Monitoring COVID-19 in Rio's *favelas*: territorial-based surveillance and shared production of knowledge

Monitoramento da Covid-19 nas favelas cariocas: vigilância de base territorial e produção compartilhada de conhecimento

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ABSTRACT This is a critical reflection essay on COVID-19 in suburban areas in Rio de Janeiro through documental analysis of the three socio-epidemiological bulletins COVID-19 in the favelas, published in FIOCRUZ COVID-19 Observatory. The results of these bulletins were presented and discussed grounded on critical epidemiology and the social determination of the health-disease process, discussing the magnitude of the disease in the favelas. Furthermore, we understood that this debate elicits and strengthens the discussion about the health and social impacts of COVID-19 in the Brazilian suburbs. We described the work process to prepare the bulletins and the methodological challenges of monitoring diseases in the suburbs. Lastly, the main results were analyzed and discussed, considering the historical inequalities that became more evident with the current pandemic.

KEYWORDS Poverty areas. Interdisciplinary placement. Access to information. Public health surveillance.

RESUMO *Apresenta-se um ensaio crítico-reflexivo sobre a ocorrência da Covid-19 em espaços periféricos do município do Rio de Janeiro, tendo como metodologia principal a análise documental dos três boletins socioepidemiológicos Covid-19 nas favelas, publicados no âmbito do Observatório Covid-19 da Fiocruz. Os resultados dos referidos boletins foram apresentados e problematizados a partir do referencial teórico da epidemiologia crítica e da determinação social do processo saúde-doença, discutindo a magnitude da doença nas favelas. Ademais, compreendeu-se que este debate visibiliza e fortalece a reflexão sobre os impactos sanitários e sociais da Covid-19 nas áreas de periferia de todo o País. Foram descritos o processo de trabalho para a elaboração dos boletins, os desafios metodológicos enfrentados para monitorar processos epidêmicos em espaços periféricos, e problematizados os principais resultados à luz das desigualdades históricas que ficaram ainda mais evidentes com a atual pandemia.*

PALAVRAS-CHAVE *Áreas de pobreza. Práticas interdisciplinares. Acesso à informação. Vigilância em saúde pública.*

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Introduction

The health and socioeconomic impacts of COVID-19 are uneven in urban areas, reaching, with greater intensity, the populations of *favelas* and suburbs precariously integrated into the urban economy, with historically violated citizenship rights. The new Coronavirus (SARS-CoV-2), which leads to illness by COVID-19, advances quicker in high poverty urban areas because these territories do not have quality public policies supporting collective protection. Moreover, living conditions hamper people from adopting individual prevention strategies widely disseminated in control guidelines, such as social distancing. As public authorities lack a structured response, residents organized themselves into solidarity networks to disseminate information to prevent COVID-19, preparing donation campaigns, pressuring governments, taking ownership of sanitation technologies, and developing territorial management and epidemiological information systems[1,2].

In the context of the COVID-19 pandemic, Fleury and Menezes[2] identified innovative experiences and built typologies on organization forms and action types, including ensuring subsistence, community communication, prevention, mapping, data production, and criticizing the Government and developing action plans. The actions involved the appropriation of knowledge about the pandemic and the means for its better dissemination to residents, the production of knowledge about the *favela*, developing the mapping of households in situations of greater vulnerability, and establishing panels of morbidity and mortality incidence in the territory. Thus, the authors concluded that "the territory has potentialities and capacities that can be mobilized by social relationships developed there"[2].

Considering the complex health-disease process, we should study the space and its dynamics to understand how to live better, get sick, and die of individuals, social groups, and populations. When dealing specifically with urban space, we note that it is unequal and heterogeneous, with intense, transformative dynamics. However, these changes cannot always be captured by how health data are made available. In the COVID-19 FIOCRUZ Observatory, three socio-epidemiological bulletins of COVID-19 in the *favelas* were prepared to foster the discussion about the health-disease process closer to the urban suburbs[1].

This critical-reflective essay employs the critical documentary analysis of the three COVID-19 *favelas*' socio-epidemiological bulletins, published in the FIOCRUZ COVID-19 Observatory. Our paper is based on the theoretical framework of critical epidemiology and the social determination of the health-disease process.

When discussing the conceptualization of essays in the scientific field, Meneghetti[3] points out that this type of text generates interdisciplinary knowledge. The author believes they are ancient means of producing knowledge in several areas such as philosophy and the social sciences that enable the construction of this information to understand the different phenomena of reality through the intersubjective relationship. It is not a random or fragmentary formulation and refers to the understanding of a given object, also mobilizing readers in a constant reflexive movement that can walk in agreement or disagreement with the authors.

This essay aims to present and debate the results of the analyses in the bulletins mentioned earlier, discussing the magnitude of the disease in *favelas* in Rio de Janeiro and understanding that this debate makes visible and strengthens the reflection on the health and social impacts of COVID-19 in the suburbs nationwide. We described the work process for preparing the bulletins and the methodological challenges to monitoring epidemic processes in suburban spaces and discussed the main results, considering the historical inequalities that became even more evident with the current pandemic.

