

PUBHBIO 7245 – Biostatistical Collaboration
2 credit hours – Spring 2026

Instructor: Qianying Lin

Office location: Cunz 359E / 247-1056 *The study was supported by the UK Research and Innovation (UKRI) Biotechnology and Biological Sciences Research Council (BBSRC) under grant BB/W010755/1*

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Class Time and Location: Tuesdays 2:20PM – 4:10PM
Online

Instructor’s Office Hours: TU/TR 4:15PM – 5:00PM
Online

TA Name, email, and office hours: Not applicable

TA responsibilities: Not applicable

Course description: This course prepares students to collaborate with biomedical researchers to design studies and experiments, plan sample size, plan the statistical analysis, and engage in statistical consulting. Topics include protocol preparation, presenting results, statistical report generation, and writing analytical code for ensuring scientific rigor and reproducibility of results.

Prerequisites: Second year student in MS/MPH Biostatistics program, Interdisciplinary PhD in Biostatistics program, or Department of Statistics programs.

Class Format: A typical class meeting will be comprised of one or a combination of:

1. Lecture on various topics in statistical collaboration.
2. Discussion of analysis strategies for a biomedical scenario.
3. Discussion of relevant literature/videos on collaboration and other related topics.
4. Mock meetings with a biomedical collaborator.
5. Presentations from collaborating statisticians in academia, industry, and government.

Course Objectives: The main objective of this course is to teach essential skills needed for success as a statistical collaborator in collaborative research in public health and medicine. Upon successful completion of this course, students will be able to:

1. Apply statistical consulting skills such as communication and collaborative problem solving.
2. Explain how the basic principles of science can be integrated with those of statistics.
3. Propose design and analysis methods appropriate for answering research questions of health science researchers, and explain these methods to these collaborators. This will involve

formulating hypotheses, choosing appropriate outcome variables, identifying potential confounding variables or other biases, and determining efficient designs and sufficient sample size.

4. Describe the use and implementation of statistical methods not covered in the standard coursework.
5. Write the statistical analysis sections for proposals, papers, and other reports.

Foundational MPH Competencies:

- Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate (3)
- Interpret results of data analysis for public health research, policy or practice (4)

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 (1)
- Recognize strengths and weaknesses of study designs and data sources commonly encountered in public health (2)
- Identify strengths and weaknesses of standard analytic methods (3)
- Describe basic concepts of probability, random variation and commonly used statistical probability distributions (4)
- Use computational methods to effectively analyze complex public health and medical data (5)

MS-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 (7)
- Recognize strengths and weaknesses of study designs, data sources, and analytic methods (8)
- Explain core concepts of probability, random variation and commonly used statistical probability distributions and how they relate to statistical inference (9)
- Use computational methods to effectively analyze complex public health and medical data (10)

Interdisciplinary PhD in Biostatistics Learning Goals:

- Understands the theoretical foundations of statistical methods
- Critique general scientific research articles and assess the appropriateness of the statistical applications and methodology involved
- Work effectively and collaboratively in a team on a biological or health-related scientific question
- Design biological or health-related research studies and construct and implement statistical analysis plans appropriate for such studies
- Effectively communicate the results of statistical analyses to statistical and non-statistical audiences

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

Readings: This is no required textbook for this course. Weekly readings will be posted on the course website.

How this Online course works

- **Mode of delivery:** This course is 100% online. We will meet virtually on Tuesdays from 2:20PM-4:10PM. You are required to log in Zoom at the scheduled class time and remain logged in for the duration of the class session. Lecture readings, slides, recordings, and assignments will be posted on Carmen.
- **Pace of online activities:** This course is divided into **weekly modules**. Required readings or pre-class assignments will be posted at least one week and lecture slides will be posted at least 24 hours in advance of the corresponding class session. Students are expected to keep pace with deadlines to have robust class discussions and meet due dates for homework assignments.
- **Credit hours and work expectations:** This is a **2-credit-hour course**. According to Ohio State policy (go.osu.edu/credithours), students should expect around 2 hours per week of time spent on direct instruction (instructor content, lectures, and in-class or Carmen activities, for example) in addition to 4 hours of homework (reading and assignment preparation, for example) to receive a passing grade.
- **Attendance and participation requirements:** Twenty percent of your grade is class participation. Students are expected to attend every synchronous class meeting (Tuesdays from 2:20PM – 4:10PM) and actively participate in class activities to get full credit for class participation. The following is a summary of students’ expected participation:

