2022 Summer School

The annual ViCBiostat Summer School will once again be held online in 2022. We look forward to you joining our team, and international guest presenter Stijn Vansteelandt, for 2 weeks of half-day courses.

Introduction to Causal Inference

Part 1 – Study design

Tuesday 8th and Wednesday 9th: 1:30-5pm

Part 2 – Analysis methods

Thursday 10th and Friday 11th: 1:30-5pm

Causal mediation methods

Monday 14th: 1:30-5pm and Tuesday 15th: 1:30-6.15pm

Network meta-analysis

Wednesday 16th and Thursday 17th: 9:30am-1pm

Risk prediction modelling

Thursday 17th and Friday 18th: 1:30-5pm

Full course details and links to register are on our website.
Tickets for each individual course are $420 standard / $300 student.
We are pleased to offer a 20% discount for attendees purchasing tickets to multiple courses.

vicbiostat.org.au/short-courses

MONASH University
murdoch children's research institute
THE UNIVERSITY OF MELBOURNE

Introduction to Causal Inference

Presented by: Margarita Moreno-Betancur, John Carlin, Andrew Forbes, Lyle Gurrin, Jessica Kasza, Marnie Downes, Daisy Shepherd, Ghazaleh Dashti, Koen Simons, Susan Ellul, Jiaxin Zhang

Part 1 – Study design

Tuesday 8th and Wednesday 9th: 1:30-5pm

This course introduces key causal inference concepts and outlines an approach for designing causal analyses of observational studies. Specifically, we will examine what is meant by causal inference and how to identify causal questions, followed by an introduction to the target trial approach for defining causal effects. We introduce directed acyclic graphs (DAGs) and show how they can be used to understand potential biases in emulating the target trial. We then bring it all together, demonstrating an approach to planning causal analyses.
The course includes lectures followed by tutorials that develop understanding of the concepts. All lectures and tutorials include illustrations from real-world observational epidemiological studies. Electronic copies of presentation materials will be made available online.

Prerequisites: It is assumed that students will have a background including elementary statistical concepts, such as population and sample, and standard methods for simple analyses (mean difference, chi-squared test etc).

Complete your learning by registering for *Part 2 – Analysis Methods* as well.

Part 2 – Analysis methods

Thursday 10th and Friday 11th: 1:30-5pm

This course introduces three key methods for causal effect estimation: standard regression, g-computation and inverse probability weighting (IPW).
Lectures and tutorials will help ground understanding of the methods, underlying intuition, and assumptions, whilst a hands-on computer practical (in R and Stata) will cover their practical implementation. All lectures and tutorials include illustrations from real-world observational epidemiological studies. Electronic copies of presentation materials will be made available online.

Prerequisites: Students must have a sound working familiarity with Stata or R and have the corresponding software installed on their computer or laptop.

Please note that *Introduction to causal inference: Part 1 – Study Design*, is a prerequisite for this course, unless you have previously completed the CEBU "*Observational studies: Modern concepts & analytic methods*" course. Please email vicbiostat@mcri.edu.au to confirm this prior to registration.

Causal mediation methods

Presented by: Margarita Moreno-Betancur, Stijn Vansteelandt, John Carlin, Ghazaleh Dashti, Marnie Downes
Monday 14th: 1:30-5pm
Tuesday 15th: 1:30-6.15pm

Many epidemiological questions concern the pathways that are presumed to mediate a relationship between a cause and its effect. Very often, the translational intent of such research questions is to inform potential intervention targets. However, until recently causal mediation analysis methods did not define mediation effects as effects of real-world interventions, and the assumptions underlying various methods were either too stringent or not assessable in practice, particularly in the context of multiple mediators. These issues have resulted in diverse views regarding the practical value of mediation analysis and related methods.

This course begins by providing an overview of the conceptual issues surrounding mediation analysis and related methods. We then present a recent approach that conceptualises mediation effects by mapping to a "target trial" evaluating interventions on one or several mediators. We describe how to define and emulate a target trial for mediation analysis and introduce an extended g-computation approach for estimating the resulting "interventional" mediation effects. Lectures and tutorials will help ground understanding of the methods, whilst a hands-on computer practical (in R and Stata) will cover their practical implementation. All lectures and tutorials include illustrations from real-world observational epidemiological studies. Electronic copies of presentation materials will be made available online.

