Access, scope and resoluteness of primary health care in northeastern Brazil

Acesso, abrangência e resolutividade da atenção básica à saúde no nordeste brasileiro

Acceso, alcance y capacidad resolutiva de la atención básica en salud en el nordeste brasileño

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Abstract

Objective: To spatially analyze the indicators related to access, scope and resoluteness of services offered by Primary Health Care dimensions in the cities of northeastern Brazil.

Methods: This is an ecological study using spatial analysis techniques, using the arithmetic means and standard deviations of the ten performance indicators agreed in the third cycle of the Brazilian National Program for Improving Access and Quality of Primary Care (PMAQ-AB - *Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica*), whose units of analysis were the 1,794 cities from northeastern Brazil.

Results: No state reached the minimum parameter in the "Resoluteness" and "Service offer scope" dimensions. In the "Access and continuity of care" dimension, there were low-low spatial cluster for consultations on spontaneous demand and high-high for appointments with scheduled consultations. In the "Resoluteness" dimension, it was possible to observe high-high spatial clusters in cities in Rio Grande do Norte, Paraíba, Pernambuco and Alagoas. In the "Service offer scope" dimension, low-low clusters were found in cities of Maranhão, Piauí and Ceará.

Conclusion: Spatial analysis allowed us to observe that there are still difficulties in the population's access to PC services in northeastern Brazil, which also leads to a decrease in the power of coverage and resoluteness of this level of care.

Resumo

Objetivo: Analisar espacialmente os indicadores relacionados às dimensões ao acesso, à abrangência e à resolutividade dos serviços ofertados pela atenção básica à saúde nos municípios da região Nordeste do Brasil.

Métodos: Estudo ecológico com técnicas de análise espacial, utilizando as médias aritméticas e desvios padrão dos dez indicadores de desempenho pactuados no terceiro ciclo do Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica, cujas unidades de análise foram os 1.794 municípios da região Nordeste do Brasil.

Resultados: Nenhum estado atingiu o parâmetro mínimo nas dimensões "Resolutividade" e "Abrangência da oferta dos Serviços". Na dimensão "Acesso e Continuidade do Cuidado", houve agrupamentos espaciais baixo-baixo para atendimentos de consultas por demanda espontânea e alto-alto para atendimentos de consulta agendada. Na dimensão "Resolutividade", foi possível observar aglomerados espaciais alto-alto em municípios do Rio Grande do Norte, Paraíba, Pernambuco e Alagoas. Na dimensão "Abrangência da oferta dos Serviços", verificou-se agrupamentos baixo-baixo em municípios do Maranhão, Piauí e Ceará.

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Conflicts of interest: nothing to declare.

Conclusão: A análise espacial permitiu observar que ainda persistem dificuldades no acesso da população aos serviços da atenção básica na região Nordeste do Brasil, o que acarreta também na diminuição do poder de abrangência e resolutividade deste nível de atenção.

Resumen

Objetivo: Analizar espacialmente los indicadores relacionados con las dimensiones del acceso, alcance y capacidad resolutiva de los servicios ofrecidos por la atención básica en salud en los municipios de la región nordeste de Brasil.

Métodos: Estudio ecológico con técnicas de análisis espacial, utilizando los promedios aritméticos y desviaciones típicas de los diez indicadores de desempeño pactados en el tercer ciclo del Programa Nacional de Mejora del Acceso y de la Calidad de la Atención Básica, cuyas unidades de análisis fueron los 1.794 municipios de la región nordeste de Brasil.

Resultados: Ningún estado alcanzó el parámetro mínimo en las dimensiones "capacidad resolutiva" y "alcance de la oferta de servicios". En la dimensión "acceso y continuidad del cuidado", hubo agrupamientos espaciales bajo-bajo en atención de consultas por demanda espontánea y alto-alto en atención de consultas agendadas. En la dimensión "capacidad resolutiva", fue posible observar aglomerados espaciales alto-alto en municipios de Rio Grande do Norte, Paraíba, Pernambuco y Alagoas. En la dimensión "alcance de la oferta de los servicios", se verificaron agrupamientos bajo-bajo en municipios de Maranhão, Piauí y Ceará.

