

# Analysis of the progression of cervical cytology screening coverage and cervical cancer incidence following the implementation of the Previne Brasil program

A análise da progressão da cobertura do citopatológico e da incidência de câncer de colo de útero pela implementação do Programa Brasil

*El Análisis de la progresión de la cobertura del citopatológico y la incidencia de cáncer de cuello uterino a partir de la implementación del programa Previne Brasil*

Eduarda Natasha Cella<sup>1</sup> , Lucas Dill Correa<sup>1</sup> , Anelise Jaeger Barancelli<sup>1</sup> 

<sup>1</sup>Universidade Tecnológica Federal do Paraná – Pato Branco (PR), Brazil.

## Abstract

**Introduction:** Cervical cancer is one of the main causes of morbidity and mortality among women, accounting for about 660 thousand new cases and 350 thousand deaths in 2022, according to the World Health Organization. In Brazil, it is the third most frequent cancer among women, with an estimated 16,590 new cases in 2020. The Ministry of Health recommends cervical cytology screening for women aged 25 to 64 years every three years after two consecutive normal results. In 2019, the *Previne Brasil* Program was created to expand coverage and improve the quality of Primary Health Care, providing financial incentives to municipalities that met targets such as 40% coverage of cytology tests. **Objective:** To analyze the evolution of preventive exams coverage and the incidence of cervical cancer in the Seventh Health Regional of the state of Paraná, in the very state, and in the South and Southeast regions of Brazil between 2018 and 2023. **Methods:** A cross-sectional quantitative study was conducted using data from the Primary Care Information System and the Oncology Panel of the Department of Informatics of the Brazilian Unified Health System, analyzing coverage and incidence rates by region and municipality. **Results:** There was a progressive increase in exams coverage, although still below the established targets. We verified improvements in the Seventh Health Regional, with variability among municipalities. In addition, we observed a correlation between increased coverage and higher detection of cases. **Conclusions:** The expansion of cervical cytology screening shows positive results, but challenges remain. Human papillomavirus vaccination and the strengthening of Previne Brasil targets are essential strategies to reduce cervical cancer incidence.

**Keywords:** Uterine cervical neoplasms; Papanicolaou test; Primary health care.

### Corresponding author:

Eduarda Natasha Cella  
E-mail: [eduardacella0621@gmail.com](mailto:eduardacella0621@gmail.com)

### Funding:

no external funding.

### Ethical approval:

not applicable.

### Informed Consent Form:

not applicable.

### Provenance:

not commissioned.

### Associate Editor:

Monique Bourget

### Peer review:

external.

Received: 08/23/2024.

Approved: 06/22/2025.

**How to cite:** Cella EN, Correa LD, Barancelli AJ. Analysis of the progression of cervical cytology screening coverage and cervical cancer incidence following the implementation of the *Previne Brasil* program. *Rev Bras Med Fam Comunidade*. 2025;20(47):4480. [https://doi.org/10.5712/rbmfc20\(47\)4480](https://doi.org/10.5712/rbmfc20(47)4480)



## Resumo

**Introdução:** O câncer de colo de útero é uma das principais causas de morbimortalidade entre mulheres, totalizando cerca de 660 mil novos casos e 350 mil mortes em 2022, segundo a Organização Mundial da Saúde. No Brasil, é o terceiro câncer mais frequente entre mulheres, com 16.590 novos casos estimados em 2020. O Ministério da Saúde recomenda o rastreamento citopatológico em mulheres de 25 a 64 anos a cada três anos após dois resultados normais consecutivos. Em 2019, o Programa *Previne Brasil* foi criado para ampliar a cobertura e a qualidade da atenção primária, oferecendo incentivos financeiros aos municípios que atingissem metas, como 40% de cobertura do exame. **Objetivo:** Este estudo analisou a evolução da cobertura dos exames preventivos e da incidência do câncer de colo de útero na Sétima Regional de Saúde do Paraná, no estado e nas regiões Sul e Sudeste do Brasil, entre 2018 e 2023. **Métodos:** Estudo transversal quantitativo, com dados do Sistema de Informação da Atenção Básica e do Painel da Oncologia do Departamento de Informática do Sistema Único de Saúde, analisando índices de cobertura e incidência por região e município. **Resultados:** Houve aumento progressivo da cobertura de exames, embora ainda abaixo das metas. A Sétima Regional apresentou avanços, mas com variações entre municípios. Observou-se correlação entre ampliação da cobertura e aumento na detecção de casos. **Conclusões:** A expansão dos exames citopatológicos mostra resultados positivos, porém persistem desafios. A vacinação contra o papilomavírus humano e o fortalecimento das metas do *Previne Brasil* são estratégias essenciais para reduzir a incidência do câncer de colo de útero.

