

Course Title: Intermediate Epidemiologic Research Methods

Course Number: EPID 0656 (Spring 2023), Section 031

Course Pre- and Co-requisite(s): PHCO 0502 (Principles and Methods of Epidemiology)
PHCO 0504 (Introduction to Biostatistics)

Course Location: New Brunswick/Piscataway Campus
School of Public Health – Room 3A/3B

Course Date & Time: Tuesdays, 6:00 PM – 8:00 PM EST

Course Instructor: Glenn Grossman
Adjunct Instructor
Department of Biostatistics and Epidemiology
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Office Hours: **Via Zoom by appointment**

Course Assistant: TBD

Course Website: <https://rutgers.instructure.com/courses/227785/>

Required Course Text: Moyses Szklo and F. Javier Nieto, Epidemiology: Beyond the Basics (4th Edition). Available as a PDF on Canvas.

Additional Readings/Resources: Additional articles posted on Canvas

Course Description: This is an intermediate-level epidemiologic methods course that builds on information and skills learned in an introductory-level course on epidemiology (PHCO 0502). The course will provide a foundation for the design, analysis, and interpretation of epidemiologic studies. The course will focus on theories of causation, study design, possible threats to validity and how they can be recognized and addressed, as well as a critical view of epidemiology and its role in public health.

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

- A. Critique epidemiological literature, assess its strengths and weaknesses, and determine if conclusion(s) are supported.
- B. Use epidemiologic techniques to quantitatively assess patterns and changes in disease occurrence.
- C. Formulate a specific hypothesis and determine an appropriate study design and analysis plan.
- D. Communicate and present study findings to professional audiences.

Visit the Concentration webpages on the School of Public Health’s website at sph.rutgers.edu for additional competencies addressed by this course for other degrees and concentrations.

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

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

Assessment of Competencies: Course competencies are tied to objectives and assessments as follows:

Competency	Course Objectives(s)	Week #	Assessment(s)
A	a, b, d, e	9,10,11, 12,13,14	Quizzes (#8, 9, 10, 11, 12), JiTT Exercises (#8, 9, 10, 11, 12), Project, Midterm Exam, Final Exam
B	c	3,4	Quizzes (#3, 4), JiTT Exercises (#3, 4), Midterm Exam, Final Exam
C	a, b, c, d, f	1,2,5,6,7, 9,10,11,12	Quizzes (#2, 5, 6, 7, 8, 9, 10, 11), JiTT Exercises (#2, 5, 6, 7, 8, 9, 10, 11), Midterm Exam, Final Exam
D	b, d, e, f	9,10,11,12,13,14	Project

Course Requirements and Grading:

- This course uses the Canvas learning management system. Guidelines for readings and assignments will be posted on Canvas throughout the semester, and most assignments will be submitted via Canvas.
- The following school-wide grade scale will be used to determine final course grades.
 - A 94 – 100
 - A- 90 – <94

B+	87 – <90
B	84 – <87
B-	80 – <84
C+	77 – <80
C	70 – <77
F	<70

- Final course grades will be based on the following:

(1) Class attendance and participation	5%
(2) Weekly online pre-class JiTT exercise	11%
(3) Weekly online post-class quizzes	11%
(4) Midterm exam	25%
(5) Final project	20%
(6) Final exam and take-home assignment	28%

- Class attendance and participation (5%):
 - Students are expected to attend class on **Tuesdays from 6:00 – 8:00 PM EST**. Active participation in class and group work is required.
 - Prior to each class students are expected to:
 - Complete assigned reading on new material
 - Access and review online mini-lecture (“Online 30”)
 - Complete weekly online pre-class JiTT exercise that will primarily be based on new material.
 - After each class students are expected to:
 - Take weekly online post-class quiz that will primarily be based on material from that week’s class.

- Weekly online pre-class JiTT exercise (11%):
 - There will be Just in Time Teaching (JiTT) exercises each week based primarily on the assigned readings and mini-lectures (starting in Week 2).
 - JiTT exercises must be completed by **4:00 PM EST on Tuesday** prior to each class.
 - There are 12 JiTT exercises each worth 1 point each. These will be graded on effort and completion. You must complete a minimum of 11 JiTT exercises to receive full credit.

- Weekly online post-class quizzes (11%):
 - There will be quizzes each week based primarily on material from the previous week. You will have 30 minutes to complete each quiz.
 - Quizzes must be completed by **10:00 PM EST on Friday** after each class.
 - There are 12 quizzes each worth 1 point each. Your lowest grade will be dropped.

- Midterm exam (25%):
 - The midterm exam will be held during class on **Tuesday March 7 from 6:00-8:00 PM EST**. The exam will be in-person and the exam will be proctored. In the event class needs to be virtual on the day of the exam, students will need an enabled web camera and internet connection for the exam.

