

EPIDEMIOLOGY I - INTRODUCTION TO EPIDEMIOLOGY

EPI 5240

COURSE

INSTRUCTORS:

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WEB PAGE:

http://cancer-epidemiology.org/epi_5240

COURSE HOURS:

Monday, 1300-1600
Optional seminars will be offered on Wednesday mornings from 0930-1130 (see later for more information)

CLASSROOM:

Health Sciences Building, room 3248.

Optional seminars:

Offered on Wednesday mornings from 0930-1130 (see later for more information)

OFFICE HOURS:

Dr. Birkett: Tuesday, 0900-1200.
Other times by appointment.

Prerequisites:

- 1) A introductory university-level biostatistics course covering topics such as descriptive statistics, hypothesis testing, confidence intervals. **This is required as a prerequisite!** EPI5240 will be assuming that people are comfortable with these topic areas. Students without prior background in this area are **strongly** encouraged to register concurrently in Biostatistics 1 (EPI 5242) or to register for the non-credit summer course on Biostatistics (see: <http://www.medicine.uottawa.ca/epid/eng/summerprog2009.html>).
 - 2) Familiarity with some aspects of the health field, through either prior education or experience.
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INTRODUCTION

This course is intended to provide an introduction to epidemiological methods and their application. It is a required course for students in the Master of Science in Epidemiology degree programme. It is an elective course for 'special' students not enrolled in this degree programme. All special students need permission of the instructor prior to registering.

COURSE FORMAT

The course material will be presented in a lecture format. The lectures are designed to cover the core material for each session. Note, that the lectures will not necessarily cover all of the material listed in the summary of session objectives. It is expected that students will be familiar with the reading material for each session prior to the lecture. Part of the lecture time will be used to address areas of confusion, uncertainty, etc. which the students raise from their readings. In some cases, the lecture will be used to highlight conceptual issues or problem areas. Do not come to this course assuming that you will learn all you need to know by simply listening to the lectures!

In addition to the lectures, we are offering 3 optional seminar sessions on Wednesday morning (0930-1130). These will not cover core material but will provide students with an opportunity to discuss some topics in more depth. Each session will be repeated four times, with a maximum class size of 14 students. Students who are interested in these sessions are asked to sign-up for a maximum of one session for each topic area. The three topics are:

- Journal Club (discussion of 2 or 3 current epidemiological papers).
- Research Ethics (a discussion of topics and issues in ethics as related to epidemiological research)
- Outbreak investigation (a paper exercise tracing an outbreak).

A full set of course objectives has been developed for each session. A copy is in the binder of reading materials with the objectives for each session at the front of that section of the binder as well. These objectives are also available on the course web site. For each session, relevant reading material has been identified, generally divided into 'core' material and 'supplemental' material. Much of the reading material will be contained in the recommended course text. However, the textbook material will be supplemented and the lectures may present material which might challenge the view put forward in the text (!! this is a graduate course after all!!).

Most of the core readings (excluding those in the textbook) have been assembled into a 'course notes pack' which students can buy from the reprography department. We have also provided a supplemental reading list for many sessions. These additional readings may present the core material from a different perspective or may provide enrichment material. You would benefit from reading all of the viewpoints but you could 'get away' with reading only one version. I will be addressing issues which may still be controversial - don't be surprised if you find more than one proposed solution. Part of your job is to understand why more than one approach might be proposed.

OBJECTIVES

The overall objective is for students to understand epidemiological investigation, especially in the area of disease etiology. The course concentrates on observational research rather than experimental research. Due to the nature of observational studies, concerns with validity are the most important issue in epidemiology. We will discuss how to avoid bias, to control confounding and to detect effect modification at study design and data analysis stages. You will develop critical appraisal skills (important in reviewing published literature and in proposals for new studies, including your own!), and an understanding of the principles of causal inference.

