MASTER OF SCIENCE
EPIDEMIOLOGY

PROGRAM HANDBOOK

Content

The MSc Epidemiology at a glance

Target group	Inspired midcareer professionals from the health and natural sciences, social sciences, IT or mathematical fields who want to focus their methodological knowledge in the fields of epidemiology, biostatistics, medical informatics and health data science in order to make a difference in population health.
Student body	30 students with qualified professional experience are accepted each year.
Schedule	The program starts annually in mid-October. There are full-time and part-time formats. Full-time students complete the program in 2 semesters (12 months). Part-time students can complete the program over the course of 4 semesters (2 years) or more.
Program structure	The program has a methods and research focus. Ten modules (courses) must be completed: five core methods modules, three advanced elective modules, a research project and a written master's thesis including an oral defense. A total of 60 credit points must be earned (ECTS in accordance with the European Credit Transfer System).
Language of instruction	English
Course location	Classes are taught on site at Charité Campus Mitte (CCM) and Charité Campus Virchow Klinikum (CVK) in Berlin, Germany.
Tuition	€ 10,200 (payable in installments per semester) plus student enrollment fees (about €300 per semester).
Degree	MSc - Master of Science, awarded by Charité - Universitätsmedizin Berlin
Application deadline	The application deadline for **early admission** is May 15th. Applications received after May 15th are processed in the order in which they are received (rolling admissions) and are accepted until September 30th of each year.

CHARITÉ

IPH | Institute of Public Health

PROGRAMM AKKREDITIERT
Akkreditierungsrat

The Berlin School of Public Health

The Berlin School of Public Health (BSPH) is a collaborative initiative of three universities in Berlin:

- Alice Salomon Hochschule (ASH)
- Charité – Universitätsmedizin Berlin, Institute of Public Health (IPH)
- Technische Universität Berlin (TU Berlin), Department of Health Care Management (MiG)

Each of the partner institutions contributes its experience and expertise in the field of public health to the school's success. The board of directors, Prof. Dr. Raimund Geene (ASH), Prof. Dr. Dr. Tobias Kurth (IPH) and Prof. Dr. Reinhard Busse (MiG), along with dedicated faculty and staff, ensure academic excellence and innovation in research.

The BSPH offers a joint, state-funded Master of Science in Public Health (MScPH) degree program that provides further education to graduates from a wide array of bachelor programs, in particular, the feeder programs in Health Sciences, Management, Social Work and Physiotherapy/Occupational Therapy offered by the three collaborating partners. The BSPH hosts post-graduate (tuition-based) masters programs in Epidemiology, directed by the Institute of Public Health and Applied Epidemiology, directed by the Robert Koch Institute. Doctoral degrees in the field of public health can be earned through the collaborating partners. The TU Berlin awards the Dr. PH and the Charité awards the Dr. rer. medic. and PhD titles.

The BSPH strives to create opportunities for interconnectedness and exchange between public health practitioners at the local, regional, and global level. Innovative research in the field of public health is needed to assess the impact of and find solutions for current challenges such as climate change, emerging infectious diseases and achieving universal health coverage. Public health research must develop new models for sustainable health system funding and create healthy living environments in an increasingly ageing, urbanized world. Additionally, digitalization in healthcare provides new sources of health data and demands the development of new methods of analysis. The BSPH partner institutions have a wide array of research projects tackling these challenges.

The Institute of Public Health

The Institute of Public Health (IPH) at the Charité – Universitätsmedizin Berlin is committed to improving population health through excellence in research and higher education. Its research focuses on renal, neurological and cardiovascular epidemiology, health outcome research, meta-research, and causal inference. The IPH directs the Master of Science in Epidemiology and co-directs the PhD program in Health Data Sciences as well as the Berlin Epidemiological Methods Colloquium. IPH faculty and researchers provide innovative perspectives to modern epidemiology and population health.

The MSc Epidemiology

The Master of Science in Epidemiology is a post-graduate master's program that offers students an advanced interdisciplinary education to focus their methodological knowledge and expand their competencies in epidemiologic research. The program is designed for inspired mid-career professionals from the medical and natural sciences, social sciences, IT or mathematical fields, who want to make a difference in clinical and population health. The program has a strong research and methodological focus. The flexible structure allows students to either study full-time or to study part-time while continuing to work part-time. The extensive collaborations with public health and health policy institutions ensure that coursework reflects current developments in research and scientific professional practice. Graduates are qualified to pursue careers as research scientists in clinical trials, outbreak investigation, infection control or disease monitoring in academia or with government agencies.

Program Overview

The MSc Epidemiology consists of five core methods modules, three advanced elective modules, a research project and a master's thesis. The program offers a variety of elective courses that students can choose from to fulfill the requirements in the advanced elective modules. The master's thesis is an independent scientific research project.

