Epidemiology

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Overview

The Department of Epidemiology faculty researches the genetic and environmental factors affecting the distribution of health and illness in large human populations. This serves as a cornerstone of the graduate program and the medical research program by utilizing highly evidence-based biostatistical methods to determine risk factors leading to disease and optimal treatment approaches for clinical practice and medical interventions essential to preventative medicine and public health. In addition to the medical sciences, the epidemiology faculty has diverse research interests and relies on a number of other basic-science disciplines including biological sciences (to understand the disease process), biostatistics (to evaluate large population data and develop research methods), geographic information science (to map disease patterns), and social science (to understand proximate and distal risk factors). The Department maintains facilities for research that enable genetic, molecular, and biochemical techniques. The faculty in the Department of Epidemiology has strong, peer-reviewed research portfolios and resources needed to support the Department’s postdoctoral and doctoral training programs.

The Department offers programs of study leading to the M.S. or Ph.D. degrees, but not an undergraduate degree. The Department offers undergraduates the opportunity to gain research experience in epidemiology through the 199 series of undergraduate research courses in epidemiology. These courses are available to all upper-division undergraduates irrespective of the individual major they have declared on campus.

Master of Science in Epidemiology

The M.S. degree in Epidemiology requires the student to complete a number of required courses in the department, and elective course work. There is a comprehensive exam at the end of the first year. In addition, the student will typically take additional seminar courses during the graduate study. The student engages in thesis research with a faculty thesis advisor, and will prepare and submit a dissertation to the thesis committee. The final examination is an oral presentation of the thesis to the committee. The normative time to degree is two years for the thesis M.S. degree.

Doctor of Philosophy in Epidemiology

At the end of the first year, students must demonstrate proficiency by passing a preliminary qualifying exam. The purpose of this exam is to verify that the student has mastered the material presented in the required courses of the first-year of the program. The goals of these first-year courses are to establish a foundation of knowledge in relevant disciplines, to acquire an understanding of research methods including the responsible conduct of research, and to sharpen critical thinking abilities. There is a formal evaluation of the student’s progress at the end of the second year, in which the student demonstrates they are ready to begin thesis research in which they will take major responsibility for the design, conduct, and publication of Ph.D.-level research projects.

Students must have selected a thesis advisor and joined the advisor’s research group by the end of the third quarter of the first year.

Advancement to Candidacy

Following successful completion of the second year of graduate study, the next step in progression toward the doctoral degree is Advancement to Candidacy. The purpose of this process is to ensure that the student has selected an appropriate topic for the dissertation and that the proposed research that has been completed or is contemplated is scientifically rigorous and likely to be completed successfully and within the normal period of graduate study. The advancement to candidacy exam must be taken by the end of the spring quarter of the third year of graduate study.

Once this examination is completed, the student is advanced to candidacy for the doctoral degree and is expected to complete the degree within two to three years. The student must submit a dissertation on this research and defend the thesis in an oral examination during the final year of graduate study. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Students who are interested in these graduate degrees in Epidemiology should apply to the Department of Epidemiology in the School of Medicine. Applications are exclusively online, through the Graduate Division website (http://www.grad.uci.edu). For further questions contact EpiGrad@uci.edu or call 949-824-7401.
The Department of Epidemiology in the School of Medicine also has a joint doctoral program with the School of Social Ecology leading to a Ph.D. in Social Ecology with a concentration in Epidemiology and Public Health. That program is designed to prepare students to conduct research on questions in epidemiology and public health and on related questions on the formulation of environmental and health policy. Students interested in that program should contact the School of Social Ecology for information.

**Faculty**

Hoda Anton-Culver, Ph.D. University of St Andrews, *Genetic Epidemiology Research Institute and Professor of Epidemiology*

Dwight Culver, M.D. Stanford University, *Genetic Epidemiology Research Institute and Health Sciences Clinical Professor of Epidemiology*

Ralph J. Delfino, M.D., Ph.D. McGill University, *Genetic Epidemiology Research Institute and Professor in Residence of Epidemiology*

Karen L. Edwards, Ph.D. University of Washington, *Professor of Epidemiology; Genetic Epidemiology Research Institute; Program in Public Health*

Rufus D. Edwards, Ph.D. Rutgers, The State University of New Jersey, *Genetic Epidemiology Research Institute and Associate Professor in Program in Public Health; Environmental Health Sciences; Epidemiology*

