Population Health's Perspective on an Aging Society

Jessica Faul, PhD, MPH

RCCN Workshop – Multidisciplinary Research in Aging and Team Science

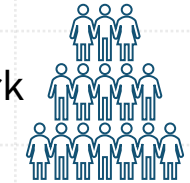
May 21, 2026

HRS | HEALTH AND RETIREMENT STUDY at the University of Michigan

The Health and Retirement Study is a longitudinal project sponsored by the National Institute on Aging (NIA U01AG009740) and the Social Security Administration.

The Tricky Target

- For this to work we need representative samples at some point in the process…



GENERALIZABILITY

Representative samples
Longitudinal collection
Harmonized data

PREDICTION



- Optimizing prediction often yields little biological insight



BIOLOGY

- "A brain is a brain," "A gene is a gene"
- Can be reductionist or ignore social and environmental context
- Limited prediction

- High internal validity is needed but often comes at the expense of portability
- Biomarkers do not predict equally well across groups



INTERNAL VALIDITY

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Population-based Studies

- Studies like the Health and Retirement Study facilitate our understanding of aging by being:
  - Public use
  - Multi-disciplinary in what is collected
  - Longitudinal
  - Nationally representative with sub-population oversamples
    - Exceptional representation of Black and Hispanic populations
    - Good national representation of education, other characteristics
    - Good national coverage of rurality, other spatial characteristics
  - Internationally comparable (harmonized)

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Health and Retirement Study

- Core survey is the foundation of a much larger structure including:
  - Administrative linkages (SSA, CMS, VA, 1940 Census, CenHRS)
  - Biomarkers (physical measures, dried blood spots, venous blood, serum/plasma/DNA/cryopreserved cells)
  - Harmonized cognitive assessment protocol (HCAP)
  - Geographic linkages to contextual data (ACS, Census, EPA, USDA etc.)

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Important in Establishing National Prevalence and Trends

[Prev Alz Dis 2024;5(11):1183-1188
Published online June 20, 2024, http://dx.doi.org/10.14283/jpad.2024.114

Original Research

Prevalence Estimation of Dementia/Alzheimer's Disease Using Health and Retirement Study Database in the United States

A.A. Tahami Monfared[1,2], N. Hummel[3], A. Chandak[4], A. Khachatryan[5], R. Zhang[1], Q. Zhang[1]

l. Eisai Inc., USA; 2. Epidemiology, Biostatistics and Occupational Health, McGill University, Canada; 3. Certara GmbH, Germany; 4. Certara Inc., USA; 5. Certara Ltd., JK.

JOURNAL ARTICLE

Persistent, Consistent, and Extensive: The Trend of Increasing Pain Prevalence in Older Americans

Zachary Zimmer, PhD ✉, Anna Zajacova, PhD

The Journals of Gerontology: Series B, Volume 75, Issue 2, February 2020, Pages 436–447,
https://doi.org/10.1093/geronb/gbx162
Published: 20 March 2018 **Article history** ▾

Multimorbidity and the Transition Out of Full-Time Paid Employment: A Longitudinal Analysis of the Health and Retirement Study

Sander K R van Zon, PhD ✉, Sijmen A Reijneveld, MD, PhD, Anne Galaurchi, BSc, Carlos F Mendes de Leon, PhD, Josué Almansa, PhD, Ute Bültmann, PhD

The Journals of Gerontology: Series B, Volume 75, Issue 3, March 2020, Pages 705–715,
https://doi.org/10.1093/geronb/gbz061

REVIEW OF POLITICAL ECONOMY
2024, VOL. 36, NO. 2, 461–480
https://doi.org/10.1080/09538259.2024.2318956

Routledge
Taylor & Francis Group

OPEN ACCESS Check for updates

No Rest for the Weary: Measuring the Changing Distribution of Retirement Wealth in the United States

Teresa Ghilarducci[a], Siavash Radpour[b] and Jessica Forden[a]

[a]Schwartz Center for Economic Policy Analysis (SCEPA), New School for Social Research, New York, NY, USA; [b]Economics, Stockton University, Stockton, NJ, USA

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Examination of Social and Environmental Contextual Effects

