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CERVICAL CANCER SCREENING IN THE NORTHERN REGION OF BRAZIL

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ABSTRACT

This study aims to screen for cervical cancer in the northern region of Brazil through a review of available bibliographies and epidemiological data. This is a systematic review of the literature. To search for articles, individual terms such as "cervical cancer", "control", "northern region", "Brazil", "health policies", "prevention" and "diagnosis" were used. The search strategies were adapted for each database using Boolean operators to refine the results. The choice of databases such as PubMed, Scielo, LILACS and VHL was strategic, considering the relevance of these platforms for health studies. The selected search terms broadly cover aspects related to cervical cancer and management in the northern region of Brazil. The results reveal significant variations in the incidence of cervical cancer among the states in the northern region of Brazil. The state of Amazonas stands out with the highest estimated number of new cases, totaling 610, and the highest crude and adjusted incidence rates, reaching 27.63 and 31.71 per 100,000 women, respectively. In contrast, the state of Roraima has the lowest estimated number of new cases, with 40, and the lowest crude and adjusted incidence rates, registering 10.91 and 13.25 per 100,000 women, respectively. It is concluded that there were decreases in the incidence of the disease, especially in urban areas, although significant challenges persist, as evidenced by the high mortality rate in the North Region compared to the national average. In addition, regional variations in cervical cancer incidence point to the need for differentiated and targeted approaches to prevention and control in each state.

Keywords: Cervical Cancer. North. Brazil. Tracking. Incidence.

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INTRODUCTION

Cervical cancer is one of the main causes of morbidity and mortality among women in the northern region of Brazil. The high incidence and mortality of this disease are worrying, especially when compared to other regions of the country. According to Silva et al. (2023), the epidemiological aspects of cervical cancer in the North region, between 2016 and 2023, indicate a persistently high incidence and mortality rate, aggravated by factors such as limited access to health services, low coverage of screening programs, and socioeconomic difficulties. The National Cancer Institute (INCA) corroborates these data, highlighting that, in 2022, the estimate of new cases in the North region was significantly higher than the national average, reflecting the urgent need for more effective and comprehensive interventions (INCA, 2022).

The estimated number of new cases of cervical cancer is 16,590 per year in the period from 2020 to 2022. Excluding non-melanoma skin tumors, cervical cancer is the second most common malignant neoplasm in the North (21.20/100,000), Northeast (17.62/100,000) and Midwest (15.92/100,000) regions. In the South Region (17.48/100 thousand), it occupies the fourth position, while in the Southeast Region (12.01/100 thousand) it is in the fifth position (INCA, 2019). In 2020, 6,627 deaths from cervical cancer were recorded in Brazil, resulting in a mortality rate of 4.6/100 thousand women. However, there are significant regional differences, especially in the North Region, where the rate was 9.52/100 thousand women, more than double the national average (Amarante, 2024).

Thus, the relevance of cervical cancer screening becomes even more evident when considering the specific challenges faced in the Northern region. The extensive geography and population dispersion hinder regular access to health services, contributing to late diagnoses and worse prognosis. In addition, Silva et al. (2023) highlight that socioeconomic disparities and the lack of adequate infrastructure amplify these problems, resulting in insufficient coverage of prevention and treatment programs. This scenario is compounded by the dearth of effective educational campaigns that could increase women's awareness and adherence to regular screening.

In addition, there is a significant lack of studies specifically focused on this region, despite its high incidence and mortality associated with this neoplasm. While many studies cover national data or focus on more developed regions, such as the Southeast and South, few studies explore in detail the particularities and challenges faced in the North region. This study aims to fill this gap by providing a specific and detailed overview of local conditions.

In addition to the geographical novelty, the relevance of this study is amplified by several factors. The North region has socioeconomic and geographic peculiarities that hinder access to health services, negatively impacting the effectiveness of screening programs. Population dispersion, inadequate infrastructure, and cultural barriers are critical aspects that influence adherence to screening and, consequently, early detection of the disease. Addressing these specific issues is crucial to developing more targeted and effective public health strategies.

Thus, this research asks, how is the situation of cervical cancer screening in the northern region of Brazil?

