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Methods and early recruitment of a community-based study of cognitive impairment among Mexican Americans and non-Hispanic whites: The BASIC-Cognitive study

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Abstract

Background—As the Mexican American (MA) population grows and ages, there is an urgent need to estimate the prevalence of cognitive impairment or dementia (CID), cognitive trajectories, and identify community resource needs. The Brain Attack Surveillance in Corpus Christi (BASIC)-Cognitive project is a population-based study to address these issues among older MAs and non-Hispanic whites (NHW) and their informal care providers.

Objective—Present the methodology and initial recruitment findings for the BASIC-Cognitive project.

Method—Random, door-to-door case ascertainment is used in Nueces County, Texas, to recruit community-dwelling and nursing home residents ≥ 65 and informal care providers. Households are identified from a two-stage area probability sample, using Census data to aim for equal balance of MAs and NHWs. Individuals with cognitive screens indicative of possible CID complete neuropsychological assessment (Harmonized Cognitive Assessment Protocol from the Health and Retirement Study). Informal care providers complete comprehensive interview and needs assessment. Study pairs repeat procedures at 2-year follow-up. Asset and concept mapping are performed to identify community resources and study care providers' perceptions of needs for individuals with CID.

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Results—1,030 age-eligible households were identified, or 27% of households for whom age could be determined. 1,320 individuals were age-eligible, corresponding to 1.3 adults per eligible household. Initial recruitment yielded robust participation in the MA eligible population (60% of 689 individuals that completed cognitive screening).

Conclusion—The BASIC-Cognitive study will provide critical information regarding the prevalence of CID in MAs, the impact of caregiving, and allocation of community resources to meet the needs of this population.

Keywords

dementia; mild cognitive impairment; Mexican American; epidemiology; caregivers; health resources

INTRODUCTION

The Hispanic population is rapidly growing in the US, and is projected to comprise one-third of the US population by 2060 [1]. This population is also aging: in 2010, 7% of the Hispanic American population was 65 years; this is expected to rise to 20% by 2050 [1]. Because the incidence of dementia rises sharply with age, this growth in the elderly population is expected to lead to a dramatic increase in dementia cases. As a result, studies are needed to better understand potential disparities in dementia across different racial and ethnic populations in the US and potential factors that contribute to these disparities. Mexican American (MA), which is the population of focus in this paper, is the largest Hispanic group in the United States, comprising 63% of Hispanic Americans [2]

There is evidence that MAs exhibit greater prevalence of cognitive impairment compared with non-Hispanic whites (NHW) [3,4], and some studies suggest that MAs may have earlier dementia onset compared with NHWs [5]. There are several potential factors contributing to this disparity. Notably, vascular risk, particularly stroke, may be a more potent risk factor for dementia in MAs, and may explain more dementia than in NHW populations [6,7]. In addition, MAs have reduced educational attainment, which is associated with increased dementia risk [8]. Given the potential evidence for increased risk for cognitive impairment and dementia (CID) in the growing MA population, we must prepare for the medical, social and economic impact of caring for these individuals. One of the many strengths of MA culture is familism, the strength of the bond among MA families, which may lead to the inclination for family members to care for those with dementia.[9] Indeed, Hispanic caregiving is associated with significant delays to institutionalization for dementia compared with NHW caregiving[10], although this may also have socioeconomic and health-related costs for caregivers [9,11].

Experiences of caregiving burden and poor health may be affected by the availability and relevance of community resources and services to support the care of individuals with dementia. Indeed, evidence has shown that ethnic minorities with dementia and their caregivers experience more barriers in access and use of services compared to NHWs [12]. It is critical to better understand the unmet needs of all those impacted by dementia, so as to

better target resources and develop tailored interventions to directly meet these needs and thus improve health and quality of life.

There is a critical need to better estimate the prevalence of CID and trajectories of cognitive decline, and to identify community resource needs within the MA population. The Brain Attack Surveillance in Corpus Christi (BASIC)-Cognitive project aims to address these needs. BASIC-Cognitive is a population-based study that aims to: 1) evaluate the prevalence of CID and trajectories of cognitive decline in MA and NHW; 2) study and compare the amount, distribution, and characteristics of informal caregiving for MA and NHW with CID; and 3) determine community resources most needed by individuals with CID and their families, and how those needs may differ by ethnicity. The project setting is Nueces County, Texas, an urban community with a large and primarily non-immigrant MA population.

The present paper presents the methodology and initial recruitment findings for the BASIC-Cognitive project. Our study hypotheses are as follows: 1) greater prevalence of CID in MAs compared to NHWs, 2) greatest ethnic CID disparity in the younger age groups (65–74 years); 3) the ethnic disparity in CID will be largely explained by cerebrovascular disease and educational attainment; 4) greater cognitive decline in MA compared with NHW over the two-year follow-up; 5) increased caregiver burden and worse physical health in MA compared to NHW caregivers; and 6) gaps between needs and resources can be identified in MAs and NHWs through a rigorous mixed-methods approach.

Our group has a well-established partnership in research within this community through the parent BASIC project. BASIC is a rigorous population-based epidemiological stroke surveillance project, NIH funded since 1999, to identify ethnic differences in stroke among MAs and NHWs [13]. Approximately 55% of BASIC participants are MA. The BASIC project has revealed increased stroke incidence in MA relative to NHW [14], in addition to greater prevalence of cognitive impairment following stroke [15].

MATERIALS AND METHODS

Study setting

Nueces County is located on the Texas Gulf coast with a 2010 population of 340,223, with 89% residing within the urban city of Corpus Christi [16]. Houston and San Antonio, the nearest other urban centers, are 200 and 140 miles from Corpus Christi, respectively. According to the US Census, 61% of Nueces County residents are MA, 33% are NHW, with 6% other race-ethnic groups [16]. Among the top 60 US metropolitan areas with the largest Hispanic concentrations, Corpus Christi has the lowest foreign-born share at 7% and the highest percentage (96%) of Hispanic US citizens [17]. Corpus Christi's socio-economic disparities mirror differences among Hispanic populations in the US. Given that Corpus Christi is a non-immigrant population, it is an optimal setting to follow MA individuals with CID and their informal caregivers longitudinally. We have partnered with the Corpus Christi Nueces County Health Department for this project, with whom we have collaborated for nearly 20 years for the BASIC project. We have also partnered with the South Texas Chapter of the Alzheimer's Association. We work closely with each of these groups in the evaluation

of community resource needs and in the application of our work toward improvement of resources for individuals with CID and their caregivers.

