EPIB 611 Intermediate Epidemiology

Semester: Spring, 2014
Classroom and Time: Rm 0301, Thursdays, 4:00pm – 6:45pm
Instructor: Cher Dallal, Ph.D.
Office Hours: By appointment
Office: 2234QQ SPH Bldg
Phone: 301-405-7065
Email: cdallal@umd.edu

Course Pre- and Co-requisites:

Required: EPIB 610 Foundations of Epidemiology
Recommended: EPIB 650 Biostatistics I, EPIB 651 Biostatistics II

Required Texts and Other Readings:

Required:

Recommended:


Class Notes:
- Class notes and relevant journal articles will be distributed in class

Additional Materials Required: calculator

Course Description:
This course is designed to discuss and apply various epidemiologic methods, such as calculating disease frequency and association, determining causal inference, assessing confounding, effect modification, threats to validity, and model building. Methods to address biases in the design and implementation of epidemiologic studies will be discussed along with measurement issues such as validity and reliability, experimental research design, sampling, and survey design. As special topic areas, additional lectures will focus on nutritional epidemiology, communicating results of epidemiologic studies and emerging topics in epidemiology will be covered.
Course Learning Objectives:
Upon completing this course, the student will be able to:
1. Distinguish among various epidemiologic study designs and evaluate strengths and weaknesses of each design.
2. Calculate and apply prevalence, risk, and cumulative incidence measures.
3. Estimate and interpret risk and rate differences to the different epidemiologic study designs and identify when each measure is useful. Calculate and interpret attributable risk and rate percent and population attributable risk and rate percent.
4. Illustrate elements to establish causality.
5. Evaluate confounding, effect modification, mediation and identify procedures to address them.
6. Apply methods to reduce random and systematic errors.
7. Build multivariable models and interpret coefficients.
8. Demonstrate different types of validity and reliability measures.
9. Compare various types of sampling methods.
10. Effectively design survey questions.
11. Assess effective ways to communicate results of epidemiologic studies.

Program Competencies Addressed in this Course:
The following competencies for the MPH degree in epidemiology are addressed in this course. This course also meets the requirements for training in epidemiologic principles for other MPH degrees at the University of Maryland College Park School of Public Health:

1. Demonstrate the importance of epidemiology for informing scientific, ethical, economic, and political discussion of health issues.
2. Assess public health problems in terms of magnitude, time, and place.
3. Distinguish among the basic terminology and definitions of epidemiology.
4. Calculate basic epidemiology measures.
5. Calculate advanced epidemiology measures.
6. Evaluate strengths and limitations of epidemiologic reports.
7. Draw appropriate inferences from epidemiologic data.
8. Explain criteria for causality.
9. Communicate epidemiologic information to lay and professional audiences.

Course Organization
The class sessions will include lectures, discussions and in-class exercises. Lectures may not cover all materials included in the reading assignments; however, students are expected to complete the assigned readings prior to class. Students are expected to actively participate in class discussions and exercises. This is a graduate level course, and students should expect to put in an average of 9 hours of work outside of class each week to master the material.

The instructor welcomes meetings with students outside of class to discuss questions as well as to gain more insight about the material presented in class. Please contact the instructor to set up an appointment. Please be reminded, however, that the class will be taught during class time only. Material will not be presented on a one-on-one basis at other times. Therefore, attendance at every class is expected. Excessive lateness or absence from class is disruptive to the class and will hinder your
learning. **Students who miss class are responsible for obtaining notes and handouts from other students.**

Course Requirements:

1. **Homework:** There is one individual assignment, 3 group assignments. They are worth 20% of your grade.

   These are due at the beginning of class on the dates listed on the syllabus. Late homework will NOT be accepted without a reasonable circumstance and advance notice. Only hard copies of homework assignments will be accepted.

2. **In-class exercises & general participation:** Students are expected to actively participate during in-class exercises. Additionally, during lectures and in-class exercise sessions, the instructor may ask questions related to the readings. These are worth 15% of your grade.

3. **Mid-term and Final exams:** A mid-term and a final exam will be held during class sessions and will be two hours in duration (for each exam). The format of the examination will consist of true/false, multiple choice, and short-answer. More details on these exams will be given in class.

