

Swiss Epidemiology Winter School 2025



Handling missing data in causal inference and randomised trials 23 – 25 January 2025

Faculty	Prof. Kate Tilling Bristol Medical School, University of Bristol, United Kingdom Prof. James Carpenter London School of Hygiene and Tropical Medicine, University of London, United Kingdom Medical Research Council Clinical Trials Unit, 90 High Holborn, London, United Kingdom
Venue	CH – 3823 Wengen SWITZERLAND Hotel Jungfraublick (map)
Course description	<p>This course is designed for epidemiologists and applied statisticians who have to handle missing data in the analysis of observational or randomised studies.</p> <p>The aim of the course is to equip you to understand the issues raised by missing data, the likely impact of missing data on a complete records analysis, and when and how to use multiple imputation to reduce bias and recover information.</p> <p>We will describe the use of directed acyclic graphs (DAGs) to capture the assumptions around missing data and their likely impact on the analysis. Following this, we introduce the concepts of data being missing at random and missing not at random, relating these to the concepts of exchangeability and no unobserved confounding, and to the DAGs.</p> <p>Using examples, we will introduce multiple imputation and show how it can be used to handle missing values in both causal modelling of observational data (using multivariable regression and also using propensity score analyses) and the analysis of randomised controlled trials with missing outcomes.</p> <p>As the assumptions underlying both complete records analysis and missing at random are untestable, we will describe how sensitivity analyses can be formulated and implemented using multiple imputation</p>

The final session of the course will give the opportunity for participants to present their data, and challenges with missing data, for discussion by the tutors and class.

Practicals will use Stata; the majority will also be available in R.

Recommended reading:

Multiple Imputation and its Application (2nd Edition, 2023) published by *Wiley*
Framework for the treatment and reporting of missing data in observational studies: the Treatment And Reporting of Missing data in Observational Studies framework (Lee et al, *Journal of Clinical Epidemiology*, 2021, **134**, 79-88, doi:10.1016/j.jclinepi.2021.01.008)

Course objectives	<ul style="list-style-type: none">• Learn how to use directed acyclic graphs to assess the likely consequences of missing data for a complete records analysis• Understand the concepts of exchangeability, missing at random and missing not at random as they relate to causal and trials analysis• Be able to use multiple imputation for missing data in (i) observational analyses; (ii) propensity scores for causal modelling, and (ii) missing outcome data in trials• Understand the role of sensitivity analysis and learn how to use multiple imputation to carry out sensitivity analyses
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Course audience	This course is designed for epidemiologists and applied statisticians who have to handle missing data in the analysis of observational or randomised studies.
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Course outline	We start early in the morning by reviewing the previous day. During the extended afternoon break, participants review course materials, catch up on email, or ski. We reconvene at 4:30 pm for the computer sessions.
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Thursday, 23 January *8:00 am – 12:00 pm | 4:30 pm – 6:30 pm*

Friday, 24 January *8:00 am – 12:00 pm | 4:30 pm – 6:30 pm*

Saturday, 25 January *8:00 am – 12:00 pm | 1:00 pm – 3:00 pm*

Credits	1.0 ECTS
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Course materials	Onsite University of Bern IT staff provides support upon e-mail (it.ispm@unibe.ch) request.
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Course book	Multiple Imputation and its Application (2nd Edition, 2023) published by <i>Wiley</i>
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Course fee	PhD Bern Students: CHF 650
	PhD Students: CHF 850
	Academic: CHF 1050
	Industry: CHF 2050

Registration	Register on the Winter School website . Pre-Registration starts on 26. August 2024 at 12:00 pm (CET) until 1 September 2024.
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Accommodation	Book your accommodation separately. Please see recommendations for special prices .
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