

# DEPARTMENT OF FAMILY MEDICINE AND POPULATION HEALTH

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Professor and chair

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The Department of Family Medicine and Population Health hosts both a robust residency program for family physicians and academic programs at the graduate level dealing with critical issues in public health. Within the department, the Division of Epidemiology integrates research, education and public health service programs. The department offers a Ph.D. degree in epidemiology along with a fully accredited Master of Public Health degree. Close ties to the Virginia Department of Health allow opportunities for students to immerse themselves in experiential learning with these public health partners. The doctoral training program in epidemiology cultivates public health scientists equipped to use state-of-the-art research methods for the purpose of advancing fundamental knowledge of issues central to the improvement of population health.

- Epidemiology, Doctor of Philosophy (Ph.D.) (<http://bulletin.vcu.edu/graduate/school-medicine/epidemiology-phd/>)
- Public Health, Master of (M.P.H.) (<http://bulletin.vcu.edu/graduate/school-medicine/public-health-mph/>)
- Public Health, Master of (M.P.H.) with a concentration in applied public health (<http://bulletin.vcu.edu/graduate/school-medicine/public-health-mph-concentration-applied/>)
- Public Health, Master of (M.P.H.) with a concentration in epidemiology (<http://bulletin.vcu.edu/graduate/school-medicine/public-health-mph-concentration-epidemiology/>)
- Public Health, Master of (M.P.H.)/Social Work, Master of (M.S.W.) [combined] (<http://bulletin.vcu.edu/graduate/school-medicine/public-health-mph-social-work-msw-combined/>)
- Medicine, Doctor of (M.D.)/Public Health, Master of (M.P.H.) [combined] (<http://bulletin.vcu.edu/graduate/school-medicine/medicine-md-mph-combined/>)
- Pharmacy, Doctor of (Pharm.D.)/Public Health, Master of (M.P.H.) [combined] (<http://bulletin.vcu.edu/graduate/school-medicine/pharmacy-pharmd-public-health-mph-combinedq/>)

## **EPID 547. Applied Data Analysis Lab I. 1.5 Hour.**

Semester course; 1.5 laboratory hours. 1.5 credits. Corequisite: BIOS 543. Lab sessions will focus on hands-on data analysis and presentation techniques using SAS statistical software. The labs will also provide exercises to help students more fully understand the statistical principles presented in the corequisite lecture course (BIOS 543).

## **EPID 548. Applied Data Analysis Lab II. 1.5 Hour.**

Semester course; 1.5 laboratory hours. 1.5 credits. Prerequisite: BIOS 543, EPID 547 with minimum grade of B. Corequisite: BIOS 544. Lab sessions will focus on hands-on data analysis and presentation techniques using SAS statistical software. The labs will also provide exercises to help students more fully understand the statistical principles presented in the corequisite lecture course (BIOS 544).

## **EPID 571. Principles of Epidemiology. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Offers the theoretical foundations, concepts and principles of epidemiological research methods utilized to examine the distribution and determinants of diseases or other health problems. Entails understanding of measures of disease frequency and association, descriptive and analytic studies, community surveys, sampling, bias, confounding surveillance, outbreak investigation, screening and research proposal writing. Also provides basic foundations for data analysis and its translation into health care planning, management and policy formulation.

## **EPID 580. Public Health Ethics. 1 Hour.**

Semester course; 1 lecture hour (hybrid online/face-to-face). 1 credit. The class examines, from an ethical perspective, federal and state public health practices, privacy and confidentiality issues; the Public Health Code of Ethics; legal power given to public health, ethics in responding to typical public health scenarios, the impact of public health ethics on public health decision-making; barriers to the ethical practice of public health; and responding to unethical events. Through exploration of principles of public health ethics, students in the course will examine current and past ethical issues in public health, drawing from case studies and current events. Included are issues such as immunization, social justice, distribution of limited resources and the evolution of the discipline of public health ethics.

## **EPID 593. Foundations of the Public Health Profession. 2 Hours.**

Semester course; 2 lecture hours. 2 credits. Enrollment is restricted to M.P.H. program students. This is a two-semester course series of practical knowledge and experience for first-year Master of Public Health students. The course offers didactic training in basic public health operations, work of local public health organizations and research teams, human research subjects protection, selected cross-cutting and career skills and leadership principles in preparation for a future assignment in a professional public health setting. By the end of the semester, students will have selected a professional public health organization or research team with which they will complete practical experience hours the following semester.

