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## EPIDEMIOLOGICAL ANALYSIS OF STROKE MORBIDITY AND MORTALITY IN YOUNG PATIENTS IN BRAZIL OVER THE LAST 10 YEARS

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**Abstract: Objective:** To analyze stroke morbidity and mortality in young patients in Brazil over the last 10 years. **Methodology:** This is an epidemiological, descriptive and retrospective study, carried out through a survey of data in TABNET/DATASUS, using the SUS Hospital Information System (SIH/SUS). The variables used were gender, age, race/color, regions and federative unit, from January 2014 to December 2024, including numbers of hospitalizations and mortality of young patients in Brazil, with a specific age cut-off. **Results:** In the last 10 years, 209,691 hospitalizations for stroke were recorded in young adults (20 to 49 years), with a higher concentration in the Southeast (40.9%) and Northeast (29.1%) regions. The majority of cases occurred in the 40-49 age group (65.8%). The mortality rate was 10.68 deaths per 100,000 inhabitants, higher among men (11.77) and indigenous people (13.68). **Conclusion:** The study identified a progressive increase in hospitalizations for stroke in young people over the last 10 years, as well as significant regional and racial differences. The Northeast and North had the highest mortality rates, while indigenous, brown and black people were the most affected. Male vulnerability was also evident. These findings highlight the need for preventive measures aimed at modifiable risk factors, as well as public policies that reduce regional and racial inequalities.

**Keywords:** Stroke; Mortality; Epidemiology.

## INTRODUCTION

Stroke remains one of the leading causes of death and disability in the world. According to the 2019 Global Burden of Disease (GBD) estimates, it is the second leading cause of death and the third when considering the combined impacts of mortality and disability (Feign *et al.*, 2022). In addition, 85% of deaths and 87% of years of life lost to disability due to stroke occur in low-income countries, highlighting

inequalities in the impact of this condition (Murphy & Werring, 2020).

The disease can manifest itself in different ways and is classified as ischemic stroke (when there is obstruction of cerebral blood flow) or hemorrhagic stroke (when there is intracranial bleeding). Regardless of the mechanism, several factors contribute to the development of stroke. Hypertension, diabetes, smoking and dyslipidemia are among the main determinants of the disease, but recent research indicates that genetic predisposition and autoimmune conditions also play a relevant role in its development (Johnson *et al.*, 2019).

In recent years, several studies have shown an increase in the incidence of stroke in young people, while the occurrence of the disease in older age groups has shown a decline. This is a worrying phenomenon, as strokes in young adults tend to have significant socio-economic impacts, affecting individuals of full working age and often resulting in lasting disabilities (Eltemany *et al.*, 2021). In addition to the traditional risk factors, thromboembolic disorders, arterial dissection and autoimmune diseases have been identified as important causes in this age group (Leppert *et al.*, 2023).

In Brazil, understanding stroke morbidity and mortality in young people is essential for assessing its regional distribution and identifying factors that can guide public health actions. Analyzing the evolution of this condition over the years can provide important data for developing prevention policies and improving care.

Given this scenario, the aim of this study is to analyze stroke morbidity and mortality in young patients in Brazil over the last 10 years, in order to characterize their epidemiological profile and contribute to the formulation of prevention and care strategies.

## METHODOLOGY

This is a descriptive, retrospective epidemiological study based on mortality data from unspecified strokes, whether hemorrhagic or ischemic, in Brazil. The information was taken from the Information Technology Department of the Unified Health System (DATASUS) and the Mortality Information System (SIM). The population is between 20 and 49 years of age, regardless of gender, from 2014 to 2024. Data analysis included descriptive and analytical approaches, with the results presented in tables and graphs. The variables considered included year of death, region/federal unit, age group, gender and color/race. Excel was used to organize and consolidate the data, while the graphs and tables were prepared in Word. As this was a study based on a public domain database, approval by a Research Ethics Committee was not required. The authors declare that they have no conflicts of interest.

## RESULTS

Analysis of hospitalizations for stroke in Brazil between 2014 and 2024 in individuals aged 20 to 49 reveals an increase in the total number of hospitalizations, from 16,666 in 2014 to 22,482 in 2024, totaling 209,691 cases in the period (Figure 1).