**Palavras-chave:** Neoplasias do colo do útero; Teste de Papanicolaou; Atenção primária à saúde.

## Resumen

**Introducción:** El cáncer de cuello uterino es una de las principales causas de morbimortalidad entre las mujeres, con aproximadamente 660.000 nuevos casos y 350.000 muertes en 2022, según la Organización Mundial de la Salud. En Brasil, es el tercer tipo de cáncer más frecuente entre las mujeres, con una estimación de 16.590 nuevos casos en 2020. El Ministerio de Salud recomienda el examen citopatológico en mujeres de 25 a 64 años cada tres años, después de dos resultados normales consecutivos. En 2019 se creó el Programa *Previne Brasil* para ampliar la cobertura y mejorar la calidad de la atención primaria, ofreciendo incentivos financieros a los municipios que alcanzaran metas como el 40% de cobertura del examen. **Objetivo:** Este estudio analizó la evolución de la cobertura de los exámenes preventivos y la incidencia del cáncer de cuello uterino en la Séptima Regional de Salud de Paraná, en el estado y en las regiones Sur y Sudeste de Brasil entre 2018 y 2023. **Métodos:** Estudio transversal cuantitativo con datos del Sistema de Información de Atención Básica y del Panel de Oncología de DATASUS, analizando los índices de cobertura e incidencia por región y municipio. **Resultados:** Se observó un aumento progresivo en la cobertura de los exámenes, aunque todavía por debajo de las metas. La Séptima Regional mostró avances, con variaciones entre municipios. **Conclusiones:** La expansión de los exámenes citopatológicos muestra resultados positivos, pero aún persisten desafíos. La vacunación contra el VPH y el fortalecimiento de las metas del *Previne Brasil* son esenciales para reducir la incidencia del cáncer de cuello uterino.

**Palabras clave:** Neoplasias del cuello uterino; Prueba de Papanicolaou; Atención primaria de salud.

## INTRODUCTION

Cervical cancer is one of the main types of cancer affecting women worldwide, with around 660 thousand new cases and 350 thousand deaths in 2022, according to the World Health Organization (WHO).<sup>1</sup> In Brazil, cervical cancer is the third most frequent among women, with an estimated 16,590 new cases in 2020.<sup>2</sup>

In this sense, to reduce the morbidity and mortality associated with cervical cancer, the Brazilian Ministry of Health recommends doing the cervical cytology test, as screening, in women aged 25 to 64 years. Routine follow-up consists of repeating the test every three years, after two consecutive normal tests performed with an interval of one year.<sup>3</sup>

To encourage doing these tests, the Ministry of Health launched in 2019 the *Previne Brasil* [Brazil Prevents] Program, through Ordinances No. 2.979, of November 12, 2019, and No. 3.222, of December 10, 2019, which aimed to extend the coverage of preventive exams for cervical cancer as well as for other diseases.<sup>4</sup>

*Previne Brasil* also aimed to increase access to health services and its quality throughout the country, encouraging the performance of Primary Health Care and strengthening the healthcare network. To this end, financial resources were transferred to the municipalities that met the goals set by the program —

such as the expansion of the coverage of preventive exams and the registration of patients in programs to follow up chronic diseases.<sup>4</sup>

The goal established by the Ministry of Health to receive the incentive to pay for performance through the Previne Brasil Program corresponds to 40% of the coverage of cervical cytology test for women between 25 and 64 years old who had done at least one cervical cytology test in a three-year period.<sup>5</sup>