## **EPID 594. MPH Practicum. 1-2 Hours.**

Semester course; 4-8 practicum hours. 1-2 credits (60 hours per credit). Prerequisite: EPID 593. Enrollment is restricted to M.P.H. students. Students typically work 120 practical hours over the course of one semester (8 hours per week average) in a professional public health setting and engage in selected training to develop a foundation of basic skills in areas such as communication, leadership and professionalism. The practicum placement will be made according to student area of interest. Students will work as members of collaborative public health teams fulfilling varied missions. Each student will have a personalized experience, which could include team tasks, shadowing public health professionals, attending meetings, data entry, descriptive data analysis, transcription of focus group discussions, creation of health promotion materials and participating in other organizational activities that will provide a basic foundation of knowledge and experience in public health research and/or practice. Graded as S/U.

## **EPID 600. Introduction to Public Health. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Describes the public health system in the United States. Explores the disease prevention and philosophy and foundations of public health management, economics, law, ethics and education. Examines the use of epidemiology and statistics to determine personal, environmental, and occupational health problems.

**EPID 601. Contemporary Issues and Controversies in Public Health. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. This course introduces students to current issues and controversies in public health such as HIV transmission risk behavior, poverty, globalization, gun control, health care access and obesity. Students will be able to describe these controversies and argue differing perspectives on the major issues.

**EPID 603. Public Health Policy and Politics. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Provides an understanding of the public health policy development process, the influence of politics and special interest groups on this process, and current governmental policies for the provision of major public health services. The legislative process is a major focus of the course.

**EPID 604. Principles of Environmental Health. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. The course is designed to provide an overview of environmental health. It provides an introduction to the methods used to understand the impact of environmental hazards on human health, such as toxicology, exposure assessment and environmental epidemiology; surveys the nature and control of environmental hazards that may cause or exacerbate health issues; and touches on some hot topics and current controversies in the field. In addition to providing a broad introduction to environmental health, this course aims to teach students how to research environmental health topics and critically assess environmental health literature.

**EPID 606. Epidemiologic Methods. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571, minimum grade of B. Focuses on examining the design, conduct and analysis of major epidemiologic studies and the methods to deal with the problems of bias, confounding and effect modification; using multivariate modeling techniques focusing on applications of logistic regression and Cox proportional hazards models to answer relevant research questions; solving meta-analytic problems using fixed and random effects models; understanding specific research areas of disease screening and exposure assessment; writing a research paper based on literature review and data analyses of a large dataset demonstrating application of essential epidemiologic and biostatistical principles.

**EPID 607. Nutritional Epidemiology. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571. This course focuses on methods of measuring exposures to dietary factors for epidemiological investigations of diet-disease relationships and risk assessment. An introductory course in basic epidemiology is a prerequisite. Students learn to select the most appropriate method(s) of collecting and analyzing food intake and to evaluate the adequacy of dietary assessment methods used in published epidemiological studies.

**EPID 620. Cancer Epidemiology. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and BIOS 543, both with a minimum grade of B. Enrollment is restricted to students in the doctoral program in epidemiology and the Master of Public Health program. Students review the epidemiology of major cancers by anatomic site and discuss seminal studies and current issues in cancer epidemiological research, including methodology, cancer surveillance, international studies, observational studies and intervention trials. The course will include an overview of basic concepts pertinent to cancer epidemiology research and prevention including biology, descriptive statistics, risk factors and genetics. Selected publications from epidemiological literature provide examples for student-faculty discussion.

**EPID 622. Maternal and Child Health. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 548, EPID 571 and BIOS 543, all with minimum grades of B; or permission of instructor. Exposes students to current issues in maternal and child health in the U.S., taking an applied approach that balances discussion of literature, applications to public health practice and practical data experience. The course will explore how policies and social determinants of health influence MCH outcomes. Students will learn about key MCH topics including intergenerational risk factors, low birth weight, infant mortality, developmental disabilities and injury and violence prevention. Students will use epidemiological methods to evaluate MCH data to determine risk and protective factors for women and children and describe how these data guide public health policy and program-planning efforts.

