SSE-801

Power Uma Distribution with Properties and Applications to Model Data from Biomedical Sciences

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ABSTRACT

The data arising from biomedical sciences are highly stochastic in nature and to find a suitable probability distribution to model data from biomedical sciences is very challenging for data scientists. Weibull distribution which is obtained using the power transformation approach from exponential distribution has been use for modeling data from biomedical sciences and engineering. But it has been observed that there are several set of data from biomedical sciences where Weibull distribution does not provide good fit. In search for a suitable distribution which provides better fit than Weibull and other power distributions, an attempt has been made in this paper to derive power Uma distribution. Its statistical properties including shapes of probability density function, cumulative distribution function, hazard function, mean residual life function and stochastic ordering have been studied. Its first four moments and variance have been derived. Maximum likelihood estimation has been discussed for estimating the parameters of power Uma distribution Applications of power Uma distribution has been discussed with two examples of biomedical sciences and its goodness of fit has been compared with other two-parameter power distributions.

Keywords: Uma distribution, Moments, Hazard function

How to Cite