

ABSTRACT

Tuberculosis (TB) is a public health problem influenced by multiple factors and varies across regions. This study clusters 27 districts/cities in West Java based on TB indicators and social determinants of health in 2024 using an integrated Self Organizing Map (SOM) and K-Medoids method. The data include TB case detection and treatment success rates, population density, health facilities, stunting, sanitation, access to clean water, adequate housing, and clean and healthy living behavior. Optimal parameters were set via hyperparameter tuning, 5×5 grid, learning rate 0.05→0.01, 600 iterations, and $k = 4$ clusters. Four clusters were obtained with a Silhouette Coefficient of 0.311, Davies-Bouldin Index of 1.006, and Calinski-Harabasz Index of 11.115. Cluster 1 with 6 regions has the lowest health facilities and TB treatment success rate, but the best housing and lowest stunting. Cluster 2 with 11 regions excels in sanitation and clean water access. Cluster 3 with 4 regions has the highest clean and healthy living behavior, but the worst infrastructure and highest stunting. Cluster 4 with 6 regions has the best TB treatment performance and health facilities. SOM–K-Medoids integration identifies patterns from multiple indicators simultaneously, robust to outliers, supporting more targeted TB control policies.

Keywords: Tuberculosis, Social Determinants of Health, Self Organizing Map, K-Medoids, Clustering