

PUBHBIO 6250 – Regression Methods for the Health Sciences
3 credits – Autumn 2025
Online, Asynchronous

Course Instructor

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Graduate Teaching Assistant

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Office Hours

Dr. Zhang: Thursdays, 12:00 pm – 1:00 pm ET (Zoom link on Carmen)
GTA (Pin-Hsun): Mondays, 9:30 am – 10:30 am ET (Zoom link on Carmen)
Office hours are also available by appointment if you cannot make any of the scheduled times.

Faculty Feedback & Response Time:

The following gives you an idea of my intended availability during the course:

- **Grading:** You can generally expect feedback within 7 days.
- **E-mail:** I will reply to e-mails (sent via Carmen) within 24 hours on school days.
- **Discussion board:** Either the GTA 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.

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 GTA 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 GTA.**

Course Description

A second course in regression modeling for public health, including models for binary outcomes, count outcomes, survival/censored outcomes, and data collected from complex survey designs.

Prerequisites

PUBHBIO 6211, or permission of instructor.

Course Learning Objectives

- CLO1) Select the appropriate regression method for a specified outcome measurement
- CLO2) Construct a regression model to estimate a population parameter specified by the scientific question
- CLO3) Interpret results from a wide variety of regression models

- CLO4) Analyze data collected via a complex sample survey (probability sample)
- CLO5) Evaluate statistical methods and results presented in the public health and biomedical sciences literature (journal articles)

Public Health Foundational Competencies:

- PHFC3) Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
- PHFC4) Interpret results of data analysis for public health research, policy or practice

MPH-BIO Specialization Competencies:

- 1) Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results.
- 3) Identify strengths and weaknesses of standard analytic methods.
- 5) Use computational methods to effectively analyze complex public health and medical data.

A complete list of College of Public Health Competencies is located in Appendix C of the CPH Graduate Student Handbook that can be found at: <https://go.osu.edu/cphgradcompetencies>

Text/Readings:

There is no required textbook for this class. Readings will be provided via Carmen as PDF files.

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

- **Mode of delivery:** This course is 100% online delivery via asynchronous Distance Learning (DL) model. There are no required sessions when you must be logged in to Carmen at a scheduled time.
- **Pace of online activities:** This course is divided into **weekly modules** that are released week-by-week. Students are expected to keep pace with weekly deadlines but may freely schedule their efforts within that time frame. Note that, in this course, **weeks start on Tuesday and end on Monday** – i.e., assignments are due on Monday at 11:59 pm. *The exception is the last two weeks of*

the course, which end on Wednesdays. For the last two weeks, the due dates for assignments will be Wednesdays at 11:59 pm.

- **Credit hours and work expectations:** This is a **3-credit-hour course**. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (e.g., watching recorded lectures, taking quizzes) in addition to 6 hours of homework/active learning activities (e.g., reading, Stata labs, problem sets) to receive a grade of (C) average.
- **Attendance and participation requirements:** Because this is an online course, your attendance is based on your online activity and participation. The following is a summary of students' expected participation:
 - **Participating in online activities for attendance: AT LEAST ONCE PER WEEK**
You are expected to log in to the course in Carmen every week. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with the instructors *as soon as possible*.
 - **Office hours and live sessions: OPTIONAL**
All live, scheduled events for the course, including office hours, are optional.
 - **Participating in discussion forums: OPTIONAL**
Discussion boards will be a place to interact with the instructor and TA, for example, to ask questions about the material and assignments. Participation is optional, but highly encouraged.

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) – optional

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

- See below ("Required Software") for details on software required for this class

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

Required Software

- **Stata** (<http://www.stata.com>)
Students are required to use Stata for this course. The software must be purchased directly from Stata (<https://www.stata.com/order/new/edu/profplus/student-pricing/>).

- If you do not plan to use Stata ever again after this course, you can consider purchasing the 6-month license for Stata/BE (\$48 as of 8/2025). If you will be taking additional biostatistics courses or conducting statistical analyses for your research, we recommend purchasing either an annual or perpetual license (please contact the instructors or your faculty advisor if you have additional questions on what would be the appropriate purchase).

Since there is no required text, you can consider purchasing Stata as your “book costs” for the course.

- **Microsoft Office 365**

All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

Assignments/Assessments

Quizzes:

Approximately two out of every three weeks has a short online multiple-choice quiz (taken via Carmen) to help reinforce understanding of the covered concepts. Students have unlimited attempts at each quiz; the highest quiz score will be kept. Please note that quiz questions may be slightly different on repeated attempts. You cannot stop a quiz, logout/login and resume at a later time. **Quizzes must be completed without the help of other individuals, but books and notes are permitted.**

Any quiz not completed by the due date will be given a 0. There are no exceptions to this rule.

Stata Labs:

Approximately two out of every three weeks has an associated active learning lab assignment. These provide an opportunity for you to implement the concepts covered in the lectures and readings, and completion of these exercises is a key component of this course. These labs will require the use of Stata software. **Students are permitted to work together on labs but submitted assignments must be written independently.**

Any lab not completed by the due date will be given a 0. There are no exceptions to this rule.

