Evaluation of Breast Cancer Screening in Women in the State Of Pará: A Situational Study

Avaliação de Rastreamento do Câncer de Mama em Mulheres no Estado do Pará: Um Estudo Situacional
Evaluación del Tamizaje de Cáncer de Mama en Mujeres del Estado de Pará: Un Estudio Situacio

RESUMO
O câncer de mama é considerado como um problema de saúde pública, pois é um dos tipos de câncer que mais acometem a população feminina. Este estudo tem por objetivo, analisar as alterações citopatológicas e histopatológicos em mulheres em diagnóstico de Câncer de Mama no Estado do Pará. Utilizou-se como metodologia, a pesquisa documental nos dados públicos contidos no SISCON e SIM, utilizando as variáveis socioeconômicas, clínicas, prevalência, mortalidade e letalidade. Os dados obtidos sobre o perfil epidemiológico das mulheres paraenses são de indivíduos da faixa de até 49 anos, da cor/raça amarela. Quanto aos dados clínicos, observou-se maior ocorrência de nódulos na mama esquerda, do tipo sólido, e descarga papilar ignorada. Já os dados das alterações citopatológicas, apresentaram maior predominância de processos benignos, tipo fibroadenoma, na mama esquerda, sendo coletados através de punção aspirativa. A taxa de prevalência de câncer de mama entre as mulheres do Estado do Pará é 106,2 por 100.000 mulheres, com taxa de mortalidade de 9,56 óbitos por 100.000 mulheres em 2024. E taxa de letalidade de 1,06 de 100.000 mulheres, no mesmo ano. Concluiu-se que as alterações citopatológicas e histopatológicos encontradas no diagnóstico de câncer de mama no Estado do Pará evidenciam que há ainda muitos desafios a serem enfrentados para garantir o controle efetivo desta neoplasia na região.
DESCRITORES: Câncer de Mama. Prevalência. Mortalidade. Letalidade.

ABSTRACT
Breast cancer is considered a public health problem, as it is one of the most common types of cancer in the female population. This study aims to analyze the cytopathological and histopathological changes in women diagnosed with breast cancer in the state of Pará. The methodology used was documentary research in public data contained in SISCON and SIM, using socioeconomic, clinical, prevalence, mortality and lethality variables. The data obtained on the epidemiological profile of women from Pará are from individuals aged up to 49 years, of yellow skin color/race. Regarding clinical data, a higher occurrence of solid nodules in the left breast and ignored nipple discharge were observed. The data on cytopathological changes showed a higher predominance of benign processes, such as fibroadenoma, in the left breast, and were collected through aspiration puncture. The prevalence rate of breast cancer among women in the state of Pará is 106.2 per 100,000 women, with a mortality rate of 9.56 deaths per 100,000 women in 2024. And a case fatality rate of 1.06 per 100,000 women in the same year. It was concluded that the cytopathological and histopathological alterations found in the diagnosis of breast cancer in the state of Pará show that there are still many challenges to be faced to ensure effective control of this neoplasm in the region.
DESCRIPTORS: Breast Cancer. Prevalence. Mortality. Lethality.

RESUMEN
El cáncer de mama se considera un problema de salud pública, ya que es uno de los tipos de cáncer que más afecta a la población femenina. Este estudio tiene como objetivo analizar las alteraciones citopatológicas e histopatológicas en mujeres diagnosticadas con cáncer de mama en el estado de Pará. La metodología utilizada fue la investigación documental en datos públicos contenidos en SISCON y SIM, utilizando variables socioeconómicas, clínicas, de prevalencia, mortalidad y letalidad. Los datos obtenidos sobre el perfil epidemiológico de las mujeres de Pará son de individuos con edad hasta 49 años, de color/

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raza amarilla. En cuanto a los datos clínicos, se observó mayor incidencia de nódulos sólidos en la mama izquierda y secreción por el pezón ignorada. Los datos sobre cambios citopatológicos mostraron un mayor predominio de procesos benignos, como el fibroadenoma, en la mama izquierda, y fueron recolectados mediante punción aspirativa. La tasa de prevalencia de cáncer de mama entre mujeres en el Estado de Pará es de 106,2 por 100.000 mujeres, con una tasa de mortalidad de 9,56 muertes por 100.000 mujeres en 2024. Y una tasa de letalidad de 1,06 por 100.000 mujeres, en el mismo año. Se concluyó que las alteraciones citopatológicas e histopatológicas encontradas en el diagnóstico del cáncer de mama en el Estado de Pará muestran que aún existen muchos desafíos a ser enfrentados para garantizar un control efectivo de esta neoplasia en la región.
DESCRIPTORES: Cáncer de mama. Predominio. Mortalidad. Letalidad.

