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A POSITIVE INFLATED DISCRETE DISTRIBUTION: PROPERTIES AND APPLICATIONS

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SUMMARY

We consider data modelling under one inflation for zero-truncated count data, as they typically arise in capture-recapture modelling. One-inflation in zero-truncated count data has recently found considerable attention. In this regard, zero-truncated New Discrete distribution and a distribution to a point mass at one are used to create a one-inflated model namely one-inflated zero-truncated New Discrete distribution. Its reliability characteristics, generating functions, and distributional properties are investigated in some detail. which includes survival function, hazard rate function, probability generating function, characteristic function, variance, skewness, and kurtosis. Monte Carlo Simulation have been undertaken to evaluate the effectiveness of the maximum likelihood estimators. To test the compatibility of our proposed model, the baseline model and the proposed model are distinguished by using the two different test procedures. The adaptability of the suggested model is demonstrated using two real-life datasets from separate domains by taking various performance measures into consideration.

Keywords: Goodness of fit; Hypothesis testing; New discrete distribution; One-inflation; Simulation; Zero-truncation.

1. INTRODUCTION

In every area of research, including biology, public health, engineering, sociology, epidemiology, and insurance, the statistical analysis and modelling of count data are fundamental. To improve decision-making while working with count data, we fit a valid probability model to the count data.

Truncation of probability distributions is an essential statistical feature that has several applications in different areas. When a specific range of values for the variables is

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