

## RESEARCH ARTICLE

## Epidemiologic Spatial Analysis of a Tuberculosis Incidence in Bandung City in 2021

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### Abstract

Tuberculosis (TB) is a communicable disease that is a significant cause of ill health and one of the leading causes of death worldwide. Tuberculosis remains a major global health problem. Tuberculosis infection remains one of the biggest health problems in Indonesia, which ranked second in the world on the list of countries with a high burden of TB. This is a cross-sectional study where the research displays population data, population density, and the incidence of TB in Bandung city, which is visualized in the mapping. This research analyzed the relationship between population density and the incidence of TB. The area with the highest TB incidence was the Babakan Ciparay subdistrict, with a total of 469 people and a population density of 205 people/hectare. The study has shown a strong relationship and a positive correlation between population density and the incidence of TB in Bandung city ( $p < 0.001$ ,  $r = 0.603$ ). Tuberculosis cases tend to be higher in areas with high population densities. Besides population density, other factors influence the incidence of TB in an area. House technical factors such as adequacy of windows, air ventilation, and lighting influence TB transmission. Besides that, household sanitation factors and occupancy density also impact the incidence of TB. In conclusion, subdistricts with a high population density show a high incidence of TB. There is a strong and unidirectional relationship between population density and the incidence of TB.

**Keywords:** Density, population, spatial, tuberculosis

### Introduction

Tuberculosis (TB) is a communicable disease that is a significant cause of ill health and one of the leading causes of death worldwide.<sup>1-5</sup> Tuberculosis remains a major global health problem.<sup>6</sup> It affects approximately 10 million people worldwide and kills more than 1 million every year.<sup>7</sup> Tuberculosis infection remains one of the biggest health problems in Indonesia, which ranked second in the world on the list of countries with a high burden of TB.<sup>8,9</sup>

Tuberculosis is caused by the bacillus *Mycobacterium tuberculosis*, which is spread when people who are sick with TB expel bacteria into the air.<sup>10-12</sup> The disease typically affects the lungs (pulmonary TB) but can also affect other sites.<sup>13</sup> Appropriate TB treatment is needed so that treatment can be completed. An unexpected condition in treating TB is the presence of

multidrug-resistant TB (MDR).<sup>11,14,15</sup> In this condition, treatment becomes more complex, and costs have the potential to be greater than it should be.

Many studies have shown that there is a relationship between various factors and the incidence of TB.<sup>16-18</sup> Several studies have shown that the incidence of TB is related to social factors such as population density.<sup>16,17,19-21</sup> Areas with a high population density are at greater risk of transmission to the community.<sup>7,22,23</sup>

This study aims to describe the distribution of population and population density and determine the relationship between population density and the incidence of TB. This research was conducted by visualizing distribution maps to make it easier to understand data distribution. Epidemiological spatial analysis makes it easier to read data by mapping according to population density and incidence of tuberculosis.

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