

# PUBH 6320, SECTIONS 01-03

Fundamentals of Epidemiology  
Fall 2019

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## COURSE & CONTACT INFORMATION

**Credits:** 3

**Meeting Day(s):** Tuesdays and Thursdays

**Meeting Time:** 3:35-5:30pm

**Lecture (Tuesday) Meeting Place:** Jackson Hall 2-137

**Lab (Thursday) Meeting Places:** Mayo D199 and Jackson Hall 2-137

**Instructor:** Rachel Widome, PhD, MHS

**Email:** widome@umn.edu

**Office Hours:** Tuesdays 2-3pm in room MoosT 5-125

**Office Location:** West Bank Office Building (WBOB - <http://campusmaps.umn.edu/west-bank-office-building>), Room 341

**Teaching assistants (TAs):** Tess Peterson, MPH ([pete9123@umn.edu](mailto:pete9123@umn.edu)) and Laura Houghtaling, MPH ([andre480@umn.edu](mailto:andre480@umn.edu))

**TA office hours start week of 9/9, time and place TBD**

## COURSE DESCRIPTION

Welcome to PubH 6320, Fundamentals of Epidemiology! This course will provide you with an understanding of the basic methods and tools used by epidemiologists to study population health. As you will soon discover, epidemiologists define health broadly and the types of questions we try to answer are varied. Epidemiology is applicable to many areas...

This course was designed for graduate students who are not majoring in epidemiology and for most of you this will be the only course on epidemiology methods that you will take during your degree program. We know you probably are not aiming to work as an epidemiologist when you finish your studies here. However, for anyone working in public health or in an area that contributes to the promotion of health among populations, a basic proficiency in the methods of epidemiology will enhance your effectiveness. Our goal is for you to be able to understand the language of epidemiology and its basic concepts, be able to interpret epidemiologic findings critically and communicate them to colleagues who may not be public health specialists, and to be able to navigate data sources. I hope that by the end of this course, you will have developed an excitement for the subject, will appreciate the relevance of epidemiology to your own discipline, and can see how it is part of our everyday lives as public health professionals.

I will cover similar ground as the introductory course taken by epidemiology majors (PubH 6341), but we will go into a bit less depth on most topics than the PubH 6341. I would encourage those who think they may be serious about being a practicing epidemiologist to instead consider taking PubH 6341, available this semester, in addition to other following courses in the Epi Methods series. Alternatively, if PubH 6320 surprises you and whets your appetite for the discipline, do not fret! You may continue on to PubH 6342 (Epi Methods II) if you earn at least an A- in PubH 6320 and at least a B- in a Biostatistics class. Please note: if you think you might want to continue even further with Epi Methods III, you will need to take additional courses in Biostatistics.

## COURSE PREREQUISITES

No specific course prerequisites are required, but students must be registered in graduate programs in the Academic Health Center. Graduate students in programs outside of the Academic Health Center may enroll with the instructor's consent.

## COURSE GOALS & OBJECTIVES

In this course, we will have 15 lectures, 11 lab exercises. The learning objectives are to:

1. Describe the general history of development of epidemiology
2. Describe natural history of disease
3. Calculate measures of disease frequency

4. Calculate measures of excess risk
5. Make appropriate comparisons by person, place, time
6. Identify and interpret data from existing national and international sources and understand strengths and limitations of each source
7. Describe each of the main study designs and understand the strengths and limitations of each design
8. Identify different sources of bias and the effect of bias on interpretation of measures of excess risk
9. Interpret study results
10. Describe conditions suitable for screening; evaluate validity and reliability of screening tests
11. Review and critically evaluate the scientific literature
12. Make appropriate causal inference
13. Identify potential confounders in various scenarios and understand how they can interfere with validity
14. Understand the phenomenon of effect modification and its relevance in exposure-disease relationships
15. Critically evaluate how epidemiologic evidence is translated into public health action

## METHODS OF INSTRUCTION AND WORK EXPECTATIONS

### Teaching Methods

This course has two components—lecture (Tuesdays, most of the time) and lab (Thursdays, most of the time).

### Course Atmosphere

Students come to this class from various backgrounds and this is a strength of our class community. In Fundamentals of Epidemiology, we will ask you to maintain an open mind to the differences around you, and we encourage you to place positive value on those differences. Although we may disagree on a particular point, we will strive to be respectful to each other.

In epidemiology, it is often the case that there is not necessarily a right answer or a single approach to a research question. Sometimes, we must choose among various alternatives the one that would seem to be most appropriate for the problem posed. We choose the best answer, given the situation, although it is not necessarily the only answer. This can be particularly aggravating for students, who might prefer that all questions have straightforward answers. Because epidemiology is immersed in the gray areas of human health and behavior, students sometimes pose questions that are challenging for your instructor and TAs to answer definitively or immediately. We also expect that some of you will come up with answers that had not occurred to us. We welcome such an exchange of ideas and look forward to learning from you!

