

## **Estimation of Hazard Rate Function under Shape Restrictions using Regression Splines**

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**Abstract:** The hazard function has an important role in the understanding and modeling of survival data. It is useful to estimate the hazard function by constraining its shape; monotone or convex assumptions are often valid based on theory. Nonparametric estimation methods are proposed in which the likelihood is maximized over a set of shape-restricted regression splines. An iteratively re-weighted least squares procedure is implemented, and the estimators are shown to obtain the optimal convergence rates. Right-censoring is a simple extension.