

Bootstrap intervals in the presence of left-truncation, censoring and covariates with a parametric distribution

ABSTRACT

Left-truncated and censored survival data are commonly encountered in medical studies. However, traditional inferential methods that heavily rely on normality assumptions often fail when lifetimes of observations in a study are both truncated and censored. Thus, it is important to develop alternative inferential procedures that ease the assumptions of normality and unconventionally relies on the distribution of data in hand. In this research, a three parameter log-normal parametric survival model was extended to incorporate left-truncated and right censored medical data with covariates. Following that, bootstrap inferential procedures using non-parametric and parametric bootstrap samples were applied to the parameters of this model. The performance of the parameter estimates was assessed at various combinations of truncation and censoring levels via a simulation study. The recommended bootstrap intervals were applied to a lung cancer survival data.

Keyword: Bootstrap method; Covariate; Left-truncation; Random censoring