



TITLE: Assessing Survival Time of Heart Failure Patients: Using Bayesian Approach

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ABSTRACT

Heart failure is a failure of the heart to pump blood with normal efficiency and a globally growing public health issue with a high death rate all over the world, including Ethiopia. The goal of this study was to identify factors affecting the survival time of heart failure patients. To achieve the aim, 409 heart failure patients were included in the study based on data taken from medical records of patients enrolled from January 2016 to January 2019 at Jimma University Medical Center. The Kaplan Meier plots and log-rank test were used for comparison of survival functions; the Cox-PH model and the Bayesian parametric survival models were used to analyze the survival time of heart failure patients using R-software. Integrated nested Laplace approximation methods have been applied. Out of the total heart failure patients in the study, 40.1% died, and 59.9% were censored. The estimated median survival time of patients was 31 months. Using model selection criteria, the Bayesian log-normal accelerated failure time model was found to be appropriate. The results of this model show that age, chronic kidney disease, diabetes mellitus, etiology of heart failure, hypertension, anemia, smoking cigarettes, and stages of heart failure all have a significant impact on the survival time of heart failure patients. The Bayesian log-normal accelerated failure time model described the survival time of heart failure patient's data-set well. The findings of this study suggested that the age group (49 to 65 years, and

greater than or equal to 65 years); etiology of heart failure (rheumatic valvular heart disease, hypertensive heart disease, and other diseases); the presence of hypertension; the presence of anemia; the presence of chronic kidney disease; smokers; diabetes mellitus (type I, and type II); and stages of heart failure (II, III, and IV) shortened their survival time of heart failure patients.

Keywords: Heart failure, Survival time, Bayesian, Survival Data Analysis, INLA

BIOGRAPHY

The author was born in Oromia regional states, North Shoa Zone, Yaya Gulale District, Fital 01 Town in 1993 from his mother Tedalu Gutema and his father Ashine Tefera Tufa. When his age was reached for education he joined Fital Elementary School. He attended Fital Secondary and Preparatory School in Fital Town. Then, he joined Ambo University in 2012 and has been graduated in the department of Statistics in 2015. He has been working at Department of Statistics, College of Natural Science, Assosa University since August, 2015. And he has joined the MSc Program at Department of Statistics, Jimma University in September, 2017. He is graduate studies in the specialization of Biostatistics. He has completed his MSc at the age of 26 years from Jimma University, Ethiopia. Now he is a lecturer at Assosa University, Ethiopia. He has one publication.



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