Post-data Estimation of Binomial Testing Power

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Abstract

Under a robust Bayesian framework, we study the problem of power estimation in binomial hypothesis testing problems. For testing the binomial mean, the observed powers are maximum likelihood estimates of power functions for one-sided and two-sided problems. With respect to these functions, we found that the observed power is too extreme when the data is significant for reasonable families of priors. A practical implications about sample size calculation problem was discussed.

Key words and phrases: Bayesian robustness analysis, beta prior, observed power, power function, Bayes estimates, binomial hypothesis testing, sample size calculation.