

## Hospital morbidity and mortality of malignant neoplasms of the lip, oral cavity and pharynx in Brazil (2016–2021)

### Morbidade e mortalidade hospitalar de neoplasias malignas de lábio, cavidade oral e faringe no Brasil (2016–2021)

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#### ABSTRACT

The aim of this study was to describe the morbidity and hospital mortality of malignant neoplasms of the lip, oral cavity and pharynx in Brazil (from 2016 to 2021). This is an epidemiological, observational, analytical and cross-sectional study of notifications of malignant neoplasms, using information from DATASUS (Brazilian Public Health Service Database) and analyzed using descriptive statistics. A total of 150.025 reports of malignant neoplasms of the lip, oral cavity, and pharynx in Brazil from 2016 to 2021 were analyzed. In 2016, the national rate of malignant neoplasms of the lip, oral cavity, and pharynx was 12.43 per 100.000 inhabitants, decreasing to 10.25 in 2021. Among the regions of the country, the highest rates were found in the South region, ranging from 19.35 in 2016 to 16.40 in 2021. As for the characteristics of hospitalizations, the highest incidence was noted for males (73.76%), the age group was between 50 and 64 years (45.56%), and the race/color was white (43%). Considering the patients hospitalized in the period, 18.185 died, representing a lethality rate of 12.12%. In Brazil, the incidence of oral cancer in the analyzed period differed among the regions. Although the number of hospitalizations for malignant neoplasms of the lip, oral cavity and pharynx remains high, there was a decrease in the period analyzed, with a downward trend in hospitalizations for oral cancer, increasingly emphasizing the need for early action, such as prevention, diagnosis and treatment by dental professionals, as well as public policies to prevent this disease.

**Keywords:** Hospitalization. Indicators of morbidity and mortality. Oral neoplasms.

#### RESUMO

O objetivo deste estudo foi descrever a morbidade e a mortalidade hospitalar das neoplasias malignas de lábio, cavidade oral e faringe no Brasil (período de 2016 a 2021). Trata-se de um estudo epidemiológico, observacional, analítico e transversal de notificações de neoplasias malignas, utilizando informações do DATASUS (Base de Dados do Serviço Público de Saúde Brasileiro) e analisadas por meio de estatística descritiva. Foram analisadas 150.025 notificações de neoplasias malignas de lábio, cavidade oral e faringe no Brasil, de 2016 a 2021. Em 2016, a taxa nacional de neoplasias malignas de lábio, cavidade oral e faringe foi de 12,43 por 100 mil habitantes, diminuindo para 10,25 em 2021. Entre as regiões do país, as maiores taxas foram encontradas na região Sul, variando de 19,35 em 2016 a 16,40 em 2021. Quanto às características das internações, a maior incidência foi notada para o sexo masculino (73,76%), a faixa etária estava entre 50 e 64 anos (45,56%) e a raça/cor branca (43%). Considerando os pacientes internados no período, faleceram 18.185, representando letalidade de 12,12%. No Brasil, a incidência de câncer bucal no período analisado diferiu nas diferentes regiões. Embora o número de internações por neoplasias malignas de lábio, cavidade oral e faringe continue elevado, houve diminuição no período analisado, com tendência de redução das internações por câncer bucal, enfatizando cada vez mais a necessidade de atuação precoce, tais como prevenção, diagnóstico e tratamento por profissionais da Odontologia, além de políticas públicas para prevenção dessa doença.

**Palavras-chave:** Hospitalização. Indicadores de morbimortalidade. Neoplasias orais.

#### INTRODUCTION

One of the leading causes of death globally is cancer. According to estimates by the World Health Organization, in 2020, there was an incidence of 19.292.789 new cases, accounting for almost 10 million deaths in that same year (World Health Organization, 2022). In Brazil, cancer is the second most frequent cause of death. Each year, there are approximately 232.000 deaths and 450.000 new cases. In the current scenario, this disease presents itself as a serious challenge to Public Health, due to its high incidence (Instituto Nacional de Câncer [INCA], 2022a).

Malignant neoplasms of the lip, oral cavity and pharynx are defined, as well as other malignant neoplasms, as a chronic multifactorial disease. There is no isolate causative agent (carcinogen) clearly defined or accepted, resulting from the interaction of intrinsic factors that affect the processes of control of proliferation and growth cell and extrinsic factors, such as exposure to sunlight and behavioral factors, especially smoking (Instituto Nacional de Câncer [INCA], 2022b). Genetics does not seem to play an important etiologic role in oral carcinoma (Neville & Day, 2002).

