

Course Title: Intermediate Epidemiologic Research Methods
Course Number: EPID 0656
Course Location: Newark: One River Front Plaza, 10th Floor Room 1005
Course Date & Time: Tuesdays 6:00 pm - 8:00 pm

This course requires 30 minutes of online learning and graded exercises each week before the in-class lecture (online 30)

Course Instructor: Dennis Fried, PhD, MPH, MBA, Assistant Professor of Epidemiology
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Do not email the course instructors through Canvas

Office Hours: Office hours by appointment.

Required Course Text: Moyses Szklo and F Javier Nieto, Epidemiology: Beyond the Basics. 4th edition

Additional/Supplemental Readings/Resources: Vandenbroucke JP, von Elm E, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, Poole C, Schlesselman JJ, Egger M; STROBE Initiative. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *PLoS Med.* 2007 Oct 16;4(10): e297. PMID: 17941715
<http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0040297>

Additional readings are required before each class. These will be assigned throughout the semester and will be provided on the course Canvas website.

Course Description: This is an intermediate-level epidemiologic methods course that builds on information and skills learned in the introductory-level PHCO Epidemiology course. The course will focus on study design, possible threats to validity, and how threats can be minimized.

Selected Concentration Competencies Addressed: Each Concentration identifies competencies for each degree offered. The competencies addressed in this course for the MPH in *Epidemiology* include:

- Critique epidemiologic literature, assess its strengths and weaknesses, and determine if conclusion(s) are supported.
 - *Link to course content and assessments:*
 - *Lecture addressing this competency: Week 2, 3, 6, 7, 9*
 - *Assessment:*
 - *Journal critique;*
 - *Online mini-lecture questions #'s 1,2,3,6,7,8*
- Use epidemiologic techniques to quantitatively assess patterns and changes in disease occurrence.
 - *Link to course content and assessments:*
 - *Lecture addressing this competency: Week 4, 5, 10, 11*

- *Assessment:*
 - *Online mini-lecture questions #'s 4,5*
 - *Midterm exams*
- Formulate a specific hypothesis and determine an appropriate study design.
 - *Link to course content and assessments:*
 - *Lecture addressing this company: Week 1,2,3,6,7*
 - *Assessment:*
 - *Journal critique;*
 - *Final exam*
- Communicate and present study findings to professional audiences.
 - *Link to course content and assessments:*
 - *Lecture addressing this company: Week 12*
 - *Assessment:*
 - *Journal critique*

Course Objectives: By the completion of this course, students will be able to:

- Identify epidemiologic study designs and apply the appropriate epidemiologic study design to a research question.
- Identify potential bias threats to validity in epidemiologic studies and strategies to address them.
- Identify, calculate, interpret, and differentiate between epidemiologic measures of occurrence and association.
- Identify and assess how exposure-disease relationships are impacted by covariates including by confounding, interaction, and mediation.
- Be able to critically review published epidemiological literature.
- Be able to discuss how theories of causation play a role in epidemiology, public policy and public health interventions

Course Canvas Site: The course Canvas site can be found after logging in to <http://Canvas.rutgers.edu/>. Please test your access to the site as soon as possible. Important course materials will be posted there including lectures and class assignments. If you cannot access the site, let Dr. Fried know as soon as possible. There are training materials available to help you with Canvas and can be accessed from your Canvas homepage or you can reach out to Canvashelp@ca.rutgers.edu for assistance.

Course Requirements and Grading: Detailed course requirements

(1) Class Participation:

- Students are expected to attend class. During class students are expected to participate in class discussions and group exercises
- Prior to each class students are expected to:
 - Access, review, and complete assigned online mini-lecture(s) and complete and submit the mini-lecture questions (see next section, 'Weekly online mini-lectures and questions').
 - Mini lectures are usually between 10 and 15 minutes long – there are 1 to 3 per week.

- Complete assigned readings. Exercises from the text book are recommended to assess your comprehension of the material.

