

---

# ALOOG: A NEW CLASS OF SURVIVAL REGRESSION MODELS FOR LEFT CENSORED DATA ANALYSIS

---

Abdisalam Hassan Muse<sup>1,\*</sup>

<sup>1</sup>*School of Postgraduate Studies and Research, Amoud University, Amoud Valley, Borama, 25263, Somalia*

## ABSTRACT

Survival regression models play a crucial role in analyzing left censored survival data sets. In this paper, we introduce a novel class of survival regression models called ALOOG (Adaptive Left censored Outcomes and Observations in Generalized survival models). The ALOOG class encompasses more than four types of survival regression models, including the proportional reverse hazard model, accelerated reverse hazard model, accelerated failure time model, and a general class of reverse hazard model. We extend the capabilities of these models by incorporating four continuous probability distributions, namely Fréchet, Gompertz, log-logistic, and Marshall- Olkin distributions, as baseline distributions. By leveraging real-life left censored HIV dataset, we compare the performance of the ALOOG models using model selection criteria such as Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). Our findings reveal that the Fréchet baseline distribution consistently outperforms the other distributions across all regression models within the ALOOG class. This highlights the suitability of the Fréchet distribution in capturing the underlying survival patterns in the left censored HIV dataset. The ALOOG class of survival regression models presents a significant advancement in the analysis of left censored survival data sets. The incorporation of multiple regression models and the selection of the most appropriate baseline distribution, as demonstrated by the superior performance of the Fréchet distribution, enhances the accuracy and robustness of survival analysis. These findings have implications for various fields, including medical research, where left censored survival data is prevalent.

**Keywords** survival analysis · regression models · probability distributions · left censored data

---

\*Corresponding Author's E-mail: [abdisalam.hassan@amoud.edu.so](mailto:abdisalam.hassan@amoud.edu.so)