WORKSHOP

Causal approaches to the design and analysis of epidemiological studies

Presented by
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Sponsored by
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Murdoch Childrens Research Institute
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La Trobe University (School of Public Health and COMPASS)
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Date: Monday August 9, 2010

Venue: Seminar Room 1, Level 5, Monash University, The Alfred Centre, 99 Commercial Road, Melbourne, 3004.

Workshop summary:

In the past two decades causal diagrams and statistical methods for causal inferences have increasingly informed the design and been used for the analysis of epidemiological studies. Causal diagrams offer an intuitive approach to the documentation and communication of assumptions about the relationships between variables in observational and randomised studies. They provide a unified approach to the study of confounding and selection biases and they present an excellent opportunity for integration into epidemiological teaching at introductory and advanced levels. These diagrams have also informed the development of new analytic methods to deal with confounding and selection biases, particularly for the analysis of longitudinal studies with time-varying exposures and confounders.

The objectives of this workshop are to:

1. explain causal terminology and how causal graphs can inform approaches to statistical analyses
2. provide an in-depth understanding of confounding and its control
3. explain the role and potential of different methodological approaches to overcome confounding and selection bias, including inverse probability weighting and marginal structural models
4. provide an opportunity for participants to cast their own substantive problems in causal terms and diagrams
5. provide an opportunity for practical data analysis experience using Stata software (for participants who are Stata users)

Target Audience:
Epidemiologists, biostatisticians, PhD students wishing to learn about causal concepts in epidemiological research.
Prerequisite knowledge for this workshop is a good understanding of epidemiological and statistical concepts including multivariable regression models and survival analysis.

Note on computing:
Familiarity with the Stata software package is advantageous but not required. Participants familiar with Stata are encouraged to bring a laptop computer with Stata pre-loaded to enable hands-on practical data analysis. Participants not familiar with Stata will receive a guided interactive demonstration of data analysis with detailed discussion.

Workshop timetable:

8:15-8:45	Registration and coffee
8:45-9:00	Welcome and introduction
9:00-10:00	Causal concepts and causal diagrams
10:00-10:20	Morning tea
10:20-11:20	Causal diagrams: confounding and selection bias
11:20-12:30	Small group exercises with causal diagrams and general discussion
12:30-1:15	Lunch
1:15-2:15	Analytical methods 1: propensity scores and inverse probability weights
2:15-3:15	Analytical methods 2: time dependent confounding and marginal structural models
3:15-3:35	Afternoon tea
3:35-5:00	Data analysis practical example: propensity scores, inverse probability weights and marginal structural models with either: (a) Stata hands on data analysis; OR (b) Discussion session examining details of the practical example
5:00-5:15	General discussion and closing comments