Full-time students complete the program in one year (12 months) and part-time students complete the program in two years (four semesters). The program's flexible structure makes it possible for students to create individual course plans should they need more time to complete the program.

Classes are taught by experienced faculty from the Charité and partnering institutions such as the Robert Koch Institute, the Max Delbrück Center, the Berlin Institute of Health, Bayer AG and the Hasso Plattner Institute.

All courses have a seminar character. In addition to imparting knowledge, courses are designed to promote interaction and exchange between students so that the knowledge each student brings from their original discipline or work experience is built upon and shared throughout the program.

Overview of courses and lead faculty:

	Module Title	Lead Instructor	Credits (ECTS)
Module 1	Public Health Research • Part 1: Research Methods – Seminar • Part 2: Statistical analysis with "R"	PD Dr. Yanina Lenz Dr. Stefan Konigorski	5
Module 2	Epidemiology I	PD Dr. Linus Grabenhenrich	5
Module 3	Biostatistics I • Lecture • Tutorial	Annette Aigner, PhD	5
Module 4	Epidemiology II	Prof. Dr. Dr. Tobias Kurth	5
Module 5	Biostatistics II	Dr. Stefan Konigorski	5
Module 6/7/8	*Choose six Advanced Elective Courses or Intensive Short Courses for a total of 15 credits*		
	Introduction to Medical Informatics	Prof. Dr. Fabian Prasser	2,5
	Applied Medical Informatics	Prof. Dr. Felix Balzer	2,5
	Biometrics in Pharmaceutical Industry	Dr. Christian Seitz	2,5
	Molecular Epidemiology	Prof. Dr. Tobias Pischon	2,5
	Cancer and Nutritional Epidemiology	Prof. Dr. Tobias Pischon	2,5
	Infectious Disease Epidemiology	Prof. Dr. Klaus Stark	2,5
	Health Monitoring	PD Dr. Hannelore Neuhauser	2,5
	Social Epidemiology	PD Dr. Thomas Lampert	2,5
	Evidence-Based Medicine	Dr. Monika Nothacker	2,5
	Intensive Short Course	See current listing	2,5
Module 9	Research Project	Prof. Dr. Ute Latza	5
Module 10	Master's Thesis	Prof. Dr. Ute Latza	15
		Total	60

Full-time students

Full-time students have a very compact schedule and complete the program's 60 credits in two semesters (12 months). The program starts in the winter semester, which runs from October 1 to March 31. There are 18 weeks of classes that start in mid-October and end in March. Courses meet on Mondays, Tuesdays, Thursdays and Fridays between 14:30 and 19:00 hours. In addition, students identify and prepare the research project they will be working on in their master's thesis during this first semester.

The second semester (summer semester) runs from April 1 to September 30 and there are 12 weeks of classes starting in mid-April and ending in July that must be completed. Additionally, Intensive Short Courses are offered as one-week intensives in August and September. Full-time students complete their research and write their master's thesis in the second semester parallel to completing coursework.

Full-time students must budget an average of 40 hours per week to participate in the classes and complete all preparation and follow-up work (Student Investment Time, SIT).

Schedule full time: 40h/week SIT

	Mondays 14:30-19:30	Tuesdays 14:30-19:30	Thursdays 14:30-19:30	Fridays 14:30-19:30
Winter Semester October 1 - March 31 18 weeks of classes	Module 1 / 2 / 3		Research Project – self-study	
			Elective 3 / 4	Elective 5 / 6
Summer Semester April 1 - September 30 12 weeks of classes	Master's Thesis - self study			
	Module 5	Elective 1 / 2	Substitute an Intensive Short Course for an elective	
	Module 4 - online			

Part-time students

Part-time students complete the program's 60 credits over the course of four semesters, with each semester averaging 15 credits. The program starts in the winter semester, which runs from October 1 to March 31. There are 18 weeks of classes that start in mid-October and end in March. The summer semesters run from April 1 to September 30 with only 12 weeks of classes starting in mid-April and ending in July. Additionally, Intensive Short Courses are offered each year as one-week intensives in August and September.

Part-time students complete three of the five core methods modules in their first semester (winter). Classes meet on Mondays and Tuesdays between 14:30 and 19:00 for 18 weeks.

In the second semester (summer), part-time students complete the remaining two core methods modules as well as taking two advanced elective courses. Classes meet on Mondays and Tuesdays between 14:30 and 19:00 for 12 weeks. Module 4 – Epidemiology II is taught in an online asynchronous format, allowing participants to schedule their study time independently. Students can substitute an Intensive Short Course for any elective during the summer semester.

In the third semester (winter) classes meet on Thursdays and Fridays between 14:30 and 19:00 for 18 weeks. Students take four advanced elective courses and identify and prepare the research project they will be working on in their master's thesis in this semester.

The fourth semester is for working on the master's thesis and aside from the peer group presentation and the oral defense, there is no further coursework requiring attendance during this final semester.