(2) Weekly online mini-lectures and quizzes

- There are 1 to 3 mini-lectures posted on the Canvas course webpage each week which must be viewed before class
- There will be quizzes each week based primarily on the mini-lecture.
- Quizzes must be completed before class
 - Starting with the 3rd quiz at least one question will cover a topic from previous lectures
 - There are 9 quizzes
 - Quizzes # 1 and # 2: 1 point each; Quizzes # 3-9: 3 points each
 - You will drop your lowest quiz 3-point grade

(3) Group project: Journal article critique:

- The products for this assignment are:
 - A PowerPoint presentation file (.pptx)
 - A 15-minute group presentation (all members of the group must present)
- Students will be assigned to a group and will be responsible for working with their group to:
 - Select an appropriate epidemiologic journal article as directed in class
 - Use PowerPoint to develop and present:
 - The group’s in-depth critique of the article
 - The group’s proposed next study design based on the study and the findings
- Guidelines for choosing the article, the critique and presentations will be distributed as per the course schedule.

(4 & 5) Midterm and Final Exams:

- Exams will be in class and include material covered during classes and material from the readings.
- The final exam will be cumulative but will emphasize material covered since the midterm.
- The exams will be held in the regular classroom on the dates indicated on the course schedule. Time allotted to complete exams in class: Midterm = 2 hours; Final exam = 3 hours.
 - The exams are closed book.
 - Students can bring one 2-sided page of notes in any format to use during the test.
 - Students must bring their Student ID (A number) to use to identify themselves on the exam. Student may **NOT** write their name on the exam.

Grade value for assessments		SPH Grading Policy			
(1) Class participation	10%	94 – 100	A	80 – <84	B-
(2) Weekly online mini-lectures and quizzes	25%	90 – <94	A-	77 – <80	C+
(3) Group project: Journal article critique	20%	87 – <90	B+	70 – <77	C
(4) Midterm	20%	84 – <87	B	<70	F
(5) Final Exam	25%				

Week/ Date	Lecture Topic(s)	Online - 30 learning activity	Required Readings
Week 1/ 21-Jan	Course Introduction Causal inference	Complete online form View TedTalk	<ul style="list-style-type: none"> Course syllabus Szklo & Nieto: Chapter 10 through sect. 10.2 (pp 437-456) Bradford Hill AB. The environment and disease: association and causation. Proc R Soc Med 1965; 58:295-300
Week 2/ 28-Jan	<ul style="list-style-type: none"> Study Designs in Epidemiology Design of cross-sectional and longitudinal studies 	<u>Mini-lecture: RCTs</u> <u>Quiz # 1 (1 pt)</u>	<ul style="list-style-type: none"> Szklo & Nieto: pp 1-23 (read until section 1.4.1) IARC article: Cohort studies
Week 3/ 04-Feb	<ul style="list-style-type: none"> Design of case control studies 	<u>Mini lecture: Basics of the case control study design and control selection</u> <u>Quiz # 2 (1 pt)</u>	<ul style="list-style-type: none"> Szklo pp 23-38 IARC article: Case control studies
Week 4/ 11-Feb	<ul style="list-style-type: none"> Measures of Disease Occurrence Review group journal critique assignment 	<u>Mini lectures:</u> 1. Review of Incidence and Prevalence 2. Threats to validity - random chance 3. Confidence intervals <u>Quiz # 3 (3 pts)</u>	<ul style="list-style-type: none"> Szklo & Nieto: Chp. 2
Week 5/ 18-Feb	Measures of Disease Association	<u>Mini lecture: Basics of measures of disease association</u> <u>Quiz # 4 (3 pts)</u>	<ul style="list-style-type: none"> Szklo & Nieto: Chp. 3 Schmidt C., Kohlmann T. When to use the odds ratio or the relative risk? International Journal of Public Health 53(2008) 165-167 Bring an article to class to discuss with group
Week 6/ 25-Feb	Understanding lack of validity: Bias	<u>Mini lecture: Bias overview; Selection bias</u> <u>Quiz # 5 (3 pts)</u>	<ul style="list-style-type: none"> Szklo & Nieto: Chp. 4
Week 7/ 03-Mar	Identifying non-causal associations: Confounding	<u>Mini lecture: Confounding</u> <u>Quiz # 6 (3 pts)</u>	<ul style="list-style-type: none"> Szklo & Nieto: Chp. 5