Overview of study design

Study procedures were approved by the institutional review board of the University of Michigan Medical School (IRBMED). The BASIC-Cognitive project utilizes door-to-door, community-based and nursing home case ascertainment to identify individuals with CID. Individuals who are eligible and agree to participate provide demographic and medical information and complete cognitive assessment, and informal care providers complete comprehensive interviews. Study pairs (i.e., participants and their informal care providers) then repeat these assessments at two-year follow-up, to evaluate trajectories of cognitive decline, changes in caregiving experiences and unmet needs. Figure 1 displays the study design overview. The initial (baseline) recruitment occurs over a period of two years, followed by two years of follow-up.

Sampling methodology

Households are identified from a two-stage area probability sample of Nueces County housing units, with use of Census data and ethnicity indicators to aim for an equal balance of MA and NHW sampled households. The two-stage sample of Census Blocks and housing units is stratified based on the expected residential density of eligible MA and NHW adults. Random replicates of sample housing units are released sequentially over the two-year baseline recruitment period. The replicate sample release permits the study team to adjust the size of sample from the MA/NHW ethnicity strata to account for ethnic differences in study eligibility and response rates. Sample housing unit (HU) addresses are selected from a commercially available version of the USPS Delivery Sequence File. Field personnel contact each sampled address to identify household residents who are eligible for the study. Field staff make at least three attempts to make contact with households before determining that they cannot be reached. A separate sampling procedure is conducted for nursing home residents in Nueces County, in addition to screening the household sample (i.e., asking if an immediate family member who previously resided in the house now resides in a nursing home). The purpose for including nursing home residents in the aggregate sample is to provide full study coverage of all older adults in the Nueces County population. *Inclusion/exclusion criteria:* Participants are eligible if they reside in Nueces County, Texas for at least six months every year; are 65 years of age and older; speak English or Spanish; and are community-dwelling or resident of a nursing-care facility. We enroll individuals of any race/ethnicity in order to obtain an overall estimate of population cognitive impairment. Cognitive screening is performed on all potential participants using the Montreal Cognitive Assessment (MoCA; [18]). We utilized the Spanish translation of the MoCA that is provided on its website (www.mocatest.org), with minor adaptations to the instructions text for local Spanish. We selected a conservative cut-off for normal cognition (i.e., 26 or higher; [18]) so as to optimize the inclusion of individuals with possible cognitive impairment. Effort is made to accommodate sensory (e.g., hearing, vision) and motor impairments. The HCAP is abbreviated when necessary (i.e., omitting tests that cannot be administered due to sensory or motor impairments). Individuals are only excluded when sensory or motor impairments preclude any participation in cognitive assessment. When individuals exhibit severe

cognitive impairment and are unable to participate in the cognitive assessment, study enrollment proceeds with the study partner. To study caregiving experiences, participants must also identify an informal care provider to participate in the study. Informal care providers are eligible if they are 18 years of age or older and perform in the normal range on a brief cognitive screening instrument (Mini-Cog; [18]). We utilize the Spanish version of the Mini-Cog that is available on its website (www.mini-cog.com). Study pairs are compensated with a gift card (\$15 each) per visit for their participation.

Procedure

Cognitive assessment: All eligible participants complete the Harmonized Cognitive Assessment Protocol (HCAP-Respondent; [20]) within their homes. This home-based assessment model aligns with procedures for the HRS HCAP study. Interviewers make effort to reduce possible sources of distraction (e.g., TV, phones, family member interruption) within respondents' homes. Of note, there are few circumstances in which home-based assessment is refused by the respondent; in those instances, another quiet location that is conducive to assessment is utilized (e.g., the BASIC-C field office). The HCAP was developed through the Health and Retirement Study (HRS) at the University of Michigan (<http://hrsonline.isr.umich.edu/>). Cognitive impairment classification algorithms (i.e., not impaired; mild cognitive impairment (MCI); dementia) using the HCAP are currently under development with the HRS and its international sister studies (e.g., Mexican Health and Aging Study [MHAS]; www.MHASweb.org). We also perform measures of literacy (Wide Range Achievement Test- 4th edition, Reading subtest, for English interviews [21]; the Word Accentuation Test [22]) is planned for a sub-sample of Spanish interviews at 2-year follow-up) and health literacy (Short Assessment of Health Literacy—Spanish and English; SAHL-S/E [23]). We measure self-reported use and proficiency of English and Spanish [24] and perform a brief objective assessment of bilingualism (animal naming in English and Spanish).

The HCAP is available in Spanish, which was developed in collaboration between the HRS and MHAS. Determination of language of test administration is made in collaboration with each respondent after completion of self-rated language proficiency. Bilingual respondents are paired with bilingual interviewers and are permitted to provide responses in either language.

Other assessments: Participants provide information regarding their demographic and medical history (e.g., medical diagnoses; current medications); this information is also asked of the study partner to confirm respondents' self-report. Blood pressure is measured by field staff during the appointment using a standard protocol. Specifically, after a 5-minute rest, BP was measured three times at 15-second intervals in the right arm of seated participants using an appropriately sized cuff and a standard automated BP measurement arm monitor (OmRON model 700 series; Omron, Mannheim, Germany), that has been validated to be accurate by the Association for the Advancement of Medical Instrumentation. BP was averaged across the 3 BP measurements. Symptoms of depression are measured with an abbreviated version of the Center for Epidemiological Studies- Depression scale (CES-D) as part of the HCAP interview. Of note, we ask study participants for permission to link their

identifying information to the database for the BASIC study to determine if they have had a stroke at any time since the year 2000. As such, we will have detailed information about stroke history, when relevant, and can explore associations of cerebrovascular disease with MCI and dementia by ethnicity in this community.

Informal care provider interviews: Informal care providers complete the HCAP-Informant interview, which includes their observations of cognitive and functional abilities. Informal care providers also perform assessments of their own health (Short Form Health Survey, SF-36 [25]) and experiences of burden with caregiving (i.e., Zarit Caregiver Burden Scale [26]). Both scales have Spanish translations available [27–28]). MAs complete assessments of acculturation (Acculturation Rating Scale for Mexican Americans-II, ARSMA II; validated in English and Spanish, [29]), familism (Sabogal familism scale; validated and available in English and Spanish [30]), and health literacy (SAHL-S/E).