Prior to establishing this systematization, the recording of the data on test performance was regionally carried out by the System of Registration of Health Pacts and Indicators (*Sistema de Registro de Pactuações e Indicadores em Saúde*). In other words, the quantitative values did not take into account the actual coverage of the population, but rather the total values of the tests performed, i.e., a woman who did the test two or more times would be counted according to the old metrics, thus hindering the understanding of the actual coverage scenario.<sup>6</sup>

However, despite the efforts of the Previne Brasil Program, information on the effectiveness of the coverage of preventive exams in the country is still incipient in terms of scientific research, which evidences the need to evaluate how the progression of coverage took place since the implementation of the system. Within this context, in the present research, we aimed to analyze the advance of the coverage of preventive exams for cervical cancer both in the years 2018 and 2019, which preceded the systematization, as well as in the context of the Previne Brasil Program since its establishment until 2023, also presenting the incidence of cervical cancer in the Seventh Health Regional of the State of Paraná, in the South and Southeast regions, and in Brazil.

## METHODS

This is a cross-sectional and quantitative study to evaluate numerical data regarding the coverage index of preventive exams and the incidence of cervical cancer in the municipalities of the Seventh Health Regional of the State of Paraná, in the Southeast and South regions of Brazil, and in the country as a whole during and after the implementation of the Previne Brasil Program, covering the period from 2018 to 2023.

The territorial stratification of the Seventh Health Regional of the State of Paraná includes 15 cities: Bom Sucesso do Sul, Chopinzinho, Clevelândia, Coronel Domingos Soares, Coronel Vivida, Honório Serpa, Itapejara d'Oeste, Mangueirinha, Mariópolis, Palmas, Pato Branco, São João, Saudade do Iguaçú, Sulina, and Vitorino.<sup>7</sup>

Data collection to estimate the coverage of cytology tests for cervical cancer screening was carried out in the Primary Care Information System (*Sistema de Informação da Atenção Básica – SISAB*),<sup>8</sup> through the performance indicators of women with cervical cytology tests in Primary Health Care, in percentage, in the third four-month period of the years 2018 to 2023, including the municipalities of the Seventh Health Regional the State of Paraná, the South and Southeast regions of Brazil, and data on the country as a whole, with this data model being available. Considering the unavailability of unified data from the Seventh Health Regional in the system, the average percentage of the cities that compose the administrative region was carried out.

The Seventh Health Regional was selected for convenience, with the analysis extending from its municipalities to regional, state, macroregional, and national levels. For comparative purposes, the Southeast region was deemed as a reference, considering its high population density, geographical proximity, and cultural and socioeconomic similarities.

To collect data on the incidence of cervical cancer, the system of the Oncology Panel was used,<sup>9</sup> made available by the Ministry of Health, through the Department of Informatics of the Brazilian Unified Health System, covering the period from 2018 to 2023, stratified according to data from the municipalities of the Seventh Health Regional of the State of Paraná, from the South and Southeast regions of Brazil, and the total incidence values in the country and cases per year, with options of detailed diagnosis of malignant neoplasm of the cervix and carcinoma *in situ* of the cervix.

After gathering such information, the structuring of tables and figures and the analysis of the data by descriptive statistics were performed, calculating the average by using the Microsoft Office Excel software, according to the tabular presentation standards of the Brazilian Institute of Geography and Statistics,<sup>10</sup> with the coverage of cytology tests and information on the incidence of cervical cancer in the period of implementation of the current control system. The aim was to analyze how the data progressed, thus showing the progression in coverage and incidence values.

This research waives ethical approval and evaluation according to Resolution No. 510/2016 of the National Health Council, as it deals with public data.

## RESULTS

For comparison purposes, all data collected in the Primary Care Information System<sup>8</sup> refer to the last four-month period of each year. They were systematized and presented as a percentage, according to the year and the reference place, as shown in Table 1. Similarly, the data collected in the Oncology Panel, referring to the absolute number of cancers, are presented in Table 2.

