

Training workshop: Introduction to Biostatistical Analysis with R

CRIR's Biostatistics services is organizing its first training workshop. Lasting 3 days, this practical workshop will focus on an overview of the basic methods of statistical analysis using the statistical programming software R.

The practical workshop, at the beginner level, is intended primarily for students and postdoctoral fellows and research professionals. The training will be in French, the teaching materials in English and the questions and answers in both languages.

Why R ? R is a free, open-source statistical programming software that represents an alternative to commercial software such as SPSS and SAS. It covers a wide variety of statistical analysis techniques in disciplines as diverse as economics, social sciences, and biomedical research. R allows the manipulation and processing of very large heterogeneous data and also has excellent graphical representation capabilities that far exceed the graphical resources of commercial statistical analysis software. The R software has thus become an essential tool in data science. Built around a core group of statisticians and programmers, hundreds of volunteer contributors from around the world work to improve the statistical and graphical features of R, to create new ones, and to share them with the public through packages (collections of functions) stored in a public directory (<https://www.r-project.org>) and available for download and installation.

Workshop plan:

Day 1: Introduction to R

Day 2: Introduction to Biostatistical Analysis with R

Day 3: Case Study

Face-to-Face Workshop – Free for CRIR members

Date: September 7 to 9, 2022 | 9 a.m. to 4 p.m.

Registration required: before August 25, 2022

Capacity: Maximum 20 people

Location: **CIUSSS du Centre-Sud-de-l'Île-de-Montréal**
Centre de recherche, Institut universitaire de gériatrie de Montréal
(CRIUGM)
4565, Queen-Mary Road, Montreal, H3W 1W5 | Room : M6804 (6th floor)
Google Map [here](#) | Metro Stations : Côte-des-Neiges or Côte Ste-Catherine

Information : statistique.criugm.crir@gmail.com - administration.crir@ssss.gouv.qc.ca

Registration form: <https://forms.gle/7GREoGgh7unyRmPQ7>

PLAN

A Practical training at the beginner level and intended for those wishing to learn about the statistical programming environment R.

Biostatistical techniques and methods will be illustrated using examples and case studies. No experience with R is required for this training.



Trainer :
Ali Filali Ph.D
Senior Biostatistician

Program day 1: Introduction to R

- Installing **R** and **R Studio**
- Basic syntax and functions
- The use of loops and conditions
- The "Help" function in **R** and the documentation
- Installing **R Packages**
- The different types of objects and data format
- Importing, manipulating, and exporting datasets
- Mathematical and logical operators
- The creation of simple functions
- Graphical visualization with the **ggplot** package

Program day 2: Introduction to Biostatistical Analysis with R

- Data types
- Descriptive statistics
- Discrete and continuous distributions and probability distributions
- Principle of statistical analysis:
 - Statistical estimation
 - Hypothesis testing
 - Non-parametric methods
- Group comparison:
 - Continuous data
 - One-way ANOVA
 - Categorical data
- Relationship between two continuous variables:
 - Parametric and non-parametric correlations
 - Linear regression
- Relationships between several variables:
 - Two-way ANOVA
 - Multiple regression
 - Generalized linear model
 - Models for repeated measures
 - Mixed linear model
 - Logistic regression

Program Day 3: Case Studies

- Case studies illustrating all the techniques and methods taught during days 1 and 2.