



SOCIAL INEQUALITY AND DEATHS FROM BREAST AND CERVICAL CANCER

DESIGUALDADES SOCIAIS E ÓBITOS POR CÂNCER DE MAMA E DE COLO DO ÚTERO

LAS DESIGUALDADES SOCIALES Y LAS MUERTES POR CÁNCER DE MAMA Y CUELLO UTERINO*

Maisa Paulino Rodrigues¹, Maria Angela Fernandes Ferreira², Amanda Paulino de Oliveira³, Aíla Marôpo Araújo⁴

ABSTRACT

Objective: to analyse the association between determining the geographic occupation area and death from breast and cervical cancer in Natal / RN (Brazil). **Method:** descriptive and exploratory study in an ecological nature, based on cancer registry data from the Epidemiological Surveillance Unit of the Municipal Health Secretariat of Natal/RN, Brazilian Institute of Geography and Statistics (IBGE) and the Municipal Planning and Strategic Management Secretariat (SEMPA) in Natal/RN, during the years of 2006 to 2010. Data analysis was performed by means of georeferencing and descriptive statistics based on the theoretical framework of Milton Santos. **Results:** data showed 402 deaths, 280 from breast cancer and 122 from cervical cancer, of these cases 136 in the western region and 115 in the northern region which together account for 62.5%. These regions were classified with a lower Quality of Life Index (QLI), and data showed that the differences in spatial distribution of mortality from breast and cervical cancer are more concentrated in the regions with the lowest social indicators. **Conclusion:** it was possible to verify that the geographic occupation area in the city of Natal (Brazil), is a reflection of social conditions and the prevailing socio-economic model, that determines the method of death from breast and cervical cancer showing social inequalities. **Descriptors:** breast neoplasms; uterine cervical neoplasms; social inequity; mortality; geographic information systems.

RESUMO

Objetivo: analisar a associação entre determinação da ocupação do espaço e morte por câncer de mama e de colo do útero em Natal/RN (Brasil). **Método:** estudo descritivo e exploratório de cunho ecológico, a partir dos dados do Registro de câncer do setor de Vigilância Epidemiológica da Secretaria Municipal de Saúde de Natal/RN, Instituto Brasileiro de Geografia e Estatística (IBGE) e Secretaria Municipal de Planejamento e Gestão Estratégica (SEMPA) de Natal/RN, entre 2006 e 2010. A análise dos dados foi realizada por meio do georeferenciamento e da estatística descritiva à luz do referencial teórico de Milton Santos. Para a análise das informações sociodemográficas utilizou-se o censo demográfico do IBGE dos anos de 2000 e 2010. Os dados foram organizados em figuras. Este estudo seguiu as recomendações da Resolução nº 196/96 que trata de pesquisas envolvendo seres humanos. **Resultados:** os dados apontaram 402 óbitos, sendo 280 por câncer de mama e 122 por câncer cervical. Destes, 136 na região oeste e 115 na região norte que juntas respondem por 62,5%. Estas regiões foram classificadas com menor Índice de Qualidade de Vida (IQV), e os dados evidenciaram que as diferenças na distribuição espacial da mortalidade por câncer de mama e de colo uterino estão mais concentradas nas regiões com menores indicadores sociais. **Conclusão:** foi possível verificar que a ocupação do espaço geográfico da cidade de Natal, reflexo das condições sociais e do modelo socioeconômico predominante, determina o modo de morrer por câncer de mama e de colo do útero evidenciando as desigualdades sociais. **Descritores:** neoplasias da mama; neoplasias do colo do útero; iniquidade social; mortalidade; sistemas de informação geográfica.

