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PUBH 510.50: Introduction to Epidemiology

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PUBH 510

Introduction to Epidemiology

Syllabus

Three credit hours
Spring 2022

Instructor:

Ellen Leahy, RN, MN, MPH
Adjunct Faculty
School of Public and Community Health Sciences (<http://health.umt.edu/publichealth/>)
College of Health

Format:

Online, Moodle through UM Online

Office Hours:

Remote by appointment.
Instructor Leahy is typically available via e-mail 9:00 am - 6:00 pm Monday through Friday.

Contact Info:

ellen1.leahy@umontana.edu e-mail is best. Please place "510" in subject line
Phone: 406-240-5077 available M-F 9-6 or after hours for urgent needs
Zoom meeting link: <https://umontana.zoom.us/j/4652925510>

Course Description:

The course introduces principles and methods of epidemiologic investigation and an overview of relevant biostatistical applications. Students will be provided with the basis for conducting and interpreting epidemiologic studies. The techniques of descriptive and analytic epidemiology are presented. Measures of disease frequency and quantitative measures to determine risk association will be described as well. Several types of study design will be introduced, including randomized trials, case-control and cohort studies, and outbreak investigations. Approaches for assessing causality, validity and extrapolation of effect measures to populations will be introduced. Students will also be provided a unique examination of an unfolding pandemic. The course uses other case scenarios for considering application of basic epidemiological principles and methods in practice.

Required Text:

Celentano and Szklo. Gordis Epidemiology, 6th Edition. W.B. Saunders: Philadelphia, PA. ISBN 032355229

Course Objectives:

1. Calculate direct and indirect age-adjusted rates.
2. Identify morbidity and mortality data sources for descriptive epidemiology.
3. Compute crude, stratified, and standardized disease rates.
4. Calculate key measures for assessing screening tests and screening programs.
5. Explain key terms in the areas of disease transmission, natural history of disease, outbreak investigations, and descriptive and analytical epidemiology.
6. Calculate rates, proportions, ratios, including outcome measures for observational studies.
7. Identify key events in the history of epidemiology.
8. Identify epidemiological measures used in the course of the Covid-19 pandemic.
9. Explain the procedures used for statistical hypothesis testing in epidemiological studies.
10. Differentiate the effect measures used in case-control versus cohort studies.
11. Interpret the use of p-values and confidence intervals when summarizing findings from epidemiological studies.
12. Develop written proposals for case-control and cohort studies to evaluate an association between a suspected risk factor and a disease/condition.
13. Design a case-control study for assessing the association between an environmental agent or behavioral factor and risk of disease.
14. Explain the role that epidemiology plays in public health and health policy and identify associated ethical considerations in the practice of epidemiology.
15. Explain risk factor/disease associations in terms of population attributable risk.
16. Identify the key factors in assessing causal relationships in epidemiological studies.
17. Compare the strengths and limitations of different observational study designs.
18. Identify existing disease or environmental exposure surveillance at the international, federal, and local levels.
19. Describe where environmental agents can play a role in the natural history of disease and how periods of induction and latency effect the temporal sequence between exposure and disease.
20. Identify three different categories of biomarkers used in epidemiology.
21. Discuss the importance of causal criteria in assessing epidemiological findings.
22. Distinguish between the traditional epidemiological triad model of infectious disease causality and the multiple factor causal models.
23. Contrast the epidemiological population-based approach to disease with the medical patient-based approach to disease.

Education for Public Health (CEPH) Master's Foundational Competencies:

This class will address the following **Foundational Competencies**:

1. Apply epidemiological methods to the breadth of settings and situations in public health practice.
4. Interpret results of data analysis for public health research, policy or practice.
7. Assess population needs, assets and capacities that affect communities' health.
15. Evaluate policies for their impact on public health and health equity.
19. Communicate audience-appropriate public health content, both in writing and through oral presentation.
22. Apply systems thinking tools to a public health issue.

This class will address the following **Master's Generalist Concentration-Specific Competencies**:

1. Gather, integrate and analyze descriptive health data from rural or frontier settings.
2. Identify the common demographic characteristics of rural or frontier areas and their implications for provision of public health services.
5. Utilize basic statistical skills to reason about problems associated with the populations of low density and widespread geographic dispersion.

