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HOSPITAL ADMISSIONS FOR MALIGNANT NEOPLASMS OF THE LARYNX, LIP, ORAL CAVITY, AND PHARYNX IN BRAZIL: A TIME-SERIES ANALYSIS (2018–2024)

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ABSTRACT

Objective: To analyze hospital morbidity due to malignant neoplasms of the larynx, lip, oral cavity, and pharynx in Brazil, highlighting temporal trends, sociodemographic profile, and impacts on health systems between 2018 and 2024. **Methodology:** Ecological epidemiological study of time series with an analytical approach, based on data from the Hospital Information System of the SUS (SIH/SUS) made available by DATASUS. Variables such as number of hospitalizations, deaths, age group, gender, hospital costs, and average value per hospitalization were evaluated. The analysis was complemented by a literature review in the PubMed, SciELO, Google Scholar and Elsevier databases. **Results:** In the period analyzed, lip, oral cavity and pharyngeal neoplasms corresponded to 67.57% of hospitalizations, while laryngeal neoplasms accounted for 32.43%. There was a male predominance (77.38% of hospitalizations and 79.52% of deaths), with a higher concentration of cases among individuals aged 50 to 69 years. Mortality was higher in neoplasms of the lip, oral cavity and pharynx (71.54% of deaths). The highest number of deaths occurred in 2023, while 2020 had the lowest rate, possibly influenced by the COVID-19 pandemic. Hospital costs were high, with a progressive growth in the average value per hospitalization over the years, reaching an increase of 11.61%. **Conclusion:** The data reveal a worrying panorama regarding the incidence, mortality, and financial impact of malignant neoplasms of the larynx, lip, oral cavity, and pharynx in Brazil. The need for public policies aimed at prevention, early diagnosis and qualified access to treatment is reinforced, especially for the most at-risk groups.

Keywords: Oral Neoplasms. Laryngeal Neoplasm. Hospital morbidity. Public health. Epidemiology.

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INTRODUCTION

Cancers of the mouth, oropharynx, and laryngopharynx are responsible for a significant portion of the morbidity and mortality related to malignant tumors of the head and neck. Oral cancer is the sixth most common type of cancer in the world and the seventh in Brazil, being the largest group of head and neck cancer (Faria et al., 2020). Laryngeal malignant neoplasm is the most common cancer of the head and neck region and one of the most common tumors of the respiratory tract (So et al., 2025).

The oropharynx and laryngopharynx are distinct anatomical parts of the head and neck region, and cancers that originate in these locations have unique epidemiological, etiological, and prognostic features (Bruss & Sajjad, 2019). It is of great importance to differentiate between the subtypes, since biological behavior, risk factors, and therapeutic strategies may differ between the various anatomical locations involved (Périé et al., 2014).

Oropharyngeal cancer has historically been associated with tobacco and alcohol consumption. However, in recent decades, there has been a notable increase in the incidence of human papillomavirus (HPV)-related oropharyngeal cancer, particularly HPV type 16 (Nieto & Pracy, 2024). HPV is a sexually transmitted virus, and its association with oropharyngeal cancer has significantly altered the epidemiological profile of the disease, with an increased incidence in younger, non-smoking individuals with good socioeconomic status (Chaturvedi & Zumsteg, 2018). Among the subtypes of oral and oral cavity cancers, Squamous Cell Carcinoma (SCC) is the most common subtype (approximately 90% of cases), strongly associated with smoking, alcohol and, more recently, HPV infection (Yang et al., 2023). It mainly affects structures such as the lips, tongue, and floor of the mouth (Yang et al., 2023).

The laryngopharynx, on the other hand, encompasses the lower part of the pharynx, above the larynx. Laryngopharyngeal cancer, like oropharyngeal cancer, is also strongly linked to tobacco use (in its various forms: cigarette, snuff, chewing) and tobacco use (Choi & Kahyo, 1991). According to the National Cancer Institute (INCA), occupational exposure to substances such as asbestos, silica or heavy metals has also been implicated as a risk factor for laryngeal cancer.

The malignant neoplasm of pharyngitis has the highest prevalence of Squamous Cell Carcinoma (SCC) in 95% of cases. Tobacco is a risk factor in 75% of cases resulting from tar, of which benzopyrene is a potent carcinogen in the etiopathogenesis. Alcohol, on the other hand, contains high concentrations of ethanol that decreases salivary secretion with a consequent increase in the concentration of carcinogens (BERTO, José Carlos).

The present study seeks to analyze the morbidity associated with malignant neoplasms of the lip, oral cavity, pharynx and larynx in the Brazilian population, aiming at a better understanding of the distribution of these neoplasms in the national territory, in addition to providing information that enables the development of specific national public policy strategies for more effective prevention and treatment.

METHODOLOGY

SEARCH PROTOCOL

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 malignant neoplasm of the lip, oral cavity and pharynx and malignant neoplasms of the larynx, through the analysis. The data were collected between March 2nd and 8th, 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, the regions (SOUTH, SOUTHEAST, MIDWEST, NORTHEAST AND NORTH) were selected, in addition to age group, type of care, Average Value per hospitalization, Average length of stay, Deaths, Mortality Rate, Chapter – ICD 10 (Chapter II Neoplasms (tumors), Morb List ICD 10 (Malignant neoplasm of the lip, oral cavity and pharynx and malignant neoplasms of the larynx). The data were stored in a specific database and analyzed with Microsoft Excel and Apple Numbers software.

