THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

PUBHEPI 7430 – Epidemiology III
4 credits – Autumn 2025
Tuesdays 9:35am-10:55am Baker Systems 144
Thursdays 9:35am-10:55am or 2:20pm-3:40pm Cunz 230

Course Instructor
Dr. Jeffrey Wing, PhD, MPH, Division of Epidemiology, College of Public Health (8/18/2025)
342 Cunz / 614-688-3793
wing.68@osu.edu

Instructor's Office Hours
Thursdays 1-2pm, 342 Cunz

Faculty Feedback & Response Time:
The following gives you an idea of my intended availability during the course:

- **Grading:** You can generally expect feedback within 14 days.
- **E-mail:** I will reply to e-mails (sent via Carmen) within 24 hours on school days.
- **Discussion board:** Either the TA or the instructor will check and reply to messages in the discussion boards at least every 12 hours on school days, and every 24 hours on weekends, unless a different turnaround time (due to travel, etc.) is announced.

Graduate Teaching Assistant (GTA)
Laxmi Sureshkumar, sureshkumar.19@buckeyemail.osu.edu, Mondays 1:30pm-2:30pm,
https://osu.zoom.us/j/97729693694?pwd=SaMI3PrYy3QrApVXhVaJoh30gZpGm8.1

GTA Responsibilities
The GTA assigned to the course will hold regular office hours and lead review sessions for any students who need help with class material. The TA may assist with scoring assignments; however, final grades will be assigned by the professor. **Any questions regarding grading should be directed to the professor and not the TA.**

Course Description
This course provides instruction and hands-on experience in the analysis and interpretation of data from epidemiologic studies. It is designed for students seeking an MPH, MS or PhD in Epidemiology specialization and for others interested in the interpretation of data from epidemiologic research. The course consists of two related analytic exercises: a cohort study and a case-control study.

Prerequisites
Grad standing in Public Health, or permission of instructor. The following two courses must be successfully completed (earning a B- or higher) prior to PUBHEPI 7430: PUBHEPI 7410 (Epidemiology II) and PUBHBIO 6211 (Design and Analysis of Studies in the Health Sciences II). Familiarity with SAS or R is essential (either through PUBHBIO 6270 or through other training).

Course Goals

The goal of this course is to provide MPH, MS, and PhD students a hands-on experience with epidemiologic data analysis to help them develop an understanding of basis data analytic procedures, improve their data analytic skills, writing and reporting of results, and to reinforce epidemiologic concept presented in previous EPI courses (EPI I and II).

Course Learning Objectives

- Develop an understanding of basic data analytic procedures.
- Develop data analytic skills including on how to examine interactions, confounders, and nonlinear relationships among variables in regression models.
- Develop skills for epidemiologic abstract and manuscript preparation.
- Reinforce epidemiologic concepts presented to date.

Competencies:

PhD: Specialization in Epidemiology

7) Identify and address potential sources of bias, including selection bias, measurement error, and confounding, in both the design and analysis phases of epidemiological studies.

MS: Specialization in Epidemiology

2) Summarize relevant theories and conceptual models that inform their research.
3) Conduct a research project using appropriate research methods and ethical approaches.
6) Identify and understand the impact of potential sources of bias, including selection bias, measurement error, and confounding, in epidemiological studies.
7) Demonstrate familiarity with the content and issues in at least one substantive epidemiological topic.

MPH: Specialization in Epidemiology

2) Choose the correct analysis for data obtained from an epidemiologic investigation, including data from surveys, matched and unmatched case-control studies, cohort studies, and clinical trials.
3) Analyze and interpret data obtained from an epidemiologic investigation, including data from surveys, matched and unmatched case-control studies, cohort studies, and clinical trials.
4) Assess confounding and effect modification in data from an epidemiologic investigation.
6) Use appropriate computer software for the management and analysis of epidemiologic data.

A complete list of College of Public Health Competencies is located on the College of Public Health website: https://cph.osu.edu/students/competencies.

Text/Readings:

Rothman et al., *Modern Epidemiology*, 3rd Edition. Additional readings will come from the peer-reviewed literature in the field and will be available on Carmen and are listed in the course outline.

Carmen

There is a Carmen site for this course: https://carmen.osu.edu. All course materials are available via Carmen.

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions (https://admin.resources.osu.edu/buckeyepass/adding-a-device)

- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application (https://admin.resources.osu.edu/buckeyepass/installing-the-duo-mobile-application) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357(HELP) and IT support staff will work out a solution with you.

