O MUNDO DA SAÚDE

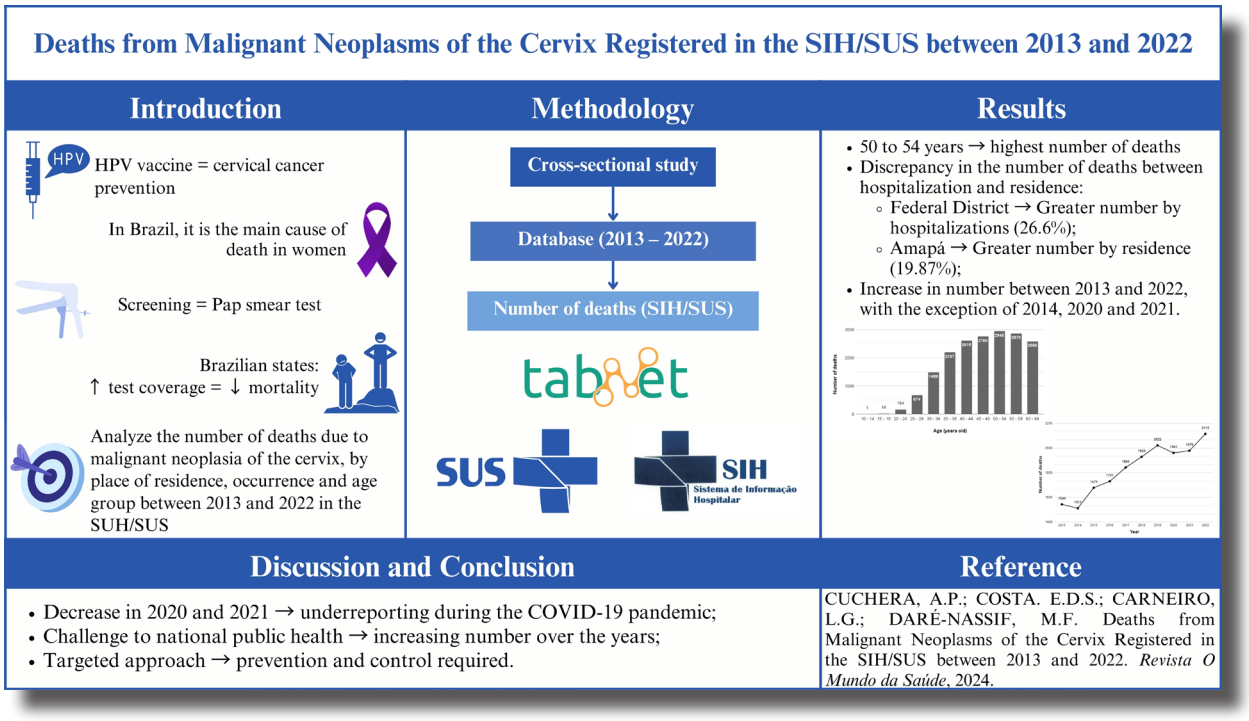
Deaths from malignant neoplasms of the cervix registered in the SIH/SUS between 2013 and 2022

Ana Paula Cuchera[1] Eduarda dos Santos Costa[1] Leandro Gouveia Carneiro[1] Mariana Firmino Daré Nassif[1]

[1]Universidade Nove de Julho, Faculdade de Medicina, Campus Osasco. Osasco/SP, Brasil.
E-mail: anapaulacchr@gmail.com

DOI: 10.15343/0104-7809.202448e15422023I

Graphical Abstract



Abstract

The impact of malignant cervical neoplasms on the global population and public policies is notable. Given the importance of this issue, the objective of this article is to analyze the number of deaths from malignant cervical neoplasms by place of residence and place of hospitalization and age group during the period from 2013 to 2022, as recorded in the Hospital Information System of SUS (SIH/SUS). This is a descriptive cross-sectional study. Data collection was performed using Information Systems hosted on DATASUS/TABNET. The results revealed discrepancies in the number of deaths across Brazilian states when comparing the place of hospitalization and place of residence. The age group with the highest number of deaths was recorded from 50 to 54 years; the COVID-19 pandemic impacted the reduction in records in 2020 and 2021. It is concluded that malignant cervical neoplasm represents a challenge for public health in Brazil, with an increase in the number of deaths recorded over the years, although this may be influenced by factors such as population density and the quality of records. Disparities between deaths by hospitalization and deaths by residence among states were observed, indicating the need for specific prevention and control strategies, as well as more comprehensive analyses considering other sources of information and contributing factors to these differences.

Keywords: Cervical Neoplasms. Death. Epidemiology.

DOI: 10.15343/0104-7809.202448e15422023I

INTRODUCTION

Malignant cervical neoplasm is characterized by the disordered replication of cells from the lining epithelium of the cervix. There are two main categories of invasive carcinomas: squamous cell carcinoma, representing 90% of cases, and adenocarcinoma, which represents about 10% of cases. Both forms are caused by infection with oncogenic types of Human Papillomavirus (HPV)[1,2].