The regional distribution shows that the Southeast concentrated most hospitalizations, with 85,869 cases (40.95%), possibly due to its larger population. The Northeast was in second place, with 61,091 hospitalizations (29.14%), followed by the South (34,487 cases; 16.45%), the Midwest (14,982; 7.14%) and the North (13,262; 6.33%) (Figure 2).

The distribution of hospitalizations by self-declared color/race showed significant disparities. Patients who identified themselves as brown accounted for the majority of hospitalizations, with a total of 90,312 cases, followed by whites, with 56,631, and blacks,

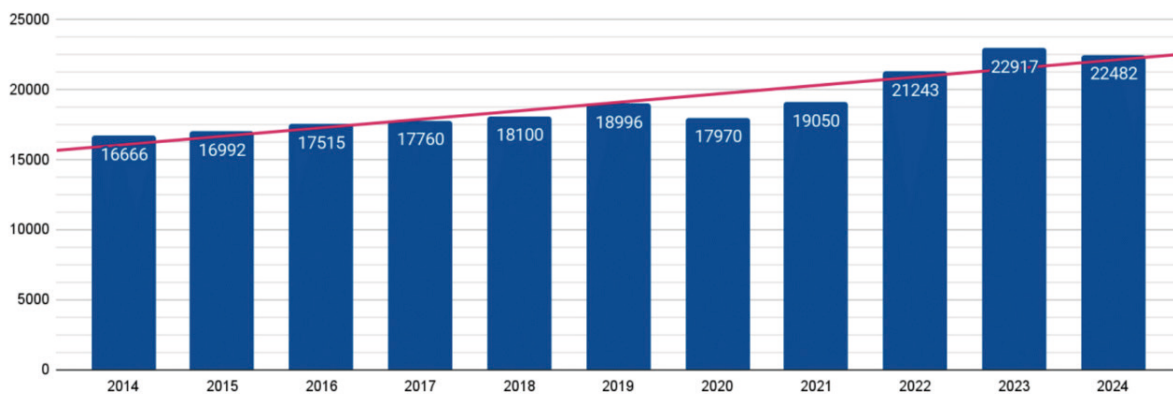


Figure 1 - Hospital admissions for stroke in Brazil (2014 - 2024)  
 Source: Prepared by the author, with data from DATASUS (2025).

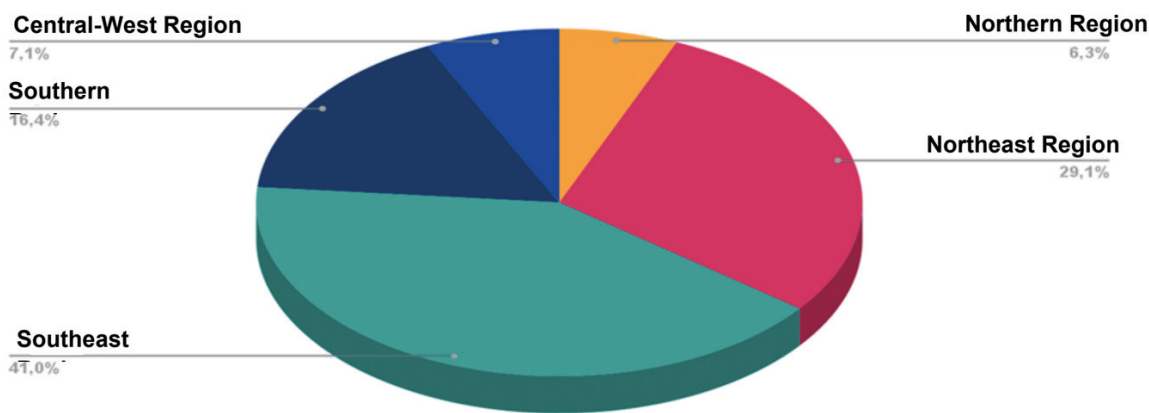


Figure 2 - Stroke hospitalizations in Brazil by region (2014-2024)  
 Source: Prepared by the author, with data from DATASUS (2025).