Class Format: How this course works

- This is an in-person course with class sessions split between lecture, in-class exercises, and discussion (Tuesdays), applied laboratory sessions (Thursdays), and readings/videos (distance day). The major components of the class are methodologic and software-based homework assignments. These assignments will require the use of SAS or R statistical packages. Students may choose either package. Each week will consist of an in-person lecture, interspersed with short activities and may also have additional recorded lecture content to supplement the live content. The lecture activities are ungraded but will be measured as part of class participation. You will be responsible for reviewing the weekly assigned reading and completing a weekly quiz on Carmen.
- For the most part, the Tuesday in-class sessions will be spent on mini-lectures and discussing assigned readings and analytic homework assignments. The Thursday lab session will take place in Cunz 230. During weekly laboratory sessions, you will conduct a cohort study of post-stroke depression among older adults using the National Health and Aging Trends Study.
- The distance day lecture is to be completed on your own time (although, on the course outline it is listed as a "Friday" class). Part of the "distance day" will include recorded online content. This will mostly be a mix of lecture content for the following week and lab content from the current week. You will be responsible for reviewing the assigned reading and completing the quiz on Carmen. Reading materials and quizzes will be posted at least a week in advance. You must complete the quiz before 11:59 PM on Sundays.
- The laboratory sessions will highlight common questions or introduce new software coding or hints based on questions received. Additional lab content may be posted as recorded videos.
- All assignments will be due before lectures on Tuesdays (2:20 PM) unless otherwise noted. There will be regularly scheduled virtual office hours each week, but please email the instructor or TA if an alternative time is necessary or if an in-person option is needed.
- Should in-person classes be canceled, I will notify you as to which alternative methods of teaching will be offered to ensure continuity of instruction for this class. Communication will be via Carmen.
- **Credit hours and work expectations:** This is a **4-credit-hour course**. According to Ohio State policy (go.osu.edu/credithours), students should expect around 4 hours per week of time spent on direct instruction (e.g., lecture, examples, activities) in addition to 8 hours of homework/active learning activities (e.g., homeworks/quizzes) to receive a grade of (C) average.
- **Attendance and participation requirements:** Attendance in this course is compulsory. Success in this course is a function of attendance and participation. Participation will be monitored by lecture and laboratory attendance and completion of weekly quizzes. While the short activities nested in the lectures themselves are ungraded, completion of activities will document your participation.

Course Technology

Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)

Required equipment

- **Computer:** current Mac (Mac OSX) or PC (Windows 10+) with high-speed internet connection
- **Calculator:** Students should have access to a scientific calculator that can perform basic arithmetic, square roots, logarithms, and exponentiation.
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Optional equipment (for participation in optional live office hours and/or review sessions)

- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone

Required software

- **Microsoft 365 Copilot (formerly Office 365)**
  All Ohio State students are now eligible for free Microsoft 365 Copilot (formerly Office 365). Full instructions can be found at go.osu.edu/office365help.
- Students will be required to use either SAS or R for the course assignments. Free options of these are available for personal installation.
  - SAS OnDemand for Academics, available at: https://www.sas.com/en_us/software/on-demand-for-academics/references/getting-started-with-sas-ondemand-for-academics-studio.html
  - R/RStudio, available at: https://rstudio.com/products/rstudio/#rstudio-desktop

Technology support

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** http://it.osu.edu/help
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu

Assignments/Assessments

Quizzes/participation: 5%

Each week you will need to take a short, low-stakes quiz on Carmen. The quiz will be active until 11:59 PM on Sunday night. You will be given two attempts at each quiz, however **quizzes must be completed without the help of other individuals (books and notes are okay)**. We suggest completing the online readings and first attempt the quiz prior to the lecture, and if necessary, the second attempt after the lecture.

Assignments: 75% (6 Assignments)

During weekly laboratory sessions, you will conduct a cohort study of post-stroke depression among older adults using the National Health and Aging Trends Study. Depression is a common complication after stroke or major health event and is often caused by biological changes in the brain. With the aging US population and the success of revascularization therapies for stroke, the prevalence will continue to grow. Depression can lead to emotional, physical, and social consequences like influencing the ability to care for oneself and can also have psychological effects including decreased quality of life. Previous studies have demonstrated that the risk of depression is higher among stroke survivors compared to those who had not experienced a stroke, but funding for public health programs to adequately educate older individuals about depression risk is limited. Therefore, the primary aims of the cohort study analysis are:

1. To estimate the magnitude of the association between stroke and depression
2. To determine whether the association between stroke and depression differs among major racial/ethnic populations that might be targeted for educational programs.

