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### Title

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### Permalink

<https://escholarship.org/uc/item/14h4w1s2>

### Journal

Alzheimer's & Dementia: Translational Research & Clinical Interventions, 9(2)

### ISSN

2352-8737

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### Publication Date

2023-04-01



### DOI

10.1002/trc2.12392

Peer reviewed

## PERSPECTIVE

# Inclusion of Vietnamese Americans: Opportunities to understand dementia disparities

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### Funding information

National Institute on Aging, Grant/Award Numbers: R01AG067541, P30AG072972, R24AG063718; Alzheimer's Association, Grant/Award Numbers: AARGD-19-619832, USPOINTER

### Abstract

There is a dearth of research on cognitive aging and dementia in Asian Americans, particularly Vietnamese Americans, who are the fourth largest Asian subgroup in the United States. The National Institutes of Health is mandated to make certain that racially and ethnically diverse populations are included in clinical research. Despite the widespread recognition to ensure that research findings can be generalizable to all groups, there are no estimates of the prevalence or incidence of mild cognitive impairment and Alzheimer's disease and related dementias (ADRD) in Vietnamese Americans, nor do we understand ADRD risk and protective factors in this group. In this article, we posit that studying Vietnamese Americans contributes to a better understanding of ADRD in general and offers unique opportunities for elucidating life course and sociocultural factors that contribute to cognitive aging disparities. That is, the unique context of Vietnamese Americans may provide understanding in terms of within-group heterogeneity and key factors in ADRD and cognitive aging. Here, we provide a brief history of Vietnamese American immigration and describe the large but often ignored heterogeneity of Asian Americans in the United States, elucidate how early life adversity and stress might influence late-life cognitive aging, and provide a basis for the role of sociocultural and health factors in the study of Vietnamese cognitive aging disparities. Research with older Vietnamese Americans provides a unique and timely opportunity to more fully delineate the factors that contribute to ADRD disparities for all populations.

### KEYWORDS

Alzheimer's disease, Asian Americans, dementia, immigrants, refugees, trauma, Vietnamese Americans, war

## 1 | INTRODUCTION

Asian Americans are the fastest growing racial and ethnic population in the United States; by 2060, the number of Asian Americans is pro-

jected to rise to 35.8 million, more than triple their 2000 population.<sup>1</sup> In this article, we use the US Office of Management Budget's current government-wide standard when referring to Asian Americans, which includes persons who have "origins in any of the original peoples

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of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.”<sup>2</sup> Though they are the fastest growing segment of the US population, there is surprisingly very little known about their cognitive aging and Alzheimer’s disease and related dementias (ADRD) risk. The little epidemiological work that exists suggests that Japanese Americans have similar or lower dementia incidence rates compared to non-Hispanic Whites (NHWs).<sup>3</sup> In 2016, the first incidence rates of ADRD for select Asian American subgroups were published and suggested lower rates of dementia compared to NHWs.<sup>4</sup> Importantly, incidence rates varied among Asian American subgroups.<sup>5</sup> However, even these seminal studies have only included rates for Chinese-, Filipino-, and Japanese Americans. In a recent study of > 1.8 million individuals enrolled in the Veterans Health Administration integrated nationwide health-care system, results showed that age-adjusted incidence rates of dementia were higher for Asian American compared to White participants;<sup>6</sup> however, it is unclear what Asian American subgroups were included in the study.

## 1.1 | Heterogeneity of Asian Americans

Asian Americans are a diverse, heterogeneous group, numbering 22 million and coming from > 20 countries in East and Southeast Asia and the Indian subcontinent. A large body of research has documented differences in demographic and health risk factors across subgroups.<sup>7-9</sup> Despite these demographic, cultural, health, and health-care access differences, Asian Americans continue to be aggregated as a group and with Native Hawaiians/Pacific Islanders (NHPI). Aggregating Asian Americans and NHPIs in research masks the large heterogeneity that exists in these groups and contributes to inaccurate and misleading information about ADRD.<sup>10</sup> Moreover, Asian Americans are the most economically divided racial group in the United States, with the largest wealth gap reported in Los Angeles, California. A 2016 study using the National Asset Scorecard for Communities of Color showed that Japanese- and Chinese-American households had higher median wealth (\$590,000 and \$408,200, respectively) compared to White households, but that Vietnamese American households had a substantially lower amount of wealth (\$61,500).<sup>11</sup>

