

Colorado School of Public Health

Masters of Science (MS) in Epidemiology (for students matriculating Summer 2024 or later)

Description of the Program:

The Master of Science (MS) program in epidemiology provides graduate-level training in the causes, distribution, and control of disease in populations, with an emphasis on epidemiologic and analytic methods and training in foundational epidemiology concepts, which, along with the practical research and programming experience provided by the thesis experience, differentiates the program from the MPH. The degree is tailored for students who seek careers as data analysts, data managers, research coordinators or program managers working with collaborative teams in academic research or public health practice.

Pre-requisites:

Students are required to have taken one semester of college level calculus (Calc I) and have taken college courses in biological sciences. Students should have a baccalaureate degree in a scientific field from an accredited college or University or completion of work equivalent to the baccalaureate or master's degree in a scientific field given at University of Colorado. Minimum undergraduate/graduate GPA of at least 3.0 on a 4 point scale. While not a requirement, students entering the MS program will benefit from previous coursework or experience with statistics or biostatistics and prior exposure to statistical software

Foundational Public Health Knowledge Requirement:

It is a requirement of the school's accreditation that all ColoradoSPH MS and PhD students are grounded in foundational public health knowledge. This is a curriculum requirement of the MS program, and a prerequisite to the PhD program. To satisfy this requirement, all MS and PhD students must complete the following courses:

- Foundations in Public Health (PUBH6600- 2 credits)
- Public Health Concepts for Non-MPH (EHOH 6601- 1 credit)
- Epidemiology (EPID 6630- 3 credits)

Students with a prior MPH degree or a graduate-level degree from a CEPH-accredited institution may be eligible to waive this requirement. These students must submit a requirement waiver request form to the Office of Academic affairs, documenting the student's eligibility to waive this requirement.

The form is available at:

<http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/Forms.aspx>

Epidemiology MS students who are approved to waive this requirement must replace the associated waived credits with an equal number of alternative elective credits.

Contact Information:

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Colorado School of Public Health

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Competencies for MS in Epidemiology	Course in which competency is addressed
<p>MS EPID 1- Formulate sound public health research questions.</p>	<p>This competency for MS students is addressed through introductory didactic course work (EPID6630, EPID6631) completed in the first year that break down the components of a sound research questions and the skill is further honed in higher level courses (EPID7631) competed in the second year. EPID 6626 (Research Methods in Epidemiology) provides additional lectures and practical experience to reinforce the skill of hypothesis formulation and study question development. The written thesis or research paper developed in a research proposal in preparation for the application for MS candidacy provides an experience in practical application of this competency, and mentors work with the student to properly hone the research question before the student continues into their thesis work.</p>
<p>MS EPID 2- Select and apply appropriate study design, data collection and analysis methods to address research or public health topics.</p>	<p>Study designs and associated data collection methods are discussed extensively in EPID6630, EPID 6631 and EPID 6626 as well as in the second-year upper-level course EPID 7631. The statistical aspects of data analysis as well aspects of data collection in terms of data formats and variable specification are covered in BIOS 6611 (Biostatistical Methods I) and BIOS 6612 (Biostatistical Methods II). These topics are also covered from an epidemiologic perspective (matching analysis to study design and data type) in EPID6630, EPID 6631, and EPID 662, as well as reinforced and covered from a more theoretical and notation heavy perspective in EPID 7631. BIOS 6680 (SAS Database Design and Management) also covers practical data handling in SAS, which is preparatory to analysis. Lastly the thesis project provides a real-world application of this competency from deciding on an appropriate study design to analysis, addressing a relevant and timely research or public health topics.</p>
<p>MS EPID 3- Critically appraise research and public health studies for internal and external validity, with consideration of how these issues influence interpretation of study findings.</p>	<p>Critical appraisal of the literature is a skill conveyed through both didactic coursework primarily in EPID 6626, which highlights principles, concepts and methods for conducting ethical, valid and scientifically correct epidemiological research, and through mandatory attendance in the extracurricular Epidemiology Discussion Group, which convenes once per week, with a regular journal club session monthly to review current and classic epidemiologic articles across a range of subject areas. The concepts of internal and external validity are covered extensively in core epidemiology courses including EPID 6630, EPID 6631 and the second-year course EPID 7631.</p>
<p>MS EPID 4- Determine strategies to prevent or minimize study biases in research and public health studies</p>	<p>All required core epidemiology courses teach students to recognize various types of bias that occur in observation research and some well-known study design or sample selection errors that can introduce bias. This coursework includes EPID6630, EPID 6631 and EPID 6626 as well as in</p>

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	the second year upper level course EPID 7631. Analytic courses such as BIOS 6611 (Biostatistical Methods I) and BIOS 6612 (Biostatistical Methods II) extensively cover analytic strategies for controlling bias, in particular confounding.
MS EPID 5- Calculate and interpret measures of disease frequency and association measures to draw appropriate inferences and evaluate causality.	Students learn measures of disease frequency and association, both the underlying concepts (and interpretations) and how to practically calculate, in core epidemiologic coursework, in particular EPID 6630, EPID 6631 and the second-year course EPID 7631. They learn how to implement these calculations with data in analytic coursework such as BIOS 6611 (Biostatistical Methods I) and BIOS 6612 (Biostatistical Methods II). The thesis experience also provides practical application of theory and calculations for some measures, depending upon the available data

MS EPID Coursework Checklist

Course Requirements	Credit Hours	Completed
Core Epidemiology Coursework	12 total	
EPID 6626 (Research Methods)	3	_____
EPID 6630 (Epidemiology)	3	_____
EPID 6631 (Analytical Epidemiology)	3	_____
EPID 7631 (Advanced Epidemiology 1)	3	_____
Topic-Based Epidemiology or Research or Analytic Methods Coursework (list classes below)	7 total	_____

Additional Electives (list classes below)	2 total	_____

Core Biostatistics Coursework	9 total	
BIOS 6611 (Biostatistical Methods I)	3	_____
BIOS 6612 (Biostatistical Methods II)	3	_____
BIOS 6680 (SAS Database Design and Management) OR EPID 6605 Intro to R for Health Sciences AND EPID 6607 R for Data Management	3	_____
General Public Health Coursework	3 Total	
PUBH 6600 (Foundations in Public Health)	2	_____
EHOH 6601 (Public Health Concepts for Non-MPH)	1	_____
Ethics Coursework	1 Total	
CLSC 7150 or CLSC 7151 (Ethics in Research)	1	_____
Thesis/ Research Paper	4 Total	
EPID 6651/ EPID 6950	4	_____
Total Semester Credit Hours	38	Total=