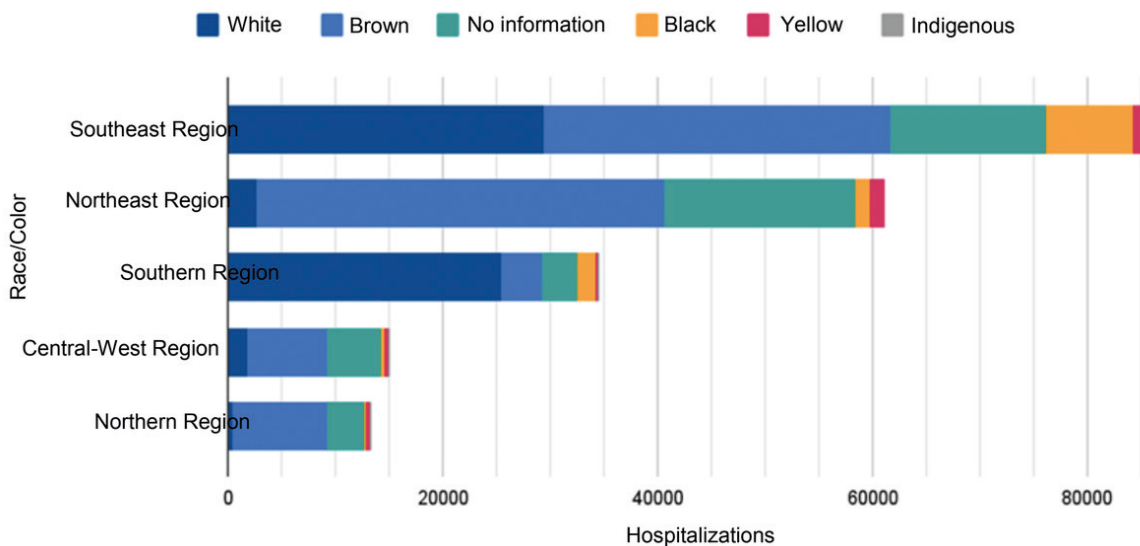


Figure 3 - Hospital admissions for stroke by race/color in Brazil (2014-2024)  
 Source: Prepared by the author, with data from DATASUS (2025).

with 11,589. The greatest disparity was observed in the Southeast, where the number of hospitalizations of white patients (29,369) was three times higher than that of black patients (8,101), while browns recorded 32,341 hospitalizations. In the South, the discrepancy was even more marked, with 25,464 hospitalizations among whites, while only 1,675 occurred among blacks and 3,820 among browns.

In addition, yellow and indigenous patients had lower absolute numbers, with 3,883 and 234 hospitalizations, respectively, over the period analyzed. The group with no information on color/race totaled 44,042 admissions, showing a high percentage of missing data which may influence the analysis of racial inequalities in access to hospital care.

These differences may be associated with inequalities in access to health services, epidemiological variations and socioeconomic factors that influence both the incidence of stroke and the demand for hospitalizations among different population groups (Figure 3).

Between 2014 and 2024, stroke mortality increased in all Brazilian regions, both in absolute numbers and rates. The Southeast registered 8,966 deaths, with a mortality rate of 10.44 per 100,000 inhabitants. In the Northeast, there were 7,955 deaths (rate of 13.02); in the South, 2,267 deaths (6.57); in the Midwest, 1,479 deaths (9.87); and in the North, 1,723 (12.99) (Figure 4).

These data suggest a worrying trend, especially in the North and Northeast, where mortality rates are higher than the national average (10.68), highlighting the need for investigations into risk factors, regional inequalities and more effective public policies to mitigate these rates.

The mortality rate among men was (11.77) higher than that observed among women (9.68) (Figure 5).

In terms of age group, the highest rate was observed among individuals aged 40 to 49 (11.26), followed by those aged 30 to 39 (10.08) and 20 to 29 (8.19) (Figure 6).

Among the different population groups, the highest mortality rate was recorded among indigenous people (13.68), followed by browns (12.01), blacks (11.11) and yellows (10.76). The lowest rate was among whites (7.68) (Figure 7).

