SPPH 531
Health Care Systems Analysis
UBC School of Population and Public Health
SPPH 424 | Mondays 1:00-4:00pm

Course Description

This course provides a theoretical and practical foundation for health care systems research and evaluation. The theory will cover how we think about the performance of health care systems and how the relevant concepts of performance (e.g. quality, continuity) might be measured. The practical part of the course will cover the use of administrative data to conduct health care systems research, in particular to develop variables that represent the concepts of interest using SAS. This course also provides an overview of ethics and privacy issues related to research uses of administrative data.

This course uses a problem-based learning approach to introduce students to the evaluation of health care systems. Each week of the course will build on the last. This course is not specifically about health care system policies or health research study design / statistical methods. The material covered here will be complementary to other SPPH courses, building health services research competencies such as knowledge of health care system frameworks, critical and analytic thinking, and skills in quantitative analysis.

This course is open to any student who is interested in working with administrative data. It is aimed most directly at students who anticipate research careers in areas related to health care services and systems, including health services research and health policy / program evaluation.

There are no prerequisites for this course, but it is intended to be a 2nd (or subsequent) (graduate-level) year course.

Purpose and Objectives:

Upon completion of this course, you will be able to:

1. Understand, describe, and use basic concepts in health system analysis
2. Identify and apply health system classification terminology and concepts
3. Articulate privacy issues and protections as they relate to the analysis of administrative health data for research purposes
4. Develop an actionable plan for creating an algorithm to use administrative data to measure a concept related to health system performance
5. Create comprehensive documentation for your algorithm that aids both replicability and use of that algorithm
6. Use SAS software for relatively complex data management tasks
7. Use SAS for (relatively simple) data analysis
8. Troubleshoot, test and interpret findings
9. Present findings showing the policy relevance of your research

Attaining Course Competencies:

The course competencies will be attained in five ways: readings, video resources, lecture, class discussion and student writing / project(s). Reviewing required material prior to each class

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is a critical part of successful learning and effective class participation. To aid in directed reading of the material, we will discuss the purpose of next week's readings at the end of each class. The ongoing student projects are meant to assist with developing both theoretical and practical knowledge. Students are expected to use their project work as a means to explore the application of theories and concepts they are learning and to provide a basis for class participation.

Instructors:

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Class Time & Location: Mondays 1:00-4:00 pm, SPPH Room 424.
Class will start promptly at 1 pm, *and students are expected to attend (except under extenuating circumstances) and to arrive on time.*

Evaluation

Privacy test:	*required but not counted towards marks*
Key concepts *or* framework one-page write-up	5%
Key concept *or* framework presentation	5%
Proposed algorithm	10%
Building operational details / Metadata	15%
Student topic presentation	15%
Flowchart part 1: Proposed flowchart	5%
Flowchart part 2: Completed flowchart + SAS code	20%
Final paper	25%

There will be penalties for assignments submitted late. Typically the penalty will be 10% per day. Extensions of the due date for the written assignments will be considered pending extenuating circumstances. Assignments are to be emailed / submitted on the SRTL by midnight on the designated due date.

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Students are expected to know what constitutes plagiarism, to understand that plagiarism is a form of academic misconduct, and that such misconduct is subject to penalty. Please review the Student Discipline section of the UBC Calendar (available online at www.ubc.ca).

Please note: The course outline and readings are in draft and are subject to change. They will in fact almost certainly change at least somewhat, as this is intended as a Problem Based Learning course, so the flow over the term will to some degree be directed by the participants.

