



JOHNS HOPKINS
BLOOMBERG
SCHOOL *of* PUBLIC HEALTH

Curricular offerings in Epidemiology

MPH Presentation

July 17, 2007

Epi curriculum: options

- Two epidemiology course series
 - “Applied track” vs. “research track”, or...
take Epi 1 (current course) and be done
- **Applied Epidemiology track**: focuses on application of epidemiology to public health problems, as utilized in health departments, health interventions, and health policy.
- **Epidemiologic Research track**: focuses on design, conduct, and analysis of epidemiologic studies, using longstanding and emerging epidemiologic methods.

New curriculum: options

	Applied Epidemiology Track	Epidemiologic Research Track
Audience	Future health department, health policy, health program professionals ("users")	Future researchers in epidemiology ("researchers")
Courses required:	Principles of Epi (340.601) Observational Epi (340.608) Applied Epi (340.647)	Epidemiologic Methods 1 (340.751) Epidemiologic Methods 2 (340.752) Epidemiologic Methods 3 (340.753)
Examples of topics:	Surveillance Sources and uses of data Outbreak investigation Evaluation of epidemiologic evidence	Causal inference and modeling Study design issues Analysis of epidemiologic data using statistical software

Applied Epidemiology track: competencies

- 1. Identification and critical assessment of public health problems and priorities.**
- 2. Understanding of major epidemiologic methods: study populations, designs and evaluation issues.**
- 3. Understanding of inferential processes relevant to public health policy and action in an applied field setting.**
- 4. Communication, implementation and impact.**
- 5. Special applications of epidemiology to specific areas of public health (i.e., infectious, noninfectious, environmental events).**

Applied Epidemiology track: faculty

- **Brad Astor, PhD**
- **Rosa Crum, MD, MHS**
- **Leon Gordis, MD, MPH, DrPH**
- **Greg Kirk, MD, MPH, PhD**
- **William Moss, MD, MPH**
- **Eric Seaberg, PhD, MPH**
- **Frangiscos Sifakis, PhD, MPH**
- **Taha Taha, PhD, MPH, MCM, MBBS**

Principles of Epidemiology (340.601) – Summer term

- Describe basic epidemiologic methods and study design
- Critically review published epidemiologic papers and assess the validity of their design and their inferences.
- Identify the place of epidemiology in preventive medicine and disease investigation
- Explain how epidemiologic methods are used to evaluate new drugs and other therapeutic modalities, the benefits of screening and early disease detection, and alternative ways of delivering health care.

Observational Epidemiology (340.608) – 2nd quarter

- Identify and assess public health problems and priorities.
- Identify sources of data and epidemiological methods to assess burden of health problems.
- Identify strengths and limitations of both conventional and non-conventional epidemiological study designs.
- Understand the concept of causation and guidelines to establish causality.
- Identify threats to validity
- Understand quality control and assurance and approaches to minimize measurement errors.

Applied Epidemiology track: courses

Applied Epidemiology (340.647) – 3rd quarter

- Evaluate and synthesize evidence to establish causal inference in public health.
- Conceptualize inferential processes and identify the nature and impact of these processes as they related to applied epidemiology.
- Understand the concepts of effectiveness and translation of epidemiological information into policy.
- Identify the role of epidemiology in the decision-making process that leads to implementation or changes in public health practice and policy.
- Communicate epidemiological information influencing implementation and outcome of public health interventions.

Epidemiologic Research track: competencies

- 1. Identify public health problems from existing information.**
- 2. Formulate a research question.**
- 3. Identify an appropriate study design and population for testing a hypothesis.**
- 4. Identify potential sources of bias and variance in studies testing a particular hypothesis and implement strategies to control bias(es) and to reduce variance.**
- 5. Apply stratified and multivariate methods for data analysis to test hypothesis in a manner consistent with underlying mechanism.**
- 6. Make inferences from results of analysis and interpret findings in a causal framework.**

Epidemiologic Research track: faculty

- **Stephen Cole, PhD**
- **M. Daniele Fallin, PhD**
- **Stephen Gange, PhD**
- **Thomas Glass, PhD, MS**
- **Eliseo Guallar, MD, DrPH**
- **Lisa Jacobson, ScD, MS**
- **Shruti Mehta, PhD, MPH**
- **Elizabeth Platz, ScD, MPH**
- **Jonathan Samet, MD, MS**

Epidemiologic Research track: courses

- Four quarters (first 3 required, 4th optional for all but Epidemiology doctoral students).
- Focuses on research skills.
- Each course is M/W/F, with a lab exercise following lecture on M & W.
- Sequence uses a common set of studies and datasets for reference and in lectures and labs.
- Sequence parallels progression of Biostatistics series (620s).

Epidemiologic Research track: courses

- 1. Epidemiologic Methods I (340.751)**
- 2. Epidemiologic Methods II (340.752)**
- 3. Epidemiologic Methods III (340.753)**
- 4. Methodologic Challenges in
Epidemiologic Research (340.754) -
OPTIONAL**

Epidemiologic Research track: courses

Epidemiologic Methods 1 (340.751) – 1st quarter

- Explain the applicability of epidemiologic methods in biomedical and public health research
- Describe epidemiologic principles for investigating health and disease in populations
- Select, calculate, and interpret population health measures; and
- Apply causal reasoning to interpreting epidemiologic and other scientific evidence

Epidemiologic Research track: courses

Epidemiologic Methods 2 (340.752) – 2nd quarter

- Compare and contrast epidemiologic study designs and identify questions that can be appropriately answered with these different designs;
- Recognize and analyze the most important threats to validity; selection, information, and confounding bias;
- Address biases in the design and implementation of epidemiologic studies;
- Describe the role of randomization and how deviations from randomness can be approached

Epidemiologic Research track: courses

Epidemiologic Methods 3 (340.753) – 3rd quarter

- Link appropriate analytic models with public health research questions, epidemiologic study designs, and data structure;
- Conduct and interpret epidemiologic analyses using a range of multivariable models (including linear, logistic, Poisson, discrete- and continuous-time survival regression models);
- Understand considerations for model selection and validation
- Identify and critically evaluate different approaches to modeling complex exposures including dose-response relationships & time-varying exposures;

Methodologic Challenges in Epidemiologic Research (340.754)

- NOT required
- Integrates and extends material learned in first three courses.
- Focuses on the application of strategies for addressing key methodologic challenges that arise when carrying out epidemiologic research.

Methodologic Challenges in Epidemiologic Research

(340.754) – 4th quarter

- Identify complex methodologic problems in epidemiologic research, including missing data, bias, multilevel determinants of disease, multiple exposures
- Apply appropriate analytical tools to diagnose and account for complex problems
- Evaluate the sensitivity of an etiologic inference to possible bias due to complex methodologic problems

- **Will students in the Applied Epidemiology track be able to transfer into the Epidemiologic Research track mid-sequence?**

No. The 750 courses are designed as a series to build upon the previous terms.

- **Will students in the Epidemiologic Research track be able to transfer into the Applied Epidemiology track mid-sequence?**

Yes.

- **Can I skip Epi 751 and move directly to Epi 752?**

MPH students who have earned a **B or better** in Principles of Epi and are NOT in the Quantitative Methods concentration, can take 752 without completing 751.

We strongly encourage you to keep up with the 751 lectures and will provide access to the course website as a guest.

If you are in the Quantitative Methods concentration, you must enroll in Epi 751 in order to fulfill the concentration requirements.