SEMINAR

Victorian Centre for Biostatistics

Thursday 28th July 2016
9.30am to 10.30am
Melbourne School of Population and Global Health, University of Melbourne
Seminar Room 515, Level 5, 207 Bouverie St, Carlton

Marginal structural models: powerful tools to estimate the causal effect of time varying exposures and the optimal dynamic regime

Associate Professor Liliana Orellana
Deakin University

In the first part of this talk I will introduce one of the methods to estimate the causal effect of time-varying exposures: inverse probability of treatment weighting (IPTW) of marginal structural models (MSMs). These models proposed by Robins et al (2000) allow estimation of causal effects from observational data even in the presence of time-dependent confounders, intermediate variables that are also confounders. I will present the ideas underlying MSMs, describe how an observational study can be used to emulate a hypothetical randomised trial, discuss the kind of causal questions that can potentially be answered using MSMs and point out the challenges faced when applying these models to real data sets.

In the second part of this talk I will introduce dynamic treatment regimes (DTR), individually tailored treatments based on patient covariate history, the potential outcomes associated with DTR and the target parameter for inference when evaluating the causal effect of a DTR. I will describe an extension of MSMs suitable for estimating the optimal DTR from longitudinal data when the set of regimes of interest comprises simple rules that can be indexed by a Euclidean vector and discuss some of the practical issues when applying dynamic MSMs.

Liliana Orellana (LO) [BSc (Hons, Physics, 1980), MS (Biometrics, 1999), MS (Biostatistics, 2005), PhD (Biostatistics, 2007)] is Associate Professor of Biostatistics at Deakin University. After receiving her PhD from Harvard University, she was awarded repatriation funds to return to the University of Buenos Aires (UBA) as an Assistant Professor. She was Director of the Institute of Calculus, UBA, a research centre primarily focused on Statistics and Applied Mathematics (2008-2010). Liliana proposed and directed, from its creation in 2008, a Master by coursework in Statistics for Health Sciences, UBA. She has worked on the development of novel statistical methods in the areas of robust statistics and causal inference, but also has broad expertise working in multidisciplinary teams. She has acted as senior statistician for different projects of the Argentinean Ministry of Health (AIDS Program, Department of Epidemiology, Oncopaediatric Registry, and Cervical Cancer Prevention Program) and the National Cancer Institute. In 2015, after moving to Australia, Liliana was appointed Director of the Biostatistics Unit, Deakin University.

www.vicbiostat.org.au

Murdoch Childrens Research Institute — Healthier Kids. Healthier Future.

MONASH University

THE UNIVERSITY OF MELBOURNE