

**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 transparently describe data that was collected for a given study. In addition you learn how to make inferences and draw 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 will receive a temporary Stata license for this)
- 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 module follows the concepts of the textbook «Essential medical statistics» (<https://www.blackwellpublishing.com/essentialmedstats/>) 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 teaching material will be made available on a password-protected module homepage (<http://basic-biostats.ispmbn.ch/>).

Between August 19 and August 22 you will need to work about 20 hours off-class on module tasks.

**Exam**

Written exam during the module

**Preparation and postprocessing**

12 hours preparation, no postprocessing  
 In total 20 hours of off-class work and module tasks between August 19 and August 22

**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 module**

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**

16 to 18 August and 23 and 24 August 2021

**Location**

Bern

**Fees**

CHF 2'100.- (incl. material and software)

**Registration deadline**

16 June 2021

**Additional information**

- The teaching language is English.
- Participants are requested to bring along their notebook (Windows or Mac) and a scientific calculator.
- The module will be taught in distance education mode if required by COVID-19 regulations.