



EPI T680: Electronic Health Records (Analysis of Healthcare Data and Electronic Health Records)

Term of Offering: Winter

Credit hours: 3

Pre-requisites: None

Meeting time, meeting frequency: Asynchronous virtual

Instructor Information

Instructor Name: Neal D. Goldstein, PhD, MBI

Contact information (phone, e-mail, website): ng338@drexel.edu; 267.359.6126

Office hours: Virtual office hours will be held every Wednesday, from 4-5pm Eastern (Zoom link on Blackboard); or email to setup a virtual meeting

Course Description

Given the near ubiquity of electronic data in healthcare, including electronic health records (EHRs) and insurance claims databases, researchers must be aware of the opportunities and limitations of these data for research purposes. More data do not necessarily equate to better quality research. This course introduces students to the concept of the electronic health record, insurance claims data, and healthcare delivery; discusses how these data can be used for research; and addresses the shortcomings of these data. After taking this course, students will be able to design, conduct, and interpret studies performed using secondary data from the EHR and claims databases.

Course Purpose

This is an elective course for in the graduate program of epidemiology open to all masters or doctoral level students. The course is intended to provide students who may be working with EHR and insurance claims data in their careers the necessary skills and knowledge for doing so.

Course Materials

Required: [A researcher's guide to using electronic health records.](https://www.goldsteinepi.com/books/ehr/index.html) Goldstein ND. © 2023 Routledge. 2nd edition. Book website: <https://www.goldsteinepi.com/books/ehr/index.html>

Drexel library has both a hard copy and an Ebook available:

https://drexel.primo.exlibrisgroup.com/permalink/01DRXU_INST/1pcij0q/cdi_askewsholts_vlebooks_9781000908886

Course Learning Objectives

- Understand what is meant by the electronic health record and insurance claims
- Define the architecture of the EHR including database systems
- Discuss clinical workflow and how clinicians interact with the EHR
- Enumerate the various data types found in the EHR
- Formulate a research question that uses EHR or insurance claims data
- Identify the pros and cons of EHR and claims data
- Work with real EHR data
- Define what is meant by EHR data quality, data completion, and patient catchment
- Create an analytic approach for working with EHR and claims data in a research study
- Connect theory to practice in terms of research case studies

Assignments and Grading

Graded Assignments

There are five graded assignments in the course, one per module (every 2 weeks). For additional details including due dates, check Blackboard.

Module 1. *EHR vendor.* Group assignment. Each group must select a unique EHR vendor and describe the product. You may not select one of the EHRs demonstrated in this module: i.e., Cerbo, VistA, or Epic. This assignment is intentionally open ended to allow for your creativity, but at a minimum you need to cover the EHR product, vendor, market, applications, and research support, if any. I would also suggest conducting a brief literature search to see if this EHR has been used in epidemiological research before. Recommended presentation length: 10-15min. After the main deliverable has been turned in, please use this Group Peer Review Form to evaluate your teammates.

Module 2. *Summary of interviews.* Individual assignment. Please select four (4) of your favorite "Interviews with a Clinician" and summarize their interviews. As part of this summary,



please compare and contrast their position on the use of EHRs for research including pros and cons. Recommended length of report: ~1,000-1,500 words.

Module 3. Working with EHR data. Individual assignment. After completing the required MIMIC training on the responsible conduct of EHR research, you will have access to real EHR data and asked to respond to several questions regarding the data. Students may use any statistical software of their choosing, but the assignment may be completed just using Excel.

Module 4. Designing EHR research. Individual assignment. You are asked to 1) find a published article that has used EHR data, 2) complete the research planner (as much as possible) using the information gleaned from the article, and 3) write a brief report summarizing the research study and the ability to which the article conveyed the important aspects of research captured in the planner. Recommended length of report: ~500 words + completed planner.

Module 5. EHR case study. Group assignment. Each group must select one case study and one case brief from the course textbook and respond to the questions. Unlike the first group assignment, groups may select the same questions, but each group must work separately. Recommended length of report: ~1,500-2,000 words.

