University of Maryland School of Public Health

HLTH 301 – Epidemiology for Public Health Practice

Semester: Fall 2017
Classroom and Time: Online & weekly (mandatory) Discussion sections Thursday, 2-3:15 PM in SPH 1303
Instructor: Natalie Slopen, ScD MPH
Office: SPH Building, Room 2234DD
Hours by appointment
Phone: 301.405.6589
Email: nslopen@umd.edu
Supporting TA’s: Becky Scherwatzky: rscherwa@umd.edu; Jessica Goldstein: jgolds99@terpmail.umd.edu; Merritt Dermer, merrittdermer@gmail.com; Nicole Messina, nmessin1@gmail.com

Lead TA: Esther Choi
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Hours by appointment & Tuesdays 2-3:15 PM
Email: echoi124@umd.edu

Course Description: Epidemiology—the fundamental science underlying public health—is the study of the distribution and determinants of health and diseases at the population-level, including infectious and chronic diseases, mental disorders, community and environmental health hazards, and unintentional injuries. In contrast to medicine, which is the study of health at the individual level, epidemiology looks at the causes and outcomes of disease and health in groups of people. This course will introduce students to basic epidemiologic methods, and the application of epidemiologic research to public health practice. The subject matter is applicable to a variety of fields, such as health promotion, medicine and other health professions, communication, education, psychology, environmental health, sociology, and social work. The goal of the course is to enable students to become informed and intelligent consumers of epidemiologic literature and to provide a basis for further studies and careers in public health sciences and other related fields.

Course Pre- and Co-requisites: Required: HLTH 300 or EPIB 300, Biostatistics for Public Health Practice

Course Learning Objectives:
Upon completing this course, the student will be able to:
1. Discuss the epidemiologic or population perspective used in the study of health and disease;
2. Discuss the feasibility, strengths, and limitations of different study designs;
3. Identify key sources of epidemiologic data;
4. Define measures of disease occurrence including incidence, prevalence, morbidity, mortality;
5. Describe the distribution of disease in terms of person, place, and time;
6. Define measures of association including odds ratios and relative risk and describe concepts such as effect modification and confounding;
7. Discuss criteria for causality;
8. Discuss models of the natural history of disease;
9. Critically review published epidemiologic studies and assess their validity and generalizability;
10. Describe ethical issues regarding research and evaluation;
11. Understand the place of epidemiology in disease prevention and health promotion;

Program Competencies Addressed in this Course:
The following competencies for the Public Health Science program are addressed in this course:
1. Identify and describe core scientific concepts underlying disease prevention, environmental protection, and health promotion.
2. Identify and define public health problems from an ecological and interdisciplinary perspective.
3. Synthesize scientific knowledge to formulate solutions to public health problems.
Required Texts and Other Readings:


The book will be on reserve in the library.

Course Requirements and Structure:

This course schedule is organized by week. It is expected that you will be spending about **10 hours per week** completing the required course content. It is recommended that you work through the material in order. Required activities will include:

1. Weekly reading from the textbook: students are required to complete the reading assignments before attending the Thursday discussion section. The online lectures will not necessarily cover all materials included in the reading assignments.
2. Weekly online lectures and videos; online material will be released every Friday, at the latest.
3. Weekly brief online homework assignments (graded discussion or a short set of questions that will be completed via Elms, due Thursday at 11:59 PM) (15%);
4. Weekly (live) Discussion session (Thursdays, 2-3:15 PM) (5% participation grade);
5. Three written assignments (2 group work, 1 independent), specific instructions will be provided in Discussion sections. (10% each, 30% total)
   - Assignment #1: due Friday, Oct. 6th 11:59 PM
   - Assignment #2: due Friday, Nov. 3rd 11:59 PM
   - Assignment #3: due Friday, Dec. 1st 11:59 PM
6. Three tests (10% each, 30% total) and a final cumulative exam (20%).
   - Test 1: September 28th (10%)
   - Test 2: October 19th (10%)
   - Test 3: November 16th (10%)
   - Comprehensive Final Exam: Date TBD (20%)

