

SAGES I Numeric Variables

Name	Description	Type Unit	Min	Max	^a Miss (%)	Source	Time	Abbreviated Reference	Notes
vd3ms	Modified Mini-Mental State (3MS) examination	Num	71	100	None	Patient interview	Baseline	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	SAGES administered the 3MS test at baseline to screen for dementia.
vdadlt	Activities of Daily Living dependency score	Num	0	7	6 (0.2%)	Patient interview	Baseline, 1, 2, 6, 12, 18 months	Pisani M. Journal of the American Geriatrics Society. 2017. 65(1): 51. Table 1	ADL dependency score is a simple summary score of 7 ADL items. Each item has values: 0 = no help; 1 = help; 2 = unable to do. Refused and don't know responses are coded as missing. Higher score indicates higher level of impairment. Summary score is prorated as long as 4 or more items are not missing.
vdagesurg	Age at index surgery	Num years	70	90+	None	Patient interview	Baseline	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	Age at index surgery is defined as (surgery date - date of birth) divided by 365.25. 90 years and above are top coded as 90+.
vdbmi	Body Mass Index (BMI)	Num kg/(m)^2	28	>60	115 (4.3%)	Patient interview	Baseline, 2, 6, 12, 18 months	Hshieh T. Annals of Surgery. 2017. 265(4): 647. Table 1	We use self-reported height and weight to calculate BMI using the standard formula: mass (kg) / height (m)^2.
vdbpv	Brain Parenchymal Volume (BPV)	Num cubic centimeters	752	1330	None	MRI	Baseline	Cavallari M. Neurobiology of aging. 2015. 36(6): 2122. Table 2	The Brain Parenchymal Volume (BPV) represents the total volume of the brain parenchyma. BPV was measured using the automatic segmentation of FreeSurfer [Fischl, 2002]. All the brain structures segmented by FreeSurfer and included in the brain parenchyma (i.e. all of the FreeSurfer brain labels except the cortical and ventricular CSF, and the choroid plexi) were summed together to obtain a measure of the whole brain parenchymal volume in.
vdcamseveritysf_peak	Peak CAM-S score, short form	Num	0	7	None	Hospital assessment	Daily	Vasunilashorn S. Journal of general internal medicine. 2016. 31(10):1164. Inouye, S.K., 2014. Annals of Internal Medicine, 160(8), pp.526-533.	Short form Peak CAM-S score during index hospitalization.
vdcamseveritylf_peak	Peak CAM-S score, long form	Num	0	19	None	Hospital assessment	Daily	Vasunilashorn S. Journal of general internal medicine. 2016. 31(10):1164. Table 2	Long form Peak CAM-S score during index hospitalization.
vdcamseveritysf_sum	Sum of all CAM-S score, short form	Num	0	58	None	Hospital assessment	Daily	Vasunilashorn S. Journal of general internal medicine. 2016. 31(10):1164.	Sum of all CAM-S scores in short form during index hospitalization.

