CUIDADO É FUNDAMENTAL

TRENDS IN CERVICAL CANCER SCREENING IN THE STATE OF MATO GROSSO FROM 2014 TO 2021

Tendência do rastreamento do câncer de colo uterino em Mato Grosso, período de 2014 a 2021

La tendencia del seguimiento del cáncer de cuello uterino en Mato Grosso, período de 2014 a 2021

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ABSTRACT

Objective: analysis of cervical cancer screening trends in the sate of Mato Grosso. **Method:** a descriptive study with a quantitative approach, conducted using DATASUS data, involving women who underwent cytological screening in Mato Grosso from 2014 to 2021, through linear regression analysis. **Results:** data analysis revealed a trend of stability during the study period for the variables analyzed. The age group that most frequently underwent the screening was 25 to 64 years old, and the primary reason for the examination was cervical cancer screening. Most of the samples were adequate, the majority of the exams showed transformation zone representation, and the majority of the exams were delivered after a 30-day period. **Conclusion:** due to this observed stability, there is a need to reconsider the oncological care policy for women in the state regarding cervical cancer.

DESCRIPTORS: Mass screening; Uterine cervical neoplasms; Health information systems;

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RESUMO

Objetivo: analisar a tendência do rastreamento do câncer de colo uterino em Mato Grosso, entre 2014 a 2021. **Método:** estudo descritivo, quantitativo, realizado a partir do DATASUS, com mulheres que realizaram o exame citopatológico em Mato Grosso, no período de 2014 a 2021, por meio de análise de regressão linear. **Resultados:** a partir da análise dos dados foi observado tendência de estabilidade no período para as variáveis analisadas. A faixa etária que mais realizou o exame foi a de 25 a 64 anos, o principal motivo do exame foi o rastreamento do câncer de colo uterino, a maioria das amostras foram adequadas, a maior parte dos exames apresentou representação de zona de transformação e a maior parte dos exames foi entregue com mais de 30 dias. **Conclusão:** devido a esta estabilidade observada, necessita-se rever a política de atenção oncológica para as mulheres no estado quanto ao câncer de colo uterino.

DESCRITORES: Programas de rastreamento; Neoplasias do colo do útero; Sistemas de informação em saúde;

RESUMEN

Objetivos: analizar la tendencia del cribado del cáncer de cuello uterino en el estado de Mato Grosso. **Método:** un estudio descriptivo con enfoque cuantitativo, realizado utilizando datos de DATASUS, involucrando a mujeres que se sometieron a un cribado citológico en Mato Grosso desde 2014 hasta 2021, a través del análisis de regresión lineal. **Resultados:** el análisis de datos reveló una tendencia de estabilidad durante el período de estudio para las variables analizadas. El grupo de edad que con mayor frecuencia se sometió al cribado fue de 25 a 64 años, y la razón principal para el examen fue el cribado del cáncer de cuello uterino. La mayoría de las muestras fueron adecuadas, la mayoría de los exámenes mostraron representación de la zona de transformación, y la mayoría de los exámenes se entregaron después de un período de 30 días. **Conclusión:** debido a esta estabilidad observada, es necesario reconsiderar la política de atención oncológica para las mujeres en el estado con respecto al cáncer de cuello uterino.

DESCRIPTORES: Tamizaje masivo; Neoplasias del cuello uterino; Sistemas de información en salud.

INTRODUCTION

According to estimates made by the World Health Organization (WHO), the global trend is for cancer cases to increase in the coming years. This increase by 2030 could result in 24.6 million new cases of cancer. The incidence will be higher in countries in Africa (37.7%) and Latin America (31.0%).[1]

In Brazil, in 2020, the incidence of cervical cancer (CC) was 15.8/100,000 women and the mortality rate was 8.8/100,000 women. For the three-year period 2023 to 2025, 17,010 new cases of CC are expected in Brazil, a rate of 15.38/100,000 women (INCA, 2022). [1-2]

In the state of Mato Grosso, 220 new cases of CC had been reported by March 2023, with an age-adjusted incidence rate of 11.14/100,000 women, making it the second state in the central-west region with the highest incidence. For the three-year period 2023-2025, the estimated incidence rate for cervical cancer is 16.6/100,000 women.[2]

