

Statistical Modelling of the Survival of HIV/AIDS Patients and Identification of Early Mortality Changepoints after Initiation of ART : A Case Study at Hawassa University Referral Hospital

BY :Denekew Bitew

The objective of this study is to estimate survival probabilities, identify the determinant factors and identification of early mortality changepoints for the survival of HIV/AIDS patients in Hawassa University referral Hospital after initiating ART during the treatment period. The data were taken from the from HIV/AIDS patients registered during August 2005 to January 2012. These data were studied using the survival analysis methods; Kaplan-Meier estimation method, Cox proportional hazard model and more advanced approaches which allow to search for changepoint in the survival curves. Patients have mean survival time of 33.24 months with standard deviation of the mean 2.14, median time 38 months. From 119 patients incorporated in the study, 68.9% of them are females and 31.1% of them are male patients those who are under ART. From the total of the data 22(18.48%) have died and 97(81.52%) are censored during the treatment period. From the parametric Cox regression results it is found that the survival status of the patients are statistically significant with the covariate sex, base line CD4 count, TB status, alcoholic intake, WHO clinical stage, drug abuse and tobacco use. The hazard rate of the male patient is higher than female patients that is 4.06 higher than female patients. The patients who don't take alcohol have more survival time than from alcoholic patients after initiating ART. From the changepoint search mechanism the time for the patients survival is more or less affected in some specified time. The most innovative part of our study is that there are two changepoints in the survival curve of patients at Hawassa University Referral University hospital. More over, we tried to find the threshold time which shows the patients death rate changes which may indicate abrupt changes. This time (month) is an indicator for threshold time for the patients survival time. After initiation of ART, the survival improves faster at month nine and at month fourteen. This means that patients can expect to see a faster progression in their well being, after ART, after nine months and fourteen months.

Keywords: Antiretroviral Therapy, Cox Proportional Hazard Model, Change-point, Threshold time