Rush Alzheimer's Disease Center

Codebook for data set 754
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This codebook contains 13 variables.

Longitudinal cycle explanation

All longitudinal data sets are organized by projid + visit or fu_year

visit	fu_year	explanation
00	0.0	Baseline
01	1.0	1st year follow-up
02	2.0	2nd year follow-up
03	3.0	3rd year follow-up
04	4.0	4th year follow-up
XX	XX.0	XXth year follow-up

variable suffix	type	explanation
_bl	cross-sectional	baseline cycle score; for medical history questions, the score may cover the period from prior to study participation to baseline visit.
_ever	cross-sectional	reported in any cycle at least one time
_l	cross-sectional	last cycle score
_lv	cross-sectional	last valid score

_cum	longitudinal	reported in past history or in at least one follow-up cycle up to this cycle

ApoE and TOMM40

ApoE and TOMM40 > ApoE

ApoE genotype : apoe_genotype

Apolipoprotein E genotype

Apolipoprotein E (APOE) genotype

value	coding
22	E2E2
23	E2E3
24	E2E4
33	E3E3
34	E3E4
44	E4E4

DNA was extracted from PBMCs or brain. Genotyping was performed by Agencourt Bioscience Corporation utilizing high-throughput sequencing of codon 112 (position 3937) and codon 158 (position 4075) of exon 4 of the APOE gene on chromosome 19.

Data updated 6/23/2015

Participants were genotyped for APOE alleles by Polymorphic DNA Technologies.

All APOE data were generated by Polymorphic DNA Technologies as part of a collaboration with Allan Roses and Zinfandel. http://www.polymorphicdna.com/ (http://www.polymorphicdna.com/)

References

TOMM40'523 variant and cognitive decline in older persons with APOE ?3/3 genotype.
Yu L, Lutz MW, Wilson RS, Burns DK, Roses AD, Saunders AM, Gaiteri C, De Jager PL, Barnes LL, Bennett DA
Journal: Neurology 2017 Feb 14; 88(7) 661-668

Clinical Diagnosis

Clinical Diagnosis > Dementia

Age at first Alzheimer's dementia dx : age_first_ad_dx

Age at cycle where first Alzheimer's dementia diagnosis was given

The **age at first Alzheimer's dementia diagnosis (dx)** variable represents the age at the first cycle where an Alzheimer's dementia diagnosis was rendered. This is calculated using the variables age at visit (/radc /var/displayVariable.htm?id=617) and clinical diagnosis summary (/radc/var/displayVariable.htm?id=349) (value = 4 or 5). This is the best approximation of "age at onset of Alzheimer's dementia" available, as most participants are seen on a yearly basis. This measure is not available for participants that were demented at baseline cycle.

Clinical cognitive diagnosis summary : dcfdx

Clinical diagnosis of cognitive status (Alzheimer's dementia, other dementia, MCI, or no impairment)

A **clinical diagnosis of cognitive status** is rendered at every assessment based on a three-stage process including computer scoring of cognitive tests, clinical judgment by a neuropsychologist, and diagnostic classification by a clinician.

All participants undergo a uniform, structured, clinical evaluation including a battery of 19 cognitive tests. These tests were scored by computer using a decision tree designed to mimic clinical judgment and a rating of severity of impairment was given for 5 cognitive domains. A neuropsychologist, blinded to participant demographics, reviews the impairment ratings and other clinical information and renders a clinical judgment regarding the presence of impairment and dementia. A clinician (neurologist, geriatrician, or geriatric nurse practitioner) then reviews all available data and examines the participant and renders a final diagnostic classification.

Clinical diagnosis of dementia and clinical Alzheimer's dementia are based on criteria of the joint working group of the National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association (NINCDS/ADRDA). The diagnosis of Alzheimer's dementia requires evidence of a meaningful decline in cognitive function relative to a previous level of performance with impairment in memory and at least one other area of cognition.

Diagnosis of mild cognitive impairment (MCI) is rendered for persons who are judged to have cognitive impairment by the neuropsychologist but are judged to not meet criteria for dementia by the clinician.