Needs assessment: A mixed-methods approach is used for needs assessment. First, the Camberwell Assessment of Needs in the Elderly (CANE; [31]) is a semi-structured interview that evaluates unmet physical and mental health needs of participants and their caregivers. Second, in collaboration with the Alzheimer's Association, an asset map is created that provides information on existing dementia-related resources, their catchment areas, target population and services offered. Third, concept mapping is completed with Groupwisdom™, an online-based tool, to study the perceptions of needs of individuals with dementia by informal care partners and clinicians working with these patients. Informal caregivers of both community-dwelling and nursing home residents as well as clinicians complete the concept mapping process. Four groups of informal caregivers will be selected from the informal caregiver baseline sample using purposive techniques to include 40 MA and 40 NHW caregivers, balancing ethnicity, cognitive impairment severity, and community-dwelling and nursing home residents. Input will also be collected through concept mapping with a group of 20 health professionals working with individuals with CID and their caregivers (e.g., social workers, nurses, physicians) recruited from the healthcare providers in Nueces County.

Two-year follow-up: At two-year follow-up, participants repeat cognitive assessment (HCAP) and blood pressure assessments. Informal care providers repeat informant ratings (HCAP-Informant), measures of health and caregiver burden (SF-36, Zarit), and unmet needs (CANE). We will assess mortality through frequent contacts (4 times per year) with study pairs and at follow-up, supplemented by vital statistics data from the Texas Department of Health.

Enrollment targets: Precision estimates led us to target 719 completed study pairs at baseline and 584 completed study pairs at two-year follow-up. For nursing home residents, we targeted selection of a total probability sample of 75 MA and 75 NHW. Of note, this sample will not be large enough to support precise stand-alone analysis for this special subpopulation. Instead, the purpose for including nursing home residents is to provide full coverage of all older adults in the Nueces County population. We aimed to sample 14,313 housing units; given an expected occupancy rate of 88%, we expected to reach 12,596

households for initial screen. Based on 2012–2016 American Community Survey data sources [32], an estimated 22% of Nueces County sample households were expected to include one or more eligible adults age 65+, with an average of 1.4 eligible adults per eligible household. Expecting an 85% response rate for initial demographic screening, we expected to identify 3,469 age-eligible adults. We expected that 75% would agree to complete the baseline cognitive screening, and that cognitive screening (MoCA < 26) would yield 37% eligible for the study based upon HRS MCI and dementia prevalence estimates [33, 34], resulting in 1028 adults eligible for the study (Figure 2). Based on current field experience in the HCAP study (unpublished report), we estimated that 70% of eligible adults would identify an informal care provider that agreed to participate, resulting in baseline interviews with 719 study pairs. Based on experience in similar two-year follow-ups in the Aging, Memory and Demographics Study (ADAMS) and HRS, we expected that 82% (n = 584) of surviving community-dwelling pairs and 75% of the nursing home pairs would be successfully re-interviewed at follow-up. Based on total population prevalence estimated in the ADAMS study, we expect that after final HCAP diagnostic classification, 15% (n=367) of the 2448 individuals that completed baseline cognitive screening would be classified as having probable dementia and approximately 22% (n=538) with MCI [33, 34]. Based on information from HRS, we anticipated that we could meet enrollment targets with a team of 10 field interviewers, in addition to a field office director and project manager.

Analysis

Sample control, sample weighting and variance estimation: Final analysis weights will be developed for individual respondents/caregivers to reflect varying subsampling probabilities including the nursing home samples for eligible adults as well as adjustments for differential baseline and follow-up nonresponse among socio-demographic subgroups of sample members. U.S. Census American Community Survey current five-year population estimates for Nueces County will be used to post-stratify the analysis weights to improve the precision and minimize bias of the estimates of MCI and dementia prevalence for MAs and NHWs. All data analyses will utilize SAS or R software that explicitly reflects the effects of weighting and sample clustering on the variances of descriptive estimates and model parameters.

Analysis plan: Weighted estimates and contrast of population proportions (prevalence) by cognitive status classification (normal, MCI, dementia) will be computed for MA and NHW as well as subpopulations defined by age group, education level and stroke status. Tests of ethnic differences in prevalence at baseline and cognitive trajectory between the baseline and two-year follow-up will be performed using the pairwise t-tests or X^2 test of association (ethnicity x cognitive classification) that adjust for the complex sample design. Generalized multiple logistic regression modeling will serve to estimate the association between cognitive status classification and ethnicity (MA, NHW) [35].

It is important to note that our study design is optimized for investigating cognitive change over time among persons with baseline MCI or dementia (Aim 1, Hypothesis 4) as well as caregiver burden (Aim 2) and needs assessment for care of persons living with MCI and dementia (Aim 3). The conservative (i.e., against false-negative classification) MoCA cut-off

and the presence of an informal caregiver as full study inclusion criteria censors detailed HCAP measurement and cognitive status classification for cognitively impaired persons who do not meet one or both criteria. The HRS HCAP study has administered the HCAP to large national samples of Hispanic and Non-Hispanic adults age 65 and older. HRS HCAP respondent data will be used to multiply impute cognitive status to all eligible sample adults in the BASIC-Cognitive household and nursing home samples [36,37]. Individuals who did not receive the HCAP due to their score on the MoCA screen, lack of a caregiver, or did not consent to the HCAP administration will have their cognitive status multiply imputed. Population prevalence estimates and models of cognitive functioning will be conducted using methods for estimation and inference with multiply imputed data [36]. Confidence intervals for MCI and dementia prevalence estimates and trajectories will incorporate the added uncertainty due to multiple imputation of cognitive status.

For Aims 2 and 3 (i.e., ethnic differences in caregiving; needs assessment): Descriptive estimation and multiple regression analysis methods similar to those described above for Aim 1 will be applied in the analysis of patterns of caregiving, caregiver burden and health effects, as well as perceived needs measured in the CANE.

