B106.20.23

Basic Biostatistics

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.ispmbern.ch/). Between August 23 and August 28 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 23 and August 28
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
Module lead	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 to 23 August and 28 and 29 August 2023
Location	Bern
Fees	CHF 2'100.- (incl. materials)
Registration deadline	21 June 2023
Additional information	- Teaching languages are English and German. - Participants are requested to bring along their notebook (Windows or Mac) and a scientific calculator.