

# SPPH 506: Quantitative Research Methods

School of Population and Public Health

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## Course Logistics

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## Course Description

This course provides an overview of quantitative research methods, focusing on approaches central to undertaking quantitative health services and policy research studies. The intent is to familiarize students interested in conducting quantitative research with key concepts, tools and ideas that can support them in assessing the quality of existing studies, developing their own research proposals, and ultimately conducting more rigorous research.

Areas of emphasis related to methodology include: concepts of association and causality; developing research questions; approaches to measurement, including reliability and validity; common data sources used in quantitative health research; sources of bias; and a comprehensive overview of observational study design.

Students will learn to develop and enhance designs for research proposals, and critically examine research proposals, and published health research. The course is intended for doctoral- and masters-level graduate students in health research and related fields. It is designed to be complementary to departmental courses in epidemiology, measurement principles, program evaluation, administrative data analysis and economic evaluation.

## Course Structure

Each class will typically be structured into two components. First, each will include lecture content on a specific topic in the area of research methods. This will be based largely on a “transmission” approach to teaching, and be heavily reliant on the mandatory readings for the week. Reading the material for class will be critical to fully understanding the lecture content and participating in the ensuing discussion. The second half of each lecture will use a problem-based learning approach to research methods. The “problems” we will discuss will be students’ proposals, which will be developed over the course of the semester. It is the intent of the course that students will be able to work toward a proposal that could become part of their later thesis work.

The lecture content will focus on key methods and approaches; they will involve a series of interactive lecture presentations – with facilitated discussion in which students will be expected to actively participate. The content of the lectures is flexible, in that they will be organized to cover topics most relevant to the body of students enrolled in the class, as well as to provide opportunities to address issues that would benefit from more in-depth discussion. Should there be specific methods not outlined in the course syllabus that any

student would like to discuss, they are encouraged to highlight this gap to the course instructor early in the semester.

It is expected that the course will be useful to the extent that students actively participate in applying the approaches being studied. Accordingly, a number of aspects of the course are intended to encourage such application. Students are expected to actively engage in discussion in class. To contribute, assigned readings should be reviewed and understood before each class; typically some will require focused and multiple reviews to be understood. Discussion sessions that follow the lectures will often critically examine a specific problem or issue in health research and will require advance preparation. A series of exercises will encourage students to actively apply the methods and approaches to their own research interests, in preparation for the final assignment. These will be used to guide the discussion among students in the second part of each class. Where issues and approaches arising from individual proposals may contribute to the learning of the entire class, students will be invited to share their work from these exercises.

Students will also be expected to participate in a mock in-class ‘peer review committee’ process. This will involve providing a verbal critique of a peers’ proposal using a format that simulates the approach used by the Canadian Institutes of Health Research (CIHR) to evaluate open operating grants (this has now been replaced, but the new system is still too new for us to try and simulate). The exercise is intended to provide perspective on developing a strong proposal, and also to provide peer feedback to students.

### Learning Objectives

1. Gain an understanding of observational research methods typically used in health research by becoming familiar with prevailing threats to validity and common research designs and approaches.
2. Understand issues of internal and external validity in observational studies.
3. Understand concepts of measurement reliability and validity.
4. Demonstrate an ability to thoughtfully apply the concepts in order to critique published research and research proposals, as well as to develop a cohesive research proposal as a final project.

### Course Readings

The document entitled ‘Lecture Content’ provides readings and guidance for each class. Content may be revised as the class proceeds; the instructors will make updated content available online well before each class - please use it as a guide to prepare each week prior to class!

Typically, each session outline covers the following areas:

- a set of bulleted items, which outline key areas to be addressed – both as you prepare for class, and as we review materials during class
- required reading(s) that cover(s) important content areas
- required reading(s) ‘for discussion’ that typically represent(s) applications of the content area, or may raise controversies to stimulate discussion
- a listing of any in class exercises related to the content area

- optional readings and resources, for those who wish to understand a given topic in greater depth

### **Required readings**

Typically, required readings for each session will be made available in a variety of ways – from required textbooks that have been placed on reserve and/or are available for purchase (see below), from identified websites, and from UBC library ejournals. Please pay attention to pages identified as required – often a specific section, rather than the entire document is identified as required reading.

### **Required textbooks**

*Note: The following textbooks will be made available ‘on reserve’ at the Woodward Library in the IRC Building:*

- Health Services Research Methods (2nd Edition). Shi L. Delmar Cengage Learning 2008.
- Experimental and Quasi-experimental Designs for Generalized Causal Inference. Shadish, Cook & Campbell. Houghton Mifflin 2002.

