

The Zero-Modified Negative Binomial Distribution

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In this paper, we give detailed descriptions of the Zero-Modified Negative Binomial distribution for analyzing count data. In particular, we study the characterizations and properties of this distribution, whose main advantage is its flexibility which makes it suitable for modeling a wide range of overdispersed and underdispersed count data (which may or may not be caused by zero-modification, i.e., the inflation or deflation of zeroes), without requiring previous knowledge about any of these inherent data characteristics. We derive maximum likelihood estimation of the model parameters based on positive observations, and evaluate the loss of efficiency by considering this procedure. We illustrate the suitability of this distribution on real data sets with different types of zero-modification.

Palavras-chave: Negative Binomial Distribution; Underdispersion; Zero-Deflated Count Data; Relative Efficiency.

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