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INTRODUCTION

Cancer, also known as malignant neoplasia, is a genetic disease resulting from the combination of various factors, such as hereditary predisposition, excessive alcohol and tobacco consumption, stress, obesity and exposure to ionizing radiation, among others. It is characterized by the uncontrolled multiplication of abnormal cells and can affect all multicellular organisms, animals and plants by altering cell growth and development[1]. Among the various types of cancer, it stands out as the second most common among women and is among those that cause the most deaths both in Brazil and worldwide[2].

Despite positive advances in recent years, the diagnosis of breast cancer still represents a significant source of anguish, often associated with the stigma of death and the fear of mutilation. The data reinforces this concern: in 2024, 2.3 million new cases of breast cancer were recorded worldwide. In Brazil, the National Cancer Institute (INCA) estimates that there will be 73,610 new cases in 2025, which corresponds to an incidence of 41.89 cases per 100,000 women. The highest rates are concentrated in the South and Southeast regions, while the North has the lowest rates, with 2,410 new cases predicted, the lowest number of any region in the country[2].

The highest incidence of breast cancer is observed in women over the age of 50, with cases before the age of 35 being considered rare[2]. In the northern region of Brazil, the age group with the highest incidence is between 50 and 54[3]. Given this scenario, the importance of prevention is reinforced, which is widely disseminated through health campaigns, with an emphasis on mammography from the age of 40. It should be noted, however, that the test is less effective in younger women due to the greater density of the breasts, which can make early detection of the tumor more difficult[4].

In addition to the high incidence with which it occurs, its diagnosis represents a strong threat, as it is associated with the possibility of loss, suffering and even uncertainty about life itself[5]. Discovering that she has breast cancer will therefore mean that the woman will have to live with feelings of anguish resulting from the limitations it brings[6].

Brazil, through the Unified Health System (SUS), has intensified its breast cancer screening, diagnosis and treatment actions, supported by public health policies. The Ministry of Health has implemented the Breast Cancer Control Information System (SISMAMA) throughout the country, with the aim of monitoring early detection of breast cancer[7].

This system enables studies on breast cancer screening, early detection and mortality reduction, recording information on mammography, cytopathol-

ogy and histopathology exams carried out by the SUS, since the year it was implemented, making it accessible to anyone interested in knowing the epidemiology[8].

The epidemiological analysis of breast cancer in the state of Pará reveals a high incidence of this malignant neoplasm. Despite the relevance of the subject, there is a lack of scientific research focused on the regional reality. The few studies available contribute to quantifying the magnitude of the pathology, showing high incidence and mortality rates associated with the disease in the region[9].

One of the factors that challenges obtaining more accurate data on the epidemiology of breast cancer in the state of Pará is the limited access to health services by populations living in riverside communities that are more distant from urban centers, depending on the river as their main means of transport. This difficulty of access compromises the provision of adequate medical care, contributing to the late diagnosis of breast cancer[10].

In this context, epidemiological screening of breast cancer cases in the state of Pará is of great importance, as it provides essential data for evaluating the effectiveness of public health policies related to breast cancer, providing a robust database for scientific research, which can contribute to the development of new treatments and prevention strategies.

In view of the above, this study aims to analyze cytopathological and histopathological alterations in women diagnosed with breast cancer in the state of Pará.

METHOD

This is a descriptive, retrospective and epidemiological study based on the Cancer Information System (SISCAN) with the aim of analyzing cases of breast cancer in women in the state of Pará.

