Modeling the agreement of discrete bivariate survival times using kappa index

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Abstract: Estimation of the agreement between discrete bivariate survival times is examined when the same event time is measured by two methods. In previous works, the relationships between two interraters are usually reflected by the odds ratio, which measures the association between events. However, the primary interest in study may lie in the agreement rather than the association of two measurements. In this paper, we choose kappa index, the frequently used agreement parameter for categorical data, to assess the agreement between the two survival time measures at each grid point. We model the marginal distributions and kappa-index in terms of covariates. An estimating equation is used for modeling the marginal distributions and a pseudo-likelihood procedure is used to estimate the kappa agreement index and covariate effects relating to the kappa index. The performance of the estimation procedure is examined through simulations. The proposed method can be extended to multivariate discrete distributions.

Key Words: agreement, discrete bivariate survival times, kappa