

PUBH 6320, SECTIONS 01-03

Fundamentals of Epidemiology
Fall 2018

COURSE & CONTACT INFORMATION

Credits: 3
Meeting Day(s): Tuesdays and Thursdays
Meeting Time: 3:35-5:30pm
Lecture (Tuesday) Meeting Place: On September 4: MoosT 2-620; all other lectures: MoosT 1-450
Lab (Thursday) Meeting Places: WDH W2-110 and Mayo D325

Instructor: Rachel Widome, PhD, MHS
Email: widome@umn.edu
Office Hours: Tuesdays 2-3pm in room MoosT 1-455
Office Location: West Bank Office Building (WBOB - <http://campusmaps.umn.edu/west-bank-office-building>), Room 341

Teaching assistants (TAs): Aubrey Hubbard, MPH (hubba208@umn.edu) and Tyler Richter (richt469@umn.edu)
TA office hours: Aubrey, Thursdays 10-11am; Monday at 3:30-4:30pm

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 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 are not 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. And it is this reason that makes epidemiology a difficult subject to teach and to learn. Because epidemiology is immersed in the gray areas of human health and behavior, students sometimes pose questions that are difficult even for your instructor and TAs, seasoned epidemiologists, to answer 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 concerns relating to the course that you may have. I will hold regular office hours on the East Bank and is also 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 have an impromptu meeting if her time allows or to set up a mutually convenient alternative time.

To reach the TAs: The best way to reach the TAs is via email. The TAs 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 M-F.**

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).

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

Week	Topic for Tuesday lecture	Readings	Thursday labs and assessments
Week 1: Sept 4 & 6	<ul style="list-style-type: none"> • Introduction to epidemiology and causality 	<ul style="list-style-type: none"> • Ch 1 & 15 	<ul style="list-style-type: none"> • Causality lab
Week 2: Sept 11 & 13	<ul style="list-style-type: none"> • Measures of disease frequency 	<ul style="list-style-type: none"> • Ch 2 	<ul style="list-style-type: none"> • Measures of disease frequency lab
Week 3: Sept 18 & 20	<ul style="list-style-type: none"> • Measures of excess risk 	<ul style="list-style-type: none"> • pg 57-69 	<ul style="list-style-type: none"> • Measures of excess risk lab
Week 4: Sept 25 & 27	<ul style="list-style-type: none"> • Descriptive epidemiology 	<ul style="list-style-type: none"> • Ch 4 & 5 	<ul style="list-style-type: none"> • Descriptive epidemiology lab
Week 5: Oct 2 & 4	<ul style="list-style-type: none"> • Confounding 	<ul style="list-style-type: none"> • pg 295-301 	<ul style="list-style-type: none"> • Confounding lab
Week 6: Oct 9 & 11	<ul style="list-style-type: none"> • Rate adjustment 	<ul style="list-style-type: none"> • pg 69-72 	<ul style="list-style-type: none"> • Exam 1
Week 7: Oct 16 & 18	<ul style="list-style-type: none"> • Selection and information bias 	<ul style="list-style-type: none"> • Ch 10 	<ul style="list-style-type: none"> • Rate adjustment lab
Week 8: Oct 23 & 25	<ul style="list-style-type: none"> • Study design overview 	<ul style="list-style-type: none"> • Ch 6 	<ul style="list-style-type: none"> • Bias lab
Week 9: Oct 30 & Nov 1	<ul style="list-style-type: none"> • Experimental studies 	<ul style="list-style-type: none"> • Ch 7 	<ul style="list-style-type: none"> • Experimental studies lab
Week 10: Nov 6 & 8	<ul style="list-style-type: none"> • Cohort studies 	<ul style="list-style-type: none"> • Ch 8 	<ul style="list-style-type: none"> • Cohort studies lab
Week 11: Nov 13 & 15	<ul style="list-style-type: none"> • Case control studies 	<ul style="list-style-type: none"> • Ch 9 	<ul style="list-style-type: none"> • Exam 2
Week 12: Nov 20 & 22	<ul style="list-style-type: none"> • Infectious disease epidemiology 	<ul style="list-style-type: none"> • TBD 	
Week 13: Nov 27	<ul style="list-style-type: none"> • Screening 	<ul style="list-style-type: none"> • Ch 16 	<ul style="list-style-type: none"> • Screening lab
Week 14: Dec 4 & 6	<ul style="list-style-type: none"> • Effect modification 	<ul style="list-style-type: none"> • Ch 13 	<ul style="list-style-type: none"> • Effect modification lab
Week 15: Dec 11	<ul style="list-style-type: none"> • Translating epidemiology 	<ul style="list-style-type: none"> • TBD 	

