

# Statistical inference based on restricted sequential order statistics for weibull distribution with a power trend model

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## SUMMARY

In engineering systems, it is usually assumed that the lifetime of the components are independent and identically distributed (iid). But, failing a components causes more load on the remaining components. Thus, the distribution of the surviving components would be changed (cf. [1]). For modeling this kind of systems, the theory of sequential order statistics (SOS) may be used. Assuming the Weibull distribution for the lifetime of the components and *conditionally proportional hazard rates* model as a special case of SOS theory, the Maximum Likelihood estimates of the unknown parameters were obtained in different cases. A new model, called PTCPHM, as a generalization for iid case is proposed. Statistical inference including point and interval estimates and the problem of hypothesis testing for PTCPHM are discussed. Finally, an illustrative example and a simulation study to carry out the performance of the procedures obtained are given.

**Keywords:** Hypothesis testing, Likelihood Estimation, Proportional hazard rate, Sequential order statistics, Weibull model

**AMS Classification:** 62F03, 62N01, 62N03

## References

- [1] BALAKRISHNAN, N., BEUTNER, E., KAMPS, U. (2008). Order restricted inference for sequential  $k$ -out-of- $n$  systems. *Journal of Multivariate Analysis* **99**, 1489–1502.

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