

EPIDEMIOLOGY, MHS

Master of Health Science Degree Program Overview

The Master of Health Science degree in Epidemiology (<https://publichealth.jhu.edu/academics/mhs-dept-of-epidemiology/>) is a full-time on-campus 9-month program that provides professional training in epidemiologic methods and biostatistics with particular focus on the application of these methods to public health research and practice. The program is grounded in real-world challenges and informed by leading edge scholarship, with a diverse faculty of the leading experts in the field and a student body bringing lived experiences to the classroom. The degree is intended for students with limited work experience (e.g. new BA/BS graduates) to serve as an entrance to a career in public health.

There are two paths: the Applied path or the Analytic path.

The **Applied** path is ideal for individuals with an interest in using data to inform policies and interventions that promote health and health equity. Skills will focus on study design, biostatistics, and data interpretation and dissemination to policy makers and the public. Successful applicants are those individuals who are motivated to apply rigorous quantitative methods to improve health in community-based real-world settings. Graduates from the MHS in Epidemiology-Applied path will be uniquely trained to work in state/local health departments, federal government offices, or with non-governmental organizations.

The **Analytic** path is ideal for individuals with an interest in generating and analyzing data to promote health and health equity. Skills will focus on study design, biostatistics, research methods, and data interpretation and dissemination to scientific audiences. Successful applicants are those individuals who are motivated to apply rigorous quantitative methods to improve health in research settings. Graduates from the MHS in Epidemiology-Analytic path will be uniquely trained to work in academic or research settings, or with industry or consulting organizations.

Program Highlights

MHS Applied Path

- **Duration and financial commitment:** 9 months (four terms of 16 credits per term)
- **Ideal for:** Individuals with an interest in using data to inform policies and interventions that promote health and health equity
- **Target careers:** State and local health departments, federal government offices, non-governmental organizations
- **Research track:** Not applicable
- **Work experience required?:** No
- **Core Epidemiologic Methods courses:** 340.721, 340.722, 340.723
- **Core Biostatistics courses:** 140.621, 140.622, 140.623, 140.624
- **Thesis required?:** No. Students complete a culminating experience in 4th Term.

MHS Analytic Path

- **Duration and financial commitment:** 9 months (four terms of 16 credits per term)
- **Ideal for:** Individuals with an interest in generating and analyzing data to promote health and health equity

- **Target careers:** Academic or research settings, industry or consulting organizations
- **Research track:** Not applicable
- **Work experience required?:** No
- **Core Epidemiologic Methods courses:** 340.751, 340.752, 340.753
- **Core Biostatistics courses:** 140.621, 140.622, 140.623, 140.624 OR 140.651, 140.652, 140.653, 140.654
- **Thesis required?:** No. Students complete a culminating experience in 4th Term.

Bachelor's/MHS

The Bachelor's/MHS degree is designed for undergraduate students pursuing a BA or BS at Johns Hopkins University Krieger School of Arts and Sciences, majoring in Public Health Studies (<https://krieger.jhu.edu/publichealth/academics/bamasters-program/>), and interested in pursuing an advanced degree at BSPH. The program prepares students for further graduate work or prominent careers in research and science. The benefit of the Bachelor's/MHS is that it allows Johns Hopkins University undergraduates to take BSPH courses during their undergraduate program and apply up to 16 credits accumulated as undergraduates into the MHS program. Students who complete the undergraduate degree at JHU enroll as MHS candidates and follow the timeline for the MHS program.

Degree Program Requirements

Non-Course Requirements

Residency

A minimum of 64 credits is required to complete the MHS degree program. The residency requirement is four consecutive terms of at least 16 credits each. Residency must be completed during the program.

Quarterly Master's Meetings

The Program Directors host quarterly meetings with all master's students. These meetings provide a forum to learn about academic policies and deadlines, raise questions and concerns, and to connect. All students are expected to attend.

Core Coursework

The MHS degree is comprised of 64 credits minimum as follows: Students in the Analytic Path will complete 40 required credits and students in the Applied Path will complete 39 required credits (detailed in Table below). In addition, students will select a minimum of 12 credits (3-4 courses) within the list of approved Primary Electives. These Primary Electives will allow students to develop focused skills/expertise in topical or methodological areas within Epidemiology. Students will then take an additional 12 credits (Analytic Path) or 13 credits (Applied Path) of General Electives, which may be within or outside of the field of Epidemiology. Students will select Primary and General Elective courses in consultation with the director of their path.