Conclusión: El análisis espacial permitió observar que aún persisten dificultades en el acceso de la población a los servicios de atención básica en la región nordeste de Brasil, lo que también conlleva una reducción del poder de alcance y capacidad resolutiva de este nivel de atención.

Introduction

In Brazil, the recent interest in assessing the Primary Health Care (PHC) quality has contributed to the development of the Brazilian Unified Health System (SUS – *Sistema Único de Saúde*) and, mainly, to the improvement of Family Health Strategy (FHS). The health service quality was measured by the degree of user satisfaction with medical care. However, this assessment began to encompass the potential degree of recovery of users' health, easier access to the services needed by the population and the reduction of unnecessary secondary care. [1]problemas e propostas sobre a qualidade da Atenção Básica no Brasil, com ênfase na integralidade do cuidado, expressa na completude das ações de saúde. Estudos sobre acesso e qualidade da Estratégia Saúde da Família (ESF

PHC corresponds to the preferred level of health care for users to enter the public health system, offering services that go beyond the limits of the clinic, acting as coordinator of Health Care Networks (RAS - *Redes de Atenção à Saúde*). Due to its articulation with other levels of care and its proximity to the population, it is essential to guarantee access, scope and resoluteness of care. Given its heterogeneity and magnitude, PHC assessment is not restricted to a federal level prerogative, it requires joint efforts from different institutions and professionals, with different perspectives, enabling a broad and rigorous view of its diversity and effectiveness.[2]

Universal access to health services is one of the principles that support SUS since its creation, based on Organic Health Law 8,080/90. However, a study has pointed to barriers imposed on users, such as queues for scheduling appointments and appointments and difficulties in ensuring resoluteness and continuity of care. Despite being constitutionally guaranteed, there are still factors that limit access to PHC services that are mostly associated with the socioeconomic context or geographic barriers and advances related to the expansion of services offered by PHC.[3]economic, social, organizational, technical and symbolic aspects in establishing access to universal healthcare. This theoretical review paper intends to discuss the different approaches, analyze the context and policies for special groups on access, marking an analysis model delineated by the above aspects, from readings on the topic in question. This analysis reveals a diversity of approaches to access the formulation and implementation of public policies and their potential for changing the organization of the health system. We identified progress in reducing inequalities in health and increased access to the network of the Unified Health System (SUS

Moreover, the offer scope of PHC services involves the individual and collective aspects of health promotion, protection and recovery, aiming to develop comprehensive care that impacts people's health and autonomy. To this end, it is essential that Basic Health Units (BHU) are organized to provide users with access to services with an adequate population coverage and high capacity for care and resoluteness, avoiding unnecessary referrals of users to other points of care in the RAS.[4]

In this context, the exercise of care and management practices using complex and varied technologies can help in managing population's needs with greater frequency and relevance in their territory. Spatial analysis is a strategy in which it is possible to observe and recognize the population's living conditions and health situation in an area covered, as well as the standards of access and quality indicators that involve management, the work process and the results achieved by the teams in order to promote a monitoring and assessment of actions developed by the teams and management.[5,6]

Therefore, this study aimed to spatially analyze the indicators related to access, scope and resoluteness of services offered by PHC dimensions in cities in northeastern Brazil.

Methods

This is an ecological study with spatial analysis techniques and the use of secondary data from the third cycle of the Brazilian National Program for Improving Access and Quality of Primary Care (PMAQ-AB - *Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica*), whose units of analysis were the cities in northeastern Brazil.

The Northeast is one of the five regions of Brazil and is made up of nine states: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. It has a territorial extension of 1,554,257 km^2, which houses about 53,081,950 inhabitants and 1,794 cities.[7]

The cities in the Northeast whose Primary Care (PC) teams participated in the third cycle of the PMAQ-AB that took place between 2015/2019 were used as units of analysis. The PMAQ-AB was created in 2011 aiming at inducing the expansion of access and the improvement of PHC quality through a set of qualification strategies, monitoring and assessment of health teams' work. The program is composed of phases that make up a cycle of continuous improvement of access and quality of PHC, namely: compliance and contractualization, certification, and recontractualization. In the certification phase, the participating teams are assessed considering the teams' external performance assessment; performance assessment of contracted indicators; and verification of accomplishment of a self-assessment moment by PC team professionals.