- **Final project: journal article poster and presentation (20%):**
 - In preparation for the project, students should read Szklo & Nieto: Ch. 9 as well as the project guidelines (to be posted).
 - Students will be randomly assigned one of five epidemiologic journal articles to read and critically evaluate. Students will create a poster using PowerPoint (.pptx) suitable for presentation at a conference and present a 4-5 minute presentation to accompany the poster. The poster will be due on **Tuesday April 25 by 4:00 PM EST**.
 - On Tuesday April 26, class time will be provided for students to present their posters (randomly assigned) and provide peer-evaluations.

- **Final exam and take-home assignment (28%):**
 - The final take-home assignment will be due on **Tuesday May 2 by 6:00 PM EST**.
 - The final exam will be held in person during class time on **Tuesday May 2 from 6:00-8:00 PM EST**. The exam will be proctored. In the event class needs to be virtual on the day of the exam, students will need an enabled web camera and internet connection for the exam.

Course Schedule: This is a preliminary schedule and is subject to change/updates as needed throughout the semester. Please attend class and check the Canvas site weekly for updates. All readings other than the textbook will be posted on the Canvas course site.

WEEK 1	
Date:	January 17
Before Class Reading:	<input type="checkbox"/> Read Course Syllabus <input type="checkbox"/> Read Lau et al. Perspectives on the future of epidemiology. <i>Am J Epidemiol</i> (2020). <input type="checkbox"/> Read Pearce and Vandenbroucke. Educational note: types of causes. <i>Int J Epidemiol</i> (2020)
Online 30:	<input type="checkbox"/> Complete your introduction and meet your classmates <input type="checkbox"/> JiTT #1 (SPH Honor Code) due by January 20, 10:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Course Overview <input type="checkbox"/> Lecture: Causal Inference Part One <input type="checkbox"/> Group Activity: Causal Inference Part One
After Class:	<input type="checkbox"/> Quiz #1 due by January 20, 10:00 PM EST

WEEK 2	
Date:	January 24
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch 10.1 through 10.2.4 (pp 437-456) <input type="checkbox"/> Read Hill AB. The environment and disease: association or causation? <i>Proc R Soc Med</i> (1965) <input type="checkbox"/> (Optional) Read Rothman and Greenland. Causation and Causal Inference in Epidemiology. <i>Am J Public Health</i> (2005)
Online 30:	<input type="checkbox"/> Mini Lecture: TED Talk (Margaret Heffernan: Dare to Disagree) <input type="checkbox"/> JiTT #2 due by January 24, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Causal Inference Part Two <input type="checkbox"/> Group Activity: Causal Inference Part Two
After Class:	<input type="checkbox"/> Quiz #2 due by January 27, 10:00 PM EST

WEEK 3

Date:	January 31
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 2 <input type="checkbox"/> Read Szklo & Nieto: Ch. 9 (in preparation for project)
Online 30:	<input type="checkbox"/> Mini Lecture and Activity: DAGgity <input type="checkbox"/> JiTT #3 due by January 31, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Measures of Disease Occurrence <input type="checkbox"/> Group Activity: Measures of Disease Occurrence
After Class:	<input type="checkbox"/> Quiz #3 due by February 3, 10:00 PM EST

WEEK 4	
Date:	February 7
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 3 <input type="checkbox"/> Read Schmidt and Kohlmann. When to use the odds ratio or the relative risk? <i>Int J Public Health</i> (2008)
Online 30:	<input type="checkbox"/> Mini Lecture: Measures of Disease Association (Basics) <input type="checkbox"/> JiTT #4 due by February 7, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Introduction to the Final Project <input type="checkbox"/> Lecture: Measures of Disease Association <input type="checkbox"/> Group Activity: Measures of Disease Association
After Class:	<input type="checkbox"/> Quiz #4 due by February 10, 10:00 PM EST

WEEK 5	
Date:	February 14
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 1 (we will re-read). Section 1.2 can be skipped. <input type="checkbox"/> Read IARC Intervention Trials
Online 30:	<input type="checkbox"/> Mini Lecture: Random Error, Confidence Intervals, P-Values <input type="checkbox"/> JiTT #5 due by February 14, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Overview of Study Designs <input type="checkbox"/> Lecture: RCT <input type="checkbox"/> Group Activity: RCT
After Class:	<input type="checkbox"/> Quiz #5 due by February 17, 10:00 PM EST

WEEK 6	
Date:	February 21
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 1 (1.3, 1.4.1, 1.4.3) <input type="checkbox"/> Read IARC Cohort Studies
Online 30:	<input type="checkbox"/> Mini Lecture: Cross-Sectional Study and Ecologic Study <input type="checkbox"/> JiTT #6 due by February 21, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Cohort Study <input type="checkbox"/> Group Activity: Cohort Study
After Class:	<input type="checkbox"/> Quiz #6 due by February 24, 10:00 PM EST

