

EPIDEMIOLOGY AND BIostatISTICS, PhD

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Degree: Doctor of Philosophy (PhD)
Field of Study: Epidemiology and Biostatistics

Program Overview

The mission of the Doctoral Program in Epidemiology and Biostatistics in the Department of Population and Quantitative Health Sciences is to prepare students for an active, fulfilling, and lifelong research career, with the goal of improving human health.

The program draws on the core disciplines of epidemiology and biostatistics, broadly defined, but may also include a wide range of other academic areas, ranging from human genetics to health policy. As part of their training students will develop the knowledge, skills, and competencies necessary to be leading researchers in areas that provide improved understanding of how to advance public health. Through challenging coursework and research opportunities, both independent and collaborative, students will develop a thorough understanding of the multiple determinants of population health outcomes, the individual and structural factors that may lead to disparities in those outcomes, and the way in which specific policies and interventions can influence the nature and impacts of population health determinants. A key aspect of the program is to train students to define important, unanswered questions and design appropriate strategies to solve our pressing health problems, locally, nationally and globally. In addition, the program in Epidemiology and Biostatistics is committed to developing the skills necessary for lifelong learning as we recognize this as being key to continued success.

The program is designed to train students to address critical research questions to advance human and population health utilizing a wide variety of research tools and trans-disciplinary collaborations. This is distinct from historical training in a single discipline (e.g., statistics or genetics) or expertise in a small number of technical skills. The educational mission of the PhD Program in Epidemiology & Biostatistics is to train students using an integrated approach that draws broadly from the population and quantitative health sciences. These include global, population, public, and community health, biostatistics, epidemiology, health behavior and prevention, genomic epidemiology, bioinformatics, and computational biology. This training provides the foundation for trainees to play integral roles in successfully solving our most pressing health problems.

Through our rigorous coursework, exposure to discussion of important health related issues, and their research experiences during graduate training, students will develop into junior colleagues of the faculty who will develop the capacity to work independently. To develop into the research leaders expected of our graduates, each student will take a common set of first and second-year courses that provides extensive exposure to each of the areas noted above. By the end of their first year, students will choose a mentor and laboratory in which to do their

dissertation work. Research areas span all of the above and often combine these approaches with the expectation that cross-disciplinary studies will result in broader and more complete solutions to complex public health problems.

Exposure to cutting-edge research will be facilitated by our department-wide seminar that includes talks by world-leading experts both from off- and on-campus. As part of their training, all students will participate in these seminars, including as speakers. This will help develop the necessary communication skills that are expected of successful researchers.

Graduates from accredited universities and colleges will be considered for admission to the department. All applicants must satisfy both CWRU and department requirements for graduate admission. Upon acceptance into the PhD program, each student will be assigned an academic advisor, who will guide the student through department and graduate school regulations, assist him or her in designing the initially planned program of study, and track the student's progress toward degree completion.

Research and training will be guided by a committee of faculty including the student's research advisor. The research advisor will have the major responsibility for facilitating, guiding, and advising the student in his or her research, but this will be done in consultation with the faculty committees. A Mentoring Committee, selected after the first year of PhD training, will help students select courses and educational goals most useful for their research interests. This committee will be replaced at the end of the second year by a Dissertation committee that will play an important role in guiding the student's research project.

On completion of all Core Curriculum course requirements, students take a qualifying examination that is necessary to remain and advance in the program. Exceptions to required courses based on prior course work will be decided on a case by case basis.

Important Note: The program information contained on this page is current as of May 1st, 2023. For the most current information, we advise you to review the PhD in Epidemiology and Biostatistics program handbook.

PhD Policies

For PhD policies and procedures, please review the School of Graduate Studies section of the General Bulletin.

Program Requirements

The Doctor of Philosophy degree in Epidemiology and Biostatistics in the Department of Population and Quantitative Health Sciences comprises 42 credit hours from the following components:

- Required Curriculum (24 credit hours)
- [Electives \(18 credit hours\)](#)

In addition, students must fulfill the following requirements:

- Department Research Seminar (8 semesters)
- Pass the Qualifying Exam
- Dissertation Research (18 credit hours)

The required curriculum is designed to provide PhD students with a strong foundation in epidemiology and biostatistics and related areas - the fields that comprise population and quantitative health sciences - and

the methodological and analytic training to conduct rigorous, high quality research in the student's selected specialization or concentration.

