Racism as a social determinant that impacts brain health

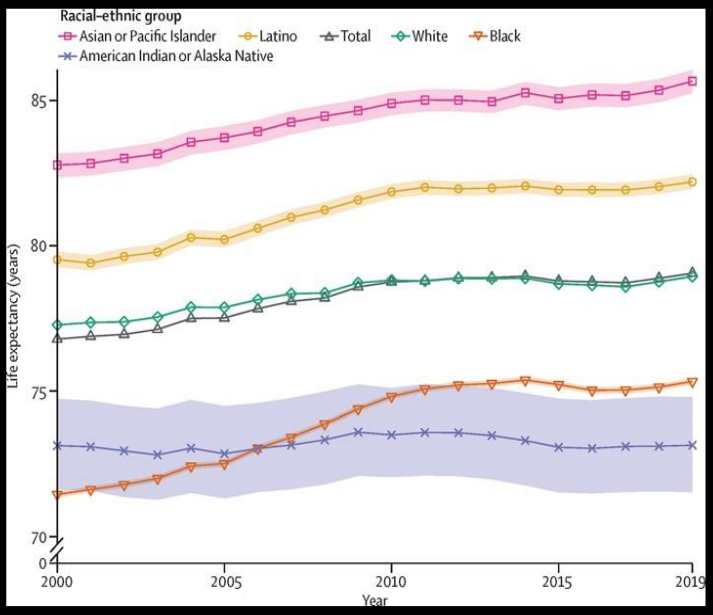
Lisa L. Barnes, PhD

Associate Director, Rush Alzheimer's Disease Research Center
Alla V. and Solomon Jesmer Professor of Gerontology & Geriatric Medicine
Rush University Medical Center

Rush Alzheimer's Disease Center

Life expectancy by race and ethnicity in U.S

Inequities in life expectancy among racial-ethnic groups are widespread and enduring

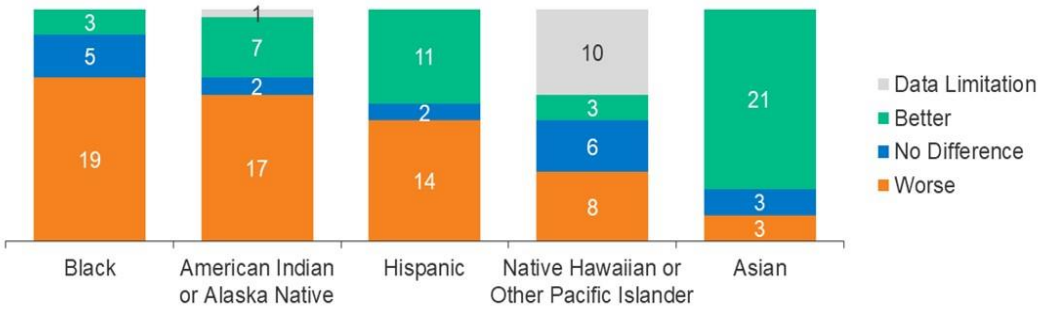


Dwyer-Lindgren, Kendrick, O Kelly et al., Lancet, 2022

Figure 2

People of Color Fare Worse than their White Counterparts Across Many Measures of Health Status

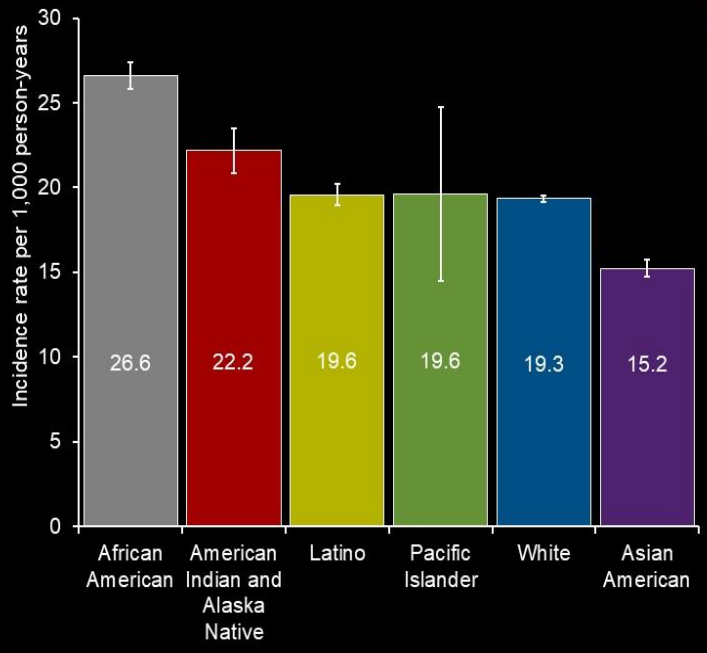
Number of health status measures for which group fared better, the same, or worse compared to White counterparts:



