



**ORIGINAL ARTICLE**

# Mortality from larynx malignant neoplasm in Brazil: historical series (2001-2010)

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## Abstract

**Introduction:** Neoplasms are the second leading cause of death in the Brazilian population over 40 years old. Approximately 2% of new cancer cases are due to malign neoplasms of the larynx. **Objective:** To describe mortality from malign neoplasm of the larynx in Brazil, in the period from 2001 to 2010. **Materials and Methods:** A descriptive study was undertaken through historical series using Ministry of Health and the Brazilian Institute of Geography and Statistics data. It was considered the International Classification of Diseases (ICD-10) code C32, for the study period. **Results:** Mortality indicators that had laryngeal cancer as the cause of death were analyzed, according to region, gender and age. In these ten years, there was an increase in the number of deaths by laryngeal tumors in all regions of Brazil, where the southern region had the highest mortality rate (2.48 per 100,000), and the northern region the lowest rate (0.75 per 100,000). The men in adulthood had more significant percentages: 88% of the 31,741 deaths recorded in the 10 years of the series. According to age, there was a concentration of deaths from the fifth decade (76.89%). **Conclusion:** The results found may serve as an instrument for the search for improvements in care, coverage and quality of care for patients with laryngeal neoplasia in our country.

**Keywords:** larynx; laryngeal neoplasms; mortality; Brazil.

## Introduction

Nowadays, cancer is the second higher cause of death of people older than forty years, preceded only by cardiovascular diseases<sup>1</sup>. Malignant neoplasia of the larynx is one of the highest causes in head and neck tumors<sup>2,3</sup>.

It is estimated that approximately 2% of the new cancer cases in the Brazilian population occur due to larynx malignant neoplasias<sup>3</sup>. Among the annual death by cancer rate, the mortality by larynx cancer reaches 3.8% in men and 0.6% in women<sup>4</sup>. The subtype more commonly found is the squamous cells carcinoma. However, the larynx can also be the primary site of other neoplasias, as sarcomas, adenocarcinomas, cylinders, lymphomas and histocytes<sup>3</sup>.

The larynx is a fundamental structure in speech, breath and deglutition, and the tumors in this region can result in grand damage with direct impact on the life quality of these patients, including the vocal function<sup>5</sup>.

Thus, this study has as objective to describe the mortality by larynx malignant neoplasia in Brazil, in the period from 2001 to 2010.

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**Financial support:** CAPES/CNPq.

**Conflicts of interest:** No conflicts of interest declared concerning the publication of this article.

**Submitted:** August 07, 2017.

**Accepted:** March 20, 2018.

The study was carried out at Hospital das Clínicas, Universidade Federal de Goiás (UFG), Goiânia, GO, Brasil.



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## Methods

Descriptive epidemiological study, retrospective developed by historical series, using the secondary data basis published by the IT Department of the Single Health System of Brazil (DATASUS) of the Health Ministry, as were used the demographical data registered in the Brazilian Institute of Geography and Statistics (IBGE).

In this study the death by residency occurred in Brazil in the period from 2001 to 2010, that presented larynx malignant neoplasias as basic death cause found in the Mortality Information System (SIM)<sup>6</sup>, available in the DATASUS electronic address was included. The International Classification of Diseases (ICD-10) was considered to classify larynx cancer with the code C32. Thus, the aspects registered and consequently the variables analyzed were: region, gender and age range in the study period.

The data collected were organized in an Excel spreadsheet (Microsoft Office 2007<sup>®</sup>) and statistically analyzed with help from the program Statistical Package for Social Science<sup>®</sup> (SPSS), 20.0 version. The mortality rate per 100,000 inhabitants and the method of linear regression were used for analysis inhabitant, being fixed  $p < 0.05$  significant.

As the research worked only with secondary data available in SIM (DATASUS) and IBGE, in which there is no identification of individuals, it was not necessary the liberation from the Research Ethic Committee.

## Results

According to the Brazilian Institute of Geography and Statistics (IBGE), the population from Brazil, in the year of 2001, was of 172,385,776 inhabitants, being 49.2% of the male gender and 50.8% of the female gender. In 2010 the total population was of 190,755,799 inhabitants, being 49% male and 51% female. In these ten years of study, it was observed that the Brazilian population has grown 10.65%<sup>7</sup>.