Code	Title	Hours
Required Courses:		
PQHS 430	Basics of Probability and Statistical Theory	0
PQHS 431	Statistical Methods I	3
PQHS 432	Statistical Methods II	3
PQHS 440	Introduction to Population Health	3
PQHS 444	Communicating in Population Health Science Research	1
PQHS 445	Research Ethics in Population Health Sciences	0
PQHS 465	Design and Measurement in Population Health Sciences	3
PQHS 472	Integrated Thinking in Population and Quantitative Health Sciences	2
PQHS 473	Integrated Thinking in Population and Quantitative Health Sciences II	2
PQHS 490	Epidemiology: Introduction to Theory and Methods	3
PQHS 491	Advanced Study Design and Analysis in Population Health Sciences	3
PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	18
IBMS 500	On Being a Professional Scientist: The Responsible Conduct of Research	1
IBMS 501	Responsible Conduct of Research for Advanced Trainees	0

- a The SOM requires that PhD students who are 4 years beyond their initial RCR training in IBMS 500, register for IBMS 501.

Electives (18 credit hours)

Electives are chosen in consultation with the student's mentor and mentoring committee.

Seminars (0 credit hours, eight semesters)

Attending research seminars is integral to our graduate program and student's professional development. Students are required to attend weekly research seminars. These seminars provide a forum for students to develop skills in scientific presentation, thought and communication, and balance general and concentration-specific speakers and topics. Meeting locations may vary from week to week depending upon the speaker. Each student is required to attend in person eight semesters of seminars. All students are required to present once a year during research seminars after their first year in the program.

Qualifying Exam

Following the completion of the core required courses at the end of their second year; students will take an oral exam based on required coursework that involves analyses of a novel data set. This will include a description of the results, their interpretation and a short proposal on alternative or future research directions based on these findings. Students will be given two attempts to pass this examination. A second failure will result in dismissal from the program.

Dissertation (18 credits)

After passing the qualifying examination and completing second-year course work, students will select a dissertation committee and develop a thesis proposal, based on anticipated research for their dissertation. This will be presented to the student's Dissertation committee that will evaluate the written document and an oral defense of the document. This will be completed no later than the end of the fall semester of the third year. Successful completion of this exam will move the student to candidacy. Each student will be allowed two attempts to pass the oral defense of the proposal.

Students are required to complete 18 credits of dissertation (PQHS 701) prior to graduation.

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First Year

Fall		Hours
PQHS 430	Basics of Probability and Statistical Theory	0
PQHS 431	Statistical Methods I	3
PQHS 440	Introduction to Population Health	3
PQHS 490	Epidemiology: Introduction to Theory and Methods	3
PQHS 501	Research Seminar	0
Hours		9
Spring		
PQHS 432	Statistical Methods II	3
PQHS 491	Advanced Study Design and Analysis in Population Health Sciences	3
PQHS 501	Research Seminar	0
Elective		3
Hours		9

Second Year

Fall		
PQHS 444	Communicating in Population Health Science Research	1
PQHS 472	Integrated Thinking in Population and Quantitative Health Sciences	2
PQHS 465	Design and Measurement in Population Health Sciences	3
Elective		3
PQHS 501	Research Seminar	0
Hours		9
Spring		
PQHS 445	Research Ethics in Population Health Sciences	0
IBMS 500	On Being a Professional Scientist: The Responsible Conduct of Research	1
PQHS 473	Integrated Thinking in Population and Quantitative Health Sciences II	2
Elective		3
Elective		3
PQHS 501	Research Seminar	0
Hours		9

Third Year**Fall**

Electives		6
PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	1 - 3
Hours		7-9

Spring

PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	1 - 9
Hours		1-9

Fourth Year**Fall**

PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	1 - 9
Hours		1-9

Spring

PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	1 - 9
Hours		1-9

Fifth Year**Fall**

PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	1 - 9
Hours		1-9

Spring

PQHS 501	Research Seminar	0
PQHS 701	Dissertation Ph.D.	1 - 9
Hours		1-9

Total Hours		48-90
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