CUNY SPH
GRADUATE SCHOOL OF PUBLIC HEALTH & HEALTH POLICY

COURSE SYLLABUS

Population Health Dashboards
EPID 634
(section: 80)
3 Credits
Fall, 2025

Time and location	Online - Asynchronous
Instructor	Sehyun Oh, Ph.D., Assistant Professor Department of Epidemiology and Biostatistics Sehyun.Oh@sph.cuny.edu
Office hours	Available by appointment (https://calendly.com/sehyun-oh62/15-minutes-meeting)
Course Description	This course introduces students to the best practices in data visualization, producing effective visualizations, and communicating the results identified from data visualization. The course will cover the basics of <u>data collection, cleaning, and visualization</u> **using the R programming language**. Students will use publicly available health-related data to demonstrate their understanding of these concepts and practice their skills. By the end of the course, students will be able to create effective data visualizations in a dashboard format and communicate their findings to others.
Course prerequisites	None
Course format	Online
Course readings and resources	None
Additional reading and resources	• Data Analysis and Visualization in R for Ecologists (https://datacarpentry.org/R-ecology-lesson/index.html) • Introduction to Data Science: Data Wrangling and Visualization with R (http://rafalab.dfci.harvard.edu/dsbook-part-1/)

Program Competencies	Course Learning Objectives	Assessment Methods
This course will help you to:	*What skills and knowledge you will strengthen through the course:*	*Competencies and learning objectives will be assessed as part of the following:*
Assess stakeholder data, information, and knowledge needs	Compare techniques for representing population health data	• Quizzes • Presentation
Design, develop, and implement user-centered population health information systems using effective approaches	• Understand the basic concepts of data visualization ○ Learn key visualization skills and tools (R programming) ○ Understand how to clean and organize data for analysis and complete analysis for the Dashboard using R programming	• Data Science Units • Quizzes • Assignment • Develop an interactive dashboard using public health data of students' interest. The assignment is evaluated based on the effectiveness of the visualization and the user-friendliness of the dashboard.
Analyze strategies for integrating informatics knowledge within organizations and communities and maximizing the availability of information for public health through implementing solutions that ensure confidentiality, security, and integrity.	○ Understand the advantages and disadvantages of data visualization ○ Understand the weaknesses of several widely-used plots • Evaluate factors to be considered in the representation of health data • Summarize how storytelling techniques can make data meaningful • Discuss best practices in visualizing health data • Describe how location can be an important aspect of visualizing public health trends • Determine the essential features to inform the selection of visualization tools that are useful and effective • Evaluate the usefulness and effectiveness of population health dashboards ○ Practice effective communication both in written and verbal formats	• Data Science Units • Quizzes • Presentation • Assignment • Peer Review

Course Assessments

Assignments: There will be three assignments; <u>the worst will be removed</u> from the final grade. Assignments will involve reproducible analysis of a published dataset. The assignment you hand in should be individual, so it must be primarily your own work and must provide attribution for any code or text that you didn't write yourself. Each assignment will take an equal weight (9% of the total grade).

For **Assignment #3**, you can <u>work with your peers (optional)</u> in the assigned group. Your group member will have varying familiarity/proficiency in programming. While your final submission should be your own work, you are strongly encouraged to discuss the exploratory data analysis (EDA) process with your peers. Each group may request one synchronous session with the instructor to go over the progress and for Q&A.

Quizzes: There will be five quizzes; <u>the worst will be removed</u> from the final grade. You can take each quiz only once. Each quiz will take an equal weight (5% of the total grade). For example, if you receive 9 out of 15 points for Quiz 1, your final grade is lowered by only 2 points (6/15pts x 5%), not 6 points.

Peer Review: You will be assigned to review three of your classmates' presentations for two presentations. Your peer reviews are NOT used for the instructor's grading, but are a learning tool for you and the student whose assignment you are reviewing. Your feedback will be shared. To be fully scored, your review should follow the provided review guidelines/instructions. Each of your reviews will receive one point, so completing all peer reviews will earn 6 pts (1 point x 3 assigned x 2 presentations).