Part-time students must budget an average of 20 hours per week to participate in the classes and complete the preparation and follow-up work in the program (Student Investment Time, SIT). Depending on their individual needs, students can choose to extend the program by changing the suggested course sequence to meet the demands their personal work or life may require.

Schedule part time: 20h/week SIT

	Mondays 14:30-19:30	Tuesdays 14:30-19:30	Thursdays 14:30-19:30	Fridays 14:30-19:30
Winter Semester October 1 – March 31 18 weeks of classes	Module 1 / 2 / 3			
Summer Semester April 1 – September 30 12 weeks of classes	Module 5	Elective 1 / 2	Module 4 – online / Substitute an Intensive Short Course for an elective	
Winter Semester October 1 – March 31 18 weeks of classes	Research Project – self-study		Elective 3 / 4	Elective 5 / 6
Summer Semester April 1 – September 30 12 weeks of classes	Master's Thesis – self study			

Coursework

Modules 1 through 5: Core Methods Modules

The aim of the five core methods modules is to ensure that all students have a comprehensive set of theoretical and applied skills in epidemiologic research methods. The core modules have 5 credits each for a total of 25 credits. Both full-time and part-time students should complete these modules in the first and second semesters of the program. The assessment in the modules varies and is either an on-site exam or take-home assignment.

Overview of Core Methods Modules:

	Module Title	Contact hours (45 minutes)	Credits (ECTS)
Winter	Module 1 Public Health Research • Part 1: Research Methods – Seminar • Part 2: Statistical analysis with "R"	12 sessions à 2,5 hours 6 sessions à 5 hours	2,5 2,5
Winter	Module 2 Epidemiology I • Lectures • Workshops	12 sessions à 2,5 hours 6 sessons à 5 hours	5
Winter	Module 3 Biostatistics I • Lecture • Tutorial	12 sessions à 2,5 hours 12 sessions à 2,5 hours	5
Summer	Module 4 Epidemiology II	Online, asynchronous	5
Summer	Module 5 Biostatistics II	12 sessions à 5 hours	5
		Total	**25 ECTS**

Description of Core Methods Modules

Module 1: Public Health Research

This course provides students with the tools to conduct research in epidemiology.

Part 1: Research Methods – Seminar

The seminar in Part 1 of this course focuses on how to develop meaningful and clear research questions, what to watch out for when planning a research project, data sources and primary data collection as well as publishing and communicating results from epidemiologic research.

<u>Topics Part 1</u>: Research methods in the social sciences and public health; phases of the research process; development of research questions; conceptualization and operationalization; survey instruments and study design; sampling and field work; ethics and data protection; quantitative, qualitative and mixed methods study design.

<u>Lead Instructor:</u>   PD Dr. Yanina Lenz, Bayer AG

<u>Assessment:</u>   Research Proposal

<u>General Information:</u> Mondays from 17:00 to 19:00, Week 1–12
2,5 ECTS, 30 contact hours and 45 self-study hours
Winter Semester

Part 2: Research Methods – Statistical analysis with "R"

Sessions in Part 2 of this course introduce students to the statistical software "R" and its applications in managing and analyzing data.

<u>Topics Part 2</u>: Statistical analyses of biomedical and epidemiological datasets using the software R and graphical interface RStudio, data manipulation, documentation and report writing using R Markdown, Creating tables and plots to visualize data and results.

<u>Lead Instructor:</u>   Dr. Stefan Konigorski, Hasso Plattner Institute (HPI)

<u>Assessment:</u>   Take-home exam

<u>General Information:</u> Mondays from 14:30 to 19:00, Week 13-18
2,5 ECTS, 30 contact hours and 45 self-study hours
Winter Semester

Module 2: Epidemiology I

This course introduces students to epidemiologic concepts and methods.

Topics: Principles of epidemiological research and epidemiologic thinking (descriptive, analytical, experimental); populations and sampling, units of observation, variables, measures of frequency, comparing and standardization; demography, burden of disease, health reporting, surveillance; Interventional studies, randomization, blinding, clustering; Observational study design, ecologic, cross-sectional, cohort designs, case-control approaches; causal inference, counterfactuals, selection and information bias, internal validity, sources of error and strategies for controlling confounding, intermediates, DAGs, measures of effect, stratification; Diagnostics and screening, prediction models; Evidence-based medicine/public Health, external validity, reporting standards, Good Epidemiologic Practice (GEP).

Lead Instructor: PD. Dr. Linus Grabenhenrich, Robert Koch Institute (RKI)

Assessment: Exam

General Information: Lectures: Tuesdays from 14:30 to 16:30, Week 1-12
                         Workshops: Tuesdays from 14:30 - 19:00 , Week 13-18
                         5 ECTS, 60 contact hours and 90 self-study hours
                         Winter Semester

Module 3: Biostatistics I

This course introduces students to biostatistical concepts and statistical methods in epidemiological and clinical research.

