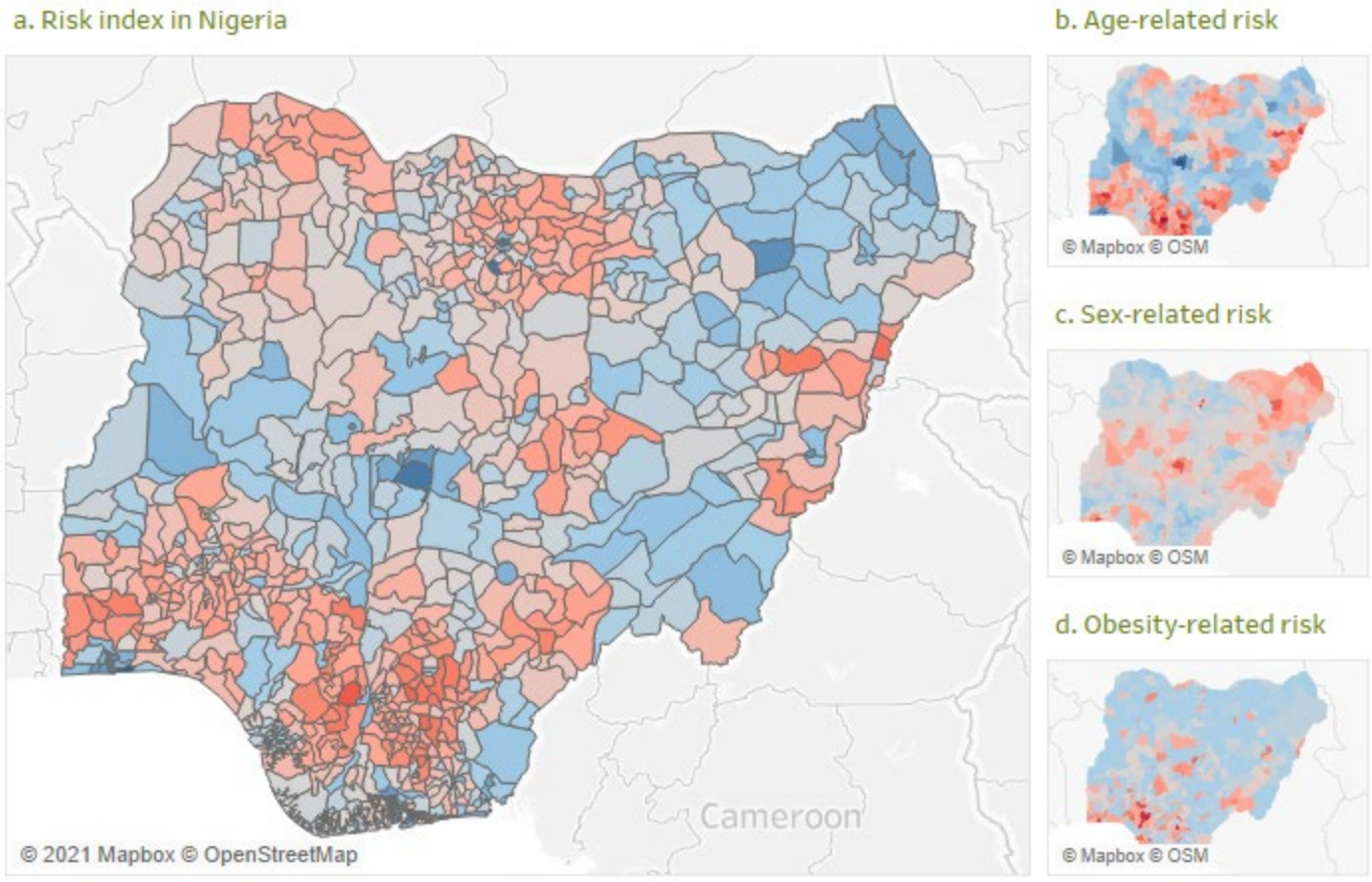
ASSESSING THE RISK OF COVID-19 IN NIGERIA

