

# Inverse Truncated Negative Binomial Rayleigh Distribution and Its Properties

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**Abstract:** *Rayleigh distribution has many applications in lifetime studies. In this article, a new three parameter lifetime model called Inverse Truncated Negative Binomial Rayleigh (ITNBR) distribution is introduced and its various properties are discussed. This new distribution is obtained by compounding inverse truncated negative binomial and Rayleigh distribution. The shape properties of the probability density function and hazard rate, model identifiability, moments and median of the ITNBR are studied. The unknown parameters of the distribution are estimated using maximum likelihood method. Simulation is carried out to illustrate the performance of maximum likelihood estimates of model parameters.*

**Keywords:** Inverse Rayleigh distribution, Marshall-Olkin family of distributions, Maximum likelihood, Truncated negative binomial distribution