   **As a general rule, make-up exams and advance exams will not be given.** Exceptions to this rule are evaluated on a case-by-case basis. Students must submit the request before the exam takes place and will need to provide valid supporting documents. Requests will not be considered after the exam date unless an extreme exception has occurred, i.e. the student is hospitalized during the exam period.

Use of laptops, netbooks, smartphones, e-readers, or other communication devices

Please place your cell phone on vibrate or turn it off during class and also limit the use of laptops/netbooks/smartphones/e-readers/communication devices to legitimate classroom purposes (e.g., taking notes, downloading class information from ELMS/Canvas, working on an in-class exercise). E-mail, instant messaging, surfing the Internet, reading the news, watching movies, or playing games are not considered legitimate classroom purposes. Each classroom session includes a scheduled break. In addition, you may quietly step out of the room to attend to urgent emails or calls.

During exams, use of laptops, netbooks, smartphones, e-readers, or other communication devices is prohibited. If these devices are seen and/or used during an exam, the exam will be collected from the student, the student will no longer be allowed to continue taking the exam and will earn a grade of zero.

Canvas:

The syllabus, readings from journals, and other course materials will be posted on the Canvas website for EPIB611: [https://elms.umd.edu](https://elms.umd.edu). Please remember to check it on a regular basis.

Course Policies:

**Email – The Official University Correspondence:**

Verify your email address by going to [www.my.umd.edu](http://www.my.umd.edu).
All enrolled students are provided access to the University’s email system and an email account. *All official University email communication will be sent to this email address* (or an alternate address if provided by the student). Email has been adopted as the primary means for sending official communications to students, so email must be checked on a regular basis. Academic advisors, faculty, and campus administrative offices use email to communicate important and time-sensitive notices.

**Students are responsible for keeping their email address up to date or for redirecting or forwarding their email to another address.** Failure to check email, errors in forwarding email, and returned email (from “full mailbox” or “unknown user” errors for example), will not excuse a student from missing University announcements, messages, deadlines, etc. Email addresses can be quickly and easily updated at [www.my.umd.edu](http://www.my.umd.edu) or in-person at the Student Service Counter on the first floor of the Mitchell Building.

For technical support for University email: [www.helpdesk.umd.edu](http://www.helpdesk.umd.edu) or call 301-405-1400.

**Absence Policy:**
In accordance with University policy, if you are absent for a single (1) lecture due to illness or some form of personal or family emergency, this absence will be considered “excused” and the instructor will accept a note from you attesting to the date of the illness/incident, along with an acknowledgement that the information is true. Whenever feasible, you should try to contact the instructor in advance.

Multiple or prolonged absences, and absences that prevent attendance at a major scheduled grading event (like an exam or test) will require written documentation from an appropriate health care provider/organization.

A link to pull information on the new policy covering absences from class can be found at [http://www.president.umd.edu/policies/v100g.html](http://www.president.umd.edu/policies/v100g.html)

**Late work:**
All assignments are due at the beginning of class on their specified dates. **Only hard copies of assignments, reports and papers are accepted, except where indicated. E-mail and FAX copies will not be accepted, except where indicated.** 10% will be deducted for each day the assignment is late unless arrangements have been made prior to class. Work will not be accepted beyond two days after deadline except in extreme circumstances approved by your instructor. All coursework must be completed by the end of the term, or an incomplete grade will be assigned.

**Religious Observances:**
The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs; students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. **It is the student’s responsibility to inform the instructor in advance of any intended absences for religious observance.**
Special Accommodations / Disability Support Services:
If you have a documented disability and wish to discuss academic accommodations for test taking or other needs, you will need documentation from Disability Support Service (301-314-7682). If you are ill or encountering personal difficulties, please let the instructor know as soon as possible. You can also contact Learning Assistance Services (301-314-7693) and/or the Counseling Center (301-314-7651) for assistance.

