

Missing data

Background

Missing data is often unavoidable when collecting data for scientific research. In this course we focus on the context of health(care) and (bio)medical research, where participant data records are often incomplete due to, for instance, loss to follow-up, non-response to questionnaires, selective medical work-up or lack of adequate linkage of data for different levels of healthcare. We pay attention to both single data sets of primary studies as well as of combined data sets from multiple studies (such as in individual participant data meta-analysis). It is well known that there are detrimental consequences to the analysis of incomplete data records when the missingness is not adequately taken into account.

In the past decades, many advances have been made regarding the methods for analysis of datasets with missing data. In this comprehensive course we discuss the mechanisms of missing data, illustrate the impact of missing data, practice how to deal with missing data when analysing your data (e.g. using multiple imputation) and how to report analyses of data with missing data, focusing both on single and combined data sets. The course consists of plenary lectures, small-group discussions, and computer exercises.

Objectives

The first day will cover the types of missing data and their impact and will give an overview of missing data approaches. The second and third data will be used to learn about and practice with different approach to handle missing data. On the fourth data we will discuss design and reporting of analyses with missing data.

At the end of the course, participants will understand the essentials and be able to:

1. Explain the potential impact of missing data on various forms of data analysis
2. Formulate the plausible mechanisms for missing data
3. Critically appraise the evidence from analysis on different types of datasets with missing data
4. Formulate the limitations of analysis on single or combined datasets with missing data
5. Perform an analysis of imputed data
6. Report an analysis of imputed data

Target audience

The workshop is directed to researchers, healthcare workers, journal editors, guideline developers and policy makers, who wish to know more about analyses with missing data and understanding the opportunities and limitations of imputation methods.

Prerequisites

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 missing data
 - a. Types of missing data
 - b. Overview of methods to deal with missing data
 - c. Practical: impact of missing data
 - d. Practical: missing indicator method
2. Basics of missing data imputation
 - a. The principles of imputation of missing data
 - b. Practical: imputation of missing data
3. Advanced topics in missing data
 - a. Imputation via Joint Modelling
 - b. Imputation via Fully Condition Specification
 - c. Exercise on predictive mean matching
 - d. Practical: advanced topics
4. Design and reporting

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

- Maarten van Smeden, PhD, Julius Center, UMC Utrecht (coordinator)
- Carl Moons, PhD, Cochrane Netherlands and Julius Center, UMC Utrecht.
- Jeroen Hoogland, MSc, Julius Center, UMC Utrecht
- Thomas Debray, PhD, Cochrane Netherlands and Julius Center, UMC Utrecht.
- Valentijn de Jong, PhD, Cochrane Netherlands and Julius Center, UMC Utrecht.

Language

English.

Dates, insurance & cancellation

Online – 21 to 25 June, 2021.

This is a 4-day workshop. On Monday, Tuesday, Thursday and Friday are the lecture days (Wednesday is a day off). Live Q&A sessions are planned during the lecture days and there will be an assignment in small groups. Participants can do the other learning activities in their own pace.

NB: For this course a minimum number of participants is required. Two weeks before the start of the course we will decide whether the course will go ahead.

A full refund will be available if you notify us by email up to 30 working days before the date of the event. Refunds are not available if you cancel your place within 30 working days before the date of the event. The organization does not accept liability for individual medical, travel or personal insurance. Participants are strongly advised to take out their own personal insurance policies. In case an unforeseen event would force the organization to cancel the meeting, the organization will fully reimburse the participants registration fees.

Course fee

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.

Cochrane Netherlands
Julius Center, University Medical Center Utrecht
Huispostnr. Str. 6.131
P.O. Box 85500
3508 GA UTRECHT
The Netherlands
P: +31 (0) 88 75 681 69
E: cochrane@umcutrecht.nl
W: www.cochrane.nl