Note: Measures are for 2018 or the most recent year for which data are available. "Better" or "Worse" indicates a statistically significant difference from Whites at the p<0.05 level. No difference indicates no statistically significant difference. "Data limitation" indicates data are no separate data for a racial/ethnic group, insufficient data for a reliable estimate, or comparisons not possible due to overlapping samples. Persons of Hispanic origin may be of any race but are categorized as Hispanic for this analysis; other groups are non-Hispanic.

KFF

Higher incidence of dementia in AA & AI/AN



Mayeda, Glymour, Quesenberry, Whitmer, Alz Dementia, 2016

Even in VA where there is equal access to care

Age-adjusted incidence of dementia consistently higher among older Hispanic, Black, & Asian patients

Kornblith, Bahorik, Boscardin, et al., JAMA, 2022

Prevalence of AD/MCI higher in African Americans & Hispanic Americans than in White Americans in the Chicago Health and Aging Project

	Clinical AD Prevalence, cases per 100 (95% CI)	Mild Cognitive Impairment Prevalence, cases per 100 (95% CI)
All Participants		
Non-Hispanic White	10.0 (9.6, 10.4)	21.1 (20.8, 21.5)
Hispanic	14.0 (12.0, 16.1)	25.9 (24.5, 27.3)
African American	18.6 (18.0, 19.1)	32.0 (31.7, 32.4)
Overall Prevalence	11.3 (10.7, 11.9)	22.7 (22.3, 23.2)
65–74 Years		
Non-Hispanic White	4.3 (4.1, 4.6)	20.2 (19.9, 20.6)
Hispanic	7.0 (5.8, 8.3)	24.9 (23.5, 26.3)
African American	10.1 (9.6, 10.6)	30.9 (30.6, 31.3)
Age-Specific Prevalence	5.3 (4.9, 5.7)	21.9 (21.5, 22.4)
75–84 Years		
Non-Hispanic White	11.9 (11.3, 12.4)	23.1 (22.7, 23.4)
Hispanic	18.7 (15.8, 21.5)	28.2 (26.7, 29.7)
African American	25.2 (24.5, 25.9)	34.7 (34.3, 35.1)
Age-Specific Prevalence	13.8 (13.1, 14.5)	24.6 (24.2, 25.1)
Over 85 Years		
Non-Hispanic White	31.6 (30.7, 32.5)	20.7 (20.3, 21.0)
Hispanic	44.0 (39.3, 48.7)	25.5 (24.1, 26.9)
African American	54.0 (53.0, 55.0)	31.6 (31.2, 32.1)
Age-Specific Prevalence	34.6 (33.3, 35.8)	22.1 (21.6, 22.5)

Rajan, Weuve, Barnes et al., Alz Dementia, 2021

Inequities in health are created by larger inequities in society

- Over twice as likely to live in poverty
- Experience less upward economic mobility
- Far less likely to own their own homes
- Have a family median wealth ($17,000) that is less than 1/10th that of White families ($171,000)

The Economic State of Black America in 2020; https://www.jec.senate.gov/public/_cache/files/ccf4dbe2-810a-44f8-b3e7-14f7e5143ba6/economic-state-of-black-america-2020.pdf

