

Flexible Regression Models and the Crossing Effects of Survival Functions

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Abstract

We shall analyse survival data from clinical trials in oncology, when the crossing effects of survival functions could be observed. Accelerated life models, based on counting processes (see Andersen, Borgan, Gill, Kieding (1993)), are used more and more often in carcinogenesis studies for such kind of problems to relate lifetime distribution to the time-depending explanatory variables. Classical examples are the well-known data concerning effects of chemotherapy and chemotherapy plus radiotherapy on the survival times of gastric and lung cancers patients ; Stablein and Koutrouvelis (1985), Klein and Moeschberger (1997), Piantadosi (1997), Wu, Hsieh and Chen (2002), and Bagdonavicius, Hafdi and Nikulin (2004), Zeng and Lin (2007). Following Bagdonavicius, Levuliene, Nikulin (2009) , Bagdonavicius, Kruopis (2011), Nikulin (2011), Nikulin and Wu (2006) we give examples to illustrate and compare possible applications of the Hsieh model (2001) and Bagdonavicius and Nikulin's (2002, 2005, 2006) simple cross effect (SCE) model, both of them are particularly useful for the analysis of survival data with one crossing point. These models can be useful in many other clinical trials, see Sasco and Nikulin (2008), for example..