## CONCLUSION

This study showed a progressive increase in the number of hospitalizations for stroke over the last decade, with a predominance in the 40-49 age group. The Southeast and Northeast concentrated most of the hospitalizations, while the highest mortality rates were recorded in the North and Northeast, showing regional inequalities in dealing with the disease.

Regarding racial distribution, brown patients accounted for the majority of hospitalizations, but the highest mortality rate was observed among indigenous people, followed by brown and black people, which suggests disparities in access to prevention and treatment. In addition, men were more vulnerable to death from stroke than women, highlighting the need for specific prevention and care strategies for this group.

These findings reinforce the need to implement preventive measures aimed at modifiable risk factors such as hypertension, diabetes, dyslipidemia and poor lifestyle habits, combined with actions to reduce regional and racial inequalities in access to health.

Future research should further investigate the social and structural determinants of health that influence stroke morbidity and mortality in young people, with a view to developing more equitable and effective policies to control this condition in Brazil.

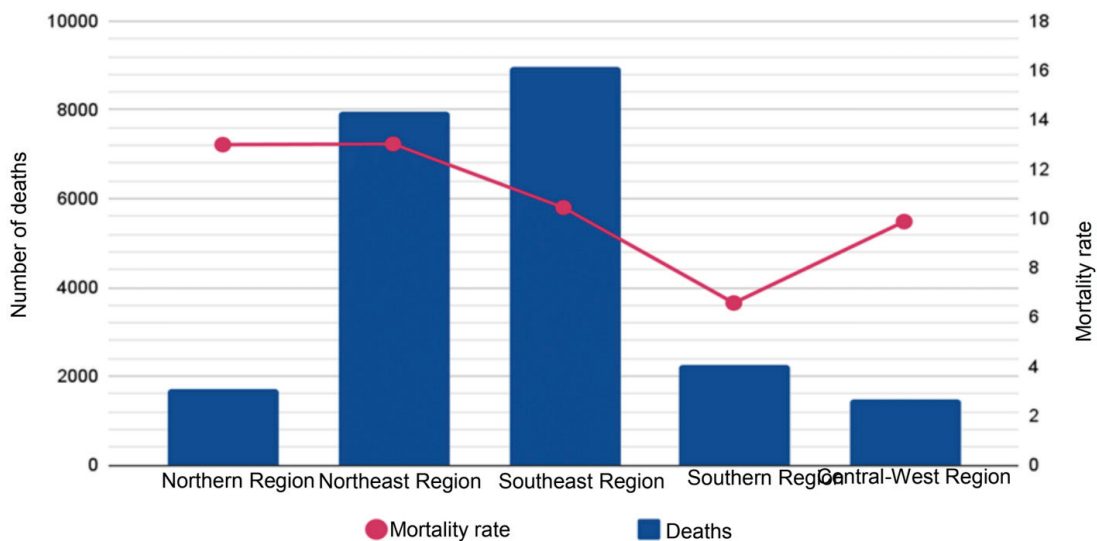


Figure 4 - Stroke Mortality in the Brazilian Regions (2014-2024)

Source: Prepared by the author, with data from DATASUS (2025).