Data Science Units: These are graded for completion only. You earn 2.5 pts for each DataCamp module you complete, each of which takes ~4 hours. You can earn 25 pts by completing at least ten modules and 1 extra point if you finish all 14. You will be provided with a suggested module each week, but you are welcome to complete any combination of modules at any time you wish (even non-R-based modules). You can submit these early if you want to get them out of the way, but you cannot submit for a weekly deadline that has already passed. It is recommended to stay on top of these or even get ahead early in the course because they will help you with your assignments. The grading will be done altogether at the end of the semester.

Presentation #1: You will choose an existing public health dashboard or data visualization example that interests you. You will ask a question of your interest and demonstrate how to use a dashboard to answer your question. You should submit a <u>pre-recorded presentation of up to 5 minutes</u> on this activity. This mid-term presentation will contribute to 10% of the overall grade.

Presentation #2 (Final): For the final project, you will select the dataset of interest and create a dashboard. You will explore data visualization using <u>R or any other platform of your choice</u>. It has two parts - <u>a report and a pre-recorded presentation</u>. You will explain to the class why you chose the dataset, how you performed the analysis, and what conclusion you reached, using a

pre-recorded presentation of up to 7 minutes. The final project will contribute to 20% of the overall grade.

Grading

The relative weight of each course component is as follows:

Assessment	Weight
10 Data Science Unit	26%
Quizzes (best 4 out of 5)	20%
Assignments (best 2 out of 3)	18%
Presentation #1	10%
Presentation #2 (Final)	20%
Peer Review	6%
	100%

The grading system for the CUNY SPH is as follows:

Letter Grade	Quality Point Value	Percentage
A +	4	97.5% - 100%
A	4	92.5% - 97.4%
A-	3.7	90.0% - 92.4%
B+	3.3	87.5% - 89.9%
B	3	82.5% - 87.4%
B-	2.7	80.0% - 82.4%
C+	2.3	77.5% - 79.9%
C	2	70.0% - 77.4%
F	0	<70%

Course Policies
- Students are expected to participate in assignments, quizzes, presentations, and Data Science Units throughout the course.
- Late submissions are deducted at a rate of 4% of the total possible grade per hour, with a grade of zero assigned to any submission that is more than 25 hours late.
- There are **_no_** provisions for make-ups, rewrites, or extra credit. Flexibility is provided to everyone through not counting your worst quizzes, assignment, and Data Science Units (see grading section).
- Questions about applying rubrics (*e.g.,* how a certain answer will be graded) can be discussed only **_after_** the score for the submitted work is announced. This is because the instructor will make the final adjustment/grading details only after all the students' results are collected.
- The instructor will generally respond to emails within 2 business days. If you do not receive a response to an email after 2 days, please re-send it to ensure its delivery.
- Quizzes (if they include assay-type answers) and assignments will be graded and returned within 2 weeks of their submission deadline.

Grade appeals

If you want to challenge an earned final grade for a course, please use the grade appeals process. Details about the academic appeals procedures can be found in the School's academic policies under the School's current catalog.

Withdrawal

The Academic Calendar has all the deadlines to drop or withdraw from a course.

Grade of Incomplete

Incomplete final grades will not be granted unless the request is justified by a legitimate and documented emergency. The granting of an incomplete grade is at the discretion of the instructor. Refer to the School's academic policies for further details.

Accessibility

To request accommodation because of a disabling medical condition, disability, or pregnancy and recovery, confidentially set up an account with the CUNY SPH Office of Accessibility Services (OAS). Then, before the start of every semester, email OAS with your course number(s) and corresponding instructor name(s) to accessibility@sph.cuny.edu. For Religious Accommodations, contact the Associate Dean of Student Affairs & Alumni Relations, Lynn Roberts lynn.roberts@sph.cuny.edu. For Accommodations based on Status as a Victim of Domestic Violence, Sex Offense, or Stalking, contact Sahana Gupta, Title IX, and ADA-504 Coordinator at sahana.gupta@sph.cuny.edu. If you believe that an accommodation because of a disabling medical condition, disability, or pregnancy and recovery has not been appropriately determined or implemented and you wish to appeal the denial, contact Sahana Gupta, Title IX and ADA-504 Coordinator at sahana.gupta@sph.cuny.edu.

CUNY SPH follows the CUNY Reasonable Accommodations and Academic Adjustments Policy. Requesting a Disability Accommodation or Academic Adjustment and for Accommodations based on Pregnancy, Childbirth or a Related Medical Condition (Under Title IX of the Education Amendments of 1972 students are also protected from sex-based discrimination, which includes pregnancy and recovery). CUNY SPH complies with the CUNY Policy on Equal Opportunity and Nondiscrimination and Policy on Sexual Misconduct (Title IX). For more information, please see the Equity, Diversity & Inclusion Policy and Compliance webpage.

