Analysis of the Socio-Environmental Vulnerability of Black and Caucasian Pregnant Women in Salvador, Bahia, Brazil to the Occurrence of Microcephaly Associated with the Congenital Syndrome of Zika Virus

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Abstract

To understand the occurrence of the Congenital Zika Syndrome (CZS), the living conditions of pregnant individuals must be considered in order to identify factors and areas of risk. An intersectional approach provides an understanding of the vulnerabilities to which Black women are subjected. The presents a survey of Black and Caucasian, pregnant women through an overview of spatio-temporal distribution of confirmed cases of microcephaly associated with CZS, and an intersectional lens of race and class in Salvador, Bahia, Brazil in the 2015-2016 period. To consider the confirmed cases of microcephaly and other neurological anomalies associated with CZS, a Living Condition Index (LCI) was utilized to rate the socio-environmental vulnerability of pregnant women. There was less information in the notification records with regard to Black, pregnant women resulting in fewer examinations. Twelve high-risk areas for Black, pregnant women were identified and only two for Caucasian women. The CZS cases referred to Black, pregnant women were found to be concentrated in census sectors with low (31.6%) and very low (34.5%) LCI, while those referred to Caucasian, pregnant women were concentrated in areas with high (35.6%) and intermediate (29.4%) LCI. The study concludes that inequities in health expose different population groups to different forms of illnesses, and institutional racism solidifies scenarios of exclusion. In this sense, Black women experiences manifest directly in their health. Confrontation with arboviruses requires the implementation of inter-institutional policies aimed at overcoming discriminatory practices of exposure.

Keywords: Pregnant; Zika virus; Intersectionality

Introduction

Enumeration of indicators associated with socioeconomic variables have been carried out during the last decades for various living conditions of the population to understand the relationship between social, biological, economic and environmental aspects in the patterns of the health or illness in a determined territory. Utilization of such indicators make a reliable evaluation of living conditions of distinct populations possible, favoring the elaboration of public policies to achieve better equity in health by indicating gaps in health care that needs to be closed [1]. To guide this approach social inequalities in health are studied through the association between living conditions, access to health services and comprehensive care, while taking the epidemiological situation in the neighborhood into account.

Exposition to various illnesses differs between population groups due to factors, such as the immediate environment, cultural context as well as genetics. Thus, we have the pattern of social reproduction and maintenance of conditions that promote disease and injury or sanity, manifested through the various forms of oppression characterized by class division, race or gender.
Environmental and social conditions which favor the permanent circulation of *Aedes aegypti* in Brazilian, together with the resident population under attack of infections transmitted by this mosquito, configure an associated pattern of vulnerabilities [2]. In a study carried out in a county of São Paulo, presents evidence that the incidence rate of dengue is four times higher for Black people, which emphasizes that all inhabitants are not under the same risk.

The Zika Virus (ZIKV) has been present in American and Caribbean countries for more than 50 years causing occasional outbreaks, but without epidemiological impact. The US National Library of Medicine/National Institutes of Health database of medical articles (PubMed) includes about 30 million references. Out of these, 112 articles mention the earliest known circulation of the virus from 1952 to 2014, highlighting the cases in French Polynesia and Pacific Islands in 2014, and in Yap, an island belonging to the Federated States of Micronesia in 2017. Between 2015 and 2016, more than 1,300 articles were published, and by February 2016, the World Health Organization (WHO) identified the circulation of ZIKV with criteria for a health emergency. One year later, 48 American countries and territories had already registered the circulation of the virus [3].

In 2015, the Brazilian Public Health authorities declared a National Public Health Emergency and intensified the campaign of vector control of *A. aegypti* in order to confront the ZIKV epidemic. The epidemiological evidence indicated an association between the infection by ZIKV and the occurrence of deformations and neurological anomalies, such as microcephaly in fetuses of mothers affected by the virus [4]. The north-eastern region of the country was most affected; especially the states of Bahia, Pernambuco and Rio Grande do Norte. Not surprisingly, the population of these states is mostly poor, living in places that favor the vectors and, consequently, the circulation of the virus due to absence of mosquito nets, the ambient climate conditions or both.

An evaluation of susceptibility between population groups verifies the idea that Black women are the most vulnerable to the mosquito-borne transmission since they are generally housed in the most susceptible regions for this kind of viral diseases and also affected by precarious socio-environmental conditions [5]. The negligence of public institutions promotes the development of an unhealthy environment, characterized by inadequate water supply and sewage systems. In these environments it is easy to identify territories structured on the foundations of environmental racism that is the ways in which socio-environmental inequalities occur in different forms for different ethnic groups [6].

