

# **EPIDEM 100: Introduction to Epidemiology**

## **UCLA Fielding School of Public Health**

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Course website: TBA

Teaching Assistants: TBA

Office hours, are available on the course website.

***“...it is the knowledge about the way in which the disease is propagated which will cause them to disappear.”***

*- John Snow*

### ***Course Format***

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This course will be held entirely online, with the opportunity to meet with the professor and/or TAs over Zoom as needed. Students are expected to:

1. Complete the readings for each module before viewing the course material online.
2. Watch all lecture videos and supplemental materials for each module.
3. Take the quiz and/or complete the homework assignment for each lesson.

The class format will include lectures (videos), thought questions, homeworks, and quizzes/final exam as described below. The course website will show the steps students should follow in each module.

### ***Course Outline***

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Epidemiology is the systematic and rigorous study of health and disease in a population. The purpose of this course is to introduce you to core concepts in epidemiology as a foundation for further learning in the public health field. You will learn about several aspects of epidemiology and will discover and learn to apply analytical methods to study patterns of disease and injury. Upon learning concepts of inference, bias and confounding you will assess epidemiological associations and causation of disease. You will recognize how to apply these concepts to inform basic and clinical science as well as policy. The course requires problem-based learning of epidemiological concepts and methods, so you will be able to use epidemiology as a scientific tool for addressing the health needs of the community.

### ***Required readings***

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Readings will be listed on course website.

### ***Objectives***

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To familiarize you with how epidemiology contributes to:

1. The understanding of the causes and natural course of disease of all kinds,
2. The control of disease in human populations, and
3. Scientific judgment and inquiry in public health problems.

By successfully completing this course, you should be able to:

1. Discuss the role of epidemiology within the broader field of public health
2. Discuss the principles of disease prevention within populations
3. List and describe key terms used in the epidemiology and prevention of infectious disease
4. Calculate and interpret basic population measures of health and disease occurrence including incidence, prevalence, and survival
5. Make appropriate comparisons of disease rates within and between populations
6. Distinguish between basic measures of association, including rate ratio, risk ratio, incidence density ratio, odds ratio, attributable risk, and population attributable risk
7. Select and apply fundamental epidemiologic study designs including randomized clinical trial, cohort, case-control, and ecologic for the purpose of investigating public health problems
8. Identify the role of bias and confounding in epidemiologic research and apply methods appropriate to assessment of confounding and various types of bias
9. Differentiate between various epidemiologic study designs and compare their respective strengths and weaknesses
10. Critique published epidemiological studies and identify their strengths and weaknesses

**Association of Schools of Public Health (ASPH) competencies covered in class (epidemiology specific):**

After completion of this course, you should be able to:

1. Identify key sources of data for epidemiologic purposes.
2. Identify the principles and limitations of public health screening programs.
3. Describe a public health problem in terms of magnitude, person, time and place.
4. Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues.
5. Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data.
6. Apply the basic terminology and definitions of epidemiology.
7. Calculate basic epidemiology measures.
8. Communicate epidemiologic information to lay and professional audiences.
9. Draw appropriate inferences from epidemiologic data.
10. Evaluate the strengths and limitations of epidemiologic reports.

**Council on Education for Public Health Foundational Competencies for Bachelor's Degrees (epidemiology specific):**

1. You will develop the ability to locate, use, evaluate and synthesize public health information

**Class Schedule Class Schedule**

Week 1		
Video lectures	Readings	Homeworks
Epi 100 Introductory lecture	<a href="#">Chapter 1, "What is epidemiology?" in Foundations of Epidemiology, M. Bovbjerg.</a>	Individual homework due

