SPPH 520 - Control of Communicable Diseases
January - April 2013

TIME: Mondays, 9:00AM- 12:00PM

LOCATION: Room 143, School of Population and Public Health Bldg (Formerly Known as the Library Processing Centre)

INSTRUCTORS: Dr. David M. Patrick and Colleagues (See Schedule)

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ASSISTANT HOURS: Fridays are the best day for booking appointments, but please plan ahead. Even Fridays book up quickly. Email or call Cecilia to book.

TEACHING ASSISTANT: Alexis Crabtree

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COURSE OBJECTIVES:
• To understand the unique features of infectious disease epidemiology.
• To learn and develop approaches to investigating outbreaks and managing problems in infectious diseases control.

PREREQUISITES:
• SPPH 502 or a similar course in introductory epidemiology
• SPPH 400 or a similar course in introductory statistics
• Students will require some University level background in the biological or health sciences or SPPH 524 - Biology of Public Health Diseases
TEXTBOOK:


In addition to the above text, students will require:

Communicable Disease Control Manual. David Heymann Ed. 18th Edition or more recent. American Public Health Association. The 18th ed. of this book is also available electronically through the Library via STAT!Ref:

http://toby.library.ubc.ca/resources/infolpage.cfm?id=440 under Connect to STAT!Ref medical titles.

EQUIPMENT REQUIREMENTS:
All assignments will require a personal computer with the equivalent of Microsoft office.

COURSE NOTES:
The slides from each student discussion and faculty lecture will be posted on the course web page by the lecturer prior to each lecture.

COURSE EVALUATION:
This is a participatory course. The major components of evaluation:

- Group Discussions 25 
- Assignments 20 
- Mid-Term Exam (Objective) 15% 
- Final group project 40%

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## Teaching Schedule Winter 2012

*Subject to Change*

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Instructor(s)</th>
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| 7 January  | Orientation and Introduction  
Meet Term Project Leaders  
Contagion – The Movie                                        | David Patrick  
Faculty                                      |
| 14 January | “Biology Day”  
What the Lab Can Do For You – Student Presentations  
Host Agent & Environment - Lecture                | Mel Krajden  
David Patrick                                   |
| 21 January | Modes of Transmission vs. Infection Control – Student Presentations                     | Bruce Gamage  
David Patrick                                   |
| 28 January | Herd Immunity and Community Control Measures  
The Reproductive Number (Ro)                     | Danuta Skowronska  
David Patrick                                    |
| 4 February | Surveillance and Outbreak Investigation  
Review Principle of CD Surveillance  
Learn the Steps in Outbreak Investigation          | Bonnie Henry  
David Patrick                                   |
| 11 February| Statutory Holiday (BC Family Day)  
Mid-Term Examination to Be Scheduled This Week     |                                                  |
| 18-22 February | Reading Week                                                      |                                                |
| 25 February | Outbreak exercise  
Gain Practical experience with OB Investigation in class | Marsha Taylor                   |
| 4 March    | Vector-Borne Diseases and Non-enteric Zoonoses  
Conceptual approaches to Vector-Borne disease       | Bonnie Henry                           |
| 11 March   | Sexually Transmitted Infection                                                            | Gina Ogilvie                            |
| 18 March   | Immunization                                                                             | Monika Naus                             |
| 25 March   | Blood Borne Pathogens and HIV                                                            | Jane Buxton                             |
| 1 April    | Easter Monday                                                                             |                                                  |
| 8 April    | Term Project Presentations                                                                | David Patrick                           |
| 15 April   | Term Project Presentations                                                                | David Patrick                           |
Session Specific Objectives and Activities for SPPH 520

1. January 7, 2012 – Orientation and Introduction with Dr. Patrick

Objectives

• Get oriented to course activities and assignments
• Discuss “Contagion” exercises and what to watch for in the film
• Review the History of CD Control
• Discuss Conceptual Models for CD Control

Activities

Course Introduction – Dr. David Patrick
Lecture – History of CD Control and Conceptual Models – Dr. Patrick
Meet and Greet Term Project Leaders – Various Faculty

Readings: Nelson chapters 1 and 2

Assignments

• Groups are assigned “Contagion” discussions to cover the next 2 weeks
• Descriptive Epidemiology Assignment (Ebola) is posted for individual completion – due on January 23

2. January 14, 2012 - Biology Day

Objectives:

• Understand the methods used by laboratories to diagnose infectious disease
• Understand the role of molecular typing in clarifying outbreak epidemiology
• Understand performance characteristics of diagnostic tests
• Overview the Host/Agent/Environment Conceptual Framework
• Review Host Defenses
• Review Microbial Virulence Factors
• Discuss Key Environmental Contributors to Infectious Disease
• Learn related quantitative concepts

First Half – Group Discussions with Dr. Mel Krajden
“What the Lab Can Do For You”

• Microscopy
• Culture
• Serological Testing (Diagnostic Immunology)
• Fingerprinting by RFLP
• Polymerase Chain Reaction for Detection
• Chips or other methods for multiple pathogens

Second Half - Host Agent and Environment Lecture – David Patrick
Readings: Nelson chapters 8, 9 and 10


