

UC Davis
Geriatrics

Title

Diversifying the Study of Aging and Cognitive Impairment Using White Matter Hyperintensities: A Systematic Review

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<https://escholarship.org/uc/item/69s8h46b#supplemental>

Data Availability

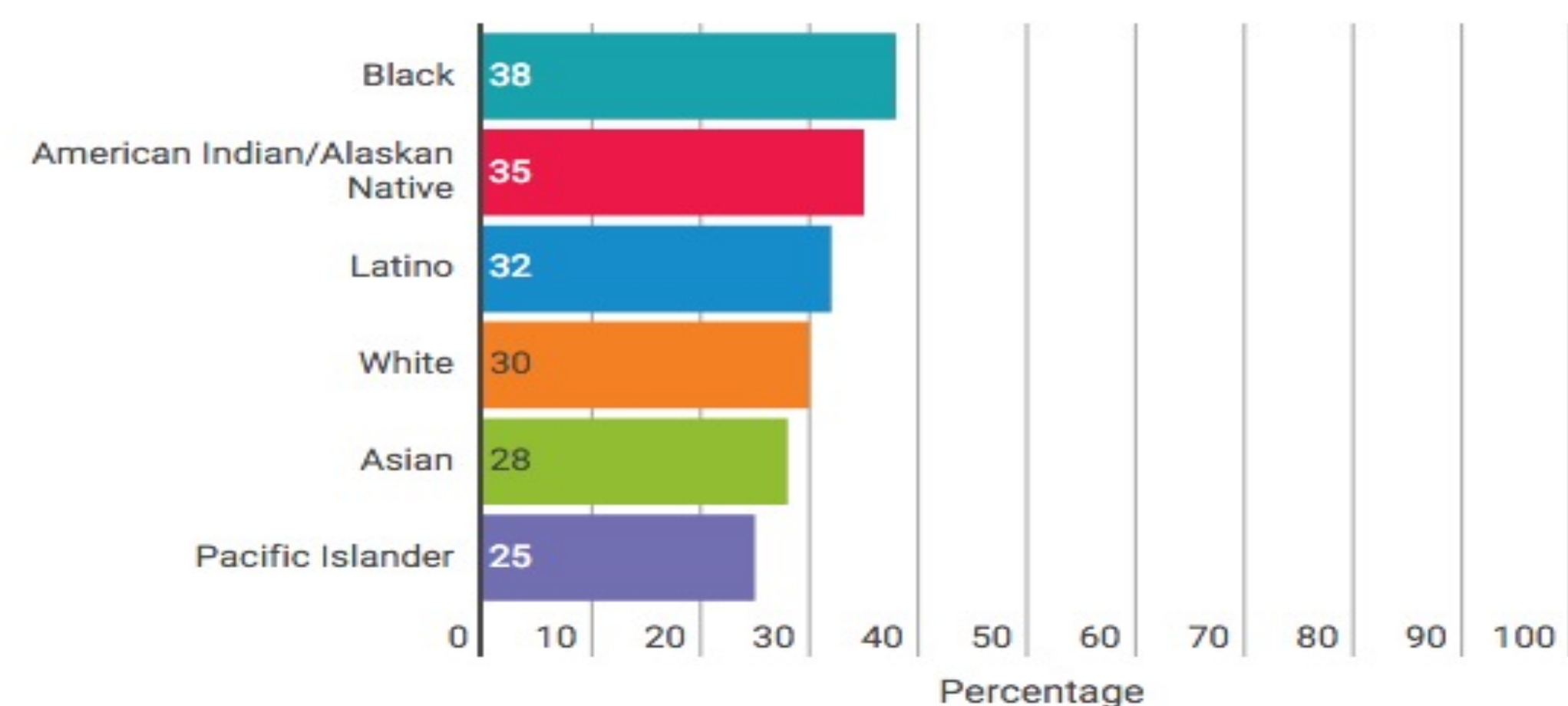
The data associated with this publication are not available for this reason: NA

Background

- US elderly population is rapidly becoming more diverse.
- Historically, studies of aging and dementia do not reflect this increase in diversity.
- Aging and cognitive health is affected by psychosocial and environmental determinants that particularly impact diverse groups.
- White Matter Hyperintensities (WMH) are imaging findings that have been linked to dementia and Alzheimer's Disease processes¹.
- To date, we are not aware of a systematic review that has investigated the extent to which white matter hyperintensities contribute to the ethno-racial disparities in dementia and cognitive impairment.

