

## ANALYSIS OF THE PROFILE OF CERVICAL CANCER NEOPLASMS IN PIAUÍ DURING THE PERIOD FROM 2019 TO 2023: DOES THE DISTRIBUTION PATTERN OF NEOPLASMS FOLLOW THE SCREENING TARGETS?

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***Wanderson da Silva Nery***

Student of medicine course at: ``Instituto de  
Educação Superior do Vale do Parnaíba``  
Parnaíba – Piauí  
<https://orcid.org/0000-0002-4078-9486>

***Antonio Levi Farias Borba***

Student of medicine course at:  
``Universidade Estadual do Piauí``  
Teresina - Pi  
<https://orcid.org/0000-0001-8691-4417>

***Levi de Carvalho Freires***

Doctor by: ``Instituto de Educação Superior  
do Vale do Parnaíba``, Parnaíba – Piauí  
<http://lattes.cnpq.br/0800485328955768>

***Felipe Manoel Moreira Lima Matias da Paz***

Doctor by: ``Faculdade de Medicina de  
Olinda``, Olinda – PE  
<http://lattes.cnpq.br/4762250801719095>

***Mariana Elvas Feitosa Holanda***

Doctor at: ``Centro universitário Unifacid  
IDOMED``, Teresina - PI  
<https://orcid.org/0000-0003-0481-5496>

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***Maria Victoria Sousa Dias***

Doctor by: UniFacid Idomed

Teresina - PI

<https://orcid.org/0000-0002-2943-1934>

***Sofia Rocha Santos***

Doctor by: Unifacid Idomed

Teresina - PI

ORCID: <https://orcid.org/0009-0008-6038-8779>

***João Paulo da Silva Pereira***

Student of medicine course at: ``Centro universitário UNIFACID IDOMED``

Teresina - PI

<https://lattes.cnpq.br/9371970435709701>

***Lucas Meneses de Santana e Silva***

Student of medicine course at:

``Universidade Estadual do Piauí``

Teresina - Piauí

<http://lattes.cnpq.br/6172521675728153>

***Paulo Afonso Vieira Gomes Filho***

Doctor by: ITIPAC

Porto nacional

<http://lattes.cnpq.br/4532865871665374>

***Larissa Eva Macedo Nunes***

Doctor by: ``UNIFACID IDOMED``

Teresina - PI

Lattes : <http://lattes.cnpq.br/2007592019005512>

***Maria Clara Brito Monteiro***

Doctor at: ``Centro universitário Unifacid IDOMED``

Teresina - Pi

ORCID: 0009-0005-4817-7299

**Abstract:** INTRODUCTION: In Brazil, cervical cancer, if non-melanoma skin cancers are excluded, ranks as the third most common neoplasm in women. According to the national cancer institute (INCA), for each year of the 2023-2025 period, 17,010 new cases of this neoplasm in question were estimated. Such data represent a gross incidence of 15.38 cases per hundred thousand women. As for the regions, cervical cancer is the second most common in the north and northeast regions. The mortality rate for this specific type of cancer is 4.5 deaths per 100,000 women. OBJECTIVES: To analyze cervical-vaginal histologies in the last 5 years and verify the epidemiological profile of malignant cervical neoplasms from CIN III. METHODOLOGY: This is a retrospective, descriptive study of a quantitative nature that used secondary population data between the years 2019 and 2023 for the state of Piauí, collected from the IT department of the single health system (DATASUS). The variables selected for analysis were age, CIN 3 malignant neoplasms, microinvasive squamous cell carcinoma, invasive squamous cell carcinoma, squamous cell carcinoma with lesion impossible to evaluate, adenocarcinoma in situ, invasive adenocarcinoma, other malignant neoplasms, race/color, number of colposcopies performed, anatomopathological examinations of the cervix and health regions that performed the most colposcopies. RESULTS AND DISCUSSIONS: Between 2019 and 2023, 14,393 colposcopies were performed in Piauí, detecting 191 cases of malignant neoplasms, with the majority in the age range recommended by the Ministry of Health. Intraepithelial neoplasia type 3 was the most frequent (127 cases), followed by invasive squamous cell carcinoma (32 cases). The peak of colposcopies occurred in 2019, with 4,407 exams. The Entre Rios health region led with 10,383 tests. Malignant

