ON MODIFICATIONS TO THE LONG-TERM SURVIVAL MIXTURE MODEL IN THE PRESENCE OF COMPETING RISKS

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A mixture model for long-term survivors has been adopted in various fields such as biostatistics and criminology where some individuals may never experience the type of failure under study. It is directly applicable in situations where the only information available from follow-up on individuals who will never experience this type of failure is in the form of censored observations. In this paper, we consider a modification to the model so that it still applies in the case where during the follow-up period it becomes known that an individual will never experience failure from the cause of interest. Unless a model allows for this additional information, a consistent survival analysis will not be obtained. A partial maximum likelihood (ML) approach is proposed that preserves the simplicity of the long-term survival mixture model and provides consistent estimators of the quantities of interest. Some simulation experiments are performed to assess the efficiency of the partial ML approach relative to the full ML approach for survival in the presence of competing risks.

KEY WORDS: Long-term survivors, mixture models, competing risks, exponential distribution, Gompertz distribution.