I also highly recommend the following textbook for students planning a dissertation at either the MSc or PhD level:

- Proposals That Work: A Guide for Planning Dissertations and Grant Proposals. Locke LF, Spirduso WW, Silverman SJ. Sage Publications 2007.

Several other web-based materials are HIGHLY recommended:

- Introduction to Methods for Health Services Research and Evaluation, open courseware available from the Johns Hopkins Bloomberg School of Public Health at: <http://ocw.jhsph.edu/courses/HSRE/index.cfm>
- Health Services Research (HSR) Methods, available from AcademyHealth (a US based organization that supports health services researchers, policy analysts and practitioners) at: <http://www.hsrmethds.org/Home.aspx>
- Health Services Research Methodology Core Library Recommendations, 2007, available from the US National Library of Medicine at: <http://www.nlm.nih.gov/nichsr/corelib/hsrmethds.html>

Additional supplemental materials will be made available from identified websites, from UBC library ejournals (<http://toby.library.ubc.ca/ejournals/ejournals.cfm>), and from the instructors’ libraries, to support class- and individual-level learning on topics of interest.

### **Document Sharing**

Document sharing for the course will be conducted using Google Drive. More details will be provided in class, but students are encouraged to sign up for a Google account should they not already have access to one.

### **Student Evaluation**

Students will be evaluated on four major areas of activity: in-class participation; a mid-term paper; a final assignment; and assessment of peers’ proposals.

### **In-class Participation (10% of grade)**

- Students will be expected to actively participate in class discussions and are encouraged to actively apply concepts and issues being presented in relation to their own research interests.
- Students will be expected to prepare for and participate in a variety of exercises that focus on applying course concepts to their own research interests, presenting these in class, and providing constructive peer feedback.
- In addition students will be expected to actively prepare for and participate in a mock committee review; this exercise will use review processes that govern CIHR committee review and involve presentation of a formal review and active participation in a discussion to arrive at a consensus assessment. The reviews will be conducted as a peer review, using other student assignments.

### **Mid-term paper (25% of grade)**

*Date due: March 17, 2016 (by email)*

This exercise involves undertaking a critical review of a quantitative health research study. Students are expected to provide a brief review (5 pages) that summarizes their assessment of a number of key areas, using a format that will be provided. Students may critique an article related to a health services research topic of interest, using a process that will be outlined in class. In order to proceed, a suitable article must be approved by the instructors (submit articles for approvals by March 7<sup>th</sup> 2016) and submitted along with the review; guidance will be provided in class.

The following journals regularly feature eligible research (all are available online through the UBC library) and could be a source for articles to review: CMAJ, BMJ, JAMA, NEJM, PLoS Medicine, Healthcare Policy, Health Policy, Health Services Research, Health Affairs, Medical Care.

### **Final assignment (50% of grade)**

*Draft 1 (Background and objectives, not marked): January 28, 2016*

*Draft 2 (Data sources, marked, 10%): February 11, 2016*

*Draft 3 (Methods, marked, 10%): March 4, 2016*

*Draft 4 (Final draft, not marked): March 31, 2016*

*Final Version (marked, 30%): April 21, 2014*

Prepare a health services research proposal that could be submitted to a granting agency. Papers will be approximately 10 to 13 pages in length (single spaced). We will develop the proposals throughout the semester and discuss these in small groups of our peers. Further guidance on this assignment will be provided in class. Students will also be asked to formally respond to feedback provided by their peers during a mock committee exercise. The quality of their response will be incorporated into their final version mark.

### **Peer Assessment of Proposals (15% of grade)**

- At four points during the semester, students will be assigned a proposal from another student for their review and comment.
- Students will be graded on the quality of the comments and suggestions they provide on other students' proposals at the second and third instance, and for the quality of the one-page review they produce during the peer review exercise.
- This feedback will be given on the draft of Data Sources to be reviewed for Week 7 (February 26), and the draft of Methods to be reviewed for Week 9 (March 12).

### **Late submissions**

Extensions will not normally be given, and late assignments will be given a mark of zero unless prior permission is obtained. Please notify the instructor or TA as soon as you anticipate not being able to fulfil a course requirement by the deadline due to circumstances outside of your control. We will assess these requests on a case-by-case basis.

### **Marking reassessments**

Should you have concerns about the mark you have received on an assignment, you are welcome to request a re-assessment from the instructor. In order to request such a reassessment, please write one paragraph explaining why you believe you deserve a different mark from the one you received. This will be read in conjunction with your original submission. The instructor will reassess your assignment based on this information, and your mark may increase, stay the same, or decrease as a result. Requests for changes in marking made in any other manner will not be considered.