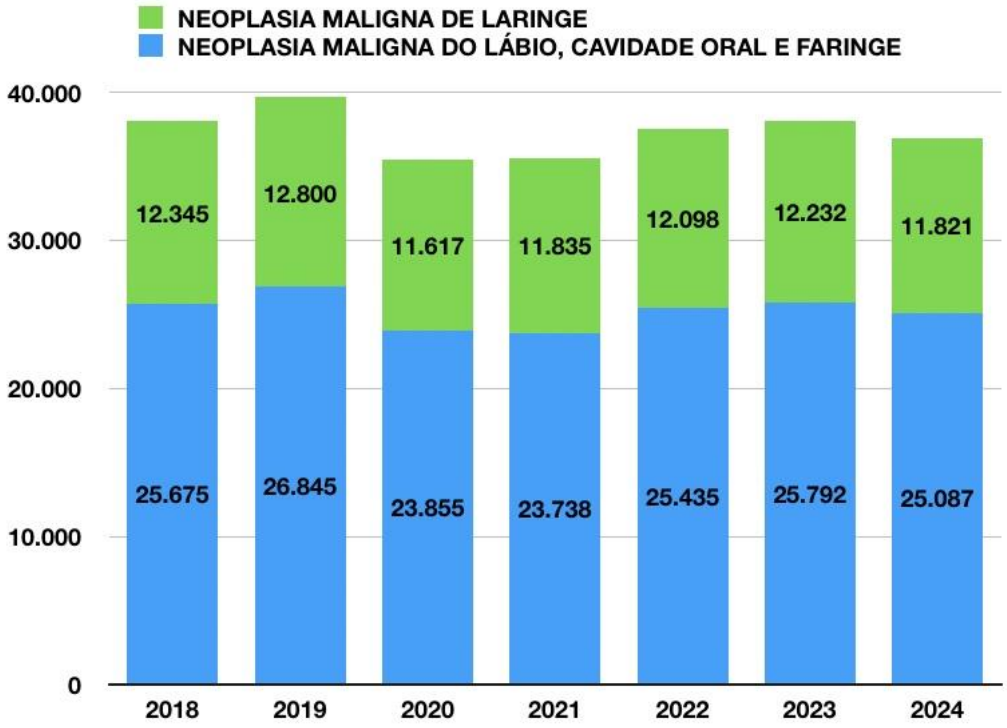
The bibliographic references were obtained from the databases GOOGLE SCHOLAR, PUBMED, ESLEVIER and SCIELO, from which the keywords "Oral cavity neoplasm", "malignant neoplasms of the oral cavity", "malignant neoplasms of the pharynx", "laryngopharyngeal neoplasms", "laryngeal neoplasms", "public health", "epidemiology", "hospital morbidity" were used.

RESULTS AND DISCUSSION

HOSPITALIZATIONS FOR MALIGNANT NEOPLASM OF THE LARYNX AND MALIGNANT NEOPLASM OF THE LIP, ORAL CAVITY AND PHARYNX (2018-2024)

The analysis of hospital admissions for malignant neoplasms of the lip, oral cavity, and pharynx, as well as of the larynx, in Brazil between 2018 and 2024 reveals variations over the years, possibly influenced by factors such as changes in epidemiological patterns, the impact of the COVID-19 pandemic, and public health strategies for diagnosing and treating these conditions.

Figure 1. Total number of hospitalizations for Malignant Neoplasm of the Larynx and Malignant Neoplasm of the lip, oral cavity and pharynx in Brazil, in the years 2018-2024:



Over the years, the predominance of hospitalizations was of patients with malignant neoplasms of the lip, oral cavity and pharynx, representing 67.57% of the cases, with a monthly average of 2,102.45 hospitalizations. Laryngeal malignant neoplasms corresponded to 32.43% of hospitalizations, with an average of 1,008.90 monthly hospitalizations. In total, these neoplasms resulted in an average of 37,336 annual hospitalizations in Brazil.

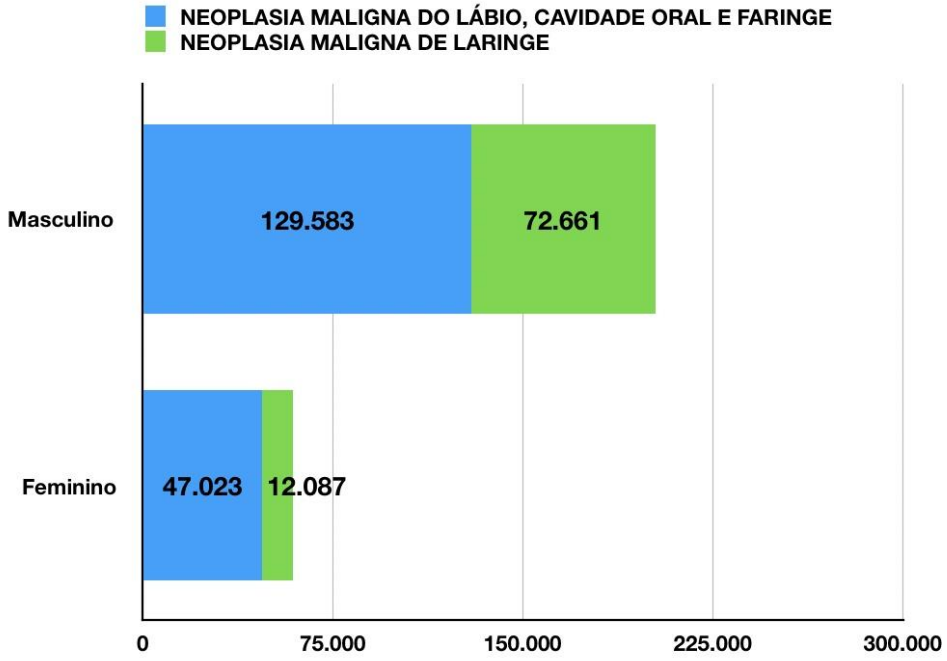
In 2018, there were 25,675 hospitalizations for malignant neoplasms of the lip, oral cavity, and pharynx, while malignant neoplasms of the larynx resulted in 12,345 hospitalizations. The following year, there was an increase in the numbers, with 26,845 and 12,800 hospitalizations, respectively. However, in 2020, there was a significant reduction in hospitalized cases, with

