



Course Guide for EPID 801 Fall 2022

Department of Public Health Sciences

Introduction to Epidemiology

September 12, 2022 – December 7, 2022

Mondays 10:00-11:25 am and Wednesdays 10:00-11:25 am

Carruthers 102

Instructor:

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Carruthers 102

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Office hours:

Instructor: Directly after class or by appointment. Email with absences, and any concerns re accessibility, accommodations, or grades.

Teaching Assistants: Directly after class or by appointment

Course Description

Epidemiology is a scientific discipline that aims to: 1) describe and characterize patterns of disease occurrence; 2) identify determinants of disease and other health-related conditions; and 3) evaluate disease prevention and health care interventions. With a focus on human populations, epidemiology is directly linked with public health research, policy, and practice and provides the conceptual and practical tools necessary for studying, understanding and solving public health problems, regardless of one's area of concentration or specialization.

This course introduces students to the principles and methods of epidemiology. Course content includes principles of causation and causality, data sources in epidemiology, study designs, measures of disease frequency and measures of association, bias, confounding and effect modification, cluster investigations, surveillance, screening methods, and systematic reviews. Emphasis is placed on applying these concepts to real-world problems in public health, and fostering critical thinking of epidemiological studies through case studies.

Learning Environment

We look forward to working together in an atmosphere of mutual respect and promotion of diversity. We have made every effort to make this course accessible to all. We encourage active learning and critical thinking through a range of group activities designed to engage learners. Acceptance of diversity and principles of equity are the foundations for learning in this course. Students have a wide range of experiences and education that contribute greatly to the richness of this class. We expect to work in a collegial, compassionate, and collaborative environment, not a competitive one. Please help others. This course is required for every Masters program in the Department of Public Health Sciences. **If you have any concerns or need special accommodations, please contact Maria as soon as possible.**

Objectives

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

1. Describe the principles of epidemiology in design, conduct and analysis of public health research and/or practice.
2. Familiarize with the main methods of epidemiology and how they inform past and current scientific, ethical, economic and political discussions and decision making in the area of health and health policies.
3. Build skills in accessing, assessing and applying epidemiological evidence

Competencies

Successful completion of this course will contribute to the attainment of the following core competencies:

- Explain what epidemiology is and how it can be used to inform public health issues.
- Distinguish between association and causation and understand the criteria to evaluate causal associations.

- Familiarize with the use of descriptive epidemiological measures of disease burden to describe a public health problem in terms of magnitude, person, time, and place.
- Identify key sources of epidemiological data; their strengths, limitations, and potential ethical issues.
- Understand, calculate and interpret measures of disease frequency and association in epidemiology.
- Describe epidemiological study designs and the advantages, limitations and practical aspects of each.
- Demonstrate ability to match research questions with appropriate methodologies and approaches.
- Understand and identify the concept of bias in epidemiological studies.
- Familiarize with the concept of effect modification and how it differs from confounding.
- Describe conditions suitable for population screening.
- Identify types of surveillance systems and approaches used in surveillance.
- Familiarize with methodological principles to conduct systematic reviews.
- Understand Indigenous health issues and inequalities from an epidemiological perspective.

Each session has **specific learning objectives** that explicitly state the concepts and skills that students are expected to master. This course is reading, writing, and research intensive, and uses guided self-instruction, student-led discussions and peer-group training as major teaching tools. Consequently, students who successfully complete the course will be able to:

- Read and critically evaluate epidemiologic articles (and media summaries of them) and discuss them with other professional and lay audiences;
- Develop "thought-provoking" questions and moderate discussions;
- Provide constructive feedback and assistance to fellow students.

Learning Resources

All information about the course will be provided through **onQ EPID801 F22**. Detailed information on learning objectives and assignments/tasks for each individual session will be posted on onQ. Assigned readings can be textbook chapters and/or scientific articles. Power Point lectures complement the assigned readings for each session and will be posted on onQ after each Monday session.

Required Textbook: Aschengrau A; Seage GR. Essentials of Epidemiology in Public Health (4th edition). Sudbury, Massachusetts: Jones and Bartlett Publishers: 2018. (3rd edition of the book is also good).

