Semiparametric methods for the Interval-censored c-index

曾議寬

國立中央大學統計研究所

Abstract

The concordance index (c-index) is a widely used metric in medical research to assess the discriminatory ability of predictive models in distinguishing between low-risk and high-risk patients. It also evaluates the performance of models in predicting the probability of experiencing an event of interest. While numerous methods exist for estimating the c-index in right-censored survival data, research on c-index estimation for interval-censored survival data remains limited. To address this gap, we propose the development of semiparametric methods for estimating the c-index in interval-censored survival data. Our approach will integrate semiparametric hazard regression models, including the Cox proportional hazards model, the accelerated failure time (AFT) model, and transformation models. We will investigate the large-sample properties of the proposed estimation methods to ensure their theoretical validity. To evaluate their practical performance, we will conduct comprehensive simulation studies. Finally, we will apply our proposed methodologies to real-world data from the Taiwan AIDS cohort study to demonstrate their effectiveness in medical research applications.

Keyword: AIDS, Concordance index, Interval censor