

## **Propensity score weighting with post-treatment survey data**

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The propensity score weighting approach is a powerful tool in causal inference for mitigating confounding bias. However, it solely addresses the internal validity of an observational study and the results do not necessarily generalize to the target population. In this talk, we will present our recent work on dealing with the generalizability issue of observational studies. We first propose a general framework called “survey weighted propensity score weighting” approach to causal inference when the observational dataset is a probability survey sample from a target finite population. We propose estimators of a class of finite-population weighted average treatment effects for the target population or sub-populations of interest and establish theoretical properties of the estimator under the proposed “two-phase randomization model” framework. The resulting estimators as well as the proposed inferential procedure are shown to be robust against model misspecifications. We further extend our results to observational non-probability survey samples and show how to combine auxiliary population information from multiple external reference probability samples for more reliable estimation. We illustrate our proposed methods through the analysis of a real-world survey dataset.