Codebook for Data Set: GWAS Autopsy Yu 0714

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, it 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 1 follow-up cycle up to this cyclev

Total variables: 13

Clinical Diagnosis(count: 2)

Clinical Diagnosis - Dementia

Variable	age_first_ad_dx	Age - First Dx of AD	Cross-sectional

Description

Float variable for age at cycle where first Alzheimer's disease dx was given.

A variable which calculates age at each cycle (see age_at_visit) is utilized to locate the age at the first cycle where a Alzheimer's disease dx was rendered via the variable, dcfdx (ad = dcfdx = 4 or 5). Most participants are seen on a yearly basis, so this is the best approximation of age at onset of AD. This measure is not available for participants that were demented at baseline cycle.

dcfdx - Clinical Dx by cycle

dementia	value	coding
NO	1	NCI - No cognitive impairment
NO	2	MCI - Mild cognitive impairment
NO	3	MCI+ - Mild cognitive impairment and other Dx
YES	4	AD - Alzheimer's disease
YES	5	AD+ - Alzheimer's disease and other Dx
YES	6	Other - Other Dx
	Other	Unknown

age_at_visit - Float variable for age at cycle

date_ce is used to computed this age which is determined by the first date found for a valid form 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

Clinical Diagnosis - Final Judgement

Variable	cogdx	Final Clinical Dx - Clinical Consensus Diagnosis	Cross-sectional

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

Description

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

Cognitive(count: 1)

Cognitive - Test Scores

Variable	cts_mmse30	MMSE - 2014	Cross-sectional
Other Forms	_l, _lv, _bl		

Description

The Mini Mental State Examination is a widely used, 30 item, standardized screening measure of dementia severity. It has previously been used in epidemiologic studies and is a component of the CERAD protocol. Short term temporal stability is excellent and scores are highly correlated with those on other scales of severity of dementia. This test provides a global measure of cognitive function useful for descriptive purposes. The initial ten items provide a psychometric measure of orientation.

Participants are asked a series of questions to assess orientation to time and place, recall ability, short-term memory, and arithmetic ability.

Data is available at baseline (_bl), last (_l) and last valid (_lv) levels.

*see below for reference.

table1

value	coding
0	Error
1	Correct
7	Not applicable
8	REFUSAL
9	DON'T KNOW

Code book variables:

Variables	Coding	Question
q1mme	table1	1. What is the year?
q2mme	table1	2. What is the season of the year?
q3mme	table1	3. What is the date?
q4mme	table1	4. What is the day of the week?
q5mme	table1	5. What is the month?
q6mme	table1	6. What state are we in?
q7mme	table1	7. What county are we in?
q8mme	table1	8. What city are we in?
q9mme	table1	9. What room are we in?
q10amme*	table1	10a. What is the address of this place? (Street Number)
q10bmme*	table1	10b. What is the address of this place? (Street Name)

*Note: both q10a and q10b have to be correct to get a point

apple	table1	11a. I am going to name 3 objects. After I have said them, I want you to repeat them. Apple (repeated successfully).
tabl	table1	11b. Table (repeated successfully).
penny	table1	11c. Penny (repeated successfully).
q12bmme	0-5	12. WORLD spelled backwards
q13amme	table1	13a. What were the three objects I asked you to remember? Apple.
q13bmme	table1	13a. What were the three objects I asked you to remember? Table.
q13cmme	table1	13a. What were the three objects I asked you to remember? Penny.
q14mme	table1	14.[SHOW WRIST WATCH] What is this called?
q15mme	table1	15.[SHOW PENCIL] What is this called?
q16mme	table1	16.Repeating the phrase -No if s, and s or but s.
q17mme	table1	17. Read the words on this card, then do what it says.
paper	table1	18a. I'm going to give you a piece of paper. When I do, take the paper in your right hand, fold the paper in half with both hands, and put the paper down on your lap.(1 pt for each completed portion of command) Takes paper in right hand.
folds	table1	18b. Folds in half
places	table1	18c. Places in lap
q19mme	table1	19. Write any complete sentence on this piece of paper for me.
q20mme	table1	20.Please copy the drawing on this piece of paper.

Folstein MF, Folstein SE, McHugh PR. Mini-mental state. A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975 Nov;12(3):189-98

Demographics(count: 6)

Variable	age_at_visit	Age at Cycle - Fractional	Longitudinal

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

Description

```
Float variable for age at cycle.

date_ce is used to computed this age which is determined by the
   first date found for a  valid form in the following heirarchy:

    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
```

Variable	age_death	Age at death	Cross-sectional

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

Description

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age of death is calculated from subtracting date of birth
from date of death and dividing the difference by days per year (365.25).

The autopsy rate of the Rush MAP exceeds 80%. Thus, for most participants from the MAP, the
exact date of death is known by being the day an autopsy was performed. In addition to their
annual evaluations, participants from both cohorts (MAP and the MARS) also are contacted
quarterly to determine vital status and changes in health, and death is occasionally learned
of during quarterly contacts. Finally, research assistants for both studies regularly search
the Social Security Death Index via the internet for the small number of persons we are unable
to contact.
```

Variable	educ	Years of education	Cross-sectional

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

Educational attainment and cognitive decline in old age.

Wilson RS, Hebert LE, Scherr PA, Barnes LL, Mendes de Leon CF, Evans DA

Journal: Neurology 2009 Feb 3 ; 72(5) 460-5

Description

```
Education level-

Highest grade or year of regular school as
recorded during the baseline cognitive testing.

