Principals of Epidemiology, Family and Community
Fall 2021-Reprodcutive Doctorate Program, Shahrood Unviersity Course Syllabus

I. COURSE IDENTIFYING INFORMATION

Course: RepDr14, 2 credits
Course Title: Principals of Epidemiology, Family and Community
Term: Fall 2021
Dates: Tuesday 2:30-4:30 pm (SJ), see the outline below for dates
Wednesday 10-12 pm (RM), see the outline below for dates
Venue: **Sky room**
Office Hours
Prerequisites: None

Instructor	Dr. Shayesteh Jahanfar, Ph.D.(s) (Epidemiology and Health Care; Obstetrics and Gynecology) Dr. Marzieh Rohani-Rasaf, PhD of Epidemiology
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Email Address	Shayesteh.Jahanfar@tufts.edu Rohani_marzieh@yahoo.com
Classroom with Sky room	https://www.skyroom.online/ch/shmu/family-and-social-epidemiology-phd-shjahanfar

Academic Calendar

READ ALL 19 PAGES OF THE SYLLABUS

Academic Biography:

Dr. Jahanfar has been teaching for more than 25 years. She has taught a broad range of courses including epidemiology, biostatistics, maternal-child health, systematic reviews, research methodology, Doctor-Patient and Society Module at the graduate and undergraduate level. She has also delivered a series of workshops/webinars to support faculty development teaching software (SPSS, R, SAS, STATA), regression modeling, cluster analysis and survival analysis. Dr. Jahanfar is an international Cochrane trainer and has conducted over 25 Cochrane workshops/webinar series in the USA, Canada, Malaysia, Middle East on standard author training and trained over 400 clinicians and scientists.

Dr. Marzieh Rohani-Rasaf received her M.S. in 2012, and Ph.D. in Epidemiology in 2019 at Shahid Beheshti University of Medical Sciences (Iran). Currently, she is Assistant Professor and Head of Student Research Committee at Shahroud University of Medical Sciences (Iran). Her research interests include modeling in epidemiology, working with big data, inequality in health, cancer, cccident. She has taught a wide range of courses including Epidemiology Principles, Research Methodology, Critique of Quantitative Studies, Occupational Diseases Epidemiology, Communicable Diseases Epidemiology, Non-Communicable Diseases Epidemiology at the graduate and undergraduate levels. She has also presented a series of workshops in the field of scientific writing, proposal writing, reference manager and effect size extraction from articles.

Sky room

Sky room is a web-based learning management system licensed by university.

TEXTBOOKS AND INSTRUCTIONAL MATERIALS

Textbooks and Course Materials:

Aschengarau Ann. Essentials of epidemiology in public health (Latest edition) Jones & Bartlett Learning. Available at Hirsh Health Sciences Library. This book can be accessed online via e-resources. Consult the required reading listed in the schedule. Please note that free access number is limited.

Other Requirements and Materials for the Course:

Access to a personal computer and the internet. For online delivery, students must have ready access to an up-to-date computer with high-speed Internet connectivity. Students must be able to install or arrange for the installation of specific browser plugins (such as Flash Player) and client-side software (such as a PDF reader) for the ability to complete course requirements. Students may be expected to do homework via an online module (or equivalent electronic format), ask questions via email, conduct research using the internet and participate in live chat with the instructors and fellow students.

III. COURSE DESCRIPTION

As an introductory course, a broad perspective on epidemiological terminology, concepts, and methods are introduced. The teaching methodology is based on group teaching, flip classroom and self-learning.

In each session, specific examples of how each epidemiologic method or concept taught is used in public health – both in practice settings and in the epidemiologic literature – in order to help students, understand the relevance and utility of the method taught. The final exam will include public health scenarios in which students will be asked to apply specific methods to answer questions regarding that scenario.

Students are expected to read the relevant book chapter/papers and view other sources (e.g., video/audio) prior to the live session and attend the live session equipped with the knowledge acquired from the sources.

