

A new count data model applied in the analysis of vaccine adverse events and insurance claims

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ABSTRACT

The article presents a new probability distribution, created by compounding the Poisson distribution with the weighted exponential distribution. Important mathematical and statistical properties of the distribution have been derived and discussed. The paper describes the proposed model's parameter estimation, performed by means of the maximum likelihood method. Finally, real data sets are analyzed to verify the suitability of the proposed distribution in modeling count data sets representing vaccine adverse events and insurance claims.

Key words: poisson distribution, weighted exponential distribution, compound distribution, count data, maximum likelihood estimation.

1. Introduction

Compounding a discrete distribution with a continuous distribution is a valuable method for creating flexible distributions to assist modelling of count data. Count data distributions play a key role in several applications for applied fields and theoretical research like health, transport, insurance and engineering, etc. Barreto-Souza and Bakouch (2013) obtained a new class of compound distribution with decreasing failure rate by compounding zero-truncated Poisson Lindley distribution and exponential distribution. Hajebi et al. (2013) obtained a new lifetime model by compounding exponential distribution with negative binomial distribution. Mohmoudi and Jafari (2014) introduced a new lifetime compound probability distribution which generalizes the linear failure rate of distribution. Ghitany et al. (2011) obtained weighted Lindley

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