PNAS

Supplementary Information for

Trends in Inequalities in the Prevalence of Dementia in the U.S.

Péter Hudomiet, Michael D. Hurd, Susann Rohwedder.

*Corresponding author: Péter Hudomiet.
Email: Peter_Hudomiet@rand.org

This PDF file includes:

Supplementary text
Figures S1 to S7
Tables S1 to S17
SI References

Supplementary Information Text

Measuring Social Security Income

HRS respondents report their monthly and yearly income from Social Security retirement, spouse, or widow benefits in each survey wave (1). The reported values could be zero if the person did not have such income and missing if the person did not provide the value to the HRS.

To minimize measurement error in the self-reported values, we collapsed all reports from the panel into a single person-specific value using the following procedure:

1. We defined annual Social Security income as 12 times the reported monthly income. We used the directly reported yearly income if the monthly income was missing.
2. We inflation-adjusted all values to June 2015 dollars using CPI-U of the Bureau of Labor Statistics.
3. We took the average of all positive non-missing values reported after 65.
4. If the average was not defined (i.e., all reports were zeros or missing after age 65), we replaced it with the average of all positive non-missing values (irrespective of age).
5. If the average was still not defined, and all reports after age 65 were zeros, we used zero income. The remaining cases were considered missing.
6. Then, we repeated steps 1-5 for participants' spouses if the person had a spouse at least in one survey wave after age 65. In the rare cases that the person had multiple spouses, we used all spouse values as if they came from the same spouse.
7. For individuals observed at least once as having a spouse, we defined Social Security income as the maximum of the individual's own and the spouse's averages. If either one was missing, we used the non-missing value. If both were missing, Social Security income was considered missing, and it was imputed by Multiple Imputation within the MCMC model.

Details of the Latent Variable Model

This section discusses the model we used to estimate the prevalence of dementia in the U.S. We used the same model in a companion paper (2) to estimate the lifetime risk of living with dementia for different durations.

We developed a joint longitudinal latent variable model of cognitive function, dementia, and survival. The model assumes that individual i's cognitive function at time t, denoted by c_{it}^*, is an unobserved latent variable, and it evolves according to the equation

$$c_{it}^* = \beta x_{it} + \eta_{i0} + \eta_{i1} a_{it} + \varepsilon_{it}^c, \qquad (1)$$

where x_{it} denotes observed covariates, a_{it} is age, η_{i0} is a random person-specific intercept, η_{i1} is a random slope (with respect to age), and ε_{it}^c is a noise term. Among the x_{it} covariates, we include a cubic function of age, sex, race and ethnicity, whether the person was born in the U.S., education, Social Security income, marital status, ever having a stroke, birth years interacted with all variables. The random-effects terms are assumed to be normally distributed and possibly correlated:

$$\begin{pmatrix} \eta_{i0} \\ \eta_{i1} \end{pmatrix} \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{\eta0}^2 & \rho\sigma_{\eta0}\sigma_{\eta1} \\ \rho\sigma_{\eta0}\sigma_{\eta1} & \sigma_{\eta1}^2 \end{pmatrix} \right) \qquad (2)$$

The noise term (ε_{it}^c) is normally distributed and assumed to be uncorrelated with all other variables.

Individuals are assumed to have dementia if their cognitive function falls below 0, and they are cognitively impaired (without dementia) if their cognitive function is between 0 and 1. (These cutoff values are normalizations.) The cognitive status of individuals (dementia, cognitive impairment, normal) is only observed in the four waves of ADAMS.

The HRS includes a set of cognitive variables, such as immediate and delayed word recall. We assume that performance on these tests depends on individuals' latent cognitive function as well as on other predictor variables:

$$y_{it}^s = \alpha^s x_{it} + \phi^s c_{it}^* + \varepsilon_{it}^s \tag{3}$$

where s indexes the different available tests. In a baseline version of the model, there would be no covariates other than cognition in (3). By including other predictor variables in (3), we allow the cognitive test to vary in the population. For example, highly educated individuals may perform better on some cognitive tests, irrespective of their underlying cognitive abilities. The set of predictors in x_{it} is similar to (1). The first difference is that we only use a linear (as opposed to cubic) function of age. Second, we do not include the birth year in the equation. Third, for the cognitive tests in self-interviews, we added dummy variables indicating if it was the first time the person responded to the particular cognition questions. We hypothesized that individuals might learn how to answer these questions over time, and answering the cognition questions for the first time may be more challenging. Third, we added the immediate word recall test outcome as a predictor in the delayed word recall test because we found that performance on these two tests was closely related.

The HRS has many cognitive variables that could be used as outcome variables in (3). After investigating the correlation structure of the variables as well as patterns in their missing values, we aggregated the individual items into seven composite scores. Aggregation made it more likely that the outcome variables have a well-behaved distribution (such as normal), and it also simplified coding and speeded up the simulation of the model. The aggregated variables were defined as follows:

1. subjective limitations defined as the sum of a) subjectively assessed memory; b) instrumental activities of daily living; c) subjectively assessed health,
2. immediate word recall,
3. delayed word recall,
4. serial 7 subtractions,
5. mental status defined as the sum of a) backward counting; b) date of interview; c) naming the president; d) naming cactus; e) naming scissor,
6. interviewers' assessment of cognitive limitations,
7. proxy-reported cognitive problems defined as the sum of a) person ever gets lost; b) person ever wanders off; c) person cannot be left alone; d) person sees or hears things.

If any item of a composite score was missing, the composite variables were assumed to be missing as well (and they are imputed using multiple imputation as discussed below). The histograms of the composite scores are shown in Figure S5. The composite scores 1. and 2. were assumed to have normal distributions based on the histograms. Scores 3., 4., 5., and 7. were assumed to have truncated normal distributions. Scores 3. and 7. were truncated at zero, score 4. was truncated at zero and five, and score 5. was truncated at 9. Score 6. was modeled as an ordered probit.

Some cognitive tests are only available in self- or proxy-interviews. We used a selection equation to model interview type. The probability that individual i at time t answers through a proxy respondent is a probit:

$$\Pr\left(I_{it}^p = 1\right) = \Phi\left(f\left(x_{it}, c_{it}^*\right)\right) \tag{4}$$

where Φ denotes the standard normal CDF, and $f(\cdot)$ is a flexible function of cognition and other covariates: a cubic function of age, sex, race and ethnicity, whether the person was born in the U.S., education, Social Security income quartile, marital status, having had a stroke, interview wave dummies, latent cognitive function (c_{it}^*), and interactions between interview wave dummies. These interaction terms were added because we found in our earlier research that HRS conducted fewer and somewhat more selective proxy-interviews after 2006 (3).

Survival is modeled using a Gompertz model. The hazard of death at time t is

$$h_i(t) = \lambda_{0i} \exp(\lambda_1 t) \tag{5}$$

$$\ln \lambda_{0i} = \omega_0 + \omega_1 x_i + \omega_2 \eta_{i0} + \omega_3 \eta_{i1} \tag{6}$$

Covariates enter the shape parameter of survival (λ_{0i}). We only included time-invariant covariates in (6): sex, race and ethnicity, birthplace, education, Social Security income quartile,

birth-year, the two random effects in the cognition equation (η_{i0} and η_{i1}), and various interaction terms between birth-years and demographics. The model allowed correlations between cognition and survival flexibly by adding the random effects terms.

We use a continuous-time model, but interview dates are only observed to the precision of months in the publicly available HRS data. Individuals were selected into ADAMS via stratified sampling to increase the number of cases of dementia. We model selection into the ADAMS samples based on the published selection strata (4).

1,770 individuals were selected to participate in the first wave of ADAMS. Of them, 856 individuals (48.4%) were successfully diagnosed, 227 individuals (12.8%) died before diagnosis, and 687 (38.8%) refused to participate. The probability of refusal was modeled as probit, and it was a function of age and cognition. In the refusal model, we used the age of respondents at the time of the ADAMS interview. This age, however, was not available for those who did not respond, so their age at their potential interview was imputed using multiple imputation. We assumed that the time between the last HRS interview and their potential ADAMS interview followed a lognormal distribution:

$$\ln T_{it} = \tau_0 + \tau_1 x_{it} + \tau_2 c_{it}^* + \varepsilon_{it}^T \tag{7}$$

We included age, cognition, an indicator that the previous HRS interview was in 2002, and interactions of this variable with age and cognition. Adding this indicator was necessary because the HRS was significantly slower in scheduling ADAMS interviews at the beginning of their field period.

The timing of interviews and interview refusals were modeled analogously in the 2nd, 3rd, and 4th waves of ADAMS.

The HRS cognitive tests were sometimes missing (Table S17), and these values were modeled by multiple imputation using equation (3). We found evidence that cognitively less able individuals were more likely to have missing values, so we added selection equations for the probabilities of missing values, which we modeled as probits. Apart from basic demographic covariates and cognition, we included survey wave dummies, and their interactions with cognition, because we saw evidence that missing rates fluctuated over time in the HRS. The final specifications were:

$$\Pr(y_{it}^s = .) = \Phi\left(\psi_0^s + \psi_1^s x_{it} + \psi_2^s w_{it} + \psi_3^s c_{it}^* + \psi_4^s w_{it} \times c_{it}^*\right) \tag{8}$$

where w_{it} indicates the survey wave.

Missing predictor variables (such as education and Social Security income quartile) were also imputed using multiple imputation. Because very few predictor variables were missing, we assumed a simple categorical distribution for the prior distribution of these variables.

The model was estimated by Markov Chain Monte Carlo using 2,000,000 simulation draws, and the first 10% burn-in draws were discarded. Table S13 shows the model outcome. Figure S7 shows the time series plots and histograms of the MCMC simulation draws of selected coefficients and statistics. The draws are highly correlated over time, a common issue in MCMC models. Still, the 2 million draws appear to be enough to recover the distribution of the parameters accurately: The time series plots fluctuate around the mean, and the histograms are Bell-shaped.

This model is computationally intensive, but it substantially increases the precision of the estimates compared to cross-sectional models used in the literature. The final version ran for about three weeks on a RAND Unix server. The MCMC model directly produces the standard errors of all parameters.

Estimating Dementia Prevalence and Other Statistics Based on the Model
The cognition model (discussed in the previous section) can estimate the prevalence of dementia in the population and other interesting statistics. These statistics can be estimated together with the model coefficients. In each MCMC simulation draw, we used equation (1) to draw a cognition value for each person at each wave. For each person-wave observation in our data, we estimated the person-wave-specific expected value of cognition (i.e., our point-estimate of cognition for that person-wave observation) within the MCMC model. The histograms of the point estimates are shown in the top panel of Figure S6, and the bottom panel shows the histogram of the wave-to-wave changes in cognition. We also took the weighted average of the simulation draws in the

population and subpopulations by sex etc., in each simulation draw. The point estimate for dementia prevalence is defined as the mean of these values across the simulation draws. The top four panels of Figure S7 show the time-series plots (over the simulation draws) and histograms of dementia prevalence in 2000 and 2016.

One drawback of estimating these statistics together with the model parameters is that one needs to estimate the entire model to recover the statistics, which is time-consuming. To facilitate the use of our model, we saved 901 "representative" simulation draws of latent cognition for each person and period. More precisely, after discarding the first 10% burn-in draws, we saved every 2000th simulation draws of the remaining 1.8 million. The means of these values in different subgroups were very close (to the third digit) to the means based on the total 1.8 million simulation draws. Thus, they can estimate other statistics that were not saved during estimation. We used this approach (i.e., the 901 draws) to implement the regression-based adjustments of the prevalence estimates presented in the paper.

Testing the Model on Synthetic Data and Comparisons to the Literature
We tested our statistical methodology on synthetic data with known parameter values. We used a larger simulated dataset than the HRS (N=30,000) to increase precision. We simulated a random dataset with known parameter values that followed the HRS-ADAMS design. Then we estimated our model using the same code we used for our final model. Table S14 shows the actual and estimated model parameter values. The estimates track the true values very closely. Tables S15 and S16 show actual and estimated dementia prevalence by survey wave, sex, and age in the synthetic data. Again, the estimated statistics track the actual values very closely.
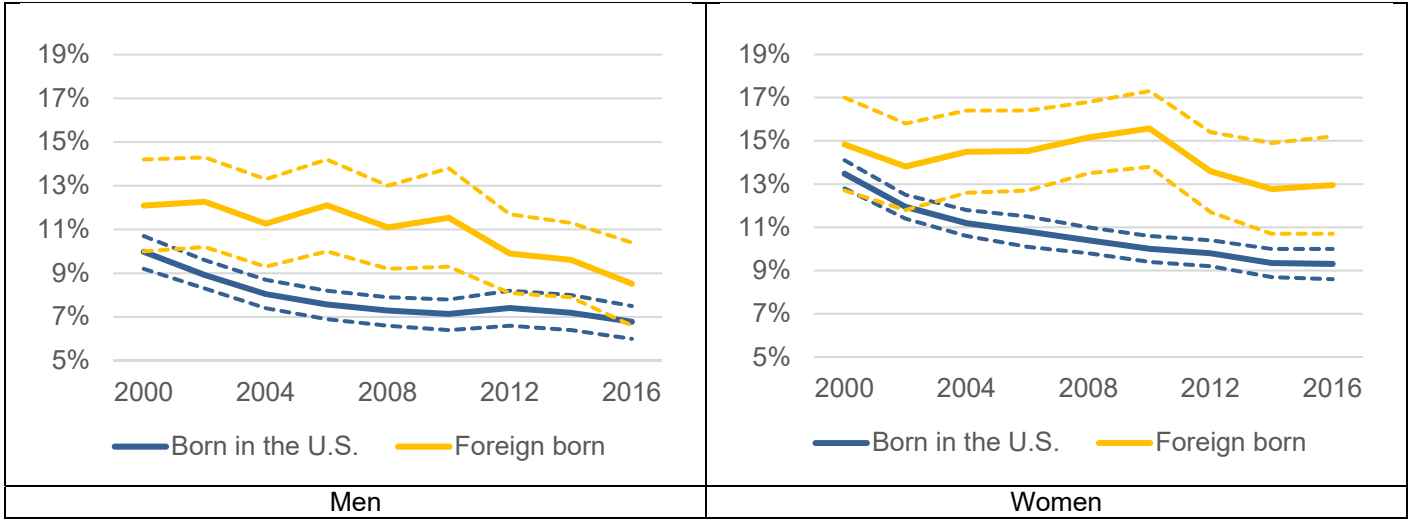
Table S11 shows dementia prevalence estimated in the U.S. among individuals aged 71-years and above by sex and weighted to be population representative. The first column shows Plassman et al.'s (5) estimates: the prevalence rates as directly observed in the first ADAMS wave. Because the ADAMS sample is selected from the nationally representative HRS, the Plassman rates have been used in the literature as the gold standard estimates to which other algorithms and estimation methods can be compared (6). The second column shows estimates based on our model. The point estimates are closely comparable in the total sample and by sex. Still, our estimates' 95% confidence intervals are considerably narrower, thanks to the larger sample and the additional longitudinal information we use. In the total sample, the width of our confidence interval was 1.3 percentage points (ppts), compared to 5 ppts in Plassman. We note that our confidence intervals consider the uncertainties from the model estimation and averaging. We used our model to estimate trends in the prevalence of dementia and found a decrease from 11.8% in 2000 to 9.1% in 2012. This decline is similar to reductions in prevalence that others have found. For example, Langa et al. (7) reported prevalence rates of 11.6% in 2000 and 8.8% in 2012.

Adjusting the Sample to Demographic Changes
The paper presented dementia prevalence estimates after adjusting the sample to trends in age, education, and other risk factors of dementia. Panel A of Figure 1 shows trends in dementia prevalence in the 65+-year-old population after adjusting the mean of age in each survey wave to be equal to the sample mean over the entire time period. To achieve this, we ran a regression model of dementia on a cubic function of age interacted with indicators of each survey wave. Then we calculated the average predicted dementia prevalence holding age at the sample mean, using Stata's margins command. The other Panels in Figures 1 used the same procedure within each population subgroup.

In Tables 1 and 2, we presented dementia prevalence estimates after adjusting the sample to changes in the distributions of an expanded set of factors. In the most comprehensive adjustment model ("Age-, education-, demographics, & health adjusted"), we ran a regression of dementia on sex, education, Social Security income quartiles, race and ethnicity, birthplace (U.S. born vs. not), marital status (single vs. married), cardiovascular risk factors (hypertension, diabetes, stroke, heart problems), a cubic function of age, a complete interaction between education, the demographic and health covariates and the age polynomial, a linear time trend, and the time trends interacted with all variables above, including the interaction terms. After estimating the model, we calculated its predicted values in 2000 and 2016 after keeping all variables at their

means (calculated over the entire 2000-2016 period) either in the total population or in specific subgroups. The tables also presented alternative adjustment models with fewer covariates.

We adjusted the male and female samples separately for the other models in Tables 1 and 2. The regression models used for this were analogous to the "All, adjusted" model, except that we did not include sex indicators.