Smokers have a twenty times greater risk of developing

oral cancer compared to people who have never smoked. Other factors are also related to the incidence of these neoplasms, such as alcoholism, diet (if low in vitamins and minerals, triggers an increased risk of mouth cancer), hereditary factors, immunosuppression, infection with some types of viruses (human papillomavirus/HPV and Epstein-Barr virus/EBV). (Instituto Nacional de Câncer [INCA], 2022a). However, a cell itself can manifest malignant potential, autonomously or associated with extrinsic factors.

When the diagnosis of a malignant tumor is late, it will invade the neighboring structures, which can lead to the patient's death (Lima, France, Ignacio & Baioni, 2005; Boraks, 2011). As for the prevention of malignant neoplasms of the lip, oral cavity and pharynx, it is essential to know the factors that can contribute to their appearance and development, so that preventive policies can be established in order to reduce the incidence of this tumor (Volkweis, Blois, Zanin & Zamboni, 2014).

The vast majority of oral malignant tumors are visible, or at least palpable or detectable with clinical maneuvers. To this end, it is essential that the dental surgeon and other health professionals are trained to promote the prevention and early

detection of this type of cancer and, thus, contribute to timely treatment. A careful physical examination of the oral cavity can identify early lesions of this disease, even if complementary tests, such as a biopsy, are necessary to conclude the diagnosis (Boraks, 2011).

However, in most cases, the detection of the pathology is delayed, when the disease is at an advanced stage (Instituto Nacional de Câncer [INCA], 2022a; Instituto Nacional de Câncer [INCA], 2022c). The rates of malignant neoplasms of the lip, oral cavity and pharynx go far beyond epidemiological data, indicating how the health of the population is intrinsically related to the quality of dental care and socioeconomic conditions (Torres-Pereira, Angelim-Dias, Melo, Lemos & Oliveira, 2012).

Considering that the number of cases is still high worldwide and that cancer is among the main causes of death, but with important regional differences, this study aims to describe and analyze hospital morbidity and mortality due to malignant neoplasms of lip, oral cavity and pharynx in Brazil (2016-2021).

## MATERIALS AND METHODS

This is an epidemiological, observational, analytical and cross-sectional study of hospital morbidity rates for malignant neoplasms of the lip, oral cavity and pharynx in Brazil.

Data were obtained through the indirect documentation technique of the Unified Health System (SUS) and the Hospital Information System (SIH/SUS) available online at the Department of Informatics of the Unified Health System (DATASUS).

The following variables were analyzed: age, race/color (white, black, yellow, brown, indigenous and no information), regions (North, Northeast, South, Southeast and Midwest), and gender (female and male).

Data were analyzed using descriptive statistics, represented by absolute and relative frequencies and morbidity rates due to malignant neoplasms of the lip, oral cavity and pharynx. The rate was calculated by the ratio between the number of morbidity due to malignant neoplasms divided by the number of cases in the same location and year, multiplied by 100.000.

The present study used exclusively non-nominal secondary data, in accordance with Decree No. 7.724 of May 16, 2012, which provides for access to information, and Resolution No. 510 of April 7, 2016. As these are secondary data from a public platform, the approval of the Standing Committee on Ethics in Research involving Human Beings was not necessary.

## RESULTS AND DISCUSSION

In the search and epidemiological analysis of the incidence of malignant neoplasms of the lip, oral cavity and pharynx in Brazil, 150.025 notifications were found during the period from 2016 to 2021. In this context, there was a decline in the national rates of hospitalizations for malignant neoplasms of the lip, oral cavity, and pharynx in the country, from 12.43 in 2016 to 10.25 in 2021. The only region in which there was no reduction in rates was the North region, which had a rate of 3.30 in 2016 and 3.36 in 2021 (Figure 1).

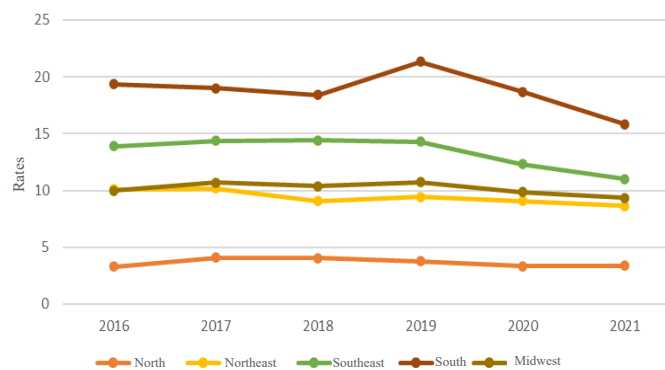
An important aspect to consider in this period was the COVID-19 pandemic (2020-2023), as it is known to have impacted hospital medical care around the world, not just in Brazil. Therefore, hospitalizations for diseases other than COVID-19 decreased to make room for beds to treat patients infected with SARS-CoV-2 (World Health Organization, 2020). Brazil was one of the epicenters of the COVID-19 pandemic, with millions of confirmed cases and deaths (Carvalho, Boschiero & Marson, 2021).