Weekly content will become available each Friday (at the latest) and any homework assignments for that module are due the following Thursday at midnight. Ideally, you will have completed the weekly module BEFORE the Discussion section on Thursday, but we have the due date that evening in case you have clarifying questions to discuss that day. All tests will be taken during the Discussion section, and the cumulative final exam will be scheduled as part of the university final exam schedule. You will be provided one page of formulas for you to use during the tests and exam. Each course concept builds on the next and requires students to be actively engaged in readings and discussions activities. The weekly Discussion activities will focus on the practical applications of the course material, and opportunities for more in-depth discussion than possible online.
University Course Related Policies:

All University of Maryland-approved course policies are provided at the following website: [http://www.ugst.umd.edu/courserelatedpolicies.html](http://www.ugst.umd.edu/courserelatedpolicies.html)

Policy descriptions, resources, and links to official policy documents are provided for:

**Academic Integrity:** What is cheating? What is plagiarism? What is the Honor Pledge?

**Code of Student Conduct:** What behavior is prohibited?

**Sexual Misconduct:** What to do in case of sexual harassment or sexual assault.

**Discrimination:** Procedures to prohibit discrimination, complaints about discrimination, harassment, and retaliation.

**Accessibility:** Information about disability support services (DSS) and accommodations.

**Attendance, Absences, or Missed Assignments:** The student must notify the instructor in a timely manner (typically first week of class). Read this prior to Schedule Adjustment date.

**Student Rights Regarding Undergraduate Courses:** What should I find in the course syllabus? Am I allowed to see my exams after they are graded?

**Official UMD Communication:** Use of email, communication with faculty, communication about cancelled class meetings, and weather-related or other urgent notifications.

**Mid-Term Grades:** Provided for 100 and 200 level courses, and all student athletes.

**Complaints About Course Final Grades:** Questions about course grades should first be addressed to the course instructor.

**Copyright and Intellectual Property:** Who owns the work that I produce in class?

**Final Exams:** Final exams are scheduled by the University.

**Course Evaluations:** The School of Public Health is committed to the use of student course evaluations for improving the student experience, course and curriculum delivery, and faculty instruction.

**Campus Resources:** ELMS, counseling, learning workshops, tutoring, writing help, questions about graduation, adding or dropping classes, withdrawing from the semester, etc.

Other Course Policies:

a) **Absence policy for weekly Discussion section:** In accordance with University policy if you are absent for a single (1) Discussion due to illness or some form of personal or family emergency, this absence will be considered “excused” and the instructor/TA will accept a note from you attesting to the date of the illness/incident, along with an acknowledgement that the information is true. Whenever feasible, you should try to contact the instructor/TA in advance. Multiple or prolonged absences, and absences that prevent attendance at a major scheduled grading event (like an exam or test) will require written documentation from an appropriate health care provider/organization. See: [http://www.president.umd.edu/policies/v100g.html](http://www.president.umd.edu/policies/v100g.html)

b) **Late homework questions and assignments:** Extensions for homework and assignments will only be in the case of personal emergency (e.g., illness, death in the family), and will require appropriate documentation. If you find yourself in this position, please contact the instructor or TA before the deadline to discuss alternative arrangements.

c) **Missed tests or exams:** There are no makeups for tests or exams, with the exception of documented medical excuses or personal emergencies to be discussed in advance with the Instructor. If you are ill or need to reschedule a test or exam for some other reason, please notify the instructor in advance by
email so arrangements can be made. Make-up tests or exams will be considered only for those students who have a legitimate reason for absence and provide written documentation to substantiate their absence. Otherwise, no accommodation will be made, to be fair to all students.

d) Inclement Weather / University Closings / Emergency Procedures:
In the event that the University has a delayed opening or is closed for an emergency or extended period of time, the instructor will communicate to students regarding schedule adjustments, including rescheduling of examinations and assignments due to inclement weather and campus emergencies.

e) Copyright Notice:
Class lectures and other materials are copyrighted by me, the course instructor. This includes all tangible course materials, including but not limited to written or recorded lecture, PowerPoint presentations, handouts, tests, and other assignments. These materials may not be reproduced (e.g. students may not copy and distribute these materials) for anything other than personal use without my permission.

