HARVARD
School of Public Health

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UNIVERSITÄT
BERN

SSPH+
SWISS SCHOOL OF
PUBLIC HEALTH +

Causal Inference in Observational Epidemiology
January 19th – 21st, 2017

Course description

Faculty	**Prof. Miguel Hernan (course co-ordinator)** Harvard School of Public Health, Harvard University, Boston, USA **Prof. Marcel Zwahlen** Institute of Social and Preventive Medicine (ISPM), University of Bern, Switzerland
Place	**CH – 3823 Wengen | SWITZERLAND** Hotel Jungfraublick (see map on http://www.epi-winterschool.org/hotels)
Introduction	Causal inference from observational data is a key task of epidemiology and of allied disciplines such as behavioral 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.
Course objectives	By the end of this short course participants will have • An in-depth understanding of confounding and selection bias • 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 • Practical data analysis experience using Stata®software.

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What you have to bring	Students should bring their own portable computers. A course license for Stata® will be available, to be installed before arrival. University of Bern IT staff onsite can provide help.
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 19th
- Introduction to causal diagrams
- Confounding
- Selection bias and time-dependent confounding
- Group work
- Review of day 1

Friday, January 20th
- Inverse probability weighting of marginal structural models
- Applications of marginal structural models
- STATA practical: Marginal structural models
- Review of day 2

Saturday, January 21st
- Further applications of inverse probability weighting such as the construction of adjusted survival curves.
- STATA practical: Further applications of inverse probability weighting
- Review of day 3 and course evaluation

Credit	1.5 ECTS
Course fee	SSPH+: CHF 0.00 Academic: CHF 900 Industry: CHF 2000
Registration	You can register on the Winter School website www.epi-winterschool.org.
Course hotels	Participants not staying in the group house should book their accommodations themselves (see map and recommendations on www.epi-winterschool.org/hotels).