### Course Communication

We would like to encourage communication. We will be taking advantage of the course website to keep you updated about course matters.

To reach Rachel: E-mail is the best and fastest way! Please feel free to contact me regarding any questions or concerns relating to the course that you may have. I will hold regular, weekly office hours on the East Bank. I can also be available to meet with you in person by appointment. If you happen to stop by the WBOB, feel free to pop into my office and we can chat if time allows.

To reach the TAs: The best way to reach the TAs is via email. The TAs will also hold regular office hours. You may inquire about times that they would be available to meet with you outside of office hours if their office hours do not work for your schedule.

Rachel and the TAs will also occasionally communicate with the class through umn.edu e-mail. **It is a requirement of this class that you check your umn.edu e-mail account at least once a day Monday through Friday.**

The instructor and TAs meet on a weekly basis to coordinate teaching efforts and discuss any concerns related to the course. Please feel free to communicate about issues that you think we need to discuss at our weekly meeting.

### What to expect in the lab

Lab sessions will primarily utilize a cooperative learning teaching strategy. In cooperative learning, students work as a team to discuss topics and improve their understanding of material. Each team member is responsible for learning what is taught and helping their fellow teammates learn. Working as a team is relevant to your training because tackling public health issues and problems frequently involves working in interdisciplinary teams to arrive at a solution. The TAs will provide assistance as needed and facilitate discussion for selected problems.

We will establish groups at the first lab session, consisting of 3-4 students each. This will be your lab group for the entire semester. In addition to working on the specific group-oriented assignments in this course, we encourage you to use your group for support on other aspects of the course as well. For example, you might study together prior to exams or communicate via e-mail to complete lab

exercises. Many of the professional activities and projects in your career will involve group collaboration. Accordingly, the laboratory exercises are intended to be completed as a group to enhance your public health collaboration skills. We also believe that group support and learning are integral to getting the most from these assignments. Groups provide:

- a broader perspective and a larger experience and expertise base for completing the assignment
- an opportunity to subdivide responsibilities for completing the assignment
- an opportunity to utilize specific abilities of individuals in the group in a complementary way
- an opportunity to learn from each other

During each lab session, students will work in their groups to complete the weekly lab exercise that corresponds to that week's lecture. Only one exercise per group will be turned in to the TA and everyone in the group will receive the same score.

Lab procedures:

#### **Prior to lab**

- The group will be responsible for dividing the upcoming exercise into assignments for each group member.
- Each group member skim the entire exercise prior to lab.
- Each group member will take a closer look at the section of lab they were assigned before lab, perhaps having roughed out some answers that can be a starting point for group-work on the problems in lab.

#### **During lab**

- For the first 15-20 minutes of the lab, the TA will review material from lecture and answer questions.
- During the next 60-90 minutes, group members will go over each section of the lab, work through answers, make adjustments, and collate answers. This is an opportunity to teach each other about each assigned lab section. A final lab exercise is due by 7pm the following Tuesday.
- During the last ~15 minutes, the TA will hand out graded assignments from the previous week and review the answers.

Grading of the weekly lab assignment:

Your attendance in lab is essential for effective group participation. For each lab session attended, you will receive 3 points. **If you do not attend lab, you will lose all 3 attendance points for that lab, regardless of the reason for your absence.** Each completed lab report, that your lab hands in as a team, is worth up to 10 points, depending on the quality of the answers; and there is one grade given to the whole lab group. In grading, we believe the process is an important part of what you learn from the exercises. Your group will need to turn in its completed lab **by 7pm on the Tuesday after the lab section was held.**

If you must miss a lab, as previously mentioned, you will lose the 3 points for attendance. But you can still get points for completing the lab exercise if you complete it in its entirety and hand it in **by 7pm on the Tuesday after the lab section was held.** In this case your lab will be graded individually.

Rarely, a group member does not contribute to the lab exercise. If this is brought to the attention of the TA, the TA or instructor will first discuss the matter with the student. If the problem persists, the TA may opt to grade each member's lab assignment individually.

Points will be subtracted from assignments that are handed in late.

## **COURSE TEXT & READINGS**

All course-related materials (except the text) may be downloaded from the Moodle site: <https://ay18.moodle.umn.edu/my/>

Our required text is:

**Essentials of Epidemiology in Public Health, 4th Edition** by Ann Aschengrau and George R. Seage III, published by Jones and Bartlett (<http://www.jbpub.com>), Copyright 2018 (ISBN-13: 9781284028911). You may also find earlier editions of the text. Please note that if you are using an earlier edition, the page numbers I communicate may not align with your version and there may be parts of the text have been since modified or enhanced in the latest (4<sup>th</sup>) edition.

