Supplement for **Group Activity Participation in Relation to Contextual Isolation of United States Nursing Home Residents Living with Alzheimer’s Disease and Related Dementias**

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**Supplemental Table 1. Rationale for Potentially Socially Isolating Characteristics Considered for the Expert Nurse Survey.**

|  |  |
| --- | --- |
| Brief Description | Rationale |
| **Shared Demographic characteristics** | |
| Gender - Men | Women residents form the majority in most nursing homes (Fashaw et al., 2019).  Most direct care nursing home staff are women (National Center for Health Statistics, 2009, Table 1).  Men who live in nursing homes are more likely to report loneliness (Drageset et al., 2011). |
| Gender – Women | The Veterans Affairs provides financial support for nursing home care to eligible veterans (U.S. Department of Veteran Affairs, 2019).  A small minority (~3%) of long-stay residents in Veterans Affairs nursing homes are women (Mills et al., 2019).  Women in nursing homes with dementia often exhibit anxiety and sadness (Resnick et al., 2020). |
| Transgender | Discrimination against transgender people in healthcare delivery is common (Winter et al., 2016). |
| Lesbian, Bisexual, or Gay | Loneliness is a common experience among older LGBTI populations (Hughes, 2016).  Gay men are frequently concerned about being alone later in life (Hughes, 2009).  Elder LGBT people often came of age before the Gay Rights movement, and thus have learned to cope by remaining invisible and reserved (Butler, 2008). |
| Young Age | Nursing home residents aged ≥ 65 years form the majority in most nursing homes (Fashaw et al., 2019).  In assisted living and community settings, older age is associated with a reduced sense of loneliness (Park et al., 2020; Theeke, 2010).  Residents being of similar ages predicts friendship in nursing homes (Retsinas & Garrity, 1985). |
| Advanced Age | Residents being of similar ages predicts friendship in nursing homes (Retsinas & Garrity, 1985). |
| Veteran Status | Families of veterans cared for in VA facilities reported greater satisfaction with care than veterans cared for in non-VA nursing homes (Lu et al., 2010).  Socially isolated veterans have a higher hospitalization rate (Greysen et al., 2013). |
| Service Branch (Army, Navy, Air Force, Coast Guard, Marines) | Men in each service branch construct hegemonic masculinities designed to foster connection within the branch, and to subordinate members of other branches (Hinojosa, 2010). |
| Hispanic of any race(s) | In most nursing homes, Hispanics form a small minority (Fashaw et al., 2019).  Whites in racially diverse neighborhoods, express lower levels of discriminatory attitudes towards Hispanics than in White majority neighborhoods (Cain et al., 2000; Oliver & Wong, 2003). |
| Non-Hispanic White alone | Many Whites experience anxiety about forming close interracial relationships (Godsil & Richardson, 2017).  Whites in multiracial settings may fear anti-White discrimination (Craig & Richeson, 2018). |
| Non-Hispanic Black alone | In most nursing homes, Blacks form a small minority (Fashaw et al., 2019).  African Americans report more experiences of discrimination in predominantly White contexts (Tropp, 2007).  White adults feel less close to Blacks when they have limited exposure (Tropp, 2007).  Blacks living in predominantly White neighborhoods often express fears of discrimination (Cain et al., 2000).  White anti-Black prejudice tends to increase as the proportion of Blacks in the local population increases, but plateaus or decreases beyond a Black proportion of 20% (Taylor, 1998). |
| Non-Hispanic American Indian or Alaska Native alone | Residents who are not Hispanic, Black, or White form a small minority of nursing home residents (Jones et al., 2009).  Many American Indian elders leave families and familiar communities to receive nursing home services in nursing homes unfamiliar with their way of life (Mick, 1983; Manson & Callaway, 1988). |
| Non-Hispanic Asian alone | Residents who are not Hispanic, Black, or White form a small minority of nursing home residents (Jones et al., 2009).  Older Asian immigrants in America frequently report depression related to social support (Kuo et al., 2008).  In racially diverse neighborhoods, Whites express lower levels of discriminatory attitudes towards Asians (Cain et al., 2000; Oliver & Wong, 2003). |
| Non-Hispanic Native Hawaiian or other Pacific Islander | Residents who are not Hispanic, Black, or White form a small minority of nursing home residents (Jones et al., 2009). |
| Non-Hispanic Multiracial | Residents who are not Hispanic, Black, or White form a small minority of nursing home residents (Jones et al., 2009).  Biracial adults often report feeling socially isolated (Reed, 2008). |
| Language translation services needed | Canadian seniors born outside Canada who do not speak English or French are more likely to report isolation (de Jon Gierveld et al., 2015).  Older Asian immigrants in America frequently report depression related to English proficiency and acculturation (Kuo et al., 2008). |
| Heavy-bodied (BMI classified as “obese”) | Discrimination on the basis of weight for height is prevalent in America (Andreyeva et al., 2008).  Adults express preferences for greater social distance from obese persons than non-obese persons (Vartanian et al., 2015). |
| **Shared Habits** | |
| Current tobacco use | Older adults who smoke are often socially isolated (Choi & DiNitto, 2015).  Conflict between smoking residents and staff is common in smoke-free nursing homes (Adler et al., 2008). |
| Nonuse of tobacco | Nonsmokers frequently complain about passive smoke in nursing homes where smoking is allowed (Kochersberger & Clipp, 1996). |
| Religious Practice Important | Nursing home residents who engage in public religious activities experience lower rates of depression (Commerford & Reznikoff, 1995).  On-site religious activities encourage social interaction for residents for whom religious practice is important – thus the absence of such activities may be detrimental for these residents (McFadden & Jacobson, 2003).  Muslim elders have few prospects to identify a nursing home setting that respects their religious needs (Alfarah et al., 2012). |
| Religious Practice Not Important | Adults without strong religious beliefs are more likely to report loneliness (Lauder et al., 2006). |
| Agitated Behaviors | Verbal disruptive behaviors are associated with more social isolation (Draper et al., 2000). |
| Fondness for Animals / Pets | An experiment to randomly assign animal interaction to nursing home residents reduced loneliness and slowed reductions in quality of life (Sollami et al., 2017).  Animal-human interactions can lead to greater human-human contact, in turn reducing loneliness (Banks and Banks, 2002). |
| Musical Tastes (Contemporary, Gospel, Country, Classical, Silence) | Engagement in choir reduced social isolation in nursing home residents with Alzheimer’s disease (Harris et al., 2104). |
| Keeping Up with Current Events |  |
| Shared Political Orientation | Americans are increasingly engaged in smaller social networks that are politically homogenous (Lee et al., 2020). |
| **Shared Clinical Conditions** | |
| Severe mental illness | Most nursing home residents do not have severe mental illness (Fashaw et al., 2019).  Loneliness is frequently reported by people with severe mental illnesses, including in congregate settings (Brown, 1996).  Desire for social distance from persons living with schizophrenia is higher among adults with no prior familiarity with persons with the condition (Angermeyer et al., 2004).  Persons being treated for schizophrenia also express desire for social distance from others living with schizophrenia (Van Dorn et al., 2005). |
| Intellectual disability (developmental delay, Down syndrome, autism) | Adults living with intellectual disabilities report high levels of loneliness (Gilmore & Cuskelly, 2014).  Neighbors of persons with intellectual disabilities are sometimes reluctant to develop typically neighborly relations with persons with intellectual disabilities (van Alphen et al., 2010). |
| Sensory deprivation (Hearing, Vision, Speech) | Impairments in hearing, communication, and vision are associated with lower social engagement in nursing home residents (Resnick et al., 1997). |
| Disfiguring Conditions (Amputation, Paralysis, Burns) | Amputees may feel socially isolated due to their altered appearance and function (Liu et al., 2010).  Some burn survivors experience significant stigmatization (Bayuo et al., 2016)  Disfigurement is a source of stigma for cancer survivors (Reynolds, 2020). |
| Visible Stigmatizing Conditions (Parkinson’s, Huntington’s, Tourette’s, Aphasia) | A high proportion of people living with Parkinson’s report feeling socially isolated (37%) (Brod et al., 1998).  Diminished social networks often follow a diagnosis of aphasia (Vickers, 2009); People living with aphasia often report social exclusion (Parr, 2011). |
| Alzheimer’s disease or related dementia | Elders with dementia are more likely to report social loneliness (Holmén et al., 2000). |
| Neurological Deficits (Stroke) | Nearly half of veterans surviving a stroke experienced social isolation (Haun et al., 2008) |
| Active HIV diagnosis | Most nursing home residents living with HIV are admitted to a nursing home with fewer than 5% HIV+ residents (Meyers et al., 2019).  A high proportion of residents living with HIV report depression (Olivieri-Mui et al., 2019)  A recent Kaiser Family Foundation survey found that 37% of Americans would not feel comfortable sharing living space with someone who is living with HIV (Kirzinger et al., 2019).  Socially isolated veterans with HIV infection have a higher hospitalization rate (Greysen et al., 2013). |
| In Cancer Treatment | Loneliness is associated with higher mortality among nursing home residents with cancer (Drageset et al., 2012).  Identity threat is a common consequence of cancer diagnosis (Knapp et al., 2014). |
| End-of-Life Care | With an average length-of-stay of at least two years in a nursing home, most residents with ADRD do not have a limited life expectancy (Zissimopoulos et al., 2014).  Many residents near the end of life experience existential loneliness (Ettema et al., 2010). |
| Edentulous (Missing most teeth, or requires pureéd food) |  |
| Isolating treatment modalities: (Tracheostomy, Ventilator, Infectious Disease Isolation) | *Included as a negative control. We believed* a priori *that these treatment modalities, by their isolating nature, would prevent experiences of solidarity between similarly situated residents.* |