Fig. S1. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex and birthplace.

25%
20%
15%
10%
5%
0%
2000 2004 2008 2012 2016

Less than HS   High school
Some college   College or more

Panel A: Non-Hispanic White men

25%
20%
15%
10%
5%
0%
2000 2004 2008 2012 2016

Less than HS   High school
Some college   College or more

Panel B: Non-Hispanic White women

25%
20%
15%
10%
5%
0%
2000 2004 2008 2012 2016

Less than HS   High school
Some college   College or more

Panel C: Non-Hispanic Black men

25%
20%
15%
10%
5%
0%
2000 2004 2008 2012 2016

Less than HS   High school
Some college   College or more

Panel D: Non-Hispanic Black women

25%
20%
15%
10%
5%
0%
2000 2004 2008 2012 2016

Less than HS   High school
Some college   College or more

Panel E: Hispanic men

25%
20%
15%
10%
5%
0%
2000 2004 2008 2012 2016

Less than HS   High school
Some college   College or more

Panel F: Hispanic women

Fig. S2. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex, education, and race and ethnicity.
* Sample: Health and Retirement Study, 2000-2016, Age 65+. Non-Hispanic other race not shown due to small sample size.
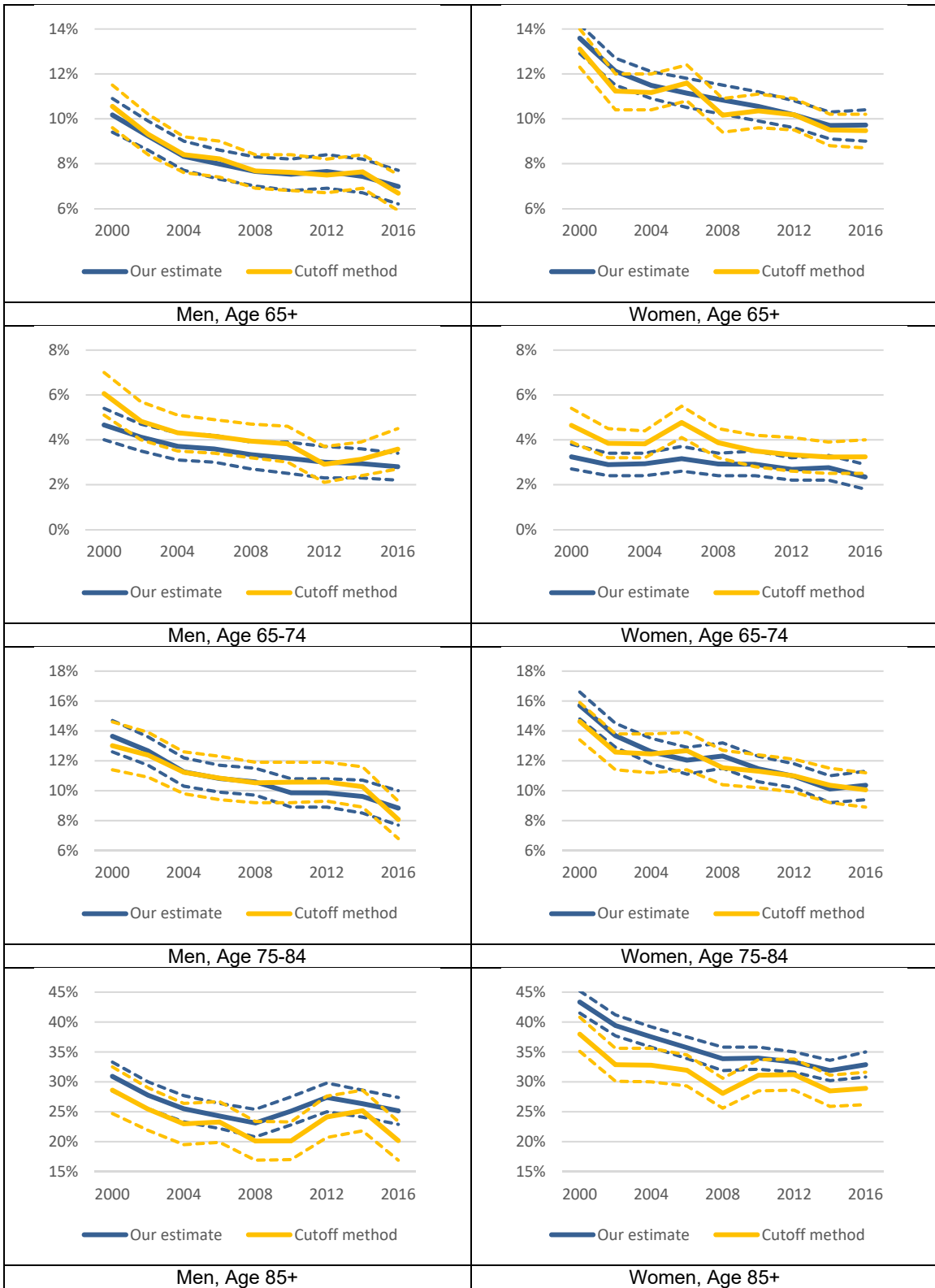
Fig. S3. Trends in age-adjusted dementia prevalence by age: comparison of methods.

* The cutoff method follows the widely used methodology discussed by Crimmins et al. (8). In self-interviews it sums responses to 27 items from the HRS cognitive battery. If the score is below a cutoff level, the respondent is assumed to have dementia. A similar method is used for proxy-interviews.
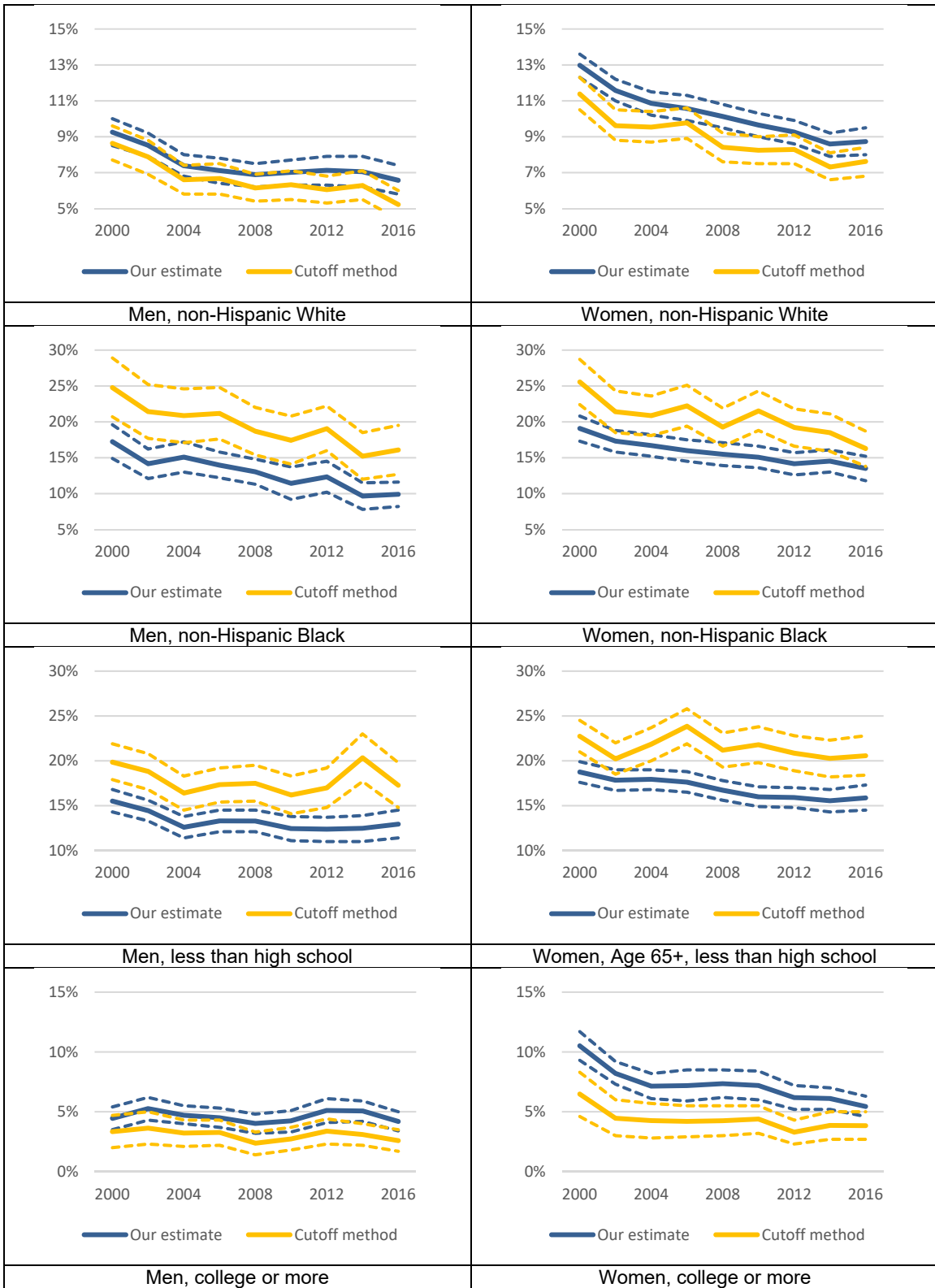
Fig. S4. Trends in age-adjusted dementia prevalence by race and ethnicity and education.

* The cutoff method follows the widely used methodology discussed by Crimmins et al. (8). In self-interviews, it sums responses to 27 items from the HRS cognitive battery. If the score is below a cutoff level, the respondent is assumed to have dementia. A similar method is used for proxy-interviews.
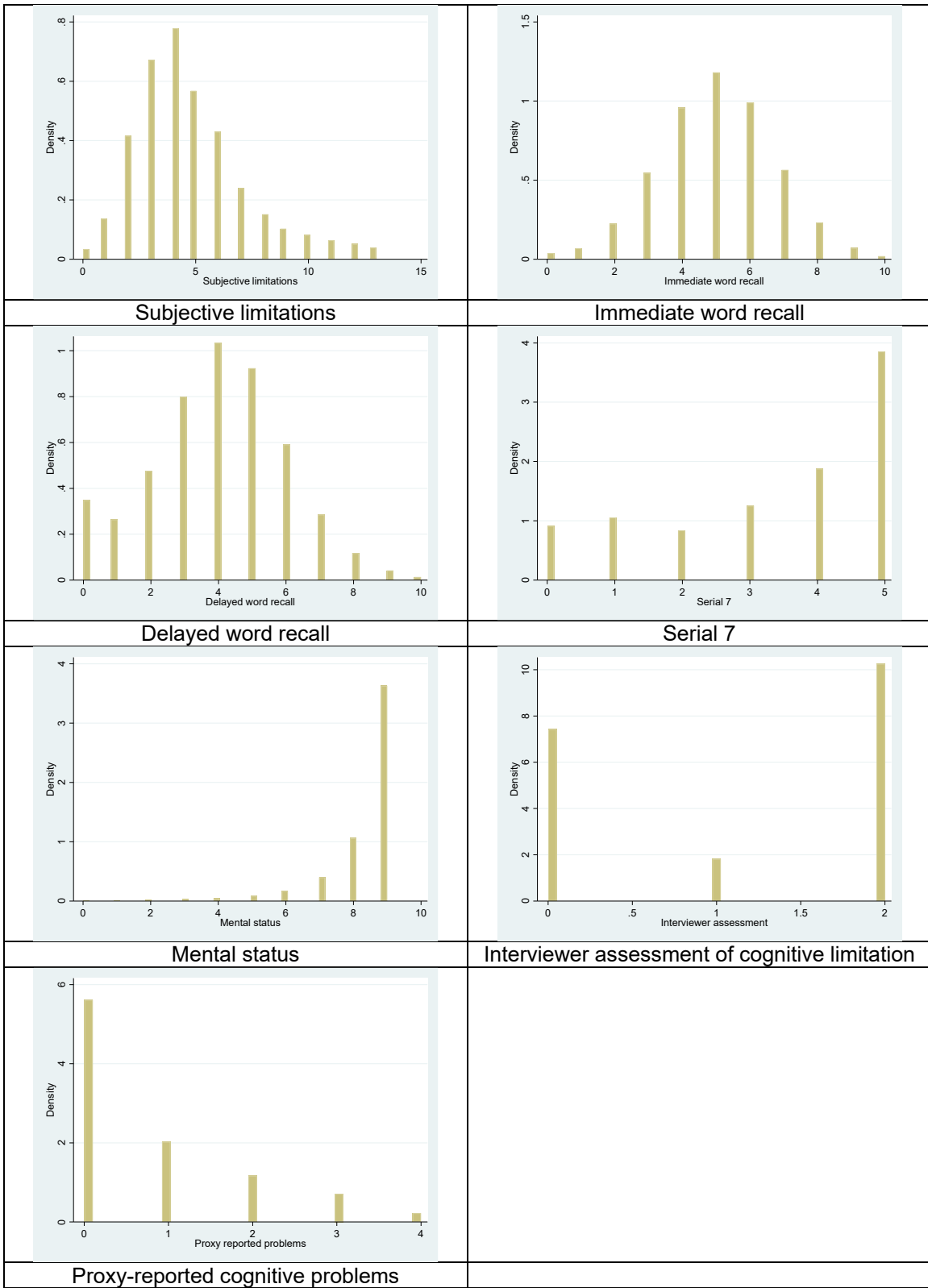
Fig. S5. Histograms of seven composite cognition scores in the HRS.

Panel A: Histogram of latent cognition

Panel B: Histogram of wave-to-wave changes in cognition
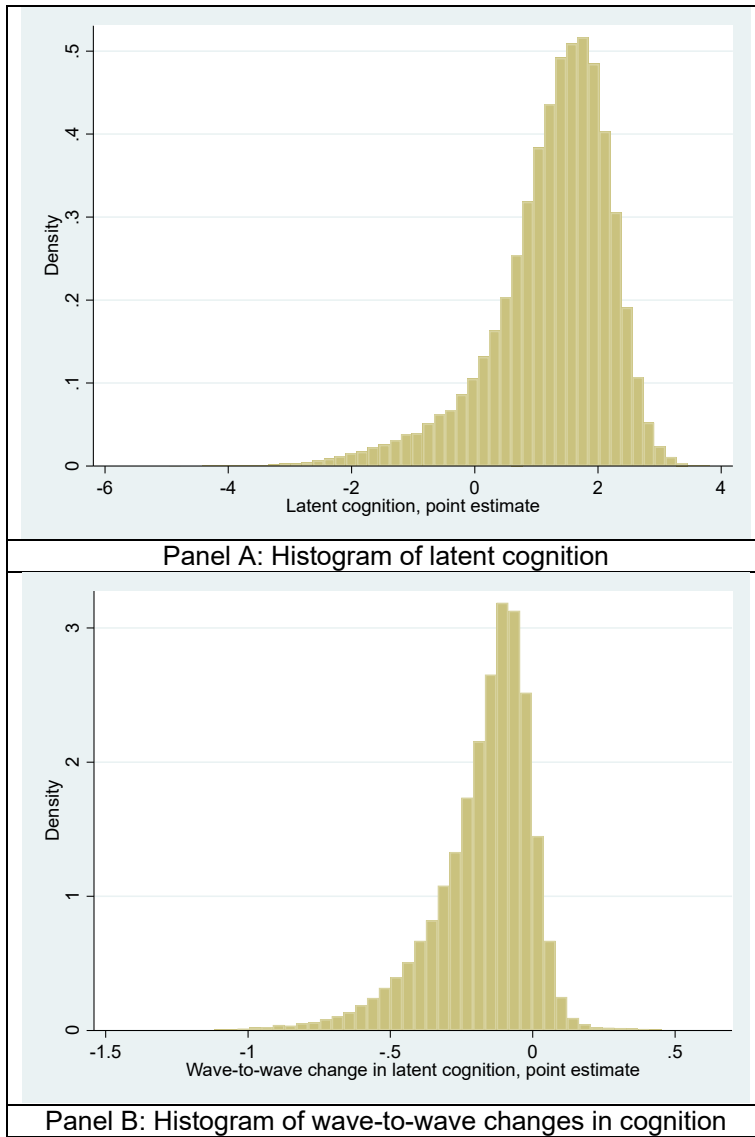
Fig. S6. Histograms of cognition and wave-to-wave changes in cognition based on the latent variable model.
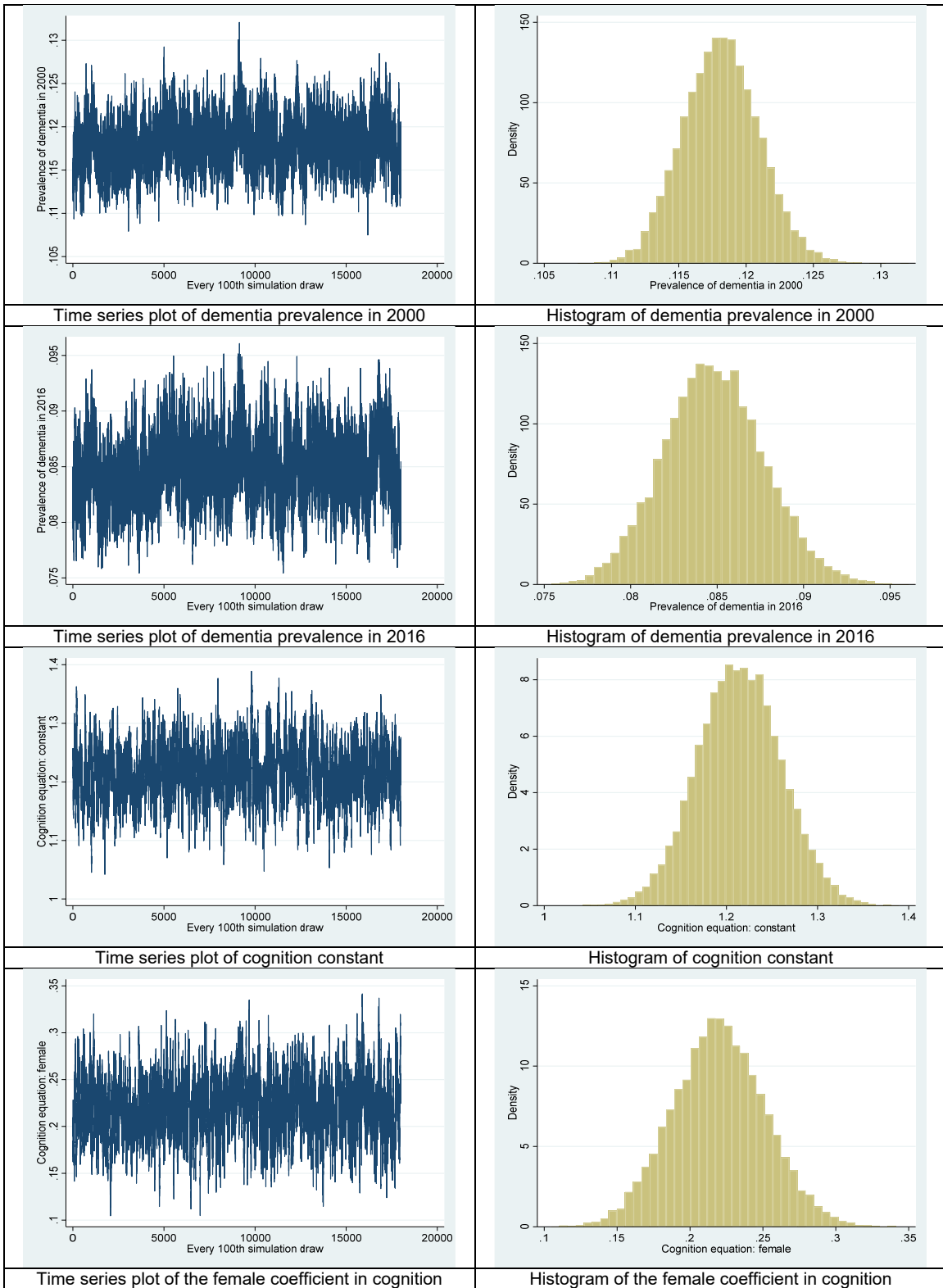
Fig. S7. Time series plots and histograms of the MCMC simulation draws of selected coefficients.