Results and discussion

Bulletin construction process and methodological challenges

The need to prepare bulletins on COVID-19 for *favela* areas emerged from the concern of FIOCRUZ COVID-19 Observatory researchers to understand how the spreading of the disease in urban suburbs would be, especially in large cities in the underdeveloped countries – considering that most of the recommendations and measures to control the disease, established at the outset of the pandemic, focused on the individual level, which presupposes providing a minimum of material living conditions.

In a country where around 17 million people live in households considered 'subnormal clusters' by the Brazilian Institute of Geography and Statistics (IBGE)[4], marked by insufficient access to basic sanitation and incipient and irregular access to water, practices such as social distancing and isolation and frequent hand hygiene are limited by the historic violation of social rights to which populations residing in these territories are subjected[5]. According to data from the Pereira Passos Institute (IPP)[6], Rio de Janeiro Municipality has 163 districts, and about 86% of its area is made up of *favelas*. Some districts have a significant territorial extension of areas occupied by *favelas*, such as Rocinha, Jacarezinho, Complexo do Alemão, and Vila Kennedy. However, most *favelas* are smaller and located 'inside' a district or 'crossing over' more than one. A relevant number of *favelas* are made invisible by how health data are organized[7,8].

Although the need to monitor the occurrence of COVID-19 in urban suburbs – particularly in Rio's *favelas* – is consensual, a methodological challenge related to the scale of data available for intra-municipal analysis in Rio de Janeiro emerges. The public data in the Municipality's Panel are available only by district scale and Postal Address Code (CEP)[9]. Therefore, for epidemiological monitoring, we considered methodological approaches that could give visibility to COVID-19 in the *favelas* and produce information to strengthen the struggle for social rights, especially the right to health information.

Information is a privilege of the State apparatus and hegemonic economic groups. Those at the top can capture the information and direct it to a collecting center, which selects, organizes, and redistributes it according to its interest. The others are receivers, especially those less capable of deciphering the signals and codes employed by the formal media[10].

In a society whose information was socialized, it would be necessary to organize a data system concerning social life, in which suburban desires could materialize through an agreement in which society and the State (re)produce each other, assuring citizenship to the population[10]. We need to uncover the inequalities in the production, distribution, and use of information among populations. Martins[11] defends it as a public good and states that people's right to information should be considered a priority, such as education, health, and food, which is a fundamental aspect of strengthening democracy.

The bulletins articulated three health surveillance perspectives: classic epidemiological, civil health, and local, territorial surveillance, acting complementarily and allowing a more reliable approach to reality. We employed quantitative and qualitative methodological approaches. The quantitative approach focused mainly on descriptive critical epidemiology, and the qualitative approach was based on the collective ombudsman's report[12], through online conversation circles with *favela* interlocutors, people who live or work in the territories. This effort allows articulating different knowledge and perspectives, as pointed out by Breilh[13]:

> [...] we need good mathematics, but also sound procedures for intensive observation and qualitative analysis to look at reality... so that we can articulate the discourse of science, the academic, with those that are part of other knowledge that has a lot to do in the fight for health.

The classical/traditional epidemiological surveillance approach was based on the analysis of data made available in the COVID-19 Panel of the Municipality of Rio de Janeiro, results presented in the first and second bulletins; and flu-like syndrome data, available on OpenDataSUS, presented in the third bulletin. The districts were classified by urban type based on the percentage of the area of the district covered by *favelas* to overcome the lack of epidemiological data for Rio de Janeiro *favelas* and find a methodological alternative capable of being a proxy for the realities of the Rio de Janeiro's suburban spaces. To this end, we adopted the most recent version of the cartographic grid of *favelas* made available by the IPP. The city's districts were classified into five groups: No *favelas*; Low (<10%); Median (11-20%); High (21-50%); and Extremely high (>50%) concentration of *favelas*. Among the methodological limitations, a district classified as 'no *favelas*' and 'low proportion of *favelas*' should not necessarily be understood as an area with good material living conditions. Districts with an extensive territorial area may have low percentages of *favelas*, but host other forms of urban poverty, such as squatters and tenements[8].

We calculated the incidence, mortality, and lethality rate indicators for the abovementioned classes. We had to make a population projection[1] to build the indicators. In the first bulletin, we analyzed data from March to June 21, 2020; and in the second, data from June 22 to September 28, 2020. The flu-like syndrome data, analyzed in the third bulletin, refer to the period from March to August 1, 2020[1,7,14].

Civil health surveillance was developed in the 1990s by researcher Victor Vincent Valla. It is based on recognizing local culture and Paulo Freire's popular education, adding processes of shared construction of knowledge and collective ombudsman to embody popular participation. Civil surveillance is expected to contribute to social transformation and, in turn, complement traditional epidemiological surveillance[12].