Available Support Services:

Public Health Librarian:
Need help using the University Libraries? Subject specialist librarians are here for you! How can your librarian help you? Provide one-on-one research assistance online, in-person, or over the phone and help identify gaps in the literature when you’re planning a research project: http://lib.guides.umd.edu/PublicHealth

Writing Center:
To help you with writing assignments, peer consultants are available in the Writing Center, 1205 Tawes Hall. The consultants can help you with all aspects of your writing process, from generating ideas to organizing your thoughts to revising your prose. Check the website for current semester hours. Daytime hours include both appointments and walk-in (call 301-405-3785 for a 30 or 60 minute appointment), while evening hours are walk-in only. To make an appointment, go to umd.mywconline.com. The Writing Center also maintains limited walk-in hours in 2101 McKeldin Library.

Other Resources:
The University of Maryland and the School of Public Health offer a wide variety of resources and services for students. These are both personal and academic. A list can be found here.

Grading Procedures:

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<thead>
<tr>
<th>Graded Assignment</th>
<th>Percent of Grade</th>
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<tbody>
<tr>
<td>Tests (3)</td>
<td>30%</td>
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<tr>
<td>Exam (1)</td>
<td>20%</td>
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<tr>
<td>Assignments (3)</td>
<td>30%</td>
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<tr>
<td>Online homework sets* (1% each)</td>
<td>15%</td>
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<tr>
<td>Discussion Session Participation</td>
<td>5%</td>
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*Number of homework question sets is subject to change.

Course grade will be assigned as follows:

A+ 100 – 97 %  A 96.9 – 93 %  A- 92.9 – 90 %
B+ 89.9 – 87 %  B 86.9 – 83 %  B- 82.9 – 80 %
C+ 79.9 – 77 %  C 76.9 – 73 %  C- 72.9 – 70 %
D+ 69.9 – 67 %  D 66.9 – 63 %  D- 62.9 – 60 %
F < 60 %
<table>
<thead>
<tr>
<th>Week</th>
<th>Week of...</th>
<th>Topic</th>
<th>HW &amp; Assignments</th>
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</table>
| 1    | 8/28       | Introduction to epidemiology  
History and uses of epidemiology  
**No Thursday Discussion group this week** | HW #1 (due Friday) |
| 2    | 9/4        | Epidemiological sampling and data presentation  
Epidemiological measurements  
Thursday: Introductions & Case study activity | HW #2  
HW #3 |
| 3    | 9/11       | Data sources  
Descriptive epidemiology I & II  
Thursday: Introduction & work on Assignment #1 | HW #4  
HW #5 |
| 4    | 9/18       | Types of associations  
Establishing causality in epidemiology I & II  
Thursday: Case study activity & review for Test 1 | HW #6  
HW #7 |
| 5    | 9/25       | Online review activities  
Thursday: Test #1 | |
| 6    | 10/2       | Introduction to epidemiologic study, Ecological & Cohort studies  
Case control studies  
Thursday: Case study activity & Introduction of Assignment #2 | Assignment #1 due |
| 7    | 10/9       | Experimental studies  
Study validity and confounding  
Thursday: Review for Test #2 | HW #9  
HW #10 |
| 8    | 10/16      | Online review activities  
Thursday: Test #2 | |
| 9    | 10/23      | Epidemiology and policy  
Thursday: Case study activity | HW #11 |
| 10   | 10/30      | Screening  
Thursday: Introduce Portfolio Assignment & Case study activity | Assignment #2 due |
| 11   | 11/6       | Infectious disease epidemiology  
Thursday: Review for Test #3 | HW #13 |
| 12   | 11/13      | Online review activities  
Thursday: Test #3 | |
| 13   | 11/20      | Thanksgiving week: Work on Portfolio Assignment #3  
Thursday: No section this week (Thanksgiving) | |
| 14   | 11/27      | Outbreak investigation  
Thursday: Case study activity | HW #14  
Assignment #3 due |
| 15   | 12/4       | Social epidemiology  
Thursday: Review for final exam | HW #15 |
<table>
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<tr>
<th>Week</th>
<th>Beginning...</th>
<th>Topic</th>
<th>Assignments (Due Thursday, 11:59 PM)</th>
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</thead>
</table>
| #1   | Aug. 28th   | Introduction, history, and uses of epidemiology  
Readings: Syllabus & Friis Chapter 1 | HW#1  
(due Friday, 11:59 pm) |