**Citations for Supplemental Table 1**

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**Supplemental Table 2: Summarized Results of Nurse Expert Surveys (n=7)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Potential Source of Shared Experiences / Solidarity with other Residentsa | Potential Basis for Social Exclusion / Ostracism by Other Residentsa | This Characteristic Contributes to a Sense of Identity within the Nursing Homea | I would guess that being in the minority matters for most residents with this characteristic when they are less than X% of the resident population | Confidence in my opinionsb | Meets Nurse Expert Survey Requirements for Inclusionc | Operational Measure Available in Minimum Data Set 3.0 |
| SHARED DEMOGRAPHIC CHARACTERISTICS | | | | | | | |
| Male | 2.8 | 1.8 | 3.0 | 10% | 3.0 | Y | Y |
| Female | 3.0 | 1.6 | 3.1 | 18% | 3.3 | Y | Y |
| Transgender | 2.4 | 3.0 | 2.3 | 14% | 2.1 | Y | Yd |
| Lesbian, Bisexual or Gay | 3.2 | 2.4 | 2.7 | 18% | 2.4 | Y | N |
| Widowed | 3.7 | 1.9 | 2.7 | 13% | 3.5 | Y | Y |
| Divorced or Separated | 2.7 | 1.5 | 2.0 | 10% | 2.3 | Y | Y |
| Currently Married | 3.0 | 1.3 | 2.9 | 10% | 3.1 | Y | Y |
| Having Children | 3.2 | 1.7 | 3.1 | 19% | 3.4 | Y | N |
| Young Age  (<65 years) | 3.2 | 2.1 | 2.7 | 13% | 3.3 | Y | Y |
| Advanced Age (95+years)e | 2.8 | 1.7 | 2.9 | 13% | 3.3 | Y | Y |
| Veteran Status | 3.3 | 1.3 | 3.0 | 13% | 3.1 | Y | N |
| Service Branch (Army, Navy, Air Force, Coast Guard, Marines) | 3.2 | 1.6 | 3.2 | 12% | 3.0 | Y | N |
| Hispanic of any race(s) | 2.9 | 1.9 | 3.2 | 16% | 2.8 | Y | Y |
| Black / African American | 2.9 | 2.0 | 3.3 | 20% | 2.7 | Y | Y |
| White | 3.1 | 1.7 | 2.7 | 17% | 3.3 | Y | Y |
| Asian | 2.7 | 1.9 | 3.3 | 17% | 2.6 | Y | Y |
| Native Hawaiian or other Pacific Islander | 2.6 | 2.0 | 2.6 | 13% | 2.4 | Y | Y |
| American Indian or Alaska Native | 3.2 | 2.0 | 2.3 | 10% | 2.4 | Y | Y |
| Multiracial | 2.7 | 1.7 | 2.6 | 18% | 2.7 | Y | Y |
| Staff needs a translator to communicate | 3.3 | 2.9 | 2.8 | 19% | 2.9 | Y | Y |
| Heavy-bodied (Body mass index >30kg/m2) | 2.5 | 2.3 | 2.3 | 18% | 3.0 | Y | Y |
| SHARED HABITS / BEHAVORS / PREFERENCES | | | | | | | |
| Current tobacco use | 3.1 | 2.3 | 2.3 | 12% | 3.7 | Y | Y |
| Tobacco non-user | 2.9 | 1.3 | 2.0 | 19% | 3.0 | Y | Y |
| Participant in religious practices | 3.4 | 1.9 | 2.7 | 17% | 3.1 | Y | Y |
| Declines to participate in religious practices | 2.4 | 1.8 | 2.0 | 18% | 2.8 | Y | Y |
| Agitated behaviors | 1.6 | 3.6 | 2.0 | 20% | 3.3 | N | - |
| Fondness for Animals / Pets | 3.4 | 1.3 | 2.3 | 12% | 3.0 | Y | Y |
| Musical Tastes (Contemporary, Gospel, Country, Classical, Silence) | 3.5 | 1.5 | 3.0 | 14% | 3.3 | Y | Y |
| Keeping Up with Current Events | 3.2 | 1.2 | 3.0 | 11% | 3.2 | Y | Y |
| Shared Political Orientation | 3.3 | 2.2 | 3.4 | 18% | 2.8 | Y | N |
| SHARED CLINICAL CONDITIONS | | | | | | | |
| Severe Mental Illness (Bipolar Disorder, Psychotic Disorder, Schizophrenia) | 1.6 | 3.0 | 1.6 | 13% | 2.8 | N | - |
| Intellectual Disability (Pervasive Developmental Delay, Autism, Down Syndrome) | 2.5 | 3.0 | 2.3 | 16% | 2.3 | Y | Y |
| Sensory Deprivation (Hearing, Vision, Speech) | 2.2 | 2.8 | 2.5 | 14% | 3.3 | Y | Y |
| Disfiguring Conditions (Amputation, Paralysis, Burns) | 2.7 | 2.2 | 2.8 | 11% | 2.6 | Y | Y |
| Visible Stigmatized Conditions (Parkinson’s, Huntington’s, Tourette’s, Aphasia) | 2.0 | 2.8 | 1.6 | 17% | 2.8 | N | - |
| Alzheimer’s Disease or other Dementia | 1.8 | 2.3 | 2.5 | 23% | 3.7 | N | - |
| Neurological Deficits (Stroke) | 2.2 | 2.3 | 2.2 | 16% | 3.0 | Y | Y |
| HIV Diagnosis | 2.2 | 1.8 | 2.4 | 9% | 3.0 | Y | Y |
| Cancer | 3.3 | 2.0 | 3.6 | 13% | 3.4 | Y | Y |
| In End-of-Life Care (Hospice, or Physician-documented limited life expectancy) | 2.2 | 2.2 | 3.2 | 10% | 3.0 | Y | Y |
| Edentulous (missing most teeth, or requires pureéd food) | 2.2 | 2.0 | 1.2 | 18% | 3.0 | N | - |
| Isolating Treatment Modality (Tracheostomy, Ventilator, Infectious Disease Isolation) | 1.5 | 3.0 | 1.7 | 20% | 3.0 | N | - |

a Average of ratings, where "Yes, for ALL or Nearly All residents with this characteristic"=4; "For MOST residents with this characteristic"=3; "for SOME residents with this characteristic"=2; "For NONE, or only for A FEW residents with this characteristic"=1.

b Average of ratings, where "Highly confident"=4; "Fairly confident"=3; "I have limited experience to draw from"=2; "Honestly, I don't feel qualified to comment about residents with this characteristic"=1.

c Average rating for solidarity >=2.0 AND average rating for sense of identity>=2.0

d ICD-10 codes: F64.\* (Gender identity disorders); Z87.890 (Personal history of sex reassignment). Excluded from further consideration because fewer than 50 residents met this criteria.

Shaded rows are excluded from further consideration.

**Supplemental Table 3. Operational Definitions of Potentially Socially Isolating Characteristics Derived from the Minimum Data Set 3.0**

We used a lookback window of 300 days to capture of the most recent comprehensive assessment (i.e. admission, annual, or significant change in status). We carried the last valid observation forward if data were missing for indicators of intellectual disability (items in section A15), religious participation (items F0500h and F0800t), severe mental illness (items I5900, I5950, I6000), tobacco status (item J1300), height (K0200a) and weight (K0200b). The operational definitions of the numerator and denominators are shown in the Table below.

