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Papers

Ethnic-Racial Disparity and Mortality Due to Covid-19: Case Study of Two Medium-Sized Cities

Diuster de Franceschi Gariboti[1]
Flavio Manoel Rodrigues da Silva Júnior[2]

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Abstract
Ethnic-racial disparity is a disturbing adversity that is present in the current context of Brazilian society. During the New Coronavirus pandemic, different countries around the world pointed out the relationship between this and other socioeconomic vulnerabilities and mortality from the virus. This research aimed to analyze and substantiate how an ethnic-racial disparity was present during the COVID-19 pandemic, contextualizing the problem from the analysis of two medium-sized cities located in Rio Grande do Sul: Rio Grande, RS and Pelotas, RS. The article was based on the hypothetical-deductive approach method, with the use of the bibliographic research technique together with the case study, in which the general mortality rates of the population and the mortality stratified among whites, blacks and browns were estimated, based on data from the Civil Registry of Deaths in the cities mentioned. The results obtained in the present study show higher mortality rates among blacks than among whites (an increase of 36% in Rio Grande and 46% in Pelotas), similarly to results obtained in other studies that investigated Brazilian metropolises. In the meantime, the findings of this study expand the issue of ethnic-racial disparity in the context of the COVID-19 pandemic beyond the large Brazilian metropolises and highlight a structural problem in medium-sized cities.

[1] Universidade Federal do Rio Grande – FURG, Rio Grande, RS, Brazil. garibotidiuster@gmail.com
[2] Universidade Federal do Rio Grande – FURG, Rio Grande, RS, Brazil. f.m.r.silvajunior@gmail.com

INTRODUCTION

SARS-CoV-2 is the etiological agent of COVID-19, a disease that since 2020 has had vast negative consequences around the world. In March 2020, the disease that began in the city of Wuhan, China, was declared a pandemic (CIOTTI, 2020). The first reports pointed to a local flu outbreak, which, in a short time, spread to other Asian countries and, later, to the other continents of the world (SAÚDE, 2020). In a conceptual sense, a pandemic is a situation in which, to a large extent, the spread of a given disease across different countries and regions occurs (WHO, 2020).

Brazil has been identified as the country most affected by the COVID-19 virus among South American countries and, in the global context, the country lags behind India and the United States in terms of the highest number of registered deaths (CARTAXO et al., 2021). In mid-November 2021, Brazil surpassed the mark of 609,000 deaths caused by the SARS-CoV-2 pandemic, according to data of coronavirus disease 2019 (COVID-19) in Brazil by the Ministério da Saúde (2021).

Global concerns about this pandemic have been related to the lethality of the virus in vulnerable groups, such as the elderly and people with previous comorbidities, including chronic noncommunicable diseases, combined with the ability of the virus to cause health systems around the world to become saturated, culminating in the collapse of these health systems (SANTOS, 2021). Previous studies have demonstrated the fragility of the Brazilian health system in facing the COVID-19 pandemic, combined with a lack of political articulation and social vulnerability (DA SILVA et al., 2020).

In addition, some preexisting conditions, such as cities with high population densities, housing and mobility difficulties, and health-related outcomes (established endemic diseases and flu outbreaks in the winter period), contribute to promoting disorder and chaos in the country (SANTOS, 2021).

In countries characterized by immense social disparities, the impacts of the new coronavirus pandemic have been seen even more clearly. A recent study conducted by Albuquerque et al. (2021) showed the geographical disparity in the spread of SARS-CoV-2 across Brazilian territory, associated with socioeconomic and territorial indicators, and underscored the need for a special look at the most vulnerable populations. The study reported that the number of confirmed cases was higher in the main Brazilian capitals and cities with ports and large airports, while a high number of deaths was more frequently reported in states such as São Paulo, Rio de Janeiro, Ceará, and Pernambuco. It should be noted that these numbers reflect the behavior of the first wave of the disease in the country.

In the diverse environment in which the world currently lives, ways of living are understood to be biased due to the enormous lack of socioeconomic stability expressed through the loss of jobs and, consequently, of wages, in addition to the lack of finances, housing, infrastructure, and access to health (ARAÚJO et al., 2020). Thus, it can be seen that all these indicative points highlight the highest mortality rates of people living in the context of vulnerability (ARAÚJO et al., 2020), with black individuals being the most affected.

In the fight against the SARS-CoV-2 virus, some components are understood to be essential for helping current leaders in the field of public and humanitarian health, in order to efficiently combat this viral outbreak. Thus, the assimilation of actions by individuals and systems aimed at preventing contagion, encouraging population mobility, and acting in a resilient way to face and overcome the pandemic is highlighted (ZHANG et al., 2020).

