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Spatial distribution of the appropriateness of pap smears in the northeastern region of Brasil

Distribución espacial de la idoneidad de las pruebas de papanicolaou en la región noreste de Brasil

Distribuição espacial da adequabilidade dos exames de papanicolaou na região nordeste Brasileira

ABSTRACT

Objective: To perform the spatial analysis of the adequacy of cytopathological examinations in the northeastern region. **Method:** This is an ecological, quantitative descriptive study, with unit of analysis the municipalities of the Northeast region and the exams performed in the period between 2015 and 2019. **Results:** The northeast region presented 272,619 unsatisfactory collections, it was observed that 252 (14.05%) of the northeastern municipalities presented adequacy between 100% and 95%, 29 (1.62%) with adequacy below 95% and 1,513 (84.34%) did not notify the performance of Pap smears. The main causes of unsatisfactory collections were the presence of drying artifacts (119,115) of the slides, presence of pyocytes (41,547) and collection of cellular material (31,736). **Conclusion:** We identified the absence of registration in the vast majority of municipalities in the spatial analysis, as errors related to the difficulty on the part of professionals who collect cytological material.

DESCRIPTORS: Women's Health; Papanicolaou Test; Quality Control; Spatial Analysis.

RESUMEN

Objetivo: Realizar un análisis espacial de la adecuación de los exámenes citopatológicos en la región noroeste. **Método:** Se trata de un estudio ecológico, cuantitativo y descriptivo, con unidad de análisis los municipios de la región Nordeste y las pruebas realizadas en el periodo comprendido entre 2015 e 2019. **Resultados:** La región nordeste presentó 272.619 coletas insatisfactorias, se observó que 252 (14,05%) de los municipios del nordeste presentaron adecuación entre el 100% y el 95%, 29 (1,62%) con adecuación inferior al 95% y 1.513 (84,34%) no notificaron la realización del Papanicolauo. Las principales causas de coletas insatisfactorias fueron la presencia de artefactos de resecamiento (119,115) de las láminas, la presencia de piócitos (41,547) y la coleta de material celular (31,736) **Conclusión:** Se identificó la ausencia de registro en la mayoría de los municipios del análisis espacial, así como, errores relacionados con la dificultad por parte de los profesionales coletores de material citológico.

DESCRIPTORES: Salud de la Mujer. Prueba de Papanicolaou. Control de Calidad. Análisis Espacial.

RESUMO

Objetivo: Realizar a análise espacial da adequabilidade dos exames citopatológicos na região nordeste. **Método:** Trata-se de um estudo ecológico, quantitativo descritivo, com unidade de análise os municípios da região Nordeste e os exames realizados no período entre 2015 e 2019. **Resultados:** A região nordeste apresentou 272.619 coletas insatisfatórias, observou-se que 252 (14,05%) dos municípios nordestinos apresentaram adequabilidade entre 100% e 95%, 29 (1,62%) com adequabilidade abaixo de 95% e 1.513 (84,34%) não notificaram a realização de Papanicolauo. As principais causas de coletas insatisfatórias foram a presença de artefatos de dessecação (119.115) das lâminas, presença de piócitos (41.547) e coleta de material acelular (31.736) **Conclusão:** Identificou-se a ausência de registro na grande maioria dos municípios da análise espacial, bem como, erros relacionados à dificuldade por parte dos profissionais coletores de material citológico, necessitando de prioridade para melhoria do registro e das técnicas de rastreamento do Câncer de Colo do Útero.

DESCRITORES: Saúde da Mulher; Teste de Papanicolaou; Controle de Qualidade; Análise Espacial.

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INTRODUCTION

The Pap smear is characterized as a test to detect precursor lesions of Cervical Cancer (CC) which, according to the Guidelines for Screening Cervical Cancer,¹ is important in the context of women's health and Public Health due to its high accuracy, low unit cost and good resolution for screening.²

According to the guidelines made available on the Portal of Good Practices in Women's Health,³ One of the pillars of the Action Plan for Reducing the Incidence and Mortality of Cervical Cancer is to guarantee the quality of the Pap smear. For this, it is emphasized the importance of cytological samples being obtained following the Technical Parameters for the Screening of Cervical Cancer⁴ highlights that unsatisfactory samples should not exceed 5% of the total samples taken.

