A study on admissibility results for the selected hazard rates

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Abstract

Consider k (≥ 2) independent populations $\Pi_1, \ldots, \Pi_k$, where each population Π_i follows an exponential distribution with hazard rate β_i, $(i = 1, \ldots, k)$. Let $X_{i1}, \ldots, X_{in}$ represent a random sample of size n drawn from the ith population Π_i, where $i = 1, \ldots, k$. For each $i = 1, \ldots, k$, consider $X_i = \sum_{j=1}^{n} X_{ij}$. Based on a special case of Gupta's rule (1962), estimation of the hazard rate associated with the selected population is undertaken with respect to the entropy loss function. Several natural estimators of the hazard rate of the corresponding population are proposed. Brewster-Zidek technique is applied to find out a sub-class of admissible estimators within a class. Estimators improving upon the natural ones are obtained by using the method of differential inequalities.

Keywords: Hazard rate; Natural selection rule; Differential inequality; Entropy loss function; Brewster-Zidek technique.