Among the data presented regarding the coverage of cervical cytology test, we highlight the municipality of Coronel Domingos Soares, whose initial value of the series from 2018 to 2023 was 23%. It ended the period with a 62% coverage, presenting the highest final value, as well as the municipality of Bom Sucesso do Sul, but with the highest real gain. In turn, according to data from the Seventh Health Regional of the State of Paraná, we verified the initial value of 20.8% and the final value of 46.73%. In the state of Paraná, the values were significantly lower, starting the series with a coverage of 11% and ending it with 28% coverage. However, there was an equivalent relative rise. In Table 1, we describe the characteristics of the sample.

When analyzing regional data, we observed that southern Brazil recorded a significant increase in the coverage of tests. In 2018, coverage accounted for 15% only. By 2023, this index rose to 30%, resulting in an increase of 15 percentage points. Comparing the South with the Southeast region of Brazil, there was also an increase of 15 percentage points. Nonetheless, the final coverage of 2023 in the Southeast region was 25%, while in 2018 it was 10%. In the national scenario, tests coverage increased from 11% in 2018 to 27% in 2023, reflecting overall improvement over the period.

With regard to cancer records, it is worth emphasizing that data at the municipal level have limitations on their reliability. This is because municipalities that are deemed reference in health in the region, such as Pato Branco and Palmas, concentrate most of the oncological diagnoses and treatments. Consequently, these cities end up gathering a disproportionate volume of records, which can generate distortion in the real distribution of cases in the regional population. Given this concentration, the data of these municipalities do not accurately reflect the epidemiological situation of the entire region and, therefore, were excluded from the present analysis. This decision is justified by the inadequacy of these data to subsidize the formulation of local public policies or to serve as a basis on predictive models aimed at public health.

**Table 1.** Percentage of the coverage of cervical cytology tests in the municipalities of the Seventh Health Regional of the State of Paraná, in Paraná, in the South and Southeast regions of Brazil, and in the country as a whole, covering the third four-month period of the years 2018 to 2023.

	2018	2019	2020	2021	2022	2023
Bom Sucesso do Sul	36	34	25	38	45	62
Chopinzinho	24	27	28	32	40	43
Clevelândia	3	8	13	22	36	53
Coronel Domingos Soares	23	30	36	38	53	62
Coronel Vivida	38	43	41	39	40	52
Honório Serpa	23	21	19	21	30	47
Itapejara D'Oeste	23	38	32	29	27	46
Mangueirinha	16	41	45	47	53	55
Mariópolis	12	15	19	27	39	43
Palmas	18	24	20	21	24	33
Pato Branco	33	36	35	29	34	40
Sao João	19	26	28	33	38	43
Saudade do Iguaçu	8	24	25	28	29	30
Sulina	23	42	46	45	44	57
Vitorino	13	15	15	14	22	35
Average of the Seventh Regional	20.8	28.26	28.46	30.86	36.93	46.73
Paraná	11	15	14	16	23	28
South	15	18	17	18	24	30
Southeast	10	19	13	14	19	25
Brazil	11	14	14	15	22	27

Source: Primary Care Information System (SISAB).<sup>8</sup>

The concentration of records in reference centers emphasizes the importance of considering the territorial and functional context of health services when interpreting epidemiological data. Although these regional centers play a strategic role in access to diagnosis and specialized treatment, their centrality can mask the reality of other municipalities, requiring specific methodological approaches that contemplate such dynamics to ensure greater accuracy in inferences and in the formulation of intervention strategies.

As for data concerning the Seventh Health Regional, the annual number of diagnoses ranges between 133 and 210, with an average of 154 new cases per year. Throughout the state of Paraná, the number of cases fluctuates between 2,343, in the year with the lowest record, and 2,995, in the year with the highest number, with an annual average of 2,658 cases (Table 2).

In the Southern region of Brazil, the number of cases ranged between 5,027 and 7,466, with an annual average of 6,478. In comparison, the Southeast region presented higher numbers, with a minimum of 7,825 and a maximum of 10,346 cases, resulting in the annual average of 9,409 cases. In Brazil, the cases ranged from 22,371 to 30,402, with an annual average of 27,421 new cases.

## DISCUSSION

Based on data collected from the Primary Care Information System, we observed a fluctuating progression of the coverage levels of cervical cytology tests since the beginning of the new systematization

**Table 2.** Incidence of malignant neoplasm of the cervix and carcinoma *in situ* of the cervix in the municipalities of the Seventh Health Regional of the State of Paraná, in Paraná, in the South and Southeast regions of Brazil, and in the country as a whole, covering the third four-month period from 2018 to 2023.

