

Department of Epidemiology and Biostatistics

Biostatistics 9510A

Biostatistical Research Methods
Fall 2022

Lectures:

Tuesdays, 10:30 – 12:00, PHFM 3015
Thursdays, 10:30 – 12:00, PHFM 3015

Instructor: Yun-Hee Choi

Office Hours: By appointment

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Course Description

The purpose of this course is to introduce students to statistical methods and software that can be used most frequently in research in the health sciences, in particular, in epidemiology and medical research.

Course Information

Enrollment in this course is restricted to graduate students in the Department of Epidemiology and Biostatistics, as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student's home program.

Course Learning Outcomes/Objectives

Upon successful completion of this course, students will be able to:

- Explain principal concepts about biostatistics
- Understand appropriate use of biostatistical methods frequently used in medical research
- Conduct simulation studies to assess statistical methods
- Design and conduct biostatistical research and write scientific papers
- Confidently use statistical software for biostatistical research

Course Materials

Required textbook: Lachin (2011) Biostatistical Methods; The Assessment of Relative Risks (2nd ed.) Wiley

Additional resource: Casella and Berger (2002) Statistical Inference (2nd ed.) Duxbury

Peat, J. (2002) Scientific Writing: Easy when you know how, BMJ Books

Additional materials will be provided on the course's OWL website.

Methods of Evaluation

- 30% - 5 Assignments
- 30% - Midterm
- 10% - Outline of your final project

- 10% - Oral presentation
- 20% - Final project

Course Timeline and Format

Subject to change.

Week	Date	Lecture Topic	Chapters
1	September 8	Introduction	Lachin 1
2	September 13, 15	Statistical inference	Casella 7-9
3	September 20, 22	Simulation study	
4	September 27, 29	Relative risk estimates and tests	Lachin 2
5	October 4, 6	Relative risk estimates and tests	Lachin 2
6	October 11, 13	Sample size and power	Lachin 3
7	October 18, 20	Stratified analysis	Lachin 4
8	October 25, 27	Case control and matched study	Lachin 5
November 1, 3		Study break: No classes	
9	November 8, 10	Case control and matched study	Lachin 5
10	November 15, 17	Maximum likelihood + Midterm (Nov. 17)	Lachin 6
11	November 22, 24	Logistic regression models	Lachin 7
12	Nov. 29, Dec. 1	Logistic regression models	Lachin 7
13	December 6	Final project presentation	
14	December 15	Final project due	

Western Academic Policies and Statements

Absence from Course Commitments

All non-medical absences must be approved in advance. In the case of an unexpected absence on compassionate grounds, documentation may be requested. If documentation is required for either medical or non-medical academic accommodation, then such documentation must be submitted by the student to the instructor.

Statement on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the

system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Support Services

As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page <http://www.music.uwo.ca/>, and our own McIntosh Gallery <http://www.mcintoshgallery.ca/>.

Registrarial Services: <http://www.registrar.uwo.ca>

USC Student Support Services: <http://westernusc.ca/services/>

Academic Support and Engagement: <http://academicsupport.uwo.ca/>

SGPS Life & Community web page: https://grad.uwo.ca/life_community/self/index.html

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (Graduate Chair), or other relevant administrators in their unit. Health and Wellness-related information and services are available at <https://www.uwo.ca/health/>.

Students who are in emotional/mental distress should refer to Mental Health@Western <https://www.uwo.ca/health/> for a complete list of options about how to obtain help.

Accessible Education Western (AEW)

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education Western (AEW), a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged.

These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction. More information and access to services is available on the AEW website: http://academicsupport.uwo.ca/accessible_education/index.html

Department & Faculty Offices

The Department of Epidemiology and Biostatistics is located on the third floor of the Western Centre for Public Health & Family Medicine (PHFM) on Western University's Main Campus.

Technology Requirements

You are responsible for all required course materials and announcements posted to the course's OWL website. Please ensure after the first class that when you log in you are able to access the course site. A copy of the course outline will be available on both OWL and the departmental website.

Cell Phone and Electronic Device Policy

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School and the Department of Epidemiology and Biostatistics that any electronic devices, i.e., cell phones, tablets, cameras, or iPod are strictly prohibited. These devices MUST be left either at home or with the student's bag/jacket at the front of the room and MUST NOT be at the test/exam desk or in the individual's pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-programmable calculators are only allowed when indicated by the instructor. The Department of Epidemiology and Biostatistics is not responsible for stolen/lost or broken devices.