

# HEALTH AND RETIREMENT STUDY

Aging, Demographics, and Memory Study (ADAMS) Supplement

Data Release (v. 8.0)  
April, 2013  
(Sensitive Health Data)

Data Description and Usage  
for  
Tracker  
Wave A  
Wave B  
Wave C  
Wave D

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Health and Retirement Study  
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University of Michigan

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# Data Description and Usage

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## 1. Introduction to the ADAMS

The ADAMS early data release consists of data obtained as part of the Aging, Demographics, and Memory Study (ADAMS). Three waves of data were collected from 2001 through 2008. By receiving the dataset, you agree to use it for research and statistical purposes only and make no effort to identify subjects. In addition, you agree to send us a copy of any publications you produce from these data. (See *Obtaining the Data* at the end of this document for additional details.)

### 1a. Study Overview and Purpose

The Aging, Demographics, and Memory Study (ADAMS) is a supplement to the Health and Retirement Study (HRS) funded by the National Institute on Aging (U01-AG009740) with the specific aim of conducting a population-based study of dementia. HRS formed a partnership with a research team at Duke University led by Brenda Plassman, Ph.D. to conduct in-person clinical assessments for dementia on selected HRS respondents. The purpose was to gather additional information on respondents' cognitive status and assign a diagnosis of (1) dementia, (2) cognitive impairment but not demented (CIND), or (3) non-case. Prior community-based studies of dementia have focused on a particular geographical area or have been based on nationally distributed samples that are not representative of the population. This study is the first of its kind to conduct in-home assessments of dementia in a national sample that is representative of the U.S. elderly population.

### 1b. Study Goals

The primary goal of the ADAMS was to collect data that will allow researchers to estimate the prevalence, predictors, and outcomes of dementia in the U. S. elderly population. The study will facilitate our understanding of the natural history of pre-clinical dementia as well as the role of dementia in changing the health and social functioning of older Americans. ADAMS provides an opportunity for conducting in-depth investigations related to the impact of dementia and cognitive impairment, not dementia on formal health care utilization, informal caregiving, and the total societal costs of this care. In addition, the study permits the examination of the validity of the HRS cognitive functioning measures as a screening tool for cognitive impairment or dementia.

### 1c. Study Design

A group of 1,770 HRS respondents, age 70 or older, was selected from the 2000 and 2002 waves based on the score on the self- or proxy-cognitive assessment measure. Among this group, we completed initial assessments (Wave A) with 856 respondents. In order to ensure a sufficient number of respondents across the full range of cognitive ability, the sample was stratified based on cognitive status. Five cognitive strata (ranging from "low functioning" to "high normal") were defined based on respondents' performance in the cognitive measures in the most recent HRS interview (either 2000 or 2002, depending on the timing of recruitment into ADAMS). Scores on the full set of

HRS cognitive items (ranging from 0 to 35 points) were used to classify self respondents, and scores on the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE; Jorm, 1994) were used to classify proxy respondents. The cognitively normal group was further stratified by age (age 70-79 versus 80 or older) and sex in order to ensure adequate numbers in each of these subgroups. More detailed information on the ADAMS sampling strategy, including the cut-points and sample size for each cognitive stratum is available in *Aging, Demographics and Memory Study (ADAMS): Sample Design, Weighting and Analysis for ADAMS* a report by Heeringa, Fisher, Hurd, Langa, Ofstedal, Plassman, Rodgers, & Weir, available on the HRS website.

More information about the HRS self and proxy respondent cognitive measures is described in the HRS documentation report *Documentation of Cognitive Functioning Measures in the Health and Retirement Study* by Ofstedal, Fisher, & Herzog <<http://hrsonline.isr.umich.edu/sitedocs/userg/dr-006.pdf>>.

### **1d. Fieldwork Timing and Response Rate**

**1d-1. Wave A.** Initial ADAMS assessments (Wave A) were completed for 856 subjects (representing a 56% response rate among non-deceased sample members) between August 2001 and December 2003. 227 subjects (12.8%) died before an initial Wave A assessment could be completed, and 687 subjects (38.8%) refused an assessment or did not participate for another reason (e.g., the subject did not have an available informant or the in-home assessment was cancelled due to illness of the subject or informant). A table comparing the demographic characteristics of the assessed subjects, individuals who were deceased before an assessment could be conducted, and the living non-respondents are presented the study design and methods paper by Langa et al. (2005) published in *Neuroepidemiology*.

**1d-2. Wave B.** It is standard practice in tertiary AD specialty clinics to defer diagnosis in uncertain cases until longitudinal follow-up information is obtained. However, this is not an option in research protocols. Thus, for each subject, a diagnosis was assigned after the Wave A assessment and follow-ups (Wave B assessments) were attempted for those with a diagnosis of “cognitive impairment, not demented,” mild dementia, or borderline normal cognition and for whom longitudinal information will likely clarify the diagnosis. Subjects for whom a reassessment would be useful were identified during the diagnostic conferences. A subset of 333 subjects was contacted for follow-up assessments (Wave B) between November 2002 and March 2005. A total of 252 subjects completed Wave B follow-up visits (85% of non-deceased initial assessment participants). 36 subjects died before a Wave B assessment could be completed, and 45 subjects refused a Wave B assessment or did not participate for another reason (e.g., the subject did not have an available informant or the in-home assessment was cancelled due to illness of the subject or informant).