When considering the annual progression of the disease in the country, there have been some periods of decrease over the

years. From 2019 to 2020, the number of confirmed notifications for this morbidity totaled 26.845 cases in the first year, increasing to 23.855 in the second year. The number of cases dropped the following year, reaching 21.868 cases in 2021.

**Figure 1**

Historical series of rates of malignant neoplasms of the lip, oral cavity and pharynx, according to the region of hospitalization in Brazil, from 2016 to 2021.



Source: SUS Hospital Information System (SIH/SUS).

Regarding the notifications of malignant neoplasms of the lip, oral cavity and pharynx in Brazil, there was a predominance of hospitalizations in men (73.76), aged between 50 and 64 years (45.56%) and white race/color (43%) (Table 1). Similar results were found by Miranda Vargas et al. (2022) and Faria, Nascimento and Kulcsar (2022), who also mentioned low schooling.

When analyzing the profile by region, the Northeast region had the highest proportion of hospitalizations of children under 20 years of age due to malignant neoplasms of the lip, oral cavity, and pharynx in the period from 2016 to 2021, with 2.318 cases (43.67%).

With regard to the number of deaths, it is possible to observe that there was variation in the numbers throughout the historical series. In general, reports for neoplasms in the lip, oral cavity and pharynx decreased at the national level. However, even though the number of notifications has decreased, the number of deaths has not dropped proportionally, explaining the little difference in rates over the years (Table 2).

The behavior of trends in morbidity rates due to malignant neoplasms of the lip, oral cavity and pharynx in Brazil between 2016 and 2021 showed variations between the characteristics addressed, indicating the importance of careful monitoring of this condition.

In the present study, the national incidence rates reduced in the period from 2016 to 2021. This trend may be reflecting the variations that the country has been experiencing in tobacco consumption. Smoking indicators in Brazil from 2006 to 2021 decreased, with its prevalence decreasing from 15.7% to 9.1%. This decline was more noticeable among men than women (National Cancer Institute [INCA], 2022b).

Studies point to alcohol intake, HPV infection and diet low in fruits and vegetables as risk factors for the malignant neoplasms (Amaral et al., 2022; Instituto Nacional de Câncer [INCA], 2022c). Given this context, Resolution WHA 63.13 was approved in 2010, reinforcing the Global Strategy for reducing the harmful use of alcohol, with the aim of preventing people from driving under the influence of alcohol, as well as regulating the content and volume of marketing, in addition to setting limits on the availability of alcoholic beverages and increasing taxes (World Health Organization, 2010).

**Table 1**

Profile of reports of malignant neoplasms of the lip, oral cavity and pharynx in Brazil, from 2016 to 2021.

	North		Northeast		Southeast		South		Midwest		Brazil	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Sex</b>												
Female	1.191	29.78	10.699	33.30	17.079	24.19	7.867	23.54	2.533	25.67	39.369	26.24
Masculine	2.808	70.22	21.432	66.70	53.525	75.81	25.558	76.46	7.333	74.33	110.656	73.76
<b>Age</b>												
<20 years	231	5.78	2.318	7.21	1.603	2.27	723	2.16	432	4.38	5.307	3.54
20 to 34	193	4.83	1.671	5.20	1.900	2.69	885	2.65	359	3.64	5.008	3.34
35 to 49	761	19.03	5.377	16.73	10.572	14.97	4.858	14.53	1.792	18.16	23.360	15.57
50 to 64	1.495	37.38	12.450	38.75	33.664	47.68	16.411	49.10	4.335	43.94	68.355	45.56
65 to 79	1.117	27.93	8.306	25.85	19.233	27.24	8.964	26.82	2.468	25.02	40.088	26.72
80 or more	202	5.05	2.009	6.25	3.632	5.14	1.584	4.74	480	4.87	7.907	5.27
<b>Race/color</b>												
White	318	7.95	2.138	6.65	32.541	46.09	28.069	83.98	1.438	14.58	64.504	43.00
Black	77	1.93	1.759	5.47	4.984	7.06	1.033	3.09	301	3.05	8.154	5.44
Brown	2.792	69.82	23.248	72.35	24.906	35.28	2.586	7.74	3.531	35.79	57.063	38.04
Yellow	221	5.53	377	1.17	467	0.66	199	0.60	91	0.92	1.355	0.90
Indigenous	8	0.20	8	0.02	4	0.01	8	0.02	5	0.05	33	0.02
No informations.	583	14.58	4.601	14.32	7.702	10.91	1.530	4.58	4.500	45.61	18.916	12.61

Source: SUS Hospital Information System (SIH/SUS).

