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Health Equity for Individuals with Multimorbidity

Great Plains IDeA Clinical and Translational Research Network

Ana R. Quiñones, PhD

May 20, 2022

- Gerontologist : health services and outcomes research, epidemiology of aging

- Research focus : racial and ethnic disparities in health and wellbeing in mid and late life; health care delivery changes to improve chronic disease management for vulnerable older adults

  - *Development of multimorbidity, adverse health outcomes among racially and ethnically diverse older adults*

Disclosures

- No financial conflicts of interests
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The views expressed in this talk are my own and do not necessarily represent the official views of the NIH.

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Background

- Multimorbidity: multiple co-occurring chronic diseases (2+ diseases)

- Cascading consequences of multimorbidity on health outcomes greater than the risks attributable to individual diseases
  (Tinetti & Fried, 2004; Vogeli, Shields, Lee, et al., 2005)

- Multimorbidity is <u>prevalent</u>, <u>disabling</u>, and <u>costly</u>

  (Tinetti, Fried & Boyd, 2012; Lochner, 2013)

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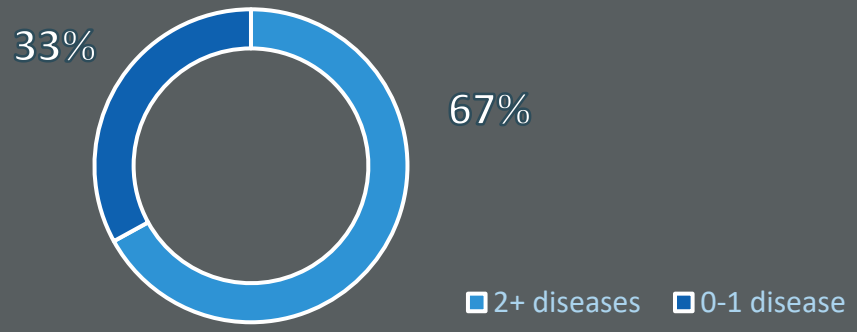
Multimorbidity in the U.S.

Age ≥50:



Age 50-65:

Age 65-74:

Age ≥75:

(Salive, 2013)

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AMERICA'S HEALTH RANKINGS®
UNITED HEALTH FOUNDATION

Health Disparities Report

2021

Data in the *Health Disparities Report* are based on the most recent publicly available data, which were collected prior to the pandemic.

Source: https://www.americashealthrankings.org/learn/reports/2021-disparities-report

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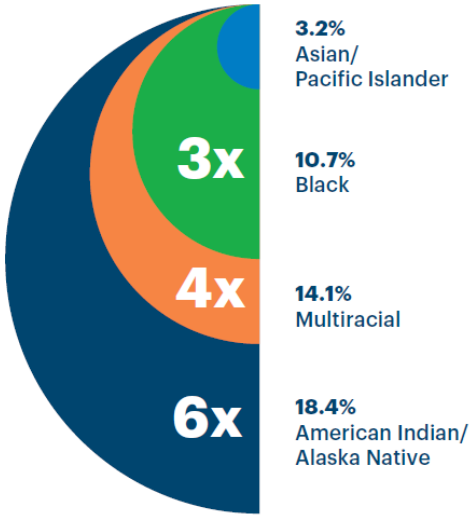
In 2017-2019, wide disparities persisted in multiple chronic conditions by race and ethnicity.

Compared to Asian/Pacific Islander adults (3.2%), the percentage of adults with multiple chronic conditions was 6x higher for American Indian/Alaska Native adults (18.4%), 4x higher for Multiracial adults (14.1%) and 3x higher for Black adults (10.7%).



