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Breast cancer mortality in brazil between 2000 and 2020: ecological study

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1 INTRODUCTION

Breast cancer is one of the most incident types of cancer and was once considered the leading cause of death for women worldwide. When it is restricted to a lobule or mammary duct, it is defined as non-invasive breast cancer, such as ductal carcinoma in situ and lobular carcinoma in situ. On the other hand, when malignant cells extend to adjacent or distant regions of the breast tissue, a picture of invasive or metastatic breast cancer is characterized, such as infiltrated ductal and lobular carcinomas, mucinous carcinoma and tubular carcinoma[1].

From menarche to senility, with each menstrual cycle or gestational period, the breast tissue undergoes several physiological changes. From the moment that atypical cell units develop, whose replication occurs in an uncoordinated and exacerbated way to the point of overcoming immunological mechanisms and apoptosis, the neoplastic focus appears with a structure and functioning distinct from the tissue of origin[2].

The incidence of breast cancer is influenced by modifiable risk factors and inherited mutations in genes such as BRCA1 and BRCA2. It is known that the incidence of the disease is higher in married women, nulliparous, whose first pregnancy occurred after the age of 30, who use contraceptive pills or started hormone replacement therapy. A diet with foods high in fat and low in fiber, as well as obesity, family history, smoking and alcoholism are also known risk factors for cancer. Women are 100 times more likely to develop breast cancer than men and the risk is increasing as aging progresses, being a rare disease before the age of 20[3].

From the anamnesis and physical examination, suspicion of breast cancer arises. During the initial evaluation, it is necessary to investigate age at menarche and menopause, gestational history, family history,

medications in use and personal history of cancer. The use of self-examination is controversial, considering that there are no studies that demonstrate an impact on the number of deaths when encouraging its practice. To complement the investigation, tests such as breast ultrasound, single photon emission computed tomography (SPECT) or positron emission (PET/CT) are performed4.

The diagnosis of breast cancer is only made through a biopsy that demonstrates malignant neoplastic cells under microscopy, while mammography is the gold standard exam for screening and early detection of patients5. In all stages of cancer, the measurement of tumor markers is recommended because they allow predicting metastases, determining the therapeutic approach and monitoring the evolution of the condition. The most used tests investigate the presence of estrogen and progesterone receptors in the breast tissue, in addition to the HER2 receptor identified in immunohistochemistry, to obtain information about the aggressiveness of the cancer and the expected response to certain therapies6.

Survival from breast cancer varies according to the socioeconomic level of the location considered in relation to the restriction of access to resources and infrastructure for early recognition, diagnosis and treatment. Developed countries show a decline in mortality and an increase in prevalence due to easier access to such elements, which does not happen in developing countries like Brazil7.

It has already been described that awareness of the mortality rates of a disease and its demographic distribution allow the elaboration of public policies and more efficient interventions based on state planning and ecological studies8,9. Thus, considering the lack of research on the subject, the present study aimed to present a longitudinal analysis of breast cancer mortality in Brazil between the years 2000 and 2020.

2 METHODOLOGY

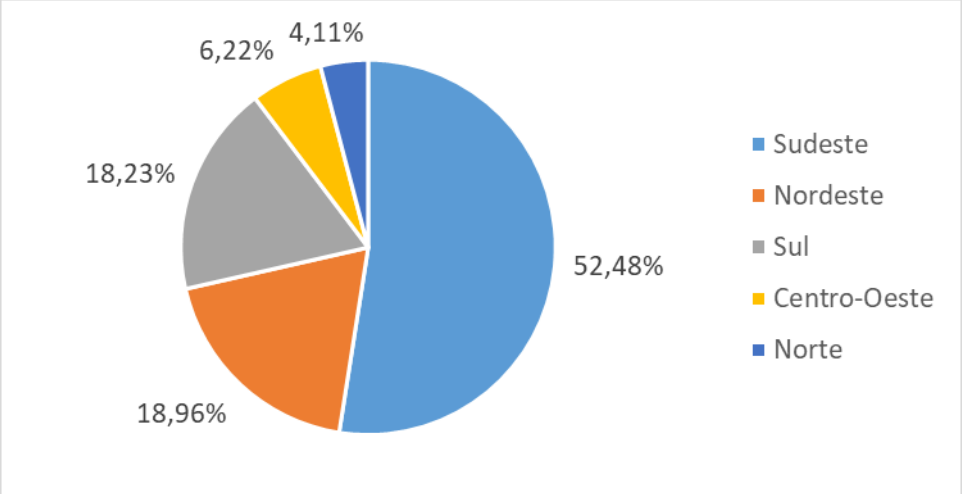
In this ecological study, the Mortality Information System (SIM) and the Management System for Studies and Analysis of Demographic Dynamics of the Directorate of Research at IBGE10,11 were used. From these databases, the numbers of deaths were collected by place of residence and year according to region, age group, sex, color/race, level of education and marital status; population estimate by sex.