The instructors of this course will meet with you every Tuesday from 2:30-4:30 pm. We will discuss the concepts via lectures, group discussion, group exercises, case study. We will practice the textbook problems, go over extra problems and calculations, and will respond to your questions and dark points on a regular basis. Students will contribute to the learning process, as well. Students will select and criticize scientific, epidemiological publications from their own area of interest or expertise, and we will discuss and critique these papers as a group.

Ongoing participation, three homework papers, an open-book, take-home final exam, and two final group presentations of a paper critique are the basis of assessment. The final exam will include calculations. We will discuss the exams and assignments in every live session to ensure you are up to speed.

IV. Course Learning Objectives

Apply epidemiological methods to the breadth of settings and situations in public health practice.

V. METHODOLOGY: Group teaching, and flip classroom

1) Pre-reading of chapters/pages identified in the course outline.
2) Read prepared slides and watch videos when indicated.
3) Discussion on papers from Areas of Expertise Presentation
4) Submitting to homework assignments, prepare a presentation and take the final exam

VI. COURSE OUTLINE/ASSIGNMENTS

Course outline		
0	Read the syllabus Flip through the textbook Study the Syllabus carefully	
1 **14th Sep**	**Introduction** **Learning objectives:** a. Define and discuss the goals of public health. b. Distinguish between basic, clinical, and public health research. c. Define epidemiology and explain its objectives. d. Discuss the key components of epidemiology—population and frequency, distribution, determinants, and control of disease. e. Discuss important figures in the history of epidemiology f. Discuss important modern studies, including the Streptomycin Tuberculosis Trial, Doll and Hill's studies on smoking and lung cancer, and the Framingham Study. g. Discuss the current activities and challenges of modern epidemiologists. **Before coming to the class** • Read Chapter 1 **Tasks After the class** • Solve Chapter 1 textbook practice questions-Non informative • Optional: Week 1 test (Extra Credit)	SJ
2 **21th Sep**	**Measure of disease frequency** **Learning objectives:** • Define and provide examples of a population. • Distinguish between a fixed and dynamic (or open) population. • Explain how epidemiologists create a case definition and discuss how the definition of acquired immunodeficiency syndrome (AIDS) has changed over time. • Describe the key aspects of measuring disease occurrence. • Define and distinguish between cumulative incidence, incidence rate, and prevalence. • Describe the mathematical relationship between the measures of disease frequency. • Provide examples of commonly used measures of disease frequency in public health. **Before coming to the synchronous session** Read Chapter 2 **Tasks After the synchronous session**	SJ

	• Solve Chapter 2 textbook practice questions-Non informative • Optional: Week 2 test (Extra Credit)	
3 **28th Sep**	**Comparing disease frequency** **Learning objectives:** • Organize disease frequency data into a two-by-two table. • Describe and calculate absolute and relative measures of comparison, including rate/risk difference, population rate/risk difference, attributable proportion among the exposed and the total population, and rate/risk ratio. • Verbally interpret each absolute and relative measure of comparison. • Describe the purpose of standardization and calculate directly standardized rates. **Before coming to the synchronous session** Read Chapter 3 **Tasks After the synchronous session** Chapter 3 textbook practice questions -Non informative	**SJ**
4 **5th Oct**	**Descriptive epidemiology** **Learning objectives:** • Describe and provide examples of the three main elements of descriptive epidemiology: person, place, and time. • Define the terms disease cluster, outbreak, and epidemic. • Describe the steps involved in investigating a disease outbreak (have guest speaker). • Describe the Ebola outbreaks and their investigation in Africa. • Discuss the scientific and administrative uses of descriptive epidemiology. • Describe the demographic characteristics of the US population and its pattern of mortality by age. • List the strengths and limitations of mortality data. • Discuss the descriptive epidemiology of childhood lead poisoning, human immune deficiency virus (HIV) infection, and breast cancer in the United States. **Before coming to the synchronous session** Read Chapter 5 **Tasks After the synchronous session** Chapter 5 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise-Cross sectional studies Homework 1 is due October 4th Midnight	**SJ**
5 **12th Oct**	**Overview of epidemiological study designs** **Learning objectives:** • Distinguish between experimental and observational studies. • Describe the key characteristics of experimental, cohort, case-control, cross- sectional, and ecological studies regarding subject selection, data collection, and analysis. • Identify the design of a particular study.	**SJ**

