2019 年度

帝京大学大学院公衆衛生学研究科

第 9 回 ハーバード特別講義
Harvard Special Session 2020

授 業 計 画
(Course Syllabus)

TEIKYO

Teikyo-Harvard Program 主催

Course Syllabus

Visiting professor : Garrett Fitzmaurice

Course	Biostatistics		
Credit	1	Method of Teaching	Lecture

Objective

Title for lectures is "Modeling Longitudinal and Multilevel Data".

The emphasis of this course is on understanding basic concepts and methods and how they can be applied in the health sciences.

Outline

The aim of the course is to review methods for the analysis of longitudinal and multilevel data. Topics include a general introduction to linear mixed effects models, and extensions of generalized linear models, to longitudinal and multilevel data. The course is intended for all students interested in epidemiology, biostatistics and public health.

Class Schedule   (90 minutes each)

Day 1 (January 7, 2020)

1. **Linear Mixed Models for Longitudinal Data**   (9:00am-10:30am)

    Readings: FLW, Chapters 1, 2, and 8.

2. **Smoothing Longitudinal Data using Penalized Splines**   (11:00am-12:30pm)

    Readings: FLW, Chapter 19.

Day 2 (January 8, 2020)

3. **Generalized Linear Models for Longitudinal Data Part 1**

    (Marginal Models and Generalized Estimating Equations)   (9:00am-10:30am)

    Readings: FLW, Chapters 11, 12, and 13.

4. **Generalized Linear Models for Longitudinal Data Part 2**

    (Generalized Linear Mixed Models)   (11:00am-12:30pm)

    Readings: FLW, Chapters 14 and 16.

Day 3 (January 9, 2020)

5. **Introduction to Multilevel Data**   (9:00am-10:30am)

    Readings: GH, Chapters 1 and 11; FLW, Chapter 22 (Sections 22.1-22.2).

6. **Multilevel Linear Models**   (11:00am-12:30pm)

    Readings: GH, Chapters 12 and 13 (Sections 13.1-13.2); FLW, Chapter 22 (Section 22.3).

Day 4 (January 10, 2020)

7. **Multilevel Generalized Linear Models**   (9:00am-10:30am)

    Readings: GH, Chapters 14 and 15; FLW, Chapter 22 (Sections 22.4-22.5).

8. **Non-Nested Data: Cross-Classified and Multiple-Membership Structures**   (11:00am-12:30pm)

    Readings: GH, Chapter 13 (Section 13.5).

Written Examination (January 10, 2020): (1:30-3:00pm)

We may add seminars by Japanese teachers for each to assist students with difficulty in language/background knowledge

Texts

Fitzmaurice, G.M., Laird, N.M., and Ware, J.H. (2011). Applied Longitudinal Analysis, 2nd Ed. Wiley & Sons. (FLW)

Gelman, A. and Hill, J. (2007). Data Analysis Using Regression and Multilevel/Hierarchical Models. Cambridge University Press. (GH)

Related readings

Will be made available prior to the lecture.

Achievement evaluation

There will be a written final exam about conternts in the class upon completion of the course.

Course Syllabus

Visiting professor : Ichiro Kawachi

Course	Behavioral Science / Social Epidemiology		
Credit	1	Method of Teaching	Lecture

Objective

The purpose of this course is to introduce students to the major social variables -- social class, gender, poverty, income distribution, social networks/support, community cohesion, the psychosocial work environment and neighborhood contexts -- that affect population health.

By the end of the course, students should be able to:

- Describe the two strategies of prevention (the high risk and population strategies) and formulate interventions to address population health problems using these concepts and principles.
- Critique the validity and reliability of methods used to measure the dimensions of socio-economic status (SES), i.e. income, education, and occupation.
- Describe the theories (mechanisms and pathways) through which income, education, and occupation affect health, health behavior, and illness, and analyze their applicability to different types of health problems.
- Describe and contrast the absolute versus relative approaches to conceptualizing and measuring poverty.
- Identify community-level determinants of health, such as neighborhood assets (e.g. social capital) and deficits (e.g. concentrated disadvantage).
- Compare and contrast compositional versus contextual influences of neighborhood environments on health.
- Discuss the mechanisms and pathways by which neighborhood contexts influence population health.
- Define and describe measurement approaches to assess social networks, social support, and social capital.
- Describe the mechanisms through which social networks affect health outcomes.
- Describe the demand/control model of job stress.
- Describe the hierarchy of public health strategies (information, incentives, regulations) to reduce health disparities.
- Describe the process of developing policies to address health disparities, and the barriers to implementing such policies.

Outline

The course covers the theoretical underpinnings of each construct, their measurement, and empirical research linking each to population health status. Methods are introduced to operationalize each construct for the purposes of empirical application in epidemiologic research.