The text provides a general overview of epidemiologic principles and will be a useful resource throughout your career. Students may find other texts to be helpful for understanding the concepts.

## COURSE OUTLINE/WEEKLY SCHEDULE

<b>Week</b>	<b>Tuesday (lectures)</b>	<b>Readings</b>	<b>Thursday (labs and assessments)</b>
<b>Week 1:</b> Sept 3 & 5	<ul style="list-style-type: none"> <li>• Introduction to epidemiology and causality</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 1 &amp; 15</li> </ul>	<ul style="list-style-type: none"> <li>• Causality lab</li> </ul>
<b>Week 2:</b> Sept 10 & 12	<ul style="list-style-type: none"> <li>• Measures of disease frequency</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 2</li> </ul>	<ul style="list-style-type: none"> <li>• Measures of disease frequency lab</li> </ul>
<b>Week 3:</b> Sept 17 & 19	<ul style="list-style-type: none"> <li>• Measures of excess risk</li> </ul>	<ul style="list-style-type: none"> <li>• pg 57-69</li> </ul>	<ul style="list-style-type: none"> <li>• Measures of excess risk lab</li> </ul>
<b>Week 4:</b> Sept 24 & 26	<ul style="list-style-type: none"> <li>• Descriptive epidemiology</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 4 &amp; 5</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive epidemiology lab, online qualitative research module</li> </ul>
<b>Week 5:</b> Oct 1 & 3	<ul style="list-style-type: none"> <li>• Confounding</li> </ul>	<ul style="list-style-type: none"> <li>• pg 295-301</li> </ul>	<ul style="list-style-type: none"> <li>• Confounding lab</li> </ul>
<b>Week 6:</b> Oct 8 & 10	<ul style="list-style-type: none"> <li>• Rate adjustment</li> </ul>	<ul style="list-style-type: none"> <li>• pg 69-72</li> </ul>	<ul style="list-style-type: none"> <li>• Exam 1</li> </ul>
<b>Week 7:</b> Oct 15 & 17	<ul style="list-style-type: none"> <li>• Selection and information bias</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 10</li> </ul>	<ul style="list-style-type: none"> <li>• Rate adjustment lab</li> </ul>
<b>Week 8:</b> Oct 22 & 24	<ul style="list-style-type: none"> <li>• Study design overview</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 6</li> </ul>	<ul style="list-style-type: none"> <li>• Bias lab</li> </ul>
<b>Week 9:</b> Oct 29 & Oct 31	<ul style="list-style-type: none"> <li>• Experimental studies</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 7</li> </ul>	<ul style="list-style-type: none"> <li>• Experimental studies lab</li> </ul>
<b>Week 10:</b> Nov 5 & 7	<ul style="list-style-type: none"> <li>• Cohort studies</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 8</li> </ul>	<ul style="list-style-type: none"> <li>• Cohort studies lab</li> </ul>
<b>Week 11:</b> Nov 12 & 14	<ul style="list-style-type: none"> <li>• Case control studies</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 9</li> </ul>	<ul style="list-style-type: none"> <li>• Exam 2</li> </ul>
<b>Week 12:</b> Nov 19 & 21	<ul style="list-style-type: none"> <li>• Infectious disease epidemiology</li> </ul>	<ul style="list-style-type: none"> <li>• TBD</li> </ul>	<ul style="list-style-type: none"> <li>• ID/screening lab</li> </ul>
<b>Week 13:</b> Nov 26	<ul style="list-style-type: none"> <li>• Screening</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 16</li> </ul>	~THANKSGIVING BREAK~
<b>Week 14:</b> Dec 3 & 5	<ul style="list-style-type: none"> <li>• Effect modification</li> </ul>	<ul style="list-style-type: none"> <li>• Ch 13</li> </ul>	<ul style="list-style-type: none"> <li>• Effect modification lab</li> </ul>
<b>Week 15:</b> Dec 10	<ul style="list-style-type: none"> <li>• Translating epidemiology</li> </ul>	<ul style="list-style-type: none"> <li>• TBD</li> </ul>	

## SPH AND UNIVERSITY POLICIES & RESOURCES

The School of Public Health maintains up-to-date information about resources available to students, as well as formal course policies, on our website at [www.sph.umn.edu/student-policies/](http://www.sph.umn.edu/student-policies/). Students are expected to read and understand all policy information available at this link and are encouraged to make use of the resources available.