Persistent infection by various oncogenic subtypes of HPV, primarily transmitted sexually, is responsible for almost 100% of cervical cancer cases (approximately 70% of infections are caused by subtypes 16 and 18)[3,4]. In the pathophysiology, the integration of HPV DNA into the host cell genome occurs, leading to genetic alterations and subsequent formation of cervical carcinomas, strengthening the evidence that HPV infection is a "necessary cause" to develop invasive carcinoma. Studies on HPV began in 1980, which enabled the development of highly immunogenic vaccines. HPV vaccination is only effective if administered before the onset of sexual activity, and even vaccinated individuals should undergo screening when they reach the target age for clinical detection of potential precancerous lesions and subsequent treatment[5,6].

This disease is known for its slow development, often without symptoms in the early stages, but can progress with symptoms such as intermittent vaginal bleeding or post-coital bleeding, abnormal vaginal discharge, and abdominal discomfort, as well as being associated with secondary diseases in the genitourinary and gastrointestinal systems in more advanced stages[1,7].

The Pap smear is a preventive test for screening precancerous lesions with the aim of early diagnosis, performed by collecting cells from the cervix, allowing the detection of pre-malignant changes in the cells of the cervical region[5]. Due to this, the Pap smear has become essential in cervical cancer control programs[8,9,10]. The test is offered at primary and secondary levels, mainly in health centers and public and private gynecological clinics. In specific cases, the test can be requested at the tertiary level, such as in specialized hospitals.

Screening for precancerous lesions is carried out both in the private sector and in the public sector[1,9], expanding access and trying to ensure specialized assistance in early diagnosis. However, the influence of socioeconomic and cultural inequalities and access to health services hinders the necessary coverage of tests and the full success of this public health action. In this context, health services are considered of great relevance, acting as facilitators or limiters of disease diagnosis and treatment[3].

In 2018, about 570,000 women were diagnosed worldwide with cervical neoplasms. Of these, more than 300,000 died from the disease, with 85% of deaths occurring in low- and middle-income countries. The World Health Organization (WHO) estimates a worsening scenario for the next ten years, predicting a 27% increase in deaths from cervical cancer in developing countries, while in high-income countries, the forecast is only a 1% increase[10,11].

In Brazil, when excluding non-melanoma skin tumors, cervical cancer ranks third in incidence among women[2,12,13]. Additionally, it is important to note that this cancer holds the fourth position in lethality among other cancers[14,15,16]. The National Cancer Institute José Alencar Gomes da Silva (INCA) estimated approximately 17,010 new cases of the disease in Brazil in 2023, which equates to an incidence of 13.25 cases per 100,000 Brazilian women[12].

Considering that HPV vaccination is an effective ally in preventing cervical cancer and, combined with screening actions for early diagnosis, when well established, they increase the prospects of controlling this disease, the global number of deaths and the lethality of the disease in Brazil are surprising. Adding to this is the notable worsening of this condition expected in the coming years, which

DOI: 10.15343/0104-7809.202448e15422023I

is likely to impact Brazil more significantly due to its socioeconomic inequalities across its different geographic regions. Thus, understanding the distribution of morbidity and mortality from cervical cancer in Brazilian regions is urgent.

This research provides an epidemiological evaluation of the number of deaths from cervical neoplasms registered in the Hospital Information System of SUS (SIH/SUS) originating from SUS participating hospital units (public or private). This allows the analysis of areas with the highest number of deaths from malignant cervical neoplasms according to the SIH and encourages future studies to investigate the possible causes of predominance in certain regions. Therefore, the study aims to analyze the number of deaths from malignant cervical neoplasms by place of residence, place of hospitalization, and age group during the period from 2013 to 2022 as recorded in the SIH/SUS.

METHODOLOGY

This is a descriptive cross-sectional time-series study. Epidemiological data were collected on October 10, 2023, from a secondary source in a public domain information system, the Hospital Information System (SIH) in the item Hospital Morbidity of SUS (SIH/SUS) hosted on DATASUS/TABNET with data from 2013 to 2022. Data on the number of deaths from malignant cervical neoplasms were selected, choosing the variables: sex (female), place (residence or hospitalization), stratified by federative unit and by age group (10-14 years, 15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, 55-59 years, 60-64 years). The distribution data of deaths by age group and year/time are presented in absolute frequencies.

In the evaluation of death data by place of hospitalization and residence, the proportional difference between deaths recorded by place of residence and by place of hospitalization is presented, resulting in positive and negative values.

The calculation of the relative number of deaths was also used: % = (sample ÷ total deaths) x 100. For the variables, as it is a descriptive cross-sectional study using data from secondary sources such as a health information system, the confidentiality and anonymity of the original participants are guaranteed, as well as the exemption from submission to a research ethics committee and obtaining informed consent, complying with the provisions of resolutions 466/12 and 510/16.

