

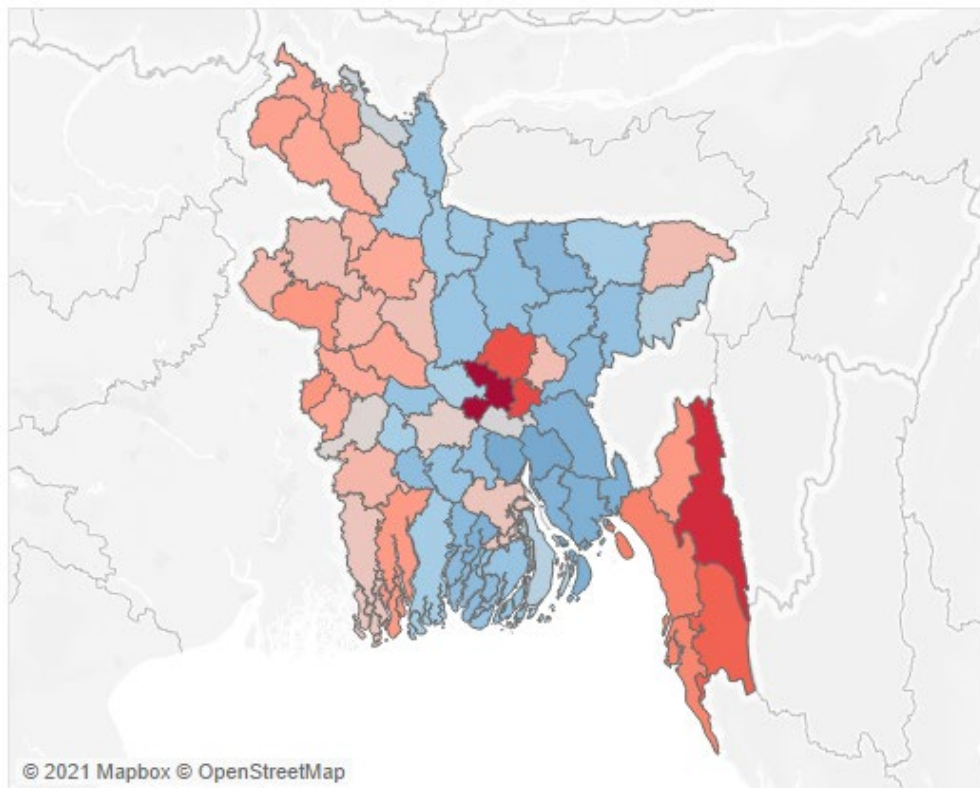
## ASSESSING THE RISK OF COVID-19 IN BANGLADESH

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.

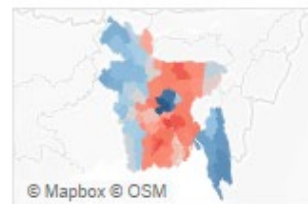
Based on patient data compiled and analyzed worldwide, the science community's consensus is that key COVID-19 risk factors include age, sex, and obesity. Being old, male, and obese increases both vulnerability to infection and the likelihood of negative outcomes. Based on each indicator's COVID-19 death 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- and sex-related risks show somewhat opposite patterns. The age-related risk is lowest in Dhaka (i.e., younger population), but its sex-related risk is the country's highest (i.e., more male). The obesity-related risk is highest in Rangamati (Chittagong), followed by Barisal (Barisal) and Khulna (Meherpur). Overall, the composite risk index value is highest in Dhaka.

