

# **Regression Analysis of Competing Risks Data With General Missing Pattern in Failure Types**

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## **Abstract**

In competing risks data, missing failure types (causes) is a very common phenomenon. In a general missing pattern, if a failure type is not observed, one observes a set of possible types containing the true type along with the failure time. Dewanji and Sengupta (2003) considered nonparametric estimation of the cause-specific hazard rates and suggested a Nelson-Aalen type estimator under such general missing pattern. In this work, we deal with the regression problem, in which the cause-specific hazard rates may depend on some covariates, and consider estimation of the regression coefficients and the cause-specific baseline hazards under the general missing pattern using some semi-parametric models. We consider two different proportional hazards type semi-parametric models for our analysis. Simulation studies from both the models are carried out to investigate the finite sample properties of the estimators. We also consider an example from an animal experiment to illustrate our methodology.