

HODGKIN'S DISEASE IN BRAZIL: TRENDS IN HOSPITALIZATIONS, DEATHS, AND HOSPITAL COSTS FROM 2018 TO 2024

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ABSTRACT

Introduction: Hodgkin's disease is a malignant neoplasm of the lymphatic system, with a higher incidence in adolescents and young adults. With a high potential for cure, its efficient management depends on early diagnosis and targeted public policies. This study analyzed the profile of hospital admissions for Hodgkin's disease in Brazil, between 2018 and 2024, considering clinical, sociodemographic, and economic variables. **Methodology:** Descriptive and quantitative study, with secondary data obtained from DATASUS/TabNet. Hospital admissions due to Hodgkin's disease (ICD-10: C81) were analyzed, considering year, sex, age group, race/color, nature of care (urgent or elective), hospital deaths, and financial values (average cost per hospitalization and annual total). **Results:** A total of 37,367 hospitalizations were recorded in the period, with a higher concentration among patients aged 10 to 29 years (49.4%) and a predominance of males (55.59%). Emergency hospitalizations accounted for 55.61% of the total, suggesting a delay in diagnosis. Brown (42.44%) and white (42.29%) were the most affected racial groups. The peak of deaths occurred in 2023 (216), and the lowest number in 2020 (165). The average cost per hospitalization ranged between R\$ 2,472.09 and R\$ 2,878.80, with a progressive increase in total hospital expenses, reaching R\$ 13.26 million in 2024. **Conclusion:** Hodgkin's disease in Brazil maintains its classic pattern of incidence, with a predominance in young men. The high proportion of hospitalizations due to urgency and the increase in hospital costs reinforce the need for strategies for early diagnosis, rationalization of resources, and strengthening of cancer care in the SUS.

Keywords: Hodgkin's disease. Hospital admissions.

INTRODUCTION

Hodgkin's lymphoma (HL) is an uncommon lymphoproliferative neoplasm that mainly affects young adults, although it can also affect elderly individuals less frequently (KAHN et al., 2023). It is histopathologically characterized by the presence of multinucleated neoplastic cells

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called Reed-Sternberg cells, considered a diagnostic milestone of the disease (ANSELL et al, 2021).

Although it was first described in 1832, the etiology of HL remains partially elucidated (SERGI, 2024). However, its association with conditions that compromise the immune response, such as infection with the Epstein-Barr virus and the human immunodeficiency virus (HIV), which considerably increase the risk of developing the disease is recognized (JAVED et al., 2023). Clinically, HL manifests predominantly by lymphadenomegaly, especially in cervical chains, and can also affect mediastinal, axillary, and para-aortic regions (SACHDEV et al., 2017). In addition, approximately one third of patients have systemic symptoms, such as fever, night sweats, weight loss, and persistent pruritus (BHATT; ARMITAGE, et al 2020).

In Brazil, a bimodal age pattern of incidence is observed: the first peak occurs among individuals aged 20 to 24 years, with an average of 18 cases per 100,000 inhabitants, while the second appears in the age group of 55 to 59 years, with about 11 cases per 100,000 inhabitants (MINATTI et al., 2024).

Evidence suggests a higher incidence of HL in more developed regions and among individuals with high socioeconomic levels (MACK et al., 2015). Considering only cancers that do not involve non-melanoma skin tumors, Hodgkin's lymphoma ranks 20th among the most frequent types in Brazil (MOREIRA et al., 2024). Among men, it is the 16th most incident cancer in all regions of the country, according to data from the National Cancer Institute (INCA, 2023). Also according to INCA (2023), it is estimated that, in the 2023–2025 triennium, there will be approximately 3,080 new cases of HL in Brazil, 1,500 in men and 1,580 in women.

In recent decades, the treatment of Hodgkin's lymphoma has undergone significant advances, especially with the development of less toxic and more effective therapeutic regimens, resulting in increased cure rates (SMITH; FRIEDMAN et al, 2022). Standard treatment involves chemotherapy, which can be given alone or in combination with radiotherapy or high-dose chemotherapy with hematopoietic progenitor cell support (ANDRÉ et al, 2014).