Root cause of racial inequities

RACISM

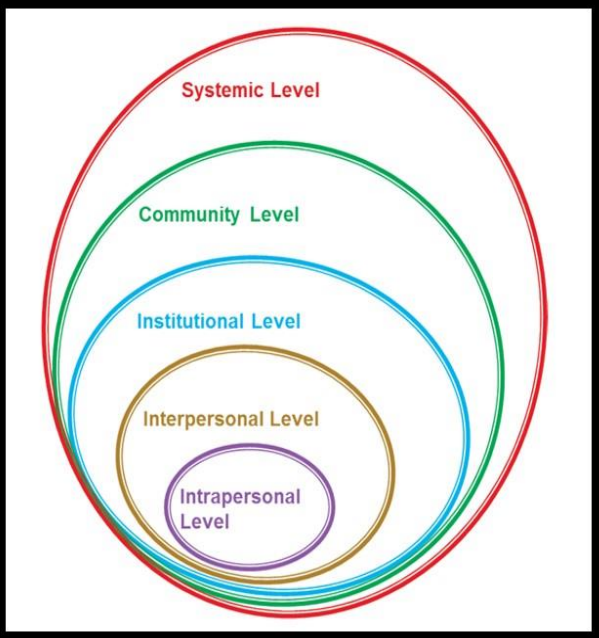
Systemic: policies (e.g., immigration, predatory banking)

Community: segregated schools, neighborhoods

Institutional: hiring & promotion practices, racial profiling

Interpersonal: overt discrimination, implicit bias

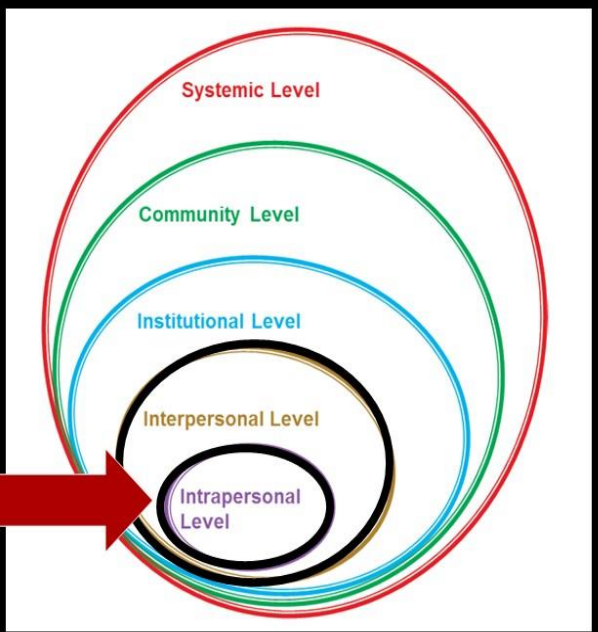
Intrapersonal: internalized racism, stereotype threat



NASEM: Communities in Action: Pathways to Health Equity, 2017; Concept from McLeroy et al., 1988