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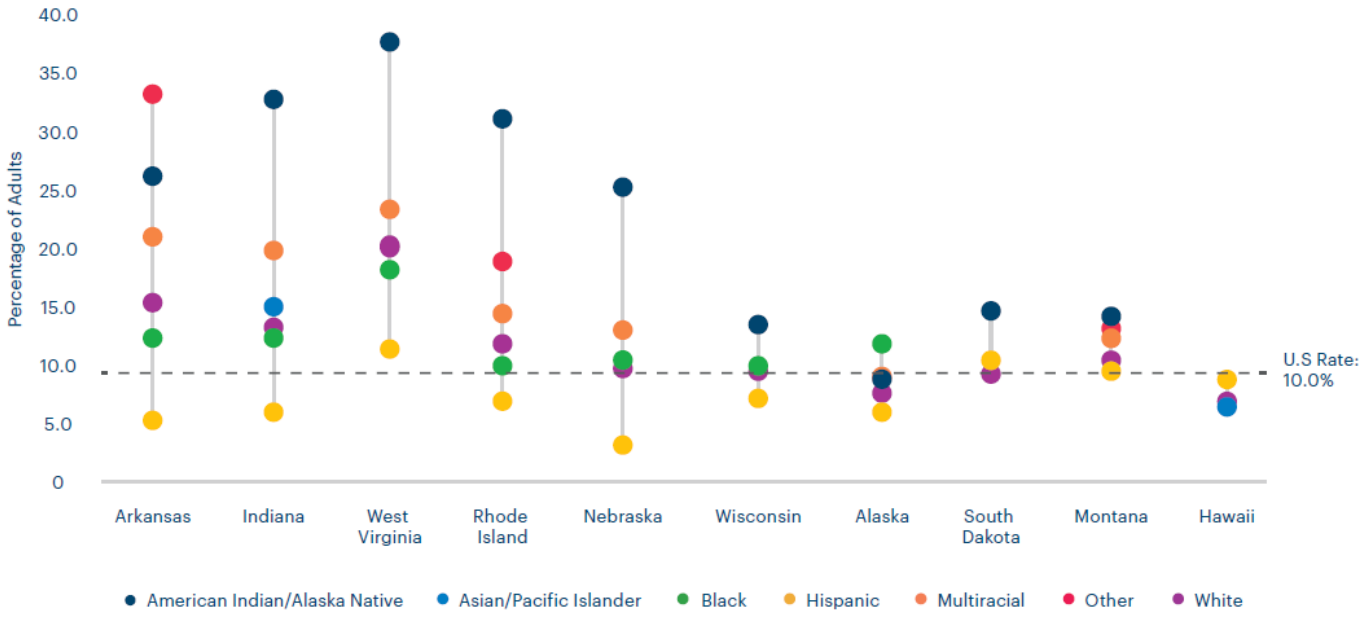
Top States with the Highest and Lowest Disparities in Rate of Multiple Chronic Conditions

by Race and Ethnicity, 2017-2019



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Gaps in what we know

1) Increase the evidence base on the epidemiology of multimorbidity
2) Ensure that individuals with multimorbidity are included in studies, particularly clinical trials
3) Incorporate a patient-centered approach in assessing the impact of multimorbidity on individuals' lives

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Multimorbidity measurement

ORIGINAL ARTICLE

Measuring Multimorbidity

Selecting the Right Instrument for the Purpose and the Data Source

Jerry Suls, PhD, Elizabeth A. Bayliss, MD, MSPH,†‡ Jay Berry, MD, MPH,§‖*
*Arlene S. Bierman, MD, MS,¶ Elizabeth A. Chrischilles, PhD,# Tilda Farhat, PhD, MPH,***
Martin Fortin, MD, MSc, CMFC,†† Siran M. Koroukian, PhD,‡‡ Ana Quinones, PhD,§§
Jeffrey H. Silber, MD, PhD,‖‖ Brian W. Ward, PhD,¶¶ Melissa Wei, MD, MPH, MS,##
*Deborah Young-Hyman, PhD,*** and Carrie N. Klabunde, PhD, MHS, MBA†††*

Background: Adults have a higher prevalence of multimorbidity—or having multiple chronic health conditions—than having a single condition in isolation. Researchers, health care providers, and health policymakers find it challenging to decide upon the most appropriate assessment tool from the many available multimorbidity measures.

Objective: The objective of this study was to describe a broad range of instruments and data sources available to assess multimorbidity and offer guidance about selecting appropriate measures.

Design: Instruments were reviewed and guidance developed during a special expert workshop sponsored by the National Institutes of Health on September 25–26, 2018.

Results: Workshop participants identified 4 common purposes for multimorbidity measurement as well as the advantages and disadvantages of 5 major data sources: medical records/clinical assessments, administrative claims, public health surveys, patient reports, and electronic health records. Participants surveyed 15 instruments and 2 public health data systems and described characteristics of the measures, validity, and other features that inform tool selection. Guidance on instrument selection includes recom-

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Multimorbidity measurement

- For what purpose? What are we trying to understand?
- Data quality and availability partially dependent on data sources themselves
- Tailored to purpose vs. comparability
  - Measurement: numerator?
  - Measurement: denominator?