**Table 2**

Deaths caused by malignant neoplasms of the lip, oral cavity and pharynx according to major regions in Brazil, from 2016 to 2021.

Deaths	2016	%	2017	%	2018	%	2019	%	2020	%	2021	%	Total	%
North	87	14.92	91	15.61	111	15.14	116	16.7	95	15.32	94	14.78	598	14.95
Northeast	638	11.27	640	11.31	565	10.99	629	11.7	586	11.25	542	10.87	3.663	11.40
Southeast	1.447	12.05	1.595	13.28	1.766	13.96	1.603	12.7	1.354	12.37	1.310	13.28	9.177	13.00
South	655	11.55	605	10.67	566	10.32	567	8.9	506	9.28	481	9.99	3.430	10.26
Midwest	203	12.98	227	14.51	220	13.16	226	12.9	230	14.15	199	12.72	1.317	13.35
Brazil	3.030	11.89	3.158	12.39	3.228	12.57	3.141	11.7	2.771	11.62	2.626	12.01	18.185	12.12

Source: SUS Hospital Information System (SIH/SUS).

There is evidence of the carcinogenic action of HPV in the development of oral cancer, although studies on its real role are still inconclusive. However, the study shows that people with poor oral hygiene had a higher prevalence of HPV infection (Lima, 2021).

Considering regional disparities, the lowest rates were recorded in the North and Northeast regions, where there is a predominance of people with low socioeconomic conditions. It can be assumed that the low socioeconomic level experienced in these regions interferes with access to diagnosis, regular screening, treatment, and prevention services, characterizing a failure in the care system for malignant neoplasms of the mouth (Vaz et al., 2020).

The analysis of the epidemiological profile of oral cancer in Brazil showed a greater prevalence of the disease among people aged 50 to 64 years. This data is in agreement with research that points out that age is a risk factor, so that the probability of developing cancer increases with age (Mateus, 2008).

It was observed that 73.76% of the individuals affected by oral cancer were male and 26.24% were female. The results were similar to those reported by Volkweis et al. (2022), who

related the higher incidence of the disease in men. Malignant neoplasms of the lip, oral cavity, and pharynx affect more men than women because of less exposure to risk factors. Modern women, however, work under similar conditions and have acquired habits that were previously more common to men (Neville & Day, 2002; Matthew, 2008).

The present study showed that in several regions of Brazil there was a predominance of the white or brown race/color, with the national rate being higher for the white race/color, coinciding with the literature (Oliveira, 2011). A limitation of this research is the lack of information on the race/color of many patients in DATASUS. The Northeast region stood out for having the highest incidence of oral cancer in children under 20 years of age in Brazil. This fact may be related to exposure to risk factors, for example, sexual behaviors that lead to vulnerability and HPV infection, in addition to high alcohol and tobacco consumption (Soares & Pereira, 2018).

According to the present study, morbidity rates due to malignant neoplasms of the lip, oral cavity and pharynx have been decreasing. The mortality rate, however, did not decrease significantly and, in some periods and regions, increased during

the time series. Possibly, this occurred since survival rates are associated with other factors, such as socioeconomic factors, the availability of health services for early diagnosis, as well as quality treatment (Cunha, Prass & Hugo, 2020).

## CONCLUSION

Morbidity rates due to malignant neoplasms of the lip, oral cavity and pharynx have been decreasing in Brazil in recent years. On the other hand, the mortality rate from this disease did not reduce significantly and increased in some regions. The differences in notification rates between the major regions highlight the need for actions that take these disparities into account when planning actions to tackle this disease. The number of hospitalizations for malignant neoplasms of the lip, oral cavity and pharynx remains high, with a downward trend in hospitalizations for oral cancer in Brazil, increasingly emphasizing the need for action by the dental field and public policies for the prevention, diagnosis and treatment of this type of disease.

## CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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The authors declare that they have no financial interests.

## AUTHOR CONTRIBUTIONS

*Conceptualization:* L. C. S. F. *Data curation:* L. M. A. *Formal analysis:* C. A. F. *Investigation:* L. M. A., C. A. F. *Methodology:* F. M. F. *Project administration:* L. C. S. F., C. A. F. *Resources:* H. C. H. *Software:* F. F. L., F. M. F. *Supervision:* L. C. S. F. *Validation:* L. M. A., L. C. S. F. *Visualization:* L. M. A., L. C. S. F. *Writing the initial draft:* L. M. A., L. C. S. F. *Revision and editing of writing:* F. F. L., L. C. S. F.

## PEER REVIEW

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