The entire national territory was considered, the years 2000 to 2020 and the categories ICD-10 C50 malignant breast cancer and ICD-10 D05 breast carcinoma in situ. A summary containing all collected data was created to compare the adjusted values according to the total number of people belonging to each group, disregarding ignored data to avoid overestimated results. To calculate specific mortality, the number of deaths from breast cancer each year was divided by the estimate of the population residing in that year, multiplying the result by 105, which provides information on the number of deaths from cancer. of breast every 100 thousand inhabitants. Fitted values and specific mortality rates were evaluated to establish trends.

3 RESULTS

As mortality from breast cancer was about 200 times higher in females (200,684) than in males (2,114), only female deaths were considered to avoid underestimating results. Considering the region of Brazil, 105,327 deaths were recorded in the Southeast, 38,054 in the Northeast, 36,577 in the South, 12,478 in the Midwest and 8,248 deaths in the North of the country.

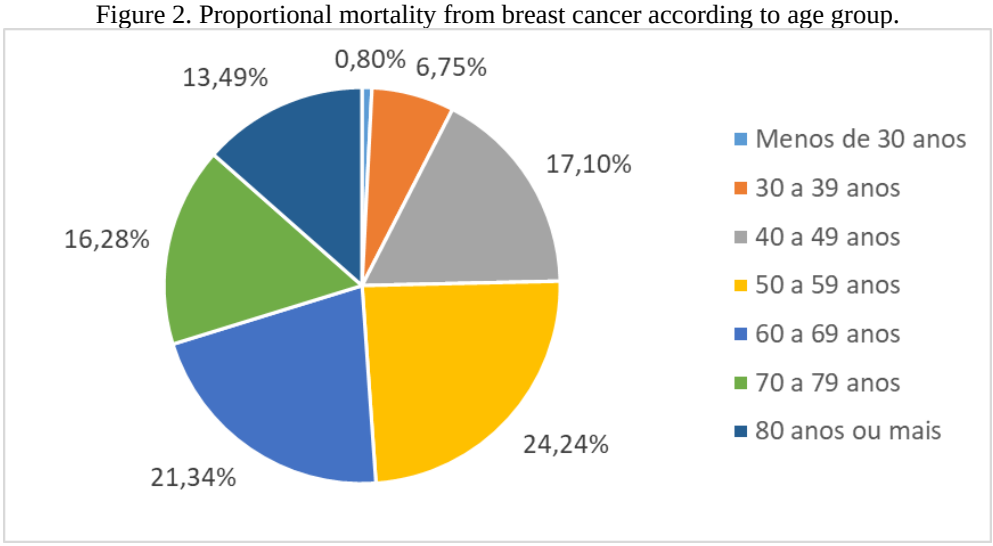
Figure 1. Proportional mortality from breast cancer by region of Brazil.



Subtitle: Southeast / Northeast / South / Midwest / North

The number of deaths from breast cancer before the age of 20 was equal to 25, while between the ages of 20 and 29 it was equal to 1,585. Between 30 and 39 years old the number of deaths was equal to 13,541, between 40 and 49 years old equal to 34,307, between 50 and 59 years old equal to 48,648, between 60 and 69 years old equal to 42,825, between 70 and 79 years old equal to 32,675. Finally, 27,078 women aged 80 years or older died from breast cancer between the years 2000 and 2020.

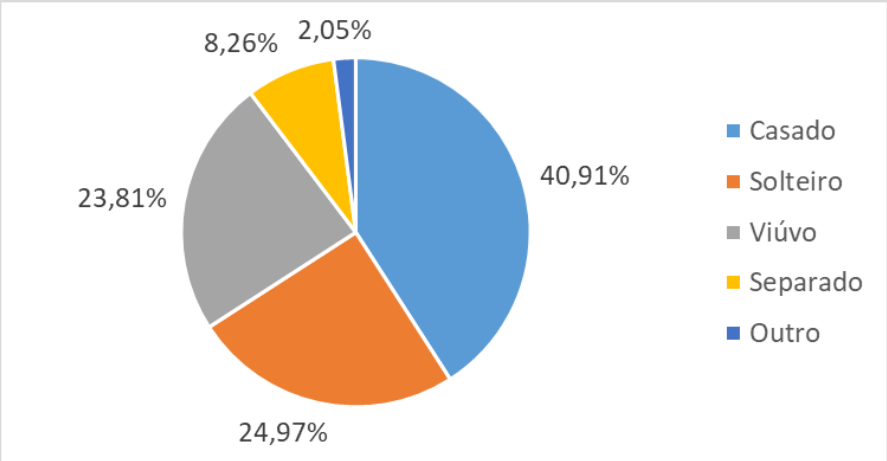
Figure 2. Proportional mortality from breast cancer according to age group.