Furthermore, it is noteworthy that the understanding of vulnerable social groups helps health agents and authorities to carry out the guidelines according to specific demands for these groups. In this sense, it is understood that there is a precariousness of housing, access to health and infrastructure in these spaces as exposed by Araújo et al. (2020).

Studies in other parts of the world have shown that mortality rates are not similar when groups of different social and economic classes are compared (MENA et al., 2021), as well as ethnic-racial groups (BRANDT et al., 2020). In Brazil, these findings have also been mentioned, but they have addressed in terms of a regional or national scenario (BAQUI et al., 2020), with initial data from the pandemic (OLIVEIRA et al., 2020), or results obtained for large metropolises (MARINHO et al., 2020), with little or no attention to small and medium-sized municipalities.

This article addresses a problem discussed globally, focusing on two medium-sized Brazilian cities and investigating the existence of ethnic-racial disparity, in light of the number of deaths related to the disease. The guiding question arises from the indispensability of understanding whether, during the pandemic,

there were clear differences in the mortality rate between blacks and whites. Thus, this investigation aims to analyze and substantiate how ethnic-racial disparity was present during the COVID-19 pandemic, contextualizing it from the scenario of comparing mortality rates between whites, blacks and browns, in two medium-sized municipalities of the state of Rio Grande do Sul: Rio Grande and Pelotas.

METHODOLOGY

Population studied

The case study was conducted with data referring to the cities of Pelotas and Rio Grande, both in the extreme south of the Rio Grande do Sul state. According to the Instituto Brasileiro de Geografia e Estatística (IBGE), which is the federal agency responsible for the population data, the municipality of Pelotas is the third-largest in the state and has 343,132 inhabitants, and the municipality of Rio Grande has 211,965 inhabitants (IBGE, 2021). The absolute numbers of the population and those separated by skin color (white, black, and brown), for the year 2020, were used from the IBGE population estimates (total population) available in the IBGE Automatic Recovery System (SIDRA, 2021). The age groups used in the study were those available at the IBGE and were consistent with the age groups made available in the data on deaths due to COVID-19.

Data on mortality from COVID-19

Data regarding the total number of deaths and the number of deaths by skin color (white, black, and brown) were extracted on May 31, 2021 from the public database in the Registro Civil de Óbitos (RCO), which is the government database with information on deaths (BRASIL, 2021). Due to the emergence of the COVID-19 pandemic, a special section was made available to provide data on deaths from the disease. The age groups used in the study were those available in the RCO.

Calculations of mortality rates (crude and standardized) per 100,000 inhabitants

The crude mortality rate was calculated from the equation below:

$$R_{crude} = \frac{ni\ deaths}{pop\ i} \times 100.000$$

(Equation 1)

Where:
R_{crude} is the crude mortality rate;
Ni_{deaths} is the total number of deaths in the general population or in different groups by skin color;
pop_i is the total population or each population group by skin color.
R_{crude} is a measure that disregards differences in outcome related to skin color.

However, it is known that COVID-19 is a disease that primarily affects the older population and that the number of blacks and browns in this age group is proportionally smaller than the number of whites. Thus, it is convenient to use another measure that takes these differences into account, known as the age-standardized mortality rate (R_{stand}). This measure takes into account the proportion of people in the corresponding age groups of a standard population (PÓLIS, 2021).

The standardized mortality rate (R_{stand}) was calculated based on the equation below:

$$R_{stand} = \frac{Rcrude_f \times SP_f}{100.000}$$

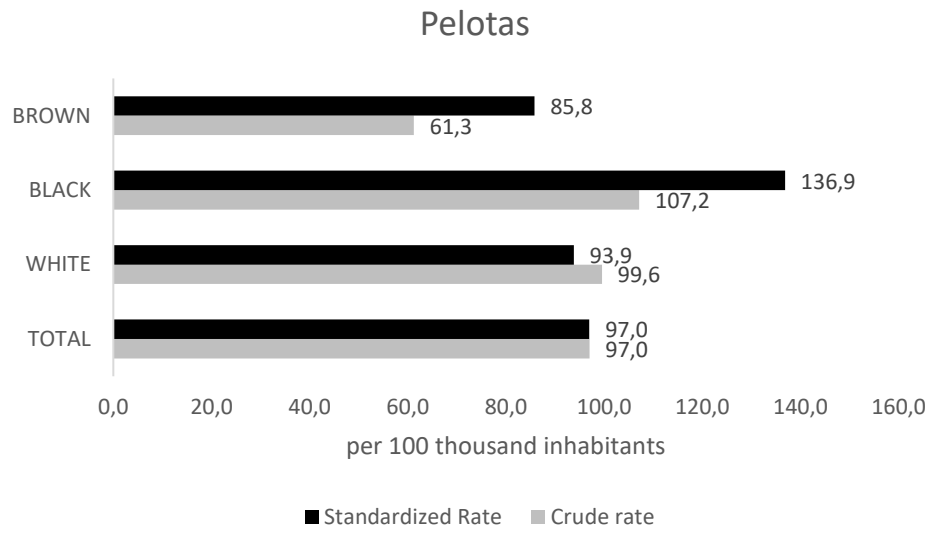
(Equation 2)

