Matching in Cross-time Observational Studies

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Abstract

In the evaluation of observational studies repeated over time, sometimes, a second intervention may occur in between implementations of the first intervention program. To identify the treatment effect of the second intervention, comparability of subjects in different treatment groups at different time points and stability of the treatment effect from the first intervention are often needed to establish a casaul relationship. Between 2001 and 2006, a smoking cessation program has been implemented every year in Rome, Italy to compare two treatment options–Bupropion plus counseling and counseling only. In January 2005, a nationwide smoking ban in public areas was in effective in Italy. To estimate the additional effect of smoking ban on cessation, comparable subjects in four groups are identified via non-bibartite matching and a nonparametric estimator is obtained with the assumption of stable smoking cessation program effect. A sensitivity analysis follows to assess the impact of violation of stability and comparability.