Topics: This module will enable students to present data descriptively in an appropriate way, understand the basics of statistical tests and interpret their results, select appropriate statistical methods for data analysis, calculate and interpret confidence intervals, apply analysis methods such as regression models and survival time models and interpret their results.

Lead Instructor: Annette Aigner, PhD, Institute of Biometry and Clinical Epidemiology (iBikE), Charité – Universitätsmedizin Berlin

Assessment: Exam

General Information: Lectures: Mondays from 14:30 to 16:30, Week 1-12
                         Tutorials: Tuesdays from 14:30 to 16:30, Week 1-12
                         5 ECTS, 60 contact hours and 90 self-study hours
                         Winter Semester

Module 4 : Epidemiology II

This course builds on the knowledge gained in Epidemiology I and provides students with a thorough understanding of epidemiological research with an emphasis on causality, causal inference, sources of bias, and methods to improve the validity of epidemiologic studies.

Topics: In-depth treatment of epidemiological study types (cohort studies, case-control studies, intervention studies); error control methods (matching, misclassification, selection bias, confounding and effect measure modification); theoretical considerations and interpretations of findings; techniques of implementation and quality assurance.

Lead Instructor: Prof. Dr. Dr. Tobias Kurth, Institute of Public Health (IPH), Charité-Universitätsmedizin Berlin

Assessment: Exam

General Information: 15 lectures and assignments, asynchronous online
5 ECTS, 150 self-study hours
Summer Semester

Module 5: Biostatistics II

This course builds on the knowledge gained in Biostatistics I and provides students with in-depth theoretical and practical knowledge of biostatistics. Students will be able to critically analyze epidemiological studies and their reports.

Topics: Statistical aspects of study design and study planning: power and sample size calculation; Statistical methods for handling missing values; Generalized linear models: practical aspects of linear models, regression models for count and ordinal data, analysis of variance; Linear mixed models for the analysis of clustered data and longitudinal data; Meta-analysis; Statistical methods for causal inference; Statistical methods for the analysis of large data sets (e.g. cluster analysis, factor analysis); Advanced data analysis with R.

Lead Instructor: Dr. Stefan Konigorski, Hasso Plattner Institute (HPI)

Assessment: Take-home exam

General Information: Mondays from 14:30 to 19:00, Week 1-12
5 ECTS, 60 contact hours and 90 self-study hours
Summer Semester

Modules 6, 7 and 8: Advanced Elective Courses

The advanced elective courses provide room for students to pursue individual interests in 15 credits worth of courses. The intent of the electives is to impart specialized methodological skills in various fields of epidemiology. Students select six courses á 2,5 ECTS each for a total of 15 ECTS to fulfill the requirements in Modules 6, 7 and 8. Please note that not all courses listed below are offered every year.

Intensive Short Courses

The IPH offers a variety of Intensive Short Courses (ISCs) each year that can be substituted for any advanced elective course regularly provided in the MSc Epidemiology program. Intensive Short Courses are open to the general research community and participants include PhD candidates as well as researchers from the Charité and other institutions. The course format is usually one week full time with classes meeting Monday to Friday from 9:00 to 17:00. ISCs are taught by renowned guest faculty and provide an excellent opportunity for networking!

Overview of Advanced Elective Courses:

	Course Title	Contact hours (45 minutes)	Credits (ECTS)
Summer	Introduction to Medical Informatics	12 sessions à 2,5 hours	2,5
Summer	Applied Medical Informatics	12 sessions à 2,5 hours	2,5
Summer	Biometrics in Pharmaceutical Industry	12 sessions à 2,5 hours	2,5
Winter	Molecular Epidemiology	6 sessions à 5 hours	2,5
Winter	Cancer and Nutritional Epidemiology	6 sessions à 5 hours	2,5
Winter	Infectious Disease Epidemiology	6 sessions à 5 hours	2,5
Winter	Health Monitoring	6 sessions à 5 hours	2,5
Winter	Social Epidemiology	6 sessions à 5 hours	2,5
Winter	Evidence-Based Medicine	6 sessions à 5 hours	2,5
	Examples of Intensive Short Courses		
Summer	Rethinking Epidemiologic Concepts with Matthew Fox, Boston University	1 Week	2,5
Summer	Mastering "R" for Epidemiologic Research with Malcolm Barret, University of Southern California	Monday to Friday from 9:00 to 17:00	2,5
Summer	Causal Research and Prediction Modeling with Rolf Groenwold and Maarten van Smeden, Leiden University		2,5
	Select electives to total		**15 ECTS**

Description of Advanced Elective Courses

Introduction to Medical Informatics

This course introduces students to information systems and standards in health care, as well as the context of medical research. The students will learn to work with basic types of biomedical data and to understand the most relevant data processing methods. The course content covers further topics of high practical relevance, such as information security and data protection, software development methods for the life sciences, and open science approaches in medicine. Graduates of this course should be able to assess opportunities and risks presented by data-driven approaches in healthcare and medical research.