Cervical cancer is a disease that is associated with high morbidity and mortality in the female population. It therefore requires a great deal of attention in Brazilian public health. When diagnosed in the early stages, there is a positive prognosis. Therefore, screening for this disease is essential in order to reduce mortality from this cancer.[3]

The risk factors associated with cervical cancer are: early onset of sexual life, as the woman will have more time to be exposed to the virus, immunosuppression, multiparity, smoking, prolonged use of oral contraceptives due to the high exposure to estrogen. One of the risk factors for CC, although not a determining factor in the development of cervical cancer, is infection with the Human Papilloma Virus (HPV).[4]

Cytology, also known as Pap smears, is a method of identifying precursor or malignant cervical cells by staining a slide. As well as being affordable, it is easy to carry out and can be done in outpatient clinics, making it the best option for screening a large number of women for cervical cancer.[5]

The Guidelines for Cervical Cancer Screening, developed by the National Cancer Institute (INCA) in 2011 and updated in 2016, set out recommendations for health professionals and health managers to organize the line of care. This guideline also contains recommendations on the periodicity and age range for screening. The cytopathology test is offered free of charge by the Unified Health System (SUS) and is recommended for women aged 25 to 60. The recommendation is to have the test annually, or every three years after two results without alterations.[6]

Thus, the development of research on this subject is relevant, as it provides information to management bodies for possible interventions in cervical cancer screening policies and guidelines.

With this in mind, this study aims to analyze the trend in cervical cancer screening in Mato Grosso between 2014 and 2021.

METHOD

This is a descriptive, quantitative, time-series study using secondary data from the Unified Health System (SUS) and information databases from the Department of Informatics of the Unified Health System (DATASUS) and the Cancer Information System (SISCAN). It was not possible to use

a longer period, since data from the period prior to 2014 does not contain the variables: Reason for Examination and Representation of Transformation Zone.

The state of Mato Grosso is located in the center-west of Brazil, in Latin America, at a geodesic point between the Atlantic and Pacific oceans, with a territory of 903,357.908 km², making it the third largest state in terms of territory. It has a population of 3,035,122 million inhabitants and a population density of 3.36 inhabitants per km². The number of men in the state is 51.05%, while women represent 48.95% of the population, which differs from the national picture, where the majority of the population is female (51.1%). The Human Development Index (HDI) is 0.725, ranking 11th in the national HDI ranking.[7]

The municipality of Rondonópolis, located in the state of Mato Grosso, has a population of 244,897 inhabitants. It is the third most populous municipality in the region,

However, it stands out as the second most developed in the state, with an HDI of 0.755. This puts it in second place behind the capital Cuiabá, with an HDI of 0.785.[8]

The sample consisted of women who underwent Pap smears in the state of Mato Grosso and in the municipality of Rondonópolis, between 2014 and 2021, through the Unified Health System and who were registered in the DATASUS information database, whose source is SISCAN. The database is non-nominal, downloaded separately by variable, making it impossible to analyze associations between them.

The inclusion criteria were all women who underwent a Pap test between 2014 and 2021, aged between 25 and 65. The exclusion criteria were duplicate data and/or incomplete data.

Data was collected from the DATASUS/SISCAN information database in January 2023. Initially, the variables suitability, cellular atypia, age group, reason for examination, representation of transformation zone and result interval were chosen. However, due to the high level of incompleteness, it was necessary to exclude the cellular atypia variable, which was more than 70.0% incomplete.[9]

The other variables were collected from the database and have categories describing them, which are: Age group: "< 25 years", "25 to 64 years", and ">64 years"; Suitability: "Yes" or "No"; Reason for examination: "Screening", "Follow-up" and "Repeat"; Representation of transformation zone: "Yes" or "No" and Result interval: "< 10 days", "11 to 20 days", "21 to 30 days" and "> 30 days".

The data obtained was tabulated using Microsoft Excel to clean and organize the data collected. The data was then analyzed using STATA 16 statistical software.

For the age group variable, a calculation was made using the IBGE population estimate by age in the denominator, as per the calculation below.

$$\text{Population estimate} = \underline{\text{Women who have had a Pap smear}} = \text{x1000}$$

To describe the frequency of a characteristic in a population, we used the statistical technique of characterization by proportion, which is based on calculating the proportion of individuals who have the characteristic in question in relation to the total sample. This technique is applicable in various areas of knowledge, such as health, education and economics, and can be used to identify the prevalence of diseases in a population and guide prevention and treatment actions.[10]

For the trend analysis, the Shapiro-Wilk normality analysis was first carried out. Linear regression analysis was then carried out using STATA software version 16.