Infections transmitted by vectors occur in different ways in different territories and this interferes with the dynamic of transmission. Thus it is important to consider a number of facts, such as the climate, the prospect of locations as breeding grounds, the relationship between the population densities of vectors and humans, the index of local infestation, living conditions, access to sanitation and garbage collection services as well as the history of exposure to infection [4].

In addition to these factors, we have an intersectional approach, which, when assessing the interweaving of oppressions, allows the understanding of the different stages of vulnerability, considering the differences between class and race.

The intersectional approach as a theoretical and methodological model makes possible a reflection that does not contemplate the hierarchy, but the association or interweaving in the axes of oppression. The concept of intersectionality coined by the American [7] addresses the existence of differences within difference. The author points out that all people experience an intersectional experience, but policies do not consider this aspect in their formulations. In this sense, it proposes that research and institutions adopt an intersectional approach to race, class, and gender in their discourses and practices about human rights. This approach is fundamental for a real understanding of the epidemiological scenario in view of the inequalities between the different population groups, mainly among blacks and caucasians in Brazil and especially in the city of Salvador, whose black population represents 80% of the population of the cities [8].

To carry out this evaluation, georeferencing was used for the construction of thematic maps utilized to accomplish the objective of description and visualization of spatial distributions. The maps point to the determined locations and associations between an event and its determinants [9]. The study embarked on is a descriptive exploratory study with a quantitative approach, in which Census Sectors (CS) were used as a spatial analytical unit, defined as the lowest level of spatial aggregation for which periodically updated data is available, related to the demographic structure and social characteristics of the population [8].

This study intends to present an exposition of Black and Caucasian, pregnant women through the lens of spatio-temporal distribution of confirmed cases of microcephaly associated with the congenital ZIKV syndrome considering the intersectional approach of race and class in the municipality of Salvador, Bahia in 2015 and 2016.

**Materials and Methods**

**Study area**

The study was conducted in the municipality of Salvador, Bahia, Brazil focusing on the metropolitan region of the city of Salvador. Currently, the municipality is composed of 2,675,656 inhabitants distributed through 12 Sanitation Districts. The territory extends 692,820 km², which corresponds to a population density of 3,859.44/km² according to the Brazilian Institute of Geography and Statistics Instituto Brasileiro de Geografia e Estatística (IBGE).

**Database**

The database was composed by confirmed cases of microcephaly and other neurological malformations associated with the congenital ZIKV syndrome related to both Black and Caucasian pregnant women in the period of 2015 and 2016. This information was made available from the notification sheets kept by the Municipal Secretary of Health of Salvador via the Directory of Epidemiological Vigilance. Duplicate or incomplete notifications were discarded. The variables used for the evaluation were grouped by socio-demographics and health assistance, as seen in Table 1.

The Digital Cartographic Base (DCB) of the urban area of Salvador was provided by IBGE in shape file format at the scale of 1:2000, with an urban mesh constituted of 3,549 CSs.

The software ArcGis 10.1 (ESRI, Redlands, CA, USA) was used together with the DCB of the city of Salvador, the referent addresses of confirmed cases of microcephaly associated with the Zika virus and the Living Conditions Index (LCI).

All georeferencing was done according to the Mercator Transverse...
Universal Projection (MTU) coordinates using Global Positioning System (GPS) available in Google Earth.

The CSs were classified following the living conditions of their respective populations, the LCI was calculated as developed by [1], who used five proxy variables to living conditions selected from the 1991 Demographic Census: income (proportion of heads of households in permanent private households, with average monthly income equal to or less than the minimum wage); favela (percentage of houses in urban agglomerations); education (proportion of illiterate people aged 10 to 14); sanitation (percentage of households with access to piped water supply); and crowding (number of residents per room). However, it was necessary to make adjustments to the Favela and Resident/Room indices, using the available data from the Demographic Censuses from 2000 to 2010. Thus, the variable number of households in subnormal clusters, which represented the numerator of the Favela indicator, was obtained from the variable type of sector that, in the last two Censuses, represented the census sector of the subnormal special agglomerate type. Regarding Resident/Room indicator, the average number of rooms per household and average number of bedrooms per household variables did not exist in the aforementioned Censuses and were replaced by permanent private households and residents in permanent private households, making it possible to calculate the