Learning Objectives:
- The definition of epidemiology
- Key characteristics of the discipline
- Important figures in the history of epidemiology
- The contemporary era of epidemiology
- Describe uses of epidemiology (historical, community health, health services, risk assessment, disease causality)

Program Competencies: 1, 2  
Course objectives addressed: 1,11,12

<table>
<thead>
<tr>
<th>Week #1 Section</th>
<th>No section this week</th>
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<tr>
<td>#2</td>
<td>Sept. 4</td>
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</table>
|               | Epidemiologic sampling and data presentation, and measurements  
Reading: Friis Chapters 2 and 3 | HW #2  
HW #3 |

Learning Objectives:
- Understand epidemiologic sampling methods
- Graphic presentation of epidemiologic data
- Rate, incidence, prevalence
- Difference between incidence and prevalence
- Epidemiologic measures related to morbidity and mortality (crude, specific, and adjusted rates; case fatality ratio; proportional mortality ratio)

Program Competencies: 1,2  
Course objectives addressed: 1,2,3,4

<table>
<thead>
<tr>
<th>Week #2 Section</th>
<th>Case study activity: ratios, proportions, and rates</th>
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<tbody>
<tr>
<td>#3</td>
<td>Sept. 11th</td>
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|               | Data sources & Introduction to Descriptive Epi  
Reading: Friis: Chapter 4 and 5 | HW #4  
HW #5 |

Learning Objectives:
- Factors that affect the quality of epidemiologic data
- Data sources that are used in epidemiologic research
- Life expectancy
- Death and birth rates
- Define the term descriptive epidemiology
- Types of descriptive epidemiologic studies and their uses
- The process of epidemiologic inference in the context of descriptive epidemiology
- Examples of person, place, and time variables and how they relate to the distribution of health outcomes

Program Competencies: 1,2  
Course objectives addressed: 1,2,3,4,5

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<thead>
<tr>
<th>Week #3 Section</th>
<th>Introduction of Assignment #1</th>
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<tr>
<td>#4</td>
<td>Thursday, Sept. 14th</td>
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|               | Types of associations & Establishing causality  
Reading: Friis Chapter 6 | HW #6  
HW#7 |

Learning Objectives:
- Terminology for analytic epidemiology
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<th>Week</th>
<th>Beginning...</th>
<th>Topic</th>
<th>Assignments (Due Thursday, 11:59 PM)</th>
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</table>
|      |              | • Methods for displaying data graphically (scatter plots, contingency tables)  
• Epidemiological research strategies  
• Criteria of causality  
• Counterfactuals  
• How chance affects epidemiologic associations | | |

Program Competencies: 1,2  
Course objectives addressed: 1,2,3,4,5,7

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<tr>
<th>Week #4 Section</th>
<th>Case study activity &amp; Review for Test #1</th>
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<tbody>
<tr>
<td>#5</td>
<td>Case study activity &amp; Review for Test #1</td>
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<td></td>
<td>#5</td>
<td>Sept. 25&lt;sup&gt;th&lt;/sup&gt;</td>
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<tr>
<th>Week #5 Section</th>
<th>Test #1</th>
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<td>#6</td>
<td>Test #1</td>
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|                  | #6      | Tuesday, Oct. 2<sup>nd</sup> | Epidemiologic study designs: ecological, cohort, and case-control studies  
Reading: Friis Chapter 7, p147-157 |

Learning Objectives:  
• Characteristics that differentiate epidemiologic study designs  
• Ecologic studies  
• Cohort studies  
• Calculating relative risk and attributable risk within cohort studies  
• Characteristics of case-control studies  
• How to decide between different observational design options  
• How to calculate odds ratios within case-control studies

Program Competencies: 1  
Course objectives addressed: 1,2,3,6,7,9

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<tr>
<th>Week #6 Section</th>
<th>Case study activity &amp; Introduction of Assignment #2</th>
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<td>#7</td>
<td>Case study activity &amp; Introduction of Assignment #2</td>
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|                  | #7                                                | Oct. 9<sup>th</sup> | Intervention/experimental studies & Study validity and confounding  
Reading: Friis Chapter 7, p158—162 |