In accordance with research ethics standards, this research is part of a matrix study entitled "Gynecological Cancer in Mato Grosso: Analysis of Screening, Diagnosis and Mortality" approved by the Research Ethics Committee of the Federal University of Rondonópolis under CAAE: 54233321.6.0000.0126, opinion no. 5.180.828, on December 20, 2021.

RESULTS

In the period analyzed, from 2014 to 2021, 83,092 tests were carried out in Rondonópolis and 1,098,631 cytopathological tests in the state of Mato Grosso.

In the municipality of Rondonópolis, the 24 to 64 age group performed the most tests, accounting for 80.94% of the total. Women under 25 accounted for 13.74% of the tests, while women over 64 accounted for 5.30%.

In the state of Mato Grosso, screening was more prevalent in the 25-64 age group, accounting for 79.55% of screenings, followed by the group of women under 25, accounting for 15.77% of screenings, and 4.57% in the over-65 age group.

In Rondonópolis, the "reason for examination" category had the following proportions of occurrence: "screening" represented the vast majority, with 96.05%, while "repetition" accounted for just 0.76%, and "follow-up" had a proportion of 3.18%.

In the state of Mato Grosso, during the period, the category "reason for examination" was also evaluated, and the results showed an even greater predominance of "screening", with a significant proportion of 97.25%. "Follow-up" had a lower proportion, at 2.40%, followed by "repetition", which had an even lower proportion, at 0.33%.

In the state of Mato Grosso, when analyzing the "suitability" of the samples, it was observed that 98.33% of them were considered "satisfactory". The samples considered "unsatisfactory" accounted for 1.44%, and the "rejected" samples were 0.24%.

In Rondonópolis, the "Yes" category for representation of the Transformation Zone (ZT) was 61.05%, the "No" category was 38.61%, and the "Ignored" category was 0.32%. With regard to the "representation of the transformation zone" samples for the period 2014 to 2021 in the state of Mato Grosso, 59.14% of the samples analyzed were classified as

"yes", while 39.47% were classified as "no" and 1.37% were classified as "ignored".

With regard to the "test interval" in the state of Mato Grosso during the study period, it was observed that the majority were delivered "more than 30 days late", corresponding to 40.02% of all tests. Next, 24.05% of the exams were delivered between "11 and 20 days", followed by 19.02% between "21 and 30 days" and 16.89% in the first 10 days after the exam. In Rondonópolis, 22.48% were delivered "before 30 days" and 77.51% took "more than 30 days" to be delivered.

Table 1 - Relative frequency of cervical cancer screening, according to the variables analyzed. Rondonópolis and Mato Grosso, from 2014 to 2021.

RONDONÓPOLIS								
VARIABLE	**2014 %**	**2015 %**	**2016 %**	**2017 %**	**2018 %**	**2019 %**	**2020 %**	**2021 %**
AGE GROUP								
<25 years old	16,6	21,0	22,7	18,4	14,4	14,5	8,5	11,5
25 - 64 years old	109,1	133,3	142,5	131,1	101,3	107,3	67,1	97,7
> 64 years old	7,5	9,4	10,1	8,4	6,7	6,4	3,5	5,4
REASON FOR EXAMINATION								
Tracking	93,6	93,9	96,7	96,8	96,6	97,3	97,1	96,9
Repetition	0,4	0,4	0,7	1,12	0,8	0,6	1,6	0,8
Follow-up	6,0	5,7	2,6	2,0	2,6	2,1	1,2	2,4
FITNESS								
Rejected	0,32	0,13	0,12	0,03	0,01	0,01	0,00	0,08
Satisfactory	99,56	99,80	99,81	99,93	99,65	99,72	99,52	98,91
Unsatisfactory	0,12	0,07	0,07	0,03	0,34	0,27	0,48	1,0
REPRESENTATION ZONE T								
Yes	58,5	56,6	57,2	61,3	64,7	65,1	63,3	65,0
No	41,1	43,2	42,6	38,7	35,0	34,7	36,3	34,0
Ignored	0,5	0,2	0,2	0,1	0,3	0,2	0,5	1,0
EXAM INTERVAL								
0-10 days	9,6	1,35	2,64	2,01	1,11	0,78	7,30	4,13
11-20 days	30,73	2,83	2,43	3,18	2,72	0,88	12,21	22,70
21-30 days	31,76	7,81	3,46	5,96	2,54	1,90	10,89	24,38
>30 days	28,34	88,01	91,47	88,85	93,64	96,44	69,68	48,79
MATO GROSSO								
VARIABLE	**2014 %**	**2015 %**	**2016 %**	**2017 %**	**2018 %**	**2019 %**	**2020 %**	**2021 %**
AGE GROUP								
<25 years old	6,1	8,5	19,1	19,7	17,5	17,1	9,5	11,9
25 - 64 years old	41,0	54,1	118,8	119,6	107,6	107,5	61,3	82,2
> 64 years old	2,5	2,9	7,2	7,1	6,3	6,2	3,0	3,9