Class Schedule (90 minutes each)

Day 1 (January 19, 2020)

1. Introduction to the social determinants of health (13:05-14:35)
2. Socio-economic status, Measurement and causal evidence (14:50-16:20)

Day 2 (January 20, 2020)

3. Income distribution and health (13:05-14:35)
4. Social networks, social support, and health (14:50-16:20)

Day 3 (January 21, 2020)

5. Social capital, social cohesion, and health (13:05-14:35)
6. Psychosocial work environment and health (14:50-16:20)

Day 4 (January 22, 2020)

7. Behavior economics and public health (13:05-14:35)
8. Reducing health inequalities: a policy perspective (14:50-16:20)

Examination (January 22, 2020): (17:20-18:50)

We may add seminars by Japanese teachers for each to assist students with difficulty in language/background knowledge

Text

Berkman LF, Kawachi I & Glymour MM. (2nd eds). Social Epidemiology. New York: Oxford University Press, 2014.

Related readings

Kawachi I. "Inochi no Kakusa wa Tomerareruka". Shogakukan 101 Shinsho, 2013 [in Japanese].

Achievement evaluation

Written examination consisting of 4 short-essay questions

Course Syllabus

Visiting professor : Murray A. Mittleman

Course	Epidemiology		
Credit	1	Method of Teaching	Lecture and Seminar

Objective

The objective of this course is to provide students with a solid understanding of fundamental epidemiologic principles and methods and to apply them to evaluate public health questions and develop skills in critiquing the epidemiologic and clinical research literature. The course will be taught with an emphasis on epidemiologic measures, study design and control of confounding.

By the end of the course, students should be able to:

1. Understand the basic principles of epidemiology, including how to calculate and interpret measures of disease frequency and association; epidemiologic study designs for descriptive and analytic studies; how to interpret results from epidemiologic studies including cohort and case-control designs

2. Understand the concepts needed to identify sources of bias that may arise in epidemiologic studies including confounding and selection bias

3. Be an informed consumer of the public health and epidemiologic literature

Outline

Measures of Disease Frequency and Measures of Association: Characteristics of basic measures of disease frequency (prevalence, cumulative incidence, incidence rates) and association (relative and absolute measures) with a focus on the use, interpretation, and relationship between these measures.

Epidemiologic Study Design: Characteristics, strengths and limitations of each of the major study designs including descriptive and analytic studies with a focus on cohort and case-control approaches.

Causal Inference in Epidemiology: Core concepts of exchangeability, the counterfactual basis for understanding causal effects and identification of confounding and recognizing the presence of effect measure modification on the additive and multiplicative scales.

Class Schedule   (90 minutes each)

Day 1 (January 15, 2020)

1.   Lecture: Measures of disease frequency and association   (9:00-10:30 am)
2.   Seminar: Measures of disease frequency and association   (11:00-12:30pm)

Day 2 (January 16, 2020)

3.   Lecture: Study design overview and cohort studies   (9:00-10:30am)
4.   Seminar: Cohort study critique   (11:00-12:30pm)

Day 3 (January 17, 2020)

5.   Lecture: Exchangeability and Confounding   (9:00-10:30 am)
6.   Lecture: Effect measure modification   (11:00-12:30pm)

Day 4 (January 18, 2020)

7.   Lecture: Case-control study design   (9:00-10:30am)
8.   Seminar: Case-control critique   (11:00-12:30pm)

Examination (January 18, 2020): (2:00-3:30pm)

We may add seminars by Japanese teachers for each to assist students with difficulty in language/background knowledge

Text

Rothman KJ. Epidemiology: An Introduction (2nd ed.) New York, NY: Oxford University Press, 2012 (ISBN-10 0199754551)

Related readings

Will be provided

Achievement evaluation

Students are expected to attend all classes, read the course material before coming to class, and actively engage in course discussions.

There will be a written final exam after the completion of the course.

Course Syllabus

Visiting professor : Alastair Gray

Course	Health Policy Management		
Credit	1	Method of Teaching	Lecture

Objective

To introduce students to the methods and uses of health economic analysis. By the end of the course students should be familiar with the main methods used by health economists, and the main uses to which economics can be put in the area of health and health care.

Outline

The course will consist of 8 lectures over 4 days. It will begin with a broad introuction to economics and health economics. It will then demonstrate some of the main tools of economic analysis and how these can be applied in health and health care. The course will then examine the main steps involved in evaluating health interventions: measuring costs, measuring and valuing quality of life, modelling and extraolation, and using cost-effectiveness to set priorities and make decisions.

Class Schedule   (90 minutes each)

Day 1 (January 20, 2020)

1. **Economics, health and health economics**   (9:00-10:30 am)

    What is economics; what is health economics; health care spending: international trends; health care spending: composition and explanations. Health and wealth.

2. **Applying economic tools to health and health care**   (11:00-12:30am)

    Supply and demand; the market for health and health care; market failure and its consequences

Day 2 (January 21, 2020)

3. **Costs**   (9:00-10:30 am)

    Costs, prices and opportunity costs. Which perspective: the patient, the health system, the employer, society. How to collect cost information. Hospital costs and DRGs; the cost of events. international comparisons of costs.

4. **Cost of illness and burden of disease**   (11:00-12:30am)

    What are cost of illness studies; what do they tell us; the Global Burden of Disease study; some national examples and their uses; using cost of illness data to inform research spending priorities.