Cells to Society Courses (CEPH Requirements)

To address breadth, the National accreditor for schools of public health, Council on Education for Public Health (CEPH), has twelve "Introductory Public Health Knowledge Learning Objectives" in which all students must complete didactic coursework, and the "Cells-to-Society" courses to help programs meet this requirement.

For Epidemiology degree programs, five of the twelve competencies are covered through required Epidemiology Core Coursework. All students need to complete the eight indicated Cells-to-Society Courses by the end of their first year.

View a full list of Cells-to-Society courses and term offerings (<https://publichealth.jhu.edu/academics/course-directory/schedule-of-cells-to-society-course-offerings/>). Epidemiology degree students are required to complete these 8 of the 12 sessions. Each course is 0.5 credits and is offered only online. Many of these courses can be used as introductions to full-term courses offered in multiple modalities throughout the year.

Code	Title	Credits
PH.552.601	Foundational Principles of Public Health	0.5
PH.552.603	The Role of Qualitative Methods and Science in Describing and Assessing a Population's Health	0.5
PH.552.607	Essentials of Environmental Health	0.5
PH.552.608	Biologic, Genetic and Infectious Bases of Human Disease	0.5
PH.552.609	Psychological and Behavioral Factors That Affect A Population's Health	0.5
PH.552.610	The Social Determinants of Health	0.5
PH.552.611	Globalization and Population Health	0.5
PH.552.612	Essentials of One Health	0.5

Required Coursework

MHS Analytic path

Code	Title	Credits
FIRST TERM		
PH.140.621 or PH.140.651	Statistical Methods in Public Health I Methods in Biostatistics I	4
PH.340.751	Epidemiologic Methods 1	5
PH.340.860	Current Topics in Epidemiologic Research	1
SECOND TERM		
PH.140.622 or PH.140.652	Statistical Methods in Public Health II Methods in Biostatistics II	4
PH.340.752	Epidemiologic Methods 2	5
PH.340.860	Current Topics in Epidemiologic Research	1
THIRD TERM		
PH.140.623 or PH.140.653	Statistical Methods in Public Health III Methods in Biostatistics III	4
PH.340.753	Epidemiologic Methods 3	5
PH.340.860	Current Topics in Epidemiologic Research	1
FOURTH TERM		
PH.140.624 or PH.140.654	Statistical Methods in Public Health IV Methods in Biostatistics IV	4
PH.340.754	MHS Culminating Experience in Analytic Epidemiology (This is the MHS Culminating Experience in Analytic Epidemiology.)	3
PH.340.860	Current Topics in Epidemiologic Research	1

MHS applied path

Code	Title	Credits
FIRST TERM		
PH.140.621	Statistical Methods in Public Health I	4
PH.340.721	Epidemiologic Inference in Public Health I	5

PH.340.860	Current Topics in Epidemiologic Research	1
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SECOND TERM

PH.140.622	Statistical Methods in Public Health II	4
PH.340.722	Epidemiologic Inference in Public Health II	4
PH.340.860	Current Topics in Epidemiologic Research	1

THIRD TERM

PH.140.623	Statistical Methods in Public Health III	4
PH.340.723	Epidemiologic Practice Methods for Population Health Research	2

PH.340.860	Current Topics in Epidemiologic Research	1
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FOURTH TERM

PH.140.624	Statistical Methods in Public Health IV	4
PH.340.735	MHS Culminating Experience in Applied Epidemiology (This is the MHS Culminating Experience in Applied Epidemiology.)	3
PH.340.860	Current Topics in Epidemiologic Research	1

elective courses: METHODOLOGICAL AND SKILLS-BASED COURSES

Code	Title	Credits
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*Terms and offerings change each year. Always check the Course Directory for the most up-to-date offerings.

FIRST TERM

PH.140.776	Statistical Computing	3
PH.340.660	Practical Skills in Conducting Research in Clinical Epidemiology and Investigation	3
PH.340.696	Spatial Analysis I: ArcGIS	4
PH.380.611	Fundamentals of Program Evaluation	4
PH.317.605	Methods in Quantitative Risk Assessment	4

SECOND TERM

PH.340.697	Spatial Analysis II: Spatial Data Technologies	3
PH.380.602	Basic Demography and Population Dynamics	3
PH.340.717	Health Survey Research Methods	4
PH.340.603	Applied Epidemiologic Analyses for Causal Inference	2
PH.340.769	Professional Epidemiology Methods	4
PH.340.770	Public Health Surveillance	3
PH.221.645	Large-scale Effectiveness Evaluations of Health Programs	4