The University of Minnesota has official policies, including but not limited to the following:

- Grade definitions
- Scholastic dishonesty
- Makeup work for legitimate absences
- Student conduct code
- Sexual harassment, sexual assault, stalking and relationship violence
- Equity, diversity, equal employment opportunity, and affirmative action
- Disability services
- Academic freedom and responsibility

Resources available for students include:

- Confidential mental health services
- Disability accommodations
- Housing and financial instability resources
- Technology help
- Academic support

## EVALUATION & GRADING

Grading will be based on your test scores, lab attendance and completion of lab exercises. We plan to give three in-person examinations—two midterms and a final. The final examination will be comprehensive in that each topic builds on the previous so that by the end of the course you will be asked to demonstrate your skill in integrating the methods you have been taught.

Examinations utilize an open-book, open-note format. You must work on them by yourself, no consulting with peers or others, by text, IM, e-mail or otherwise is permitted. Bring a calculator. Use of pencils with erasers is strongly encouraged. The examinations will lean heavily toward application of the concepts which require critical thinking, as opposed to memorization of the subject matter. For questions involving calculations, we will give partial credit if you show your work even if you get the wrong answer.

I keep the graded exams—you are welcome to come to my office to check out your exam for personal perusal.

**\*\*Extra Credit\*\*** Students may earn up to 2% extra credit by participating in the weekly 1-minute paper. At the end of the lecture before leaving class, students who turn in a 1-minute paper will earn one extra point. The 1-minute paper consists of two parts: 1) name one new concept that you learned that day, and 2) list one question that you have about that day's lecture. Both parts must be included to earn 1 point. Comments and criticisms about the lecture do not count for extra credit. Only one 1-minute paper per lecture will be counted for extra credit. 1-minute papers will only be accepted in class on lecture day. If you miss lecture, you cannot submit a 1-minute paper. I will answer some of the most useful questions posed, and will distribute the questions and answers to the class via the class website.

Below is a list of the activities by which you will be graded and their assigned weights:

Activity	Date/time given	Percent of grade
Exam 1	October 10	20%
Exam 2	November 14	25%
Final Exam	December 17 – 10:30am-12:30pm	30%
Lab participation	Per lab schedule	10%
Lab group exercises	Due at 7pm on the Tues. following lab	15%
Extra credit	After each lecture, 1-minute paper	2% maximum extra

### Grading Scale

The University uses plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following, and you can expect the grade lines to be drawn as follows:

% In Class	Grade	GPA
93 - 100%	A	4.000
90 - 92%	A-	3.667
87 - 89%	B+	3.333
83 - 86%	B	3.000
80 - 82%	B-	2.667
77 - 79%	C+	2.333
73 - 76%	C	2.000
70 - 72%	C-	1.667
67 - 69%	D+	1.333
63 - 66%	D	1.000
< 62%	F	

- A = achievement that is outstanding relative to the level necessary to meet course requirements.
- B = achievement that is significantly above the level necessary to meet course requirements.
- C = achievement that meets the course requirements in every respect.
- D = achievement that is worthy of credit even though it fails to meet fully the course requirements.
- F = failure because work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I (Incomplete).
- S = achievement that is satisfactory, which is equivalent to a C- or better
- N = achievement that is not satisfactory and signifies that the work was either 1) completed but at a level that is not worthy of credit, or 2) not completed and there was no agreement between the instructor and student that the student would receive an I (Incomplete).

#### **Grade Option Change (if applicable)**

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at [onestop.umn.edu](http://onestop.umn.edu).

#### **Course Withdrawal**

Students should refer to the Refund and Drop/Add Deadlines for the particular term at [onestop.umn.edu](http://onestop.umn.edu) for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw. Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at [sph-ssc@umn.edu](mailto:sph-ssc@umn.edu) for further information.

#### **Course Evaluation**

The SPH will collect student course evaluations electronically using a software system called CoursEval: [www.sph.umn.edu/courseval](http://www.sph.umn.edu/courseval). The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: [www.sph.umn.edu/grades](http://www.sph.umn.edu/grades). All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Rachel will also ask students to complete unofficial quick and voluntary course evaluations at several points along the semester in order to get a feel for how the class is going for you and make improvements along the way.