You can purchase this new or used textbook through the Queen's bookstore. Any additional course readings/materials will be posted onQ.

Supplemental Resources:

This course gives an introduction to the field of epidemiology. The following books are recommended (**not mandatory**) to those with more extensive interest in the field.

- Friis R, Sellers, T. Epidemiology for Public Health Practice (3rd Edition). Boston: Jones and Bartlett Publishers; 2004.

- Gerstman BB. Epidemiology Kept Simple: Introduction to Traditional and Modern Epidemiology (3rd Edition). Oxford: John Wiley & Sons; 2013.
- Koepsell TD, Weiss N. Epidemiologic Methods: Studying the Occurrence of Illness. New York: Oxford University Press; 2003.
- Porta M (Ed). A Dictionary of Epidemiology (5th Edition). New York: Oxford University Press; 2008.
- Oleckno WA, Anderson B. Essential Epidemiology: Principles and Applications. Prospect Heights, IL: Waveland Press; 2002.

The links below are useful sources of epidemiologic information:

- Centers for Disease Control and Prevention
- Epidemiology Supercourse
- Gapminder
- Boston University online learning modules (drop down for Epidemiology): <https://sphweb.bumc.bu.edu/otlt/MPH-Modules/Menu/index.html>
- Canadian Public Health Association. <https://www.cpha.ca/>
- Canadian Society for Epidemiology and Biostatistics. <https://cseb.ca/>
- Public Health Ontario. <https://www.publichealthontario.ca/>

Podcasts:

- Casual Inference: <https://casualinfer.libsyn.com/>
- This podcast will kill you: <http://thispodcastwillkillyou.com/>
- Global Caveat: <https://anchor.fm/global-caveat>

Science in the Cinema

There are some very nice movies and documentaries about Epi topics. Enjoy!

- And the Band Played On (1993) <https://tinyurl.com/bdhhkjht>
- Miss Evers' Boys (1997) <https://tinyurl.com/2w8rujuh>
- The Last Man on Earth (1964) <https://tinyurl.com/yxw9bf3p>
- The Deadly Deception (2014) <https://tinyurl.com/3px36ft7>
- The 1918 Influenza Pandemic in America (2014) <https://tinyurl.com/4c5e7twu>
- Lockdown 2025 (2021) <https://tinyurl.com/va7mc4zn>
- Contagion (2011) <https://tinyurl.com/3v37s2pe>

Need a Break?

What about a bit of fun in-between readings?

- The Outbreak Game: <https://www.the-outbreak.com>
- Survive the Outbreak: <http://www.survivetheoutbreak.com>

Course Format

We will review one or two topics per week. Lectures will be delivered by the course instructor or guest speaker reviewing the topic(s) of the week. Lectures will be followed by active learning activities (e.g., discussion and debates, group work, case studies, and problem-solving activities). We will use a clicker-free student response system (SRS) ([Poll Everywhere](#)) for some in-class activities. You may need your cell phone or laptop to participate in the SRS-based activities.

This is a graduate class where most learning occurs outside of class, with key concepts and their application presented in lectures and worked through in small group exercises. **Expected student learning hours necessary for success in this course in addition to class time are approximately 10 to 12 hours/week.**

Please do the assigned readings **before** class – this is critical for your engagement in class.

You are welcome to post your questions on onQ in the site area created for this purpose. We ask this because your question may be similar to a question someone else may have. If you have questions/concerns about your grades or any particular circumstance, please feel free to email the instructor or the TA. We will respond to your email or posting as soon as possible.

Course Work Evaluation

Assessments	Percentage	Due Dates
Assignments (n=2)	30%	Oct 3 (15%), Nov 14 (15%)
Quizzes (n=5)	20%	Top 4 scores count; 5% per quiz
Mid-term exam	20%	Oct 31
Cumulative final exam	30%	Dec 7

Every effort is made to align the assessments with the stated learning outcomes

1) Assignments (30%)

Two assignments (15% each) will give you an opportunity to apply new concepts, practice new skills, and express yourself in writing. **Check your work for plagiarism prior to submitting.** You can work alone or in groups up to 5 people (hand in ONE version with all names). If you submit the assignment by 5pm on the due date, you will get some feedback from TAs in one week. If you submit the assignment later than 5pm on the due date and prior to one week after the due date, you will get a grade with no feedback. No assignment will be accepted after one week following the due date. Submissions are through onQ.

