

- Course Title:** Applied Methods in Epidemiologic Research
- Course Number:** EPID 0657 (Spring 2020)
- Course Pre- and Co-requisite(s):** Students must have completed Intro to Biostatistics (CORE 0504), Principles of Epidemiology (CORE 0502), Intermediate Epidemiologic Research Methods (EPID 0656), and Biometrics Computing (BIST 0535) or obtain written approval from the Instructor.
- Course Location:** School of Public Health (Piscataway), Room 2A
- Course Date & Time:** Wednesdays, 6:00 PM – 8:00 PM
- Course Instructor:** Michelle T. Bover Manderski, PhD, MPH
Lecturer, Biostatistics & Epidemiology, Rutgers School of Public Health
Core Faculty, Rutgers Center for Tobacco Studies
303 George Street, Suite 500, New Brunswick, NJ
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- Office Hours:** In Person on Wednesdays, 4 PM to 5 PM, SPH Room 319 (Except 2/12 and 2/19, which will be in Room 130)

Via WebEx on Mondays, 1 PM to 2 PM,
<https://rutgers.webex.com/meet/bovermi>

By Appointment at another mutually convenient time/location
- Course Assistant:** TBD
- Course Website:** canvas.rutgers.edu
- Required Readings:** Articles posted on course website (Canvas)
- Required Software:** SAS version 9.4 or higher. Please bring your laptop with SAS to class each week
- Recommended Text:** Cody & Smith. Applied Statistics and the SAS Programming Language, 5th Edition.

Course Description: This is an intermediate course designed to provide students with hands-on experience in the integration of epidemiologic theories and concepts with the analysis of study data. Students are introduced to various analytic approaches and quantitative methods for investigating public health issues, with a particular focus on logistic regression models. Students work on a publicly available dataset and work in designated groups throughout the semester. Students will perform a literature review, develop focused research hypotheses, develop an analytic plan, and analyze/interpret data applying the range of methods presented in lecture using SAS software. The data analysis project culminates in both oral and written presentations. Homework and a closed-book midterm examination are also required.

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. Formulate a specific hypothesis and determine an appropriate study design and analysis plan
- B. Design and implement basic quality control methods during data entry and analysis
- C. Appropriately analyze and interpret epidemiologic data, including large national and state level datasets
- D. Communicate and present study findings to professional audiences

Please 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. Formulate study aims and hypotheses
- b. Use SAS software to run analyses and read SAS output
- c. Build analytic models to test associations
- d. Assess the presence of confounding and interaction
- e. Report and interpret findings from analytic models
- f. Present results in written and verbal form

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

Competency	Course Objective(s)	Lessons (Week #)	Assessment(s)
A	a	1, 2	Assignments 1 & 7; Exam; Project
B	b	1-15	Assignments 2-6, 8-10; Exam; Project
C	b	1-13	Assignments 2-6, 8-10; Exam; Project
	c	4-7, 11-13	Assignments 3-6, 8-10; Project
	d	6, 7	Assignments 5, 6; Exam; Project
D	e	4-7, 11-14	Assignments 3-6, 8-10; Project
	f	14, 15	Project

Course Requirements and Grading:

