

### Goal

Statistics is the discipline that deals with randomness and probabilities and how to extract information from data in the face of randomness. Each scientific discipline attempting to learn about real world phenomena deals with statistical issues. Biostatistics is the sub-discipline of Statistics that focuses on applications in medicine and public health.

In this module you learn how to describe transparently data that was collected for a given study. In addition you learn how to make inferences and conclusions that go beyond the current data set and make statements about the underlying population of interest. Furthermore, the information in the data set has to be condensed and presented in an understandable fashion. For this

- you reduce data by calculating group level quantities (like means, risks etc.)
- you quantify and interpret the amount of statistical uncertainty in your data, mostly by using 95% confidence intervals
- you make the first steps in using a statistical software (Stata) for data description, data transformation and simple statistical analyses
- you communicate appropriately the results obtained
- you translate specific questions into relevant statistical quantities of interest

### Contents

Quantities of descriptive statistics and the fundamentals of statistical inference

- Uncertainty due to randomness
- 95% confidence intervals
- Calculating and transforming probability statements
- The interpretation of a p-value

### Methods

The course is based on the textbook «Essential medical statistics» (<https://www.blackwellpublishing.com/essential-medstats/>) and is a mixture of lectures and solving practical problems on concrete examples and data sets (in-class and at home). With this you will develop a solid understanding of the main concepts of statistical inference biomedical sciences. The course material will be made available on a password-protected course homepage (<http://basic-biostats.ispmbern.ch/>). In total 24 hours of off-class work and project and course tasks between August 23 and August 27.

### Exam

Written exam during the course

### Preparation and postprocessing

12 hours preparation, no postprocessing

In total 24 hours of off-class work and project and course tasks between August 23 and August 27

### ECTS Credits

3 ECTS credits

### Requirements

required are:

- «Introduction to Epidemiology and Study Designs» (B101.20)
- «Konzepte, Methoden und Anwendungen der deskriptiven und analytischen Epidemiologie» (B102.30)

### Organisation

Institut für Sozial- und Präventivmedizin der Universität Bern

### Coordination of course

Prof. Dr. Marcel Zwahlen, Institut für Sozial- und Präventivmedizin der Universität Bern

### Lecturers and tutors

Prof. Dr. Marcel Zwahlen, Institut für Sozial- und Präventivmedizin der Universität Bern

### Dates

21 - 22 August and 28 - 29 August 2017

### Location

Bern

### Fees

Fr. 2100.- (incl. material and software)

### Registration deadline

21 June 2017

### Additional information

- Participants are requested to bring along their notebook (Windows or Mac), if possible a calculator as well
- The period from 23 to 27 August will be needed for course work at home