neoplasms were distributed mainly among brown (69 cases) and yellow (64 cases) people, although mortality is higher in brown and white people. **CONCLUSION:** It appears that cervical cancer screening in Piauí has been widely implemented, with the majority of colposcopies performed in the recommended age group. The distribution of malignant neoplasms follows this pattern, concentrating in age groups between 25 and 64 years old. However, the incidence of malignancies outside this age group suggests the need for adjustments in screening policies, especially for women over 64 years of age. The considerable incidence of neoplasms in the elderly population and greater survival in yellow patients highlight the importance of individualized monitoring. Furthermore, regional variation in colposcopies indicates disparities in access to health services, requiring specific strategies to ensure equity in care in all regions of the state.

**Keywords:** Cervical Cancer; Epidemiological Profile; Colposcopy; Histologies

## INTRODUCTION

In Brazil, cervical cancer, if non-melanoma skin cancers are excluded, ranks as the third most common neoplasm in women. According to the national cancer institute (INCA), for each year of the 2023-2025 period, 17,010 new cases of this neoplasm in question were estimated. Such data represent a gross incidence of 15.38 cases per hundred thousand women. As for the regions, cervical cancer is the second most common in the north and northeast regions. The mortality rate for this specific type of cancer is 4.5 deaths per 100,000 women. (INCA 2023).

Cervical cancer arises due to a disordered multiplication of cells in the lower portion of the uterus, such as the cervical region. It is noted that this disordered multiplication can reach nearby tissues, but can even migrate to

more distant locations. (SILVA et al., 2020). In most cases, this disease is predominantly asymptomatic, however, it can contribute to the manifestation of vaginal bleeding during and after sexual intercourse, dark-colored discharge with or without a foul odor and, in more advanced stages, can cause hemorrhage, obstruction of the gastrointestinal system and urinary tract. (GISMONDI et al., 2021).

There are some risk conditions and behaviors that contribute to the manifestation of this specific neoplasm. One of them is HPV, which infects the skin and is transmitted through sexual intercourse, however, it is present in environmental factors and genetic conditions. (ALMEIDA et al, 2021). Another favorable time for the manifestation of cervical cancer is around 40 to 50 years of age, which corresponds to the climacteric period (a period that marks the transition between the reproductive and non-reproductive periods, where menopause occurs, which consists of the last menstruation of the woman's life, confirmed only after 12 months without menstrual episodes (DE SOUZA et al., 2023). This happens because this period is surrounded by physiological, hormonal and immunological changes, which increases the risk of neoplasms, due to being climacteric and not getting pregnant, women at this stage of life show a greater tendency to have unprotected sex and, as a result, contract the HPV virus and develop cervical cancer (MAIA et al., 2018).

The term cervical intraepithelial neoplasia (CIN) emerged in 1968 to indicate numerous types of cellular atypia restricted to the epithelium. This classification was divided into CIN 1, 2 and 3. CIN initially corresponded to mild dysplasia, CIN 2 refers to dysplasia moderate and CIN 3, both severe dysplasia and carcinoma in situ identified. CIN is identified through microscopic examination of cervical cells in a cytological smear stained

by the Papanicolaou technique. (SELLORS et al., 2004). In cytological preparations, changes in individual cells are evaluated to obtain the diagnosis of CIN and its classification. In contrast, histological examination of the entire tissue allows a more complete assessment of other varied characteristics.

Therefore, the cytological evaluation of CIN alone, based only on nuclear and cytoplasmic changes, often presents a high level of difficulty. (DE SÁ; SILVA, 2019).

Therefore, the final diagnosis of CIN is established through the anatomopathological examination of a cervical biopsy using a punch or excision sample. The final opinion on the presence or absence of a CIN in a tissue sample from the cervix and its classification according to the degree depends on histological characteristics referring to differentiation, maturation, cellular stratification, nuclear anomalies and the proportion of the thickness of epithelial cells with undifferentiated mature cells and only a thin layer of mature and differentiated cells on the surface region. (ROCHA et al., 2018).

Based on the above, this article aims to analyze cervical-vaginal histologies in the last 5 years and verify the epidemiological profile of malignant cervical neoplasms from CIN III.

