

# Quantile residual lifetime with right-censored and length-biased data

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**Abstract** Right-censored length-biased data are commonly encountered in many applications such as cancer screening trials, prevalent cohort studies and labor economics. Such data have a unique structure that is different from traditional survival data. In this paper, we propose an estimator of the quantile residual lifetime (QRL) with this kind of data based on the nonparametric maximum likelihood estimation method. In addition, we develop two tests by taking difference and ratio of the QRL from two independent samples. We also establish the asymptotic properties of the proposed estimator and the test statistics. Simulation studies are performed to demonstrate that the proposed estimator works well in finite-sample situations. We illustrate its application using two data examples: one is the Oscars Award data, the other is the Channing house data.