



JOHNS HOPKINS
BLOOMBERG
SCHOOL of PUBLIC HEALTH

Department of Biostatistics

BIOSTATISTICS SEMINAR

Introducing the Overlap Weights to Causal Inference

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Abstract:

Covariate balance is crucial for unconfounded descriptive or causal comparisons in observational studies. We propose a unified framework ---the balancing weights---to balance the weighted distributions of the covariates between treatment groups. These weights incorporate the propensity score to weight each group to an analyst-selected target population and include several commonly used weighting schemes such as inverse-probability weight and trimming as special cases. We derive the large-sample results on nonparametric estimation based on these weights. We further propose a new weighting scheme, the overlap weights, in which each unit's weight is proportional to the probability of that unit being assigned to the opposite group. The overlap weights are bounded, and minimize the asymptotic variance of the weighted average treatment effect among the class of balancing weights. The overlap weights also possess a small-sample exact balance property, based on which we propose a new method that achieves exact balance for means of any selected set of covariates. We apply the method the Framingham Heart Study to evaluate the effect of statins on health outcomes. Extensions to subgroup analysis and multi-arm treatments will also be discussed.

Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics

Monday, November 12, 2018, 12:15:1-15

Room W2008 (Refreshments 12:00pm)

Note: Taking photos during the seminar is prohibited

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