

GPH 404 / ST 404

Epidemiology and Statistics in Global Public Health (3 cr)

Fall 2018

Tuesdays and Thursdays, 10:15 - 11:30 AM
204 Cox Hall

Instructors

Dr. Cathrine Hoyo, Department of Biological Sciences
Dr. Brooke Alhanti, Department of Statistics

Contact information:

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TA

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Office Hours

Dr. Cathrine Hoyo: Tue, 12-1 pm, 3515 Thomas Hall
Dr. Brooke Alhanti: By appointment
Kiran Nihlani: Mon/Wed: 9:30-11, SAS 1101

Prerequisites

Required: B- or better in one of these courses: ST 305, ST 311, ST 350, ST 370, or ST 371
Strongly recommended: B- or better in GPH 201

Required Course Materials

Students will use either JMP or R to analyze data. Both are free for NC State students.

Textbook:

Epidemiology: An Introduction (2nd edition). Kenneth Rothman (2012) New York: Oxford University Press. ISBN 0199754551 Approximate cost: \$40.

Course Description

This course will provide a general introduction to methods used in global health, combining elements of epidemiology and biostatistics. The course will focus on linear and logistic regression, survival analysis, traditional study designs, and modern study designs. Students will learn fundamental principles in epidemiology, including statistical approaches, and apply them to topics in global public health. The course prerequisite is a B- or better in one of these courses: ST 305, ST 311, ST 350, ST 370, or ST 371. In addition, a B- or better in GPH 201 is strongly recommended.

Course Objectives

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

- Demonstrate how global public health problems are quantified and studied
- Describe examples of how epidemiological studies have been used to make global policy decisions
- Analyze and interpret continuous, dichotomous, and time-to-event data using the appropriate regression method
- Identify and describe the application of classic and modern or hybrid study designs to address public health questions
- Research and discuss global public health problems in an epidemiological context

Grading Policy

Point values for assignments and exams are in the table below. If you feel an error has been made in grading one of your assignments, return the assignment to the instructor with a written explanation of the error, and the entire assignment will be re-graded. Re-grade requests should be submitted within one week of the graded assignment being returned to you. Although errors in recording grades are rare, mistakes can happen, therefore it will be important that you keep your graded assignments. This will allow mistakes to be corrected before the final grade is assigned.

| Description of assignment | Points |
|--|------------|
| In-class exercises | 50 |
| Homework | 100 |
| Midterms | 200 |
| Global public health paper on study design | 100 |
| Statistics Round Table | 100 |
| Final exam | 100 |
| Total | 650 |

Grading Scale

Course grades will be determined using the scale below. Grades will not be curved.

| | | | | |
|-----|---|-----------|---|-----|
| 630 | ≤ | A+ | ≤ | 650 |
| 604 | ≤ | A | < | 630 |
| 585 | ≤ | A- | < | 604 |
| 565 | ≤ | B+ | < | 585 |
| 539 | ≤ | B | < | 565 |
| 520 | ≤ | B- | < | 539 |
| 500 | ≤ | C+ | < | 520 |
| 474 | ≤ | C | < | 500 |
| 455 | ≤ | C- | < | 474 |
| 435 | ≤ | D+ | < | 455 |
| 409 | ≤ | D | < | 435 |
| 390 | ≤ | D- | < | 409 |
| 0 | ≤ | F | < | 390 |

Assessment

In-Class Exercises. There will be approximately 10 in-class exercises throughout the semester. These will include work on topics related to the lecture and will be graded for content. These exercises cannot be made up. If you miss for a university-sanctioned excuse, your grade will be adjusted accordingly.

Homework. There will be approximately 5 homework assignments throughout the semester. They may be given offline or online (through Moodle).

Midterms. There will be 2 midterm exams focusing on conceptual and quantitative material from the class. The exams would be closed books, closed notes.