Class Schedule

Week #	Date	Topic	Assignments / Notes
1	Sep 9	Introduction to the course and setting out the "problem"	Privacy and ethics	
2	Sep 16	Introduction to linked administrative data	Population Data BC	Introduction to the Secure Research Environment (SRE)	**Assignment due**: Privacy test
3	Sep 23	Key concepts in evaluating health care system performance	Emergent properties	SAS Module 1	**Assignment due:** ½ Student presentations and one page write-up on concept/framework
4	Sep 30	Frameworks for health system analysis	SAS Module 2	**Assignment due:** ½ Student presentations and one page write-up on concept/framework
5	Oct 7	Developing algorithms	Preparing metadata and documentation	SAS Modules 3 & 4	
	Oct 14	NO CLASS	**Assignment due Tues Oct 15:** Proposed algorithm
6	Oct 21	Student topics, part 1	SAS Modules 5 & 6	
7	Oct 28	Student topics, part 2	SAS Module 7	**Assignment due:** Metadata
8	Nov 4	Student topics, part 3	SAS Module 8	**Assignment due:** Proposed flowchart
	Nov 11	NO CLASS	
9	Nov 18	Student topics, part 4	SAS review, trouble-shooting, remaining questions	Macros / reading raw data into SAS	

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10	Nov 25	Stratification and sensitivity	Student presentations summarizing what we've learned individually / putting it all together	**Assignment due**: Completed flowchart and SAS code
	Dec 9	END OF TERM	**Assignment due:** Final paper

Week 1: Introduction to the course

During the first class session we will:
- Have class introductions, to people and resources
- Review the syllabus and administrative issues
- Discuss grading and grading criteria
- Establish the overarching problem / question the course will try to address
- Review and understand ethical issues in the use of administrative data

READING

Canadian Standards Association Model Code for Protection of Personal Information
http://cmcweb.ca/epic/internet/incmc-cmc.nsf/en/fe00076e.html

Tri-Council Policy Statement: Ethical conduct for research involving humans, chapters other than 1 & 5: http://www.pre.ethics.gc.ca/eng/policy-politique/initiatives/tcps2-eptc2/Default/

Panel on Research Ethics tutorial on the Tri-Council policy statement referred to above. This will be very useful for people who want more in-depth information on research involving human subjects. It is required for students who wish to conduct research at a University.
http://www.pre.ethics.gc.ca/eng/education/tutorial-didacticiel/

PRIVACY TEST: Review privacy material provided by PopData, and take the PopData test. Must pass with a score of 80% or higher before continuing.

Submit: On-line, automatic submission once the privacy test is completed. The test and access to it will only be available after you have read through the relevant privacy information.

Description/Instructions: You will need a login and password in order to complete the test. This will be emailed to you by PopData staff. If you do not have this information, please let me know. You will receive a score immediately, and PopData will report the score to the course instructor as well.

Grading Criteria: Automatic, generated by the PopData website, based on answers to multiple-choice questions.

ADDITIONAL RESOURCES (RECOMMENDED)

Donabedian, A. (1966). Evaluating the quality of medical care. *The Milbank Memorial Fund Quarterly*, *44*(3). Retrieve from http://www.jstor.org/stable/3348969

Berwick D, Nolan T and Whittington J. *The Triple Aim: Care, Health and Cost.* Health Affairs. 27(3):759-760. 2008 http://content.healthaffairs.org/content/27/3/759.full

A TEDx talk by Dr. Bill Ghali from Alberta on the "crisis" in health care performance: https://www.youtube.com/watch?v=UNs_eH6Z4ps

Week 2: Privacy and ethics / Introduction to linked administrative data / Introduction to the Secure Research Environment (SRE)

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

- Describe administrative data, identify sources of administrative data, and describe appropriate research uses of these data
- Describe data linkage methods, review data linkage systems around the world, and introduce Population Data BC
- Understand both what the Secure Research Environment is and how to use it

READINGS:

Jutte DP, LL Roos, MD Brownell. Administrative Record Linkage as a Tool for Public Health Research. *Annual Review of Public Health* 2011; 32:91-108: http://www.annualreviews.org/doi/pdf/10.1146/annurev-publhealth-031210-100700

Population Data BC website, including the Overview video and Data Linkage sections: http://www.popdata.bc.ca/aboutus

Week 3: Concepts and theories in health care systems research / Emergent properties

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

- Articulate the major concepts around health system performance
- Provide examples of emergent properties as they relate to health system performance

Graded assignment 1 – Concept one-pager +/- presentation

Each student will be responsible for all required readings, and then will take particular responsibility for a specific "concept". All will prepare a one-page write-up on that concept, and half (randomly selected) will give a <5 minute presentation on the definition of that concept. This should include an overall definition, and examples of its measurement and use.