	2018	2019	2020	2021	2022	2023	Total
Bom Sucesso do Sul	2	3	0	0	3	0	8
Chopinzinho	5	5	5	3	7	8	33
Clevelândia	6	2	3	5	4	6	26
Coronel Domingos Soares	4	10	4	2	3	0	23
Coronel Vivida	2	10	3	11	7	5	38
Honório Serpa	2	2	0	1	1	5	11
Itapejara D'Oeste	2	6	2	2	2	8	22
Mangueirinha	5	5	12	3	5	4	34
Mariópolis	1	4	1	2	1	2	11
Palmas	108	115	64	77	55	43	462
Pato Branco	12	37	36	34	49	52	220
São João	3	3	1	1	1	4	13
Saudade do Iguaçu	1	1	2	2	2	0	8
Sulina	0	2	0	1	3	0	6
Vitorino	1	5	0	0	2	0	8
Seventh Health Regional	154	210	133	144	145	137	923
Paraná	2,500	2,717	2,343	2,456	2,995	2,934	15,945
South region	5,027	6,410	6,125	6,373	7,465	7,466	38,866
Southeast region	7,825	9,977	8,594	9,606	10,346	10,103	56,451
Brazil	22,371	28,727	25,685	28,089	30,402	29,247	164,521

Source: Oncology Panel.<sup>9</sup>

of targets of the *Previne Brasil* Program, with positive and relevant progression compared to the period from 2018 to 2023.

The average coverage of cervical cytology test found in the municipalities of the Seventh Health Regional was 20.8% in 2018 and 46.73% in 2023, showing an increase of 25.93% in test coverage. This finding is lower than the parameter recommended by the WHO for the effective control of cervical cancer, which is at least 80%,<sup>1</sup> but it represents a higher value than that recommended by the Ministry of Health, which was 40%.<sup>5</sup>

According to the data, of the municipalities of the Seventh Health Regional of the State of Paraná, Bom Sucesso do Sul, Chopinzinho, Clevelândia, Coronel Domingos Soares, Coronel Vivida, Honório Serpa, Itapejara D'Oeste, Mangueirinha, Mariópolis, Pato Branco, São João, and Sulina met the targets set by *Previne Brasil*, contributing to a more effective control of cervical cancer incidence. Conversely, the municipalities of Palmas, Saudade do Iguaçu, and Vitorino did not reach the recommended value of 40%; however, we verified positive progression in the three cities from 2018 to 2023, with increases of 15% for Palmas and 22% for both Saudade do Iguaçu and Vitorino, evidencing the effort to reach the recommended values.

In the state of Paraná, the coverage of cervical cytology test increased by 17% in the period from 2018 to 2023, with a final value of 28% — a lower increase compared to the Seventh Health Regional of the State of Paraná, but showing greater control in relation to cervical cancer in these municipalities.

As for the South and Southeast regions of Brazil, as well as Brazil as a whole, we observed an increase in the coverage of cervical cytology test between 2018 and 2023, with an increase of 15% for the South and Southeast regions and 16% for the country. Nevertheless, neither the regions nor the national total met the target established by the *Previne Brasil* Program.

Schönholzer et al.,<sup>11</sup> in their study on performance indicators in Primary Health Care in the third four-month period of 2021, demonstrated that no Brazilian state had reached the 40% target for cytology test coverage. Nevertheless, the Northeast and South regions showed a relative increase in the average of this test, indicating a national effort to raise the coverage rates since the implementation of the program. Thus, as per the data previously presented in this study, there seems to be a continuity of these efforts, showing a consistent increasing trend from the beginning of the program's implementation to the present day.

