Parametric maximum likelihood estimation of cure fraction using interval-censored data

ABSTRACT

A significant proportion of patients in cancer clinical trials can be cured. That is, the symptoms of the disease disappear completely and the disease never recurs. In this article, the focus is on estimation of the proportion of patients who are cured. The parametric maximum likelihood estimation method was used for estimation of the cure fraction based on application of the bounded cumulative hazard (BCH) model to interval-censored data. We ran the analysis using the EM algorithm considering two cases: i) when no covariates were involved in the estimation, and ii) when some covariates were involved. This paper shows derivation of the estimation equations for the cure rate parameter followed by a simulation study.

Keyword: Cure fraction; BCH model; Interval censoring; Covariates; MLE method; EM algorithm