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Epidemiological analysis of tuberculosis in Brazil

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ABSTRACT
INTRODUCTION: Tuberculosis (TB) is still a major public health problem worldwide. It is estimated that in 2019, worldwide, about ten million people evolved with TB and 1.2 million died due to the disease. As for treatment outcomes, in 2018, the percentage of treatment success was 85% among new cases. OBJECTIVES: To conduct an epidemiological analysis of tuberculosis in Brazil from 2012 to 2022. METHODOLOGY: This is a bibliographic and theoretical-descriptive research, based on studies and theoretical research, seeks to identify elements to describe characteristics related to information, usability and visualization of platforms that provide open data. Data collection was performed in the following sources: Database of the Unified Health System - DATASUS and official documents of the Ministry of Health. Descriptors used for the search were tuberculosis, epidemiology, incidence, vulnerability. The time frame determined 2012- 2022. RESULTS: In the stratification by Federated Unit, there is evidence of an important heterogeneity in the country, with the highest incidence coefficients of TB in the Southeast. Men between 25 and 40 years old are the most affected by TB, a fact that may be related to the man's lifestyle. Indigenous, black and brown populations appear to be more vulnerable to tuberculosis. The prevalence of TB higher in individuals who have not completed elementary school. FINAL CONSIDERATIONS: It is concluded that the greatest representativeness of populations are the most vulnerable to TB, among new cases, which indicates that intersectoral actions will be necessary to serve vulnerable populations, in addition to articulated actions between the three spheres of management of the Unified Health System (SUS).

Keywords: Tuberculosis, Epidemiology, Incidence, Vulnerability.

1 INTRODUCTION

Tuberculosis (TB) is still a major public health problem worldwide. It is estimated that in 2019, worldwide, about ten million people evolved with TB and 1.2 million died due to the disease. As for treatment outcomes, in 2018, the percentage of treatment success was 85% among new cases1. Brazil is among the 30 countries with a high burden of TB and TB-HIV co-infection, considered a priority for the control of the disease in the world by the World Health Organization (WHO) 1,2.

The planning of tuberculosis control actions depends on the epidemiological indicators of the disease. Facing the new coronavirus has worsened the epidemiological situation of TB in the country and in the world3. TB mainly affects people who have compromised immune systems to some degree,

such as patients with HIV. However, historically, TB represents a panorama of class inequality, people who suffer a process of marginalization by society, people in a situation of vulnerability, among others, that is, according to the state in which the individual is in becomes more susceptible to exposure to Koch's bacillus2,3.

The disease is cured through effective treatment, which is carried out with the use of various anti-TB drugs. According to the PNCT (National Program for Tuberculosis Control), of the Ministry of Health, there are four drugs used in the basic regimen for the treatment of tuberculosis, in combination, in adults and adolescents: Rifampicin 150 mg, Isoniazid 75mg, Pyrazinamide 400mg and Ethambutol 275mg. In the case of the disease in children, Ethambutol 275mg is removed from the regimen, using only the first three4.

In Brazil, the diagnosis of TB is performed as recommended in the Manual of Recommendations for the Control of Tuberculosis in Brazil being subdivided into clinical, differential, bacteriological, imaging, histopathological diagnosis and other diagnostic tests. In addition to laboratory diagnosis, clinical evaluation is of paramount importance for the diagnosis of TB and chest X-ray is indicated as a complementary method for this diagnosis4.

According to the recommendations of the Ministry of Health there is a group of people who are more susceptible to becoming infected by tuberculosis, it is called "populations more vulnerable to tuberculosis" that includes indigenous people, the population deprived of liberty, people living with HIV/AIDS and homeless people. This population demands specific care. For the Information System of Diseases and Notifications (SINAN), there is a "special group" in which health professionals are considered vulnerable along with the population mentioned above3.

Considering that TB is a serious disease that affects the most vulnerable population, the study aims to perform an epidemiological analysis of tuberculosis in Brazil between 2012 and 2022.