Although Hodgkin's lymphoma has high cure rates, it is a neoplasm of considerable biological and clinical complexity, which justifies the need for updated studies that evaluate aspects such as hospitalizations, mortality, demographic characteristics, and prognosis in the Brazilian context (ZHOU et al., 2019). Therefore, the present study aims to analyze the morbidity

and mortality associated with Hodgkin's lymphoma in Brazil, seeking to understand its impact in different regions of the country.

OBJECTIVE

To analyze the epidemiological profile of hospital admissions for Hodgkin's disease in Brazil between 2018 and 2024, considering sociodemographic characteristics, type of care, mortality, and economic impact on the Unified Health System (SUS).

METHODOLOGY

The present study is an ecological epidemiological study of time series, with an analytical approach through the database of the SUS Hospital Information Systems (SIH) made available by the SUS Department of Informatics (DATASUS), at the electronic address (<http://www.datasus.gov.br>), without personal identification and open to public consultation, without the need to submit to the Research Ethics Committee.

The period analyzed was from January 2018 to December 2024, referring to all federative units of Brazil, through the records of hospitalizations for Hodgkin's Lymphoma, through the analysis. The data was collected between March 14 and 19, 2025. Data collection was through direct access to the DATASUS website, then it was redirected to the TABNET platform, directing to the epidemiological and morbidity base, soon after, the option hospital morbidity of the SUS (SIH/SUS) and "general by place of hospitalization from 2008" were selected, with the option "Brazil by Region and Unit and Federation", in the geographical coverage area. On the data collection page, all regions of Brazil were selected as "SOUTH", "MIDWEST", "SOUTHEAST", "NORTHEAST" and "NORTH", in addition, Age Group, character of care, Average Value per hospitalization, Average Length of Stay, Deaths, Mortality Rate, Chapter – ICD 10 (Chapter II Neoplasms (tumors), ICD Morb List 10 (Hodgkin's Disease). The data were stored in a specific database and analyzed with Microsoft Excel and Apple Numbers software.

The bibliographic references were obtained from the databases GOOGLE SCHOLAR, PUBMED, ESLEVIER and SCIELO, from which the keywords "Hodgkin's disease", "Hodgkin's lymphoma", "public health", "epidemiology", and 'hospital morbidity' were used.

DEVELOPMENT

HOSPITALIZATION FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024)

Figure 1 – Annual distribution of hospital admissions due to Hodgkin's disease in Brazil, from 2018 to 2024.



A total of 37,367 hospital admissions for Hodgkin's disease were recorded in Brazil, with an annual average of approximately 5,338 admissions. In 2018, the country accounted for 5,035 hospitalizations. In the following year, 2019, there was an increase of 10.0%, totaling 5,538 hospitalizations (FIGURA1). In 2020, the first year of the COVID-19 pandemic, which significantly impacted the dynamics of elective and oncological hospital care, there was a drop of 8.9% compared to the previous year, with 5,044 hospitalizations (CARVALHO et al, 2022) (FIGURA1).

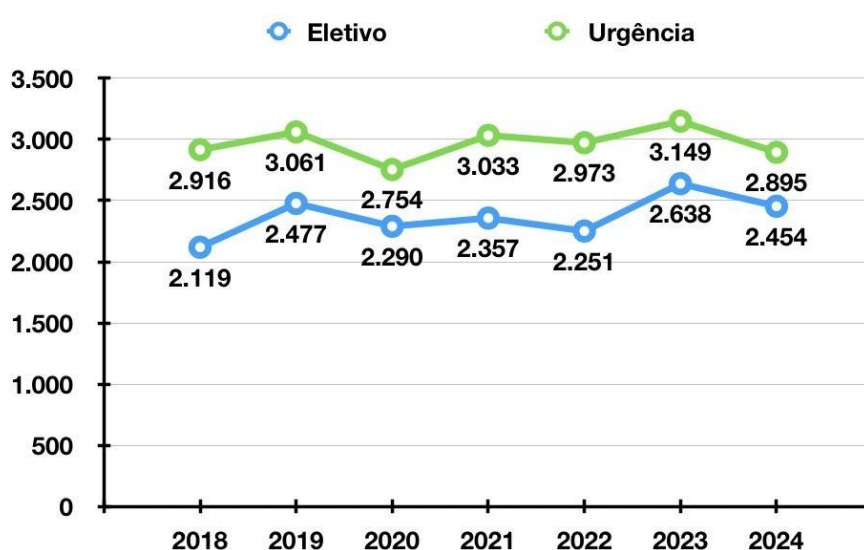
In 2021, the number grew again, reaching 5,390 hospitalizations, which represents an increase of 6.9% compared to 2020. In 2022, there was a new reduction of 3.1%, totaling 5,224 hospitalizations. In 2023, the highest number of records in the period was observed, with 5,787 hospitalizations, an increase of 10.8% compared to the previous year (FIGURE 1).