Table S1. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex, Age 65+.

	Total		Men		Women	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.122	[0.117; 0.127]	0.102	[0.094; 0.109]	0.136	[0.129; 0.142]
2002	0.109	[0.104; 0.114]	0.092	[0.086; 0.099]	0.121	[0.115; 0.127]
2004	0.102	[0.097; 0.106]	0.083	[0.077; 0.09]	0.115	[0.109; 0.121]
2006	0.098	[0.093; 0.103]	0.080	[0.073; 0.086]	0.111	[0.105; 0.118]
2008	0.095	[0.09; 0.1]	0.077	[0.07; 0.083]	0.108	[0.102; 0.115]
2010	0.093	[0.087; 0.098]	0.075	[0.068; 0.082]	0.106	[0.099; 0.112]
2012	0.091	[0.086; 0.096]	0.077	[0.069; 0.084]	0.102	[0.096; 0.108]
2014	0.087	[0.082; 0.093]	0.074	[0.067; 0.082]	0.097	[0.091; 0.103]
2016	0.085	[0.079; 0.091]	0.070	[0.062; 0.077]	0.097	[0.09; 0.104]
$\Delta_{2000\text{-}'16}$	-0.037		-0.032		-0.039	

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S2. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex and age.

Men	Age 65-74		Age 75-84		Age 85+	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.047	[0.04; 0.054]	0.136	[0.126; 0.147]	0.309	[0.285; 0.333]
2002	0.041	[0.035; 0.047]	0.127	[0.117; 0.136]	0.278	[0.255; 0.3]
2004	0.037	[0.031; 0.043]	0.113	[0.103; 0.122]	0.255	[0.233; 0.277]
2006	0.036	[0.03; 0.042]	0.108	[0.099; 0.117]	0.243	[0.222; 0.264]
2008	0.033	[0.027; 0.039]	0.106	[0.097; 0.115]	0.231	[0.208; 0.254]
2010	0.032	[0.025; 0.039]	0.099	[0.089; 0.108]	0.251	[0.228; 0.275]
2012	0.030	[0.023; 0.037]	0.099	[0.089; 0.108]	0.274	[0.25; 0.298]
2014	0.029	[0.023; 0.036]	0.096	[0.085; 0.107]	0.263	[0.241; 0.286]
2016	0.028	[0.022; 0.034]	0.088	[0.077; 0.1]	0.252	[0.229; 0.274]
$\Delta_{2000\text{-}'16}$	-0.019		-0.048		-0.058	

Women	Age 65-74		Age 75-84		Age 85+	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.032	[0.027; 0.038]	0.157	[0.148; 0.166]	0.433	[0.415; 0.452]
2002	0.029	[0.024; 0.034]	0.137	[0.129; 0.145]	0.394	[0.377; 0.412]
2004	0.029	[0.024; 0.034]	0.126	[0.118; 0.135]	0.375	[0.358; 0.392]
2006	0.032	[0.026; 0.037]	0.120	[0.111; 0.129]	0.357	[0.339; 0.375]
2008	0.029	[0.024; 0.034]	0.123	[0.115; 0.132]	0.339	[0.319; 0.358]
2010	0.029	[0.024; 0.035]	0.115	[0.106; 0.123]	0.340	[0.321; 0.358]
2012	0.027	[0.022; 0.032]	0.110	[0.102; 0.118]	0.333	[0.316; 0.35]
2014	0.028	[0.022; 0.033]	0.101	[0.092; 0.11]	0.319	[0.302; 0.336]
2016	0.023	[0.018; 0.029]	0.104	[0.094; 0.113]	0.329	[0.308; 0.35]
$\Delta_{2000\text{-}'16}$	-0.009		-0.053		-0.105	

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S3. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex and education.

Men	Less than high school		High school		Some college		College or more	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.162	[0.149; 0.174]	0.079	[0.068; 0.09]	0.077	[0.063; 0.09]	0.054	[0.044; 0.065]
2002	0.150	[0.138; 0.162]	0.072	[0.062; 0.082]	0.068	[0.057; 0.078]	0.056	[0.046; 0.066]
2004	0.130	[0.118; 0.142]	0.072	[0.062; 0.083]	0.067	[0.058; 0.076]	0.048	[0.04; 0.056]
2006	0.133	[0.121; 0.145]	0.075	[0.065; 0.085]	0.054	[0.043; 0.064]	0.043	[0.035; 0.05]
2008	0.132	[0.12; 0.144]	0.074	[0.064; 0.083]	0.053	[0.041; 0.065]	0.039	[0.031; 0.047]
2010	0.122	[0.108; 0.136]	0.077	[0.066; 0.089]	0.064	[0.052; 0.075]	0.040	[0.031; 0.048]
2012	0.123	[0.109; 0.136]	0.076	[0.063; 0.088]	0.063	[0.05; 0.076]	0.049	[0.039; 0.058]
2014	0.119	[0.105; 0.133]	0.071	[0.056; 0.085]	0.066	[0.052; 0.079]	0.050	[0.042; 0.059]
2016	0.121	[0.106; 0.136]	0.070	[0.055; 0.086]	0.062	[0.049; 0.075]	0.042	[0.034; 0.05]
$\Delta_{2000\text{-}'16}$	-0.041		-0.009		-0.015		-0.013	

Women	Less than high school		High school		Some college		College or more	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.187	[0.176; 0.198]	0.124	[0.114; 0.133]	0.106	[0.096; 0.117]	0.105	[0.094; 0.116]
2002	0.177	[0.166; 0.188]	0.113	[0.104; 0.121]	0.086	[0.077; 0.094]	0.079	[0.07; 0.088]
2004	0.182	[0.171; 0.192]	0.101	[0.092; 0.109]	0.079	[0.07; 0.088]	0.073	[0.064; 0.083]
2006	0.177	[0.166; 0.188]	0.098	[0.089; 0.107]	0.082	[0.07; 0.093]	0.067	[0.055; 0.079]
2008	0.171	[0.159; 0.182]	0.098	[0.087; 0.108]	0.079	[0.069; 0.088]	0.070	[0.059; 0.081]
2010	0.156	[0.146; 0.167]	0.107	[0.097; 0.117]	0.076	[0.067; 0.085]	0.069	[0.058; 0.079]
2012	0.159	[0.148; 0.17]	0.100	[0.091; 0.11]	0.074	[0.064; 0.084]	0.062	[0.052; 0.071]
2014	0.156	[0.144; 0.168]	0.092	[0.083; 0.1]	0.074	[0.062; 0.085]	0.063	[0.053; 0.073]
2016	0.155	[0.141; 0.169]	0.093	[0.082; 0.103]	0.079	[0.068; 0.09]	0.059	[0.05; 0.068]
$\Delta_{2000\text{-}'16}$	-0.032		-0.031		-0.027		-0.046	

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S4. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex and Social Security income quartile.

Men	Lowest SS income		2nd SS income		3rd SS income		Highest SS income	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.159	[0.141; 0.176]	0.134	[0.121; 0.147]	0.070	[0.059; 0.08]	0.063	[0.053; 0.074]
2002	0.148	[0.133; 0.163]	0.114	[0.101; 0.126]	0.069	[0.06; 0.078]	0.060	[0.051; 0.07]
2004	0.133	[0.118; 0.147]	0.106	[0.093; 0.119]	0.057	[0.049; 0.064]	0.059	[0.051; 0.067]
2006	0.128	[0.114; 0.142]	0.106	[0.093; 0.119]	0.056	[0.046; 0.065]	0.054	[0.045; 0.063]
2008	0.114	[0.099; 0.128]	0.110	[0.098; 0.123]	0.053	[0.045; 0.062]	0.055	[0.046; 0.064]
2010	0.099	[0.084; 0.115]	0.110	[0.095; 0.124]	0.060	[0.051; 0.07]	0.056	[0.047; 0.066]
2012	0.101	[0.086; 0.115]	0.109	[0.093; 0.125]	0.068	[0.057; 0.078]	0.055	[0.046; 0.065]
2014	0.107	[0.09; 0.124]	0.100	[0.084; 0.115]	0.059	[0.048; 0.07]	0.059	[0.049; 0.068]
2016	0.090	[0.075; 0.104]	0.098	[0.081; 0.116]	0.065	[0.053; 0.077]	0.050	[0.041; 0.06]
$\Delta_{2000\text{-}'16}$	-0.069		-0.036		-0.005		-0.013	

Women	Lowest SS income		2nd SS income		3rd SS income		4th SS income	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.179	[0.166; 0.192]	0.157	[0.145; 0.168]	0.102	[0.092; 0.111]	0.101	[0.091; 0.11]
2002	0.171	[0.159; 0.183]	0.141	[0.131; 0.152]	0.083	[0.074; 0.091]	0.084	[0.077; 0.092]
2004	0.169	[0.158; 0.181]	0.138	[0.128; 0.148]	0.080	[0.072; 0.088]	0.068	[0.059; 0.077]
2006	0.163	[0.15; 0.175]	0.131	[0.12; 0.142]	0.080	[0.07; 0.09]	0.072	[0.062; 0.083]
2008	0.155	[0.143; 0.168]	0.128	[0.117; 0.138]	0.083	[0.073; 0.093]	0.070	[0.061; 0.08]
2010	0.150	[0.138; 0.162]	0.127	[0.115; 0.139]	0.081	[0.073; 0.09]	0.070	[0.061; 0.079]
2012	0.147	[0.134; 0.159]	0.127	[0.116; 0.138]	0.078	[0.069; 0.087]	0.063	[0.055; 0.072]
2014	0.140	[0.127; 0.152]	0.126	[0.114; 0.139]	0.065	[0.056; 0.073]	0.069	[0.06; 0.078]
2016	0.144	[0.131; 0.158]	0.125	[0.111; 0.138]	0.069	[0.06; 0.079]	0.064	[0.055; 0.073]
$\Delta_{2000\text{-}'16}$	-0.035		-0.032		-0.032		-0.037	

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S5. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex, race and ethnicity.

Men	Non-Hispanic White		Non-Hispanic Black		Non-Hispanic other		Hispanic	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.093	[0.085; 0.1]	0.172	[0.149; 0.196]	0.162	[0.122; 0.203]	0.121	[0.098; 0.143]
2002	0.085	[0.079; 0.092]	0.142	[0.121; 0.162]	0.156	[0.122; 0.19]	0.105	[0.082; 0.127]
2004	0.074	[0.068; 0.08]	0.151	[0.13; 0.172]	0.149	[0.115; 0.182]	0.107	[0.084; 0.13]
2006	0.071	[0.064; 0.078]	0.140	[0.122; 0.158]	0.100	[0.075; 0.126]	0.123	[0.105; 0.142]
2008	0.069	[0.062; 0.075]	0.130	[0.113; 0.148]	0.089	[0.053; 0.124]	0.111	[0.094; 0.128]
2010	0.070	[0.063; 0.077]	0.114	[0.092; 0.137]	0.083	[0.046; 0.119]	0.094	[0.077; 0.112]
2012	0.071	[0.063; 0.079]	0.123	[0.102; 0.145]	0.061	[0.031; 0.092]	0.087	[0.07; 0.103]
2014	0.071	[0.062; 0.079]	0.097	[0.078; 0.115]	0.058	[0.02; 0.095]	0.096	[0.077; 0.116]
2016	0.066	[0.058; 0.074]	0.099	[0.082; 0.116]	0.057	[0.025; 0.089]	0.084	[0.066; 0.103]
$\Delta_{2000\text{-}'16}$	-0.027		-0.073		-0.105		-0.036	
	-0.290		-0.426		-0.649		-0.302	

Women	Non-Hispanic White		Non-Hispanic Black		Non-Hispanic other		Hispanic	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
2000	0.130	[0.123; 0.136]	0.191	[0.173; 0.208]	0.187	[0.144; 0.229]	0.138	[0.118; 0.158]
2002	0.116	[0.11; 0.122]	0.173	[0.158; 0.188]	0.182	[0.147; 0.217]	0.116	[0.099; 0.132]
2004	0.109	[0.102; 0.115]	0.167	[0.152; 0.182]	0.143	[0.116; 0.169]	0.123	[0.108; 0.137]
2006	0.106	[0.099; 0.113]	0.160	[0.145; 0.175]	0.112	[0.086; 0.138]	0.120	[0.101; 0.139]
2008	0.101	[0.095; 0.108]	0.155	[0.139; 0.171]	0.093	[0.064; 0.123]	0.138	[0.12; 0.156]
2010	0.097	[0.09; 0.103]	0.151	[0.136; 0.166]	0.084	[0.05; 0.117]	0.156	[0.136; 0.175]
2012	0.093	[0.086; 0.099]	0.142	[0.126; 0.157]	0.091	[0.058; 0.124]	0.150	[0.131; 0.169]
2014	0.086	[0.079; 0.092]	0.145	[0.13; 0.161]	0.100	[0.064; 0.135]	0.144	[0.122; 0.166]
2016	0.087	[0.08; 0.095]	0.135	[0.118; 0.152]	0.107	[0.062; 0.151]	0.136	[0.115; 0.157]
$\Delta_{2000\text{-}'16}$	-0.043		-0.056		-0.080		-0.002	

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S6. Trends in the age-adjusted prevalence of dementia from 2000 to 2016 by sex and birthplace.