RACISM

Bulk of empirical evidence for brain health



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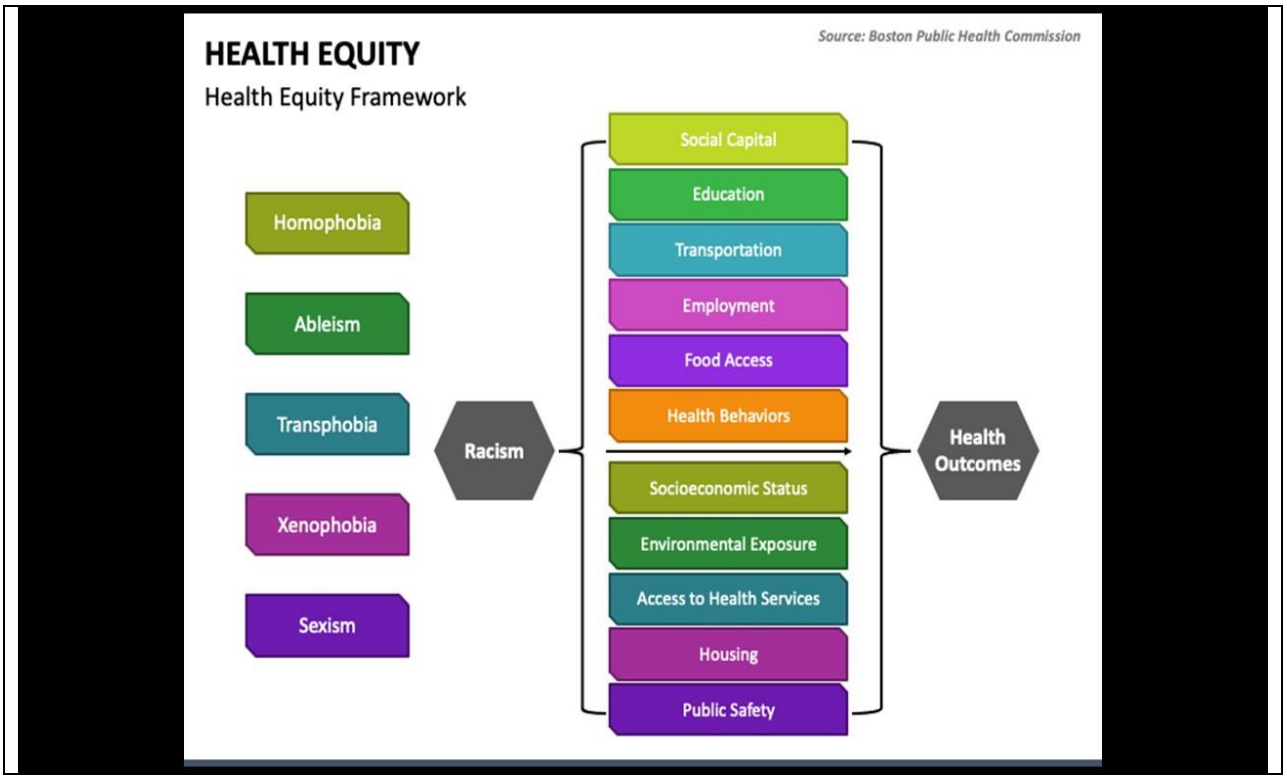
