

Supplementary Material

Difficulties with Activities of Daily Living and Receipt of Care Among Older Adults with Cognitive Impairment: Differences Between Those Living Alone and Those Living with Others

Supplementary Table 1. Adjusted generalized estimating equation (GEE) models of any 11-item I/ADL difficulty among with probable dementia or CIND by gender and race/ethnicity.

		Total Obs. (living alone)	Prevalence ratio [95% CI]
Model 1	All Women, living alone (versus with others)	18,807(6,602)	0.89 [0.85, 0.92]***
Model 1A	Non-Hispanic White Women, living alone (versus with others)	9,872(3,996)	0.86 [0.81, 0.90]***
Model 1B	Non-Hispanic Black Women, living alone (versus with others)	5,463(1,773)	0.87 [0.80, 0.95]**
Model 1C	Latina/Hispanic Women, living alone (versus with others)	3,472(833)	0.99 [0.88, 1.12]
Model 2	All Men, living alone (versus with others)	147,33(2,973)	0.92 [0.86, 0.98]
Model 2A	Non-Hispanic White Men, living alone (versus with others)	8,724(1736)	0.93 [0.86, 1.01]
Model 2B	Non-Hispanic Black Men, living alone (versus with others)	3,679(962)	0.88 [0.77, 1.00]
Model 2C	Latinx/Hispanic Men, living alone (versus with others)	2,330(275)	0.94 [0.73, 1.17]

Underlying data are pooled observations of respondents with probable dementia or CIND observed in the 2000-2016 waves of the Health and Retirement Study. Sample weights are set equal to the respondent's average weight in the sample. The prevalence ratios and their 95% confidence intervals are presented from a generalized estimating equation ("geeglm") configured to the Poisson distribution, logit link function, and unstructured within-group correlation. Covariates include age in years, survey wave, educational attainment, urban rural residency, and Medicaid. I/ADL, basic and instrumental activities of daily living (11 items including: dressing, walking across room, bathing, eating, getting in and out of bed, toileting, preparing a hot meal, shopping for groceries, making phone calls, taking medications, and managing money). CIND, Cognitive impairment no dementia (describes individuals whose cognitive functioning falls below normal but who do not meet dementia criteria). For the model predicting any I/ADL difficulty, the interaction term for living alone and Latina/Hispanic among older women is statistically significant ($p = 0.018$). Asterisks denote statistical significance at * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Supplementary Table 2. Adjusted generalized estimating equation (GEE) models of any 6-item ADL difficulty and difficulty without help among with probable dementia or CIND by gender and race/ethnicity.

	Total Obs. (living alone)	6-item ADL any difficulty Prevalence ratio [95% CI]	6-item ADL any difficulty without help Prevalence ratio [95% CI]
All Women, living alone (versus with others)	18,807 (6,602)	0.87 [0.83, 0.91]***	1.11 [1.04, 1.19]**
Non-Hispanic White Women, living alone (versus with others)	9,872 (3,996)	0.83 [0.77, 0.88]***	1.12 [1.03, 1.23]*
Non-Hispanic Black Women, living alone (versus with others)	5,463 (1,773)	0.87 [0.78, 0.96]*	1.09 [0.95, 1.24]
Latina/Hispanic Women, living alone (versus with others)	3,472 (833)	0.98 [0.86, 1.11]	1.08 [0.90, 1.27]
All Men, living alone (versus with others)	147,33 (2,973)	0.97 [0.88, 1.06]	1.24 [1.11, 1.37]***
Non-Hispanic White Men, living alone (versus with others)	8,724 (1736)	1.00 [0.89, 1.13]	1.29 [1.14, 1.47]***
Non-Hispanic Black Men, living alone (versus with others)	3,679 (962)	0.90 [0.75, 1.06]	1.07 [0.90, 1.28]
Latinx/Hispanic Men, living alone (versus with others)	2,330 (275)	0.97 [0.71, 1.29]	1.39 [0.97, 1.92]*

