Equivalence testing: Bioequivalence and beyond

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Abstract

In hypothesis testing problems, the null hypothesis is often a statement of equality. The two-sample t-test is a classic example where the null hypothesis states that two population means are equal. In some applications on the comparison of two means, it is more appropriate to test if the two means are equivalent; i.e., if they are close according to a specified threshold. Many applications call for testing equivalence, rather than equality, where the statement of equivalence is the alternative hypothesis so that equivalence is concluded by rejecting the null hypothesis. In the talk I will give a few applications where equivalence testing is required. These will include testing bioequivalence, testing the equivalence of several normal means relevant to the comparison of several treatments in a clinical trial, testing the equivalence of covariance matrices, comparing drug dissolution profiles, and equivalence testing for food safety assessment. All of the problems will be motivated and illustrated using practical applications.

Keywords

Equivalence of covariance matrices, Drug dissolution profiles, Food safety assessment, Likelihood-based criteria.