

Accepted Manuscript

Analysis of left truncated and right censored competing risks data

Debasis Kundu, Debanjan Mitra, Ayon Ganguly

PII: S0167-9473(16)30247-X

DOI: <http://dx.doi.org/10.1016/j.csda.2016.10.020>

Reference: COMSTA 6370

To appear in: *Computational Statistics and Data Analysis*

Received date: 25 May 2016

Revised date: 17 August 2016

Accepted date: 22 October 2016



Please cite this article as: Kundu, D., Mitra, D., Ganguly, A., Analysis of left truncated and right censored competing risks data. *Computational Statistics and Data Analysis* (2016), <http://dx.doi.org/10.1016/j.csda.2016.10.020>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ANALYSIS OF LEFT TRUNCATED AND RIGHT CENSORED COMPETING RISKS DATA

Debasis Kundu¹ & Debanjan Mitra² & Ayon Ganguly³

Abstract

In this article, the analysis of left truncated and right censored competing risks data is carried out, under the assumption of the latent failure times model. It is assumed that there are two competing causes of failures, although most of the results can be extended for more than two causes of failures. The lifetimes corresponding to the competing causes of failures are assumed to follow Weibull distributions with the same shape parameter but different scale parameters. The maximum likelihood estimation procedure of the model parameters is discussed, and confidence intervals are provided using the bootstrap approach. When the common shape parameter is known, the maximum likelihood estimators of the scale parameters can be obtained in explicit forms, and when it is unknown we provide a simple iterative procedure to compute the maximum likelihood estimator of the shape parameter. The Bayes estimates and the associated credible intervals of unknown parameters are also addressed under a very flexible set of priors on the shape and scale parameters. Extensive Monte Carlo simulations are performed to compare the performances of the different methods. A numerical example is provided for illustrative purposes. Finally the results have been extended when the two competing causes of failures are assumed to be independent Weibull distributions with different shape parameters.

KEY WORDS AND PHRASES: Maximum likelihood estimators; competing risks; Gibbs sampling; prior distribution; posterior analysis; credible set.

AMS 2000 SUBJECT CLASSIFICATION: Primary 62F10; Secondary 62H10, 62F15.

¹ Department of Mathematics and Statistics, Indian Institute of Technology Kanpur, Uttar Pradesh 208016, India. Corresponding author. E-mail:kundu@iitk.ac.in

² Operations Management, Quantitative Methods and Information Systems Area, Indian Institute of Management Udaipur, India.

³ Department of Mathematics, Indian Institute of Technology Guwahati, Guwahati, Assam 781039, India.

Download English Version:

<https://daneshyari.com/en/article/4949384>

Download Persian Version:

<https://daneshyari.com/article/4949384>

[Daneshyari.com](https://daneshyari.com)