WEEK 7	
Date:	February 28
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 1 (1.4.2, 1.4.4, 1.4.5) <input type="checkbox"/> Read IARC Case-Control Studies
Online 30:	<input type="checkbox"/> Mini-Lecture: Case-Series and Case-Crossover Study <input type="checkbox"/> JiTT #7 due by February 28, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Case-Control Study

	<input type="checkbox"/> Group Activity: Case-Control Study
After Class:	<input type="checkbox"/> Quiz #7 due by March 3, 10:00 PM EST

WEEK 8	
Date:	March 7
Before Class:	
Online 30:	<input type="checkbox"/> Prepare for Midterm Exam
In Class:	<input type="checkbox"/> MIDTERM EXAM
After Class:	None!

(Spring Recess: March 11-19)

WEEK 9	
Date:	March 21
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 4
Online 30:	*No Mini Lecture <input type="checkbox"/> JiTT #8 due by March 21, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Bias <input type="checkbox"/> Group Activity: Bias
After Class:	<input type="checkbox"/> Quiz #8 due by March 24, 10:00 PM EST

WEEK 10	
Date:	March 28
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 5
Online 30:	<input type="checkbox"/> Mini Lecture: Confounding (Basics) <input type="checkbox"/> JiTT #9 due by March 28, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Confounding and Mediation <input type="checkbox"/> Group Activity: Confounding and Mediation
After Class:	<input type="checkbox"/> Quiz #9 due by March 31, 10:00 PM EST

WEEK 11	
Date:	April 4
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 6
Online 30:	<input type="checkbox"/> Mini Lecture: Interaction (Basics) <input type="checkbox"/> JiTT #10 due by April 4, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Interaction <input type="checkbox"/> Group Activity: Interaction
After Class:	<input type="checkbox"/> Quiz #10 due by April 7, 10:00 PM EST

WEEK 12	
Date:	April 11
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 7 <input type="checkbox"/> Read Szklo & Nieto: Ch. 9 (in preparation for project)
Online 30:	<input type="checkbox"/> Mini Lecture: Communicating Epidemiologic Evidence <input type="checkbox"/> JiTT #11 due by April 11, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Stratification and Adjustment

	<input type="checkbox"/> Group Activity: Stratification and Adjustment
After Class:	<input type="checkbox"/> Quiz #11 due by April 14, 10:00 PM EST

WEEK 13	
Date:	April 18
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 8
Online 30:	<input type="checkbox"/> Mini Lecture: Validity (Basics) <input type="checkbox"/> JiTT #12 due by April 18, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Quality Assurance and Control <input type="checkbox"/> Group Activity: Quality Assurance and Control
After Class:	<input type="checkbox"/> Quiz #12 due by April 21, 10:00 PM EST

WEEK 14	
Date:	April 25
Before Class Reading:	<input type="checkbox"/> Read Szklo & Nieto: Ch. 10.4-10.7
Online 30:	<input type="checkbox"/> Final Project Poster due by April 25, 4:00 PM EST <input type="checkbox"/> Final Project Presentation due by April 25, 4:00 PM EST
In Class:	<input type="checkbox"/> Lecture: Evaluating Epidemiologic Evidence <input type="checkbox"/> Group Activity: Virtual Poster Session
After Class:	<input type="checkbox"/> Prepare for Final Exam

WEEK 15	
Date:	May 2
Before Class Reading:	<input type="checkbox"/> Prepare for Final Exam <input type="checkbox"/> Final Take Home Assignment will be posted on Wednesday April 26 at
Online 30:	8:00 AM EST and due by May 2, 6:00 PM EST
In Class:	<input type="checkbox"/> FINAL EXAM
After Class:	None!

Attendance Expectations: When class is held in-person, students are expected to attend in-person as scheduled. If students are ever unable to attend class because of quarantine or illness, students can view the lecture on canvas and complete the group activity individually. Students must inform the instructor on absence.

Special Circumstances During COVID-19 (Spring 2023): To keep our on-campus communities safe, compliance with all current guidance and policies as set forth in the [Guide to Returning to Rutgers](#) is required at all times and without exception. Students, faculty, staff, or visitors who do not comply with these policies will not be permitted to remain on-site. The use of face-coverings indoors *IS* required in classrooms and offices as well as shared spaces (such as hallways and bathrooms). Rutgers employees and students must use the [My Campus Pass](#) symptom checker, a self-screening application, each day when traveling to campus or entering a Rutgers building. Please remember to wash your hands, wear a mask while indoors, particularly in crowded spaces and groups, and stay up-to-date on university guidance by consulting the [Guide to Returning to Rutgers](#) and the university's [COVID-19 website](#).