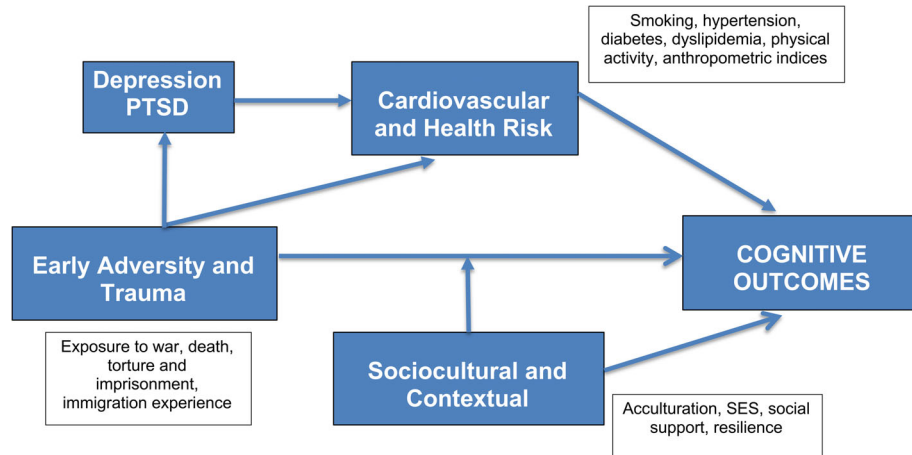
Vietnamese Americans are the fourth largest Asian subgroup in the United States, numbering approximately two million and are at high risk for adverse health outcomes,<sup>12,13</sup> partially due to their sociopolitical history. Yet, it is unknown how these health disparities impact cognitive aging and ADRD risk in late life. The prevalence of cognitive impairment for Vietnamese Americans in the United States is unknown. In a recent study of 3308 Vietnamese ( $\geq 60$  years) in six provinces in Vietnam, results from a global measure of cognition (Mini-Mental State Examination) showed that  $\approx 46\%$  of the sample were categorized as having cognitive symptoms of dementia (cut-off point of 24<sup>14</sup>). However, extrapolation from findings in Vietnam to the United States may not be appropriate for many reasons, including selective migration and immigration experiences of the Vietnamese American population,<sup>15</sup> and the differences between the Vietnamese and Amer-

### RESEARCH IN CONTEXT

- 1. Systematic Review:** We provide a brief history on the context of Vietnamese American immigration to the U.S. and how early life factors associated with war and immigration may contribute to late life dementia risk.
- 2. Interpretation:** The unique historical and social context of Vietnamese Americans may provide understanding in terms of social and cultural factors, as well as how within-group heterogeneity, are associated with heterogeneity in cognitive aging. The Vietnamese Insights into Aging Program (VIP) is the first known study to enroll a prospective cohort of Vietnamese Americans to study early life factors and cognitive aging.
- 3. Future Directions:** Future studies with culturally diverse populations that include community-based organizations as partners in research have potential for addressing and reducing ADRD-related disparities for all groups.

ican cultures and societal contexts.<sup>16</sup> Vietnamese Americans are a relatively recent immigrant group compared to other Asian American subgroups.

Vietnam as a country has a long history of war and colonization, first by China and then by France. In 1954, Ho Chi Minh and the Indochinese Communist Party defeated the French and the Vietnam War ensued as Communist forces moved throughout the country from 1956 to 1975.<sup>15</sup> Before 1975 (when the Vietnam War ended), < 5000 Vietnam-born persons were admitted into the United States.<sup>17</sup> With the fall of Saigon and the Communist Party takeover, almost 125,000 Vietnamese refugees fled to the United States in 1975. Over the next couple of decades, there were several waves of immigration with hundreds of thousands more Vietnamese seeking refuge in the United States; each wave is characterized by different levels of socioeconomic status (SES), exposure to and familiarity with the United States (i.e., acculturation level), and supportive environments. The first wave consisted mainly of military personnel and urban, educated professionals (and their family members) whose connections with the US military or the South Vietnamese government made them targets of the communist regime. In the late 1970s/early 1980s, the second wave of Vietnamese refugees, referred to as the “boat people,” because of their primary means of travel being by sea, entered the United States. These refugees came from mainly rural areas and were often less educated than earlier arrivals; many were ethnic Chinese immigrants fleeing persecution in Vietnam. These first two waves were characterized by more harrowing escapes and travel than the third wave. Throughout the 1980s and 1990s, the third wave came to the United States and contained fewer refugees and included thousands of Vietnamese Amerasians (children of US servicemen and Vietnamese mothers) as well as political prisoners.<sup>18</sup>