23,855 hospitalizations for lip, oral cavity, and pharyngeal neoplasms and 11,617 for laryngeal neoplasms. This decline may be associated with the impact of the COVID-19 pandemic, which has led to reduced access to health services and postponement of diagnoses and treatments. (Silva et al, 2020)

In subsequent years, hospitalizations remained relatively stable, with a slight recovery in the numbers in 2022 (25,435 and 12,098 hospitalizations) and 2023 (25,792 and 12,232 hospitalizations). However, in 2024, there was a new slight reduction, with 25,087 hospitalizations for lip, oral cavity, and pharyngeal neoplasia and 11,821 for laryngeal neoplasia.

THE MALE PREDOMINANCE IN HOSPITAL ADMISSIONS FOR MALIGNANT NEOPLASM OF THE LARYNX AND MALIGNANT NEOPLASM OF THE LIP, ORAL CAVITY AND PHARYNX

Figure 2: Number of hospital admissions for Malignant Neoplasm of the Larynx and Malignant Neoplasm of the lip, oral cavity and pharynx in Brazil, in relation to gender, in the years 2018-2024:



The analysis of hospital admissions for malignant neoplasm of the larynx and malignant neoplasm of the lip, oral cavity, and pharynx in Brazil between 2018 and 2024 shows a significant predominance of males. In the period analyzed, men accounted for 77.38% of hospitalizations, totaling 202,244 cases. Women, on the other hand, were responsible for 22.61% of hospitalizations, totaling 59,110 hospitalizations.

When segmenting the data, it was observed that malignant neoplasms of the lip, oral cavity and pharynx were responsible for most hospitalizations in both sexes. Among men, this category totaled 129,583 hospitalizations (64.08% of male hospitalizations), while for women,

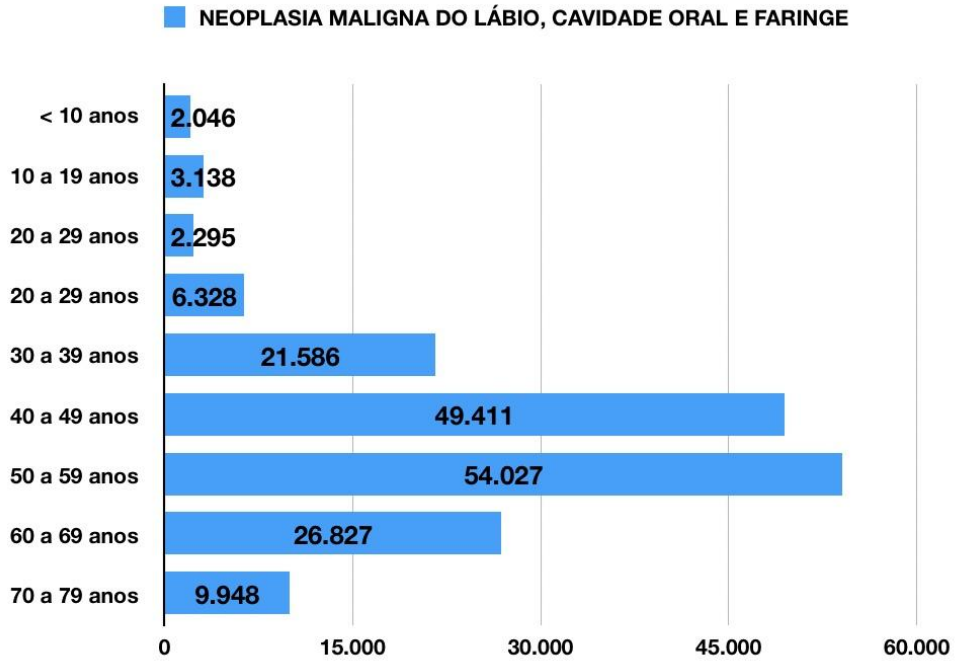
47,023 cases were recorded (79.54% of female hospitalizations). Malignant laryngeal neoplasia accounted for 72,661 male hospitalizations (35.92% of the male total) and 12,087 female hospitalizations (20.46% of the female total).