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Multimorbidity measurement

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People.™

PREVENTING CHRONIC DISEASE
PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY

SPECIAL TOPIC

Volume 10 — April 25, 2013

Defining and Measuring Chronic Conditions: Imperatives for Research, Policy, Program, and Practice

Richard A. Goodman, MD, MPH; Samuel F. Posner, PhD; Elbert S. Huang
Parekh, MD, MPH; Howard K. Koh, MD, MPH

Suggested citation for this article: Goodman RA, Posner SF, Huang ES, Parekh AK, Koh HK.
Chronic Conditions: Imperatives for Research, Policy, Program, and Practice. Prev Chronic
http://dx.doi.org/10.5888/pcd10.120239 .

PEER REVIEWED

Abstract

Current trends in US population growth, age distribution, and disease dynamics foretell ri
chronic diseases and other chronic conditions. These trends include the rapidly growing p
increasing life expectancy associated with advances in public health and clinical medicine,
prevalence of some risk factors, and the emerging high prevalence of multiple chronic con
and mitigating the effect of chronic conditions requires sufficient measurement capacities
constrained by lack of consistency in definitions and diagnostic classification schemes and
systems and methods of data collection. We outline a conceptual model for improving und
standardizing approaches to defining, identifying, and using information about chronic co
States. We illustrate this model's operation by applying a standard classification scheme f
national-level data systems.

Although the literature does not support a single uniform definition for chronic disea
include the non–self-limited nature, the association with persistent and recurring hea
duration measured in months and years, not days and weeks. *Thrall* (1)

So far, many different approaches have been used to measure the prevalence and con
diseases and health conditions in children, resulting in a wide variability of prevalenc
be readily compared. *van der Lee et al* (2)

Table 3. Twenty Chronic Conditions Selected by OASH for a Standard Classification Scheme and Their Corresponding Codes in 5 HHS Data Systems

Return

OASH List of Chronic Conditions	Name of Condition in Data Collection System	Data Collection System	Term or Code Used
Hypertension	Hypertension/high blood pressure	NHIS[a]	Self-reported
		NAMCS[b]	Checkbox
		MEPS[c]	98, 99
		NIS[d]	98, 99
		CMS[e]	401.0, 401.1, 401.9, 402.00, 402.01, 402.10, 402.11, 402.90, 402.91, 403.00, 403.01, 403.10, 403.11, 403.90, 403.91, 404.00, 404.01, 404.02, 404.03, 404.10, 404.11, 404.12, 404.13, 404.90, 404.91, 404.92, 404.93, 405.01, 405.09, 405.11, 405.19, 405.91, 405.99, 362.11, 437.2
Congestive heart failure	Congestive heart failure	NHIS[a]	Not applicable
		NAMCS[b]	Checkbox
		MEPS[c]	108
		NIS[d]	108
		CMS[e]	398.91, 402.01, 402.11, 402.91, 404.01, 404.11, 404.91, 404.03, 404.13, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9
Coronary artery disease	Coronary artery disease	NHIS[a]	Not applicable
		NAMCS[b]	Included in ischemic heart disease
		MEPS[c]	100, 101
		NIS[d]	100, 101
		CMS[e]	410.00, 410.01, 410.02, 410.10, 410.11, 410.12, 410.20, 410.21, 410.22, 410.30, 410.31, 410.32, 410.40, 410.41,

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Let’s talk about data

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Data: Health & Retirement Study

- University of Michigan Institute for Social Research
- Biennial nationally-representative community sample
- Middle- and older-age adults (51 years and older)
  - Includes oldest-old
  - Repeated observations of individuals upon study entry
- Approximately 43,000 people surveyed

HRS | HEALTH AND RETIREMENT STUDY
A Longitudinal Study of Health, Retirement, and Aging
Sponsored by the National Institute on Aging