Statistics Round Table Discussion. Students will be provided with epidemiological data sets and would be required to analyze them using statistical techniques covered in the class and the pre-requisite statistics courses. This assignment will be a group activity.

Global public health paper on study design. Students will be provided a topic that requires application of statistical methods and study designs covered in this class. This assignment will be a group activity.

Final exam. All students will take a final exam, which will take place at the university scheduled time.

Policy on Incompletes

At the discretion of the instructor, students may be given an IN grade for work not completed because of a serious interruption in their work not caused by their own negligence; detailed arrangements for completion of the required work must be made prior to the end of finals for this semester. The instructor will assign an IN only if these arrangements are made before the end of finals for this semester.

If an extended deadline is not authorized by the instructor or department, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including summer sessions), or (b) the end of 12 months if the student is not enrolled, whichever is shorter. Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at <http://policies.ncsu.edu/regulation/reg-02-50-03>.

Academic Integrity

Students will comply with University policies concerning academic honesty outlined at <http://policies.ncsu.edu/policy/pol-11-35-01>. These include completing all course work alone or within assigned groups. Assignments should not contain plagiarized materials from Wikipedia or any other resource, and presentations of primary literature must not contain cut-and-paste sentences from the original paper. A grade of "0" will be given on any assignment for which cheating or plagiarism is suspected and may also result in an "F" for the entire course no matter how many points the student has accumulated. Cheating in any form can lead to suspension or expulsion from NC State University.

Missed Assignments

Make up work for assignments is allowed only if you provide documentation of a university-sanctioned excuse. The student is responsible for any technical difficulties encountered in completing homework by the deadline. Assignments are not accepted late.

Course Evaluations

Online class evaluations will be available for students to complete during the last 2 weeks of the term. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any instructors.

Accommodation for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Services Office at Suite 2221, Student Health Center, Campus Box 7509, [919-515-7653](tel:919-515-7653). For more information on NC State's policy on working with students with disabilities, please see the [**Academic Accommodations for Students with Disabilities Regulation \(REG 02.20.01\)**](#). If the student requires an accommodation, it is their responsibility to contact the instructor and the DELTA Testing Center as soon as possible and well before any exams. DELTA is equipped to make any accommodation recommended by DSO, but prior arrangements are required to ensure that accommodations are in place for students when they arrive to take their exam. The student is required to verify whether or not they need to make exam appointments with DELTA and to make appointments if necessary for their accommodations.

Electronically-Hosted Course Components

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

Course Schedule (subject to change)

Aug 23: Introduction

Aug 28, 30: Introduction to Epidemiology and Causal Inference

Sept 4, 6: Public Health Surveillance

Sept 11, 13: Introduction to Ecological Studies, Cross-sectional design, Confounding

Sept 18, 20: Risk Ratios, Risk Difference, Odds Ratios

Sept 25, 27: Review cross sectional designs

Oct 2: **Midterm 1**

Oct 4: Fall Break, no class

Oct 9, 11: Cohort design, Multiple Linear Regression

Oct 16, 18: Case control design, Logistic Regression

Oct 23, 25: Screening tests

Oct 30, Nov 1: **Statistics Round Table Discussion**

Nov 6, 8: Hazard Ratios, Survival Analysis

Nov 13, 15: Hybrid/modern designs, Midterm review

Nov 20: **Midterm 2** (no class Nov 22 – Thanksgiving)

Nov 27, 29: Course takeaways, Finals review

Dec 4, 6: **Global public health paper on study design – class presentations**

Dec 11: **Final exam (8-11 am, in class)**

Policy on Discrimination

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <https://policies.ncsu.edu/regulation/reg-04-25-02>. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 515-3148.

Class Courtesy

Please refrain from use of cell phones or other handheld devices during class time. Repeat offenders may have their participation grade reduced, since it is a clear distraction from the class material. Use of laptops and tablets for class-related material is fine, but please refrain from any use or activity that will distract you or your fellow students.

GEP Requirements

This course does not meet any GEP requirements.