Evaluation/Grading Policy	Evaluation/Grading Policy Description
<p><b>Scholastic Dishonesty, Plagiarism, Cheating, etc.</b></p>	<p>You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis (As defined in the Student Conduct Code). For additional information, please see <a href="https://z.umn.edu/dishonesty">https://z.umn.edu/dishonesty</a></p> <p>The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <a href="https://z.umn.edu/integrity">https://z.umn.edu/integrity</a>.</p> <p>If you have additional questions, please clarify with your instructor. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.</p> <p>Indiana University offers a clear description of plagiarism and an online quiz to check your understanding (<a href="http://z.umn.edu/iuplagiarism">http://z.umn.edu/iuplagiarism</a>).</p>
<p><b>Late Assignments</b></p>	<p>If lab is 0-24 hours late, 2 points are deducted. 24-48 hours late = 4 point deduction. 48+ hours late = 6 point deduction.</p>
<p><b>Attendance Requirements</b></p>	<p>Attendance at lecture and lab is encouraged. Attendance at lab is worth 10% of the final grade (see grading grid above).</p>
<p><b>Exam make-up policy</b></p>	<p>We will provide make-up exams in cases of unforeseen family emergencies, severe illness, or other extraordinary circumstances. We will consider student requests to take exams at non-scheduled times for other reasons, on a case by case basis, if requested at least one month in advance of the exam. For the final exam, students who have an exam conflict or three exams within a 16-hour period may request an adjustment. Please submit this request at least one month before the scheduled final exam date.</p>
<p><b>Extra Credit</b></p>	<p>The 1-minute papers are the only opportunity for extra credit. If all 1-minute papers are completed, 2% will be added to final grade. (See grading grid above and also see description of 1-minute paper exercise.)</p>

## CEPH COMPETENCIES

Competency	Learning Objectives	Assessment Strategies
Competencies 1 - 4, 11	As described below	<b>Two mid-term and one final examinations during the semester; examinations are designed to assess cumulative knowledge and skills in the course.</b>
1. Apply epidemiological methods to the breadth of settings and situations in public health	<p><b>Week 1</b></p> <ul style="list-style-type: none"> <li>Define epidemiology.</li> <li>Describe aims of epidemiology: describe, explain, predict, control.</li> <li>Use causal frameworks to examine relationships between factors.</li> </ul> <p><b>Week 2</b></p> <ul style="list-style-type: none"> <li>Interpret measures of disease frequency.</li> <li>Identify the appropriate measures of disease frequency to use in a given situation.</li> <li>Calculate measures of disease frequency appropriately in a given situation.</li> </ul> <p><b>Week 3</b></p> <ul style="list-style-type: none"> <li>Interpret relative and absolute measures of association/excess risk.</li> <li>Explain when it is appropriate to use different measures of association/excess risk.</li> <li>Calculate measures of association/excess risk.</li> </ul> <p><b>Week 4 Lecture 1</b></p> <ul style="list-style-type: none"> <li>Explain different types of public health surveillance and their uses.</li> <li>Interpret data, including graphical data, in terms of characteristics of descriptive epidemiology, i.e., person, place, and time.</li> <li>Explain the appropriate uses of descriptive data.</li> <li>Explain the differences between etiologic and non-etiologic associations.</li> <li>Describe qualitative research data collection and analysis: focus groups. (see assessment below).</li> </ul> <p><b>Week 6</b></p> <ul style="list-style-type: none"> <li>Interpret the results of direct and indirect standardization for the control of confounding by age.</li> <li>Describe the appropriate situations for use of each standardization method.</li> <li>Calculate direct and indirect standardization for the control of confounding by age.</li> </ul> <p><b>Week 5, 8</b></p> <ul style="list-style-type: none"> <li>Explain systematic and random error and the types and properties of confounders.</li> <li>Explain the strengths and limitations of methods used to control confounding.</li> <li>Identify selection and information bias and recognize how measures of association are affected by these biases.</li> </ul>	<p><b>Week 1 assignment:</b></p> <p>Students are asked to work through an exercise regarding whether exposure to cats causes mental health issues. This exercise reinforces concepts and frameworks of causal reasoning which are foundational to epidemiology.</p> <p><b>Week 2 assignment:</b></p> <p>Students are given real or hypothetical scenarios and are expected to <u>select</u> the appropriate measure of disease frequency to use in response to specific questions. Students are asked to <u>calculate and interpret</u> the selected measures from data tables or short word problems.</p> <p><b>Week 3 assignment:</b></p> <p>Students are given brief descriptions of epidemiologic studies with data tables, then based on short word problems, they are expected to <u>select, calculate and interpret</u> the appropriate measures of excess risk.</p> <p><b>Week 4 assignment 1:</b></p> <p>Students are expected to synthesize information and apply concepts they learned in new situations e.g., they are given data from a disease outbreak and asked to identify person, place and time characteristics from the information provided. In addition, students are asked to identify one source of data that could provide information about the disease and one strength and one limitation of the source identified.</p> <p><b>Week 7 assignment:</b></p> <p>Students are asked to calculate direct and indirect standardization for the control of confounding by age, sex or other variables using data tables and to identify when it is appropriate to use the different methods of standardization</p> <p><b>Week 5 and 8 assignments:</b></p> <p>Students are expected to explain how to detect confounding using data from a hypothetical study in 2 x 2 tables. Also, given results of a hypothetical study, they are asked assess and explain whether or not confounding is present in the measures of excess risk.</p> <p>Given stratified data, students are asked to determine whether or not confounding of the disease exposure association is present.</p>

