

Palakorn Seenoi 2014: A Mixture of Exponentiated Inverted Weibull Distribution. Doctor of Philosophy (Statistics), Major Field: Statistics, Department of Statistics. Thesis Advisor: Assistant Professor Winai Bodhisuwan, Ph.D. 168 pages.

The Weibull distribution is the most widely used distribution to analyze the lifetime data. It provides vast impact of reliability and quality control. In some cases, the Weibull distribution may not be fit to real data corrected from applications. However, there are some distributions, e.g., inverse Gaussian, gamma, inverse gamma, lognormal that can be alternatively applied. In this thesis, the length-biased exponentiated inverted Weibull (LBEIW) and the mixture exponentiated inverted Weibull (MEIW) distributions are introduced. Important probabilistic properties will be discussed, i.e., probability density function, cumulative distribution function and survival function and hazard rate. Some structural properties of these distributions, such as moment about the origin, mean, variance, coefficient of skewness and coefficient of kurtosis are presented. The LBEIW distribution includes the length-biased inverted Weibull (LBIW) distribution as a sub-model. The MEIW distribution also includes the LBEIW, LBIW and EIW distributions as sub-models. Parameter estimation is derived by the maximum likelihood estimation and Bayesian approach. Monte Carlo simulation study is also used to demonstrate the parameter estimation based on some specified parameters. Some real data sets will be applied by using LBEIW and MEIW distributions.

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