Research letter

The burden of COVID-19 in Brazil is greater in areas with high social deprivation

COVID-19 and social deprivation

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Highlight

This study showed a spatial association between COVID-19 and poor living conditions in a population in Northeast Brazil. The case fatality rate was 1.42 times higher in the municipalities with very high social deprivation. Priority municipalities have been identified for intervention by the public authorities.

Keywords: SARS- CoV-2; Coronavirus Disease; Social Vulnerability; Ecological Study; Social Determinants; Social Conditions; Social Inequity.

To the Editor,

In Brazil, COVID-19 was first confirmed on February 26, 2020, in São Paulo. [1] Since then, from the communication networks between the cities, the disease has spread to states and municipalities. [2,3] On August 7, the country had 2.9 million cases and 98.4 thousand deaths as a result of the disease, representing the second highest burden of the disease on the planet. [4]

In a country of continental dimensions, with important socio-spatial, cultural, economic, and political inequalities, COVID-19 tends to produce different impacts, according to the living conditions of the population.[2,5] The degree of suffering from the disease seems to be strongly influenced by the point of insertion of individuals into the social environment and access to goods and services. For several reasons, these

conditions in which people live and work may increase the risk of dissemination and mortality due to COVID-19. [2,5]

Measuring the burden of COVID-19 in areas of high social deprivation may contribute to contain the spread of the virus in the country. For this reason, this study analyzed the spatial association between the Social Deprivation Index (SDI) and the incidence, mortality, and case fatality rate (CFR) by COVID-19 in the state of Bahia, northeastern Brazil, to identify priority areas for intervention.

An ecological study was carried out involving the records of COVID-19 in the state of Bahia on August 6, 2020. Bahia is the largest state in the Northeast region and has a population of 15.1 million inhabitants. Data were obtained from the CoVida network (https://painel.covid19br.org/#/brasil). We used the SDI described by Souza et al.[6] The SDI is composed of four variables: i. Municipal socio-economic performance index - economy and finance; ii. Average monthly per capita income; iii. Proportion of extremely poor; and iv. The number of households with a density greater than three people per bedroom. The indicator varies between 0.142 and 0.699, the higher the greater the social deprivation experienced by the population. [6]

The analysis was performed using the Moran Local Bivariate statistic. Municipalities with high social needs and a high burden of COVID-19 were identified, based on their location in the Moran scatter plot (Quadrant 1/ Q1). Moran's index defines the degree of spatial association. A significance of 5% was adopted. The study did not require the approval of the Research Ethics Committee.

On August 6, 2020, the state of Bahia totaled 179,139 confirmed cases and 3,767 deaths due to COVID-19 (Incidence rate: 757.3 / 100,000; Mortality rate: 10.85 / 100,000 and CFR: 2.1%). A spatial association between the epidemiological indicators and the SDI was observed: 22 municipalities were considered priority for the incidence (incidence rate 1.6 times higher than the state rate: 1,219.1/100,000 and 757.3/100,000, respectively); 40 municipalities were considered priority for mortality (mortality rate 1.2 times higher than the state rate: 12.7/100,000 and 10.85/100,000, respectively); and 40 municipalities were considered priority for CFR, whose rate was 4.1 times higher than that observed in the state (8.5% and 2.1%, respectively). The CFR was 1.42 times higher in the municipalities with very high social deprivation, when compared to those with low deprivation (2.2% and 1.54%, respectively). It was also observed that the SDI in these priority groups was higher than the state SDI (Figure 1; Supplementary 1).

In Brazil, COVID-19 arrived first in large urban centers and more developed locations [2]. From them, it moved towards the interior of the country, reaching smaller municipalities and more exposed to pragmatic social vulnerability: poverty, violation of basic rights, reduced access to the health system are problems commonly observed [2]. In these places, deficient living conditions can contribute to the spread of the disease, as well as hinder the adoption of containment measures and contribute to the increase of mortality due to the disease, [2,5,7-9] as we observed in this study.

The relationship between the transmission of COVID-19 and social deprivation is mutual and complex. At the same time that social deprivation increases the risk of illness, COVID-19 also increases social deprivation. It is estimated that a 1% reduction in the global economy as a result of the pandemic could place 10 million people in poverty. [8] In Brazil, it is believed that COVID-19 can increase the income inequality index by 6.5%. [10]

It is urgent to adopt public policies that can reduce the degree of municipal social need. Without such a measure, the degree of suffering of poor populations tends to be even greater than that already observed today. There are reasons to believe that confronting the pandemic should include a wide range of measures, from those directly linked to the health sector to the adoption of social protection mechanisms for the population.

Ethics

Approval and Consent to Participate As this study used only secondary data in the public domain, it is not possible to identify the subjects. For this reason, Research Ethics Committee approval was waived.

Authors' Contributions

R.F.C, C.D.F.S and MFF conceived the study, carried out the analysis and drafted the first manuscript. All authors discussed the results, critically read and revised the manuscript and gave final approval for publication.

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Conflict of Interest

The authors have declared no conflicts of interest.

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Figure 1- Spatial association between COVID-19 and the Social Deprivation Index. Bahia, Brazil, 2020.

Legend: SDI- Social Deprivation Index