

REVIEW ARTICLE

# Addressing the disparities in dementia risk, early detection and care in Latino populations: Highlights from the second Latinos & Alzheimer's Symposium

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#### Abstract

The Alzheimer's Association hosted the second Latinos & Alzheimer's Symposium in May 2021. Due to the COVID-19 pandemic, the meeting was held online over 2 days, with virtual presentations, discussions, mentoring sessions, and posters. The Latino population in the United States is projected to have the steepest increase in Alzheimer's disease (AD) in the next 40 years, compared to other ethnic groups. Latinos have increased risk for AD and other dementias, limited access to quality care, and are severely underrepresented in AD and dementia research and clinical trials. The symposium highlighted developments in AD research with Latino populations, including advances in AD biomarkers, and novel cognitive assessments for Spanish-speaking populations, as well as the need to effectively recruit and retain Latinos in clinical research, and how best to deliver health-care services and to aid caregivers of Latinos living with AD.

## 1 | INTRODUCTION

Alzheimer's disease (AD) is the most common cause of dementia and has emerged as a significant societal issue and a global priority. Countries in Latin America (LatAm) and the global community of Latinos will experience substantial increases in dementia and its associated impacts in the near future.<sup>1</sup>

US Latinos are projected to have the steepest increase in Alzheimer's disease and related dementias (ADRD) in the next 40 years compared to other ethnic groups.<sup>2</sup> Therefore, it is essential to involve this population in research that can improve: (1) understanding of the pathology of AD among Latino populations, (2) identification of social and environmental factors that either increase or decrease risk for this group, (3) enrollment of Latinos in clinical trials, and (4) development of models of care with tailored approaches that are culturally and linguistically inclusive. With this goal, in May 2021 the Alzheimer's Association hosted the second Latinos & Alzheimer's Symposium, in which researchers from the United States and Latin America high-

lighted current AD-related research among Latinos. Bringing these diverse groups into the research enterprise is essential to address the health disparities that put Latinos and other groups at higher risk of dementia. In addition, convening a meeting of researchers interested in Latino health strengthens their expertise, networks, and purpose. Due to the COVID-19 pandemic, the symposium was held virtually over 2 days in May, and welcomed >1400 registrants from 39 different countries across six continents.

As the older adult population grows around the world, so does the prevalence of AD. However, the increase in AD will not affect all people equally. For example, although the prevalence of AD in the United States is estimated at 1.6%, higher rates have been reported among non-Hispanic Blacks and Latinos >65 years of age.<sup>2</sup> By 2060, the AD prevalence in Latinos ≥ 65 years old is projected to increase 7-fold over current estimates.<sup>2</sup> Although this estimate is highest among Latino populations compared to any other major ethnic/racial group, 3 out of 10 Latinos say they will not live long enough to develop dementia.<sup>3</sup> These dual realities, plus a rapidly growing disease burden within a

perpetually underserved population, force public health institutions to consider how to increase Latino participation in AD research. Moreover, clinicians and policymakers must prioritize efforts to enhance access to quality care and resources for the millions of Latino AD caregivers.

Latinos are racially and ethnically diverse, and often reflect a mix of culture, environment, and genetic ancestries drawn from African, Amerindian, and European source populations.<sup>4</sup> In the United States, Latinos of Mexican descent are the largest group, followed by Puerto Ricans, Central Americans, South Americans, and Cubans.

Although the terms to define Latinos have changed over time, for this article we refer to “Hispanic” as those whose country of origin or ancestry is from a primarily Spanish-speaking country, including Spain. We use the term “Latinos” to refer to people whose country of origin or ancestry is from Latin America. As terminology used differs between studies, in this article we use the terms that were originally used in the cited studies.

## 2 | LATINOS, AD, AND DEMENTIA—CULTURAL, LINGUISTIC, AND PSYCHOSOCIAL FACTORS

Prevalence estimates for ADRD among Latino populations vary widely in the United States, with the highest rates for those with a Caribbean background (Dominican and Puerto Rican) and the lowest for those with Mexican and Central American backgrounds.<sup>5</sup> These estimates are already 20 years old, though, which highlights a need for updated data that can reveal population-level trends in risk and caregiving, and provide a foundation for understanding the sociocultural, cardiovascular, and genomic factors involved in Latino cognitive health.

This need has spurred the Study of Latinos-Investigation of Neurocognitive Aging (SOL-INCA), which is an ancillary study of the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) focused on cardiovascular disease in Latinos. SOL-INCA investigates cognitive aging and impairment among diverse Latinos.<sup>6</sup> Some recent findings suggest that Latinos of Amerindian backgrounds seem relatively protected from the effects of the well-known apolipoprotein E (APOE)  $\epsilon$ 4 risk allele compared to Latinos of European ancestry,<sup>7</sup> and epidemiology, biomarker, and brain data suggest that vascular risk factors such as diabetes or hypertension predominate in dementias in Latinos. A central hypothesis is that vascular disease could increase risk in midlife, thus impacting dementia rates later in life. This suggests that improving vascular health for middle-aged adults, which includes addressing obesity, may reduce risk of ADRD disease burden in older Latinos.