Students will work through stages of an epidemiologic analysis of cohort data starting with cleaning and description, and eventually assessing confounding and effect measure modification. Assignments are broken into smaller pieces and due every 2-3 weeks (see course outline). Some of these assignments may be completed in groups. See additional details below.

Final Course Project: 20%
The final class project is based on an analysis of a second National Health and Aging Trends Study data set. This **individual** project will require you to apply and extend methods and skills developed for the cohort study assignments. Results of the case-control project are presented in an abstract with supplemental tables and a figure. Instructions for the final case-control project will be available in early November. You are strongly encouraged to begin the analysis early.

Style Points
95% of your grade for all assignments is based on content. The remaining 5% is assigned based on style. Factors considered when assigning style points include the formatting of graphs and tables, rounding rules, and legibility in hand calculations. Please note that style points only refer to the way *you* present results. Text exceeding word limits, errors resulting from the use of rounded values in computations, and other such oversights/errors are graded as content, not style. If you have questions or concerns about grading or about your individual performance on an assignment, please see your instructor, not the TA.

Grading

Quizzes/Weekly participation	5%
Cohort project assignments	75%
Orientation Assignment	
Data Description	
Categorical Covariates	
Continuous Covariates	
Confounding	
Effect Measure Modification	
Case-control assignment	20%
Total	**100%**

Grading Scale

A	**93 to 100**	Outstanding work that reflects mastery of the material and the ability to apply it
A-	**90 to <93**	Excellent work that reflects mastery of the material
B+	**87 to <90**	Good work that reflects mastery of most of the material
B	**83 to <87**	Good work that reflects mastery of some of the material
B-	**80 to <83**	Good work that reflects mastery of a few aspects of the material
C+	**77 to <80**	Mediocre work that reflects familiarity with, but not mastery of the material
C	**73 to <77**	Mediocre work that reflects familiarity with most of the material
C-	**70 to <73**	Mediocre work that reflects little familiarity with the material
D+	**67 to <70**	
D	**60 to <67**	
E	**Below 60**	

Class Policies

Late work is not accepted without prior communication with the instructor. I will try to accommodate reasonable requests in an equitable manner.

All assignment must be submitted on Carmen. We strongly encourage you to work in groups (sharing ideas toward solving problem sets) on your cohort study analysis and assignments. A group is defined as no more than three students. You may choose your own group (i.e. groups are not assigned). As a group, you may turn in a single written assignment, for which each group member will receive the same grade or you may work with your group to perform analyses and interpret results, but submit your assignments individually. Either way, you must be sure you understand **all** aspects of the work and are capable of completing all of the analyses and assignments on your own. This is especially important because the final class project (the case-control analysis) **must** be done on an *individual* basis. PhD students must turn in their **own** individual work for each assignment and are **not** permitted to work in groups, but may consult with one another on the cohort assignments.

You are prohibited from uploading course materials to Quizlet, Chegg, etc. If you have questions/concerns about the course material, please reach out to the instructor or attend office hours.

Copyright Statement

Generative AI Policy

Given that the learning goals of this class are to help you grow *your* skills in writing, coding, presentation, and interpretation of results, the use of generative artificial intelligence (GenAI) tools such as Copilot or ChatGPT is not permitted in this course. Any use of GenAI tools for work in this class may therefore be considered a violation of Ohio State's Academic Integrity policy and Code of Student Conduct because the work is not your own. If I suspect that you have used GenAI on an assignment for this course, I will ask you to communicate with me to explain your process for completing the assignment in question. The use of unauthorized GenAI tools will result in referral to the Committee on Academic Misconduct.

If you feel you need to use GenAI for translation, please contact me first. If you have any other questions regarding this course policy, please contact me.

Office of Student Life: Disability Services

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are ill and need to miss class, including if you are staying home and away from others while experiencing symptoms of a viral infection or fever, please let me know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

Mental Health Services

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Religious Beliefs or Practices Accommodations

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement and the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the Civil Rights Compliance Office. (Policy: Religious Holidays, Holy Days and Observances)

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all

instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-48.7 (B)). For additional information, see the Code of Student Conduct.