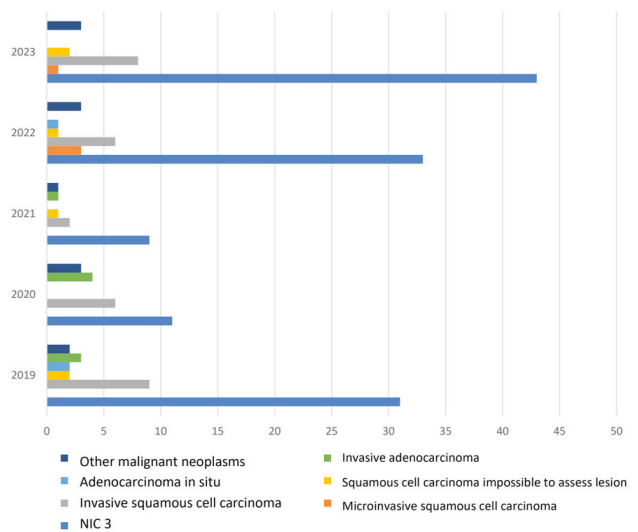
## METHODOLOGY

This is a retrospective, descriptive study of a quantitative nature that used secondary population data between the years 2019 and 2023 for the state of Piauí, collected from the IT department of the single health system (DATASUS). The variables selected for analysis were age, CIN 3 malignant neoplasms, microinvasive squamous cell carcinoma, invasive squamous cell carcinoma, squamous cell carcinoma with lesion impossible to evaluate, adenocarcinoma in situ, invasive adenocarcinoma, other malignant neoplasms, race/color, number of colposcopies performed,

anatomopathological examinations of the cervix and health regions that performed the most colposcopies. Ages were categorized into three groups: under 25 years old, 25 to 64 years old, and 65 years old and over. This categorization was chosen to analyze the behavior of cervical cancer cases in the state of Piauí and verify whether there is a predominance in the age groups selected by the Ministry of Health.

For data tabulation and analysis, the Microsoft Excel 2019 program was used. It is important to highlight that this work consists of an analysis based on secondary and public domain databases, therefore not requiring approval by the ethics committee. However, all ethical precautions provided for in Resolution 466/12, of the National Health Council, were taken.

## RESULTS AND DISCUSSIONS



Graphic 1: Frequencies of Malignant Neoplasms between 2019 and 2023 in Piauí

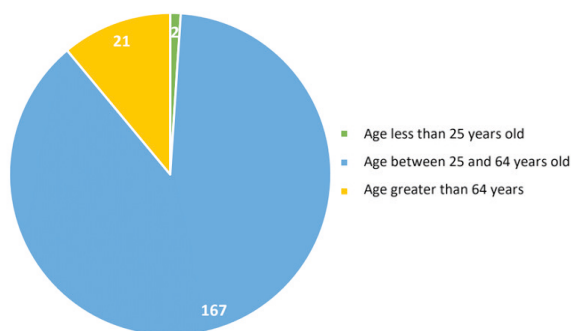
Source: DATASUS

The Graphic 1 shows that during the period studied there were 191 cases of malignant neoplasms, which consist of neoplasms with uncontrolled and invasive growth throughout the body. Malignant cells have the ability to invade adjacent tissues and spread to other

parts of the body, unlike benign cells, which generally do not metastasize and remain inert or demonstrate more controlled growth. (CÂMARA et al., 2023). Among the types of cervical cancer, the most common was type 3 intraepithelial neoplasia with 127 cases, followed by invasive squamous cell carcinoma with 32 cases and “other neoplasms” with 12 cases. The other neoplasms mentioned in the Graphic had a frequency of less than 10 cases in the 5 years studied.

The Ministry of Health recommends that screening with cancer cytology begins at age 25 in sexually active women. After two negative results for malignancy in tests carried out in the same year, screening must occur every three years, until the woman reaches 64 years of age, the age at which screening can be suspended. It must be noted that the Ministry of Health recommends avoiding screening in women under 25 years of age and over 64 years of age. (INCA 2016).

In this context, Graphic 2 demonstrates the distribution pattern of neoplasms according to age. Through it, it was found that 87.43% of cervical neoplasms occur in the age range recommended for screening. At the extremes of the screening age ranges, women over 65 years of age represented 11% of cases of malignant neoplasms, followed by women under 25 years of age, who represented 1.66% of notifications.