RESULTS

The total number of deaths due to malignant neoplasm of the cervix recorded in the Hospital Information System of SUS (SIH/SUS) from 2013 to 2022 is 18,316, considering both the place of hospitalization and the place of residence. Analyzing the deaths by year and by federative unit, all states showed fluctuations in the number of deaths from cervical neoplasm over the years. However, the absolute numbers revealed differences when comparing deaths by place of residence to those by place of hospitalization across different states in Brazil, as recorded in SIH/SUS between 2013 and 2022. The proportional difference was calculated to compare deaths recorded by place of hospitalization and place of residence. In this analysis, we subtracted the hospitalization records from

DOI: 10.15343/0104-7809.202448e15422023I

the residence records, resulting in positive and negative numbers. Positive numbers indicate a higher incidence of deaths by hospitalization, while negative numbers suggest a higher number of deaths by residence.

Analyzing the states with the greatest discrepancies between deaths by residence and by hospitalization, the Federal District stands out with a difference of 26.60%, followed by Amapá with -19.87%, Goiás with -19.67%, Piauí with 16.35%, and Roraima with -13.46%.

Certain federative units show significantly higher numbers of deaths recorded in SIH/SUS by hospitalization. The Federal District registers the largest disparity with a difference of 83 deaths (26.60%), followed by Piauí (n = 43; 16.35%), Rondônia (n = 14; 8.64%), São Paulo (n = 167; 5.32%), and Pernambuco (n = 32; 2.69%). On the other hand, the states with higher death rates by residence show negative differences, such as Amapá with 31 deaths (-19.87%), Goiás (n = 107; -19.67%), Roraima (n = 14; -13.46%), Mato Grosso (n = 17; -6.94%), and Mato Grosso do Sul (n = 23; -6.82%).

Some states stand out for the almost non-existent disparity between deaths by residence and by hospitalization. The states of Rio Grande do Sul and Rio Grande do Norte show total equality. Meanwhile, Paraná and Santa Catarina register minimal differences of 0.10% and 0.16%, respectively. Ceará and Rio de Janeiro show the same value with a difference rate of -0.49%. Tocantins, Paraíba, and Sergipe also show insignificant discrepancies with consecutive variations of 0.58%, 0.64%, and 0.81% (Table 1).

The analysis by age group of the 18,316 deaths due to cervical cancer from 2013 to 2022 recorded in SIH/SUS shows significant variation according to age. The study reveals a progressive increase in the number of deaths as the age group rises up to 54 years, and a decrease in the number of deaths related to this pathology from the 55-59 age group onward. The age group between 50 and 54 years recorded the highest number of deaths, accounting for 16.08% of the total, followed by the 55-59 age group (15.67%), 45-49 years (15.07%), 40-44 years (14.28%), 60-64 years (14.12%), 35-39 years (11.99%), 30-34 years (8.12%), 25-29 years (3.68%), 20-24 years (0.90%), 15-19 years (0.08%), and 10-14 years (0.01%) (Figure 1).

It is noted that the age group between 40 and 44 years shows the most significant increase in deaths from cervical cancer, with a rise of 190.2% compared to the previous age group of 35-39 years.

Data recorded in SIH/SUS show a progressive increase in the total number of deaths caused by cervical cancer from 2013 to 2019, with 1,544 deaths in 2013 and 2,022 deaths in 2019, representing an increase of 30.95%. However, it is necessary to consider population growth and possible improvements in SIH data collection, which makes it impossible to affirm an increase in the death rate (Figure 2). During this period, only 2014 showed a decrease of approximately 2% compared to 2013. Nevertheless, there was a resumption of progressive growth in 2015, with around 11% more than in 2014. In relation to 2019, there was a drop of 3.02% in 2020 and 2.1% in 2021. However, it increased again in 2022, surpassing the number of deaths recorded in 2019 by approximately 4.6%.

Thus, the analysis of the presented data allows the discussion of results to elucidate and propose intervention actions.