The state of Pará is the second largest state in Brazil and the most populous in the North. It is bathed by large rivers such as the Amazon and Tapajós, and its capital is the city of Belém. It is bordered to the north by Suriname and the state of Amapá; to the northeast by the Atlantic Ocean; to the east by the states of Maranhão and Tocantins; to the south by the state of Mato Grosso; and to the northwest by Guyana and the state of Roraima[12]. According to the 2022 Census, its population is 8,120,131 people spread over 144 municipalities, making it the 9th most populous in Brazil[12]. In an analysis of the characterization of the population of Pará, it was observed that women represent 49.44% of the total population, among the age groups of20 a 49 years[13].

Data was collected from the public database of the Ministry of Health, presented by the Cancer Information System (SISCAN[11]) and the Mortality Information System (SIM[14]) , which receives information from death certificates. The period chosen was 2013 a 2024, in order to provide a more in-depth profile of cancer in the state of Pará.

The inclusion criteria were women living in the state of Pará, diagnosed with breast cancer and registered on SISCAN and SIM between 2013 a and 2024. The exclusion criteria were not being female and the data not being included in SISCAN and SIM.

Data collection procedures were carried out by selecting the study site, the state of Pará, selecting the period of 2013 a2024, A strategy used to collect this data was through the variables: sociodemographic (age group, schooling, color/race), clinical (has nodule, high risk, papillary discharge, type of nodule, breast, material sent, adequacy, result by fine needle aspiration (FNAB), benign results of the material collected, undetermined malignancy, suspected malignancy, positive malignancy, results of papillary discharge or cystic content, interval of collection, interval of result, time of examination), as well as year, month, municipality with the highest diagnosis.

Prevalence rates were analyzed according to the total population at risk for each year and multiplied by 1000. The mortality rate for breast neoplasms was also defined according to the year, using the DATASUS calculation method: number of deaths from the specific cause divided by the total population multiplied by 100,000 women. The lethality rate was calculated by dividing the number of deaths by the number of breast cancer cases.

The SISCAN and SIM survey data were tabulated and statistically analyzed in a Microsoft Office Excel spreadsheet, with the aim of obtaining comparative graphs to determine the proportions, detection rates and analyses of this study.

They were then tabulated in Microsoft Word® and grouped together in order to obtain indicators for evaluating the results. The data was processed using the descriptive method, with a quantitative approach, seeking to reflect on the authors' opinions on the topics discussed throughout the study.

This study complied with all the ethical precepts contained in National Health Council Resolution 466/2016 and 510/2016. The data used in the preparation of this study does not contain data identifying the individuals, thus dispensing with the need for assessment by a Research Ethics Committee.

RESULTS

Based on the results obtained, 4,321 mammograms and breast histopathologies were analyzed in the state of Pará. According to the table1, a most of the women who underwent these exams declared themselves to be yellow (56.0%), aged up to 49 years (78.6%) and were not at high risk of developing breast cancer (92.6%) (Table 1).

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Table 1. Epidemiological profile of women who underwent mammography in the state of Pará,2014 a 2024

	N	%
Skin color		
White	330	7,6
Black	109	2,5
Brown	1082	25,1
Yellow	2420	56,0
Indigenous	3	0,1
No information	377	8,7
Age group		
Up to 49 years old	3396	78,6
50 a 69 years old	829	19,2
Over 69 years old	97	2,2
High risk of breast cancer		
Yes	203	4,7
No	4002	92,6
Doesn't know	116	2,6
Has a nodule		
Right breast	1074	29,1
Left breast	1772	48,0
Both breasts	75	2,1
No	720	19,5
Ignored	50	1,3
Type of nodule		
Solid	3527	81,6
Solid-cystic	179	4,1
Cystic	440	10,2
Ignored	175	4,1
Papillary discharge		
Crystal	179	4,2
Hemorrhagic	96	2,2
Ignored	4046	93,6

Source: Breast Cancer Control Information System (SISMAMA), 2025.

As for the presence of breast lumps, the largest proportion were found in the left breast (48.0%), of the solid type (81.6%) and the presence of papillary discharge was ignored (9.6%) followed by crystalline discharge.

When analyzing the cytopathology reports, there was a predominance of positive results in the left breast (47.8%). The material analyzed was through aspiration puncture (96.2%), showing a higher proportion of benign alterations (74.4%), especially fibroadenoma (55.7%) (Table 2).