Following this central idea of complementarity of the different ways of doing health surveillance, the analyses of the epidemiological data were preliminarily presented and discussed with the interlocutors of the *favela* territories who know the reality based on their life experiences[8] to produce the bulletins. These individuals' reflections, data, and notes are essential for the qualification of health information, raising other perspectives for understanding the problem/phenomenon and presenting socio-spatial processes that cannot be apprehended only by health indicators and captured by health information systems. The workflow developed for the elaboration of the bulletins approached the process of shared knowledge production, whose central idea is not to facilitate the transmission of information but rather build knowledge with social movements and local interlocutors, integrating knowledge and elaborating health information that highlights social inequalities and strengthens the struggle for social rights.

The methodology of shared construction of knowledge assumes the possibility of reducing hierarchies of technical-scientific and popular knowledge to a minimum. Since its origins, it has sought to support popular civil organizations, to give technical consistency to their claims, and health sector planners, to promote the adequacy of services to meet the population's needs[15,16].

Finally, the perspective of local, territorial surveillance was based on the local surveillance methodologies developed

within the Epidemiological Monitoring Project of the municipalities surrounding the Petrochemical Complex of the State of Rio de Janeiro (COMPERJ Project), conducted within the Sergio Arouca National School of Public Health Program (ENSP/ Oswaldo Cruz Foundation – FIOCRUZ), from 2009 to 2018. One of the components of this surveillance presupposed using the Family Health Strategy (ESF) work territory as a unit of analysis to obtain local indicators from the compatibility of Family Health with the cartographic base of the IBGE census tracts[17,18].

On the form of bulletins and their importance for popular communication

Bulletins prepared within the health services, especially those that focus on epidemiological data, are essential instruments for analyzing data collected by health information systems, both for analyzing and discussing reality and for publicizing the information produced, whether for health professionals or users[19]. Despite the orientation that bulletins be made in an adequate and unambiguous language, some epidemiological bulletins usually do not provide clear health information, especially for socially vulnerable groups. Considering that the main interlocutors of the socio-epidemiological bulletins are residents of *favelas* and urban suburbs, reflecting on the form of the bulletin was as crucial as the content.

Communication in health and scientific dissemination, emphasizing a popular perspective, is essential for producing scientific knowledge, especially when working with socially vulnerable groups, as academic language can hinder apprehending and debating the content produced. Considering that the central objective of the bulletins was to produce information that strengthened the struggle for social rights, especially the right to health, the information produced in this monitoring had to be built with popular groups and appropriated by them. The COVID-19 socio-epidemiological bulletins had an unconventional format to 'translate' the knowledge produced into a more popular language and democratize access to information, considering the specificities of socially vulnerable groups.

The need to publish the COVID-19 epidemiological data analyses in a format more accessible to the public was a demand brought about by the social movements. In response to this need, we included explanations, for example, on how to read graphs[14], and produced a short video with accessible language[20].

Teixeira[21] points out that access to information, after the implementation of the Unified Health System (SUS), gained progressive importance in the medical-health debate, especially after the Law of Health Councils was institutionalized (nº 8.142/1990), and the discussion about assuring the democratization of information was central. However, in practical terms, the predominance of the communication model was maintained in which the proposed dialogue cannot disguise the unilinearity implicit in the proposed rhetorical decoding – from the 'technical' to the popular – suggesting that the 'Health Consciousness' corresponds to a behavior predefined by the technicians[21].

Several challenges were imposed to advance health communication so that it is a shared process developed in a dialogic relationship. However, closer communication with popular groups was partially achieved in this new format developed for the bulletins – because traditional media and leaders and members of social movements appropriated the information more easily. However, information is still far from being widely circulated by most historically subordinated groups. Moreover, the construction of bulletins with epidemiological

data in other formats is evaluated positively, and health professionals increasingly use bulletins.

Reflecting on the main results

We analyzed data from the socio-epidemiological bulletins of COVID-19 from Rio's *favelas* on the premise that each health situation must be analyzed in its historical, social, and geographical context. We contextualized the particularities of the geographic space and the spatial organization processes and identified the historical, social, and environmental characteristics that determine and condition the profile of illness and death by COVID-19 in Rio de Janeiro.

Santos[22] believes that working with the notion of cause and effect deals with what is seen. On the other hand, when working with the notion of context, one also looks at what is unseen and, often, is even more important than what is visible. Looking at the context allows grasping a perspective beyond form and appearance, embracing what underpins the phenomenon.

Similarly, the health-disease process cannot be understood in isolation, only through the cause-and-effect rationality; we need to understand the economic production, the historical, social, cultural, and biological aspects.