Learning Check-ins:

In the weeks that contain lectures, quizzes, and Stata labs, there will also be a short (2 questions) learning check-in (taken as a “quiz” in Carmen). These provide an opportunity for you to reflect on your learning and give feedback to the instructor on the “muddiest points” from the week. These check-ins are graded complete/incomplete. The instructor will review student responses and provide feedback to the class at the start of the next week. **Students are expected to complete these check-ins independently.**

Any check-in not completed by the due date will be given a 0. There are no exceptions to this rule.

Data Analysis Assignments:

On weeks when there is no online quiz or Stata lab (approximately one out of every three weeks) there will be a data analysis assignment. These will involve application of regression methods to a real data set using Stata. **Students are permitted (indeed, encouraged) to work together on data analysis assignments, but submitted assignments must be written independently.**

Any data analysis assignments not completed by the due date will be given a 0. There are no exceptions to this rule.

Case Studies (Article Critiques):

On weeks when there is no online quiz or Stata lab (approximately one out of every three weeks) there will be a case study assignment. These will involve reading a published article that investigates a public health/biomedical research question and answering questions about the statistical methods and results

presented. **Students are permitted (indeed, encouraged) to work together on case study assignments, but submitted assignments must be written independently.**

Any case study assignments not completed by the due date will be given a 0. There are no exceptions to this rule.

Final Project:

The final project in this class will be the creation of a “study guide” that contains an overall summary of the course and is intended to be a reference for you to use when conducting regression analyses and/or reading about regression analyses in articles in the future (after this class is over). More details, including specific requirements and a grading rubric, will be provided on Carmen. **Students are expected to work on their project independently – i.e., no collaboration is allowed. However, books and notes and additional outside resources are permitted.**

Exams:

There are no exams in this course.

Grading

Final class grade will be determined as follows:

- Quizzes: 20%
- Data Analysis Assignments: 20%
- Case Studies (Article Critiques): 20%
- Stata Lab Assignments: 20%
- Learning Check-Ins: 5%
- Final Project: 15%

Grading Scale

This course will use the following grading scheme*:

93 to 100	A	87 to <90	B+	77 to <80	C+	60 to <70	D
90 to <93	A-	84 to <87	B	74 to <77	C	<60	E
		80 to <84	B-	70 to <74	C-		

*The instructor reserves the right to adjust the grading scale if it appears necessary due to overall class performance. These adjustments will only raise a student’s grade, not lower it.

Assignment Scoring

Clear and effective communication is crucial in statistics. In any problem-solving question it is the student’s responsibility to make sure that they justify their answer and provide enough detail for the grader to understand. Points may be deducted for answers that are not well-justified, even if they are correct.

Any questions regarding grading must be addressed **within one week** of the return of the assignment. No request of regrading on previous assignments will be accepted after the final exam is submitted. As a general policy, when requested, the regrading will apply to the whole exam or the homework, not just to the specific part which the student thinks there might be a mistake. Consequently, regrading may lead to a lower overall score. **Any questions regarding grading must be directed to the professor and not the GTA.**

Class Policies

- **Quizzes:** Quizzes must be completed without the help of other individuals, but books and notes are permitted.
- **Stata Labs:** Students are permitted to work together on lab assignments but submitted assignments must be written independently. Since these are an active learning component through

which students will learn to use the statistical tools illustrated in lecture, it is to the student's benefit to initially attempt these independently.

- **Learning Check-Ins:** Check-ins must be completed without the help of other individuals.
- **Data Analysis Assignments:** Students are permitted (indeed, encouraged) to work together on data analysis assignments, but submitted assignments must be written independently.
- **Case Studies (Article Critiques):** Students are permitted (indeed, encouraged) to work together on case study assignments, but submitted assignments must be written independently.
- **Final Project:** The final project must be completed without the help of other individuals, but books and notes are permitted.

Copyright Statement

This syllabus and all course materials (e.g., homework assignments, solution keys, course materials) are under copyright by the instructor and cannot be posted elsewhere without written permission.

Generative AI Policy

Introduction

Generative AI (GenAI) tools are reshaping all aspects of our lives, including education. In this resource, we explore responsible GenAI integration and our course policy for using these tools in an academic setting. We will also share more information about Microsoft Copilot, an AI companion that can enhance the learning experience.

Policy Overview

In this course, we recognize the potential of generative artificial intelligence (AI) tools to assist in various aspects of academic work. Tools such as Copilot, ChatGPT, and Google Gemini can be invaluable during the brainstorming, drafting, or revision processes. In this course, the use of generative AI must be limited to the earliest stages of the problem solving process, which include:

- Brainstorming ways to approach a problem
- Developing outlines or approaches for your work

As this course relies heavily on writing code in Stata software, you are also permitted to use generative AI for:

- Getting help writing or troubleshooting Stata code

You may not submit output directly from AI tools for any assignments in this course, as this cannot be considered a substitute for developing the fundamental skills and expertise represented by the learning objectives of this course. You should complete all graded assignments without any assistance from AI tools beyond the initial/early stages of the process as described above.