Objectives
• Review Modes of Transmission of CD
• Review Infection Control Measures for Each

Activities:
Student-Led Group Discussions with Mr. Bruce Gamage and Dr. David Patrick – each group 15 minutes each
• Airborne vs Droplet Transmission and Their Interruption
• Food or Water Borne Disease and Interrupted Transmission
• Contact Transmission and its Interruption
• Sexual Transmission and its Interruption
• Blood-borne transmission and its interruption
• Vector-borne transmission and its interruption

Practical Intro to Equipment for Infection Control – Bruce Gamage

Review Answers to Descriptive Epidemiology assignment (Ebola)

Herd Immunity Exercise Assigned (Due in 2 weeks)

Readings: Nelson Review chapter 14

The Reproductive Number (R0)

Objectives
• Understand the meaning of the Case Reproduction Number (R0)
• Understand the concept of herd immunity and its mathematical link to Ro
• Understand how social distancing measures may effect Ro and the networks of social connection through which pathogens travel
• Understand the difference between quarantine and isolation and some examples of settings where these methods may be employed
• Understand practical issues with employing these above concepts in a real world pandemic

Activities
Student Led Discussions with Dr. Danuta Skowronski
(20 minute presentations with 10 minute discussion period)
• Basic and Net Reproductive Number and Herd Immunity
• Social Distancing and School Closure
• Quarantine vs Isolation and Community Transmission
Practical Issues for Pandemics – Lecture from Dr. Skowronski

Readings: Nelson chapter 6

5. February 4, 2012 – Surveillance and Outbreak Investigation

Objectives:

- Review Principles of CD Surveillance
- Learn the Steps in Outbreak Investigation

Activities:

Student Led Presentations with Dr. Bonnie Henry

20 minutes each with 10 minute discussion period
- Public Health Act and CD Reporting
- Map Levels of Reporting Local, Provincial, National, Global
- Describe Panorama or Another Application for Surveillance

Patrick Review of Approach to OB Investigation (Lecture)

Patrick Review Herd Immunity Exercise (Exercise Due Before Class)

Individual Outbreak Exercise is Assigned (Due in 4 weeks)

Readings: Nelson chapter 4 and 5

6. February 11, Statutory Holiday

7. February 18, 2012 – Reading Week

Objective
- Reacquaint yourself with "sloth"

8. February 25, 2012 – In-Class Outbreak Exercise

Objectives:
- Gain Practical Experience with OB Investigation
- Get messy. Make mistakes.

In Class Exercise with Marsha Taylor

Review – Catch up on Any Outstanding Questions – Patrick
9. March 4, 2012 Vector-Borne Disease and Non-enteric Zoonoses

Objectives
- Learn conceptual approaches to Vector-Borne disease control
- Review examples of control for three vectorborne diseases
- Learn conceptual approaches to Zoonotic disease control
- Review examples of control for three zoonoses

Activities

Student-Led Discussions of 15 minutes each with 5 minutes for questions
Dr. Bonnie Henry
- Lyme Disease
- West Nile Virus
- Malaria
- Tularemia
- Anthrax
- Rabies

Readings: Nelson chapters 24, 25 and 26
Heymann on Malaria, West Nile, Lyme
Heymann on Rabies, Tularemia, Anthrax
Nelson chapter 13

10. March 11, 2012 – Sexually Transmitted Infections

Objectives:
- Review the unique biology of sexual transmission
- Conceptual models for STD control
- Review examples of STD’s and Control Strategies
- Learn how Sexual Networks may determine the course of epidemics
- Review Health Promotion as it applies to Sexual Behavior

Student Discussions 20 minutes each
- Non-random contact and Anderson and May’s treatment of Ro
- Why Network Structure Matters
- Screening and Treatment as Prevention

Review Individual Outbreak Exercise (Due Before Class)

Readings: Nelson chapters 21 and 23
Heymann: Read Chlamydia, Gonorrhea, Genital herpes, Syphilis, Chancroid, HIV and Human Papillomavirus

11. March 18, 2012 – Dr. Monika Naus
- Overview the current BC Vaccine Schedule and its rationale
• Understand Vaccine safety Monitoring
• Understand the Various Ways to Design a Vaccine

Student Presentations 30 minutes
• The Canadian Vaccine Schedule
• Vaccine Safety Monitoring
• Types of Vaccine (Live, Killed, Subunit)

Readings: Nelson chapters 10, 11, 16 and 17

12. March 25, 2012 – Dr. Jane Buxton
Blood Borne Pathogens and HIV

Objectives
• Overview common blood-borne agents and causes of viral hepatitis
• Learn Prevention Approaches for Blood Borne Transmission
• Learn about Surveillance for Known and Unknown Threats
• What was learned from Kreyer?

Student Discussions 10 minutes
• New Variant CJD
• Hep C
• HIV
• Babesiosis
• How is blood screened today
• The Krever inquiry

Readings: Nelson chapters 14, 21 and 22

April 1 is Easter Monday

13. April 8, 2012 – Dr. David Patrick
Term Project Presentations

14. April 15, 2012 – Dr. David Patrick
Term Project Presentations