

EPID 210: Epidemiology of Aging
Department of Epidemiology and Biostatistics

Overview

- Term: Winter 2020
- Schedule: Fridays, January 8 - March 19, 8:45am to 10:15am
- By Zoom
- Units: 2

Faculty and Staff

Primary Instructor

Jackie Torres (pronouns: she/her), PhD
Assistant Professor, Department of Epidemiology and Biostatistics
Jacqueline.Torres@ucsf.edu
Office Hours: By Appointment

Guest Lecturers

Steve Cummings, MD, FACP
Professor Emeritus, Department of Medicine
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Peggy Cawthon, PhD, MPH
Associate Professor, Department of Epidemiology and Biostatistics
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Kala Mehta, DSc, MPH
Associate Professor, Department of Epidemiology and Biostatistics
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Course Coordinator

Clair Dunne, MPA
Analyst 4, Department of Epidemiology and Biostatistics
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Objectives

This seminar course offers an introduction to the methods involved in epidemiologic research of aging and to common functional impairments in elderly populations. Students will learn to integrate epidemiologic methods and subject matter knowledge to critically appraise literature about aging and age-related diseases and disorders. The course is designed to complement the T32 training program in chronic disease and aging.

Upon completion of this course, students will be able to:

- Understand theories of biological and social processes that underlie the development of diseases and disorders in aging populations
- Understand common applications of epidemiological methods to questions asked in aging populations, especially in a longitudinal context
- Identify core sources of bias in epidemiologic research on age and age-related diseases and approaches to measuring and addressing these sources of bias.
- Identify major risk factors associated with diseases and disorders in older populations

Prerequisites

This course is appropriate for any graduate student, postdoc, fellow, or faculty in a health sciences discipline who is interested in the topic.

Course Format

Course content will be delivered through interactive weekly lectures by Zoom. All course materials will be made available through the course website.

Course Requirements

- Class Participation (25%): Dynamic discussion is critical for this course. It is thus essential that students read the assigned materials and actively participate in the classroom. Students should plan to attend all sessions.
- Write-up Regarding Measurement (15%): Each student must focus on a unique chronic disease or disorder, type of physical or cognitive dysfunction, or mood disorder associated with aging and write three single-spaced pages (not including references) that consider the issues of measurement that may arise in research in the selected domain in epidemiologic research. Use standard 8.5"x11" pages with 1-inch margins and an 11- or 12-point standard font. Adhere to length limits; the instructor will not read beyond the length specified. Due at 8:45am on January 29th.
- Student Measurement Presentation (25%): Each student must prepare a 15-minute lecture and lead a five-minute discussion regarding the domain selected for their measurement assignment. Students should define the condition, provide descriptive epidemiology, and introduce a methods concern (other than measurement) relevant to studying the disorder. Slides should be uploaded by 8:00am on the day of the presentation.
- Final Assignment (35%): This assignment will center on an unsettled question or debate relevant to the epidemiology of aging – and ideally to the student's own research interests. This assignment will require writing five single-spaced pages that describe the unsettled question or debate with a brief summary of existing literature, the competing theoretical perspectives, the core methodological issues that have precluded a clear answer to the question (with a focus on selection bias and/or measurement error as relevant to your study), and the ideal study or set of studies that would be required to settle the debate, argument, or unsettled question in the epidemiology of aging. Use standard 8.5"x11" pages with 1-inch margins and an 11- or 12-point standard font. Adhere to length limits; the instructor will not read beyond the length specified. Due at 8:45am on March 19th. **All assignments should be turned in on the course website.**

Schedule

Date	Topic(s)	Presenter(s)	Assignment(s)
Jan 8	- Course Introduction - Epidemiology of Aging	Jackie Torres	- Aronson L. (2019). <i>Elderhood</i>. [Excerpt, pp. 75-81]. New York: Bloomsbury Publishing. - Beam Dowd J et al. Demographic Science Aids in Understanding the Spread and Fatality Rates of COVID-19. <i>PNAS</i>. 2020; 117(18): 9696-9698. https://www.pnas.org/content/117/18/9696 - Nepomuceno MR et al. Besides Population Age Structure, Health and other Demographic Factors can Contribute to Understanding the COVID-19 Burden. <i>PNAS</i>. 2020; 117(25): 13881-13883. - Crimmins E & Beltrán-Sánchez H. Mortality and Morbidity Trends: Is There a Compression of Morbidity? <i>JGSS</i>. 2010. 66B(1): 75-86. https://academic.oup.com/psychsocgerontology/article/66B/1/75/583170
Jan 15	Methods Themes: Selection Bias	Jackie Torres	- Rank three possible topics for the measurement assignment (January 29) and student presentation. The instructor will choose one of the three topics (so as to avoid overlap across students). - Banack H et al. Investigating and Remediating Selection Bias in Geriatrics Research: The Selection Bias Toolkit. <i>JAGS</i>. 2019; 67: 1970-1976. - Howe C & Robinson WR. Survival-Related Selection Bias in Studies of Racial Health Disparities: The Importance of the Target Population and Study Design. <i>Epidemiology</i>. 2018; 29: 521-524. - Ospina-Romero M, et al. Association Between Alzheimer Disease and Cancer with Evaluation of Study Biases: A Systematic Review and Meta-Analysis. <i>JAMA Netw Open</i>. 2020; 3(11): e2025515. Additional/Recommended Readings and Resources: <u>More reading on quantifying/addressing selection bias in the epidemiology of aging</u> - Mayeda ER, et al. Can Survival Bias Explain the Age Attenuation of Racial Inequalities in Stroke Incidence? A simulation study. <i>Epidemiology</i>. 2018; 29(4): 525-532. - Long DL et al. An Investigation of Selection Bias in Estimating Racial Disparity in Stroke Risk Factors. <i>Am J Epidemiol</i>. 2019; 188(3): 587-597. - Weuve J et al. Accounting for Bias Due to Selective Attrition: The Example of Smoking and Cognitive Decline. <i>Epidemiology</i>. 2012; 23(1): 119-128. <u>More on the inverse cancer-AD association</u>

