Europubhealth+

EHESP

Université de Rennes

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# European Master in Public Health
# EUROPUBHEALTH+

## Year 2 - Specialisation:
## Advanced Biostatistics and Epidemiology

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# European Master in Public Health (Europubhealth+)
# Advanced Biostatistics and Epidemiology

The present document details the content of the second year specialisation of the **Europubhealth+** programme delivered in Rennes (France) by the EHESP School of Public Health. For the first year of the Europubhealth+ programme, a foundation course with the core competences in public health is delivered at the University College Dublin (Ireland) or the University of Sheffield (United Kingdom) in English, at the Andalusian School of Public Health - University of Granada (Spain) in Spanish, or at the University of Liège (Belgium) in French language.

## I. PRESENTATION

The specialization course lasts two semesters and students get 30 ECTS for taught modules and 27 ECTS for the dissertation work and related placement (a 4-month practical placement is mandatory during semester 2). A mandatory integration module worth 3 ECTS is organized by the EHESP School of Public Health in Rennes at the end of the academic year.

This specialisation is for students with an appetite for evidence-based public health, with the professional perspective to become autonomous in design, data collection, analysis and communication of epidemiological studies.
Successful students will enter the year with a good understanding of the basic concepts of epidemiology and biostatistics, and will have gathered a first working experience in epidemiology/biostatistics, either through previous professional activity or an M1 internship.
According to the module selection, the resulting professional profile will span from clinical research, over multidisciplinary quantitative research in collaboration with biomedical, social or political sciences, to biostatistical data science and epidemiological modelling of diseases and public health programs.
Successful graduates will join public health authorities, NGOs, pharmaceutical industry or research groups as epidemiologist or data scientist, and may continue in a PhD program in epidemiology, biostatistics or public health. During the M2 year, students often develop or pursue an interest in specific epidemiological domains, such as social epidemiology, infectious disease epidemiology, environmental epidemiology, or epidemiological modelling for surveillance or health services optimization.

## II. QUALIFICATIONS OF THE GRADUATE

The aim of the specialisation is to train young professionals to identify the health problems of a population, analyse the resources needed to preserve and improve population health, and progressively become a new generation of decision makers in health. To achieve this, the EHESP pedagogy stresses an inter-disciplinary approach, consisting in placing students in realistic problem contexts from which they utilize various professional skills and methodologies. The MPH encourages a degree of specialisation according to the students' career objectives.

All students in this specialization will develop a solid knowledge base in epidemiology and biostatistics. They will shape their individual profile by the choice of elective modules from applied epidemiology to advanced data analytic techniques.

At the end of the M2 year, students are able to:

- Understand and draw appropriate inferences from health and public health data from a large variety of sources (surveillance, reimbursement, cohorts, experiments and clinical research, …), nd evaluate the strengths and limitations of epidemiologic reports.
- Describe and analyse public health problems, determinants (risk and preventative factors) and health impact in terms of magnitude, person, time and place and calculate appropriate epidemiology measures.
- Apply concepts and methods from epidemiology, biostatistics and related quantitative methods to evaluate and to produce valid evidence for public health decision making.
- Design and conduct epidemiological studies, including data collection, analysis and reporting

- Identify and implement appropriate statistical methods for analysis of data from a variety of sources (surveillance, reimbursement, cohorts, experiments and clinical research, …)
- Comprehend basic ethical and legal principles pertaining to health data and health research.

## III. REQUIREMENTS FOR GRADUATION

To graduate, students must get an overall average of at least 10/20 to obtain all mandatory credits of the second year specialisation. Students must also pass all mandatory credits during the first year of the programme in the partner university (Dublin, Sheffield, Granada or Liège) as well as both joint integration modules organized at EHESP in Rennes.