**FIGURE 1** Conceptual model of risk and protective factors for cognitive impairment and dementia in older Vietnamese Americans. Risk factors are early life adversity and trauma related to the Vietnam War and immigration. These are hypothesized to be associated with cognitive outcomes and mediated by depression, PTSD, and cardiovascular and health risk factors (e.g., smoking, hypertension, diabetes, dyslipidemia, physical activity, overweight, waist-to-hip ratio, and body mass index). Sociocultural and contextual factors, including SES, acculturation, social support, and resilience, are hypothesized moderators of the association between early life adversity and trauma and cognitive outcomes. PTSD, post-traumatic stress disorder; SES, socioeconomic status

Although there has been some work on early life adversity and cognitive aging (e.g., Barnes et al.),<sup>19</sup> there is a dearth of research that includes refugee and immigrant populations whose adverse circumstances include war and trauma related to leaving their country of origin. Based on life course theories and socio-ecological models of health, we propose a conceptual model of early life adversity and trauma and potential mechanisms for how they might influence later life cognition and dementia in older Vietnamese Americans. Early life adversity is characterized by a wide range of circumstances or events that pose a serious threat to physical or psychological well-being. Examples of childhood adversity include “child abuse and neglect, domestic violence, bullying, serious accidents or injuries, discrimination, extreme poverty, and community violence.” On the other hand, trauma “occurs when a person perceives an event or set of circumstances as extremely frightening, harmful, or threatening—either emotionally, physically, or both,” and may continue even beyond the initial exposure to an adverse event. Trauma is one possible outcome of exposure to adversity.<sup>20</sup>

Figure 1 suggests that early life adverse experiences (e.g., sporadic bombing raids in Vietnam) and trauma (e.g., witnessing the death of family members or soldiers) are related to later life cognitive outcomes (cognitive impairment, dementia). We propose that these early life experiences are associated with a greater risk for post-traumatic stress disorder (PTSD) and depression, which can lead to cardiovascular disease (CVD) and health risks, including smoking, hypertension, diabetes, dyslipidemia, exercise, and overweight. Furthermore, cardiovascular and health risk factors mediate the association between early life adversity and trauma and later life cognition, while sociocultural and contextual risk factors and protective factors may moderate the association. For example, higher SES and greater social support can attenuate the association between early life adversity and trauma and later life cognitive impairment. This conceptual model and its hypothesized mechanisms—consisting of early life, sociocultural, and

contextual factors, as well as cardiovascular and health risk factors—can be used to inform cognitive aging disparities research in other understudied populations.

## 1.2 | Early experiences of adversity and trauma

Due to their distinct sociopolitical history, Vietnamese Americans faced much trauma before their immigration to the United States. Common pre-migration traumatic experiences include physical and sexual assault, combat/war, imprisonment and torture, and sudden evacuation from their country. Additionally, many Vietnamese faced harrowing experiences on their journey to the United States, including being captured by pirates at sea, witnessing family members being killed or raped, and enduring hunger and other refugee camp hardships. Post-migration adversity included loss of social status (e.g., working as a physician in Vietnam and a factory worker in the United States), language barriers, lack of social support, and acculturative stress. In the only nationally representative dataset of Asian Americans, the National Latino and Asian American Study (NLAAS), it was shown that ≈70% of Vietnamese Americans experienced pre-migration trauma, and that these individuals were also more likely to have traumatic experiences after immigrating to the United States.<sup>21</sup> In a qualitative study by Meyer et al., 7/10 Vietnamese American dementia caregivers indicated that they or their care recipient had experienced loss or trauma after the fall of Saigon. Other qualitative work with Vietnamese Americans<sup>22,23</sup> suggest that individuals had lost family members pre- and post-Vietnam War and had themselves suffered physical, sexual, or psychological trauma throughout their lives.<sup>23</sup> Middle-aged Vietnamese Americans (in the mid-1970s) experienced the brunt of this life course of trauma and adversity.<sup>24</sup> This is the current population of older Vietnamese Americans in the United States today, who are

vulnerable to dementia and yet whose basic epidemiology such as prevalence and incidence of ADRD are unknown.

