IDENTIFIKASI POLA SPASIAL DAN PEMODELAN FAKTOR RISIKO DEMAM BERDARAH DENGUE DI KABUPATEN JEMBER BERBASIS GIS *(IDENTIFICATION OF SPATIAL PATTERNS AND RISK FACTOR MODELING OF DENGUE HEMORRHAGIC FEVER IN JEMBER REGENCY BASED ON GIS)*

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ABSTRACT

Dengue Hemorrhagic Fever (DHF) is a major health threat in tropical regions such as Jember Regency, with an uneven distribution of cases across sub-districts. This study aims to identify spatial patterns and model DHF risk factors using Geographic Information System (GIS)-based analysis of secondary data from 2021, including DHF cases, climatic parameters (rainfall, temperature, humidity), demographic data (population density), and vector indicators (Larvae Free Index/ABJ). The analytical methods employed include spatial autocorrelation (Global Moran's I, LISA) and spatial regression (SLM, SEM) using a K-Nearest Neighbors weight matrix (k=5). The results indicate significant spatial clustering with Moran's I = 0.15 – 0.33 ($p < 0.05$), with persistent hotspots in Ajung and Kaliwates and seasonal dynamics (cluster peak in the first quarter). Population density emerged as the dominant risk factor throughout the year ($p < 0.001$), while climatic factors (rainfall, temperature) showed seasonal significance. The ABJ variable was not a significant predictor, indicating potential data bias. The findings were implemented in an interactive WebGIS that visualizes risk maps, case trends, and spatial analysis results. The study concludes the necessity of hotspot-based interventions prioritizing densely populated areas and integrating climatic factors into control strategies, supported by recommendations for strengthening vector surveillance and cross-sector collaboration in endemic regions.

Keywords: *Dengue Hemorrhagic Fever, Spatial Pattern, GIS, Spatial Regression, Jember Regency, Risk Factors.*