

ABSTRACT

Modeling of Cox Proportional Hazard Classic- Multivariate Adaptive Regression Spline on Survival Hemodialysis Patients in Ibnu Sina Hospital Gresik

Survival analysis as a statistical method can be used to calculate the life expectancy of research subjects. This method uses statistical procedures for analyzing the data that its outcome variable was the time to occurrence of an event. Previous studies show that the survival analysis had low R^2 , to overcome these problems can be combined with Multivariate Adaptive Regression Splines (MARS) method. MARS is one method of nonparametric regression and semiparametric regression, flexible high dimension data, the relationship between the predictor and the response can be patterned linear or nonlinear, can involve a lot of interaction between predictor, able to detect these interactions for the development of Recursive Partition Regression (RPR) with Spline method so continuous in knots. This study aimed to modeling Cox Proportional Hazard (CPH) Classical and CPH-MARS in the Hemodialysis Patient. This analytic observational study using a retrospective cohort design with the right censor type of observations (Progressively censoring). A population of 155 at simple random sampling with a samples size 111. The data was analyzed using Cox regression, with $\alpha = 0.05$. Regression analysis CPH classical methods declared 7 variables affects the survival life of hemodialysis patients ($R^2 = 0,286$) with the model equations $\hat{h}_i(t) = \hat{h}_o(t) \cdot \exp(0,764 \cdot \text{Gender (female)} - 1,040 \cdot \text{Age (elderly)} - 0,938 \cdot \text{Employment status (no working)} + 2,261 \cdot \text{Insurance status (no Insurance)} - 0,867 \cdot \text{Nutritional Status (abnormal)} - 1,384 \cdot \text{Hypertension (no hypertension)} + 0,669 \cdot \text{Diabetes Mellitus (no diabetes mellitus)})$. Whereas 2 variables affects the survival life of hemodialysis patients ($R^2 = 0,401$) using CPH-MARS analysis could be explained in the following equation: $y = [x_2 (\text{Age}) * (x_6 (\text{Hypertension}) - 0,035)]_+$. The data concluded that the CPH- MARS analysis could give the good result the only on specific data in accordance with the residual Cox PH forming a knots the fracture spline. Suggested the further research to analyze another factors that had not been researched in this study, using the same method with continuous data and hospitals need to took some remedial action and special treatment for hemodialysis patients who had comorbidities hypertension so that the life expectancy of patients could be improved and needs to be given the education, information and communication to the family and the patients who had insurance membership to maintain health and healthy lifestyle.

Keyword : Cox Proportional Hazard Classic, Cox Proportional Hazard-Multi Adaptive Regression Splines, Hemodialisis