

**ASYMPTOTIC PROPERTIES OF BOOTSTRAP LIKELIHOOD RATIO
STATISTICS FOR TIME CENSORED DATA**

by

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ABSTRACT

Much research has been done on the asymptotic distributions of likelihood ratio statistics for complete data. In this paper we consider the situation in which the data are censored and the distribution of the likelihood ratio statistic is a mixture of continuous and discrete distributions. We show that the distribution of signed square root likelihood ratio statistic can be approximated by its bootstrap distribution up to second order accuracy. Similar results are shown to hold for likelihood ratio statistics with or without a Bartlett correction. The main tool used is a continuous Edgeworth expansion for the likelihood-based statistics, which may be of some independent interest. Further, we use a simulation study to investigate the adequacy of the approximation provided by the theoretical result by comparing the finite-sample coverage probability of several competing confidence interval procedures based on the two parameters Weibull model. Our simulation results show that, in finite spaces, the methods based on the bootstrap signed square root likelihood ratio statistic outperform the bootstrap-t and BC_a methods in constructing one-sided confidence bounds when the data are Type I censored.