

BIOSTAT/STAT 576
Statistical Methods for Survival Data

Problem Set 6

1. A study was designed to compare two treatments, A and B say, using paired subjects. Specifically within each pair, one subject would be randomized to receive treatment A and the other to receive treatment B . A total of n pairs would be recruited into the study. The primary endpoint of interest was time-to-event type and subject to potential censoring. In addition to the treatment assignment, other concomitant covariates are also collected at baseline when the randomization was conducted.
 - (a) Propose a proportional hazards model for the primary time-to-event endpoint in this study. State your model assumptions. Interpret the parameters you choose to characterize a treatment effect. Discuss the advantage and potential limitation of your model.
 - (b) Propose an estimation procedure to estimate the regression parameters in your proportional hazards model. Sketch a proof on how you would proceed to demonstrate the asymptotic properties of your estimators.
 - (c) Propose some test statistic to test the null hypothesis that treatments A and B are not different, i.e., there is no treatment effect.
 - (d) Develop a sample size formula to detect the alternative of your proposed proportional hazards model.