The interaction of genetic and environmental factors in the development and progression of AD is complex for the Latino population due to the influence of lower levels of education, acculturation, socioeconomic conditions, immigration, language proficiency, and bilingualism, among others. Many Latino adults in the United States are bilingual, with 59% of those speaking English also speaking Spanish.<sup>8</sup> As language experience powerfully shapes brain and cognitive function, bilingualism may play an important role in one's protection or risk to develop dementia later in life. One idea is that bilingualism may build

### RESEARCH-IN-CONTEXT

1. **Systematic review:** The Latino population in the United States is projected to have the steepest increase in Alzheimer's disease (AD) in the next 40 years, compared to other ethnic groups. The authors report the updates and advances in research presented at the second Latinos & Alzheimer's Symposium in May 2021.
2. **Interpretation:** Latinos have increased risk for AD and other dementias, limited access to quality care, and are severely underrepresented in AD and dementia research and clinical trials. There have been developments in research with Latino populations, including novel cognitive assessments for Spanish-speaking populations
3. **Future directions:** There is a need to effectively recruit and retain Latinos in clinical research, and further understand how best to deliver health care services and to aid caregivers of Latinos living with AD and other dementia. These and other topics will be explored at the third symposium, planned for April 2022.

cognitive reserve, which would allow the brain to better cope in the face of ADRD-related changes.<sup>9</sup>

Studies find both benefits and downsides to bilingualism in different tasks. Cognitive benefits of bilingualism are frequently found in tasks of inhibitory control,<sup>10,11</sup> which reflects executive function.<sup>12</sup> But bilinguals show deficiencies on fluency tests compared to monolinguals.<sup>13</sup> Combining verbal tasks with inhibitory control, however, results in a net positive effect of bilingualism.<sup>14</sup> For example, among those with amnesic mild cognitive impairment (aMCI), bilinguals had better performance than monolinguals on tasks of verbal memory that require the control of proactive interference.<sup>15</sup> Additionally, some evidence suggests an effect of bilingualism on brain plasticity.<sup>16,17,18</sup> This and other evidence suggests bilingualism can delay the onset of dementia, though this remains controversial.<sup>19,20</sup>

Bilingualism may also impact cognitive test performance, independently of underlying brain and cognitive processes. In evaluating people for cognitive impairment, it is important to take into account their bilingual background to obtain accurate measures of task performance; this may mean conducting cognitive assessments via bilingual evaluators, and developing neuropsychological normative data for bilinguals.

Social isolation has been shown to negatively impact physical and mental health including cognitive health and dementia risk. It may be particularly detrimental for Latinos who place a high value on family interactions. Many US Latinos live and work far from home, which can create stress and loneliness, and might ultimately lower their cognitive function. To try to capture novel insights into social isolation, a new study has leveraged data from the Texas Alzheimer's Research and Care Consortium (TARCC). This registry collects longitudinal clinical, genetic, biomarker data of people with AD or MCI, as well

as demographic, environmental, and interpersonal data that can be used as a proxy for social isolation. Using data from nearly 300 people, 77% of whom identified as Latino, regression modeling found that interpersonal variables such as marital status, number of children, and number of siblings had a positive, Latino-specific effect on cognition. This suggests that interventions based on increasing community connections might benefit cognitive health in Latinos.

New research also points to the importance of additional psychosocial factors. Having a sense of purpose in life is often considered beneficial for cognitive health. Specifically, purpose in life refers to a sense of meaning and the perception that there is value in achieving one's goals, and this sense may reflect a healthy brain at work. The relationship between cognitive health and having a sense of purpose is being studied among older Latinos in Latin America, including sites in Argentina, Chile, Dominican Republic, Mexico, and Peru, as part of Massachusetts General Hospital's Multicultural Alzheimer's Prevention Program (MAPP). Using a self-reported Life Purpose questionnaire, and the Everyday Cognition scale to capture purpose in life and subjective cognitive decline, respectively, preliminary regression analysis results show that higher purpose in life scores predict lower perceived cognitive decline, which can be a harbinger of AD. The associations between purpose in life and objective measures of cognitive decline remain unclear in these populations, but differences between countries suggest potential cultural influences.

### 3 | ASSESSMENT AND BIOMARKERS IN LATINOS—CHALLENGES AND OPPORTUNITIES

There are crucial knowledge gaps about normal aging, cognitive decline, and the roles of AD biomarkers in the Latino population. To understand how cognition relates to the biology of AD, assessment tools must be validated across different populations. Commonly used neuropsychological tests may not be sensitive to cognitive changes in Latinos in the United States who speak Spanish as their first language. Moreover, cultural factors have also been shown to influence an individual's approach to cognitive tasks. Thus, cultural and linguistic factors, as well as other sociodemographic factors, need to be considered when examining cognitive performance.