When studying the adequacy of collections, it is not intended only to know the technical variables, but in line with this to observe the impacts of errors in tracking the CC, considering that users with exams characterized as unsatisfactory or rejected undergo a new collection process due to the lack of results.^{4,5}

In this context, it is necessary to identify the main causes of errors, highlighting the information regarding slides rejected by the laboratory that showed absence or error in identification, error in collection and damaged or missing slides.⁴ The percentage of municipalities with unsatisfactory samples above 5% points to the need to invest locally in professional qualification, in which nurses are inserted.

By knowing the main points of unsatisfactory collections, it is possible to plan access to the Pap smear, improvement of CC screening and guarantee of comprehensive care, for this to happen effectively, PHC professionals must master the collection protocols, knowing the target audience and understand the importance of the Pap smear for guidance and referral flow according to the specific results for each user.⁶

The screening carried out by nursing professionals must be subsidized by qualified technical and professional competence both for the collection and dispatch of the sample and for the subsequent interpretation of the reports.⁵ In nursing consultation, health education is carried out, characterizing this moment between the professional and the user as an opportunity to clarify doubts and encourage self-care, in addition to the appropriate referral to specialized care services. Nurses provide women with qualified listening and risk reduction, facilitating long-term follow-up and women's adherence to conduct and treatment.^{7,8}

As a way of knowing the critical points of collections with unsatisfactory samples and thinking of ways to plan nursing actions in tracking in the PHC territory, the creation and use of Health Maps stands out as an important resource for management and care that facilitates the planning and evaluation from the indicators of public and private services from the precepts of Geoprocessing of territorial areas using the Geographic Information System (GIS), database in Health and spatial analysis techniques.^{9,10}

Given the above, the article aims to investigate the spatial distribution of the

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adequacy of Pap smears in the Northeast region of Brazil.

METHODS

This is a quantitative descriptive study of the ecological type, presenting as a spatial reference the municipalities of the Northeast region, which has 9 states (Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia), 1,793 municipalities and an approximate area of 1.723,622 km² with an estimated population in 2019 of

65.168,254 million inhabitants and a Human Development Index (HDI) of 0,67.

The study was developed based on data from secondary sources in the public domain of the Ministry of Health by the Cancer Information System, regarding the adequacy of cervical cytopathological tests, collected between September and November 2020. Cervical cytopathological tests carried out between 2015 and 2019, totaled 9.305.593.

Data referring to exams with unsatisfactory collection due to the presence of acellular/hypocellular material, blood,

piocytes, desiccation artifacts, external contaminants or cellular superposition were included in the research. As a non-inclusion criterion, there are satisfactory slides that presented the samples with cytological material in a good amount of distribution, well fixed and stained.

Data were processed and analyzed using the BioEstat[®] 5 program and presented in graphs and tables with descriptive measures. The georeferencing was performed using the QGIS[®] 10.12. program, based on the cartographic base provided by IBGE. The geographic coordinates were obtained by the lat/long and datum SIRGAS 2000 projection for the elaboration of the maps. The website <http://batchgeo.com/> was used to locate the geographic coordinates, latitude and longitude. The states in Northeast Brazil were defined as ecological aggregates for the study. To perform the suitability calculation, the formula was used:

$$\frac{\text{Number of unsatisfactory samples}}{\text{Total exams performed in the same place and year}} \times 100$$

Research that includes a bibliographic review or data in the public domain that does not identify the research participants, without the involvement of human beings, do not require approval by the CEP/CONEP System.

RESULTS

In the period established for the study (2015 to 2019), 9.305.593 cervical cytopathological tests were performed, with 272.619 unsatisfactory collections. The age group of women surveyed corresponded to 15,85% under 25 years old, 76,64% between 25 and 64 years old and 7,51% over 64 years old (Graph 1)

The results showed the presence of desiccation materials had the most significant numbers, which totaled respectively 43,85% in screening tests, 37,52% in repeat tests and 32,85% for follow-up collections, followed by the presence of acellular material with 11,61%, 11,64% and 14,08% and as the third reason for notification and unsatisfactory collection

Graph 1. Pap test reports according to the age group of users of the health service in the northeast region, 2015-2019. São Luís - MA, 2020.