where:
$R_{crude f}$ is the crude mortality rate for a given age group;
SP_f is the number of inhabitants of the standard population (per 100,000 inhabitants) in a given age group.

Case study of two medium-sized cities in Rio Grande do Sul

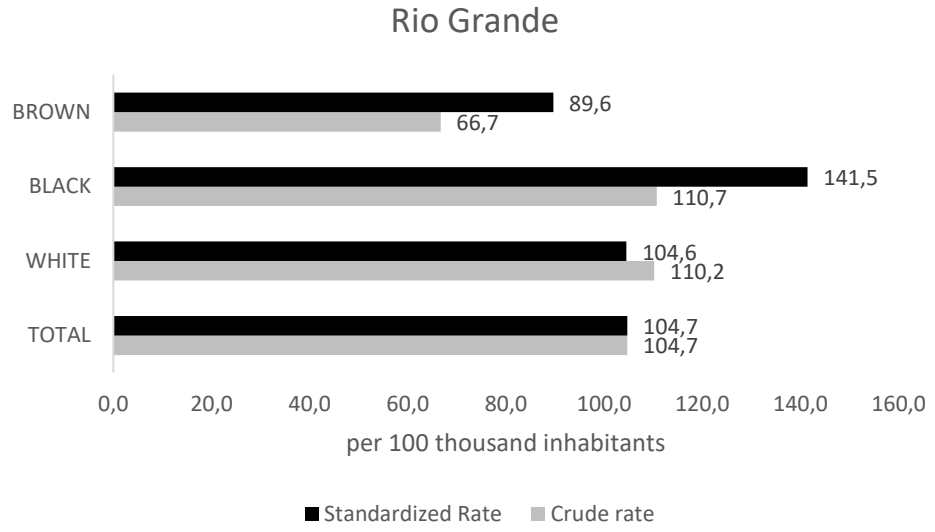
The rates of mortality from COVID-19 (crude and age-standardized) in the municipalities of Pelotas and Rio Grande, for the year 2020, are shown in Figures 1 and 2, respectively, and were prepared based on death information and population data on the two cities: Pelotas (Tables 1 and 2) and Rio Grande (Tables 3 and 4). The COVID-19 mortality rate for the general population was 97 deaths per 100,000 inhabitants in the municipality of Pelotas and 104.7 deaths per 100,000 inhabitants in the municipality of Rio Grande.

Figure 1 - Crude and standardized mortality rates by COVID-19 in the city of Pelotas, in 2020.



Source: The authors (2021)

Figure 2 - Crude and standardized mortality rates by COVID-19 in the city of Rio Grande, in 2020.



Source: The authors (2021)

Table 1 - Number of deaths from COVID-19, in the city of Pelotas-RS, in 2020, by age group, in the general population and by skin color.

Age group	General population	White	Black	Brown
0 to 9 years	1	0	0	1
10 to 19 years	0	0	0	0
20 to 29 years	4	4	0	0
30 to 39 years	9	6	2	1
40 to 49 years	19	13	5	1
50 to 59 years	40	30	9	0
60 to 69 years	81	69	8	4
70 years or older	179	154	15	10
Total	333	276	39	17

Source: extracted from RCO (BRASIL, 2021).

Table 2 - Estimate of the general population, by age group, skin color and standardized population for 100 thousand inhabitants, in the city of Pelotas-RS, for the year 2020.

Age group	General population	White	Black	Brown	Standard population (100 thousand inhabitants)
0 to 9 years	41069	32013	4408	4462	11969
10 to 19 years	54860	41366	6988	6232	15988
20 to 29 years	57923	46373	6719	4549	16881
30 to 39 years	47764	38870	5262	3345	13920
40 to 49 years	47416	38771	4927	3557	13819
50 to 59 years	42052	35018	4023	2727	12255
60 to 69 years	28179	24046	2402	1603	8212
70 years or older	23868	20780	1662	1274	6956
Total	343132	277237	36391	27750	100000

Source: adapted from IBGE (2021)

Table 3 - Number of deaths from COVID-19, in the city of Rio Grande-RS, in 2020, by age group, in the general population and by skin color.