It is NOT an objective that students would be able to actually design a research project - that will require additional study. However, you should be able to participate in a meaningful way in the development of a research project in collaboration with other investigators. You should also be able to critically appraise published reports in order to determine their value and meaning. Within this broad goal, students will be addressing the following objectives:

- 1) To develop the attitude that data drives conclusions, not the other way around;
- 2) To be able to tell good from bad research;
- 3) To be aware of sources of data about the health status of Canadians, as well as the strengths and weaknesses of this data;
- 4) To understand the basic approaches to epidemiological research and be able to describe the advantages and disadvantages of the various design options;
- 5) To understand the major threats to the validity of epidemiologic research and to be able to apply basic strategies to preventing and adjusting for these problems.
- 6) To be able to define and use the main measures of mortality, morbidity and study group comparison.

EVALUATION METHODS

The evaluation will be based on three assignments and a 3 hour closed book examination. The final grade will be assigned based on the following weighting system:

Assignment #1 (due: October 5)	10%
Assignment #2 (due: November 9)	25%
Assignment #3 (due: December 7)	25%
Participation in on-line discussion forum	5%
Final examination (December 17)	35%
TOTAL	100%

Each assignment will examine primarily material covered in sessions since the previous assignment. The final examination will cover the entire course.

VIDEOS

I have copies of two NOVA videos which show epidemiology in action. They both last about 45 minutes. I will arrange to show these videos on the first two days, right after class. Attendance is voluntary.

ON-LINE DISCUSSION FORUM

The large class size will make it difficult for the course instructor to provide one-on-one out-of-class instruction to the level which I would normally like to do. In any event, there are often issues raised in private meetings which are of relevance and benefit to the whole class. Plus, there are major benefits to students to participate in resolving questions, etc. which are posed by their classmates. To this end, we have set-up a discussion forum for this course at this URL:

<http://cancer-epidemiology.org/smf>

Most students will have had experience with some type of discussion forum, either as part of their education or through personal interests. We are using a standard forum package (SMF) which should be easy to use. Each registered student in EPI 5240 will be added to the discussion forum and given access to the EPI 5240 part of the forum. There will be a number of sections within the EPI 5240 discussion forum to cover various topics (check the forum for details). Students are asked to use this forum for all course-related questions. Faculty and the TA will check the forum at least once per day and will address questions. However, we expect that students will attempt to answer questions posed by other students, not just use the forum as a one-way conduit of information.

The forum will only be successful if students actively participate by posting questions and assisting in their resolution. Students will be awarded up to 5% of the final grade to reflect the degree of their participation in the discussion forum.

READING MATERIAL

We recommend that all students buy two textbooks (see below), one introductory and one more advanced. The course will roughly follow the outline of the Aschengrau and Seage book, especially for the first two months. The second book (Szklo and Nieto) will be particularly useful for the last half of the course. Some topics which are not well covered in either book will be addressed using a course notes pack (e.g. communicable diseases). We will also provide you with a series of supplemental readings for most sessions in case you want to explore topics in more depth. Finally, a list of recommended intermediate and advanced level books is available on the web site.

The main (introductory) textbook for the course is:

Aschengrau A, Seage GR III. Essentials of Epidemiology in Public Health, 2nd Edition. Jones and Bartlett Publishers Inc, Sudbury, MA, 2007 ISBN: 076374025X

Copies of this book have been ordered and should be available in the Health Sciences bookstore at the Ottawa General Hospital. I strongly encourage everyone to get a copy of this book.

The second level textbook I am recommending is:

Szklo M, Nieto FJ. Epidemiology: Beyond the Basics, 2nd Edition. Jones and Bartlett Publishers Inc, Sudbury, MA, 2008 ISBN: 978-0763729271

Copies of this book have been ordered and should be available in the Health Sciences bookstore at the Ottawa General Hospital. If you prefer, you can copy the key chapters from the binder. However, buying the book will save you photocopy charges and give a good resource for your future studies and work.

I strongly encourage you to read the book by Dan Gardner on Risk (see below). It is not a formal textbook, having been written for an educated lay audience. However, it is a fascinating examination of the way people mis-interpret risks (and why). Since epidemiology is largely about estimating risk and then trying to change behaviour, an understanding of these issues would be very beneficial. You should be able to find this book at Chapters or Amazon.ca for about \$22.

