Exact two-sample tests for equivalence based on linear rank statistics

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Since the early 1990's it has become customary to approach problems of statistical equivalence assessment also from a non- and semiparametric perspective. The majority of methods developed in that vein are based on large-sample approximations and involve computationally intricate estimators for the asymptotic variance of the test statistic under general alternatives to the traditional null hypothesis (cf. §§ 6.2, 6.3 and 6.6 of [3]). Our objective here is to show that for some common two-sample settings involving data of the continuous type, these tests admit far-reaching simplification through considering just the corresponding linear rank statistics per se and computing pairs of critical limits to the latter from their exact distributions under the proportional hazards model. Although the resulting testing procedures are exact in a strict sense only in this specific semiparametric submodel, the asymptotic theory developed by Janssen ([1], [2]) suggests that their basic properties are fairly insensitive against violations of the proportional hazards assumption. Results of simulation experiments will be presented providing answers to the question under what conditions and to what extent this conjecture holds true for concrete applications with finite sample sizes.

References

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