Topics: Health information systems; communication standards; terminologies & ontologies; essentials of technical and practical computer science; medical data modelling, integration and analytics; medical information security and data protection; research information systems; medical imaging and pattern recognition; clinical decision support; connected health; (research) software engineering; introduction to bioinformatics.

Lead Instructor: Prof. Dr. Fabian Prasser, Berlin Institute of Health (BIH)

Assessment: Take-home exam

General Information: Tuesdays from 17:00 to 19:00, Week 1-12
                    2,5 ECTS, 30 contact hours and 45 self-study hours
                    Summer Semester

Applied Medical Informatics

This course enables graduates to assess and apply digital health solutions. Practical applications of digital health and human-computer interfaces in healthcare are particular emphasized. Students will learn to assess interoperability standards between medical devices and electronic health records, to use self-generated health data for medical diagnostics or treatment (connected health), and to estimate the usefulness of digital technologies such as robotic surgery, augmented reality, or telemedicine for routine clinical practice.

Topics:
Introduction to clinical data science; communication standards in practice; terminologies & ontologies in practice; usability and regulations of medical devices; patient data modalities in the electronic health record; data anonymization hands-on; innovative forms of care; telemedicine; wearables hands-on; digital surgery.

Lead Instructor: Prof. Dr. Felix Balzer, Berlin Institute of Health (BIH)

Assessment: Take-home exam

General Information: Tuesdays from 17:00 to 19:00, Week 1-12
                    2,5 ECTS, 30 contact hours and 45 self-study hours
                    Summer Semester

Biometrics in Pharmaceutical Industry

A variety of biometric and epidemiological methods are used in drug research and development. This course presents applications, fields of work as well as statistical methods from different phases of drug research and development from the perspective of industry practitioners.

Topics: Introduction to drug research and development; preclinical studies & non-clinical statistics; clinical studies before and after drug approval (e.g. first in man studies, efficacy studies, safety studies); selected statistical problem areas, e.g. non-inferiority studies, survival time analysis for recurrent events, multiplicity and repeated measurements or handling missing data; pharmaco-epidemiology and pharmacovigilance.

Lead Instructor: Dr. Christian Seitz and PD Dr. Christoph Gerlinger, Bayer AG

Assessment: Take-home exam

General Information: Tuesdays from 17:00 to 19:00, Week 1-12
                            2,5 ECTS, 30 contact hours and 45 self-study hours
                            Summer Semester

Molecular Epidemiology

The aim of the course is to provide an overview of the field of molecular epidemiology. The conceptual framework for molecular epidemiology, the use of biomarkers as well as study designs specific to the field of molecular epidemiology are presented. Fundamentals for the use of genetics and modern high-throughput methods (such as metabolomics, transcriptomics and proteomics) are introduced. Ethical aspects within the framework of molecular epidemiological studies and the predictability and risk assessment of health-related events are discussed.

Topics: Definition and delimitation of molecular epidemiology; use and concepts of biomarkers in molecular epidemiology; precision, accuracy, validity and reliability in molecular epidemiology; special features of study design (embedded case-control studies, case cohort studies); causal inference molecular epidemiology (Mendelian Randomization); overview of high-throughput methods and their uses, high-throughput techniques (metabolomics, transcriptomics and proteomics); overview of the use of genetics in molecular epidemiology (metabolomics, transcriptomics and proteomics); biobanks and ethics; prediction of events in molecular epidemiology (disease prediction).

Lead Instructor: Prof. Dr. Tobias Pischon, MPH, Max Delbrück Center for Molecular
                            Medicine (MDC)

Assessment: Take-home exam

General Information: Fridays from 14:30 to 19:00, Week 1-6
                            2,5 ECTS, 30 contact hours and 45 self-study hours
                            Winter Semester

Cancer and Nutritional Epidemiology

Chronic diseases such as cardiovascular disease (CVD) and cancer are the leading causes of death in the industrialized world. As low and middle-income countries adopt lifestyles that go hand in hand with increasing urbanization and economic progress, cancer and heart disease incidence and mortality are also on the rise here. Eating and drinking habits play a crucial role in the development, occurrence and disease progression of chronic illnesses. The aim of the module is to give insight into applied cancer and nutritional epidemiology. Concepts of descriptive cancer epidemiology are discussed and data sources for incidence, mortality and trends over time are analyzed. Cancer epidemiology has set itself the task of identifying risk factors (primary prevention) and researching options for population-wide early detection through screening (secondary prevention). Nutritional epidemiology explores the interactions between eating habits and disease development.