Culturally appropriate cognitive assessment is a critical issue when working with the diverse Latino populations in the United States. The network of Alzheimer's Disease Research Centers in the United States contributes longitudinal data to the National Alzheimer's Coordinating Center; 8% of enrollees are Latino, of whom 69% speak Spanish as their primary language. The registry collects standard clinical and cognitive data called the Uniform Data Set (UDS); the data include scores on common tests of memory, visuospatial abilities, processing speed, executive function, and language—but the instruments were all originally developed in English. Given cultural differences, the tests not only need to be translated, but also adapted. As such, in 2017 Version 3 of the UDS battery was translated into Spanish, with adaptations to a naming task to account for objects that are not familiar to Latinos (e.g., a port-hole), and for multiple Spanish words used for the same objects among

Latinos from different countries.<sup>21</sup> Even with these changes, Latinos who primarily speak English outperform those who primarily speak Spanish in multiple cognitive tasks; this is likely an effect of educational attainment, as the English-speaking Latinos had, on average, several more years of education. Without taking education into account, a cognitively healthy Latino may have test scores that put them into below-average ranges.

Latinos in the United States have experienced a disproportionate burden of COVID-19 infection, hospitalization, and COVID-19-related mortality.<sup>22</sup> Increasing evidence suggests that an estimated 30% of COVID-19 survivors experience memory loss<sup>23</sup> and prolonged neurological symptoms. A new study examined whether plasma biomarker concentrations for amyloid beta ( $A\beta$ ) pathology ( $A\beta_{40}$ ,  $A\beta_{42}$ ), axonal injury (neurofilament light), and neurodegeneration (total tau) differ among a non-clinical population of Latinos who were also COVID-19 survivors compared to non-exposed individuals. It also examined associations between plasma biomarkers with neurocognitive assessments. Community-engaged recruitment took place at a church on eastern Long Island. In the resulting diverse population of foreign-born Latinos at mid-life, the researchers found that plasma biomarker concentrations for  $A\beta_{40}$ ,  $A\beta_{42}/40$ , and total tau differed among COVID-19 survivors compared to non-exposed individuals. Plasma concentrations were further associated with significant decreases across domain-specific cognitive assessments.

To begin understanding normal aging, cognitive decline, and AD biomarkers in Latinos, researchers at the Harvard Aging Brain Study (HABS) are recruiting a sample of cognitively unimpaired older Latinos to comprehensively track their clinical, cognitive, and neuroimaging features as they age. Initial cross-sectional results showed that there were no differences in *in vivo* markers of  $A\beta$  or tau pathology, or hippocampal volume between Latino and non-Hispanic White participants. In contrast, despite having similar levels of formal education, Latinos had lower performance on a cognitive composite score, specifically on timed tasks, which may be partially explained by cultural differences. These initial findings emphasize the importance of considering cultural and linguistic factors in neuropsychological assessment, and the need to investigate cognitive and biomarker longitudinal trajectories among Latinos. To this end, the Boston Latino Aging Study (BLAST) seeks to investigate the impact of different AD risk factors on cognition and brain function, including culturally appropriate, validated measures, in older Latino individuals.

To understand how the development of amyloid, tau, and neurodegeneration (ATN) biomarkers proceeds among diverse populations, the Health and Aging Brain among Latino Elders (HABLE) has been characterizing the onset and progression of ADRD biomarkers in Mexican Americans and non-Hispanic Whites in the Dallas-Fort Worth area of Texas.<sup>24-26</sup> This has been extended to a study of Health Disparities (HABS-HD), in which 1000 Mexican Americans, 1000 non-White Hispanics, and 1000 African Americans are being enrolled for a comprehensive evaluation of cognitive function, brain health, and AD-related biomarkers. Some interesting differences have already come to light: compared to non-Hispanic Whites, Mexican Americans have an earlier age of onset of MCI, which confirms earlier work,<sup>27</sup>

develop neuroimaging-based signs of neurodegeneration earlier, and yet exhibit a lower frequency of APOE  $\epsilon$ 4 alleles and lower rates of amyloid positivity.

The profile of multiple proteins in blood have different patterns in Mexican Americans, with metabolism-related markers predominating in MCI, then shifting to inflammation-related ones in dementia, whereas the opposite relationship was observed in non-Hispanic Whites. Preliminary data indicate that amyloid deposition in the brain, as detected by positron emission tomography scanning, occurs at a lower rate in Mexican Americans and African Americans than in non-Hispanic Whites, in contrast to the earlier age of onset of cognitive decline. Sociocultural factors influence these biomarkers differently for different ethnic subgroups. For example, subjective memory concerns were associated with neurodegeneration markers in non-Hispanic Whites, but not in Mexican Americans. These and many other measures are publicly available, which will help obtain a clearer picture of the complex associations between cognition and AD-related biomarkers in different ethnic groups.

First, future studies should examine biomarkers of proteinopathies and neurodegeneration, as well as vascular contributions to cognitive impairment and dementias. Second, studies examining the role of sociocultural factors, including acculturation and quality of education, are needed, as well as research that helps develop more appropriate cognitive tests and normative data for different Latino heritages. Third, explorations of the unique genomic ancestry of diverse Latinos will yield exciting and new insights into Latino health, cognitive aging, and impairment. Importantly, increased engagement with Latino communities is essential for successfully recruiting diverse and representative Latinos into cognitive aging and dementia research.