Therefore, this study aims to screen for cervical cancer in the northern region of Brazil through a review of available bibliographies and epidemiological data. And more specifically, to map the coverage of cervical cancer screening programs in the North region between 2016 and 2023; Identify which cities in the north have the highest rate; Look for the factors that contribute to the indicated indexes.

This work is structured in five main parts. The introduction presents the contextualization of the theme, then the literature review addresses previous relevant studies, providing a theoretical and comparative basis for the analysis of regional data. The methodology details the data collection and analysis procedures, ensuring the robustness and validity of the results. The results section presents the findings of the study, focusing on screening coverage rates, the obstacles identified, and proposals for improvements. Finally, the conclusion summarizes the main findings of the study.

METHODOLOGY

The present study is a systematic review of the literature. This type of study, according to Escole, Melo and Alcoforado (2014) aims to compile, analyze and synthesize the available evidence on a specific topic, using rigorous and replicable methods. The eligibility criteria included articles published between 2010 and 2023, in Portuguese and English, that address the management and control of cervical cancer in the northern region of Brazil. Observational studies, literature reviews, government reports, and clinical guidelines were included. Case studies, book reviews, editorials, and articles that did not present specific data on the northern region of Brazil were excluded.

To search for articles, individual terms such as "cervical cancer", "control", "northern region", "Brazil", "health policies", "prevention" and "diagnosis" were used. The search strategies were adapted for each database using Boolean operators to refine the results. As such, in PubMed, the search was structured as follows: ("cervical cancer" AND

"management" AND "northern Brazil") OR ("health policy" AND "prevention" AND "cervical cancer"). In Scielo, the following were used: ("cervical cancer" AND "management" AND "northern region") OR ("health policies" AND "prevention" AND "cervical cancer"). These strategies ensured the retrieval of a significant number of relevant studies.

After collecting the articles, the data were sorted into three phases: reading of the titles, reading of the abstracts, and complete reading of the texts. Two independent reviewers screened to ensure objectivity and minimize bias. In case of disagreement, a third reviewer was consulted. The data were extracted and organized in a table, highlighting the author, year of publication, objectives, methodology, results and conclusions. The qualitative analysis followed the thematic synthesis method, identifying emerging categories and subcategories related to the management challenges in cervical cancer control in the northern region of Brazil.

Table 1: Search Criteria

Criterion	Detail
Publication period	2010-2023
Language	Portuguese, English
Publication type	Observational articles, literature reviews, government reports, clinical guidelines
Databases	PubMed, Scielo, LILACS, BVS
Search terms (individual)	"cervical cancer", "control", "northern region", "Brazil", "health policies", "prevention", "diagnosis"
Boolean Operators	AND, OR
Screening strategies	Reading of titles, reading of abstracts, complete reading of texts
Reviewers	Two independent reviewers, with a third tiebreaker

Source: Authors, 2024.

The table presents a structured view of the search criteria used in the study. The publication period from 2010 to 2023 ensures the inclusion of recent and relevant studies. The inclusion of Portuguese and English languages allows for a broad spectrum of literature. The choice of databases such as PubMed, Scielo, LILACS and VHL was strategic, considering the relevance of these platforms for health studies. The selected search terms broadly cover aspects related to cervical cancer and management in the northern region of Brazil. The use of Boolean operators was essential to refine the searches and obtain more specific results. Finally, the three-phase screening strategy, with independent reviewers, ensures objectivity and quality in the selection of articles included in the review.

RESULTS

Table 2 below summarizes the main results of studies on cervical cancer in the Northern Region of Brazil. It offers a panoramic view of the findings presented in several

studies, addressing aspects such as incidence, mortality, and the impact of the COVID-19 pandemic on health services.

Table 2: Main results of the studies cited on cervical cancer in the Northern Region of Brazil

Author	Year	Data
Silva, G. A et al.	2022	Decrease in cervical cancer, except in the interior of the North region.
Silva and Fontes	2020	21.20/100 thousand is the incidence of cervical cancer in the North Region.
Nascimento et al.	2021	70% drop in cervical cancer screening exams in 2020 due to the pandemic.
Amaral et al.	2024	Decrease in Pap smears in Pará between 2020 and 2021 due to the pandemic.
Tomazelli, Ribeiro and Dias	2022	It reports losses of information on cervical cancer in several states, including Pará, in 2019.
Aguiar et al.	2024	In Santarém, 37 cases of cervical cancer were diagnosed in 2021, being the first most incident neoplasm in the North region.
Silva et al.	2023	Mortality from cervical cancer in Brazil is 6.12%, while in the North Region it is 10.06%.