Underlying data are pooled observations of respondents with probable dementia or CIND observed in the 2000-2016 waves of the Health and Retirement Study. Sample weights are set equal to the respondent's average weight in the sample. The prevalence ratios and their 95% confidence intervals are presented from a generalized estimating equation ("geeglm") configured to the Poisson distribution, logit link function, and unstructured within-group correlation. Covariates include age in years, survey wave, educational attainment, urban rural residency, and Medicaid. ADL, basic activities of daily living (6 items including: dressing, walking across room, bathing, eating, getting in and out of bed, and toileting). CIND, Cognitive impairment no dementia (describes individuals whose cognitive functioning falls below normal but who do not meet dementia criteria). Asterisks denote statistical significance at * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Supplementary Table 3. Adjusted generalized estimating equation (GEE) models of any 5-item IADL difficulty and difficulty without help among with probable dementia or CIND by gender and race/ethnicity.

	Total Obs. (living alone)	5-item IADL any difficulty Prevalence ratio [95% CI]	5-item IADL any difficulty without help Prevalence ratio [95% CI]
All Women, living alone (versus with others)	18,807(6,602)	0.82 [0.78, 0.86]***	1.19 [1.06, 1.33]**
Non-Hispanic White Women, living alone (versus with others)	9,872(3,996)	0.77 [0.72, 0.82]***	1.17 [1.01, 1.35]*
Non-Hispanic Black Women, living alone (versus with others)	5,463(1,773)	0.83 [0.75, 0.92]**	1.24 [0.99, 1.56]
Latina/Hispanic Women, living alone (versus with others)	3,472(833)	0.94 [0.82, 1.09]	1.12 [0.78, 1.57]
All Men, living alone (versus with others)	147,33(2,973)	0.85 [0.78, 0.94]***	1.45 [1.21, 1.74]***
Non-Hispanic White Men, living alone (versus with others)	8,724(1736)	0.83 [0.75, 0.91]**	1.30 [1.04, 1.59]**
Non-Hispanic Black Men, living alone (versus with others)	3,679(962)	0.81 [0.68, 0.96]*	1.38 [1.00, 1.85]*
Latinx/Hispanic Men, living alone (versus with others)	2,330(275)	0.93 [0.66, 1.23]	2.32 [1.30, 3.73]**

Underlying data are pooled observations of respondents with probable dementia or CIND observed in the 2000-2016 waves of the Health and Retirement Study. Sample weights are set equal to the respondent's average weight in the sample. The prevalence ratios and their 95% confidence intervals are presented from a generalized estimating equation ("geeglm") configured to the Poisson distribution, logit link function, and unstructured within-group correlation. Covariates include age in years, survey wave, educational attainment, urban rural residency, and Medicaid. IADL, instrumental activities of daily living (5 items including: preparing a hot meal, shopping for groceries, making phone calls, taking medications, and managing money). CIND, Cognitive impairment no dementia (describes individuals whose cognitive functioning falls below normal but who do not meet dementia criteria). Asterisks denote statistical significance at * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Supplementary Table 4. Adjusted generalized estimating equation (GEE) models of any (I)ADL difficulty without help among those with probable dementia or CIND and at ≥ 1 I/ADL difficulty by gender and race/ethnicity.

		11-item I/ADL Any difficulty without help	6-item ADL Any difficulty without help	5-item IADL Any difficulty without help
	Total Obs. (living alone)	Prevalence ratio [95% CI]	Prevalence ratio [95% CI]	Prevalence ratio [95% CI]
All Women, living alone (versus with others)	9,083 (3,204)	1.20 [1.16, 1.25]***	1.24 [1.18, 1.30]***	1.32 [1.19, 1.45]***
Non-Hispanic White Women, living alone (versus with others)	4,751 (1,901)	1.24 [1.17, 1.30]***	1.29 [1.21, 1.38]***	1.36 [1.20, 1.55]***
Non-Hispanic Black Women, living alone (versus with others)	2,640 (854)	1.22 [1.15, 1.30]***	1.23 [1.13, 1.35]***	1.35 [1.11, 1.69]**
Latina/Hispanic Women, living alone (versus with others)	1,692 (449)	1.08 [0.97, 1.20]	1.11 [0.97, 1.26]	1.15 [0.83, 1.53]
All Men, living alone (versus with others)	6,038 (1,191)	1.34 [1.27, 1.41]***	1.36 [1.27, 1.46]***	1.64 [1.41, 1.87]***
Non-Hispanic White Men, living alone (versus with others)	3,657 (737)	1.32 [1.23, 1.41]***	1.40 [1.28, 1.53]***	1.42 [1.19, 1.68]***
Non-Hispanic Black Men, living alone (versus with others)	1,431 (350)	1.33 [1.21, 1.45]***	1.25 [1.10, 1.42]**	1.69 [1.25, 2.17]***
Latinx/Hispanic Men, living alone (versus with others)	950 (104)	1.42 [1.18, 1.65]**	1.47 [1.16, 1.81]**	2.53 [1.65, 3.54]**