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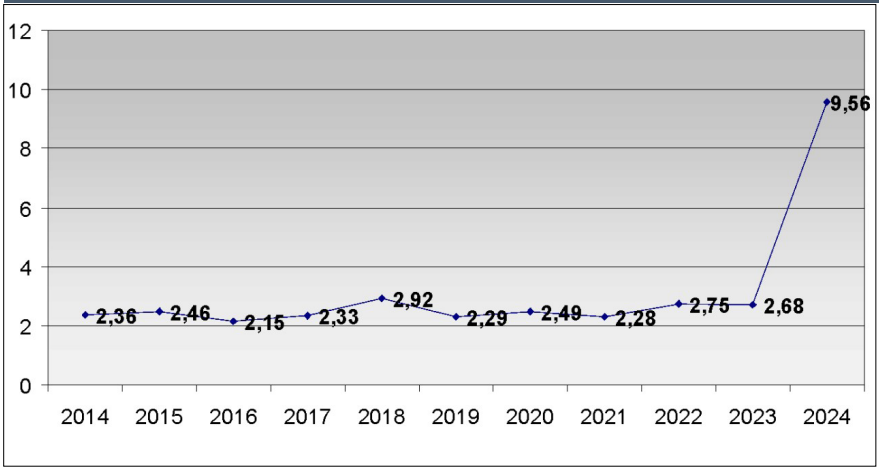
Table 2. Cytopathology reports of mammograms in women in the state of Pará,2014 a 2024

	N	%
Breast examination		
Right breast	2558	59,2
Left breast	2063	47,8
Evaluated material		
Papillary discharge	100	2,3
Aspiration puncture	4158	96,2
Cystic content	63	1,5
Fine Needle Aspiration Puncture (FNAP) results		
Benign processes (negative for malignancy)	3214	74,4
Undetermined malignancy	9	0,2
Suspicion of malignancy	89	2,1
Positive for malignancy	40	0,9
Ignored	969	22,4
Main benign processes		
Mastitis	18	0,5
Fibroadenoma	2406	*55,7*
Phycrocystic condition	19	0,4
Epithelial lesion	291	6,7
Other	473	11,0
Ignored	1108	25,7

Source: Breast Cancer Control Information System (SISMAMA), 2025.

The prevalence rate of breast cancer among women in the state of Pará is 106.2 per 100,000 women. The mortality rate per year for breast cancer in women in the state of Pará, according to the Mortality Information System - SIM14, was found to be 2.36 deaths per 100,000 women at2014 a , with fluctuations over the decade, falling in 2016, with 2.15 deaths, and increasing the following year, until reaching a rate of 9.56 deaths per 100,000 women in 2024 (figure 1).

Figure 1: Breast cancer mortality rates per 100,000 women in the state of Pará, between2014 a 2024



Source: Mortality Information System (SIM), 2025.

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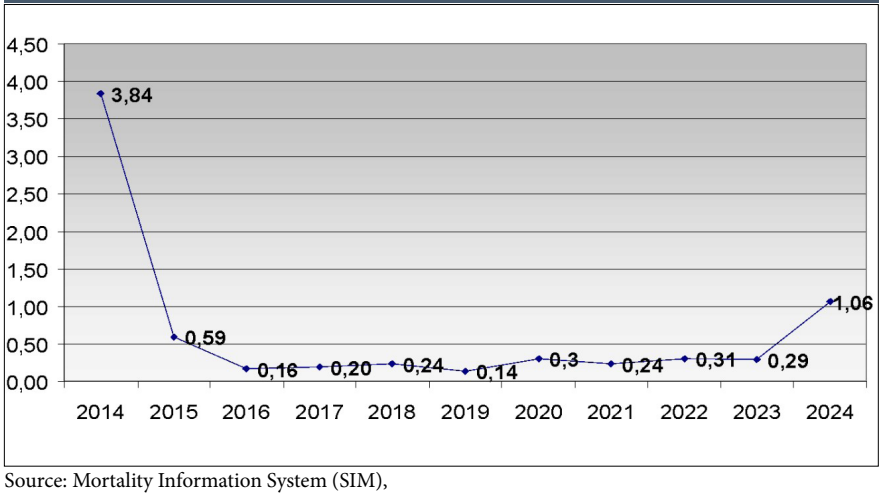
The lethality rate for breast cancer in women in the state of Pará was highest in 2014, at 3.84 out of 100,000 women. From that year onwards, rates fell, rising again in 2024, with 1.06 out of 100,000 women (figure 2).