Box 1. Comparison of incidence, mortality and lethality rates by COVID-19 between the 1st and 2nd Bulletin

Type	1st Bulletin	2nd Bulletin	Situation
Incidence rate (per 10,000 inhabitants)			
No *favelas*	115.58	135.68	Increased
Low	74.98	73.19	Stable
Median	58.11	58.97	Stable
High	32.62	27.03	Decreased
Extremely high	23.94	22.34	Stable
Municipality of Rio de Janeiro	70.71	67.74	Decreased
Mortality rate (per 10,000 inhabitants)			
No *favelas*	10.67	2.21	Decreased
Low	8.90	3.15	Decreased
Median	7.79	2.23	Decreased
High	5.36	1.29	Decreased
Extremely high	4.66	0.71	Decreased
Municipality of Rio de Janeiro	8.30	2.63	Decreased
Lethality rate (%)			
No favelas	9.23	1.63	Decreased
Low	11.88	4.30	Decreased
Median	13.41	3.78	Decreased
High	16.43	4.79	Decreased
Extremely high	19.47	3.18	Decreased
Municipality of Rio de Janeiro	11.73	3.89	Decreased

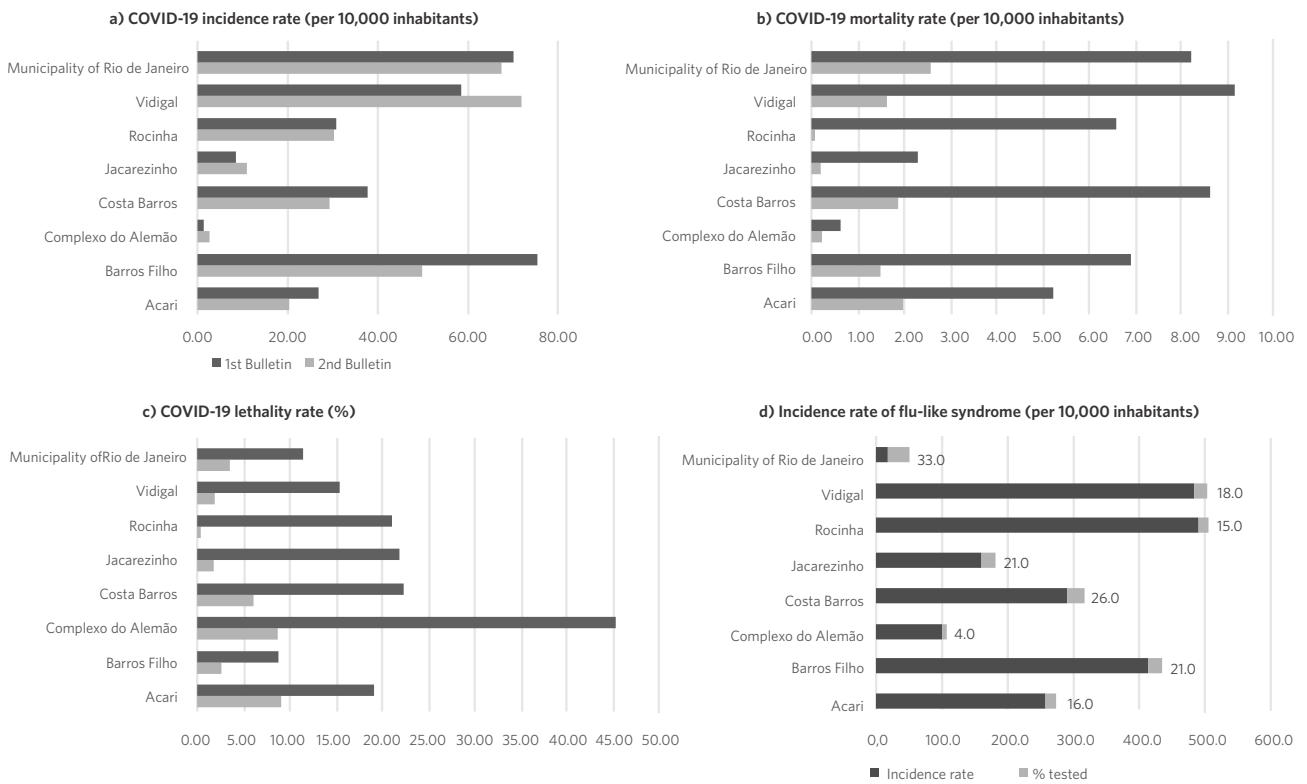
Source: Own elaboration based on Covid-19 socio-epidemiological bulletins in favelas 1 and 2[1,7].

Data from bulletins 1 and 2, presented in *box 1*, showed that the districts classified as 'no *favelas*' had the highest incidence rate for COVID-19 in Rio de Janeiro. In the first bulletin, in districts classified as 'no *favelas*', the incidence rate was 116 per 10,000 inhabitants, while it ranged from 33 to 24 cases per 10,000 inhabitants in districts classified as a high and extremely high percentage of area covered by *favelas*. This result could misinterpret reality if analyzed only descriptively, without a critical perspective on socio-spatial processes. The explanatory hypothesis that access to testing for confirmation of COVID-19 illness was uneven and incipient was raised, especially in the city's suburbs. The unequal access to testing assumption was confirmed by analyzing the flu-like syndrome data in the third bulletin.

