

Weighted estimating equations for additive hazards models with missing covariates

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Abstract This paper presents simple weighted and fully augmented weighted estimators for the additive hazards model with missing covariates when they are missing at random. The additive hazards model estimates the difference in hazards and has an intuitive biological interpretation. The proposed weighted estimators for the additive

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hazards model use incomplete data nonparametrically and have close-form expressions. We show that they are consistent and asymptotically normal, and are more efficient than the simple weighted estimator which only uses the complete data. We illustrate their finite-sample performance through simulation studies and an application to study the progression from mild cognitive impairment to dementia using data from the Alzheimer's Disease Neuroimaging Initiative as well as an application to the mouse leukemia study.

Keywords Kernel smoother · Missing covariates · Nonparametric method · Weighted estimators · Weighted estimating equations