	• Discuss the factors that determine when a particular design is indicated. **Before coming to the synchronous session** Read Chapter 6 **Tasks After the synchronous session** Solve Chapter 6 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise-Ecological studies	
6 **19th Oct**	**Experimental studies** **Learning objectives:** • Distinguish between the types of experimental studies, including individual versus community trials, preventive versus therapeutic trials, parallel versus crossover trials, and simple versus factorial trials. • State the established sequence for conducting trials of new drugs. • Describe the key features of conducting experimental studies, including the enrollment and consent process, randomization, use of placebos and masking, maintenance and assessment of compliance, follow up and ascertaining the outcomes, and data analysis. • Discuss the special ethical issues of experimental studies, including equipoise and use of placebo controls. **Before coming to the synchronous session** Read Chapter 7 **Tasks After the synchronous session** Solve Chapter 7 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise- Experimental Studies	**SJ**
7	**Cohort studies** **Learning objectives:** • Distinguish between the various types of cohort studies, including open, fixed, closed, retrospective, prospective, and Ambidirectional designs. • Describe the key features of conducting cohort studies, including the selection of the exposed and unexposed populations; the sources of information on the exposure, outcomes, and other key variables; approaches to follow up; calculating person-time; and data analysis. • Discuss the strengths and limitations of cohort studies. **Before coming to the synchronous session** Read Chapter 8 **Tasks After the synchronous session** Solve Chapter 8 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise_ Cohort Studies	**MR**
8	**Case-control Studies**	**MR**

	Learning objectives: • Discuss the traditional and modern views of case-control studies. • List the settings in which case-control studies are desirable. • Describe the key features of conducting case-control studies, including the selection of cases and controls, the sources of exposure information, and data analysis. • Describe the key aspects of case-crossover studies. • Discuss the strengths and limitations of case-control studies. **Before coming to the synchronous session** Read Chapter 9 **Tasks After the synchronous session** Solve Chapter 9 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise_ Case Control Studies Homework 2 is due November 1st Midnight	
9	**Bias, Confounding and Effect modification** **Learning objectives:** • Describe the key features and provide examples of selection bias, including control selection bias; self-selection bias; loss to follow up; and differential surveillance, diagnosis, or referral. • Describe the key features and provide examples of information bias, including recall bias, interviewer bias, and differential and nondifferential misclassification. • Discuss how the magnitude and direction of bias can affect study results. • List the ways that selection and information bias can be avoided • Distinguish between confounding and effect measure modification. • Describe the methods for evaluating effect measure modification. • State the relationship between the measure of association and effect measure modification. **Before coming to the synchronous session** Read Chapter 10 & 11 &13 **Tasks After the synchronous session** Solve Chapter 10 & 11 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise_ Bias and Confounding	**MR**
10	**Random effect** **Learning objectives:** • Define precision, and random error. • Describe the process of hypothesis testing, calculate hypothesis testing statistics, and interpreting a P-value. • Describe the process of confidence interval estimation and interpreting 95% confidence intervals.	**MR**