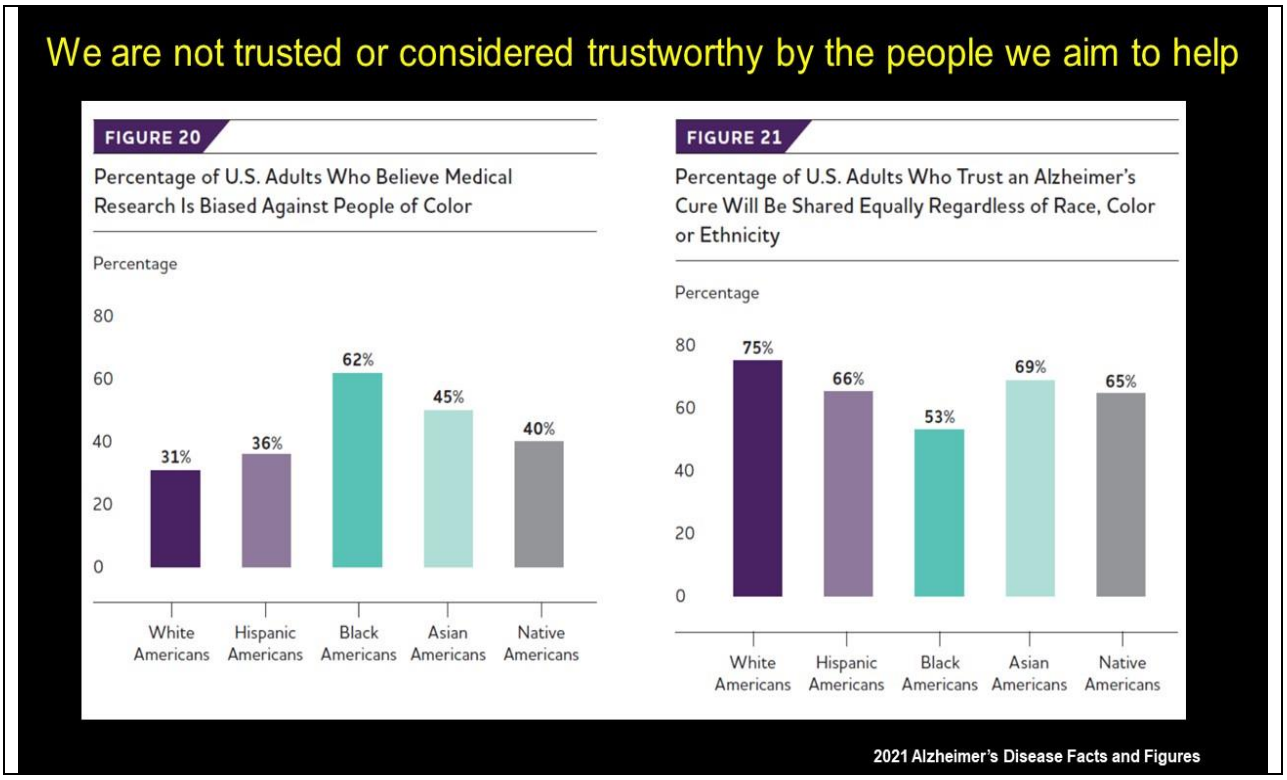
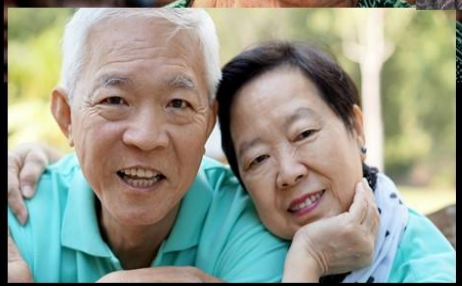
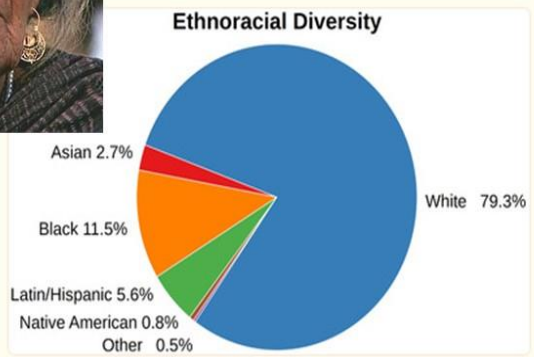