Although male predominance is evident, female numbers are also considerable, demonstrating that these neoplasms significantly affect both sexes. Risk factors, such as smoking and alcohol consumption—the main agents associated with the development of these diseases—have historically been more prevalent among men, which may explain the discrepancy in the numbers (INSTITUTO NACIONAL DE CÂNCER, 2024). According to INCA, in 2020, there were approximately 530 thousand new cases of oral cavity cancer in the world, of which 373 thousand were in men, representing a risk of 8.46 cases per 100 thousand inhabitants, while women had 157 thousand new cases, with an estimated risk of 3.20 per 100 thousand inhabitants (INSTITUTO NACIONAL DE CÂNCER, 2025). Smoking and excessive alcohol consumption are considered the main risk factors, especially when combined, significantly increasing the chance of developing these neoplasms (INSTITUTO NACIONAL DE CÂNCER, 2025).

However, the increase in female exposure to these factors in recent years may impact future statistics. Studies indicate that the age group of 30 to 39 years, which showed an upward trend in mortality from oral and oropharyngeal cancer in Brazil, coincides with the age group in which there is a higher prevalence of habitual consumption of alcoholic beverages among women in the country (SILVA et al., 2020). This suggests that changes in consumption habits may lead to a progressive reduction in the difference between the sexes in the rates of hospitalization and mortality from these neoplasms.

HOSPITALIZATIONS FOR MALIGNANT NEOPLASM OF THE LIP, ORAL CAVITY AND PHARYNX IN BRAZIL BY AGE GROUP (2018-2024)

Figure 3: Classification by age group by age in years of the number of hospital admissions for malignant neoplasms of the lip, oral cavity and pharynx in Brazil, in the years 2018-2024



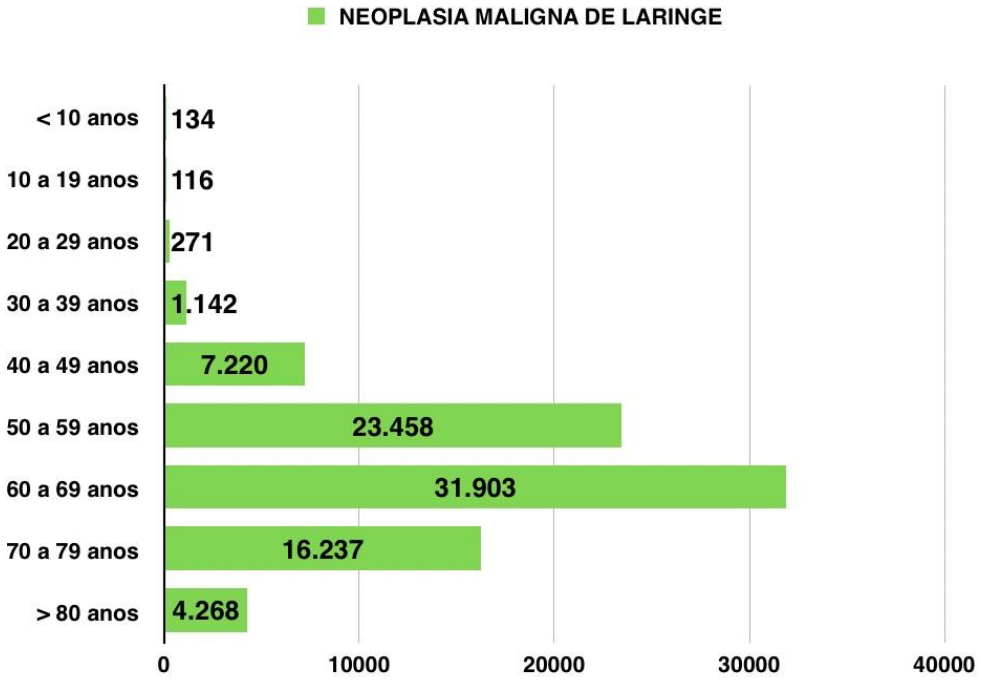
The distribution of hospital admissions for malignant neoplasms of the lip, oral cavity, and pharynx in Brazil between 2018 and 2024 reveals a significant prevalence among individuals aged 50 to 59 years. This age group totaled 54,027 hospitalizations, representing 30.77% of the total. Next, there is a high incidence in the 40 to 49 age group, which corresponds to 28.14% of hospitalizations, and in the 60 to 69 age group, with 15.28%.

The age group from 30 to 39 years old also has a significant number of cases, with 12.29% of hospitalizations. The other age groups, including younger groups and elderly people over 70 years old, together add up to only 13.53% of hospitalizations, without representing a statistically significant impact compared to the other groups.

These data reinforce that the risk of hospitalization for malignant neoplasms of the lip, oral cavity and pharynx increases considerably from the age of 40, reaching its peak between the ages of 50 and 59.

