UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# SYLLABUS DEL CORSO

# Big Data in Public Health

**2122-2-F9101Q032-F9101Q032M**

## Aims

This course aims to provide the basic concepts of epidemiology that are at the basis of a proper methodological approach to a research project in public health. The student will be able to deal with big data in public health particularly focusing on several aspects including design, data managment and analysis. Student will be able to implement optimal design strategies on registries and administrative health data. Student will be able to calculate quality/performance indicators.

## Contents

Population epidemiology. Study designs. Survival analysis. Statistical methods with application to registries and administrative health data.

## Detailed program

Basics in population epidemiology. Study designs: advanced designs to combine data from different sources (registry data, biomarkers, biobanks, surveys). Survival analysis: survival estimate and Cox model regression. Record linkage approaches and statistical methods with application to registries and administrative health data. Examples of Quality/performance indicators, outcome research with administrative data, system of indicators to evaluate the appropriateness of clinical pathways in chronic diseases.

## Prerequisites

Descriptive and inferential statistics.

## Teaching form

Lectures with the use of active methodologies (such as microsimulations) will be interspersed with computer labs in supervised small groups activities. Critical reading of methodological public health papers.

## Textbook and teaching resource

Kenneth J. Rothman Sander Greenland, Timothy L. Lash . Modern Epidemiology. Lippincott Williams & Wilkins; 3 ed.

Eric Vittinghoff, David V. Glidden, Stephen C. Shiboski, Charles E. McCulloch. Regression Methods in Biostatistics Linear, Logistic, Survival, and Repeated Measures Models. Statistics for Biology and Health book series. Springer; 2 edition (March 6, 2012)

## Semester

second semester

## Assessment method

Final questionnaire with closed answer to evaluate the preparation on the overall program (50% of the overall grade).

Final project exercise on big data to test the ability of the student in the application of research methodology in public health to be done independently at home. The appropriatness of analyses and their presentation will be evaluated (50% of the overall grade).

For non-attending students only: practical exam on the application of the R functions seen in class to solve an exercise (passed/ not passed).

## Office hours

Tuesday 10-12 with appointment.