The indicator of cervical cytology test with the implementation of *Previne Brasil* in the state of Minas Gerais was evaluated in the years 2022 and 2023, and researchers showed that the coverage percentage in the third four-month period of 2023 was 30%, also below the recommended, but higher than the values recorded in previous years. Between 2022 and 2023, there was a significant increase in the performance of cervical cytology test in several health macroregions, such as in the city of Jequitinhonha (51.61%), in the North (52.32%), and in the West (50%). This evolution indicates an effort similar to that observed in the Seventh Health Regional, although more heterogeneous among the different regions of the state.<sup>12</sup>

Both the state of Minas Gerais and the Seventh Health Regional of the State of Paraná faced similar difficulties, such as the impacts of the COVID-19 pandemic, which impaired the performance of tests and temporarily reduced financial transfers, although with important differences that are worth highlighting. While the Seventh Health Regional seems to have had a more homogeneous performance among its municipalities, in Minas Gerais the advances were quite unequal, with some regions registering an increase of less than 15% — such as in Triângulo do Sul (11.11%).<sup>12</sup>

The difficulty implementing the law with the COVID-19 pandemic, especially between 2020 and mid-2022, prevented carrying out campaigns and projects to expand coverage in some municipalities, which ultimately resulted in a slower rate of coverage increase. The production of care in Primary Health Care was affected during the pandemic because of the increase in demands related to the disease, in addition to restrictions on circulation, businesses operation, and interruption of face-to-face activities, which aimed to reduce the spread of the virus and resulted in the creation of specific safety protocols and guidelines.<sup>13</sup> These restrictions impacted coverage values and, consequently, may have influenced cancer incidence data. In addition to these social restrictions, there was a reduction of 44.6% of the budgeted destined to perform cytology tests in Brazil in 2020.<sup>14</sup>

Another aspect worth considering is the impact of the relation between performance markers and municipal funding by the Federal Government. Unlike the previous model, based on the provision of services and the weighted capitulation of the population, *Previne Brasil* introduced performance indicators as a variable remuneration criterion. This change caused a mobilization on the part of municipal managers and family health teams to expand cervical cancer screening, as the increase in coverage became directly associated with the increase in financial transfers of the Federal Government. The financial incentive linked to performance contributed to the organization of the agenda of preventive exams, active search of women with delayed exams, greater regularity in the provision of the service, and training of the teams to properly collect and record data.<sup>15</sup>

However, challenges to be overcome are also highlighted, such as those related to access to the test and to the awareness of the population in places of notorious social vulnerability — such as women

with lower levels of education, Black, older individuals, and those living in the North and Northeast regions of Brazil.<sup>16</sup>

Such conditions are of great importance in the presented regions, especially social inequality in territories of the Southeast, where there are still places in which the State presence is insufficient, as is the case of favelas in Rio de Janeiro.<sup>17</sup> Furthermore, it is worth mentioning the increasing rate of population aging, especially in the South region.<sup>16</sup>

By analyzing the incidence of malignant neoplasm of the cervix and carcinoma *in situ* of the cervix in large population groups, such as those of the state of Paraná, the South and Southeast regions, and Brazil as a whole, we verified a significant increase in the frequency of these diagnoses. This increase may be related to the expansion of the coverage of Pap smear in these locations, evidencing the relation between the expansion of screening and the increase in diagnosed cases.

The absence of an inverse correlation between increased coverage of cervical cytology test and reduction of the incidence of cervical cancer can be attributed to the fact that coverage levels, despite the increasing trend, still remain below the minimum recommended by the WHO, whose goal is  $\geq 80\%$  coverage of the target population so that screening programs have a significant impact on the reduction of incidence and mortality due to cervical cancer.

Given the short time from the implementation of the program to the measurement of the presented data, we still have a small dimension of the impacts of the systematization. Therefore, although the expansion of the coverage of cervical cytology test between 2018 and 2023 is an important advance, the levels are still insufficient to generate measurable impact on the incidence of cervical cancer. The continuity of efforts to achieve the 80% coverage target, combined with the qualification of the follow-up of altered cases, the modernization of screening with the inclusion of the human papillomavirus (HPV) test, and the improvement of population cancer records will be essential to achieve significant results in the prevention and control of this neoplasm in the coming years.

In the long term, the continuous monitoring of the coverage of cervical cytology tests and its correlation with the incidence and results of cervical cancer diagnoses will be crucial. This analysis complements the assessment of the impact of early screening strategies to adjust public health policies to better control neoplasm of the cervix.