|  |  |  |
| --- | --- | --- |
| Brief Description | Operational Definition of Numerator | Operational Definition of Denominator |
| **Demographic Characteristics** | | |
| Gender- Men | A0800 – “Gender – 1. Male; 2. Female” = ‘1’ | A0800 = ‘1’ or ‘2’ |
| Gender- Women | A0800 = ‘2’ |
| Widowed | A1200 – “Marital Status – 1.Never married; 2. Married; 3. Widowed; 4. Separated; 5. Divorced” = ‘3’ | A1200 in(‘1’,’2’,’3’,’4’,’5’) |
| Divorced, Separated, or Never Married | A1200 in(‘1’,‘4’,‘5’) | A1200 in(‘1’,’2’,’3’,’4’,’5’) |
| Currently Married | A1200 = ‘2’ | A1200 in(‘1’,’2’,’3’,’4’,’5’) |
| Young Age | 40<=C\_Rsdnt\_Age\_Num<65 | 40<=C\_Rsdnt\_Age\_Num |
| Hispanic of any race(s) | A1000d – “Race/Ethnicity – Check all that apply – Hispanic or Latino” = ’1’ | A1000a = ‘1’ or ‘0’  OR  A1000b = ‘1’ or ‘0’  OR  A1000c = ‘1’ or ‘0’  OR  A1000d = ‘1’ or ‘0’  OR  A1000e = ‘1’ or ‘0’  OR  A1000f = ‘1’ or ‘0’ |
| Non-Hispanic White alone | A1000f – “White” = ’1’  AND  NOT(A1000a=’1’ or A1000b=’1’ or A1000c=’1’ or A1000d=’1’ or A1000e=’1’) |
| Non-Hispanic Black alone | A1000c – “Black or African American” = ’1’  AND  NOT(A1000a=’1’ or A1000b=’1’ or A1000d=’1’ or A1000e=’1’ or A1000f=’1’) |
| Non-Hispanic American Indian or Alaska Native alone | A1000a – “American Indian or Alaska Native” = ’1’  AND  NOT(A1000b=’1’ or A1000c=’1’ or A1000d=’1’ or A1000e=’1’ or A1000f=’1’) |
| Non-Hispanic Asian alone | A1000b – “Asian” = ’1’  AND  NOT(A1000a=’1’ or A1000c=’1’ or A1000d=’1’ or A1000e=’1’ or A1000f=’1’) |
| Non-Hispanic Native Hawaiian or Pacific Islander or Asian and Pacific Islander | A1000e – “Native Hawaiian or Other Pacific Islander” = ’1’  AND  NOT(A1000a=’1’ or A1000c=’1’ or A1000d=’1’ or A1000f=’1’) |
| Non-Hispanic Multiracial | NOT(A1000d=’1’)  AND  ( (A1000a=’1’ AND (A1000b=’1’ or A1000c=’1’ or A1000e=’1’ or A1000f=’1’))  OR  (A1000b=’1’ AND (A1000c=’1’ or A1000f=’1’))  OR  (A1000c=’1’ AND (A1000e=’1’ or A1000f=’1’))  OR  (A1000e=’1’ AND A1000f=’1’) ) |
| Staff needs a translator to communicate | A1100 – “Language – Does the resident need or want an interpreter to communicate with a doctor or health care staff?” = ‘1’ | All residents |
| Heavy-bodied (Body Mass Index 30 to 60 kg/m2) | 30 kg/m2<(703 \* K0200b – “Weight (in pounds). Base weight on most recent measure in the last 30 days; measure weight consistently, according to standard facility practice (e.g., in a.m. after voiding, before meal, with shoes off, etc.)” / (K0200a2) – “Height (in inches). Record most recent height measure since admission”)<60 kg/m2 | 15<(703 \* K0200b / (K0200a2))<60 |
| **Shared Habits / Behaviors / Preferences** | | |
| Current tobacco use | J1300 – “Current tobacco use” = ’1’ | J1300 = ‘0’ or ‘1’ |
| Nonuse of tobacco | J1300 = ’0’ |
| Participant in religious activities | F0500h – “While you are in this facility…how important is it to you to participate in religious activities or practices?” = ‘1’ – “Very important” or ‘2’ – “Somewhat important” or ‘5’ – “Important, but can’t do or no choice”  OR  F0800t – staff-assessed: “Participating in religious activities or practices” = ‘1’ | F0500h = ‘1’ or ‘2’ or ‘3’ or ‘4’ or ‘5’  OR  F0800t = ‘0’ or ‘1’ |
| Declines to participate in religious activities | (F0500h = ‘3’ – “Not very important” or ‘4’ – “Not important at all” OR F0800t = ’0’)  AND  NOT (F0500h = ‘1’ or ‘2’ OR F0800t = ’1’) |
| Fondness for Animals / Pets | F0500c – “While you are in this facility…how important is it to you to be around animal such as pets?” = ‘2’ – “Very important” or ‘2’ – Somewhat important” or ‘5’ – “Important, but can’t do or no choice”  OR  F0800n – staff-assessed: “Being around animals such as pets” = ‘1’ | F0500c = ‘1’ or ‘2’ or ‘3’ or ‘4’ or ‘5’  OR  F0800n = ‘0’ or ‘1’ |