Studies have linked stress and PTSD to an increased risk of memory impairment and dementia in later life.<sup>25,26</sup> Research with multi-ethnic samples demonstrated that early life experiences (e.g., adversity) impacted baseline cognitive function as well as cognitive decline.<sup>27-29</sup> In the first study of PTSD and dementia in civilians and in both men and women in the United States, Flatt et al. used 13 years of prospective data on a large, diverse population of older adults ( $N = 499,844$ ) and found that individuals with PTSD had a 73% increase in risk of dementia compared to those without PTSD.<sup>30</sup> Early life adversity related to war and life course trauma may exert its influence on cognition through CVD and depression pathways. Among other populations, a meta-analysis based on 4108 participants in 60 studies showed that PTSD was associated with significant neurocognitive effects, including verbal learning, speed of information processing, attention/working memory, and verbal memory, with rather large effect sizes.<sup>31</sup>

### 1.3 | Cardiovascular and health risk factors

Recent Lancet<sup>32</sup> and World Health Organization<sup>33</sup> reports suggest that up to 40% of dementia cases may be preventable through the adoption of healthy lifestyle factors that include physical activity and diet. Additionally, research has shown the importance of CVD risk and its relationship to ADRD,<sup>34,35</sup> but this has not been studied in the Vietnamese American population, who have a high prevalence of smoking and physical inactivity compared to NHWs.<sup>36</sup> Studies on smoking have shown that Vietnamese American men in particular have a high prevalence of smoking: Vietnamese men in Vietnam: 45%,<sup>37</sup> Vietnamese American men: 35.4%,<sup>38</sup> general population: 23.9%.<sup>39</sup> Both men and women have low physical activity and poor health literacy in terms of knowledge of heart attack and stroke symptoms.<sup>40</sup> In a Behavioral Risk Factor Surveillance System study, 40% of Vietnamese Americans, compared to 12% of NHWs, did not engage in any moderate or vigorous activity, echoing similar findings from an Australian cohort study of Vietnamese immigrants.<sup>41</sup> A recent report of Vietnamese Americans living in Northern California found that a higher proportion of Vietnamese Americans had been diagnosed with diabetes compared to NHWs, other Asian Americans, and all adults in the county as a whole.<sup>42</sup> The report also indicated that 29% of Vietnamese Americans had high blood pressure, and a higher percentage (37%) had high cholesterol than adults county-wide and adults from all other major racial and ethnic minority groups.

Hypertension is a major risk factor for CVD with a prevalence of 33% in the United States.<sup>43</sup> One of the few US studies of hypertension indicated that among a small community on the Gulf Coast, 44% of Vietnamese Americans were hypertensive. Although current CVD prevalence rates for Vietnamese Americans are similar to NHWs, given the higher risk factors (e.g., smoking, hypertension) and low health literacy in this population, it is likely the rates of adverse cardiovascular outcomes for Vietnamese Americans (e.g., heart attacks and strokes) will eventually exceed those of NHWs.<sup>40</sup> Thus, it is impera-

tive that we understand how CVD risk factors and health behaviors impact cognitive aging and ADRD risk for the Vietnamese American population.

There is distinct heterogeneity in CVD mortality rates across the six largest Asian American subgroups, including Vietnamese,<sup>44</sup> and CVD risk factors for Vietnamese Americans are high. The proportionate mortality burden of hypertensive heart disease and cerebrovascular disease is higher in Vietnamese Americans compared to NHWs. Iyer et al. found that Vietnamese Americans lost more years of life than the aggregate Asian American group (except for Filipinos) as well as NHWs.<sup>45</sup> A more recent study using death certificate data from the National Center for Health Statistics over the past two decades showed that while age standardized mortality rates (ASMRs) from ischemic heart disease decreased in all subgroups of Asian American, NHW, and Hispanic women, as well as in Chinese, Filipino, Japanese, Korean, NHW, and Hispanic men, they remained stagnant in Asian Indian and Vietnamese American men. Moreover, the highest cerebrovascular disease ASMRs among Asian American subgroups in 2017 was in Vietnamese American men and women.<sup>46</sup>

