



## Causal Inference in Observational Epidemiology

January 18<sup>th</sup> – 20<sup>st</sup>, 2018

### Course description

<b>Faculty</b>	<p><b>Prof. Miguel Hernan</b> Harvard T.H. Chan School of Public Health, Boston, USA</p> <p><b>Prof. Marcel Zwahlen</b> Institute of Social and Preventive Medicine (ISPM), University of Bern, Switzerland</p>
<b>Place</b>	<p><b>CH – 3823 Wengen   SWITZERLAND</b> Hotel Jungfraublick (see map on <a href="http://www.epi-winterschool.org/hotels">http://www.epi-winterschool.org/hotels</a>)</p>
<b>Introduction</b>	<p>Causal inference from observational data is a key task of epidemiology and of allied disciplines such as behavioural sciences and health services research. Commonly used statistical methods estimate association measures which cannot always be causally interpreted, even when all potential confounders are included in the analysis. In contrast, a causally explicit approach formally defines causal effects, identifies the conditions required to estimate causal effects without bias, and uses analytical methods that, under those conditions, provides estimates that can be endowed with a causal interpretation. This course presents such framework for causal inference from observational data and recent methodological developments, with a special emphasis on complex longitudinal data. The application of these methods will be illustrated using data from a synthetic HIV cohort study. The course is aimed at epidemiologists, statisticians, and other researchers who work with longitudinal observational data.</p>
<b>Course objectives</b>	<p>By the end of this short course participants will have</p> <ul style="list-style-type: none"><li>• An in-depth understanding of confounding and selection bias</li><li>• An understanding of the role and potential of different methodological approaches to overcome these problems, including inverse probability weighting, marginal structural models and nested structural models</li><li>• Practical data analysis experience using Stata<sup>®</sup> software.</li></ul>
<b>What you have to bring</b>	<p>Students should bring their own portable computers. A course license for Stata<sup>®</sup> will be available, to be installed before arrival. University of Bern IT staff onsite can provide help.</p>

**Contact:**

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**Outline of course**

The course will run over three days and consists of lectures in the morning and computer practicals during the evening. During the extended break in the afternoon, participants review course materials, catch up on emails or go skiing.

*Thursday, January 18<sup>th</sup>*

- Confounding and selection bias
- The bias of conventional methods
- Group work
- Review of day 1

*Friday, January 19<sup>th</sup>*

- Inverse probability weighting for marginal structural models
- IP weighting for survival analysis
- STATA practical: Marginal structural models
- Review of day 2

*Saturday, January 20<sup>st</sup>*

- Static versus dynamic treatment strategies
- IP weighting for dynamic strategies
- STATA practical: Dynamic strategies3
- Review of day 3 and course evaluation

<b>Credit</b>	1.5 ECTS		
<b>Course fee</b>	SSPH+:	CHF	0
	Academic:	CHF	900
	Industry:	CHF	2000
<b>Registration</b>	You can register on the Winter School website <a href="http://www.epi-winterschool.org">www.epi-winterschool.org</a> .		
<b>Course hotels</b>	Participants must book their accommodations themselves (see map and recommendations on <a href="http://www.epi-winterschool.org/hotels">www.epi-winterschool.org/hotels</a> ).		