ESTIMATION OF TREATMENT EFFECTS IN RANDOMIZED TRIALS WITH NONCOMPLIANCE AND A DICHOTOMOUS OUTCOME

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We propose a class of estimators of a received treatment effect on a dichotomous outcome among the treated subjects within covariate and treatment arm strata in randomized trials with non-compliance. Recent articles have presented consistent and asymptotically linear estimators of a causal odds ratio, which rely, beyond correct specification of a model for the causal odds ratio, on a correctly specified model for a (potentially high dimensional) nuisance parameter. In this talk we propose consistent, asymptotically linear (and locally efficient) estimators of a causal relative risk and a new parameter - called a switch causal relative risk - which only rely on the correct specification of a model for the parameter of interest. We illustrate our methodology with a data analysis and simulation.
In addition, we present a new approach which allows us to data adaptively select among a class of estimators whose underlying assumptions range from 1) the treatment arm is randomized (which is a fact known to be true in randomized trials) to 2) the treatment arm is randomized AND the actual received treatment is randomized w.r.t. to measured confounders. These estimators are still guaranteed to be efficient in model 1), but in finite samples they are shown to significantly improve on estimators only relying on the randomized treatment arm assumption.