The variables used in this study were the 10 performance indicators of PC teams agreed in the third cycle:

a. Access and continuity of care dimension: Average number of visits by physicians and nurses per inhabitant (Parameter 0.45 consultations/inhabitant/quarter); Percentage of consultations by spontaneous demand (Parameter 40% of consultations with physicians and nurses/quarter); Percentage of appointments scheduled (Parameter 25-35% of physician and nurse consultations/quarter); Rate of visits by assessed health condition (Parameter 0.90/quarter); Ratio of collection of cytopathological material from the cervix (Parameter 0.075 exam/population/quarter); First programmatic dental appointment coverage (Parameter 3.75% attendance of first programmatic dental appointment/quarter).
b. Resoluteness dimension: Percentage of referrals to specialized service (Parameter 5 to 20% medical referrals to specialized service/quarter); Ratio between completed treatments and first programmatic dental appointments (Parameter 0.5-1 treatment completed/quarter).
c. Scope dimension: Percentage of services offered by the PC team (Parameter 70 in the quarter); Percentage of services offered by the Oral Health team (Parameter 70 in the quarter).

Data referring to the indicators were obtained from the PMAQ website – Portal of the Department of PC of the Ministry of Health (Available at http://dab.saude.gov.br/portaldab/ape_pmaq.php).[8]

For each indicator, the mean and standard deviation (SD) of the results obtained by the teams evaluated were calculated so that the unit of analysis was the cities in northeastern Brazil, considering the respective minimum parameters and/or the averages defined by the program for each indicator. The univariate Moran Global Index was calculated to verify whether the spatial distribution of indicator occurs randomly in space. Then, univariate analysis was performed using Local Indicators of Spatial Autocorrelation (LISA), whose objective is to assess whether space is a relevant vari-

able for the phenomenon studied from the production of specific values for each territorial area that identifies cluster areas with significant patterns of spatial association with their neighbors.[9]

LISA distribution analysis results allows classifying the variable of interest into four clusters: high/high, that is, observations with values above the average, with a neighborhood also above average; low/low, which means those below average with neighbors also in the same situation; high/low and low/high representing, respectively, areas of low values surrounded by high values and areas of high values surrounded by low values.[9]

The TerraView (*Instituto Nacional de Pesquisas Espaciais* (INPE, SP, BR, version 4.2.2)) and GeoDa (GeoDa Center for Geospatial Analysis, Chicago, USA, version 1.8.12) programs were used to build the maps using the cartographic base, in shapefile format, in the geographic latitude/longitude projection system (Geodesic Reference System - SIRGAS 2000) of the Northeast available on the website of the Brazilian Institute of Geography and Statistics.[7]

As this is research with secondary data in the public domain, this study did not require submission of a project to the Research Ethics Committee.

Results

The total number of AB teams that voluntarily joined and participated in the third cycle of the PMAQ-AB was 16,215 teams, distributed in 1,752 cities in the Northeast. A total of 42 cities that did not complied with the program's third cycle were excluded from the analysis. It is noteworthy that no state reached the minimum parameter in "Resoluteness" and "Service offer scope" dimensions. In the "Access and continuity of care" dimension, no state reached the minimum parameter for the "Percentage of consultations by spontaneous demand" indicator, differently from the Percentage of appointments scheduled, in which all states obtained values above the established parameter.