Men	Born in the U.S.		Foreign born	
	Mean	95% CI	Mean	95% CI
2000	0.100	[0.092; 0.107]	0.121	[0.1; 0.142]
2002	0.089	[0.083; 0.096]	0.123	[0.102; 0.143]
2004	0.081	[0.074; 0.087]	0.113	[0.093; 0.133]
2006	0.076	[0.069; 0.082]	0.121	[0.1; 0.142]
2008	0.073	[0.066; 0.079]	0.111	[0.092; 0.13]
2010	0.071	[0.064; 0.078]	0.115	[0.093; 0.138]
2012	0.074	[0.066; 0.082]	0.099	[0.081; 0.117]
2014	0.072	[0.064; 0.08]	0.096	[0.079; 0.113]
2016	0.068	[0.06; 0.075]	0.085	[0.066; 0.104]
$\Delta_{2000\text{-}'16}$	-0.032		-0.036	

Women	Born in the U.S.		Foreign born	
	Mean	95% CI	Mean	95% CI
2000	0.135	[0.128; 0.141]	0.148	[0.127; 0.17]
2002	0.120	[0.114; 0.125]	0.138	[0.118; 0.158]
2004	0.112	[0.106; 0.118]	0.145	[0.126; 0.164]
2006	0.108	[0.101; 0.115]	0.145	[0.127; 0.164]
2008	0.104	[0.098; 0.11]	0.152	[0.135; 0.168]
2010	0.100	[0.094; 0.106]	0.156	[0.138; 0.173]
2012	0.098	[0.092; 0.104]	0.136	[0.117; 0.154]
2014	0.094	[0.087; 0.1]	0.128	[0.107; 0.149]
2016	0.093	[0.086; 0.1]	0.130	[0.107; 0.152]
$\Delta_{2000\text{-}'16}$	-0.042		-0.019	

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S7. 16-year change in the prevalence of dementia by sex, adjusting for compositional changes in factors added one-by-one.

	Dementia prevalence		
	2000	2016	Δ_2000-2016
Men, unadjusted	0.093	0.069	-0.024***
	[0.003]	[0.003]	[0.003]
Men, age-adjusted	0.093	0.068	-0.025***
	[0.003]	[0.003]	[0.003]
Men, age- & education-adjusted	0.087	0.073	-0.014***
	[0.003]	[0.004]	[0.003]
Men, age- & income-adjusted	0.09	0.071	-0.019***
	[0.003]	[0.004]	[0.003]
Men, age- & race- and ethnicity-adjusted	0.094	0.068	-0.026***
	[0.003]	[0.003]	[0.003]
Men, age- & birth country-adjusted	0.094	0.068	-0.026***
	[0.003]	[0.003]	[0.003]
Men, age- & marital status-adjusted	0.094	0.068	-0.026***
	[0.003]	[0.003]	[0.003]
Men, age- & hypertension-adjusted	0.094	0.068	-0.026***
	[0.003]	[0.003]	[0.003]
Men, age- & diabetes-adjusted	0.096	0.067	-0.029***
	[0.003]	[0.003]	[0.003]
Men, age- & heart problem-adjusted	0.094	0.068	-0.025***
	[0.003]	[0.003]	[0.003]
Men, age- & stroke-adjusted	0.093	0.068	-0.025***
	[0.003]	[0.003]	[0.003]
Women, unadjusted	0.127	0.094	-0.032***
	[0.003]	[0.003]	[0.003]
Women, age-adjusted	0.127	0.093	-0.034***
	[0.003]	[0.003]	[0.003]
Women, age- & education-adjusted	0.123	0.097	-0.026***
	[0.003]	[0.003]	[0.003]
Women, age- & income-adjusted	0.124	0.096	-0.028***
	[0.003]	[0.003]	[0.003]
Women, age- & race- and ethnicity-adjusted	0.129	0.092	-0.037***
	[0.003]	[0.003]	[0.003]
Women, age- & birth country-adjusted	0.127	0.093	-0.034***
	[0.003]	[0.003]	[0.003]
Women, age- & marital status-adjusted	0.127	0.094	-0.033***
	[0.003]	[0.003]	[0.003]
Women, age- & hypertension-adjusted	0.127	0.093	-0.033***
	[0.003]	[0.003]	[0.003]
Women, age- & diabetes-adjusted	0.13	0.091	-0.039***
	[0.003]	[0.003]	[0.003]
Women, age- & heart problem-adjusted	0.127	0.093	-0.034***
	[0.003]	[0.003]	[0.003]
Women, age- & stroke-adjusted	0.125	0.095	-0.030***
	[0.003]	[0.003]	[0.003]

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations. The 2000 and 2016 values are estimated after fitting a linear time trend on the data. The unadjusted models do not adjust the samples to compositional changes. The adjusted models adjust the distribution of different factors in the 2000 and 2016 samples to the overall sample mean between 2000 and 2016.

Table S8. 16-year change in the prevalence of dementia among men, by age, race and ethnicity, birthplace, and Social Security income quartile.

	Age-adjusted prevalence			Age-, education-, demographics-, & health-adjusted prevalence		
	2000	2016	$\Delta_{2000\text{-}2016}$	2000	2016	$\Delta_{2000\text{-}2016}$
Age 65-69	0.037 [0.003]	0.02 [0.003]	-0.017*** [0.004]	0.034 [0.003]	0.022 [0.003]	-0.012*** [0.004]
Age 70-74	0.051 [0.003]	0.035 [0.003]	-0.016*** [0.004]	0.046 [0.003]	0.039 [0.004]	-0.006* [0.004]
Age 75-79	0.1 [0.004]	0.065 [0.004]	-0.035*** [0.004]	0.094 [0.004]	0.071 [0.005]	-0.023*** [0.004]
Age 80-84	0.17 [0.005]	0.119 [0.006]	-0.051*** [0.006]	0.164 [0.005]	0.124 [0.006]	-0.039*** [0.006]
Age 85-89	0.247 [0.007]	0.202 [0.009]	-0.045*** [0.009]	0.24 [0.008]	0.208 [0.009]	-0.031*** [0.009]
Age 90+	0.331 [0.016]	0.358 [0.015]	0.027 [0.021]	0.305 [0.017]	0.369 [0.016]	0.064*** [0.022]
Non-Hispanic White	0.084 [0.003]	0.065 [0.004]	-0.019*** [0.003]	0.077 [0.003]	0.069 [0.004]	-0.008** [0.003]
Non-Hispanic Black	0.163 [0.009]	0.097 [0.008]	-0.067*** [0.010]	0.154 [0.009]	0.103 [0.008]	-0.051*** [0.010]
Non-Hispanic other	0.162 [0.014]	0.039 [0.014]	-0.123*** [0.019]	0.155 [0.014]	0.043 [0.014]	-0.111*** [0.019]
Hispanic	0.121 [0.009]	0.086 [0.008]	-0.036*** [0.011]	0.116 [0.009]	0.089 [0.008]	-0.027** [0.011]
Born in the U.S.	0.09 [0.003]	0.066 [0.004]	-0.025*** [0.003]	0.084 [0.003]	0.071 [0.004]	-0.013*** [0.003]
Foreign born	0.128 [0.009]	0.092 [0.008]	-0.036*** [0.010]	0.126 [0.009]	0.093 [0.008]	-0.033*** [0.010]
Lowest Soc. Sec. income quartile	0.152 [0.007]	0.087 [0.006]	-0.065*** [0.008]	0.145 [0.007]	0.092 [0.006]	-0.053*** [0.008]
2nd quartile	0.12 [0.006]	0.098 [0.007]	-0.021*** [0.007]	0.12 [0.006]	0.098 [0.007]	-0.022*** [0.007]
3rd quartile	0.063 [0.004]	0.061 [0.005]	-0.002 [0.005]	0.062 [0.004]	0.062 [0.005]	0.001 [0.005]
Highest Soc Sec. income quartile	0.06 [0.004]	0.054 [0.004]	-0.006 [0.004]	0.059 [0.004]	0.055 [0.004]	-0.004 [0.004]

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations. The 2000 and 2016 values are estimated after fitting a linear time trend on the data. The unadjusted models do not adjust the samples to compositional changes. The age-, education-, demographics-, & health-adjusted models adjust the distributions of age, education, income, race and ethnicity, foreign-born status, marital status, hypertension, diabetes, stroke, and heart problems in the 2000 and 2016 samples to the overall sample mean between 2000 and 2016. The age-adjusted versions only adjust the distribution of age.

Table S9. 16-year change in the prevalence of dementia among women, by age, race and ethnicity, birthplace, and Social Security income quartile.

	Age-adjusted prevalence			Age-, education-, demographics-, & health-adjusted prevalence		
	2000	2016	Δ_{2000-2016}	2000	2016	Δ_{2000-2016}
Age 65-69	0.026	0.02	-0.006**	0.026	0.019	-0.007**
	[0.002]	[0.003]	[0.003]	[0.002]	[0.003]	[0.003]
Age 70-74	0.04	0.033	-0.007**	0.04	0.035	-0.005
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Age 75-79	0.101	0.068	-0.033***	0.095	0.07	-0.026***
	[0.003]	[0.004]	[0.003]	[0.003]	[0.004]	[0.004]
Age 80-84	0.2	0.134	-0.066***	0.19	0.137	-0.052***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
Age 85-89	0.33	0.236	-0.094***	0.319	0.248	-0.071***
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Age 90+	0.526	0.433	-0.093***	0.498	0.454	-0.045***
	[0.011]	[0.012]	[0.013]	[0.012]	[0.012]	[0.013]
Non-Hispanic White	0.122	0.083	-0.039***	0.115	0.089	-0.026***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Non-Hispanic Black	0.182	0.134	-0.048***	0.177	0.136	-0.041***
	[0.007]	[0.007]	[0.008]	[0.007]	[0.007]	[0.008]
Non-Hispanic other	0.163	0.081	-0.081***	0.162	0.081	-0.081***
	[0.015]	[0.017]	[0.020]	[0.015]	[0.017]	[0.020]
Hispanic	0.125	0.146	0.021**	0.119	0.148	0.029***
	[0.007]	[0.009]	[0.010]	[0.008]	[0.009]	[0.010]
Born in the U.S.	0.125	0.089	-0.036***	0.119	0.093	-0.025***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Foreign born	0.15	0.133	-0.016*	0.151	0.131	-0.020**
	[0.009]	[0.009]	[0.010]	[0.009]	[0.009]	[0.010]
Lowest Soc. Sec. earnings quartile	0.177	0.138	-0.039***	0.175	0.137	-0.038***
	[0.005]	[0.006]	[0.006]	[0.005]	[0.005]	[0.006]
2nd quartile	0.146	0.121	-0.025***	0.142	0.122	-0.020***
	[0.005]	[0.006]	[0.005]	[0.005]	[0.006]	[0.005]
3rd quartile	0.092	0.068	-0.024***	0.089	0.07	-0.019***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Highest Soc Sec. earnings quartile	0.086	0.061	-0.024***	0.085	0.061	-0.024***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations. The 2000 and 2016 values are estimated after fitting a linear time trend on the data. The unadjusted models do not adjust the samples to compositional changes. The age-, education-, demographics-, & health-adjusted models adjust the distributions of age, education, income, race and ethnicity, foreign-born status, marital status, hypertension, diabetes, stroke, and heart problems in the 2000 and 2016 samples to the overall sample mean between 2000 and 2016. The age-adjusted versions only adjust the distribution of age.

Table S10. Descriptive statistics in the analytic sample.

N = 97,629	Unweighted frequency	Unweighted fraction	Weighted fraction
Men	40934	0.419	0.428
Women	56695	0.581	0.572
Age 65-69	25972	0.266	0.301
Age 70-74	23787	0.244	0.239
Age 75-79	20053	0.205	0.189
Age 80-84	14362	0.147	0.141
Age 85-89	8573	0.088	0.084
Age 90-94	3762	0.039	0.036
Age 95+	1120	0.011	0.010
Non-Hispanic White	74061	0.759	0.824
Non-Hispanic Black	13324	0.136	0.086
Non-Hispanic other	1953	0.020	0.022
Hispanic	8266	0.085	0.068
Race/ethnicity missing	25	0.000	0.000
Born in the U.S.	87498	0.896	0.906
Foreign born	10023	0.103	0.093
Birth country missing	108	0.001	0.001
Less than high school	29286	0.300	0.263
High school	31048	0.318	0.318
Some college	19173	0.196	0.206
College or more	18104	0.185	0.213
Education missing	18	0.000	0.000
Lowest Social Security income quartile	20890	0.214	0.200
2nd quartile	24083	0.247	0.237
3rd quartile	25787	0.264	0.261
Highest Social Security income quartile	24748	0.253	0.279
Social Security income missing	2121	0.022	0.023
Married/partnered	56337	0.577	0.574
Single	41239	0.422	0.426
Marital status missing	53	0.001	0.001
Never had a stroke	86849	0.890	0.896
Had a stroke	10700	0.110	0.103
Stroke missing	80	0.001	0.001
Survey wave 2000	10737	0.110	0.094
Survey wave 2002	10941	0.112	0.098
Survey wave 2004	11113	0.114	0.099
Survey wave 2006	11403	0.117	0.103
Survey wave 2008	11352	0.116	0.107
Survey wave 2010	10951	0.112	0.113
Survey wave 2012	10751	0.110	0.120
Survey wave 2014	10387	0.106	0.127
Survey wave 2016	9994	0.102	0.138

* Sample: Health and Retirement Study, 2000-2016, Age 65+. The sample includes 21,442 individuals and 97,629 person-year observations.

Table S11. Comparing our dementia prevalence estimates to Plassman et al. (5).

Group	Period	Source	Prevalence	95% CI
Age 71+	2001-2003	Plassman et al.	0.139	[0.114; 0.164]
Age 71+	2002	own estimate	0.146	[0.139; 0.152]
Age 71+, males	2001-2003	Plassman et al.	0.111	[0.078; 0.145]
Age 71+, males	2002	own estimate	0.122	[0.114; 0.13]
Age 71+, females	2001-2003	Plassman et al.	0.157	[0.124; 0.191]
Age 71+, females	2002	own estimate	0.161	[0.153; 0.169]
Age 71-79	2001-2003	Plassman et al.	0.050	[0.026; 0.073]
Age 71-79	2002	own estimate	0.072	[0.066; 0.078]
Age 71-79, males	2001-2003	Plassman et al.	0.053	[0.013; 0.093]
Age 71-79, males	2002	own estimate	0.074	[0.066; 0.082]
Age 71-79, females	2001-2003	Plassman et al.	0.048	[0.018; 0.077]
Age 71-79, females	2002	own estimate	0.070	[0.063; 0.077]
Age 80-89	2001-2003	Plassman et al.	0.242	[0.193; 0.291]
Age 80-89	2002	own estimate	0.214	[0.204; 0.224]
Age 80-89, males	2001-2003	Plassman et al.	0.177	[0.117; 0.237]
Age 80-89, males	2002	own estimate	0.189	[0.174; 0.203]
Age 80-89, females	2001-2003	Plassman et al.	0.278	[0.204; 0.353]
Age 80-89, females	2002	own estimate	0.228	[0.216; 0.24]
Age 90+	2001-2003	Plassman et al.	0.374	[0.255; 0.493]
Age 90+	2002	own estimate	0.479	[0.454; 0.504]
Age 90+, males	2001-2003	Plassman et al.	0.446	[0.217; 0.675]
Age 90+, males	2002	own estimate	0.351	[0.31; 0.392]
Age 90+, females	2001-2003	Plassman et al.	0.347	[0.234; 0.460]
Age 90+, females	2002	own estimate	0.526	[0.497; 0.556]

Table S12. Estimated prevalence of dementia in 2002 by race and ethnicity: comparison of methods.

	N	mean	S.e.	CI low	CI high
Non-Hispanic White					
ADAMS wave 1	592	0.124	0.014	0.097	0.150
Our model, 2002	5689	0.136	0.003	0.129	0.142
Cutoff, 2002	5686	0.116	0.004	0.107	0.124
Non-Hispanic Black					
ADAMS wave 1	159	0.222	0.033	0.157	0.287
Our model, 2002	771	0.228	0.009	0.210	0.246
Cutoff, 2002	771	0.285	0.016	0.253	0.317

* Age 71+. Dementia status was directly observed in ADAMS wave 1 interviews conducted between 2001 and 2003. The cutoff method follows the widely used methodology discussed by Crimmins et al. (8). In self-interviews, it sums responses to 27 items from the HRS cognitive battery. If the score is below a cutoff level, the respondent is assumed to have dementia. A similar method is used for proxy-interviews. CI low and CI high denote the 95% confidence interval. S.e. of Cutoff not adjusted upward for model and estimation uncertainty. All statistics are weighted.

Table S13. Output of the model estimated on HRS data.

