



PubH 6320-001-003

Fundamentals of Epidemiology

Fall 2015

Credits: 3

Meeting Days: Tuesday (lecture) and Thursday (lab)

Meeting Time: 3:35-5:30

Meeting Place: Lecture: Mayo A110, lab section 002: Mayo A110, Lab section 003: Mayo D199

Instructor: Rachel Widome, PhD MHS

Office Address: West Bank Office Building (WBOB), Office 341

Office Phone: 612-624-3518

E-mail: widome@umn.edu

Office Hour: Tuesdays 2-3pm.

TAs: Summer Martins (mart1154@umn.edu); office hour: TBD
Patrick Hammett (hamm0311@umn.edu); office hour: TBD

I. 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 the health of populations. As you will soon discover, epidemiologists define health very broadly and the types of questions we try to answer are infinitely varied. Epidemiology is actually 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. As such, 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 are not specialists in public health areas, and to be able to navigate data sources. I also 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 class does. I would encourage those who think they may be serious about being a practicing epidemiologist to consider taking PubH 6341, also available this semester. Alternatively, if PubH 6320 whets your appetite for the discipline, 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 with Epi Methods III, you will need to take additional courses in Biostatistics.

II. 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 attend with the instructor's consent.

III. Course Goals and 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 study design 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

IV. Methods of Instruction and Work Expectations

Teaching Methods

This course has two components—lecture (Tuesdays) and lab (Thursdays).

Course Atmosphere

You are a very diverse group of students. Diversity is a strength in our society at large and also here at the University of Minnesota. In this class, 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. Sometimes we choose the best answer, given the alternatives, 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 Rachel regarding any concerns relating to the course that you may have. Rachel 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 Rachel's 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 group 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. It will be important to be somewhat familiar with the lab to assure an equitable distribution of labor for completing the lab.
- Each group member will come to lab with their own written answers to the entire exercise. The answers to the non-assigned sections may be quite rough and filled in as the group works its way through the exercise during lab. The student will want to have a more polished answer for the assigned section.
- Each group member will come to lab prepared to present the answer to his or her assigned section to group members, and be prepared to explain the reasoning behind his or her answer.

During lab

- For the first 15-30 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, compare 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 lecture the following Tuesday.
- During the last 15-30 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; 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 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 detracted from assignments that are handed in late.

V. Course Text and Readings

All course-related materials (except the text) may be downloaded from the Moodle site:
<https://ay13.moodle.umn.edu/my/>

We will be using:

Essentials of Epidemiology in Public Health, 3rd Edition by Ann Aschengrau and George R. Seage III, published by Jones and Bartlett (<http://www.jbpub.com>), Copyright 2014 (ISBN-13: 9781284028911).

This book can be purchased or rented from the UMN bookstore.

This text is also available as an e-book at: <http://www.coursesmart.com/9781284044027>

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.

VI. Course Outline/Weekly Schedule

| Week | Date of Lecture | Lecture Topic | Date of Lab | Lab Exercise | Readings |
|--|-----------------|---|-------------|-------------------------------|-------------|
| 1 | 9/8 | Introduction to Epidemiology Causality | 9/10 | Causality | Ch. 1 & 15 |
| 2 | 9/15 | Measures of Disease Frequency | 9/17 | Measures of Disease Frequency | Ch. 2 |
| 3 | 9/22 | Measures of Excess Risk | 9/24 | Measures of Excess Risk | pp. 59-70 |
| 4 | 9/29 | Descriptive Epidemiology | 10/1 | Descriptive Epidemiology | Ch. 4 & 5 |
| 5 | 10/6 | Confounding | 10/8 | Confounding | pp. 293-302 |
| 6 | 10/13 | Rate Adjustment | 10/15 | Rate Adjustment | 71-74 |
| 7 | 10/20 | Selection & Information Bias | 10/22 | Exam 1 | Ch. 10 |
| 8 | 10/27 | Study Design | 10/29 | Study Design | Ch. 6 |
| 9 | 11/3 | Intervention Studies | 11/5 | Intervention studies | Ch. 7 |
| 10 | 11/10 | Cohort Studies | 11/12 | Cohort Studies | Ch. 8 |
| 11 | 11/17 | Case-control Studies | 11/19 | Case-control Studies | Ch. 9 |
| 12 | 11/24 | Infectious Disease Epidemiology | 11/26 | Exam 2 | TBD |
| 13 | 12/1 | Screening | 12/3 | <i>Thanksgiving break</i> | Ch. 16 |
| 14 | 12/8 | Effect modification | 12/10 | Effect modification | Ch. 13 |
| 15 | 12/15 | Translating Epidemiology | | | |
| Final Exam: Tuesday, 12/22, 1:30-3:30 | | | | | |