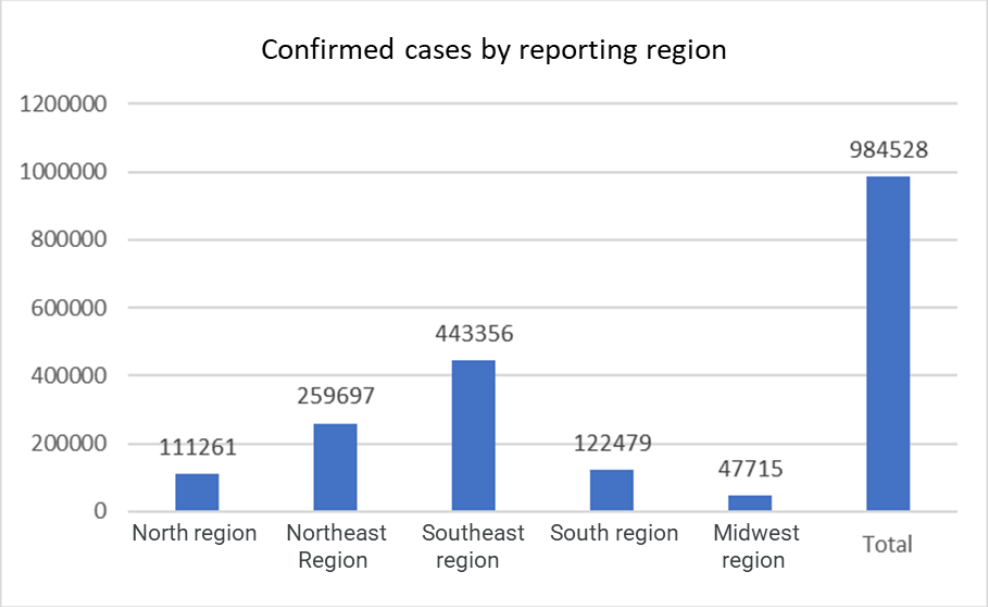
2 METHODOLOGY

It is a bibliographic and theoretical-descriptive research, based on studies and theoretical research, seeks to identify elements to describe characteristics related to information, usability and visualization of platforms that provide open data. It is also an exploratory research, whose objective is to provide an overview of a certain fact and enable increased familiarity with the problem from concepts related to the theme makes an exploratory research. Data collection was performed in the following sources: Database of the Unified Health System - DATASUS and official documents of the Ministry of Health. Descriptors used for the search were tuberculosis, epidemiology, incidence, vulnerability. The time frame determined 2012-2022.

3 FINDINGS

In the stratification by Federated Unit (UF), there is evidence of an important heterogeneity in the country, with the highest incidence coefficients of TB in the Southeast, as shown in Graph 1.

Graph 1 – Confirmed cases of TB according to Region of notification in the Period: 2012-2022



Sources: Ministry of Health/SVS - Information System of Notifiable Diseases - Sinan Net, 2022.

Brazil covers approximately 50% of South America and is subdivided into five administrative/geographical regions (North, Northeast, Southeast, South and Midwest). These five regions show different climatic patterns, socioeconomic characteristics, political dynamics and administrative structures, although the organization of health services is also different between regions, the majority (71%) of the population depends on the public health services provided by the Unified Health System. The primary health care (PHC) system should be the first point of contact for people who interact with the health system6.

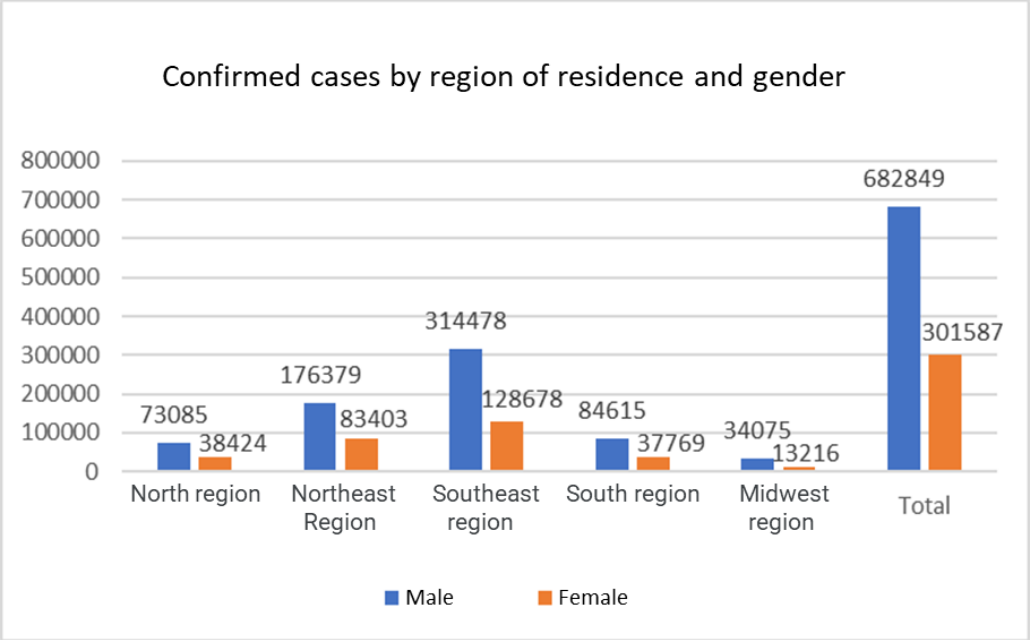
The Northeast region with an increase in notification cases in the year 2021, but there is a data conflict when compared to the table above, which highlights the Southeast region with a high number of notifications of 183,659 cases above the Northeast region, these data can be justified by the lack of notification of the region. The two regions have individual characteristics, such as economic and economic conditions.