	Coef.	95% CI
Latent cognition		
Constant	1.214	[1.125; 1.304]
Female	0.220	[0.158; 0.282]
Non-Hispanic Black	-0.255	[-0.34; -0.171]
Non-Hispanic other	-0.317	[-0.513; -0.121]
Hispanic	-0.058	[-0.176; 0.06]
High school dropout	-0.132	[-0.213; -0.051]
Some college	0.097	[0.001; 0.193]
College or more	0.198	[0.091; 0.306]
Foreign born	-0.091	[-0.205; 0.024]
Lowest Social Security income quartile	-0.122	[-0.203; -0.041]
3rd Social Security income quartile	0.195	[0.108; 0.281]
Highest Social Security income quartile	0.091	[-0.006; 0.189]
Single	-0.087	[-0.144; -0.031]
Had a stroke	-0.446	[-0.533; -0.359]
Birthyear (decades after 1930, BY)	-0.099	[-0.14; -0.057]
BY x female	-0.034	[-0.061; -0.006]
BY x Non-Hispanic Black	0.090	[0.051; 0.129]
BY x Non-Hispanic other	0.080	[-0.013; 0.173]
BY x Hispanic	0.055	[-0.002; 0.112]
BY x High school dropout	0.035	[-0.001; 0.071]
BY x Some college	0.023	[-0.016; 0.061]
BY x College or more	0.089	[0.049; 0.128]
BY x Foreign born	0.007	[-0.043; 0.056]
BY x Lowest Social Security income q.	0.056	[0.018; 0.095]
BY x 3rd Social Security income quartile	-0.026	[-0.067; 0.015]
BY x Highest Social Security income q.	0.014	[-0.026; 0.055]
BY x Single	-0.031	[-0.05; -0.011]
BY x Had a stroke	-0.035	[-0.059; -0.01]
Age (decades after 65)	-0.781	[-0.835; -0.728]
Age squared	-0.385	[-0.415; -0.355]
Age cube	-0.066	[-0.085; -0.047]
BY x Age	0.094	[0.068; 0.121]
BY x Age squared	0.058	[0.033; 0.082]
BY x Age cube	-0.038	[-0.047; -0.029]
Residual distribution		
Random intercept std	0.850	[0.808; 0.893]
Random growth std	0.720	[0.682; 0.758]
Intercept-growth correlation	0.554	[0.535; 0.574]
Error std	0.127	[0.116; 0.138]
Proxy selection		
Constant	-0.197	[-0.31; -0.085]
Female	-0.343	[-0.409; -0.277]
Non-Hispanic Black	-0.046	[-0.133; 0.04]
Non-Hispanic other	0.188	[-0.009; 0.385]
Hispanic	0.087	[-0.033; 0.208]

High school dropout	0.253	[0.169; 0.336]
Some college	-0.094	[-0.196; 0.009]
College or more	-0.111	[-0.226; 0.004]
Foreign born	0.045	[-0.073; 0.162]
Lowest Social Security income quartile	-0.046	[-0.13; 0.038]
3rd Social Security income quartile	0.067	[-0.025; 0.158]
Highest Social Security income quartile	0.088	[-0.014; 0.19]
Single	-0.339	[-0.407; -0.271]
Had a stroke	-0.100	[-0.201; 0.001]
Survey wave 2002	0.059	[-0.006; 0.124]
Survey wave 2004	-0.065	[-0.132; 0.001]
Survey wave 2006	-0.266	[-0.334; -0.197]
Survey wave 2008	-0.269	[-0.338; -0.2]
Survey wave 2010	-0.113	[-0.182; -0.043]
Survey wave 2012	-0.288	[-0.359; -0.217]
Survey wave 2014	-0.325	[-0.397; -0.253]
Survey wave 2016	-0.335	[-0.41; -0.261]
Age (decades after 65)	-0.251	[-0.306; -0.197]
Age squared	0.063	[0.022; 0.105]
Age cube	0.036	[0.016; 0.057]
Cognition	-0.940	[-1.006; -0.875]
Cognition x 2002	0.015	[-0.042; 0.072]
Cognition x 2004	-0.018	[-0.079; 0.042]
Cognition x 2006	-0.106	[-0.172; -0.039]
Cognition x 2008	-0.144	[-0.213; -0.075]
Cognition x 2010	-0.218	[-0.29; -0.147]
Cognition x 2012	-0.244	[-0.319; -0.169]
Cognition x 2014	-0.193	[-0.268; -0.117]
Cognition x 2016	-0.212	[-0.294; -0.13]

Subjective limitations

Constant	6.700	[6.545; 6.855]
Female	0.054	[-0.041; 0.149]
Non-Hispanic Black	0.092	[-0.032; 0.217]
Non-Hispanic other	-0.203	[-0.489; 0.084]
Hispanic	0.483	[0.307; 0.658]
High school dropout	0.585	[0.462; 0.708]
Some college	-0.074	[-0.222; 0.074]
College or more	-0.322	[-0.491; -0.153]
Foreign born	-0.057	[-0.23; 0.116]
Lowest Social Security income quartile	0.032	[-0.09; 0.154]
3rd Social Security income quartile	0.050	[-0.083; 0.183]
Highest Social Security income quartile	-0.216	[-0.365; -0.067]
Single	-0.115	[-0.21; -0.019]
Had a stroke	0.531	[0.379; 0.683]
Age (decades after 65)	-0.045	[-0.117; 0.028]
Cognition	-1.657	[-1.738; -1.576]

Residual distribution

Error std	1.735	[1.724; 1.746]

Immediate word recall

Constant	3.269	[3.169; 3.369]
Female	0.470	[0.41; 0.531]
Non-Hispanic Black	-0.247	[-0.328; -0.167]
Non-Hispanic other	-0.167	[-0.352; 0.018]
Hispanic	-0.350	[-0.464; -0.237]
High school dropout	-0.527	[-0.606; -0.448]
Some college	0.171	[0.077; 0.265]
College or more	0.460	[0.353; 0.568]
Foreign born	0.066	[-0.045; 0.177]
Lowest Social Security income quartile	-0.010	[-0.089; 0.068]
3rd Social Security income quartile	-0.073	[-0.158; 0.013]
Highest Social Security income quartile	0.148	[0.053; 0.243]
Single	0.068	[0.006; 0.129]
Had a stroke	0.153	[0.056; 0.25]
Age (decades after 65)	-0.385	[-0.432; -0.339]
First time responder	-0.156	[-0.246; -0.066]
Cognition	1.043	[0.991; 1.095]
Residual distribution		
Error std	1.283	[1.276; 1.29]

Delayed word recall		
Constant	-0.790	[-0.856; -0.724]
Female	0.132	[0.094; 0.169]
Non-Hispanic Black	-0.365	[-0.415; -0.314]
Non-Hispanic other	-0.054	[-0.171; 0.063]
Hispanic	0.014	[-0.057; 0.086]
High school dropout	-0.209	[-0.257; -0.16]
Some college	0.034	[-0.022; 0.091]
College or more	0.101	[0.037; 0.165]
Foreign born	-0.004	[-0.073; 0.064]
Lowest Social Security income quartile	-0.012	[-0.061; 0.038]
3rd Social Security income quartile	-0.015	[-0.066; 0.037]
Highest Social Security income quartile	0.074	[0.017; 0.131]
Single	0.071	[0.033; 0.109]
Had a stroke	0.103	[0.043; 0.163]
Age (decades after 65)	-0.247	[-0.275; -0.218]
First time responder	-0.202	[-0.293; -0.111]
Immediate word recall	0.755	[0.747; 0.763]
Cognition	0.578	[0.544; 0.611]
Residual distribution		
Error std	1.307	[1.3; 1.313]

Serial 7		
Constant	2.243	[2.07; 2.415]
Female	-0.833	[-0.937; -0.728]
Non-Hispanic Black	-1.562	[-1.701; -1.423]
Non-Hispanic other	-0.647	[-0.968; -0.326]
Hispanic	-1.210	[-1.406; -1.014]
High school dropout	-1.384	[-1.519; -1.248]
Some college	0.300	[0.138; 0.462]
College or more	0.807	[0.623; 0.992]

Foreign born	0.573	[0.381; 0.765]
Lowest Social Security income quartile	-0.142	[-0.278; -0.005]
3rd Social Security income quartile	-0.078	[-0.224; 0.069]
Highest Social Security income quartile	0.218	[0.056; 0.381]
Single	0.139	[0.033; 0.245]
Had a stroke	0.310	[0.142; 0.478]
Age (decades after 65)	0.191	[0.111; 0.271]
First time responder	-0.255	[-0.425; -0.084]
Cognition	1.775	[1.685; 1.865]
Residual distribution		
Error std	2.227	[2.209; 2.246]
Mental status		
Constant	7.970	[7.816; 8.124]
Female	0.140	[0.046; 0.234]
Non-Hispanic Black	-0.876	[-0.999; -0.752]
Non-Hispanic other	-0.523	[-0.808; -0.237]
Hispanic	-0.530	[-0.704; -0.355]
High school dropout	-0.723	[-0.844; -0.602]
Some college	0.053	[-0.092; 0.198]
College or more	0.178	[0.013; 0.343]
Foreign born	-0.122	[-0.293; 0.049]
Lowest Social Security income quartile	-0.147	[-0.268; -0.025]
3rd Social Security income quartile	-0.137	[-0.268; -0.006]
Highest Social Security income quartile	0.008	[-0.138; 0.154]
Single	0.185	[0.09; 0.28]
Had a stroke	0.171	[0.022; 0.32]
Age (decades after 65)	-0.247	[-0.318; -0.176]
First time responder	-0.249	[-0.415; -0.083]
Cognition	1.567	[1.487; 1.646]
Residual distribution		
Error std	2.009	[1.99; 2.029]
Interviewer assessment		
Constant	-0.340	[-0.636; -0.043]
Female	0.181	[-0.026; 0.388]
Non-Hispanic Black	0.064	[-0.195; 0.322]
Non-Hispanic other	-0.923	[-1.508; -0.337]
Hispanic	0.291	[-0.048; 0.629]
High school dropout	0.300	[0.057; 0.542]
Some college	0.148	[-0.168; 0.464]
College or more	0.125	[-0.222; 0.473]
Foreign born	-0.604	[-0.928; -0.28]
Lowest Social Security income quartile	-0.156	[-0.406; 0.094]
3rd Social Security income quartile	0.107	[-0.165; 0.379]
Highest Social Security income quartile	-0.179	[-0.474; 0.116]
Single	0.913	[0.686; 1.139]
Had a stroke	0.577	[0.312; 0.841]
Age (decades after 65)	0.200	[0.062; 0.338]
Cognition	-2.216	[-2.408; -2.025]
Residual distribution		

Error std	2.228	[2.086; 2.37]
Proxy-reported problems		
Constant	-0.881	[-1.059; -0.702]
Female	0.252	[0.128; 0.376]
Non-Hispanic Black	-0.189	[-0.341; -0.037]
Non-Hispanic other	-0.464	[-0.82; -0.107]
Hispanic	0.324	[0.124; 0.523]
High school dropout	0.119	[-0.023; 0.261]
Some college	0.100	[-0.082; 0.283]
College or more	0.294	[0.092; 0.495]
Foreign born	-0.327	[-0.517; -0.138]
Lowest Social Security income quartile	-0.018	[-0.162; 0.127]
3rd Social Security income quartile	0.242	[0.083; 0.401]
Highest Social Security income quartile	-0.016	[-0.189; 0.156]
Single	0.211	[0.078; 0.344]
Had a stroke	-0.016	[-0.163; 0.13]
Age (decades after 65)	-0.203	[-0.285; -0.121]
Cognition	-1.193	[-1.273; -1.113]
Residual distribution		
Error std	1.681	[1.634; 1.728]
Subjective limitations missing		
Constant	-2.799	[-3; -2.598]
Female	0.040	[-0.065; 0.144]
Non-Hispanic Black	-0.011	[-0.143; 0.121]
Non-Hispanic other	-0.094	[-0.413; 0.226]
Hispanic	-0.181	[-0.378; 0.016]
High school dropout	0.020	[-0.096; 0.136]
Some college	-0.125	[-0.272; 0.021]
College or more	-0.117	[-0.275; 0.041]
Foreign born	0.222	[0.075; 0.369]
Lowest Social Security income quartile	0.044	[-0.094; 0.183]
3rd Social Security income quartile	0.134	[-0.003; 0.27]
Highest Social Security income quartile	-0.026	[-0.185; 0.133]
Single	0.161	[0.053; 0.268]
Had a stroke	-0.022	[-0.152; 0.109]
2002 wave	-0.244	[-0.482; -0.005]
2004 wave	-0.035	[-0.237; 0.167]
2006 wave	0.026	[-0.171; 0.222]
2008 wave	-0.095	[-0.308; 0.117]
2010 wave	-0.044	[-0.252; 0.163]
2012 wave	-0.053	[-0.267; 0.161]
2014 wave	0.067	[-0.129; 0.262]
2016 wave	0.140	[-0.055; 0.335]
Age (decades after 65)	-0.031	[-0.098; 0.036]
Cognition	-0.286	[-0.397; -0.175]
Cognition x 2002 wave	0.112	[-0.063; 0.287]
Cognition x 2004 wave	0.026	[-0.125; 0.177]
Cognition x 2006 wave	0.040	[-0.106; 0.186]
Cognition x 2008 wave	0.027	[-0.133; 0.186]

Cognition x 2010 wave	0.091	[-0.065; 0.247]
Cognition x 2012 wave	0.150	[-0.009; 0.308]
Cognition x 2014 wave	-0.020	[-0.165; 0.126]
Cognition x 2016 wave	0.069	[-0.08; 0.218]
Immediate word recall missing		
Constant	-1.443	[-1.568; -1.318]
Female	-0.055	[-0.113; 0.002]
Non-Hispanic Black	-0.081	[-0.161; -0.001]
Non-Hispanic other	-0.169	[-0.372; 0.035]
Hispanic	-0.067	[-0.182; 0.049]
High school dropout	0.053	[-0.02; 0.126]
Some college	0.055	[-0.026; 0.137]
College or more	0.047	[-0.042; 0.137]
Foreign born	-0.076	[-0.181; 0.029]
Lowest Social Security income quartile	0.024	[-0.053; 0.102]
3rd Social Security income quartile	0.003	[-0.075; 0.082]
Highest Social Security income quartile	-0.003	[-0.087; 0.082]
Single	0.013	[-0.047; 0.073]
Had a stroke	-0.208	[-0.297; -0.12]
2002 wave	0.049	[-0.075; 0.173]
2004 wave	-0.076	[-0.203; 0.05]
2006 wave	-0.146	[-0.273; -0.019]
2008 wave	-0.181	[-0.309; -0.053]
2010 wave	-0.186	[-0.32; -0.051]
2012 wave	-0.130	[-0.258; -0.002]
2014 wave	-0.261	[-0.395; -0.128]
2016 wave	-0.169	[-0.302; -0.035]
Age (decades after 65)	-0.086	[-0.127; -0.045]
First self-interview in HRS	0.269	[0.091; 0.447]
Cognition	-0.743	[-0.842; -0.644]
Cognition x 2002 wave	0.238	[0.124; 0.351]
Cognition x 2004 wave	0.199	[0.08; 0.318]
Cognition x 2006 wave	0.166	[0.043; 0.289]
Cognition x 2008 wave	0.133	[0.006; 0.26]
Cognition x 2010 wave	0.260	[0.134; 0.386]
Cognition x 2012 wave	0.325	[0.207; 0.444]
Cognition x 2014 wave	0.151	[0.016; 0.286]
Cognition x 2016 wave	0.178	[0.044; 0.312]
Delayed word recall missing		
Constant	-0.979	[-1.11; -0.847]
Female	0.040	[-0.012; 0.091]
Non-Hispanic Black	0.019	[-0.048; 0.086]
Non-Hispanic other	0.184	[0.036; 0.332]
Hispanic	-0.002	[-0.097; 0.093]
High school dropout	0.112	[0.05; 0.174]
Some college	0.034	[-0.04; 0.107]
College or more	0.102	[0.023; 0.181]
Foreign born	-0.052	[-0.138; 0.035]
Lowest Social Security income quartile	0.004	[-0.063; 0.07]

3rd Social Security income quartile	0.029	[-0.039; 0.096]
Highest Social Security income quartile	0.015	[-0.059; 0.088]
Single	0.023	[-0.03; 0.077]
Had a stroke	-0.119	[-0.192; -0.046]
2002 wave	0.298	[0.158; 0.438]
2004 wave	0.127	[-0.014; 0.268]
2006 wave	0.074	[-0.066; 0.213]
2008 wave	-0.005	[-0.148; 0.138]
2010 wave	0.372	[0.236; 0.507]
2012 wave	0.438	[0.306; 0.57]
2014 wave	0.350	[0.217; 0.483]
2016 wave	0.320	[0.183; 0.456]
Age (decades after 65)	0.009	[-0.025; 0.044]
First self-interview in HRS	0.048	[-0.157; 0.253]
Immediate word recall	-0.288	[-0.307; -0.269]
Immediate word recall missing	3.533	[3.425; 3.642]
Cognition	-0.449	[-0.569; -0.329]
Cognition x 2002 wave	0.370	[0.239; 0.5]
Cognition x 2004 wave	0.109	[-0.033; 0.251]
Cognition x 2006 wave	0.109	[-0.033; 0.251]
Cognition x 2008 wave	-0.002	[-0.156; 0.152]
Cognition x 2010 wave	0.154	[0.017; 0.291]
Cognition x 2012 wave	0.110	[-0.026; 0.246]
Cognition x 2014 wave	0.164	[0.028; 0.301]
Cognition x 2016 wave	0.200	[0.06; 0.34]

