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Disparities in cervical cancer mortality: a decade-long analysis across Brazilian regions

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ABSTRACT

OBJECTIVE

To identify the mortality rate from cervical cancer (CC) in Brazilian regions between 2013 and 2022.

METHODOLOGY

Observational, descriptive study based on secondary data made available by the Online Mortality Atlas of the National Cancer Institute (INCA) on CC (ICD C53). Mortality rates, per 100,000 inhabitants, were analyzed by states and regions of Brazil. The most affected age group was also included in the analysis.

RESULTS

From 2013 to 2022, there were 62,175 deaths from CC, with 2022 recording the highest absolute frequency (n = 6,983). The state of Amazonas had the highest adjusted rate (13.81 deaths/100,000), followed by Amapá (9.93) and Maranhão (9.66), in the sum of the years. São Paulo (3.98) and Minas Gerais (4.05) had the lowest rates. The North region led with the highest rate (9.38), while the Southeast had the lowest (4.52). The most affected age group was 50 to 59 years old, with 13,477 deaths, followed by 40 to 49 years old (12,422) and 60 to 69 years old (11,840).

CONCLUSION

Mortality due to CC in Brazil reveals significant regional disparities, with emphasis on the North. Factors such as limited access to health care and socioeconomic inequalities reinforce the need to expand vaccination against human papillomavirus, screening and health education.

DESCRIPTORS

Cervical neoplasms; Mortality; Regionality.

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INTRODUCTION

Cervical cancer (CC) is a malignant neoplasm that represents a major public health problem, especially in developing countries. This type of cancer results from the progressive transformation of the epithelium of the cervix, characterized by a multifactorial process that can evolve from precursor lesions to an invasive tumor[1-3]. Despite prevention, CC continues to affect women, especially those in vulnerable social situations, due to barriers in accessing health services and the lack of effective prevention programs[4].

Persistent infection with oncogenic types of human papillomavirus (HPV) is the main etiological factor associated with cervical cancer[5]. Transmitted mainly through unprotected sexual contact, HPV is associated not only with cervical cancer, but also with other neoplasms of the lower genital tract[6,7]. Although the infection is often transient, viral persistence can lead to the development of precancerous lesions that, if left untreated, progress to malignancy[8,9]. Other risk factors include smoking, polygamy, prolonged use of contraceptives, co-infection with other sexually transmitted infections and risky sexual behaviors[10].

Treatment options for cervical cancer vary depending on the stage of the disease. Early lesions can be successfully treated with surgery or radiotherapy, while advanced cases often require a combined approach of chemotherapy and radiotherapy[11,12]. Despite the availability of effective therapies, prevention remains the most effective strategy. In Brazil, preventive measures include cytopathological examination, commonly known as the Papanicolaou test, and HPV vaccination, provided by the Unified Health System (SUS). These interventions have shown high efficacy in reducing the incidence and mortality associated with CC[13-15]. However, challenges remain regarding vaccination coverage, adherence to screening and access to early treatment, especially in poorer regions[16].

Regional disparities in CC mortality highlight disparities in access to health services and diagnostic technologies. Women living in areas with limited infrastructure face a higher risk of late diagnosis, compromising prognosis and survival[16]. The analysis of differences between states and regions, combined with the identification of prevalent risk factors, is essential for the development of public policies that promote health equity.

Therefore, identifying mortality rates by region and discussing the determinants of CC mortality in Brazil is a crucial step to fill the existing gaps in prevention and care. This reinforces the need for comprehensive strategies that integrate health education, expand vaccination coverage, and strengthen primary care networks, especially in the most vulnerable regions of the country, since CC is the third most common cancer among women and the fourth leading cause of cancer death[17]. In this context, this study aims to identify CC mortality rates in Brazilian regions between 2013 and 2022.

METHODS

This is an observational, descriptive study based on secondary data provided by the Online Mortality Atlas of the National Cancer Institute (INCA). The research was conducted following systematic steps that ensure the reliability and organization of the results obtained.

The data were extracted directly from the INCA Online Mortality Atlas, covering the period from 2013 to 2022 and covering all age groups. The information was segmented by Brazilian states and regions.

The mortality rate, measuring the number of deaths per 100,000 inhabitants, was adopted as the main indicator to assess cervical cancer mortality in the country.

The information collected was organized and processed using Excel 2019 software. This procedure allowed the compilation and creation of tables, optimizing the visualization of regional and state disparities and ensuring a clearer and more objective comparative analysis.

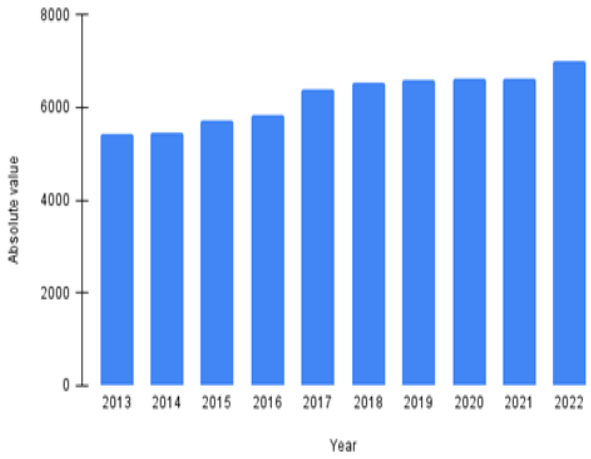
Finally, the data were analyzed to identify CC mortality rates throughout the study period, highlighting regional and state differences. The descriptive analysis allowed us to highlight disparities and correlate them with possible socioeconomic and structural factors related to access to health care.