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vdcamseveritylf_sum	Sum of all CAM-S score, long form	Num	0	132	None	Hospital assessment	Daily	Vasunilashorn S. Journal of general internal medicine. 2016. 31(10):1164. Table 2	Sum of all CAM-S scores in long form during index hospitalization.
vdcamseveritysf	CAM-S severity score, short form	Num	0	7	11 (0.5%)	Hospital assessment	Daily	Inouye S. Annals of Internal Medicine. 2014. 160(8): 526. Figure 1	CAM-S severity score short form is the sum of 4 CAM features, including fluctuating course, inattention, disorganized thinking, and altered level of consciousness. A subject missing or “uncertain” on more than 50% of CAM features will have their severity score set to missing. A subject missing or “uncertain” on less than 50% of CAM features will have their severity be pro-rated.
vdcamseveritylf	CAM-S severity score, long form	Num	0	19	12 (0.6%)	Hospital assessment	Daily	Inouye S. Annals of Internal Medicine. 2014. 160(8): 526. Table 1	CAM-S severity score long form is the sum of all CAM features, including fluctuating course, inattention, disorganized thinking, altered level of consciousness, disorientation, memory impairment, perceptual disturbances, psychomotor agitation, and sleep-wake disturbance. A subject missing or “uncertain” on more than 50% of CAM features will have their severity score set to missing. A subject missing or “uncertain” on less than 50% of CAM features will have their severity be pro-rated.
vdcrp_preop	Preoperative c-reactive protein (CRP) level	Num mg/L	0.06	96.1	7 (1.2%)	Biomarker	Index hospitalization	Vasunilashorn S, et al. J Am Geriatr Soc. 2017; 65:e109; Figure 1	
vdcrp_pod2	Postoperative day 2 CRP level	Num mg/L	0.21	485.7	4 (0.7%)	Biomarker	Index hospitalization	Vasunilashorn S. The journals of gerontology. Series A, Biological sciences and medical sciences. 2015. 70(10): 1289. Table 2	
vdeduc	Years of education	Num years	5	20	None	Patient interview	Baseline	Inouye S. Alzheimer’s & dementia. 2016. 12(7): 766. Table 1	Missing values are replaced with singly imputed values (using sex, mother’s and father’s education, nativity, financial well-being in youth) as predictors using iterative chained equations.
vdgcp	General Cognitive Performance (GCP) score	Num	16.6	84.1	17 (0.5%)	Patient interview	Baseline, 1, 2, 6, 12, 18 months	Gross A. Neuroepidemiology. 2014. 42(3): 144. Figure 4	The General Cognitive Performance (GCP) score is an item response theory based factor score based on patient’s performance on multiple neuropsychological tests. The GCP in SAGES is scaled to the ADAMS study, which is representative of the US population.

Name	Description	Type Unit	Min	Max	^a Miss (%)	Source	Time	Abbreviated Reference	Notes
vdiadlt	Instrumental Activities of Daily Living (IADL) dependency score	Num	0	12	6 (0.2%)	Patient interview	Baseline, 1, 2, 6, 12, 18 months	Hshieh T. <i>Annals of Surgery</i> . 2017. 265(4): 647. Figure 1	IADL dependency score is a simple summary score of 7 IADL items. Each item has values: 0 = no help; 1 = some help; 2 = unable to do. Refused and don't know responses for each item are coded as missing. Higher score indicates higher level of impairment. Summary score is prorated as long as 4 or more items are not missing.
vdicv	Intracranial Cavity Volume	Num cubic centimeters	1048	1813	None	MRI	Baseline	Cavallari M. <i>Neurobiology of aging</i> . 2015. 36(6): 2122. Table 2	The intracranial cavity includes the brain parenchyma as well as ventricular and cortical cerebrospinal fluid (CSF). Intracranial cavity masks were segmented from T2-weighted images using the BET (Brain Extraction Tool; Smith, 2002) and subsequently reviewed and manually corrected by a neuroimaging expert. Intracranial cavity volume (ICV) is expressed in cubic centimeters. We used this variable to normalize the volumetric MRI variables by head size.
vdicq	Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) score, proxy reported	Num	1.12	5	82 (3.9%)	Proxy interview	<i>Baseline, 6, 12, 18 months</i>	Inouye S. <i>Alzheimer's & dementia</i> . 2016. 12(7): 766. Figure 2, Tables 1 & 4	SAGES study collects a proxy-rated IQCODE that measures patient's cognitive decline every six months. IQCODE is a composite score taken the mean of sixteen items. Refused and don't know responses for each item are coded as missing. The overall IQCODE score is set to missing if more than 8 items are not answered.
vdmrilefhippo	Left Hippocampal Volume	Num cubic centimeters	1.56	4.39	None	MRI	Baseline	Cavallari M. <i>Neurobiology of aging</i> . 2015. 36(6): 2122. Tables 2 and 3	Measurement of the hippocampal volume was based on the automated parcellation of this structure by FreeSurfer [Fischl, 2002]. The volume of the left and right hippocampus volume are provided. Hippocampal volume is expressed in cubic centimeters. In our analysis, we used the average hippocampal volume (left+right)/2.
vdmrighhippo	Right Hippocampal Volume	Num cubic centimeters	1.36	4.90	None	MRI	Baseline	Cavallari M. <i>Neurobiology of aging</i> . 2015. 36(6): 2122. Tables 2 and 3	Measurement of the hippocampal volume was based on the automated parcellation of this structure by FreeSurfer [Fischl, 2002]. The volume of the left and right hippocampus volume are provided. Hippocampal volume is expressed in cubic centimeters. In our analysis, we used the average hippocampal volume (left+right)/2.

