

Title: Heterogeneity in Long-Term Survivors: A frailty Model with Immunes

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Abstract:

In this thesis, a combination of the mixture model and the frailty model is introduced. Here the hazards model turns out to

$$h_o(t) = (\exp(-\lambda t^\delta) \delta \lambda p t^{\delta-1} / ((-1 + \exp(-\lambda t^\delta)) p + 1)) \exp(\beta Z) [1 - \theta \exp(\beta Z) \ln\{1 - p + p \exp(-\lambda t^\delta)\}]^{-1}$$

, assuming that the survival times follow the Weibull distribution with scale parameter λ and shape parameter δ , and the frailty variable follows the one-parameter gamma distribution $G(1/\theta)$. Maximum likelihood estimation method is utilized to estimate the parameters. Properties of this model are investigated using simulated data.

Keywords: survival analysis, immunes, frailty, Weibull, one-parameter gamma, MLE