Intellectual Diversity

Ohio State is committed to fostering a culture of open inquiry and intellectual diversity within the classroom. This course will cover a range of information and may include discussions or debates about controversial issues, beliefs, or policies. Any such discussions and debates are intended to support understanding of the approved curriculum and relevant course objectives rather than promote any specific point of view. Students will be assessed on principles applicable to the field of study and the content covered in the course. Preparing students for citizenship includes helping them develop critical thinking skills that will allow them to reach their own conclusions regarding complex or controversial matters.

Grievances and Solving Problems

A student who encounters a problem related to his/her educational program has a variety of avenues available to seek resolution. According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, you may take your case to the department chairperson. Specific procedures are outlined in Faculty Rule 3335-8-23, the CPH Graduate Student Handbook, and the CPH Undergraduate Student Handbook. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Civil Rights Compliance Office:

Online reporting form at http://civilrights.osu.edu/,
Call 614-247-5838 or TTY 614-688-8605,
Or Email civilrights@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Civil Rights Compliance Office to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any

human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Course Outline

Week	Date	Readings & Topics	Assignments Due*
1	8/26	Introductions, Review of course format, orientation to data set and cohort analysis **Readings**: • Course syllabus • von Elm E, Altman DG, Egger M, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet. 2007;370(9596):1453–7. • Medeiros GC, Roy D, Kontos N, Beach SR. Post-stroke depression: A 2020 updated review. *General Hospital Psychiatry.* Volume 66, 2020, Pages 70-80.	
	8/28	**Lab:** Data Cleaning and Description	
	8/29	**Distance day:** Read assigned readings, complete quiz **Readings**: • Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. • Pages 32-50 (Ch 3 – Measures of Occurrence) • Hayes-Larson E, Kezios, KL, Mooney SJ, Lovasi G. Who is in this study, anyway? Guidelines for a useful Table 1. Journal of Clinical Epidemiology 2019;114:125-132	
2	9/2	**Lecture:** Orientation to data set and cohort analysis	
	9/4	**Lab:** How to make a Table 1	
	9/5	**Distance day:** Read assigned readings, complete quiz **Readings:** • Davydow DS, Zivin K, Langa KM. Hospitalization, depression and dementia in community-dwelling older Americans: findings from the national health and aging trends study. Gen Hosp Psychiatry. 2014 Mar-Apr;36(2):135-41. • Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. • Pages 32-50 (Ch 3 – Measures of Occurrence) • Pages 51-53 (Ch4 – Measures of effect) **Supplemental Reading** • Trends in smoking initiation among adolescents and young adults--United States, 1980-1989. MMWR. 1995;44(28):521–544. • Brackbill RM, Siegel PZ, Ackermann SP. Self reported hypertension among unemployed people in the United States. Bmj. 1995;310(6979):568. • Busse M, Stromgren K, Thorngate L, et al. Parents' Responses to Stress in the Neonatal Intensive Care Unit. Crit. Care Nurse. 2013;33(4):52–59.	
3	9/9	**Lecture:** Exploring and describing the data – **VIRTUAL DAY**	**Orientation Assignment**
	9/11	**Lab:** Data Description	

Week	Date	Readings & Topics	Assignments Due*
	9/12	**Distance day:** Read assigned readings, complete quiz **Readings:** • Poole C. Low P-values or narrow confidence intervals: Which are more durable? Epidemiology. 2001;12(3):291–294. • Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. • Pages 151-167 (Ch10 – Precision and Statistics in Epi Studies)	
4	9/16	**Lecture:** General and generalized linear models	**Assignment 1: Data Description**
	9/18	**Lab:** Crude Analyses: Categorical Variables I	

	9/19	**Distance day** Read assigned readings, complete quiz
		Readings:
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Pages 51-53 (Ch4 – Measures of effect)
		  • Pages 243-253 (Ch14 – Two Study Groups)
		  • Pages 383-4 (Ch20 - binary regression)
		  • Page 392 (Ch20 - linear risk regression)
		  • Pages 393-5 (Ch20 - exponential risk & logistic models)
		  • Pages 407-8 (Ch20 - categorical regressors)	

5	9/23	**Lecture:** Analysis of categorical variables	
	9/25	**Lab:** Crude Analyses: Categorical Variables II	

