

## Partially varying coefficient single-index additive hazard models

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Received: 27 August 2013 / Revised: 15 February 2014 / Published online: 12 September 2014  
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**Abstract** The partially linear additive hazards model has been proposed to study the interaction between some covariates and an exposure variable. In this paper, we extend it to the partially varying coefficient single-index additive hazard model where the high dimension covariates are collapsed to a single index, due to practical needs. Two sets of estimating equations were proposed to estimate the varying coefficient functions in the linear components: the link function for the single index and the single-index parameter vector separately. It was shown that the proposed local and global estimators are asymptotically normal. Simulation studies were conducted to examine the finite-sample performance of our method to compare the relative performance of our method with existing ones. A real data analysis was used to illustrate the proposed methods.

**Keywords** Varying coefficient · Partially linear single-index · Two sets of estimating functions · Iteration · Asymptotic normality