#### 4 | CLINICAL TRIALS FOR LATINO PARTICIPANTS—FROM BEHAVIORAL INTERVENTIONS TO PHARMACOLOGICAL TREATMENTS

Latinos comprise < 1% of clinical trials for AD.<sup>28</sup> To engage, recruit, and retain sufficient participant numbers to conduct well-powered studies focused on Latinos, researchers will have to adjust their recruitment strategies, and standardize procedures for the diverse Latino populations enrolled. This is true for a variety of study types, from trials testing pharmaceuticals to lifestyle interventions, as well as for genetic studies of rare, dominantly inherited variants for AD.

For example, a trial focused on targeting cellular processes underlying aging in individuals with AD needed to adjust recruitment strategies to attain 40% Latino representation in its participant pool. Based in south Texas in the United States, the trial, called Rapamycin—Effects on Alzheimer's and Cognitive Health (REACH) study (NCT04629495) is testing the safety, tolerability, and feasibility of 12 months of oral rapamycin treatment in older adults with aMCI and early-stage AD. By blocking the effects of a kinase, rapamycin promotes cell growth, metabolism, and proliferation. Rapamycin has been shown to extend lifespan in multiple species, and can improve cognition in mice.<sup>29</sup> During recruitment, the researchers found that typical strategies such as

advertising in the newspaper, on the radio, or on Facebook did not effectively reach Latinos. Instead, recruiting through health care clinics was more successful, and comprehensive clinical care is offered as part of the study. This health- and family-centered research approach works to build trust by taking time to form relationships with participants.<sup>30</sup>

Inspired by the success of the Finnish FINGER trial,<sup>31</sup> the LatAm-FINGERS trial aims to determine whether a similar, and culturally adapted, multi-level lifestyle intervention provides cognitive benefits for people living in 12 countries of Latin America.<sup>32</sup> The randomized, controlled trial consists of a 1-year multi-domain intervention involving diet, exercise, cognitive training, and vascular risk mitigation. A second year of intervention will be held upon feasibility outcomes accomplishment. The study will be launched in the fall of 2021 and seeks to enroll 100 older adults at risk of cognitive impairment from each country. Data will be standardized to allow data sharing with other large trials, as well as to achieve harmonization within the multi-center study involving the diverse Latino populations involved. This calls for flexibility; for example, though the diet component of the intervention calls for fish, fish consumption varies widely across Latin American countries. This means that diet compliance will have to be measured in ways beyond simple consumption of specific food groups.

The Dominantly Inherited Alzheimer Network Trial Unit (DIAN-TU) is a global platform for clinical trials, which has recently added new sites in Mexico, Colombia, Brazil, and Argentina. These countries were chosen because of a growing number of dominantly inherited Alzheimer's disease (DIAD) cases detected there, who carry mutations in amyloid-related genes (e.g., *PSEN1*, *PSEN2*, and *APP*). These pockets of high DIAD frequency are due to founder effects, and mostly reflect mutations that originated in Europe.<sup>33</sup> Ongoing observational studies have laid the groundwork for clinical trials such as the Primary Prevention study, which seeks to prevent A $\beta$  pathology in people carrying these high-risk mutations by clearing or preventing A $\beta$  aggregation, or the Tau NexGen study (secondary prevention), which seeks to lower tau tangle formation via anti-tau antibodies, small molecules, or even gene therapies. Practical challenges come with orchestrating a study across multiple countries, such as insufficient infrastructure for collecting biomarkers or country-specific regulations, but these are surmountable.

In the arc of a study, recruitment is often considered an afterthought, but in reality it is just as important as other components, and directly impacts the feasibility of any study and the generalizability of the study results. This means that the process of recruitment warrants its own priority in the design and conduct of clinical research. Despite the need to recruit Latinos to clinical trials, researchers find this challenging. To better understand these challenges, the Alzheimer's Clinical Trials Consortium (ACTC) is using a data-driven, evidence-based approach to understand potential selection biases, through the collection and analysis of outreach data, pre-screening data, and study data across all of the trials conducted by the Consortium. This includes using the definition of race and ethnicity based on current US Census categories. This has enabled a more granular view of what happens both prior to consent and post-consent, and the reasons individuals are not eligible for studies, including practical concerns about transportation or time.



