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Testing for uniform stochastic ordering via empirical likelihood

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Abstract This paper develops an empirical likelihood approach to testing for the presence of uniform stochastic ordering (or hazard rate ordering) among univariate distributions based on independent random samples from each distribution. The proposed test statistic is formed by integrating a localized empirical likelihood statistic with respect to the empirical distribution of the pooled sample. The asymptotic null distribution of this test statistic is found to have a simple distribution-free representation in terms of standard Brownian motion. The approach is extended to the case of right-censored survival data via multiple imputation. Two applications are discussed: (1) uncensored survival time data of mice exposed to radiation, and (2) right-censored time-to-infection data from a human HIV vaccine trial comparing a placebo group with a vaccine group.

Keywords Distribution-free · Order-restricted inference · Nonparametric likelihood ratio testing

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