

Classical rank tests vs. pseudo-rank-based approaches in preclinical data analysis

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Rank-based nonparametric methods are frequently used in the life sciences, and in the empirical sciences in general. Among the best-known examples of nonparametric rank-based tests are the Wilcoxon-Mann-Whitney test and the Kruskal-Wallis test, which are often regarded as the method of choice for skewed data, or in case that outcomes are ordinal. For example, the use of nonparametric methods for analyzing skewed data is explicitly recommended by the National Toxicology Program. However, recently, potential pitfalls and paradoxical results pertaining to the use of traditional rank-based procedures for more than two samples have been highlighted, and so-called pseudo-ranks have been proposed as a remedy for this type of problems. In this talk, it will be demonstrated that pseudo-ranks might also behave counterintuitively in particular situations, though. Moreover, some differences between ranks and pseudo-ranks with respect to the interpretation of the results will be discussed. Summing up, one should decide based on thorough case-by-case considerations whether ranks or pseudo-ranks are appropriate.

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