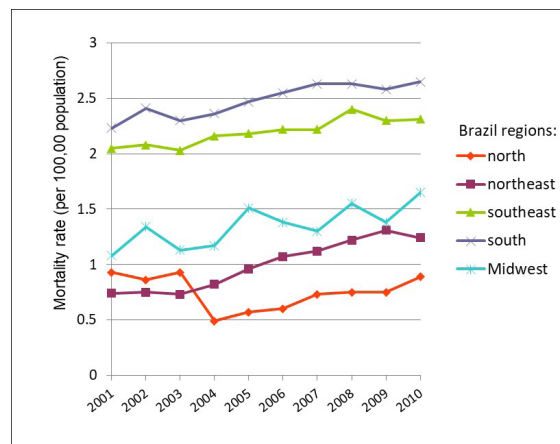
The analysis of the temporal evolution of mortality by larynx malignant neoplasms in Brazil comprised the period from 2001 to 2010. In this period a total of 9,067,523 death (external causes excluded) was registered in SIM. From these, 1,514,390 (16.7%) were caused by diverse neoplastic lesions, among which 31,741 (2.1%) presented larynx tumors as cause.

The mortality by larynx malignant tumors, according to the macro-regions of the country, is reported in Table 1, with absolute values by region, and the specific death rate can be observed in Figure 1, with values relative to 100,000 inhabitants. By the analysis of the registered death in SIM (Table 1), the Southeast region showed the higher quantity of death, followed by the South region; however, the analysis of specific mortality rate (Figure 1) shows that the higher rates were in the South region (2.48/100,000 hab.), followed by the Southeast region (2.19/100,000 hab.). The north region presented the smallest mortality rate and a grand variation, with growth until 2003 and after that a decrease of 47% of mortality until 2007, when the indexes return to match the initial years of the series.

The behavior of the mortality rate by gender showed the growth profile similar between both, being those rates referent to the women always inferior

**Table 1.** Deaths by larynx malignant neoplasms, according to region and year (Brazil, 2001-2010).

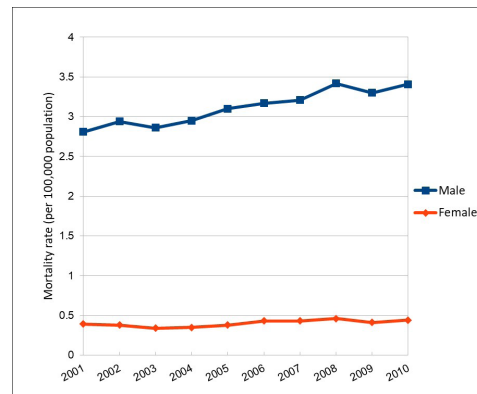
Year	North	Northeast	Southeast	South	Center-West	Total - N (%)
2001	88	362	1515	569	130	2664 (8.39%)
2002	85	366	1560	623	164	2798 (8.81%)
2003	95	360	1536	601	141	2733 (8.61%)
2004	72	419	1679	630	151	2951 (9.30%)
2005	84	490	1718	667	198	3157 (9.95%)
2006	91	556	1776	698	184	3305 (10.41%)
2007	112	589	1796	728	177	3402 (10.72%)
2008	115	654	1915	725	214	3623 (11.41%)
2009	117	611	1852	717	193	3490 (11.00%)
2010	141	658	1861	725	233	3618 (11.40%)
<b>Total</b>	1000	5065	17208	6683	1785	31741(100.00%)
<b>R<sup>2</sup></b>	0.82	0.96	0.94	0.93	0.87	

Source: Brasil<sup>6</sup>.**Figure 1.** Mortality Rate by larynx malignant neoplasms, according to region and year (Brazil, 2001-2010).

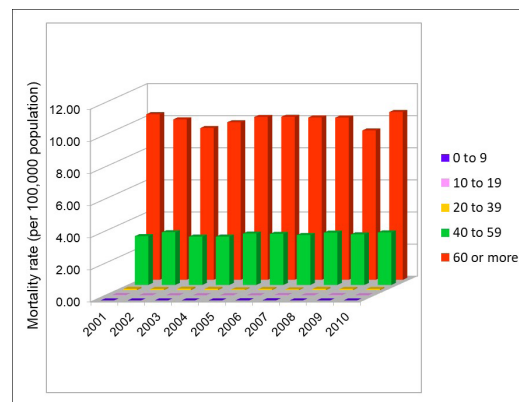
as the ones observed for men (Figure 2). The absolute death quantity, in these 10 years, was of 27,927 male deaths in the country and 3,813 female deaths. By the linear regression analysis, it was observed  $R^2$  0.97 for men and  $R^2$  0.85 for women.

In the analyzed period, according to age group, it was observed a constancy of growth in all years, verifying a concentration and significant increase of deaths in the age group from 50 to 79 years, representing 77.26% (24,525 deaths) (Table 2).

