HRM 748: Population and Public Health

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Course description
This course provides an overview of core concepts and methods in population and public health. The course will be structured into five sections. The first section will introduce the population health approach by exploring the historical evolution of definitions of health, and population and public health. The next two sections will examine the definitions and measurement of health outcomes and determinants at the population level. We will then discuss study designs and methodological issues relevant to investigating population health issues. This will consist of a review of related concepts and methods at the individual level, an exploration of the concepts and methods at the population level, and discussion of the differences and implications of a population level approach. The course will be structured as student and faculty-led discussion sessions, using relevant literature as background and case studies to illustrate the components and to stimulate discussion and learning.
Course Objectives
1) To understand the population approach to health.
2) To understand health outcomes and health determinants at the population level, to be familiar with sources of data to measure population health, and to be able to appraise the validity of these data.
3) To explore the methodologies available for investigating the health of populations.

Educational method
Readings for the course will be drawn from published journal articles, textbook chapters, and web-based resources. Prior to each lecture, students are expected to become familiar with the content of the required readings and to be prepared to discuss them in class. Each class will consist of a student and faculty-led group discussion of the readings to specifically address the objectives for that session. Examples will be used to stimulate discussion and to illustrate the application of the concepts. A didactic component will be included when necessary and at the discretion of the faculty member facilitating the session.

Pre-requisites
Pre-requisites for this course include one graduate level statistics course, HRM 721 (or equivalent) and HRM 751 (or equivalent).

Evaluation method

1) Class participation 15%
Students are expected to prepare for class by reading the required materials and integrating this material with the related class objectives. Participation will be assessed based on:
   • Evidence of background preparation and understanding of the material.
   • Effectiveness in contributing to class discussions.
   • Support of the group’s learning by contributing to a positive class environment.

2) Preparation of a researchable question for the final project 15%
The researchable question will address a health issue at the population level. Students will submit an overview (2 pages maximum – double spaced, 12 pt. Times New Roman font) that describes their research question and objectives, and outlines their research approach. This will be submitted by February 13, 2020.

3) Final paper
Paper 50%
Presentation 20%

Students will prepare a paper on the population health issue identified as their researchable question. The paper will take the form of a research grant to investigate the issue, included objectives, justification, review of the literature, materials and methods, proposed statistical analysis, and potential problems and their solutions. The paper also
will include a statement on the potential public health impact of the results. The paper length should not exceed 20 double-spaced pages in 12 pt. Times New Roman font.

Students will present their paper to the group. The presentation should highlight the importance of the issue to population and public health and discuss the important aspects of the proposed research. The use of audio-visual aids is appropriate and encouraged. Each student will have 12 minutes to present their paper.

**Due Dates for Final Paper**

1. **April 9**: Come to class to present your paper.
2. **April 16**: Submit the final versions of your paper to the course coordinators via e-mail. You must submit by 5PM.
Course overview

A) Setting the context
Session 1: Evolving concepts of population and public health

B): The determinants of health
Session 2: Health determinants

C) The health of populations
Session 3: Defining health in populations
Session 4: Measuring health in populations
Session 5: Heterogeneity in health within and between populations

D) Methodological issues in population and public health
Session 6: Observational Studies for Population Health
Session 7: Analysis of Observational Studies in Population Health
Session 8: Analysis of Observation Studies in Population Health
Session 9: Design and Conceptual Issues in Multi-level Designs
Session 10: Analytical Issues in Multi-level Designs
Session 11: Causal concepts in population and public health
Session 12: Class presentations and discussion

NOTES: April 2, is HEI Research Day, please plan to attend. This course WILL run during reading week (Feb 20). There will be no class March 5. The final class will be April 9, with presentations.
Course outline

A) SETTING THE CONTEXT

SESSION 1: EVOLVING CONCEPTS OF POPULATION AND PUBLIC HEALTH

Objectives:
1) To understand the current definitions and concepts of population and public health.
2) To understand the advantages of the high risk versus population health strategies.

Required readings:


Additional (optional) readings:
B) THE DETERMINANTS OF HEALTH

The section on the determinants of health assumes that students have an understanding, from pre-requisite courses, of common measure of disease frequency, including prevalence, incidence, and standardization of rates.

SESSION 2: HEALTH DETERMINANTS

Objectives:
1) To review the definition of ‘health’, and the categories of health indicators associated with it.
2) To define determinants of health.
3) To understand the models and pathways through which determinants of health affect health of the population

Required readings:


Additional (optional) readings:


**C) THE HEALTH OF POPULATIONS**

The section on health of populations assumes that students have an understanding, from pre-requisite courses, of common measure of disease frequency, including prevalence, incidence, and standardization of rates.