In June 2020, the World Health Organization (WHO) stated that Brazil did few tests compared to its population size. In September, when the goal was to test a quarter of the population (25%)[24], testing was close to 7%. Despite an argument that could be based on the justification of a low supply of tests was no longer a plausible argument over time. This lack of offer is also reflected in the historical and systematic non-availability of other essential public policies for maintaining life in *favelas* and urban suburbs, such as health equipment, leisure, culture, basic sanitation, and inclusive education policies. Furthermore, failure to conduct adequate testing also makes the confirmation of COVID-19 cases invisible,

which clouds factual knowledge of the disease's evolution in the country's distinct locations, especially in regions with greater socio-environmental vulnerability, such as the *favelas*[24].

Figure 1. Incidence, mortality and lethality rate by Covid-19 and incidence rate of flu-like syndrome in districts with extremely high *favela* classification



Source: Own elaboration based on Covid-19 socio-epidemiological bulletins 1 , 2 and 3[1,7,14].

However, even with this inequality in access to testing, we could identify unique situations, such as the case of Barros Filho, a district classified with an extremely high proportion of areas with *favelas* located in the North Zone of the city. In June 2020, it had an incidence rate of 76 per 10,000 inhabitants, higher than the mean rate in Rio de Janeiro (71 per 10,000 inhabitants) (*figure 1*).

Another result deserving a critical reflection is the case lethality rate despite the limitations in using this indicator in a low testing context. The first bulletin showed that the lethality rate in districts with an extremely high percentage of area covered by *favelas* (19.5%) was more than double that of districts classified as 'no *favelas*' (9.2%) (*box 1*). Lethality is a measure that expresses the relationship between deaths and total cases, identifying populations with more severe cases that rapidly progress to death[25]. Despite the biological similarities in the way of getting sick when seen at the individual level, such a marked difference in this indicator points to inequalities expressed at the population level, such as the insufficient supply of beds, delayed medical care, the lack of social support, the impossibility of implementing isolation, among other relevant situations in this social determination process.

In the second bulletin, which brought results from June to September 2020, we identified a delay in entering COVID-19 notifications on the Municipality's official platform. Although the different time for data recording by health units is understandable, the continuous defense of the availability of health information and the formulation of an information flow that occurs as soon as possible, updating the information that supports decision-making, is relevant. Since the health-disease situation is not static but complex, dynamic, mixed, and not compartmentalized, we should move forward.

> Understanding the meaning of information in appropriate language reveals/unveils the conditioning factors and social, political, and economic determinants of the health-disease-care situation[26(651)].

If health information becomes useless, it will not contribute to knowledge production, will not support decision-making, and will fulfill a merely aesthetic and decorative role[26].

Also, in the second bulletin, we observed that the incidence rate remained high in practically all urban typologies studied, despite the significant downswing in the mortality rate, following the decline observed for the entire city (*box 1*). In the intra-municipal analysis, we noticed that most deaths occurred in districts in the West Zone (Campo Grande, Bangu, Realengo, Santa Cruz, Taquara, Guaratiba, Freguesia, and Cosmos). These districts have a low percentage of areas covered by *favelas* due to their sizeable territorial extension. However, some *favelas* in these districts have little visibility than those more integrated into the city's South Zone. For this reason, we sought to give visibility to small *favelas* by naming them in the bulletin text and criticizing the lack and deficiency of urban public facilities in the West Zone of the city[7].

Another fundamental analysis that emerged from the social interlocutors of *favela* territories addressed urban mobility, evidenced by the statement of the activist from the Rocinha *favela* :

> [...] Although Campo Grande has a central job offer, several people who work in the city center live in the West Zone. Thus, they move more around the city. They are more exposed to contamination [by COVID-19] because they need to use public transport, and we know that it is substandard, crowded, and without maintenance. I believe that has something to do with it too. Lack of access to mobility and substandard public transport [...][7].

The themes identified on urban mobility and access to public transport should be highlighted to determine illness by COVID-19, unequally reaching a specific population

segment compared to another. Circulation, work, recreation, and housing are essential city functions that should be made available to ensure quality urban daily life[27].

Malta et al.[28] point out that the West Zone of Rio de Janeiro has the second-largest population in the city, with the three most populous districts in the city: Campo Grande, Bangu, and Santa Cruz. The authors mentioned above proposed a socio-environmental vulnerability index and characterized the West Zone as highly vulnerable, with small territorial sectors classified as extremely high. The authors indicate that socio-environmental vulnerability is related to Brazilian urbanization and claim that the unequal formation of the social structure is expressed in the urban structure; that is, the right to the city is not fair and equal for all its residents[28]. Specifically, Rio de Janeiro has an excluding urbanization process.