Course Format:

This course will be delivered in an online format using Moodle. **Course week will run Tuesday through Monday ending at 11:59 pm each Monday night and starting the next week at 12:00 am (midnight) on Tuesday. Mountain Standard Time (MST) or Mountain Daily Savings Time (MDST) after the spring time change. Students are expected to log into the course multiple times during the week, every week.** Slides and other course materials than accompany the reading materials will be posted each week. Discussion board prompts will be posted most weeks and students will be required to respond to the prompts and participate in the discussion of other students' responses throughout the week. Discussion board rubric to guide you and by which your posts will be assessed is presented later in this syllabus. Assignments are due throughout the course and a course paper, developed in three sections, is also required. A mid-term and final exam are scheduled. On most weeks we will have a one-hour live e-meeting using Zoom video conferencing. Students are required to lead one session. Participation when not leading is encouraged but not required. All assignments and paper sections must be submitted via Moodle. Further details of course components follow:

Assignments

There are five assignments throughout the course, each designed to provide practice in applying the course material. Assignments are due Monday, MST or MDST, unless otherwise noted. Moodle is set to accept assignments until 11:59 pm of the date due. Please refer to Syllabus for the due dates of each Assignment. Assignments are to be uploaded using the Assignment feature in Moodle. Late assignments will be graded zero unless there are serious and verifiable extenuating circumstances. Students who wish to request permission to submit an assignment late must contact Instructor Ellen Leahy well before the assignment deadline. Answer keys will be posted on Moodle after grading occurs so that both individual and class feedback can be provided.

e-meetings

On most Fridays at noon, we will have e-meetings for review and discussion of course material and the problem set at the end of each Gordis chapter, or other review questions as the instructor assigns. Students are required to lead one of these sessions, joined by another one or two of your classmates. When not conducting the lead, attendance is not required but strongly encouraged as possible. All sessions will be recorded and posted after they occur so those unable to attend can benefit from the review and discussion. Sign-ups to lead are available in the Welcome and Course Overview section. Join at <https://umontana.zoom.us/j/4652925510>

Discussion Board

Discussion board will be used most weeks. The class is split into two smaller discussion boards, each receives the same prompt. **Make your initial response to the prompt or first round of responses to classmates by the first half of the week (mid-week is Friday at 6pm MST)** so that you can engage in further discussion with classmates and their posts. Following is the discussion board rubric for guiding you and for instructor assessment of the quality and timeliness of your posts:

Points	Quality	Engagement
5	Fully responds to prompt and includes references and demonstrates use of course material	Initial post by mid-week; and posts multiple examples of meaningful engagement throughout the week with majority of classmates in the group
3-4	Partially responds to prompt or fails to include references or fails to apply course materials	Makes initial post after mid-week or has infrequent or insignificant responses to classmates
1-2	Initial post does not address the prompt.	Initial posts occur after mid-week.
0	Does not make initial post	Does not respond to other students' posts.

Preparatory Tutorials:

UMOnline has numerous online tools to support students in using Moodle. Please see the following website: <http://umonline.umt.edu/studentsupport/default.php>.

Course Grading:

Students will be graded on the following assessment components:

- 1) Class participation 15%
- 2) Assignments 20%
- 3) Midterm, 20%
- 4) Course paper, 20%
- 5) Lead e-meeting 5%
- 6) Final 20%

Grades will be calculated based on the percentage of total points available using the formula:

93 to 100 percent = A; 90 to 92 percent = A-minus; 87 to 89 percent = B-plus; 83 to 86 percent = B; 80 to 82 percent = B-minus; 77 to 79 percent = C-plus; 73 to 76 percent = C; 70 to 72 percent = C-minus; 67 to 69 percent = D-plus; 63 to 66 percent = D; 60 to 62 percent = D-minus; below 60 percent = F.

Exams (Midterm: 20%, Final: 20%)

Two exams (a midterm and a final) will be given during the semester. Administered through Moodle, the exams have combination of multiple choice, short answer questions, short essay questions, and problem sets.

Moodle Course Procedures and Expectations:

Moodle will be used in this class and online activities will be required throughout the semester. Moodle procedures may be adjusted if necessary. While class content, expectations and assessment will () not change dramatically, the instructor may make mid-course revisions especially in response to student feedback.

Announcements and Syllabus Changes:

Class announcements will be posted by the instructor. Moodle system administrators will sometimes post announcements about the Moodle system. This syllabus is subject to change by the instructor. Any changes will be communicated during the weekly announcements.

Communication:

Communication will take place using e-mail, discussion boards, and the virtual classroom. Please check your UM email account frequently, as this is how I will communicate directly with you. E-mail should be used for “private” communication with the instructor or other students. Any questions regarding grades or communication about more personal issues should be handled via email. Discussion boards are appropriate for questions or discussions that would normally occur in the classroom. Please remember that the discussion board is public, and your classmates can read what you post there. **Please show “PUBH 510” in the subject line for e-mail communication with the instructor.**

Logging In:

You are expected to log in every weekday to read current announcements that have been posted. You may do this at any time of day.

Additional Notes:

Accommodations:

Students with disabilities will receive reasonable accommodations in this online course. To request course modifications, please contact the instructor as soon as possible. The instructor will work with you and Disability Services in the accommodation process. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call 406-243-2243.

Library Resources:

Some assignments may require library resources. To access the UM’s Mansfield Library resources from off-campus, students will be required to enter their SCAUID and password. This is the same ID and password that you use to login to Moodle and use for your official UM e-mail address. Information on resources available through the Mansfield Library can be found at: <http://www.lib.umt.edu/howto>.