Another institution-level barrier to inclusive research is underrepresentation of Latino investigators within the workforce. The growing appreciation for the importance of developing a diverse scientific workforce is seen in the newly created Alzheimer's Disease Resource Centers for Minority Aging Research (RCMAR), which supports the priorities outlined in the 2019 ADRD Summit. Through several initiatives and community engagement cores, these centers support and mentor diverse and emerging scholars in pursuit of independent scientific careers focused on cognitive aging, impairment, and disorders. To better understand and meet the needs of the community, researchers need to build trust, foster long-term relationships between academic centers and the community, consider the needs of the community first, and partner with other established associations. One approach is to rely on individuals and groups already in the community for data collection and recruitment, such as home care workers or undergraduate students. More information about RCMAR-related community engaged research and recruitment of diverse older adults into AD research can be found in a recent issue of *Ethnicity and Disease*, with a foreword from the National Institutes of Health (NIH).<sup>34</sup>

Other ways to build trust and recruit Latino participation in studies include giving results or updates from trials to participants, which increases their sense of involvement and commitment to remain in the trial. Home visits or digital technology may help circumvent time and transportation constraints; increasing the diversity of the study and health-care workforce can also help foster understanding between researchers and participants. While studies in Latin America seem to face less difficulty recruiting than in the United States, reaching rural populations in these countries still presents a challenge.

## 5 | STRATEGIES FOR CARE AND SUPPORT

The 2021 Alzheimer's Disease Facts and Figures Special Report on Race, Ethnicity and Alzheimer's in America found that one-third of Hispanics reported discrimination when seeking health care.<sup>3</sup> The Alzheimer's Association has called for diversification of the health-care workforce, and better education and preparation to care for a diversity of patients, as well as increasing the representation of Latinos in clinical trials.

Latinos face many obstacles in getting access to health-care services for ADRD, which are exacerbated by lack of awareness about the condition. According to the Behavioral Risk Factor Surveillance System (BRFSS) only 44% of Hispanics with self-reported cognitive decline would discuss their symptoms with a health-care professional,<sup>35</sup> and 39% of those with subjective cognitive decline have experienced one or more barriers to access health-care services. Some of the most common barriers are: lack of health insurance, concerns about cost, lack of transportation, and long wait times for an appointment. Latinos also have misconceptions about dementia. Many believe that dementia is a preliminary stage to AD, characterized by changes in behaviors, and that AD is a stage where the individuals' ability to connect and remember is lost. Overall, most individuals believe it is important to seek care

for AD, but they do not know what treatments or services are available for people with memory problems, or they have had problems navigating the health-care system and finding resources in their preferred language.<sup>36</sup>

Caregivers face new challenges when a person with AD returns home after a hospital stay. This transition places those with AD at risk for medication errors and adverse events because care is fragmented, information is lost in transition, and discharge instructions are missing, not culturally tailored, or difficult to follow. Preliminary results from a longitudinal, in-depth qualitative study of caregivers involved in hospital-to-home transitions illustrated some of their difficulties: worry about overmedication, resignation about the limited effectiveness of drugs, scarcity of translated and culturally specific information, wariness toward health-care providers, distress over having to lie to a loved one to avoid unnecessarily uncomfortable situations, and a lack of easily accessible information that is truly helpful. These perceptions outline strategies for health-care systems and home health care agencies to improve care, earn trust, and develop culturally appropriate information that can educate and empower Latinos with AD and their caregivers.

Many Latinos believe that AD is a normal part of aging, or may think they will not live long enough to develop AD, or would be insulted if a doctor suggested cognitive testing.<sup>3</sup> This situation demands concerted outreach efforts, which can include high-tech options such as using the popular messaging app WhatsApp to reach people with AD information, and low-tech informational flyers in restaurants frequented by Latinos. Other outreach methods make use of existing organizations, such as churches, Hispanic chambers of commerce, or the Promotores program of the National Hispanic Council on Aging, which enlists community health workers to increase health literacy in Latino communities.

Other cultural considerations discussed included a tendency for Latinos to wait until a crisis or an emergency occurs before seeking help, which may be too late for AD interventions. It would be important to encourage Latinos to ask questions to their primary care doctors or other health-care personnel, and likewise encourage health-care providers to share information about the disease and ask patients questions to improve their awareness and facilitate early diagnosis and interventions. Further, health-care personnel should give patients and their families the opportunity to describe their symptoms in their own words, because the words used might be different from those used regularly by non-Hispanic Whites.<sup>37</sup> Special care needs to be taken when health information is translated; given the diversity of languages and dialects in the United States, information needs to be culturally adapted and modified to match the unique characteristics of the community, including health literacy and educational attainment. Caregivers prefer to get information from other people who have had the same experience, as much of the information they receive from health services seems too general, and not relevant to their particular situations. Therefore, providing caregivers support group options would be beneficial. It is critical to provide health-care systems with resources to reach out to Latino populations and redesign models of care to better suit their needs.

## 6 | MENTORING SESSIONS

To ensure the workforce is representative of communities served going forward, diversifying and supporting the next generation of AD and dementia clinicians and researchers is of utmost importance. To this end, the symposium included two mentoring sessions. The first session focused on career trajectories, and offered attendees the opportunity to meet and engage with leading investigators in the field in a small group setting. Topics discussed included community engagement, epidemiology and public health, juggling clinical practice and research, and the interplay between academia and industry. The second session focused on how to build a successful career in Alzheimer's research, highlighting resources available through the NIH and fellowship programs including the Global Brain Health Institute.