Table 1: Categorization of Study Variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>DEFINITION/METHODOLOGY/APPROACH</th>
<th>CATEGORY USED IN THE STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>Autoreferenced</td>
<td>Black or Caucasian</td>
</tr>
<tr>
<td>Age</td>
<td>Autoreferenced</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
| Neurological anomaly | 1. Microcephaly  
|                   | 2. Microcephaly with CNS' anomaly  
|                   | 3. CNS' anomalies without microcephaly  
|                   | 4. No information                                        | Mcphephaly with CNS' anomaly                                    |
| Arbovirus infection | 1. Chikungunya  
|                   | 2. Dengue  
|                   | 3. Chikungunya and dengue  
|                   | 4. None of these infections  
|                   | 5. Unsure  
|                   | 6. No information                                        | Chikungunya and dengue                                          |
| Syphilis          | Serology                                                  | 1. Negative  
|                   | 2. Positive  
|                   | 3. Not realized  
|                   | 4. No information                                        | Syphilis                                                       |
| Toxoplasmosis     | Serology                                                  | 1. Negative  
|                   | 2. Positive  
|                   | 3. Not realized  
|                   | 4. No information                                        | Toxoplasmosis                                                  |
| Zika infection    | Serology                                                  | 1. Yes  
|                   | 2. No  
|                   | 3. No information                                        | Zika infection                                                 |
| TORCH**           | Serology                                                  | 1. Yes  
|                   | 2. No  
|                   | 3. Unsure  
| Exanthema         | Symptomatology                                            | 1. Yes  
|                   | 2. No  
|                   | 3. Unsure  
| Fever             | Symptomatology                                            | 1. Yes  
|                   | 2. No  
|                   | 3. Unsure  

*Central nervous system; **Cluster of symptoms caused by congenital infection with a number of various infections, e.g., cytomegalovirus, herpes simplex, parvovirus, rubella, syphilis, toxoplasmosis, varicella zoster and zika virus
Examinations completed during the prenatal period between 2015 and 2016 in the city of Salvador, Bahia

Table 2: Proportional distribution between Black and Caucasian women with reference to various infections.

<table>
<thead>
<tr>
<th>Examination</th>
<th>Caucasian women (%)</th>
<th>Black women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORCH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>100</td>
<td>92.5</td>
</tr>
<tr>
<td>No</td>
<td>-</td>
<td>2.3</td>
</tr>
<tr>
<td>Uninformed</td>
<td>-</td>
<td>5.2</td>
</tr>
<tr>
<td>Zika</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17.6</td>
<td>15.5</td>
</tr>
<tr>
<td>No</td>
<td>29.4</td>
<td>15.0</td>
</tr>
<tr>
<td>Uninformed</td>
<td>53.0</td>
<td>69.5</td>
</tr>
<tr>
<td>Toxoplasmosis (Result)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>100</td>
<td>82.2</td>
</tr>
<tr>
<td>Positive</td>
<td>-</td>
<td>2.3</td>
</tr>
<tr>
<td>Not realized</td>
<td>-</td>
<td>2.9</td>
</tr>
<tr>
<td>No information</td>
<td>-</td>
<td>12.6</td>
</tr>
<tr>
<td>Syphilis (Result)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>88.2</td>
<td>82.2</td>
</tr>
<tr>
<td>Positive</td>
<td>11.8</td>
<td>3.4</td>
</tr>
<tr>
<td>Not realized</td>
<td>-</td>
<td>2.3</td>
</tr>
<tr>
<td>No information</td>
<td>-</td>
<td>12.1</td>
</tr>
</tbody>
</table>

Examinations completed during the prenatal period between 2015 and 2016 in the city of Salvador, Bahia

Table 3: Association between presence of microcephaly linked to congenital zika virus infection and the living conditions index.

<table>
<thead>
<tr>
<th>Living conditions</th>
<th>Neighbourhood (No.)</th>
<th>Black (%)</th>
<th>Caucasian (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>42</td>
<td>9.2</td>
<td>35.3</td>
</tr>
<tr>
<td>Intermediate</td>
<td>39</td>
<td>24.7</td>
<td>29.4</td>
</tr>
<tr>
<td>Low</td>
<td>38</td>
<td>31.6</td>
<td>23.5</td>
</tr>
<tr>
<td>Very low</td>
<td>39</td>
<td>34.5</td>
<td>11.8</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

According to the final classification criteria, 34.3% (227/662) referred to confirmed cases of microcephaly associated with the congenital syndrome of the Zika Virus. Almost 47.1% (312/662) of the cases were discarded after investigation to verify that there is no association of the neurological alteration of the children with the occurrence of Zika virus infection by the mother, with 11.3% (75/662) remaining under investigation, while there were no classification records for 7.3% (48/662) of the notifications.