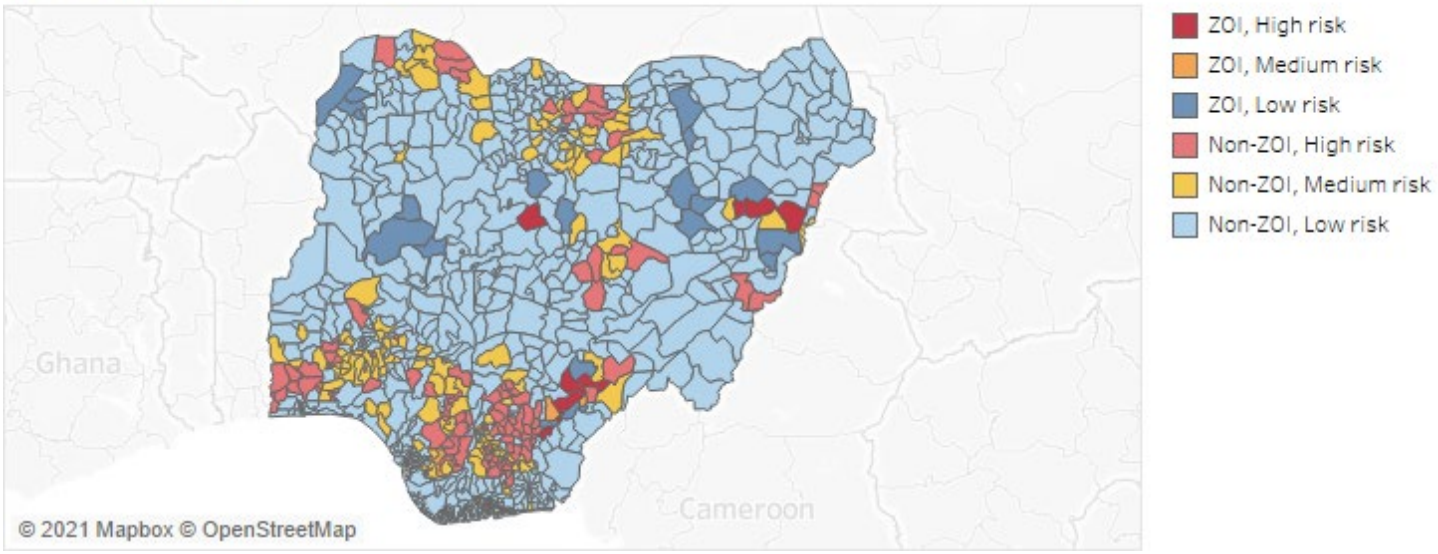
As COVID-19 vaccines are becoming available, governments will need to assess the number and location of the most vulnerable people within their populations. However, problematically, tracking data for most low- and middle-income countries are only available at the national level. To support the COVID-19 relief effort, the Gender, Climate Change, and Nutrition Integration Initiative (GCAN) was commissioned to develop a subnational dataset of key COVID-19 risk indicators and potential risk hotspots.

Based on patient data compiled and analyzed worldwide, the science community's consensus is that key COVID-19 risk factors include age, sex, and obesity. Being old, male, and obese increases both vulnerability to infection and the likelihood of negative outcomes. Based on each indicator's COVID-19 death hazard ratio, a composite index for the second-level subnational administrative units was constructed using exploratory factor analysis (a statistical technique that reduces the number of variables). The results of the subnational risk index (map a) and the risk indicators (maps b, c, and d) are presented visually below, resulting in hotspots (the redder colors) and cold spots (the bluer colors).

The age-related risk is high across the South-West, South-South, and North-East Zones. The sex-related risk (i.e., more male) is highest in the North-Central and North-East Zones. The obesity-related risk is high in the South-West, South-South, and South-East Zones. Overall, the risk index pattern follows the age-related risk indicator.



e. Risk index classes



f. Distribution of adult population in each class of risks

The above figures categorize the risk index values into areas of low, medium, and high risk (map e) and visualize the number of adults (≥18 years old) in each category (figure f). ZOI indicates the zone of influence of the U.S. Government's Feed the Future program. The total number of adults in the high risk areas is about 13.2 million (13% of the country's total adult population), of which 78% (10.2 M) are located in rural areas. About 1% of the total adult population at high risk is in ZOI (dark red; 0.9M). Half of the top ten hotspots overlap with the (unofficial) subnational reporting of confirmed cases[1], including Ogun, Oyo, Delta, Plateau, and Edo States. While Lagos overwhelmingly leads the number of cases, it is estimated as a low-risk area due to the younger urban population and its relatively more efficient handling of COVID-19 cases than other states[2].

Given the relatively high estimated risk in rural areas, supporting interventions targeting agricultural laborers should be encouraged. Recently published studies also underscore that, across low- and middle-income countries, rural areas show lower accessibility to safe water for personal hygiene and healthcare facilities than urban areas. Only 31% of the rural population in Nigeria has access to a basic handwashing facility with soap and water, compared to 53% of the population in urban areas.[3] Other notable vulnerabilities in rural areas relate to widespread cultural and religious beliefs and informal (i.e., word-of-mouth) communication channels that tune out vital information about the pandemic situation and prevention measures.[4] To mitigate the transmission risk in rural communities, socially distanced farming activities should be practiced. Interventions used in other countries include collecting harvested grain at the farm gate to minimize farmers' travel to markets and the use of informal social networks to coordinate fieldwork on rotating days.

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[1] *Nigeria: Coronavirus (Covid-19) Subnational.* HERA, 2021. https://data.humdata.org/dataset/nigeria_covid19_subnational. Accessed 9 February 2021.

[2] Eze et al. 2021. *Community Informatics for Sustainable Management of Pandemics: A Case Study of COVID-19 in Nigeria.* https://doi.org/10.1016/j.jemep.2021.100632.

[3] *WASH and COVID-19.* UNICEF, 2020. https://data.unicef.org/topic/water-and-sanitation/covid-19. Accessed 9 February 2021.

[4] Ogunkola et al. 2020. *Rural communities in Africa should not be forgotten in responses to COVID-19.* https://doi.org/10.1002/hpm.3039