The right to the city as another theme that emerges from the set of three socio-epidemiological bulletins also deserves conceptual reflection. This right is characterized as a third dimension in the scope of rights, indicating group ownership. The individual dimension is preserved, but its emphasis is centered on collective support, ensuring the city for the people and social experience based on solidarity. It is legally supported by the 1988 Federal Constitution and the 2001 Cities' Statute. It refers to the feasibility of a space that provides dignity to the human being, improves citizens' quality of life, values the social and cultural heritage, securing the right to housing, public transport, and other social rights[27].

David Harvey[29] complements this understanding, proposing the need to claim the right to the city and affirms that it is a right that must be an object of collective ambition, grounded on the discussion of human rights, overlapping the neoliberal rationale in which the simple right to private property and profitability above fundamental rights for the maintenance of societal life is hegemonic. Thus, claiming the right to the city is to advance in understanding the social determinants of the health-disease process, ratifying that the guarantee of health as a social right for the populations of *favelas* and urban suburbs also involves ensuring the city as a right.

Further discussing the main results of the bulletins, the ethnicity/skin color theme emerges as one of the relevant dimensions of studies on health inequalities since ethnic inequalities are reflected in the insufficient access to health services. In the first bulletin, the failure to complete the ethnicity/skin color field of the COVID-19 illness or death information sheets (45% unknown among cases and 42% unknown among deaths) was a factor that hampered the measurement of the actual pattern of COVID-19 illness and mortality by ethnicity/skin color in Rio de Janeiro. It is a concrete example of how the lack of information prevents the analysis and structuring of public policies suited to the different realities of the city.

In the second bulletin, a significant improvement was identified in completing the ethnicity/skin color field in the information sheets (14% of unknown cases and 20% of deaths), which allowed describing the magnitude and severity of COVID-19 for this variable. Public action by the Public Federal Prosecutor's Office with the involvement of Black movements induced this change, which required the mandatory completion of this information field in the notification forms[30].

Table 1. COVID-19 incidence and mortality rate by ethnicity/skin color and gender (per 10,000 inhabitants)

	Incidence		Mortality		Lethality	
Ethnicity/skin color	**White**	**Black**	**White**	**Black**	**White**	**Black**
No *favelas*	80.23	176.71	1.19	2.12	1.48	1.20
Low	50.04	72.59	1.72	3.43	3.45	4.72
Median	43.56	54.51	1.65	2.09	3.78	3.83
High	19.98	25.58	0.65	1.17	3.24	4.56
Extremely high	18.65	19.78	0.92	0.50	4.92	2.53
Municipality of Rio de Janeiro	54.53	70.08	1.75	2.90	3.21	4.14
Gender	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
No *favelas*	121.09	152.85	1.79	2.69	1.48	1.76
Low	73.38	74.20	2.75	3.64	3.75	4.91
Median	59.93	57.88	2.02	2.46	3.37	4.26
High	27.91	26.07	1.06	1.56	3.79	5.97
Extremely high	25.27	19.18	0.69	0.74	2.72	3.85
Municipality of Rio de Janeiro	67.78	68.49	2.32	3.01	3.42	4.40

Source: Own elaboration based on the 'COVID-19 Socioepidemiological Bulletin in the Favelas' 2[7].

Therefore, it was evident that the risk of getting sick and dying from COVID-19 in Rio de Janeiro was more significant for Black people than whites. Specifically, in districts classified as 'no *favelas*', the incidence rate in the Black population was about twice as high as the white population. The inequality between whites and Black people becomes even more significant when one considers that districts classified as 'no *favelas*' are predominantly composed of whites, about 70% of the population. Regarding this result, one cannot fail to reflect on the historical, accurate, and symbolic confinement of the Black population in degraded and substandard urban areas[31]. Garcia signals that

> [...] the social distancing between Black people and whites, even with spatial proximity, reveals the uniqueness of Brazilian urban segregation and its underlying class and racial antagonisms[31].

Oliveira et al.[32] believe this unequal behavior of the disease between whites and Black people confirms the analyses of racial inequalities resulting from our colonial matrix that naturalizes the place in the world destined for each based on ethnicity, which also is a political construct. Regarding the unsatisfactory quality of information by ethnicity/skin color, the failure to record this variable reveals racism, in institutional terms, as it prevents the true magnitude of the exclusion of the Black population from being seen.

Garcia[31] advocates the concept of urban racial segregation and the hypothesis that Brazilian segregation should not be seen only through the prism of the socioeconomic dimension. Based on the analysis of indicators of occupation, income, urban goods, and collective consumption services, spatialized and stratified by ethnicity/skin color, the author highlighted the relationship between racial inequalities and urban segregation in Rio de Janeiro. This process is linked to how racism has been introduced in Brazil since the establishment of cities. When addressing population distribution by ethnicity/skin color, it recreates and, in some contexts, crystallizes the logic of the masters' house and enslaved people's quarters.

Regarding the gender dimension, the bulletins pointed out that mortality is higher among men, although the risk of getting sick was similar between men and women. Gender inequality becomes smaller in areas of high and extremely high concentration of *favelas*, possibly because substandard material living conditions are preponderant in determining the health-disease process compared to the gender issue in these areas (*table 1*). The higher mortality among men may be associated with the delay in seeking health services, which would lead to the aggravation of the disease, progressing to death, and the inclusion of this population contingent in substandard work activities[1].