HOSPITALIZATIONS FOR LARYNGEAL MALIGNANT NEOPLASM IN BRAZIL BY AGE GROUP (2018-2024)

Figure 4: Classification by age group by age in years of the number of hospital admissions for Malignant Laryngeal Neoplasm in Brazil in the years 2018-2024



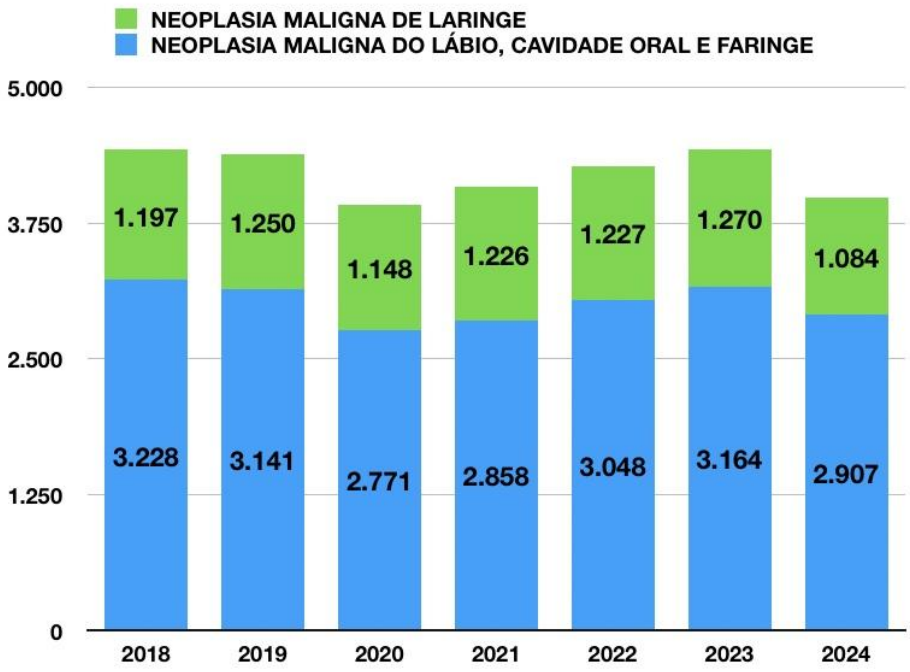
The analysis of hospital admissions for laryngeal malignant neoplasm in Brazil between 2018 and 2024 shows a significant prevalence in the 60-69 age group, which totaled 31,903 hospitalizations, representing 37.64% of the total. Soon after, a high incidence was observed among individuals aged 50 to 59 years, with 28,458 hospitalizations (27.68%), and those aged 70 to 79 years, with 23,458 hospitalizations (19.16%).

On the other hand, the age groups from 30 to 39 years old and over 80 years old have a lower impact on hospitalization rates, corresponding to 1.35% (1,142 cases) and 5.04% (4,268 cases), respectively. The other ages, added together, do not present expressive values in relation to the total number of hospitalizations.

These data demonstrate that most hospitalizations occur in individuals over 50 years of age, reinforcing the association of the disease with aging and prolonged exposure to risk factors, such as smoking and excessive alcohol consumption. The identification of this age pattern is essential to guide prevention, screening, and early diagnosis strategies, prioritizing more vulnerable groups and contributing to the reduction of mortality associated with this neoplasm.

MORTALITY FROM MALIGNANT NEOPLASM OF THE LARYNX AND OF THE LIP, ORAL CAVITY AND PHARYNX IN BRAZIL (2018-2024)

Figure 5 - Total number of deaths due to hospitalizations of laryngeal malignant neoplasm and malignant neoplasm of the lip, oral cavity and pharynx in Brazil, in the years 2018 - 2024:



The analysis of deaths resulting from hospitalizations due to malignant neoplasms of the larynx and lip, oral cavity, and pharynx in Brazil, between 2018 and 2024, shows annual variations that reflect the severity of these diseases. During this period, the lowest number of deaths was recorded in 2020, totaling 3,919 deaths, which corresponds to 13.28% of the total fatalities in the period. On the other hand, the highest number of deaths occurred in 2023, with 4,434 deaths, representing 15.02% of the total.

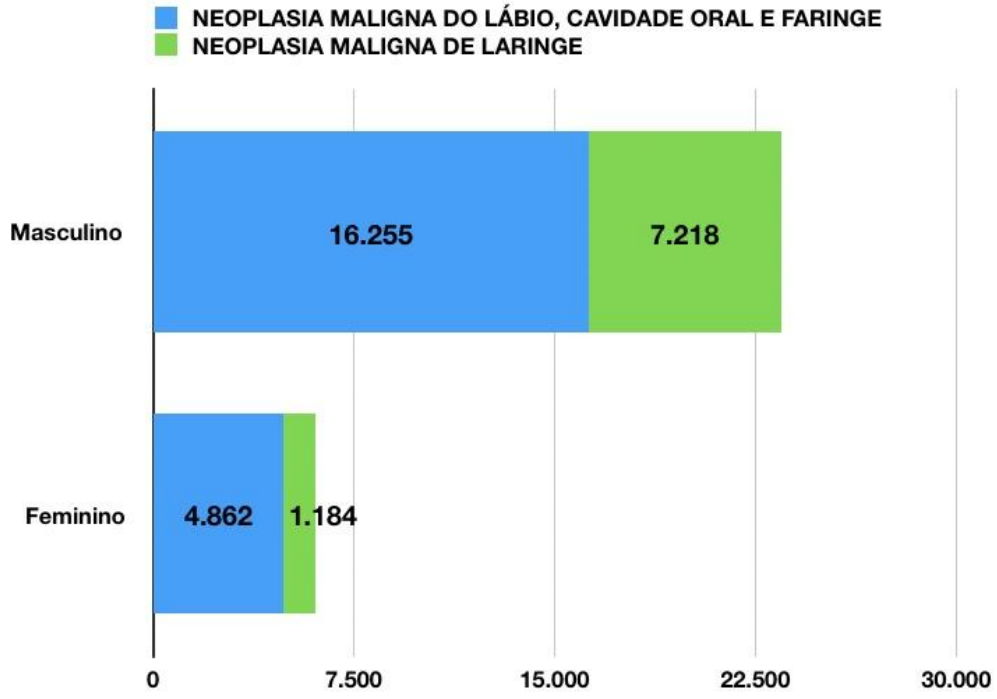
When considering the consolidated data, it is observed that the total number of deaths from both neoplasms varied significantly over the years. In 2018, 4,425 deaths were recorded, followed by a slight reduction in 2019, with 4,391 deaths. In 2020 and 2021, there was a decrease and subsequent increase, with 3,919 and 4,084 deaths, respectively. In 2022 and 2023, the numbers rose again, reaching 4,275 and 4,434 deaths, respectively. In 2024, a further reduction was observed, totaling 3,991 deaths.