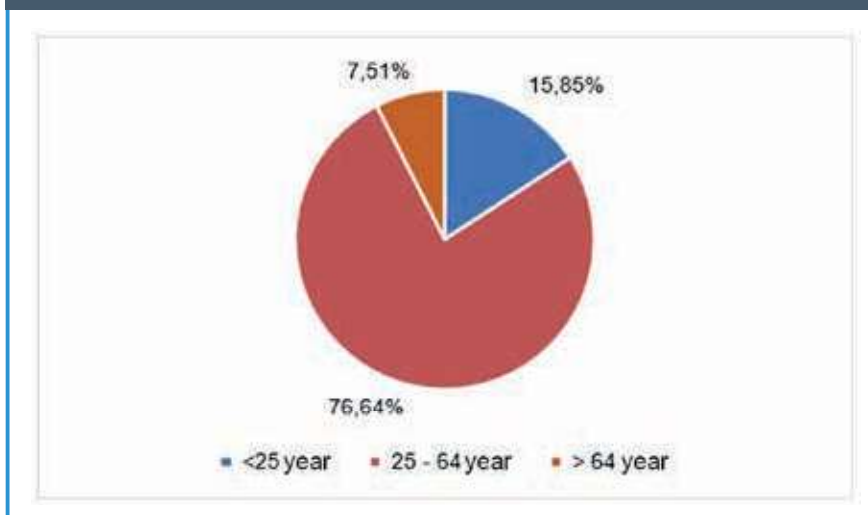


Table 1. Distribution of unsatisfactory reports according to the indication of the Pap smear in the Northeast region, 2015-2019. São Luís - MA, 2020. (n=272.619)

VARIABLES	SCREENING		REPETITION		FOLLOW UP	
	N	%	N	%	N	%
Blade-related errors	23.605	8,79	58	7,50	184	5,41
Presence of Blood	21.488	8,00	89	11,51	487	14,31
Presence of Piocytes	40.918	15,24	133	17,21	496	14,58
Acellular Material	31.176	11,61	90	11,64	479	14,08
Desiccation Artifacts	117.707	43,85	290	37,52	1.118	32,85
Overlapping cells	11.905	4,43	22	2,85	104	3,06
External Contaminants	3.275	1,22	3	0,39	28	0,82
Others causes	18.369	6,84	88	11,38	507	14,90
Total	268.443	100	773	100	3.403	100

Source: Health Surveillance Service, MS, 2020

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according to the indication of the test is the presence of piocytes with 15,24%, 17,21% and 14,58%. The presence of external contaminants were the factors with the lowest rates with 1,22%, 0,39% and 0,82%, respectively (Table 1).

A total of 1.794 municipalities in the Northeast region were evaluated regarding the suitability (Figure 1) of screening tests for cervical cancer, resulting in 252 (14,05%) municipalities with suitability

between 100% and 95%; 29 (1,62%) with suitability below 95% and 1,513 (84,34%) municipalities without notifications of cervical cytopathological exams in the last 5 years.

The spatial distribution of the adequacy of Pap smears in the Northeastern Brazilian states, shown in Figure 1, showed a higher percentage of low adequacy (< 95%) in the states of Pernambuco, Bahia and Alagoas. The State of Piauí has the

highest percentage of municipalities without test notifications.

DISCUSSION

According to the Pan American Health Organization (PAHO) it is recommended that a laboratory of excellence, in order to maintain quality standards, needs to present a minimum production of 15 thousand exams/year. In Brazil, in 2008, laboratories that provide services to the SUS had low production, where only 15% of the 1.116 units had production above this threshold.¹⁰

In addition to the number of exams collected, there are many factors that contribute to the calculation of adequacy of collection, storage and transport of cytological samples. Among these factors are the materials used in the procedures such as the correct use of the Ayre spatula and the endocervical brush, following the collection guidelines is the best methodology to obtain satisfactory smears.^{9,10} Important conduct when evaluating the number of unsatisfactory slides due to the presence of cellular material and superposition sent to cytological analysis laboratories in the Northeast during the period studied.

Hartmann¹¹ when analyzing the collections of cytopathological material from the cervix, they observed that 32,9% had failure in the technique of cell collection, which contributed to a high rate of false-negative results due to the incipency of the cells present in the smear. Because of this great relationship between professional failure and the result of the Pap smear, the Pap test was questioned about its effectiveness in screening, as these false-negative results result in a loss of opportunity to identify early signs of CC and timely treatment of these lesions precursors or early stage cancer itself.¹²

As for the age group, according to the guidelines for screening for cervical cancer,¹ women between 25 and 64 years old should be prioritized. But in Brazil there is a predominance of opportunistic search, where the women who manage to carry out the collection are those who seek the

Graph 2. Appropriateness of screening tests for cervical cancer in the northeast region, 2015-2019. São Luís - MA, 2020. (n=272.619)