RESUMEN

Objetivo: Análisis de la relación entre la ocupación de la determinación del espacio geográfico y la muerte por cáncer de mama y el cáncer de cuello uterino en Natal / RN (Brasil). **Método:** Estudio descriptivo y exploratorio de los sistemas ecológicos, a partir de los datos del registro del cáncer de la Unidad de Vigilancia Epidemiológica de la Secretaría Municipal de Salud de Natal / RN, el Instituto Brasileño de Geografía y Estadística (IBGE) y el de Planificación y Gestión Estratégica Municipal (SEMPA) en Natal / RN (Brasil), Entre los años 2006 y 2010. El análisis de datos se realizó mediante la georeferenciación y la estadística descriptiva a la luz del marco teórico de Milton Santos. **Resultados:** los datos mostraron 402 muertes, 280 por cáncer de mama y 122 cáncer de cuello uterino. De éstos, 136 en la región oeste y 115 en la región norte que en conjunto representan el 62,5%. Estas regiones fueron clasificadas con un menor Índice de Calidad de Vida (ICV), y los datos mostraron que las diferencias en la distribución espacial de la mortalidad por cáncer de mama y de cuello están más concentradas en las regiones con indicadores sociales inferiores. **Conclusión:** fue posible verificar que la ocupación del espacio geográfico de Natal (Brasil), un reflejo de las condiciones sociales y el modelo socio económico imperante que determina el modo de morir por cáncer de mama y cuello uterino que muestra las desigualdades. **Descritores:** neoplasias de la mama; neoplasias del cuello uterino; inequidad social; mortalidad; sistemas de información geográfica.

¹Doctor of Dental Surgery, PhD in Health Sciences UFRN, Assistant Professor II in the Department of Dentistry at UFRN and Post Graduate Program in Public Health / UFRN. Natal (RN), Brazil. E-mail: maisarodrigues@ufrnet.br; ²Ph.D in Dentistry UFRN. Assistant Professor IV in the Department of Dentistry at UFRN and Post Graduate Program in Public Health / UFRN. Natal (RN), Brazil. E-mail: angelaferreira@ufrnet.br; ³Nurse. graduated from the University Faculty of Sciences Culture and Extension of Rio Grande do Norte / UNIFACEX. Postgraduate student in Oncology at Faculdade Redentor-RJ, Rio de Janeiro and Northeriogrاندense League Against Cancer. Natal (RN), Brazil. E-mail: amanda@uol.com.br; ⁴Nurse. Postgraduate student in Nursing at the Workplace by the Integrated Center for Education and Research (CENPEX). Academic of 5th period in the Undergraduate Program in Management Systems and Health Services UFRN/RN/Brazil. Natal (RN), Brazil. E-mail: ailamaropo@yahoo.com.br

INTRODUCTION

The area has been understood and interpreted by humans in many ways. Most of the time it is naturally understood, such as terrain, climate, hydrology, vegetation, among others. Other conceptions understand the area where social relations occur, i.e., in its political, cultural and economic dimensions.¹

The social inequality patterns are under strong influences of the demographic and environmental determinants and access to health services and policies, this problem is directly influenced by population saturation and the constructed environment.²

The health determinants have been analyzed by the statistical model requirements that fragment reality through so-called individual and population variables. Usually translated by indicators of income, education, consumption capacity, and individual habits, these variables have limited the ability of some researchers to understand society in its totality. The consequences of this are restricted and limited conclusions, probably due to difficulties in the restoration of the theoretical framework.

The re-dimensioning of the area in epidemiological studies has been emphasized to the extent that the health-disease process dynamism, inserted in the territory, allows a better knowledge of the situation, facilitating the implementation of public policies and health services organizations.³ In this direction, it is necessary to restore more comprehensive theories, such as the theory of Milton Santos, to aid in epidemiological data interpretation.¹

Thus, the area is characterized as a technical-scientific-informational means, since its use is determined by science, technology and information, which is a reflection of globalization. In fact it is an indivisible whole set of objects (fixed) and actions (flows) that interact and is the result of a historical production that results from these relationships. Since the territory is the area where the production and social relations, political and ideological processing modes, which exert a decisive influence on the locations.¹

Based on this conception it can be seen that the epidemiological studies on breast and cervical cancer in national literature, present limitations in the geographical area influence analysis. Although having observed that the

breast and cervical cancer show high incidence and mortality rates, besides having a close socioeconomic status relationship with individuals, such studies require a more holistic approach. Thus, this study seeks to analyze from the theoretical perspective of Milton Santos, the dialectical and historical influence socioeconomic and political occupation determinants in the city of Natal/RN, Brazil about dying from breast and cervical cancer.

OBJECTIVE

- To assess the association between area occupation determination and death from breast and cervical cancer.

