Digital Public Health Graduate Program

université de BORDEAUX

Opening in September 2018

MSc Public Health Data Science

A year of international research in public health data science, from project design to real life health data analysis and communication of results. With multidisciplinary skills in epidemiology, informatics and statistics, the MSc will provide you with sound knowledge about strengths and limitations of digital technologies and their use in public health research.

Master of Science

Multidiciplinary objectives

› Epidemiology

Translating a public health/clinical problem into a research question, designing the research plan for surveillance systems, observational and experimental studies (i.e. clinical trials), evaluating the validity and the causality of an association.

› Informatics

Architectures of data integration (i2b2, Transmart), interoperability, knowledge representation (terminologies, ontologies), natural language processing, data visualization, programming, cloud computing and Hadoop, linked open data, security, confidentiality and integrity of data.

› Statistics

Methods for supervised and unsupervised statistical analysis and modelling of biomedical data (including high-dimensional and time-to-event data), statistical learning, data mining, data integration, advanced computational statistics.

Student Profile

Background (e.g. master level) in at least one of these disciplines

Reasons to apply ?

- **Original "data-centred" curriculum**
- **Interdisciplinary teams working on real case studies**
- **Practicum hosted by a research team or industrial partners**
- **Flipped classrooms teaching to develop skills transfer**

Courses location ISPED, Bordeaux France **– Nb students** 20 **– Duration** 1 year

University of Bordeaux

université de BORDEAUX — INITIATIVE D'EXCELLENCE — INVESTISSEMENTS D'AVENIR — BORDEAUX POPULATION HEALTH Research Center - U1219 — ISPED Bordeaux School of public health, Institut de Santé Publique d'Epidémiologie et de Développement

Digital Public Health Graduate Program

université de BORDEAUX

MSc Public Health Data Science

Master of Science

Future Career

Our Digital Public Health graduates will have a global vision of data science issues in relation to epidemiology and public health, as well as the research and leadership skills that will enable them to access chief data officer jobs and be the future leaders of the digital public health domain in public and private sectors.

At the same time, our courses will provide a strong foundation for students interested in obtaining a PhD in Digital Public Health.

Tuition Fees

Mandatory university registration fees (400€)
International program training fees (4500€)

In 2018-2019, scholarships will be granted to all selected applicants in order to fully cover their training fees. Applications for these scholarships shall be submitted during the application for the master program.

The DPH Graduate program

The Digital Public Health Graduate Program, directed by Pr. Rodolphe Thiébaut, was developped by the Bordeaux Population Health research center (BPH) and the Bordeaux School of Public Health (ISPED) and is funded by the third French Program on Investments for the Future (PIA3).

The Digital Public Health Graduate Program includes also the creation of:
- a Doctoral Program (PhD) open to students from all disciplines
- a novel University Diploma (DU) program on connected devices and e-Health

Contact us dph@u-bordeaux.fr **Info** facebook.comDPHgraduateprogram

université de BORDEAUX · Initiative d'Excellence · Investissements d'Avenir · Bordeaux Population Health Research Center - U1219 · ISPED Bordeaux school of public health

Digital Public Health Graduate Program

université de BORDEAUX

Training program

MSc Public Health Data Science

› Basics 6ECTS

To give to students the basics knowledge and working capabilities of the tools essential for health data analytics.

Core principle of Biostatistics (likelihood, testing) - Experiment design and modeling - Database design and management - Parallel programming & reproducible science - Basic of digital health communication - Data visualisation & result diffusion - Data Legislation - Scientific literature review - Core principles of epidemiology - Object-oriented programming

› Digital Cohorts 6ECTS

To give to students the abilities needed to conceptualize, manage, analyze and communicate through cohort studies that integrate digital tools.

Case study : Survival analyses of cohort studies including genetic and imagery data

Fondamentals of digital cohort studies - Digital tools for epidemiology - Communication strategies in eHealth and mHealth – Causality - Missing data - Sampling - Survival analysis - Project (personal/team pratical project)

› Electronic care and reimbursement data 6ECTS

To give to students the abilities needed to conceptualize, manage, analyze and communicate through health research performed from Electronic Health Records (E-HR) and medico-administrative databases (MA-DBs).

Presentation of existing datasources (MADBs, and EHRs: constitution principles, differences) - Juridic environment - How to deal with missing information: advanced study designs and advanced statistical methods (propensity ±HD, DRS) - From research question to research protocol and from research protocol to research dataset - Electronic Health Records - Project (presentations, follow-up and round table) - ETL/data integration - Secondary use of electronic health data - Clinical technologies

› Web-based Data 6ECTS

To give to students the abilities to perform Public Health studies which integrate data from social networks and web forums, linked open data and mobile data. To practice through a dedicated use cases on processing a large mobile data set (call details records).

Case study : Analysing large call data records together with Linked Open Data to tackle a public health issue

Web based data for pharmacoepidemiology and surveillance - Natural Language Processing - Text mining, Semantic indexing and retrieval - Linked Open Data - Visual analytics

› Omics Data 6ECTS

To give to students the abilities needed to conceptualize, manage, analyze and communicate through clinical studies that integrate high dimensional data.

Case study : Transcriptomics data in an HIV vaccine clinical trial

Principles of clinical trials - Principle of Genome-wide association studies - Data-management and dataware house systems (e.g. Labkey server) - High dimensional data analysis - Descriptive analysis tools for high dimensional data (PCA, PLS) - Mixed models - Predictive analysis (strategy and indicators) - Gene and geneset annotations - Project (presentations, follow-up and round table)

› Value Creation 6ECTS

To prepare students to be immediate contributors in the workplace upon graduation in academia or industry (chief project managers). To make students aware of their entrepreneurial capacity and comprehension.

Ouputs : Know the basics on how to manage a project and transfer research into other scientific environments as well as into the market

Principles of value creation in academia and industry - Creating value in industry - Creating value in academia - Communicating "value" effectively in English.

› Internship 24ECTS

Intership hosted by a research team

Students will choose whether to carry out their project in the team which generated the case study of their project in a new team from the extensive research network of the Graduate Program