

On Some Parametric Models for Survival Data with Surviving Fraction¹

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Abstract

In this article, statistical methods for survival data which take into account the immune proportion or cure rate are discussed. Emphasis is given to Yakovlev's proposal of a model within the cancer clinical trial framework involving the introduction of an unobserved latent variable N which stands for the number of carcinogenic cells in each patient. The lognormal distribution is used to specify the progression time of the carcinogenic cells. Parameter estimates for the lognormal model and the variance-covariance matrix for the estimates are derived. Some comparisons between the lognormal distribution and the Weibull distribution for Yakovlev's method and the mixture distribution method are carried out by analyzing a real data set. Based on the Akaike Information Criterion (AIC), it is observed that the lognormal model is just as good as, if not better than, the Weibull model.

Keywords: Surviving fraction, lognormal model, mixture model, latent variable, score function, variance-covariance matrix.

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