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A Simulation Study of Methods Used to Reduce Variability in the Inverse Probability of Treatment Weights for Marginal Structural Cox Models

Extreme values among the inverse probability of treatment weights can unduly affect the results of marginal structural Cox models. Besides standardization, methods including truncation, trimming and normalization are suggested in the literature to reduce the variability of these weights. To compare the performance of these methods, we used simulated data that mimicked survival data in which both treatment and confounders were time-dependent. The findings from this simulation study were used to guide the weighted adjustment in an application where we investigated the impact of beta-interferon treatment in delaying disability progression in patients from the British Columbia Multiple Sclerosis database (1995-2008).