Evaluation method/Assignment	Proportion of final grade
Module 1. EHR vendor	10%
Module 2. Summary of interviews	20%
Module 3. Working with EHR data	30%
Module 4. Designing EHR research	20%
Module 5. EHR case study	20%

Grading Scale

A+	98-100
A	94-97
A-	90-93
B+	88-89
B	84-87
B-	80-83
C+	78-79
C	74-77



C-	70-73
D+	64-69
D	60-63
F	Below 60

Grading Criteria

- All assignments are assessed based on the grading scale above. Specific information about grading criteria will be distributed with the assignment.
- Late or incomplete assignments will not be accepted and graded as zero points.
- There are no make-ups or rewrites allowed.
- Students are expected to actively contribute to the discussion. Contributions will be assessed by the number, tone, and content.
- **Assignments must be submitted by date indicated on Blackboard.**

Generative AI Statement

The use of ChatGPT or its equivalent in any aspect of this class -- including but not limited to programming code, discussion board posts, written assignments, and PowerPoint slide decks -- is expressly prohibited and constitutes plagiarism. Any student who uses this technology or plagiarizes others will at a minimum receive a zero on the assignment and at a maximum receive an 'F' for this class and be referred to the Office of Academic Integrity.

Course Calendar

Week	Topic/Lecture	Reading/Resource	Assignment
1	Module 1: The Technology	EHR book: Chapters 1 & 2	EHR vendor
2	-What is the EHR? -Databases and EHR architecture -Demo of a simple EHR: Cerbo -Demo of a legacy EHR: VistA -Demo of a complex EHR: Epic		



3	Module 2: The Clinician -Concepts in healthcare -Interview with a clinician	EHR book: Chapter 2	Summary of interviews
4		Articles: Gawande; Hunter	
5	Module 3: The Data -Obtaining EHR data -Accessing EHR data (Epic) -Data management, privacy, and security -Missing data in the EHR	EHR book: Chapters 4, 5, & 6	Working with EHR data
6			
7	Module 4: The Epidemiology -Introduction to epidemiology (optional) -Planning for EHR research -Epidemiological challenges -Advanced and emerging methods -Working with free text	EHR book: Chapters 3, 7, 9, & 12; Appendix 1 Article: Gianfrancesco & Goldstein	Designing EHR research
8			
9	Module 5: The Applications -Surveillance -Case studies	EHR book: Chapters 14 & 15	EHR case study
10			
11	Finals Week	--	NO FINAL



Dornsife Antiracism Accountability Agreement

The Dornsife School of Public Health is committed to the creation of a community with an emphasis of antiracism and inclusion, that welcomes diversity along numerous dimensions of identity (i.e. race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs). The school is located on traditional territory of the Lenni Lenape Nation and in West Philadelphia, which is comprised of a majority-Black community that has faced harms of gentrification such as displacement, rising real estate costs, and social or cultural exclusion driven by local universities. We have a responsibility to learn about this ongoing history and work towards equitable public health and research partnerships. We achieve that by continuous engagement and collaborative growth in teaching, service and scholarship that consistently challenges oppressive and unjust forces of hate. Also, we recognize that our teaching and learning experiences are impacted by racism, sexism, and other systems of oppression that differentially shape access to and ability to thrive within graduate education. However, through this course we will work to dismantle these norms. As the instructor, I ask that students who are very comfortable participating in class strive to make room for other voices, and I encourage those who tend to be quieter to speak up, whether verbally or in writing. The success of this course is dependent upon each of us to create a safe and restorative learning environment that allows for the open exchange of ideas, raising student and instructor awareness of the ongoing threat of bias and racism, the need to take personal responsibility in creating an inclusive learning environment and creating equitable opportunities and respect for all persons. Everyone is expected to actively participate in establishing and maintaining an environment where all students, staff, and faculty regardless of race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs can contribute without fear of personal ridicule, or intolerant or offensive language.

**If you have concerns about classroom climate (i.e. witness or experience racism, discrimination, micro-aggressions, or other offensive behavior) you are encouraged to bring this to the attention of the course director, your advisor, a member of the departmental or SPH Diversity Committee and/or the program director if you feel comfortable so that we can learn from it and take steps to make our class environment safer for all. You can also report these behaviors to the [Office for Institutional Equity and Inclusive Culture](#).