METHODOLOGY

Descriptive and exploratory study in an ecological perspective, performed in the city of Natal, capital of Rio Grande do Norte, Brazil. The city has a land area of 167.160km², a population density of 4808.20 inhabitants/km² and total population of 801,164 inhabitants, among them 376,759 men and 424,405 women.⁴

The municipality is divided into administrative regions (AR) (North, South, East and West), each in turn, divided into several districts. Of these, the Northern Region is the most populous, with 303,453 inhabitants, followed by the Western region, with 218,405 inhabitants while the Eastern Region is less populated, with 112,725 inhabitants, and the Southern region, with 166,491 habitants.⁵ These regions have large socioeconomic disparities between themselves, i.e., the southern and eastern regions are more economically favorable while the northern and western show a greater deficiency.⁴

Concerning the health sector the city is divided into five Health Districts receiving the same names as the aforementioned AR. The Northern and Western districts have serious infrastructure problems and social indicators presenting a below average within the city. Since the Eastern and Southern districts are more economically favorable and have better social indicators.

The data on breast and cervical cancer were obtained the Municipal Health Department of Epidemiological Surveillance in Natal/RN, Brazil after authorization by the Institutional Term of Consent by the institution, while the municipality cartographic database used to define the

Quality of Life Index (QLI) was obtained from the Municipal Planning and Strategic Management (SEMPLA).⁶ The data referred to the four health districts during the period from 2006 to 2010. The different anatomical local tumor sites were identified by the Tenth Revision of the International Classification of Diseases - ICD 10 code C53 (cervical cancer) and code C50 (breast cancer).

For the analysis data from the IBGE census of 2000 was used, whereas those from the 2010 census provided socio- demographic information for completion of the study. The data were organized into diagrams.

To calculate the QLI same methodology as the Human Development Index (HDI) was followed, composed of the same three sub-indices: QLI-income-QLI-education QLI-environment which are part of seven indicators: average heads of household,% income of heads of households with incomes of up to two minimum wages; illiteracy rate of people 15 years of age or older, % heads of household with less than a year of schooling; % of households with inadequate water supply (weight3, % of households with inadequate garbage collection (weight 3), % of households with inadequate sanitation (weight 4). The QLI is a measure of inequality of a given population, as the mathematic average of these three sub-indices and proposes a range from 0 (worst quality of life level) to 1 (better quality of life level). Therefore, the development of a city or a country is measured not only by economic factors.⁶

The QLI has the following classifications: low (0.0 - 0.5), medium (0.5 - 0.69) and high (0.7-1.0) in this way the districts in Natal were also classified into 3 groups (Group III, Group II and Group I) respectively obeying the three classifications.⁶

From the QLI sub-indices calculations, georeferencing was done by district, with the Terraview 4.0.0 software, constructing regional maps. The maps constructed, the intensity of the gray levels is directly are directly related to the QLI index magnitude and deaths, that is, the darker, the worse the values. The findings interpretation was based on the Geographical Area conception from the perspective of Milton Santos.

RESULTS

The results show that 402 deaths occurred between the two types of cancer, and 280 by breast cancer and 122 cervical cancer.⁷ Of these, 136 are located in the Western region and 115 in the Northern region which together account for 62.5 % of the deaths (Figures 1 and 2), demonstrating that the lower the QLI in the region, the greater the number of deaths, stressing that social inequality implies impact on illness and death from cancer. The QLI found in the Northern region was classified as low (covering almost all of the districts) and Western Region 60% of districts were classified as low, i.e., six districts with low QLI and the four medium QLI can be seen in Figure 3.

Residential District	2006	2007	2008	2009	2010	Total
Northern District	4	6	8	13	8	39
Southern District	7	2	2	2	5	18
Eastern District	4	4	4	4	5	21
Western District	6	6	7	13	12	44
Total	21	18	21	32	30	122

Figura 1. Número de óbitos por câncer de mama entre 2006 a 2010. Natal/RN, 2011. Fonte: SVE/SMS, 2012. Fonte: Prefeitura Municipal de Natal/SEMPLA, 2012

Residential District	2006	2007	2008	2009	2010	Total
Northern District	10	20	13	21	12	76
Southern District	13	13	09	16	10	61
Eastern District	13	11	08	10	09	51
Western District	15	21	20	12	24	92
Total	51	65	50	59	55	280

Figure 2. Number of deaths from cervical cancer from 2006 to 2010. Natal/RN, 2011. Source: EVS / SMS, 2012. Source: City of Natal / SEMPLA, 2012.

