PPHS 602- Foundations of Population Health

Instructors: Drs. Gilles Paradis and Scott Weichenthal
Teaching Assistants: Holly Cochrane, Katherine Jennings, Robert MacTavish, Alanna Miller
Session: Fall 2019 - Credits: 3
Course material available on "My courses"

Contact Information

Gilles Paradis chair.epid@mcgill.ca 514-398-6259 Purvis Hall, Room 32 Office Hours: by appointment	**Scott Weichenthal** scott.weichenthal@mcgill.ca 514-398-1584 Lady Meredith, Room 301 Office Hours: by appointment
Teaching Assistants **#1 – Holly Cochrane** email holly.cochrane@mail.mcgill.ca Purvis Hall, Room 21A Office Hours: Wednesdays, 10:00am-11:00am **#2 – Katherine Jennings** email katherine.jennings@mail.mcgill.ca Purvis Hall, in Solarium Office Hours: Tuesdays, 11:30am-1:30pm	 **#3 – Robert MacTavish** email robert.mactavish@mail.mcgill.ca Purvis Hall, Room 21A Office Hours: Tuesdays, 11:30am-1:30pm **#4 – Alanna Miller** email alanna.miller@mail.mcgill.ca Purvis Hall, Room 21A Office Hours: Fridays, 12:00-1:30pm

Course Learning Objectives

1. To understand the concepts and principles of and distinguish from each other Population health, Public health, Demography and Epidemiology.
2. To understand, know how to apply, and interpret basic concepts and measures related to population dynamics and demography.
3. To understand and be able to use measures of health status of populations.
4. To understand and be able to calculate different measures of mortality and morbidity.
5. To be able to calculate standardized event rates, to construct life tables and derive life expectancy estimates and to calculate simple Kaplan-Meier survival probabilities.
6. To understand and be able to interpret age, cohort, and period effects.
7. To understand the key features of surveys (including sampling), surveillance systems, census, registries, and vital statistics.
8. To understand and be able to apply the major concepts of measurement in epidemiology including measurement error.
9. To understand and be able to calculate different measures of reliability and validity.
10. To be able to critically review/plan epidemiological studies from the perspective of exposure assessment and make sound judgements with respect to the likely impact of exposure measurement error on the reported findings.
11. To understand the concepts of determinants of health as they apply in PPH.
12. Understand the conceptual basis of the PPH approach to prevention.

Content

This course provides an overview of conceptual, methodological, and substantive issues in population health. It is divided into two parts:

- ***Part I*** addresses the conceptual and methodological issues in the description and understanding of population dynamics and the health of populations, major data sources and methods used to assess the health of populations. (G. Paradis)
- ***Part II*** provides an overview of important concepts related to measurement in epidemiology including the concepts of reliability and validity, measurement error, and related topics. (Scott Weichenthal)

Date, Time and Location

Tuesdays and Thursdays

10:05-11:25 am

Classroom Education Building – Room 129

Breakout rooms (small groups) with TAs on either a Tuesday or Thursday:

- Education 129 TA – Holly Cochrane
- Education 437 TA – Katherine Jennings
- Education 613 TA – Robert MacTavish
- Education 629 TA – Alanna Miller

Please consult MyCourses to see which small group you are assigned to

Assessment

Assignments (n=6):	30 points
Mid-term Exam:	30 points
Final Exam:	40 points

Late Policy

No late assignments will be accepted unless there is a valid (medical emergency, etc.) reason. Late submission of assignments will result in a grade of zero.

Required Books

- Rose, G.A., Khaw K.T., Marmot M.G. (2008). Rose's strategy of preventative medicine. Oxford, NY: Oxford University Press.
- White E., Armstrong B.K., Saracci R. (2008). Principles of exposure measurement in epidemiology. Collecting, evaluating, and improving measures of disease risk factors, 2nd edition. Oxford University Press.

