ARIMA MODEL FOR FORECASTING DOMESTIC VIOLENCE CASES IN YOGYAKARTA CITY AND HISTORICAL DATA-BASED DYNAMIC ANALYSIS

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ABSTRACT

Yogyakarta City is widely recognized as a center of education and cultural heritage. However, behind this image lies a concerning issue—an increasing trend in domestic violence cases year over year. Although the government has established the Technical Implementation Unit for the Protection of Women and Children (UPT PPA) under the Department of Women's Empowerment, Child Protection, Population Control, and Family Planning (DP3AP2KB) to address and document such cases, many incidents likely go unreported, leading to incomplete data that hinders effective policy formulation and targeted preventive measures. To address this gap, a data-driven analytical approach is required to quantitatively forecast future trends and support more precise decision-making. This study aims to forecast the number of domestic violence cases in Yogyakarta City through dynamic analysis using historical data from the Yogyakarta City Department, spanning January 2021 to February 2025. The Autoregressive Integrated Moving Average (ARIMA) method was employed to project the number of cases over the next two months. Six ARIMA models were tested: ARIMA(1,1,0), ARIMA(1,1,1), ARIMA(2,1,0), ARIMA(2,1,1), ARIMA(3,1,0), and ARIMA(3,1,1). Evaluation results indicated that ARIMA(1,1,1) was the best-fitting model, yielding the lowest Akaike Information Criterion (AIC) value of 347.52. This model also demonstrated solid predictive performance, with an RMSE of 7.576, MAE of 5.636, MAPE of 45.387, MASE of 0.601, and ME and MPE values of 0.611 and -23.461, respectively. The forecast suggests a slight decline in domestic violence cases, from 22 to 21 incidents, within the next two months.

Keywords: Domestic Violence, Family, Forecasting, Dynamics, ARIMA