Analytical Strategies for Failure Time Data with a Cured Fraction

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Abstract
Some failure time data come from a population that consists of some subjects who are susceptible to and others who are non-susceptible to the event of interest. The data typically have heavy censoring at the end of the follow-up period, and a traditional survival analysis would not always be appropriate, yet it is commonly seen in literatures. For such kind of data, we carry out simulation studies to compare the performances of the Cox’s PH model with the proportional hazards mixture cure (PHMC) model and the accelerated failure model (AFT model) with the AFT mixture cure (AFTMC) model respectively. Then we apply the models to the datasets of Lung Cancer and Eastern Cooperative Oncology Group (ECOG) phase III clinical trial E1684. The conclusions are as follows. The PHMC model and the AFTMC model do not have obvious advantages for time-to-event data without a cured fraction. In this case, it is recommended to use the Cox’s PH model or AFT model for analysis. If some subjects are non-susceptible to the event of interest in the data, it is recommended to use the PHMC model or AFTMC model for analysis, however, which may need a sufficient sample size. Keywords: Cox’s PH model; PHMC model; AFT model; AFTMC model; cure model

Full-text
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