Since this is a study with secondary data and made available to the population, there was no need to submit it to the Research Ethics Committee of the Educational Institution.

RESULTS

Between 2013 and 2022, the period covered by this study, a total of 62,175 deaths from CC were recorded in INCA's Online Mortality Atlas, and from 2017 onwards, the numbers exceeded 6,000 deaths each year. The absolute frequency of deaths continues to increase progressively between years, and in 2022, the highest number of registered cases (n=6,983) of women's deaths due to cervical cancer was observed (Graph 1).

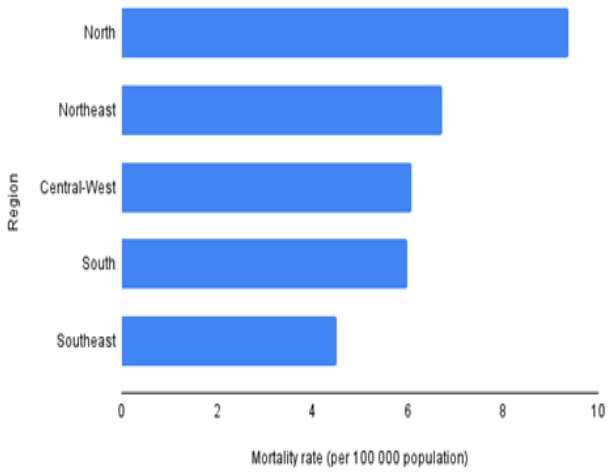
Graph 1 - Number of deaths from cervical cancer according to the year, from 2013 to 2022.



Source: Adapted from the National Cancer Institute INCA Information System (2024).

Among the five Brazilian regions (graph 2), the North region had the highest adjusted mortality rate due to CC with a total of 9.38 deaths for every 100,000 inhabitants, followed by the Northeast region (6.72 deaths/100,000 inhabitants), Central-West (6.09 deaths/100,000 inhabitants), South (6.00 deaths/100,000 inhabitants) and Southeast (4.52 deaths/100,000 inhabitants).

Graph 2 - Cervical cancer mortality rate per 100,000 inhabitants according to region, from 2013 to 2022



Source: Adapted from the National Cancer Institute INCA Information System (2024).

Specifically by state, Table 1 illustrates that the Amazonas had the highest mortality rate, with 13.81 deaths per 100,000 inhabitants, followed by Amapá (9.93 deaths/100,000 inhabitants) and Maranhão (9.66 deaths/100,000 inhabitants). At the same time, it can be observed that the lowest mortality

rates refer to the states of São Paulo (3.98 deaths/100,000 inhabitants) and Minas Gerais (4.05 deaths/100,000 inhabitants).

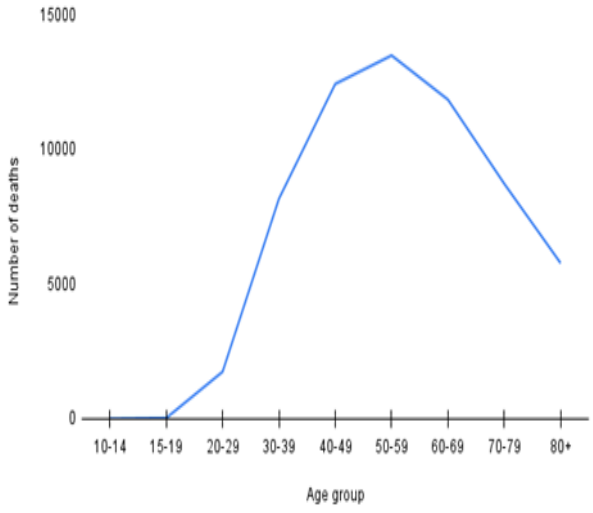
Table 1 - Distribution of mortality rate (per 100,000 inhabitants) in Brazilian states.

Region	State	Mortality rate (per 100,000 inhabitants)
North	Amazonas	13,81
	Amapá	9,93
	Roraima	8,67
	Acre	8,48
	Para	8,19
	Tocantins	8,07
	Rondônia	6,44
Northeast	Maranhão	9,66
	Piauí	7,74
	Paraíba	6,75
	Pernambuco	6,71
	Alagoas	6,57
	Ceará	6,53
	Sergipe	6,44
	Rio Grande do Norte	5,93
	Bahia	5,51
Central West	Mato Grosso do Sul	6,75
	Goiás	6,10
	Distrito Federal	5,88
	Mato Grosso	5,72
Southeast	Espírito Santo	6,31
	Rio de Janeiro	6,09
	Minas Gerais	4,05
	São Paulo	3,98
South	Rio Grande do Sul	6,42
	Paraná	5,85
	Santa Catarina	5,55

Source: Adapted from the National Cancer Institute INCA Information System (2024).

