CAUSAL INFERENCE IN HEALTH DATA SCIENCE

A two-day workshop of the ViCBiostat Summer School

25-26 February, 2020

In this era of "data science" it is vitally important to clearly articulate the questions that we ask of data, understand the challenges inherent in answering different types of questions, and ensure that our analysis methods are suitably aligned. An overwhelming number of clinical and public health research studies ask "causal" questions, for example about the effect of treatments, policies, behaviours and other exposures on health outcomes. These questions are key to guiding decision making in health policy and practice when the goal is to improve patient outcomes and population health. Causal inference requires carefully structured reasoning to guide appropriate statistical analysis.

This workshop will provide a comprehensive introduction to causal thinking and the key methods for defining and estimating causal effects. The course will be delivered by some of our own international leaders in the field.

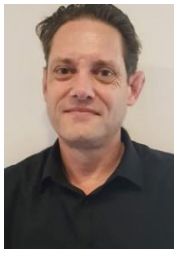
Dr Margarita Moreno-Betancur, PhD

Margarita is an ARC DECRA fellow, and Team Leader/Senior Research Fellow at The University of Melbourne and Murdoch Children's Research Institute. Since her PhD in Biostatistics (Université Paris-Sud, France), she has led research developing statistical methods motivated by analytical challenges arising in health and medical research studies, with focus on the areas of causal inference, missing data and survival analysis. This is fuelled by various collaborative work, particularly in life course and social epidemiology.

Prof Andrew Forbes, PhD

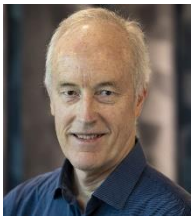
Andrew is Head of the Biostatistics Unit in the Department of Epidemiology and Preventive Medicine at Monash University. Since completing a PhD in Statistics at Cornell University (USA) he has been actively engaged in collaborative epidemiological and clinical research projects. His research interests are methods for comparative effectiveness research, assessment of the effects of time dependent exposures, interrupted time series designs and methodology in clinical trials.

Prof Lyle Gurrin, PhD



Lyle is a teaching and research academic at the Melbourne School of Population and Global Health. He completed a PhD in biostatistics at the Telethon Kids Institute in Perth, Western Australia. He has previously led epidemiological research into HFE-associated hereditary haemochromatosis and food allergy, and more recently has been collaborating on the evaluation of interventions to mitigate the consequences of significant social adversity in early childhood. He develops methods for the analysis of longitudinal and correlated data in cohort studies and, more generally, making causal inferences from observational data.

Prof John Carlin, PhD



John is Director of the Clinical Epidemiology and Biostatistics Unit (CEBU) at the Murdoch Children's Research Institute, and Professor at the Melbourne School of Population & Global Health, The University of Melbourne. Since completing a PhD in Statistics at Harvard University, John has had a long and influential career in medical and public health research. He played a leading role in establishing the Victorian Centre for Biostatistics (ViCBiostat), which has developed a broad program of methodological research motivated by extensive collaborations in health and medical research.

Workshop Overview

The workshop will cover the following topics:

Day 1: Introduction to causal inference concepts

- What is causal inference
- The target trial
- Causal diagrams/directed acyclic graphs to identify sources of bias
- Analysis planning for target trial emulation

Day 2: Methods for estimation of causal effects in point-exposure studies

- Regression
- g-computation
- Inverse probability weighting by the propensity score

The workshop includes lectures followed by tutorials testing understanding of the concepts, with a computer practical at the very end (R and Stata). All lectures and tutorials include illustrations from real-world observational epidemiological studies.

Who should attend?

Health data scientists including epidemiologists and biostatisticians, with a background including elementary statistical concepts, such as population and sample, and standard methods for simple analyses (mean difference, chi-squared test etc).

Materials:

Electronic copies of presentation materials will be made available online. For Day 2, attendees are required to have access to a laptop with R or Stata installed.

This workshop is offered by the Victorian Centre for Biostatistics (ViCBiostat)

Registration: https://www.trybooking.com/BHMNS

Venue

School of Public Health and Preventive Medicine, Monash University
Ground Floor Conference Rooms 2 and 3
553 St Kilda Rd, Melbourne, Victoria, 3004

Contact Details: Fiona Snashall Phone : +61 3 9936 6700
Email : fiona.snashall@mcri.edu.au