Finally, in 2024, the number of hospitalizations showed a slight drop of 7.6% compared to 2023, with 5,349 cases. Even so, this value remained above the historical average, surpassing all years prior to 2023 (FIGURA1).

CHARACTER OF HOSPITALIZATION CARE FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024)

The nature of hospitalizations is a fundamental indicator for understanding how patients access hospital services, and is essential for identifying patterns of entry into the health network and for formulating strategies that promote more appropriate clinical conduct, in addition to enabling the improvement of the organization of cancer care.

Figure 2 – Attendance of hospital admissions for Hodgkin's disease in Brazil, according to type (elective and urgent), from 2018 to 2024.



Emergency hospitalizations prevailed in all the years analyzed, totaling 20,781 records, which corresponds to 55.61% of hospitalizations due to HL in the period. Elective hospitalizations totaled 16,586 cases, representing 44.38% of the total. As a result, the absolute number of emergency hospitalizations exceeded that of elective hospitalizations by 11.23% in the seven years (FIGURE 2).

Regarding the annual evolution, emergency hospitalizations had the lowest number in 2020, with 2,754 records, which represents a reduction of 10% compared to 2019 (3,061 hospitalizations), probably influenced by the restrictions imposed by the COVID-19 pandemic. The highest number was observed in 2023, with 3,149 emergency admissions, an increase of 13.1% compared to 2022 (2,973 hospitalizations) (FIGURE 2).

Elective hospitalizations, on the other hand, had their lowest value in 2018, with 2,119 cases, and also peaked in 2023, with 2,638 hospitalizations, an increase of 19.2% compared to the previous year (2,251 hospitalizations in 2022). (FIGURE 2) In 2020, there was also a drop in

elective hospitalizations (2,290 cases), reflecting the restrictions imposed on the scheduling of non-urgent procedures during the pandemic period (FIGURE 2).

The annual average in the period was approximately 2,969 emergency hospitalizations and 2,369 elective hospitalizations. The constancy of the predominance of emergency hospitalizations over the years may indicate delays in diagnosis, clinical worsening prior to hospital care, or barriers to access to specialized oncological care (FIGURE 2).

PREVALENCE OF SEX BY HOSPITALIZATION FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024)

The prevalence of males among cases of Hodgkin's disease is well documented in the medical literature, with higher incidence observed especially in adolescents and young adults (LEE et al., 2020). This trend has been related to multifactorial mechanisms, including genetic, hormonal, and immunological differences, which can influence the body's response to the development of lymphoproliferative neoplasms (KENDEL et al., 2024).

Figure 3 – Distribution of hospital admissions due to Hodgkin's disease in Brazil, according to sex, from 2018 to 2024.

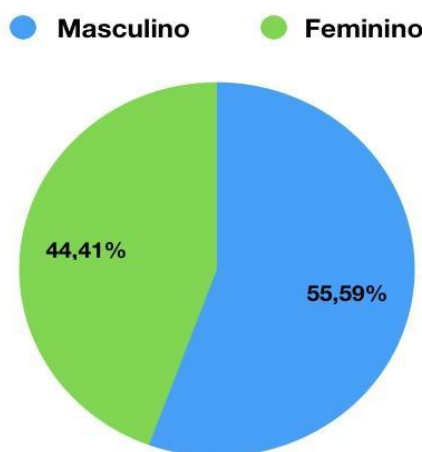


Figure 3 shows the distribution of hospital admissions due to Hodgkin's disease in Brazil, between 2018 and 2024, according to the sex of the patients. In the period analyzed, 20,771 hospitalizations of male individuals were recorded, corresponding to 55.59% of the total, while

16,596 hospitalizations occurred among female individuals (44.41%). This difference represents a total of 4,175 more cases among men (FIGURE 3).

