

## SISCER Module 17 - 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.

Wednesday 28th July	Session 1	<i>The need for adjustment: confounding in observational studies.</i> <ul style="list-style-type: none"><li>- experimental and observational studies</li><li>- causal quantities of interest</li><li>- graphical representations</li><li>- confounding</li><li>- the need for balance</li><li>- basic tools &amp; computations</li></ul>
	Session 2	<i>Manufacturing balance: the propensity score.</i> <ul style="list-style-type: none"><li>- balancing constructions</li><li>- the propensity score for binary treatments</li><li>- beyond the binary case</li></ul>
Thursday 29th July	Session 3	<i>Statistical tools utilizing the propensity score.</i> <ul style="list-style-type: none"><li>- stratification</li><li>- matching</li><li>- regression methods</li><li>- inverse weighting</li></ul>
	Session 4	<i>Examples and extensions.</i> <ul style="list-style-type: none"><li>- simulation study</li><li>- NHANES example (knitr)</li><li>- longitudinal extensions</li><li>- practical considerations</li><li>- new developments</li></ul>

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