Academic Integrity:
The University’s code of academic integrity is designed to ensure that the principle of academic honesty is upheld. Any of the following acts, when committed by a student, constitutes academic dishonesty:

- **CHEATING:** intentionally using or attempting to use unauthorized materials, information, or study aids in an academic exercise.
- **FABRICATION:** intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- **FACILITATING ACADEMIC DISHONESTY:** intentionally or knowingly helping or attempting to help another to violate any provision of this code.
- **PLAGIARISM:** intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise.

For more information see: [http://www.shc.umd.edu/code.html](http://www.shc.umd.edu/code.html).

The Honor Pledge is a statement undergraduate and graduate students should be asked to write by hand and sign on examinations, papers, or other academic assignments. The Pledge reads:

*I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination.*

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.shc.umd.edu](http://www.shc.umd.edu).

Copyright Protection for Class Materials:
My lectures and course materials, including power point presentations, tests, outlines, and similar materials, are protected by copyright. Persons who publicly distribute or display, or help others publicly distribute or display, copies or modified copies of an instructor’s course materials may be considered in violation of the University Code of Student Conduct, Part 9(k). You may take notes and make copies of course materials for your own use. You may not, and may not allow others, to reproduce or distribute lecture notes and course materials publicly, whether or not a fee is charged, without my express written consent.

Inclement Weather / University Closings:
In the event that the University is closed for an emergency or extended period of time, the instructor will communicate to students regarding scheduled adjustments, including rescheduling of examinations and assignments due to inclement weather and campus
emergencies. Official closures and delays are announced on the campus website (http://www.umd.edu) and snow phone line (301-405-SNOW), as well as local radio and TV stations.

**Course Evaluations**
The University, the School of Public Health, and the Department of Epidemiology and Biostatistics is committed to the use of student course evaluations for improving the student experience, course and curriculum delivery, and faculty instruction. Your evaluations help instructors improve their courses; help deans and department chairs decide on merit pay for faculty, renewal of contracts, and support tenure and promotion decisions; and help current and future students decide on classes. The system (www.CourseEvalUM.umd.edu) will open Tuesday, April 29th and close on Friday, May 14th for Spring 2014 courses.

**Grading Procedures:**
**Grade Weights**
Class participation (including in-class exercise participation): 15%
Homework: 20%
Mid-Term Exam: 30%
Final exam: 35%

**Grading**
Below is a ‘general guideline’ for grading. However, *final grades may be assigned relatively based on the curve of the class.*