Figure 2: Breast cancer mortality rate in the state of Pará, between2014 a 2024



Source: Mortality Information System (SIM), 2025.

DISCUSSION

Breast cancer screening is of great importance for the expansion of public health policies aimed at the prevention, treatment and control of the disease, establishing priorities in the care of patients with this neoplasm [7]. By analyzing the epidemiological data available on breast cancer in the state of Pará, it is possible to get a baseline of the temporal patterns of this neoplasm and its changes over the chosen period, enabling an estimate of its future changes, thus being able to anticipate interventional processes to improve patient care[15].

The epidemiological profile analyzed shows women of yellow skin color, contrasting with the reality of the region, which has a higher rate of brown women, due to the great miscegenation in the region, between blacks, indigenous and whites[16]. This may indicate socioeconomic variables that influence the prevalence of breast cancer, showing that certain populations have greater access to diagnostic services[3]. There is also the fact that there is a great deal of miscegenation in the region, as well as subjective interpretations regarding color and belonging to a certain race, which can lead to misinterpretations during the collection of patient information, or even a possible failure to feed the national database, which may explain the data obtained on breast cancer in the yellow race in the state of Pará19. The reason why many women declare themselves to be yellow is probably because they think that brown can be referred to in this way.

The age range of the patients is below 50 years, similar data found in epidemiological studies in the region, which states that the search for routine examinations in this age group is higher, especially among women who are entering menopause, and are at greater risk of more aggressive tumors, as well as the risk of recurrence among women who have already presented this neoplasm previously, being more prone to death, compared to older women[3].

This increase in the search for mammograms in this age group shows that the Ministry of Health's initiatives to prevent this neoplasm have had an effect, in addition to other factors that amplify this perception, such as fear of breast cancer, skepticism about clinical examination, and regular access to health centers[17]. However, the Ministry of Health is against mammography screening in women under the age of 50, considering it counterproductive, since the risk of a false negative result is greater than any other benefit the test could bring[9].

When analyzing the nodules detected in the mammograms of women from Pará, there was a higher occurrence of nodules in the left breast, of the solid type, and ignored papillary discharge. Similar data was found in another study in this state, demonstrating that asymmetry between the breasts can occur due to anatomical or physiological factors that should be studied in greater depth, as they are relevant to future epidemiological and public health studies in the state[19]. The predominance of solid nodules may indicate greater malignant potential, requiring a more detailed evaluation[16-20]. It can also be seen that the presence of ignored papillary discharge may indicate a failure to fill in or collect clinical data, hindering a complete assessment of the patient[16].

The cytopathology reports of breast lesions in women from Pará revealed benign processes in the left breast, indicating a high frequency of suspected breast cancer cases. The classification of lesions according to cytopathology reports as benign processes has been observed in several Brazilian studies, allowing us to understand that screening actions have been more effective[20-21].

The material from the exams was collected by aspiration puncture and showed benign processes, such as fibroadenoma. Similar data was found in a study in Patos de Minas, with a higher prevalence of benign reports, especially fibroadenoma, a benign lesion that is very common in young women, which is the age group that has most frequently sought preventive examinations[21-22]. This benign process usually occurs in

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women of reproductive age, and it is estimated that 10% of the world's female population may present with fibroadenoma once in their lifetime[21].

The prevalence rate of breast cancer among women in the state of Pará was 106.2 per 100,000 women. This data shows an increase in the prevalence of breast cancer in the state of Pará, especially in the last ten years, corroborated by an epidemiological study already carried out in the same region, revealing that this continuous growth could mean both an increase in cases of the neoplasm, as well as greater awareness of the importance of early detection[15].