In this period from 2013 to 2022, the data, illustrated in graph 3, show that the age group with the highest number of deaths from CC was 50 to 59 years old, with 13,477 deaths, followed by the groups 40 to 49 years old (n=12,422), 60 to 69 years old (n=11,840), 70 to 79 years old (n=8,719), 30 to 39 years old (n=8,161), 80 or over (n=5,775), 20 to 29 years old (n=1,747), 15 to 19 years old (n=30) and 10 to 14 years old (n=2).

Graph 3 - Number of deaths from cervical cancer according to age group, from 2013 to 2022.



Source: Adapted from the National Cancer Institute INCA Information System (2024).

DISCUSSION

The results indicate significant inequality in CC mortality between regions of Brazil, with the North region emerging as the most affected, with an adjusted rate of 9.38 deaths per 100,000 inhabitants. States such as Amazonas, Amapá and Maranhão had the highest rates, probably reflecting the difficulties in accessing health services and prevention campaigns in these areas. The lowest rates observed were in the Southeast (4.52 deaths per 100,000 inhabitants) and South (6 deaths per 100,000 inhabitants) regions, which can be attributed to better socioeconomic conditions and greater availability of infrastructure for early diagnosis and treatment.

The high mortality rates in the North and Northeast states point to historical and structural problems, as well as to the difficulty in accessing basic health services, especially in remote areas[18,19]. This geographic barrier is possibly aggravated by the lack of access and awareness of the importance of preventive screening, such as the Papanicolaou test.

Data on the ratio of doctors to inhabitants show that the proportion in Brazil in 2022 was 2.41 doctors for every 1,000 inhabitants. However, when analyzing by regions or even states, there is a disproportion in the northern (1.45 doctors/1,000 inhabitants) and northeastern (1.93 doctors/1,000 inhabitants) regions, with the state of Pará having the lowest doctor-to-inhabitant ratio[20]. Information with this consistency, in relation to other health professionals, was not located, but it is estimated that the ratio is similar, reinforcing the finding that the regions with the highest mortality from CC probably have less healthcare support for the population, both in terms of prevention and care.

Another aspect worth highlighting is the often late diagnosis in the most affected regions[18]. This reality may occur due to logistical constraints, cultural and social issues such as the stigma surrounding gynecological projects, misinformation and the difficulty in prioritizing health conditions[19]. Therefore, further studies are needed to investigate these factors.

In addition, in the Northeast, although the adjusted rate (6.72 deaths per 100,000 inhabitants) is lower than that of the North region, the state of Maranhão presents numbers comparable to the highest rates, indicating similar challenges in terms of prevention and access to treatment. In contrast, states such as São Paulo and Minas Gerais, in the Southeast, presented significantly lower rates, reinforcing the relationship between more robust health infrastructure and better mortality indicators[21].

The data also indicate a progressive increase in the number of deaths in the period analyzed, with a peak in 2022 (6,983 deaths). This growth may be related to accumulated gaps in prevention and treatment, aggravated by the effects of the COVID-19 pandemic, which overwhelmed the health system and disrupted surveillance programs[22].

Furthermore, the higher number of deaths in the 50-59 age group evidenced in this study followed the same direction as some studies analyzing the mortality trend due to CC from 2012-2016 in Brazil[23] and from 2000-2019 in Campo Grande, Mato Grosso do Sul[24].

In this context, it is imperative that specific strategies be implemented to mitigate these disparities. Expanding HPV vaccination coverage and strengthening primary care networks, particularly in rural and peripheral areas, should be priorities[18,19,21]. In addition, it is necessary to invest in educational campaigns adapted to regional particularities, which promote greater adherence to preventive screening, especially in populations at higher risk.

The late diagnosis and high mortality rates observed in states in the North region, such as Amazonas and Amapá, highlight the need to direct specific efforts to these areas, ensuring that the most vulnerable populations have access to early diagnosis and timely treatment. Measures such as moving health teams to remote regions and using innovative technologies, such as telemedicine, can be alternatives to overcome geographical barriers[25].

The central role of the SUS in addressing this problem is also highlighted. The continued strengthening of the SUS, through investments in infrastructure, human resources and health education programs, is essential to ensure equity in access to services and to promote a comprehensive approach to prevention and care.

CONCLUSION

Based on the analysis of the results of this evaluation, it is crucial to disseminate understanding about information related to CC prevention, focusing on public policies to reduce mortality. The continued strengthening of the SUS, through investments in infrastructure, human resources and health education programs, is essential to ensure equity in access to services and to promote a comprehensive approach to prevention and care.

Ultimately, this study reinforces the need for integrated public policies that take into account regional inequalities and the cultural and social specificities of each location. Only with coordinated efforts will it be possible to reduce CC mortality, promoting health and quality of life for all.

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