| Musical Tastes (Contemporary, Gospel, Country, Classical, Silence) | F0500b – “While you are in this facility…how important is it to you to listen to music you choose?” = ‘2’ – “Very important” or ‘2’ – Somewhat important” or ‘5’ – “Important, but can’t do or no choice”  OR  F0800m – staff-assessed: “Listening to music” = ‘1’ | F0500b = ‘1’ or ‘2’ or ‘3’ or ‘4’ or ‘5’  OR  F0800m = ‘0’ or ‘1’ |
| Keeping up with current events | F0500d – “While you are in this facility…how important is it to you to keep up with the news?” = ‘2’ – “Very important” or ‘2’ – Somewhat important” or ‘5’ – “Important, but can’t do or no choice”  OR  F0800o – staff-assessed: “Keeping up with the news” = ‘1’ | F0500d = ‘1’ or ‘2’ or ‘3’ or ‘4’ or ‘5’  OR  F0800o = ‘0’ or ‘1’ |
| **Shared Clinical Conditions** | | |
| Intellectual disability (developmental delay, Down syndrome, autism) | A1550a – “Down syndrome” = ‘1’  OR  A1550b – “Autism” = ‘1’  OR  A1550d – “Other organic condition related to MR/DD” = ‘1’  OR  A1550e = “MR/DD with no organic condition”  OR  A1510b – “Mental retardation/Developmental delay”  OR  I8000a-I8000j – “Additional active diagnoses”:  Intellectual disability (ICD-9-CM code 319\* or ICD-10 code F79)  OR  Pervasive developmental disorder (ICD-9-CM code 299\* or ICD-10 code F84\*)  OR  Down syndrome (ICD-9-CM code 758.0\* or ICD-10 code Q90\*) | All residents |
| Sensory deprivation | B0200 – “Hearing” = ‘2’ – “Moderate difficulty – speaker has to increase volume and speak distinctly” OR ‘3’ – “Highly impaired – absence of useful hearing”  OR  B0600 – “Speech Clarity” = ‘2 – “No speech – absence of spoken words”  OR  B1000 – “Vision” = ‘3’ – “Highly impaired – object identification in question, but eyes appear to follow objects” OR ‘4’ – “Severely impaired – no vision or sees only light, colors or shapes; eyes do not appear to follow objects” | B0200 in(‘0’,’1’,’2’,’3’)  OR  B0600 in(‘0’,’1’,’2’)  OR  B1000 in(‘0’,’1’,’2’,’3’,’4’) |
| Disfiguring conditions (amputation, paralysis, burns) | G0600d – “Mobility devices – Limb prosthesis’ = ‘1’  OR  O0500i – “Restorative Nursing Programs – Amputation/prosthesis care” = ‘1’  OR  I4900 – “Hemiplegia or Hemiparesis” = ‘1’  OR  I5000 – “Paraplegia” = ‘1’  OR  I5100 – “Quadriplegia” = ‘1’  OR  M1040f – “Other Ulcers, Wounds and Skin Problems – Burn(s) (second or third degree)” = ‘1’ | G0600d in(‘0’,’1’)  OR  O0500i in(‘0’,’1’)  OR  I4900 in(‘0’,’1’)  OR  I5000 in(‘0’,’1’)  OR  I5100 in(‘0’,’1’)  OR  M1040f in(‘0’,’1’) |
| Stroke | I4500 – “Cerebrovascular Accident (CVA), Transient Ischemic Attack (TIA), or Stroke” = ‘1’ | I4500 in(‘0’,’1’) |
| Active HIV diagnosis | I8000a-I8000j – “Additional active diagnoses”:  Symptomatic HIV infection (ICD-9-CM codes 042\*-044\* or ICD-10 codes B20\*-B24\*)  OR  Asymptomatic HIV infection (ICD-9-CM code V08\* or ICD-10 code Z21\*)  OR  Counseling for HIV status (ICD-9-CM code V65.44 or ICD-10 code Z71.7) | All residents |
| Cancer | I0100 – “Cancer (with or without metastasis)” = ‘1’  OR  O0100a2 – “Chemotherapy Performed *while a resident* of this facility and within the *last 14 days*” = ‘1’  OR  O0100b2 – “Radiation Performed *while a resident* of this facility and within the *last 14 days*” = ‘1’ | I0100 in(‘0’,’1’)  OR  O0100a2 in(‘0’,1’)  OR  O0100b2 in(‘0’,’1’) |
| In end-of-life care (hospice, or physician-documented limited life expectancy) | J1400 – “Prognosis – Does the resident have a condition or chronic disease that may result in a life expectancy of less than 6 months? (Requires physician documentation)” = ‘1’ | J1400 = ‘0’ or ‘1’ |

