

Stanford University
Department of Statistics

DEPARTMENTAL SEMINAR

The Stanford/Berkeley Joint Statistics Colloquium

4:30pm, Tuesday, October 28, 2019

McCullough Building (04-490) Room 115

Refreshments served at 4pm in Sequoia Lounge.

Speaker: Peng Ding
Department of Statistics,
UC Berkeley

Title: Sensitivity analyses in observational studies for causal effects

Abstract:

Unmeasured confounding may undermine the validity of causal inference with observational studies. Sensitivity analysis provides an attractive way to partially circumvent this issue by assessing the potential influence of unmeasured confounding on causal conclusions. Without imposing strong assumptions, we derive a bounding factor and a sharp inequality such that the sensitivity analysis parameters must satisfy the inequality if an unmeasured confounder is to explain away the observed effect estimate or reduce it to a particular level. Our new bounding factor implies not only the traditional Cornfield conditions that both the relative risk of the exposure on the confounder and that of the confounder on the outcome must satisfy, but also a high threshold that the maximum of these relative risks must satisfy. Based on the high threshold, we propose the E-value, a measure of evidence for causation in observational studies. We also make connections to the sensitivity analysis technique proposed by Paul Rosenbaum in the context of matched observational studies.