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A Copula-based Estimator for the Intracluster Correlation Coefficient

Exchangeable copulas are used to model an extra-binomial variation in Bernoulli experiments with a variable number of trials. Maximum likelihood inference procedures for the intra-cluster correlation coefficient are proposed. Profile confidence intervals are constructed for several specifications of the copula family. Alternative models where the probability of success depends on the number of trials are investigated. The sensitivity of the inference to the specification of the copula family is investigated in a simulation study. Numerical examples are presented.