When evaluating deaths by type of neoplasia, it is noted that cancers of the lip, oral cavity, and pharynx had a significantly greater impact on mortality when compared to laryngeal cancer. In total, these neoplasms were responsible for 21,117 deaths, representing 71.54% of

deaths in the period, while malignant neoplasms of the larynx totaled 8,402 deaths, corresponding to 28.46%.

MORTALITY FROM MALIGNANT NEOPLASM OF THE LARYNX AND OF THE LIP, ORAL CAVITY AND PHARYNX IN BRAZIL BY SEX (2018-2024)

Figure 6 - Number of deaths due to hospital admissions of Malignant Neoplasm of the Larynx and Malignant Neoplasm of the lip, oral cavity and pharynx in Brazil, in relation to gender, in the years 2018 - 2024:



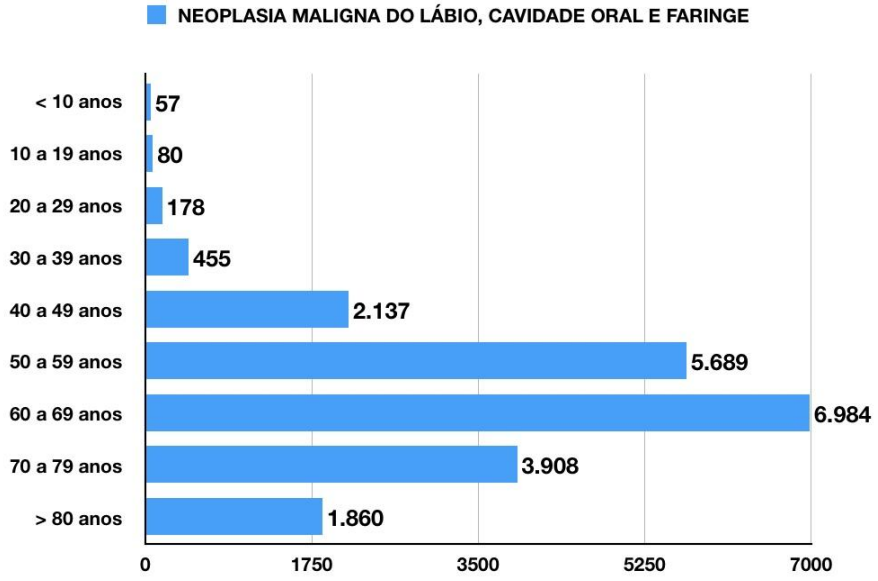
The analysis of hospitalization deaths due to malignant neoplasms of the larynx and lip, oral cavity, and pharynx in Brazil, between 2018 and 2024, reveals a significantly greater impact on the male population. The data indicate that 23,473 deaths occurred among men, representing 79.52% of the total deaths registered in the period. On the other hand, the number of deaths among women was considerably lower, totaling 6,046 deaths, which is equivalent to 20.48% of the total.

In addition to the male predominance in overall deaths, the distribution of deaths by type of neoplasm also presents relevant differences between the sexes. In the male population, malignant neoplasms of the lip, oral cavity and pharynx were responsible for 16,255 deaths, which corresponds to 69.25% of deaths in this group, while laryngeal neoplasms caused 7,218 deaths, representing 30.75%. Among women, most fatalities were also caused by malignant neoplasms of the lip, oral cavity and pharynx, with 4,862 deaths (80.42%), while malignant neoplasm of the larynx was associated with 1,184 deaths (19.58%).

MORTALITY FROM MALIGNANT NEOPLASM OF THE LARYNX AND OF THE LIP, ORAL CAVITY AND PHARYNX BY AGE GROUP (2018-2024)