Univariate analysis of "Access and continuity of care" dimension indicators indicated the presence of spatial clusters with a low-low pattern in the cities located in the state of Sergipe, northern Bahia and southern Maranhão for "Average number of visits by physicians and nurses per inhabitant" (Figure 1A) and "Rate of visits by assessed health condition" indicators (Figure 1D). It was also observed in these same states, groups with a low-low pattern for the "Percentage of consultations by spontaneous de-

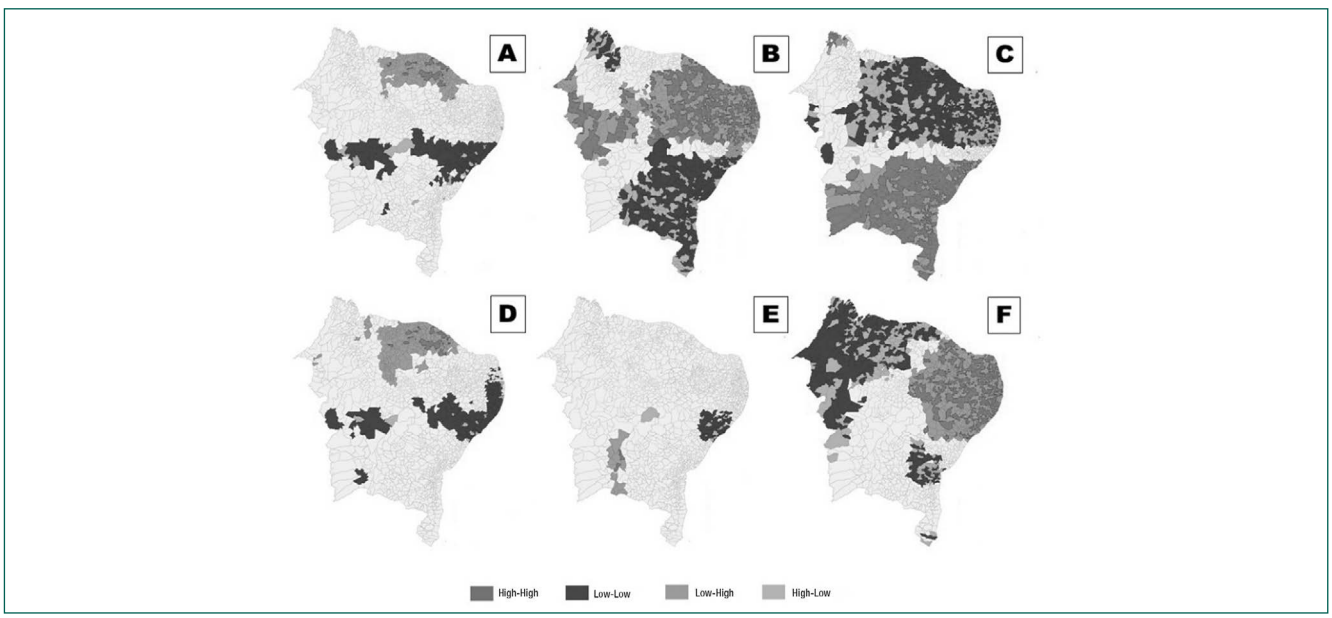

Figure 1. Spatial clusters demonstrated by Moran's analysis of "Access and continuity of care" dimension indicators
(A): Moran's analysis for the "Average number of visits by physicians and nurses per inhabitant" indicator; (B): Moran's analysis for the "Percentage of consultations by spontaneous demand" indicator; (C): Moran's analysis for the "Percentage of appointments scheduled" indicator; (D): Moran's analysis for the "Rate of visits by assessed health condition" indicator; (E): Moran's analysis for the "Ratio of collection of cytopathological material from the cervix" indicator; (F): Moran's analysis for the "First programmatic dental appointment coverage" indicator.

mand" indicator (Figure 1B), having this pattern inverted (high-high) when analyzing the "Percentage of appointments scheduled" indicator (Figure 1C).

The analysis of the "Ratio of collection of cytopathological material from the cervix" indicator (Figure 1E) showed a low-low cluster, mainly in the state of Sergipe. The "First programmatic dental appointment coverage" indicator (Figure 1F) showed a high-high pattern in the states of Sergipe, Alagoas, Pernambuco, Paraíba, Ceará and Rio Grande do Norte.

As for analysis of the "Percentage of referrals to specialized service" indicator in the "Resoluteness" dimension, high-high spatial clusters were observed in the cities of Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Sergipe, and low-low clusters mainly in Maranhão, Piauí and Bahia (Figure 2A). Regarding the oral health team, the percentage of services offered presented a low-low standard for Sergipe, Bahia and northern Maranhão and a high-high standard for Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Alagoas (Figure 2B).