Week 8/ 10-Mar	MIDTERM EXAM	Covers all materials from weeks 1 to 7	
Week 9/ 24-Mar	Assessing heterogeneity of effects: Interaction	<u>Mini lecture</u> : Interaction and effect modification <u>Quiz # 7</u> (3 pts)	• Szklo & Nieto: Chp. 6
Week 10/ 31-Mar	Stratification and adjustment: Multivariate analysis in epidemiology	<u>Mini lecture</u> Direct and indirect stratification <u>Quiz # 8</u> (3 pts)	• Szklo & Nieto: Chp. 7
Week 11/ 07-Apr	Quality assurance and quality control	<u>Mini lecture</u> : Measures of validity <u>Quiz # 9</u> (3 pts)	• Szklo & Nieto: Chp. 8
Week 12/ 14-Apr	Application of epidemiologic results		• Szklo & Nieto: Chp. 9 & 10
Week 13/ 21-Apr	TBA		
Week 14/ 28-Apr	Presentation of group projects		
Week 15/ 05-May	Final Exam- Cumulative		



This is a general schedule and **is subject to change/updates** as needed throughout the semester. Please attend class and the Canvas site weekly for updates. All readings other than the text will be posted on the Canvas course site.

Learning Management System: Moodle will be used extensively throughout the semester for course syllabus, assignments, announcements, communication and/or other course-related activities. It is the student's responsibility to familiarize themselves with Moodle and check it regularly. If you have difficulties accessing Moodle, please inform the instructor and Moodle Support (moodlehelp@ca.rutgers.edu). Moodle is accessible at moodle.rutgers.edu.

School of Public Health Honor Code: The School of Public Health Honor Code is found in the student bulletin (sph.rutgers.edu/academics/catalog/index.html). Each student bears a fundamental responsibility for maintaining academic integrity and intellectual honesty in his or her graduate work. For example, all students are expected to observe the generally accepted principles of scholarly work, to submit their own rather than another's work, to refrain from falsifying data, and to refrain from receiving and/or giving aid on examinations or other assigned work requiring independent effort. In submitting written material, the writer takes full responsibility for the work as a whole and implies that, except as properly noted by use of quotation marks, footnotes, etc., both the ideas and the works used are his or her own. In addition to maintaining personal academic integrity,

each student is expected to contribute to the academic integrity of the school community by not facilitating inappropriate use of her/his own work by others and by reporting acts of academic dishonesty by others to an appropriate school authority. It should be clearly understood that plagiarism, cheating, or other forms of academic dishonesty will not be tolerated and can lead to sanctions up to and including separation from the Rutgers School of Public Health.

Students with Disabilities: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student must Apply for Services by first completing a Registration Form with the Rutgers Office of Disability Services (ODS) at ods.rutgers.edu. The student will also be required to participate in an ODS intake interview and provide documentation. If reasonable accommodations are granted, ODS will provide you with a Letter of Accommodations which should be shared with your instructors as early in your courses as possible.

Graduate Student Computer Policy: Students are required to possess a personal laptop, no older than approximately two years, that must meet minimum requirements which may be found online at: sph.rutgers.edu/student_life/computer_requirements.html

Policy Concerning Use of Recording Devices and Other Electronic Communications Systems: When personally owned communication/recording devices are used by students to record lectures and/or classroom lessons, such use must be authorized by the faculty member or instructor who must give either oral or written permission prior to the start of the semester and identify restrictions, if any, on the use of mobile communications or recording devices.

Withdrawal/Refund Schedule: Students who stop attending their course(s) without processing an [Add/Drop Course](#) form will receive a failing grade. Furthermore, students dropping to zero credits for the semester are considered withdrawn and must submit a completed [Leave of Absence](#) form from the School of Public Health's Office of Student Affairs. The School of Public Health refunds tuition only. Administrative and technology fees are non-refundable. You may find the Withdrawal/Refund Schedule on the School of Public Health website at: sph.rutgers.edu/academics/registration/school_calendars.html