This male predominance may reflect not only biological factors, but also behavioral and social issues, such as lower adherence of men to primary care and early screening, which may result in more advanced conditions at the time of hospitalization (AL-BARZINJI, 2006).

AGE OF HOSPITALIZATION FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024)

The age distribution of hospitalizations due to Hodgkin's disease is a fundamental aspect to understand the epidemiological profile of the disease and to guide health care strategies. Different age groups present important variations in the incidence and form of clinical presentation. The analysis of these data allows the identification of priority groups for prevention, early diagnosis and treatment actions. The following are the national data for the period from 2018 to 2024.

Figure 4 – Distribution of hospital admissions due to Hodgkin's disease in Brazil, by age group, from 2018 to 2024.

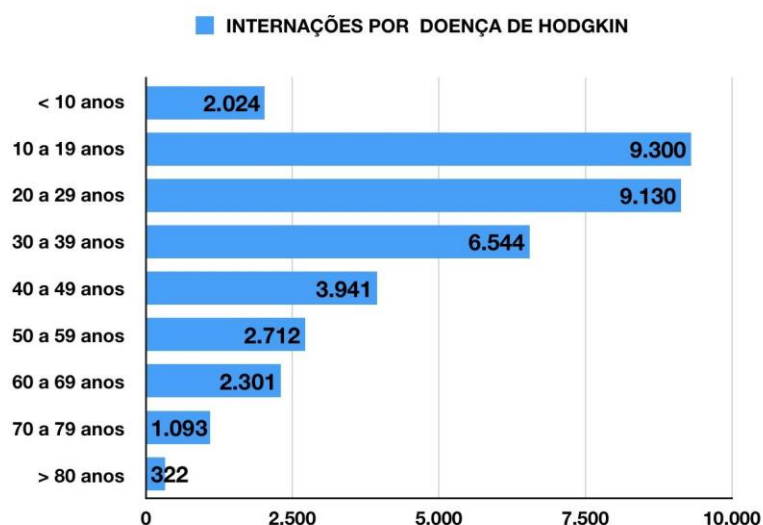


Figure 4 shows the distribution of hospitalizations for Hodgkin's disease in Brazil between 2018 and 2024, segmented by age groups. The data show that the highest concentration of hospitalizations occurred among individuals aged 10 to 29 years, reinforcing the classic bimodal pattern of the disease, with a predominance in young adults (FIGURE 4).

In the age group of 10 to 19 years, 9,300 hospitalizations were registered, representing 24.9% of the total. Next, the 20 to 29 age group had 9,130 cases, corresponding to 24.5% (FIGURE 4). Together, these two age groups account for 49.4% of all hospitalizations in the

period analyzed, indicating that almost half of the cases occur in individuals under 30 years of age (FIGURE 4).

From the age of 30, there is a progressive reduction in the number of hospitalizations. In the 30 to 39 age group, 6,544 cases (17.5%) were registered, while between 40 and 49 years of age there were 3,941 hospitalizations (10.5%). In the 50 to 59 age group, 2,712 hospitalizations (7.3%) were recorded, and between 60 and 69 years old, the number was 2,301 cases (6.2%). The population between 70 and 79 years of age had 1,093 hospitalizations (2.9%), and among individuals aged 80 years or older, the number was even lower, with 322 records, corresponding to only 0.9% of the total analyzed (FIGURE 4).

The lowest frequency of hospitalizations was observed among children under 10 years of age, totaling 2,024 cases (5.4%) (FIGURE 4). This age profile confirms the typical epidemiology of Hodgkin's disease, which has a peak incidence in adolescents and young adults, followed by a decline in the older age groups. The low occurrence in the elderly may be related to both the lower incidence and factors such as underdiagnosis, limited access to specialized services, or the presence of comorbidities that make it difficult to hospitalize specifically for cancer treatment.