### 1.4 | Sociocultural and contextual factors

Effect modification by psychosocial and sociocultural risk and protective factors (e.g., SES differences in native country vs. United States acculturation level) could provide critical information about the biology of diseases like ADRD, and can only be found in diverse populations. Vietnamese Americans have poorer mental health and lower SES compared to NHWs and other Asian Americans, which may make them more vulnerable to dementia. Nationally representative data from NLAAS indicate that 36% of Vietnamese live in poverty.<sup>47</sup> In a recent population-based study, Meyer et al.<sup>48</sup> examined racial and ethnic disparities in psychological distress among those caring for an older family member. Results showed significant disparities for Vietnamese Americans; despite comparable levels of education with NHWs and Chinese Americans, Vietnamese had significantly lower annual incomes, the highest levels of psychological distress, and the poorest self-rated health.<sup>48</sup>

Acculturation is important in immigrant health, yet nothing is known about how variation in acculturation impacts ADRD risk for Vietnamese Americans. Acculturation is a process in which members of one cultural group adopt the beliefs and behaviors of another, more dominant group.<sup>49</sup> Acculturation has multiple domains that are assumed to change, such as language, media and food preferences, and ethnic identity.<sup>50,51</sup> The majority of studies that examine the relationship between a measure of acculturation (e.g., nativity status) and cognition has looked at the Hispanic paradox in Latino adults, which suggests that despite having lower SES, Latino immigrants (those presumably less acculturated) are more cognitively healthy than their NHW counterparts. In contrast, a study of an ethnically diverse group of participants from Hispanic, Asian, or Middle-Eastern descent showed that higher levels of adaptation to US culture was associated with better performance on processing speed.<sup>52</sup> Data from the Health and Retirement

Study<sup>53</sup> and other work in Latino and Chinese American older adults highlight the nuanced role of cultural factors such as acculturation on cognition.<sup>54-56</sup>

More recently, Li et al. showed that higher levels of acculturation in Chinese Americans were associated with better global cognition and that acculturation also moderated the relationship between family type (i.e., solidarity and conflict level) and cognition.<sup>57</sup> Minority older immigrants with higher levels of acculturation may have better social integration and potentially access to health care, which could benefit cognitive function.<sup>56</sup> Certain proxies of acculturation, such as bilingual proficiency, may also be involved in dementia risk. A meta-analytic study by Anderson et al. indicated that while there was weaker evidence that bilingualism prevents the occurrence of Alzheimer's disease (AD), findings indicated a moderate effect size for the protective effect of bilingualism on age of onset of symptoms of AD.<sup>58</sup> Thus, acculturation is an important determinant of ADRD risk but has not been studied in Vietnamese Americans. Acculturation problems, such as resettling in the United States with limited English language proficiency, may strongly influence Vietnamese Americans' health and health behaviors.

Although experiences of war-time trauma and adversity may make older Vietnamese Americans at risk for cognitive health disparities, a number of factors, including social support and resilience factors, may buffer against the negative impact of adversity and trauma. Asian cultures are typically more collectivistic (e.g., higher reliance on and support from family members), and there is some research showing the association between social support and health in collectivistic countries.<sup>59</sup> Given the evidence indicating higher levels of social support and its association with lower levels of psychological distress, depression, and anxiety among Asian Americans<sup>60</sup> as well as work showing that social support has direct effects on hypertension and cardiovascular reactivity among Asian American immigrants<sup>61</sup> it is reasonable to conclude that certain aspects of Vietnamese culture and families, including social support, may buffer against the negative impact of adversity and trauma on cognition.

## 1.5 | Opportunities for advancing the study of ADRD

By 2030, the number of NHW and Black older adults living with ADRD in California will double while it will triple for Asian Americans.<sup>62</sup> By 2055, Asian Americans are projected to become the largest group of immigrants in the United States, and by 2065, nearly two out of five immigrants will be Asian American.<sup>63</sup> Despite the rapid growth of this population, very little is known about their cognitive aging risk factors. Compared to other large Asian American subgroups (e.g., Chinese Americans), Vietnamese Americans may be at greater risk for cognitive impairment and dementia due to the abovementioned factors. The specific context of Vietnamese Americans (i.e., high exposure to life course trauma and adversity, and high prevalence of CVD risk factors) offers an opportunity to examine the interplay of adversity and trauma, CVD, social factors, and ADRD risk and resilience that may

have relevance for other US immigrants and individuals from adverse backgrounds. Work in this area will lead to a better understanding of cognitive aging and mechanisms of disease in Vietnamese Americans and may also have broader implications for prevention and intervention efforts among other subgroups vulnerable to health disparities. With the growing influx of refugees from war-torn countries seeking asylum in the United States today, it is essential that more is known about how their early life experiences, trauma, and sociocultural factors impact their risk for dementia.