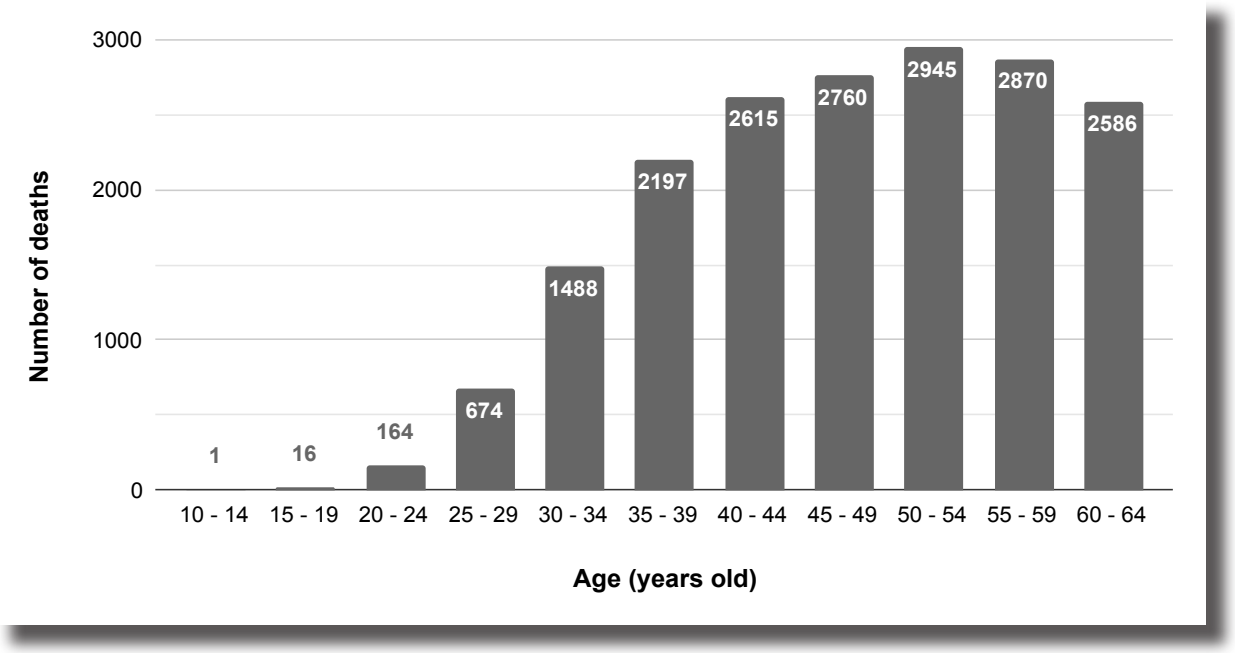
DOI: 10.15343/0104-7809.202448e15422023I

Table 1 - Number of deaths from malignant neoplasm of the cervix in different federative units of Brazil according to place of hospitalization and residence and their difference in the period from 2013 to 2022, recorded in the Hospital Information System of SUS - SIH/SUS.

Federative Unit	Deaths		Difference (%)
	Hospitalization	Residence	
Amapá	125	156	-19.87%
Goiás	437	544	-19.67%
Roraima	90	104	-13.46%
Mato Grosso	228	245	-6.94%
Mato Grosso do Sul	314	337	-6,82%
Acre	77	82	-6.10%
Maranhão	1,104	1,149	-3.92%
Pará	764	790	-3.29%
Minas Gerais	1,343	1,385	-3.03%
Bahia	1,113	1,138	-2.20%
Alagoas	395	403	-1.99%
Sergipe	123	124	-0.81%
Paraíba	312	314	-0.64%
Tocantins	171	172	-0.58%
Ceará	403	405	-0.49%
Rio de Janeiro	2,222	2,233	-0.49%
Rio Grande do Sul	1,014	1,014	0.00%
Rio Grande do Norte	162	162	0.00%
Paraná	1,003	1,002	0.10%
Santa Catarina	621	620	0,16%
Espírito Santo	371	365	1.64%
Amazonas	520	507	2.56%
Pernambuco	1,223	1,191	2.69%
São Paulo	3,304	3,137	5.32%
Rondônia	176	162	8.64%
Piauí	306	263	16.35%
Distrito Federal	395	312	26.60%
TOTAL	**18,316**	**18,316**	**-**

