ABSTRACT

Dengue Hemorrhagic Fever (DHF) is one of several diseases in the tropical area which is tends to follow the changes of the weather, especially rain. DHF incidence in Nganjuk occurs every year, and became the highest incidence rate in 2015. Using weather (temperature, precipitation, solar radiation, humidity, and wind speed) as predictor variable and the incidence of DHF in Nganjuk from 2014-2015 as response variable, this study used Modeling Time Series Multivariate Adaptive Regression Spline (TS_MARS) and Adaptive Spline Threshold Autoregressive (ASTAR) to predict the incidence of Dengue Hemorrhagic Fever (DHF) in Nganjuk. Data processing was carried out in three stages, the establishment of a model, interpretation model equations and interpretation of selected variables. Modeling with TS_MARS method cannot produce a model, because transfer function of predictor variables cannot be formed and stationer assumption not meets the requirement. The incidence model of DHF in Nganjuk formed by ASTAR model was:

Y = 27.111 + 0.393 * BF1 - 0.466 * BF2 + 2.530 * BF4 - 0.057 * BF6 + 0.219 * BF7 + 0.980 * BF8 - 1.191 * BF10 + 0.073 * BF12 - 0.911 * BF13

BF1 = max(0, DBD_T1 - 52.000);BF2 = max(0, 52.000 - DBD_T1); BF3 = max(0, MATAHARI - 47.900); BF4 = max(0, 47.900 - MATAHARI); BF6 = max(0, 47.900 - MATAHARI) *BF2; BF7 = max(0, LEMBAB_T - 78.900) * BF4; BF8 = max(0, 78.900 - LEMBAB_T) * BF4; BF10 = max(0, 24.300 - SUHU_T1) * BF4; BF12 = max(0, 67.400 - LEMBAB_T) * BF3;BF13 = max(0, HUJAN_T1 - 676.000);

From the model, incidence of dengue was affected by the previous month incidence, solar lighting, the moisture, the temperature, and rainfall in the last month.

Keywords: TS_MARS, ASTAR, DHF, weather