Race and Dementia Risk

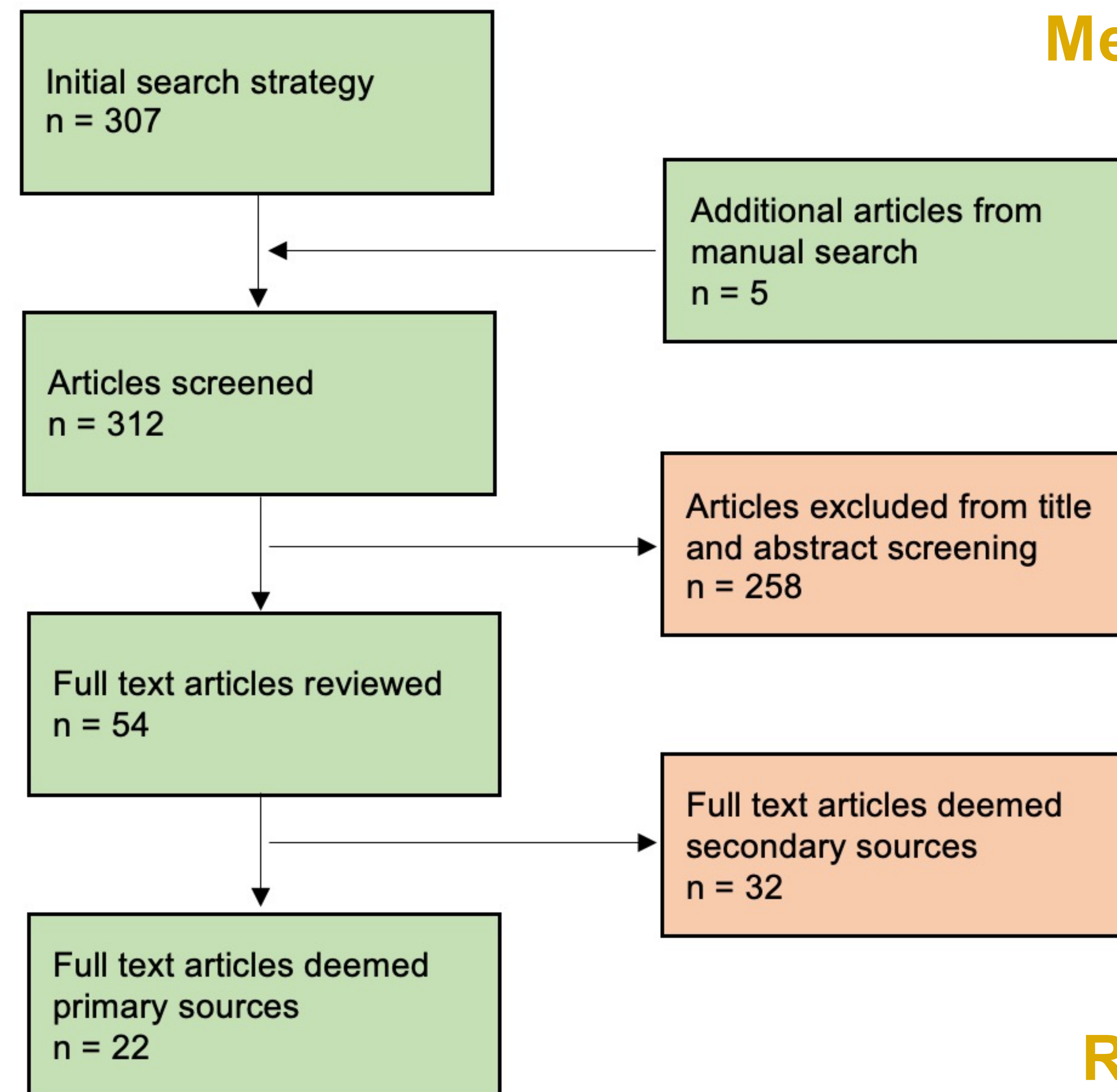
Researchers found significant variation in dementia rates among six ethnic and racial groups. This chart shows each group's likelihood of developing dementia within 25 years after age 65.



Objective

To systematically review the literature for the prevalence of ethnic and racial differences on the cognitive impact of WMH in diverse populations of people in the US.

Methods



Search Strategy: PubMed papers were identified based on a search query that contained three major categories: *white matter hyperintensities*, *diversity*, and *cognition*.