Learning Objectives:  
• Describe experimental/intervention studies  
• Randomized controlled trials  
• Quasi-experimental designs  
• Appropriate uses of randomized controlled trials and quasi-experimental designs  
• Key principals of human subjects research and ethical dilemmas  
• Threats to validity of study designs (internal validity, external validity, bias)  
• Definition and characteristics of confounding

Program Competencies: 1  
Course objectives addressed: 1,2,3,6,7,9

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<tr>
<th>Week #7 Section</th>
<th>Case study activity &amp; Review for Test #2</th>
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<tr>
<td>#8</td>
<td>Case study activity &amp; Review for Test #2</td>
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<td>#8</td>
<td>Oct. 18&lt;sup&gt;th&lt;/sup&gt;</td>
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<th>Week #8 Section</th>
<th>Test #2</th>
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<td>#9</td>
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|                  | #9      | Oct. 23<sup>rd</sup> | The role of epidemiology for healthy policy  
Reading: Friis Chapter 8 |

Learning Objectives:  
• “Health policy” and the role of epidemiologists

Program Competencies: 1  
Course objectives addressed: 1,2,3,6,7,9
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<th>Week</th>
<th>Beginning...</th>
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<th>Assignments (Due Thursday, 11:59 PM)</th>
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<tr>
<td></td>
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<td>• Steps involved in risk assessment</td>
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<td>• Introduction to disease screening</td>
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<td>Program Competencies: 1, 2, 3 Course objectives addressed: 1, 2, 11</td>
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**Week #9 Section**

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<thead>
<tr>
<th>#10</th>
<th>Oct. 30th</th>
<th>Screening</th>
<th>HW #12 Assignment #2</th>
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<td>Reading: Friis Chapter 9</td>
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Learning Objectives:
- Concepts of reliability and validity as they relate to disease screening (including sensitivity and specificity)
- Policy implications of disease screening
Program Competencies: 1, 2, 3 Course objectives addressed: 1, 10, 11

**Week #10 Section**

<table>
<thead>
<tr>
<th>#11</th>
<th>Nov. 6th</th>
<th>Infectious disease epidemiology</th>
<th>HW #13</th>
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<tr>
<td></td>
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<td>Reading: Friis Chapter 10, p 207-227</td>
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Learning Objectives:
- The “epidemiologic triangle” (agent, host, environment)
- Modes of transmission of communicable diseases
- Examples of significant infectious diseases
Program Competencies: 1, 2, 3 Course objectives addressed: 1, 2, 4, 5, 7, 8, 11

**Week #11 Section**

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<thead>
<tr>
<th>#12</th>
<th>Nov. 13th</th>
<th>Case study activity &amp; Review for Test #3</th>
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<td>Online review activities</td>
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**Week #12 Section**

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<tr>
<th>#13</th>
<th>Nov. 20th</th>
<th>Thanksgiving week: Work on portfolio assignments</th>
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<td>Cancelled due to Thanksgiving</td>
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**Week #13 Section**

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<thead>
<tr>
<th>#14</th>
<th>Nov. 27th</th>
<th>Infectious disease outbreak investigations</th>
<th>HW #14 Assignment #3</th>
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<tr>
<td></td>
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<td>Reading: Friis Chapter 10, p 228-230</td>
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Learning Objectives:
- Procedures for investigating infectious disease outbreaks
Program Competencies: 1, 2, 3 Course objectives addressed: 1, 2, 4, 5, 7, 8, 11

**Week #14 Section**

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<tr>
<th>#15</th>
<th>Dec. 4th</th>
<th>Infectious disease outbreak investigation case study</th>
<th>HW #15</th>
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<tr>
<td></td>
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<td>Social epidemiology</td>
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<td>Reading: Friis Chapter 11</td>
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Learning Objectives:
- Define social and behavioral epidemiology
- Role of stress for health and disease
- Policy implications of the “social determinants of health” framework
Program Competencies: 1, 2, 3 Course objectives addressed: 1, 2, 3, 5, 9, 10, 11

**Week #15 Section**

<table>
<thead>
<tr>
<th>#16</th>
<th>Dec. 11th</th>
<th>Review for cumulative final exam</th>
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