## STUDY PLAN
## Advanced Biostatistics and Epidemiology

| Name of the subject | Class form | M/E/ F* | Credit form | Teaching hours | ECTS |
|---|---|---|---|---|---|
| **Mandatory Modules** | | | | | **9** |
| Advanced module Epidemiology (203) https://mph.ehesp.fr/wp-content/uploads/2022/09/Syllabus_Module_203Epi_2022-2023.pdf | Lecture & lab Homework | M | Mark | 30 | 3 |
| Advanced module Biostatistics (204) https://mph.ehesp.fr/wp-content/uploads/2020/09/Syllabus_Core_ISB_204-2020.pdf | Lecture & lab Project based learning | M | Mark | 30 | 3 |
| Concepts, Methods and design in Epidemiology (223) | Lecture & lab Reading | M | Mark | 30 | 3 |
| **Elective A** **1 elective Advanced module** to be chosen among: | | | | | **3** |
| Fundamentals in environmental health and climate change (206) | Lectures Tutorials Group Work | E | Mark | 30 | 3 |
| Advanced module – Prevention and Health Promotion (202) | Lectures Group Work | E | Mark | 30 | 3 |
| Advanced module – Health Policy and Management (205) | Lectures Group Work & Discussions | E | Mark | 30 | 3 |
| **Elective B** **5 elective modules** to be chosen among: | | | | | **15** |
| Introduction to R: computing, graphics for statistics & Epidemiology (215) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus_module-215-2023-2024.pdf | Lecture & lab Exercise | E | Mark | 30 | 3 |
| Analysis in Epidemiology (I) (224) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus-modules-224-225_2023-24.pdf | Lecture & lab Homework | E | Mark | 30 | 3 |
| Analysis in Epidemiology (II) (225) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus-modules-224-225_2023-24.pdf | Lecture & lab Homework | E | Mark | 30 | 3 |

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|---|---|---|---|---|---|
| Multidimensional & multivariate statistical methods (214) https://mph.ehesp.fr/wp-content/uploads/2023/12/syllabus_214_2023_2024.pdf | Lecture Discussion Computer lab Conference | E | Mark | 30 | 3 |
| Multi-level Analysis (230) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus_Module_230_23-24.pdf | Lecture & lab Homework | E | Mark | 30 | 3 |
| Modeling of infectious diseases (229) https://mph.ehesp.fr/wp-content/uploads/2024/04/Syllabus_module-229_23-24.pdf | | E | Mark | 30 | 3 |
| Spatial statistical analysis (231) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus_Module-231_23-24.pdf | | E | Mark | 30 | 3 |
| **Elective C – Applied Epidemiology**<br>**1 elective module** to be chosen among: | | | | | **3** |
| Infectious Disease Epidemiology (210) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus-module-210-2023-24.pdf | Lecture Discussion Exercise | E | Mark | 30 | 3 |
| Chronic Disease Epidemiology (211) https://mph.ehesp.fr/wp-content/uploads/2023/12/Syllabus-Chronic-disease-epidemiology-23-24.pdf | Lecture Discussion Exercise | E | Mark | 30 | 3 |
| Perinatal & Pediatric Epidemiology (238) https://mph.ehesp.fr/wp-content/uploads/2023/01/Syllabus_module238_janvier-2023.pdf | Lecture Project | E | Mark | 30 | 3 |
| **SUPRA OPTIONAL modules:**<br>Can be chosen among | | **F** | Pass/Fail | | **Not credited** |
| Electives B and C | | | | | |
| GIS & Environmental Health (233) https://mph.ehesp.fr/wp-content/uploads/2023/12/syllabus-module-233-23-24.pdf | Lectures Lab Group Work | F | | | |
| Advanced quantitative methods in Population Mental Health | Lectures Group Work | F | | | |
| Biostatistics upgrade | Lectures Lab | F | | | |
| **Dissertation and placement** (4 to 6 months) | - | M | Mark | - | **27** |
| **Integration Module 2:** Building Innovative and sustainable solutions to global health challenges | Seminar – Group work | M | Mark | | **3** |

**M = Mandatory /E = Elective /F = Facultative**

➔ For full description of each module and overall planning, please go to: https://mph.ehesp.fr/year-2/