MODELING LIFE EXPECTANCY AND INFANT MORTALITY RATE IN EAST JAVA USING NONPARAMETRIC BI-RESPONSE SPLINE REGRESSION APPROACH

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ABSTRACT

Important aspect to measure human welfare is the Human Development Index, which consists of the life expectancy index, education index, and decent living standard index. Life expectancy index is one of the indicators used to determine progress in the health sector as seen from the magnitude of life expectancy and infant mortality rate. Identification of the factors that affect both indicators appropriately can be done with modeling, one of which is a nonparametric regression analysis for the relationships that occur between the variables do not follow a specific pattern. Nonparametric regression approach used is Spline, with its advantage is that the model is more likely estimating the data whenever it moves. This is because there is a point in the Spline knots that is joint fusion point, indicating a change of pattern in data’s behavior. In this study, a nonparametric bi-response Spline regression approach were used. The variables that may hold significant influence over the expected life expectancy and infant mortality rate is the percentage of households using drinking water from bottled water, the percentage of infants aged 0-11 months who were breastfed for 1-3 months, the percentage of births assisted by medical personnel, the percentage of births assisted by non-medical personnel, and the rate of economic growth. The best model obtained is the model with 1 knot as the optimal knots point.

Keywords: life expectancy, infant mortality rate, nonparametric regression, Spline.
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