We can state that government efforts to increase the coverage rates of this important prevention instrument have presented satisfactory results, although still below the consolidated international metrics. The continuity of the methodology established in the program, with subsequent increase in the target values, is essential.

In addition to the aforementioned aspects, we highlight the expectation of an even greater decrease in cases of cervical cancer in the coming years, due to the inclusion of the HPV vaccine in the vaccination schedule in 2014,<sup>18</sup> considering that countries that implemented this vaccine earlier in their vaccination schedule, such as Australia, have recorded significant reductions in the incidence of both genital warts and cervical cancer in four years.<sup>19</sup> Thus, in the long term, it is expected that the comparative data with the diagnosis of cervical cancer will demonstrate the actual impact of prevention, diagnosis, and early treatment of dysplasias precursor of this type of neoplasia.

## CONFLICT OF INTERESTS

Nothing to declare.

## AUTHORS' CONTRIBUTIONS

ENC: Conceptualization, Data curation, Formal Analysis, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. LDC: Formal analysis, Writing – original draft, Writing – review & editing. AJB: Formal analysis, Supervision, Validation, Writing – review & editing.

## REFERENCES

1. UN News. OMS celebra janeiro como mês de conscientização sobre câncer do colo do útero [Internet]. Nova York: United Nations; 2025 [cited on Apr. 29, 2025]. Available at: <https://news.un.org/pt/story/2025/01/1843101>
2. Instituto Nacional de Câncer José Alencar Gomes da Silva. Estimativa 2020: incidência de câncer no Brasil [Internet]. Rio de Janeiro: Instituto Nacional de Câncer José Alencar Gomes da Silva; 2020 [cited on Apr. 27, 2023]. Available at: <https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/estimativa-2020-incidencia-de-cancer-no-brasil.pdf>
3. Instituto Nacional de Câncer José Alencar Gomes da Silva. Diretrizes para o rastreamento do câncer do colo do útero [Internet]. Rio de Janeiro: Instituto Nacional de Câncer José Alencar Gomes da Silva; 2016 [cited on Apr. 27, 2023]. Available at: [https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/diretrizesparaora-streamentodocancerdocolodoutero\\_2016\\_corrigido.pdf](https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/diretrizesparaora-streamentodocancerdocolodoutero_2016_corrigido.pdf)
4. Brasil. Ministério da Saúde. Portaria nº 2.979, de 12 de novembro de 2019. Dispõe sobre as diretrizes para a organização da Atenção Primária à Saúde no âmbito do Sistema Único de Saúde. Diário Oficial da União 2019;Seção 1:72-6.
5. Brasil. Ministério da Saúde. Nota Técnica nº 3/2022-DESF/SAPS/MS [Internet]. Brasília: Ministério da Saúde; 2022 [cited on Apr. 27, 2023]. Available at: <https://www.cnm.org.br/cms/images/stories/Links/NT-Alteracao-Indicadores-de-Desempenho-Previne-Brasil-1.pdf>
6. Brasil. Ministério da Saúde. Gabinete do Ministro. Comissão Intergestores Tripartite. Resolução nº 8, de 24 de novembro de 2016. Diário Oficial da União [Internet]. 2016 [cited on Apr. 21, 2023]. Available at: [https://bvsmms.saude.gov.br/bvs/saudelegis/cit/2016/res0008\\_24\\_11\\_2016.html](https://bvsmms.saude.gov.br/bvs/saudelegis/cit/2016/res0008_24_11_2016.html)
7. Sétima Regional de Saúde. Pato Branco. Secretaria da Saúde do Paraná [Internet]. [cited on Apr. 21, 2023]. Available at: <https://www.saude.pr.gov.br/Pagina/7a-Regional-de-Saude-Pato-Branco>
