Principles of Population Health Science  
Population Health 795  

A course in the Program in Population Health  
Fall 2007  
University of Wisconsin-Madison, School of Medicine and Public Health  

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Office hours: Monday 2:30-4:00; or, by appointment.  

Acknowledgements: We would like to thank Jenna Klink and the faculty of the Department of Population Health Sciences for their support in developing this course. The redesign of this course was supported, in part, by a grant from the UWS Instructors in Science, Technology, Engineering, or Math (STEM).  

OVERVIEW  
Despite significant advances in medicine and public health, disparities in health persist. Understanding health on a population level is an approach that seeks to improve the health of the whole population, unravel variations in health outcomes, and to identify effective strategies for reducing or eliminating disparities both within and between population groups.
The purpose of this course is to provide students with a foundation for understanding: 1) how population health is defined and measured; 2) the biological, cultural, social, economic, and healthcare determinants of population health; 3) research development and design for studying population health; and 4) prevention and intervention strategies for improving population health.

This course will be divided into four distinct modules. The first module will explain how population health is defined and measured. The second module will examine the multiple determinants of population health and their complex inter-relationships. The third module will help students understand how to approach population health research questions and how to design studies to answer these questions. The fourth and final module will focus on how research can be effectively translated into practice. The course will consist of two weekly lectures and a weekly discussion group session (or “lab”). The weekly discussion session will allow students to further explore and apply the concepts raised in the lectures.

COURSE OBJECTIVES

By the end of this course, students will be able to:

- Discuss various definitions of population health
- Describe methodological approaches for measuring population health
- Identify and explain the multiple determinants of population health and their interrelationships
- Explain how risk is assessed in the health of populations
- Understand and discuss research design and development in population health
- Explain various preventive and intervention strategies for improving population health

COURSE ADMINISTRATION

Dr. Witt will be responsible for all administrative issues and grading. A course website is set up on the LEARN@UW system. This is the electronic course home. A main purpose of this website is that it will be a repository of downloadable copies of the course readings and, where appropriate, copies of lecture slides (not all lectures will have slides made available in this manner, so good note taking will be important). Occasionally, announcements will be posted under the "News" heading on the course homepage. Students should check the course website frequently. Students may audio record lectures for their own personal use (i.e. not for distribution) with permission of the lecturer. Lectures will be digitally captured in QuickTime and can be viewed online through the course website on LEARN@UW.

The lecture will be held in HSLC 1345 on Tuesday/Thursday 9:30-10:45am. A required discussion session (“lab”) will be held prior to lecture in 1345 HSCLC on Tuesdays from 8:30-9:20am.

GRADING

The grading for the course is based on three elements:
1. **Exams (65\% of course grade)**
   Two exams will be given in the course-- a midterm will given in place of the lab on Oct 16 (8:30-9:20) and final exam to be administered during the class session on Dec 13 (9:30-10:45).

2. **Quizzes (20\% of course grade)**
   There will be a quiz for each module of the course (5\% for each quiz).

3. **Participation in discussion group, lab exercises, and lectures (15\% of grade)**

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<thead>
<tr>
<th>Grading Mechanism</th>
<th>Date</th>
<th>Percent of Grade</th>
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<tbody>
<tr>
<td>Quiz 1</td>
<td>9-25-07 from 8:30-8:45</td>
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<td>Quiz 2</td>
<td>Online quiz (Learn@UW)</td>
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<td>MIDTERM</td>
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<td>Quiz 3</td>
<td>Online quiz (Learn@UW)</td>
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<td>Quiz 4</td>
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<td>FINAL</td>
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<td>Participation in labs and lectures</td>
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**READINGS**

Required and additional readings for each particular lecture or module will be posted on the course webpage at Learn@UW. Most readings will be available for download from the course webpage or will be available electronically from UW-Madison Libraries.

The following books are required for the course. They are available for purchase at University Book Store Health Sciences (located inside HSLC) and on course reserve in Ebling Library.