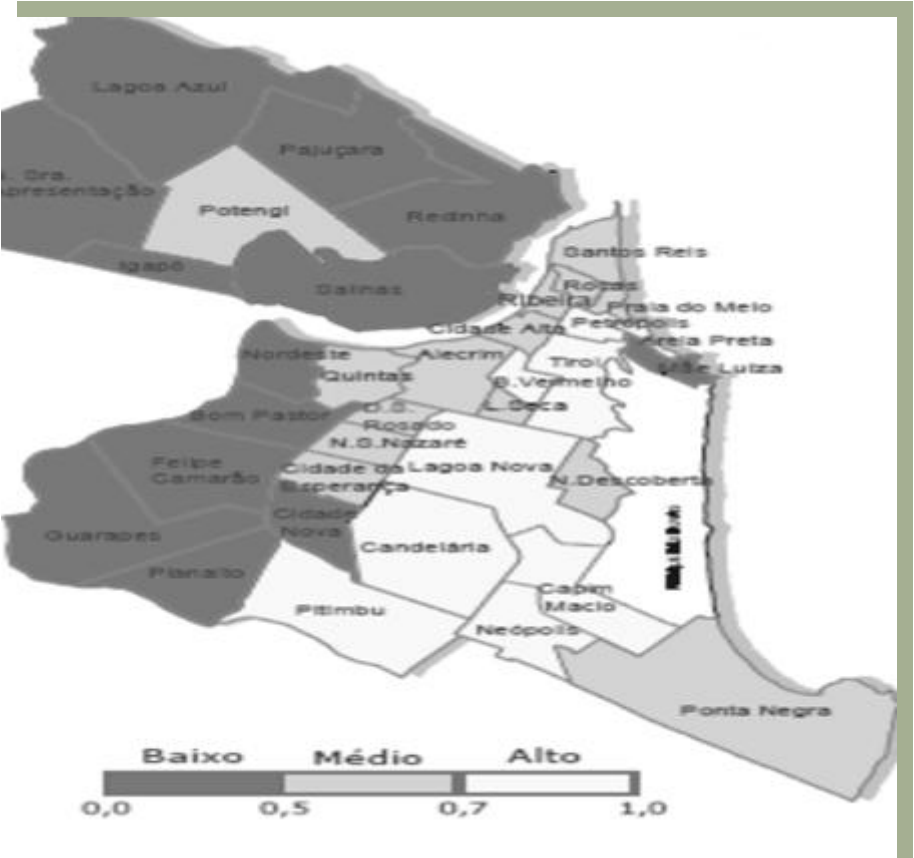


Figure 3 (adapted). QLI Spatial distribution by district. Natal/RN, 2006. Source: City of Natal / SEMPLA, 2012.