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READINGS and RESOURCES

Institute of Medicine 2001. Crossing the quality chasm: a new health system for the 21st century. https://www.nap.edu/read/10027/chapter/1 (Executive Summary, and specifically pages 1-9)

Ian Sommerville. Emergent properties of sociotechnical systems. http://www.youtube.com/watch?v=ZCBaQpEq1U8

Iezzoni, Lisa I. Assessing Quality Using Administrative Data. *Annals of Internal Medicine*. 127(8): 666-674. 1997. https://annals.org/aim/article-abstract/710911/assessing-quality-using-administrative-data

L. Barbera, H. Seow, R. Sutradhar, A. Chu, F. Burge, K. Fassbender, K. McGrail, B. Lawson, Y. Liu, R. Pataky, A. Potapov. Quality of end-of-life cancer care in Canada: a retrospective four-province study using administrative health care data http://www.current-oncology.com/index.php/oncology/article/view/2636/1921

STAN 101 Module 1 (online SAS training - link immediately below).

NOTE: For the rest of the term, please view videos and read material prior to class. The videos are part of an online resource established by Population Data BC: https://my.popdata.bc.ca/ → Login → Education & Training tab → Statistical Analysis → STAN 101 SAS Tutorials

ADDITIONAL RESOURCES

Rickles, Hawe and Shiell. A simple guide to chaos and complexity. *J Epidemiol Community Health* 2007 61: 933-937. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2465602/pdf/933.pdf

NOTE: For the rest of the term we will be asking you to view videos and read material prior to attending class. The videos are part of an on-line learning resource established by Population Data BC, which is here: https://my.popdata.bc.ca/ → Account → Login → Education & Training tab → Courses → Statistical Analysis, STAN 101 SAS Tutorials

Week 4: Frameworks for health system analysis and development of research questions

- Various frameworks for health systems analysis / performance (e.g. CIHI, OECD)
- What the frameworks address; how they are organized
- What is the level of analysis? What do they cover and not cover?
- Do these frameworks appear complete? Suitable for a Canadian environment?
- Are they theoretical or practical?
- What makes a "good" health care system performance /analysis framework?

Graded assignment 2 – Framework one-pager +/- presentation

Each student will be responsible for all required readings, and then will take particular responsibility for one specific framework. All will prepare a one page write-up on the pros and

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cons of the framework, and half (randomly selected) will present their thoughts to the class (< 5 minutes). This will include summarizing the main points, relating the framework to other approaches, and relating the framework back to the required readings.

READINGS - FRAMEWORKS FOR DISCUSSION

World Health Organization. 2000. Chapter One: *Why Do Health Systems Matter? The World Health Report 2000 - Health Systems: Improving Performance*. Geneva, Switzerland. http://www.who.int/whr/2000/en/ (specific focus on pages 3-11 and chapter 2)

Bureau of Health Information. 2014. *Describing and Assessing Performance in Health Care: An Integrated Framework.* April 2014. http://www.bhi.nsw.gov.au/__data/assets/pdf_file/0013/217030/Spotlight_on_measurement_APR_2013.pdf (overview on pages 3-16 sufficient for those not presenting this framework)

NHS Outcomes Framework https://digital.nhs.uk/data-and-information/publications/ci-hub/nhs-outcomes-framework and Indicators https://digital.nhs.uk/data-and-information/publications/clinical-indicators/nhs-outcomes-framework/current

Canadian Institute for Healthcare Information. *A performance measurement framework for the Canadian health system*. May 2013. https://secure.cihi.ca/free_products/HSP-Framework-ENweb.pdf

Conference Board of Canada. *Measuring Success: A Framework for Benchmarking Health Care System performance*. September 2012. https://www.conferenceboard.ca/temp/441cc848-eae6-41e4-96cc-bd9715ff8eeb/13-080_BenchmarkingHealthCare-CASHC.pdf (specific focus on Chapters 3 and 4) AND Conference Board of Canada. *Paving the Road to Higher Performance: Benchmarking Provincial Health Systems*. May 2013. https://www.conferenceboard.ca/e-library/abstract.aspx?did=5489 (specific focus on Chapters 1-3)