	<p><b>Week 12</b></p> <ul style="list-style-type: none"> <li>• Define important terms used in infectious disease epidemiology, e.g., herd immunity.</li> <li>• Interpret common measures used in infectious disease epidemiology, e.g. infectivity, pathogenicity and virulence.</li> <li>• Calculate common measures used in infectious disease epidemiology, e.g. infectivity, pathogenicity and virulence.</li> <li>• Explain the agent, host, and environmental factors which contribute to likelihood and emergence of infectious disease.</li> <li>• Apply methods to identify exposure(s) likely to have caused an epidemic.</li> </ul> <p><b>Week 13</b></p> <ul style="list-style-type: none"> <li>• Explain criteria for population screening programs.</li> <li>• Interpret the measures used to evaluate the efficacy of a screening test.</li> <li>• Calculate the measures used to evaluate the efficacy of a screening test e.g. sensitivity, specificity, PV+, PV-.</li> <li>• Explain the difference between a screening test and a diagnostic test.</li> <li>• Explain the biases, advantages and disadvantages of the various epidemiologic study designs used to evaluate efficacy of screening.</li> </ul>	<p>Students are asked to consider various hypothetical scenarios, with real numbers and describe the magnitude and direction of information and selection bias.</p> <p>Given scenarios, students identify and or propose methods to use to control for confounding.</p> <p>Given scenarios, students characterize the types of potential biases present as differential or non-differential and identify the specific type of bias, e.g. selection bias (loss-to-follow up or participation bias).</p> <p><b>Week 12 assignment:</b></p> <p>Students are given a scenario with data and are expected to <u>select, calculate and interpret</u> the appropriate measure for infectious disease epidemiology.</p> <p>Students are asked to describe the components of the infectious disease triangle: host, agent, environment; this includes being able to explain an infectious disease in the context of the triangle. Students must define, calculate and interpret transmission, infectivity, pathogenicity and virulence and give examples.</p> <p>Students are expected to identify different epidemic curves.</p> <p>In a laboratory assignment, students “carry out” a disease outbreak investigation and develop an epidemic curve.</p> <p>Students are asked to consider how various choices in screening for an infection disease might impact sensitivity, specificity, PV+, PV-.</p> <p><b>Final examination</b></p> <p>Given specific public health scenarios and data, students are expected to: list and explain criteria for population screening programs;</p> <p>select, calculate and interpret the appropriate measure to use to evaluate the efficacy of a screening test e.g. sensitivity, specificity, PV+, PV-; explain circumstances when public health officials would want to maximize sensitivity versus specificity;</p> <p>explain the difference between a screening test and a diagnostic test; and describe the biases, advantages and disadvantages of the various methods, i.e., study designs, used to evaluate efficacy of screening programs.</p>
<p>2. Select quantitative and qualitative data collection methods appropriate for a given public health context</p>	<p><b>Week 4 Lecture</b></p> <ul style="list-style-type: none"> <li>• Explain different types of public health surveillance and their uses.</li> <li>• Interpret data, including graphical data, in terms of characteristics of descriptive epidemiology, i.e., person, place, and time.</li> <li>• Explain the appropriate uses of descriptive data.</li> </ul>	<p><b>Week 4, assignment:</b></p> <p>In an assignment, students are expected to answer objective questions on: the nature and potential uses of focus groups, a qualitative data collection method, and the features that make focus group interviews research.</p>