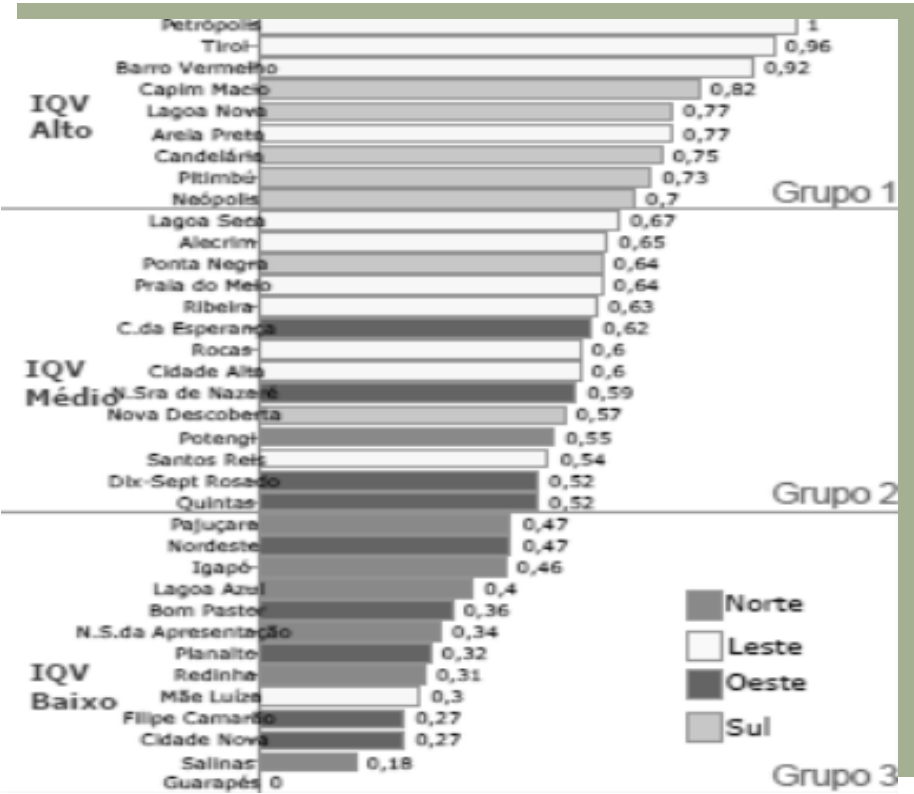


Figure 4 (adapted). Quality of Life Index - QLI by neighborhood and groups. Natal/RN, 2006. Source: City of Natal / SEMPLA, 2012.

In Figure 4 a difference in QLI between regions can be seen, namely the Northern and Western present the lowest levels, indicating poor living conditions, making it clear that the high mortality rates coincide with the worst social indicators in these regions.

The Western Region has 14 public health units. By using a population of 218,405 inhabitants to build an indicator, there is an average of 15,600 inhabitants per health unit. In this area there is also the greatest

percentage of slums, amounting to more than 36%. The production of household waste is approximately 0.55 kg/inhabitant/day continuing in third place, in descending order. Regarding electricity consumption, the Western Region, which houses 27% of the population in the capital, receives 12% of the total energy allotted to the municipality. In terms of sports facilities, its share is approximately 13% of the total, with low indicators, notably the courts, fields and gymnasiums, equivalent to 14% of the urban

facilities. Regarding public safety, of the four administrative divisions, it shows the lowest percentage in the public safety unit distribution, i.e. 17% of the total.⁸

The Northern region is the most populous and also has the worst social indicators. In terms of education there is an average of 869 students per school unit. Regarding the health issue, this region has 33 Health Units In the region there more than 27% slums which includes 40% of the population that lives in this situation.

Production of household waste is a consumption indicator, therefore, used to determine, in part, the social situation of a population. In this sense, the Northern Region has the least household waste production, on

average, among the four regions it has an average of 0.52 kg/inhabitant/day, compared to the production of 1.66 kg/inhabitant/day in the Southern Region, and 1.58 kg/person/day, in the Eastern Region. As for electricity consumption this region accounts for 17% of the capital's consumption. This calls attention to the paving and drainage, showing the worst coverage ratios for both variables. Public safety comprises 30.5% of the municipal facilities, since it is an area with high levels of dangerousness.⁸

In Figure 5 the population distribution by Natal's administrative regions and their respective classifications regarding the QLI can be seen.

Administrative Region	Group 1: High level		Group 2: Average level		Group 3: Low level		Total Population
	n	%	n	%	n	%	
East	30,701	26.5	69,347	59.7	16,058	13.8	116,106
West	0	0.0	98,389	40.2	146,354	59.8	244,744
North	0	0.0	81,750	41.8	113,834	58.2	195,584
South	143,401	92.2	12,481	8.0	0	0.0	155,883
Total	174,102	24.4	261,967	36.8	276,246	38.8	712,317

Figure 5. Population distribution by administrative region and group according to QLI level. Natal/RN, 2006. Source: City of Natal / SEMPLA, 2012.