Contents lists available at ScienceDirect

Ageing Research Reviews

journal homepage: www.elsevier.com/locate/arr

Social hallmarks of aging: Suggestions for geroscience research

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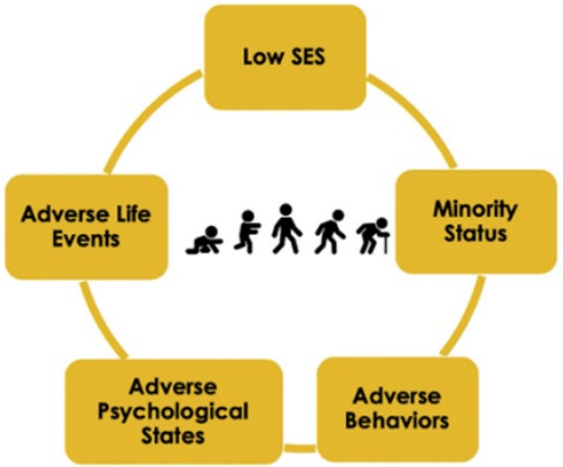
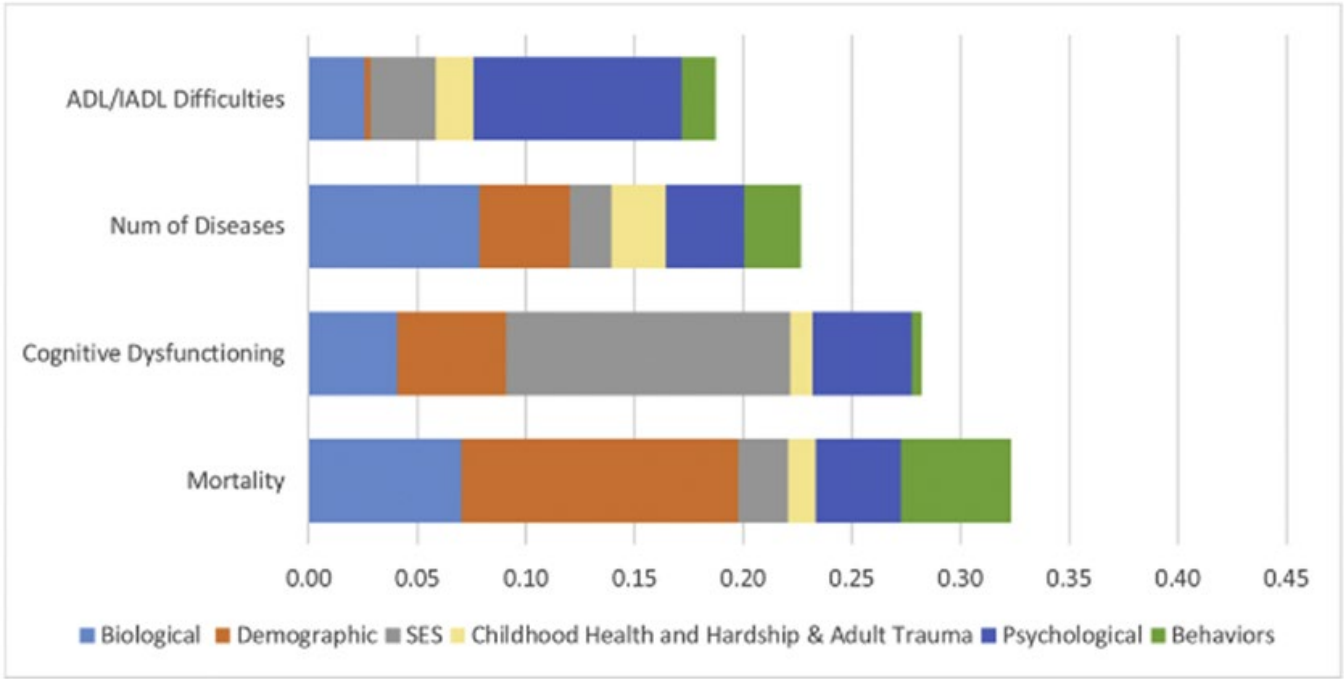


Fig. 1. The Social Hallmarks of Aging.

