



Berlin School of Public Health | BSPH

# Advanced Epidemiologic Methods

Summerschool | 9<sup>th</sup> - 13<sup>th</sup> July, 2012, 9:00 - 17:00

## Lecturer

Professor Timothy Lash  
Professor, Division of Public Health Sciences, Wake Forest University School of Medicine  
Professor of Cancer Epidemiology, Department of Clinical Epidemiology, Aarhus University

## Biographical Sketch

Dr. Lash is Professor of Epidemiology at Wake Forest University School of Medicine, Public Health Sciences Division. He is also Professor of Cancer Epidemiology at Aarhus University, Department of Clinical Epidemiology. He is an editor and co-author of the major textbook, Modern Epidemiology, and the recipient of several awards for excellence in teaching and research. Dr. Lash received a B.S. in Life Sciences from the Massachusetts Institute of Technology (1987), an M.P.H. in Epidemiology and Environmental Health from the Boston University School of Public Health (1992), and a D.Sc. in Epidemiology from the Boston University School of Public Health (1999).

## Research Interests

Dr. Lash's current research centers on the etiology and treatment of breast cancer. He also works on methods aimed at quantifying bias and uncertainty arising from systematic error in observational studies. His consulting work focuses on interpreting the results of epidemiologic investigations, and applying these interpretations to environmental and occupational exposures. He also works on methods aimed at quantifying bias and uncertainty arising from systematic error in observational studies and has recently co-authored the textbook Applying Quantitative Bias Analysis to Epidemiologic Data.

## Venue

Charité - Universitätsmedizin Berlin | Campus Virchow-Klinikum  
Augustenburger Platz 1 | 13353 Berlin

## Audience

Public Health Professionals, Epidemiologists and Clinicians familiar with advanced epidemiologic knowledge, algebra, and statistical computing.

Language	English
ECTS	3
Course fees	360 € for students 450 € other participants

## Registration Information

Ms. Tanja Te Gude, Student Services  
Tel. (030) 450 570 812  
Email [tanja.te-gude@charite.de](mailto:tanja.te-gude@charite.de)  
The number of participants is limited to 50.  
Payment of the course fee ensures participation.

Further information about BSPH: <http://bspb.charite.de>

Design: Christine Voigts, Fotos: Wiebke Peitz, Zentrale Medienserviceleistungen, Charité - Universitätsmedizin Berlin



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## Course Objectives

The intent of this course is to strengthen the methodological skills of the research community.

At the end of the week participants should be able to:

- Use the sufficient cause model, counterfactual susceptibility type model, and a causal graph to assist with the design or analysis of an epidemiologic study.
- Calculate adjusted measures of effect and select those that, when collapsible, correspond to the no-confounding condition. Use the adjusted measures of effect to estimate the direction and magnitude of confounding.
- Distinguish effect measure modification, interdependence, and statistical interaction from one another as separate - but related - concepts of interaction.
- Weigh the advantages and disadvantages of significance testing.
- Compare the advantages and disadvantages of frequentist and Bayesian approaches to analysis of a single study, to evidence, and to changing your mind.

Textbook  
Rothman KJ, Greenland S, Lash TL.: Modern Epidemiology.  
3rd Edition. Lippincott-Raven,  
Philadelphia, 2008

## Course Outline

### July 9 **Monday**

Advanced methods to address confounding: causal graphs, propensity scores, marginal structural models, instrumental variables

July 10, afternoon

Concepts of interaction: effect measure modification, causal interdependence and its connection with the counterfactual model, statistical interaction

### July 10 **Tuesday**

Advanced methods to address confounding: causal graphs, propensity scores, marginal structural models, instrumental variables

July 10, afternoon

Concepts of interaction: effect measure modification, causal interdependence and its connection with the counterfactual model, statistical interaction

### July 11 **Wednesday**

Misclassification: emphasis on corrections for misclassification and exceptions to the rule that misclassification biases toward the null

July 11, afternoon

Probability distributions for epidemiologic data (binomial, poisson, hypergeometric, extension to logistic regression and survival analysis). Introduction to p-values

### July 12 **Thursday**

p-values, p-value functions, confidence intervals, likelihoods

July 12, afternoon

Bayesians versus Frequentists

### July 13 **Friday**

Dose- response analysis and multiple comparisons

July 13, afternoon

Bias analysis and causal inference

Participants will be given access to an extensive e-learning platform with exercises, literature and lecture slides.