Source: Authors, 2024.

The studies presented in the table reveal a series of important information about cervical cancer in the North Region. First, the drops in the incidence of the disease stand out, as observed by Silva, G. A et al. (2022), with the exception of the interior areas of the region. However, despite this decrease, the incidence still remains significantly high, as indicated by the study by Silva and Fontes (2020), which reports a rate of 21.20 cases per 100 thousand women in the region.

In addition, the impacts of the COVID-19 pandemic are evident in the results. The 70% drop in screening tests in 2020, as reported by Nascimento et al. (2021), and the decrease in Pap smears in Pará between 2020 and 2021, as noted by Amaral et al. (2024), highlight the challenges faced in health services during this period.

Another relevant point is the issue of mortality. While mortality from cervical cancer in Brazil is 6.12%, as reported by Silva et al. (2023), in the North Region, this number is significantly higher, reaching 10.06%.

Table 3 presents the estimates of incidence and number of cases according to data from the José Alencar Gomes da Silva National Cancer Institute, referring to the 2023-2025 triennium. It offers a detailed view of the distribution of cases by state in the region:

Table 3: Estimates of incidence and number of new cases of cervical cancer for the Northern region of Brazil, according to the José National Cancer Institute, for the 2023-2025 triennium:

Regions/State	No. of cases	Gross Rate	Adjusted Rate*
North	1.980	20,48	16,77
Acre	70	15,23	15,41
Amapá	100	21,86	26,73
Amazonas	610	27,63	31,71
Pará	830	18,65	19,48
Rondônia	150	16,33	16,39
Roraima	40	10,91	13,25
Tocantins	180	22,00	16,77

Source: INCA (2019)

In this table:

- "No. of cases" represents the estimated number of new cases of cervical cancer.
- "Crude rate" is the crude rate of incidence per 100 thousand women.
- "Adjusted Rate" refers to the rate adjusted by the world population, per 100,000 women.

The results of the table reveal significant variations in the incidence of cervical cancer among the states of the northern region of Brazil. The state of Amazonas stands out with the highest estimated number of new cases, totaling 610, and the highest crude and adjusted incidence rates, reaching 27.63 and 31.71 per 100,000 women, respectively. In contrast, the state of Roraima has the lowest estimated number of new cases, with 40, and the lowest crude and adjusted incidence rates, registering 10.91 and 13.25 per 100,000 women, respectively.

DISCUSSIONS

The study by Silva, G. A. et al. (2022) highlights a drop in the incidence of cervical cancer in the region, except in interior areas. This suggests a possible efficacy of the prevention and screening strategies implemented. However, the COVID-19 pandemic has had a significant impact on health services, as noted by Nascimento et al. (2021) and Amaral et al. (2024), with sharp drops in screening tests and decreases in Pap smears, respectively.

The study by Silva et al. (2023) reveals a mortality rate from cervical cancer in the North Region (10.06%) significantly higher than the national average (6.12%). This suggests an urgent need for interventions to improve early diagnosis and access to treatment in the region.

The data in Table 3, from INCA data (2019), show significant variations in the incidence of cervical cancer among the states of the North Region. In this scenario,

Amazonas has the highest rates, while Roraima has the lowest rates. Amaral et al. (2024) and Aguiar et al. (2024) address clinical-epidemiological aspects of cervical cancer in Belém and Santarém, respectively, providing an understanding of specific risk factors and challenges in diagnosis and treatment.

The analysis of the data presented in Table 3, provided by Inca (2019) for the 2023-2025 triennium, reveals important information about the incidence of cervical cancer in the Northern Region of Brazil. First, an estimated total number of 1,980 new cases of cervical cancer is observed in the region, which represents a significant concern for public health. This estimate reflects the high burden of the disease in the region and highlights the need for effective interventions for the prevention and control of this type of cancer.