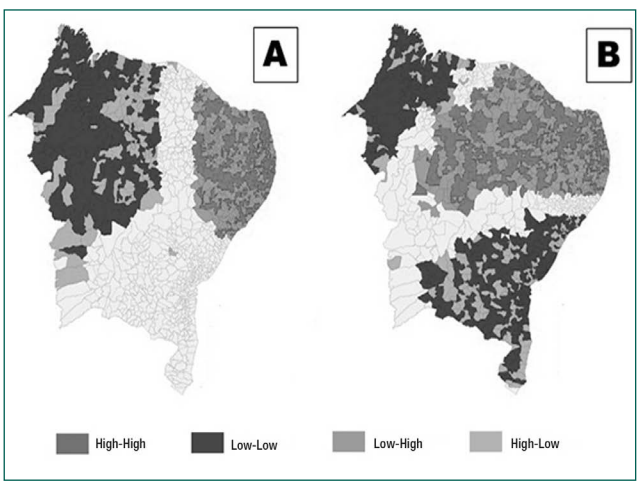

Figure 2. Spatial clusters demonstrated by Moran's analysis of "Resoluteness" dimension indicators
(A): Moran's analysis for the "Percentage of referrals to specialized service" indicator; (B): Moran' analysis for the "Ratio between completed treatments and first programmatic dental appointments" indicator.

Regarding "Service offer coverage" dimension indicators, low-low clusters were found in Maranhão, Piauí and Ceará when the percentages of services offered by PC (measures the number of services offered to the population in relation to the total number of services and actions in PC) and Oral Health teams (measures the number of services offered in Oral Health to the population) were assessed. On the other hand, the states of Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Sergipe presented cities with a high-high standard (Figure 3).

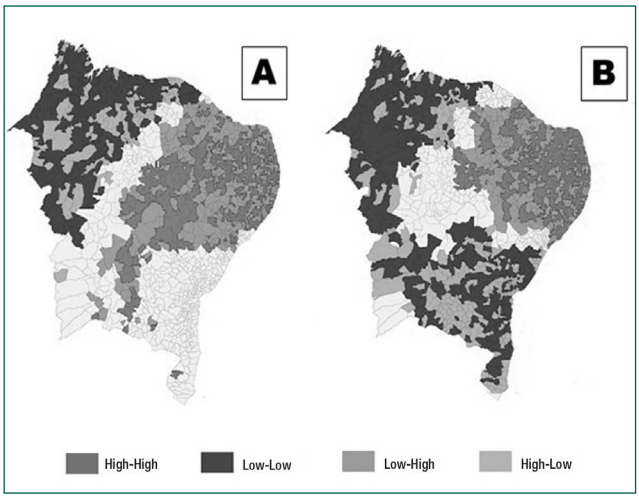

Figure 3. Spatial clusters demonstrated by Moran's analysis of "Service offer scope" dimension indicators
(A): Moran's analysis for the "Percentage of services offered by the PC team" indicator; (B): Moran's analysis for the "Percentage of services offered by the Oral Health team" indicator.

Discussion

An important criterion for monitoring PHC performance are the indicators defined by the PMAQ-AB, which refer to some of the main strategic focuses of this level of care. The indicators consider a set of measurable aspects regardless of the context in which they are inserted and their regular monitoring promotes complementation of information on the offer of services in order to reflect the efforts of health teams and management to improve PHC quality.[10]

The PMAQ-AB indicators were categorized into three major dimensions: access, resoluteness and coverage. Access concerns the quantity and nature of care provided by the health team. Resoluteness refers to the ability of teams to recognize and solve the needs and demands of the territory within PHC itself. Finally, the scope dimension reflects the diversity of resources available to meet local needs, and the way in which these resources are offered and the effectiveness of these actions.[11]

