EPI 220: Principles of Infectious Disease Epidemiology

UCLA School of Public Health
https://ccle.ucla.edu/course/
Syllabus – Winter 2016

Course information

Time: Tuesdays and Thursdays 4-5:50 PM
Location: 33-105 CHS
Units:

Instructor: Roger Detels, MD, MS
Professor, Epidemiology and Infectious Diseases
UCLA Schools of Public Health and Medicine
71-269 CHS
Los Angeles, California 90095-1772
Office phone: (310) 206-2837
detels@ucla.edu
Office Hours: TA (Joshua Quint) TBD

Reading Selection

Supplemental reading will be available on the syllabus for individual lectures

COURSE OBJECTIVES:

After taking this course students will be able to:

1. Describe and understand the main epidemiological characteristics of the major infectious diseases of humans
2. Know the terms/vocabulary used to describe infectious agents and the natural history of infection by them
3. Understand the human immune system's response to infection by an infectious agent
4. Know epidemiological characteristics of infectious agents, such as incubation period, infectious period, means of transmission, and reservoir of these infectious diseases
5. Identify strategies used in the investigation of an existing or newly emerging or re-emerging infectious disease
6. Describe the objectives and methods used to investigate an outbreak
7. Describe how epidemiological characteristics can be utilized to develop and evaluate strategies to prevent epidemics or endemic transmission of the major infections of humans
8. Recommend effective interventions for the major infectious diseases
9. Understand the economic, social, and political impact of infectious diseases

Principles of Infectious Disease Epidemiology

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33-105 CHS

Please note that there may be occasions when scheduling changes need to be made. In addition, we cannot guarantee that PPT presentations will always be available online before class.

TEXTBOOK HOLD: The Biomed library currently has "Control of Communicable Diseases Manual" available to the class. Go to the reserves desk with your student ID for a 2-hour checkout period for this book. The library will purchase "Infectious Disease Epidemiology: Theory and Practice", so that probably won't be available until late January.

Tues Jan 5 (Wk 1)	History, Current Major Infectious Disease Problems	R. Detels
Thurs Jan 7 (Wk 1)	Classifications, Modes of Spread and Infection, and Properties of Agents	R. Detels
Tues Jan 12 (Wk 2)	The Human Immune Response	T. Rickabaugh
Thurs Jan 14 (Wk 2)	Geographic Information Systems	D. Morales
Tues Jan 19 (Wk 3)	HIV/AIDS	R. Detels
Thurs Jan 21 (Wk 3)	Sexually Transmitted Infections	J. Klausner
Tues Jan 26 (Wk 4)	Epidemiologists and Laboratory Science	N. Aziz
Thurs Jan 28 (Wk 4)	Surveillance & Transmission	R. Detels
Tues Feb 2 (Wk 5)	Emerging and Re-emerging Diseases	R. Detels
Thurs Feb 4 (Wk 5)	Respiratory Infections, Diarrhea and Influenza	R. Detels

Tues Feb 9	Wk 6	Tuberculosis	S. Shin
Thurs Feb 11		MID-TERM EXAMINATION	
Tues Feb 16	Wk 7	Viral Hepatitis A, B, and C	R. Detels
Thurs Feb 18		Modeling Infectious Diseases	R. Brookmeyer
Tues Feb 23	Wk 8	Staphlococci and Streptococci in the Context of Hospital-Associated Infections	S. Shafir
Thurs Feb 25		Malaria	F. Sorvillo
Tues Mar 1	Wk 9	Parasitic Diseases	L. Ash
Thurs Mar 3		Human Papilloma Virus and New Lab Testing	R. Detels
Tues Mar 8	Wk 10	Arboviral Diseases	R. Detels
Thurs Mar 10		Infectious Disease Interventions/Vaccines	R. Detels
TUESDAY Mar 15 **3-6 PM**		FINAL EXAMINATION	

Grading   Midterm exam = 33.3% of total grade if better than final
            Final exam   = 66.7% of total grade if worse than midterm; else, final grade only

Course Description

Infectious diseases remain a major cause of morbidity and mortality, especially in developing countries, and are the major cause in the countries of sub-Saharan Africa. Lower respiratory diseases and diarrhea are the leading causes of death in children in developing countries. Even developed countries are impacted by newly emerging and re-emerging infectious diseases such as HIV/AIDS, Ebola, and measles. This course presents the major characteristics of infectious diseases, strategies for control, and public health aspects of their occurrence and prevention. The biology and public health issues of currently important diseases and key infectious disease strategies, including surveillance and laboratory assessment, will be presented to the class. Student performance will be assessed by mid-term and final examinations. The course is required for epidemiology majors who do not have a medical background. Students are advised to have taken at least one course in epidemiology before enrolling.