DISCUSSION

Brazil has a per capita income higher than that found in developing countries. However, living with intense economic and social inequalities. In the 1990s, this inequality was one of the greatest in the world. And in 40 years, grew from a medium HDI (0.500 to 0.800) to a high HDI (0.830), bringing development in increased income, life expectancy and education. It is noteworthy that this growth occurred more rapidly in some states in the country emphasizing the differences between the various regions.⁹

The literature brings evidence of inequalities in health levels among different socioeconomic groups, noting that poor society generally have worse health conditions than more advanced society. However, this issue has been thoroughly discussed, emphasizing that one can not only consider socioeconomic status, but relate it to other settings considering the various social, political and cultural constituents of "poverty", "deprivation", "lack", "exclusion" or "disadvantage".¹⁰

Data on breast and cervical cancer mortality in the city Natal show a strong social inequality in relation to illness and death from these diseases. Such that, mortality is more frequent in socioeconomically disadvantaged regions, i.e., in the northern and western

regions, being lower in the southern and eastern.

This mortality spatial distribution was also reported by another study¹¹ through mortality rates, when assessing the death trends from oral cancer in the city of São Paulo. Thus, when the socioeconomic indicators on income, employment, education and social inequality were cross examined, a high correlation was observed between low district indicators and increased mortality, similar to the findings.

The lowest mortality rates are shown in the city's southern and eastern areas, and are certainly due to the fact that individuals of higher social classes have access to private and contracted health services allowing early diagnosis and consequent treatment, leading cure or increased survival. The spatial distribution of this disease, mainly deaths, clearly reflects the differences in land use over the years, where the more economically favored classes occupy the noblest areas of the city while the other population groups are condemned to live in more peripheral areas and devoid of essential quality of life conditions.

Brazil has in its State of condition is responsible for urban infrastructure implementation in cities, the differences and spatial segregation existing in Brazilian cities, among these this study's setting is

highlighted, in which state policies and government, historically promoted a visible segregation.

Introducing the territory as the analysis unit in epidemiologic studies necessarily requires an economic history, political and cultural place, reflection in the analysis. Assuming that the constructed area and this population's distribution in the territory does not play a neutral role in the life and evolution of social formations. The differences between the places are the result of particular production methods, spatial arrangement, namely the changes in area are defined by social, political and economic, evolving from the production process needs and their successive moments, and largely influenced by international regulations.¹

The population's excessive growth in the 1950s, combined with lack of planning resulted in an inter-urban spatial differentiation, with several areas marked by pockets of poverty. Compared to previous years, the city of Natal had a reduction in this component. In 2010, the percentage of population living below the poverty line was only 9.5%, while 20.8% were between poverty and destitution lines and others (69.7%) lived above the poverty line. In two decades, the rate of people receiving up to half a minimum wage was reduced by 23%. The most economically advantaged were responsible for 68.6% of the accumulation of the income produced in the city, while the economically underprivileged were responsible for only 1.6%.

¹²

In the study city, the authors report that in the 1970s, housing construction for people with high incomes was made mainly by the Institute of Guidance for Housing Cooperatives of Rio Grande do Norte [Instituto de Orientação às Cooperativas Habitacionais do Rio Grande do Norte](INOCOOP-RN). In the meantime the state of Rio Grande do Norte through the People's Housing Plan [Plano Habitacional Popular], created the Housing Company of Rio Grande do Norte [a Companhia de Habitação Popular do Rio Grande do Norte] (RN-COHAB), which had the financier to the National Housing Bank [Banco Nacional de Habitação], and producing housing for the less privileged classes.¹³ This fact shows that public policies spatially segregated the city since the 1970s when the INOCOOP-RN built housing in the city's southern region and COHAB-RN built housing in the city northern region. Thus, the population of high income is located mainly in the Southern

region of the city, while the low-income in the Northern region of the city which has always been neglected by the government, and has historically lower public resource investments in urban infrastructure.

Natal's GDP in 2007 was 8.02 billion Reals and the GDP per capita, 10,362.00 reals. The city has great importance in the state's economic scene, and represents about 40% of the total Rio Grande do Norte's GDP and the second highest GDP per capita in the state.⁸

The city's new economic design has a significant impact on the division of labor, which in turn interferes with the people distribution in the area. For every moment of the division of labor, new geographical formats are established with the purpose of servicing roles, being building spaces or functionally altering existing ones. This process can be called "society geographization".¹

In this sense, it is inferred that poverty is not created only by economic causes, but also by geographical causes. Thus, the value of each person is defined by where they are located.¹⁴ This characteristic is rather peculiar in developing and industrialized countries since, they are lacking capitalist modernity. In it the opulence of economic life and its material expressions are intertwined and signs of "unconsciousness" in accordance with the delayed social and political structures.

