SPPH 520 - Control of Communicable Diseases  
January - April 2016

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

LOCATION:  Room 143, School of Population and Public Health Bldg

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

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

TEACHING ASSISTANT:  TBA

EMAIL:  TBA

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:


COURSE NOTES:

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

COURSE EVALUATION:

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

• Contribution to General Discussions          5 %
• Assignments (3 assignments)                  15 %
• Term Paper (20) and Mini-Seminar (10)        30 %
• Mid-Term Exam (Objective)                    10 %
• Final exam (Essay/Point Form Format)          40 %
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<th>Date</th>
<th>Lecture/Discussion</th>
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<td>Introduction of Students and Faculty Overview of Course</td>
<td>David Patrick</td>
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<td>11 January</td>
<td>Lecture/Discussion - <em>Inf Disease Epidemiology</em></td>
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<td>18 January</td>
<td>Lecture/Discussion - <em>Lab Tools for CD Control</em></td>
<td>Jennifer Gardy Bruce Gamage</td>
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<td>25 January</td>
<td>Lecture/Discussion - <em>Community Control Measures &amp; Herd Immunity</em></td>
<td>David Patrick Babak Pourbohloul</td>
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<td>1 February</td>
<td>Lecture/Discussion-Control of Diarrheal Disease</td>
<td>Eleni Galanis Stephanie Konrad David Patrick</td>
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<td>8 February</td>
<td>BC Family Day</td>
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<td>15 February</td>
<td>UBC Reading Week</td>
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<td>22 February</td>
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<td>Lecture/Discussion <em>STI</em></td>
<td>Gina Ogilivie Jay Johnston</td>
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<td>7 March</td>
<td>Lecture Discussion - <em>Vaccine Preventable Disease and Immunization Epidemiology</em></td>
<td>Monika Naus Students</td>
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<td>14 March</td>
<td>Lecture/Discussion - <em>Vector Borne Diseases and Zoonoses</em></td>
<td>Bonnie Henry Students</td>
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<td>21 March</td>
<td>Influenza</td>
<td>Danuta Skowronski</td>
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<td>28 March</td>
<td>Easter Monday</td>
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<td>Date</td>
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<td>4 April</td>
<td>Student Mini-Seminars 10-12 Review</td>
<td>Students</td>
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<td>David Patrick</td>
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<td>11 April</td>
<td>Final Exam this Week</td>
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Session Specific Objectives and Activities for SPPH 520

January 4, 2016 – Orientation and Introduction (Come Having Read for This Week)

Objectives
• Get oriented to course activities and assignments
• Review the History of CD Control
• Review what you should know about biological basis of CD Control
  o Host Defenses
  o Microbial Virulence Factors
  o Environmental Contributors to Infectious Disease

• Introduction to Host Agent and Environment

Activities
• Introduction of Students and Faculty
• Overview of Course
• Term Paper / Seminar Organization and Sign Up
• Lecture – A History of CD Control
• Lecture – Host Agent and Environment
• January Assignment Distributed

Readings: Nelson 3rd edition chapters 1, 8, 10

January 11, 2016 - Introduction to Infectious Disease Epidemiology

Objectives
• Learn the many implications of “Dependency” in Infectious Diseases
• Understand Key Concepts Related to Distribution of Person Place and Time in Infectious Disease Epidemiology
• Overview the Host/Agent/Environment Conceptual Framework for CD Control
• Gain an understanding of the elements of outbreak investigation
• Review the application of basic epidemiological principles (eg. Causality) to CD questions

Activities
• Lecture and Discussion - Infectious Disease Epidemiology
• Lecture and Discussion - Introduction to Outbreak investigation

Readings: Nelson 3rd edition chapters 2,3,5
January 18, 2016 – Lab and Infection Control Methods for Epidemiologists

Objectives
• Understand the methods used by laboratories to diagnose infectious disease
• Understand the role of molecular typing in clarifying outbreak epidemiology
• Understand the role of whole genome sequencing in discovering transmission networks
• Understand performance characteristics of diagnostic tests
• Review Modes of Transmission of CD
• Review Infection Control Measures for Each

Activities
• Lecture and Discussion – Lab Tools for CD Epidemiology
• In Class Exercise - A Practical Introduction to Infection Control

Readings: Nelson 3rd edition chapter 9, 14 Review Chapter 8

January 25, 2016 –Community Control Measures and Introduction to Mathematical Modeling

Objectives
• Understand the meaning of the Case Reproduction Number (Ro)
• 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
• Understand the structure of basic mathematical models
• Understand the role of mathematical modeling in planning and modifying communicable disease control activities.

Activities
• Lecture and Discussion - Community Measures and Herd Immunity
• Lecture and Discussion - Mathematical Modeling in Infectious Diseases

Readings: Nelson 3rd edition chapters 4,6,12,13
February 1, 2016 – Diarrheal Disease, Outbreak Exercise, Midterm Review

Objectives

• Learn the major agents causing morbidity
• Review general approaches to controlling diarrheal disease at population level
• Gain Practical Experience with OB Investigation
• Get messy. Make mistakes.