			• Driver JA, Beiser A, Au R, et al. Inverse Association Between Cancer and Alzheimer's Disease: Results from the Framingham Heart Study. <i>BMJ</i>. 2012;344: e1442. PMID: 22411920. • Ospina-Romero M et al. Rate of Memory Change Before and After Cancer Diagnosis. <i>JAMA Netw Open</i>. 2019; 2(6): e196160. • Hayes-Larson E. The competing risk of death and selective survival cannot fully explain the inverse cancer-dementia association. <i>Alzheimer's & Dementia</i>; 2020;16:1696-103. • <u>Recruitment and retention:</u> • Special issue of <i>Ethnicity & Disease</i> on recruitment and retention of diverse older adults in Alzheimer's disease research: https://www.ethndis.org/edonline/index.php/ethndis • Talk for the Methods for Longitudinal Dementia Research group (MELODEM) by Dr. Jonathan Jackson: https://www.dropbox.com/s/gz4yp3sp2kqcdin/JJackson_CNS_051420.mp4?dl=0 • Gleason et al. Association between Enrollment Factors and Incident Cognitive Impairment in Blacks and Whites: Data from the Alzheimer's Disease Center. <i>Alzheimer's & Dementia</i>. 2019; 15(12):1533-1545. • <u>General resources on selection bias and solutions:</u> • Howe CJ, Cole SR, Lau B, Napravnik S, Eron JJJ. Selection Bias Due to Loss to Follow Up in Cohort Studies. <i>Epidemiology</i>. 2016;27:91-97. Note: This is a more technical article on selection bias in cohort studies, with the motivating example based on HIV cohort studies. • Dr. Howe's EpiTools Seminar Session: https://www.youtube.com/watch?v=n2c5TCFKg_o&feature=youtu.be • Chapter 8 from: Hernán MA, Robins JM (2020). Causal Inference: What If. Boca Raton: Chapman & Hall/CRC. https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1268/2020/11/ciwhatif_hernanrobins_23nov20.pdf. Note: This is a more technical chapter from one of the leading textbooks for causal inference in epidemiology.
Jan 22	• Methods Themes: Measurement in Elderly Populations	Jackie Torres	• Gianattasio KZ, Wu Q, Glymour MM, Power MC. Comparison of Methods for Algorithmic Classification of Dementia Status in the Health and Retirement Study. <i>Epidemiology</i>. 2019; 30(2):291-302. • Freedman VA et al. Validation of New Measures of Disability and Functioning in the National Health and Aging Trends Study. <i>Journals of Gerontology: Medical Sciences</i>. 2011; 66A(9):1013-1021. • Magaziner J, Zimmerman SI, Gruber-Baldini AL, Hebel JR, Fox KM. Proxy reporting in five areas of functional status: Comparison with self-reports and observations of performance. <i>Am J Epidemiol</i>. 1997 Sep 1;146(5):418-28

