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Preview Notes

Spatial analysis of social inequities and mortality from tuberculosis: an ecological study

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ABSTRACT

Aim: to analyze the spatial and spatial-temporal distribution of tuberculosis deaths and their relation to indicators of social inequity. **Method:** ecological study to be carried out in Natal-RN. All cases of death that have tuberculosis as the underlying or associated cause, registered in the Mortality Information System, will be considered in the period 2008-2014. An exploratory analysis of sociodemographic and operational variables will be performed. Data from the 2010 Demographic Census will be used to formulate social indicators through analysis of key components. The scan statistic will be used to identify clusters of risk. The relationship between death and social inequity will be verified through multiple linear and spatial regression and residue investigation to evaluate spatial dependence through the application of the Moran Global I Test. **Expected results:** Mortality due to tuberculosis is not randomly distributed in the municipality, and is more frequent in groups with greater social inequity.

Descriptors: Tuberculosis; Mortality; Social Inequity.

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SITUATION PROBLEM AND ITS MEANING

Tuberculosis (TB) continues to be a serious global health problem. It is the cause of sickness of millions of people every year, and is classified as the leading cause of death by infectious diseases worldwide[1]. In 2015, Brazil had an incidence of 41 cases per 100,000 inhabitants and a mortality rate of 2.4 deaths per 100,000 inhabitants[1].

Despite the decline in mortality rates for TB in Brazil and the world in recent years, the number of deaths is still high and has an impact on the economy and health systems. Accordingly, in 2014, according to the Sustainable Development Objectives, the World Health Organization established the End TB strategy, aimed to reduce mortality by 95.0% and 90.0% in the incidence of TB for the year 2035, considering the indicators for 2015[2].

The high prevalence of TB is observed especially among the subpopulations that live in situations of social vulnerability, such as in the metropolitan regions of the country, where there are sanitary conditions that increase the risk of death due to TB, such as high population density and poverty concentration[3].

Thus, considering the hypothesis of the study that the distribution of TB deaths in a territory is not random and occurs incisively in groups with greater social disadvantage, the analysis of the distribution of TB deaths, together with the identification of its determinants in the population in the space and time, it becomes paramount for the knowledge of the reality experienced, with a view to implementing actions and/or interventions consonant with the main problems identified.

OBJECTIVES

General

The goal is to analyze the spatial and spatial-temporal distribution of TB deaths and their relationship with indicators of social inequity.

Specifics

- To describe the sociodemographic and operational characteristics of TB deaths;
- To construct indicators of social inequity using data from the census tracts of the 2010 Demographic Census;
- To analyze the spatial dependence between the TB mortality rates of the census tracts and the indicators of social inequity;
- To identify spatial and spatial-temporal clusters of risk for the occurrence of TB deaths according to census tracts of the 2010 Demographic Census.

METHOD

This is an ecological study, using multiple measures of analysis, to be carried out in the city of Natal-RN. The study population will be composed of all the cases that evolved to death due to TB as a basic or associated cause, registered in the Mortality Information System (*Sistema de Informação sobre Mortalidade* – SIM), from 2008 to 2014. The methodological analysis of the data will be divided in four stages: I - exploratory analysis through descriptive statistics of the quantitative parameters, of the sociodemographic and operational variables of the deaths; II- construction of indicators of social inequity through the technique of multivariate analysis of main components, processed in software Statistica version 12.0; III: Spatial analysis of TB deaths, in which, initially, the geocoding of deaths will be processed in TerraView version 4.2.2. Multiple

linear regression using the least squares method and spatial regression will be used to analyze the relationship of spatial dependence between social inequality indicators and TB mortality rates. Autocorrelation in multiple linear regression residuals will be tested using the Moran Global Test. For the diagnosis of the best spatial regression model, the Lagrange Multiplier test will be used. In all tests, the significance level in alpha of 5% ($p<0.05$) will be set. In addition, the spatial analysis technique called scanning will be employed through the use of SaTScan™ software version 9.2 for detecting clusters in space and in space-time. The research project was approved by the Research Ethics Committee of the Nursing School of Ribeirão Preto under Opinion No. 972,998, issued on March 4, 2015.

EXPECTED RESULTS

It is expected to verify the association between social inequity and TB deaths, that is, it is hoped that TB mortality is not distributed randomly in municipalities, becoming more frequent in less privileged groups in relation to health goods and services. In this line of reasoning, it is assumed that the distribution of deaths in the territory occurs incisively in groups with greater social disadvantage.

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