Age group	General population	White	Black	Brown
0 to 9 years	1	1	0	0
10 to 19 years	2	2	0	0
20 to 29 years	3	2	1	0
30 to 39 years	5	5	0	0
40 to 49 years	9	8	0	1
50 to 59 years	26	21	3	2
60 to 69 years	49	40	6	3
70 years or older	127	107	10	10
Total	222	186	20	16

Source: extracted from RCO (BRASIL, 2021).

Table 4 - Number of deaths from COVID-19, in the city of Pelotas-RS, in 2020, by age group, in the general population and by skin color.

Age group	General population	White	Black	Brown	Standard population (100 thousand inhabitants)
0 to 9 years	27618	21239	2025	4217	13030
10 to 19 years	34808	26264	3507	4908	16422
20 to 29 years	35876	28701	3139	3768	16926
30 to 39 years	29828	23443	2951	3295	14072
40 to 49 years	28390	22763	2568	2899	13394
50 to 59 years	25995	21460	1982	2416	12264
60 to 69 years	15974	13439	1030	1407	7536
70 years or older	13476	11457	864	1081	6358
Total	211965	168766	18065	23991	100000

Source: adapted from IBGE (2021)

The study reports crude mortality rates related to COVID-19. However, as mentioned earlier, the lethality of this disease is influenced by age (higher among older adults). In this case, the age-standardized mortality rate is considered a better indicator of mortality from COVID-19 (PÓLIS, 2020).

In the municipality of Pelotas, the standardized mortality rate, measured per 100,000 inhabitants, was 93.9 among whites, 85.8 among browns, and 136.9 among blacks. In the city of Rio Grande, the profile of mortality rates was similar and the standardized mortality rate among whites was 104.6, 89.6

among browns, and 141.5 among blacks. These findings show that the mortality rate among blacks was higher than among whites in both municipalities (approximately 36% in Rio Grande and 46% in Pelotas).

DISCUSSION

Over the years 2020 and 2021, SARS-CoV-2 spread in an uncontrolled way around the world and, therefore, represents a major setback for the health systems of all countries, especially the Brazilian public health system (SUS). In light of this, scientific studies that aim to identify the most vulnerable individuals or population groups can work as a good management tool for health systems. Accordingly, the reallocation of financial resources for the formation and strengthening of public policies aimed at populations that are in a vulnerable situation, which are affected on a larger scale by the virus, can be a strategy to both reduce mortality for these groups, as in others, and propagate welfare equity.

In this context, social determinants related to health are understood as aspects that promote and influence the population's health situation and have a multidimensional tendency, so that they are directed through economic, environmental, biological, social, cultural, and political ideals (FERREIRA, 2020). Within the scope of the present study, social determinants of health at different levels are directly related to ethnic-racial disparity, including socioeconomic, cultural, and environmental conditions, educational level, access to health services, housing conditions, and lifestyle. In epidemic, endemic, or pandemic periods (as portrayed here) it is essential that these reported determinants are perceived, understood, and analyzed, especially in countries portrayed as having immense social inequality.

The data referring to the case study presented here reveal an increase in mortality rates among blacks and browns compared to the rates among white people in the two cities investigated. In several countries around the world, especially in the United States, authors have reported ethnic-racial disparities in outcomes related to COVID-19. Wong et al. (2021) reported higher rates of infection and mortality in black, Hispanic, Native Hawaiian, and Asian populations, while the study conducted by Kim et al. (2021) in 3,108 North American counties pointed to higher case and mortality rates among blacks and Hispanics, but reported that these rates have fluctuated over time, due to social, cultural, and political influences.

The number of studies on this topic in other parts of the world is quite small and limited to short evaluation periods. Even so, a study conducted in Spain, within the first months of the pandemic in 2020, showed that the risk of contagion among African, Latin American, and Caribbean migrants was higher than the risk among Spaniards and migrants from other regions of the world (GUIJARRO et al., 2021). In Brazil, a study revealed an increase in the mortality rate of almost 35% among indigenous people during the months of April to December 2020, while the increase among nonindigenous people was 18.1%. The study by Martins-Filho et al. (2021), providing data up to August 2020, showed a 1.5-fold increased risk of mortality among blacks in Brazil compared to whites.