Deborah Goodman, Ph.D., M.D., M.P.H. University of California, Los Angeles, *Genetic Epidemiology Research Institute and Associate Adjunct Professor of Epidemiology*

Luohua Jiang, Ph.D. University of California, Los Angeles, *Genetic Epidemiology Research Institute and Assistant Professor of Epidemiology*

Feng Liu Smith, Ph.D. Iowa State University, *Genetic Epidemiology Research Institute and Assistant Researcher of Epidemiology*

Christine E. McLaren, Ph.D. Case Western Reserve University, *Genetic Epidemiology Research Institute and Professor of Epidemiology*

Trina Norden-Krichmar, Ph.D. The Scripps Research Institute, *Genetic Epidemiology Research Institute and Assistant Professor of Epidemiology*

Andrew O. Odegaard, Ph.D. University of Minnesota, *Genetic Epidemiology Research Institute and Assistant Professor of Epidemiology*

Hannah L. Park, Ph.D. Stanford University, *Genetic Epidemiology Research Institute and Assistant Professor in Residence of Epidemiology*

Norbert Staimer, Ph.D. Technical University of Munich, *Genetic Epidemiology Research Institute and Project Scientist of Epidemiology*

Nathan D. Wong, Ph.D. Yale University, *Genetic Epidemiology Research Institute and Adjunct Professor of Medicine; Epidemiology*

Argyrios Zogas, Ph.D. University of Southern California, *Genetic Epidemiology Research Institute and Associate Adjunct Professor of Epidemiology*

**Affiliate Faculty**

Ellen S. Burt, Ph.D. Yale University, *Professor of English; Comparative Literature; European Languages and Studies* (eighteenth-century French literature and nineteenth-century poetry)

**Courses**

**EPIDEM 199. Undergraduate Research in Epidemiology. 2-4 Units.**

Provides disciplinary research participation. Original or existing research options provide undergraduates the opportunity for faculty/mentor interactions including access to appropriate facilities. Medical Epidemiology research areas: Cancer, Genetic/Molecular, Environmental, Occupational, Biostatistics, and Infectious Disease.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

**EPIDEM 200. Principles of Epidemiology. 4 Units.**

Fundamental principles of epidemiology, biostatistics, and epidemiological research. Topics include research methods of measuring health problems in populations, disease control and prevention in populations, how epidemiology contributes to knowledge of disease etiology, and biostatistical analysis and interpretation of epidemiologic data.

Restriction: Graduate students only.
EPIDEM 201. Cancer Epidemiology. 4 Units.
Concentrates on understanding how epidemiology plays a role in the search for cancer etiology, prevention, control, and treatment; gives an overview of cancer research with an appreciation of the multidisciplinary nature of the field.

Prerequisite: EPIDEM 203 or PUBHLTH 203 or PUBHLTH 206
Restriction: Graduate students only.

EPIDEM 202. Genetic Epidemiology. 4 Units.
Concentrates on the role of genetic factors in the etiology of disease in human populations with an objective of disease control and prevention and the role of interactions of genetic factors and environmental exposures in the occurrence of disease.

Prerequisite: PUBHLTH 203 or EPIDEM 203 or PUBHLTH 206
Restriction: Graduate students only.

EPIDEM 204. Biostatistics I. 4 Units.
Designed to help students develop an appreciation for statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about data that form evidence-based understanding of the world around us.

Same as PUBHLTH 204.
Restriction: Graduate students only.

EPIDEM 205. Environmental Epidemiology. 4 Units.
Concentrates on epidemiological approaches to the assessment of community environmental hazards; issues involved in environmental exposure estimation; interdisciplinary approaches to environmental epidemiology, including the use of biomarkers of exposures and susceptibility; epidemiological studies within the context of risk assessment.

Prerequisite: EPIDEM 200 and EPIDEM 204
Restriction: Graduate students only.

EPIDEM 215. Introduction to Statistical Genetics. 4 Units.
Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.
Same as STATS 257.

EPIDEM 217. Advanced Epidemiologic Methods. 4 Units.
Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package.

Prerequisite: PUBH 101B or STATS 111 or STATS 211
Same as PUBHLTH 205.
Concurrent with PUBHLTH 119.