		Saturday @ 11:59pm
Optional additional reading	Chapter 2, "Pioneers in Epidemiology and Public Health," in Epidemiology, An Introduction, K. Rothman. <a href="#">Available from the UCLA library</a> .	
Week 2		
Studying populations	<a href="#">Chapter 2, "Measures of Disease Frequency," in Foundations of Epidemiology, M. Bovbjerg.</a>  Ashengrau and Seage, Essentials of Epidemiology in Public Health "Definition of Primary, Secondary, and Tertiary Prevention," p 825-828. <a href="#">Reading available from the UCLA library</a> or on Canvas.  Chapter 2: "Dynamics of Disease Transmission", in Gordis Epidemiology, Elsevier. Reading available on Canvas.	Individual homework due Weds at 11:59pm.  Group Homework due Saturday @ 11:59pm
Age adjustment/ a.k.a. direct standardization	Gordis chapter 4, 75-81. Direct and indirect age adjustment. Reading available on Canvas.	
Week 3		
Overview of study designs	<a href="#">Chapter 4, "Introduction to 2 x 2 Tables, Epidemiologic Study Design, and Measures of Association" in Foundations of Epidemiology, M. Bovbjerg.</a>	Individual homework due Weds at 11:59pm.
Measures of association	Gordis, Chapter 4. Pages 64-75. Reading available on Canvas.	Group Homework due Saturday @ 11:59pm
Week 4		
Ecological studies	Ashengrau and Seage, Essentials of Epidemiology in Public Health "Cross-sectional studies," and "Ecological studies," p 352-361. <a href="#">Reading available from the UCLA library</a> or on Canvas.	Quiz
Intervention studies/ Clinical Trials	Gordis, "Assessing Preventive and Therapeutic measures: Randomized trials," p 138-154, in Gordis, Epidemiology, Elsevier. Reading available on Canvas.	
Week 5		
Cohort studies	Gordis, "Cohort studies," p 178-186, in Gordis, Epidemiology, Elsevier. Reading available on Canvas.	
Sources of Public Health Data	"Chapter 4: Data and disease occurrence," in Friis, Epidemiology 101, APHA Press. Reading available on Canvas or <a href="#">online, here</a> .	
Week 6		

Case-control studies	Chapter 10: “Case-control study designs”, p 189-208, in Gordis Epidemiology, Elsevier. Reading available on Canvas.	Individual homework due Weds at 11:59pm.  Group Homework due Saturday @ 11:59pm
Random error	<a href="#">Chapter 5, “Random Error,” in Foundations of Epidemiology, M. Bovbjerg.</a>	
Week 7		
Bias	<a href="#">Chapter 6, “Bias,” in Foundations of Epidemiology, M. Bovbjerg.</a>	Quiz
Week 8		
Confounding	Aschengrau and Seage, “Chapter 11: Confounding,” Essentials of Epidemiology in Public Health p 591-629. <a href="#">Reading available from the UCLA library</a> or on Canvas.	Individual homework due Weds at 11:59pm.
Effect Measure Modification	<a href="#">Chapter 8, “Effect Measure Modification,” in Foundations of Epidemiology, M. Bovbjerg.</a>	Group Homework due Saturday @ 11:59pm
Week 9		
Causal inference	<a href="#">Chapter 10, “Causality and Causal Thinking in Epidemiology,” in Foundations of Epidemiology, M. Bovbjerg.</a>  Aschengrau and Seage, “Hill’s guidelines for assessing causation,” Essentials of Epidemiology in Public Health p 786-795. <a href="#">Reading available from the UCLA library</a> or on Canvas.	
Screening	Friis, Epidemiology 101, p. 189-202, “Epidemiology and Screening for Disease.” Reading available on Canvas.	
Week 10		
Ethics	Friis, Epidemiology 101, Pages 181-183, “Ethics and epidemiology”. Reading available on Canvas.	Group project
Review of studies	<a href="#">Chapter 9, “Study designs revisited,” in Foundations of Epidemiology, M. Bovbjerg.</a>	
Finals week		
Final Exam	Will occur over Zoom. We will send a signup time later in the class.	

### ***Homeworks, weeks 1-4: Individual (13%) and Group (20% of grade)***

Each week you will have a homework assignment which is aimed for you to apply epidemiologic principles. Homeworks will be posted on the course website.