- Final course grades will be based on the following:
 - Homework 30%
 - Midterm Exam 30%
 - Project Paper/Presentation 30%
 - Attendance & Participation 10%
- This course utilizes Canvas learning management system. Guidelines for assignments, as well as assigned readings and discussions, will be posted on Canvas throughout the semester, and most assignments will be submitted via Canvas.
- Attendance and Participation: Students are expected to attend class in person on Thursdays from 6 to 8 PM, as well as complete up to 30 minutes of additional web-based instructional activities such as videos or graded discussions ('Online 30'). Active participation in both lecture and web-based activities is **required**. Unless otherwise noted, the following 3-point rubric will be used to assess graded discussions:
 - Provocative (3/3) – Response goes beyond simply answering the prompt, attempts to stimulate further thought and discussion, is relevant to epidemiology and concepts learned in class, and is respectful of others' posts
 - Substantial (2/3) – Response adequately answers the prompt but does not stimulate further analysis/discussion of the subject, is somewhat relevant to epidemiology and concepts learned in class, and is respectful of others' posts
 - Superficial (1/3) – Response provides obvious information without further analysis of the concept, lacks depth of knowledge or reasoning, or has very little relevance to epidemiology and concepts learned in class
 - None (0/3) – Response is not complete or is not respectful of others' posts
- Homework assignments will be assigned throughout the semester, some will be related to the final project. Homework must be submitted by the designated due date/time. Late submission will result in the following deduction:
 - 25% automatic deduction if submitted within 24 hours following the due date/time
 - 50% automatic deduction if submitted within 48 hours following the due date/time
 - Homework will not be accepted after 48 hours following the due date/time
- A final project will consist of a group presentation and an individual paper. Details will be provided during the semester.
- Participation grades will be assigned as a function of class attendance, active participation in classroom activities, and participation in 'Online 30' activities.
- All assignments are individual assignments, unless explicitly stated otherwise. This includes homework assignments and the final paper. While collaborative learning is encouraged, each student must submit their own work.

- The following school-wide grade scale will be used to determine final course grades. Please note that grades will not be “rounded” or “curved,” and please do not rely on Canvas grade calculations (they are sometimes incorrect):
 - 94 – 100 A
 - 90 – 93.99 A-
 - 87 – 89.99 B+
 - 84 – 86.00 B
 - 80 – 83.00 B-
 - 77 – 79.99 C+
 - 70 – 76.99 C
 - < 70 F

- **Communication:** Although you are always welcome to email your instructor privately, **I encourage you to ask (and answer) general course and content questions in class or in our Canvas forum, so the entire class can benefit from the discussion.** Working with your classmates, explaining concepts to each other, and interacting with your instructors are the most effective ways to understand the principles of epidemiology and succeed in this course!

Course Schedule: Below is a PRELIMINARY course schedule. Updates to this schedule, as well as additional readings, assignments, and ‘Online 30’ activities, will be communicated via Canvas

WEEK 1	
Date:	January 22
Topic(s), activities:	Review Syllabus and course format; Review of epidemiology concepts and analytic approaches; Review of SAS programming language; National Health Interview Survey (NHIS);
Online 30:	Graded discussion – Introductions;
Readings:	Visit www.cdc.gov/nchs/nhis.htm <ul style="list-style-type: none"> • Review survey content/information • Explore code books/variables Be prepared to discuss topics of interest for the project.
Assignments:	About Me survey – PLEASE COMPLETE ASAP
Project Timeline:	Review NHIS documentation, brainstorm potential project ideas

WEEK 2	
Date:	January 29
Topic(s), activities:	Conducting a literature review; Developing Aims and Hypotheses; Data Management and Exploration; Downloading, merging, and analyzing NHIS datasets
Online 30:	Discussion – Project topics, objectives, aims, hypotheses Recorded video tutorial: Week 2 lab activity
Readings:	Dahlhamer et al (2016) Barriers to health care...; Brucker (2016) Food security among young adults...; Hrywna et al (2014) Sex differences in the association...
Assignments:	Assignment #1 – Due 2/5 – GROUP SUBMISSION
Project Timeline:	Finalize topic, develop aims and hypotheses
WEEK 3	
Date:	February 5
Topic(s), activities:	Power and Sample Size
Online 30:	Graded Discussion – Background sections
Readings:	Hoening & Keisey (2001) Abuse of Power Bramer et al (2018) A systematic approach to searching Video: Literature Review
Assignments:	Assignment #2 – Due 2/12
Project Timeline:	Begin literature review
WEEK 4	
Date:	February 12
Topic(s), activities:	Linear Regression
Online 30:	Recorded video tutorial: Linear regression
Readings:	SAS Documentation – PROC REG
Assignments:	Assignment #3 – Due 2/19
Project Timeline:	Complete literature review; Identify study variables
WEEK 5	
Date:	February 19
Topic(s), activities:	Logistic Regression
Online 30:	Recorded video tutorial: Logistic regression
Readings:	SAS documentation – PROC LOGISTIC; Persoskie & Ferrer (2016) A Most Odd Ratio
Assignments:	Assignment #4 – Due 2/26
Project Timeline:	Recode study variables for analysis
WEEK 6	
Date:	February 26
Topic(s), activities:	Confounding and Mediation
Online 30:	Recorded video tutorial: Change-in-estimate strategy
Readings:	Walter & Tiemeier (2009) Variable selection practices
Assignments:	Assignment #5 – Due 3/4
Project Timeline:	Identify potential confounders, recode if necessary