It was observed that the mortality rate according to age, in all the series, shows a similar curve, where until the 39 years were found less than 1 death per 100,000 inhabitants (0.75) and from 40 to 59 years this rate increases: 3.15 deaths per 100,000 inhabitants. It is also observed that from the 60 years the rates increase significantly, reaching 10 deaths every 100,000 inhabitants (Figure 3).



**Figure 2.** Specific Mortality Rate by larynx malignant neoplasms, according to year and gender (Brazil, 2001-2010).



**Figure 3.** Specific Mortality Rate by larynx malignant neoplasms, according to year and age range (Brazil, 2001-2010).

**Table 2.** Deaths by larynx malignant neoplasias, according to age range and year (Brazil, 2001-2010).

Year	0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	≥ 80	Ignored	Total
2001	1	3	5	46	360	664	821	559	201	4	2,664
2002	1	1	3	38	396	753	808	582	212	4	2,798
2003	1	2	7	47	373	716	791	560	231	5	2,733
2004	2	1	7	44	377	783	875	627	232	3	2,951
2005	1	-	5	29	406	868	905	655	285	3	3,157
2006	3	2	5	39	395	923	929	690	319	-	3,305
2007	3	3	2	33	378	962	978	728	313	2	3,402
2008	2	1	7	43	419	1,022	1,050	735	342	2	3,623
2009	-	5	5	39	386	1,028	964	710	349	4	3,490
2010	1	-	4	41	356	1,061	1,010	768	375	2	3,618
<b>Total</b>	15	18	50	399	3,846	8,780	9,131	6,614	2,859	29	31,741

Source: Brasil<sup>6</sup>.

## Discussion

The mortality rate corresponds to an important health indicator, even in more developed countries, being used as evaluation subsidy and public politics planning in the prevention of diseases as cardiovascular and malignant neoplasms<sup>8</sup>, hence the importance of historical series involving this index.

In the studied series, in a general way, there was an elevated growth in the mortality indexes by larynx malignant neoplasms in the whole country. Among the macro-regions of the country, it was observed higher concentration of death by this disease in the Southeast region, 54.21% (2.19 deaths per 100,000 hab.), however, the higher specific death rate was found in the South region, 2.48 deaths per 100,000 inhabitants.

The smallest quantity (3.15%) and the death rate (0.75 per 100,000 hab.) were found in the North region. However, in the North of the country the proportion of death with this cause can be higher and being cloaked by the access difficulties to the health services, thus retarding the disease diagnosis, and to the socioeconomic conditions, once the individuals economically disfavored, possible do not afford treatment similar to those whom have favorable financial conditions. Another relevant fact can be related to the quality of data added to the information system in the region.

The data found per region alert the necessity of decentralization of the oncological services, permitting the creation of diagnosis and therapy centers in needy locality of this kind of service, aiming not only the premature diagnosis, but also the access from the population to a global treatment in their residency location. It is worth of highlighting that, even with all the increases observed in the health information systems in Brazil, these still seek a greater data cover and quality of generated information, mainly in the north region of the country that has many records ignored<sup>9</sup>.

In this study, the analysis verified a death increase both for male and female. However, the men presented more expressive rates (from 2.81 to 3.41 deaths per 100,000 hab.) in relation to women (from 0.39 to 0.44 deaths per 100,000 hab.). This inequality between genders and the prevalence are already highlighted in the literature<sup>10-12</sup>. The west and South of Europe as regions where the mortality by larynx cancer among men holds high rates, followed by countries from South America, as Argentina, Uruguay and the south region of Brazil. In Porto Alegre, the head and neck neoplasias (oral cavity, oropharynx, larynx and hypopharynx) were the more frequent in the male gender<sup>8</sup>. The female mortality rate increase is related to the changes of life habits of women, as elevation of tobacco users<sup>8,9</sup>.

In relation to the age range, it was observed that other researches also refer higher incidence of neoplasms starting in the fifth decade of life<sup>4,11,12</sup>. It is known that the increase in the life expectancy makes grow the frequency of diseases and aggravations non-transmittable, reflection of the epidemiological transition<sup>2</sup>. Special attention must be given to the aggravation, considering its predominance in the elderly population and the accelerated rhythm of aging of the population. From this situation, the necessity of combat politics elaboration to the risk factors and promotion of the healthy aging of the population.

## Conclusion

The information collected by this kind of study are important, so the epidemiological situation of a region can be comprehended. The results found can serve as instrument for improvements searches in assistance, coverage and quality of the treatment in laryngeal neoplasia patients in Brazil. It is suggested that researches as this one, be accomplished in a more specific way by states and regions, making possible the establishment of a more detailed and current panorama of the reality of cancer in Brazil.

## Acknowledgements

To Joaquim Tomé de Souza, for his support in the statistical analysis.

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