	<ul style="list-style-type: none"> <li>• Explain the differences between etiologic and non-etiologic associations.</li> <li>• <b>Describe qualitative research data collection and analysis: focus groups.</b></li> </ul> <p><b>Week 5, 7</b></p> <ul style="list-style-type: none"> <li>• Explain systematic and random error and the types and properties of confounders.</li> <li>• Explain the strengths and limitations of methods used to control confounding</li> <li>• Identify selection and information bias and recognize how measures of association are affected by these biases.</li> </ul> <p><b>Week 8, 9, 10, 11</b></p> <ul style="list-style-type: none"> <li>• Explain the objectives, features, advantages, and disadvantages of experimental and observational study designs.</li> <li>• Interpret results of epidemiologic studies including their implications for public health.</li> </ul>	<p>In two open-ended question, students are given a public health problem and told that a hospital administrator has asked for their help to better understand the causes of the problem; they are asked to identify people for focus group interviews and write two questions they would ask of the participants.</p> <p><b>Week 5, 8 assignments</b></p> <p>Students are expected to explain how to detect confounding using data from a hypothetical study in 2 x 2 tables. Also, given results of a hypothetical study, they are asked assess and explain whether or not confounding is present in the measures of excess risk.</p> <p>Given stratified data, students are asked to determine whether or not confounding of the disease exposure association is present.</p> <p>Given scenarios, students identify and or propose methods to use to control for confounding.</p> <p>Given scenarios, students characterize the types of potential biases present as differential or non-differential and identify the specific type of bias, e.g. selection bias (loss-to-follow up or participation bias).</p> <p><b>Week 9, 10 assignments:</b></p> <p>Given specific public health scenarios students are expected to:</p> <p>Identify a study design from a scenario;</p> <p>Select appropriate designs and data collection methods given a scenario accounting for the nature of the question being addressed, the hierarchy of evidence (state of knowledge of disease), prevalence of outcomes and risk factors, and ethical considerations.</p> <p>Choose, calculate and interpret measures of excess risk;</p> <p>Identify strengths, limitations and sources of bias for given study designs.</p>
<p>3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate</p>	<p><b>Week 4</b></p> <p>Explain different types of public health surveillance and their uses.</p> <ul style="list-style-type: none"> <li>• Interpret data, including graphical data, in terms of characteristics of descriptive epidemiology, i.e., person, place, and time.</li> <li>• Explain the appropriate uses of descriptive data.</li> <li>• Explain the differences between etiologic and non-etiologic associations.</li> <li>• <b>Describe qualitative research data collection and analysis: focus groups.</b></li> </ul> <p><b>Week 5, 7</b></p> <ul style="list-style-type: none"> <li>• Explain systematic and random error, and the types and properties of confounders.</li> </ul>	<p><b>Week 4 assignment</b></p> <p>Students are expected to answer objective questions on: the nature and potential uses of focus groups, a qualitative data collection method, and the features that make focus groups interviews research.</p> <p>Students are expected to describe how to select the type of analysis needed for focus group interviews, the importance of being systematic and having a verifiable protocol, the Classical Method of qualitative analysis and approaches to determining priorities in analysis.</p> <p><b>Week 5, 8 assignment:</b></p>

	<ul style="list-style-type: none"> <li>• Explain the strengths and limitations of methods used to control confounding.</li> <li>• Identify selection and information bias and recognize how measures of association are affected by these biases.</li> </ul> <p><b>Week 8, 9, 10, 11</b></p> <ul style="list-style-type: none"> <li>• Explain the objectives, features, advantages, and disadvantages of experimental and observational study designs.</li> <li>• Interpret results of epidemiologic studies including their implications for public health.</li> <li>• Describe criteria for and the process of obtaining approval from an Institutional Review Board for studies involving human subjects.</li> </ul>	<p>Students are expected to explain how to detect confounding using data from a hypothetical study in 2 x 2 tables. Also, given results of a hypothetical study, they are asked assess and explain whether or not confounding is present in the measures of excess risk.</p> <p>Given stratified data, students are asked to determine whether or not confounding of the disease exposure association is present.</p> <p>Given scenarios, students identify and or propose methods to use to control for confounding.</p> <p>Given scenarios, students characterize the types of potential biases present as differential or non-differential and identify the specific type of bias, e.g. selection bias (loss-to-follow up or participation bias).</p> <p><b>Week 9, 10 assignment:</b></p> <p>Students identify weaknesses in study designs that lack a clear temporal sequence between exposure and disease (e.g., some cross-sectional studies and ecologic studies)</p>
<p>4. Interpret results of data analysis for public health research, policy or practice (primary)</p>	<p><b>Week 3</b></p> <ul style="list-style-type: none"> <li>• Interpret relative and absolute measures of association/excess risk.</li> <li>• Explain when it is appropriate to use different measures of association/excess risk.</li> <li>• Calculate measures of association/excess risk.</li> </ul> <p><b>Week 4</b> Explain different types of public health surveillance and their uses.</p> <ul style="list-style-type: none"> <li>• Interpret data, including graphical data, in terms of characteristics of descriptive epidemiology, i.e., person, place, and time.</li> <li>• <b>Explain the appropriate uses of descriptive data.</b></li> <li>• <b>Explain the differences between etiologic and non-etiologic associations.</b></li> <li>• Describe qualitative research data collection and analysis: focus groups.</li> </ul> <p><b>Week 5, 7</b></p> <ul style="list-style-type: none"> <li>• Explain systematic and random error, and the types and properties of confounders.</li> <li>• Explain the strengths and limitations of methods used to control confounding.</li> <li>• Identify selection and information bias and recognize how measures of association are affected by these biases.</li> </ul> <p><b>Week 9, 10, 11, 12</b></p> <ul style="list-style-type: none"> <li>• Explain the objectives, features, advantages, and disadvantages of experimental and observational study designs.</li> </ul>	<p><b>Week 3 assignment:</b></p> <p>Students are given brief descriptions of epidemiologic studies with data tables, then based on short word problems, they are expected to <u>select, calculate and interpret</u> the appropriate measures of excess risk.</p> <p><b>Week 4 assignment:</b></p> <p>Students are expected to synthesize information and apply concepts they learned in new situations e.g., they are given data from a disease outbreak and asked to identify person, place and time characteristics from the information provided. In addition, students are asked to identify one source of data that could provide information about the disease and one strength and one limitation of the source identified.</p> <p><b>Week 5, 8 assignment:</b></p> <p>Students are expected to explain how to detect confounding using data from a hypothetical study in 2 x 2 tables. Also, given results of a hypothetical study, they are asked assess and explain whether or not confounding is present in the measures of excess risk.</p> <p>Given stratified data, students are asked to determine whether or not confounding of the disease exposure association is present.</p> <p>Given scenarios, students identify and or propose methods to use to control for confounding.</p> <p>Given scenarios, students characterize the types of potential biases present as differential or non-differential and identify the specific type of bias,</p>