Development, in the Northeast region there is a need to supervise and monitor the notifications made, to ensure greater reliability of the data and already in the Southeast region has a larger population, with greater development of the region with a greater number of penitentiaries, and people who perform the treatment for access to health service. According to the MS, in 2022 were notified 84,1 cases of the disease for each group of 100 thousand people in the Amazon. Rio emerges in second place with 75.9, and Roraima in third place with 68.8 cases. Data from the information system indicate

that, in general numbers, 3,826 cases and 214 deaths from the disease were recorded in 2022, throughout the state7.

Men between 25 and 40 years of age are the most affected by TB, a fact that may be related to the man's lifestyle (Graph 2) According to studies, men are more likely to suffer from cases of silicosis, drug use, alcohol abuse, chronic obstructive pulmonary disease, human immunodeficiency virus (HIV) infection and lung cancer, factors that can interfere with the body's defenses when fighting the bacterium Mycobacterium tuberculosis6.

Graph 2 - Confirmed Cases by Region of Residence and Sex in the period of 2012-2022

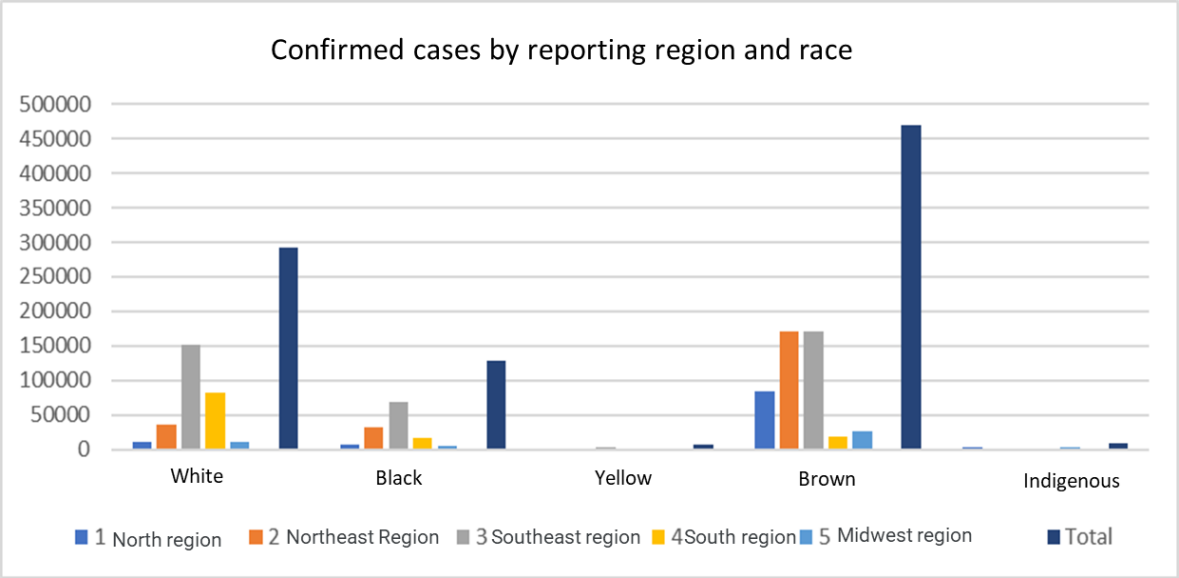


Sources: Ministry of Health/SVS - Information System of Notifiable Diseases - Sinan Net, 2022.

