GROUP SEQUENTIAL TEST OF NON-PARAMETRIC STATISTICS FOR SURVIVAL DATA

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Abstract
In this study a group sequential test of non-parametric statistics is examined in order to compare two groups of survival data. A new general form for a group sequential test of non-parametric statistics is given. The distribution of test statistics, obtained at the end of each stage, have been derived for this general form. In addition, an example based on a simulated data set is used to illustrate the test process that covers the group sequential test of non-parametric statistics in the given general form.

Keywords: Group sequential test, Survival data, Log-rank test, Wilcoxon test, Tarone-Ware family.

1. Introduction
In any experiment or survey, data is accumulated over a period of time especially in industrial acceptance sampling and clinical trials. Because of ethical, administrative and economic reasons, interim analyses of accumulated data are conducted. Sequential tests were proposed because a fixed sample test is not useful for such data. However, sometimes, continuous data monitoring can be a serious practical burden. So it is most convenient to analyze the data in groups, thus accumulating data is analyzed at intervals rather than at every new observation. This is the major difference between Sequential Tests and Group Sequential Tests (GSTs). GSTs are convenient to conduct, they support the early stopping a trial, and can achieve most of the benefits of sequential tests (namely, lower expected sample sizes and shorter average study lengths).

For instance, in a phase III clinical trial, if an early stopping occurs, the hypothesis that there is no difference between the effects of treatments on survival times of individuals is rejected and subsequent patients are assigned to the superior treatment. In a phase III clinical trial, the primary interest is to investigate the effects of alternative treatments

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