North Texas Chapter
American Statistical Association

Network Meta-Analysis

(ASA Council of Chapters Traveling Course)

Instructor: Professor Christopher Schmid (Professor and Chair of Biostatistics

Brown University School of Public Health)

Date: November 8, 2018 (Thursday)

Time: 8:30 a.m. – 3:30 p.m. (Lunch 11:30 a.m. – 1:00 p.m.)

Location: The Forum, Hughes-Trigg Student Center, Southern Methodist University, 3140 Dyer Street, Dallas, TX 75205

Registration and Fee:

$35 for students
$55 for ASA Members
$65 for others

An additional fee of $10 will be charged for registrations received after October 26, 2018. The registration fee includes all the course materials and lunch on November 8, 2018.

Registration will be opened in early October. Information related to registration will be provided soon.

Abstract

Comparative effectiveness usually involves evaluation of multiple interventions and may involve multiple outcomes measured at multiple times as well. Meta-analysis, whether of continuous or discrete outcomes, has in the past focused on summarizing the evidence comparing two treatments or classes of treatments. Recently, methods have been developed to integrate comparisons of multiple treatments into coherent models that allow simultaneous comparison of all treatments, combining the direct evidence from head-to-head studies with indirect evidence from trials that involve common comparators. The network models provide estimates of the relative effectiveness or harms of all included treatments, and a ranking with associated probability estimates. These methods depend on a crucial assumption that the direct and indirect evidence are compatible (consistency) and that treatments are mutually exchangeable across studies (transitivity). This course will introduce meta-analysis in the context of evidence-based science and will then outline the basic principles of network meta-analysis and assessment of the validity of its assumptions including the key role that potential effect modifiers play. Examples of its application to different types of outcomes, both efficacy and safety with discussion of incomplete data problems will be discussed.

Outline

The course is aimed at statisticians and other data analysts who will be designing, performing and interpreting network meta-analysis. The presentation will combine principles and intuition about the proper application of the methods as well as technical information about the models employed. Although most of the examples will be taken from healthcare, the methods are applicable in any discipline where meta-analysis is undertaken including education, psychology, economics, etc. Examples in each of these areas will be given and discussion is welcomed. The course will cover the following topics:

(1)   Review of Meta-analysis and meta-regression for two treatments;
(2)   Definition of Direct and indirect comparisons and network consistency;
(3)   Network meta as a meta-regression problem;
(4)   Role of Heterogeneity and Exchangeability in choosing studies;
(5)   Evaluating Network Assumptions: Exchangeability, Consistency;
(6)   Network Diagnostics;
(7)   Models for Categorical Outcomes;
(8)   Ranking of Treatments;
(9)   Treatment of Missing Data
(10) Software

Biography

Dr. Schmid is Professor and Chair of Biostatistics at Brown University School of Public Health. He co-founded the Center for Evidence Synthesis in Health there. He directs the Research Design, Epidemiology and Biostatistics Core of the Rhode Island Center to Advance Translational Science and also directs the Evidence Synthesis Academy, a federally funded educational program for mid-career professionals and users of healthcare evidence. He is a Fellow of the American Statistical Association, founding Editor of the journal *Research Synthesis Methods*, long-time statistical editor of the *American Journal of Kidney Diseases* and member of the Data Safety and Risk Management Committee for FDA. His research focuses on methods and applications for meta-analysis particularly Bayesian methods and software and on predictive models derived from combining data from different sources. He was lead statistician for the CKD-EPI consortium that developed the most commonly used formulas to estimate GFR based on the biomarkers serum creatinine and serum cystatin. Recently, he has been focusing efforts on meta-analysis of N-of-1 studies and is lead statistician on three current funded series of trials. He is an author of more than 250 publications and has served as a consulting statistician in diverse areas of medicine and health for academia, government and industry. He has co-authored consensus CONSORT reporting guidelines for N-of-1 trials and single-case designs, and PRISMA guidelines extensions for meta-analysis of individual participant studies and for network meta-analyses as well as the Institute of Medicine report that established national standards for systematic reviews Dr. Schmid graduated from Haverford College with a BA in Mathematics and received his PhD in Statistics from Harvard University. He worked for 20 years at Tufts Medical Center, including 6 years directing its Biostatistics Research Center before moving to Brown in 2012 where he directed its Masters program for 4 years.