THIRD TERM

PH.140.628	Data Science for Public Health I	4
PH.140.631	The SAS Statistical Package: A Survey for Statisticians	3
PH.140.698	Spatial Analysis III: Spatial Statistics	4
PH.330.650	Methods in Implementation Science	3
PH.340.694	Power and Sample Size for the Design of Epidemiological Studies I	1
PH.601.733	Applied Spatial Statistics	4
PH.140.664	Causal Inference in Medicine and Public Health I	4

FOURTH TERM

PH.140.629	Data Science for Public Health II	4
PH.340.600	Stata Programming I (Basic)	2
PH.340.667	Health Equity Research Methods to Address Social Determinants of Health	4

PH.140.699	Spatial Analysis IV: Spatial Design and Application	3
PH.313.790	Introduction to Economic Evaluation	3

elective courses: TOPICAL COURSES

Code	Title	Credits
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*Terms and offerings change each year. Always check the Course Directory for the most up-to-date offerings.

FIRST TERM

PH.340.616	Epidemiology of Aging	3
PH.340.653	Epidemiologic Inference in Outbreak Investigations	3
PH.340.654	Epidemiology and Natural History of Human Viral Infections	6
PH.340.687	Epidemiology of Kidney Disease	2
PH.340.731	Principles of Genetic Epidemiology 1	4
PH.340.646	Epidemiology and Public Health Impact of HIV and AIDS	4
PH.340.612	Epidemiologic Basis for Tuberculosis Control	3

SECOND TERM

PH.340.732	Principles of Genetic Epidemiology 2	3
PH.340.620	Principles of Clinical Epidemiology	2
PH.340.624	Etiology, Prevention, and Control of Cancer	4
PH.340.627	Epidemiology of Infectious Diseases	4
PH.340.640	Eye Disease: Epidemiology and Control	1
PH.340.641	Healthcare Epidemiology	4
PH.340.645	Introduction to Clinical Trials	3
PH.340.666	Foundations of Social Epidemiology	3
PH.340.682	Pharmacoepidemiology Methods	3
PH.340.607	Introduction to Cardiovascular Disease Epidemiology	4

THIRD TERM

PH.340.733	Principles of Genetic Epidemiology 3	3
PH.340.609	Concepts and Methods in Infectious Disease Epidemiology	4
PH.340.633	Data Management in Clinical Trials	3
PH.340.683	Human Rights in Public Health Practice	2
PH.340.699	Epidemiology of Sensory Loss in Aging	3

FOURTH TERM

PH.340.734	Principles of Genetic Epi 4: Emerging and Advanced Methods	2
PH.340.639	Assessing Epidemiologic Impact of Human Rights Violations	2
PH.340.644	Epidemiology of Diabetes and Obesity	2
PH.340.651	Emerging Infections	2
PH.340.680	Environmental and Occupational Epidemiology	4
PH.340.692	Prisons, Public Health, and Human Rights	2

Culminating Experience

MHS Analytic Path

In this culminating experience, students will create a scholarly product that generates new knowledge or synthesizes/integrates existing knowledge. Students will select from several datasets that will be made available for this course. Students will learn and apply the research process, including formulating a research question, selecting an

appropriate analytical method and covariates, conducting the data analysis, and writing a scholarly research paper.

MHS Applied Path

Students will create a scholarly product that synthesizes/integrates existing knowledge important for improving public health and health equity. Students will use a real-world data set to create a series of products aimed for different target audiences. These will include products such as Situation Analysis, a Fact Sheet, and a Data Dashboard. Students will learn how to analyze real-world data and disseminate the information to a variety of key stakeholder audiences.

The Policy and Procedures Manual for the Master of Health Science

The Department of Epidemiology reserves the right to augment the PPM (<https://my.jhsph.edu/Resources/PoliciesProcedures/ppm/PolicyProcedureMemoranda/Forms/AllItems.aspx>) for BSPH. Current students can access the Epidemiology Student Handbook on the MHS program page on the BSPH website.

Academic Advising

The Program Directors serve as Group Advisors to MHS students. The Group Advisors serve as Academic Advisors and meet with a group of advisees regularly to discuss academic issues, progress, development, and goals in the degree program. As part of their advising support, students will meet regularly with the Academic Program Manager and the Epidemiology Academic Core staff.