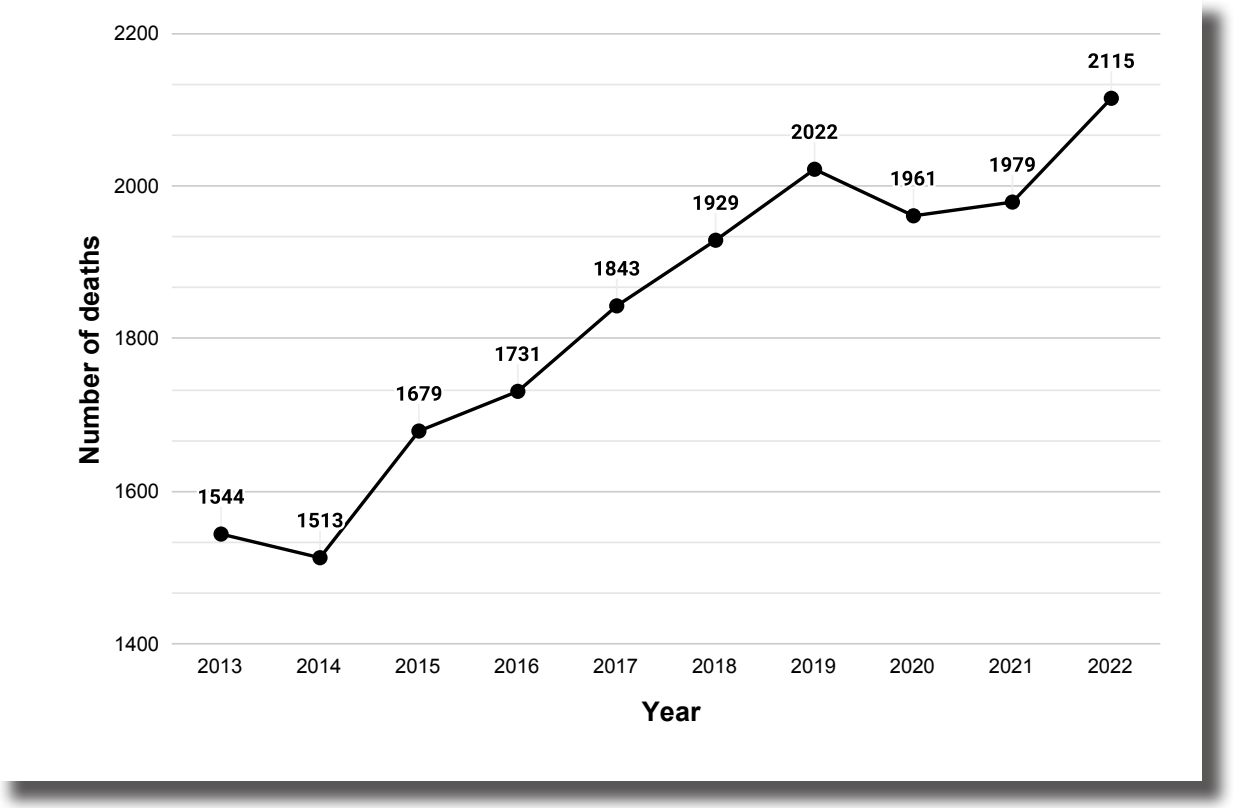
Source: SIH/SUS, October 10th, 2023

DOI: 10.15343/0104-7809.202448e15422023I



Source: SIH/SUS, October 10th, 2023.

Figure 1- Total deaths from malignant cervical neoplasm from 2013 to 2022 by age group recorded in the SUS Hospital Information System (SIH/SUS).



Source: SIH/SUS, October 10th, 2023.

Figure 2- Total deaths from malignant cervical neoplasm from 2013 to 2022 by year of occurrence recorded in the SUS Hospital Information System (SIH/SUS).

DISCUSSION

DOI: 10.15343/0104-7809.202448e15422023I

The data available on DATASUS are organized by place of hospitalization and place of residence. It is important to differentiate how these data are analyzed to enrich epidemiological questions and reflections. Every death creates two epidemiological data points: the place of hospitalization, indicating where the patient died, and the place of residence, indicating where the deceased resided. Ultimately, the total number of deaths recorded in SIH/SUS should be equal for both metrics, as they are derived from the same initial data—the death itself. The total number of deaths for each location indicator were equal, totaling 18,316 in both measures, suggesting that the data collected by SIH/SUS and presented on DATASUS is robust.

However, in the most populous states, São Paulo and Rio de Janeiro stand out for the highest absolute number of deaths both by residence and by hospitalization, which can be explained by the significant population density of these regions. This high density also brings a greater demand for health care related to cervical cancer, leading to more service offerings in densely populated areas[1].

The data found suggests that the state of São Paulo presents a greater demand for the treatment of this disease, since there is a difference of 5% more in hospitalizations when related to deaths of people who resided in the state. On the other hand, the state of Rio de Janeiro, with similar numbers of deaths per residence and hospitalizations, may suggest that people residing in the state are not traveling to seek health care, highlighting the need to investigate migratory flows between different federative units.

A discrepancy was observed in the Federal District and Amapá between the number of deaths by place of hospitalization and those occurring by place of residence. With regard to Amapá, there was a lower number of deaths by place of hospitalization, with a reduction of 19.87% when compared to deaths by place of residence. This difference may be related to the possible search for treatment outside the state or even the low availability or poor distribution of vacancies that cover the entire population. On the other hand, the Federal District showed an increase of 26.60% in deaths by place of hospitalization when compared to deaths by place of residence, which suggests hypotheses that the treatment location has a greater offer of services, which has a greater availability of hospital beds or even better tracking for subsequent treatment. This finding was mentioned in another study that observed that the coverage of Pap smears in large capitals and in the federal district is high, reaching 83.80%[18].

The states of Rio Grande do Sul, Rio Grande do Norte and Paraná showed no difference in the number of deaths by place of hospitalization and residence, suggesting that the majority of deaths occurred in places close to residence. This may also indicate that the public policies for offering services in these states are self-sufficient in serving their population, not suggesting the presence of migratory currents in search of health treatment.

The comparative analysis of the difference in the number of deaths by place of hospitalization and residence carried out in this study allows us to suggest or even indicate which possible federative units are experiencing an exodus in healthcare in the final phase of life or treatment with subsequent death, as well as which federative unit is receiving more patients who, in the natural development of the disease, die. These analyzes do not allow inferring causality, due to incomplete data from the DATASUS system and statistical limitations, such as reasons for moving to other states or staying in the location or lack of inferential analysis. However, these are still valuable data to be used in understanding the movement of patients seeking treatment until the final stage of this disease across the federative units of Brazil.