As mentioned above, the third bulletin aimed to study flu-like syndrome notifications (illness considered a suspected COVID-19 case, which triggers the investigation and testing process to confirm the case). Flu-like syndrome notifications have become mandatory in all public and private health establishments nationwide since the onset of the COVID-19 pandemic.

Before the pandemic, this action was restricted, as sentinel surveillance, to only a few health units. Therefore, from these data, especially in a low testing context, it was possible to identify the disease transmission dynamics in depth because these notifications derive mainly from emergency and PHC units[14].

Table 2. Percentage distribution of neighborhoods with tests without information by urban typology in the city of Rio de Janeiro, Brazil

	Up to 50%	50-80%	> 80%	Total
No *favelas*	18.2	72.7	9.1	100%
Low	19.0	64.6	16.5	100%
Median	2.4	90.4	7.1	100%
High	0	58.3	41.7	100%
Extremely high	0	42.9	57.1	100%

Source: 3rd 'COVID-19 Socioepidemiological Bulletin in the *Favelas*'[14].

These data confirmed low testing and unequal access to tests in Rio de Janeiro. The analysis was conducted throughout 2020 for the Municipality. However, it was only possible to perform the analysis until August of that year on the intra-municipal scale due to the non-availability of the database with the identification of CEP and district by the Ministry of Health.

Despite this limitation, we found that the districts with the highest proportion of *favelas* were the ones that tested the least until that moment – the districts with high and extremely high proportions of *favelas* had more than 50% of notifications without information about testing (*table 2*). In the conversation wheel to discuss the first bulletin, the statement by the member of the Unified Black Movement (MNU) from the *favela* of Jacarezinho already pointed to this backdrop:

> Underreporting and not having a test for everyone is very serious. Private laboratories test freely for those who can pay, but people do not do it in the public ones, and, when they do, it takes a long time to know the result [...] The Government wants to give an air of normality with these data[1].

The complex processes involved in the underreporting of COVID-19 cases were also evident in the statements of the member of the newspaper 'Voz da Comunidades' and the member of the Grupo Eco in Santa Marta. They highlight the challenge of integration with the population, the necessary dialogue for a better understanding of health-disease processes, and the critical role of health information as an instrument that guarantees democracy and strengthens the right to health:

> Here in the Alemão, we had the presence of 'Dados do Bem' [Data of Good], who remained for almost a month on the block of the Itararé road. Moreover, it was challenging for us to convince the residents to take the test as a local communication vehicle. I can't say exactly what might have happened to many of them not being interested [...] I also wanted to find an answer to this: Why didn't people perform the tests?[14].

> The Family Clinic here in Santa Marta is doing a test, but I didn't know that. Many people don't know that. This information was not publicized. No explanatory element facilitates people's interpretation of this information to effectively relate to the process of producing this disease and understand the role of the public service[7].

We cannot interpret this information brought by the experience of organized civil society without considering the political and economic context, centralizing the discussion on the increasing unemployment rate, the end of emergency aid, and the unstable work relationships to which most suburb residents are subjected. According to data from the Continuous National Household Sample Survey (PNAD Continuous)[33], Brazil set a record in the first half of 2021 with the highest unemployment rate in the series started in 2012 (14.7%), which corresponds to almost 15 million of people looking for jobs in the country.

Testing followed by confirmation of the positive COVID-19 case and, in turn, compliance with the social distancing measure means for subordinated groups the inability to move around the territory, which, in the absence of social security, is the only means to ensure survival, whether in informal work or in the mobilization of solidarity actions to collect staple food baskets. Santos et al.[34] discussed the role of community engagement, particularly the actions of social movements and civil society in the face of COVID-19. According to them, given the Brazilian political context, in which the presence of the necropolitical mechanism is evident in the face of the pandemic, the solidarity and struggle actions promoted by social movements aimed to ensure food and hygiene security for the most vulnerable and the mobilization of resources to offer accessible information about the current situation, consistent with social and ethnic conditions, ensuring their role as health promoters.

Complementing this reasoning, identifying people getting sick or dying from COVID-19 through their inclusion in the labor market or their occupation[35] was an emerging topic highlighted in the second bulletin. The low completion level of the occupation data in the notification forms contributes to a policy of erasing the reality of those who are exposing themselves, getting sick, and dying.

Frutuoso and Viana[36] point out that the discussion and decisions about hunger gain complexity through bodies at risk in the search for food or resources and in the struggle for life that does not distance itself from the contours of the neoliberal market. Although it can ensure the sector's survival, the delivery mode sale adaptation of restaurants evidences the substandard work of delivery people of virtual platforms who keep working in unhealthy conditions of vulnerability to the virus while developing an essential service[37].

