

COMPARISON OF SEVERAL IMPUTATION TECHNIQUES FOR LOG LOGISTIC MODEL WITH COVARIATE AND INTERVAL CENSORED DATA

(Perbandingan antara Beberapa Teknik Imputasi untuk Model Logistik Log dengan Kovariat dan Data Tertapis Selang)

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ABSTRACT

The main purpose of this study is to compare the performance of midpoint, right, and left imputation techniques for log logistic model with covariate and censored data. The maximum likelihood estimation method (MLE) is used to check the efficiency of imputation techniques by estimating the parameters. The performance of the estimates is evaluated based on their bias, standard error (SE), and root mean square error (RMSE) at different sample sizes, censoring proportions, and interval widths via a simulation study. Based on the results of the simulation study, the right imputation had the best overall performance. Finally, the proposed model is fitted to the real breast cancer data. The findings suggest that the log logistic model fits the breast cancer data well and the covariate of treatment significantly affects the time to cosmetic deterioration of the breast cancer patients.

Keywords: log logistic; imputation techniques; covariate; right censored; interval censored

ABSTRAK

Tujuan utama kajian ini adalah untuk membandingkan prestasi teknik imputasi titik tengah, kanan dan kiri bagi model logistik log dengan kovariat dan data tertapis. Kaedah penganggaran kebolehjadian maksimum (MLE) digunakan untuk memeriksa efisiensi teknik imputasi dengan menganggar parameter. Prestasi anggaran parameter dengan teknik imputasi titik tengah, kanan dan kiri dinilai dan dibandingkan pada saiz sampel, kadar penapisan dan lebar selang yang berbeza. Berdasarkan hasil kajian simulasi, teknik imputasi kanan mempunyai prestasi keseluruhan yang terbaik. Akhirnya, model yang dicadangkan telah dipadankan pada data kanser payudara sebenar. Hasilnya mencadangkan bahawa model logistik log sesuai dengan data kanser payudara dan kovariat rawatan mempengaruhi masa kemerosotan kosmetik pesakit kanser payudara secara signifikan.

Kata kunci: logistic log; teknik imputasi; kovariat; tertapis kanan; tertapis selang

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