

On Estimating Survival Functions Under Stochastic Order

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Abstract

Let \bar{H} , \bar{G} , and \bar{F} be survival functions satisfying the constraint $\bar{F} \leq \bar{H} \leq \bar{G}$. Lee, Yan, and Shi (1999) had developed an algorithm to estimate the survival function \bar{H} when \bar{F} and \bar{G} are known. However, lacking a closed form of the estimator makes the investigations of the properties of the estimators difficult. In this paper, we propose alternative estimators for \bar{H} in the case where \bar{F} and \bar{G} are known. However, lacking a closed form of the estimator makes the investigations of the properties of the estimator difficult. In this paper we propose alternative estimators for \bar{H} in the case where \bar{F} and \bar{G} are known and in the case where they are unknown. The estimators are proved to be strongly uniformly consistent in both cases: the formulas for the bias and the mean squared error (MSE) are also derived. In the simulations the MSE of our estimators, when \bar{F} and \bar{G} are known, are uniformly better than that of Lee, Yan, and Shi when the sample size is small (30): when the sample size is large, further investigation is needed.