Estimation procedure allowing for mismeasurements of the covariate in Cox model with grouped data: a case-study of the risk of leukemia death for Hiroshima A-bomb survivors.

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Abstract

If the risk estimation procedure does not take the mismeasurement of covariates into account, then the risk estimator is biased. We propose a new method of estimating the instantaneous risk in the Cox model with grouped data where the mismeasurement of a categorised covariate is modelled as a misclassification. An easily implemented estimation procedure based on a generalisation of the least squares method is devised then the statistical properties of the estimators are studied. The procedure is applied in estimating the risk of leukemia death in Hiroshima as a function of the dose of radiation. Our simulation study assesses the properties of the estimators. It also shows that the estimation of the instantaneous risk is altered in a very significant way when mismeasurement is not taken into account.

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