Persons diagnosed with MCI or Alzheimer's dementia may also be diagnosed with another condition that contributes to their cognitive impairment (CI).

Persons without dementia or mild cognitive impairment (MCI) are categorized as having no cognitive impairment (NCI).

Value	Coding
1	NCI: No cognitive impairment
2	MCI: Mild cognitive impairment, no other condition contributing to CI
3	MCI+: Mild cognitive impairment AND another condition contributing to CI
4	AD: Alzheimer’s dementia, no other condition contributing to CI (NINCDS/ADRDA Probable AD)
5	AD+: Alzheimer’s dementia AND other condition contributing to CI (NINCDS/ADRDA Possible AD)
6	Other dementia: Other primary cause of dementia, no clinical evidence of Alzheimer’s dementia

Other Forms : _l, _lv, _bl

References

Natural history of mild cognitive impairment in older persons.
Bennett DA, Wilson RS, Schneider JA, Evans DA, Beckett LA, Aggarwal NT, Barnes LL, Fox JH, Bach J
Journal: Neurology 2002 Jul 23; 59(2) 198-205

Decision rules guiding the clinical diagnosis of Alzheimer's disease in two community-based cohort studies compared to standard practice in a clinic-based cohort study.
Bennett DA, Schneider JA, Aggarwal NT, Arvanitakis Z, Shah RC, Kelly JF, Fox JH, Cochran EJ, Arends D, Treinkman AD, Wilson RS
Journal: Neuroepidemiology 2006; 27(3) 169-76

Clinical Diagnosis > Final consensus diagnosis

Final consensus cognitive diagnosis : cogdx

Clinical consensus diagnosis of cognitive status at time of death

Physician’s overall cognitive diagnostic category

At the time of death, all available clinical data were reviewed by a neurologist with expertise in dementia, and a summary diagnostic opinion was rendered regarding the most likely clinical diagnosis at the time of death. Summary diagnoses were made blinded to all postmortem data. Case conferences including one or more neurologists and a neuropsychologist were used for consensus on selected cases.

Value	Coding
1	NCI: No cognitive impairment (No impaired domains)
2	MCI: Mild cognitive impairment (One impaired domain) and NO other cause of CI

Value	Coding
3	MCI: Mild cognitive impairment (One impaired domain) AND another cause of CI
4	AD: Alzheimer's dementia and NO other cause of CI (NINCDS PROB AD)
5	AD: Alzheimer's dementia AND another cause of CI (NINCDS POSS AD)
6	Other dementia: Other primary cause of dementia

References

Mixed brain pathologies account for most dementia cases in community-dwelling older persons.
Schneider JA, Arvanitakis Z, Bang W, Bennett DA
Journal: Neurology 2007 Dec 11; 69(24) 2197-204

Demographics

Age at visit : age_at_visit

Age at visit (longitudinal)

Age at visit is calculated by subtracting the date of birth from the date of the visit and dividing the difference by days per year (365.25).

The date of the visit is defined as the first valid date in the following hierarchy:

1. cognitive date
2. clinical evaluation date (neurological exam, med hx, meds)
3. interview date
4. DCF date (diagnostic classification form)
5. neuropsychologist impression date

References

Purpose in life is associated with a reduced risk of incident disability among community-dwelling older persons.
Boyle PA, Buchman AS, Bennett DA
Journal: The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry 2010 Jun 10; 18(12) 1093-102

Age at death : age_death

Age at death

Age of death is calculated from subtracting date of birth from date of death and dividing the difference by days

per year (365.25).

For participants in autopsy cohorts, the exact date of death is known for most participants as it is the day an autopsy was performed. In all cohorts, in addition to annual evaluations, participants are also contacted quarterly to determine vital status and changes in health, and death is occasionally learned of during quarterly contacts.

Education : educ

Years of education

The **years of education** variable is based on the number of years of regular school reported at baseline cognitive testing.