After the analysis of the table highlights some factors that predispose each sex to the bacillus, the male sex is more vulnerable. Men had a lower schooling rate than women, worked and had more time dedicated to activities outside the home. The female participants had higher schooling, worked and dedicated more time to activities at home, these exposure factors have high relevance in terms of sex and exposure to TB. Male genders stand out in exposure to the agent, due to individual gender factors such as: type of work, not seeking health services, low level of education, neglect of the disease, among other factors7,8. In all regions of the country according to TABNET data, the male sex stands out in the cases of notification of the disease reaching twice as much as the female sex, The region where there are higher notifications of the disease in males and the Southeast region, in this same region there are less than half in females, reaching 128,678 cases of notification, and the region that remains in second place in cases of notification is the Northeast region1,5,6.

Indigenous, black and brown populations are considered more vulnerable to tuberculosis.

Graph 3 - Confirmed Cases by Region of Residence and Race in the period of 20122022

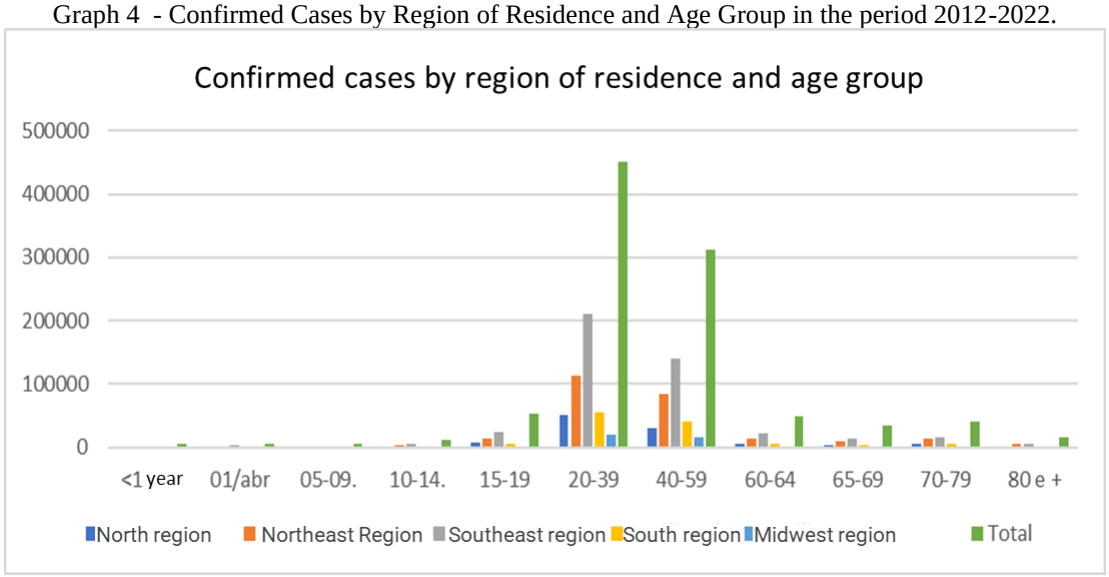


Sources: Ministry of Health/SVS - Information System of Notifiable Diseases - Sinan Net, 20225.

In view of the data collection shown in the table, we analyze that people of the brown race are being more infected by tuberculosis because they are a population in a greater situation of economic and social vulnerability.

However, the increased incidence of tuberculosis in vulnerable populations reflects the need for collaborative behaviors, since only popular participation and the rights provided for by law will, in fact, be granted equally among individuals. Note the importance of priority in developing projects and actions with repercussions in the fight and eradication of the disease, which pays attention to the most vulnerable groups with regard to reducing the incidence of TB.