Also for Aim 3, data collected in the qualitative group concept mapping sessions will be used to create a similarity index which is then used in non-metric multidimensional scaling, a multivariate analysis, to map the points representing the distances and relations between the statements[38]. Hierarchical cluster analysis will be used to divide the map into clusters representing an idea or concept. The rating information is used to determine each statement average mean importance and priority ratings. The data collected through the asset maps will provide us information on existing resources, their target populations and geographical reach along with information on the awareness and current usage by informal caregivers in our sample. This, together with the needs identified, will highlight ethnic-specific resource gaps and result in the recommendation of new resources or modification to existing resources to address resource gaps in the community.

RESULTS

Our study design budgeted approximately two years for recruitment of the baseline cohort and two years for completion of the two-year follow-up procedures, with buffers embedded in the timeline in the event of slower than expected recruitment. Data collection began on 5/1/2018; as such, we anticipated completion of our baseline cohort assessments in May, 2020. To evaluate enrollment for our first year of project recruitment (5/1/18–4/30/19), we report enrollment status (i.e., through completion of cognitive screening) for all individuals who were initially approached prior to 3/1/19, tracking enrollment status of these individuals through 4/30/19.

Figure 2 provides information on participant recruitment. Within this recruitment period, 6,109 households were approached, of whom 3,879 (63.4%) were reached. 1,030 age-eligible households were identified, corresponding to 27% of households for whom age could be determined. 1,320 individuals were determined to be age-eligible, corresponding to

1.3 adults per eligible household. 689 (52%) completed cognitive screening, 474 (35%) refused screening, and 134 (10%) are pending follow-up.

Table 1 displays the demographic characteristics for individuals that completed cognitive screening. 689 individuals completed cognitive screening, 411 (60%) of whom were MA, 241 (35%) were NHW, and 37 (5%) were from other racial/ethnic groups. These groups did not differ with regard to age (median age = 72 years for all groups). Groups did differ with regard to gender (62% women in the MA group relative to 50% women in the NHW and Other groups) and education (median of 12 years of education in the MA group relative to 15 and 13 years in the NHW and Other groups, respectively). In the MA group, 23% completed cognitive screening in Spanish, 5% completed the screening in both English/Spanish, and the remaining 72% completed screening in English.

DISCUSSION

The BASIC-Cognitive study will provide critical information regarding the prevalence of CID in Mexican Americans, the impact of caregiving, and allocation of community resources to meet the needs of this growing population. This project expects to contribute to the epidemiology of MCI and dementia in MAs and NHWs by understanding prevalence and progression of CID and the risk factors that contribute to progression. Given the expected large growth in the US Hispanic population, understanding the potential impact of this disparity in cognitive function and dementia risk is especially important. The BASIC-Cognitive study aims to evaluate the presence and impact of these disparities, and together with our comprehensive needs assessment, will identify targets for culturally appropriate, novel interventions.

Factors that may contribute to increased risk for CID in the MA population are complex and multifaceted. Ethnic disparities in SES, educational and occupational attainment, chronic stress associated with acculturation and discrimination, and reduced access to health care are some of the many psychosocial factors that may confer increased vulnerability to CID [39,40]. With regard to medical risk factors, stroke and diabetes each contribute a substantially increased risk of dementia, and both conditions are more prevalent in MAs compared with NHWs [41]. APOE ϵ 4 may be a less important risk factor for dementia in MA patients compared with NHWs [41,42]. These findings suggest that dementia risk may be relatively more amenable to modification through aggressive vascular risk factor modification in the MA population, which would translate to modifiable targets for intervention.

This study will add critical incremental information to existing knowledge of prevalence of CID in Hispanics. Many existing estimates of dementia prevalence in Hispanics have defined cognitive impairment primarily through brief cognitive screening instruments [43, 44, 45] which allows for less precision relative to the more thorough cognitive assessment and informant report procedures utilized in the present study. We also collect information regarding relevant cultural, demographic, and linguistic characteristics to facilitate interpretation of cognitive test performance and to allow for consideration of our sample's comparability with other Hispanic communities within the US. Second, many existing

studies do not include sampling of nursing home residents [47] and restrict sampling to Medicare beneficiaries [44, 47], resulting in incomplete sampling of older adults. The strength and uniqueness of our protocol is in its use of door-to-door ascertainment, sampling of nursing home residents, and use of in-home assessments (i.e., not requiring transportation to a clinic), which enhances participation access for all age-eligible community members. Our use of the HCAP, which is used in several international studies of cognitive aging, will allow us to directly link and compare our study's prevalence estimates with nationally representative data in the HRS, in addition to cross-national comparisons (e.g., with the Mexican Health and Aging Study).

Our study will provide new and valuable data on the needs of those with CID and their caregivers across MA and NHW populations and identification of community services and resources required to address those needs. Hispanic caregiving may be associated with excessive stress and burden among informal caregivers; may be due in part to economic necessity rather than cultural values, and may constrain the younger generation of MAs to attain education and employment. This may perpetuate socioeconomic disparities among MAs and NHWs [48,49]. As such, disparities in income and social standing may widen if MA family members care for their cognitively impaired family members informally, while NHW families are more likely to access formal caregiving services. There are many factors that may impact availability and access to these community services. These include demographic and socio-economic factors (e.g., gender, ethnicity, employment), knowledge and beliefs about care needs (e.g., health literacy, cultural practices), social support, and disease severity. These combined factors may contribute to ethnic differences in unmet needs within the community.

The initial recruitment for our project has been encouraging in many ways. We have found robust participation in the MA community relative to NHW. This finding is counter to traditional concerns in research with minority populations [50]. Multiple factors have been identified that may contribute to reduced study enrollment in minority populations, such as restrictive exclusion criteria, language barriers, reduced awareness of available research, and mistrust of the scientific community [51,52]. Some evidence suggests similar rates of willingness to participate in research across racial and ethnic groups once contacted and invited to participate [53,54]. Our sampling and case ascertainment methodology, targeting the approach of equal proportion of MA and NHW households, may alleviate barriers in access to research participation. In addition, our field interviewers, who were recruited from the local community, are primarily bilingual and facile in communicating in the local Spanish spoken in the community. Given that nearly 30 percent of our interviews for MA participants were conducted either exclusively in Spanish or bilingually, it was imperative to hire bilingual field staff. Our bilingual field staff was also asked to review the language used in our recruitment and interview materials to ensure their appropriateness to the local community. In addition, we created an infographic that provides a simple visual display of the study design and activities to enhance communication about our study during recruitment.

