

# Swiss Epidemiology Winter School 2024



## Statistical Analysis with Missing Data Using Multiple Imputation and Inverse Probability Weighting 18–20 January 2024

### Faculty

#### 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

#### Dr. Andrew Atkinson, PhD

Department of Infectious Diseases, Bern University Hospital, Bern, Switzerland

### Venue

#### CH – 3823 Wengen | SWITZERLAND

Hotel Jungfraublick ([map](#))

### Course description

Missing data are ubiquitous in observational and experimental research. They lead to a loss of statistical power, but more importantly, may introduce bias into the analysis. In this course we adopt a principled approach to handling missing data, in which the first step is a careful consideration of suitable assumptions regarding the missing data for a given study and analysis. Based on this, appropriate statistical methods can be identified that are valid under the chosen assumptions. The course will focus particularly on the practical use of multiple imputation (MI) to handle missing data in realistic epidemiological and clinical trial settings, but will also include an introduction to inverse probability weighting methods and new developments that combine these with MI.

### Course objectives

By the end of this course participants will:

- be introduced to the issues raised by missing data, and the associated statistical jargon (missing completely at random, missing at random, missing not at random)
- be aware of the shortcomings of ad-hoc methods for 'handling' missing data
- understand the reasons for using multiple imputation for statistical analysis with missing data
- understand the need for and use accessible methods for exploring the sensitivity of inference to the missing at random assumption

Through computer practical sessions using Stata®, participants will learn how to apply the statistical methods introduced in the course to realistic datasets.

### Contact:

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<b>Course audience</b>	This course is aimed at epidemiologists, biostatisticians, and other health researchers with quantitative skills and some experience in statistical analysis. Stata® will be used for the computer practical sessions, and so familiarity with the package is desirable, although code and solutions will be provided.
<b>Course outline</b>	<p>The course runs over three days and consists of lectures, group work, and computer practical sessions.</p> <p>We start early in the morning by reviewing the previous day. During extended afternoon breaks, participants review course materials, catch up on email, or ski. We reconvene at 4:30 pm for computer sessions.</p> <p><i>Thursday, 18 January</i>      <i>8:00 am – 12:00 pm   4:30 pm – 6:30 pm</i></p> <p><i>Friday, 19 January</i>      <i>8:00 am – 12:00 pm   4:30 pm – 6:30 pm</i></p> <p><i>Saturday, 20 January</i>      <i>8:00 am – 12:00 pm   1:00 pm – 3:00 pm</i></p>
<b>Credits</b>	1.0 ECTS
<b>Course materials</b>	<p>Bring a portable computer. A course license for Stata® will be available to install before arrival.</p> <p>Onsite University of Bern IT staff provides support upon e-mail (<a href="mailto:it@ispm.unibe.ch">it@ispm.unibe.ch</a>) request.</p>
<b>Course book</b>	On the first day of the course, we provide <i>Multiple Imputation and its Application</i> (2013) by J.R. Carpenter and M.G. Kenward M. G. (2013).
<b>Course fee</b>	<p>PhD Bern Students: CHF 400</p> <p>PhD Students: CHF 750</p> <p>Academic: CHF 950</p> <p>Industry: CHF 2050</p>
<b>Registration</b>	Register on the <a href="#">Winter School website</a> . Pre-Registration starts 29 August 2023 at 12:00 pm (CET).
<b>Accommodation</b>	Book your accommodation separately. Please see <a href="#">recommendations for special prices</a> .