REASON FOR EXAMINATION								
Tracking	95,5	96,0	96,6	97,0	98,0	98,2	98,3	98,4
Repetition	0,2	0,3	0,4	0,4	0,3	0,3	0,4	0,4
Follow-up	4,3	3,7	2,8	2,6	1,7	1,5	1,3	1,2
FITNESS								
Rejected	0,3	0,2	0,2	0,4	0,3	0,2	0,3	0,1
Satisfactory	98,4	98,8	98,7	98,7	98,5	97,5	97,1	98,4
Unsatisfactory	1,3	1,0	1,0	0,9	1,2	2,3	2,6	1,5
REPRESENTATION ZONE T								
Yes	58,6	58,6	60,8	59,6	58,6	56,3	58,0	62,7
No	39,7	40,3	38,4	39,5	40,3	41,5	39,5	36,1
Ignored	1,6	1,2	0,8	0,9	1,1	2,2	2,5	1,2
EXAM INTERVAL								
0-10 days	15,1	21,5	19,0	20,1	15,4	9,3	14,1	19,3
11-20 days	32,6	20,6	23,2	22,3	28,9	17,9	23,7	26,0
21-30 days	22,6	19,0	12,8	17,0	19,7	23,4	21,7	18,5
>30 days	29,7	38,8	44,9	40,6	35,9	49,3	40,5	36,2

Source: DATASUS/SISCAN/MT

Table 2 - Trends in cervical cancer screening, according to the variables analyzed. Rondonópolis and Mato Grosso, 2014 to 2021.
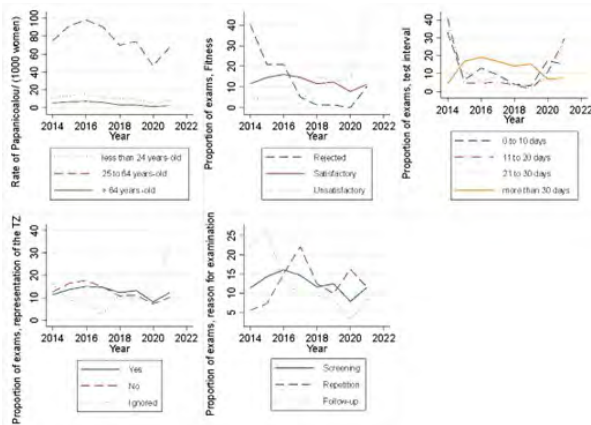
	RONDONÓPOLIS		
VARIABLE	**P VALUE**	**CONF INTERVAL. 95%**	**TREND**
AGE GROUP			
<25 years old	0.250	- 2.040112 .708187	Stable
25 - 64 years old	0.498	-10.17428 5.87311	Stable
> 64 years old	0.105	-1.599751 .2247771	Stable
REASON FOR EXAMINATION			
Tracking	0.186	-1149.689 278.4269	Stable
Repetition	0.406	-8.155558 17.53651	Stable
Follow-up	0.008	-116.5138 -26.46234	Downward Trend
FITNESS			
Rejected	0.022	-6.183692 - 69726	Stable
Satisfactory	0.135	-1228.41 211.8152	Stable
Unsatisfactory	0.025	1.642694 16.97635	Stable
REPRESENTATION ZONE T			

Yes	0.344	-601.4599	246.0552	Stable
No	0.045	-648.8667	-10.53808	Downward Trend
Ignored	0.255	-4.698505	14.65089	Stable
EXAM INTERVAL				
0-10 days	0.434	-136.1965	66.72028	Stable
11-20 days	0.773	-482.9896	376.8944	Stable
21-30 days	0.598	-511.9677	322.0629	Stable
>30 days	0.600	-1733.034	1093.653	Stable