	• Calculate measures of central tendency and dispersion for data with normal, binomial, and Poisson distributions. • Calculate 95% confidence intervals of measures of disease frequency and association. • Explain the elements of sample size and power calculations. • Define and provide examples of effect measure modification, including synergy and antagonism. **Before coming to the synchronous session** Read Chapter 12 Watch the recorded video from SJ **Tasks After the synchronous session** Solve Chapter 12 & 13 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise _ Random Error Written assignment is due on 16th November Midnight	
11	**Causation** **Learning objectives:** • Define and state the important characteristics of a cause. • Describe the historical development of disease causation theories, including the germ theory and the web of causation. • Discuss the causal guidelines proposed by Sir A.B. Hill, including their limitations. • Distinguish between a risk factor and a cause. • Describe the key elements of the sufficient-component cause model. • Discuss why most scientists believe that the human immunodeficiency virus (HIV) is the cause of HIS infection and acquired immune deficiency syndrome (AIDS). **Before coming to the synchronous session** Read Chapter 15 **Tasks After the synchronous session** Solve Chapter 15 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise _Causation Study design quiz to support in class discussion _Causality Midterm is due on November 23rd Midnight	**MR**
12	**Screening in public health practice** **Learning objectives:** • Describe the general features of the natural history of disease. • Distinguish between primary, secondary, and tertiary prevention. • List the key characteristics of diseases appropriate for screening. • Describe the important features of a screening test. • Define and calculate sensitivity, specificity, predictive value positive, and predictive value negative. • Discuss the outcome measures and study designs for evaluating the effectiveness of a screening program.	**MR**

	• Define lead-time bias, length-biased sampling, and volunteer bias. • Describe the effect of screening on prostate cancer incidence and breast cancer mortality. **Before coming to the synchronous session** Read Chapter 16 **Tasks After the synchronous session** Solve Chapter 16 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise _ Screening in Public Health Practice Homework 3 is due November 30th Midnight	
13 **7th Dec**	**Critical review of epidemiological studies** **Learning objectives:** • Describe a method for critically evaluating published literature. • Apply the critique outline to published articles. **Before coming to the synchronous session** Read Chapter 14 **Tasks After the synchronous session** Solve Chapter 14 textbook practice questions (non-informative) Graded Discussion: Papers from Areas of Expertise_ Critical Review of Epidemiological Studies	**SJ**
14	**Review the concepts** • Students are welcome to ask questions and review the concepts **Before coming to the synchronous session** Review the concepts **Tasks After the synchronous session** Final is due on December 14th.	**MR**

Assignment and Assessment Information

	Group or Individual (G/I)	Week Due
	Homework 1	Homework 1 is due October 5th Midnight
	Homework 2	Homework 2 is due November 2nd Midnight
	Written Assignment	Written assignment is due on 16th November Midnight
	Midterm	Midterm is due on November 23rd Midnight
	Homework 3	Homework 3 is due November 30th Midnight
	Final exam	Final is due on December 14th
	Participation a. Discussion board on Canvas b. Study design quiz to support in class discussion	See modules for each week
	Extra credit (Optional)	Week 1, 2 are due by Sunday Midnight same week
Total		

VII. Assignments

	Assignments	Points
1	Homework 1	15% of final grade
2	Homework 2	15% of final grade
3	A Written Assignment: Epidemiological skills and public health	10% of final grade
4	Homework 3	15% of final grade
5	Midterm	15% of final grade
6	Final exam	20% of final grade
7	Participation a. Discussion board on Canvas (5%) b. Study design quiz to support in class discussion (5%)	10% of final grade

Written Assignment: Epidemiological skills and public health

The assignment is worth 10% of your final grade. The goal of the assignment is to have each student apply the epidemiological skills they learned prior to the midterm. Each student will identify a problem (clinical or public health question) in their field of choice and identify 2 relevant peer-reviewed scientific papers to answer their question. They will need to critically appraise the papers and consider the application of the evidence to practice - what knowledge gained could be passed to relevant stakeholders (e.g., clinical leads, public health officials, or policymakers). The written assignment is due on 16th November at Midnight.