**SESSION 3: DEFINING HEALTH IN POPULATIONS**

**Objectives:**

1. To assess indicators commonly used to monitor changes in population health.
2. To understand why and how mortality and morbidity indicators have been combined into summary measures.
3. To review how indicators and summary measures can be used to understand patterns of health and disease in populations.

**Required readings:**


Additional (optional) readings:


3) Bonneux L. How to measure the burden of mortality? J Epidemiol Community Health. 2002; 56; 128-131. [http://jech.bmj.com/content/56/2/128](http://jech.bmj.com/content/56/2/128)


5) Addington-Hall J and Lalit K. Who should measure quality of life? BMJ. 2001; 322; 1417-1420. [http://www.bmj.com/content/322/7299/1417](http://www.bmj.com/content/322/7299/1417)
SESSION 4: MEASURING HEALTH IN POPULATIONS

Objectives:
1) To review the definition of health surveillance and how surveillance is carried out.
2) To be aware of the potential strengths and weaknesses of a variety of surveillance databases.
3) To understand how surveillance data can be used for planning and evaluating health programs.
4) To be aware of different source of data for population and public health

Required readings:


Additional (optional) readings:


D) METHODOLOGICAL ISSUES IN POPULATION AND PUBLIC HEALTH

SESSION 5: OBSERVATIONAL STUDIES FOR POPULATION HEALTH

Objectives:
1) To understand levels of measurement, levels of analysis, and levels of inference used in studies at the population-level.
2) To understand study design for investigating health in populations
3) To compare and contrast the advantages and disadvantages of individual and population-based study designs and to discuss the implications of each with respect to addressing population health issues.

Prior to this session, it is assumed that students are familiar with experimental and observational study designs, including randomized controlled trials, case-control studies and cohort studies.

Required readings:

Additional (optional) readings:
1) Mann CJ. Observational research methods. Research design II: Cohort, cross sectional, and case-control studies. Emerg Med. 2003; 20; 54-60. http://emj.bmj.com/content/20/1/54
3) Reidpath DD. Population health. More than the sum of the parts? J Epidemiol Community Health. 2005; 59; 877-880 http://jech.bmj.com/content/59/10/877
SESSION 6: HETEROGENEITY IN HEALTH WITHIN AND BETWEEN POPULATIONS

Objectives:
1) To introduce and discuss the concept of social structure that influences population and individual health.
2) To understand heterogeneity in population health as a product of differences within and between individuals.
3) To learn about methods of measuring health inequalities.
4) To discuss health as a cultural construct.

Required readings:


Additional (optional) readings:


SESSION 7: ANALYSIS OF OBSERVATIONAL STUDIES IN POPULATION HEALTH

Objectives:

1) To define and measure noncausal associations in observational research
2) To understand analytical approaches to addressing noncausal associations
3) To define and measure effect modification
4) To understand analytical approaches to addressing effect modification
5) To understand advanced analytical strategies for observational studies

Prior to this session, it is assumed that students are familiar with sampling strategies and the concepts of bias, confounding, and interaction as they apply to individual-level studies.

Required readings:

   https://www.r2library.com/resource/detail/1449604692/ch0005s0080

   https://www.r2library.com/resource/detail/1449604692/ch0006s0108


SESSION 8: DESIGN AND ANALYSIS OF CLUSTER RANDOMIZED TRIALS

Objectives:
1) To understand advanced analytical strategies for cluster randomized trials
2) To understand sample size estimation for cluster randomized trials

Prior to this session, it is assumed that students are familiar with sampling strategies and the concepts of bias, confounding, and interaction as they apply to individual-level studies.

Required readings:


SESSION 9: DESIGN AND CONCEPTUAL ISSUES IN MULTI-LEVEL DESIGNS

Objectives:
1) To understand sampling in population health studies.
2) To understand how to design multi-level studies.
3) To understand biases in multi-level studies.

Required readings:


Additional (optional) reading:
http://ije.oxfordjournals.org/content/18/1/269.short


3) Dunn et al., 2014. Translating multilevel theory into multilevel research: challenges and opportunities for understanding the social determinants of psychiatric disorders. Soc Psychiatry Psychiatr Epidemiol, 49(6); 859-872. 
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4067412/
SESSION 10: ANALYTICAL ISSUES IN MULTI-LEVEL DESIGNS

Objectives:

1) To understand the role of spatial analysis for population health data.
2) To understand the basics of the analysis of multilevel models for population health data.

Required readings:


Additional (optional) reading:


SESSION 11: CAUSAL CONCEPTS IN POPULATION AND PUBLIC HEALTH

Objectives:
1) To review evolving theories of causation over time.
2) To understand why models for causation at the individual level may not be appropriate at the population level.
3) To understand current theories of causation at the population level.

Required readings:


Additional (optional) readings:


SESSION 12: CLASS PRESENTATIONS AND DISCUSSION