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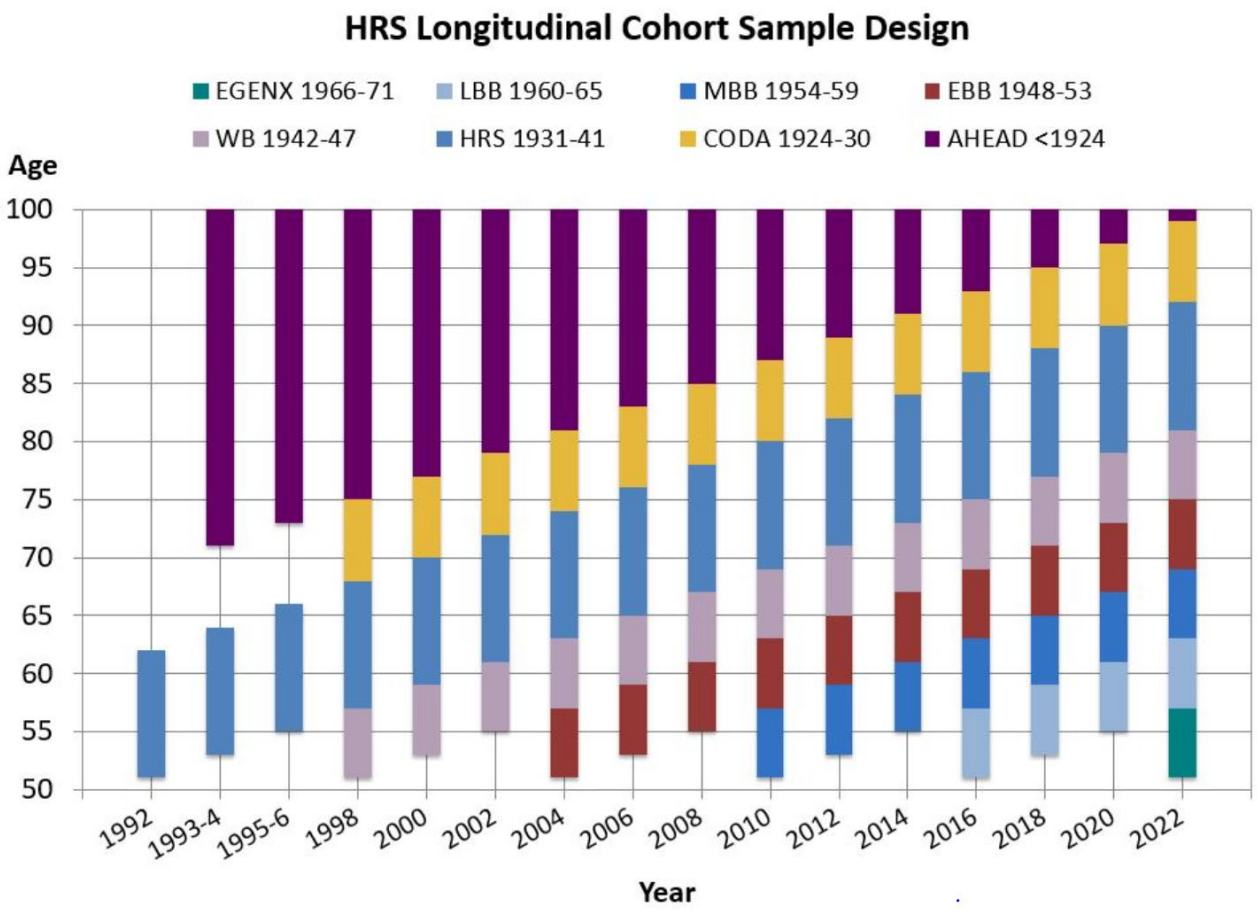
Data: Health & Retirement Study



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Multimorbidity and Race/Ethnicity

PLOS ONE

RESEARCH ARTICLE

Racial/ethnic differences in multimorbidity development and chronic disease accumulation for middle-aged adults

Ana R. Quiñones[1,2*], Anda Botoseneanu[3,4], Sheila Markwardt[2], Corey L. Nagel[5], Jason T. Newsom[6], David A. Dorr[7], Heather G. Allore[8,9]

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Check for updates

OPEN ACCESS

Citation: Quiñones AR, Botoseneanu A, Markwardt S, Nagel CL, Newsom JT, Dorr DA, et al. (2019) Racial/ethnic differences in multimorbidity development and chronic disease accumulation for middle-aged adults. PLoS ONE 14(6): e0218462. https://doi.org/10.1371/journal.pone.0218462

Abstract

Background

Multimorbidity–having two or more coexisting chronic conditions–is highly prevalent, costly,