Inclusion/Exclusion Criteria:

- Full text sources must have examined the interaction of race/ethnicity across two or more ethno-racial groups in the US.
- These articles were further divided into primary or secondary sources.
- A source was considered primary if the focus of the manuscript was to describe ethno-racial differences in WMH burden.
- A source was considered secondary if two or more ethno-racial differences in WMH burden were reported but the primary emphasis of the manuscript focused on other associations such as association between WMH burden and cognition.

Results

- 22 full text articles were analyzed for WMH comparisons across ethno-racial groups and critically evaluated for its statistical methodology.
- These studies consisted of a total 22,398 diverse participants (Figure 1) with an average age of 67.9 years.
- 16/22 studies were cross sectional analysis, 5/22 studies were longitudinal analysis, and 1/22 studies included both.
- 8 studies directly quantified WMHs at baseline and compared across ethno-racial groups.
 - 5/8 found significant differences across ethno-racial groups, with African Americans having greater WMH than Whites. **None of these statistical methods accounted for vascular or socioeconomic factors.**
 - 3/8 found no significant differences across ethno-racial groups or **differences that became attenuated after adjusting for vascular and socioeconomic factors** (Figure 2).

Figure 1 Demographic Breakdown

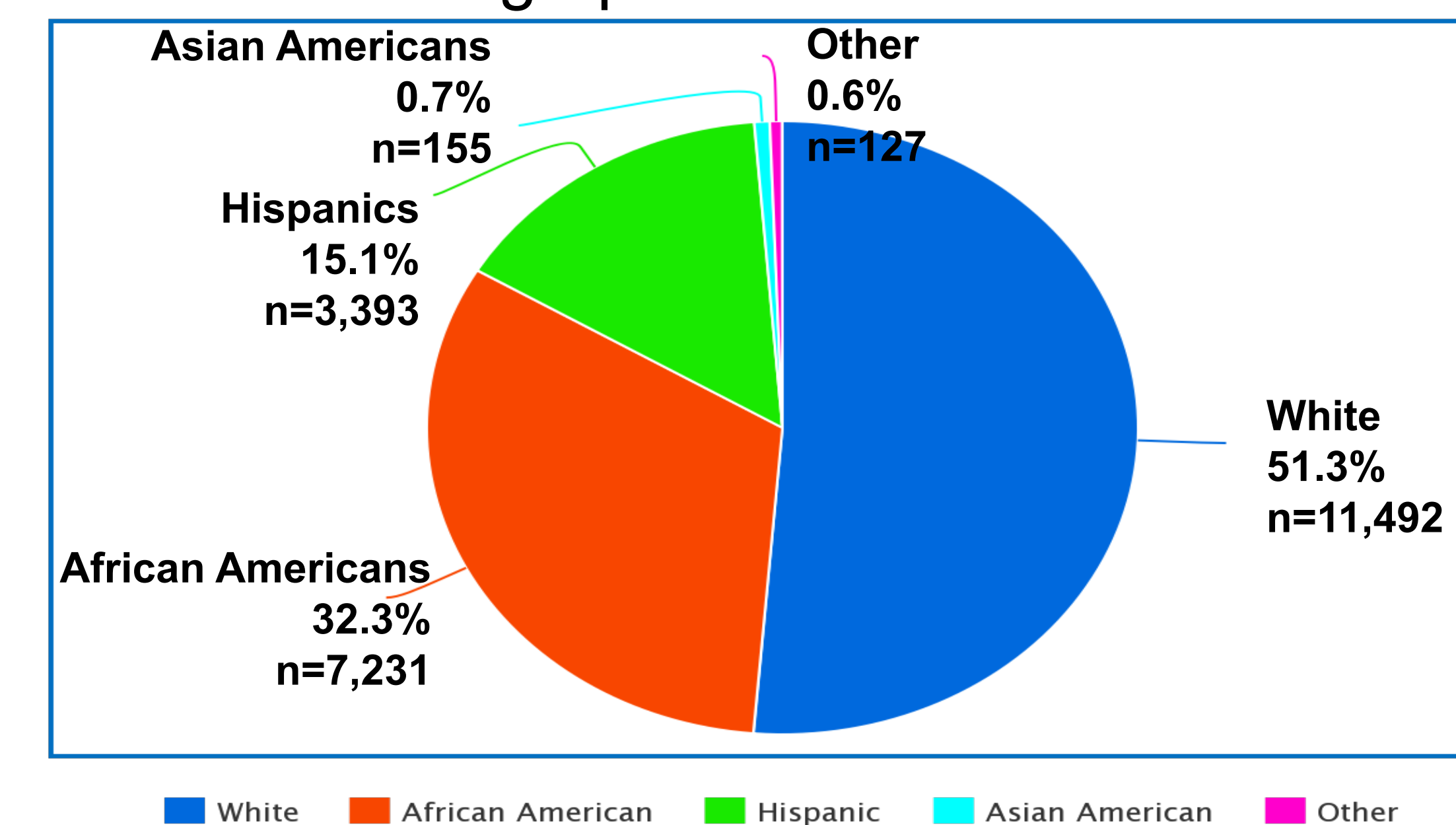
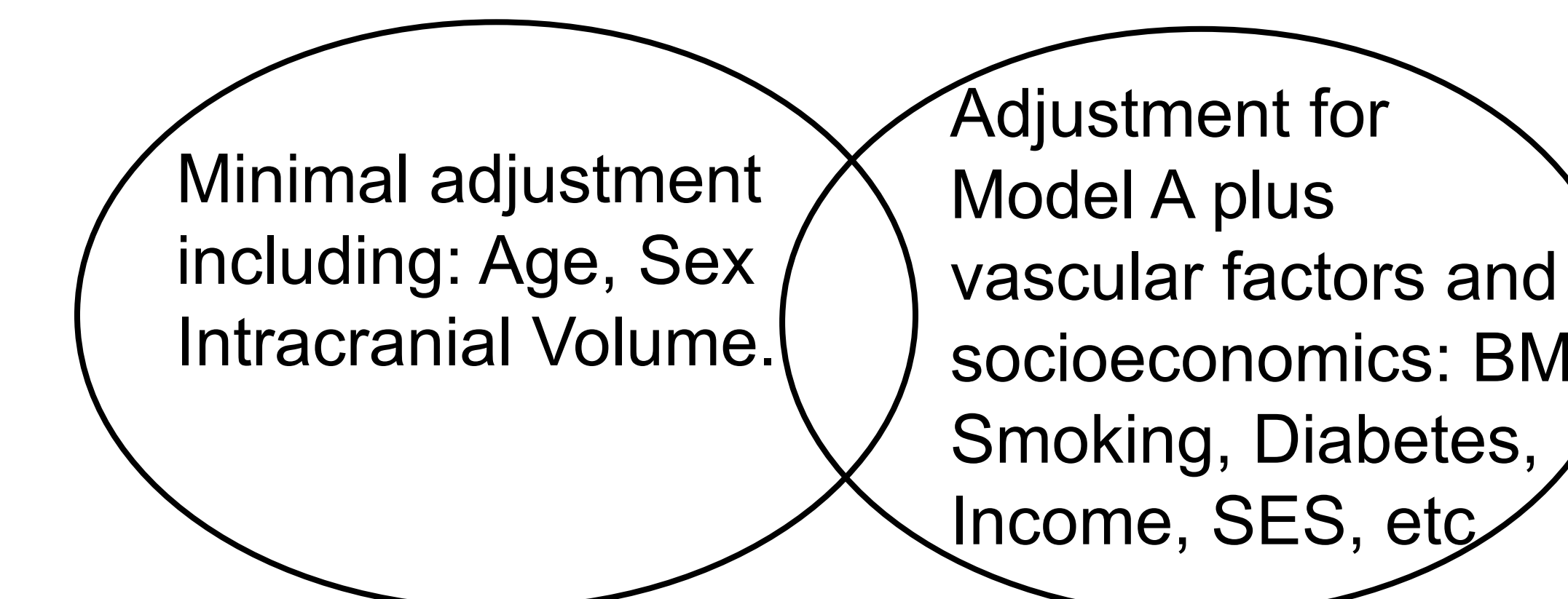


Figure 2 Model A: Ethnoracial Difference vs Model B: No Difference



Summary/Conclusions

- Results of the systematic review were heterogenous, and therefore we cannot make any definitive conclusions.
- However, there appears to be consistencies that show a greater burden of vascular and socioeconomic risk factors among African Americans that may contribute to greater WMH compared to Whites.
- Data on Hispanics, Asian Americans, and other groups are limited.
- We see a critical need for prospective-based longitudinal cohort studies of diverse elderly individuals.

Future Studies

DiverseVCID is a 6-year study of 2,250 Americans from diverse backgrounds to understand the role that WMH play in developing Alzheimer's disease and other dementias.



References

1. DeBette S, Beiser A, DeCarli C, et al. Association of MRI markers of vascular brain injury with incident stroke, mild cognitive impairment, dementia, and mortality: the Framingham Offspring Study. *Stroke*. 2010;41(4):600-606.

Acknowledgements

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