- **Required participation for grade:**

You are expected to attend class meetings and actively participate in class activities. Class activities will be a combination of breakout rooms and full class discussions. Full class discussions will utilize Zoom polls and chats to stimulate participation. Your participation in each class session will be graded on the following two-point scale:

Score	Criteria
2	Logged into the entire Zoom session, responded to all prompts (e.g., polls and chat requests), and engaged breakout room discussions
1	Was not logged into the entire Zoom session, failed to respond to prompts in a timely manner, or did not participate in breakout room discussions
0	Did not attend class or logged in and did not engage in any class activities

Additionally, you will need 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 instructor *as soon as possible*.

- Online MPH students who are not able to attend class meetings are required to register for the attendance exception by sending emails to the instructor before an assigned deadline. Once approved, MPH students can replace the 20% attendance by completing additional writing reflections and or short reports. These make-up submissions are intended to match the learning value of live participation. Registration requests

received after the deadline will not be accepted, and the make-up option will not be available.

○ **Office hours:**

Office hours are intended to provide a meeting time to discuss any questions you may have about the course material. Attending office hours is optional.

Grading:

Final class grade will be determined as follows:

- 80% Homework
- 20% Collaborative Participation
 - See rubric under “Attendance and Participation Requirements”

Grading Scale:*

94 to 100:	A	90 to < 94:	A-	
87 to < 90:	B+	84 to < 87:	B	80 to < 84: B-
77 to < 80:	C+	74 to < 77:	C	70 to < 74: C-
60 to < 70:	D	< 60:	E	

* 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.

Exams

Not applicable

Homework Assignments

Homework	Brief Description	Weight (%)	Due
1*	Data Analysis #1: Questions for Collaborator	4	Jan 26
2*	Data Analysis #1: <ul style="list-style-type: none"> • Introduction • Methods 	5	Feb 6
3*	Data Analysis #1: <ul style="list-style-type: none"> • Descriptive Statistics • Dyndoc/Rmarkdown report 	5	Feb 20
4*	Data Analysis #1: Final Report	20	Mar 6
5	Study Design: Questions for Collaborator	6	Mar 9
6	Article Critique	5	Mar 23
7	Study Design Aim 1	5	Mar 27
8	Study Design—Aim 1 and 2	20	Apr 10
9	Reflection on role of collaborating statistician in academia, industry, and government	5	Apr 27
10	Data Analysis #2: Final Report	25	Apr 30

*Group Assignment

Most of the homeworks is oriented around three major course assignments: two data analysis reports (one group report and one independent report) and one study design assignment for a mock grant submission. Two of these homeworks (1 and 6) involve writing questions (written in an appropriate non-technical language) for a mock collaborator to help you understand their needs on the analysis project or grant proposal. Other homeworks (2, 3, and 7) require you to submit preliminary work to obtain feedback before the final report. Groups for Data Analysis #1 will be assigned based on answers to the biographical survey due at the end of Week 1. More details regarding each assignment are available on Carmen Assignments page.

Carmen

Homework will be submitted to Carmen. Supplemental course material will be posted on Carmen.

Course technology

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 ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** ocio.osu.edu/help
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu
- **TDD:** 614-688-8743

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 (MacOs) or PC (Windows 10) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Required software

- One of the following statistical software packages:
 - STATA: STATA is available at a reduced rate for students on the [student purchasing page](#) of the STATA website. If you only plan on using STATA for this class, I recommend purchasing a 6-month license of STATA BE (Basic Edition) for \$48. STATA may also be accessed for free for the Public Health Informatics Lab (Cunz 230)
 - [R](#) and [RStudio](#): You can download and install both free of charge using links provided.

Recommended software

- 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.

Carmen access

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 (go.osu.edu/add-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 (go.osu.edu/install-duo) 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 Policies

- **Homework assignments:** During our class meetings, we will break into groups to discuss strategies that can be taken on your homework assignments. However, your completed assignments should be your *own original work* or, in the case of group assignments, your group's original work. Late assignments are not accepted. You are to contact me as soon as possible if you feel that your situation warrants an exception to this policy.
- **Use of generative artificial intelligence (GenAI):** Given that the learning goals of this class include developing effective oral and written communication skills, the use of generative artificial intelligence (GenAI) tools such as Copilot or ChatGPT, writers' aids like Grammarly, or translation platforms such as Google Translate are 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. The use of unauthorized GenAI tools will result in referral to the [Committee on Academic Misconduct](#). 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.