RACE HOSPITALIZATION FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024)

The race/color variable is an important marker for the analysis of health inequalities in Brazil, especially in chronic diseases such as cancer. Evaluating the ethnic-racial profile of patients hospitalized for Hodgkin's disease allows us to understand patterns of illness and possible barriers in access to oncological services. This analysis contributes to the planning of more equitable and diversity-sensitive actions in the Brazilian population. Figure 5 presents the national data on hospitalizations by race/color in the period from 2018 to 2024.

Figure 5 – Distribution of hospital admissions due to Hodgkin's disease in Brazil, according to race/color, from 2018 to 2024.

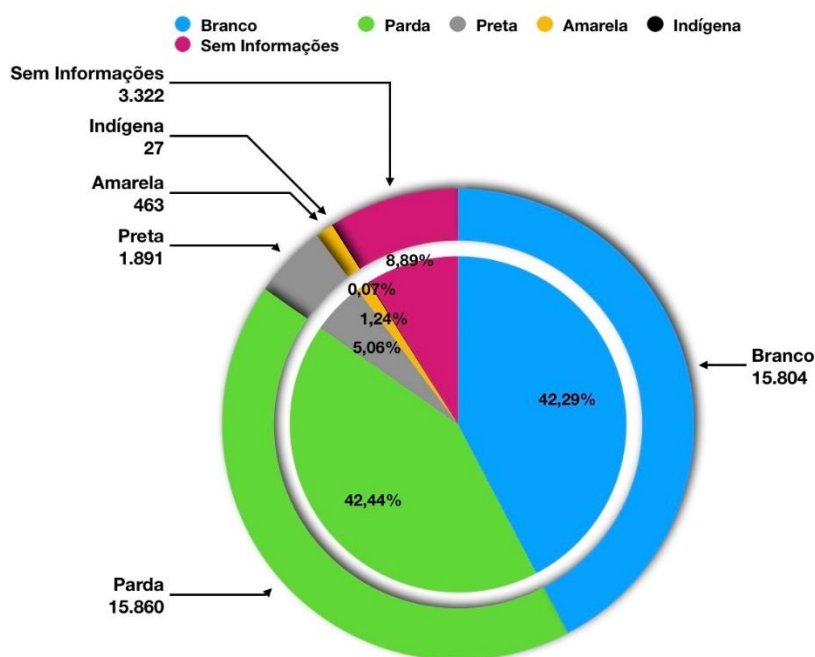


Figure 5 shows the distribution of hospital admissions due to Hodgkin's disease in Brazil between 2018 and 2024, categorized according to the race/color of the patients. The data indicate that most hospitalizations occurred among self-declared brown (42.44%) and white (42.29%) individuals, who together accounted for 84.73% of the total cases registered in the period, partially reflecting the Brazilian demographic composition.

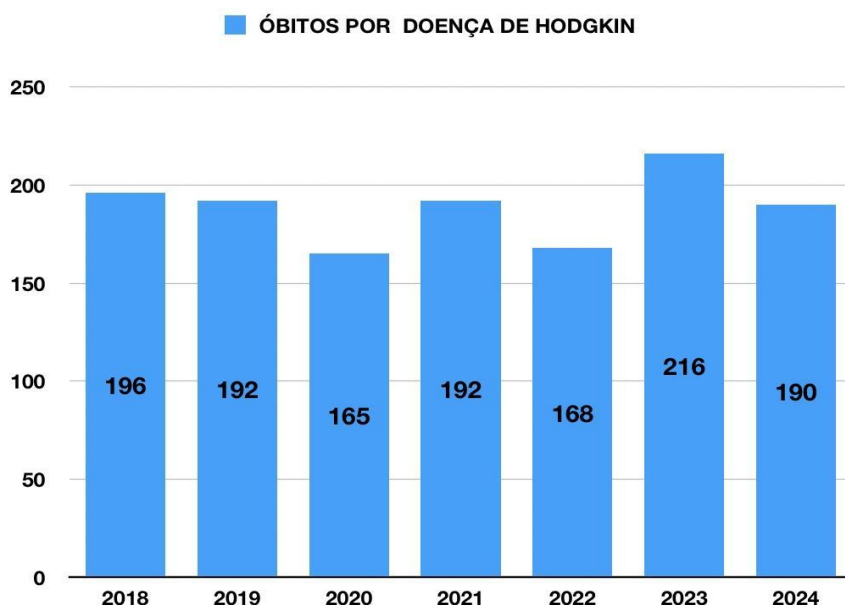
Among the other groups, black patients stand out, with 1,891 hospitalizations (5.06%), followed by yellow patients, with 463 cases (1.24%), and indigenous patients, who totaled only 27 records, which is equivalent to 0.07% of hospitalizations (FIGURE 5).

