

An Exact Non-inferiority Test for Diagnostics Accuracy Based on the Paired Partial Areas under ROC Curves

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Non-inferiority is a reasonable approach to assessing diagnostic accuracy of the new diagnostic procedure if it provides an easier administration or reduces the cost. The area under the ROC curve is one of common measures for overall diagnostic accuracy. However, it may not differentiate various shapes of ROC curves. The partial area under the ROC curve (PAUROC) may present an alternative that can provide complimentary information which requires the false positive rate within a certain level. Nonparametric and maximum likelihood methods can be used for the non-inferiority tests based on difference in PAUROC. Their performance has not been investigated in finite samples. We propose to apply generalized p-value to construct an exact non-inferiority test for diagnostic accuracy for the difference in partial paired areas under ROC curves. Simulation results show that the proposed exact non-inferiority test not only controls size but also is uniformly more powerful than the nonparametric methods.

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