It is necessary to point out that Natal, like other capital cities, is the result of the socio-economic and political model in force in Brazil since the colonial period, slavery, to its developmental apex, always characterized as a society with high social inequity.

Although the so-called "slums" are hidden from the sight of citizens and tourists visiting the city, the contrasts and income disparities between regions are striking, namely reflecting on the social development indices. This structural inequality model explains the difficulty of access to health services and epidemiological contrast between the inhabitants of the East / South and North / West sanitary districts.

Thus, mortality from breast and cervical cancer in this study is an example of this inequality in population illness and death, since the effects of social inequality on health indicators have been prominently displayed in health debates.

Poverty is the most responsible for the high mortality and low life expectancy rates.¹⁵ Other authors believe that social inequality

itself has a greater weight in the process.¹⁶ This statement can be understood by the fact that the so-called developed societies, even with a high gross domestic product (GDP), cannot improve their mortality rates, mental illness, violence and crime.

This discussion may seem redundant in such a way that it becomes very difficult to separate the effects of poverty and social inequality on health. Furthermore, these studies have limitations because of the indicators used, based, mostly on income and consumption capacity of individuals, not being the most appropriate to measure the actual social inequalities.¹¹ Public policy, in health, not are sufficient to meet the poorest of the population even when it comes to essential services, such as cancer services, as there is a high demand and long waiting lists for exams, and effective treatments.

In 2005, Natal had a total of 373 health facilities, among these, 98 were public. In this universe Northern-Rio Grande connects as a player against cancer.⁸ The Northern-Rio Grande cancer connection in 2010 registered a total of 5,763 new cancer cases of all types, with a monthly average of 480 cases. Among these, 69% were users of the Unified Health System (SUS) while 31% came from health plans.¹⁸

Most of the poor have a greater need for medical care and health services. However, the difficulty in accessing public services is observed at the national level, which results in late diagnosis and precarious treatment. As a result there has been an early and preventable death in this part of the population. This difficulty has been proven daily by professionals in the Family Health Strategy (FHS), which refer patients to specialized centers and waiting months to wait for the appropriate treatment. This situation at a hospital in the São Paulo's capital city, to find that most of the SUS, seeking chemotherapy services had to wait a long time, besides the repeated interruptions due to lack of chemotherapy.¹⁹

Even in less complex care levels there is inequity as in access to tests used for cancer prevention.²⁰ As an example, the prevention of breast cancer is mentioned by studying factors associated with the lack of mammograms and clinical breast examinations, noting that the SUS offers a small number of annual mammograms and clinical examinations. Similar studies were conducted in various parts of the country corroborating with these results.¹⁴

Women show demonstrate greater health care than men and that they are more aware and active in self-care.²¹ However, this care, most often, has no continuity, as these women have no access to more complex care, causing disease non-detection in early stages, thus progressing to more serious cases and death which reflects the social inequalities in health.²²⁻³

CONCLUSION

After 23 years of SUS implementation in Brazil and the important achievements in Brazilian society in the public health field, there are still many posed challenges. SUS needs to align with the constitutional determinations in order to ensure universal and equitable health care comprehensiveness.

Whereas the State and the governmental structure installation reflect the political struggle installed between the various social sectors, it is necessary that organized civil society mobilizes and redirects to influence public policies, especially health policy in order to accommodate the needs and interests of the population. It is believed that the city, from the area constructed by this diversity in social classes, income differences and the cultural models should resist the irrationality of the current economic model.

This study's analysis demonstrates the complexity of the spatial distribution in Natal/RN regarding social inequalities that reverberates in illness and death of the population.

Discussions about area while flow and fixed scenarios highlights the need for new approaches to the geographical dimensions in the search for holistic understanding of the health-disease process, as well as the death conditions arising from social inequities highlighted in this study.

It was observed that Natal's geographic area occupation, a reflection of social conditions and the prevailing socio-economic model, determines the mode of dying from breast and cervical cancer highlighting social inequalities.

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Corresponding Address

Maísa Paulino Rodrigues
Ed. Terra de Santa Cruz/1102
Av. Amintas Barros, 3735 A
Lagoa Nova
CEP: 59075-250 – Natal (RN), Brazil