Advisor/Advisee Manual

Each student in the Department will engage in several advisee roles throughout their program, whether it be as a Teaching Assistant, Graduate Research Assistant, or academic advisee. In accepting any of these roles, the student agrees to abide by the University's Student Conduct Code (<https://studentaffairs.jhu.edu/policies-guidelines/student-code/>). Faculty, fellows, staff, and students of the School assume a shared obligation to conduct themselves in a manner appropriate to the University's mission as an institution of higher education. The School's Policy and Procedures Memorandum (PPM) for student academic ethics is available on SharePoint. ([https://my.publichealth.jhu.edu/Resources/PoliciesProcedures/ppm/_layouts/15/WopiFrame.aspx?sourcedoc=%7B72A082F5-4CC8-462B-A887-1FE0872BD8A8%7D&file=Academic_Programs_08_Master_of_Health_Science.mentor/mentee_role_assumes_maintaining_the_academic_integrity_of_the_institution_and_preserving_an_environment_conducive_to_the_safe_pursuit_of_the_School's_educational_research_and_professional_practice_missions.Advisor\(s\)_have_the_responsibility_of_serving_as_a_guide_and_mentor.This_manual_is_intended_to_guide_the_student_and_the_faculty_member\(s\)_in_making_the_Advisor/advisee_relationship_as_successful_as_possible_by](https://my.publichealth.jhu.edu/Resources/PoliciesProcedures/ppm/_layouts/15/WopiFrame.aspx?sourcedoc=%7B72A082F5-4CC8-462B-A887-1FE0872BD8A8%7D&file=Academic_Programs_08_Master_of_Health_Science.mentor/mentee_role_assumes_maintaining_the_academic_integrity_of_the_institution_and_preserving_an_environment_conducive_to_the_safe_pursuit_of_the_School's_educational_research_and_professional_practice_missions.Advisor(s)_have_the_responsibility_of_serving_as_a_guide_and_mentor.This_manual_is_intended_to_guide_the_student_and_the_faculty_member(s)_in_making_the_Advisor/advisee_relationship_as_successful_as_possible_by))

- Answering questions that students frequently ask
- Providing guidance on how the student and Advisor can interact most effectively

Responsibilities of Advisors include:

- Provide oversight of the student's progress by:
 - Providing a plan, overview, and goals for the role
 - Assisting in the selection of activities, and aiding in skill development
 - Supporting students in meeting milestones

- Being reasonably available to meet with the student
- Assessing and developing the student's interests and abilities in the context of the position
- Referring students to the appropriate individuals or offices that provide academic support and/or resources
- Provide leadership in matters of academic integrity:
 - Being knowledgeable about ethical issues that pertain to academics, research, and practice
 - Helping students interpret and understand institutional policies and procedures regarding the responsible conduct of research
 - Discouraging students from circumventing institutional policies and procedures, and when confronted with such issues, directing students to appropriate institutional resources or contacts, avoiding actual or appearance of conflicts of interest
 - Respecting the confidentiality of students
- Guide and facilitate connection and participation in the greater community (department, school, university, local, state, national, international)

Responsibilities of Advisees include:

- Being an active participant in the role by:
 - Arranging meetings and check-ins
 - Preparing for sessions and adhering to deadlines
 - Identifying and developing professional goals and interests together
 - Understanding policies, guidelines, and procedures as related to the role
- Being a partner in their development by:
 - Asking questions and asking for feedback
 - Working to have positive relationships with the mentor, other members of the team, and/or collaborators
 - Identifying and addressing priorities and learning needs
 - Setting goals for the role

Guidelines for both Advisor and Advisees:

- Communication and Email:
 - Be thoughtful and conducted in a respectful and professional manner and tone
 - Think critically and carefully if there is disagreement; put forth ideas and disagree respectfully and ask clarifying questions
 - Be respectful of personal time; emails may be sent at any time of the day or night; barring urgency, there is no expectation to read or respond immediately
- Meetings:
 - Establish a regular meeting schedule
 - Use the time wisely and be flexible about scheduling
 - Listen actively and ask questions
 - Used as an opportunity to continue to build trust and rapport
- Conflicts:
 - Resolve respectfully, starting with direct resolution if possible (i.e., the first course of action should be to address the conflict with the individual or individual(s) involved)
 - The Change or Add New Advisor form is available on SharePoint (<https://my.publichealth.jhu.edu/sites/EPI/Departmental%20Forms/Forms/Public%20listing.aspx>).

Transferring Degree Programs

Transferring from the MHS Applied Path to the MHS Analytic Path

This switch must occur before matriculation into the program. The core course requirements are different, and the courses build on the knowledge gained in the course in the series before it. Prior to matriculation, MHS students can switch from the Applied Path to the Analytic Path.