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<tr>
<th>Module #:</th>
<th>Week</th>
<th>Session</th>
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<td>1: Defining and Measuring Population Health</td>
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<td>9/4/07</td>
<td>Population Health: An Overview</td>
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<td>Health and Healthcare Disparities</td>
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<td>6</td>
<td>9/20/07</td>
<td>Modeling Population Health</td>
<td>Witt</td>
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<td>LAB 3</td>
<td>9/25/07</td>
<td>Discussion Session/Lab: (1) group quiz (2) view and discuss “Worlds Apart: a four part series on cross-cultural healthcare” Part 1</td>
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<td>2: Determinants of Population Health—From Cell to Society</td>
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<td>10/23/07</td>
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<td>Medical Care as a Determinant and an Overview of the US Health Care System</td>
<td>Kindig/Ridley</td>
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<td>Discussion Session/Lab: Cost, Quality and Access</td>
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<td>10/30/07</td>
<td>The US Health Care System: Quality, Delivery of Services and Reform</td>
<td>Van Bree</td>
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<td>Discussion Session/Lab: Research design &amp; Dev’t</td>
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<td>Community Intervention Trials</td>
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<td>Strategies and applications of population health studies</td>
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<td>11/29/07</td>
<td>Levels of analyses for population health studies</td>
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<td>Translating evidence into practice</td>
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<td>Panel Discussion on Population Health Improvement and Interventions</td>
<td>Remington as the discussant, Greg Nycz, Vivian Chen, Ana Martinez-Donate</td>
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<td>12/11/07</td>
<td>Global Perspectives on Pop. Health Improvement and Interventions</td>
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<td>12/13/07</td>
<td>FINAL EXAM</td>
<td>Diprete-Brown</td>
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READINGS

Please read all required readings prior to the class session. Readings listed as “additional” are not required and their content will not be included on exams or quizzes.

MODULE 1: Defining and Measuring Population Health

Sept. 4  
**Session 1:** Population Health: An Overview

Required:
- CHAPTER 1 POP HEALTH: CONCEPTS AND METHODS

Sept. 6  
**Session 2:** Population Health Terminology

Required:

Sept. 11  
**LAB 1:** Defining Health

**Session 3:** Traditional Measures of Population Health (Mortality and Morbidity)

Required:
- CHAPTER 2 POP HEALTH: CONCEPTS AND METHODS

Additional:
- Healthy People 2010 web site: http://www.healthypeople.gov/About/

Sept. 13  
**Session 4:** Defining Health in Individuals and Populations
Required:
- CHAPTER 3 POP HEALTH: CONCEPTS AND METHODS

Additional:

Sept. 18 LAB 2: Measuring Health

**Session 5:** Health and Healthcare Disparities

Required:

Sept. 20 Session 6: Modeling Determinants of Population Health

Required:
- CHAPTER 4 POP HEALTH: CONCEPTS AND METHODS

MODULE 2: Determinants of Population Health—From Cell to Society


**Session 7:** Behavioral and Cultural Determinants

Required:

Additional:

Sept. 27  
**Session 8:** Molecular/Genetic Determinants

**Required:**

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**Part A: Non-Medical Determinants**

Oct. 2  
**LAB 4:** Part 2 “Worlds Apart: a four part series on cross-cultural healthcare”

**Session 9:** Social Determinants (I)—Gender, Race, & Socioeconomic determinants

**Required:**
• Please view the following lecture by David Williams, PhD entitled: "Race, Racism and Health";

Oct. 4  
**Session 10:** Social Determinants (II)—Neighborhood/Community Context

**Required:**

Additional:

Oct. 9  
LAB 5: Social Determinants I and II

Session 11: Social Determinants (III)—Global Health Issues

Required:
• Gwatkin DR. Health inequalities and the health of the poor: What do we know? What can we do? Bull WHO. 200;78(1).
• The Millennium Development Goals, Targets and Indicators

Additional:
• Pearson TA. Cardiovascular Disease in Developing Countries: Myths, Realities, and Opportunities,” Cardiovascular Drugs and Therapy. 1999;13:95-104.