Topics: Concepts and methods in cancer epidemiology; epidemiology and risk factors of selected chronic diseases; models of cancer development and their importance for prevention; nutritional survey methods; biomarkers as an indicator of nutrient intake; evidence criteria for nutrition and cancer; tumor-promoting nutritional factors, nutritional factors for the risk of cardiovascular diseases.

Lead Instructor: Prof. Dr. Tobias Pischon, Dr. Katharina Nimptsch, Max Delbrück Center for Molecular Medicine (MDC)

Assessment: Take-home exam

General Information: Fridays from 14:30 to 19:00, Week 7-12
2,5 ECTS, 30 contact hours and 45 self-study hours
Winter Semester

Infectious Disease Epidemiology

Infectious disease epidemiology deals with the cause, distribution, risk factors and control of communicable diseases. Both specialized and general epidemiological models and methods are presented. The studies covered in this course generally have a strong real life application and form the basis for targeted public health interventions.

Topics: General principles and methods in infectious disease epidemiology; surveillance of infectious diseases; investigation of infection outbreaks; statistics in infectious disease epidemiology, modelling in infection epidemiology; epidemiological and public health aspects of coronavirous and influenza; epidemiology of HIV and AIDS, epidemiology of sexually transmitted infections other than HIV; epidemiology of Hepatitis B and C, Tuberculosis: epidemiology and control; epidemiology of immunization prevention, epidemiology of antibiotic-resistant pathogens.

Lead Instructor: Prof. Dr. Klaus Stark, Robert Koch Institute (RKI)

Assessment: Presentation

General Information: Thursdays from 14:30 to 19:00, Week 7-12
2,5 ECTS, 30 contact hours and 45 self-study hours
Winter Semester

Health Monitoring – NCDs, mental health and their social and behavioral determinants

Regular, reliable data on the health status of a population is invaluable for public health interventions and health policy decisions. The Robert Koch Institute (RKI) is Germany's National Public Health Institute and plays a key role in generating reliable population based data. The RKI is responsible for Germany's health monitoring and caries out numerous health surveys that provide cross-sectional and longitudinal data for all age groups and makes the analysis of developments and trends over time possible. The RKI combines the data from health surveys with various other data sources, e.g. official statistics, social insurance claims data or social science surveys to form a meaningful overall picture. The course provides insight into the work of the Robert Koch Institute at the interface between research, politics and the numerous actors in the health and social sectors.

Students learn how to plan and conduct population-wide health studies and how this data is used for epidemiological analysis, health reporting, and public health. They learn to assess the significance of the data, also with a view to translation, i.e. the transfer of data and knowledge into the various practical fields of public health, as well as in the international context.

Topics: Public health, health monitoring, health reporting; RKI health surveys; physical health; mental health; health behavior; participatory approaches; social determinants of health; information systems for health reporting (IS-GBE).

Lead Instructor: PD Dr. Hannelore Neuhauser, Robert Koch Institute (RKI)

Assessment: Take-home exam

General Information: Thursdays from 14:30 to 19:00, Week 1-6
                    2,5 ECTS, 30 contact hours and 45 self-study hours
                    Winter Semester

Social Epidemiology

Human health and illness are determined by social and biological determinants. Social factors affect and change the biological-physical constitution of humans, just as biological determinants find social forms of expression (e.g. in height and stature or chronic lifestyle diseases). Social epidemiology examines the effects of social determinants such as gender, social situation, work, housing, living environment and social cohesion on health. Study designs, methods and instruments of social epidemiological research must be suitable for determining the influence of social factors on health and illness and combine quantitative-epidemiological with social-scientific research methods for a mixed methods approach.

Social determinants of health develop changing relevance and characteristics over the course of a lifetime; they influence health and illness differently in each phase of life. The course discusses various applied fields of social epidemiology.

Topics: Social determinants of health and illness throughout the life course; meaning of health and illness throughout the life course; research questions, theories and concepts of social epidemiology; child and adolescent health; health in middle age: gainful employment vs. unemployment, family; determinants of health and illness in old age: health care and long term nursing care needs.

Lead Instructor: PD Dr. Thomas Lampert, Robert Koch Institute (RKI)

Assessment: Presentation

General Information: Wednesdays from 14:30 to 19:00, Week 7-12
2,5 ECTS, 30 contact hours and 45 self-study hours
Winter Semester

Evidence-based medicine (EBM)

This course introduces students to evidence-based medicine (EBM) and the process of systematically synthesizing available evidence on healthcare interventions to improve decision making both on the individual patient level as well as on a health policy level.

Topics: The Cochrane guidelines and standard methods applicable to every review (planning a review, developing study objectives (PICO), searching and selecting studies for inclusion, data collection process, risk of bias assessment, rating the quality of the best available evidence, statistical analysis, and interpreting results) are practiced. Registries for systematic review protocols are introduced. The process for creating, maintaining and updating treatment guidelines based on the results of EBM is presented.