**EPID 623. Injury and Violence Epidemiology. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 548 and EPID 571, both with a minimum grade of B. Enrollment is restricted to majors in public health and epidemiology; others by permission of instructor. This course will introduce students to current issues and methods in injury and violence epidemiology using primarily a domestic focus. Students will learn about key injury-related topics, including motor vehicle traffic crashes, drug overdoses, drowning, traumatic brain injuries, suicide and self-harm, homicide/assault, and intimate partner violence, with an emphasis on methods commonly used to conduct surveillance and analyze data, as well as related prevention strategies and theories of causation. Students will be able to describe how epidemiological methods are used to determine incidence and prevalence within populations, identify risk and protective factors, and describe how injury and violence surveillance data guide public health policy and program planning efforts.

**EPID 624. Chronic Disease Epidemiology. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571 with a minimum grade of B or permission of the instructor. Course will cover the contribution of chronic diseases to population disease and disability as well as identify the incidence, prevalence and financial impact of each of the model diseases addressed. At the conclusion of the course, the student should be able to apply the concepts to all chronic diseases. The student will analyze selected current research in the area and determine points at which translational research is likely to improve the ability of the health care system to manage these problems.

**EPID 628. Public Health Program Planning and Evaluation. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and EPID 593. Enrollment is restricted to graduate students in any concentration within the Master of Public Health program; other graduate students may enroll with permission of instructor and program administrator. This course provides an overview of the process of public health program planning, including assessment, design, planning, implementation and evaluation. Students examine the methods frequently used to determine whether health-related programs are achieving their objectives. Students will gain practical experiences through a series of in-class and team-based exercises and will leave the course with an understanding of how to implement public health programs and evaluate their effectiveness.

**EPID 642. Advanced Epidemiological Protocol Design. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571; EPID 606 or equivalent; and BIOS 554 Develops skills needed to design and describe in written format a valid and appropriate epidemiology study to address specific hypotheses. Hypotheses and possible design methods will be discussed in class and subsequently students will present (both orally and in written form) a research design to include a critical review of the literature and hypotheses to be tested. The proposal must address sample size and power, exposure definition, methods for accurate exposure assessment, prevention of measurement errors, and statistical methods proposed for analysis.

**EPID 645. Public Health Genomics. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. This course provides an overview on the influence of genetic and environmental factors and their role in population health. Students will learn fundamental concepts in genetics and genomics, including advances in genomic technologies, and examine the challenges of integrating genetic and genomic technologies into clinical practice and public health and the impact of such applications on society. Learning approaches will include didactic lectures, case studies, readings, practical activities and an exploration of genomic test results.

**EPID 646. Epidemiology of Psychiatric and Substance Use Disorders. 3 Hours.**

Semester course; 2 lecture and 1 laboratory hours. 3 credits. This course is intended to introduce the descriptive and analytic epidemiology for major mental disorders of childhood, adulthood and late adult life. The course will address three main topics: (1) conceptual and methodological considerations in psychiatric epidemiologic research, (2) the descriptive epidemiology of major psychiatric and substance use disorders and (3) the analytic epidemiology of major psychiatric and substance use disorders. The course will also examine issues of classification and the nosology of psychiatric disorders as well as operational case definitions and the measurement techniques for field surveys and risk-factor research. Students will become familiar with epidemiologic surveys appropriate for risk factor research for psychiatric and substance use disorders. Prerequisite for master's students: EPID 571 with a minimum grade of B; prerequisite for doctoral students: EPID 650 with a minimum grade of B; or permission of instructor.

**EPID 648. Behavioral Epidemiology. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571; SBHD 605 with a minimum grade of B; and BIOS 543 or BIOS 547 and EPID 547 with minimum grades of B; or permission of instructor. Covers behavioral epidemiology and its role in public health. Students will be able to identify and explain the appropriate methods for measuring health-related behaviors and related psychosocial constructs; critically analyze the appropriateness of methods used within published studies on behavior as well as determine appropriate methods for behavior-related research questions; and apply behavioral theory/models to current public health problems including, but not limited to, intervention development and evaluation.

**EPID 649. Analysis of Health Datasets. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Corequisites: EPID 650 and STAT 643, or permission of instructor. Epidemiologic research, health services research and social/behavioral science research very often conduct "secondary analysis" of existing population-level datasets, as well as different forms of health care data (claims data, electronic prescribing data, electronic medical records). At the end of the course, students will be familiar with the scope of available large, population-based public datasets for health care and public health research. They will understand the strengths and limitations of using these datasets for secondary research and be able to apply this understanding to decisions regarding research questions, dataset use and analysis plans. In the process, they will also develop skills in manipulating complex administrative data sources (including claims data, electronic prescribing data and electronic medical records). Students will acquire knowledge to deal with potential challenges in implementing case-control or cohort studies based on data collected for reasons other than for research. Competencies in sampling methods, weighting, small area estimation techniques, probabilistic matching, multiple imputation methods, geocoding and other issues will be emphasized. Students will download, link and analyze several data sets to understand the advantages of these data. Familiarity with statistical analysis software is required.