Name	Description	Type Unit	Min	Max	^a Miss (%)	Source	Time	Abbreviated Reference	Notes
vdwmh	White Matter Hyperintensity Volume	Num cubic centimeters	1.03	60.67	None	MRI	Baseline	Cavallari M. Neurobiology of aging. 2015. 36(6): 2122. Table 2	White Matter Hyperintensities (WMH) volume is a measure of brain damage of presumed cerebrovascular origin. Total WMH volume was obtained using a semi-automated image segmentation method based on three channels: T1-weighted, T2-weighted and FLAIR (FLuid Attenuated Inversion Recovery) images. Bias-field correction to account for field inhomogeneities and automated spatial co-registration of T1-weighted, T2-weighted and FLAIR images was performed using the 3DSlicer software (www.slicer.org).

SAGES I Binary and Categorical Variables

Name	Description	Type	Values	^a Miss (%)	Source	Time	Abbreviated Reference and notes	Notes
vdadlany	Any ADL impairment	Bin	0 [no] 1 [yes]	6 (0.2%)	Patient interview	Baseline, 1, 2, 6, 12, 18 months	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	A binary indicator of any impairment in ADL. Values of 1 indicate any impairment, defined by having a summary score greater than or equal to 1.
vdalcohol	Current Alcohol Consumption (Frequency)	Cat	1 [every day] 2 [5-6 times a week] 3 [3-4 times a week] 4 [1-2 times a week] 5 [1-3 times a month] 6 [<1 time a month] 7 [occasionally] 8 [never]	6 (1.1%)	Patient interview	Baseline	Devore E. The journals of gerontology. Series A, Biological sciences and medical sciences. 2017. 72(12): 1697. Table 1	We created this indicator from the question "How often do you drink alcoholic beverages?" and add a "never" response value for people indicating so in the precedent question "Do you presently drink alcoholic beverages?". The variable is code as missing if source variables have either a refused or don't know response value.
vdcamdelirium	Confusion Assessment Method (CAM) delirium	Bin	0 [no CAM delirium] 1 [CAM delirium]	None	Hospital assessment	Daily	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766.	CAM delirium is equal to 1 (present) if patient experiences acute change in mental status or behavior fluctuation in addition to the presence of inattention and either disorganized thinking or altered level of consciousness during daily hospital interview. Each of these symptoms are rated by the SAGES field staff.
vdcamsyndromal	Subsyndromal delirium (SSD)	Bin	0 [no SSD] 1 [SSD]	None	Hospital assessment	Daily	Vasunilashorn S. Journal of the American Geriatrics Society. 2017. 65(8): e109. Figure 2	Subsyndromal delirium is equal to 1 (present) if patient experiences acute change in mental status or behavior fluctuation in addition to either the presence of two CAM core features (inattention, disorganized thinking, level of consciousness) or one CAM core feature and one of the following symptoms: disorientation, perceptual disturbance, delusion, psychomotor agitation, psychomotor retardation or inappropriate behavior scored in either the CAM or the Delirium Symptom Interview (DSI) when available.
vdcci	Charlson Comorbidity Index	Cat	0, 1, 2, 3, 4, 5, 6, 7	None	Medical chart	Index hospitalization	Hshieh T. Annals of Surgery. 2017. 265(4): 647. Table 1	The Charlson Comorbidity Index is a weighted sum of comorbidities collected from medical chart abstraction. These comorbidities (and their weights) are specified in Charlson et. al (1987).
vddrisk93	Any visual impairment (over 20/70 after correction)	Bin	0 [no] 1 [yes]	3 (0.5%)	Patient interview	Baseline	Jones R. Journal of Geriatric Psychiatry and Neurology. 2016. 29(6): 320. Table 1	A binary indicator of corrected vision worse than 20/70.