Scope of Assignment

Each student will identify a problem (clinical or public health question) in their field of choice and identify 2 relevant peer-reviewed scientific papers that address their question. They will need to critically appraise the papers, evaluate the evidence, and consider the application of the evidence to practice - what knowledge gained could be passed to relevant stakeholders (e.g., clinical leads, public health professionals, or policymakers).

Objective of Assignment

By the end of this assignment, you will be able to:

1) Conduct to a basic level each of the four skills necessary for evidence-based practice:

(a) Formulate an epidemiologic/clinical/public health question in a manner that allows its evidence bases to be assessed

(b) Search the key medical databases i.e., PubMed, Embase, and Cochrane to find the relevant publications

(c) Apply epidemiologic knowledge learned in MPH646 to critically appraise the published papers in a systematic manner

(d) To synthesize the evidence and communicate the findings in the form of a written report

2) Apply the four skills, noted above, in an integrated fashion to find an evidence-based answer to a 'real-life' Question

3) Discuss the contributions of epidemiological principles to disease prevention, health promotion, and health policy.

4) Assess the role of epidemiological approaches in evaluating the effectiveness and efficiency of health care systems and preventive health care services.

Assignments must be labeled with the students' names and family names. Assignments will be uploaded on Canvas. See the Rubric for more information.

HomeWorks

We will have three homework assignments. You may work on the homework in teams of two to three students. If you do, everyone on the team will turn in the same assignment with the names of all team members included on the top of the page. Homework is graded on a 0–100 scale. See the outline for due dates.

Midterm

The midterm exam is an open-book, take-home exam. It has true/false, multiple choice, open, and short answer questions that cover material from lectures, readings, and class discussion. The midterm Exam has 15% of the final grade and is **due on November 23rd**. The midterm will be available on the November 16th.

Final Exam

The final exam is an open-book, take-home exam. It has true/false, multiple choice, open, and short answer questions that cover material from lectures, readings, and class discussion. The final Exam is **due on December 14th**. The final holds 20% of the final grade and will be available on the December 10th.

Participation

Students are expected to be active participants in the course, both on canvas and in class discussion.

a. Discussion board: Papers from Areas of Expertise

Your participation in weekly discussions on Canvas is necessary to accumulate 5% of the final grade.

Your participation starts in Week 5 and ends on week 14 (Total of 10 papers will be reviewed by each student).

Here is the list of papers subject areas that you can find and prepare discussion for from week 5 to week 14.

Week 5: Ecological Studies
Week 6: Experimental Studies
Week 7: Cohort Studies
Week 8: Case-control studies
Week 9: Bias & Confounding
Week 10: Random Error and Effect Measure Modification

Week 11: Causation
Week 12: Screening in Public Health Practice
Week 13: Critical Review of Epidemiological Studies
Week 14: Systematic Reviews

Steps:

1. Find a paper of your choosing related to "relevant study design for the week". For instance, to find a paper for Week 5 on "Ecological Studies", go to PubMed, type the keyword "Ecological study" and add the keywords related to your area of expertise.
2. Leave a link to the paper when possible or quote the reference on the discussion board.
3. Post **at least one discussion points** on the Weekly Discussion (found under the week's Module) on Canvas. The initial post is to be done by Monday, 11:59 PM of each week, followed by a response to your peers by Sunday, 11:59 PM of the same week.

b. Study design quiz to support in class discussion

Each week one paper is posted under weekly modules. Respond to weekly quizzes on Canvas. You will accumulate 5% of the final grade by responding to these quizzes. Respond to these quizzes before coming to the class.

c. Taking part in class discussion (non-informative)

During the live session, selected presenters will present the papers and you also contribute actively by asking questions and making comments. Your participation in the live session discussions is crucial.

Background distractions are discouraged during class. Please ensure that all other web pages and browsers not related to the class are closed unless you have a family or personal matter that requires your attention urgently. No phone!