Serial 7 missing

Constant	-1.401	[-1.512; -1.289]
Female	0.443	[0.388; 0.499]
Non-Hispanic Black	0.172	[0.105; 0.238]
Non-Hispanic other	0.124	[-0.038; 0.287]
Hispanic	0.123	[0.027; 0.219]
High school dropout	0.415	[0.35; 0.479]
Some college	-0.050	[-0.13; 0.031]
College or more	-0.212	[-0.308; -0.116]
Foreign born	-0.192	[-0.286; -0.097]
Lowest Social Security income quartile	0.092	[0.024; 0.16]
3rd Social Security income quartile	0.050	[-0.022; 0.123]
Highest Social Security income quartile	0.052	[-0.028; 0.133]
Single	-0.069	[-0.123; -0.015]
Had a stroke	-0.230	[-0.311; -0.148]
2002 wave	-0.064	[-0.169; 0.04]
2004 wave	-0.118	[-0.222; -0.013]
2006 wave	-0.385	[-0.494; -0.276]
2008 wave	-0.280	[-0.386; -0.174]
2010 wave	-0.415	[-0.531; -0.3]
2012 wave	-0.339	[-0.45; -0.228]
2014 wave	-0.529	[-0.647; -0.41]
2016 wave	-0.424	[-0.54; -0.308]
Age (decades after 65)	-0.178	[-0.217; -0.14]

First self-interview in HRS	0.115	[-0.059; 0.288]
Cognition	-0.688	[-0.761; -0.615]
Cognition x 2002 wave	-0.017	[-0.108; 0.074]
Cognition x 2004 wave	0.076	[-0.012; 0.164]
Cognition x 2006 wave	0.150	[0.058; 0.242]
Cognition x 2008 wave	0.092	[0; 0.184]
Cognition x 2010 wave	0.045	[-0.061; 0.15]
Cognition x 2012 wave	0.134	[0.037; 0.231]
Cognition x 2014 wave	0.149	[0.043; 0.255]
Cognition x 2016 wave	0.116	[0.009; 0.223]
Mental status missing		
Constant	-1.747	[-1.887; -1.606]
Female	0.027	[-0.042; 0.097]
Non-Hispanic Black	0.168	[0.081; 0.255]
Non-Hispanic other	0.039	[-0.176; 0.254]
Hispanic	0.100	[-0.028; 0.227]
High school dropout	0.306	[0.218; 0.394]
Some college	0.125	[0.02; 0.229]
College or more	0.191	[0.078; 0.303]
Foreign born	-0.103	[-0.224; 0.017]
Lowest Social Security income quartile	0.053	[-0.037; 0.143]
3rd Social Security income quartile	0.012	[-0.087; 0.11]
Highest Social Security income quartile	0.029	[-0.078; 0.135]
Single	-0.026	[-0.098; 0.046]
Had a stroke	-0.283	[-0.391; -0.176]
2002 wave	-0.065	[-0.197; 0.068]
2004 wave	-0.181	[-0.315; -0.047]
2006 wave	-0.192	[-0.324; -0.06]
2008 wave	-0.285	[-0.422; -0.147]
2010 wave	-0.320	[-0.467; -0.173]
2012 wave	-0.299	[-0.441; -0.157]
2014 wave	-0.375	[-0.522; -0.228]
2016 wave	-0.285	[-0.428; -0.143]
Age (decades after 65)	-0.149	[-0.202; -0.096]
First self-interview in HRS	0.333	[0.141; 0.524]
Age exactly 65	0.867	[0.78; 0.954]
Cognition	-0.745	[-0.841; -0.65]
Cognition x 2002 wave	0.089	[-0.031; 0.209]
Cognition x 2004 wave	0.045	[-0.08; 0.17]
Cognition x 2006 wave	0.206	[0.089; 0.322]
Cognition x 2008 wave	0.054	[-0.08; 0.188]
Cognition x 2010 wave	0.023	[-0.124; 0.17]
Cognition x 2012 wave	0.093	[-0.043; 0.229]
Cognition x 2014 wave	0.176	[0.039; 0.312]
Cognition x 2016 wave	0.021	[-0.125; 0.166]
Proxy-reported problems missing		
Constant	-2.081	[-2.301; -1.86]
Female	0.094	[-0.012; 0.2]
Non-Hispanic Black	0.037	[-0.086; 0.159]

Non-Hispanic other	-0.194	[-0.506; 0.119]
Hispanic	-0.169	[-0.348; 0.01]
High school dropout	0.001	[-0.113; 0.115]
Some college	0.058	[-0.087; 0.204]
College or more	0.160	[0.004; 0.316]
Foreign born	0.025	[-0.123; 0.173]
Lowest Social Security income quartile	-0.067	[-0.185; 0.052]
3rd Social Security income quartile	0.048	[-0.082; 0.177]
Highest Social Security income quartile	0.036	[-0.097; 0.17]
Single	0.058	[-0.058; 0.174]
Had a stroke	0.009	[-0.093; 0.112]
2002 wave	0.597	[0.389; 0.805]
2004 wave	0.178	[-0.061; 0.417]
2006 wave	0.295	[0.047; 0.543]
2008 wave	0.006	[-0.287; 0.299]
2010 wave	0.204	[-0.05; 0.458]
2012 wave	0.006	[-0.296; 0.308]
2014 wave	0.050	[-0.252; 0.352]
2016 wave	0.270	[-0.003; 0.544]
Age (decades after 65)	-0.090	[-0.156; -0.024]
Cognition	-0.350	[-0.483; -0.216]
Cognition x 2002 wave	0.218	[0.07; 0.366]
Cognition x 2004 wave	0.067	[-0.099; 0.234]
Cognition x 2006 wave	0.035	[-0.135; 0.205]
Cognition x 2008 wave	-0.178	[-0.371; 0.016]
Cognition x 2010 wave	0.019	[-0.158; 0.196]
Cognition x 2012 wave	0.007	[-0.193; 0.207]
Cognition x 2014 wave	-0.085	[-0.276; 0.106]
Cognition x 2016 wave	0.116	[-0.075; 0.307]
ADAMS Selection, 2000, proxy		
Constant	-0.045	[-0.174; 0.084]
Stratum 1	-0.178	[-0.402; 0.047]
Stratum 2	-1.823	[-2.237; -1.408]
Stratum 3	-1.872	[-2.22; -1.523]
Stratum 4	-1.829	[-2.36; -1.297]
Stratum 5	-1.368	[-1.848; -0.889]
Stratum 6	-1.646	[-2.133; -1.16]
ADAMS Selection, 2002, proxy		
Constant	-0.496	[-0.648; -0.345]
Stratum 1	0.561	[0.312; 0.809]
Stratum 2	-0.041	[-0.31; 0.229]
Stratum 3	-0.871	[-1.152; -0.59]
Stratum 4	-0.957	[-1.368; -0.547]
Stratum 5	-0.379	[-0.784; 0.026]
Stratum 6	-0.607	[-0.999; -0.216]
ADAMS Selection, 2000, self		
Constant	-0.282	[-0.457; -0.107]
Stratum 1	-0.282	[-0.516; -0.047]

Stratum 2	-1.526	[-1.746; -1.306]
Stratum 3	-1.750	[-2.036; -1.463]
Stratum 4	-1.766	[-2.045; -1.488]
Stratum 5	-1.294	[-1.598; -0.991]
Stratum 6	-1.450	[-1.736; -1.163]
Stratum 7	-1.650	[-1.878; -1.422]
Stratum 8	-1.678	[-1.891; -1.465]
Stratum 9	-1.539	[-1.882; -1.197]
Stratum 10	-1.384	[-1.641; -1.126]
ADAMS Selection, 2002, self		
Constant	-0.075	[-0.288; 0.137]
Stratum 1	0.075	[-0.19; 0.341]
Stratum 2	-0.563	[-0.791; -0.335]
Stratum 3	-1.351	[-1.617; -1.086]
Stratum 4	-1.344	[-1.603; -1.084]
Stratum 5	-0.976	[-1.259; -0.692]
Stratum 6	-1.069	[-1.334; -0.804]
Stratum 7	-1.578	[-1.82; -1.336]
Stratum 8	-1.578	[-1.811; -1.344]
Stratum 9	-1.171	[-1.459; -0.884]
Stratum 10	-1.316	[-1.576; -1.056]
ADAMS W1 log interview timing		
Constant	-1.910	[-2.026; -1.795]
2002	-0.822	[-0.973; -0.671]
Age	0.020	[-0.042; 0.082]
Age x 2002	-0.006	[-0.087; 0.074]
Cognition	0.021	[-0.012; 0.054]
Cognition x 2002	0.076	[0.029; 0.122]
Residual distribution		
Error std	0.423	[0.405; 0.441]
ADAMS W2 log interview timing		
Constant	-1.995	[-2.082; -1.908]
2002	0.075	[-0.027; 0.178]
Age	0.028	[-0.012; 0.068]
Age x 2002	-0.047	[-0.095; 0.001]
Cognition	0.017	[-0.027; 0.061]
Cognition x 2002	-0.036	[-0.092; 0.019]
Residual distribution		
Error std	0.113	[0.103; 0.123]
ADAMS W3 log interview timing		
Constant	-0.661	[-0.768; -0.553]
2002	-0.163	[-0.283; -0.042]
Age	-0.018	[-0.065; 0.028]
Age x 2002	-0.018	[-0.071; 0.035]
Cognition	-0.018	[-0.061; 0.025]
Cognition x 2002	-0.010	[-0.059; 0.04]
Residual distribution		
Error std	0.124	[0.114; 0.133]

ADAMS W4 log interview timing

Constant	-0.290	[-0.41; -0.17]
2002	-0.222	[-0.353; -0.09]
Age	-0.027	[-0.081; 0.027]
Age x 2002	0.004	[-0.056; 0.065]
Cognition	-0.055	[-0.103; -0.006]
Cognition x 2002	0.036	[-0.018; 0.091]

Residual distribution

Error std	0.096	[0.087; 0.105]

Survival

Coefficients in log shape parameter

Constant	-2.338	[-2.441; -2.235]
Female	-0.524	[-0.574; -0.473]
Non-Hispanic Black	0.080	[0.009; 0.152]
Non-Hispanic other	0.009	[-0.176; 0.194]
Hispanic	-0.126	[-0.232; -0.019]
High school dropout	0.250	[0.187; 0.313]
Some college	-0.054	[-0.127; 0.02]
College or more	-0.251	[-0.331; -0.171]
Foreign born	-0.295	[-0.396; -0.195]
Lowest Social Security income quartile	0.189	[0.118; 0.26]
3rd Social Security income quartile	-0.093	[-0.163; -0.024]
Highest Social Security income quartile	-0.174	[-0.249; -0.099]
Birthyear (decades after 1930, BY)	-0.067	[-0.145; 0.012]
BY x female	0.001	[-0.048; 0.05]
BY x Non-Hispanic Black	0.067	[-0.001; 0.135]
BY x Non-Hispanic other	0.018	[-0.17; 0.205]
BY x Hispanic	-0.018	[-0.119; 0.084]
BY x High school dropout	0.085	[0.024; 0.146]
BY x Some college	0.019	[-0.053; 0.091]
BY x College or more	-0.105	[-0.187; -0.024]
BY x Foreign born	-0.086	[-0.173; 0.001]
BY x Lowest Social Security income q.	0.093	[0.028; 0.158]
BY x 3rd Social Security income quartile	0.022	[-0.048; 0.092]
BY x Highest Social Security income q.	-0.011	[-0.084; 0.062]
Random intercept in cognition	-0.535	[-0.58; -0.49]
Random growth in cognition	-0.565	[-0.621; -0.51]

Other parameters

Scale parameter	1.392	[1.338; 1.445]

ADAMS W1 non-response

Constant	-0.042	[-0.233; 0.149]
Age	0.100	[-0.001; 0.202]
Cognition	0.032	[-0.026; 0.089]

ADAMS W2 non-response

Constant	0.512	[-0.056; 1.079]
Age	0.218	[-0.066; 0.503]
Cognition	0.272	[-0.034; 0.577]

ADAMS W3 non-response

Constant	0.717	[0.117; 1.317]
Age	0.033	[-0.251; 0.318]
Cognition	0.155	[-0.042; 0.353]
ADAMS W4 non-response		
Constant	0.810	[-0.101; 1.721]
Age	-0.004	[-0.408; 0.4]
Cognition	0.323	[0.013; 0.633]

Table S14. Output of the model estimated on a synthetic dataset and comparisons to the actual coefficients.

	Actual	Estimated	95% CI
Latent cognition			
Constant	0.800	0.801	[0.756; 0.845]
Female	0.100	0.099	[0.072; 0.127]
Non-Hispanic Black	-0.100	-0.092	[-0.132; -0.051]
Non-Hispanic other	-0.050	-0.089	[-0.157; -0.021]
Hispanic	0.000	0.017	[-0.019; 0.054]
High school dropout	-0.010	-0.030	[-0.073; 0.012]
Some college	0.020	0.005	[-0.035; 0.046]
College or more	0.030	0.001	[-0.039; 0.041]
Foreign born	-0.050	-0.055	[-0.083; -0.028]
Lowest Social Security income quartile	-0.050	-0.065	[-0.105; -0.025]
3rd Social Security income quartile	0.050	0.038	[-0.004; 0.079]
Highest Social Security income quartile	0.050	0.074	[0.034; 0.114]
Single	-0.100	-0.092	[-0.115; -0.07]
Had a stroke	-0.500	-0.470	[-0.499; -0.441]
Birthyear (decades after 1930, BY)	0.010	0.015	[-0.018; 0.049]
BY x female	0.050	0.047	[0.027; 0.068]
BY x Non-Hispanic Black	-0.010	-0.024	[-0.053; 0.005]
BY x Non-Hispanic other	-0.005	-0.004	[-0.055; 0.046]
BY x Hispanic	0.000	-0.015	[-0.042; 0.012]
BY x High school dropout	-0.050	-0.058	[-0.088; -0.027]
BY x Some college	0.100	0.107	[0.077; 0.136]
BY x College or more	0.200	0.209	[0.18; 0.238]
BY x Foreign born	-0.100	-0.108	[-0.128; -0.087]
BY x Lowest Social Security income q.	-0.050	-0.036	[-0.065; -0.007]
BY x 3rd Social Security income q.	0.100	0.113	[0.084; 0.143]
BY x Highest Social Security income q.	0.200	0.179	[0.15; 0.208]
BY x Single	-0.020	-0.022	[-0.036; -0.007]
BY x Had a stroke	-0.050	-0.059	[-0.076; -0.042]
Age (decades after 65)	-0.100	-0.101	[-0.122; -0.079]
Age squared	-0.050	-0.064	[-0.081; -0.047]
Age cube	0.000	0.003	[-0.01; 0.016]
BY x Age	-0.050	-0.060	[-0.079; -0.041]
BY x Age squared	-0.020	-0.014	[-0.032; 0.003]
BY x Age cube	0.000	-0.002	[-0.007; 0.003]
Residual distribution			
Random intercept std	0.700	0.692	[0.675; 0.709]
Random growth std	0.600	0.598	[0.581; 0.615]
Intercept-growth correlation	0.500	0.509	[0.493; 0.524]
Error std	0.100	0.106	[0.098; 0.113]
Proxy selection			
Constant	0.000	-0.011	[-0.061; 0.04]
Female	0.100	0.109	[0.087; 0.13]
Non-Hispanic Black	-0.200	-0.212	[-0.245; -0.178]
Non-Hispanic other	-0.100	-0.163	[-0.216; -0.11]

