UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Methods and Applications of Causal Inference in epidemiology

2425-2-129R-BIO.62

Aims

Introduction to the construction and interpretation of Directed Acyclic Graphs (DAGs) Causal Diagrams as tools for:

1. represent assumptions about the relationships between variables in observational and randomized studies
2. obtain from this representation a guide in pragmatic statistical analysis
3. thanks to this representation, avoid common errors and biases in statistical analysis

Contents

- Causality and Correlation between variables.
- Graphical representation of causality between variables.
- Simpson's paradox
- Causal path between variables and characteristics: open, closed, backdoor, D-separation.
- Characteristics of variables within a causal path: confounder, mediator, common cause, other.
- Impact of study design on the possible distortion of causal relationships: the observational case-control study and eligibility criteria in randomized studies.

The concepts introduced from a theoretical point of view will always be accompanied by an example on simulated data analyzed with the STATA software.

The student will be asked to reproduce/integrate some calculations to be discussed together using a software chosen from: R, SPSS, STATA, SAS.

Detailed program

Prerequisites

1. Basic elements of probability calculation
2. Construction of frequency tables and regression models with a statistical software chosen from: R, Stata, SAS, SPSS

Teaching form

Standard class

Textbook and teaching resource

Slides

Semester

3 April 11-13 - Kythos Building in Monza
7 April 11-13 - Kythos Building in Monza
10 April 11-13 - Kythos Building in Monza
14 April 11-13 - Kythos Building in Monza

Assessment method

Quiz

Office hours

Sustainable Development Goals