

## **Cure models with exponentiated Weibull exponential distribution for the analysis of melanoma patients**

### **ABSTRACT**

In the survival data analysis, commonly, it is presumed that all study subjects will eventually have the event of concern. Nonetheless, it tends to be unequivocally expected that a fraction of these subjects will never expose to the event of interest. The cure rate models are usually used to model this type of data. In this paper, we introduced a maximum likelihood estimates analysis for the four-parameter exponentiated Weibull exponential (EWE) distribution in the existence of cured subjects, censored observations, and predictors. Aiming to include the fraction of unsusceptible (cured) individuals in the analysis, a mixture cure model, and two non-mixture cure models—bounded cumulative hazard model, and geometric non-mixture model with EWE distribution—are proposed. The mixture cure model provides a better fit to real data from a Melanoma clinical trial compared to the other two non-mixture cure models.

**Keyword:** Survival analysis; Cure fraction models; Exponentiated Weibull exponential distribution; Maximum likelihood method; Right-censored data