UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# SYLLABUS DEL CORSO

## Statistica Medica

**2526-1-E4104B007**

### Learning objectives

1. Knowledge and understanding: at the end of the course the student will have the conceptual tools to understand the peculiarities of the statistical method in the area of biomedical research.
2. Applying knowledge and understanding: at the end of the course the student will have the analytical tools to apply statistical methods in the area of biomedical research. Specifically, the student will be able to calculate and interpret a measure of disease frequency and its possible outcomes; to calculate and interpret a measure of association between an exposure and an outcome; to apply direct and indirect rate standardization procedures; to identify the most appropriate study design to answer a given research question; to critically interpret the results of a clinical or epidemiological study.
3. Making judgements: through practical exercises, the student will be able to interpret the main epidemiological measures covered during the course.
4. Communication skills: through practical exercises, the student will be able to communicate the main research results obtained.
5. Learning skills: through the reading of scientific articles, the student will be engaged in the study and in the critical interpretation of the main research results.

### Contents

1. The role of statistical sciences in the scientific research
2. The frequency of the disease and of its outcomes
3. Common techniques
4. The scientific research between experiment and observation
5. Randomized clinical trials
6. Observational studies

## Detailed program

The role of statistical sciences in the scientific research

- Natural history of the disease
- Clinical approach to disease
- Public health approach to disease
- Statistical approach to disease

The frequency of the disease and of its outcomes

- Incident and prevalent cases
- Fixed cohort and dynamic population
- Rates and proportions

Common techniques

- Direct and indirect standardization
- Analysis per cohorts
- Perinatal mortality

The scientific research between experiment and observation

- The concept of causality
- Experimental research
- Observational research

Randomized clinical trials

- The steps of the experimental research
- Within-subjects designs
- Between-subjects designs

Observational studies

- Correlation studies
- Cohort studies
- Case-control studies

## Prerequisites

No prerequisites needed

## Teaching methods

Frontal lectures and exercises.
No hours delivered remotely are foreseen.

## Assessment methods

The exam consists of a written exam (practical excercices) and of an optional oral exam.
There are no on-going tests.

## Textbooks and Reading Materials

The teaching material will be available on the e-learning platform (slides of the lectures and exercises).

## Semester

II semester, II period (approximatively from May to mid June)

## Teaching language

Italian

## Sustainable Development Goals

GOOD HEALTH AND WELL-BEING