

## TESTS OF EQUALITY AND MULTIPLE COMPARISONS OF SEVERAL INDEPENDENT BINOMIAL PROPORTIONS

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- **ABSTRACT:** *In frequentist theory, inferences about more than two binomial proportions are performed using analysis of variance and multiple comparisons procedures, or still, by means of asymptotic tests and computational intensive methods. All these procedures have limitations due to violations of some of the assumptions required by tests. Therefore, this work aimed to propose a bayesian multiple comparisons test for proportions and a binomial test for the equality of several binomial proportions, and also to evaluate their performance using Monte Carlo simulation. Independent binomial populations with parameters  $\pi_i$  and  $n_i$ ,  $i = 1, 2, \dots, k$  were considered and Monte Carlo simulations were performed for each configuration involving combinations the quantities  $k$ ,  $n_i$ 's and  $\pi_i$ 's, considering conjugate betas prior with parameters  $\alpha_i$  and  $\beta_v$ , settled by trial and error for minimizing the type I error rates and maximizing the power. The TB for equality of several binomial proportions showed excellent performance and relatively high power. The TCMB for binomial proportions, under complete and partial  $H_0$ , was conservative and showed high power.*
- **KEYWORDS:** *Monte Carlo simulation; bayesian test for equality of several binomial proportions; bayesian multiple comparisons test; type I error; power.*

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