From this perspective, it is evident that, as inferred by Laurens Holmes Jr. et al. (2020), according to historicity, minority population groups have drastic outcomes when it comes to morbidity and mortality, whatever the epidemic/endemic/pandemic. In this context, it is essential that, in previous pandemic times, the aspect of mortality generated large-scale damage, mainly to populations in vulnerable conditions, especially ethnic-racial minorities (NIEDZWIEDZ et al., 2020).

It is observed, then, that this racial disparity is related to aspects of precarious socioeconomic situations and care accessibility. This leads to black people and subaltern communities having more unfavorable outcomes than white individuals (FERREIRA, 2020). Ferreira (2020) also points out that racism promotes and maintains a link with mortality from COVID-19, due to ideals indicative of ethnic disparities in mortality in different countries, the difficulty of accessibility to public health services, and the preponderance of comorbidities that aggravate the disease.

Santos et al. (2020) report that the black population is harmed by social deprivation, including in education, employment, economic, housing, and basic sanitation. Accordingly, as predicted by Batista (2004), statistics on mortality, disability, access to welfare means, qualitative care, environmental aspects, and quality/dignified living conditions are relevant, informative, and quantitative data for the promotion of health indicators.

Thus, in health crises such as the new coronavirus, it is necessary to explain that these situations can prevent socially vulnerable

individuals from accessing the necessary resources for prevention and health promotion during these emergencies, as disclosed by the Centers for Disease Control and Prevention (2020).

The study conducted by Oliveira et al. (2020) analyzed the national scenario of the New coronavirus pandemic, together with statistical data from the United Nations Development Program (UNDP) and IBGE, and the researchers reported that, over the last few years, there has been an increase in inequality indicators, which has affected the black population on a large scale. For example, in the city of Rio de Janeiro, in 2018, 30.5% of black people (black and brown) lived in *favelas*, compared to 14.3% of white people.

In addition, it is known that blacks comprise the majority of the population residing in locations without adequate basic sanitation infrastructure, with blacks comprising 42.8% of the population, compared to 26.5% of the white population who do not have sanitary sewage (OLIVEIRA et al., 2020). It can also be seen that the disparity is certain when we see that "32.9% of blacks make up the portion of Brazilians who live on up to USD5.50 a day" (OLIVEIRA et al., 2020, p. 5).

In addition, it is understandable that the concentration of people within a given household, simultaneously, in these populations, is high, which prevents compliance with the recommendations of social distancing indicated by health bodies (in situations of positive cases of COVID-19). It is possible that many of these individuals residing in these vulnerable regions work on the front lines of the pandemic, a situation that, combined with "the precariousness of housing and the overload of domestic work, increases the probability of contagion at home and illness" (OLIVEIRA et al., 2020, p. 5).

As a result, it is recommended that for the COVID-19 crisis to be tackled, it is necessary that the highlighted inequalities are addressed. Thus, it is not expected that significant advances in minimizing ethnic-racial disparities in the field of health will be achieved "without a solid scientific basis and without broad, sustainable, and longitudinal initiatives that address social, political, and economic indicators" (ARAÚJO et al., 2020, p. 17).

Finally, it is understood that it is essential to embark on, focus on, and continue with repairing the wrongs contained in the social environment. In doing so, the social determinants of health will be prioritized, in order to avoid possible new unforeseen problems that surround the world/Brazil, such as the current one, which cause enormous damage to individuals, predominantly to black populations (FERDINAND et al., 2020).

FINAL CONSIDERATIONS

In Brazil, as in other countries around the world, the rates of mortality from COVID-19 are not equal among different ethnic-racial groups. The case study conducted with two medium-sized cities in Rio Grande do Sul revealed that the mortality rate among blacks was at least one third higher than that among whites in the year 2020 (36% higher in Rio Grande and 46% higher in Pelotas). These data reflect the scenario of the first phases of the pandemic, without the availability of vaccines, and we reinforce the need for research like this to gather information from other stages of the pandemic. The results of this study reinforce the need to prioritize public policies aimed at the most vulnerable groups and highlight that health systems need to be able to provide the necessary response in this and other health emergencies.

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AUTHORS' CONTRIBUTION

Flavio Manoel Rodrigues da Silva Júnior managed the project, performed the formal analysis, conceptualized and curated the data. Diuster by Franceschi Gariboti did the first writing and wrote the article. Flavio Manoel Rodrigues da Silva Júnior reviewed, edited, investigated, carried out the methodology and obtained funding. All authors wrote and approved the final text of the manuscript.