MATO GROSSO

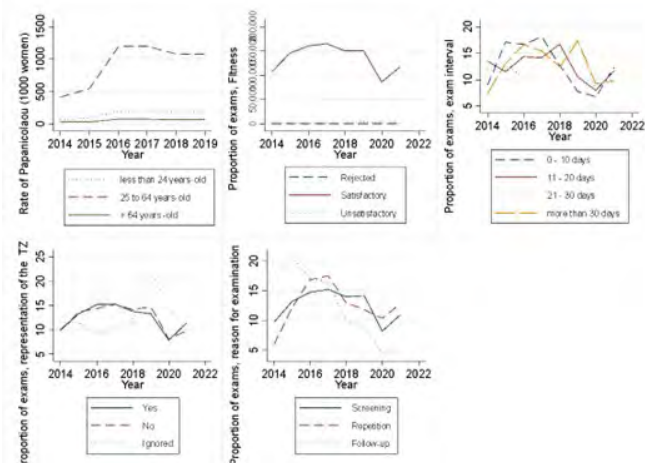| VARIABLE	2014 %	2015 %	2016 %	2017 %	2018 %	2019 %
AGE GROUP						
<25 years old		0.082		-4.78998	51.78215	Stable
25 - 64 years old		0.078		-25.27308	307.5468	Stable
> 64 years old		0.100		-2.493651	18.91683	Stable
REASON FOR EXAMINATION						
Tracking		0.594		-13487.79	8441.746	Stable
Repetition		0.714		-45.84754	62.89516	Stable
Follow-up		0.001		-856.4374	-393.2055	Downward Trend
FITNESS						
Rejected		0.368		- 70. 35154	30.28011	Stable
Satisfactory		0.499		- 14364.99	7839.041	Stable
Unsatisfactory		0.196		- 97.9569	385.3379	Stable
REPRESENTATION ZONE T						
Yes		0.548		-8432.433	4948.981	Stable
No		0.465		-6103.567	3155.043	Stable
Ignored		0.484		-175.0944	328.4277	Stable
EXAM INTERVAL						
0-10 days		0.339		-4421.442	1787.323	Stable
11-20 days		0.301		-3842.94	1411.678	Stable
21-30 days		0.859		-2448.636	2103.422	Stable
>30 days		0.881		-7249.601	6381.554	Stable

Source: DATASUS/SISCAN/MT

Graph 1 - Trend of Pap smear variables according to age group, reason for exam, sample adequacy, T-zone representation and exam interval. Rondonópolis, 2014 to 2021.

Source: DATASUS/SISCAN/MT

Graph 2 - Trend of Pap smear variables according to age group, reason for exam, sample adequacy, T-zone representation and exam interval. Rondonópolis, 2014 to 2021.

Source: DATASUS/SISCAN/MT

DISCUSSION

Based on this study, it was possible to observe that the age group that underwent the most cytopathological examinations in the city of Rondonópolis and in the state of Mato Grosso was the "25 to 64 years" age group, the main reason for the examination was "screening", and the majority of the samples were "adequate", just over half showed representation of the Transformation Zone and more than half took "more than 30 days" to receive the results of the examinations.

Screening for cervical cancer is carried out periodically through the cytopathological examination, and is considered the most widely used preventive strategy in Brazil. The target age group is women aged 25 to 64.[11]

Unlike other neoplasms, cervical cancer is highly predictable due to its slow evolution and the availability of the Pap test, which is easy to access, low cost and highly effective.[11]

This diagnostic method aims to screen for precursor lesions of cervical cancer. This test microscopically analyzes any cellular alterations, making it possible to diagnose everything from low-grade intraepithelial lesions (LSIL) to the most serious lesions that can develop into a neoplasm. The cytopathology test, if carried out at appropriate intervals, is still the most effective method for screening for cervical cancer.[12]

In the trend analysis carried out in the municipality of Rondonópolis (Table 2, Graph 1), no significant trend was identified in any of the age groups. It was hoped to find an increase in the trend of this variable for the target age group for the exam, according to the Ministry of Health (25 to 64 years), with the aim of reaching a greater number of women undergoing screening in the target age group for the exam. In Brazil, women usually undergo cytopathology tests opportunistically, with the reason for going to the health unit being another issue. It is necessary to change to an organized screening model, replacing the opportunistic model.[13]

Although a significant percentage of women under the age of 25 are undergoing the test, it is believed that this section of the population is becoming increasingly necessary due to the increase in the number of sexual partners and the early onset of sexual activity, which is a risk factor for cervical cancer and a greater risk of contracting the HPV virus and the aggravating factor of not being included in the Ministry of Health's target age group, which is why it often ends up being neglected.

