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Archimedean Copulas for Clustered Binary Data

This presentation shows that Archimedean copulas provide several models to accomodate an extra-binomial variation in Bernoulli experiments. These models feature parameters for the marginal probability of success and a copula dependency parameter. Two applications are presented. First, we construct profile likelihood confidence intervals for the intra-cluster correlation. The second is concerned with the estimation of the closed population size from a mark-recapture study. Unit level covariates are recorded on the units that are captured and copulas are used to model a residual heterogeneity that is not accounted for by covariates. A particular copula model can be selected using the AIC.