In addition, the School of Public Health recognizes that students may experience challenges or be negatively impacted due to the COVID-19 pandemic, mental and emotional health toll from

systemic racism, altered personal and professional obligations, and other crises existing at the moment in our local, national, and global communities. Students are encouraged to discuss these challenges and circumstances with their instructor, if they feel they may need additional support or temporary accommodations at the beginning or during this course. The course instructor may consider making reasonable temporary adjustments depending on the student's situation. If additional support is needed, students may reach out to the Office of Student Affairs (studentaffairs@sph.rutgers.edu) or any of the appropriate referral resources listed on the [SPH Student Connect](#) Canvas page.

Remote Learning Policies: The following are class policies for when/if our class meets virtually over Zoom. All students are expected to adhere to the policies.

General: Log into Zoom using your Rutgers NetID and sign-in with your full first name and last name as listed on the class roster. (If you use a different name than what is listed on the class roster, please email the instructor in advance of the class or send a private Chat message.) Using your full name allows the instructor to know who is in attendance and to quickly sort students into their groups when needed. Users who do not log into Zoom using their Rutgers NetID may have trouble accessing the Zoom classroom.

Video: Please turn on your video when possible. We recognize that this isn't always easy but this will help to build our class community. Seeing the faces of your classmates more closely duplicates the typical in-person learning experience and may shift your mindset into more focus and attention. Seeing each other can also provide each of us with positive social interactions.

- If you're unable to find an environment without a lot of visual distractions or prefer to not show your living space as a background, feel free to use a virtual background (several virtual background images created by the School of Public Health are available in the SPH Student Connect Canvas page).
- To save bandwidth, there may be times during class when the instructor asks students to turn off videos.
- Add a photo to your Zoom profile. (Then in times when videos are off, we'll see photos of everyone rather than an empty box.)
- If you have limited internet bandwidth or other issues impacting your video use, please inform the instructor.

Audio: Mute your microphone when you are not talking. This helps eliminate background noise.

- Use a headset, if possible. If you own headphones with a microphone, please use them. This improves audio quality.
- Be in a quiet place, if possible. Turn off any music, videos, etc. in the background.

Chat: Stay on topic and be respectful. Use the chat window for questions and comments that are relevant to class.

NOTE: Class meetings will be recorded and made available for students in the course on Canvas only.

Learning Management System: Canvas 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 Canvas and check it regularly. If you have difficulties accessing Canvas, please inform the instructor and Canvas Support (help@canvas.rutgers.edu). Canvas is accessible at canvas.rutgers.edu.

School of Public Health Honor Code: The School of Public Health Honor Code is found in the School Catalog (sph.rutgers.edu/academics/catalog.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.

Commitment to Safe Learning Environment: The Rutgers School of Public Health is committed to helping create a safe learning environment for all students and for the School as a whole. Free expression in an academic community is essential to the mission of providing the highest caliber of education possible. The School encourages civil discourse, reasoned thought, sustained discussion, and constructive engagement. Provocative ideas respectfully presented are an expected result. An enlightened academic community, however, connects freedom with responsibility. The School encourages all students to disclose any situations where you may feel unsafe, discriminated against, or harassed. Harassment or discrimination of any kind will be not tolerated and violations may lead to disciplinary actions.

Reporting Discrimination or Harassment: If you experience any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, know that help and support are available. You may report such incidents to the [RBHS Title IX Office](#) or to the School of Public Health's [Office of Student Affairs](#). Rutgers University has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. If you experience any other form of discrimination or harassment, including racial, ethnic, religious, political, or academic, please report any such incidents to the School's [Office of Student Affairs](#). The School strongly encourages all students to report any incidents of discrimination or harassment to the School. Please be aware that all Rutgers employees (other than those designated as confidential resources such as advocates, counselors, clergy and healthcare providers as listed in Appendix A to [Policy 10.3.12](#)) are required to report information about such discrimination and harassment to the School and potentially the University. For example, if you tell a faculty or staff member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty or staff member must share that information with the [RBHS Title IX Coordinator](#). If you wish to speak to a confidential employee who does not have this reporting responsibility, you can find a list of resources in Appendix A to University [Policy 10.3.12](#). For more

information about your options at Rutgers, please visit [Rutgers Violence Prevention and Victim Assistance](#).

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-support.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.

Policy Concerning Use of Turnitin: Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com (directly or via learning management system, i.e. Canvas) for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site. Students who do not agree should contact the course instructor immediately.

Withdrawal/Refund Schedule: Students who stop attending their course(s) without submitting a completed [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/academic-calendar.html.