HEALTH EQUITY
Source: Boston Public Health Commission
Health Equity Framework
Homophobia
Ableism
Transphobia
Xenophobia
Sexism
Racism
Social Capital
Education
Transportation
Employment
Food Access
Health Behaviors
Socioeconomic Status
Environmental Exposure
Access to Health Services
Housing
Public Safety
Health Outcomes


We are not trusted or considered trustworthy by the people we aim to help
FIGURE 20
Percentage of U.S. Adults Who Believe Medical Research Is Biased Against People of Color
Percentage
80
60
40
20
0
31%
36%
62%
45%
40%
White Americans
Hispanic Americans
Black Americans
Asian Americans
Native Americans
FIGURE 21
Percentage of U.S. Adults Who Trust an Alzheimer's Cure Will Be Shared Equally Regardless of Race, Color or Ethnicity
Percentage
80
60
40
20
0
75%
66%
53%
69%
65%
White Americans
Hispanic Americans
Black Americans
Asian Americans
Native Americans
2021 Alzheimer's Disease Facts and Figures

Incomplete narratives from people deemed invisible… Often very people most at risk

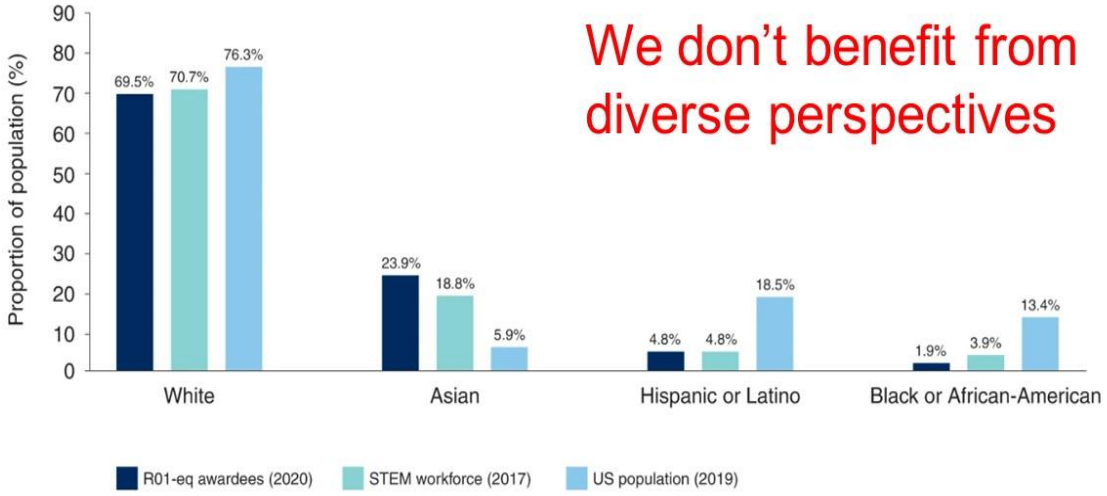




Birkenbihl, Salimi, Domingo-Fernandez, et al., Alz Dementia, 2020

Fig. 2: Racial and ethnic representation among NIH R01-eq grantees, STEM doctoral workforce, and US population (2017, 2019 and 2020).

From: The US National Institutes of Health approach to inclusive excellence



We don't benefit from diverse perspectives

Sources: NIH, Chief Officer for Scientific Workforce Diversity, 2021 Progress Infographic, accessed August 2021; NSF, National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2017; US Census, Quick Facts, 2019 Population Estimates, accessed August 2021.

Racism as a psychosocial stressor

- Mental health (depression)
- Quality of life
- Cognition
- Inflammatory markers
- Brain metrics (MRI)
- Neuropathology
- Mortality

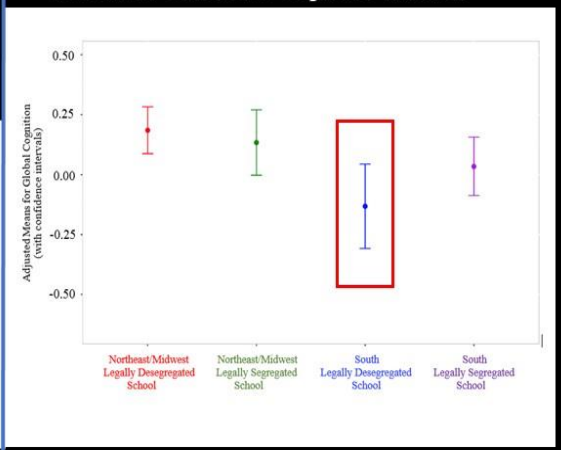
Experiences of discrimination & school segregation associated with poor cognition in African Americans (MARS)

Higher reports of discrimination in Black adults are associated with lower cognition in late-life

Variables	Global cognition	Episodic memory	Perceptual speed
Age	-0.02 (.004)**	-0.03 (.004)**	-0.04 (.005)**
Sex	-0.08 (.052)	-0.17 (.064)*	-0.17 (.076)*
Education	0.07 (.007)**	0.04 (.008)**	0.09 (.010)**
Discrimination	**-0.02 (.010)***	**-0.03 (.013)***	**-0.04 (.015)***

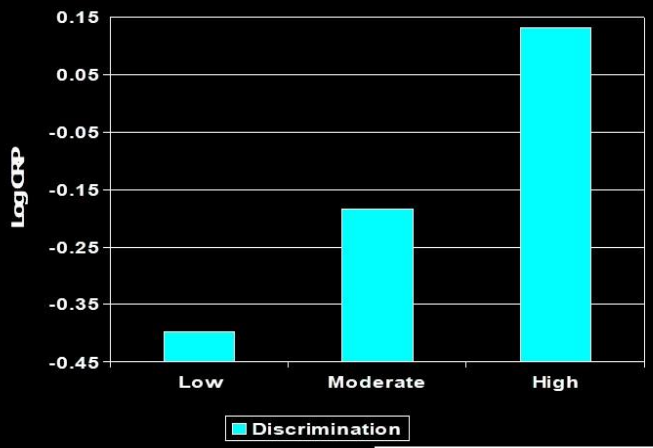
Barnes, Lewis, Begany, et al., JINS. 2012