C. Model 3 - R^2 attributed to Biological, Demographic, and Social Factors



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Enables Aging Research in Population Subgroups

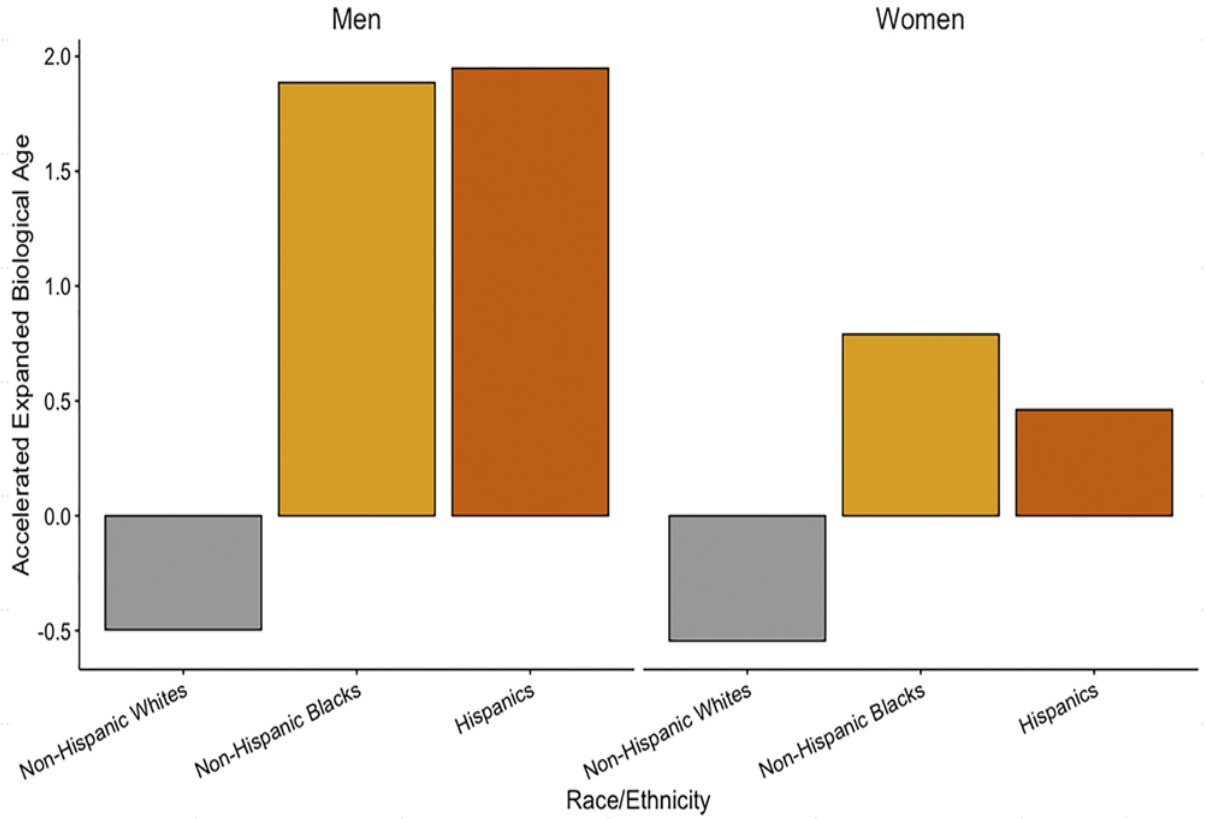
Journal of Aging and Health
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https://doi.org/10.1177/08982643221120743

SAGE journals

Article

Racial/Ethnic Differences in Biological Aging and Their Life Course Socioeconomic Determinants: The 2016 Health and Retirement Study

Mateo P. Farina, PhD, Jung Ki Kim, PhD, and Eileen M. Crimmins, PhD



Featured Article

Racial disparities and temporal trends in dementia misdiagnosis risk in the United States

Kan Z. Gianattasio[a], Christina Prather[b], M. Maria Glymour[c], Adam Ciarleglio[d], Melinda C. Power[a,*]

SSM Popul Health. 2019 Apr; 7: 100331.
Published online 2018 Nov 30. doi: 10.1016/j.ssmph.2018.100331
PMCID: PMC6305800
PMID: 30623009

Racial and ethnic differences in end-of-life care in the United States: Evidence from the Health and Retirement Study (HRS)