According to the Brazilian Guidelines for Cervical Cancer Screening and the National Program for Comprehensive Attention to

DOI: 10.15343/0104-7809.202448e15422023I

Women's Health (PNAISM), it is determined that screening through the Pap smear (cytological exam) be carried out in patients in the age range of 25 to 64 years old. This stipulated age range was based on epidemiological studies and knowledge of the natural history of the disease. The start of screening at age 25 aims to identify possible changes in the cervix early and detection up to age 64 aims to cover a critical period in which the risk of developing cervical cancer remains significant, contributing to a comprehensive approach in prevention and control in the context of public health[19,20].

Regarding the increase in deaths after the age of 40, this age range becomes a critical point for controlling and screening cervical cancer. The age group from 40 to 44 years showed an increase of 190.2% compared to the previous age group (35 to 39 years). The age group between 50 and 54 years presented the highest number of deaths in the study, with 2,950 deaths (Figure 1), representing the peak of occurrence of deaths in women from cervical cancer. Meira and collaborators evaluated that there are mortality rates exceeding 20 deaths per 100,000 women up to 50-54 years, where mortality rates are lower in younger women, such as those aged 40-44 years. These findings corroborate the results of our study[21].

Cervical cancer, as one of the non-communicable chronic diseases (NCDs), has significant epidemiological relevance, especially related to premature mortality, defined as death between 30 and 69 years. Confortin and collaborators evaluate that there is a trend of decreasing this mortality in most Brazilian states due to the implementation of public policies for health promotion and control of risk factors[22].

These results highlight the need for investment in public policies for the prevention of premature mortality in women. Regarding mortality from cervical cancer, there is a need for effective screening to ensure early diagnosis with higher chances of remission therapy.

The years 2020 and 2021 were marked by a decline in the number of deaths from malignant cervical neoplasm, which may have been attributed to the COVID-19 pandemic, as the pandemic period had a significant impact on the records and detection of deaths, with the population in social isolation and reduced seeking of health services, consequently leading to fewer detection exams, in addition to recording services being impaired in workforce and action priority. This result was also found in other studies, such as Kaufmann *et al.*, who observed that the COVID-19 pandemic in Brazil affected the coverage of preventive cervical cancer exams in the short term but significantly. During this scenario, there was a reduction in the financial resources of health services, subsequently leading to a lack thereof; due to this perspective, a 44.6% reduction in cytopathological exams was recorded in 2020. The restriction of the population's access to preventive services led to an increase in health inequity due to the pandemic scenario. These gaps in the detection of this disease due to the pandemic can bring future harms, as already pointed out in some studies predicting an increase in cervical cancer cases until 2027[11,23,24]. In this sense, the need for investment in public policies for the control and treatment of cervical neoplasms is once again reinforced.

It is worth mentioning as a limitation of the study the difficulty of acquiring updated data from epidemiological data systems and the limitation of the present scope to collect data solely from SIH/SUS. Additionally, there is a noticeable recurring underreporting in Health Information Systems, exacerbated during the COVID-19 pandemic. However, even considering this, data analysis still proves valid due to the amount of data obtained[25].

DOI: 10.15343/0104-7809.202448e15422023I

CONCLUSION

There was a disparity between the number of deaths by residence and the number of deaths by hospitalization recorded in the Hospital Information System of SUS (SIH/SUS) that occurred in the federative units of Brazil. This suggests that some federative units are more likely to be preferred locations for hospitalizations, such as the Federal District, while others show a greater tendency for individuals to seek hospitalizations in other locations, such as the state of Amapá.

The age group analysis concluded that the group aged 50 to 54 years had the highest number of deaths, highlighting the importance of screening for this age range. Additionally, screening should be conducted during the period with the highest possibility of detecting precursor lesions to reduce the occurrence of deaths.

From 2013 to 2019, there was a gradual increase in the number of deaths from malignant cervical neoplasia. In the period from 2020 to 2021, there was a decrease in the recorded number of deaths, which may be attributed to the impacts of the COVID-19 pandemic on health services and epidemiological underreporting. In 2022, the number of reported deaths was higher than in 2019. It is not possible to infer a decrease in the number of deaths, as this may be related only to the registration process.

In conclusion, cervical cancer represents a significant public health challenge in Brazil, as records indicate an increasing number of deaths over the years. However, it is important to note that we cannot immediately infer that mortality is increasing, as this phenomenon may be related to population density growth or improvements in data collection by SIH/SUS. Additionally, the study identified a discrepancy between the number of deaths by hospitalization and by residence in Brazil's federative units. For example, São Paulo had a higher number of deaths by hospitalization, while Amapá recorded a higher number of deaths by residence. Moreover, states like Rio de Janeiro showed equal numbers of deaths by hospitalization and residence. Therefore, a targeted approach to cervical cancer is crucial, focusing on health promotion, prevention, and disease control strategies. For future studies, it is recommended to conduct a more comprehensive analysis that incorporates other sources of information, such as health information systems and primary data, also taking into account population growth and further investigating the factors contributing to these differences between deaths by residence and occurrence.