2) Quizzes (20%)

You will complete five quizzes during the course on OnQ. The purpose of these quizzes is to keep up with the course material, and to assess your comprehension of the material covered in the readings and/or slides for that given week. The lowest grade will be dropped. If you are absent for a quiz, email Aleisha or Zoe to take the quiz onQ: this is allowed only within the 24hr period after the class when the quiz took place.

3) Mid-term exam (20%) and Cumulative final exam (30%)

These exams assess independent comprehension of the course material: various approaches are used (multiple choice, matching, short answer, calculations). The final exam will be cumulative, testing all material covered in the course.

Feedback and Grading

Marked assignments and quizzes will be returned within one week and rubrics will be posted on onQ. Late assignments will NOT be accepted.

Grades reflect judgments of student achievement based on a combination of absolute achievement and relative performance in the course.

Marks (e.g., percentages) will be assigned throughout the term. A maximum of 100% can be obtained. The minimum passing grade in Graduate School is 70%.

A letter grade will be assigned at the end of the term based upon the percent of course points as follows:

% Marks	Letter Grade
96% - 100%	A+
91% - 95%	A
86% - 90%	A-
81% - 85%	B+
76% - 80%	B
71% - 75%	B-
66% - 70%	C+
61% - 65%	C
56% - 60%	C-
51% - 55%	D+
46% - 50%	D
41% - 45%	D-
Equal or Below 40%	E

Some Resources

Queen's Student Accessibility Services (QSAS)

With other members of the Queen's community, we work to ensure the university and its programs are

accessible to students with disabilities. Our goal is to support your successful transition to university and to foster an inclusive and equitable environment at Queen's.

<https://www.queensu.ca/studentwellness/accessibility-services>

School of Graduate Studies Habitat

This brings together resources for living well and staying well in grad school. There is information on: taking care of yourself and managing stress, finding friends and fun, living in Kingston, managing finances, accessibility, building a career and more. <http://www.queensu.ca/sgs/current-students/sgs-habitat>

Student Wellness Services

Student Wellness Services supports the personal, academic, and social development of students at Queen's by providing a range of programs and services including accessibility services, counselling services, and health services. Their mission is to provide a welcoming, confidential, and integrated service that is responsive to the needs of students. A full listing of services including how to make an appointment is here: <http://www.queensu.ca/studentwellness/>

Statement on Academic Integrity

Queen's students, faculty, administrators and staff all have responsibilities for upholding the fundamental values of academic integrity; honesty, trust, fairness, respect, responsibility and courage (see www.academicintegrity.org). These values are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities <http://www.queensu.ca/secretariat/policies/senate/report-principles-and-priorities>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and their behaviour conform to the principles of academic integrity. Information on academic integrity is available in the SGS Calendar (<https://www.queensu.ca/sgs/graduate-calendar/academic-integrity-policy>) and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery, falsification and unauthorized use of intellectual property, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Please visit these helpful websites to help you make sure that you are able to write things in your own words:

- <https://www.queensu.ca/academicintegrity/students/avoiding-plagiarismcheating>
- <https://integrity.mit.edu/handbook/academic-writing/avoiding-plagiarism-paraphrasing>
- http://writing.wisc.edu/Handbook/QPA_paraphrase.html

Statement on Copyright of Course Materials

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution, posting, sale or other means of dissemination, without the instructor's expressed consent. A student who engages in such conduct may be subject to penalty for a departure from academic integrity and may also face adverse legal consequences for infringement of intellectual property rights.

Statement on Academic Accommodations for Students with Disabilities

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at Senate in November 2016 (see <https://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senateandtrusteess/ACADACCOMMPOLICY2016.pdf>). If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the **Queen's Student Accessibility Services (QSAS)** and register as early as possible. For more information, including important deadlines, please visit the QSAS website at: <http://www.queensu.ca/studentwellness/accessibility-services/>

Statement on Academic Consideration for Students with Extenuating Circumstances

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances that are beyond their control and are interfering with their ability to complete academic requirements related to a course for a short period of time. The Senate Policy on Academic Consideration for Students in Extenuating Circumstances is available at <http://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senateandtrusteess/Academic%20Considerations%20for%20Extenuating%20Circumstances%20Policy%20Final.pdf>

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. SGS students can find the Academic consideration information at: <https://www.queensu.ca/sgs/accommodation-and-academic-consideration>.