			Additional Readings and Resources: More Proxy-Self-Objective Comparisons from the Baltimore Hip Fracture Study: • Shardell M, Alley DE, Miller RR, Hicks GE, Magaziner J. Comparing reports from hip-fracture patients and their proxies: implications on evaluating sex differences in disability and depressive symptoms. <i>J Aging Health</i>. 2012;24:367–383. • Shardell M, Simonsick EM, Hicks GE, Resnick B, Ferrucci L, Magaziner J. Sensitivity analysis for nonignorable missingness and outcome misclassification from proxy reports. <i>Epidemiology</i>. 2013;24(2):215-223. doi:10.1097/EDE.0b013e31827f4fa9
Jan 29	• Biology of Aging	Steve Cummings	• Write-up Regarding Measurement Due • Readings to be posted about 10 days before class.
Feb 5	• Global Perspectives on Aging	Kala Mehta	• No readings this week
Feb 12	• The Life Course Perspective and Longitudinal Methods for Aging Populations	Jackie Torres Student presentations	• If applicable, upload presentation slides to the course website. • Required Readings: • Power MC, et al. (2013). Blood Pressure and Cognition: Factors that May Account for their Inconsistent Association. <i>Epidemiology</i> 24(6): 886-893. • Mishra G, Nitsch D, Black S, et al. A Structured Approach to Modelling the Effects of Binary Exposure Variables Over the Life Course. <i>Int J Epidemiol</i>. 2009;38(2):528-37. PMID: 19028777. More Readings and Resources: <u>Definitions of the Field and Key Terms in Life-Course Epidemiology</u> • Kuh et al. Life course epidemiology. <i>J Epidemiol & Community Health</i>. 2003; 57: 778-773 <u>More on the Life-course Perspective and Late-Life Health Inequities:</u> • Johnson RC, Shoeni R. Early-Life Origins of Adult Disease: National Longitudinal Population-Based Study of the United States. <i>Am J Pub Health</i>. 2011; 101(12): 2317-2324. • Marden J et al. Contribution of Socio-economic Status at 3 Life-Course Periods to Late-Life Memory Function and Decline: Early and Late Predictors of Dementia Risk. 2017; 186(7): 805-814. • Glymour MM & Manly JJ. Lifecourse Social Conditions and Racial and Ethnic Patterns of Cognitive Aging. <i>Neuropsychol Rev</i>. 2008; 18(3): 223-254. <u>More on the Life-course Perspective as Relevant to the Blood Pressure-Cognition Relationship</u>

			- Launer LJ, Ross GW, Petrovitch H, Masaki K, Foley D, White LR, Havlik RJ. Midlife blood pressure and dementia: the Honolulu-Asia aging study. <i>Neurobiol Aging</i>. 2000;21(1):49-55. - Power MC et al. Life-course Blood Pressure in Relation to Brain Volumes. <i>Alz & Dementia</i>. 2016; 12(8): 890-899.
Feb 19	Multimorbidity and Chronic Disease	Jackie Torres Student Presentations	- If applicable, upload presentation slides to the course website. Required Readings: - Lunde et al. The role of comorbidity in mortality after hip fracture: A nationwide Norwegian study of 38136 women with hip fracture matched to a general-population comparison cohort. <i>Am J Epidemiol</i>. 2018; 188(2): 398-407. - Quiñones AR et al. Racial/ethnic differences in multimorbidity development and chronic disease accumulation for middle-aged adults. <i>PLoS One</i>. 2019; 14(6): e0218462.
Feb 26	The Epidemiology of Sarcopenia	Peggy Cawthon	- If applicable, upload presentation slides to the course website. - Manini TM, Clark BC. Dynapenia and aging: an update. <i>J Gerontol A Biol Sci Med Sci</i>. 2012 Jan;67(1):28-40. doi: 10.1093/gerona/gle010. Epub 2011 Mar 28. PMID: 21444359; PMCID: PMC3260480. https://pubmed.ncbi.nlm.nih.gov/21444359/ - Bhasin S, Travison TG, Manini TM, Patel S, Pencina KM, Fielding RA, Magaziner JM, Newman AB, Kiel DP, Cooper C, Guralnik JM, Cauley JA, Arai H, Clark BC, Landi F, Schaap LA, Pereira SL, Rooks D, Woo J, Woodhouse LJ, Binder E, Brown T, Shardell M, Xue QL, D'Agostino RB Sr, Orwig D, Gorsicki G, Correa-De-Araujo R, Cawthon PM. Sarcopenia Definition: The Position Statements of the Sarcopenia Definition and Outcomes Consortium. <i>J Am Geriatr Soc</i>. 2020 Jul;68(7):1410-1418. doi: 10.1111/jgs.16372. Epub 2020 Mar 9. PMID: 32150289. https://pubmed.ncbi.nlm.nih.gov/32150289/ - Bianchi L, Ferrucci L, Cherubini A, et al. The Predictive Value of the EWGSOP Definition of Sarcopenia: Results From the InCHIANTI Study. <i>J Gerontol A Biol Sci Med Sci</i>. 2016;71(2):259-64. PMID: 26333772
Mar 5	Alzheimer's Disease and Dementia	Jackie Torres	- If applicable, upload presentation slides to the course website. Required readings: - Satizabal CL, Beiser AS, Chouraki V, et al. Incidence of Dementia over Three Decades in the Framingham Heart Study. <i>N Engl J Med</i>. 2016;374(6):523-32. PMID: 26863354. - Skoog et al. Decreasing Prevalence of Dementia in 85-year olds examined 22 years apart: the influence of education and stroke. <i>Scientific Reports</i>. 2017; 7(1): 6136
Mar 12	Cognitive Decline and Cognitive Reserve	Jackie Torres	- If applicable, upload presentation slides to the course website. Required readings: - Ávila J et al. Education differentially contributes to cognitive reserve across racial/ethnic groups. <i>Alz & Dementia</i>. 2021; 17: 70-80. - Mayeda ER et al. Does selective survival before study enrollment attenuate estimated effects of education on rate of cognitive decline in older adults? <i>A</i>

			simulation approach for quantifying survival bias in lifecourse epidemiology. <i>Int J Epidemiol</i> ; 2018: 1507-1517.
Mar 19	• Course Wrap-up	Jackie Torres	• Final papers due