Generalization entails the addition of parameter(s) to the Lindley distribution and specification of conditions under which the generalized distribution reduces to the Lindley distribution. Theoretical results suggest that, under certain conditions, a generalized Lindley distribution reduces to the Lindley distribution with the same scale parameter. But these results provide no practical guideline on how the generalization affects the parameter estimate of the resulting Lindley distribution. Additionally, the results provide no possible implications of generalization on size and power of tests on parameter(s).

This study compares two generalized Lindley distributions and assesses consistency between theoretical and analytical results. Data (complete and censored) assumed to follow the Lindley distribution are generated and analyzed using two generalized Lindley distributions, and maximum likelihood estimates of parameters from the generalized distributions are obtained. Size and power of tests of hypotheses on the parameters are assessed drawing on asymptotic properties of the maximum likelihood estimates. Results suggest that whereas size of some of the tests of hypotheses based on the considered generalized distributions are essentially $\alpha$-level, some are possibly not; power of tests of hypotheses on the Lindley distribution parameter from the two distributions differs.


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