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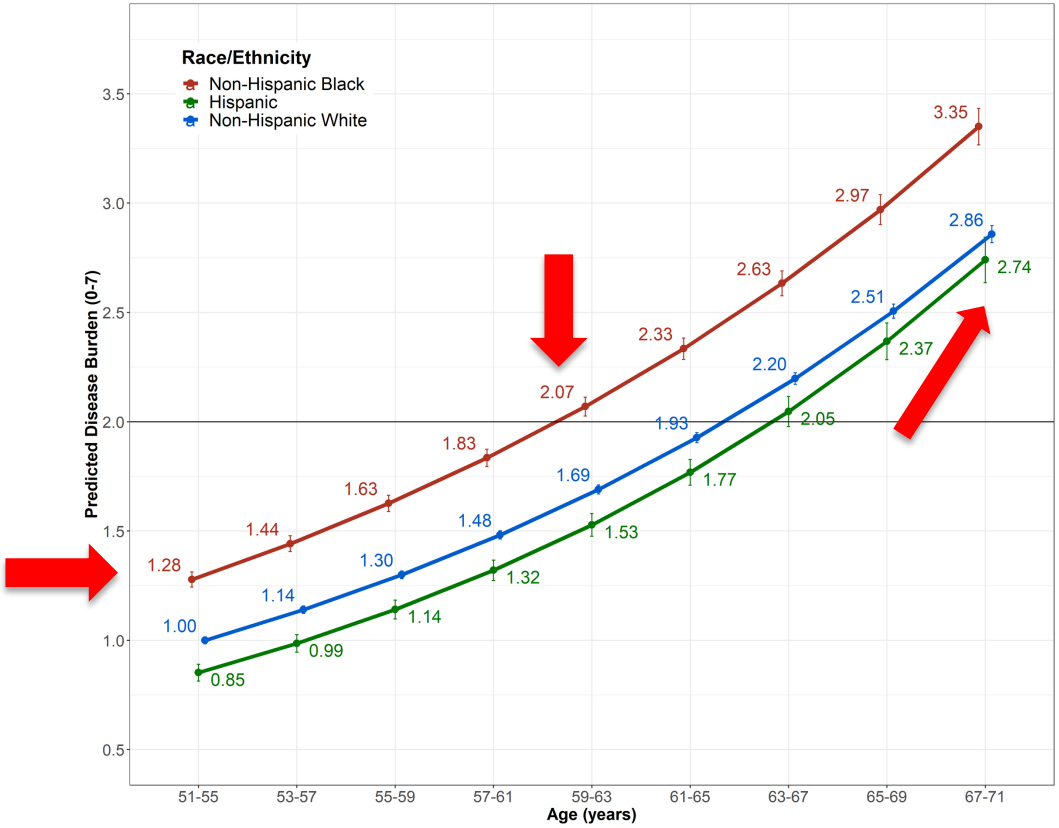
Trajectories of chronic disease accumulation over time, HRS 1998–2014



Quiñones AR, Botoseneanu A, Markwardt S, et al. Racial/ethnic differences in multimorbidity development and chronic disease accumulation for middle-aged adults. PLOS ONE. 2019;14(6):e0218462.

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Multimorbidity and Race/Ethnicity

ORIGINAL ARTICLE

Racial and Ethnic Differences in Multimorbidity Changes Over Time

Ana R. Quiñones, PhD,† Jason T. Newsom, PhD,‡ Miriam R. Elman, MPH,† Sheila Markwardt, MPH,† Corey L. Nagel, PhD,§ David A. Dorr, MD,‖ Heather G. Allore, PhD,¶# and Anda Botoseneanu, MD, PhD**††*

Background: Our understanding of how multimorbidity progresses and changes is nascent.

Objectives: Assess multimorbidity changes among racially/ethnically diverse middle-aged and older adults.

Design, Setting, and Participants: Prospective cohort study using latent class analysis to identify multimorbidity combinations over 16 years, and multinomial logistic models to assess change relative to baseline class membership. Health and Retirement Study respondents (age 51 y and above) in 1998 and followed through 2014 (N = 17,297).

Measures: Multimorbidity latent classes of: hypertension, heart disease, lung disease, diabetes, cancer, arthritis, stroke, high depressive symptoms.

Results: Three latent classes were identified in 1998: *minimal disease* (45.8% of participants), *cardiovascular-musculoskeletal* (34.6%), *cardiovascular-musculoskeletal-mental* (19.6%); and 3 in 2014: *cardiovascular-musculoskeletal* (13%), *cardiovascular-musculoskeletal-metabolic* (12%), *multisystem multimorbidity* (15%). Remaining participants were deceased (48%) or lost to follow-up (12%) by 2014. Compared with *minimal disease*, individuals in *cardiovascular-musculoskeletal* in 1998 were more likely to be in *multisystem multimorbidity* in 2014 [odds ratio (OR) = 1.78, $P < 0.001$], and individuals in *cardiovascular-musculoskeletal-mental* in 1998 were more likely to be deceased (OR = 2.45, $P < 0.001$) or lost to follow-up (OR = 3.08, $P < 0.001$). Hispanic and Black Americans were more likely than White Americans to be in *multisystem multimorbidity* in 2014 (OR = 1.67, $P = 0.042$; OR = 2.60, $P < 0.001$, respectively). Black compared with White Americans were more likely to be deceased (OR = 1.62, $P = 0.01$) or lost to follow-up (OR = 2.11, $P < 0.001$) by 2014.