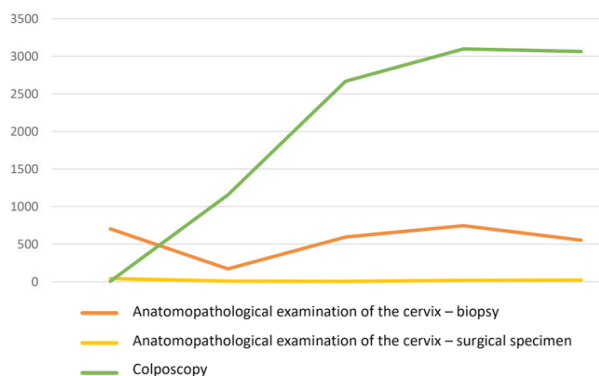
Graphic 2: Frequency of Malignant Neoplasms by Age between 2019 and 2023 in Piauí

Source: DATASUS

It is important to highlight that the Pap smear, or oncotoc colposcopy, consists of studying cervical cells that have been desquamated from the cervix or mechanically removed with the aid of an Ayres spatula or endocervical brush. The objective is to define the degree of biological activity, therefore being a screening test for cancer precursor lesions, but it must not be prioritized as a diagnostic method. (SOUZA et al., 2022)

Colposcopy, in turn, is a visual examination that analyzes the cervix, vagina, internal and external vaginal lips, as well as the vulva. In the context of cervical cancer, colposcopy can detect pre-invasive lesions, which, if treated early, can prevent the development of cancer. This exam must be requested if oncotoc cytology detects abnormal cells or when the clinical exam shows changes. Furthermore, colposcopy is used to monitor patients already undergoing treatment for lesions caused by HPV or who are being monitored due to expectant management. Therefore, colposcopy is more sensitive for detecting abnormalities that may have gone unnoticed in routine examinations. (SILVA et al., 2019).

In cases where colposcopy visualizes neoplasm-like lesions, a small sample of the tissue from the lesion is removed (biopsy). After this, the sample is sent for histopathology. Histopathological analysis is based on architectural and cellular morphological criteria and represents the gold standard in morphological diagnosis. Furthermore, the biopsy, when causing the local lesion, induces the immune system to promote a reaction in the lesion and help in its regression. (STOFLER et al., 2011).



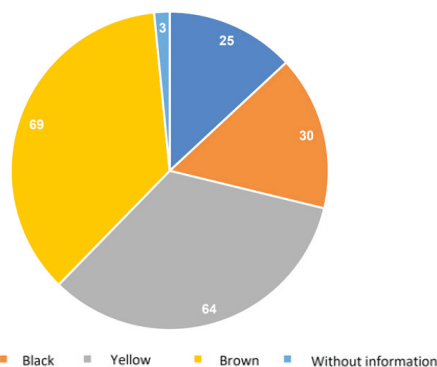
Graphic 3: Exams that analyzed the cervix between 2019 and 2023

Source: DATASUS

Between 2019 and 2023, 14,393 colposcopies, 2,765 biopsies and 92 anatomopathological exams of the cervix were performed for histological analysis of surgically removed pieces, as shown in Graphic 3. The peak of colposcopies occurred in 2019, with 4,407 exams. In 2020, this number fell to 1,156, but rose again in 2021, reaching 2,667 exams, an increase of 130%.

In 2022, the number of colposcopies grew again, reaching 3,098, and in 2023, the growth stabilized, totaling 3,065 exams. Regarding the profile of biopsies, a behavior similar to that of colposcopies was observed. In 2019, 705 exams were carried out, followed by a significant drop in 2020, with only 170 exams. In 2021, the number of procedures rose to 594, reaching a peak in 2022 with 745 biopsies. In 2023, there was a new drop, with 552 exams.