**EPID 650. Epidemiologic Methods for Research. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students in the doctoral program in epidemiology; other doctoral students require permission of the instructor. Students will learn principles of epidemiologic methods and their application for analysis and interpretation of public health data. This course provides advanced introductory training for conducting epidemiologic investigations of disease etiology, surveillance and health care services, as well as for interpretation of published epidemiologic studies. Upon completion, students should be sufficiently familiar with epidemiologic research methods to begin applying these methods in their own work. The course is intended for doctoral students in epidemiology or related disciplines.

**EPID 651. Intermediate Epidemiologic Methods for Research. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 650, minimum grade of B. Course will provide in-depth understanding of epidemiologic methods and their application for analysis and interpretation of public health data. This course emphasizes decision-making in research methods to increase the efficiency of study design by reducing bias. Students will gain expertise in methodologic thinking as applied to their own work. Nonexperimental study designs are the focus of the class. Course provides opportunities for students to develop expertise in reading epidemiologic methods research. Upon completion, students should have attained expertise in epidemiologic research methods to apply in their own work. The course is intended for doctoral students in epidemiology or related disciplines.

**EPID 652. Advanced Epidemiologic Methods and Data Analysis. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 573 or BIOS 602; and EPID 651, both with a minimum grade of B. Focuses on development of analytical strategies for data analysis guided by epidemiologic principles. Specific statistical modeling will be tailored for analysis of data from cross-sectional, case-control and cohort studies with emphasis on causal inference, prediction, controlling for confounding and assessment of interaction and intermediate effects. Course topics include logistic regression, Poisson regression, Cox proportional hazards model, propensity score method, generalized estimating equations and path analysis technique.

**EPID 690. Journal Club. 1 Hour.**

Semester course; 1 lecture hour. 1 credit. Talks given by students and faculty describing and critiquing recent published research or review articles. Graded as S/U/F.

**EPID 691. Special Topics. 1-6 Hours.**

Semester course; variable hours. 1-6 credits. This course provides the opportunity for students to focus in depth on a particular area of interest and allows students to tailor their education to their specific needs and interests. Such flexibility adds strength to the program and promotes the independence of dedicated students. Arrangements are made with the appropriate faculty member.

**EPID 692. Independent Study. 1-6 Hours.**

Semester course; variable hours. 1-6 credits. Provides the opportunity for students to explore a topic of interest under the direction of a faculty member. A proposal must be submitted for approval and credits are assigned commensurate with the complexity of the project. Arrangements are made directly with the appropriate faculty member and graduate program director.

**EPID 693. Public Health Internship. 1-3 Hours.**

Semester course; 1-3 field experience hours. 1-3 credits (60 hours per credit). Prerequisites: 18 credits in the M.P.H. program; EPID 548, EPID 571 and BIOS 544, all with minimum grades of B. Students will spend 180 hours in a planned, supervised experience with a community agency. Such agencies might include a local free clinic or other nonprofit organization, such as the American Cancer Society, or a local, state or federal public health agency. Graded as S/U/F.

**EPID 694. MPH Capstone Project. 1-6 Hours.**

Semester course; variable hours. 1-6 credits. Each student will complete a research project that demonstrates the application of the knowledge acquired in the MPH program. The student will answer one or more relevant research or applied practice questions; the final product is a scholarly written report of publishable quality. A proposal must be submitted for approval and credits are assigned commensurate with the complexity of the project. Arrangements are made directly with a faculty member and approved by the graduate program director. Graded as S, U or F.

**EPID 696. Special Topics. 1-3 Hours.**

Semester course; 1-3 variable hours. 1-3 credits. Provides the opportunity for students to focus in depth on a particular area of interest and allows students to tailor their education to their specific needs and interests. Such flexibility adds strength to the program and promotes the independence of dedicated students. Arrangements are made with the appropriate faculty member. Graded as S/U/F.

**EPID 697. Directed Research in Epidemiology. 1-15 Hours.**

Semester course; 1-15 credits. Research leading to the Ph.D. degree. Graded as "S," "U" or "F".