Part I: Populations, denominators and numerators (Dr. G. Paradis)		
Date	**Lecture**	**Readings**
September 3, 2019 Lecture 1	**Numerators** (Guest lecturer Dr. J. Cox) - Measuring events - Disease, disability, handicap - Model of natural history of disease - People, place, time - Prevention	Rose, Chapters 2 and 3 See material on *MyCourses*
September 5, 2019 Lecture 2	**Introduction** **Populations and Denominators** - Populations - Characteristics - Age, Sex distribution - Fecundity and population dynamics - Epidemiologic transition - Source population	Rose, Chapters 1 and 5 See material on *MyCourses*
September 10, 2019 Lecture 3	**Indicators of health and disease**	See material on *MyCourses*
September 12, 2019	**Exercise #1: Denominators, numerators and health indicators (TA)** *Assignment #1 handed out*	
September 17, 2019 Lecture 4	**Mortality (1)** - Crude, adjusted - Standardization	See material on MyCourses
September 19, 2019	**Exercise #2: Standardization (TA)** *Assignment #2 handed out*	
September 24, 2019 Lecture 5	**Mortality (2)** - Life-tables - Survival analysis *Assignment #1 due*	See material on *MyCourses*
September 26, 2019 Lecture 6	**Age, birth cohort and period effect** *Assignment #2 due*	See material on MyCourses
October 1, 2019 Lecture 7	**Surveys (1)** - Key features - Design of surveys - Components - Errors and estimation - Data collection	See material on MyCourses
October 3, 2019	**Exercise #3: Life Table and survival analysis (TA)** *Assignment #3 handed out*	

Date	Lecture	Readings
October 8, 2019 Lecture 8	**Surveys (2)** - Sampling - Non response	*See material on MyCourses*
October 10, 2019	**Exercise #4: Age, period and cohort effect (TA)** *Assignment #4 handed out*	See material on MyCourses
October 15, 2019 Lecture 9	**Surveillance, census, vital statistics and registries** *Assignment #3 due*	See material on *MyCourses*
October 17, 2019	**Exercise #5: Surveys and sampling (TA)** *Assignment #5 handed out*	
October 22, 2019 Lecture 10	**Sick individuals and sick populations: public health and population health** *Assignment #4 due*	Rose, Chapters 4-8
October 24, 2019	**Exercise #6: Surveillance (TA)** Assignment #5 due	
October 29, 2019	**Mid Term Exam (10:05-12:00pm for 2 hours)** **Location: Breakout rooms with TAs**	

Part II: Basics of Measurement in Epidemiology (Dr. S. Weichenthal)		
Date	**Lecture**	**Readings**
October 31, 2019 Lecture 11	**Assessing the Quality of Measurements: Validity and Reliability** - Bias and precision - Measuring validity and reliability for continuous and categorical variables - Introduction to Effect modification *Assignment #6 handed out*	White, Chapters 3 and 4
November 5, 2019 Lecture 12	**Measurement in Practice** - Illustrate important measurement concepts/methods using a new study of residential wood burning and children's health in British Columbia	White, Chapters 2 and 6 Class slides See material on *MyCourses*
November 7, 2019	**Exercise #7: Case Study I (TA)** **Small Group**	See material on *MyCourses*
November 12, 2019 Lecture 13	**Consequences of Mismeasurement** - Differential and non-differential error - Consequences of measurement error in epidemiology	White, Chapter 3 See material on *MyCourses* • *Hutcheon et al. BMJ* 2010; 340: 1402

Part II: Basics of Measurement in Epidemiology (Dr. Weichenthal)		
Date	**Lecture**	**Readings**
November 14, 2019 Lecture 14	**Exposure: Population Perspective** - Why do small changes in population exposures matter? - High Risk vs. Population Approach to Disease prevention - Example: Flint Water Crisis ***Case Study:*** *Iqaluit Landfill Fire* *Assignment #6 Due*	See material on *MyCourses* • *Hanna-Attisha et al. Am J Public Health.* 2016; 106: 283-290
November 19, 2019 Lecture 15	**Introduction to Exposure Science** - Overview of Important Concepts in Exposure Science related to Public Health	White, Chapter 1 See material on *MyCourses* • *Lioy et al. Environ Health Perspect* 2013; 121: 405-409. • *Wild CP. Int J Epidemiol 2012; 41: 24-32*
November 21, 2019	**Exercise #8: Case Study II (TA)** **Small Group**	
November 26, 2019 Lecture 16	**Introduction to Risk Assessment**	See material on *MyCourses*
November 28, 2019 Lecture 17	**Communicating Risk and Uncertainty**	Annu. Rev. Stat. Appl. 2017. 4:31–60
December 3, 2019 Lecture 18	**Review**	
December 5, 2019	**Final Exam (10:05-12:00pm for 2 hours)** **Location: Breakout rooms with TAs**	

McGill Policy Statements

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/integrity for more information).

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.