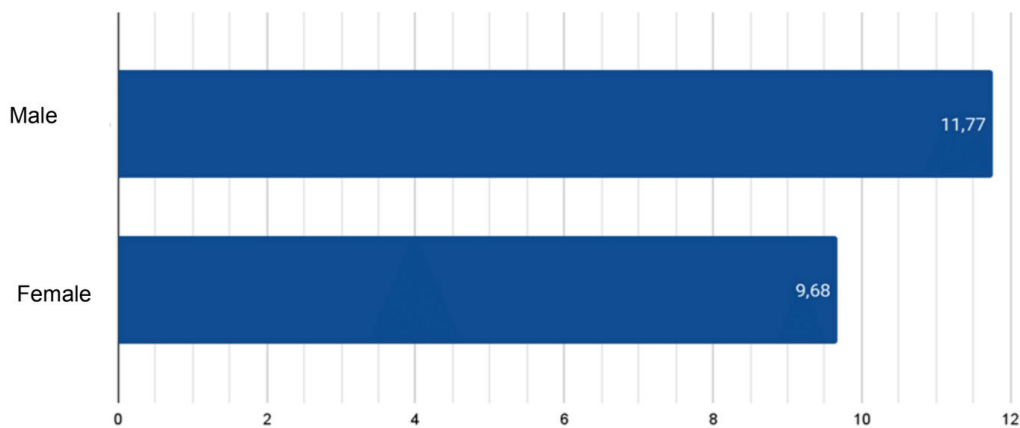


Figure 5 - Hospital admissions for stroke in Brazil by gender (2014-2024)

Source: Prepared by the author, with data from DATASUS (2025).

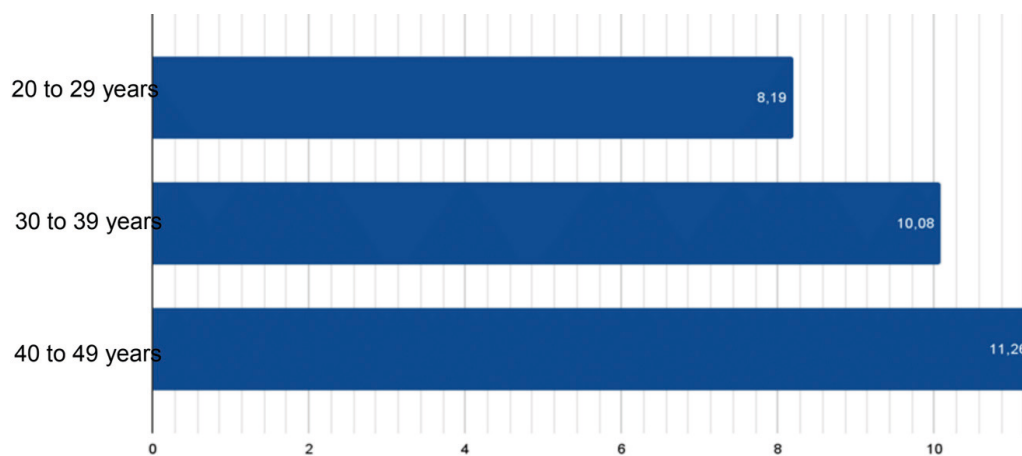


Figure 6 - Stroke mortality rate in Brazil by age group (2014-2024)

Source: Prepared by the author, with data from DATASUS (2025).



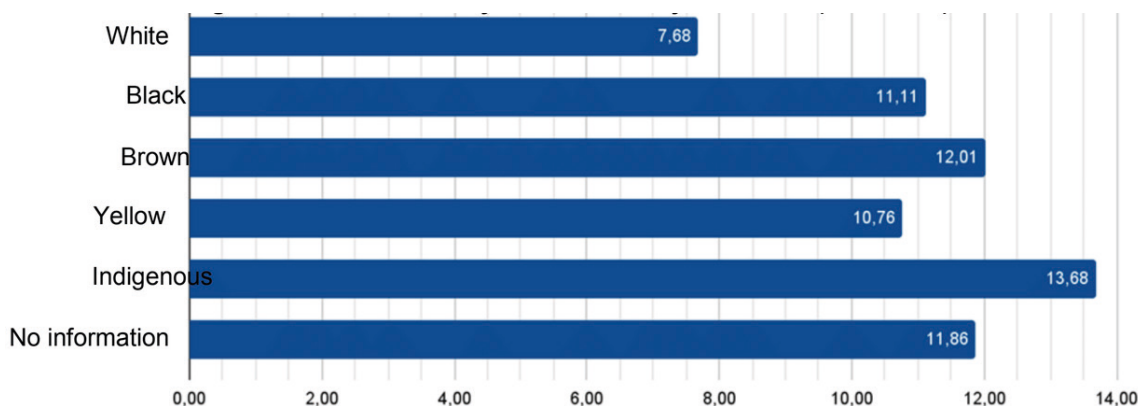


Figure 7 - Stroke mortality rate in Brazil by race/color (2014-2024)

Source: Prepared by the author, with data from DATASUS (2025).

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