Modeling Right Censored and Left Truncated Competing Risks Failure Time Data Using Inverse Weighting Technique

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In medical studies one often needs to analyze the competing risks failure time data and to assess covariate effects on the summary measurement of cumulative incidence probabilities. Recently, Fine and Gray (1999) proposed a proportional regression model to directly model the subdistribution of a competing risk and developed some estimating procedures based on inverse probability of censoring weighting for right censored only competing risks data. In medical studies, failure times are often right-censored **and** left-truncated. In this study, we derived two weight functions: one based on a mass redistribution algorithm for truncated and censored failure time data which reduces to a standard left truncated version of Aalen-Johansen estimator's estimator for the cumulative incidence function for no covariate case. The second weight was derived from conditional censoring distribution after delayed entry time. We use these new weights to implement such a proportional regression model for the subdistribution hazards. Inference procedures are developed and the large sample properties of the proposed estimators are derived. The estimators based on both weights are asymptotically unbiased. The performances based on these two weights are studied through a simulation study. For illustration, we analyze a data set from clinical records of children with acute leukemia.