VII. Evaluation and 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 | 10/22/15, during lab time | 20% |
| Mid-term 2 | 11/26/15, during lab time | 25% |
| Final Exam | 12/22/15, 10:30-12:30 pm | 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 |

The University utilizes plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following: For additional information, please refer to: <http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html>.

- A 4.000 - Represents achievement that is outstanding relative to the level necessary to meet course requirements
- A- 3.667
- B+ 3.333
- B 3.000 - Represents achievement that is significantly above the level necessary to meet course requirements
- B- 2.667
- C+ 2.333
- C 2.000 - Represents achievement that meets the course requirements in every respect
- C- 1.667
- D+ 1.333
- D 1.000 - Represents achievement that is worthy of credit even though it fails to meet fully the course requirements
- S Represents achievement that is satisfactory, which is equivalent to a C- or better.

Make-up exam policy:

We will provide make-up exams in cases of family emergencies, severe illness, or other extraordinary circumstances.

For the final exam, students who have an exam conflict or three exams within a 16-hour period may request an adjustment. We would appreciate receiving such a request at least 2 weeks prior to the examination period.

We will consider requests for alternate make-up exams for other reasons if requested at least one month in advance of the exam. We only occasionally grant requests for make-up exams that do not fall into either of the above two categories.

Late work:

For each day that a lab is late, we will subtract three points (out of 10 points total)

Course Evaluation

The SPH will collect student course evaluations electronically using a software system called CourseEval: www.sph.umn.edu/courseeval. 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.

Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy

A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

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.

Student Conduct Code:

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*.

To review the Student Conduct Code, please see:

http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom:

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference:

<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Scholastic Dishonesty:

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. (Student Conduct Code:

http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see:

<http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <http://www1.umn.edu/oscai/integrity/student/index.html>. If you have additional questions, please clarify with your instructor for the course. 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.

Makeup Work for Legitimate Absences:

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see:

<http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>.

Appropriate Student Use of Class Notes and Course Materials:

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Sexual Harassment:

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy:

<http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

Equity, Diversity, Equal Opportunity, and Affirmative Action:

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy:

http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations:

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center Student Services is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DRC at 612-626-1333 or drc@umn.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, <https://diversity.umn.edu/disability/>.

Mental Health and Stress Management:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

The Office of Student Affairs at the University of Minnesota:

The Office for Student Affairs provides services, programs, and facilities that advance student success, inspire students to make life-long positive contributions to society, promote an inclusive environment, and enrich the University of Minnesota community.

Units within the Office for Student Affairs include, the Aurora Center for Advocacy & Education, Boynton Health Service, Central Career Initiatives (CCE, CDes, CFANS), Leadership Education and Development – Undergraduate Programs (LEAD-UP), the Office for Fraternity and Sorority Life, the Office for Student Conduct and Academic Integrity, the Office for Student Engagement, the Parent Program, Recreational Sports, Student and Community Relations, the Student Conflict Resolution Center, the Student Parent HELP Center, Student Unions & Activities, University Counseling & Consulting Services, and University Student Legal Service.

For more information, please see the Office of Student Affairs at <http://www.osa.umn.edu/index.html>.

Academic Freedom and Responsibility: *for courses that do not involve students in research:*

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, (Dr Kristin Anderson, SPH Dean of Student Affairs), or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

** Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

Student Academic Success Services (SASS): <http://www.sass.umn.edu>:

Students who wish to improve their academic performance may find assistance from Student Academic Support Services. While tutoring and advising are not offered, SASS provides resources such as individual consultations, workshops, and self-help materials.

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