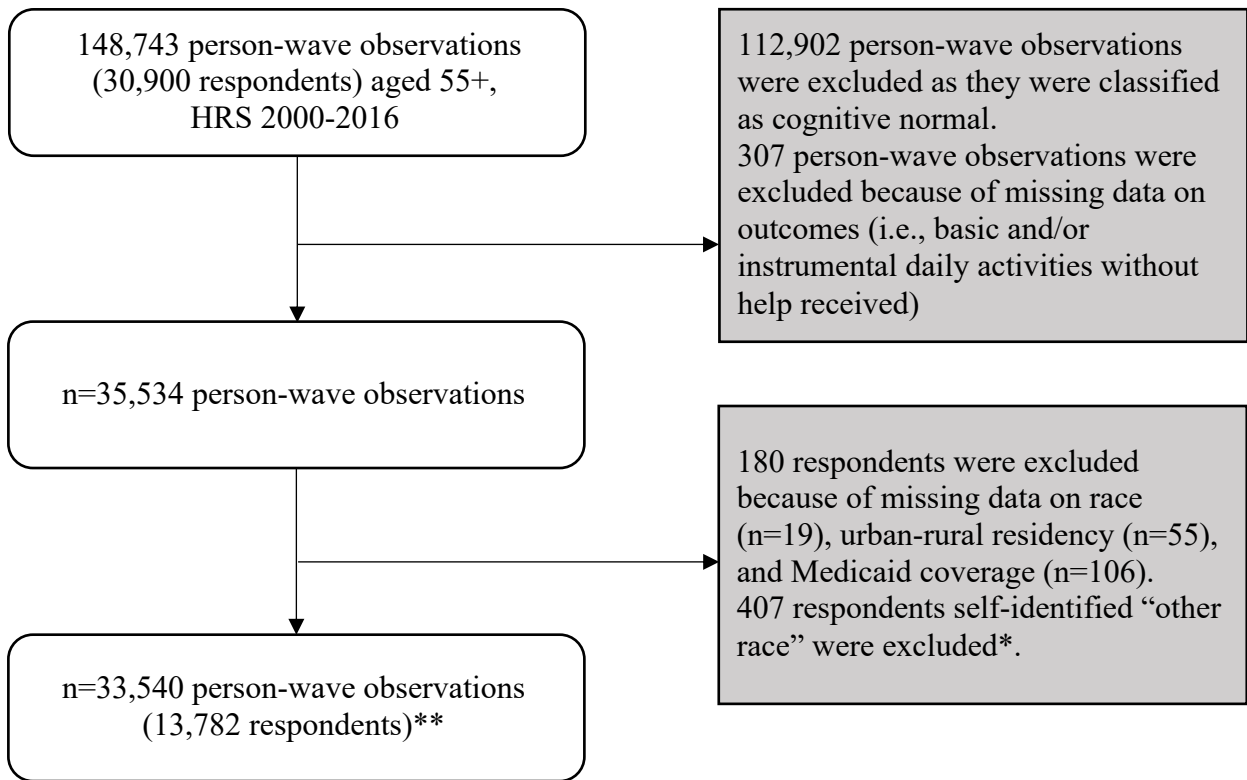
Underlying data are pooled observations of respondents with probable dementia or CIND observed in the 2000-2016 waves of the Health and Retirement Study. Sample weights are set equal to the respondent's average weight in the sample. The prevalence ratios and their 95% confidence intervals are presented from a generalized estimating equation ("geeglm") configured to the Poisson distribution, logit link function, and unstructured within-group correlation. Covariates include age in years, survey wave, educational attainment, urban rural residency, and Medicaid. ADL, basic activities of daily living (6 items including: dressing, walking across room, bathing, eating, getting in and out of bed, and toileting). IADL, instrumental activities of daily living (5 items including: preparing a hot meal, shopping for groceries, making phone calls, taking medications, and managing money). I/ADL, basic and instrumental activities of daily living (11 items combined ADLs and IADLs). CIND, Cognitive impairment no dementia (describes individuals whose cognitive functioning falls below normal but who do not meet dementia criteria). For the model predicting any I/ADL difficulty without help, the interaction term for living alone and Latina/Hispanic among older women is statistically significant ($p = 0.016$). For the models predicting any ADL difficulty without help, the interaction term for living alone and Latina/Hispanic among older women is statistically significant ($p = 0.029$). For the models predicting any IADL difficulty without help, the interaction term for living alone and Latinx/Hispanic among older men is statistically significant ($p = 0.021$). Asterisks denote statistical significance at * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Supplementary Table 5. Adjusted generalized estimating equation (GEE) models of any 11-item I/ADL difficulty without help among with probable dementia or CIND without proxy responses by gender and race/ethnicity.