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<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tr>
<td>98% +</td>
<td>A+</td>
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<tr>
<td>94% – 97%</td>
<td>A</td>
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<tr>
<td>90% – 93%</td>
<td>A−</td>
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<tr>
<td>88% – 89%</td>
<td>B+</td>
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<tr>
<td>84% – 87%</td>
<td>B</td>
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<td>80% – 83%</td>
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<td>78% – 79%</td>
<td>C+</td>
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<tr>
<td>74% – 77%</td>
<td>C</td>
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<tr>
<td>70% – 73%</td>
<td>C−</td>
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<tr>
<td>68% – 69%</td>
<td>D+</td>
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<tr>
<td>64% – 67%</td>
<td>D</td>
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<td>60% – 63%</td>
<td>D−</td>
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<td>&lt; 60%</td>
<td>F</td>
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<td>Date</td>
<td>Learning Objectives</td>
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| Session 1 1/30 | 1                   | **Topic:** Introduction  
Overview of class  
Overview of Study Design – Ecologic, Cross-sectional, Cohort studies  
**Reading:**  
• Szklo & Nieto, Chapter 1; pp14-32.  
• Rothman et al., Chapter 6 (recommended) |
| Session 2 2/6 | 1,2                 | **Topic:** Overview of Study Design – Case-Control, Nested Case-Control  
Case Cohort, Case-Cross Over, Intervention Studies  
Measures of Disease Frequency  
**Reading:**  
• Szklo & Nieto, Chapter 1; pp14-32, Chapter 2  
• Rothman et al., Chapter 6, Chapter 3 (recommended)  
Instructor will ask questions on various aspects of study designs.  
**In-class Exercises on Measures of Disease Frequency** |
| Session 3 2/13 | 3                   | **Topic:** Measures of Association  
**Reading:**  
• Szklo & Nieto, Chapter 3  
• Rothman et al., Chapter 4 (recommended)  
**In-class Exercises on Measures of Disease Association** |
| Session 4 2/20 | 4, 6                | **Topic:** Causal Inference in Epidemiology  
Bias  
**Readings:**  
• Szklo & Nieto, Chapter 4  
• Rothman et al. Chapter 2, 9 (recommended) |
| Session 5 2/27 | 5                   | **Topic:** Confounding  
**Readings:**  
• Szklo & Nieto, Chapter 5  
• Rothman et al. Chapter 9 (recommended)  
**Assignment due:** Work with another student (in pairs) to select a paper from an Epidemiology or Public Health journal, identify the study design, exposure, outcome, and confounder(s). Be prepared to discuss in class why you consider the variable a confounder and how it affects the true relationship between exposure and outcome. |
| Session 6 | 3/6 | **5** | **Topic:** Effect Modification (part I)  
**Readings:**  
- Szklo & Nieto, Chapter 6  
- Rothman et al., Chapter 5 (recommended)  
**Assignment due:** a problem set on topics that have been covered in class. This will serve also as a good opportunity to review and prepare for midterm exam. |
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<tr>
<td>Session 7</td>
<td>3/13</td>
<td><strong>Midterm Exam</strong></td>
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<td>3/20</td>
<td><strong>Spring Break!</strong></td>
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| **Session 8** | **3/27** | **6,7** | **Topic:** Effect modification (part II)  
Stratification and Adjustment  
**Readings:**  
- Szklo & Nieto, Chapter 6 & 7  
- Rothman et al., Chapter 11, Chapter 15 (pp258-265) (recommended) |
| **Session 9** | **4/3** | **8, 9** | **Topic:** Measurement  
Validity & Reliability  
Experimental Research, Randomization  
Quasi-experimental design  
Scale Development  
**Readings:**  
- Neuman, Chapter 7-10  
- Rothman et al., Chapter 24 (recommended)  
**Please note: class will run longer on 4/3**  
4 pm – 7:30  
**Assignment due:** Work in groups to select a paper from an Epidemiology or Public Health journal, identify the study design, exposure, outcome, and effect modifier(s). Be prepared to discuss in class why you consider the variable an effect modifier and how the relationship between exposure and disease is different by varying levels of effect modifier. |
<table>
<thead>
<tr>
<th>Session 10</th>
<th><strong>NO CLASS</strong>*</th>
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<tbody>
<tr>
<td>4/10</td>
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<tr>
<th>Session 11</th>
<th>Topic: Sampling</th>
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<tr>
<td>4/17 10, 11</td>
<td>Survey Design</td>
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<td>Other topics</td>
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**Readings:**
- Neuman, Chapter 7-10
- Rothman et al., Chapter 24 (recommended)

**Please note: class will run longer on 4/17**
4 pm – 7:30

**Assignment due:** Work with another student (in pairs) to identify a paper from an Epidemiology or Public Health journal which uses multivariable linear regression as an analytical tool and that includes a table with beta estimates for at least 2 covariates (as shown in Table 7-16 or Table 7-17 in the Szklo textbook). Together, you will lead a class discussion in which you will state the objective of study, the study design employed, how the exposures and outcomes were measured, and why multivariable linear regression was used. Also, be prepared to write the regression equation with 2 covariates (in addition to intercept) and explain to the class how to interpret those estimates. Bring ~20 (equivalent to number of students & instructor) copies of the table (just one-page).

<table>
<thead>
<tr>
<th>Session 12</th>
<th>Topic: Other Epidemiological Methods</th>
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<tr>
<td>4/24</td>
<td>Age, period, and cohort effects</td>
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**In-class exercises**

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<tr>
<th>Session 13</th>
<th>Topic: Emerging Topics in Epidemiology</th>
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<tr>
<td>5/1</td>
<td>Practice problems to be distributed in class; students will work on exercises in small groups</td>
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<tr>
<td>Date</td>
<td>Time</td>
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*1st half of class will be spent on review for final exam*

| Date   | Time | Session 15 | 5/15 | FINAL EXAM |