Development of Structural Equation Model Using Spatial Approach on Dengue Cases in Bone Regency South Sulawesi Province

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ABSTRACT

This research aimed to develop structural equation modeling (SEM) using spatial approach in dengue hemorrhagic fever cases in District of Bone.

This research used area approach using AceView GIS 3.2 and GeoDa programs. Sub-district was considered as unit of analysis.

The results showed that pattern of dengue case spreading in District of Bone that is in clustered SEM spatial estimator by considering spatial weight was described as follow:

\[ \gamma = \left( X' \Sigma X \right)^{-1} X' \Sigma \gamma \]

with, \( \Sigma = \lambda \sigma^2 \Lambda + \sigma^2 \theta \), \( A = I - \rho W \)

Spatial structural equation modeling of dengue hemorrhagic fever cases in District of Bone using queen contiguity and rook contiguity weighting matrices was:

\[ \text{DHF}_1 = 0.34 \sum_i \eta_i \eta_i - 0.89 \text{infrastructure} + 2.26 \text{environment} - 1.04 \text{behavior} \]

Its \( R^2 \) was equal to 0.90. That means 90% variation of DHF occurrence may be explained by infrastructure, environment and behavior.

Spatial structural equation modeling of dengue hemorrhagic fever cases in District of Bone using endemic area central queen contiguity weighting matrix was:

\[ \text{DHF}_2 = -0.519 - 0.348 \sum_i \eta_i \eta_i + 1.83 \text{environment} - 1.03 \text{behavior} \]

Its \( R^2 \) was equal to 0.91. That means 91% variation of DHF occurrence may be explained by environment and behavior.

The best spatial structural equation model of dengue hemorrhagic fever cases in District of Bone is queen contiguity weighting matrix central endemic area.

The level of dengue hemorrhagic fever cases in District of Bone influenced by environmental and behavioral factors.

Keywords: SEM, Spatial, Dengue Hemorrhagic Fever