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 isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the [Safe and Healthy Buckeyes site](#) for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations. You can connect with them at slds@osu.edu or 614-292-3307.

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 <https://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 through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Academic integrity

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University, the College of Public Health, and the Committee on Academic Misconduct (COAM) expect that all students have read and understood the University's *Code of Student Conduct* and the School's *Student Handbook*, and that all students will complete all academic and scholarly assignments with fairness and honesty. The *Code of Student Conduct* and other information on academic integrity and academic misconduct can be found at the [COAM web pages](#). Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct*, the *Student Handbook*, and in the syllabi for their courses may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Please note that the use of material from the Internet without appropriate acknowledgement and complete citation is plagiarism just as it would be if the source were printed material. Further examples are found in the *Student Handbook*. Ignorance of the *Code of Student Conduct* and the *Student Handbook* is never considered an "excuse" for academic misconduct.

If I suspect a student of academic misconduct in a course, I am obligated by University Rules to report these suspicions to the University's Committee on Academic Misconduct. If COAM determines that the student has violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in the course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Respect for Diversity

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that I can make arrangements for you.

Religious Beliefs or Practices Accommodations

It is Ohio State's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief.

Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed.

Course Schedule

Week	Date	Topic	Speaker	Assignment*
1	Jan 13	Biostatistical Collaboration & Team Science	Lin	Biographical survey due 1/16
2	Jan 20	Analyzing Data—General Strategies Communicating with collaborator—Asking Questions	Lin	
3	Jan 27	Meeting with Collaborator Writing in Statistics: Reports for Collaborators, Scientific Articles	Lin	Homework 1 due 1/26
4	Feb 3	Data Summaries	Lin	Homework 2 due 2/6
5	Feb 10	Tools for Enhancing Scientific Rigor and Reproducibility	Lin	
6	Feb 17	Literature Searches	Guest	Homework 3 due 2/20
7	Feb 24	Study Design and Sample Size Calculations	Lin	
8	Mar 3	Role of Collaborative Statistician in Grantsmanship	Lin	Homework 4 due 3/6
9	Mar 10	Meeting with Collaborator, Difficult conversations in collaboration	Lin	Homework 5 due 3/9
Spring Break				
10	Mar 24	Reading and Critiquing the Medical Literature	Lin	Homework 6 due 3/23 Homework 7 due 3/27

11	Mar 31	Data Repositories	Guest	
12	Apr 7	Collaborating in Academia	Guest	Homework 8 due 4/10
13	Apr 14	Collaborating in Industry	Guest	
14	Apr 21	Collaborating in Government	Guest	Homework 9 due 4/27 Homework 10 due 4/30

*Assignments are due at 11:59 pm on the specified dates.

Alignment of Course Assessments with Degree Program Competencies

	Journal Article Critique	Data Analysis HW	Collaborator Q's HW	Study Design HW	Reflection
Foundational MPH Competencies					
Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health (3)	X	X		X	X
Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate (3)		X			
Interpret results of data analysis for public health research, policy or practice (4)	X	X			
Communicate audience-appropriate public health content, both in writing and through oral presentation (19)	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 (1)		X		X	
Recognize strengths and weaknesses of study designs and data sources commonly encountered in public health (2)	X	X		X	
Identify strengths and weaknesses of standard analytic methods (3)	X	X		X	
Describe basic concepts of probability, random variation and commonly used statistical probability distributions (4)		X		X	
Use computational methods to effectively analyze complex public health and medical data (5)		X			
MS 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 (7)		X		X	
Recognize strengths and weaknesses of study designs, data sources, and analytic methods (8)	X	X		X	
Explain core concepts of probability, random variation and commonly used statistical probability distributions and how they relate to statistical inference (9)		X		X	
Use computational methods to effectively analyze complex public health and medical data (10)		X			
Interdisciplinary PhD in Biostatistics Learning Goals					
Can critique general scientific research articles and assess the appropriateness of the statistical applications and methodology involved	X				
Can work effectively and collaboratively in a team on a biological or health-related scientific question		X	X	X	
Can design biological or health-related research studies and construct and implement statistical analysis plans appropriate for such studies		X	X	X	
Can effectively communicate the results of statistical analyses to statistical and non-statistical audiences		X		X	