samsi
NSF·Duke·NCSU·UNC

Causal Inference Program Opening Workshop
December 9-11, 2019

SPEAKER TITLES/ABSTRACTS

Colin Fogarty
MIT

"Testing Weak Nulls in Matched Observational Studies"

We develop sensitivity analyses for weak nulls in matched observational studies while allowing unit-level treatment effects to vary. In contrast to randomized experiments and paired observational studies, we show for general matched designs that over a large class of test statistics, any valid sensitivity analysis for the weak null must be unnecessarily conservative if Fisher's sharp null of no treatment effect for any individual also holds. We present a sensitivity analysis valid for the weak null, and illustrate why it is conservative if the sharp null holds through connections to inverse probability weighted estimators. An alternative procedure is presented that is asymptotically sharp if treatment effects are constant, and is valid for the weak null under additional assumptions which may be deemed reasonable by practitioners. The methods may be applied to matched observational studies constructed using any optimal without-replacement matching algorithm, allowing practitioners to assess robustness to hidden bias while allowing for treatment effect heterogeneity.