Conclusions and Relevance: Racial/ethnic older adults are more likely to accumulate morbidity and die compared with White peers, and should be the focus of targeted and enhanced efforts to prevent and/or delay progression to more complex multimorbidity patterns.

Key Words: multimorbidity, multiple chronic conditions, latent class analysis

(*Med Care* 2021;59: 402–409)

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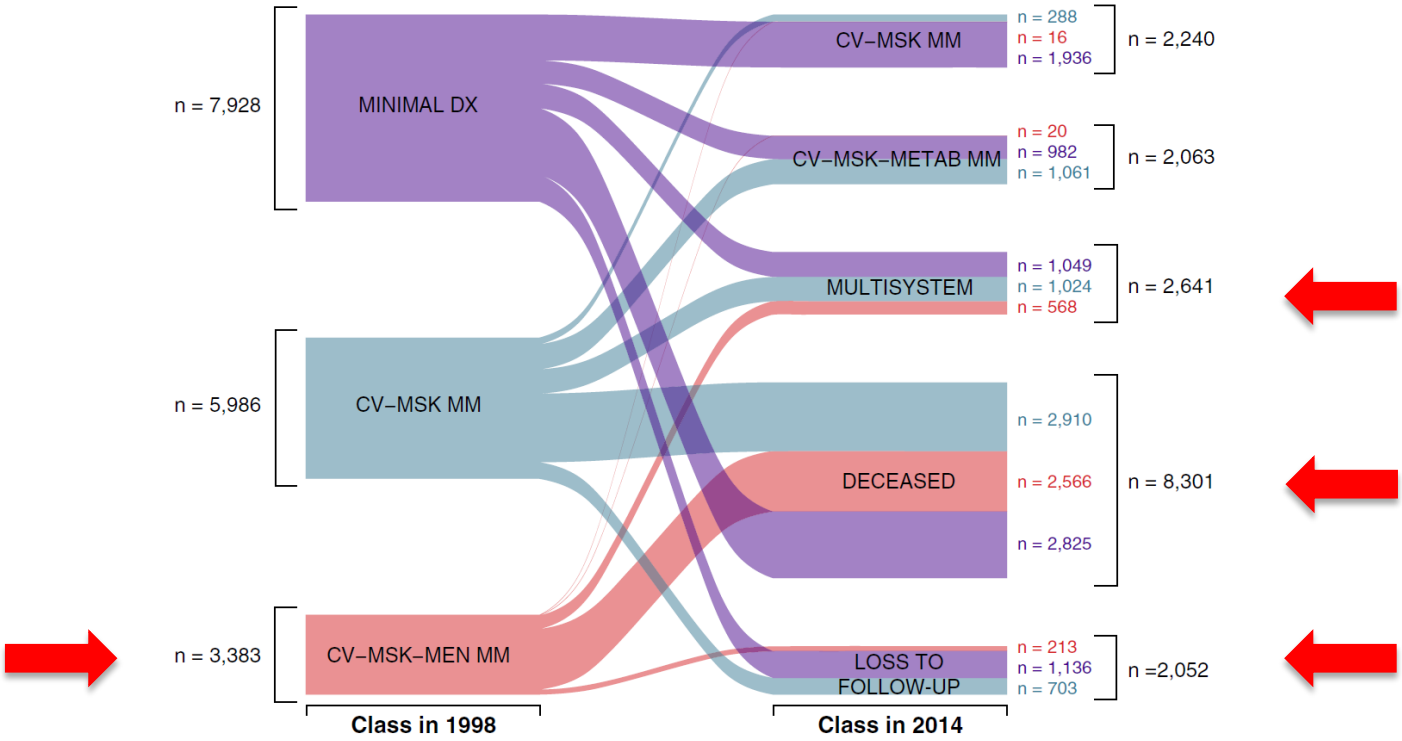
Trajectories of chronic disease accumulation over time, HRS 1998–2014



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Multimorbidity in the Safety-Net

ADVANCE Collaborative

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ADVANCE DATA

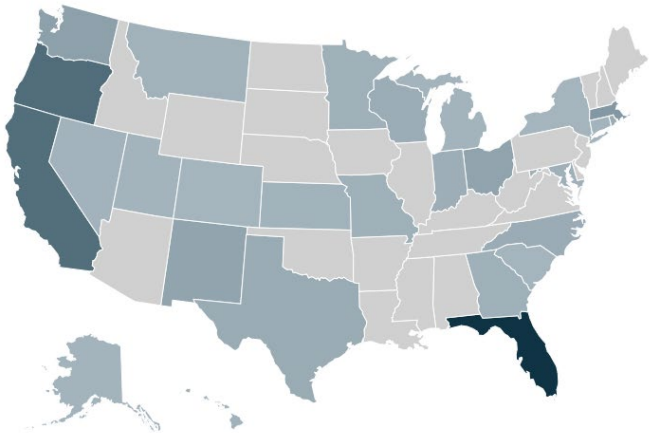
The ADVANCE Data Warehouse is the nation's most comprehensive database on healthcare and outcomes of safety net patients.