Regarding the age group, mortality and lethality were significantly higher for the older adults (over 60 years old) in the first and second bulletins in all urban typologies. Furthermore, in the second bulletin, a slight increase in the risk of illness was observed in the 40-59 years age group[1,7]. In March 2021, the discussion on the rejuvenation of the pandemic was highlighted by FIOCRUZ COVID-19 Observatory for the entire country, as researchers observed a 626% increase in cases for the respective age group, which suggests a pandemic shift to the youngest[38].

From the perspective of local, territorial base surveillance, we used data available on the newspaper 'Voz das Comunidades' website, which were initially obtained from PHC units in different *favelas* territories by the newspaper's team[39]. After selecting some *favelas*, we performed the cartographic compatibility between the area covered by the health units and the census tracts to obtain a population base to calculate local indicators (*table 3*). Among the ESF areas of activity for which data were available, we observed that the COVID-19 incidence and mortality rates were higher in Cidade de Deus, at 224.7 and 43.1 per 10 thousand inhabitants[1], respectively.

Table 3. Incidence, mortality and lethality rate in favelas in the city of Rio de Janeiro, Brazil

	Incidence Rate (Per 10,000 inhabitants)	Mortality Rate (per 10,000 inhabitants)	Lethality Rate (%)
Alemão[1]	14.7	4.7	32.3
Cidade de Deus[2]	224.7	43.1	19.2
Pavão-Pavãozinho-Cantagalo[2]	23.7	9.3	39.1
Manguinhos[1]	49.3	11.4	23.2
Jacarezinho[2]	41.9	4.9	11.8
Rocinha[2]	37.6	7.4	19.8

Source: 'COVID-19 Socioepidemiological Bulletin in the Favelas'[1].

Sabroza[18] affirms that an advance occurred in territorial-based surveillance with health information management at the municipal scale in the 1980s. However, this scale is no longer sufficient to ensure SUS territorialized action, especially in municipalities with more than 30,000 inhabitants. Besides the intra-municipal scale, with the district-level analysis, the availability of data at the sub-municipal scale is required to create local indicators that consider the ESF as a guiding model for the organization of the health care network. Nothing is institutionalized despite several emerging initiatives from this perspective.

The author points out the importance of surveillance on a local, territorial basis, exemplifying the analysis of tuberculosis data in Itaboraí/RJ, where indicators were developed for critical areas by material living conditions. These areas were mapped in fieldwork and made compatible with census tracts, showing that the incidence rate of tuberculosis was twice as high in critical areas than in other areas[18].

In the second bulletin, it was impossible to continue monitoring on this scale due to

changes in data collection by the newspaper 'Voz das Comunidades' and the difficulty of retrieving data via institutional means. However, the methodological exercise performed in the first bulletin presents an alternative that can bring the production of health information closer to the reality of the urban suburbs, mainly Rio de Janeiro's *favelas*, showing one of the possible paths for developing *favela* cartography. This perspective can be complemented by a statement made by the militant of the Eco group from Santa Marta hill, which reinforces the need for a territorial rearrangement to meet the need for data availability and strengthens the struggle for the right to health information for the *favelas*:

> We must be bold and propose new cartography with this objective and approach reality with all the inconsistencies and uncertainties we have: to dare even in imprecision or uncertainty. I think it's worth making mistakes, but it's worth pointing out the need and showing the possibility of new technical arrangements that can bring us closer to these realities[1].

Final considerations

This study brought to the center of reflection and analysis the peculiarities of COVID-19 in peripheral urban spaces, particularly in Rio de Janeiro's *favelas*. Reviewing data and information, anchored in the world view of social interlocutors of the territories, shows the need to develop other possibilities of shared construction of knowledge. The socio-epidemiological bulletins were a possible strategy to produce critical, contextualized, qualified health information articulated with popular knowledge.

Facing structural issues of life in society, mainly related to historical inequalities and social injustices, and the construction of full citizenship that points out that the right to the city is not restricted to a right of a few are the only possible paths for significant social changes, so that, in the face of a new health emergency, there will be no need to discuss, reflect, and debate the same social and health problems of vulnerable and subordinated populations.

As Breilh[13(161)] reminds us, we should

> [...] give back to epidemiology its identity and ability to dream – identity as a science with an emancipatory horizon, of the struggle for the human and opposed to the power that oppresses us, and the ability to dream again in a different world, in which the search points to the achievement of health at work, in the daily city, the cultural and political life, and our relationship with nature.

Efforts are required from authorities and public managers to improve the quality of health information and formulate strategies and technical arrangements for data availability that give visibility to suburban spaces. After all, if the way health information is organized does not allow epidemiological analysis for certain social groups and territories, it must be rethought and restructured, as health information is a right.

The traditional structure of epidemiological surveillance must be rethought, as the actions taken have been insufficient to monitor the realities of *favelas* and other suburbs at the local level. Furthermore, it is urgent to develop health surveillance closer to people's lives, in constant interaction with PHC and articulated with popular movements.

Collaborators

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