	9/26	**Distance day:** Read assigned readings, complete quiz
		Readings:
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Page 308-317 (Ch17 – Dose-response and Trend Analysis)
		  • Page 408-413 (Ch20 – Trend Models in Multiple Regression)
		Supplemental Reading
		• Greenland S, Senn SJ, Rothman KJ, et al. Statistical tests, P values, confidence intervals, and power: a guide to misinterpretations. Eur. J. Epidemiol. 2016;31(4):337–350.
		• Wasserstein RL, Lazar NA. The ASA Statement on p -Values: Context, Process, and Purpose. Am. Stat. 2016;70(2):129–133.
		• Rothman KJ. Epidemiology: An Introduction. New York, NY: Oxford University Press; 2002.
		  • Chapter 12: "Using Regression Models in Epidemiologic Analysis, 2nd Edition" (pg. 211-234). This chapter provides a simple overview of generalized linear models.	

6	9/30	**Lecture:** Analysis of continuous variables I	**Assignment 2: Categorical Variables**
	10/2	**Lab:** Crude Analyses: Continuous Variables	

Week	Date	Readings & Topics	Assignments Due*

	10/3	**Distance day:** Read assigned readings, complete quiz
		Readings:
		• Rosenberg PS, Katki H, Swanson CA, et al. Quantifying epidemiologic risk factors using non-parametric regression: Model selection remains the greatest challenge. Stat. Med. 2003;22(21):3369–3381.
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Page 308-317 (Ch17 – Dose-response and Trend Analysis)
		  • Page 408-413 (Ch20 – Trend Models in Multiple Regression)	

7	10/7	**Lecture:** Analysis of continuous variables II	
	10/9	**Lab**: Crude Analyses: Continuous Variables	
	10/10	**Distance day:** Read assigned readings, complete quiz **Readings:** • Pearl J. Causal Diagrams for Empirical Research. Biometrika. 1995;82(4):669. • Hernán MA, Hernández-Díaz S, Werler MM, et al. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology. Am. J. Epidemiol. 2002;155(2):176–84. • Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. • Pages 213-218 (Ch13 – Elements of Data Analysis – Description and Summarization)	

8	10/14	**Lecture:** Confounding, DAG analysis I
		Readings:
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Pages 128-134 (Ch9 – Confounding)
		  • Pages 259-272 (Ch15 – Heterogeneity versus Confounding – Across Strata)
		  • Pages 279-280 (Ch15 – Testing Homogeneity)
		• Greenland S, Pearl J, Robins JM. Causal diagrams for epidemiologic research. Epidemiology. 1999;10(1):37–48.
		• Howe, CJ, Bailey, ZD, Raifman, JR, Jackson, JW. Recommendations for Using Causal Diagrams to Study Racial Health Disparities. Am. J. Epidemiol. 2022; https://doi.org/10.1093/aje/kwac140
		Supplemental Reading
		• Rothman KJ. Epidemiology: An Introduction. New York, NY: Oxford University Press; 2002
		  • Pages 101-111
		  • Pages 144-166
			Assignment 3: Continuous Variables

	10/16	Fall break – **No Class**	
	10/17	Fall break – **No Class**	
9	10/21	**Lecture:** Confounding, DAG analysis II	
	10/23	**Lab:** Confounding, DAG analysis	

Week	Date	Readings & Topics	Assignments Due*

	10/24	**Distance day:** Read assigned readings, complete quiz
		Readings:
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Pages 71-83 (Ch5 – Concepts of Interaction)
		  • Pages 298-300 (C16 – Analyses of Biologic Interaction)
		  • Pages 198-211 (Ch12 – Residual confounding – end of chapter)
		• Ahlbom A, Alfredsson L. Interaction: A word with two meanings creates confusion. Eur. J. Epidemiol. 2005;20(7):563–564.
		• Hernán MA, Hernández-Díaz S, Werler MM, Mitchell AA. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology. Am. J. Epidemiol. 2002;155:176–84.	