Homework directions:

- 1) Download the homework from Canvas and work through the problems on your own. Write succinct answers that include a brief explanation or statement of support.
- 2) Upload your individual homework answers to Canvas by Wednesday night of each week by midnight (PDF or Word copy accepted; 3 points). The individual homeworks will not be graded, but will be reviewed for completeness and effort. The Instructor will pull and review some homeworks each week to review student progress.
- 3) Discuss the case study questions with your small group. Reach a consensus on the answers, including the brief explanations or statements of support so the facilitator can submit the group's consensus answers.
- 4) Submit your group answers on Canvas. Grading will be based on the consensus answers.

The last week of class, students will be asked to assign points to their group members based on professionalism and contribution to group effort. The points that each student receives will factor into his/her final homework grades.

### ***Self-Assessment (4% for completing), incorporated into individual homeworks***

We regularly ask students to assess their learning progress and describe what pieces were good and what was challenging. This provides Dr. Heck with valuable feedback on your progress.

### ***Quizzes (30% of grade)***

Every other week, quizzes will address concepts. Questions will be short answer, multiple choice, calculations, and will ask you to show your work. Quizzes are closed book and must be done individually with no discussion with other students.

Students who cannot take quizzes due to extenuating circumstances should inform the instructor as soon as possible of the illness/situation. Extenuating circumstances are defined as severe personal illness (medical note required) or circumstances beyond the student's control.

### ***Final Project (12%) and critiquing other groups projects (1%)***

Each group will be asked to read and prepare a video presentation of an epi article.

### ***Final Examination (20% of grade)***

The final exam will be conducted via Zoom. We will have a sign-up time for the final, to be sent out later in the course.

The format of the exams will include multiple choice, true or false, short answer questions, as well as calculations and step-wise work through a 'real world' epidemiological problem. This is intended to assess your application of knowledge from required readings, lectures, discussions, and will be **cumulative**.

### ***Extra credit***

Each week students are asked to think up and submit one possible quiz question and their answers, based on that week's readings and lectures, by Wednesday night at 11:59pm. We will choose among the

best questions to add questions to the quizzes. If your question is chosen, you receive a small extra credit.

### ***Late work***

There is a 10% penalty for every 24 hours that homework or assignments are late. After 5 days you will receive a 0 for any late work. Late reviews will receive a grade of 0 unless there are extenuating circumstances.

### ***Grading Scale***

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A :	94-100	B+:	87-89	C+:	77-79	D+:	67-69
A-:	90-93	B :	83-86	C :	73-76	D :	63-66
		B-:	80-82	C-:	70-72	F :	<62

### ***Student Conduct Code***

The Student Conduct Code is a valuable and venerable tradition at UCLA. You are expected to honor this tradition in all of your work. Academic dishonesty includes honoring rules for not sharing work on exams and assignments. According to [Senate Regulation A-306](#), if I suspect a student of academic dishonesty, I am required to report this suspected incidence to [the Office of Student Conduct](#).

### ***Accessibility***

All lectures will be available in closed caption format.

Your success in this class is important to me. Please let the TAs or me know if there is anything we can do to help you better understand the materials in this course, and we will try to do it if we can. Work with us; together we can develop strategies to maximize your learning potential, your understanding of the course material, and your demonstration of that understanding.

### ***Students with Disabilities***

All students taking this class are valued and it is important to me that students with disabilities are appropriately accommodated. Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE) at (310)825-1501 or in person at Murphy Hall A255. In order to ensure accommodations, students need to contact the CAE within the first two weeks of the term.

### ***Title IX Resources***

UCLA prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, there are a variety of resources to assist you.

Confidential resources: You can receive confidential support and advocacy at the CARE Advocacy Office for Sexual and Gender-Based Violence, 1st Floor Wooden Center West, (310) 206-2465, [CAREadvocate@careprogram.ucla.edu](mailto:CAREadvocate@careprogram.ucla.edu) . Counseling and Psychological Services (CAPS) also provides confidential counseling to all students and can be reached 24/7 at (310) 825-0768.

Non-confidential resources: You can also report sexual violence or sexual harassment directly to the University's Title IX Coordinator, 2241 Murphy Hall, [titleix@conet.ucla.edu](mailto:titleix@conet.ucla.edu) , (310) 206-3417. Reports to

law enforcement can be made to UCPD at (310) 825-1491. These offices may be required to pursue an official investigation.