An analysis of the ten-year timeline showed an upward trend in the average percentage of mortality due to breast cancer, reaching a rate of 9.56 deaths per 100,000 women in 2024, corroborated by various studies in the region. Epidemiological studies have shown that the high mortality rate among women in Pará may be due mainly to the inefficiency of primary care in this region in relation to breast cancer, as there are many isolated regions, which makes health services scarce or even non-existent[18].

In many cities, especially in riverside communities, the health team is very small, given the large population, leading to delays in access to care, and most of the time, the patient needs to be referred to urban centers with specialty centers[10]. However, because the waiting list is long in these places, there are delays in diagnosis and treatment, increasing the risk of mortality[18, 23].

In the same ten-year timeline, it was observed that the lethality rate of breast cancer in women from Pará has fluctuated over the last decade, with gradual increases, but with periods of falling rates, followed by peaks, as can be seen in 2024, with 1.06 out of 100,000 women. This oscillating behavior is evidence of the need to detect and treat breast cancer, since the number of cases of the neoplasm demonstrates the lethality of the disease, reinforcing the importance of integrated actions that guarantee timely and equitable early diagnosis among vulnerable populations [23, 24, 25].

CONCLUSION

The increasing prevalence seen in the last decade, coupled with the predominance of cases in women under the age of 50, corroborates the need for more effective and continuous breast cancer prevention, screening and early diagnosis.

These findings highlight the urgency of intensifying regional population monitoring actions, expanding mammography coverage, as well as strengthening the cancer care network, especially in communities that are more distant from urban centers and have less health infrastructure. In this context, it is recommended that information and epidemiological surveillance systems be improved, guaranteeing the quality of the data, as this will support more effective decisions in public policy planning.

REFERENCES

1. Barroso-Sousa R, Fernandes G. Oncologia: Princípios e prática clínica. Rio de Janeiro: Manole, 2022.

2. Brasil, Instituto Nacional de Câncer (INCA). Controle do câncer de mama no Brasil: dados e números: 2024. Rio de Janeiro: INCA, 2022.

3. Mascarenhas IT, Liber CJS, Pereira LAS. A epidemiologia do câncer de mama no estado do Pará de 2015 a 2020. Pesquisa, Sociedade e Desenvolvimento, 2022;15: 1-8.

4. Ferri FF. Ferri Oncologia e Hematologia - Recomendações Atualizadas de Diagnóstico e Tratamento. Rio de Janeiro: Guanabara Koogan, 2019.

5. Santos YM, Campos MJR, da Silva Bueno AHF, de Holanda JRC. Câncer de mama no Brasil: epidemiologia e correlação com a mamografia, de 2014 a 2024. Cuadernos de Educación y Desarrollo, 2024;16(13), 1-8.

6. Chammas R, Folgueira MAAK, Villa LL. Oncologia: Da molécula à Clínica. São Paulo: Editora dos Editores, 2022.

7. Andrade MC, Ribeiro AP, Lanza K, Lima LM, Oliveira GL. Ações de detecção precoce do câncer de mama no brasil: análise dos dados do sistema de informação do controle do câncer de mama (Sismama), 2009-2015. Revista Brasileira de Cancerologia, 68(3), 2022.

8. Alves MO, Mendonça DS. O Sistema Único de Saúde e sua importância para o enfrentamento do câncer de mama no Brasil. Revista Geográfica Acadêmica, 15(1), 113-129, 2021.

9. Sousa Júnior CP, Medeiros AA, Vargens CC, Azevedo DM, dos Santos AKR, da Silva MS, Damasceno HC, et al. Distribuição geográfica e perfil epidemiológico dos casos de câncer

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de mama em mulheres residentes das mesorregiões do estado do Pará. Revista Eletrônica Acervo Saúde, 23(9), 1-11, 2023.

10. Figueiredo Júnior AM, Lima GLOG, Vilela KAD, da Costa EC, dos Santos MLC, Freitas MDCN, Oliveira Calandrini C, et al. O acesso aos serviços de saúde da população ribeirinha: um olhar sobre as dificuldades enfrentadas. Revista Eletrônica Acervo Científico, 13, e4680-e4680. 1-8, 2020.

