ESTIMATION OF TWO STOCHASTICALLY ORDERED SURVIVAL FUNCTIONS

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Abstract

In order to understand how estimate two survival functions under stochastic order constraints. Consider the distribution functions F and G where for all x. Stochastic ordering can be found in many real life cases where one random sample is stochastically greater than the other sample. For instance consider the clinical study of 99 males who have been diagnosed with Larynx cancer patients and are undergoing chemotherapy. Through time it is expected that a percentage of patients will die due to other causes and or drop out of the study. It is of interest to estimate censored data of patients from two different stages of Larynx cancer disease. In order to estimate F and G, consider the survival cumulative functions since the empirical cumulative functions would not satisfy the stochastic order constraint. There were earlier approaches explored, Lo (1987) proposed estimators that fulfilled the stochastic order constraint, although these estimators are asymptotically minimax, and they are strongly uniformly consistent when both m and n tend to infinity. These estimators fail to account when either m or n go to infinity. To correct this problem Rojo (2004) proposed estimators that obtained the same properties needed to satisfy the order constraint and are strongly uniform consistent when only m or n tend to infinity. To further explore Rojo (2004) proposed estimators; our estimators S^f and S^g remain uniformly consistent and consider when m and n are dependent on time. Here, the estimators will also consider when data is censored. Through testing our estimators with different distributions, the results of the Monte-Carlo study show that further investigation is needed to determine whether our estimator is better when weights are time dependent.