## 7 | CONCLUSION

Research on the epidemiology, socio-cultural factors, biomarkers, and care strategies for Latinos with AD/DR is growing. Special attention needs to be given to many factors, including the heterogeneity within Latino populations, not only with respect to country of origin, but also education, genetic ancestry, socioeconomic factors, years of acculturation, migration history, and perceptions of AD and dementia. By elucidating the complex picture of AD biology and sociocultural characteristics of diverse Latinos, and by fostering the growth of Latino scientific and health-care personnel as well as Latino participation in AD research and clinical trials, research will fill critical knowledge gaps for an increasingly important segment of the older population.

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### CONFLICTS OF INTEREST

Yakeel T. Quiroz, in the past 36 months, reports grants or contracts from the US National Institute on Aging (R01AG054671, R01AG066823), Alzheimer's Association, MGH ECOR; consulting fees from Biogen; payment or honoraria for seminars, academic rounds; has served as past chair of the ISTAART Diversity and Disparities PIA; and holds a role as chair of the International Neuropsychological Society Teleneuropsychology Special Interest Group. Maria P. Aranda, in the past 36 months, reports grants or contracts: Co-Investigator and Director, Outreach, Recruitment and Engagement Core (ORE), USC Alzheimer's Disease Research Center; National Institute on Aging (5P 50AG005142); Co-Investigator and Lead, Research Education Core (REC), USC Research Center on Alzheimer's Disease-Minority Aging Research (AD-RCMAR); National Institute on Aging (2P 30AG043073); Principal Investigator, SoCal Savvy, State of California, Department of Public Health, Alzheimer's Disease Program (19-10538); Principal Investigator, Unidos en el Cuidado:

The Savvy Caregiver: Translation, Transformation, and Feasibility of Evidenced-Based Program for Dementia Caregivers (011069-00001); Project Subaward: Alzheimer's Los Angeles; Principal Investigator, Interdisciplinary Aging Research to Address Health Disparities in Alzheimer's Disease and Related Dementias; National Institute on Aging(5R13AG063477); Co-Investigator, NIA AD/ADRD Health Care Systems Research Collaboratory, IMPACT Collaboratory, National Institute on Aging (1U54AG063546-01); 2019-20 Consultant, Health Equity Team (HET); NIA AD/ADRD Health Care Systems Research Collaboratory, National Institute on Aging (1U54AG063546-01); 2017 Principal Investigator, A Program for Families Caring for a Loved One with Dementia (Savvy Caregiver Program) (12-2602-3600); Research Council, USC Suzanne Dworak-Peck School of Social Work, Los Angeles, CA; 2017 Principal Investigator, Establishing Rates of Caregiving to Adults with Physical and Cognitive Disabilities in Home- and Community-Based Services; St. Barnabas Senior Services & AARP, Los Angeles, CA. MPA also received consulting fees for Avanir Pharmaceuticals, served as Chair, Caregiver Advisory Board—one time and is a member of the External Advisory Board, San Diego Alzheimer's Disease Resource Center for Minority Aging Research. Alicia I. Arbaje, in the past 36 months, reports grants from AHRQ, NIA, JHAD-RCMAR; received payment or honoraria for lecture from HealthNetwork; participated on a DSMB or Advisory Board for a Vanderbilt University study. Mirna Arroyo-Miranda received support for attending meetings and/or travel to ISTAART Diversity PIA Day at AAIC 2019, with a Travel Fellowship Award from the Alzheimer's Association. Laura Y. Cabrera, in the past 36 months, reports grants or contracts from NIH Bioethics supplement R21TW010896 -12/2019-11/2020, P30 AG059300-01 Alzheimer's related Resource Centers for Minority Aging Research (ADRCMAR)—Latinos Perceptions and Concerns about Alzheimer Disease (MCCFAD Pilot 2) - 08/2018-06/2020; received honoraria for lectures: 2018 Michigan Academy of Nutrition and Dietetics Annual Meeting and honoraria for presentations: 2018 OECD "Minding Neurotechnology: Delivering Responsible Innovation for Health and Well-being", 2019—Keynote presentation at Markkula Center for Applied Ethics at Santa Clara University, 2019—honoraria as panelist for the Michigan State University CommSciCom; received support for travel 2019—attendance to GSA; and held role as board member for International Neuroethics Society and chair for IEEE Brain Neuroethics Subcommittee. Minerva Maria Carasquillo received funding for research from NIH grants; received honoraria for serving as reviewer for NIH grants. Maria M. Corrada, in the past 36 months, reports grants from NIA; received payment or honoraria for grant reviews and for participation in a mentoring program; received support for attending meetings and/or travel from the Alzheimer's Association and NIA grants; participated on NIA organized DSB for a blood pressure lowering pragmatic trial; held a leadership or fiduciary role at *Alzheimer's and Dementia* journal editorial board; and is a member of the Alzheimer's Association International Conference Scientific Program Committee. Lucia Crivelli, in the past 36 months, reports grants or contracts from the Alzheimer's Association for the LatAm FINGERS project; and received support for a travel fellowship from the Alzheimer's Association for AAIC 2021. Erica D. Diminich,

