

Introduction to single-index mixture cure models

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ABSTRACT

A common assumption in survival analysis is that if individuals could be followed up for an infinite time, they will all experience the event of interest. However, in many situations this assumption is not realistic (e.g. cancer studies). Those subjects who will never experience the event are said to be cured. To take this cure fraction into account, classical survival analysis has been extended to cure models. Specifically, mixture cure models allow to estimate the probability of cure and the survival function for the uncured subjects, denoted by latency. A completely nonparametric method for the estimation of both functions, in the presence of a univariate continuous covariate, was proposed in the literature. In this work, this methodology is extended to the presence of a covariate vector and a single-index model is proposed for dimension reduction. The methodology will be applied to a database of cardiotoxicity (which is an adverse effect of oncological therapy) from the University Hospital of A Coruña (CHUAC).