Subtitle: Less than 30 years/ 30 to 39 years/ 40 to 49 years/ 50 to 59 years/ 60 to 29 years/ 70 to 79 years/ 80 years or older

When looking at ethnicity, 129,000 white women died from breast cancer, 54,984 brown women, 15,286 black women, 1,243 yellow women and 171 indigenous women. As for marital status, 82,102 women were married, 50,108 were single, 47,774 were widows and 20,700 were legally or otherwise separated.

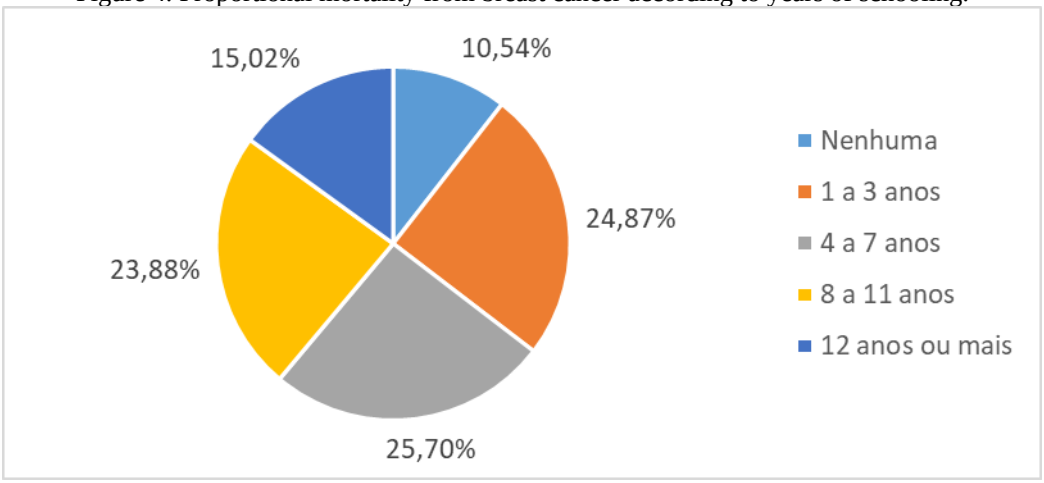
Figure 3. Proportional mortality from breast cancer according to marital status.



Subtitle: Married / Single / Widowed / Separated / Other

The level of education was also investigated, showing 21,151 women with no schooling, 49,909 women with 1 to 3 years of schooling, 51,574 women with 4 to 7 years, 47,915 women with 8 to 11 years and 30,135 women with 12 years or more of study.

Figure 4. Proportional mortality from breast cancer according to years of schooling.



Subtitle: None / 1 to 3 years/ 4 to 7 years/ 8 to 11 years/ 12 years or more

Specific mortality, considering mortality per 100,000 inhabitants, went from 5.61 in 2000 to 6.96 in 2005, after 7.52 in 2006 to 9.21 in 2010, from 9.85 in 2011 to 11.77 in 2015 and from 12.33 in 2016 to 13.74 in 2020.

4 DISCUSSION AND CONCLUSION:

Even though it is considered a success in public health, Brazil has shown problems regarding mortality from breast cancer in the last two decades, probably due to poor screening, inadequate management of risk factors, late diagnosis and treatment initiated in advanced stages of the disease12 . The socioeconomic level of the region did not influence, as would be expected, the proportions of mortality from breast cancer, but this could possibly be attributed to population differences between regions13. The same happened with the level of education, because the predominance of women with less access to education was not demonstrated, but rather proportions with statistically insignificant differences14.

Proportional mortality according to age group behaved as it appears in the scientific literature, with rare cases before the age of 20, progressive increase up to 59 years and a subtle decrease in the following years15. The study showed significant differences regarding race/color, with an evident predominance in white women (64.28%) and few cases in yellow (0.62%) and indigenous women (0.09%), which is related to the proportion that each race represents the total number of women in the country9. In addition, marital status has also shown influence on the risk of progressing to death from breast cancer, especially in married women due to the delay in seeking medical assistance, which delays the diagnosis and makes the initiation of treatment late, favoring unfavorable outcomes16 ,17.

Despite the limitations, especially records with missing data that were disregarded during the collection of the values used, the present study demonstrated behaviors of mortality rates similar to those found by other similar articles. In short, it is likely that trends in mortality from breast cancer in Brazil were determined by population differences between regions, proportions that each race represents of the total number of women, and delays in seeking medical assistance by married women. Considering the increasing specific mortality, doubling over the two decades observed, it is concluded that it is evident that strategies for screening and early detection of breast cancer are necessary in Brazil to improve the panorama of this very relevant disease.

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