**Supplemental Table 4. Contextual Isolation on the Basis of Individual Characteristics among Long-Stay US Nursing Home Residents in 2016 with Alzheimer’s Disease and Staff-Observed Participation in Group Activity (20% Cut Point).**

|  |  |  |
| --- | --- | --- |
| Social Characteristic | Proportion of Residents with this Characteristic (n=94,735)  % | Contextual Isolation on this Characteristic  (Fewer than 20% of Co-Residents Share this Characteristic)  % |
| Male | 25.4 | 1.7 |
| Female | 74.6 | 0.2 |
| Married | 21.5 | 24.1 |
| Widowed | 51.6 | 3.1 |
| Never Married, Divorced or Separated | 26.9 | 9.0 |
| Young age (50-64 years) | 5.9 | 37.6 |
| Hispanic, of any race(s) | 6.6 | 49.3 |
| Not Hispanic and | | |
| White only | 75.5 | 0.6 |
| Black only | 15.0 | 26.5 |
| AI/AN only | 0.4 | 58.3 |
| Asian only | 2.1 | 59.1 |
| NHOPI only | 0.3 | 88.5 |
| Multiracial | 0.1 | 100.0 |
| Staff needs translator | 8.1 | 59.1 |
| Heavy-bodied (BMI 30-60 kg/m2) | 15.7 | 7.1 |
| Current tobacco use | 1.1 | 60.3 |
| No current tobacco use | 98.9 | -a |
| Religious practices important | 54.3 | -a |
| Religious practices not important | 45.7 | 16.9 |
| Music important | 83.8 | -a |
| Pets/animals important | 41.0 | 0.5 |
| News/current events important | 14.5 | -a |
| Intellectual disability | 2.8 | 87.2 |
| Sensory impairment | 39.3 | 56.3 |
| Disfiguring condition | 8.4 | 82.8 |
| Stroke | 10.5 | 59.3 |
| Cancer | 4.1 | 96.1 |
| HIV infection | 0.1 | 82.9 |
| End of life care | 5.1 | 94.7 |

a Proportions based on a numerator under 50 not reported to avoid imprecise estimates.