It is also noteworthy that 3,322 hospitalizations (8.89%) were recorded without information on race/color, which partially compromises the accuracy of the analyses and shows an important weakness in the completion of data in hospital information systems. This data highlights the need for continuous qualification of health records to ensure more complete and grounded analyses.

DEATHS HOSPITALIZED FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024)

Hospital mortality due to Hodgkin's disease is a relevant indicator to assess the severity of cases and the effectiveness of cancer care in the country. The temporal analysis of deaths allows the identification of possible impacts of external factors, such as health crises, and oscillations in the quality of care provided. The following are the data on hospital mortality in Brazil between 2018 and 2024.

Figure 6 – Annual distribution of deaths from Hodgkin's disease in Brazil, from 2018 to 2024.



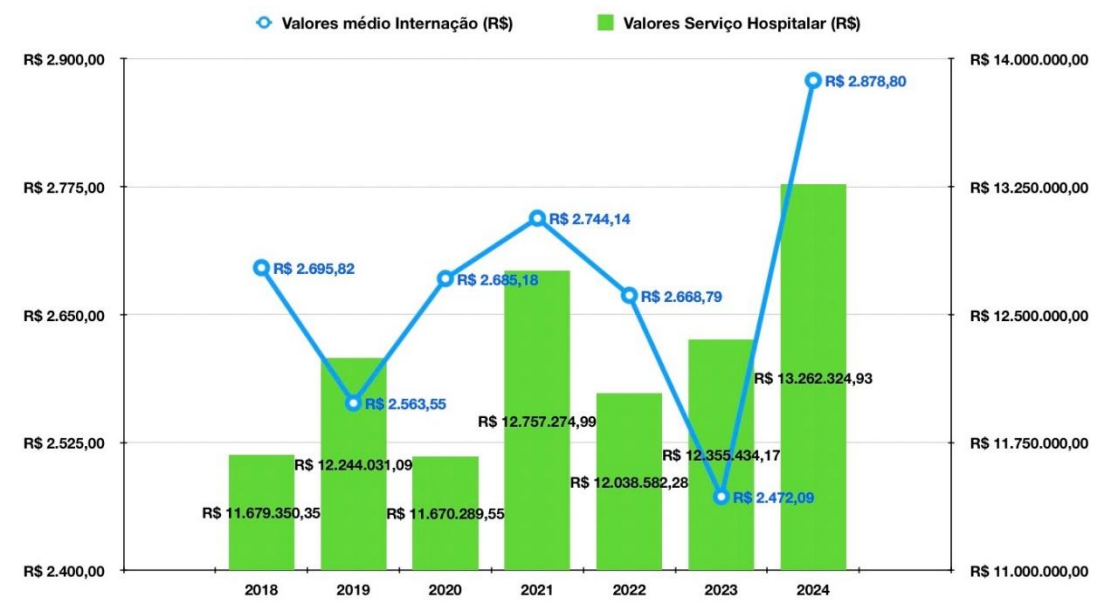
In 2018, 196 deaths were recorded, a number that showed a slight reduction in 2019, with 192 deaths. In 2020, coinciding with the beginning of the pandemic, there was a more significant drop, totaling 165 deaths — a reduction of approximately 14% compared to 2018 (FIGURE 6).