With regard to the confirmed cases, 21.9% (50/227) of the children born had microcephaly, while 67.1% (153/227) presented microcephaly with alterations because of CZS, 7% (16/227) presented without microcephaly, while there were there was no specification for the type of alteration encountered in 3.9% (9/227) of the notifications.

With respect to the question of race, 36 notification files were discarded because of lack of information. Thus, there were 191 notification files available for the evaluation of spatial distribution associated with living conditions.

The database’s evaluation yielded the observation that 91% of the pregnant women were Black, and only 8.9% Caucasian.

An analysis of the data revealed that Caucasian women received more prenatal examinations, which increased accessibility to tests and results for communicable diseases and, consequently, a healthcare intervention in a timely manner, where necessary. In relation to the completion of data forms, a difference in the information provided in the notifications was identified, as can be observed in the items without information, in relation to toxoplasmosis and Zika tests, according to Table 2.

It was found that Caucasian women did not present any history of arbovirus infection, while Black women demonstrated histories of both dengue and chikungunya (Figure 1).

The Kernel analysis identified the density of cases associated with congenital Zika syndrome CZS (Figures 2 and 3). Data evaluation showed that there was a difference in the distribution of CZS cases within the territory according to the variation of the LCI and the territory (Table 3).

The analysis of spatial distribution of the LCI allowed identification of areas with the highest concentration of microcephaly associated with CZS and the socio-environmental conditions of each census sector, with a record of occurrence, as shown in Figure 4.

The analysis of the spatial distribution, performed using the LCI, allowed us to identify that cases of microcephaly associated with CZS, in Black pregnant women, were concentrated in CSSs with low (31.6%) and very low (34.5%) LCI (Figure 5). Cases of Caucasian

Statistical analysis
The analysis of the data generated by the notification pages was conducted via SPSS, version 21, utilizing simple and relative frequencies. The analysis of density in order to identify “hot areas” was conducted using the Kernel Density Estimator, implemented through the Spatial Analyst extension of the ArcGIS program, utilizing the quartz smoothing function 13. A bandwidth of 1km was defined, from which surfaces were constructed for the cases for the population and for the ratio between the densities of the cases and population (Kernel ratio) the latter being an approximation of the risk areas, since their values are weighted by the case/population relationship.

Results
The municipality of Salvador registered the highest percentile (46.4%) of confirmed cases of CZS in the State of Bahia. During the study period, 668 notifications were registered, out of which six notifications were discarded as duplicates. In 2015, 271 cases were notified, while 2016 saw an increase of 391 notifications.

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pregnant women were concentrated in areas with high (35.6%) and intermediate (29.4%) LCI (Figure 6).

Through analysis of the case maps versus the population distribution, the risk areas for Black and Caucasian pregnant women are determined as those having children with CZS-associated microcephaly. Twelve such areas for Black women were identified in the municipality of Salvador (Figure 7). Areas of high risk for Caucasian women were discovered in only two (2) sectors, as observed in Figure 8.

**Discussion**

Thematic maps, fed by the information database, can assist managers and health teams in the planning of interventionary actions, by offering elements that will contribute to understanding the problems of the territories.

Analysis of the data reveals an elevated percentile of items without information, which compromises the understanding of the epidemiological panorama in full. This fact accounts for one of the difficulties of completing studies with secondary data.

The findings of the study conducted by [10] questions the performance of the unified health system (SUS) in reaching ethnic-racial equity. In a study with the objective of assessing equity in health services by analyzing the completeness of the race field through the SUS Performance Index (IDSUS), the authors found that of the eight (8) health information systems/modules studied, only three could be considered adequate, with more than 90% of information fields filled, and five, were classified as inadequate. Another important finding in this study concerns the indicators used to build the IDSUS, considering that, of the 24 indicators, only three were good enough for analysis.
In a study conducted by [11], to evaluate the completion of notification files of dengue, the authors concluded that the fields containing general data obtained 99% to 100% completion, while fields referencing race, schooling, and SUS card numbers presented lower completion ratings of 45.5%, 47.31%, and 0.45%, respectively. As we had a similar, even lower results in this respect, the conclusion must be that the fragility of the records, even in an epidemic period, prevents an assertive action towards equity, considering that recognizing differences are needed to allow identification of the real needs of population groups, relating especially to the formulation and monitoring of public policies that meet the demands of specific population groups.

