SCHOOL OF POPULATION AND PUBLIC HEALTH
SPPH 515 – Surveillance and Monitoring in Public Health
Syllabus – Winter 2022

1.   COURSE DESCRIPTION

This course is intended to provide students with a strong foundation in public health surveillance. The course will teach the theory and practice of surveillance supported by examples of surveillance systems from British Columbia and other areas. Students will learn to: describe the principles of public health surveillance; design and evaluate a basic public health surveillance system; analyze and interpret surveillance data; describe the application of surveillance to various settings and diseases including communicable diseases, environmental health issues, chronic diseases and injuries; and, describe how surveillance data may be used to inform public policy.

- Three credits
- Elective
- Students in other related disciplines may take the course with approval of the course instructor
- Prerequisites for this course: SPPH 502 (Epidemiological Methods I) or equivalent graduate epidemiology course; **and** SPPH 400 (Statistics for Health Research) or equivalent graduate biostatistics course; **and** basic data manipulation skills using a statistical software package (e.g., R, SAS, SPSS).

2.   COURSE OPERATION

Class: Wednesdays 0900-1200

Room: TBD

Instructors: Michael Otterstatter, MSc PhD, Clinical Assistant Professor
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                              Eleni Galanis, MD MPH FRCPC, Clinical Professor
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Office Hours: By appointment

Teaching assistant: Rachel Lai
                              [contact information to be provided]

3. LEARNING GOALS AND OBJECTIVES

SPPH 515 provides an in-depth review of concepts and methods for developing and evaluating surveillance systems and analysing and interpreting surveillance data for both infectious and non-infectious diseases.

The overall goals of this course are to:

(a)   Understand the purpose and principles of surveillance;
(b)   Identify and understand the elements required in the development of a surveillance system;
(c)   Learn how to analyse and interpret surveillance data;
(d)   Identify and measure attributes used in the evaluation of a surveillance system.

On completion of this course the student will be able to:

(a)   Identify and describe the principles, objectives and elements of public health surveillance for infectious and non-infectious diseases and conditions;
(b)   Identify and select appropriate data sources for disease and health event surveillance;
(c)   Conduct basic analysis of surveillance data, including
   ▪   using the epidemiological concepts of person, place and time to describe the data;
   ▪   calculating appropriate rates, including age-standardised rates; and,
   ▪   developing an analysis plan;
(d)   Interpret surveillance findings taking into account potential biases;
(e)   Identify effective means to disseminate surveillance findings;
(f)   Enumerate possible actions resulting from surveillance findings and describe how they may be used to inform public policy;
(g)   Explain how to conduct surveillance in a variety of public health situations;
(h)   Identify and explain ethical and legal issues related to surveillance;
(i)   Develop a surveillance system for an emerging public health issue, adhering to key attributes for evaluating surveillance systems;
(j)   Communicate recommendations to stakeholders.

4. COURSE STRUCTURE

Lectures, combined with pre-assigned readings will outline concepts, methods and examples. Small group work, class discussions, tutorials and assignments will provide an opportunity for application of these concepts. The first half of the course will review the theory of surveillance as well as the theory and application of surveillance data analysis. The second half of the course will consist of guest lectures on various surveillance systems as well as student group time to plan the development of a surveillance system.

4.1 Online classes (if required)

Most course components will be in-person for the winter 2022 session. Some lectures and mentored sessions may be delivered using online tools.

4.2   R support

Students are expected to have basic skills in data manipulation using statistical software and will be free to use the software of their choice for the data assignments and tutorials (e.g., R, SAS, Stata, SPSS). However, all examples provided in this course will be based in R. If students wish to use R and need additional support (e.g., syntax, coding, troubleshooting) they must contact the TA in advance (before assignments are due) to arrange extra help.

5.   RECOMMENDED RESOURCES

The course syllabus can be downloaded from the SPPH website. There is NO REQUIRED TEXTBOOK, only a recommended textbook, for this course, listed below. A few copies of the text will be available at the UBC bookstore and an additional copy is on reserve at the Woodward Library.

- Lee LM, Teutsch SM, Thacker SB, St. Louis ME (eds). Principles and Practice of Public Health Surveillance, 3rd edition. Oxford: Oxford University Press; 2010.

5.1   Readings

Key readings will be made available on the course website in order to enhance learning. Each week, in-class discussions will draw upon the content of these reading. All students are expected to complete the Required Readings (listed on pp. 7-8) in advance of lecture. Supplementary Readings will be made available to support learning on certain topics and should be reviewed as needed.

