Indirect comparisons and network meta-analysis: Evidence synthesis with multiple treatments (ws12-2)

January 16-19, 2012

Faculty

Dr. Julian Higgins, PhD (course co-ordinator)
MRC Biostatistics Unit, Institute of Public Health, University of Cambridge, UK
Dr. Georgia Salanti, PhD
Department of Hygiene & Epidemiology, University of Ioannina School of Medicine, Greece
Prof. Matthias Egger, MD
Institute of Social & Preventive Medicine (ISPM), University of Bern, Switzerland

Introduction

Standard meta-analysis methods for clinical trials focus on comparisons of two interventions, such as a drug versus a placebo, or a new intervention versus standard practice. Rarely are there only two interventions under consideration in clinical practice. Extensions of meta-analysis to address three or more treatments have been the subject of much methodological research in recent years, and are increasingly being applied. At simplest, indirect comparisons can be performed in ways that respect the randomization within each clinical trial. More complex are so-called network meta-analyses, also known as multiple treatments meta-analyses or mixed treatment comparison meta-analyses. These allow the simultaneous analysis of clinical trials involving different treatments.

This course is aimed at statisticians, epidemiologists and other quantitatively-minded researchers and healthcare professionals who want to perform state-of-the-art statistical syntheses of clinical trials involving multiple interventions. Knowledge of systematic reviews and the fundamentals of meta-analysis is expected of all participants. Computer practicals will use Stata®, including use of the *mvmeta* macro for performing multivariate meta-analysis. Participants will not be expected to be familiar with Stata®. Participants familiar with WinBUGS will be able to follow parallel practicals using Bayesian techniques.

Course objectives

By the end of this short course participants will have an understanding of:

- The role and potential of indirect comparisons and network meta-analysis in the evaluation of healthcare interventions;
- The principles, steps and statistical methods involved;
- The biases that can distort indirect comparisons and network meta-analysis, including conflict among different sources of evidence, and ways to address these issues.

Participants will gain practical experience in performing analyses in either Stata® or WinBUGS.

What you have to bring

Students will bring their own portable computers. A course license of Stata® will be available if required, to be installed by University of Bern IT staff on arrival on Sunday.

Outline of course

The course will run over three days and consist of lectures, group work and computer practicals. We start early in the morning with a review of the previous day. During the extended break in the afternoon participants review course materials, catch up on emails or go skiing. We reconvene at 5 pm for the computer sessions.

Monday evening

- Installation of Stata® or WinBUGS software on students' laptop computers, and possibility of self-directed session for students wishing to refresh themselves with these packages.

Tuesday

- Brief review of systematic reviews and meta-analysis
- Frequentist meta-analysis methods for direct pair-wise comparisons
- Bayesian meta-analysis methods: methods for effect estimates and arm-level summary data
- Indirect comparisons and basic network meta-analysis using meta-regression
- Computer practical (Stata® or WinBUGS)

Wednesday

- Direct versus indirect evidence: simple analyses to identify conflict
- Validity of indirect comparisons
- Introduction to multivariate meta-analysis
- Full network meta-analysis and presentation of results
- Computer practical (Stata® or WinBUGS)

Thursday

- Identifying and addressing inconsistency in network meta-analysis
- Group discussion of a published network meta-analysis
- Extensions of the network meta-analysis model to include co-variates and address bias
- Participants presenting their own problems, and/or group discussion
- Computer practical (Stata® or WinBUGS)
- Question and answer session, and feedback on the course

Maximum number of participants

The maximum number of participants on this course will be 30.

Course hotel

Course participants will stay at the Hotel SUNSTAR in Wengen. See http://wengen.sunstar.ch or http://www.sunstar-schweiz.ch/english/wengen/default.htm for details on the hotel.

Course fee and hotel costs

Course fee: CHF 1000
Hotel (including breakfast buffet and four-course dinner, access to swimming pool and steam bath):
Arrival January 16, departure January 20, 2012 (four nights):
Single occupancy: CHF 592
Double occupancy: CHF 552
Please note that the hotel bill will have to be settled by each participant upon departure.