The analysis of this study presented by the statistical analysis is related to the population proportion of caucasians and blacks in the studied region. The black population represents half of the Brazilian population, however, in the city of Salvador; this population corresponds to 80% of the local population. Although this segment is the majority, it has poor living conditions compared to the Caucasian population, so the data point out the need to consider the social determinants of health in the elaboration of public intervention policies.

The proposal was to show that there is a structural issue of vulnerability that differentiates the condition of risk exposure among different people.

The black population is composed of blacks and browns according to IBGE (2010), in the study we consider cases reported among black mothers (brown + black = 2,869,141/3,573,973=80%) and Caucasian (Caucasian = 643,539/3,573,973=18%).

Public institutions that neglect these specificities reaffirm the existence of institutional racism [12]. Thus, although there was an imbalance between the percentage of Caucasian pregnant women (8.9%) and Black pregnant women (90%) affected, the latter presented the worst results in the proportional evaluation of the groups, in the city of Salvador, Bahia.
relation to examinations, history with arboviruses, percentage of registrations without information, and greater awareness of the patients about possible symptoms (exanthema and fever).

The study conducted by [13], with the intention to evaluate the quality of prenatal basic care in all of Brazil, found a significant difference between 4,111 (67.5%) women considered of "mixed" race and 1,983 (32.5%) white women: among six (6) evaluation indicators for prenatal characterization, Black pregnant women had the worst results, with a quality of care coverage of 14.9% vs. 15.3% of Caucasian, pregnant women.

In an evaluation of the disparities between 566 Black and white pregnant women in the United States, it was observed that 78.1% were Caucasian, while 21.9% were Black. This study, even with an inverted percentage in relation to other studies, Black pregnant women had the worst indicators in relation to white women; most were pregnant adolescents and young people with low income, with a lower probability of employment, who depend on public assistance, since they have less access to health insurance. The research showed that Black women were disadvantaged before, during and after pregnancy, with the highest probability of having birth defects that affect the health of newborns [14].

In an epidemic period for CZS, in which a patient is part of a group at risk, it is expected that greater appropriation of care will be provided, as well as closer attention to these pregnant women regarding the quality of information.

This data permits an inference about the quality of care provided, as well as the education of these pregnant women, regarding the appropriation of care and access to health services, which can be reiterated by pre-existing data. The Annual Report on Racial Inequality (2010) published that, in Brazil, among the women who were evaluated in relation to schooling, Caucasian women represent 0.8% of the sample whose reports detail a complete lack of formal education, while Black women represent 2.7%; and for those with twelve (12) years or more of study, 20.7% were Caucasian and 8.9% Black. Furthermore, 71.0% of Caucasian, pregnant women received more than seven consultations, in comparison to just 42.6% of Black women [15].

In a study conducted in the municipality of Salvador [16], identified, through interviews with users of public health services, that discriminatory practices interfered with the quality of attention given by health professionals. This evaluation considered a difference in the time of care for white and Black women, as well as the accomplishment of exploratory examinations through touch, and the quality of the information provided.

These findings are similar to those of [13] in that they found that low-income women obtained less information and that pregnant women living in areas with high HDI received more information from health professionals.

To understand the occurrence of arboviruses in urban environments, it is necessary to consider the territorial configuration, in order to perceive the inequalities to which different population groups are exposed through the expression of social determinants. In this sense, discussing the environmental issue from the perspective of environmental justice favors the understanding of specific population needs, understanding that environmental problems affect different groups in different ways, because of their ethnic, racial and gender characteristics [1,17].

The International Certificate of Vaccination was created by the WHO, with the purpose of evaluating, on a territorial basis, the socioeconomic and environmental conditions of population groups associated with the occurrence of diseases and health problems. The integration of geoprocessing technologies into the health sector is necessary to better portray the spatial arrangement of sanitation districts. In this sense, the System of Geographic Information has the ability to process a large quantity of information, referencing a determined area or region, making it possible to cross-reference information, observe the interactions of multiple variables, simulate systems in order to predict events, and respond to the questions of numerous surveys [18,19].

To demonstrate the social inequalities concerning perinatal mortality in Salvador [20], conducted a study of spatial aggregates, using LCI as an indicator of the synthesis of living conditions, such as "better", "intermediate" and "poor living conditions". The author concluded that neo-mortality was higher in the intermediate strata of LCI. In all three of the strata, the biggest proportions of newborns were Black. More than half of the mothers, in all three strata, underwent less than seven prenatal consultations and the biggest proportion of public and private practices were encountered in the highest strata of LCI, while in the lowest LCI, there was only one public practice.

