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Preview Notes

Spatial inequalities and perinatal mortality in a Brazilian northeast capital: an ecological study

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ABSTRACT

Aim: to analyze the spatial inequalities of perinatal mortality in Recife (PE) in the period from 2013 to 2015. **Method:** an ecological study, whose unit of analysis will encompass neighborhoods, and the population will be composed of perinatal deaths recorded in the Mortality Information System. The gamma-type generalized linear model will analyze the statistical significance of social indicators and maternal-infant care with the coefficients of perinatal mortality by neighborhood. Spatial analysis will be used to calculate the Moran spatial autocorrelation index and to point out priority areas. The kernel density estimator will locate the spatial clusters of deaths. **Expected results:** Identify intra-urban differentials in perinatal mortality among neighborhoods with higher coefficients and worse social conditions and to assist maternal and child health, as well as to identify areas with priority attention needs, which may support the planning of health actions.

Descriptors: Spatial Analysis; Perinatal Mortality; Health Information Systems.

INTRODUCTION

Perinatal mortality is a health indicator that is associated, among other factors, with the conditions of access to services and the quality of maternal and child care[1]. In the world, perinatal deaths occur mainly in low- and middle-income countries, where the coefficient of 50.1 per thousand births is estimated[2].

In Brazil, between 2001 and 2015, the fetal component increased from 12.29 to 10.82 per thousand births (11% decline). The early neonatal component went from 10.15 to 6.69 per thousand live births (a decrease of 34%) [3]. Besides the differences in the reduction of the age components, regional inequalities still persist in the country[1,3]. In 2015, the perinatal mortality rate in the Northeast region was 21.15 per thousand births, above the national average of 17.43[3].

Spatial inequalities in perinatal mortality may be influenced by social issues related to income, education, occupation, race/color, and place of residence or work[1]. The identification of these inequalities is the object of epidemiological studies that help detecting areas that need greater attention in the health sector[1,2].

Among the methodologies used in these studies, we highlight the spatial analysis, a tool capable of integrating geo-referenced epidemiological, socioeconomic, environmental and demographic data. This analysis has been applied to detect risk factors, to verify spatial patterns and to identify priority areas for interventions[1]. Studies on this theme may contribute to the planning of actions aimed at reducing perinatal mortality in specific geographic spaces.

GUIDING QUESTION

How are the spatial inequalities of perinatal mortality distributed in the municipality of Recife, Pernambuco, in the period from 2013 to 2015?

AIM

Analyze the spatial inequalities of perinatal mortality in the municipality of Recife, Pernambuco, from 2013 to 2015.

METHOD

This is an ecological study to be carried out in the 94 districts of Recife, capital of the state of Pernambuco, Northeast Brazil. The population surveyed will be composed of all perinatal deaths of residents of the municipality, registered in the Mortality Information System (SIM), occurring in the period from 2013 to 2015.

Data from the SIM and the Live Birth Information System (*Sistema de Informações sobre Nascidos Vivos* – SINASC) will be used to calculate the perinatal mortality coefficients per neighborhood. The SINASC information will allow identifying, in each neighborhood, the following indicators: proportion of live births of mothers with non-white race/color, mother's age lower than 19 and above 34 years, schooling below eight years, without partner, beginning of prenatal care after first trimester of gestation, prenatal with less than six consultations, multiparous, cesarean delivery, live births with less than 37 weeks' gestation (preterm), and birth weight below 2500g (low birth weight).

The statistical significance of these indicators will be analyzed through the generalized linear model of the gamma type, which is used because there is a variable response with continuous and positive data and it is desired to study its relation with explanatory variables. The results of this model will indicate the variables whose increase in the percentage will influence in the increase of the perinatal mortality coefficients.

In spatial analysis, the TerraView® version 4.2.2 program will calculate the Moran spatial autocorrelation index. This index allows identifying clusters of areas with similar risks for the occurrence of the outcome of interest, and can vary from -1 to +1. Values close to zero indicate the lack of significant spatial autocorrelation between the values of the objects and their neighbors. Positive values indicate that neighboring microregions are similar to each other, and negative values suggest that they are not. The Moran index calculation will use the coefficient of perinatal mortality per neighborhood as the outcome variable, and as independent variables, those that present significance in the statistical model previously calculated.

The QGis® software version 2.14.3 will automatically locate the geographic coordinates of the maternal points of residence by geocoding addresses with search in the GoogleMaps® database, as well as apply the kernel estimation technique, which analyzes spatial patterns of point processes. It is intended, therefore, to promote statistical smoothing and to describe the influence of the density of a point on the existence of other points in nearby areas.

The research project was approved by the Research Ethics Committee of Fundação Joaquim Nabuco (CAEE: 67780817.4.0000.5619).

EXPECTED RESULTS

It is intended to identify intra-urban differentials in perinatal mortality among neighborhoods with higher coefficients and worse social conditions and assistance to maternal and child health, as well as to detect areas with priority attention needs, which may support health action planning.

REFERENCES

1. Venâncio TS, Tuan TS, Vaz FPC, Nascimento LFC. Spatial Approach of Perinatal Mortality in São Paulo State, 2003–2012. Rev Bras Ginecol Obstet [internet]. 2016 [Cited 2017 Jan 15] 38(10):492–498. Available from: https://www.ncbi.nlm.nih.gov/pubmed/27894150.

2. Saleem S, McClure EM, Goudar S, Patel A, Esama F, Garces A, Chomba E, Althabe F, Moore J, Kodkany B, Pasha O, Belizan J, Mayansyan A, Derman R, Hibberd PL, Liechty EA, Krebs NF, Hambidge KM, e Buekens P, Carlo WA, Wright LL, Koso-Thomas M, Jobe AH, Goldenberg R. A prospective study of maternal, fetal and neonatal deaths in low- and middle-income countries. Bull World Health Organ [internet]. 2014 [Cited 2017 Mar 20] 3(91):605-612. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4147405/.

3. Ministério da Saúde, Departamento de Informática do SUS. Datasus. Brasília (DF): 2017 [cited 2017 jul 26]. Available from: http://www.datasus.gov.br/DATASUS/index.php?acao=11&id=33610.

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