CRediT author statement

Conceptualization: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Methodology: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Validation: Carneiro, LG; Nassif, MFD. Statistical analysis: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Formal analysis: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Investigation: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Resources: Nassif, MFD. Writing-original draft preparation: Cuchera, AN; Costa, ES; Carneiro, LG. Writing-review and editing: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Visualization: Cuchera, AN; Costa, ES; Carneiro, LG; Nassif, MFD. Supervision: Carneiro, LG; Nassif, MFD. Project administration: Cuchera, AN; Costa, ES

All authors have read and agreed to the published version of the manuscript.

DOI: 10.15343/0104-7809.202448e15422023I

REFERENCES

1. Instituto Nacional de Câncer. Plano de Ações Estratégicas para o Enfrentamento das Doenças Crônicas e Agravos Não Transmissíveis no Brasil 2021-2030. [Internet]. Rio de Janeiro: Instituto Nacional de Câncer - INCA; 2022. 120 p. Disponível em: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/svsa/doencas-cronicas-nao-transmissiveis-dcnt/09-plano-de-dant-2022_2030.pdf
2. Barbosa IR, Souza DLB, Bernal MM, Costa ICC. Desigualdades regionais na mortalidade por câncer de colo de útero no Brasil: tendências e projeções até o ano 2030. Ciênc saúde coletiva [Internet]. 2016Jan;21(1):253–62. Disponível em: https://doi.org/10.1590/1413-81232015211.03662015
3. Lopes VAS, Ribeiro JM. Fatores limitadores e facilitadores para o controle do câncer de colo de útero: uma revisão de literatura. Ciênc saúde coletiva [Internet]. 2019Set;24(9):3431–42. Disponível em: https://doi.org/10.1590/1413-81232018249.32592017
4. Instituto Nacional de Câncer. Fatores de Risco: Informações sobre os fatores de risco para Câncer do Colo do Útero. [Internet]. Rio de Janeiro: Instituto Nacional de Câncer - INCA; 2022. Disponível em: https://www.gov.br/inca/pt-br/assuntos/gestor-e-profissional-de-saude/controle-do-cancer-do-colo-do-utero/fatores-de-risco
5. Nakagawa JTT, Schirmer J, Barbieri M. Vírus HPV e câncer de colo de útero. Rev Bras Enferm [Internet]. 2010Mar;63(2):307–11. Disponível em: https://doi.org/10.1590/S0034-71672010000200021
6. Carvalho CF, Teixeira JC, Bragança JF, Derchain S, Zeferino LC, Vale DB. Rastreamento do câncer do colo de útero com teste de HPV: Atualizações na recomendação. Rev Bras Ginecol Obstet [Internet]. 2022Mar;44(3):264–71. Disponível em: https://doi.org/10.1055/s-0041-1739314
7. Simonsen M, Pereira T, Webber RJ, Tsunoda AT, Reis R, Fregnani JHG. Presença de sintomas no momento do diagnóstico da recorrência do câncer do colo do útero está relacionada com pior prognóstico?. Rev Bras Ginecol Obstet [Internet]. 2014Dez;36(12):569–74. Disponível em: https://doi.org/10.1590/SO100-720320140005068
8. Pinho AA, Mattos MCFI. Validade da citologia cervicovaginal na detecção de lesões pré-neoplásicas e neoplásicas de colo de útero. J Bras Patol Med Lab [Internet]. 2002Jul;38(3):225–31. Disponível em: https://doi.org/10.1590/S1676-24442002000300011
9. Thuler LCS. Mortalidade por câncer do colo do útero no Brasil. Rev Bras Ginecol Obstet [Internet]. 2008Mai;30(5):216–8. Disponível em: https://doi.org/10.1590/S0100-72032008000500002
10. Medrado L, Lopes RM. Conexões históricas entre as políticas de rastreamento do câncer de colo do útero e a educação profissional em citopatologia no Brasil. Trab educ saúde [Internet]. 2023;21:e00969206. Disponível em: https://doi.org/10.1590/1981-7746-ojs969
11. Vieira YP, Viero VSF, Vargas BL, Nunes GO, Machado KP, Neves RG, Saes MD. Tendência e desigualdades no rastreamento autorrelatado do câncer de colo de útero nas capitais brasileiras entre 2011 e 2020. Cad Saúde Pública [Internet]. 2022;38(9):e00272921. Disponível em: https://doi.org/10.1590/0102-311XPT272921
12. Carvalho PG, O´Dwer G, Rodrigues NCP. Trajetórias assistenciais de mulheres entre diagnóstico e início de tratamento do câncer de colo uterino. Saúde debate [Internet]. 2018Jul;42(118):687–701. Disponível em: https://doi.org/10.1590/0103-1104201811812