Transferring from the MHS Analytic Path to the ScM Degree

Students cannot switch degree programs before matriculation. To request switching degree programs, the student must: have good academic standing, have the support of the Program Director, and support their request in a statement of purpose for the switch. The student will need to submit their request to the Academic and Credentials Committee during the 2nd Term of the 1st Year of study. The request should include:

- CV/Resume
- Letter of Support from Program Director
- Statement of Purpose: The statement must include the rationale for switching degree programs. The student should indicate which research track they would like to be placed in.
- Change of Degree Form – Signed by all parties

Transferring from the ScM Degree to the MHS Analytic Path

Students may switch from the 2-year ScM Degree to the 9-month MHS Degree. Students should consult with the Program Directors and consider whether they are a good fit for the MHS Degree program. The student can also self-elect to move from the ScM Degree to the MHS Analytic Path.

Transferring from the MHS Analytic Path to the MHS Applied Path

The student may switch from the MHS Analytic Path to the MHS Applied Path if it is determined by the Program Directors that it is a better fit. If the student is not doing well in the Epidemiology Methods course series (340.751-340.753), then the student would be moved to the Epidemiologic Inference course series (340.721-340.723), thus making the change from the Analytic Path to the Applied Path.

Academic Research & Ethics

All students must enroll in PH.550.860 Academic & Research Ethics during the 1st Term of program enrollment at BSPH. The Avoiding Plagiarism at JHU training developed by JHU Sheridan Libraries course material is contained within the PH.550.860 Academic & Research Ethics at BSPH. This is a self-paced online module and must be completed within the 1st Term of enrollment.

In the course, students are asked to upload two certificates to a CoursePlus DropBox showing completion of both parts of this course:

- Certificate from JHU for the Avoiding Plagiarism module
- Certificate from BSPH for completion of the Responsible Conduct of Research module

Students must also send an electronic copy of the certificates to the Academic Core (BSPH.EpiAcademic@jhu.edu) with their name and "Academic & Research Ethics Requirement" in the subject line of the email.

Responsible Conduct of Research

All students must fulfill the Responsible Conduct of Research requirement. While there is a Responsible Conduct of Research module within the PH.550.860 Academic & Research Ethics at BSPH, this is a separate requirement, and is not fulfilled by the module contained within 550.860.82.

This requirement can be met by completing either of the following two courses:

- PH.550.600 Living Science Ethics - Responsible Conduct of Research (1 credit)
- PH.306.665 Research Ethics and integrity (3 credits)

More resources regarding Responsible Conduct of Research are available on SharePoint (https://my.publichealth.jhu.edu/Offices/Research/rcr_resources/Pages/default.aspx).

According to the requirements of the Council on Education for Public Health (CEPH), all BSPH degree students must be grounded in foundational public health knowledge. Please view the list of specific CEPH requirements by degree type (<https://e-catalogue.jhu.edu/public-health/ceph-requirements/>).

Educational Objectives

- Gain foundational knowledge in public health.
- Gain an understanding of what epidemiology is, how it is used in public health, and the methods used to describe and evaluate variability in health states.
- Use epidemiologic methods to assess health states and interpret findings for public health research, policy, or practice.

Student Learning Outcomes

MHS Applied Path:

1. Describe the core epidemiologic study designs, and compare and contrast their strengths and weaknesses for answering specific research questions.
2. Identify sources of bias in epidemiologic research, and describe the impact of these biases on epidemiologic inference.
3. Apply methods for the analysis of weighted survey data to quantify burden of disease in a target population.
4. Discuss core applied statistical concepts and methods, as well as the display and communication of statistical data.
5. Employ Statistical Methods for Inference, including tests and confidence intervals, to draw public health inferences from data.

MHS Analytic Path:

1. Identify and distinguish epidemiologic study designs, including the use of population health measures, measures of association, and appropriate analytic models.

2. Discuss core applied statistical concepts and methods, as well as the display and communication of statistical data.
3. Design, organize, analyze, and interpret observational and experimental studies. Interpret the effects of complex mechanisms involving bias and variability.
4. Delineate the influences of social processes on the etiology and course of common diseases by constructing a framework that underscores the roles of key social conditions on the health and illness of populations.
5. Interpret and describe advanced design methods applied to epidemiologic research.
6. Interpret key findings from presentations that cover current topics in modern epidemiology methodology.