Hispanic	0.000	0.036	[0.007; 0.065]
High school dropout	-0.100	-0.085	[-0.116; -0.053]
Some college	-0.200	-0.195	[-0.226; -0.164]
College or more	-0.300	-0.295	[-0.327; -0.264]
Foreign born	0.200	0.190	[0.167; 0.212]
Lowest Social Security income quartile	-0.100	-0.097	[-0.129; -0.065]
3rd Social Security income quartile	-0.200	-0.174	[-0.205; -0.142]
Highest Social Security income quartile	-0.300	-0.309	[-0.341; -0.277]
Single	-0.200	-0.201	[-0.226; -0.177]
Had a stroke	0.200	0.231	[0.202; 0.259]
Survey wave 2002	0.000	0.025	[-0.025; 0.074]
Survey wave 2004	0.000	0.000	[-0.049; 0.049]
Survey wave 2006	0.000	-0.002	[-0.05; 0.046]
Survey wave 2008	0.000	0.014	[-0.033; 0.062]
Survey wave 2010	-0.200	-0.166	[-0.217; -0.116]
Survey wave 2012	-0.200	-0.196	[-0.247; -0.145]
Survey wave 2014	-0.200	-0.188	[-0.239; -0.138]
Survey wave 2016	-0.200	-0.183	[-0.234; -0.132]
Age (decades after 65)	0.100	0.094	[0.075; 0.113]
Age squared	0.100	0.092	[0.069; 0.114]
Age cube	0.100	0.106	[0.095; 0.117]
Cognition	-0.500	-0.502	[-0.539; -0.464]
Cognition x 2002	0.000	-0.026	[-0.074; 0.023]
Cognition x 2004	0.000	-0.005	[-0.052; 0.043]
Cognition x 2006	0.000	-0.009	[-0.056; 0.038]
Cognition x 2008	0.000	-0.003	[-0.048; 0.043]
Cognition x 2010	-0.500	-0.532	[-0.588; -0.476]
Cognition x 2012	-0.500	-0.532	[-0.588; -0.476]
Cognition x 2014	-0.500	-0.500	[-0.554; -0.446]
Cognition x 2016	-0.500	-0.544	[-0.6; -0.489]
Subjective limitations			
Constant	6.000	5.993	[5.953; 6.032]
Female	0.500	0.483	[0.461; 0.505]
Non-Hispanic Black	0.100	0.114	[0.08; 0.148]
Non-Hispanic other	0.100	0.060	[0.006; 0.114]
Hispanic	0.100	0.120	[0.09; 0.15]
High school dropout	0.150	0.148	[0.116; 0.181]
Some college	0.150	0.146	[0.115; 0.177]
College or more	0.150	0.150	[0.118; 0.182]
Foreign born	0.150	0.142	[0.119; 0.165]
Lowest Social Security income quartile	0.200	0.196	[0.164; 0.229]
3rd Social Security income quartile	0.200	0.208	[0.175; 0.24]
Highest Social Security income quartile	0.200	0.198	[0.165; 0.23]
Single	0.100	0.106	[0.082; 0.13]
Had a stroke	0.100	0.131	[0.101; 0.161]
Age (decades after 65)	0.300	0.296	[0.28; 0.312]
Cognition	-1.000	-0.998	[-1.022; -0.975]
Residual distribution			
Error std	1.000	0.998	[0.994; 1.003]

Immediate word recall

Constant	6.000	5.970	[5.922; 6.019]
Female	-0.500	-0.501	[-0.525; -0.476]
Non-Hispanic Black	0.100	0.120	[0.083; 0.157]
Non-Hispanic other	0.100	0.132	[0.074; 0.191]
Hispanic	0.100	0.096	[0.063; 0.129]
High school dropout	0.150	0.164	[0.127; 0.202]
Some college	0.150	0.150	[0.115; 0.185]
College or more	0.150	0.149	[0.112; 0.185]
Foreign born	0.150	0.170	[0.144; 0.195]
Lowest Social Security income quartile	0.200	0.221	[0.183; 0.258]
3rd Social Security income quartile	0.200	0.227	[0.19; 0.263]
Highest Social Security income quartile	0.200	0.222	[0.186; 0.259]
Single	0.100	0.113	[0.086; 0.141]
Had a stroke	0.100	0.069	[0.036; 0.103]
Age (decades after 65)	0.300	0.303	[0.284; 0.322]
First time responder	-1.000	-1.005	[-1.025; -0.984]
Cognition	1.000	1.001	[0.976; 1.026]
Residual distribution			
Error std	1.000	1.002	[0.997; 1.008]

Delayed word recall

Constant	-2.000	-1.999	[-2.065; -1.934]
Female	-0.500	-0.486	[-0.505; -0.467]
Non-Hispanic Black	0.100	0.088	[0.061; 0.116]
Non-Hispanic other	0.100	0.114	[0.071; 0.157]
Hispanic	0.100	0.087	[0.062; 0.112]
High school dropout	0.150	0.157	[0.127; 0.186]
Some college	0.150	0.147	[0.119; 0.175]
College or more	0.150	0.158	[0.13; 0.186]
Foreign born	0.150	0.151	[0.131; 0.17]
Lowest Social Security income quartile	0.200	0.199	[0.17; 0.227]
3rd Social Security income quartile	0.200	0.186	[0.158; 0.214]
Highest Social Security income quartile	0.200	0.205	[0.177; 0.232]
Single	-0.100	-0.104	[-0.125; -0.083]
Had a stroke	-0.100	-0.125	[-0.151; -0.1]
Age (decades after 65)	0.300	0.293	[0.279; 0.308]
First time responder	-1.000	-1.012	[-1.034; -0.99]
Immediate word recall	0.500	0.504	[0.495; 0.513]
Cognition	0.500	0.491	[0.471; 0.51]
Residual distribution			
Error std	1.000	1.000	[0.994; 1.006]

Serial 7

Constant	3.000	3.014	[2.977; 3.05]
Female	-0.500	-0.514	[-0.532; -0.497]
Non-Hispanic Black	0.100	0.082	[0.055; 0.108]
Non-Hispanic other	0.100	0.136	[0.094; 0.178]
Hispanic	0.100	0.091	[0.067; 0.115]
High school dropout	0.150	0.166	[0.138; 0.193]
Some college	0.150	0.162	[0.135; 0.188]

College or more	0.150	0.162	[0.135; 0.188]
Foreign born	0.150	0.151	[0.132; 0.169]
Lowest Social Security income quartile	0.200	0.196	[0.169; 0.223]
3rd Social Security income quartile	0.200	0.192	[0.165; 0.218]
Highest Social Security income quartile	0.200	0.200	[0.174; 0.227]
Single	0.100	0.095	[0.075; 0.114]
Had a stroke	-0.100	-0.137	[-0.163; -0.111]
Age (decades after 65)	0.300	0.309	[0.295; 0.323]
First time responder	-1.000	-0.985	[-1.004; -0.967]
Cognition	0.500	0.496	[0.48; 0.512]
Residual distribution			
Error std	1.000	1.002	[0.997; 1.008]
Mental status			
Constant	7.000	6.965	[6.918; 7.013]
Female	-0.500	-0.492	[-0.516; -0.468]
Non-Hispanic Black	0.100	0.113	[0.076; 0.149]
Non-Hispanic other	0.100	0.181	[0.123; 0.239]
Hispanic	0.100	0.086	[0.054; 0.118]
High school dropout	0.150	0.182	[0.146; 0.218]
Some college	0.150	0.155	[0.12; 0.189]
College or more	0.150	0.166	[0.13; 0.201]
Foreign born	0.150	0.182	[0.157; 0.207]
Lowest Social Security income quartile	0.200	0.213	[0.177; 0.25]
3rd Social Security income quartile	0.200	0.211	[0.175; 0.247]
Highest Social Security income quartile	0.200	0.201	[0.166; 0.237]
Single	-0.100	-0.107	[-0.134; -0.081]
Had a stroke	0.100	0.072	[0.038; 0.106]
Age (decades after 65)	0.300	0.292	[0.273; 0.311]
First time responder	-1.000	-0.996	[-1.015; -0.977]
Cognition	1.000	1.002	[0.976; 1.029]
Residual distribution			
Error std	1.000	0.999	[0.993; 1.006]
Interviewer assessment			
Constant	0.500	0.481	[0.453; 0.51]
Female	0.500	0.509	[0.49; 0.527]
Non-Hispanic Black	0.100	0.085	[0.057; 0.113]
Non-Hispanic other	0.100	0.073	[0.03; 0.117]
Hispanic	0.100	0.115	[0.092; 0.138]
High school dropout	0.150	0.139	[0.114; 0.163]
Some college	0.150	0.150	[0.125; 0.174]
College or more	0.150	0.148	[0.122; 0.173]
Foreign born	0.150	0.150	[0.132; 0.167]
Lowest Social Security income quartile	0.200	0.205	[0.181; 0.229]
3rd Social Security income quartile	0.200	0.222	[0.197; 0.247]
Highest Social Security income quartile	0.200	0.222	[0.196; 0.248]
Single	-0.100	-0.105	[-0.124; -0.085]
Had a stroke	0.100	0.120	[0.099; 0.141]
Age (decades after 65)	0.300	0.310	[0.299; 0.322]
Cognition	-0.500	-0.506	[-0.522; -0.49]

Residual distribution

Error std	0.500	0.498	[0.49; 0.506]

<u>*Proxy-reported problems*</u>

Constant	1.000	1.002	[0.95; 1.053]
Female	0.500	0.513	[0.482; 0.544]
Non-Hispanic Black	0.100	0.118	[0.069; 0.168]
Non-Hispanic other	0.100	0.083	[0.005; 0.161]
Hispanic	0.100	0.085	[0.043; 0.127]
High school dropout	0.150	0.163	[0.119; 0.207]
Some college	0.150	0.175	[0.131; 0.219]
College or more	0.150	0.158	[0.113; 0.204]
Foreign born	0.150	0.135	[0.103; 0.167]
Lowest Social Security income quartile	0.200	0.181	[0.137; 0.225]
3rd Social Security income quartile	0.200	0.212	[0.168; 0.257]
Highest Social Security income quartile	0.200	0.196	[0.15; 0.243]
Single	0.100	0.072	[0.037; 0.107]
Had a stroke	-0.100	-0.085	[-0.123; -0.047]
Age (decades after 65)	0.300	0.304	[0.284; 0.324]
Cognition	-1.000	-1.019	[-1.048; -0.989]

Residual distribution

Error std	1.000	1.000	[0.99; 1.01]

<u>*Subjective limitations missing*</u>

Constant	-2.000	-1.988	[-2.057; -1.92]
Female	0.300	0.293	[0.264; 0.322]
Non-Hispanic Black	0.500	0.511	[0.469; 0.553]
Non-Hispanic other	0.500	0.445	[0.38; 0.51]
Hispanic	0.500	0.531	[0.493; 0.569]
High school dropout	0.600	0.587	[0.539; 0.634]
Some college	0.700	0.690	[0.644; 0.735]
College or more	0.800	0.783	[0.737; 0.829]
Foreign born	0.700	0.681	[0.65; 0.712]
Lowest Social Security income quartile	0.100	0.104	[0.06; 0.147]
3rd Social Security income quartile	0.200	0.190	[0.147; 0.234]
Highest Social Security income quartile	0.300	0.271	[0.228; 0.314]
Single	0.200	0.190	[0.158; 0.221]
Had a stroke	0.300	0.341	[0.306; 0.376]
2002 wave	0.000	0.033	[-0.023; 0.089]
2004 wave	0.000	0.009	[-0.046; 0.065]
2006 wave	0.000	0.027	[-0.028; 0.082]
2008 wave	-1.000	-0.980	[-1.039; -0.921]
2010 wave	-1.000	-0.981	[-1.039; -0.923]
2012 wave	-1.000	-1.004	[-1.062; -0.945]
2014 wave	-1.000	-0.987	[-1.044; -0.929]
2016 wave	-1.000	-0.999	[-1.058; -0.941]
Age (decades after 65)	0.300	0.305	[0.286; 0.325]
Cognition	-1.000	-1.004	[-1.065; -0.943]
Cognition x 2002 wave	0.000	-0.021	[-0.098; 0.056]
Cognition x 2004 wave	0.000	0.018	[-0.056; 0.091]
Cognition x 2006 wave	0.000	0.009	[-0.064; 0.082]

Cognition x 2008 wave	0.300	0.274	[0.198; 0.349]
Cognition x 2010 wave	0.300	0.299	[0.225; 0.373]
Cognition x 2012 wave	0.200	0.183	[0.107; 0.258]
Cognition x 2014 wave	0.200	0.244	[0.171; 0.318]
Cognition x 2016 wave	0.100	0.084	[0.007; 0.161]

Immediate word recall missing

Constant	2.000	1.932	[1.85; 2.014]
Female	-0.300	-0.302	[-0.328; -0.275]
Non-Hispanic Black	-0.500	-0.479	[-0.519; -0.439]
Non-Hispanic other	-0.500	-0.540	[-0.605; -0.475]
Hispanic	-0.400	-0.357	[-0.393; -0.321]
High school dropout	-0.500	-0.511	[-0.55; -0.472]
Some college	-0.600	-0.592	[-0.629; -0.554]
College or more	-0.600	-0.604	[-0.642; -0.566]
Foreign born	-0.600	-0.627	[-0.654; -0.599]
Lowest Social Security income quartile	-0.100	-0.078	[-0.117; -0.039]
3rd Social Security income quartile	-0.200	-0.207	[-0.246; -0.169]
Highest Social Security income quartile	-0.300	-0.293	[-0.331; -0.254]
Single	0.200	0.199	[0.17; 0.227]
Had a stroke	-0.300	-0.292	[-0.328; -0.255]
2002 wave	0.000	0.048	[-0.034; 0.129]
2004 wave	0.000	0.072	[-0.009; 0.154]
2006 wave	0.000	0.074	[-0.006; 0.154]
2008 wave	-1.000	-0.918	[-0.997; -0.838]
2010 wave	-1.000	-0.937	[-1.018; -0.856]
2012 wave	-1.000	-0.930	[-1.012; -0.849]
2014 wave	-1.000	-0.936	[-1.017; -0.855]
2016 wave	-1.000	-0.860	[-0.943; -0.778]
Age (decades after 65)	0.300	0.308	[0.288; 0.329]
First self-interview in HRS	-0.500	-0.501	[-0.534; -0.467]
Cognition	-1.000	-0.974	[-1.038; -0.911]
Cognition x 2002 wave	0.000	0.004	[-0.076; 0.083]
Cognition x 2004 wave	0.100	0.053	[-0.025; 0.131]
Cognition x 2006 wave	0.500	0.474	[0.401; 0.546]
Cognition x 2008 wave	0.500	0.475	[0.401; 0.549]
Cognition x 2010 wave	0.100	0.045	[-0.035; 0.125]
Cognition x 2012 wave	0.000	-0.056	[-0.137; 0.025]
Cognition x 2014 wave	0.100	0.065	[-0.013; 0.144]
Cognition x 2016 wave	0.000	-0.090	[-0.172; -0.007]

Delayed word recall missing

Constant	2.000	1.609	[1.442; 1.777]
Female	-0.300	-0.274	[-0.302; -0.246]
Non-Hispanic Black	-0.400	-0.425	[-0.462; -0.387]
Non-Hispanic other	-0.400	-0.443	[-0.504; -0.382]
Hispanic	-0.300	-0.311	[-0.345; -0.277]
High school dropout	-0.400	-0.447	[-0.482; -0.411]
Some college	-0.700	-0.703	[-0.739; -0.667]
College or more	-0.800	-0.820	[-0.856; -0.784]
Foreign born	-0.800	-0.792	[-0.818; -0.765]

Lowest Social Security income quartile	-0.200	-0.213	[-0.25; -0.176]
3rd Social Security income quartile	-0.200	-0.186	[-0.222; -0.15]
Highest Social Security income quartile	-0.200	-0.199	[-0.235; -0.164]
Single	0.200	0.213	[0.186; 0.239]
Had a stroke	-0.300	-0.289	[-0.323; -0.255]
2002 wave	0.000	-0.067	[-0.151; 0.016]
2004 wave	0.000	-0.009	[-0.093; 0.075]
2006 wave	0.000	-0.017	[-0.102; 0.068]
2008 wave	-1.000	-1.055	[-1.143; -0.966]
2010 wave	-1.000	-1.058	[-1.146; -0.97]
2012 wave	-1.000	-1.035	[-1.122; -0.947]
2014 wave	-1.000	-1.033	[-1.12; -0.946]
2016 wave	-1.000	-1.041	[-1.128; -0.955]
Age (decades after 65)	0.300	0.284	[0.264; 0.304]
First self-interview in HRS	-1.000	-0.908	[-0.955; -0.861]
Immediate word recall	-0.100	-0.032	[-0.059; -0.004]
Immediate word recall missing	1.000	0.982	[0.956; 1.007]
Cognition	-0.500	-0.645	[-0.728; -0.562]
Cognition x 2002 wave	0.500	0.597	[0.518; 0.675]
Cognition x 2004 wave	0.500	0.566	[0.489; 0.644]
Cognition x 2006 wave	0.500	0.571	[0.494; 0.648]
Cognition x 2008 wave	0.000	0.109	[0.026; 0.193]
Cognition x 2010 wave	0.000	0.126	[0.044; 0.209]
Cognition x 2012 wave	0.000	0.083	[0.001; 0.165]
Cognition x 2014 wave	0.000	0.094	[0.012; 0.175]
Cognition x 2016 wave	0.000	0.087	[0.005; 0.169]

Serial 7 missing

Constant	2.000	1.959	[1.871; 2.047]
Female	-0.300	-0.294	[-0.323; -0.266]
Non-Hispanic Black	-0.300	-0.284	[-0.327; -0.242]
Non-Hispanic other	-0.500	-0.558	[-0.629; -0.487]
Hispanic	-0.500	-0.494	[-0.534; -0.454]
High school dropout	-0.500	-0.531	[-0.572; -0.49]
Some college	-0.600	-0.590	[-0.629; -0.55]
College or more	-0.800	-0.809	[-0.85; -0.767]
Foreign born	-0.800	-0.814	[-0.843; -0.784]
Lowest Social Security income quartile	-0.100	-0.123	[-0.165; -0.081]
3rd Social Security income quartile	-0.200	-0.219	[-0.26; -0.178]
Highest Social Security income quartile	-0.300	-0.307	[-0.348; -0.265]
Single	-0.200	-0.210	[-0.241; -0.179]
Had a stroke	0.300	0.304	[0.268; 0.341]
2002 wave	0.000	0.054	[-0.03; 0.138]
2004 wave	0.000	0.041	[-0.044; 0.127]
2006 wave	0.000	0.012	[-0.074; 0.098]
2008 wave	-1.000	-0.978	[-1.066; -0.89]
2010 wave	-1.000	-0.914	[-1.002; -0.827]
2012 wave	-1.000	-0.940	[-1.027; -0.852]
2014 wave	-1.000	-0.932	[-1.017; -0.846]
2016 wave	-1.000	-0.900	[-0.986; -0.814]