Attending **desegregated schools** in the South associated with worse cognitive function



Lamar, Lerner, James, et al., JGPS. 2020

Discrimination associated with higher levels of CRP measured in blood



Lewis, Aiello, Leurgans, et al., Brain Behav Immun, 2010

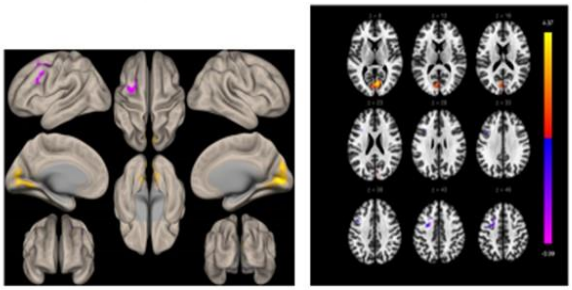
Self-reported experiences of everyday discrimination are associated with elevated C-reactive protein levels in older African-American adults

Tené T. Lewis [a,*], Allison E. Aiello [b], Sue Leurgans [c,d,e], Jeremiah Kelly [c,d], Lisa L. Barnes [c,d,f]

[a] Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, CT, USA
[b] School of Public Health University of Michigan, Ann Arbor, MI, USA
[c] Rush Alzheimer's Disease Center, Rush University Medical Center, Chicago, IL, USA
[d] Department of Neurological Sciences, Rush University Medical Center, Chicago, IL, USA
[e] Department of Internal Medicine, Rush University Medical Center, Chicago, IL, USA
[f] Department of Behavioral Sciences, Rush University Medical Center, Chicago, IL, USA

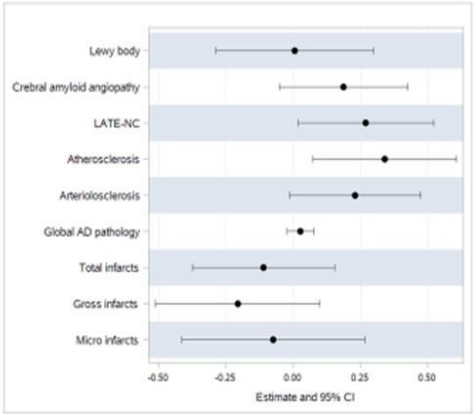
Discrimination gets "under the skin" to affect the brain

Discrimination associated with resting-state connectivity measured with fMRI



Han, Lamar, Fleischman et al., Brain Imaging Behavior, 2020

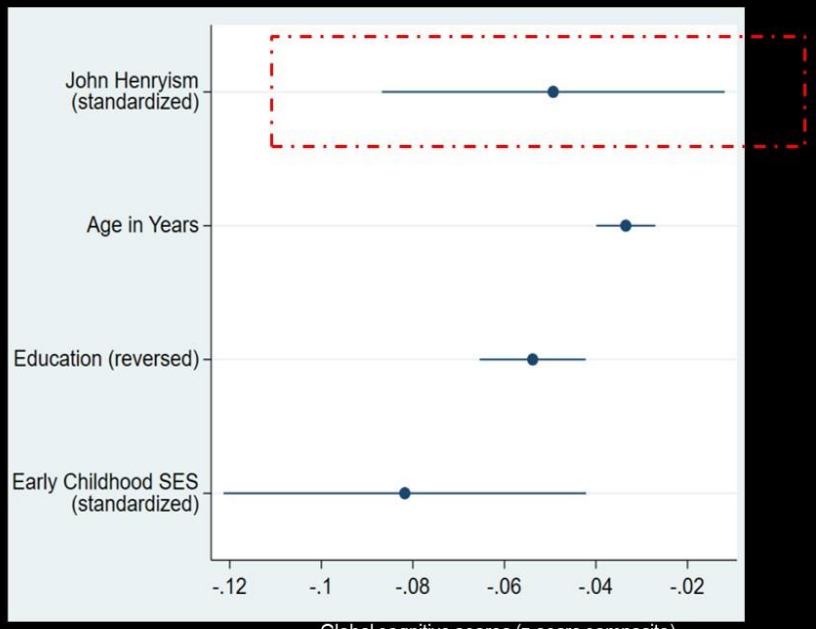
Discrimination associated with LATE-NC and atherosclerosis