Gardner, A. Risk: The Science and Politics of Fear. McClelland & Stewart, 2008. ISBN-13: 978-0771032998

Research Ethics

All epidemiological research is subject to high ethical standards. These are enforced by reviews conducted by Research Ethics Boards. In order to attain a high ethical standard, most REBs are expecting that applicants will have completed recognized study in research ethics. While this isn't a formal requirement for EPI 5240, the course provides you with a good opportunity to complete your first certification. The Ottawa Hospital REB is recommending an on-line course (<http://www.pre.ethics.gc.ca/english/tutorial>). This takes about two hours to complete and provides you with a certificate which the OHREB accepts for all applications. All it is not a formal course requirement, I encourage you to complete this course sometime this fall.

Course Schedule

#	Date	Time	Book	Topic
1	Sept 14	1300-1600	Chapter 1	Introduction to course. Historical roots of Epidemiology. Sample vignettes
		1600-1700	OPTIONAL	NOVA video: An Ebola virus outbreak
2	Sept 21	1300-1500	Chapter 2	Disease classification. Vital Statistics. Measures of Morbidity & Mortality.
		1500-1600	Chapter 4	Sources of information. Disease registries.
		1600-1700	OPTIONAL	NOVA video: Esophageal cancer in China
3	Sept 28	1300-1430	Chapter 6 (Chapter 7)	An overview of the primary study designs
		1430-1600	Chapter 5	Descriptive Epidemiology.
*4	Oct 5	1300-1500 1500-1600	Chapter 2 Chapter 3	Incidence, Prevalence, person-time, etc. Comparing disease frequencies in different study designs
5	Oct 12	NONE	NONE	NO CLASS (THANKSGIVING HOLIDAY)
6	Oct 19	1300-1500	Chapter 15	Overview of concepts of causation & association.
		1500-1600	Chapter 10	Study validity and bias.
7	Oct 26	1300-1600	-----	Concepts of Infectious Disease Epidemiology and outbreak investigation
8	Nov 2	1300-1500	Chapter 16	Diagnostic test evaluation. Screening.
		1500-1600	None	Epidemiological trends in Canada: non-communicable diseases.
*9	Nov 9	1300-1500	Chapter 10 Chapter 11 Chapter 13	Bias. Confounding and effect modification, general concepts
		1500-1600	None	Misclassification
10	Nov 16	1300-1600	Chapter 11 Chapter 13	Methods of controlling confounding. Stratified analyses. Standardization
11	Nov 23	1300-1500	Chapter 8	Cohort studies. Methodological standards. Open and closed populations. Field work issues.
		1500-1600		Estimating population impact
12	Nov 30	1300-1600	Chapter 9	Case-control studies. Principles of case and control selection. Prevalent vs incident case-control studies. Matching.
*13	Dec 7	1300-1500		Incidence estimation and related topics. Concepts of survival analysis related to incidence measures. Types of incidence measures. Inter-relationship of incidence measures. The density method.
14	Dec 14	1300-1500		Special types of case-control studies.
		1500-1600		Conceptual ideas of logistic regression
15	Dec 17	1300-1600		FINAL EXAM

* = Date assignments are due.

For students in need of learning support

Students who require accommodations or academic support because of a physical or learning disability, or any condition that affects their ability to learn, are invited to register with **ACCESS SERVICE**:

In person:	UCU 339
Telephone:	562-5976
TTY:	562-5214
E-mail:	adapt@uottawa.ca
Web:	www.sass.uottawa.ca

Students can then meet with an Access Service specialist to identify their individual needs and to discuss appropriate interventions.

IMPORTANT DATES TO REMEMBER

For requesting accommodations for a mid-term examination: Requests must be submitted at least **7 days** (not including the day of the exam nor any statutory holiday) prior to the writing date of mid-terms, tests, quizzes or other forms of written evaluations.

For requesting accommodations for final exams:

Fall Semester:	<i>before 15 November</i>
Winter Semester:	<i>before 15 March</i>
Spring/Summer Semester:	7 days prior to the exam (not including the day of the exam nor any statutory holiday)