A downward trend was observed for the variable "reason for examination" in the "follow-up" category, indicating a decrease in the number of women requiring follow-up due to the appearance of cellular atypia. This suggests a possible reduction in the incidence of cellular atypia in the population, both in Rondonópolis and in the state of Mato Grosso (Table 2, Graphs 1 and 2). Contrary to expectations, no upward trend was identified in the "screening" category. The lack of increase in this category may be a concern, as screening is fundamental for the early detection of health conditions. It is necessary to investigate the underlying reasons for the lack of growth in screening.

As for the proportion, a result similar to that found in our study was observed in the state of NP, in the years 2017 to 2020, showing that 96.51% of the tests carried out were screening tests. As for the adequacy of the samples, 95.80% were satisfactory.[14]

A similar study carried out in Pato Branco, in the state of Paraná, between 2015 and 2019, found that more than 98% were screening tests. In addition, more than 99% of the samples were satisfactory. In the representation of the transformation zone, the author mentions that the values were lower than expected (58.66%).[15]

Comparing the results of this study with the reality in other regions, it can be seen that the state of Mato Grosso lags behind, with only 96.05% of tests being carried out for screening purposes.

No significant trends were observed in any of the adequacy categories, suggesting that the quality of test results remains stable over time (Table 2, Graphs 1 and 2). This is relevant, given that an upward trend was expected in the "Satisfactory" category and a downward trend in the "Rejected" and "Unsatisfactory" categories. As for the proportion, a similar result was observed in a study carried out in

NP, where the percentages were very similar to the regions compared, with 98.33% adequacy.[14]

The representation of the Transformation Zone is another point to be assessed, as this epithelium is exactly where squamous tissue metaplasia can arise. This region is the outermost part of the external orifice of the vaginal canal.[6]

In Rondonópolis, there was a downward trend in the "No" category for the representation of TZ, which may indicate an improvement in the quality of the representation of the transformation zone in the exams carried out in the municipality (Table 2, Graph 1). However, in the state of Mato Grosso as a whole, no significant trends were identified, suggesting stability in the representation of the TZ over time (Table 2, Graph 2). In terms of proportion, Rondonópolis was very similar to Pato Branco, with 59.14% of epithelium representing the transformation zone.[14]

No significant trends were observed in the "Result Interval" in any of the regions analyzed - Rondonópolis and Mato Grosso (Table 2, Graphs 1 and 2). This suggests that the distribution of test results did not show substantial changes over the period analyzed. It was expected that there would be a downward trend in tests delivered more than 30 days later.

The Ministry of Health established in Ordinance No. 3.388, of December 30, 2013, that one of the quality parameters of cytopathological examinations is the delivery of the result within 30 days of the material entering the laboratory until the report is delivered.[9]

Possible limitations of the study include the use of secondary data in the public domain. As such, the databases are downloaded individually and it is not possible to make an association between the variables. One advantage is that the data can be analyzed quickly, providing an overview of the problem and guiding decision-making by health professionals and SUS management.

CONCLUSION

The conclusion is that there has been no trend over the years in cervical cancer screening in the state of Mato Grosso. The majority of people who have undergone the test belong to the 25 to 64 age group, and the main reason for this is screening. The majority of the samples (98.33%) were considered satisfactory, with most of them showing the transformation zone (59.14%) and a significant portion being delivered more than 30 days late (40.02%). Surprisingly, the variables analyzed did not show a significant trend, which goes against the expectation of an increase, especially in the 24 to 64 age group.

In this context, the importance of cervical cancer screening policies stands out, with the aim of promoting women's health autonomy and encouraging regular Pap smears. Such measures can play a vital role in the early detection of cervical cancer and its precursor lesions, contributing substantially to effective screening and reducing the incidence of the disease.

It is therefore imperative to adopt new strategies to improve the quality of the test, with a focus on improving screening and ensuring delivery within a maximum of 30 days.

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