Learning Objectives and Competencies

Upon completion of this course, you should be able to demonstrate the skills listed as "Course Learning Objectives" below. These learning objectives were selected to help you build competencies required for the MPH program (see http://ph.ucla.edu/current-students/programmatic-competencies).

COURSE LEARNING OBJECTIVES	HOW THESE LEARNING OBJECTIVES ALIGN WITH COMPETENCIES FOR SPECIFIC DEGREE PROGRAMS	
	MPH Core Competencies (for all MPH students)	EPI MPH Discipline-Specific Competencies (for MPH students in the EPI concentration)
1. Describe and understand the main epidemiological characteristics of the major infectious diseases of humans	F5. Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities. F14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.	D3. Describe a public health problem in terms of magnitude, person, time, and place. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. J1. Understand how to access, critique and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J3. Identify key sources of data for epidemiologic purposes. J4. Identify the principles and limitations of public health screening programs. J6. Calculate basic epidemiology measures.

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2. Know the terms/vocabulary used to describe infectious agents and the natural history of infection by them	F4. Collaborate with communication and informatics specialists in the process of design, implementation, and evaluation of public health programs. F5. Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities. F8. Engage in dialogue and learning from others to advance public health goals. F11. Articulate how biological, chemical and physical agents affect human health. F14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.	D3. Describe a public health problem in terms of magnitude, person, time, and place. D6. Apply the basic terminology and definitions of epidemiology. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D8. Communicate epidemiologic information to lay and professional audiences. D10. Evaluate the strengths and limitations of epidemiologic reports. J1. Understand how to access, critique and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J5. Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors. J6. Calculate basic epidemiology measures.
3. Understand the human immune system's response to infection by an infectious agent	F11. Articulate how biological, chemical and physical agents affect human health.	D3. Describe a public health problem in terms of magnitude, person, time, and place. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D8. Communicate epidemiologic information to lay and professional audiences. D10. Evaluate the strengths and limitations of epidemiologic reports. J1. Understand how to access, critique and interpret epidemiological studies, including their strengths and weaknesses.

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4. Know epidemiological characteristics of infectious agents, such as incubation period, infectious period, means of transmission, and reservoir of these infectious diseases	F8. Engage in dialogue and learning from others to advance public health goals. F11. Articulate how biological, chemical and physical agents affect human health.	D3. Describe a public health problem in terms of magnitude, person, time, and place. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D8. Communicate epidemiologic information to lay and professional audiences. D9. Draw appropriate inferences from epidemiologic data. J1. Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J3. Identify key sources of data for epidemiologic purposes. J4. Identify the principles and limitations of public health screening programs. J5. Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors. J6. Calculate basic epidemiology measures.

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5. Identify strategies used in the investigation of an existing or newly emerging or re-emerging infectious disease	F1. Understand the concepts of human subject protection and confidentiality. F2. Recognize ethical issues that arise in epidemiological research. F7. Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served. F13. Describe basic principles of ethical analysis (e.g., the Public Health Code of Ethics, human rights framework, other moral theories) as they relate to issues of public health practice and policy. F14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.	D2. Identify the principles and limitations of public health screening programs. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D9. Draw appropriate inferences from epidemiologic data. D10. Evaluate the strengths and limitations of epidemiologic reports. J1. Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J5. Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors. J6. Calculate basic epidemiology measures. J7. Draw appropriate inferences from epidemiologic data. J9. Behave in an ethical manner in the collection, maintenance, use and dissemination of epidemiologic data. J10. Identify, explain and apply epidemiologic principles and methods in a research, public health, or community setting.