Course Expectations

Students

- Show respect to everyone in the course.
- Study all material assigned in the course.
- Be prepared to actively participate in discussion and assignments. Missed assignments or lack of discussion participation not only affect the individual student, but they also affect the class as a whole due to the high degree of interaction within the course.
- Complete all assignments by their assigned due date. No credit will be given for work completed after the due date.
- No credit will be given for assignments suspected of plagiarism or cheating.



- Report violations of academic integrity standards to the instructor.
- Regularly check Drexel Learn and their official university email for course correspondence.
- Post questions about the course content and assignments in the discussion board.
- Contact the professor directly with individual questions related to the course.
- Ask questions and clarify course assignments and expectations.

Instructor

- Provide regular announcements, reminders, and suggestions on Drexel Learn.
- Monitor and answer questions presented during discussion
- Respond to student email within 2 business days. Do not expect a response to email during the weekend.
- Meet with students during posted office hours or by appointment.
- Provide feedback on assignments within one week of the due date.
- Post grades on Drexel Learn.

Academic Policies

Absence from Class

<https://drexel.edu/provost/policies-calendars/policies/absence/>

Academic Integrity

<https://drexel.edu/provost/policies/academic-integrity/>

Academic Calendar

<https://drexel.edu/provost/calendars/academic-calendars/>

Acceptable Use

<https://drexel.edu/it/about/policies/policies/01-Acceptable-Use/>

Course Add/Drop

<https://drexel.edu/provost/policies/course-add-drop/>

Course Withdrawal

<http://drexel.edu/provost/policies/course-withdrawal>



Grade Appeal

<https://drexel.edu/provost/policies/grade-appeals/>

Grading Scale and Grade of Incomplete

<https://drexel.edu/registrar/grades/overview/grading/>

Prohibition Against Recording Class Sessions and Appropriate Use of Course Materials

In general, students and others should not record course interactions and course activities in lecture, lab, studio or recitation. Students who have an approved accommodation from the Office of Disability Resources to record online lectures and discussions for note taking purposes should inform their course instructor(s) of their approved accommodation in advance. The recording of lectures and discussions may only be carried out by the students enrolled in the class who have an approved accommodation from Disability Resources with their instructors' prior knowledge and consent. Students with approved accommodations may be asked to turn off their recorder if confidential or personal information is presented.

If a student has any comments, concerns, or questions about provided class materials and/ or recording, talk to your course instructor first. If this does not resolve the issue, you can also reach out to the Department Head, and use the process described for a grade appeal to move your concern forward. The process described for grade appeals can be found at:

<https://drexel.edu/provost/policies/grade-appeals/>

Student Support Services

Center for Learning and Academic Success Services

https://drexel.edu/studentlife/student_family_resources/class/

Counseling and Health Services

https://drexel.edu/studentlife/support_health_services/overview/

Disability Resources

Main Building

3141 Chestnut Street, Suite 228

Philadelphia, PA 19104

Phone: 215.895.1401

TTY: 215.895.2299

Fax: 215.895.1402

Email: disability@drexel.edu



Testing: testproctoring@drexel.edu
<https://drexel.edu/disability-resources/>

IT Help Desk

<https://drexel.edu/it/services/catalog/helpdesk/>

Library

<https://www.library.drexel.edu/services/services-for/students/>

Student Center for Diversity and Inclusion

<https://drexel.edu/studentlife/diversity/overview/>

Student Well-Being

Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc. If you are experiencing concerns, seeking help is a courageous thing to do for yourself and those who care about you. If the source of your stressors is academic, please contact me so that we can find solutions together, or you can also reach out to your [academic advisor](#).

For personal concerns, Drexel has many [Student Life](#) services and resources available. Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course is urged to contact the Dean of Students for support (deanofstudents@drexel.edu; 215-895-2506).

Course Syllabus Disclaimer

Please note the syllabus may change based on the need to adapt to student interests, feedback and expertise. Always check Drexel Learn and your official university email for the most up-to-date information on the course.