**Supplemental Table 5. Cumulative Contextual Isolation among Long-Stay US Nursing Home Residents in 2016 with Alzheimer’s Disease and Related Dementias and Staff-Observed Participation in Group Activity, Stratified by Social Characteristic (20% Cut Point).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | Cumulative Contextual Isolation | | |
| Social Characteristic | n=94,735 | None | On Any One Characteristic | On Two or More Characteristics |
|  | % | % | % | % |
| Total population | 100.0 | 45.3 | 34.3 | 20.4 |
| Male | 25.4 | 37.8 | 35.2 | 27.0 |
| Female | 74.6 | 47.8 | 34.0 | 18.2 |
| Married | 21.5 | 38.4 | 36.3 | 25.3 |
| Widowed | 51.6 | 51.9 | 33.1 | 15.0 |
| Never Married, Divorced or Separated | 26.9 | 38.0 | 35.1 | 26.9 |
| Young age (50-64 years) | 5.9 | 22.0 | 31.9 | 46.1 |
| Age 65-74 years | 10.4 | 37.3 | 35.8 | 26.9 |
| Age 75-84 years | 25.3 | 44.8 | 34.5 | 20.7 |
| Age 85-94 years | 41.4 | 49.9 | 33.5 | 16.6 |
| Age 95 years and older | 11.2 | 47.9 | 37.0 | 15.2 |
| Hispanic, of any race(s) | 6.6 | 20.4 | 30.4 | 49.2 |
| Not Hispanic and | | | | |
| White only | 75.5 | 51.1 | 34.0 | 14.9 |
| Black only | 15.0 | 31.9 | 38.1 | 30.0 |
| AI/AN only | 0.4 | 22.3 | 40.9 | 36.8 |
| Asian only | 2.1 | 20.5 | 29.1 | 50.4 |
| NHOPI only | 0.3 | -a | 33.0 | 61.5 |
| Multiracial | <0.1 | -a | -a | -a |
| Staff needs translator | 8.1 | 17.9 | 28.1 | 54.0 |
| Staff does not need translator | 91.9 | 47.7 | 34.8 | 17.5 |
| Heavy-bodied (BMI 30-60 kg/m2) | 15.7 | 42.6 | 35.0 | 22.4 |
| Not heavy-bodied (BMI 15-30 kg/m2) | 84.3 | 45.8 | 34.2 | 20.1 |
| Current tobacco use | 1.1 | 19.0 | 37.2 | 43.7 |
| No current tobacco use | 98.9 | 45.6 | 34.3 | 20.2 |
| Religious practices important | 54.3 | 50.3 | 33.2 | 16.5 |
| Religious practices not important | 45.7 | 39.2 | 35.6 | 25.1 |
| Music important | 83.8 | 45.9 | 34.1 | 20.0 |
| Music not important | 16.2 | 42.0 | 35.4 | 22.6 |
| Pets/animals important | 41.0 | 49.4 | 33.7 | 16.8 |
| Pets/animals not important | 59.0 | 42.4 | 34.7 | 22.9 |
| News/current events important | 14.5 | 45.9 | 34.5 | 19.7 |
| News/current events not important | 85.5 | 45.2 | 34.3 | 20.6 |
| Intellectual disability | 2.8 | 7.3 | 35.0 | 57.7 |
| No intellectual disability | 97.2 | 46.4 | 34.3 | 19.4 |
| Sensory impairment | 39.3 | 24.9 | 43.1 | 32.0 |
| No sensory impairment | 60.7 | 58.4 | 28.6 | 12.9 |
| Disfiguring condition | 8.4 | 6.6 | 29.8 | 63.6 |
| No disfiguring condition | 91.6 | 48.8 | 34.7 | 16.5 |
| Stroke | 10.5 | 13.7 | 33.3 | 53.1 |
| No stroke | 89.5 | 49.0 | 34.4 | 16.6 |
| Cancer | 4.1 | 1.9 | 46.1 | 52.0 |
| No cancer | 95.9 | 47.1 | 33.8 | 19.1 |
| HIV infection | 0.1 | -a | -a | 62.9 |
| No HIV infection | 99.9 | 45.3 | 34.3 | 20.4 |
| End of life care | 5.1 | 2.8 | 43.2 | 54.0 |
| Not end of life care | 94.9 | 47.5 | 33.8 | 18.6 |

a Proportions based on a numerator under 50 not reported to avoid imprecise estimates.

**Supplemental Table 6. Importance of Group Activity Participation in Relation to Contextual Isolation on the Basis of Individual Characteristics among Long-Stay Residents in 2016 with Alzheimer’s Disease and Related Dementias and Staff-Observed Participation in Group Activity.**

|  |  |  |
| --- | --- | --- |
|  | Proportion of residents for whom staff reported observing group activity participation. | |
| Social Characteristic | Not Contextually Isolated on this Characteristic | Contextually Isolated on this Characteristic |
| Male | 55.3 | 58.0 |
| Female | 61.1 | 69.5 |
| Married | 58.4 | 55.1 |
| Widowed | 62.0 | 56.1 |
| Never Married, Divorced or Separated | 56.8 | 60.6 |
| Young age (50-64 years) | 51.4 | 55.6 |
| Hispanic, of any race(s) | 53.3 | 59.9 |
| Not Hispanic and | | |
| White only | 60.6 | 54.8 |
| Black only | 56.2 | 57.5 |
| AI/AN only | 59.6 | 51.1 |
| Asian only | 61.8 | 57.5 |
| NHOPI only | -a | 55.8 |
| Multiracial | -a | 50.9 |
| Staff needs translator | 58.6 | 58.2 |
| Heavy-bodied (Body mass index 30-60 kg/m2) | 61.8 | 68.9 |
| Current tobacco use | 54.3 | 57.6 |
| No current tobacco use | 59.7 | -a |
| Religious practices important | 75.4 | -a |
| Religious practices not important | 41.3 | 38.9 |
| Music important | 66.7 | -a |
| Pets/animals important | 75.4 | 74.1 |
| News/current events important | 71.1 | -a |
| Intellectual disability | 67.8 | 59.7 |
| Sensory impairment | 56.3 | 54.7 |
| Disfiguring condition | 46.9 | 54.4 |
| Stroke | 48.8 | 55.0 |
| Cancer | 64.2 | 62.7 |
| HIV infection | -a | -a |
| End of life care | 51.4 | 50.0 |

a Proportions based on a numerator under 50 not reported to avoid imprecise estimates.