In 2021, there was a new increase, returning to the level of 192 deaths. Then, 2022 showed a new drop, with 168 deaths, followed by a significant increase in 2023, when 216 deaths were recorded, the highest number recorded in the period analyzed. In 2024, deaths decreased again, totaling 190 records (FIGURE 6).

HOSPITAL VALUES HOSPITALIZATION FOR HODGKIN'S DISEASE IN BRAZIL (2018-2024):

The analysis of hospital values is essential to understand the costs involved in the treatment of Hodgkin's Disease within the scope of the SUS. Variations in the average cost and total amount invested may indicate changes in the complexity of cases, therapeutic protocols, and the financing of cancer care.

Figure 7 – Hospital values related to hospitalizations for Hodgkin's disease in Brazil, in the period from 2018 to 2024, according to average cost per hospitalization and total value of hospital services.



In 2018, the average cost per hospitalization was R\$ 2,695.82, and the total amount spent reached R\$ 11,679,350.35. In the following year, 2019, there was a reduction in the average cost to R\$ 2,563.55, accompanied by a slight increase in total expenses (R\$ 12,244,031.09), reflecting the growth in the number of hospitalizations. In 2020, the first year of the COVID-19 pandemic, the average cost fell even more, to R\$2,472.09, with a slight retraction in the total amount, which was R\$11,670,289.55 (FIGURE 7).

In 2021, there was a significant increase in the average cost (R\$ 2,744.14) and in the total invested (R\$ 12,757,274.99). In the following year, 2022, there was a slight drop in the average cost (R\$ 2,668.79) and total expenses (R\$ 12,038,582.28). In 2023, the average cost returned to R\$2,472.09, while total expenses increased to R\$12,355,434.17 (FIGURE 7).

In 2024, the highest values of the analyzed period were recorded, with an average cost of R\$ 2,878.80 per hospitalization and a total expenditure of R\$ 13,262,324.93.

These variations over the years show oscillations in both unit cost and aggregate investment, with average values ranging between R\$ 2,472.09 and R\$ 2,878.80, and total expenses ranging between R\$ 11.67 million and R\$ 13.26 million (FIGURE 7). Such fluctuations can be attributed to multiple factors, such as the clinical complexity of the cases treated, updating of therapeutic protocols, adoption of new technologies, readjustments in the SUS table, and exceptional events, such as the COVID-19 pandemic.

FINAL CONSIDERATIONS

An analysis of hospitalizations for Hodgkin's disease in Brazil between 2018 and 2024 revealed a scenario of relative stability, with moderate fluctuations in the number of annual cases. The peak of hospitalizations was observed in 2023, followed by a slight reduction in 2024, but still maintaining numbers higher than the initial years of the time series. The COVID-19 pandemic in 2020 had a noticeable impact, with a drop in the number of hospitalizations and deaths that year, reflecting a possible reduction in access to cancer diagnosis and treatment.

Urgent hospitalizations predominated over elective hospitalizations throughout the analyzed period, suggesting delays in diagnosis or clinical worsening before hospitalization. The age distribution reinforces the known epidemiological pattern of Hodgkin's lymphoma, with a higher concentration of cases among adolescents and young adults (10 to 29 years), and a progressive decrease in the older age groups.

The higher prevalence among males (55.6%) and the predominance of hospitalizations among brown and white people reflect both the epidemiological profile of the disease and the Brazilian population distribution. However, the significant presence of records without information on race/color (8.89%) points to the need for improvement in data quality.

Regarding mortality, deaths have fluctuated slightly over the years, with the highest number recorded in 2023 (216 cases). Hospital lethality remained relatively stable, with no abrupt increases, which may indicate maintenance of therapeutic efficacy in the hospital context, despite the adversities faced by the health system.

Finally, hospital values varied throughout the period, with a progressive increase in total expenses and average cost per hospitalization, culminating in 2024 with the highest values recorded. These data point to the growing investment required for the care of these patients and reinforce the importance of adequate resource planning in the public health system.

Thus, the findings of the present study contribute to an updated understanding of the epidemiological profile of Hodgkin's disease in Brazil, highlighting the need for public policies aimed at early detection, equity in access to treatment, and strengthening specialized cancer care, especially for the most vulnerable populations.

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