Download the documents below for more detailed information about the data included in our ADVANCE Research Data Warehouse.

DOWNLOAD THE SHORT GUIDE TO THE ADVANCE CLINICAL RESEARCH NETWORK

DOWNLOAD THE ADVANCE DATA DICTIONARY

DOWNLOAD THE ADVANCE SHORT GUIDE SUPPLEMENTARY TABLES



27

STATES

396

CITIES

1,287

CLINIC SITES

**Hover over each state to view its total patient count.*

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Multimorbidity in Safety-Net Clinics

Prevalent Multimorbidity Combinations Among Middle-Aged and Older Adults Seen in Community Health Centers

Ana R. Quiñones, PhD[1,2], Steele H. Valenzuela, MS[1], Nathalie Huguet, PhD[1], Maria Ukhanova, MD PhD[1], Miguel Marino, PhD[1,2], Jennifer A. Lucas, PhD[1], Jean O'Malley, MPH[1,3], Teresa D. Schmidt, PhD[3], Robert Voss, MS[3], Katherine Peak, MPH[1], Nathaniel T. Warren, MPH[3], and John Heintzman, MD[1,3]

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BACKGROUND: Multimorbidity (≥2 chronic diseases) is associated with greater disability and higher treatment burden, as well as difficulty coordinating self-management tasks for adults with complex multimorbidity patterns. Comparatively little work has focused on assessing multimorbidity patterns among patients seeking care in community health centers (CHCs).

OBJECTIVE: To identify and characterize prevalent multimorbidity patterns in a multi-state network of CHCs over a 5-year period.

DESIGN: A cohort study of the 2014–2019 ADVANCE multi-state CHC clinical data network. We identified the most prevalent multimorbidity combination patterns and assessed the frequency of patterns throughout a 5-year period as well as the demographic characteristics of patient panels by prevalent patterns.

PARTICIPANTS: The study included data from 838,642 patients aged ≥45 years who were seen in 337 CHCs frequently occurring pattern across all years is *hyperlipidemia-hypertension*. The three most frequent patterns are various iterations of hyperlipidemia, hypertension, and diabetes and are consistent in rank of occurrence across all years. *CKD-hyperlipidemia-hypertension* and *anxiety-depression* are both more frequent in later study years.

CONCLUSIONS: CHCs are increasingly seeing more complex multimorbidity patterns over time; these most often involve mental health morbidity and advanced cardiometabolic-renal morbidity.

KEY WORDS multimorbidity · multiple chronic conditions · community health centers · safety-net clinics · vulnerable populations