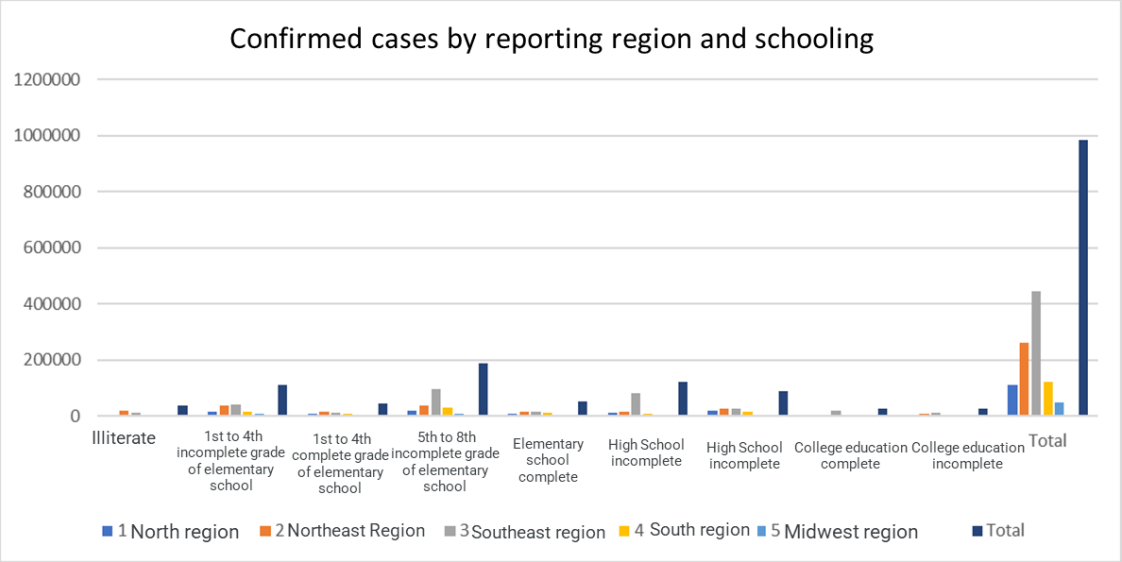
Graph 4 - Confirmed Cases by Region of Residence and Age Group in the period 2012-2022.



Sources: Ministry of Health/SVS - Information System of Notifiable Diseases - Sinan Net. 20225.

The Southeast region has 31,600 cases reported for those over 20 years of age, followed by the Northeast region with 18,122 cases reported in 2018 for those over 20 years of age, demonstrating that from adolescence entering adulthood and where the confirmed and notified cases of TB stand out, due to social factors of exposure. The age group that showed the lowest rate of contagion was in the Midwest region with 20 cases was less than 1 year in 2018. After the analysis of the data collected and the table we observed a relationship between both, with the data obtained from the tabnet in the year 2023, having relations in the age groups with higher and lower index of contagion and notification, demonstrating that from the adult phase of 20 to 59 years and where there are greater cases of notification, manifesting the most severe forms of the disease. And children under 1 year and where there are the lowest cases of notification in all regions of the country.

Graph 5 - Confirmed cases by Region of notification and Education in the period 2012-2022



Sources: Ministry of Health/SVS - Information System of Notifiable Diseases - Sinan Net, 2022.

After the analysis of the table, it is noticed that there is a greater number of confirmed cases of tuberculosis in individuals with incomplete elementary education. Low schooling may influence the lack of understanding of tuberculosis treatment, consequently causing non-continuity of therapy. This can generate difficulties for the effective control of tuberculosis, also contributing to the triggering of drug resistance. It is known that for treatment efficacy, patient adherence to the adopted regimen is fundamental, since the current therapeutic regimen is highly effective and provided free of charge with the capacity to cure practically all cases8,9.

As a consequence, the lack of accessibility to information for these individuals is low, reflecting the level of education of the majority of the population and leading to increased vulnerability to tuberculosis, being responsible for the higher incidence of the disease, which favors lower adherence to the respective treatment in Brazil 9,10.

However, it is necessary to make greater efforts by health teams, established governments, to improve the level of education, as well as continued actions to the population, especially those at risk of contracting and developing the disease, and adoption of strategies that enable communication, access to information, knowledge of the therapy used and monitoring of confirmed cases10.

4 FINAL CONSIDERATIONS

Tuberculosis is one of the infectious diseases of great importance for public health and significantly affects the most vulnerable populations. The epidemiological data of tuberculosis cases in Brazil were analyzed in the period 2012 to 2022; by the Information System of Notifiable Diseases (SINAN) and the results indicated a linear increase in cases in recent years that may be mainly related to the increase in poverty. Another factor that may contribute to TB control is linked to social determination, along with an important economic crisis that Brazil has been going through in recent years. The result of the research shows greater representativeness of populations more vulnerable to TB, among the new cases, which indicates that intersectoral actions will be necessary to serve vulnerable populations, in addition to articulated actions between the three spheres of management of the Unified Health System (SUS).

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