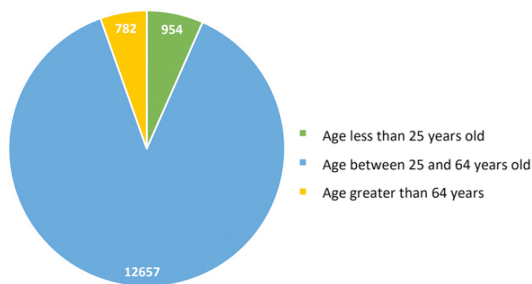
As for anatomopathological examinations resulting from surgical specimens, the peak in Piauí occurred in 2019, with 42 procedures. In 2020, there was a sharp drop, registering only 8 exams. In 2021, the number of procedures fell even further, totaling 4 exams. However, in 2022, there was a recovery, with 18 procedures, stabilizing the yellow curve of Graphic 3 in 2023 with 20 exams.



Graphic 4: Distribution of Malignant Cervical Neoplasms according to race

Source: DATASUS

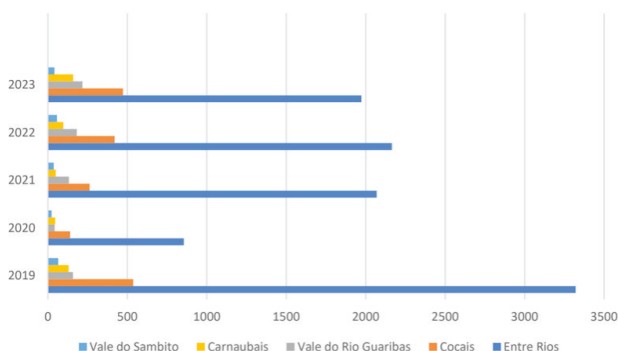
The graphic 4 shows that of the 191 cases of malignant neoplasms registered in Piauí, regarding colors/races, there were 25 notifications of white people, 30 of black people, 64 of yellow people, 69 of brown people and only 3 notifications had no color information. However, despite cases of malignant neoplasms of the cervix in yellow people occupying second place in the period studied in terms of affected patients, when analyzing mortality from this same problem from 2019 to 2022 (2023 was excluded due to the data not yet having been entered into the mortality information system) there were 544 deaths related to this pathology, of which 95 were in white people, 53 in black individuals, 3 in yellow people, 369 in brown people and 24 had no information available about their color. This fact is repeated when analyzing the national scenario, as studies analyzing mortality from cervical cancer in Brazil demonstrated that 47.3% of deaths occurred in white women, 8.1% in black women, 43.2% in women brown, 0.48% in yellow women, 0.47% in indigenous women (LUIZ et al., 2024). In this sense, it is possible to infer that yellow patients with cervical cancer have greater survival and cure potential.



Graphic 5: Number of Colposcopies from 2019 to 2023 in Piauí

Source: DATASUS

From the analysis of Graphic 5, it is highlighted that, of the 14,393 colposcopies performed, 12,657 were conducted within the age range recommended by the Ministry of Health. Furthermore, 954 exams were performed at the lower end of the screening range, covering women under 25 years old. In the age group over 64 years old, 782 colposcopies were performed. Elaborating a theoretical concept based on the number of malignancies found divided by the total number of colposcopic exams, we can infer that in Piauí, 1 in every 477 colposcopies in women under 25 years of age resulted in malignancies. For women over age 64, 1 in 37 colposcopies detected malignancies. Within the recommended screening range, 1 in 76 colposcopies identified malignancies.



Graphic 6: Quantity of Colposcopies by Health Region between 2019 and 2023 in Piauí

Source: DATASUS

Graph 6 shows the number of colposcopies performed between 2019 and 2023 separated by health region. It is noteworthy that the Entre Rios health region led the ranking with 10,383 exams, followed by Cocais with 1,831, followed by Vale do Rio Guaribas with 730, Carnaubais with 481 and Vale do Sambito with 223.

## CONCLUSION

From the data presented, it appears that cervical cancer screening in Piauí, in accordance with Ministry of Health guidelines, has been widely implemented, with the majority of colposcopies being performed within the recommended range. The distribution of malignant neoplasms follows a pattern consistent with screening guidelines, focusing predominantly on the recommended age groups. However, the incidence of malignancies in women outside this age range suggests the need for continued surveillance and possibly adjustments to screening policies to adequately address cases in women over the age of 64 years. It is noteworthy that the considerable incidence of neoplasms in the elderly population and a possible higher survival rate in yellow patients highlight the importance of individualized and timely monitoring. Furthermore, regional variation in colposcopies performed indicates disparities in access to health services, suggesting the need for specific strategies to ensure equity in care across all health regions of the state.

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