According to the UM library web page: “When connecting to licensed library resources from off-campus, users will be prompted to login using the "standard UM-M computer access user ID" (SCAUID) and password. This is the same account used for campus wireless accounts and students' Cue1 email. Creation of a separate library remote access account will no longer be necessary. For students this is the "first initial" + "last initial" + six-

digit unique number sign-on name, e.g., "jd123456". Students and employees can now look up their SCAUID on **CyberBear**: (<http://weblib.lib.umt.edu/remote.html>)

If you need assistance with library resources, please contact the library's distance learning coordinator. The toll-free number for the reference desk is 1-800-240-4939.

Plagiarism Warning:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at the University of Montana's Division of Student Affairs. Plagiarism is the representing of another's work as one's own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and may be remanded to Academic Court for suspension or expulsion. (See UM Student Conduct Code). Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed wording but also ideas. Acknowledgment of whatever is not one's own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's own original work is plagiarism.

Covid Considerations:

- Mask use is required within the classroom or laboratory.
- If you feel sick and/or are exhibiting COVID symptoms, please don't come to campus and contact the Curry Health Center at (406) 243-4330 or a medical provider in your location for covid information, precautions, testing, and perhaps treatment.
- This being a distance learning course, quarantine will not likely affect your ability to participate timely. If you are isolated and feel ill with symptoms of covid, however, please notify the instructor in order to receive support to ensure continued academic progress while upholding academic standards during illness and recovery. The instructor will treat your health information confidentially and may seek administrative guidance on how best to support your academic progress.
- If a classmate informs you they have covid, that information is not yours to share with others without express permission from the classmate.
- UM recommends students get the COVID vaccine and booster. Please direct your questions or concerns about vaccines to the Curry Health Center.
- If you are meeting in person with classmates for class purposes, please wear a mask regardless of your vaccine status.

Course Schedule

PUBH 510 Introduction to Epidemiology

Spring, 2022 Course Schedule

e-meet link <https://umontana.zoom.us/j/4652925510>

WEEK	DATES (Tues-Mon)	TOPIC	READING (in addition to reading and recordings posted in Moodle)	ASSIGNMENTS (in addition to weekly Discussion Board)	E-MEETING DATE Noon-1:00 MST
1	Jan. 18-24	History of Epidemiology: Epi in Public Health Practice	Gordis Ch 1 & 19 Ethics Reading and Case Study Videos in Moodle	Enter your intro into Moodle & Begin Weekly Discussion Board	No e-meet
2	Jan. 25-31	Infectious Disease Transmission; Notifiable Conditions	Gordis Ch 2		Jan. 28 e-meet
3	Feb 1-7	Description Epi I: Outbreak Investigations	Reading posted in Moodle "Investigating an Outbreak, pp 347-374 Steps 1-6	Paper Topic Selection DUE February 7	Feb. 4
4	Feb. 8-14	Descriptive Epi II: Measures of Disease Frequency	Gordis Ch 3 Gordis Ch 4 (pp 65-79)	Assignment #1 DUE: 2/14	Feb. 11
5	Feb. 15-20 (Presidents' Day 2/21)	Adjusting Rates Survival and Life Tables	Gordis Ch 4 (pp 80-93) Gordis Ch 6	Paper Section I DUE 2/22	Feb. 18
6	Feb. 22-28	Diagnostic and Screening Tests	Gordis Ch. 5	Assignment #2 DUE 2/28	Feb. 25
7	Mar. 1-7	Covid Pandemic	Readings, recordings posted in Moodle		Mar. 4
8	Mar. 8-14	Midterm Exam Week	Q & A on Discussion Board Mar. 8 & 9	MIDTERM EXAM Mar. 10 & 11	No e-meet
9	Mar. 15-18	Cross-sectional Studies Case-control Studies	Gordis Ch. 7		Mar 18
	Spring Break Mar. 21-25			Paper Sections 1 & 2 Due: 3/28	
10	Mar. 29-Apr. 4	Cohort Studies	Gordis Ch. 8,9	Assignment #3 DUE 4/4	Apr 1
11	Apr. 5-11	Estimating Risk	Gordis Ch.12		Apr. 8
12	Apr. 12-18	Estimating prevention potential; Extrapolation	Gordis, Ch. 13	Assignment #4 DUE 4/18	Apr. 15
13	Apr. 19-25	Causal inference; bias, confounding and interaction	Gordis, Ch. 14, 15	Assignment #5 DUE 4/25	Apr. 22
14	April 26- May 2	Experimental Epi; Randomized Trials	Gordis Ch. 10, 11	Semester Paper ALL Sections 1-3 DUE May 2	Apr. 29
15	May 3 - 8	Surveillance; Genetic and Environmental Risk Factors	Gordis Ch. 16		No e-meet
16	May 9-13	Final Review & Exam	Q & A on Discussion Board May 9 & 10	FINAL EXAM May 11 & 12	