A new study funded by the National Institute on Aging, entitled the Vietnamese Insights into Aging Program (VIP), is a first-of-its-kind prospective cohort study that will enroll 540 older Vietnamese Americans in Northern California into a longitudinal study of cognitive aging (manuscript in preparation). This study will use cognitive measures that have been validated in a small Vietnamese American population in Southern California and assess how early life adversity and war- and immigration-related traumatic experiences associate with cardiovascular health, and how this, in turn, is associated with present day cognition and ADRD risk. For the first time, we will potentially have normative cognitive data in a well-characterized cohort of older Vietnamese Americans. Additionally, the VIP is partnering with two community-based organizations and their executive directors (Q.V. and S.N.) to carry out study activities. Recruitment events and research participant interviews all take place at the community organization site. These organizations have long-standing credibility and are centrally located in the Vietnamese American community. We believe this practice of meeting people where they are, metaphorically and practically speaking, contributes to the inclusion of diverse populations in ADRD research.

Research with culturally diverse populations is critical, yet for quite some time Asian Americans, especially Southeast Asians (e.g., Vietnamese, Laotian, Cambodian, Hmong), have been missing from aging and dementia research. Including Southeast Asian refugees is vital to understanding the diversity of experiences (e.g., war trauma, resilience factors) that can contribute to cognitive aging. The unique history of Vietnamese Americans offers a naturalistic research opportunity to understand how trauma and early life adversity impact aging, both from a risk factor and resilience standpoint. Although there is considerable heterogeneity in terms of severity and duration of exposure to war-related trauma and adverse immigration experiences (e.g., subgroups such as many South Vietnamese veterans were interned in harsher re-education camps), most older Vietnamese Americans have a similar background (e.g., exposure to war) but not all will report trauma and have dementia; this unique context helps us investigate the nuanced role of early life adversity and trauma as well as potential resilience factors (e.g., acculturation, supportive environments) on cognitive aging. Understanding disparities in cognitive aging of older Vietnamese Americans who directly experienced war-related trauma has potential impact to reduce disparities for younger generations of Vietnamese Americans who might also face health and ADRD-related burden through intergenerational transmission of trauma.<sup>64</sup> This could offer deeper insights into ADRD pathophysiology and the long-term effects of trauma. Intervening early by addressing modifiable risk

factors (e.g., hypertension, smoking, PTSD symptoms, depression) could be crucial for delaying and preventing the onset of dementia for Vietnamese Americans and other groups.<sup>34</sup> We call for longitudinal studies to address the gap in knowledge regarding the epidemiology of cognitive impairment and ADRD risk in Vietnamese and other Asian American populations.

## ACKNOWLEDGMENTS

The authors would like to thank the community advisory boards, two community partners involved in the Vietnamese Insights into Aging Program (VIP)—Asian Resources, Inc. (ARI) and International Children Assistance Network (ICAN), and the supporting staff. We also want to thank Dr. Malcolm Dick for his guidance and input on the topic of neuropsychological testing in Vietnamese Americans. This work is partially supported by the National Institute on Aging (all authors: R01AG067541). O.M., S.F., D.H., and R.W. supported by P30AG072972. O.M. received partial support from the Alzheimer's Association (AARGD-19-619832) and the Doris Duke Charitable Foundation COVID-19 Fund to Retain Clinical Scientists awarded to UC Davis School of Medicine by the Burroughs Wellcome Fund. R.W. and O.M. received partial support from the Alzheimer's Association US POINTER study. O.M. and V.P. received partial support from NIA R24AG063718. The funders had no role in study conception, design, or writing of this manuscript.

## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest. Author disclosures are available in the [supporting information](#).

## CONSENT STATEMENT

No informed consent was necessary as this was a conceptual paper.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Meyer OL, Park VT, Kanaya AM, et al. Inclusion of Vietnamese Americans: Opportunities to understand dementia disparities. *Alzheimer's Dement*. 2023;9:e12392. <https://doi.org/10.1002/trc2.12392>