EPIDEM 232. Chronic Disease Epidemiology & Prevention. 4 Units.
Epidemiological aspects of chronic human diseases. Topics include methodologies for quantifying aspects of prevalent chronic diseases including risk factors, identification of susceptible groups, societal burdens, promising future research; and the intervention, prevention, and control of diseases in populations.

Restriction: Graduate students only.

EPIDEM 242. Biostatistics II. 4 Units.
Intended for graduate students in epidemiology, public health, and clinical research fields. Covers common regression-modeling techniques frequently used in biologic and medical applications.

Prerequisite: EPIDEM 204. EPIDEM 204 with a grade of B or better
Repeatability: May be taken for credit 2 times.
Restriction: Graduate students only.
EPIDEM 244. Toxic Chemicals in Environment. 4 Units.
Industrial ecology of toxicants and their impacts on environmental quality and human health. Explores theoretical basis of toxicity thresholds and regulatory issues. Uses classic and contemporary research articles to understand the legacy of traditional toxicants, and to identify emerging threats.
Restriction: Graduate students only.

EPIDEM 245. Biostatistics III Survival Analysis. 2 Units.
Intended for graduate students in epidemiology, public health, and related fields. Covers common techniques for analyzing survival or other time-to-event data.
Prerequisite: EPIDEM 242. EPIDEM 242 with a grade of B or better
Repeatability: May be taken for credit 2 times.
Restriction: Graduate students only.

EPIDEM 264. Introduction to Environmental Health Science. 4 Units.
Convergence of agents (chemical, physical, biological, or psychosocial) in environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health.
Same as EHS 264, PUBHLTH 264.
Restriction: Graduate students only.

EPIDEM 265. Advanced Environmental Health Science. 4 Units.
Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.
Same as PUBHLTH 265.
Restriction: Graduate students only.

EPIDEM 269. Air Pollution, Climate, and Health. 4 Units.
Emission of air pollutants into the atmosphere, physical and meteorological processes that affect transport, and influence on global warming. Concepts of how and where people are most exposed, and how exposures and health effects differ in developed and developing regions.
Same as EHS 269, PUBHLTH 269.

EPIDEM 270. Human Exposure to Environmental Contaminants. 4 Units.
Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.
Same as EHS 270, PUBHLTH 270.

EPIDEM 275. Special Topics in Epidemiology. 1-4 Units.
Presents various topics and latest research in the broad field of epidemiology.
Repeatability: Unlimited as topics vary.
Restriction: Graduate students only.

EPIDEM 280. Epidemiology Research Journal Club. 1 Unit.
Research journal club is a group discussion of recent publications in epidemiology and related fields. Students rotate as lead discussants, guided by faculty. All attendees are expected to be familiar with the papers at the start of class.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.

EPIDEM 282. Epidemiology Department Seminar. 1 Unit.
A forum for the presentation of recent research to epidemiology students, faculty, and other interested parties. The atmosphere is informal, yet rigorous. Speakers range from graduate students through distinguished visitors from other institutions.
Grading Option: Satisfactory/unsatisfactory only.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.
EPIDEM 290. Introduction to Biostatistics and Epidemiology for Medical Fellows. 4 Units.
Prepares medical fellows and other physicians for rotations in research programs. Understanding of basic biostatistics and study design, and interdependencies between the two. Application of principles in evaluation of medical literature for guidance on patient care and public health policy.
Prerequisite: Medical degree.

EPIDEM 296. M.S. Thesis Research and Writing. 1-12 Units.
Individual research and study necessary for a graduate student to prepare and complete the thesis required for the Master of Science (M.S.) degree.
Prerequisite: Advancement to candidacy.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.

EPIDEM 297. PhD Degree Dissertation Research & Writing. 1-12 Units.
Individual research and study necessary for a graduate student to prepare and complete the dissertation required for the Doctor of Philosophy (Ph.D.) degree.
Prerequisite: Advancement to candidacy.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.

EPIDEM 298. Directed Study in Epidemiology. 2-4 Units.
Directed study with Epidemiology faculty.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.

EPIDEM 299. Independent Study in Epidemiology. 2-8 Units.
Independent research with Epidemiology faculty.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.

EPIDEM 399. University Supervised Teaching. 2-4 Units.
Limited to students with active Teaching Assistant (T.A.) appointments.
Grading Option: Satisfactory/unsatisfactory only.
Repeatability: May be repeated for credit unlimited times.
Restriction: Graduate students only.