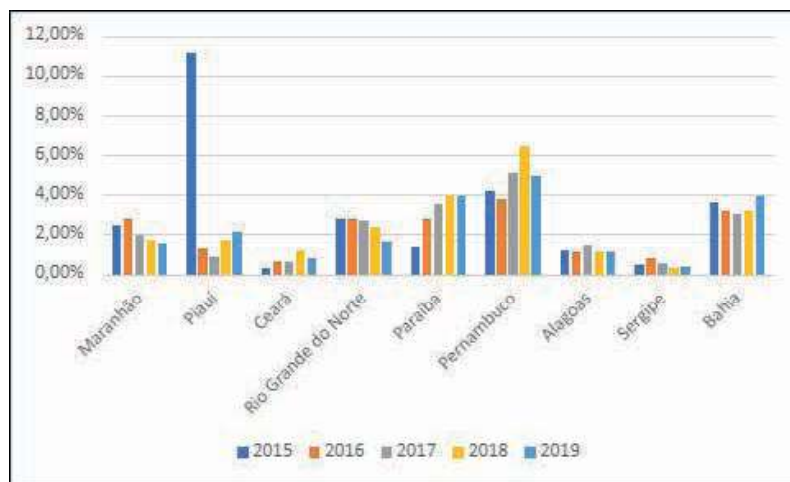
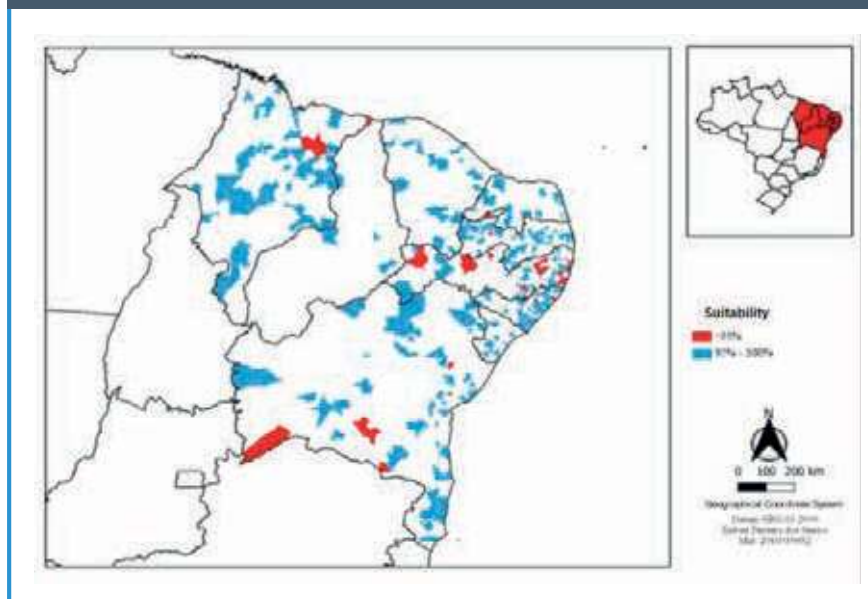


Figure 1. Spatial distribution of the adequacy of Pap smears, according to municipalities in the Northeast Region, Brazil, 2015-2019. São Luís - MA, 2020. (n=272.619)



service, resulting in exams outside the recommended age range and a disparity in access, as some women are overscreened and others are quantitative, which finds no history of the screening exam.⁷

In addition to these hypotheses, it is important to highlight gender issues related to women's difficulty in seeking care that directly affect access and are aggravated when unsatisfactory collections occur. Among these factors are shame, distance between the residence and the unit that performs the collection, logistics between work, household activities, children, the day scheduled to perform the exam incompatible with the routine and financial difficulties.^{13,14,15,16}

CONCLUSION

By analyzing, therefore, the use of spatial analysis, based on information from the Ministry of Health, allowed the descriptive analysis of indicators, enabling the identification of municipalities that need priority in interventions related to improving the collection of exams. Based on the results presented, the importance of the union between management and care is noted, as with the observed situation of the main errors that resulted in unsatisfactory collections, the difficulty of some professionals collecting cytological material

in following the collection protocols became evident. Thus, there is a certain weakness in the teams' work routine, a factor that directly hinders comprehensive care, promotion, prevention and recovery of women's health.

Thus, it is possible to envision strategies based on the needs of target municipalities, in order to reduce the problems present and assist the users of the system in a comprehensive and equitable manner. As a way to enhance this process, the awareness of the importance of correct notification of information related to collections stands out, which is a central detail in the structuring of future discussions and interventions. ■

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