Lead Instructor: Dr. Monika Nothacker, The Association of the Scientific Medical Societies in Germany (AWMF)

Assessment: Protocol of a systematic review

General Information: Wednesdays from 14:30 to 19:00, Week 1-6
2,5 ECTS, 30 contact hours and 45 self-study hours
Winter Semester

Modules 9 and 10: Research Project and Master's Thesis

The master's thesis is an independent scientific research project and makes up one third of the MSc Epidemiology degree. Module 9 is designed to provide room for finding a topic and preparing a project that is suitable for completion in the master's thesis. Module 10 is dedicated to completing the research project and documenting the process in a written master's thesis. Each student is paired with two academic advisors from the program's faculty or partner research institutions. Within the context of the master's thesis, students have the opportunity to apply the theoretical knowledge they have gained throughout the program to a practical research project. It also provides students with an opportunity to get to know potential employers.

Modules 9 and 10 are both offered each semester. This gives students maximum flexibility and the program is thereby able to accommodate any unforeseen scheduling conflicts or postponements.

Overview of research project and master's thesis:

		Module Title	Contact hours (45 minutes)	Credits (ECTS)
Summer Winter	or	Module 9 Research Project	2 sessions à 5 hours Oral presentation	5
Summer Winter	or	Module 10 Master's Thesis	1 session à 5 hours Oral presentation and Oral defense	15
			Total	**20 ECTS**

Research Project

The research project gives students time to approach potential advisors and explore topics they may want to pursue for their master's thesis. Students in the course meet once at the beginning of the semester for an introductory workshop. Once students have identified a topic they wish to pursue and advisors they wish to work with, they register formally for participation in Module 9. During the self-study period, students work independently reading the available literature regarding their topic (background), determining possible sources of data (and their availability) and developing meaningful research questions that are answerable with the selected data source.

Students are expected to discuss research ideas with their advisors creatively. We expect advisors to help students determine how best to approach their topic and to provide feedback and guidance on the research concept. In particular, the need for approval by the ethics committee or a data protection declaration should be ascertained at this point. If possible, students should access the data source to do some preliminary data analysis. Toward the end of the semester, the course meets again and students present the research concept they have developed for peer review. The peer review session takes place in small groups with an instructor and a maximum of 6 students. The advisors are not expected to participate in these sessions, though they are always welcome. Each student has 15 minutes to present their work and 15 minutes for feedback and discussion. The goal of the peer review session in Module 9 is to ensure that each research project is feasible and meets all requirements. The scope of each thesis must be such that it can be completed within six months of part time study (450 hours between April 1 and September 30 or October 1 and March 31).

The assessment for Module 9 is the development of a research proposal or study protocol that will be used to officially register for the master's thesis.

Lead Instructor: Prof. Dr. Ute Latza, Federal Institute for Occupational Safety and Health (BAuA), Dr. Nina Adelberger, Berlin School of Public Health (BSPH), Charité–Universitätsmedizin Berlin

Assessment: Research Proposal

General Information: Please sign up for a peer group presentation via Blackboard.
5 ECTS, 10 contact hours and 140 self-study hours
Winter Semester (regular schedule) or Summer Semester (alternate option)

Master's Thesis

Students complete the MSc Epidemiology by writing a publishable manuscript or monography based on their independent scientific research.

Registration

Students must formally register for admission to Module 10 by submitting the research proposal developed in Module 9 for review and approval by the Board of Admissions and Examinations. Students are formally admitted at the beginning of each semester and have six months to complete their master's thesis (either from April 1 to September 30 or from

October 1 to March 31). This includes completing the data analysis and writing a publishable manuscript or monography.

Peer review

About 8 weeks before the master's thesis is to be submitted, students present their work for peer review. The format is identical to Module 9. The peer review sessions take place in small groups with an instructor and a maximum of 6 students. Each student has 15 minutes to present their work and 15 minutes for feedback and discussion. The goal of the peer review session in Module 10 is to provide room for trouble shooting, ensure that the research project is on track and will be completed, and finally, to provide an opportunity for practicing for the oral defense.

In general, a master's thesis should contain the following chapters

- Background
- Research goal and research questions
- Methods
- Results
- Discussion

We recommend that students send a first draft of the thesis to their advisors for feedback at this time – about 8 weeks before the master's thesis is due. We expect advisors to be available for feedback and guidance on the draft while students are still in the process of writing.

Submission and oral defense

Three hard copies of the master's thesis must be submitted to the BSPH administrative office as well as an electronic version by email. The BSPH administrative office formally sends the thesis on to the advisors for grading. Once students receive the written grade, they schedule the oral defense. This is usually the final step in completing the Master of Science in Epidemiology program.