Activities

• Lecture and Discussion - Control of Diarrheal Disease
• In Class Exercise – Managing an Outbreak
• Mid-Term Review
• January Assignment Due
• February Assignment Distributed

Readings: 3rd edition chapter 20

February 8, 2015 – BC Family Day - Statutory Holiday

February 15, 2016 – Reading Week

February 22, 2016 – Mid-Term and Agents Transmitted by Blood-Borne Pathogens

Objectives

• Consolidate your learning of core concepts from first half of course
• Overview common blood-borne agents and causes of viral hepatitis
• Learn Prevention Approaches for Blood Borne Transmission
• Discuss the roll of harm reduction, immunization and curative treatment strategies

Activities

• Mid-term exam – First Half
• Lecture and Discussion - Control of Infections Transmitted by Blood and Body Fluids

Readings: Nelson 3rd edition 21, 22, 23
February 29, 2016 – Sexually Transmitted Infections and TB

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
• Learn the key differences between airborne and droplet transmission
• Review implications of these for control programming
• Learn about TB control

Activities
• Lecture and Discussion – Sexually Transmitted Diseases
• Lecture and Discussion – TB Control
• February Assignment Due
• March Assignment Distributed

Readings:  Nelson 3rd edition chapters 22 and 24
            Heymann: Read Chlamydia, Gonorrhea, Genital herpes, Syphilis, Chancroid, HIV and Human Papillomavirus

Nelson 3rd edition chapter 18
Heymann: Read TB

March 7, 2016 – Vaccine Preventable Disease and Immunization Epidemiology

Objectives
• Understand the Various Ways to Design a Vaccine
• Overview the current BC Vaccine Schedule and its rationale
• Understand Vaccine Safety and Vaccine Uptake Monitoring
• Discuss strategies to address pseudoscience as it pertains to vaccines

Activities
• Lecture and Discussion - Vaccine Preventable Diseases and Immunization Programming

Readings:  Nelson chapter 11; Review Nelson 10, 16 and 17
March 14, 2016 – Vector-borne and Zoonotic Disease

Objectives
- Understand the major vector-borne and zoonotic agents
- Adapt a modified Host Agent Environment Model which includes Animal and Vector to conceptualizing Control Measures
- Discuss strategies to address pseudoscience as it pertains to tick-borne diseases

Activities
- Discussion and Lecture – Vector-borne and Zoonotic Disease

Readings: Nelson chapters 3rd edition 25,26,27
Heymann on Malaria, West Nile, Lyme
Heymann on Rabies, Tularemia, Anthrax

March 21, 2016 – Influenza and Emerging Respiratory Diseases

Objectives
- Review the biology of influenza virus
- Understand how to design integrated surveillance of influenza morbidity
- Understand methods to assess vaccine effectiveness in “real time”
- Discuss key strategies for influenza control and how these might be improved in future.
- Discuss general principles for dealing with emerging respiratory infections

Activities
- Discussion and Lecture – Influenza – CD Control vs Evolutionary Biology

Readings: Nelson Chapter 15
Heymann Influenza

March 28, 2016 – Easter Monday

April 4, 2016 – Final Seminars and Review

April 11, 2014 (Week of) – Final Examination
Topic/Paper Suggestions

- Addressing resurgent Syphilis Epidemics in BC and Elsewhere
- MERS-CoV – What’s Missing in the Control Strategy?
- Infection Control Modalities to reduce post surgical wound infections
  o Should we be focusing on pathogen by pathogen prevention, or rather horizontal approaches to reducing all perioperative infection?
- Discuss Problems and Potential Solutions in current Influenza Vaccine Design and Immunization Programming
- Controlling C. difficile infections in hospitals and communities
- Antibiotic resistance – Control at Population Level
- Control of Chagas Disease in the Americas
- Control of Leishmaniasis in the Americas
- Examine the evidence for VZV reactivation as a possible cause of Giant Cell Arteritis using the Bradford Hill Criteria and Make Research Recommendations
- Assess the evidence (Using the Bradford Hill Criteria or other Causal approaches for an impact of the gut microbiome on the incidence of asthma or obesity or another disorder and make research recommendations
- Apply the Erickson de Waal criteria to the evaluation of:
  o the new Zoster Vaccine
  o Dengue vaccines
  o Another new vaccine product
- Discuss how the availability of curative treatment could change the landscape (or not) for Hepatitis C prevention

Deliverables for the Paper:

- Maximum 2500 words (all your own)
- Properly Referenced – Vancouver Method
- Figures and Tables Welcome
- Clearly reference and apply a conceptual model/framework (eg Host Agent and Environment, Bradford-Hill) in your work
- Provide a short summary presentation (10 slides – 10 minutes) to share with your classmates at seminar time.