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Social indicators, deaths and hospitalizations due to tuberculosis: an ecological study

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ABSTRACT

Problem: Considered as a disease linked with income inequity, the presence of tuberculosis (TB) in a certain community reflects the precariousness of local policies aimed at assisting social development. **Aim:** To analyze the connection between the spatial distribution of deaths and hospitalization due to TB and social indicators. **Method:** This is partially an ecological and an analytical study performed in the municipality of Ribeirão Preto, Brazil. The data will be acquired from three different databanks: the Brazilian Death Information System; the Hospitalization System from the Brazilian Unified Health System; and the 2010 Brazilian Census, which will provide information regarding social indicators through the analysis of the main components. To analyze the spatial distribution, scan statistics will be used, together with multiple linear regression, the method of least-squares, and spatial regression to evaluate the spatial dependency through the use of Global Moran's I Test.

Descriptors: Tuberculosis; Social Indicators; Health Information System.

SITUATION PROBLEM AND ITS SIGNIFICANCE

The presence of tuberculosis (TB) in a community reflects the lack of policies in terms of social development, indicating a higher impact on socially vulnerable groups⁽¹⁾. Identified as one of the ten main causes of death around the world, in 2012, TB affected around 8.6 million, leading to the death of 1.3 million people⁽¹⁾.

One of the challenges of the 21st Century is the elimination of the disease by 2050, on the part of 22 countries which are responsible for 80% of the TB load around the world⁽¹⁾. In 2012, Brazil was in 16th position in terms of the number of cases⁽¹⁾ with an incidence of 36.1 per 100,000 inhabitants with regard to all clinical aspects of the disease during that year.

Research into death and hospitalization due to TB is being taken into consideration as it demonstrates an important element in terms of the quality of health systems when infection is suspected, given that the incidence of death due to the late diagnosis of TB is a more serious problem with regard to public services relating to populations with more difficult access⁽²⁾.

The increased numbers of hospitalizations can be an indicator of problems related to Health Primary Care (HPC), in terms of both the management and the challenges related to the offering of diagnostic resources, or failure in terms of the management of cases and with regard to the HPC reference system⁽³⁾.

In this order, this research will contribute to an analysis of the relationship between social indicators and deaths and hospitalizations due to TB. This will also contribute to the management of the social determinants of health. Subsequently, we will identify strategies to overcome inequality in terms of access to health services, especially to the most vulnerable population groups. Therefore, this study will be able to

contribute, not only to improvements in access to health care services, but also to be able to support the introduction of elements that can assist other intersectoral actions.

AIMS

General

To analyze the relationship between the spatial and the spatial-temporal distribution of deaths and hospitalizations due to TB and social indicators.

Specific

To build social indicators using data from the 2010 Brazilian Census;

To identify special agglomerations and spatial-temporal relationships with the total number of deaths and hospitalizations due to TB;

To analyze the relationship between the spatial distribution of death and hospitalization due to TB and the social indicators.

METHOD

This is an ecological and analytical study to be performed in the municipality of Ribeirão Preto, Brazil, from 2006 to 2012. The data used will be acquired from three different databanks: Death Certificates (DO, in Portuguese), from the Brazilian Death Information System (SIM, in Portuguese), based on the cause of death according to the International Classification of Diseases (ICD) A15.0 to A19.9; reports from the Hospitalization Authorization (AIH, in Portuguese) and from the Hospitalization System (SIH, in Portuguese) of the Brazilian Unified Health System (SUS, in Portuguese), following the main

diagnoses according to the ICD mentioned above; finally, data from the 2010 Brazilian Census that will be used to generate the social indicators with regard to which the main components technique will be used, in order to select the most representative elements from the information available into new variables, based on the linear combinations of original variables.

To allow the analysis of the spatial distribution of deaths and hospitalizations due to TB, the geocoding of data will be performed using the 2012 basemap of Ribeirão Preto. Later, the search for spatial and spatial-temporal agglomerations will be done using scan statistics. These are performed through the positioning of a circle of variable radius around each centroid, calculating the number of occurrences within each circle. According to this analysis, relative risk maps (RR) will be generated to compare the results with the next step. This will involve linear multiple regression, taking into account the method of least-squares and of spatial regression. To perform the modeling of spatial regression, we will use the suppositions of variable homocedasticity and the normal distribution for dependent variables, respectively, through Bartlett's and Shapiro Wilk's Tests. The study will take into consideration the synthetic indicators of social conditions as dependent variables. In the case of autocorrelation, the model generated must incorporate the spatial structure. There is a possibility of investigating the residue in order to evaluate the existence of spatial dependency, which will be observed by the application of the Global Moran's I Test.

This research project was approved by the Committee of Ethics in Research of the Nursing School of Ribeirão Preto, under protocol 5203, issued on January 11th 2013.

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