6.   STUDENT EVALUATION

A variety of methods will be used to accumulate marks to a potential total of 100, as follows:

Distribution of Marks:

Individual Assignments	
– Analysis and Interpretation of Infectious Disease Surveillance Data	25 marks
– Analysis and Interpretation of Chronic Disease Surveillance Data	25 marks
Group In-Class Presentation - Development of a Surveillance System (Group Mark)	35 marks
Class and Group-Work Participation	15 marks

6.1   Assignments – Analysis and Interpretation of Surveillance Data

Students will be given two surveillance databases (in Classes 3 and 6) to work with individually for the analysis assignments. Students are responsible for cleaning the data; linking databases; calculating standardized rates; visualising trends and data quality issues; identifying and carrying out appropriate statistical analyses; and interpreting the findings for surveillance purposes. Students will be introduced to key concepts in working with, analysing and interpreting surveillance data during in-class lectures, examples and tutorials (Classes 3, 4 and 6).

For both analysis assignments, students are required to answer a set of questions related to data sources, data quality, epidemiological (descriptive) analysis and interpretation of patterns and trends. Assignment questions involving calculations will require clear illustration of the steps involved as well as the final results; students will be asked to submit electronic spreadsheets or code illustrating their calculations. The write-ups are to be a maximum of 4 pages inclusive of the tables/figures (12 point font, single spaced, 1" margins). The infectious disease surveillance analysis report is due Feb 9, 2022 by 5pm and the chronic disease surveillance analysis report is due Mar 9, 2022 by 5 pm. Electronic copies are to be submitted through Canvas or emailed to the instructor or the TA by the deadline. Late assignments for which there has been no prior discussion will receive a 10% deduction per day (1 minute past the due date is considered a day late). The assignments are each worth 25% each of the final grade (50% in total).

6.2   Group Presentation – Development of a Surveillance System

The instructors will assign students to groups early in the term. Groups must work together to develop a surveillance system in response to a new/emerging public health issue or an existing public health issue that is in need of a surveillance system. Development of the surveillance system must include a clearly articulated surveillance purpose with target population; key surveillance system attributes; a clearly defined outcome; practical data sources/data collection procedures including data on person, place and time variables; an analysis plan including key indicators derived from the data; identification of stakeholders/organizations responsible for surveillance within the public health system/infrastructure; identification of (any) ethical/legal considerations; and articulation of the key limitations of the surveillance system and methods. Groups will present their surveillance system, covering the topics listed above, to the class and public health stakeholders (this will include your peers/instructors and well as invited guests from public health organizations).

Groups can select their topic for the development of a surveillance system that meets a real and current (i.e. within last 2 years or next 2 years) public health need at the local, provincial, national or international level. The health condition under surveillance must be novel or not yet under surveillance and/or the proposed surveillance program or methods must be novel. Potential examples include: surveillance of illness after a disaster (e.g., gas spill in in the ocean), surveillance of an emerging multi-drug resistant strain of bacteria (e.g., CPO in the community), surveillance of injuries related to a new recreational activity (e.g., trampoline parks), use of social media or participatory surveillance to increase sensitivity of a surveillance program, etc.

A one-page proposal outlining the topic for the group presentation including a description of the public health surveillance issue is due Feb 25, 2022 by 12 pm. Proposals are to be emailed to the instructor or TA by the deadline. Presentations are scheduled for a maximum of one-hour duration, including 15 minutes for questions and answers, on Mar 30 and Apr 6, 2022 (schedule of day and time will be confirmed by the instructors). Each member of the group is expected to contribute to the oral presentation and to the Q&A session.

Presentations will be evaluated on content (75%) and format (25%) including presentation skills and clarity of slides. Marking is based on group performance as a whole and the final grade for the group will be assigned to each individual in their group. The presentation is worth 40% of the final grade.

6.3   Participation

Students are expected to attend all classes and to come to class prepared. Please notify the instructors in advance if you are unable to attend a lecture, tutorial or small group session.

Readings are to be completed before class and students should be ready to participate actively in class discussion and activities, to critically appraise evidence presented in class, and to offer content to the class discussion based on their readings, experiences and opinions. The instructors and guest speakers take responsibility for facilitating learning during classes, but in this graduate-level course students are primarily responsible for their own learning and will learn best by taking part in the range of activities offered in the course in a constructive and thoughtful manner.

Class participation is worth 10% of the final grade. Participation will be evaluated by the professors and TA based on 1) regular attendance, 2) punctuality, 3) active engagement (e.g., asking questions, answering questions, showing evidence of having prepared for class) and 4) making contributions to the course content (e.g., providing in-depth comments and critical analysis based on readings, learnings, experiences and opinions). Participation will be assessed during in-class and online lectures and related discussions over the balance of the course. During online classes or lectures, verbal contributions are strongly encouraged but IM 'chat' contributions will also be assessed. Students are encouraged to keep their video on during online classes or lectures.

Group work participation is worth 5% of the final grade. It will be evaluated by the other students in the group based on 1) regular attendance and participation in group discussions, 2) respectful input that contributes to advancing the group work, and 3) fairly sharing the workload, including meeting deadlines agreed upon by the group.