Name	Description	Type	Values	*Miss (%)	Source	Time	Abbreviated Reference and notes	Notes
vdesl	English as a Second Language (ESL)	Bin	0 [no] 1 [yes]	None	Patient interview	Baseline	Saczynski S. Lancet Psychiatry. 2014. 1(6): 437. Table 1	Values of 1 indicate that patient speaks English as a second language.
vdfacilitydc	Discharged to a post-acute facility after index hospitalization	Bin	0 [no] 1 [yes]	None	Medical chart	Index hospitalization	Racine A. Alzheimer's & dementia. 2018. 14(5): 590. Table 3 and Results	Values of 1 indicate that patient was discharged to: Acute rehabilitation facility; Subacute rehabilitation facility; or Chronic care facility after index hospitalization.
vdfemale	Female sex [self-identification]	Bin	0 [male] 1 [female]	None	Patient interview	Baseline	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	A binary indicator of patient's sex.
vdfriedfrail_index	Fried Frailty Index	Cat	0 [Not frail] 1 [Pre frail] 2 [Frail]	57 (10%)	Patient interview	Baseline	Devore E. The journals of gerontology. Series A, Biological sciences and medical sciences. 2017. 72(12): 1697.	Frailty is operationalized as a function of five indicators: unintentional weight loss, exhaustion, low physical activity, slow gait speed, low grip strength. To create the Fried Index, we count and divide the number of indicators into three groups: 0, not frail; 1-2, pre frail; 3+, frail.
vdhearingimp	Any hearing impairment	Bin	0 [no] 1 [yes]	1 (0.2%)	Patient interview	Baseline	Devore E. The journals of gerontology. Series A, Biological sciences and medical sciences. 2017. 72(12): 1697. Table 1	We define hearing impairment if patient scores 6 or more incorrect responses on Whisper test or use a hearing aid.
vdiadlany	Any IADL impairment	Bin	0 [no] 1 [yes]	6 (0.2%)	Patient interview	Baseline, 1, 2, 6, 12, 18 months	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	A binary indicator of any impairment in IADL. Values of 1 indicate any impairment, defined by having a summary score greater than or equal to 1.
vdlivesalone	Lives alone	Bin	0 [no] 1 [yes]	None	Patient interview	Baseline	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	Values of 1 indicate patient was living alone at baseline.
vdlivesatnh	Lives in a nursing home	Bin	0 [no] 1 [yes]	None	Patient interview	Baseline	Racine A. Alzheimer's & dementia. 2018. 14(5): 590. Tables 3 and 4	Values of 1 indicate patient was living in a nursing home at baseline.
vdlos	Length of stay	Cat	1 [2 days] 2 [3-5 days] 3 [6+ days]	None	Medical chart	Index hospitalization	Racine A. Alzheimer's & dementia. 2018. 14(5): 590.	

Name	Description	Type	Values	^a Miss (%)	Source	Time	Abbreviated Reference and notes	Notes
vdmarrried	Marital Status [self-identification]	Bin	0 [unmarried] 1 [currently married or living with partner]	None	Patient interview	Baseline	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	A binary indicator of patient's marital status at baseline.
vdnonwhite	Non-white or Hispanic [self-identification]	Bin	0 [not white race nor Hispanic ethnicity] 1 [White race or Hispanic ethnicity]	None	Patient interview	Baseline	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. A binary indicator of patient's race/ethnicity.	A binary indicator of patient's race/ethnicity.
vdsagesdeliriumever	Ever delirious by medical chart or in hospital CAM assessments	Bin	0 [no] 1 [Yes]	None	Hospital assessment and medical chart	Index hospitalization	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 3	Values of 1 indicate patient was classified as delirious if either CAM or medical chart criteria were met on a given day during index hospitalization.
vdsmokingstatus	Smoking status	Cat	0 [never smokes] 1 [smoked in the past] 2 [currently smokes]	None	Patient interview	Baseline	Racine A. Alzheimer's & dementia. 2018. 14(5): 590. Table 1	The variable is code as missing if source variables have either a refused or don't know response value.
vdsurg	Type of surgery	Cat	1 [orthopedic] 2 [vascular] 3 [gastrointestinal]	None	Medical chart	Index hospitalization	Inouye S. Alzheimer's & dementia. 2016. 12(7): 766. Table 1	An indicator of surgery type at index hospitalization derived from patient's medical record.

SAGES I Unique Record Indicators

Name	Description	Type	Values	^a Miss (%)
studyid	Study subject Identifier	String		None
timefr	Assessment time point	Cat	0, 1, 2, 6, 12, 18	None
day	Hospital interview day	Num	0-14	None