

Meta-analysis of Individual Participant Data (IPD) from randomized, non-randomized or real world data studies

Background

Systematic reviews and meta-analyses are the cornerstone of contemporary evidence-based medicine. The large majority of meta-analysis studies summarize aggregate data from publications. It is increasingly common that individual participant data (IPD) are obtained from primary studies, randomized or non-randomized, and even from real world data sources. As a result, new opportunities arise, and more advanced statistical methods are needed to properly analyze available IPD emerging from various studies. In this course, we discuss how a meta-analysis involving IPD from different studies can be conducted to investigate the comparative efficacy between different interventions, and to investigate the accuracy of diagnostic and prognostic tests and models with a focus on the development and validation of prediction models in large combined data sets. The course consists of plenary presentations, small-group discussions, reading and various computer exercises.

Objectives

In this four-day workshop participants will be introduced into the principles of meta-analysis of individual participant data from multiple studies, so that they are able to understand, conduct and interpret meta-analysis results. At the end of the course, participants will understand the essentials of IPD reviews and meta-analyses and able to:

1. Explain the rationale for performing an individual participant data meta-analysis (IPD-MA)
2. Understand the advantages, limitations and key characteristics of IPD-MA in intervention and prediction research.
3. Understand the relevance of between-study heterogeneity, and be familiar with statistical methods for investigating and reporting this.
4. Use statistical methods for summarizing relative treatment effects and explore the presence of treatment-covariate interactions.
5. Be familiar with the similarities and differences between one-stage and two-stage meta-analysis methods.
6. Use statistical methods for developing and evaluating diagnostic and prognostic prediction models in large combined data sets.
7. Interpret and critically appraise the results from an IPD-MA.

Target audience

The workshop is directed to healthcare researchers, healthcare providers, guideline developers and policy makers, who wish to know more about when and how to perform, and how to assess the validity of meta-analyses of individual participant data obtained from multiple sources, including randomized, non-randomized and real world data studies.

Prerequisites

Participants must have basic knowledge about the principles of intervention and prediction research and the conduct of systematic reviews and meta-analysis. Computer exercises will be done using the free statistical software R. Although knowledge of basic R commands is desired, syntax code will be provided to replicate all analyses.

Topics

1. Introduction to reviews and meta-analysis of IPD of multiple intervention studies
 - a. Drawbacks of meta-analysis of aggregate data (AD)
 - b. Potential benefits of meta-analysis of IPD from multiple intervention studies
 - c. Challenges in meta-analysis of IPD from multiple intervention studies
 - d. Differences between reviews of aggregate data and of IPD from multiple studies.
2. Statistical methodology for IPD meta-analysis of intervention studies
 - a. One-stage and Two-stage IPD meta-analysis: summarizing treatment effect(s), quantifying between-study heterogeneity, identifying treatment-effect modifiers
 - b. Differences between one-stage and two-stage meta-analysis
 - c. Computer practicals on performing an IPD meta-analysis in R
3. Introduction to IPD meta-analysis of diagnostic and prognostic model studies
 - a. Introduction to meta-analysis of IPD of diagnostic and prognostic model studies
 - b. Differences between IPDMA of intervention, diagnostic and prognostic studies
 - c. Advantages and challenges of meta-analysis of IPD as compared to AD of diagnostic and prognostic studies
 - d. Reading and discussion assignments on meta-analysis of IPD of multiple diagnostic and prognostic studies
4. Statistical methodology for IPD meta-analysis of prognostic and diagnostic model studies
 - a. Opportunities and challenges of routinely collected data
 - b. Methods for developing prediction models in large clustered data sets
 - c. Methods for validating prediction models in large clustered data sets
 - d. Computer practical on prediction model development plus validation in large combined IPD sets

Workshop Style

The workshop will consist of online lectures, interactive small group exercises with ample room for discussion, and computer exercises. Participants are asked to do some preparatory work before the workshop and to do some self-study during the workshop. Participants are asked have R installed on their computer (detailed guidance will be provided later).

Faculty

- Thomas Debray, PhD, Cochrane Netherlands and Julius Center, Utrecht.
- Carl Moons, PhD, Cochrane Netherlands and Julius Center, Utrecht.
- Hans Reitsma, MD, PhD, Cochrane Netherlands and Julius Center, Utrecht.
- Valentijn de Jong, PhD, Cochrane Netherlands and Julius Center, Utrecht, course coordinator

Facilitators are member of the Cochrane IPD meta-analysis group (<https://methods.cochrane.org/ipdma/>)

Language

English.

Dates, insurance & cancellation

Online, May 17, 18, 20 and 21, 2021.

A full refund will be available if you notify us by email up to 5 working days before the date of the event. Refunds are not available if you cancel your place within 5 working days before the date of the event. The organization does not accept liability for individual medical, travel or personal insurance. In case an unforeseen event would force the organization to cancel the meeting, the organization will fully reimburse the participants registration fees.

Course fees

The course fee amounts € 895.-

Registration and additional information

To register for the course or to receive additional information, you can contact the course organizer at Cochrane Netherlands, Sabine van Dijk- van der Sluijs, PAOJuliusCenter@umcutrecht.nl.

For more information on the content of the course, you can send an e-mail with your question(s) to cochrane@umcutrecht.nl.

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