New type II Half Logistic- G family of Distributions and its Applications

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Abstract

In recent years, several generalized family of distributions have been developed for modelling complex data sets. Many applied areas such as reliability and lifetime analysis, finance and insurance, we need extended forms of distributions. Several methods for generating new families of distributions have been proposed in literature. In this study we are investigating new type II Half logistic - G distribution (NTIIHLG), by considering inverted Weibull, inverted Lindley, etc as base line distribution. We are deriving and exploring the behavior of the newly developed family of distribution, such as, the shape of the probability density function and hazard function, quantile function and its applications, moments and its generating function, order and record statistics, R´enyi entropy etc. Based on the simulation study we are also evaluating the different estimation methods like maximum likelihood estimators, least squares and weighted least square estimators, Anderson-Darling estimators, Cram´er-von Mises estimators based on their biases and errors. The main advantage of this distribution is its flexibility and simplicity due its simple form and increased number of parameters. Finally, we are demonstrating its application in failure/reliability data which is analyzed based on real data to illustrate the flexibility of the distribution.

Keywords: New type II half logistics - G, Type II half logistic -G, Inverted family of distribution, New type II half logistics inverted Weibull, New type II half logistics Inverted Lindley, Maximum likelihood estimation.