Department of Population Health Sciences

Epidemiologic Methods 4 (PHS 805)

Fall Semester

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(608) 265-6176

Course Description: Epidemiologic Methods 4 (PHS 805) is directed to PhD and MSc students. This course expands on the knowledge and abilities developed in PHS797 and PHS798. The goal of PHS 805 is to provide students with an opportunity to learn about the rationale and use of study designs that built upon but are substantially different from the most common designs used in epidemiologic research (experimental studies, case-control studies, and cohort studies). The main emphasis of PHS 805 is on the design and interpretation of epidemiologic studies. The course will include hands-on experience on the assessment of non-traditional designs as tools to improve the validity and efficiency of epidemiologic studies. Student evaluation will be based on the development, presentation, and discussion of an individual course project.

Course Objectives: By the end the course the student will be able to:
   a) Demonstrate understanding of the rationale behind non-traditional study designs.
   b) Identify contexts where non-traditional designs may be beneficial.
   c) Explain the advantages and disadvantages of non-traditional study designs.
   d) Demonstrate understanding of the rationale for the different strategies of data analysis used in non-traditional designs.

Credits: 3

Grading: Student evaluation will be based on the development, presentation, and discussion an individual course project. Grades will be assigned as 90.0-100, A; 85.0-89.9, AB; 80.0-84.4, B; 75.0-79.9, BC; 70.0-74.9, C; etc.
Policies:  - Course readings should be completed prior to the start of the corresponding lecture.
         - Homework must be handed in to the instructor on time.
         - Students are encouraged to discuss course contents with each other.
         - Students should expect to be individually asked to participate in the class discussions
         - Hand outs and homework assignments will be delivered through learn@uw.

Online access: Desire to learn (D2L) at: https://learnuw.wisc.edu/

Course schedule: Tuesday & Thursday 1:00 to 2:15 p.m.

Course Topics and Readings:
About 12 topics will be covered in 15 weeks. Some topics may require more than two class periods to
complete, but this additional time is built into the schedule.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>- Sept 3-5</td>
<td>Causality: The Counterfactual framework</td>
<td>L Bautista</td>
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<td>- Sept 10-12</td>
<td>Causality: Causal diagrams</td>
<td>F Elwert</td>
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<td>- Sept 17-19</td>
<td>Mendelian Randomization</td>
<td>P Peppard</td>
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<td>- Sept 24-26</td>
<td>Case-crossover studies</td>
<td>L Bautista</td>
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<td>Readings: Maclure M, Mittleman MA. Should we use a case-</td>
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- Oct 1-3  **Multivariate matching methods**  
  **M Palta**  
  Readings:  

- Oct 8-10  **Ecologic studies**  
  **P Peppard**  
  Readings:  
  - Pearce N. The ecological fallacy strikes back. *J Epidemiol Community Health*. 2000; 54:326–327

- Oct 15-17  **Meta-analysis**  
  **P Peppard**  
  Readings:  

- Oct 22-24  **Cross-sectional studies: from prevalence to incidence**  
  **A Palloni**  
  Readings:  

- Oct 29-31  **Mediation analysis**  
  **F Elwert**  
  Readings:  

- Nov 5  **Disease Surveillance**  
  **C Tomasallo**  
  Readings:
- Nov 7 Exposure modelling  
K Malecki
Readings: ... ...

- Nov 12-14 Screening studies  
A Trentham
Readings:  

- Nov 19-21 Spatial Epidemiology  
R Gangnon
Readings:  

- Nov 26-28 Thanksgiving Recess

- Dec 3-5 Individual project work

- Dec 10-12 Project presentation and discussion