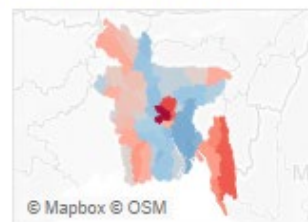
a. Risk index in Bangladesh



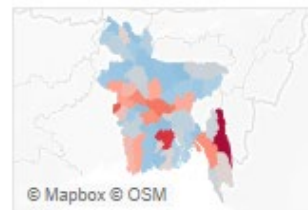
b. Age-related risk



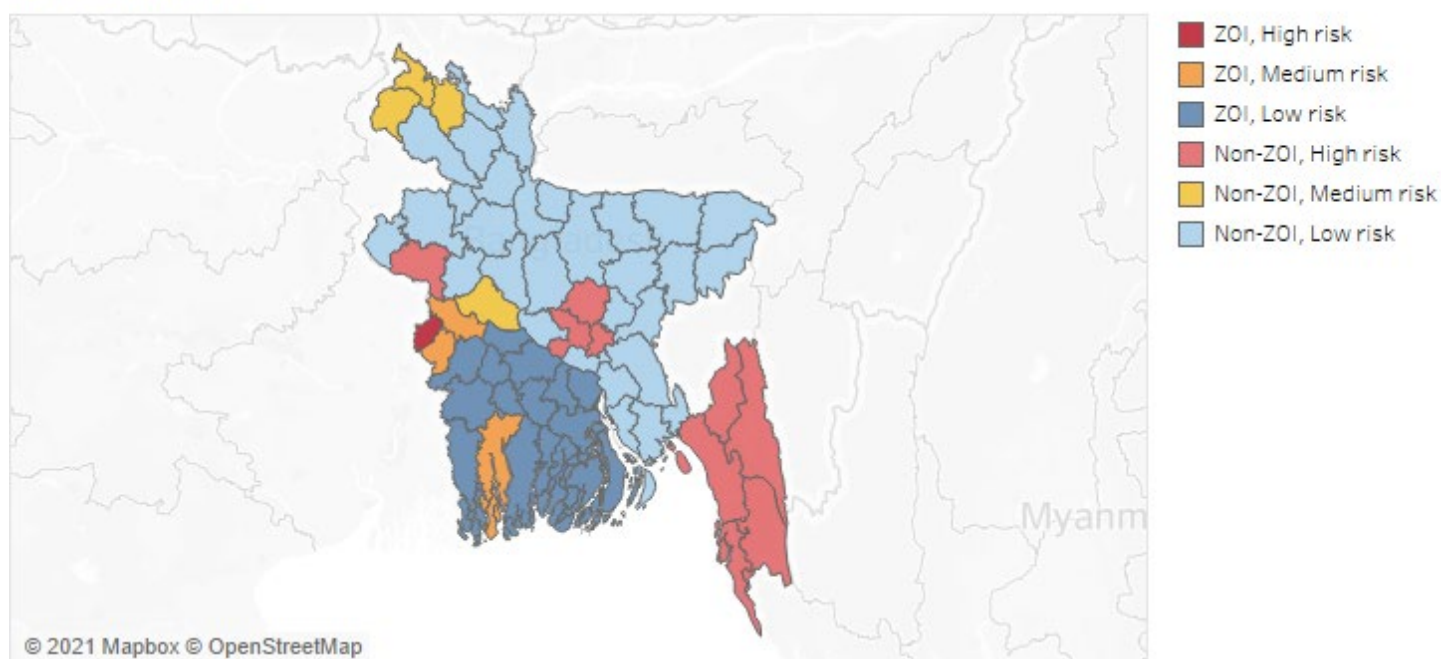
c. Sex-related risk



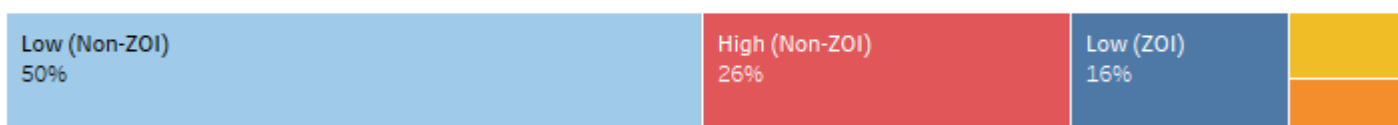
d. Obesity-related risk



### 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 ( $\geq 18$  years old) in each category (figure f). ZOI indicates the zone of influence of the U.S. Government's Feed the Future program. High risk areas are in the Divisions of Chittagong (Bandarban, Chittagong, Cox's Bazar, Khagrachhari, Rangamati Districts), Dhaka (Dhaka, Gazipur, and Narayanganj District), and Khulna (Meherpur District), Rajshahi (Rajshahi District). The only high risk area in ZOI is Khulna (Meherpur). This spatial pattern of high risk areas is similar to reported COVID-19 clusters across Dhaka and Chittagong Divisions.<sup>1</sup> The total number of adults in the high risk areas is 27.6 million (27% of the country's total adult population).

About 10% of the rice cultivating area in the country overlaps with the high risk areas. In Chittagong, for example, 30% of rice and 100% of maize areas are under high risk. Given the importance of agriculture in Bangladesh's economy, interventions targeting agricultural laborers should be encouraged. Socially distanced farming practices promoted in other countries include collecting harvested grain at the farm gate to minimize farmers' travel to markets and establish social networks to coordinate fieldwork on rotating days. Other notable vulnerabilities in rural areas are related to household structure and access to clean water. In Bangladesh, 43% more rural households live with elders than urban households. The higher share of elders across larger, rural households may render those areas particularly vulnerable to the spread of COVID-19. For personal hygiene in the household, only 26% of the rural population has access to basic handwashing stations with soap and water, compared to 51% of the urban population.<sup>2</sup>

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<sup>1</sup> Islam et al. 2021. Geospatial dynamics of COVID-19 clusters and hotspots in Bangladesh. <https://doi.org/10.1111/tbed.13973>

<sup>2</sup> WASH and COVID-19. UNICEF, 2020. <https://data.unicef.org/topic/water-and-sanitation/covid-19>. Accessed 9 February 2021.