In mapping the spatial distribution of reported cases of AIDS in adults in the city of Campinas, in São Paulo, it was evident that the concentration of AIDS cases was in areas with poor living conditions and with a higher proportion of women, while the cases with men were in areas with low LCI and high crime [21].

The results obtained by the analysis of this indicator could contribute to the development of public actions, according to the needs of each location, which could help combat the gaps identified in public assistance.

In this sense, the analysis of spatial distribution of cases of CZS in the municipality of Salvador reveal that Black women live under the worst indexes (with 31.6% of cases with low LCI and 34.5% with very low), when compared to Caucasian women (with 35.3% of cases with high LCI and 29.4% with intermediate). Analysis of the data indicates that all women are susceptible to illness; however, Black women become ill in scenarios of increased exposure and vulnerability. They are, therefore, under conditions of cyclical inequality, which generates a pattern that defines different ways of living, becoming sick and dying.

The CSs that represent areas of higher risk are concentrated in neighborhoods that are considered peripheral. However, it is worth noting that, even in peripheral areas LCI varies, but what remains consistent is that Caucasian pregnant women, even in a lower sample size, are situated in areas with the best indicators. Thus, we are forced to infer that 'whiteness' serves as a protective factor against risk exposure.

When considering the distribution of Sanitary Districts (SD), it was observed that these areas are distributed through four (4) Districts and eleven (11) neighborhoods of the city: SD of São Caetano/Valéria (Marechal Rondon, Campinas de Pirajá, São Caetano, and Boa Vista de São Caetano), SD of Subúrbio Ferroviário (Lobato and Alto de Coutos), SD of Brotas (Brotas, Cosme de Farias, Acupe de Brotas, Candeal) and SD Barra/Rio Vermelho (Engenho Velho da Federação).
The LCI aggregates data on schooling, income, housing, sanitary sewage, and person per bedroom. These variables determine the risk of exposure to *Aedes aegypti* and arboviruses caused by it, among them CZS. According to [22], efforts aimed at coping with Dengue, Yellow Fever, Chikungunya and Zika are associated with the development of actions aimed at reducing poverty rates, population density in these territories, and investment in urban infrastructure.

Privilege is capillary in various sectors, as can be observed in the historical series by [23]. In the period between 1995 and 2009, Black women had a lower life expectancy than white women, which was evaluated by calculating the number of Black women aged 60 or above, 14% and 10.3% respectively. As for income, it was pointed out that Black women received 51% of what white women received. Families with Black women the head-of-household were always worse off, followed by Black men, white women, and white males.

In this context, public institutions that ignore these specificities reaffirm the existence of institutional racism. Institutional racism is defined as “a failure of institutions and organizations to provide adequate, professional service to particular groups of people in virtue of their color, culture, and racial or ethnic origins [24].” This is certainly present in relation to the occurrence of CZS, to which Black women are more vulnerable due to systematic institutional neglect.

It is invariable that the ‘low’ and ‘very low’ categories of the LCI, in which socioeconomic and environmental variables are compiled, directly interfere with the rates of exposure and illness in the population. Thus, through the iniquity in health observed in this study, there arises the need for a new term to describe the scenario of systematic health vulnerability to which the Black population is subjected: sanitary racism.

**Final Considerations**

Living conditions are directly associated with different forms of vulnerability. Black women, insofar as they are deprived of rights via precarious housing, insufficient income, and less access to education, experience cruel and unjust forms of greater exposure to the risk of illness. Racism, as a social construct, traverses all institutional spheres and capitalizes inequalities.

Intersectionality, in this sense, allows us to understand how this oppressive web that vilifies Black women and their families is established.

The spatial dispersion of cases of microcephaly associated with the Congenital Syndrome of Zika Virus paints a portrait of the multiple oppressions to which Black women are subject, proving that the territory is alive and represents the varying experiences of privilege and oppression.

The SUS, insofar as it advocates equity, as a principle, must find ways to dialogue and generate an inter-institutional scenario, in order to guarantee National Health Policy Integral of the Black Population implementation, since 80% of the Brazilian population uses SUS as a primary form of health care and promotion.

**Ethical Aspects**

The protocol of this study was approved by the Committee of Ethics in Research of the School of Medicine at the Federal University of Bahia.

**References**