J Gen Intern Med
DOI: 10.1007/s11606-021-07198-2

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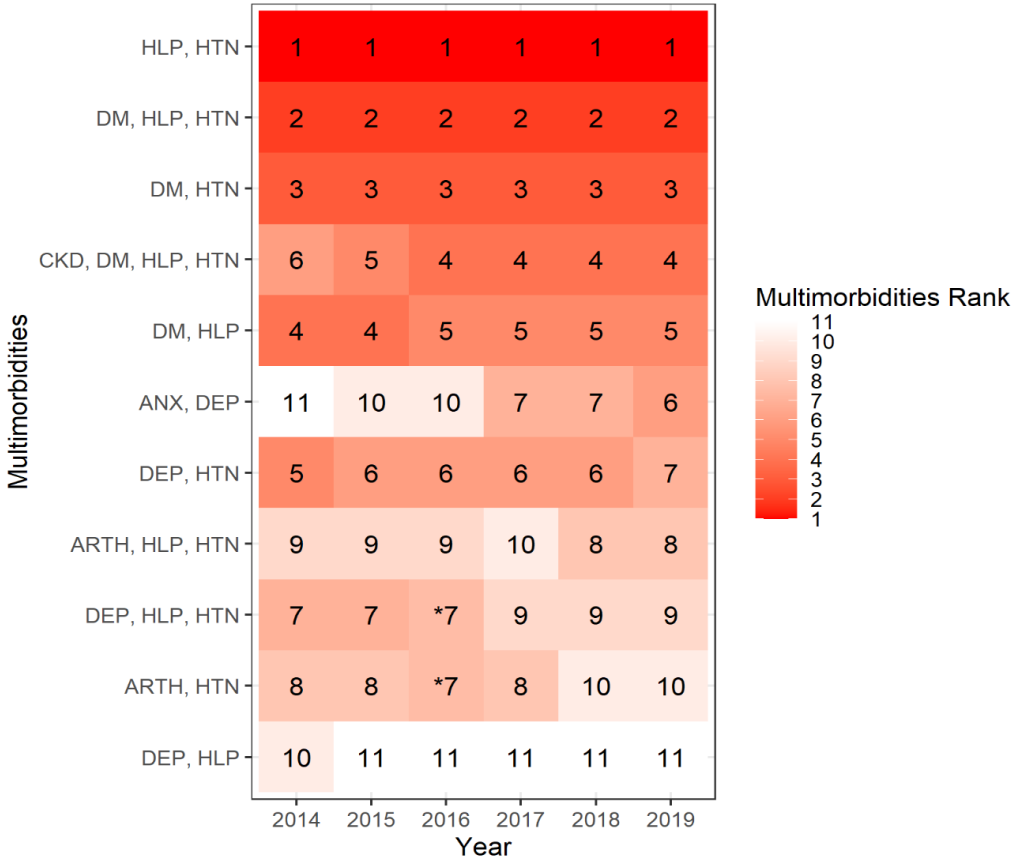
Rank Order of Prevalent Multimorbidity Combinations, ADVANCE 2014-2019



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What’s next?

Potential ways forward

- Triangulating information across multiple data sources
  - *self report, EHR, lab, Rx, administrative*

- Need for valid and reliable procedures to improve longitudinal disease measurement

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Potential ways forward

- Account for disease accumulation and subsequent changes, impairments, losses

- Develop and validate population-sensitive measures for system-wide severity that assess the HRQOL consequences of multimorbidity

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Potential ways forward

- Holding ourselves accountable (researchers, sponsors, reviewers) and encouraging close representation by race/ethnicity and other health disparity groups

- Advancing efforts to maximize response rates and minimize or account for non-random attrition

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Summary

- Investments to address causes, mechanisms, and consequences of multimorbidity in consideration of “whole person” wellbeing
  - *co-occurring disease, personal, and social conditions*
- These investments are even more consequential for disproportionately affected population groups
  - *understand what works, how, and for whom to be responsive to needs*
- Prioritize health care delivery models that enable chronic care management and maintenance of good level of quality of life
  - *clinical and community resources, services, programs that support the most vulnerable older adults*

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PROPUBLICA

The Black American Amputation Epidemic

by Lizzie Presser
May 19, 2020

Source: https://features.propublica.org/diabetes-amputations/black-american-amputation-epidemic/

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The Delta was Mississippi's poorest region, with the worst health outcomes. Fakorede had spent years studying health disparities: African Americans develop chronic diseases a decade earlier than their white counterparts; they are twice as likely to die from diabetes; they live, on average, three years fewer. In the Delta, Fakorede could treat patients who looked like him; he could find only one other black interventional cardiologist in the entire state. A growing body of evidence had shown how racial biases throughout the medical system meant worse results for African Americans.

Despite the great scientific strides in diabetes care, the rate of amputations across the country grew by 50% between 2009 and 2015. Diabetics undergo 130,000 amputations each year, often in low-income and underinsured neighborhoods. Black patients lose limbs at a rate triple that of others. It is the cardinal sin of the American health system in a single surgery: save on preventive care, pay big on the backend, and let the chronically sick and underprivileged feel the extreme consequences.

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ABOUT EVERY FIVE YEARS, the doctors and researchers who make up the U.S. Preventive Services Task Force reassess their screening guidelines. In 2018, the members returned to peripheral artery disease and the blood flow tests that Fakorede had asked local primary care doctors to conduct. Once again, the panel declined to endorse them, saying there was not enough evidence that the tests benefited the average asymptomatic American.

In their statement, they acknowledged that public commenters had raised concerns that the disease "is disproportionately higher among racial/ethnic minorities and low-socioeconomic populations" and that this recommendation "could perpetuate disparities in treatment and outcomes." In response, the panel said it needed better evidence. But as the National Institutes of Health has found, minorities in America make up less than 10% of patients in clinical trials.

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Thank you! Questions?

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