Prerequisites: It is strongly recommended that participants have previously taken either the ViCBiostat causal inference workshop (delivered in 2020 or in this same Summer School) or the course "*Observational studies: Modern concepts & analytic methods*" delivered by the Clinical Epidemiology and Biostatistics Unit (CEBU) at the Melbourne Children's / MCRI. To do the computer practical, students must also have a sound working familiarity with Stata or R and have the corresponding software installed on their computer or laptop.

Network meta-analysis

Presented by: Joanne McKenzie, Emily Karahalios

Wednesday 16th and Thursday 17th: 9:30am-1pm

Network meta-analysis is an extension to pairwise meta-analysis that synthesizes evidence about the relative effects of many competing interventions in a single model. Network meta-analysis can also be used to estimate the ranking of the hierarchy of the interventions according to their safety or effectiveness. The method is now an integral statistical tool for evidence synthesis. However, a valid network meta-analysis relies on assumptions, and understanding these, and how to examine them, is critical to using the method.

In this first day of this two half-day workshop, we will begin with an introduction to network meta-analysis models, fitting the models, and a discussion of the key assumptions that underpin network meta-analysis.

In day 2, we will cover how to assess inconsistency in a network, presenting the results of a network meta-analysis and assessing the confidence in the findings using the web-based tool Confidence In NEtwork Meta-Analysis (CINEMA).

In the lectures, methods and concepts will be introduced. Breakout sessions will provide participants with an opportunity to discuss the concepts and implement the methods using the statistical package Stata. Our focus will be on network meta-analysis of the effects of interventions from randomised trials.

Target audience

This course is suitable for quantitative epidemiologists and applied statisticians working in health research. It will be assumed that participants will have a working knowledge of the statistical package Stata, and have training or experience of pairwise meta-analysis, introductory statistics and multivariable regression.

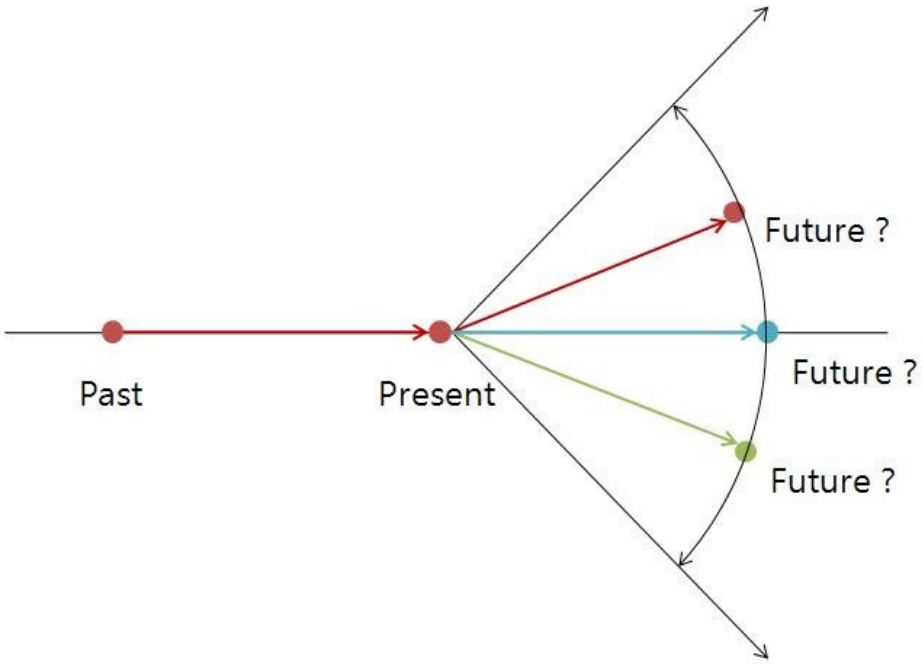
Computing

Stata version 14 or above installed.

Risk Prediction Modelling

Presented by: Rory Wolfe, Damjan Vukcevic, Thao Le

Thursday 17th and Friday 18th: 1:30-5pm



This workshop gives an introduction to topical issues in the use of prediction models in health. The application of both regression models and machine learning approaches to the process of prediction model development for individuals will be discussed and illustrated with practical computing exercises in Stata and R. The methods for model validation will be described. The use of multiple imputation when developing a new model, in order to manage the challenge of missing data, will be described, and in this context relevant methods for variable selection and model validation will be explained.

Prerequisites: Participants are expected to possess a sound understanding of epidemiological and statistical concepts including multivariable regression models, and knowledge of either Stata or R.