**Supplemental Table 7. Importance of Group Activity Participation by Cumulative Contextual Isolation among Long-Stay Residents in 2016 with Alzheimer’s Disease and Related Dementias Living in a Nursing Home and Staff-Observed Participation in Group Activities, Stratified by Social Characteristic (20% Cut Point).**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Proportion of residents for whom staff reported observing group activity participation. | | |
|  | Not Contextually Isolated on Any Characteristics | Contextually Isolated on One Characteristic | Contextually Isolated on Multiple Characteristics |
| Total | 63.6 | 58.7 | 52.5 |
| Male | 57.9 | 55.8 | 51.1 |
| Female | 65.2 | 59.7 | 53.2 |
| Married | 61.4 | 58.0 | 51.2 |
| Widowed | 65.8 | 59.7 | 52.7 |
| Divorced, Separated, or Never Married | 59.8 | 57.4 | 53.1 |
| Young (age 50-64 years) | 53.6 | 53.3 | 52.4 |
| 65-74 years | 57.4 | 53.7 | 50.8 |
| 75-84 years | 62.7 | 58.6 | 51.4 |
| 85-94 years | 65.4 | 60.2 | 53.5 |
| 95 years and Older | 66.0 | 59.4 | 54.5 |
| Hispanic of any race(s) | 58.3 | 56.6 | 55.7 |
| White | 64.1 | 58.8 | 52.6 |
| Black | 61.3 | 58.1 | 49.4 |
| American Indian/Alaska Native | 60.5 | 57.0 | 48.6 |
| Asian | 65.5 | 61.8 | 55.2 |
| Pacific Islander | -a | 67.9 | 52.2 |
| Multiracial | -a | -a | -a |
| Translation services needed | 61.2 | 60.0 | 56.5 |
| Translation services not needed | 63.7 | 58.6 | 51.4 |
| Heavy-bodied (Body mass index 30-60kg/m2) | 65.9 | 61.7 | 56.5 |
| Not heavy-bodied (Body mass index 15-30kg/m2) | 63.2 | 58.1 | 51.6 |
| Current tobacco use | 54.1 | 60.2 | 53.9 |
| No current tobacco use | 63.7 | 58.6 | 52.4 |
| Religious Practice Important | 77.2 | 74.8 | 71.2 |
| Religious Practice not Important | 43.0 | 40.8 | 37.9 |
| Music Important | 70.4 | 65.8 | 59.4 |
| Music not Important | 25.2 | 23.1 | 20.6 |
| Pets/Animals Important | 77.0 | 74.8 | 71.8 |
| Pets/animals not Important | 52.8 | 47.7 | 42.6 |
| News/Current Events Important | 73.8 | 70.8 | 65.2 |
| News/Current Events not Important | 61.9 | 56.6 | 50.4 |
| Intellectual Disability | 67.9 | 63.5 | 58.1 |
| No Intellectual Disability | 63.6 | 58.5 | 52.0 |
| Sensory Impairment | 59.2 | 57.2 | 49.9 |
| No Sensory Impairment | 64.9 | 60.1 | 56.5 |
| Disfiguring Condition | 49.2 | 57.9 | 51.3 |
| No Disfiguring Condition | 63.8 | 58.7 | 52.9 |
| Stroke | 53.1 | 55.8 | 50.2 |
| No Stroke | 64.0 | 59.0 | 53.3 |
| Cancer | -a | 66.6 | 58.8 |
| No Cancer | 63.6 | 58.2 | 51.7 |
| HIV | -a | -a | -a |
| No HIV | 63.6 | 58.7 | 52.5 |
| End-of-Life Care | 58.5 | 53.4 | 47.0 |
| Not End-of-Life Care | 63.7 | 59.0 | 53.3 |

a Proportions based on a numerator under 50 not reported to avoid imprecise estimates.

**Supplemental Table 8. Contextual Isolation on the Basis of Individual Characteristics among Long-Stay US Nursing Home Residents in 2016 with Alzheimer’s Disease and Related Dementias and Reported Importance of Group Activity Participation: Alternate Cut Points of 10%, 15%, and 20%.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Proportion of Residents with this Characteristic | Contextual Isolation on this Characteristic  (Fewer than X% of Co-Residents Share this Characteristic) | | |
|  | (n=335,421) | 10% Cut Point | 15% Cut Point | 20% Cut Point |
| Social Characteristic | % | % | % | % |
| Male | 29.3 | -a | 0.2 | 1.6 |
| Female | 70.7 | <0.1 | 0.1 | 0.2 |
| Married | 18.3 | 1.4 | 6.9 | 21.4 |
| Widowed | 51.7 | 0.4 | 1.1 | 2.6 |
| Never Married, Divorced or Separated | 30.3 | 0.5 | 2.8 | 8.7 |
| Young age (50-64) | 6.5 | 11.2 | 22..9 | 35.2 |
| Hispanic, of any race(s) | 5.8 | 23.6 | 33.5 | 42.2 |
| Not Hispanic and |  |  |  |  |
| White only | 77.6 | 0.1 | 0.3 | 0.6 |
| Black only | 14.2 | 10.8 | 18.4 | 25.6 |
| American Indian/Alaska Native only | 0.3 | 56.4 | 62.0 | 66.2 |
| Asian only | 1.8 | 31.7 | 39.5 | 45.3 |
| NHOPI only | 0.3 | 65.3 | 71.7 | 78.2 |
| Multiracial | <0.1 | 98.0 | 99.3 | 100.0 |
| Staff needs translator | 5.7 | 23.5 | 34.4 | 44.4 |
| Heavy-bodied (body mass index 30-60 kg/m2) | 26.8 | 0.2 | 1.0 | 5.8 |
| Current tobacco use | 4.2 | 32.0 | 50.9 | 64.6 |
| No current tobacco use | 95.8 | -a | -a | <0.1 |
| Religious practices important | 79.9 | -a | -a | <0.1 |
| Religious practices not important | 20.1 | 2.8 | 7.8 | 16.3 |
| Music important | 89.2 | -a | -a | <0.1 |
| Pets/animals important | 64.1 | 0.1 | 0.3 | 0.8 |
| News/current events important | 72.7 | -a | <0.1 | <0.1 |
| Intellectual disability | 1.9 | 73.9 | 84.9 | 88.9 |
| Sensory impairment | 16.7 | 12.3 | 35.4 | 59.8 |
| Disfiguring condition | 9.2 | 33.2 | 66.1 | 84.7 |
| Stroke | 11.0 | 19.3 | 40.6 | 61.2 |
| Cancer | 5.0 | 54.1 | 85.5 | 95.6 |
| HIV infection | 0.2 | 75.7 | 76.2 | 78.4 |
| End of life care | 2.0 | 62.1 | 85.8 | 94.3 |