11. Brasil, Ministério da Saúde. DATASUS. Sistema de Informação do Câncer de Mama – SISMAMA. Cito de Mama - Por Local de Residência - Pará. Disponível em: http://tabnet.datasus.gov.br/cgi/dhdat.exe?SISCAN/CITOMAMA_RESIDpa.def. Acesso em 20fev2025.

12. Fundação Amazônia de Amparo a Estudos e Pesquisas – FAPESPA. Anuário Estatístico do Pará 2024. 9.ed. Belém: FAPESPA, 2024.

13. Nascimento RLX. Caderno de caracterização: Estado do Pará. Brasília, DF: Codevasf, 2022.

14. Brasil, Ministério da Saúde, DATASUS, Sistema de Informação sobre Mortalidade (SIM). Estatísticas Vitais. Mortalidade Mortalidade – desde 1996 pelo Óbitos de mulheres em idade fértil e óbitos maternos. Disponível em: http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sim/cnv/mat10pa.def. Acesso em: 10abr2025.

15. Aguiar BGB, Neves APV, de Moura Alves, CG, Guajajara SMBV, Corrêa JP, Rodrigues FR, Sousa Silva LDC. et al. Análise temporal da incidência e da mortalidade por neoplasia maligna das mamas em um período de 10 anos (2014-2024) na região do Estado do Pará. Brazilian Journal of Implantology and Health Sciences, 6(12):1164-1185, 2024.

16. Neves IS, Aviz ACS, Cruz CDJP, Leal EG, Silva ESPM, Costa JMR, Oliveira WMC, et al. Estudo epidemiológico sobre as neoplasias malignas da mama no estado do Pará no período de 2013 a 2020. Research, Society and Development, 10(7):1-15, 2021.

17. Neto JC, Silva SF, Oliveira APC, Almeida-Santos P, Leitão LPC. Avaliação do rastreamento mamográfico do câncer de mama no Estado do Pará: Uma análise segundo as diretrizes do Ministério da Saúde do Brasil (2018-2022). Revista da ANINTER-SH, v. 1, p. 178-188, 2024.

18. Assunção K, Júnior JWPM, Souza LPM, Santos PHP, Lima PDL, Beltrão-Lima S, Feio, DCA et al. Câncer de mama: Análise da tendência de mortalidade em mulheres no Estado do Pará-Brasil. Research, Society and Development, 10(13):1-9, 2021.

19. Silva WJP, Lopes Filho JC, de Castro Sampaio LF, de Castro Sampaio PH, Lopes JE, Corrêa JP, Rocha FS, et al. Estudo do perfil epidemiológico dos exames histopatológico de neoplasia mamária na região metropolitana de Belém, Pará. Revista Eletrônica Acervo Saúde, 24(10):1-11, 2024.

20. Macedo JCG, Moreira MR. O exame citopatológico como ferramenta para o diagnóstico do câncer de mama: análise dos resultados no âmbito nacional, estadual e do município de Governador Valadares–MG. RBAC, 55(2):142-149, 2023.

21. Santos KPH. Detecção Precoce de Câncer de mama. Trabalho de Conclusão de Curso (Nível Médio Habilitação em Citopatologia). Instituto Nacional de Câncer, Rio de Janeiro, 2025.

22. Silva AF, Coelho BCP, Araújo LMB. Análise do perfil epidemiológico das mulheres com câncer de mama no município de Patos de Minas (MG). Perquirere, 19(1):120-130, 2022.

23. Reis CP. Estudo da sobrevida de mulheres com câncer de mama atendidas em um Centro Unificado de Tratamento do Câncer em Montes Claros. Dissertação (Mestrado em Ciências da Saúde. Universidade Estadual de Montes Claros - Unimontes, 2022.

24. Pontes NHL, Neiva ACD, da Silva Lopes DI, Neves Neto DN. Saúde da mulher no estado do Tocantins: um estudo epidemiológico sobre o câncer de mama. Revista Multidisciplinar do Nordeste Mineiro, 10(1), 2023.

25. Pantoja CDSM, Carmo WLN, Dantas JO, Pereira KA, Santos DN, da Silva JA, Maciel EV, et al. Cenário epidemiológico e assistencial das neoplasias no estado do Amapá. Revista Eletrônica Acervo Saúde, 24(3), 1-9, 2024.

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