Academic integrity

CUNY regards acts of academic dishonesty (e.g., plagiarism, cheating on exams, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. CUNY is committed to enforcing the Policy on Academic Integrity and will pursue cases of academic dishonesty. Academic dishonesty can result in failing the assignment or even the course.

Students in this class are encouraged to help each other in figuring out how to do assignments and to share specific and limited pieces of code. However, **the work you hand in for assignments must be primarily your own**. *Your assignments will be checked using automatic plagiarism detection software.* Any borrowed code must be attributed to its author or it may be considered plagiarism. *All incidents of academic misconduct will be reported to the CUNY SPH Academic Integrity office.*

Support Resources
- IT Resources and SPH Helpdesk
- Library Services

- [Writing Assistance](#)
- [Quantitative Tutoring](#) - This is an excellent, personalized tutoring service. Particularly if you are finding the R programming challenging, use it!!
- [Counseling and Wellness Services](#)
- [The Office of Accessibility Services](#)
- [Healthy CUNY](#) works with partners inside and outside of CUNY and promotes well-being and a culture of health to foster the academic and life success of our students. Visit [their website](#) for more information about resources related to food security, mental health, sexual health, housing, COVID-19, and more.

Consent to being recorded

Students who participate in this class with their camera on or use a profile image agree to have their video or image recorded solely to create a record for students enrolled in the class to refer to, including those enrolled students who cannot attend live. If you are unwilling to consent to recording your profile or video image, keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally agree to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.

Use of Artificial Intelligence (ChatGPT, Bing, Bard, GitHub Copilot, etc)

You are permitted to make use of AI tools in this class. The most recommended use cases include 1) improving the clarity and grammatical construction of your own writing, as long as you check the result for completeness and correctness, and 2) learning new concepts or getting some insights into valid approaches in programming. However, the output from prompts requesting code or answers/writings can contain inaccuracies and often produces code that must be edited further to be runnable and produce the desired result. Handing in such text or code without having full knowledge of what it does and testing it yourself will likely result in a zero score for the submitted work because such errors/patterns are evident to an expert reviewer, and they reveal a lack of grasp of the material. Note that all assignments are automatically machine-checked for plagiarism, and you are responsible for anything you hand in, so directly using text generated from short prompts to AI tools can expose you to discipline for plagiarism if the tool's output was copied from the Internet (see section on "Academic integrity").

Course Schedule

Please see the [CUNY Graduate School of Public Health and Health Policy's Academic Calendar](#) for important dates, including holidays and course drop/course withdrawal deadlines. The following schedule is subject to change throughout the semester (see header for "Last Updated" date.)

EPID634 requires ~9 hours per week (3 hours/credit x 3 credits).

#	Date (Mon)	Topic	Data Science Unit	Due For
0	8/26 (Tue)	• Introduction • Setup	-	Survey 1
1	9/2 (Tue)	• What is Data Visualization? • What is R and RStudio?	Unit 1	
2	9/8	• Visualization methods • Introduction to R	Unit 2	Quiz 1
3	9/15	• (continued) Visualization methods • Starting with Data	Unit 3	Presentation 1
4	9/22	• Data wrangling with *Tidyverse*	Unit 4	• Peer review • Quiz 2
5	9/29	• Data visualization principles • Reproducible projects with markdown	Unit 5	
6	10/6	Assignment 1	Unit 6	Assignment 1
7	10/13	• Geographic Information Science (GIS)	Unit 7	Quiz 3
8	10/20	• Data visualization with *ggplot2*	Unit 8	Survey 2
9	10/27	• (continued) Data visualization with *ggplot2*	Unit 9	
10	11/3	Assignment 2	Unit 10	Assignment 2
11	11/10	• Interactive visualization using Shiny	Unit 11	Quiz 4
12	11/17	• Storytelling	Unit 12	
-	11/24	No lecture		
13	12/1	• Processing JSON data	Unit 13	Assignment 3
14	12/8	Presentation 2 (Final)		
15	12/15	• SQL databases and R	Unit 14	• Peer review • Quiz 5