Day 3 (January 22, 2020)

5. **Measuring and valuing quality of life** (9:00-10:30am)

    Why measure quality of life? Some common instruments and questionnaires; valuing health states: the time trade-off and standard gamble

6. **Disease modelling and decision models** (11:00-12:30am)

    Why disease models are useful: for prognosis, for prediction, for extrapolation. How they are built and validated. Some common examples in heart disease, cancer and diabetes.

Day 4 (January 23, 2020)

7. **Using cost-effectiveness analysis to set priorities** (9:00-10:30am)

    What is a cost-effectiveness analysis. What is a cost-benefit analysis? Taking account of costs and effects. Interpreting cost-effectiveness studies. Examples of cost-effectiveness analyses in diabetes and cancer. Cost-effectiveness databases.

8. **Using cost-effectiveness to make reimbursement decisions ; the example of NICE in the UK** (11:00-12:30am)

    The National Institute for Health and Care Excellence; why it was set up; how it works; some controversies in the way it works and its decisions; other international reimbursement bodies.

Examination (January 23, 2020): (2:00-3:30pm)

We may add seminars by Japanese teachers for each to assist students with difficulty in language/background knowledge

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Text

I do not propose to have set readings for each lecture. At the end of each lecture I will provide some further reading and references.

Related readings

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Achievement evaluation

Students will be tested by oral examination "Oxford style" at the end of the course.

Course Syllabus

Visiting professor : Rose H. Goldman

Course		Environmental / Occupational Health	
Credit	1	Method of Teaching	Lecture, Discussion and Case Studies

Objective

At the end of the course the student will be able to:

1. Describe how human impacts on the environment, both local and global, contribute to promoting health and/or causing illness.

2. Describe and apply basic concepts of toxicology, exposure assessment, environmental epidemiology, risk assessment/risk management, health impact assessment/life cycle analysis and injury analysis in order to evaluate, and develop a plan for decision-making involving human health effects related to acute and chronic exposures involving major environmental and occupational hazards, such as air pollution, metals, drinking water, physical hazards (such as injuries), energy choices and climate change/climate crisis..

3. Describe how factors (such as age, disproportional exposures, socio-economic status, cigarette smoking, and nutrition) can modify the impact of environmental and occupational hazards on a population

Outline

As countries face growing energy needs and increasing concerns about the effects of climate change, greater attention is being paid to the environmental factors that detract, or enhance, human health. This course provides an introduction to environmental health, so that students can describe and apply basic concepts of toxicology, exposure assessment, environmental epidemiology, risk assessment/risk management, health impact assessment/life cycle analysis and injury analysis, to the evaluation and decision-making related to issues such as air pollution, drinking water, occupational hazards, injuries, built environment, energy choices and climate change, and most recently the climate crisis.. The course also illustrates some of the inter-relationships between local and global effects, as well as the role of other factors (such as age, disproportionate exposures, socio-economic factors, cigarette smoking, etc.) in modifying the impact of environmental and occupational hazards on a population.

Class Schedule   (90 minutes each)

Session 1 (Friday, January 24, 9:00-10:30)   Overview and Introduction to Environmental Health

Small Group Session: Individuals identify environment issue and question of interest to themselves or location

Session 2 (Friday, January 24, 10:45-12:15)   Pathways & Measurement of exposures; toxicological principles

Small Group Session: Case-- Pregnant woman, fish and mercury

Session 3 (Friday, January 24, 13:30-15:00)   Environmental Epidemiology and Air Pollution

Small Group Session: PM2.5 levels in different locations, impact on mortality, sources and prevention strategies

Session 4 (Saturday, January 25 , 9:00-10:30)   Approaches to risk assessment: toxicant risks assessment, life cycle, health impact assessment

Small Group Session: Individual question project: gather more information; approach to decision making?

Session 5 (Saturday, January 25, 10:45-12:15)   Occupational Health; Introduction to Injury Analysis and Prevention

Small Group Session: Case: Injury case-application of   Haddon's Matrix

Session 6 (Saturday, January 25, 13:30-15:00)   Water and Sanitation

Small Group Session: Water and Health—case study in Bangladesh

Session 7 (Sunday, January 26, 9:00-10:30)   Built Environment and Energy Choices

Small Group Session:Use a life cycle/health impact approach to look at the pros and cons of different energy sources

Session 8 (Sunday, January 26, 10:45-12:15)   The Climate Crisis and Health Effects

Presentations from Individuals or Small Groups

Examination (Sunday, January 26, 2017): (13:30-14:30)

We may add group work and seminars by Japanese teachers for each to assist students with difficulty in language/background knowledge.

Text – can use as a reference

Essentials of Environmental Health, Third Edition, by Robert H. Friis, 2019; publisher: Jone & Bartlett

Related readings

Will be made available in advance of the lecture. Textbook in own language may help understanding.

Achievement evaluation

There will be a written final exam after the completion of the course. Participation of the class in discussion will be appreciated.