Schedule at a Glance

Week	Date	Topic	Reading	Facilitator	Activities	Evaluations Due
W1	Sep 12	Course overview Understanding Epidemiology	Aschengrau Chapter 1	Maria Ospina	Lecture	
	Sep 14	Causation and causal inference	Aschengrau Chapter 15	Maria Ospina Aleisha Fernandes Zoe Friedman	Lecture Group activity	
W2	Sep 19	Descriptive epidemiology (person, place, time)	Koepsell Chapter 7	Maria Ospina	Lecture	Quiz 1
	Sep 21	Sources of epidemiological data	Koepsell Chapter 6 Lucyk 2015	Maria Ospina Aleisha Fernandes Zoe Friedman	Lecture Group activity	
W3	Sep 26	<u>Epidemiological Measures</u> -Incidence and prevalence Comparing disease frequencies: Relative and absolute measures of effect	Aschengrau Chapters 2 and 3	Maria Ospina	Lecture	Quiz 2
	Sep 28	Rate adjustment: Direct and indirect standardization	Naing 2000	Aleisha Fernandes Zoe Friedman	Lecture Group activity	
W4	Oct 3	<u>Epidemiological study designs</u> Case reports, case series, ecological studies, cross-sectional studies	Aschengrau Chapter 6 du Prel 2009	Maria Ospina	Lecture	Assignment 1 Due
	Oct 5		Critical appraisal ecological and cross-sectional studies	Aleisha Fernandes Zoe Friedman	Group activity	
W5	Oct 10	No Class - Thanksgiving				
	Oct 12	No Class - Fall Mid-term Break				
W6	Oct 17	<u>Epidemiological study designs</u> Case-control studies and Cohort studies	Aschengrau Chapters 8 and 9	Maria Ospina	Lecture	Quiz 3
	Oct 19		Critical appraisal case-control and cohort studies	Aleisha Fernandes Zoe Friedman	Group activity	
W7	Oct 24	<u>Epidemiological study designs</u> Experimental studies	Aschengrau Chapter 7	Derrick SSewanyana	Lecture	Quiz 4

					Group activity	
	Oct 26	Review session for mid-term		Aleisha Fernandes Zoe Friedman		
W8	Oct 31	Mid-term exam		Maria Ospina Aleisha Fernandes Zoe Friedman		Mid-term exam
	Nov 2	Chance vs. Bias	Aschengrau Chapters 10 and 12	Derrick S Sewanyana Aleisha Fernandes Zoe Friedman	Lecture Group activity	
W9	Nov 7	Confounding vs. Effect modification	Aschengrau Chapters 11 and 13	Maria Ospina	Lecture	
	Nov 9			Aleisha Fernandes Zoe Friedman	Group activity	
W10	Nov 14	Epidemiology in Practice: Surveillance and screening in public health	Aschengrau Chapter 16 Declich 1994	Maria Ospina	Lecture	Assignment 2 Due
	Nov 16			Aleisha Fernandes Zoe Friedman	Group activity	
W11	Nov 21	Systematic reviews	Unscheid 2013	Maria Ospina Aleisha Fernandes	Lecture Group activity	Quiz 5
	Nov 23	Epidemiology in Practice Outbreak and cluster investigations	Gertsman Chapter 12 Reintjes 2010	Ian Gremmill	Lecture Group activity	
W12	Nov 28	Indigenous health in context	Hayward 2021 Jaworsky 2019 Allen 2020	Maria Ospina	Lecture	
	Nov 30			Aleisha Fernandes Zoe Friedman	Group activity	
W13	Dec 5	Review session for final exam		Aleisha/Zoe	Lecture	
	Dec 7	Final exam		Maria Ospina Aleisha Fernandes Zoe Friedman		Final exam