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6. Describe the objectives and methods used to investigate an outbreak	F1. Understand the concepts of human subject protection and confidentiality. F2. Recognize ethical issues that arise in epidemiological research. F7. Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served. F14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.	D3. Describe a public health problem in terms of magnitude, person, time, and place. D5. Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D8. Communicate epidemiologic information to lay and professional audiences. D9. Draw appropriate inferences from epidemiologic data. D10. Evaluate the strengths and limitations of epidemiologic reports. J1. Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J5. Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors. J6. Calculate basic epidemiology measures. J8. Effectively communicate orally and in writing epidemiologic information to lay and professional audiences. J9. Behave in an ethical manner in the collection, maintenance, use and dissemination of epidemiologic data. J10. Identify, explain and apply epidemiologic principles and methods in a research, public health, or community setting.

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7. Describe how epidemiological characteristics can be utilized to develop and evaluate strategies to prevent epidemics or endemic transmission of the major infections of humans	F1. Understand the concepts of human subject protection and confidentiality. F2. Recognize ethical issues that arise in epidemiological research. F7. Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served. F11. Articulate how biological, chemical and physical agents affect human health.	D3. Describe a public health problem in terms of magnitude, person, time, and place D4. Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues. D6. Apply the basic terminology and definitions of epidemiology. D3. Describe a public health problem in terms of magnitude, person, time, and place. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D8. Communicate epidemiologic information to lay and professional audiences. D9. Draw appropriate inferences from epidemiologic data. D10. Evaluate the strengths and limitations of epidemiologic reports. J1. Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J4. Identify the principles and limitations of public health screening programs. J5. Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors. J6. Calculate basic epidemiology measures. J7. Draw appropriate inferences from epidemiologic data. J8. Effectively communicate orally and in writing epidemiologic information to lay and professional audiences. J9. Behave in an ethical manner in the collection, maintenance, use and dissemination of epidemiologic data. J10. Identify, explain and apply epidemiologic principles and methods in a research, public health, or community setting.

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	MPH Core Competencies (for all MPH students)	EPI MPH Discipline-Specific Competencies (for MPH students in the EPI concentration)
8. Recommend effective interventions for the major infectious diseases	F1. Understand the concepts of human subject protection and confidentiality. F2. Recognize ethical issues that arise in epidemiological research. F7. Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served. F11. Articulate how biological, chemical and physical agents affect human health. F14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.	D2. Identify the principles and limitations of public health screening programs D3. Describe a public health problem in terms of magnitude, person, time, and place D4. Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues. D6. Apply the basic terminology and definitions of epidemiology. D7. Calculate basic epidemiology measures. D9. Draw appropriate inferences from epidemiologic data. D10. Evaluate the strengths and limitations of epidemiologic reports. F8. Engage in dialogue and learning from others to advance public health goals. J1. Understand how to access, critique, and interpret epidemiological studies, including their strengths and weaknesses. J2. Describe a public health problem in terms of magnitude, person, time, and place. J3. Identify key sources of data for epidemiologic purposes. J4. Identify the principles and limitations of public health screening programs. J5. Apply the basic terminology and definitions of epidemiology, including definitions of populations, sources of bias, principles of causation for morbidity and mortality (both infectious and chronic), and risk and protective factors. J6. Calculate basic epidemiology measures. J7. Draw appropriate inferences from epidemiologic data. J8. Effectively communicate orally and in writing epidemiologic information to lay and professional audiences. J9. Behave in an ethical manner in the collection, maintenance, use and dissemination of epidemiologic data. J10. Identify, explain and apply epidemiologic principles and methods in a research, public health, or community setting.

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9. Understand the economic, social, and political impact of infectious diseases	F7. Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served. F11. Articulate how biological, chemical and physical agents affect human health. F14. Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health.	D2. Identify the principles and limitations of public health screening programs. D3. Describe a public health problem in terms of magnitude, person, time, and place. D4. Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues. D5. Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data. D9. Draw appropriate inferences from epidemiologic data. D10. Evaluate the strengths and limitations of epidemiologic reports. J1. Understand how to access, critique and interpret epidemiological studies, including their strengths and weaknesses. J3. Identify key sources of data for epidemiologic purposes. J7. Draw appropriate inferences from epidemiologic data.