

Meta–Analysis of Step-Stress Experiments

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Abstract

The step-stress model is a special case of accelerated life testing that allows for testing of units under different levels of stress with changes occurring at various intermediate stages of the experiment. Interest lies on inference for the mean lifetime at each stress level. All step-stress models discussed so far in the literature are based on a single experiment. For the situation when data have been collected from different experiments wherein all the test units had been exposed to the same levels of stress but with possibly different points of change of stress, we introduce a model that combines the different experiments and facilitates a meta-analysis for the estimation of the mean lifetimes. This set-up is also useful in designing experiments with reduced non-existence probabilities for the estimates of the mean lifetimes at each stress level. We then discuss the likelihood inference for the cases of simple step-stress experiments under exponentially distributed lifetimes with (i) Type-II censoring and (ii) Type-I censoring.

The talk is based on joint work with:

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