Extra Credit, TBD
Extra credit opportunities are two (week 1 and 2). These are simple tests designed to ear you some extra points. You are free to do these during the first two weeks or before the end of the term.

NOTE: Per the Academic Policies & Procedures of the Public Health and Professional Degree Programs, a grade of A in the course indicates work of distinction. A grade of B indicates work of good quality.

Grading scale

Grade	Numerical Equivalent	Brief Descriptor	Expanded description
A +	97 and above		Outstanding
A	94 – 96	Excellent	The high grade of A is awarded for superior work of distinction.
A -	90-93	Very Good	The high grade of A- is awarded for superior work
B +	87-89	Good	The grade of B+ is awarded for strong work
B	83-86	Satisfactory	The grade of B is awarded for work that is acceptable at the graduate level.
B -	80-82	Flawed, but acceptable	The minimally passing grade of B- is awarded for work that is barely acceptable at the graduate level.
C + or below	79 and below	Poor: Failing grade	The failing grades of C+ and below are awarded for work that is not acceptable at the graduate level

Student Involvement Hours: 8 hours per week

EXPECTATIONS

Attendance and Participation: You are expected to attend all the classes. If you have an emergency (sickness, attending a conference), contact the instructor via email and explain the situation.

Academic Integrity:

Because academic integrity is a cornerstone of the University's commitment to the principles of free inquiry, students are responsible for learning and upholding professional standards of research, writing, assessment, and ethics in their areas of study. Written or other work that students submit must be the product of their own efforts and must be consistent with appropriate standards of professional ethics. Academic dishonesty, which includes cheating, plagiarism and other forms of dishonest or unethical behavior, is prohibited.

Student Rights and Responsibilities:

Each member of university community assumes an obligation regarding self-conduct to act in a manner consistent with respect for the rights of others and with the University's function as an educational institution. As guides for individual and group actions within this community, the University affirms the general principles of conduct described in the Code of Student conduct resolution procedure.

Course requirements

Class participation in discussion, and class exercises. Students are expected to prepare for class by reading all the required book chapters, notes and by listening to all the video clips. Pre-reading is strongly recommended as it will enrich students' learning and will improve active participation in exercises.

For online delivery, students must have ready access to an up-to-date computer with high-speed Internet connectivity. Students must be able to install or arrange for the installation of specific browser plugins (such as Flash Player) and/or client-side software (such as a PDF reader) for the ability to successfully complete course requirements. Students may be expected to do homework via an online module (or equivalent electronic format), ask questions on a discussion board or via email, conduct research using the internet, and/or participate in live chat with the instructors and fellow students.

Students will test computers intended for use in online coursework for basic compatibility with University systems and seek help from IT is require assistant with uploading software, etc.

Absence and early leave

Notify the course director in advance if you will be absent for the class. Also, inform the lecturer in charge if you decide to leave the class early. Students who miss the class are responsible for downloading and reviewing the lecture materials from the Canvas page and gathering class notes from their classmates. After an initial attempt to review the materials, students are encouraged to meet with the teaching staff if they have lingering questions.

Academic integrity statement

Students are expected to abide by the School of Medicine's Standards of Academic and Professional Conduct, which include a commitment to academic integrity. As faculty, I am required to notify the Program Director if I have concerns about violations of academic integrity, including plagiarism, by any student in my course.

Examples of violations of academic integrity include:

- Plagiarism
- Violating the code of conduct for exam-taking
- Altering or misrepresenting data. Examples of common types of plagiarism are as follows:
    1. Using someone else's work and claiming it as your own
    2. Copying major portions of someone's work and claiming it as your own
    3. Changing a few words and phrases from a text and putting them in your work without proper citation.
    4. Reusing your own work from another course—either in its entirety or in part—without the explicit permission of the instructor
    5. Paraphrasing multiple sources and stitching them together without proper citation
    6. Citing some but not all sources correctly.

7. Citing all sources correctly but having very little of your own ideas in the paper.

END OF SYLLABUS