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/. 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

Pastry policy: The 1st student who e-mails me the order that includes rabbits, hares, and pica will receive a donut at following lecture.

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
Mid-term 1	October 11	20%
Mid-term 2	November 15	25%
Final Exam	December 19 - 1:30-3:30pm	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.

Course Withdrawal

Students should refer to the Refund and Drop/Add Deadlines for the particular term at 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 for further information.

Course Evaluation

The SPH will collect student course evaluations electronically using a software system called CoursEval: 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. 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
Scholastic Dishonesty, Plagiarism, Cheating, etc.	<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 https://z.umn.edu/dishonesty</p> <p>The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: https://z.umn.edu/integrity.</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 (http://z.umn.edu/iuplagiarism).</p>
Late Assignments	<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>
Attendance Requirements	<p>Attendance at lecture and lab is encouraged. Attendance at lab is worth 10% of the final grade (see grading grid above).</p>
Exam make-up policy	<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>
Extra Credit	<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
1) Apply epidemiological methods to the breadth of settings and situations in health practice	<ul style="list-style-type: none"> • Use person, place and time to describe health and disease distributions • Identify different types of public health surveillance and their use • Locate sources of public health data • Interpret results of epidemiologic studies and their applicability to various situations 	<ul style="list-style-type: none"> • Descriptive epidemiology, case control and cohort labs • Exams
2) Select quantitative and qualitative data collection methods appropriate for a given health context	<ul style="list-style-type: none"> • Use best practices for data collection that minimize bias • Identify optimal methods for exposure assessment 	<ul style="list-style-type: none"> • In class exercises on bias and 1-minute paper on bias • Exams
4) Interpret results of data analysis for public health research policy or practice	<ul style="list-style-type: none"> • Interpret relative and absolute measures of association • Interpret measures of impact for public health policy decisions • Identify and account for confounding, selection bias and measurement bias in determining validity of the estimates for informing policy and practice • Interpret effect measure modification results for targeting of interventions • Apply causal criteria to assess whether exposure-outcome relationships are causally related. • Critically appraise scientific literature according to epidemiologic principals. 	<ul style="list-style-type: none"> • Measures of association, causality, screening, and effect modification labs • Exams
6) Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels	<ul style="list-style-type: none"> • Use person, place and time to describe disease distributions • Understand appropriate data presentation to illustrate inequities 	<ul style="list-style-type: none"> • Descriptive epidemiology and measures of disease frequency labs • Exams
11) Select methods to evaluate public health programs	<ul style="list-style-type: none"> • Describe each study design and its strengths and limitations, specific to public health programs and their goals • Select study designs appropriate to resources and research question 	<ul style="list-style-type: none"> • Experimental studies, cohort, and case control labs • Exams
15) Evaluate policies for their impact on public health and health equity	<ul style="list-style-type: none"> • Interpret measures of impact for public health policy decisions 	<ul style="list-style-type: none"> • Exams
21) Perform effectively on interprofessional teams	<ul style="list-style-type: none"> • Develop skills for collaboration with peers from other disciplines to solve epidemiologic problems 	<ul style="list-style-type: none"> • Participation in lab group is worth 10% of the final grade