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 colectas 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 Papanicolaou. Las principales causas de coletas insatisfactorias fueron la presencia de artefactos de resecamiento (119,115) de las láminas, la presencia de pióncitos (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.


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 do Papanicolaou. As principais causas de coletas insatisfatórias foram a presença de artefatos de dessecamento (119,115) das lâminas, presença de pióncitos (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.

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

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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, 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.

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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 cytological tests, collected between September and November 2020. Cervical cytological 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® 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://batchesgeo.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:

\[
\text{Number of unsatisfactory samples} \times 100
\]

Total exams performed in the same place and year

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 cytological 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.
according to the indication of the test is the presence of piocyes 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.

Hartmann 11 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 incipiency 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, 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
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.

REFERENCES