Barnes et al., under review

John Henryism is associated with lower cognition

A behavioral strategy for coping with prolonged exposure to racism and stressors



McSorley, Howard, Shah, et al., Psychosomatic Medicine, 2022

"One example of structural racism pertains to the ongoing residential segregation of black Americans, which is associated with adverse birth outcomes, increased exposure to air pollutants, decreased longevity, increased risk of chronic disease, and increased rates of homicide and other crime. Residential segregation also systematically shapes health-care access, utilisation, and quality at the neighbourhood, health-care system, provider, and individual levels."

Bailey, Krieger, Agenor, et al., Lancet 2017

Neighborhood Segregation and Access to Resources

Table 2.

Association Between Cumulative Exposure to Racial Residential Segregation Throughout Young Adulthood and Midlife Cognitive Function[a]

Racial residential segregation	Cognitive measure, β (95% CI)		
	DSST	Stroop color test	RAVLT
High	−0.37 (−0.61 to −0.13)	−0.16 (−0.46 to 0.13)	−0.13 (−0.37 to 0.11)
Medium	−0.25 (−0.51 to 0.0002)	−0.07 (−0.38 to 0.24)	−0.07 (−0.33 to 0.18)
Low	1 [Reference]	1 [Reference]	1 [Reference]

Abbreviations: DSST, Digit Symbol Substitution Test; RAVLT, Rey Auditory Verbal Learning Test.

[a]Includes 1568 participants at baseline (1985). Midlife cognition was measured in 2010 in the 1985-2010 Coronary Artery Risk Development in Young Adults study. Estimates are from marginal structural models. Cognitive scores are calculated as *z* scores to facilitate comparison across estimates, and Stroop scores were additionally reverse coded. Marginal structural models were adjusted for baseline age, visit, examination center, sex, and baseline years of education. Estimates are summarized across results from 10 multiply imputed data sets.

Caunca, Odden, Glymour et al., JAMA Neurol 2020

exposure to residential segregation throughout young adulthood associated with worse processing speed among Black participants (CARDIA)

Similar findings in WHICAP, REGARDS, and HRS

Pohl et al. 2021 – Living in block groups with more minoritized individuals associated with lower language scores; most pronounced for Black adults

Jang et al., 2021 - Metropolitan segregation was associated with lower cognitive function, especially for those with lower education

Finlay et al., 2021 - residing in neighborhoods with higher availability of parks, recreational amenities, and business density was associated with higher levels of cognitive function

Examples of interventions that may indirectly impact structural racism

- Interventions that focus on stress response, building resilience, reducing fear
  - Focus on adolescents; can it work with older populations?
- Place-based interventions that aim to alter the environment in which people live
  - focus on the physical, social, or economic environment
- Relocation assistance → *Moving to Opportunity*; improvements in physical & mental health
- Most effective when done in partnership (e.g., health systems, public health dept, social service agencies, local government agencies, & investors)

What actions can we take to effect change?

- Changes in policies & systems to promote healthier neighborhoods, schools, and workplaces
- Change the distribution of resources for equal access to quality education, reduced poverty and racial segregation
- Modify barriers to and opportunities for good health
- Integrate measures of inequity into brain health research (e.g., ADI, ICE, and others)
- Account for the impact of historical factors, especially from early life (e.g., school segregation, Jim Crow policies)
- Empower the community to become agents of change

Changing how racism affects health requires changing our systems

Conclusions

- Racism is an important social determinant of health
- Dismantling racism must happen at multiple levels
- Risk reduction for ADRD will require:
  - Acknowledging and documenting the consequences of racism in our studies
  - Attention to additional forms of racism that are not traditionally measured, including interactions among multiple forms and across sectors
  - Making the invisible visible, to ensure equity in all aspects of our science (e.g., diversity in our studies, and among those making decisions about the science)