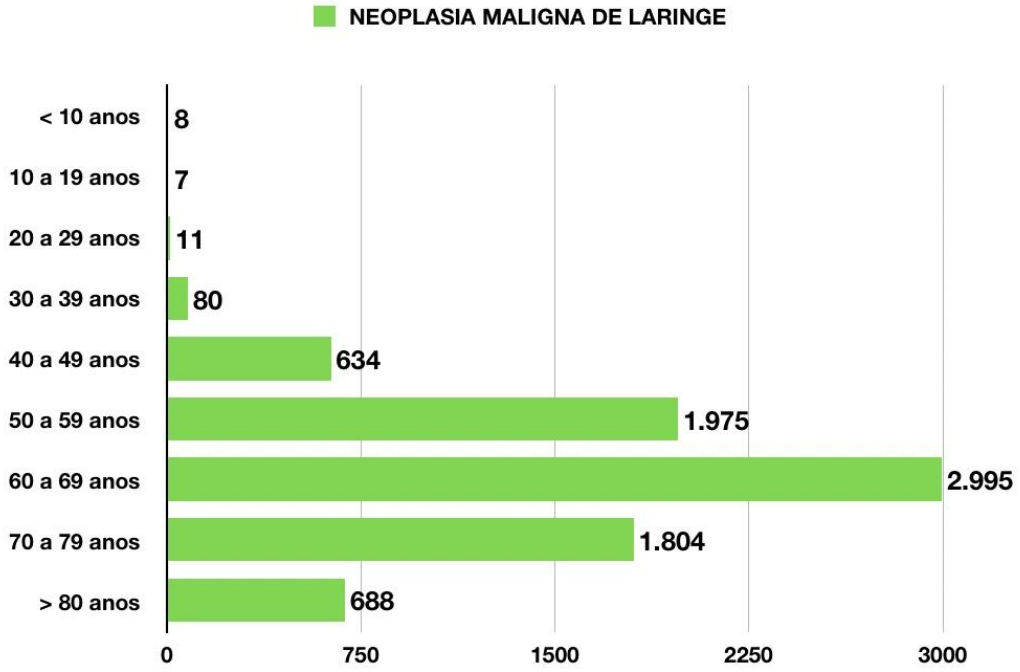
The analysis of mortality from malignant neoplasms of the larynx and of the lip, oral cavity, and pharynx in Brazil, between 2018 and 2024, shows a strong relationship between advanced age and the number of deaths. According to the data presented, most deaths occurred among individuals aged 60 years or older, representing 65.61% (15,744) of the total deaths due to neoplasms of the lip, oral cavity and pharynx and 71.91% (5,487) of the deaths due to malignant neoplasm of the larynx.

Figure 7: Classification by age group by age in years, of the number of deaths due to hospital admissions of malignant neoplasms of the lip, oral cavity and pharynx, in Brazil, in the years 2018 - 2024:



In the case of malignant neoplasms of the lip, oral cavity and pharynx, the age group with the highest number of deaths was 60 to 69 years old, with 6,984 deaths (23.25%), followed by the 50 to 59 age group, which accounted for 5,689 deaths (18.94%). Individuals between 70 and 79 years old also had a significant number of fatalities, with 3,908 deaths (13.02%). In more advanced ages, that is, over 80 years old, 1,860 deaths (6.19%) were registered. In younger age groups, the impact of mortality is significantly lower, with children under 10 years of age presenting only 57 deaths (0.19%), while the group of 10 to 19 years had 80 deaths (0.27%) and the group of 20 to 29 years of age accounted for 178 deaths (0.59%).

Figure 8: Classification by age group by age in years, of the number of deaths due to hospital admissions of Malignant Laryngeal Neoplasm, in Brazil, in the years 2018 - 2024:

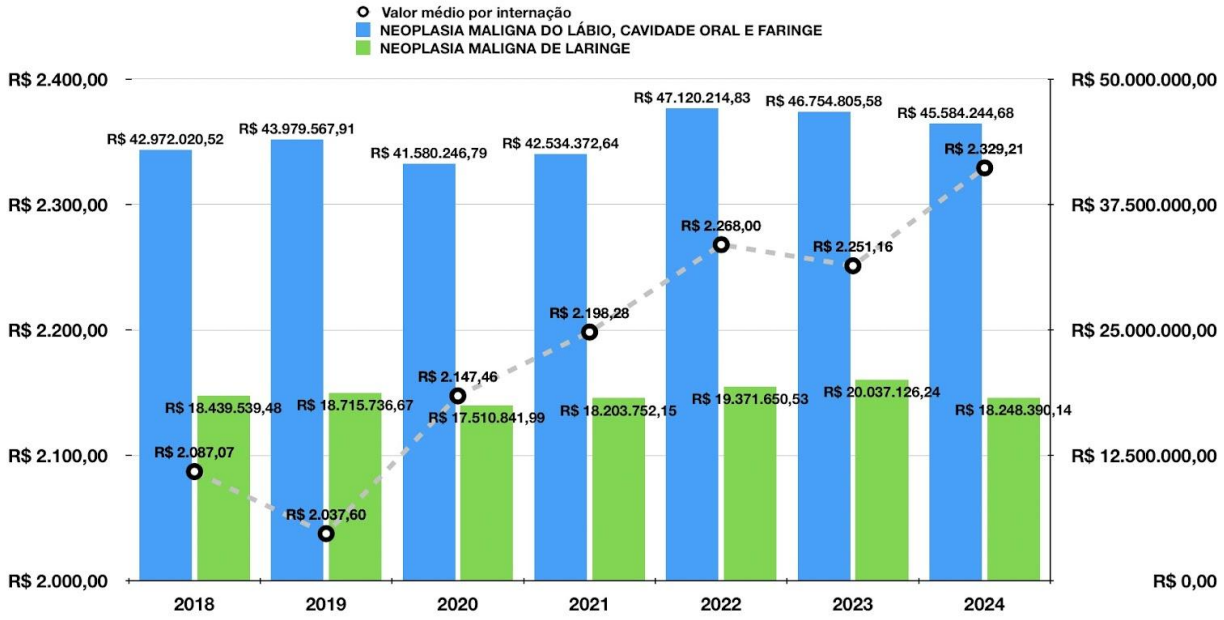


For laryngeal malignant neoplasm, the age pattern of mortality follows a similar trend, with the 60 to 69 age group registering the highest number of deaths, totaling 2,995 deaths (35.65%). Next, the age group from 50 to 59 years old had 1,975 deaths (23.52%), and the age group from 70 to 79 years old accounted for 1,804 deaths (21.47%). The population over 80 years of age recorded 688 deaths (8.19%). On the other hand, the numbers are much lower among the youngest, with 8 deaths (0.09%) in children under 10 years old, 7 deaths (0.08%) in the 10 to 19 age group and only 11 deaths (0.13%) between 20 and 29 years old.

HOSPITAL COSTS AND AVERAGE VALUE PER HOSPITALIZATION OF MALIGNANT NEOPLASMS IN BRAZIL (2018-2024)

The analysis of hospital costs associated with hospitalizations for malignant neoplasms of the lip, oral cavity, and pharynx, as well as for malignant neoplasms of the larynx, in Brazil, between the years 2018 and 2024, reveals a significant variation in the amounts invested over the period.

Figure 9 - Hospital Services Values and Average Values per hospitalization of Laryngeal Malignant Neoplasm and Malignant Neoplasm of the lip, oral cavity and pharynx in Brazil, in the years 2018 - 2024:



Spending on hospitalizations for the treatment of malignant neoplasms of the lip, oral cavity and pharynx increased between 2018 and 2022, from **R$ 42,972,020.52** to **R$ 47,120,214.83**, an increase of **9.64%.** However, in the following years, there was a slight reduction in costs, reaching **R$ 45,584,244.68** in 2024. On the other hand, the values related to hospitalizations for malignant neoplasm of the larynx followed a similar trend, starting at **R$ 18,439,539.48** in 2018, reaching the highest value in 2023 (**R$ 20,037,126.24**) and ending 2024 with a cost of **R$ 18,248,390.14**.

When we analyze the **average value per hospitalization**, we notice an oscillation over the years. In 2018, the average cost was **R$ 2,087.07**, showing a slight reduction in 2019 (**R$ 2,037.60**). However, from 2020 onwards, the values began to rise progressively, reaching **R$ 2,329.21** in 2024, an increase of **11.61%** compared to the first year analyzed.

LIMITATIONS:

The ecological approach applied to time series analysis in epidemiological studies has inherent limitations. In this study, the exclusive dependence on data from the DataSUS system may have resulted in the absence of relevant information from other databases. In addition, the hospital records used are conditioned to the accuracy of the clinical diagnosis made by the health professional responsible at the time of admission, which implies the possibility of underreporting or errors in the diagnostic classification. It should also be noted that the analysis ended in March 2024, which implies that the data and trends observed may have already

changed. Thus, the need for periodic updates and complementary analyses is reinforced to obtain a more current and accurate overview of hospitalizations for Malignant Neoplasm of the Larynx and for Malignant Neoplasm of the Lip, Oral Cavity and Pharynx in the Brazilian context.

FINAL CONSIDERATIONS

The analysis of hospital admissions for malignant neoplasms of the larynx and lip, oral cavity, and pharynx in Brazil, between 2018 and 2024, reveals a worrying panorama in relation to the incidence, mortality, and costs associated with these diseases. The highest number of hospitalizations occurred in 2019, followed by a significant drop in the years 2020 and 2021, a period that may have been impacted by the COVID-19 pandemic and its restrictions on health services. In subsequent years, there was an increase in hospitalizations in 2022 and 2023, with a further reduction in 2024.

The distribution by sex points to a significant male predominance, with 77.38% of hospitalizations and 79.52% of deaths concentrated in this group. This disparity may be associated with men's greater exposure to risk factors such as smoking and excessive alcohol consumption, the main etiological agents of these neoplasms (Leite et al, 2021). However, the number of cases in women is also significant and may grow in the coming years due to increased exposure to these factors (Leite et al, 2021).

As for age distribution, most hospitalizations occur between 50 and 69 years old, the age group that also concentrates the highest number of deaths. This suggests the need for screening and early diagnosis strategies in this population to improve clinical outcomes.

Regarding mortality, the data show that malignant neoplasms of the lip, oral cavity and pharynx are responsible for a higher number of deaths compared to laryngeal neoplasms, representing 71.54% of the total deaths in the analyzed period. The year 2023 recorded the highest number of deaths, while 2020 had the lowest rate, possibly due to underreporting and difficulties in accessing the health system during the pandemic.

The financial impact of these diseases is also significant, with high hospital costs and a progressive increase in the average value per hospitalization, which grew 11.61% over the years analyzed. This growth may be related to the complexity of treatments and the advancement of medical technologies.

Given this scenario, it is essential to implement public policies aimed at the prevention, early diagnosis, and effective treatment of these neoplasms. Awareness campaigns on risk factors, expanded access to preventive exams, and improvement in therapeutic strategies are

essential measures to reduce the incidence, mortality, and costs associated with these pathologies in Brazil.

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