Community engagement is important in enhancing minority participation [52]. To this end, we partnered with the city/county health district to conduct this work, and our staff office is

embedded within the city/county health department building. We have partnered with an investigator from a local university (Dr. Gonzales; Texas A&M University- Corpus Christi). We have also contacted local media and completed interviews with local English- and Spanish- language TV stations to enhance the awareness of our study within the community. We created a website (www.basiccognitive.org) and social media accounts that include profiles of our field interviewers and will also include testimonials from volunteer participants. We provide a token gift (re-usable shopping bags with our study's logo and website) for all that complete cognitive screening. Of note, these efforts are designed to raise awareness of our project within the community and are not used for direct recruitment/enrollment, so as not to disrupt our careful sampling procedure to ensure representativeness of our sample.

Relatively greater participation in our MA population is also indicative of lower than expected enrollment rates for NHW adults. The reasons for this are unclear. We have engaged in extensive efforts to facilitate study access and engagement for MA community members, as outlined above, including recruitment of bilingual, MA field staff. As a result, our field staff is largely represented by MAs rather than NHWs. It is unclear whether ethnicity matching is important for recruitment of non-Hispanic whites, particularly given that effects due to ethnicity mismatch on study cooperation are less frequently encountered for NHW populations than for minority populations. In other contexts (e.g., psychotherapy), ethnic matching has been found to be less important for majority than minority cultural groups[55]. We have taken care to minimize the possibility that recruitment strategies result in inadvertent bias in participation rates by ethnicity. For example, field staff are trained to describe the project goals without reference to ethnicity. We continue to be attentive to efforts to enhance participation rates for all eligible individuals. Although it would be helpful to have access to information regarding the ethnicity of individuals that did not participate in the cognitive screening, we are not able to collect this information due to their non-participation.

Despite these efforts, our overall initial enrollment rates have been lower than what was projected based upon HRS data. Although our projected enrollment numbers accounted for many anticipated challenges associated with door-to-door recruitment, a few factors were underestimated that have led to reduced enrollment rates relative to expectations. Our occupancy rate aligned with expectations (anticipated 88% relative to 91% actual); however, our predictions underestimated the number of households that we are able to contact. Although we attempted to contact households at varied times of day (e.g., daytime, evening) and on both weekdays and weekends, we could not make contact with 29% of our presumed occupied households (1600 of 5556 sampled occupied households), which represented a considerable amount of invested time for our field interviewers. Of the households we contacted, our age eligibility rate was higher than expected (27% relative to expected 22%).

We have experienced higher than expected refusal rates for cognitive screening (MoCA) with eligible community members. Whereas we anticipated 75% agreement rate, we found a 52% agreement rate during our first year. We have made adjustments to several elements of the study design in an effort to optimize recruitment and participation. For example, we initially defined the role of our informal care providers in the traditional sense of a *caregiver*

role (i.e., someone that provides assistance for activities that an individual is no longer able to complete independently). However, many potentially eligible individuals were not able to identify anyone in their life who met this definition. We thus modified our definition of the informal care provider as an *informant* (i.e., someone that knows them well and is an important part of their lives). This adjustment may enhance study participation for those with milder cognitive decline, in particular. In addition, we found that some participants identified informal care providers that lived remotely and could not participate in an in-person interview. We modified our protocol to allow for telephone-based interviews. Second, we found that some potentially eligible participants with severe cognitive impairment were not able to demonstrate an understanding of the information conveyed in our assent procedure, leading us to modify our procedure to allow for a waiver of assent for individuals that could not demonstrate capacity to provide assent. This modification allows us to gather invaluable information from informal care providers on caregiving experiences and needs. Similarly, we have adjusted our recruitment approaches for our nursing home residents in an effort to enhance participation (i.e., from sending an opt-in invitation letter to sending an opt-out invitation letter).

Limitations

Although the project is expected to significantly enhance our understanding of CID and associated needs in the MA community, our study has some limitations. Our methodology does not allow for determination of dementia etiology, as we do not perform a comprehensive medical examination and do not have access to medical records, neuroimaging, or laboratory work. However, we believe that formal determination of dementia etiology is less relevant to our study goals of understanding disparities in cognitive decline and caregiver experiences and needs, and most dementias are of mixed etiologies[56]. Second, our project is positioned within one community in South Texas. These findings will not generalize to all Hispanics, although this community is representative of the larger MA population in the United States along many factors (e.g., demographics, SES) and is predominantly non-immigrant, and we thus feel that this sample will provide invaluable information that will generalize to a large and growing proportion of MAs in the United States. Finally, given that we enroll participants with their informal care providers, we are not able to capture information on the experiences of those that are living with cognitive impairment who do not have family or friends who were willing to participate in the study. We are thus not able to capture the experiences and needs of this vulnerable and isolated population. Future research studies are needed to target this population.

Conclusions

The BASIC-Cognitive project will advance knowledge of CID in MAs, a minority population that is rapidly growing and aging, and will provide critical information regarding unmet needs of those with dementia and their families, so as to better allocate community resources to reduce disparities in care and quality of life in this population.