8. Brasil. Ministério da Saúde. Secretaria de Atenção Primária à Saúde. Painel Indicador, Estratégia eSUS-AB, Unidade Geográfica: Município. Indicador: Proporção de mulheres com coleta de citopatológico na APS [Internet]. Brasil: Ministério da Saúde [cited on Feb. 26, 2024]. Available at: <https://sisab.saude.gov.br/paginas/acesoRestrito/relatorio/federal/indicadores/indicadorPainel.xhtml>
9. Painel Oncologia. Diagnóstico detalhado: C53 - Neoplasia maligna do colo do útero, D06 - Carcinoma in situ do colo do útero (cérvis), casos por ano do diagnóstico segundo município da residência [Internet]. [cited on Feb. 26, 2024]. Available at: [http://tabnet.datasus.gov.br/cgi/dhdat.exe?PAINEL\\_ONCO/PAINEL\\_ONCOLOGIABR.def](http://tabnet.datasus.gov.br/cgi/dhdat.exe?PAINEL_ONCO/PAINEL_ONCOLOGIABR.def)
10. Instituto Brasileiro de Geografia e Estatística (IBGE). Normas de apresentação tabular [Internet]. 3. ed. Rio de Janeiro: IBGE; 1993 [cited on Apr. 27, 2023]. Available at: <https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=223907>
11. Schönholzer TE, Zacharias FCM, Amaral GG, Fabriz LA, Silva BS, Pinto IC. Indicadores de desempenho da Atenção Primária do Programa Previne Brasil. Rev Latino-Am Enfermagem. 2023;e4009. <https://doi.org/10.1590/1518-8345.6640.4009>
12. Silva PRM, Santos LS, Souza GV, Bezerra AP de L, Almeida V de, Campos KFC. Exame citopatológico em Minas Gerais: análise do indicador do previne brasil dos anos 2022-2023. Rev Bras Cancerol. 2025;71(1):e-084797. <https://doi.org/10.32635/2176-9745.RBC.2025v71n1.4797>
13. Instituto Brasileiro de Geografia e Estatística (IBGE). Censo Demográfico 2022: População residente por idade [Internet]. Brasília: IBGE; 2023 [cited on May 16, 2025]. Available at: <https://censo2022.ibge.gov.br>
14. Beer AC. Análise dos indicadores de continuidade do cuidado de atenção à saúde da mulher no contexto da pandemia de COVID-19 [dissertação online]. Rio de Janeiro: Fundação Oswaldo Cruz; 2022 [cited on Mar. 10, 2023]. Available at: [https://profsaude-abrasco.fiocruz.br/sites/default/files/autorizado\\_dissertacao\\_ana\\_claudia\\_beer\\_13fev2023profsaude\\_com\\_ficha\\_catalogografica.pdf](https://profsaude-abrasco.fiocruz.br/sites/default/files/autorizado_dissertacao_ana_claudia_beer_13fev2023profsaude_com_ficha_catalogografica.pdf)
15. Brasil. Ministério da Saúde. Secretaria de Atenção Primária à Saúde. Previne Brasil: novo modelo de financiamento da Atenção Primária à Saúde [Internet]. Brasília: Ministério da Saúde; 2020 [cited on May 16, 2025]. Available at: <https://aps.saude.gov.br/previnebrasil>
16. Vieira YP, Viero VSF, Vargas BL, Nunes GO, Machado KP, Neves RG, et al. Tendência e desigualdades no rastreamento autorrelatado do câncer de colo de útero nas capitais brasileiras entre 2011 e 2020. Cad Saúde Pública. 2022;38(9):e00272921. <https://doi.org/10.1590/0102-311XPT272921>
17. Agência Brasil. Falta de serviços básicos preocupa periferias, aponta G20 Favelas [Internet]. Brasília: Agência Brasil; 2024 [cited on May 16, 2025]. Available at: <https://agenciabrasil.ebc.com.br/direitos-humanos/noticia/2024-11/falta-de-servicos-basicos-preocupa-periferias-aponta-g20-favelas>
18. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde e Ambiente. Departamento do Programa Nacional de Imunizações. Coordenação-Geral de Incorporação Científica e Imunização. Nota Técnica nº 41/2024-CGICI/DPNI/SVSA/MS: Atualização das recomendações da vacinação contra HPV no Brasil [Internet]. Brasília: Ministério da Saúde; 2024 [cited on Apr. 22, 2025]. Available at: <https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/notas-tecnicas/2024/nota-tecnica-no-41-2024-cgici-dpni-svsa-ms>