Oct. 11  
Session 12: Biopsychosocial Determinants

Required:

Additional:

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**Oct. 16**  
**MIDTERM EXAM** (administered during the lab session)

**Session 13:** Environmental Determinants (Global)

**Required:**


**Additional:**


**Oct. 18**  
**Session 14:** Environmental Determinants (US)

**Required:**


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**Part B: Medical Determinants**

**Oct. 23**  
**LAB 7:** Environmental Determinants

**Session 15:** Medical Care as a Determinant / an Overview of the US Health Care System
Required:

Oct. 25  **Session 16:** The US Health Care System: Cost, Access and Financial Structure

Required:
• Fuhrmans, V. “Pressure Points: attacking rise in health costs, big company meets resistance” WSJ. July 13, 2004.

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**Part C: Medical / Economic Determinants**

Oct. 30  **LAB 8:** WSJ article and discussion (Cost, Quality and Access)

**Session 17:** The US Health Care System: Quality, Delivery of Services and Reform

Required:
• No assigned readings for this session

Nov. 1  **Session 18:** Economics of Health (I)

Required:

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**Part D: Economic Determinants**

Nov. 6  **LAB 9:** Midterm exam review

**Session 19:** Economics of Health (II)
Nov. 8  
**Session 20:** Economics of Health (III) / Technology and Health

**Required:**
- No assigned readings for this lecture

**Nov. 13**  
**LAB 10:** Economics, Technology and Health

**Session 21:** Asking and operationalizing population health questions I

**Required:**
- CHAPTER 6  POP HEALTH: CONCEPTS AND METHODS

**Nov. 15**  
**Session 22:** Asking and operationalizing population health questions II


**Nov. 20**  
**LAB 11:** Research Design and Dev’t

**Session 23:** Community intervention trials

**Required:**

**Additional:**
Nov. 22  Thanksgiving recess

Nov. 27  **LAB 12:** Asking and operationalizing population health questions

**Session 24:** Strategies and applications of population health studies

**Required:**
• No readings for this lecture

Nov. 29  **Session 25:** Levels of analyses for population health studies (Individual, Dyad, Family, Neighborhood, System, Policy, State)

**Required:**
• Diez Roux AV. The study of group-level factors in epidemiology: Rethinking variables, study designs, and analytical approaches. Epidemiologic Reviews. 2004;26:104-111.

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**MODULE 4: Implications for Improving Population Health**

Dec. 4  **LAB 13:** Design of pop. health studies and levels of analyses for pop. health studies

**Session 26:** Translating evidence into practice

**Required:**
• CHAPTER 7 POP HEALTH: CONCEPTS AND METHODS
• Please review the "Grand Rounds" at the CDC, use public health law to reduce the burden of chronic disease and provide an example of how to use the law to translate research into practice found at: [http://www.publichealthgrandrounds.unc.edu/legal/webcast_hi.htm](http://www.publichealthgrandrounds.unc.edu/legal/webcast_hi.htm)

Dec. 6  **Session 27:** Panel Discussion on Pop. Health Improvement and Interventions

**Required:**
• CHAPTER 8 POP HEALTH: CONCEPTS AND METHODS
Dec. 11  **LAB 14:** Population Health Improvement

- Before this lab session please view the lecture by Michael Rothschild, PhD entitled “An Introduction to Social Marketing: Considering its Philosophy and Process as Input to Public Health Practice”
  Go to this website to view: [http://videos.med.wisc.edu/videoInfo.php?videoid=159](http://videos.med.wisc.edu/videoInfo.php?videoid=159)

**Session 28:** Global Perspectives on Pop. Health Improvement and Interventions

**Required:**


Dec. 13  **FINAL EXAM**