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A flexible approach to time-varying coefficients in the Cox regression setting. (English)

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Summary: Research on methods for studying time-to-event data (survival analysis) has been extensive in recent years. The basic model in use today represents the hazard function for an individual through a proportional hazards model [*D. R. Cox*, J. R. Stat. Soc. Ser. B 34, 187-220 (1972; Zbl 0243.62041)]. Typically, it is assumed that a covariate's effect on the hazard function is constant throughout the course of the study.

We propose a method to allow for possible deviations from the standard Cox model, by allowing the effect of a covariate to vary over time. This method is based on a dynamic linear model. We present our method in terms of a Bayesian hierarchical model. We fit the model to the data using Markov chain Monte Carlo methods. Finally, we illustrate the approach with several examples.

MSC:

62P10 Applications of statistics to biology and medical sciences; meta analysis

62F15 Bayesian inference

Cited in 13 Documents

Keywords:

survival analysis; smoothing; proportional hazards model; dynamic linear model; Bayesian hierarchical model; Markov chain Monte Carlo methods

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