According to the care parameters suggested by SUS, the average number of medical consultations per inhabitant per year is two to three consultations and 0.5 to one nursing consultation per person/year, with an estimated time of three consultations per hour. The study revealed the presence of spatial clusters with a low-low pattern in the cities located in the state of Sergipe, northern Bahia and southern Maranhão for the "Average number of visits by physicians and nurses per inhabitant" indicator. In this context, the cities of these locations and their neighbors have indicators below average, which may be associated with the reduced number of these professionals in the family health teams of the Northeast, compared to other regions.[12]

Despite the implementation of the Family Health Program (PSF - *Programa de Saúde da Família*) having been consolidated before in the Northeast, a comparative study of the program performance in this region with that of the South, pointed out that the family health teams in the South were composed of physicians (12%), nurses (10%), technicians and nursing assistants (22%) and other professionals (56%), while the teams in the Northeast had physicians (7%), nurses (7%), technicians and nursing assistants (13%) and other professionals (73%).[12] The lack of supplies and medicines necessary for the work process, the precariousness of health units and the difficulty of securing medical professionals, mainly in the Northeast, are essential points to understand the difficulty in offering services, mainly in small cities in historically disadvantaged regions.

In the same study, in relation to consultations, in the South, three people were seen every hour, while in the Northeast, four consultations were performed per hour by a PSF physician.[12] Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Rio Grande do Sul and Santa Catarina. This article describes a transversal study using an external group for comparison (traditional primary care The attendance of consultations by spontaneous demand is a strong indicator of advanced access to health. This method of organizing the appointment allows users to seek and receive care from their referenced professional at the most convenient time for their needs, usually on the day the care is sought. The agenda is not divided into periods exclusive to each specialty, the agenda is kept open and its schedules are filled in each day.[13]

The referral of emergencies to other levels of care, the impossibility of meeting acute demands when seeking help, among other situations, make it difficult for the user to access the health system, especially at the primary level, exposing the difficulty of solving the health demand. It is important to point out that no state reached the minimum parameter for the "Percentage of consultations by spontaneous demand" indicator. On the other hand, all states obtained values above the parameter established in the "Percentage of appointments scheduled" indicator.[13]

Longitudinality of care is another operational measure for the evaluation of advanced access and plays an important role in ensuring care by forming a continuous source of care based on the presence of a bond and trust between users and health professionals, which allows to know users comprehensively, from behaviors, habits and the context in which they are inserted, allowing the adequate planning of care and interventions. It is achieved when users receive follow-up from their referenced professional whenever necessary, and may be hampered by barriers imposed to access, such as the accumulation of scheduled appointments.[14,15]

The Northeast is recognized for the high mortality rate from chronic non-communicable diseases (NCDs), reaching 381.8/100 thousand inhabitants in 2011, above national average of 378.0/100 thousand inhabitants and only behind the Southeast, with 382.1/100 thousand inhabitants. The analysis of the "Rate of visits by assessed health condition" indicator pointed to concentrates of low-low performance in the states of Alagoas, Pernambuco and Paraíba and low-high performance in the states of Ceará and Piauí. The high numbers of NCDs in the region may be related to worse living conditions and access to health services, a situation that makes it difficult to control these diseases and their risk factors, reflecting on the performance of these teams.[16,17]

Through the analysis of the "Ratio of collection of cytopathological material from the cervix" indi-

cator, clusters of low-low pattern were observed, mainly in the state of Sergipe, which is related to the low number of cytopathological exams performed. This may be related to low availability of examinations or low demand/compliance by women, making it necessary to spread knowledge about carrying out Pap smear, the use of condoms and immunization as a way of preventing HPV infection, as well as the search for women who do not attend the health units for examination.[18]

In 2018, the state had an Annual Coverage Rate (ACR) of cytopathological exams of 7.34% and an average of 6.08 deaths/100 thousand women from malignant cervical neoplasia, which is a worrying data mainly due to the tendency of increase in cases of cervical cancer in the age groups from 15 to 19 years. Cervical cancer is the third most frequent malignant tumor in women and the fourth leading cause of cancer death in this same group in Brazil. This type of cancer has a great impact on morbidity and mortality rates, and can be easily controlled by early detection. [18]