STAN 101 Module 2

ADDITIONAL RESOURCES

Murray CL and Frenk J. A framework for assessing the performance of health systems. Bulletin of the World Health Organization. 78(6): 717-731. 2000. http://www.who.int/bulletin/archives/78(6)717.pdf

Brathwaite et al. Health system frameworks and performance indicators in eight countries: a comparative international analysis. *SAGE Open Med* 2017 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5308535/pdf/10.1177_2050312116686516.pdf

OECD.StatExtracts: Health – International comparisons on various indicators http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT

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**Week 5: Developing algorithms / Preparing metadata / SAS training**

By the end of this week students will be able to:

- Understand the concept of an algorithm and how they are used
- Develop metadata describing the data set needed to create their proposed algorithm
- Complete assignment due before the start of class week 6 (Metadata)
- Continue with SAS basics

STAN 101 Modules 3 and 4

**Weeks 6 - 9: Student topics presentations / SAS training / Selected topics**

Learning objectives:
- In-depth on specific student-chosen algorithms and their relationship to concepts and frameworks
- Comfort with metadata and methods documentation
- Familiarity with stratification and sensitivity analysis
- Skill with SAS commands relevant to administrative data analysis

Readings / class prep

Each week will have readings chosen by students, which will be circulated to class.

Each week will cover one or two SAS modules through to module 8. In addition we will cover stratification and sensitivity analyses, plus macros and other more advanced features of SAS, time permitting.

**Week 10: Student presentations summarizing what we've learned individually / Putting it all together – learning across projects for the system as a whole**

By the end of this week students will:
- Have a much deeper understanding of several concepts that relate to health care system performance
- Feel comfortable engaging in debates about health care system performance – both how it is measured and how Canada fares
- Reflect on our chosen conceptual framework and comment on similarity / differences in interpretation of performance depending on the concept involved

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Final paper / presentation

Part of your grade for the final presentation (5% of your overall course mark) will be based on the slides / material and presentation of your topic provided in the final class session. The rest of this grade (20% of your overall course mark) will be based on a summary of your findings written in the style of an academic paper. The format and grading rubrics for these will be provided well in advance of the due dates. This will be due by 9am on Monday Dec 9.

Course Evaluation

You will receive a link to a course evaluation at the end of the semester. Your responses will be anonymous, with feedback provided in the aggregate after all grades for the course are submitted. Open-ended comments will be shared with instructors, but not identified with individual students. Your participation in course evaluation is an expectation, since providing constructive feedback is a professional obligation. Feedback is critical, moreover, to improving the quality of our courses, as well as for instructor assessment.

Optional SAS Resources

• SAS e-learning tutorials (https://support.sas.com/edu/viewmyelearn.html):

    SAS(R) Programming Introduction: Basic Concepts

        Chapter 1: Getting Started with SAS Programming

        Chapter 2: Understanding SAS Programming Basics

        Chapter 3: Navigating and Using the SAS Interface

        Chapter 4: Working with SAS Libraries, Data Sets and the Import Wizard

    SAS(R) Programming 1: Essentials

        Chapter 1: Getting Started with SAS Programming

        Chapter 2: Navigating and Using the SAS Interface

        Chapter 3: Working with SAS Code

        Chapter 4: Working with SAS Libraries and SAS Data Sets

• SAS tutorial, accessed in SAS from the Help menu, select *Getting Started with SAS Software*, then select *New SAS programmer (quick-start guide)*.

• Online SAS documentation at: http://support.sas.com/onlinedoc/913/docMainpage.jsp

• UCLA Resources to help you learn and use SAS: http://www.ats.ucla.edu/stat/sas/

• MCHP Resources to help you learn and use SAS: http://umanitoba.ca/faculties/medicine/units/community_health_sciences/departmental_units/mchp/education/sas/index.html

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