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REFERENCES

- [1]. Vincent GK, Velkoff VA (2010) The Older Population in the United States : 2010 to 2050, population estimates and projections. In Current population reports: Population estimates and projections, pp. 1–16.
- [2]. Ennis SR, Rios-Vargas M, Albert M (2011) The Hispanic Population: 2010: 2010 Census Briefs. United States Census Bureau, <http://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf>, Accessed on October 3, 2019.
- [3]. Larson EB, Yaffe K, Langa KM (2013) New Insights into the Dementia Epidemic. *N. Engl. J. Med.* 369, 2275–2277. [PubMed: 24283198]
- [4]. Castora-Binkley M, Peronto CL, Edwards JD, Small BJ (2015) A longitudinal analysis of the influence of race on cognitive performance. *Journals Gerontol. - Ser. B Psychol. Sci. Soc. Sci.* 70, 512–518.
- [5]. Fitten LJ, Ortiz F, Fairbanks L, Bartzokis G, Lu P, Klein E, Coppola G, Ringman J (2014) Younger age of dementia diagnosis in a Hispanic population in southern California. *Int. J. Geriatr. Psychiatry* 29, 586–593. [PubMed: 24478258]
- [6]. Díaz-Venegas C, Downer B, Langa KM, Wong R (2016) Racial and ethnic differences in cognitive function among older adults in the USA. *Int. J. Geriatr. Psychiatry* 31, 1004–1012. [PubMed: 26766788]
- [7]. Downer B, Raji MA, Markides KS (2016) Relationship between metabolic and vascular conditions and cognitive decline among older Mexican Americans. *Int. J. Geriatr. Psychiatry* 31, 213–221. [PubMed: 26032435]
- [8]. Al Hazzouri A, Haan MN, Neuhaus JM, Pletcher M, Peralta CA, López L, Pérez Stable EJ (2013) Cardiovascular risk score, cognitive decline, and dementia in older Mexican Americans: the role of sex and education. *J. Am. Heart Assoc.* 2, 1–9.
- [9]. Gelman CR (2014) Familismo and Its Impact on the Family Caregiving of Latinos With Alzheimer's Disease: A Complex Narrative. *Res. Aging* 36, 40–71. [PubMed: 25651600]
- [10]. Mausbach BT, Coon DW, Depp C, Rabinowitz YG, Wilson-Arias E, Kraemer HC, Thompson LW, Lane G, Gallagher-Thompson D (2004) Ethnicity and Time to Institutionalization of Dementia Patients: A Comparison of Latina and Caucasian Female Family Caregivers. *J. Am. Geriatr. Soc.* 52, 1077–1084. [PubMed: 15209644]
- [11]. Luchsinger JA, Tipiani D, Torres-Patiño G, Silver S, Eimicke JP, Ramirez M, Teresi J, Mittelman M (2015) Characteristics and Mental Health of Hispanic Dementia Caregivers in New York City. *Am. J. Alzheimer's Dis. Other Dementias* 30, 584–590.
- [12]. Janevic MR, Connell C M (2011) Racial, Ethnic, and Cultural Differences in the Dementia Caregiving Experience. *Gerontologist* 41, 334–347.
- [13]. Morgenstern LB, Smith MA, Lisabeth LD, Risser JMH, Uchino K, Garcia N, Longwell PJ, McFarling DA, Akuwumi O, Al-Wabil A, Al-Senani F, Brown DL, Moyé LA (2004) Excess Stroke in Mexican Americans Compared with Non-Hispanic Whites: The Brain Attack Surveillance in Corpus Christi Project. *Am. J. Epidemiol.* 160, 376–383. [PubMed: 15286023]
- [14]. Morgenstern LB, Smith MA, Sánchez BN, Brown DL, Zahuranec DB, Garcia N, Kerber KA, Skolarus LE, Meurer WJ, Burke JF, Adelman EE, Baek J, Lisabeth LD (2013) Persistent ischemic stroke disparities despite declining incidence in Mexican Americans. *Ann. Neurol.* 74, 778–785. [PubMed: 23868398]
- [15]. Lisabeth LD, Sánchez BN, Baek J, Skolarus LE, Smith MA, Garcia N, Brown DL, Morgenstern LB (2014) Neurological, Functional, and Cognitive Stroke Outcomes in Mexican Americans. *Stroke* 45, 1096–1101. [PubMed: 24627112]
- [16]. U.S. Census Bureau QuickFacts: Nueces County, Texas, <https://www.census.gov/quickfacts/nuecescountytexas>, Accessed on June 28, 2019.
- [17]. Motel S, Patten E (2012) Characteristics of the 60 Largest Metropolitan Areas by Hispanic Population. *Pew Hisp. Cent.* <http://www.pewhispanic.org/2012/09/19/characteristics-of-the-60-largest-metropolitan-areas-by-hispanic-population/> Accessed July 25, 2019.

- [18]. Nasreddine ZS, Phillips NA, Bäckström V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H (2005) The Montreal Cognitive Assessment, MoCA: A Brief Screening Tool For Mild Cognitive Impairment. *J. Am. Geriatr. Soc.* 53, 695–699. [PubMed: 15817019]
- [19]. Borson S, Scanlan J, Brush M, Vitaliano P, Dokmak A (2000) The Mini-Cog: a cognitive “vital signs” measure for dementia screening in multi-lingual elderly. *Int. J. Geriatr. Psychiatry* 15, 1021–1027. [PubMed: 11113982]
- [20]. Langa KM, Ryan LH, McCammon RJ, Jones RN, Manly JJ, Levine DA, Sonnega A, Farron M, Weir DR (In press) The Health and Retirement Study Harmonized Cognitive Assessment Protocol Project: Study Design and Methods. *Neuroepidemiology*.
- [21]. Wilkinson GS, Robertson GJ (2006) Wide Range Achievement Test (WRAT-4), Psychological Assessment Resources, Lutz, FL.
- [22]. Del Ser T, González-Montalvo JI, Martínez-Espinosa S, Delgado-Villalpalos C, Bermejo F (1997) Estimation of premorbid intelligence in Spanish people with the word accentuation test and its application to the diagnosis of dementia. *Brain Cogn.* 33, 343–356. [PubMed: 9126399]
- [23]. Lee SYD, Stucky BD, Lee JY, Rozier RG, Bender DE (2010) Short assessment of health literacy-Spanish and english: A comparable test of health literacy for spanish and english speakers. *Health Serv. Res.* 45, 1105–1120. [PubMed: 20500222]
- [24]. Miranda C, Rentería MA, Fuentes A, Coulehan K, Arentoft A, Byrd D, Rosario A, Monzones J, Morgello S, Rivera Mindt M, Arce Rentería M (2016) The Relative Utility of Three English Language Dominance Measures in Predicting the Neuropsychological Performance of HIV+ Bilingual Latino/a Adults. *Clin. Neuropsychol.* 30, 185–200. [PubMed: 26934820]
- [25]. Brazier JE, Harper R, Jones NM, O’Cathain A, Thomas KJ, Usherwood T, Westlake L (1992) Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ* 305, 160–4. [PubMed: 1285753]
- [26]. Zarit SH, Reever KE, Bach-Peterson J (1980) Relatives of the Impaired Elderly: Correlates of Feelings of Burden. *Gerontologist* 20, 649–655. [PubMed: 7203086]
- [27]. Alonso J, Prieto L, Antó JM (1995) [The Spanish version of the SF-36 Health Survey (the SF-36 health questionnaire): an instrument for measuring clinical results]. *Med. Clin. (Barc.)* 104, 771–6. [PubMed: 7783470]
- [28]. Martin-Carrasco M, Salvado I, Nadal S, Miji L, Rico JM, Lanz P, Al. E (1996) Adaptacion para nuestro medio de la Escala de Sobrecarga del Cuidador (Caregiver Burden Interview) de Zarit. *Rev. Gerontol.* 6, 338–346.
- [29]. Marin G, Sabogal F, Marin BV, Otero-Sabogal R, Perez-Stable EJ (1987) Development of a Short Acculturation Scale for Hispanics. *Hisp. J. Behav. Sci.* 9, 183–205.
- [30]. Sabogal F, Marín G, Otero-Sabogal R, Marín BV, Perez-Stable EJ (1987) Hispanic Familism and Acculturation: What Changes and What Doesn’t? *Hisp. J. Behav. Sci.* 9, 397–412.
- [31]. Reynolds T, Thornicroft G, Abas M, Woods B, Hoe J, Leese M, Orrell M (2000) Camberwell Assessment of Need for the Elderly (CANE). *Br. J. Psychiatry* 176, 444–452. [PubMed: 10912220]
- [32]. US Census Bureau: American Fact Finder: Community facts. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmk Accessed July 12, 2019.
- [33]. Plassman BL, Langa KM, Fisher GG, Heeringa SG, Weir DR, Ofstedal MB, Burke JR, Hurd MD, Potter GG, Rodgers WL, Steffens DC, Willis RJ, Wallace RB (2007) Prevalence of dementia in the United States: The aging, demographics, and memory study. *Neuroepidemiology* 29, 125–132. [PubMed: 17975326]
- [34]. Plassman BL, Langa KM, McCammon RJ, Fisher GG, Potter GG, Burke JR, Steffens DC, Foster NL, Giordani B, Unverzagt FW, Welsh-Bohmer KA, Heeringa SG, Weir DR, Wallace RB (2011) Incidence of dementia and cognitive impairment, not dementia in the United States. *Ann. Neurol.* 70, 418–426. [PubMed: 21425187]
- [35]. Heeringa SG, West B, Berglund P (2017) *Applied Survey Data Analysis*, Chapman and Hall, Boca Raton.
- [36]. Little R, Rubi D (2002) *Statistical Analysis with Missing Data*, John Wiley & Sons, Ltd, New York.