13. Instituto Nacional de Câncer. Dados e Números Sobre Câncer do Colo do Útero Relatório Anual 2022 [Internet]. Rio de Janeiro: Instituto Nacional de Câncer - INCA; 2022. Disponível em: https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/dados_e_numeros_colo_22setembro2022.pdf
14. Pecinato V, Jacobo A, Silva SG. Tendência temporal de mortalidade por neoplasia maligna de mama e de colo de útero em Passo Fundo, Rio Grande do Sul: uma análise segundo faixa etária e escolaridade, 1999-2019. Epidemiol Serv Saúde [Internet]. 2022;31(3):e2022440. Disponível em: https://doi.org/10.1590/S2237-96222022000300021
15. Spohr ASR, Santos CS, Teixeira MSC, Almeida DR, Campos AL, Ramos ARS, Paz KMR. Mortalidade por câncer de colo de útero nas regiões brasileiras: um panorama dos anos 2009 a 2019. RSD [Internet]. 2023;12(7):e16712742602. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/42602
16. Tallon B, Monteiro D, Soares L, Rodrigues N, Morgado F. Tendências da mortalidade por câncer de colo no Brasil em 5 anos (2012-2016). Saúde debate [Internet]. 2020Abr;44(125):362–71. Disponível em: https://doi.org/10.1590/0103-1104202012506
17. Corrêa CSL, Lima AS, Leite ICG, Pereira LC, Nogueira MC, Duarte DAP, Fayer VA, Bustamante-Teixeira MT. Rastreamento do câncer do colo do útero em Minas Gerais: avaliação a partir de dados do Sistema de Informação do Câncer do Colo do Útero (SISCOLO). Cad saúde colet [Internet]. 2017Jul;25(3):315–23. Disponível em: https://doi.org/10.1590/1414-462X201700030201
18. Oliveira MM de, Andrade SSCA, Oliveira PPV, Silva GA, Silva MMA, Malta DC. Cobertura de exame Papanicolaou em mulheres de 25 a 64 anos, segundo a Pesquisa Nacional de Saúde e o Sistema de Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico, 2013. Rev bras epidemiol [Internet]. 2018;21:e180014. Disponível em: https://doi.org/10.1590/1980-549720180014
19. Instituto Nacional de Câncer José Alencar Gomes da Silva. Diretrizes brasileiras para o rastreamento do câncer do colo do útero. [Internet]. Rio de Janeiro: Instituto Nacional de Câncer - INCA; 2016. 118 p. Disponível em: https://www.inca.gov.br/sites/ufu.sti.inca.local/files//media/document//diretrizes_para_o_rastreamento_do_cancer_do_colo_do_utero_2016_corrigido.pdf
20. Secretaria de Políticas para as Mulheres. Monitoramento e Acompanhamento da Política Nacional de Atenção Integral à Saúde da Mulher (PNAISM) e do Plano Nacional de Políticas para as Mulheres (PNPM). [Internet]. Brasília: Secretaria de Políticas para as Mulheres - SPM; 2015. 50 p. Disponível em: https://www.inca.gov.br/sites/ufu.sti.inca.local/files//media/document//diretrizes_para_o_rastreamento_do_cancer_do_colo_do_utero_2016_corrigido.pdf
21. Meira KC, Silva GA, Silva CMFP, Valente JG. Efeito idade-período-coorte na mortalidade por câncer do colo uterino. Rev Saúde Pública [Internet]. 2013 Abr;47(2):274–82. Disponível em: https://doi.org/10.1590/S0034-8910.2013047004253
22. Confortin SC, Andrade SR, Draeger VM, Meneghini V, Schneider IJ, Barbosa AR. Mortalidade prematura pelas principais doenças crônicas não transmissíveis nos estados do Brasil. Revista Brasileira de Enfermagem. [Internet] 2019 Oct 21;72:1588-94. Disponível em: https://doi.org/10.1590/0034-7167-2018-0701
23. Kaufmann LC, França AFO, Zilly A, Ferreira H, Silva RMM. Repercussões da pandemia de COVID-19 no exame preventivo de câncer de colo uterino: percepção de enfermeiros. Esc Anna Nery [Internet]. 2023;27:e20220401. Disponível em: https://doi.org/10.1590/2177-9465-EAN-2022-0401pt
24. Ribeiro CM, Correa FM, Migowski A. Efeitos de curto prazo da pandemia de COVID-19 na realização de procedimentos de rastreamento, investigação diagnóstica e tratamento do câncer no Brasil: estudo descritivo, 2019-2020. Epidemiol Serv Saúde [Internet]. 2022;31(1):e2021405. Disponível em: https://doi.org/10.1590/S1679-49742022000100010

25. Orellana JDY, Cunha GMD, Marrero L, Moreira RI, Leite IDC, Horta BL. Excesso de mortes durante a pandemia de COVID-19: subnotificação e desigualdades regionais no Brasil. Cad Saude Publica [Internet]. 2021 Feb 5;37(1):e00259120. Disponível em: https://doi.org/10.1590/0102-311X00259120

DOI: 10.15343/0104-7809.202448e15422023I

Received: 30 october 2023.
Accepted: 08 may 2024.
Published: 27 may 2024.