Martina Orlovic,[a,*] Katharine Smith,[b] and Elias Mossialos[a,c]

HRS

Improves Generalizability

Improving generalizability and study design of Alzheimer's disease cohort studies in the United States by including under-represented populations

Monica Rivera Mindt[1,2]
Dallas P. Veitch[4,9] | Pau
Michael C. Donohue[10] |
Rema Raman[10] | Rach

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The Essential Role of Population Health During and Beyond COVID-19

Published on: September 30, 2020

Salina Bakshi, MD, MPH, Katherine H. Schiavoni, MD, MPP, Lucas C. Carlson, MD, MPH, Trina E. Chang, MD, MPH, Amy O. Flaster, MD, MBA, Brent P. Forester, MD, MSc, Frannie R. Kronenberg, MD, MSc, Charles T. Pu, MD, Jack S. Rowe, MD, MPH, Dellara F. Terry, MD, MPH, Jason H. Wasfy, MD, Stephen J. Bartels, MD, MS, Thomas D. Sequist, MD, MPH, Gregg S. Meyer, MD, MSc, Mallika L. Mendu, MD, MBA

The American Journal of Managed Care, March 2021, Volume 27, Issue 3

JAMA Network | Open

Original Investigation | Environmental Health

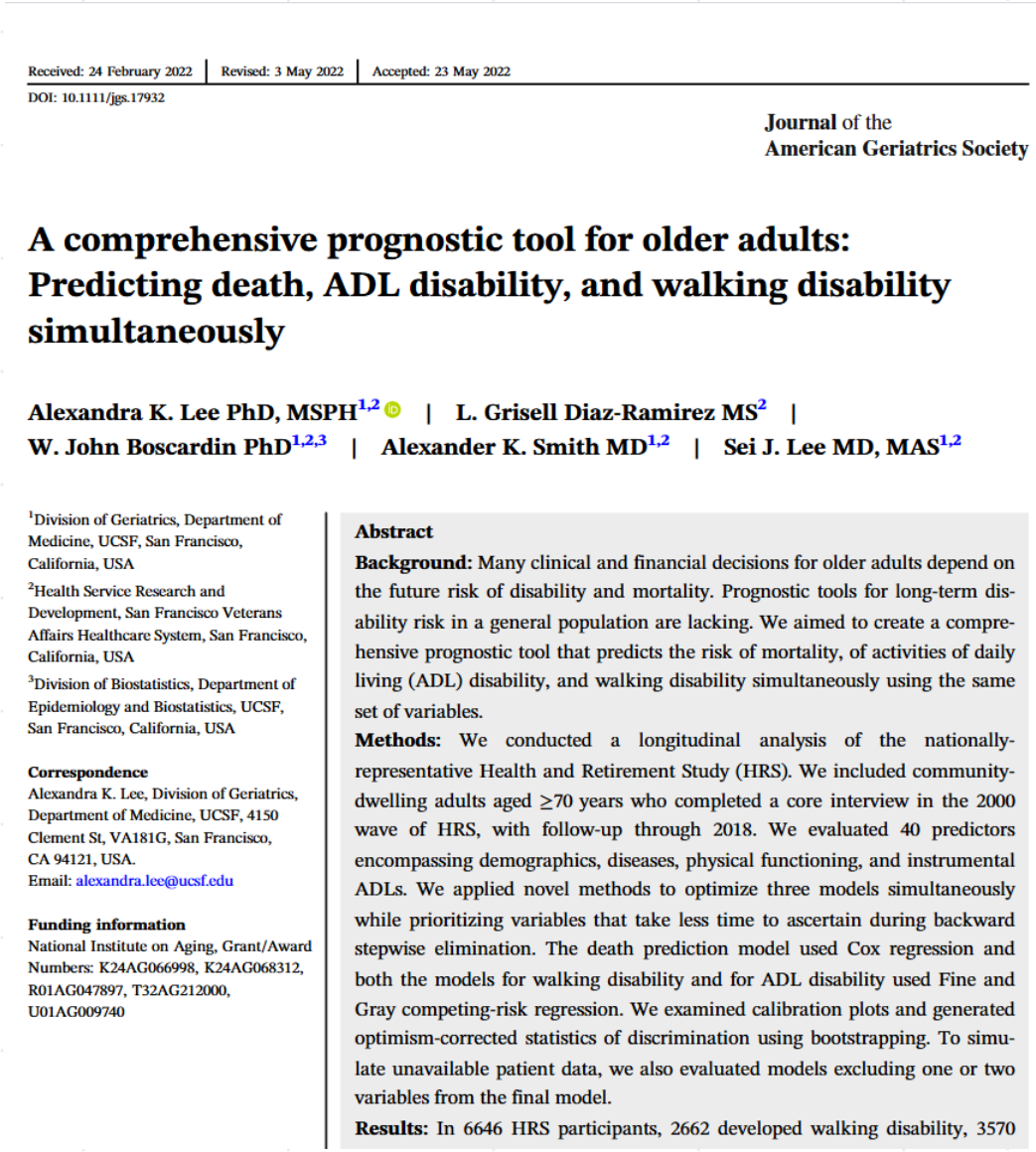
Air Pollution and the Progression of Physical Function Limitations and Disability in Aging Adults