Regarding the coverage indicator of the first programmatic dental appointment, the states of Sergipe, Alagoas, Paraíba, Ceará and Rio Grande do Norte presented high-high performance, with emphasis on the state of Pernambuco, which reached an average coverage of 13% between 2008 and 2014, reaching 18.9% in cities where the proportion of the population covered was greater than 89.24%.[19] However, 45.1% of users have difficulty accessing dental services in PHC, and when they do, continuity of treatment is stopped due to waiting time.[20]

The above-average results of the "Percentage of referrals to specialized service" indicator of the "Resoluteness" dimension in the cities of Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Sergipe indicate the efficiency of PHC in exercising its role as a gateway and organizer of the health service by identifying patients who need consultation and/or procedures of greater technological complexity than that offered by PHC itself, reflecting a greater expansion of care.[21]

On the other hand, a large part of the demand for the specialized service is a reflection of poor-quality referrals and occurs due to conditions prevalent in PHC that are inappropriately referenced. Moreover, articulation with professionals from the Family Health Support Centers (NASF - *Núcleos de Apoio a Saúde da Família*) can significantly reduce the waiting time for specialized care, enhancing PHC's ability to resolve. In general, the excess of referrals to the specialized service can indicate structural and communication problems within the health care network, which increases the wait for specialists and depletes the public coffers with unnecessary referrals.[22,23]

In Brazil, the service portfolio is one of PHC's most important organizational instruments. It is responsible for organizing all preventive, diagnostic and therapeutic services necessary for health, as well as establishing the appropriate way to solve problems of an organic, functional or social nature. The service portfolio defines the list of services and actions found in health units, clarifying commitments and expectations, in addition to guiding, qualifying and standardizing the routine of care of professionals and their actions.[24,25]

Implementing FHS has boosted PHC's ability to offer services and population coverage, improving access to services in places with historical care deficits. However, disarticulation between levels of health, lack of credibility in FHS organization and a prevalent hospital-centered culture with overvaluation of specialized care to the detriment of health promotion and prevention actions proposed by the Brazilian National Policy of PC (PNAB - *Política Nacional de Atenção Básica*) are challenges for the development of PHC's actions.[26,27]

It is noticed that limiting factors for the work process organization within the PHC units, such as inadequate physical structure, lack of materials and equipment and the high professional turnover have been identified as essential points for the viability of family health teams' work and, consequently, for the provision of services, especially in disadvantaged places, as shown by the results of this study from groups of indicators below the average in Maranhão, Piauí and Ceará when evaluating the percentages of services offered by PC and Oral Health teams, compared to the states of Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Sergipe that showed cities with an above-average standard.[27]

The main limitation of this study was the use of secondary data, since it involved factors such as data from teams not completed in their entirety and the lack of data from some teams that did not undergo assessment or that did not participate in the PMAQ-AB. The availability of valid and reliable information is crucial for analysis of health situation and, consequently, for decision-making. Poor quality of information can compromise quality of monitoring and assessment processes.[5] Given its ecological design, another limitation of this study is the inability to define the cause of the problem, requiring other types of research within this perspective to investigate the hypotheses raised.

As positive points, using spatial analysis to understand the local distribution of indicators and the comparative behavior in relation to other cities and state allowed the elaboration of epidemiological scenarios that can guide public policy actions and other studies to deepen the theme. Despite being widely used in the area of epidemiology, there is a lack of studies that use geoprocessing tools in the analysis of health indicators related to supply and quality of PHC services. Geoprocessing allows the identification, location, follow-up and monitoring of populations, thus being a valuable tool for health management, guaranteeing support for decision-making, in addition to guiding their actions by providing a broad view of the territories and their problems, favoring the advancement of the health system comprehensively, especially in the context of PHC.[28]

Conclusion

Spatial analysis allowed us to observe that there are still difficulties in the population's access to PHC services in northeastern Brazil, which also leads to a decrease in the power of coverage and resoluteness of this level of care.

Collaborations

Souza KOC, Ribeiro CJN, Santos JYS, Araújo DC, Peixoto MVS, Fracolli LA and Santos AD declare that they contributed to study design, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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