Estimating and comparing time-dependent areas under receiver operating characteristic curves for censored event times with competing risks

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(based on joint work with Jérémie Riou[2] and Hélène Jacqmin-Gadda[3])

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Abstract

The area under the time-dependent ROC curve (AUC) may be used to quantify the ability of a biomarker to predict the onset of a clinical outcome in the future. In this talk, we present methods to make inference with typical survival or competing risks data. We present a simple nonparametric inverse probability of censoring weighting estimator, its asymptotic properties and how these properties can be used to make inference. First, we show how to compute confidence intervals and test statistics for comparing two AUCs. Second, we present an efficient method to control the family-wise error rate when multiple comparisons are performed. The method consists of using a max-t test and the closed testing procedure. This approach takes into account both the correlations between the test statistics and the logical constraints between the null hypotheses. We show how the method works in practice through examples where we compare several psychometric scores to predict the t-year risk of Alzheimer's disease. This illustrates several interesting multiple testing settings and shows some advantages of using the proposed method over common alternatives.

References

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