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In the COVID-19 pandemic in Brazil, do brown lives matter?

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In *The Lancet Global Health*, a pioneering study by Pedro Baqui and colleagues[1] confirms in Brazil findings observed in other countries hit hard by COVID-19: that mortality rates from the pandemic differ by geographical region and ethnicity, with disproportionate impact for Black populations and other ethnic minorities.[2,3] We can discuss these findings in the context of the social protests occurring in the past few months against structural racism and to the slogan "Black lives matter". However, in this Comment, we go beyond ethnicity, focusing on social and environmental determinants of health for about 50% of Brazilians.

Using COVID-19 hospital mortality data from SIVEP-Gripe (*Sistema de Informação de Vigilância Epidemiológica da Gripe*) dataset, Baqui and colleagues did a cross-sectional observational study to assess regional variations in patients with COVID-19 admitted to hospital by state and by two socioeconomically grouped regions (north and central-south). The ethnicity of patients was categorised according to the five categories used by the Brazilian Institute of Geography and Statistics: *Branco* (White), *Preto* (Black), *Amarelo* (East Asian), *Indígeno* (Indigenous), or *Pardo* (mixed ethnicity). The authors used mixed-effects Cox regression survival analysis to estimate the effects of ethnicity and comorbidity at an individual level in the context of regional variation.

Baqui and colleagues found that, compared with White Brazilians, *Pardo* and Black Brazilians who were hospitalised had significantly higher mortality risk (hazard ratio 1·45, 95% CI 1·33–1·58 for *Pardo* Brazilians; 1·32, 1·15–1·52 for Black Brazilians). *Pardo* ethnicity was the second most important risk factor after age for death. The authors also showed that, in the north region, hospitalised patients had higher risk of death from COVID-19 than those in the central-south region. Rio de Janeiro was an outlier, with mortality rates similar to those of northern states.

We add to their findings that incidence rates were also higher in northern regions.[4] Speculation that severe acute respiratory syndrome coronavirus 2 would have milder transmission in low latitudes has delayed actions in northern regions. However, historically, these areas face several challenges that directly affect their capacity to respond to the COVID-19 pandemic: shortages of doctors and intensivists; fragile epidemiological surveillance; poorer network of health services than in other regions; and fewer family health teams, hospital beds, and number of intensive care units (ICUs) per inhabitant than in other regions. Therefore, discussions regarding ethnicity and regional variations must be integrated, not only because northern states and Rio de Janeiro have higher proportions of *Pardo* and Black populations, but also because the root causes of higher mortality are overlapping. The percentage of low-income families living in subnormal housing, with higher average numbers of individuals per room, is more elevated in northern areas than in the central-south region and higher among *Pardo* and Black families than in White families. These conditions favour intense circulation of respiratory pathogens. Low-income neighbourhoods also have higher population density and low adherence to social distance measures. In these often hot and crowded neighbourhoods, the streets and sidewalks have cultural importance and become part of the living space. Additionally, lower schooling in northern regions and among *Pardo* and Black populations might jeopardise the comprehension of risks and measures proposed by sanitary authorities, as well as judgment of the right time to seek medical assistance. Additionally, in the north region, lower percentages of the urban population are served by piped water compared with those of other regions (69·5% in the north, 88·7% in the northeast, and 96% in southern regions).[5] This situation means that a substantial proportion of the northern urban population has difficulty in adhering to the simplest prevention recommendation of hygiene, such as washing hands.

The prevalence of comorbidities among *Pardo* and Black populations in Brazil is higher than among other ethnicities, including overweight and obesity,[6] risk factors for severity of symptoms of COVID-19.[2–4] Hypovitaminosis D is also more prevalent among *Pardo* and Black people in Brazil than among other ethnicities.[7] The lower the level of schooling, the higher the chances of obesity in Brazilian women.[6]

With soaring numbers of cases, cities in the northern region faced collapse of their health system, with worst cases occurring in Manaus, Fortaleza, and Natal. However, we note that phases of the epidemic

vary within the country, and the northern region has probably reached the peak of the first wave of transmissions, whereas this might not be the case for other regions. The situation is dynamic, and Baqui and colleagues' research portrays a snapshot in a timeline. Additionally, substantial under-reporting of deaths and cases of COVID-19 is occurring, related to low testing. This under-reporting is more intense in the northern region, which might reinforce health inequities.

We draw attention to issues of mobility and historical shortages of doctors in villages and poverty areas, which are not discussed in Baqui and colleagues' study. In the Amazon, most people move around by boat through *igarapés* and rivers, and trips to cities with health equipment and medical doctors might take hours or even days. In Rio de Janeiro, mobility plays a role too. The poor, mostly *Pardo* and Black, live in shantytowns on steep slopes with no streets or health services, where ambulance access is difficult; or in suburbs with precarious and very crowded public transportation, facilitating transmission. In those cases, the delay to hospital admission might be fatal. Additionally, this population works mainly in unstable jobs with no payment for sick days, and thus are likely to postpone going to health services until disease symptoms are acute. Most doctors are White and might show less empathy for *Pardo* and Black patients. By contrast, the majority of non-medical health staff is composed of *Pardo* and Black people, who are more exposed to COVID-19 risks, as pointed out by Baqui and colleagues, sometimes without adequate protection equipment and tests to identify early contagion.

In Rio de Janeiro, but not exclusively, hospital equipment, beds, and ICUs were poorly managed, which left many people to die in inadequate places or at home. Irresponsibility and corruption have also played a role in this context. Therefore, there are people for whom and places where vulnerability and susceptibility[8] act together to exacerbate the risks of COVID-19, and this is compounded by a resistance of the Ministry of Health to account for ethnicity in its approach to the pandemic. Shedding light on these issues is a merit of Baqui and colleagues' study.

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