Elementary    0 1 2 3 4 5 6 7 8

High School   9 10 11 12

College       13 14 15 16

Graduate\Professional 17 18 19 20 21 ...

98 = REFUSAL (blaise code)
99 = DON'T KNOW (blaise code)

Years of formal education was determined with the education question from the 1990
US Census.
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Variable	msex	Gender	Cross-sectional

Description

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Gender

Allowable codes:
   1 = Male
   0 = Female
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Variable	race	Participant's Race	Cross-sectional

References

Biracial population study of mortality in mild cognitive impairment and Alzheimer disease.
Wilson RS, Aggarwal NT, Barnes LL, Bienias JL, Mendes de Leon CF, Evans DA
Journal: Archives of neurology 2009 Jun ; 66(6) 767-72

A population-based study of hemoglobin, race, and mortality in elderly persons.
Dong X, Mendes de Leon C, Artz A, Tang Y, Shah R, Evans D
Journal: The journals of gerontology. Series A, Biological sciences and medical sciences 2008 Aug; 63(8) 873-8

Description

```
With which group do you most closely identify yourself?


value   coding:
1       White
2       Black, Negro, African-American
3       Native American, Indian
4       Eskimo
5       Aleut
6       Asian or Pacific Island
8       REFUSAL
9       DON'T KNOW
```

Variable	spanish	Spanish/Hispanic origin	Cross-sectional

Description

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

value   coding:
1       Yes
2       No
8       REFUSAL
9       DON'T KNOW
```

Genetics(count: 1)

Variable	apoe_genotype ApoE genotype	Cross-sectional
References	**Apolipoprotein E genotype in diverse neurodegenerative disorders.** Schneider JA, Gearing M, Robbins RS, de l'Aune W, Mirra SS Journal: Annals of neurology 1995 Jul; 38(1) 131-5 **The APOE epsilon4 allele is associated with incident mild cognitive impairment among community-dwelling older persons.** Boyle PA, Buchman AS, Wilson RS, Kelly JF, Bennett DA Journal: Neuroepidemiology 2010 ; 34(1) 43-9 **Analysis of postmortem ventricular cerebrospinal fluid from patients with and without dementia indicates association of vitamin E with neuritic plaques and specific measures of cognitive performance.** Hensley K, Barnes LL, Christov A, Tangney C, Honer WG, Schneider JA, Bennett DA, Morris MC Journal: Journal of Alzheimer's disease : JAD 2011 ; 24(4) 767-74	
Description	apolipoprotein E (APOE) value coding 22.00 E2E2 23.00 E2E3 24.00 E2E4 33.00 E3E3 34.00 E3E4 44.00 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.	

Pathology(count: 3)

Pathology - Alzheimer's Disease

Variable	braaksc	Braak Stage	Cross-sectional

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

Cholinergic plasticity in hippocampus of individuals with mild cognitive impairment: correlation with Alzheimer's neuropathology.
Ikonomovic MD, Mufson EJ, Wuu J, Cochran EJ, Bennett DA, DeKosky ST
Journal: Journal of Alzheimer's disease : JAD 2003 Feb; 5(1) 39-48

Analysis of postmortem ventricular cerebrospinal fluid from patients with and without dementia indicates association of vitamin E with neuritic plaques and specific measures of cognitive performance.
Hensley K, Barnes LL, Christov A, Tangney C, Honer WG, Schneider JA, Bennett DA, Morris MC
Journal: Journal of Alzheimer's disease : JAD 2011 ; 24(4) 767-74

Description

Braak Stage

This assessment is a semiquantitative measure of neurofibrillary tangles.

Diagnosis includes algorithm and neuropathologist's opinion.

value	coding
0	0
1	I
2	II
3	III
4	IV
5	V
6	VI
8	DK
9	Missing

Braak H, Braak E. Neuropathological staging of Alzheimer related changes. Acta Neuropathol (Berl). 1991;82:239-259. PMID: 175955.

Variable	ceradsc	Assessment of neuritic plaques	Cross-sectional

References

Chronic distress, age-related neuropathology, and late-life dementia.
Wilson RS, Arnold SE, Schneider JA, Li Y, Bennett DA
Journal: Psychosomatic medicine 2007 Jan ; 69(1) 47-53

Description

CERAD AD

This assessment is a semiquantitative measure of neuritic plaques.

Diagnosis includes algorithm and neuropathologist's opinion.

value	coding
1	Definite
2	Probable
3	Possible
4	No AD
9	Missing

Pathology - Autopsy - General

Variable	pmi	Post-mortem interval in hours.	Cross-sectional
References	**Analysis of postmortem ventricular cerebrospinal fluid from patients with and without dementia indicates association of vitamin E with neuritic plaques and specific measures of cognitive performance.** Hensley K, Barnes LL, Christov A, Tangney C, Honer WG, Schneider JA, Bennett DA, Morris MC Journal: Journal of Alzheimer's disease : JAD 2011 ; 24(4) 767-74		
Description	`Interval between death and tissue preservation in hours.`		