- [37]. Schenker N, Raghunathan T (2007) Combining information from multiple surveys to enhance estimation of measures of health. *Stat. Med.* 26, 1802–1811. [PubMed: 17278184]
- [38]. Kane M, Trochim W (2007) *Concept Mapping for Planning and Evaluation*, SAGE Publications, California.
- [39]. Babulal GM, Quiroz YT, Albeni BC, Arenaza-Urquijo E, Astell AJ, Babiloni C, Bahar-Fuchs A, Bell J, Bowman GL, Brickman AM, Chételat G, Ciro C, Cohen AD, Dilworth-Anderson P, Dodge HH, Dreux S, Edland S, Esbensen A, Evered L, Ewers M, Fargo KN, Fortea J, Gonzalez H, Gustafson DR, Head E, Hendrix JA, Hofer SM, Johnson LA, Jutten R, Kilborn K, Lanctôt KL, Manly JJ, Martins RN, Mielke MM, Morris MC, Murray ME, Oh ES, Parra MA, Rissman RA, Roe CM, Santos OA, Scarmeas N, Schneider LS, Schupf N, Sikkes S, Snyder HM, Sohrabi HR, Stern Y, Strydom A, Tang Y, Terrera GM, Teunissen C, Melo van Lent D, Weinborn M, Wesselman L, Wilcock DM, Zetterberg H, O'Bryant SE (2019) Perspectives on ethnic and racial disparities in Alzheimer's disease and related dementias: Update and areas of immediate need. *Alzheimer's Dement.* 15, 292–312. [PubMed: 30555031]
- [40]. Weden MM, Miles JNV, Friedman E, Escarce JJ, Peterson C, Langa KM, Shih RA (2017) The Hispanic Paradox: Race/Ethnicity and Nativity, Immigrant Enclave Residence and Cognitive Impairment Among Older US Adults. *J. Am. Geriatr. Soc.* 65, 1085–1091. [PubMed: 28369694]
- [41]. Haan MN, Mungas DM, Gonzalez HM, Ortiz TA, Acharya A, Jagust WJ (2003) Prevalence of dementia in older Latinos: The influence of type 2 diabetes mellitus, stroke and genetic factors. *J. Am. Geriatr. Soc.* 51, 169–177. [PubMed: 12558712]
- [42]. O'Bryant SE, Johnson L, Balldin V, Edwards M, Barber R, Williams B, Devous M, Cushings B, Knebl J, Hall J (2012) Characterization of Mexican Americans with Mild Cognitive Impairment and Alzheimer's Disease. *J. Alzheimer's Dis.* 33, 373–379.
- [43]. Weden MM, Miles JNV, Friedman E, Escarce JJ, Peterson C, Langa KM, Shih RA (2017) The Hispanic Paradox: Race/Ethnicity and Nativity, Immigrant Enclave Residence and Cognitive Impairment Among Older US Adults. *J. Am. Geriatr. Soc.* 65, 1085–1091. [PubMed: 28369694]
- [44]. Moon H, Badana ANS, Hwang SY, Sears JS, Haley WE (2019) Dementia Prevalence in Older Adults: Variation by Race/Ethnicity and Immigrant Status. *Am. J. Geriatr. Psychiatry* 27, 241–250. [PubMed: 30573327]
- [45]. Sheffield KM, Peek MK (2011) Changes in the prevalence of cognitive impairment among older Americans, 1993–2004: Overall trends and differences by race/ethnicity. *Am. J. Epidemiol.* 174, 274–283. [PubMed: 21622948]
- [46]. Haan MN, Mungas DM, Gonzalez HM, Ortiz TA, Acharya A, Jagust WJ (2003) Prevalence of dementia in older Latinos: The influence of type 2 diabetes mellitus, stroke and genetic factors. *J. Am. Geriatr. Soc.* 51, 169–177. [PubMed: 12558712]
- [47]. Tang M-X, Stern Y, Marder K, Bell K, Gurland B, Lantigua R, Andrews H, Feng L, Tycko B, Mayeux R (1998) The APOE-ε4 Allele and the Risk of Alzheimer Disease Among African Americans, Whites, and Hispanics. *JAMA* 279, 751. [PubMed: 9508150]
- [48]. Luchsinger JA, Tipiani D, Torres-Patiño G, Silver S, Eimicke JP, Ramirez M, Teresi J, Mittelman M (2015) Characteristics and mental health of hispanic dementia caregivers in New York City. *Am. J. Alzheimers. Dis. Other Dement.* 30, 584–590. [PubMed: 25635108]
- [49]. Gelman CR (2014) Familismo and Its Impact on the Family Caregiving of Latinos With Alzheimer's Disease. *Res. Aging* 36, 40–71. [PubMed: 25651600]
- [50]. Duran N S, Norris K (2014) A systematic review of barriers and facilitators to minority research participation among African Americans, Latinos, Asian Americans, and Pacific Islanders. *Am. J. Public Health* 104, e16–e31.
- [51]. Yancey AK, Ortega AN, Kumanyika SK (2006) Effective recruitment and retention of minority research participants. *Annu. Rev. Public Health* 27, 1–28. [PubMed: 16533107]
- [52]. Nicholson LM, Schwirian PM, Groner JA (2015) Recruitment and retention strategies in clinical studies with low-income and minority populations: Progress from 2004–2014. *Contemp. Clin. Trials* 45, 34–40. [PubMed: 26188163]
- [53]. Wendler D, Kington R, Madans J, Van Wye G, Christ-Schmidt H, Pratt LA, Brawley OW, Gross CP, Emanuel E (2006) Are racial and ethnic minorities less willing to participate in health research? *PLoS Med.* 3, 0201–0210.