Age (decades after 65)	0.300	0.291	[0.27; 0.313]
First self-interview in HRS	-1.000	-0.971	[-1.011; -0.93]
Cognition	-1.000	-1.021	[-1.096; -0.945]
Cognition x 2002 wave	0.000	0.020	[-0.07; 0.11]
Cognition x 2004 wave	0.000	0.031	[-0.058; 0.119]
Cognition x 2006 wave	0.000	0.065	[-0.023; 0.153]
Cognition x 2008 wave	0.000	0.059	[-0.035; 0.153]
Cognition x 2010 wave	0.000	-0.005	[-0.099; 0.088]
Cognition x 2012 wave	0.000	0.042	[-0.05; 0.133]
Cognition x 2014 wave	0.300	0.310	[0.225; 0.395]
Cognition x 2016 wave	0.300	0.278	[0.192; 0.363]

Mental status missing

Constant	2.000	2.013	[1.893; 2.133]
Female	-0.300	-0.311	[-0.354; -0.267]
Non-Hispanic Black	-0.500	-0.507	[-0.572; -0.441]
Non-Hispanic other	-0.400	-0.547	[-0.652; -0.442]
Hispanic	-0.600	-0.605	[-0.667; -0.544]
High school dropout	-0.600	-0.619	[-0.682; -0.557]
Some college	-0.600	-0.615	[-0.676; -0.554]
College or more	-0.800	-0.810	[-0.873; -0.747]
Foreign born	-0.800	-0.800	[-0.845; -0.754]
Lowest Social Security income quartile	-0.200	-0.206	[-0.27; -0.142]
3rd Social Security income quartile	-0.200	-0.160	[-0.223; -0.096]
Highest Social Security income quartile	-0.300	-0.302	[-0.366; -0.239]
Single	-0.200	-0.219	[-0.266; -0.171]
Had a stroke	0.300	0.317	[0.26; 0.373]
2002 wave	0.000	0.004	[-0.093; 0.102]
2004 wave	0.000	0.034	[-0.066; 0.134]
2006 wave	0.000	-0.025	[-0.128; 0.077]
2008 wave	-1.000	-0.946	[-1.051; -0.842]
2010 wave	-1.000	-0.988	[-1.093; -0.883]
2012 wave	-1.000	-0.999	[-1.106; -0.892]
2014 wave	-1.000	-1.010	[-1.117; -0.903]
2016 wave	-1.000	-1.022	[-1.13; -0.914]
Age (decades after 65)	0.300	0.303	[0.268; 0.337]
First self-interview in HRS	-1.000	-1.024	[-1.08; -0.968]
Age exactly 65	1.000	1.037	[0.958; 1.115]
Cognition	-2.000	-1.954	[-2.098; -1.809]
Cognition x 2002 wave	0.500	0.447	[0.292; 0.602]
Cognition x 2004 wave	0.500	0.456	[0.302; 0.609]
Cognition x 2006 wave	0.500	0.447	[0.294; 0.6]
Cognition x 2008 wave	0.300	0.203	[0.033; 0.372]
Cognition x 2010 wave	0.300	0.214	[0.045; 0.383]
Cognition x 2012 wave	0.000	-0.031	[-0.208; 0.146]
Cognition x 2014 wave	0.000	0.029	[-0.147; 0.204]
Cognition x 2016 wave	0.000	-0.001	[-0.181; 0.178]

Proxy-reported problems missing

Constant	-2.000	-2.018	[-2.156; -1.88]
Female	0.200	0.244	[0.18; 0.308]

Non-Hispanic Black	0.400	0.412	[0.316; 0.508]
Non-Hispanic other	0.400	0.282	[0.133; 0.431]
Hispanic	0.400	0.446	[0.362; 0.53]
High school dropout	0.500	0.484	[0.387; 0.581]
Some college	0.600	0.625	[0.53; 0.721]
College or more	0.700	0.737	[0.64; 0.834]
Foreign born	0.600	0.571	[0.502; 0.639]
Lowest Social Security income quartile	0.200	0.171	[0.079; 0.263]
3rd Social Security income quartile	0.200	0.221	[0.127; 0.314]
Highest Social Security income quartile	0.400	0.373	[0.278; 0.468]
Single	-0.200	-0.190	[-0.261; -0.12]
Had a stroke	-0.300	-0.194	[-0.269; -0.12]
2002 wave	0.000	-0.003	[-0.107; 0.101]
2004 wave	0.000	-0.023	[-0.127; 0.082]
2006 wave	0.000	-0.015	[-0.118; 0.088]
2008 wave	-1.000	-1.042	[-1.184; -0.899]
2010 wave	-1.000	-1.108	[-1.258; -0.957]
2012 wave	-1.000	-1.127	[-1.281; -0.972]
2014 wave	-1.000	-1.092	[-1.242; -0.941]
2016 wave	-1.000	-0.988	[-1.132; -0.843]
Age (decades after 65)	0.300	0.287	[0.244; 0.329]
Cognition	-2.000	-2.083	[-2.288; -1.877]
Cognition x 2002 wave	0.000	0.151	[-0.099; 0.4]
Cognition x 2004 wave	0.000	-0.025	[-0.281; 0.231]
Cognition x 2006 wave	0.000	0.123	[-0.12; 0.365]
Cognition x 2008 wave	0.000	0.066	[-0.2; 0.331]
Cognition x 2010 wave	0.300	0.258	[0; 0.517]
Cognition x 2012 wave	0.200	0.167	[-0.095; 0.428]
Cognition x 2014 wave	0.100	0.139	[-0.123; 0.4]
Cognition x 2016 wave	0.100	0.246	[-0.008; 0.5]
ADAMS Selection, 2000, proxy			
Constant	0.500	0.561	[0.46; 0.662]
Stratum 1	-0.050	-0.091	[-0.158; -0.024]
ADAMS Selection, 2002, proxy			
Constant	0.000	-0.052	[-0.182; 0.077]
Stratum 1	-0.050	0.006	[-0.082; 0.094]
ADAMS Selection, 2000, self			
Constant	0.500	0.510	[0.371; 0.649]
Stratum 1	-0.050	-0.052	[-0.074; -0.029]
ADAMS Selection, 2002, self			
Constant	0.000	0.000	[-0.187; 0.187]
Stratum 11	-0.050	-0.046	[-0.074; -0.019]
ADAMS W1 log interview timing			
Constant	-2.400	-2.397	[-2.415; -2.378]
2002	-1.000	-1.000	[-1.035; -0.965]
Age	0.100	0.088	[0.075; 0.1]
Age x 2002	0.000	0.021	[-0.004; 0.047]
Cognition	0.100	0.089	[0.076; 0.101]

Cognition x 2002	0.050	0.067	[0.042; 0.091]
Residual distribution			
Error std	0.300	0.285	[0.279; 0.29]
ADAMS W2 log interview timing			
Constant	-2.000	-2.001	[-2.017; -1.985]
2002	-1.000	-0.971	[-1.001; -0.94]
Age	0.100	0.106	[0.095; 0.117]
Age x 2002	0.000	-0.008	[-0.028; 0.012]
Cognition	0.100	0.073	[0.053; 0.093]
Cognition x 2002	0.000	-0.024	[-0.061; 0.014]
Residual distribution			
Error std	0.100	0.095	[0.091; 0.099]
ADAMS W3 log interview timing			
Constant	-1.600	-1.591	[-1.601; -1.58]
2002	-1.000	-1.014	[-1.033; -0.994]
Age	0.100	0.097	[0.09; 0.105]
Age x 2002	0.000	0.012	[-0.002; 0.025]
Cognition	0.100	0.096	[0.088; 0.104]
Cognition x 2002	-0.050	-0.055	[-0.07; -0.04]
Residual distribution			
Error std	0.100	0.097	[0.094; 0.1]
ADAMS W4 log interview timing			
Constant	-1.200	-1.200	[-1.211; -1.19]
2002	-1.000	-0.996	[-1.017; -0.975]
Age	0.100	0.097	[0.089; 0.104]
Age x 2002	0.000	0.005	[-0.008; 0.018]
Cognition	0.100	0.105	[0.097; 0.113]
Cognition x 2002	0.000	-0.007	[-0.022; 0.009]
Residual distribution			
Error std	0.100	0.098	[0.095; 0.101]
Survival			
Coefficients in log shape parameter			
Constant	-2.000	-1.951	[-2.057; -1.846]
Female	0.100	0.111	[0.065; 0.158]
Non-Hispanic Black	0.100	0.102	[0.031; 0.172]
Non-Hispanic other	0.050	-0.045	[-0.166; 0.076]
Hispanic	0.100	0.152	[0.09; 0.213]
High school dropout	0.050	0.023	[-0.044; 0.09]
Some college	-0.100	-0.182	[-0.252; -0.113]
College or more	-0.150	-0.196	[-0.264; -0.127]
Foreign born	0.100	0.041	[-0.007; 0.089]
Lowest Social Security income quartile	0.050	0.096	[0.028; 0.163]
3rd Social Security income quartile	-0.100	-0.103	[-0.172; -0.033]
Highest Social Security income quartile	-0.150	-0.135	[-0.205; -0.064]
Birthyear (decades after 1930, BY)	-0.010	0.007	[-0.074; 0.089]
BY x female	0.005	0.020	[-0.024; 0.064]
BY x Non-Hispanic Black	0.010	-0.016	[-0.083; 0.05]
BY x Non-Hispanic other	0.005	-0.121	[-0.233; -0.008]

BY x Hispanic	0.005	-0.021	[-0.079; 0.038]
BY x High school dropout	0.010	-0.002	[-0.065; 0.062]
BY x Some college	-0.005	-0.033	[-0.097; 0.031]
BY x College or more	0.000	-0.016	[-0.079; 0.047]
BY x Foreign born	0.010	-0.025	[-0.07; 0.02]
BY x Lowest Social Security income q.	0.005	0.001	[-0.063; 0.065]
BY x 3rd Social Security income q.	-0.010	-0.021	[-0.086; 0.043]
BY x Highest Social Security income q.	-0.020	-0.050	[-0.115; 0.015]
Random intercept in cognition	-0.200	-0.214	[-0.263; -0.165]
Random growth in cognition	-0.200	-0.200	[-0.267; -0.133]
Other parameters			
Scale parameter	0.700	0.685	[0.632; 0.738]
ADAMS W1 non-response			
Constant	0.000	-0.010	[-0.061; 0.041]
Age	-0.100	-0.101	[-0.136; -0.066]
Cognition	0.100	0.108	[0.075; 0.141]
ADAMS W2 non-response			
Constant	0.000	0.006	[-0.126; 0.138]
Age	-0.100	-0.075	[-0.159; 0.01]
Cognition	0.100	0.066	[-0.084; 0.216]
ADAMS W3 non-response			
Constant	0.000	0.022	[-0.074; 0.117]
Age	-0.100	-0.105	[-0.168; -0.041]
Cognition	0.300	0.316	[0.246; 0.386]
ADAMS W4 non-response			
Constant	0.000	-0.067	[-0.167; 0.032]
Age	-0.100	-0.017	[-0.081; 0.047]
Cognition	0.300	0.275	[0.206; 0.344]

Table S15. Actual and estimated prevalence of dementia by age, men, simulated data.

	65-74			75-84			85+		
	Actual	Estimated	95% CI	Actual	Estimated	95% CI	Actual	Estimated	95% CI
2000	0.128	0.125	[0.115; 0.134]	0.217	0.218	[0.206; 0.23]	0.296	0.291	[0.276; 0.306]
2002	0.126	0.126	[0.118; 0.135]	0.224	0.228	[0.217; 0.239]	0.282	0.287	[0.273; 0.301]
2004	0.126	0.126	[0.117; 0.134]	0.240	0.236	[0.225; 0.247]	0.286	0.284	[0.271; 0.298]
2006	0.127	0.124	[0.115; 0.132]	0.238	0.235	[0.224; 0.245]	0.304	0.301	[0.288; 0.315]
2008	0.136	0.125	[0.116; 0.134]	0.232	0.237	[0.226; 0.248]	0.316	0.307	[0.294; 0.319]
2010	0.132	0.124	[0.115; 0.133]	0.235	0.237	[0.226; 0.248]	0.320	0.319	[0.306; 0.332]
2012	0.120	0.119	[0.11; 0.128]	0.249	0.245	[0.234; 0.256]	0.325	0.318	[0.305; 0.331]
2014	0.119	0.118	[0.109; 0.127]	0.243	0.242	[0.231; 0.253]	0.321	0.321	[0.308; 0.335]
2016	0.117	0.119	[0.11; 0.129]	0.240	0.244	[0.231; 0.256]	0.323	0.322	[0.309; 0.335]

Table S16. Actual and estimated prevalence of dementia by age, women, simulated data.

	65-74			75-84			85+		
	Actual	Estimated	95% CI	Actual	Estimated	95% CI		Mean	CI
2000	0.096	0.099	[0.091; 0.107]	0.191	0.201	[0.188; 0.213]	0.233	0.235	[0.219; 0.251]
2002	0.093	0.099	[0.091; 0.106]	0.203	0.201	[0.19; 0.212]	0.253	0.251	[0.236; 0.266]
2004	0.103	0.102	[0.094; 0.109]	0.207	0.203	[0.192; 0.213]	0.248	0.250	[0.236; 0.264]
2006	0.093	0.097	[0.089; 0.104]	0.209	0.211	[0.201; 0.221]	0.259	0.257	[0.244; 0.271]
2008	0.096	0.095	[0.087; 0.103]	0.207	0.213	[0.202; 0.223]	0.272	0.277	[0.263; 0.291]
2010	0.099	0.094	[0.087; 0.101]	0.207	0.205	[0.195; 0.216]	0.290	0.286	[0.272; 0.3]
2012	0.090	0.088	[0.081; 0.095]	0.213	0.207	[0.197; 0.218]	0.291	0.291	[0.278; 0.304]
2014	0.083	0.083	[0.076; 0.09]	0.207	0.206	[0.195; 0.217]	0.287	0.293	[0.28; 0.306]
2016	0.079	0.080	[0.073; 0.087]	0.214	0.209	[0.198; 0.221]	0.296	0.293	[0.281; 0.306]

Table S17. Number and fraction missing cognitive measures in the total sample.

	N	% missing
Measures available in both proxy- and self-interviews		
Number of interviews	97,629	
Missing subjective limitations	208	0.2%
Measures available in self-interviews		
Number of interviews	88,253	
Missing immediate word recall	1,352	1.5%
Missing delayed word recall	3,035	3.4%
Missing serial 7 subtractions	2,714	3.1%
Missing mental status	1,002	1.1%
Measures available in proxy-interviews		
Number of interviews	9,376	
Missing interviewer assessment	1	0.0%
Missing proxy-reported limitations	534	5.7%

SI References

1.   Anonymous, RAND HRS Data, Version P.
2.   P. Hudomiet, M. D. Hurd, S. Rohwedder (2022) The lifetime risk of living with dementia for short and medium durations based on a longitudinal model of cognition estimated on nationally representative U.S. data. (RAND Corporation).
3.   P. Hudomiet, M. D. Hurd, S. Rohwedder, Dementia prevalence in the United States in 2000 and 2012: Estimates based on a nationally representative study. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences* **73**, S10-S19 (2018).
4.   S. G. Heeringa *et al.* (2009) Aging, Demographics and Memory Study (ADAMS): Sample design, weighting and analysis for ADAMS. (Institute for Social Research, University of Michigan, Ann Arbor, Michigan).
5.   B. L. Plassman *et al.*, Prevalence of dementia in the United States: the aging, demographics, and memory study. *Neuroepidemiology* **29**, 125-132 (2007).
6.   K. Z. Gianattasio, Q. Wu, M. M. Glymour, M. C. Power, Comparison of methods for algorithmic classification of dementia status in the Health and Retirement Study. *Epidemiology (Cambridge, Mass.)* **30**, 291-302 (2019).
7.   K. M. Langa *et al.*, A comparison of the prevalence of dementia in the United States in 2000 and 2012. *JAMA Internal Medicine* **177**, 51-58 (2017).
8.   E. M. Crimmins, J. K. Kim, K. M. Langa, D. R. Weir, Assessment of cognition using surveys and neuropsychological assessment: the Health and Retirement Study and the Aging, Demographics, and Memory Study. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* **66**, i162-i171 (2011).