		Total Obs. (living alone)	Prevalence ratio [95% CI]
Model 1	All Women, living alone (versus with others)	16,482 (5,958)	1.11 [1.04, 1.18]**
Model 1A	Non-Hispanic White Women, living alone (versus with others)	8,516 (3,570)	1.10 [1.01, 1.21]*
Model 1B	Non-Hispanic Black Women, living alone (versus with others)	4,943 (1,648)	1.10 [0.97, 1.24]
Model 1C	Latina/Hispanic Women, living alone (versus with others)	3,023 (740)	1.06 [0.90, 1.26]
Model 2	All Men, living alone (versus with others)	12,088 (2,738)	1.29 [1.17, 1.42]***
Model 2A	Non-Hispanic White Men, living alone (versus with others)	7,059 (1,588)	1.33 [1.18, 1.50]***
Model 2B	Non-Hispanic Black Men, living alone (versus with others)	3,207 (905)	1.15 [0.97, 1.38]
Model 2C	Latinx/Hispanic Men, living alone (versus with others)	1,822 (245)	1.43 [1.02, 1.99]*

Underlying data are pooled observations of respondents with cognitive impaired not dementia (CIND) or probable dementia observed in the 2000-2016 waves of the Health and Retirement Study. Sample weights are set equal to the respondent's average weight in the sample. The prevalence ratios and their 95% confidence intervals are presented from a generalized estimating equation ("geeglm") configured to the Poisson distribution, logit link function, and unstructured within-group correlation. Covariates include age in years, survey wave, educational attainment, urban rural residency, and Medicaid. I/ADL, basic and instrumental activities of daily living (11 items including: dressing, walking across room, bathing, eating, getting in and out of bed, toileting, preparing a hot meal, shopping for groceries, making phone calls, taking medications, and managing money). CIND, Cognitive impairment no dementia (describes individuals whose cognitive functioning falls below normal but who do not meet dementia criteria). Asterisks denote statistical significance at * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Supplementary Figure 1. Derivation of the analytic sample



* We acknowledge that *Other* race can be a highly diverse category, including but not limited to American Indian, Asian Americans, and Pacific Islanders, thus we are not able to make fair comparisons between this diverse group to white/Black/Latinx groups. Second, the number of respondents who self-reported *Other* race was relatively small (n=407 across the entire period from 2000-2016) compared to those who self-identified as non-Hispanic white, non-Hispanic Black, or Latinx/Hispanic. We were therefore underpowered to examine differences in I/ADLs without care received by both living arrangements and gender among this group.

** We include respondents residing in assisted living facilities, residential care facilities, senior apartment housing, however this represents a small proportion of the total sample: senior housing/retirement center/retirement home (person-wave obs.=56, 0.17%) or assisted living (person-wave obs.=91, 0.28%)