10	10/28	**Lecture:** Effect measure modification I	**Assignment 4: Confounding**
	10/30	**Lab:** Effect measure modification	

	10/31	**Distance day:** Read assigned readings, complete quiz
		Readings:
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Pages 71-83 (Ch5 – Concepts of Interaction)
		  • Pages 298-300 (C16 – Analyses of Biologic Interaction)	

11	11/4	**Lecture:** Effect measure modification II	
	11/6	**Lab:** Effect measure modification	

	11/7	**Distance day:** Read assigned readings, complete quiz
		Readings:
		• Kalilani L, Atashili J. Measuring additive interaction using odds ratios. Epidemiologic Perspectives & Innovations 2006, 3:5
		• Hernán MA, Alonso A, Logroscino G. Cigarette smoking and dementia: Potential selection bias in the elderly. Epidemiology. 2008;19(3):448–450.
		• Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. 3rd Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
		  • Pages 71-83 (Ch5 – Concepts of Interaction)
		  • Pages 298-300 (C16 – Analyses of Biologic Interaction)	

12	11/11	Veteran's Day - **No class** **Recorded Lecture:** Effect measure modification III	
	11/13	**Lab:** Effect measure modification	

Week	Date	Readings & Topics	Assignments Due*
	11/14	**Distance day:** Read assigned readings, complete quiz **Readings:** • Bradshaw PT, Siega-Riz AM, Campbell M, Weissler MC, Funkhouser WK, Olshan AF. Associations between dietary patterns and head and neck cancer: The Carolina head and neck cancer epidemiology study. Am. J. Epidemiol. 2012;175:1225–1233. • Siscovick DS, Raghunathan TE, King I, Weinmann S, Bovbjerg VE, Kushi L, et al. Dietary intake of long-chain n-3 polyunsaturated fatty acids and the risk of primary cardiac arrest. Am. J. Clin. Nutr. 2000;71:3–7. • Hayden GF, Kramer MS, Horwitz RI. The Case-Control Study: A Practical Review for the Clinician. JAMA J. Am. Med. Assoc. 1982;247:326–331.	
13	11/18	**Lecture:** Case Control study I	**Assignment 5: Effect Measure Modification**
	11/20	**Lab:** Case Control study	
	11/21	**Distance day:** Read assigned readings, complete quiz **Readings:** • King G, Zeng L. Estimating risk and rate levels, ratios and differences in case-control studies. Stat. Med. 2002;21:1409–1427. • De Groot RI, Dekkers OM, Herold IHF, de Jonge E, Arbous MS. Risk factors and outcomes after unplanned extubations on the ICU: A case-control study. Crit. Care. 2011;15:1–9. • Schouten EG, Dekker JM, Kok FJ, Cessie S Le, Van Houwelingen HC, Pool J, et al. Risk ratio and rate ratio estimation in case-cohort designs: Hypertension and cardiovascular mortality. Stat. Med. 1993;12:1733–1745. • Langholz B. Estimation of Absolute Risk from Nested Case-Control. International Biometric Society. 2019;53:767–774	
14	11/25	**Lecture:** Case Control study II	
	11/27	Thanksgiving – **No Class**	
	11/28	Thanksgiving Break – **No Class**	
15	12/2	**Lecture:** Case Control study III	
	12/4	**Lab:** Case Control study	
	12/5	**Distance day:** Read assigned readings, No quiz	
16	12/9	**Lecture:** Poisson Regression	**Course Evaluation** **Case-Control Project (Due 12/12**)**

*Assignments are due on Carmen by 9:35am on Tuesdays of due week

**Quizzes are due on Carmen by 11:59pm on Sundays of due week

Alignment of Competencies with Assessments

Competencies	Cohort Assignments	Final Case-Control Project	Quizzes
PhD: Specialization in Epidemiology 8) Identify and address potential sources of bias, including selection bias, measurement error, and confounding, in both the design and analysis phases of epidemiological studies.	X	X	X
MS: Specialization in Epidemiology 2) Summarize relevant theories and conceptual models that inform their research.	X		X
3) Conduct a research project using appropriate research methods and ethical approaches.		X	
6) Identify and understand the impact of potential sources of bias, including selection bias, measurement error, and confounding, in epidemiological studies.	X	X	X
7) Demonstrate familiarity with the content and issues in at least one substantive epidemiological topic.	X	X	
MPH: Specialization in Epidemiology 2) Choose the correct analysis for data obtained from an epidemiologic investigation, including data from surveys, matched and unmatched case-control studies, cohort studies, and clinical trials.	X	X	X
3) Analyze and interpret data obtained from an epidemiologic investigation, including data from surveys, matched and unmatched case-control studies, cohort studies, and clinical trials.	X	X	X
4) Assess confounding and effect modification in data from an epidemiologic investigation.	X	X	
6) Use appropriate computer software for the management and analysis of epidemiologic data.	X	X	