

In the present work we study regression models in reliability analysis. We compare the Cox proportional hazards model, Aalen additive model, accelerated failure time model and their combinations. For each model we present procedures for estimating parametric and non-parametric risk function parts and goodness-of-fit tests based on classic regression routines and counting process theory. We demonstrate those tests on both real and simulated data and we focus on procedures how to find the model with the best fit.