in the past 36 months, reports grants from Alzheimer's Association AACSF-20-682140; NIH/National Institute on Aging AG049953-05 Diversity Supplement Award (under R01:AG049953). Karen A. Dorsman received a small scholarship as a student; received financial support (1 hotel night) to attend the Texas Alzheimer's Research and Care Consortium (TARCC) meeting in 2020; held or holds a leadership or fiduciary roles as a Student Representative-Elect for the Hispanic Neuropsychological Society (unpaid, non-voting Board member) 2021– present, Ad Hoc Advisor to the Nicaraguan Alzheimer's Foundation (unpaid) 2019–present, Latino Advisory Group member to the Alzheimer's Association, Northern California & Northern Nevada chapter 2018–2019. Mitzi Gonzales, in the past 36 months, reports grants or contracts from Alzheimer's Association Part of the Cloud Gates grant (PTCG-20-695184), NIA (R44 AG060855, U19 NS120384, U24 AG059624), the Alzheimer's Drug Discovery Foundation (GC-201908-2019443), Texas Alzheimer's Research and Care Consortium (2018-28-81-J1); received support for attending Alzheimer's Association International Conference Travel Fellowship 2021. Héctor M. González, in the past 36 months, reports grants or contracts from National Institute on Aging (R56 AG048642, RF1 AG054548, RF1 AG061022, P30 AG062429). Ana L. Gonzalez-Seda held a leadership or fiduciary role at Office of Health Equity with the California Department of Public Health and City Heights Community Development Corporation. Lea T. Grinberg, in the past 36 months, reports grants or contracts from NIH several r01s, K24 and R01, Tau consortium, Weill Neurohub; received consulting fees from CuraSen Inc; received payment or honoraria from Zydus Pharmaceuticals 2021; received support for attending meetings and/or travel from Alzheimer Association, Tau Consortium, CONY. Lourdes Guerrero has nothing to disclose. Carl V. Hill, in the past 36 months, reports grants from National Institutes of Health; and held unpaid roles with advisory groups dedicated to Diversity, Equity and Inclusion at various academic and non-profit institutions. Ivonne Z. Jimenez-Velazquez has nothing to disclose. Jorge J. Llibre Guerra received research funding from the Alzheimer Association (SG-20-690363). Francisco Lopera, in the past 36 months, reports grants from NIA, Banner, and Roche, API Colombia grant, NIH: Colbos Grant; and received support for attending meetings and/or travel from Red Lat, San Francisco California. Gladys Maestre, in the past 36 months, reports grants from National Institute on Aging/National Institutes of Health and Texas Alzheimer's Research and Care Consortium; received payment or honoraria as a reviewer for NIH; held a leadership or fiduciary role at Funda conciencia and Appremed. Luis D. Medina, in the past 36 months, reports grants or contracts from National Institutes of Health R24AG065170 (Medina) Jan 2020–Nov 2023, Alzheimer's Association 2019-AARGD-642445 (Medina) Feb 2020–Jan 2023; received honoraria for lectures from UCSD, UMass Amherst; received support to attend AAIC 2021 as member of Alzheimer's Association International Research Grant Program Council. Sid O'Bryant, in the past 36 months, reports grants or contracts from NIH/NIA, Alzheimer's Association, MJFF, Cx Precision Medicine; and receives royalties from licensed patents. SO'B is the founding scientist from Cx Precision Medicine; holds multiple patents in precision medicine for neurodegenerative diseases; and is the founding scientist of Cx