Please consult the following UBC resources to learn more about class participation:
- https://students.ubc.ca/ubclife/finding-voice-classroom
- https://keepteaching.ubc.ca/
- https://ctlt-act-2020.sites.olt.ubc.ca/files/2020/07/Guiding-Principles-Active-Engagement-in-Discussion-Lecture-Courses-2.pdf
- https://ctlt.ubc.ca/2013/01/24/course-design-community-of-practice-assessing-participation/

Students requiring academic accommodations related to a disability or ongoing medical condition should consult the UBC Access & Diversity service as early as possible (https://students.ubc.ca/academic-success/academic-supports/academic-accommodations-disabilities).

GRADING *(adapted Dr. Dan Pratt, Depart. of Educational Studies, UBC, Graduate Course Grading Policy):*

A Level (80% to 100%)
A+ is from 90% to 100%: It is reserved for exceptional work that greatly exceeds course expectations. In addition, achievement must satisfy all the conditions below.
A is from 85% to 89%: A mark of this order suggests a very high level of performance on all criteria used for evaluation. Contributions deserving an A are distinguished in virtually every aspect. They show that the individual (or group) significantly shows initiative, creativity, insight, and probing analysis where appropriate. Further, the achievement must show careful attention to course requirements as established by the instructor.
A- is from 80% to 84%: It is awarded for generally high quality of performance, no problems of any significance, and fulfillment of all course requirements.

B Level (68% to 79%)
This category of achievement is typified by adequate but unexceptional performance when the criteria of assessment are considered. It is distinguished from A level work by problems such as: One of more significant errors in understanding, superficial representation or analysis of key concepts, absence of any special initiatives, or lack of coherent organization or explanation of ideas. The level of B work is judged in accordance with the severity of the difficulties demonstrated. B+ is from 76% to 79%, B is from 72% to 75%, and B- is from 68% to 71%.

C Level (55% to 67%)
Although a C+, C, or C- grade may be given in a graduate course, the Faculty of Graduate Studies considers 68% as a minimum passing grade for doctoral graduate students

PLAGIARISM

Students are expected to know what constitutes plagiarism; that plagiarism is a form of academic misconduct, and that such misconduct is subject to penalty. Please review the Student Discipline section of the UBC Calendar (available on-line at www.ubc.ca). Please also visit the UBC Plagiarism Resource Centre for Students (available on-line at www.library.ubc.ca/home/plagiarism/).

7.   Course Schedule

READINGS WILL BE DISTRIBUTED THE WEEK PRIOR TO CLASS LECTURES.

Class	Date	Topic	Professor	Assignments	Required readings
1	Jan 12	Course overview Introduction to public health surveillance Public health surveillance ethics	M. Otterstatter		• Course syllabus • Lexicon, Definitions, and Conceptual Framework for Public Health Surveillance • Ethical Justification for Conducting Public Health Surveillance Without Patient Consent
2	Jan 19	Surveillance principles and infectious disease surveillance	E. Galanis		• Introduction to Infectious Disease Surveillance • Final Report and Recommendations from the National Notifiable Diseases Working Group
3	Jan 26	Analysis of surveillance data I Presentation of Assignment 1	M. Otterstatter		• Analyzing and Interpreting Public Health Surveillance Data
4	Feb 2	Analysis of surveillance data II Infectious disease analysis tutorial	M. Otterstatter		• Common Errors in Secondary Analyses of Surveillance Data
5	Feb 9	Chronic disease surveillance Planning a surveillance program Group work: prepare surveillance system	K. Golmohammadi E. Galanis M. Otterstatter	Assignment 1 due	• Chronic Disease Surveillance • Quebec Integrated Chronic Diseases Surveillance System, an innovative approach
6	Feb 16	Presentation of Assignment 2 Chronic disease analysis tutorial Group work: prepare surveillance system	M. Otterstatter	Proposal for surveillance system due Feb 25 at 12pm	

7. Course Schedule

7	Feb 23	**Mid-term Break – No Class**			
8	Mar 2	Evaluation of surveillance programs Professors' feedback on surveillance proposals Group work: prepare surveillance system	E. Galanis M. Otterstatter/E. Galanis/G. McKee		• Updated Guidelines for Evaluating Public Health Surveillance Systems
9	Mar 9	Injury surveillance Group work: prepare surveillance system	M. Oakey M. Otterstatter/ E. Galanis/ G. McKee	Assignment 2 due	• TBD
10	Mar 16	Mental health surveillance Group work: prepare surveillance system	TBD M. Otterstatter/ E. Galanis/ G. McKee		• TBD
11	Mar 23	Environmental health surveillance Group work: prepare surveillance system	TBD M. Otterstatter/ E. Galanis/ G. McKee		• TBD
12	Mar 30	Presentations on surveillance programs	Students	Group presentations	
13	Apr 6	Presentations on surveillance programs	Students	Group presentations	