Ann Inst Stat Math (2009) 61:753–772
DOI 10.1007/s10463-007-0156-y

Stochastic monotonicity of the MLE of exponential mean under different censoring schemes

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Received: 5 March 2007 / Revised: 21 June 2007 / Published online: 1 September 2007
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Abstract In this paper, we present a general method which can be used in order to show that the maximum likelihood estimator (MLE) of an exponential mean θ is stochastically increasing with respect to θ under different censored sampling schemes. This propery is essential for the construction of exact confidence intervals for θ via "pivoting the cdf" as well as for the tests of hypotheses about θ. The method is shown for Type-I censoring, hybrid censoring and generalized hybrid censoring schemes. We also establish the result for the exponential competing risks model with censoring.

Keywords Exponential distribution · Maximum likelihood estimation · Type-I censoring · Type-I and Type-II hybrid censoring · Type-I and Type-II generalized hybrid censoring · Exact confidence intervals · Stochastic ordering · Competing risks model