WEEK 7	
Date:	March 4
Topic(s), activities:	Effect Modification and Interaction
Online 30:	Graded Discussion: 'Methods' sections
Readings:	Van der Weele (2009): On the Distinction between Interaction and Effect Modification
Assignments:	Assignment # 6 – Due 3/11
Project Timeline:	Assess effect modification
WEEK 8	
Date:	March 11
Topic(s), activities:	Measurement
Online 30:	Graded Discussion: 'Methods' sections
Readings:	Kimberlin & Winterstein (2008) Validity and reliability of measurements Andrews & Slade (2001) Interpreting scores on the K10 scale
Assignments:	Assignment # 7 – Due 3/25
Project Timeline:	Draft 'Background' and 'Methods' sections of paper
WEEK 9	
Date:	March 18
Topic(s), activities:	SPRING BREAK – NO CLASS
WEEK 10	
Date:	March 25
Topic(s), activities:	Presenting and Reporting Results; Review Session
Online 30:	Graded Discussion: 'Results' sections
Readings:	Knol & Van der Weele (2012) Recommendations for presenting analyses of effect modification and interaction
Assignments:	Assignment # 7 – Due 4/8
Project Timeline:	Draft 'Background' and 'Methods' sections of paper
WEEK 11	
Date:	April 1
Topic(s), activities:	Exam
Online 30:	Graded Discussion: 'Results' sections
Readings:	---
Assignments:	Assignment # 7 – Due 4/8
Project Timeline:	Draft 'Results' sections of paper
WEEK 12	
Date:	April 8
Topic(s), activities:	Complex survey analysis;
Online 30:	Recorded video tutorial: Complex Survey Data Analysis;
Readings:	Keyes et al (2017) Mortality among survey respondents vs gen pop
Assignments:	Assignment # 9 – Due 4/15
Project Timeline:	Consider weighted analysis; Finalize methods and results

WEEK 13

Date:	April 15
Topic(s), activities:	Survival analysis
Online 30:	Graded Discussion: 'Discussion' sections
Readings:	Sutradhar & Austin (2017) Relative Rates not Relative Risks
Assignments:	Assignment # 10 – Due 4/22
Project Timeline:	Draft 'Discussion' section

WEEK 14

Date:	April 22
Topic(s), activities:	Hierarchical regression; Longitudinal analysis
Online 30:	Prepare presentation; solicit feedback if necessary
Readings:	Hubbard et al (2010) To GEE or not to GEE; Hayes (2006) A Primer on Multilevel Modeling
Assignments:	Assignment # 11 – Due 4/29
Project Timeline:	Practice presentation; Prepare full draft of paper

WEEK 15

Date:	April 29
Topic(s), activities:	Project Presentations
Online 30:	Peer reviews
Readings:	---
Assignments:	---
Project Timeline:	Present findings to peers; consider feedback, finalize paper

WEEK 16

Date:	May 6
Topic(s), activities:	Submit final paper on Canvas by 6PM – No class
Online 30:	---
Readings:	---
Assignments:	Final paper due by 6PM
Project Timeline:	DONE!!!

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