Jiaqi Gao, PhD; Carlos F. Mendes de Leon, PhD; Adam A. Szpiro, PhD; Jennifer Weuve, ScD; Kenneth M. Langa, PhD; Richard A. Hirth, PhD; Kelly M. Bakulski, PhD; Jinkook Lee, PhD; Boya Zhang, PhD; Jennifer D'Souza, PhD; Kayleigh P. Keller, PhD; Joel D. Kaufman, MD; Jessica Faul, PhD; Sara D. Adar, ScD

HRS

Translation to Clinical Care

- Doctors did not have a comprehensive tool for predicting long-term disability risk (loss of independence) for their patients
- Many older adults value independence as much as or more than life expectancy
- Research using the HRS showed that factors like living alone, mobility limitations, and functional status, predict outcomes as strongly as medical diagnoses
- Clinicians needed a way to incorporate this information into everyday decision-making
- ePrognosis – a tool developed at University of California San Francisco and now used in clinical settings to guide care decisions for older adults



Received: 24 February 2022 | Revised: 3 May 2022 | Accepted: 23 May 2022
DOI: 10.1111/jgs.17932

Journal of the American Geriatrics Society

A comprehensive prognostic tool for older adults: Predicting death, ADL disability, and walking disability simultaneously

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Funding information
National Institute on Aging, Grant/Award Numbers: K24AG066998, K24AG068312, R01AG047897, T32AG212000, U01AG009740

Abstract

Background: Many clinical and financial decisions for older adults depend on the future risk of disability and mortality. Prognostic tools for long-term disability risk in a general population are lacking. We aimed to create a comprehensive prognostic tool that predicts the risk of mortality, of activities of daily living (ADL) disability, and walking disability simultaneously using the same set of variables.

Methods: We conducted a longitudinal analysis of the nationally-representative Health and Retirement Study (HRS). We included community-dwelling adults aged ≥70 years who completed a core interview in the 2000 wave of HRS, with follow-up through 2018. We evaluated 40 predictors encompassing demographics, diseases, physical functioning, and instrumental ADLs. We applied novel methods to optimize three models simultaneously while prioritizing variables that take less time to ascertain during backward stepwise elimination. The death prediction model used Cox regression and both the models for walking disability and for ADL disability used Fine and Gray competing-risk regression. We examined calibration plots and generated optimism-corrected statistics of discrimination using bootstrapping. To simulate unavailable patient data, we also evaluated models excluding one or two variables from the final model.

Results: In 6646 HRS participants, 2662 developed walking disability, 3570

HRS

How to Approach Multi- (Inter-, Trans-) disciplinary Work

The most impactful population research is multidisciplinary

- To do this, leave your “discipline police” behind
- There is unlikely to be one study that can answer everything you want to know – break your research question into parts

Funders already see the benefit of this approach, academic departments need to get on board

Finding collaborators:

- Find out whether your institution has a population center
- Attend seminars in other departments
- Engage with NIA Networks and Centers – pilot innovative work, webinars, visiting scholar programs to visit potential collaborators (write a grant or paper), learn new skills

HRS

Thank You!

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http://hrsonline.isr.umich.edu/