SISCER Module 16 – Propensity Scores

Methods, Models and Adjustment

In this module, I have tried to address the motivation for, and construction of, the propensity score from first principles, to demonstrate why it is needed and where it comes from. When I first started working in the area of causal inference, I found that much of the literature did not address these fundamental components adequately, and often assumed knowledge on behalf of the reader that I did not have. Therefore this module attempts to discuss the key background mathematical ideas as well as the widely used statistical methods.

Schedule: Each day, the two sessions will be separated by a 30 minute interval, and each session will have a 5 minute break.

Thursday 28th July	Session 1	*The need for adjustment: confounding in observational studies.* – experimental and observational studies – causal quantities of interest – graphical representations – confounding – the need for balance – basic tools & computations
	Session 2	*Manufacturing balance: the propensity score.* – balancing constructions – the propensity score for binary treatments – beyond the binary case
Friday 29th July	Session 3	*Statistical tools utilizing the propensity score.* – stratification – matching – regression methods – inverse weighting
	Session 4	*Examples and extensions.* – simulation study – NHANES example (`knitr`) – longitudinal extensions – practical considerations – new developments

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July 19, 2022