COMPARISON OF TWO MARKERS BASED ON THE RATIO OF AREAS UNDER CORRELATED ROC CURVES

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The problem under consideration is to investigate if two markers in a case-control study are equivalent on disease diagnostic when the paired marker measurements are possibly correlated. To do so, confidence intervals are constructed for the ratio of the two correlated AUCs, where the AUC is the area under the associated receiver operation characteristic (ROC) curve. Parametric confidence intervals are derived for bivariate normal paired marker measurements when the measurements are completely or incompletely observed. Nonparametric confidence intervals are also discussed when bivariate normal distributions are not tenable. A simulation study is then conducted to investigate the coverage probability or length of the proposed confidence intervals under a variety of bivariate distributions with different symmetric or right-skewed marginal distributions for different rates of missing data. Finally, the proposed confidence sets are illustrated by using a real data set on detection of Duchenne Muscular Dystrophy (DMD) carriers.

References