- [54]. Ofstedal MB, Weir DR (2011) Recruitment and retention of minority participants in the health and retirement study. *Gerontologist* 51,.
- [55]. Maramba GG, Nagayama Hall GC (2002) Meta-analyses of ethnic match as a predictor of dropout, utilization, and level of functioning. *Cult. Divers. Ethn. Minor. Psychol.* 8, 290–297.
- [56]. Schneider J, Arvanitakis Z, Bang W, Bennett D (2007) Mixed brain pathologies account for most dementia cases in community-dwelling older persons. *Neurology* 69, 2197–2204. [PubMed: 17568013]

	BASELINE			2-year FOLLOW-UP		
	INSTRUMENT	PARTICIPANTS	OUTCOMES	INSTRUMENT	PARTICIPANTS	OUTCOMES
Prevalence and trajectory of CID Aim 1	1. HCAP-Respondent & Informant	Patients and informal care providers	1. Cognitive status: Prevalence of MCI/Dementia	1. HCAP-Respondent & Informant	1. Patients and Informal care providers	1. Cognitive status & trajectories
	2. Demographics		2. Role of ethnicity, age, education, stroke			
Caregiving assessment Aim 2	1. Zarit Caregiver Burden Scale	All: Informal care providers	1. Caregiver burden	1. Zarit Caregiver Burden Scale	All: Informal care providers	1. Changes in caregiver burden
	2. SF-36		2. Caregiver health			2. Changes in caregiver health
	3. ARSMA II		3. Acculturation			
	4. Sabogal familism		4. Familism			
Community needs and resources Aim 3	1. CANE	1. Informal care providers	1. Patient needs	1. CANE	1. Informal care providers	1. Changes in patient needs
	2. Asset map (year 2)	2. Research team & Alzheimer's Association	2. Existing community resources	2. Concept Mapping (year 3)	2. Informal care providers and clinicians	3. Patient/caregiver needs

Figure 1 :
BASIC-Cognitive study overview.

Note: ARSMA I II = Acculturation Rating Scale for Mexican Americans-II. CANE = Camberwell Assessment of Needs in the Elderly. CID = cognitive impairment or dementia. HCAP = Harmonized Cognitive Assessment Protocol. MCI = mild cognitive impairment. SF-36 = Short Form Health Survey

A. Projected recruitment numbers and rates

B. Year 1 recruitment numbers and rates

Figure 2 :

BASIC-Cognitive Projected and Year 1 recruitment numbers and rates.

Panel A displays the projected recruitment numbers and rates through cognitive screening.

Panel B displays actual recruitment numbers and rates for year 1 of the study. Note: MA =

Mexican American. MoCA = Montreal Cognitive Assessment. NHW = Non-Hispanic

White. ORE = Other Race/Ethnicity.

Table 1.

Sociodemographic characteristics of study participants that completed cognitive screening in Year 1

Characteristics	N=689			
	Mexican American N=411 n (%)	Non-Hispanic White N=241 n (%)	Other ^a N=37 n (%)	p-value ^b
Age (years) [median (IQR)]	72 (68–77)	72 (69–78)	72 (69–79)	0.8692 ^c
Age (categorical)				0.9192 ^d
65 – 74	253 (61.6)	156 (64.7)	22 (59.5)	
75 – 84	116 (28.2)	63 (26.1)	11 (29.7)	
85 and older	42 (10.2)	22 (9.1)	4 (10.8)	
Gender (Women)	254 (61.8)	121 (50.2)	18 (50.0)	0.0104 ^e
Education [median number of years (IQR)]	12 (7–14)	15 (12–17)	13 (12–17)	<.0001 ^c
Education				<.0001 ^e
High school or less	292 (71.1)	64 (26.6)	17 (47.2)	
More than high School	119 (29.0)	177 (73.4)	19 (52.8)	
Language of cognitive screen				<.0001 ^d
Spanish	96 (23.4)	0 (0.0)	5 (13.5)	
English	294 (71.5)	241 (100.0)	31 (83.8)	
Bilingual ^f	21 (5.1)	0 (0.0)	1 (2.7)	

Note: IQR: Interquartile Range^aNon-Hispanic Black, American Indian or Alaskan Native, Asian or Pacific Islander, other or unknown ethnicity and/or race^bp-value for differences between race/ethnic groups^cKruskal-Wallis test^dFisher test^eChi square test^fBoth Spanish and English*Note:* Education information was missing from one individual in the “Other” group.