References

Education modifies the association of amyloid but not tangles with cognitive function.
Bennett DA, Schneider JA, Wilson RS, Bienias JL, Arnold SE
Journal: Neurology 2005 Sep 27; 65(6) 953-5

Sex : msex

Sex

Self-reported **sex**, with “1” indicating male sex.

Allowable codes

1 = Male
0 = Female

Race : race7

Racial group

As of 10/16/2018, the race variable was updated to reflect the revised NIH categories. Please use this variable in place of the old race variable (race).

Race is based on self-report at baseline using the following question:

What is your race?

Value	Coding
1	White
2	Black or African American
3	American Indian or Alaska Native

Value	Coding
4	Native Hawaiian or Other Pacific Islander
5	Asian
6	Other
7	Unknown

Spanish ethnicity : spanish

Spanish/Hispanic/Latino origin

Are you of **Spanish**/Hispanic/Latino origin?

value	coding
1	Yes
2	No

Pathology

Pathology > Alzheimer's disease

Braak stage : braaksc

Semiquantitative measure of neurofibrillary tangles

Braak Stage is a semiquantitative measure of severity of neurofibrillary tangle (NFT) pathology. Bielschowsky silver stain was used to visualize NFTs in the frontal, temporal, parietal, entorhinal cortex, and the hippocampus. Braak stages were based upon the distribution and severity of NFT pathology:

Braak stages I and II indicate NFTs confined mainly to the entorhinal region of the brain
Braak stages III and IV indicate involvement of limbic regions such as the hippocampus
Braak stages V and VI indicate moderate to severe neocortical involvement.

Diagnosis includes algorithm and neuropathologist’s opinion.

value	coding
0	0
1	I
2	II
3	III

value	coding
4	IV
5	V
6	VI

References

Neuropathology of older persons without cognitive impairment from two community-based studies.
Bennett DA, Schneider JA, Arvanitakis Z, Kelly JF, Aggarwal NT, Shah RC, Wilson RS
Journal: Neurology 2006 Jun 27; 66(12) 1837-44

Neuropathological stageing of Alzheimer-related changes.
Braak H, Braak E
Journal: Acta neuropathologica 1991; 82(4) 239-59

CERAD score : ceradsc

Semiquantitative measure of neuritic plaques

CERAD score is a semiquantitative measure of neuritic plaques. A neuropathologic diagnosis was made of no AD, possible AD, probable AD, or definite AD based on semiquantitative estimates of neuritic plaque density as recommended by the Consortium to Establish a Registry for Alzheimer's Disease (CERAD), modified to be implemented without adjustment for age and clinical diagnosis. A CERAD neuropathologic diagnosis of AD required moderate (probable AD) or frequent neuritic plaques (definite AD) in one or more neocortical regions.

Diagnosis includes algorithm and neuropathologist's opinion, blinded to age and all clinical data.

value	coding	if using a binary variable, recommendation is
1	Definite	yes
2	Probable	yes
3	Possible	no
4	No AD	no

References

The Consortium to Establish a Registry for Alzheimer's Disease (CERAD). Part II. Standardization of the neuropathologic assessment of Alzheimer's disease.
Mirra SS, Heyman A, McKeel D, Sumi SM, Crain BJ, Brownlee LM, Vogel FS, Hughes JP, van Belle G, Berg L
Journal: Neurology 1991 Apr; 41(4) 479-86

Neuropathology of older persons without cognitive impairment from two community-based studies.
Bennett DA, Schneider JA, Arvanitakis Z, Kelly JF, Aggarwal NT, Shah RC, Wilson RS
Journal: Neurology 2006 Jun 27; 66(12) 1837-44

Pathology > Autopsy - General

Post-mortem interval : pmi

Time interval in hours from time of death to autopsy

Post-mortem interval (PMI) refers to the interval between death and tissue preservation in hours

References

Religious Orders Study and Rush Memory and Aging Project.
Bennett DA, Buchman AS, Boyle PA, Barnes LL, Wilson RS, Schneider JA
Journal: Journal of Alzheimer's disease : JAD 2018 May 26; 64(s1) S161-S189