In addition to the total number of cases, the analysis of crude and adjusted incidence rates per 100 thousand women provides additional information on the geographic distribution of the disease in the North Region. As such, the state of Amazonas has the highest rates, with a crude incidence of 27.63 and an adjusted rate of 31.71, indicating a substantially high burden of the disease in this region. By contrast, the state of Roraima has the lowest rates, with a crude incidence of 10.91 and an adjusted rate of 13.25, although they are still worryingly significant.

The high incidence of cervical cancer in the state of Amazonas, as evidenced by the results of the table, raises important questions about the factors that contribute to this worrying reality. Several studies have addressed this issue, providing data on the possible determinants behind the higher incidences in this region. Aguiar, et al. (2024) highlight in their study the factors related to the late diagnosis of cervical cancer in an Amazonian municipality. They identify the lack of access to health services, the low coverage of preventive exams and socioeconomic barriers as some of the main reasons that contribute to the late diagnosis of the disease in the region.

In addition, they point to specific challenges related to health infrastructure and raising awareness among the population about the importance of prevention and early detection of cancer. Another relevant study is that of Silva et al. (2022), which evaluates cervical cancer control actions in Brazil based on data from the Unified Health System. They note that despite efforts to implement prevention and screening programs, there are still significant gaps in the coverage and quality of health services, especially in remote and hard-to-reach areas, as is the case in many regions of Amazonas.

In addition, Amarante (2024) highlights the need for new screening methods that can be incorporated into the Unified Health System (SUS) to improve the early detection of cervical cancer. This suggestion points to the importance of investments in technology and

innovation in the health area, aiming to expand access to preventive exams and improve women's health outcomes in the Amazon region. These studies highlight the complexity of the scenario and the need for integrated and multidisciplinary approaches to address the challenge of cervical cancer in the state of Amazonas.

These variations in incidence rates among the states of the North Region suggest the existence of socioeconomic, demographic, and access to health care factors that influence the prevalence of cervical cancer. Therefore, prevention and control strategies must be adapted to the specific characteristics of each state, aiming to reduce the burden of disease and improve health outcomes for women in the region.

Pereira Filho et al. (2021) analyze cervical cancer screening in the city of Belém, highlighting the importance of evaluating the coverage and quality of screening programs to improve health outcomes. This analysis is complemented by the study by Nascimento et al. (2021), which discusses the impact of the pandemic on Pap smear coverage in a municipality in Paraná.

Considering the results of these studies, it is evident that cervical cancer continues to represent a significant challenge to public health in the Northern Region of Brazil. Amarante (2024) highlights the need for new screening methods that can be incorporated into the SUS, while Azevedo et al. (2020) draw attention to the importance of continuous analysis of mortality and incidence to guide effective health policies.

FINAL CONSIDERATIONS

After analyzing the studies and the available epidemiological data on cervical cancer in the Northern Region of Brazil, it is possible to conclude that the objectives of this study were partially met. The literature review and analysis of the results provided relevant information on the incidence and mortality in health services related to cervical cancer in the region.

Decreases in the incidence of the disease are noteworthy, especially in urban areas, although significant challenges persist, as evidenced by the high mortality rate in the North Region compared to the national average. In addition, regional variations in cervical cancer incidence point to the need for differentiated and targeted approaches to prevention and control in each state.

Considering the final considerations, it is essential to recognize the importance of multifaceted interventions that address not only early diagnosis and treatment, but also social, economic, and cultural determinants that influence women's health in the region. Implementing effective screening programs, strengthening health infrastructure, and

promoting awareness campaigns are crucial to reducing the burden of cervical cancer and improving health outcomes in the Northern Region.

Regarding recommendations for future research, it is suggested that longitudinal studies be conducted to monitor the effectiveness of the interventions implemented and to assess their long-term impact on cervical cancer incidence and mortality. In addition, additional research is needed to investigate the social, behavioral, and environmental determinants of cervical cancer in the Northern Region in order to guide more effective and equitable health policies.

Thus, this study provided a comprehensive view of the cervical cancer scenario in the Northern Region of Brazil, highlighting both the progress achieved and the persistent challenges. It is hoped that the conclusions and recommendations presented will contribute to guide future interventions and policies aimed at improving the prevention, diagnosis, and treatment of this disease that has such an impact on women's health in the region.

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