

## Statistical Analysis for Overdispersed Medical Count Data

**Authors :** Y. N. Phang, E. F. Loh

**Abstract :** Many researchers have suggested the use of zero inflated Poisson (ZIP) and zero inflated negative binomial (ZINB) models in modeling over-dispersed medical count data with extra variations caused by extra zeros and unobserved heterogeneity. The studies indicate that ZIP and ZINB always provide better fit than using the normal Poisson and negative binomial models in modeling over-dispersed medical count data. In this study, we proposed the use of Zero Inflated Inverse Trinomial (ZIIT), Zero Inflated Poisson Inverse Gaussian (ZIPIG) and zero inflated strict arcsine models in modeling over-dispersed medical count data. These proposed models are not widely used by many researchers especially in the medical field. The results show that these three suggested models can serve as alternative models in modeling over-dispersed medical count data. This is supported by the application of these suggested models to a real life medical data set. Inverse trinomial, Poisson inverse Gaussian, and strict arcsine are discrete distributions with cubic variance function of mean. Therefore, ZIIT, ZIPIG and ZISA are able to accommodate data with excess zeros and very heavy tailed. They are recommended to be used in modeling over-dispersed medical count data when ZIP and ZINB are inadequate.

**Keywords :** zero inflated, inverse trinomial distribution, Poisson inverse Gaussian distribution, strict arcsine distribution, Pearson's goodness of fit

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