Journal of Modern Applied Statistical Methods May 2020, Vol. 19, No. 1, eP2854. doi: 10.22237/jmasm/1608552180 בס"ד Copyright © 2020 JMASM, Inc. ISSN 1538 - 9472

Inference for Step-Stress Partially Accelerated Life Test Model with an Adaptive Type-I Progressively Hybrid Censored Data

Showkat Ahmad Lone Saudi Electronic University Riyadh, Saudi Arabia Ahmadur Rahman Aligarh Muslim University Aligarh, India **Tanveer A. Tarray** Islamic University of Science & Technology Kashmir, India

Consider estimating data of failure times under step-stress partially accelerated life tests based on adaptive Type-I hybrid censoring. The mathematical model related to the lifetime of the test units is assumed to follow Rayleigh distribution. The point and interval maximum-likelihood estimations are obtained for distribution parameter and tampering coefficient. Also, the work is conducted under a traditional Type-I hybrid censoring plan (scheme). A Monte Carlo simulation algorithm is used to evaluate and compare the performances of the estimators of the tempering coefficient and model parameters under both progressively hybrid censoring plans. The comparison is carried out on the basis of mean squared errors and bias.

Keywords: Life testing, Rayleigh distribution, Type-I progressive hybrid censoring, adaptive type-I progressive hybrid censoring, simulation study

Introduction

In accelerated life testing, Type-I and Type-II censoring schemes are the two most popular and commonly used censoring schemes. Under the conventional Type-I censoring scheme, the experiment continues up to a pre-specified time. However, the conventional Type-II censoring scheme requires the experiment to continue until a pre-specified number of failures occurs. Therefore, in a Type-I censoring scheme, the experimental time is fixed but the number of observed failures is a random variable. In a Type-II censoring scheme, the number of observed failures is fixed but the experimental time is a random variable. The main limitation of these

doi: 10.22237/jmasm/1608552180 | Accepted: May 27, 2019; Published: June 8, 2021. Correspondence: Tanveer A. Tarray, tanveerstat@gmail.com