	<ul style="list-style-type: none"> <li>• Interpret results of epidemiologic studies including their implications for public health.</li> <li>• Describe criteria for and the process of obtaining approval from an Institutional Review Board for studies involving human subjects.</li> </ul> <p><b>Week 12</b></p> <ul style="list-style-type: none"> <li>• Define important terms used in infectious disease epidemiology, e.g., herd immunity.</li> <li>• Interpret common measures used in infectious disease epidemiology, e.g. infectivity, pathogenicity and virulence.</li> <li>• Calculate common measures used in infectious disease epidemiology, e.g. infectivity, pathogenicity and virulence.</li> <li>• Explain the agent, host, and environmental factors which contribute to likelihood and emergence of infectious disease.</li> <li>• Apply methods to identify exposure(s) likely to have caused an epidemic.</li> </ul> <p><b>Week 13</b></p> <ul style="list-style-type: none"> <li>• Explain criteria for population screening programs.</li> <li>• Interpret the measures used to evaluate the efficacy of a screening test.</li> <li>• Calculate the measures used to evaluate the efficacy of a screening test e.g. sensitivity, specificity, PV+, PV-.</li> <li>• Explain the difference between a screening test and a diagnostic test.</li> <li>• Explain the biases, advantages and disadvantages of the various epidemiologic study designs used to evaluate efficacy of screening.</li> </ul>	<p>e.g. selection bias (loss-to-follow up or participation bias).</p> <p><b>Week 9, 10 assignment:</b></p> <p>Students identify weaknesses in study designs that lack a clear temporal sequence between exposure and disease (e.g., some cross-sectional studies and ecologic studies)</p> <p><b>Week 12 assignment:</b></p> <p>Students are given a scenario with data and are expected to <u>select, calculate and interpret</u> the appropriate measure for infectious disease epidemiology.</p> <p>Students are asked to describe the components of the infectious disease triangle: host, agent, environment; this includes being able to explain an infectious disease in the context of the triangle. Students must define, calculate and interpret transmission, infectivity, pathogenicity and virulence and give examples.</p> <p>Students are expected to identify different epidemic curves.</p> <p>In a laboratory assignment, students “carry out” a disease outbreak investigation and develop an epidemic curve.</p> <p><b>Final exam</b></p> <p>Given specific public health scenarios and data, students are expected to: list and explain criteria for population screening programs;</p> <p>select, calculate and interpret the appropriate measure to use to evaluate the efficacy of a screening test e.g. sensitivity, specificity, PV+, PV-; explain circumstances when public health officials would want to maximize sensitivity versus specificity;</p> <p>explain the difference between a screening test and a diagnostic test; and describe the biases, advantages and disadvantages of the various methods, i.e., study designs, used to evaluate efficacy of screening programs.</p>
<p>11. Select methods to evaluate public health programs</p>	<p><b>Week 13</b></p> <ul style="list-style-type: none"> <li>• Explain criteria for population screening programs.</li> <li>• Interpret the measures used to evaluate the efficacy of a screening test.</li> <li>• Calculate the measures used to evaluate the efficacy of a screening test e.g. sensitivity, specificity, PV+, PV-.</li> <li>• Explain the difference between a screening test and a diagnostic test.</li> <li>• Explain the biases, advantages and disadvantages of the various epidemiologic study designs used to evaluate efficacy of screening.</li> </ul>	<p><b>Final exam</b></p> <p>Given specific public health scenarios and data, students are expected to: list and explain criteria for population screening programs;</p> <p>select, calculate and interpret the appropriate measure to use to evaluate the efficacy of a screening test e.g. sensitivity, specificity, PV+, PV-; explain circumstances when public health officials would want to maximize sensitivity versus specificity;</p> <p>explain the difference between a screening test and a diagnostic test; and describe the biases,</p>

		advantages and disadvantages of the various methods, i.e., study designs, used to evaluate efficacy of screening programs.
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