The document submitted in fulfillment of the degree requirements (master's thesis) is not considered a publication and the research performed for the thesis can be published at any time in any scientific journal. Please be sure to always follow good scientific practice. The Charité – Universitätsmedizin Berlin cannot tolerate any form of plagiarism or scientific misconduct.

Lead Instructor:	Prof. Dr. Ute Latza, Federal Institute for Occupational Safety and Health (BAuA); Dr. Nina Adelberger, Berlin School of Public Health (BSPH), Charité-Universitätsmedizin Berlin
Assessment:	Publishable manuscript or monography, oral defense
General Information:	Please sign up for a presentation via Blackboard. 15 ECTS, 5 contact hours, 445 self-study hours Summer Semester (regular schedule) or Winter Semester (alternate option)

BSPH Award for outstanding Master's Theses

The topics of our students' master's theses reflect the full spectrum and diversity of public health. Since 2018, the Berlin School of Public Health has honored outstanding achievements in its master's programs with an award. Up to three of the master's theses submitted in each calendar year in fulfillment of a degree at the BSPH can receive the BSPH Award. In order to be shortlisted for the prize, the master's thesis must have received a very good grade and must have been nominated for distinction by both thesis advisors. Nominations are made for

- Current significance
- Innovation
- Significance for Public Health practice
- Sustainability
- Methodology

The BSPH Awards are presented at the annual graduation ceremony of the Berlin School of Public Health.

Admission and Enrollment

Admission requirements

In order to qualify for admission to the post-graduate Master of Science in Epidemiology, applicants must have a four-year university degree and professional work experience. In addition, we require advanced English language skills as well as an aptitude for mathematics.

- **University Degree**
  The university degree must encompass a minimum of 240 ECTS or equivalent (four years of regular course work). Since the different academic backgrounds of our students and their respective work experience greatly shape the quality of the discussions in our seminars, we look forward to applicants from the social sciences, humanities, natural sciences and medicine.

- **Professional Experience**
  The program is aimed at students with professional experience (mid-career professionals). At least one year of qualified work experience is required for admission.

- **Knowledge of English**
  Courses are taught in English. Please provide proof of English language proficiency at B2 CEFR standard (Common European Framework of Reference for Languages), i.e. TOEFL 87-109, IELTS levels 5-6. Alternative proof of language proficiency can be a previous university or high school degree from an English language institution, professional experience abroad or a list of publications in English.

- **Mathematical aptitude**
  Much of epidemiology involves numbers. Students are encouraged to have an affinity, aptitude or solid background in mathematics and statistics. Students should be willing and interested in learning IT based statistical computing.

Application

Early admission deadline: May 15th
In order to give applicants enough time to prepare and plan for the academic experience, we offer an early admissions process with a deadline of May 15th each year. Applications received by May 15th are processed immediately and notice of admission is provided in early June.

Rolling admissions until September 30th
Applications received after May 15th are processed in the order in which they are received and students are admitted as long as places are available. Applications are possible until September 30th of each year.

How to apply
Please send your complete application as a single PDF attachment by e-mail to student services, tanja.te-gude@charite.de. The necessary documents for an application are:

- Completed application form (please see our website www.bsph.charite.de)

- Curriculum Vitae (CV) in English

- Transcript of Records and Degree certificate or Diploma of all higher-level education achievements (everything after high school)

- Letter of motivation (maximum 2 pages in English) detailing
  • why do you want to study Epidemiology (career goals)
  • what makes you a good candidate for the program (personal skills and experience)

- Proof of English language proficiency at B2 CEFR standard (Common European Framework of Reference for Languages), for example TOEFL score 87-109 or IELTS levels 5-6. Alternative forms of proof are a previous university degree (or high school diploma) from an English language institution or professional experience abroad

Tuition and fees

Total tuition is €10.200 payable in installments at the beginning of each semester. Students receive a bill for tuition.

- Full-time students pay two installments of €5.100 each. The first installment is due at the time of enrollment and the second installment of €5.100 is due in March before beginning the second semester for a total tuition of €10.200.

- Part-time students pay four installments of €2.550 each for a total tuition of €10.200. The first installment is due at the time of enrollment. The next three installments are due at the beginning of each of the following semesters

- Should you take longer to complete the program no further tuition fees are applied.

- In addition, university enrollment fees are due for each semester enrolled and must be paid per semester (about €300).

Overview of tuition and fees:

Semester	Tuition part-time students	Tuition full-time students	Date due	University enrollment fees
Winter 1st Semester	2.550 € enrollment	5.100 € enrollment	October 1	
Summer 2nd Semester	2.550 €	5.100 € final semester	April 1	**about €300** **due for every semester enrolled**
Winter 3rd Semester	2.550 €	-/-	October 1	
Summer 4th Semester	2 550 € final semester	-/-	April 1	
Total	**10.200 €**	**10.200 €**		

Contact

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CHARITÉ

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Impressum

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