UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Medical Statistics

2122-2-I0201D139-I0201D217M

Aims

Basic knowledge of typical sampling schemes, methodological tools of descriptive statistics and inferential statistics to set up studies and to analyse data, with attention to the features of rehabilitation data.

At the end of the course the student will be able to:

1) read and discuss scientific literature with descriptive and inferential statistical analyses
2) have a solid knowledge to be involved in the the design and implementation of studies in rehabilitation

Contents

Basic definitions, typical sampling schemes, data representation through graphs and tables, measures of central tendency and dispersion, position measures and outlier, probability calculus, random variables, probability distributions Binomial and Gaussian, sampling probability distribution of mean and proportion, confidence interval on population mean and proportion, hypothesis testing on population mean/s and proportion/s.

Detailed program

Introduction to statistics: definitions of population, sample, variable, data, information – **chapter 1**

Sampling methods: random sampling, non probabilist sampling, stratified sampling, group sampling, multistate sampling, errors in sampling – **chapter 1**

Organization and sinthesis of data: representation by tables and plots, errors in tables and graphs – **chapter 2**

Summarizing data: central and dispersion measures (arithmetic mean, median, modal value, standard deviation) for atomic data and aggregation into classes, position measures and outlier (z-score, percentiles, quartiles) – **chapter 3**

Introduction to probability calculus: approaches to determination of probabilities, probability rules, conditional probability – **chapter 5**

Distribution probabilities: Binomial discrete, continuous Gaussian, standard Gaussian with properties and applications, Binomial with Gaussian approximation – **chapters 6 e 7**

Sampling distributions: of the sampling mean and proportion, with introduction to the concept of inference – **chapter 8**

Confidence interval on population mean and proportion: point estimate, construction of the confidence interval, calculation of the sample size for estimation of mena and proportion – **chapter 9**

Hypothesis testing on population/s mean/s and proportion/s: null hypothesis and alternative hypothesis, type one and type two errors, hypothesis testing underpinning, calculation of the test statistic and derivation of the p-value, statistical significance and practical significance – **chapter 10**

Prerequisites

Specified in the syllabus of the course.

Teaching form

Specified in the syllabus of the course.

Textbook and teaching resource

- Book: Fondamenti di statistica Micheal Sullivan III, traduzione a cura di Emma Zavarrone, Pearson 2020, diponibile anche come e-book https://www.pearson.it/opera/pearson/0-7264-fondamenti_di_statistica
- Slides

- Digital contents available on the moodle platform

Semester

Specified in the syllabus of the course.

Assessment method

Specified in the syllabus of the course.

Office hours

Specified in the syllabus of the course.