Precision Medicine and holds stocks. Claudia Peñaloza is supported by the Juan de la Cierva-Incorporación Program (IJC2018-037818) funded by Ministerio de Ciencia e Innovación, Agencia Estatal de Investigación MCIN/AEI 10.13039/501100011033. CP was employed by Boston University under NIH/NIDCD grant number U01DC014922 during the 24 previous months (January 2017–August 2020) and is currently a research consultant for that institution. Maria Mora Pinzon, in the past 36 months, reports grants or contracts from Increasing Latinx participation in ADRD through a Community-Based Approach. Wisconsin Alzheimer's Disease Research Center (ADRC) Research Education Component ("REC") Scholar; Pisando Fuerte Online Adapting to COVID-19, University of Wisconsin Institute for Clinical and Translational Research Dissemination and Implementation Launchpad; Leveraging social networks and trusted community influencers to disseminate an accurate and up-to-date understanding of COVID-19 in Black, Latinx and American Indian Communities. Wisconsin Partnership Program (WPP); Beliefs and Attitudes about Dementia among Latinx Individuals Living in Dane County – Validation of a Survey Instrument. Department of Medicine, University of Wisconsin – Madison; Pisando Fuerte: a fall prevention program for Spanish speaking seniors, Retirement Research Foundation (RRF); Pisando Fuerte: a fall prevention program for Spanish speaking seniors. University of Wisconsin – Institute for Clinical and Translational Research (UW – ICTR). This project was supported in part by grant 1UL1TR002373 to UW ICTR from NIH/NCATS; was supported by the University of Wisconsin Department of Family Medicine and Community Health Primary Care Research Fellowship, funded by grant T32HP10010 from the Health Resources and Services Administration; received support for attending meetings and/or travel 2020 - NIDDK/National Hispanic Medical Association Travel Award - Cancelled due to COVID-19; serves as President-Elect Medical Organization for the Latino Advancement - Wisconsin, Inc. (2021); was selected as an emerging scholar in the scientific training program, Interdisciplinary Aging Research to Address Health Disparities in Alzheimer's Disease and Related Dementias, USC Edward R. Roybal Institute on Aging, Los Angeles, CA. Funding for the scientific training program was made possible in part by 1 R13 AG 063477 - 01 from the National Institute on Aging. Rosa V. Pirela Mavarez has nothing to disclose. Celina F. Plum has nothing to disclose. Rema Raman received grant funding from the National Institutes of Health (R01AG063689; U24AG057437, 5R01AG061848, 5R01AG054029), Alzheimer's Association, Eli Lilly, and Eisai Inc.; she is the Vice-Chair of the Board of the Alzheimer's Association's San Diego/Imperial chapter. Katya Rascovsky, in the past 36 months, reports grants or contracts from NIH. Dorene M. Rentz in the past 36 months, received consulting fees from Neurotrack and Digital Cognition Technologies; received payment or honoraria for ACTC IMPACT AD Course as faculty for presentations and group leadership activities and received support for attending ACTC Meeting in February 2020. Yarissa Reyes has nothing to disclose. Monica Rosselli, in the past 36 months, reports grants from the Alzheimer Disease Research Center. National Institutes of Health/National Institute of Aging, PI: T Golden & R Duara; Co-I: M. Rosselli (2015-2020); Cognitive Support Strategies to Improve Medication Adherence in Older



Adults Undergoing Hemodialysis, Keryx Pharmaceutics, PI: D Hain. Co-I: M. Rosselli. (2019-2021); Neuro-imaging, and Sensitive Novel Cognitive Measures in Detection of Early Alzheimer's Disease in Bilingual and Monolingual Hispanic Americans, Florida Department of Health-Ed and Ethel Moore Alzheimer's Disease Research Program, PI: M Rosselli (2019-2021); Fit2Drive: Development and Testing of a Driver Risk Predictor for Individuals with AD Florida Department of Health-Ed and Ethel Moore Alzheimer's Disease Research Program, PI Tappen. Co-I: M. Rosselli; Communication of Dementia Diagnoses: Investigating Patient, Family, and Physician Experiences and Developing Best Practices. Florida Department of Health- Ed and Ethel Moore Alzheimer's Disease Research Program, PI: M. Armstrong (UF). Co-I M. Rosselli (2020 - 2023); In-Vehicle Sensors to Detect Cognitive Change in Older Drivers. National Institutes of Health. National Institute of Aging, PI: R. Tappen. Co-I: M. Rosselli; Florida Alzheimer's Disease Research Center. National Institutes of Health. National Institute of Aging, PI. T.Golde (UF). Co-I: M. Rosselli (2020-2025); Postdoctoral Research Fellowship in Neuropsychology and Brain Biomarkers of Abnormal Aging Florida Department of Health- Ed and Ethel Moore Alzheimer's Disease Research Program, PI: M Rosselli. Malú Gámez Tansey, in the past 36 months, reports grants or contracts from NIH, MJFF, Parkinson's Foundation; received consulting fees from INmune Bio, Cerebral Therapeutics; received multiple support for attending meetings and/or travel; participated on a DSMB or Advisory Board for MSAG, Weston Family Foundation; has held/holds stock or stock options at INmune bio. Clara Vila-Castelar receives funding from the Alzheimer's Association (2019-AARF-644631); co-chairs the Sex Differences Special Interest Group, Diversity and Disparities Professional Interest Area-PIA of the International Society to Advance Alzheimer's Research and Treatment (ISTAART). Megan Zuelsdorff, in the past 36 months, reports grants AARF18562958 - Psychosocial stressors, allostatic load, and cognitive aging; 1R03AG063303 (Zuelsdorff)- Social-biological dimensions of AD risk and resilience in a Native American cohort; held/holds a leadership or fiduciary role at Wisconsin Alzheimer's Institute Leadership Board and ISTAART Diversity & Disparities Executive Committee. Maria Carrillo is a full-time employee of the Alzheimer's Association and reports, in the past 36 months, participating on a Data Safety Monitoring Board or Advisory Board for US POINTER and holding a role for EASTERSEALS. Claire Sexton is a full-time employee of the Alzheimer's Association and, in the past 36 months, reports consultation fees from Jazz Pharmaceuticals and support for attending meetings and/or travel to the AAIC Satellite Symposium Sydney (2019) and Society for the Study of Ingestive Behavior (SSIB) Annual Meeting (2019) and reports an unpaid role as a trustee of Dementia Adventure (2018-2020).

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