Please note that generative AI tools rely on predictive models to generate content that may appear correct, but has been shown to sometimes be incomplete, inaccurate, taken without attribution from other sources, and/or biased. You are ultimately responsible for the content of the information you submit and may not attempt to pass off any work generated by an AI program as your own.

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](tel: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](tel: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 Schedule* with Alignment of Course Learning Objectives, Foundational Competencies, and MPH-BIO Competencies

Week	Topics	Assignments	Course Learning Objectives	Foundational Competencies	MPH-BIO Competencies
Tu 8/26 to M 9/1	Course Intro and Review	Quiz 1 Stata Lab 1 Learning Check-in 1			1, 5
Tu 9/2 to M 9/8	Logistic Regression – Part 1	Quiz 2 Stata Lab 2 Learning Check-in 2	CLO1: Select the appropriate regression method for a specified outcome measurement CLO2: Construct a regression model to estimate a population parameter specified by the scientific question CLO3: Interpret results from a wide variety of regression models	PHFC3, PHFC4	1, 5
Tu 9/9 to M 9/15	Logistic Regression – Part 2	Quiz 3 Stata Lab 3 Learning Check-in 3	CLO1, CLO2, CLO3	PHFC3, PHFC4	1, 5
Tu 9/16 to M 9/22	Logistic Regression – Case Studies and Application	Data Analysis 1 Case Study 1	CLO1, CLO2, CLO3, CLO5: Evaluate statistical methods and results presented in the public health and biomedical sciences literature (journal articles)	PHFC3, PHFC4	1, 3, 5
Tu 9/23 to M 9/29	Poisson Regression – Part 1	Quiz 4 Stata Lab 4 Learning Check-in 4	CLO1, CLO2, CLO3	PHFC3, PHFC4	1, 5
Tu 9/30 to M 10/6	Poisson Regression – Part 2	Quiz 5 Stata Lab 5 Learning Check-in 5	CLO1, CLO2, CLO3	PHFC3, PHFC4	1, 5
Tu 10/7 to M 10/13	Poisson Regression – Case Studies and Application	Data Analysis 2 Case Study 2	CLO1, CLO2, CLO3, CLO5	PHFC3, PHFC4	1, 3, 5
Tu 10/14 to M 10/20	Cumulative Review of Regression Methods So Far (Linear, Logistic, Poisson) (Fall Break Th/Fr)	Quiz 6 Stata Lab 6 Learning Check-in 6	CLO1, CLO2, CLO3	PHFC3, PHFC4	1, 3, 5

Week	Topics	Assignments	Course Learning Objectives	Foundational Competencies	MPH-BIO Competencies
Tu 10/21 to M 10/27	Cox Proportional Hazards Regression – Part 1	Quiz 7 Stata Lab 7 Learning Check-in 7	CLO1, CLO2, CLO3	PHFC3, PHFC4	1, 5
Tu 10/28 to M 11/3	Cox Proportional Hazards Regression – Part 2	Quiz 8 Stata Lab 8 Learning Check-in 8	CLO1, CLO2, CLO3	PHFC3, PHFC4	1, 5
Tu 11/4 to M 11/10	Cox Proportional Hazards Regression – Case Studies and Application	Data Analysis 3 Case Study 3	CLO1, CLO2, CLO3, CLO5	PHFC3, PHFC4	1, 3, 5
Tu 11/11 to M 11/17	Complex Survey Data – Part 1	Quiz 9 Stata Lab 9 Learning Check-in 9	CLO4: Analyze data collected via a complex sample survey (probability sample)	PHFC3, PHFC4	1, 5
Tu 11/18 to M 11/24	Complex Survey Data – Part 2	Quiz 10 Stata Lab 10 Learning Check-in 10	CLO3, CLO4	PHFC3, PHFC4	1, 5
Tu 11/25 to W 12/3	Complex Survey Data – Case Studies and Application (two weeks – includes Thanksgiving break)	Data Analysis 4 Case Study 4	CLO3, CLO4, CLO5	PHFC3, PHFC4	1, 3, 5
Th 12/4 to W 12/10	Choosing Among Analysis Methods	Quiz 11 Learning Check-in 11	CLO1		1, 3
Exam week	Final Project	Final Project	CLO1, CLO2, CLO3, CLO4	PHFC3, PHFC4	1, 3, 5

*Any readings for each week will be posted on Carmen

Alignment of Competencies with Assessments

	Quizzes (N=11)	Stata Labs (N=10)	Data Analysis Assignments (N=4)	Case Study Assignments (N=4)	Final Project (N=1)
Public Health Foundational Competencies					
Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate		X	X		X
Interpret results of data analysis for public health research, policy or practice	X	X	X	X	X
MPH-BIO Specialization Competencies					
Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results.	X	X	X	X	X
Identify strengths and weaknesses of standard analytic methods.			X	X	X
Use computational methods to effectively analyze complex public health and medical data.		X	X		X