a Proportions based on a numerator under 50 not reported to avoid imprecise estimates.

**Supplemental Table 9. Cumulative Contextual Isolation among Long-Stay US Nursing Home Residents in 2016 with Alzheimer’s Disease and Related Dementias and Reported Importance of Group Activity Participation, Stratified by Social Characteristic: Alternate 10% Cut Point.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | Cumulative Contextual Isolation | | |
| Social Characteristic | n=94,735 | None | On Any One Characteristic | On Two or More Characteristics |
|  | % | % | % | % |
| Total population | 100.0 | 81.6 | 15.6 | 2.8 |
| Male | 29.3 | 76.7 | 19.3 | 3.9 |
| Female | 70.7 | 83.6 | 14.1 | 2.3 |
| Married | 18.3 | 80.8 | 16.0 | 3.2 |
| Widowed | 51.7 | 84.7 | 13.3 | 2.0 |
| Never Married, Divorced or Separated | 30.3 | 76.7 | 19.4 | 3.8 |
| Young age (50-64 years) | 6.5 | 64.0 | 27.6 | 8.4 |
| Age 65-74 years | 11.4 | 75.8 | 20.4 | 3.8 |
| Age 75-84 years | 24.9 | 81.2 | 16.1 | 2.7 |
| Age 85-94 years | 41.5 | 85.2 | 12.9 | 1.9 |
| Age 95 years and older | 10.1 | 85.4 | 13.0 | 1.6 |
| Hispanic, of any race(s) | 5.8 | 61.4 | 26.8 | 11.8 |
| Not Hispanic and | | | | |
| White only | 77.6 | 85.3 | 13.1 | 1.7 |
| Black only | 14.2 | 74.7 | 21.7 | 3.6 |
| American Indian / Alaska Native only | 0.3 | 37.0 | 51.1 | 11.9 |
| Asian only | 1.8 | 59.9 | 29.6 | 10.5 |
| Native Hawaiian and other Pacific Islander only | 0.3 | 30.0 | 53.9 | 16.1 |
| Multiracial | <0.1 | -a | 83.7 | -a |
| Staff needs translator | 5.7 | 61.7 | 24.3 | 14.0 |
| Staff does not need translator | 94.3 | 82.8 | 15.1 | 2.1 |
| Heavy-bodied (BMI 30-60 kg/m2) | 26.8 | 81.1 | 15.9 | 2.9 |
| Not heavy-bodied (BMI 15-30 kg/m2) | 73.2 | 81.8 | 15.5 | 2.7 |
| Current tobacco use | 4.2 | 54.6 | 37.0 | 8.4 |
| No current tobacco use | 95.8 | 82.8 | 14.7 | 2.5 |
| Religious practices important | 79.9 | 82.5 | 15.0 | 2.6 |
| Religious practices not important | 20.1 | 78.2 | 18.4 | 3.5 |
| Music important | 89.2 | 81.7 | 15.6 | 2.7 |
| Music not important | 10.8 | 80.7 | 16.3 | 3.0 |
| Pets/animals important | 64.1 | 82.1 | 15.3 | 2.7 |
| Pets/animals not important | 35.9 | 80.7 | 16.3 | 3.0 |
| News/current events important | 72.7 | 82.2 | 15.2 | 2.5 |
| News/current events not important | 27.3 | 79.9 | 16.8 | 3.3 |
| Intellectual disability | 1.9 | 21.8 | 63.6 | 14.6 |
| No intellectual disability | 98.1 | 82.7 | 14.7 | 2.5 |
| Sensory impairment | 16.7 | 73.8 | 21.8 | 4.4 |
| No sensory impairment | 83.3 | 83.2 | 14.4 | 2.4 |
| Disfiguring condition | 9.2 | 52.0 | 35.5 | 12.5 |
| No disfiguring condition | 90.8 | 84.6 | 13.6 | 1.8 |
| Stroke | 11.0 | 61.1 | 29.5 | 9.4 |
| No stroke | 89.0 | 84.1 | 13.9 | 1.9 |
| Cancer | 5.0 | 38.5 | 51.7 | 9.8 |
| No cancer | 95.0 | 83.9 | 13.7 | 2.4 |
| HIV infection | 0.2 | 19.6 | 60.9 | 19.5 |
| No HIV infection | 99.8 | 81.7 | 15.5 | 2.7 |
| End of life care | 2.0 | 31.0 | 55.4 | 13.6 |
| Not end of life care | 98.0 | 82.6 | 14.8 | 2.5 |

a Proportions based on a numerator under 50 not reported to avoid imprecise estimates.