

Landmark Prediction of Long Term Survival Incorporating Short Term Event Time Information

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SUMMARY

In recent years, a wide range of markers have become available as potential tools for signaling progression or risk of disease. In addition to these markers, it has often been argued that short term outcome information may be very helpful in predicting long term disease outcomes. When such information is available, it would be desirable to combine this along with predictive markers to improve the prediction of long term outcomes. Most existing methods for incorporating censored short term event information in predicting long term survival focus on modeling the disease process and are derived under restrictive parametric models in a multi-state survival setting. When such model assumptions fail to hold, the resulting prediction of long term outcomes may be invalid or inaccurate. In this paper, we propose to incorporate short term event time information up to a landmark point along with baseline covariates via a flexible varying-coefficient model. To evaluate the performance of the resulting landmark prediction rule, we propose robust non-parametric procedures to make inference about the accuracy measures and the difference in the accuracy measures between various prediction rules without requiring the correct specification of the proposed varying coefficient model. Simulation studies suggest that the proposed procedures perform well in finite samples. We illustrate them here using a dataset of post-dialysis patients with end-stage renal disease.

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