**1d-3. Wave C.** Starting in 2006, we conducted follow-up visits among all initial (Wave A) participants who were still alive in 2006 and not previously diagnosed with dementia. A total of 466 respondents were targeted for these follow-up visits, and a Wave C assessment was conducted with 315 subjects between June, 2006 and May, 2008

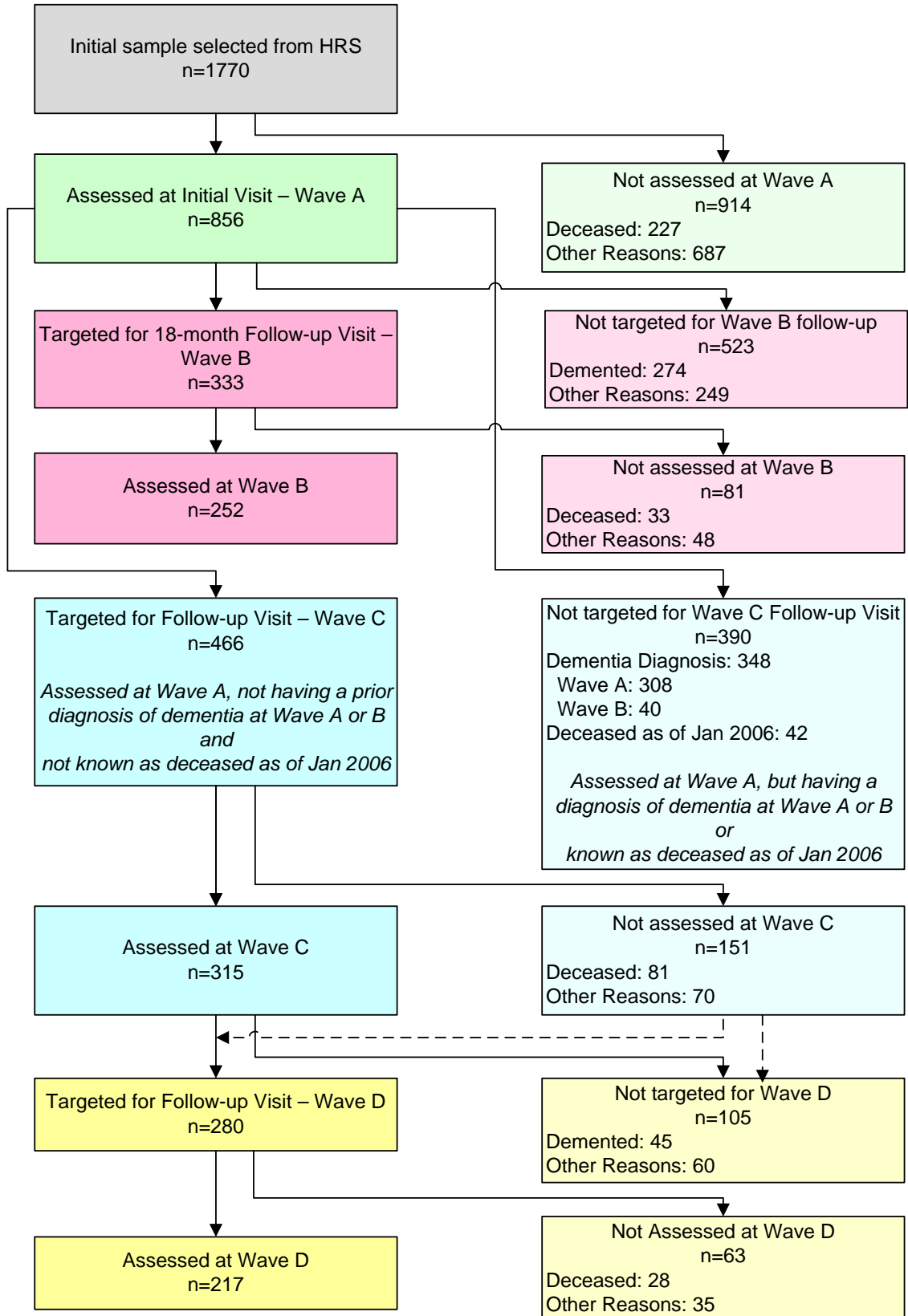
(82% response rate net of mortality). 81 subjects died before a Wave C follow-up visit could be completed, and 70 subjects refused a Wave C assessment or did not participate for another reason.

**1d-4. Wave D.** Beginning in 2008, Wave D assessments (up to the third follow-up among original ADAMS respondents) were completed among respondents identified for follow-ups during Wave C. A total of 280 respondents were targeted for Wave D follow-up visits, and a Wave D assessment was conducted with 217 subjects between January, 2008 and December, 2009 (86% response rate net of mortality). A few participants who were not available to participate in Wave C were re-contacted and completed follow-up visits in Wave D. 28 subjects died before a Wave D follow-up visit could be completed, and 35 subjects refused a Wave D assessment or did not participate for another reason.

Fieldwork for Waves A – D is summarized in Figure 1, below.



**Figure 1. ADAMS Fieldwork Flow Chart**



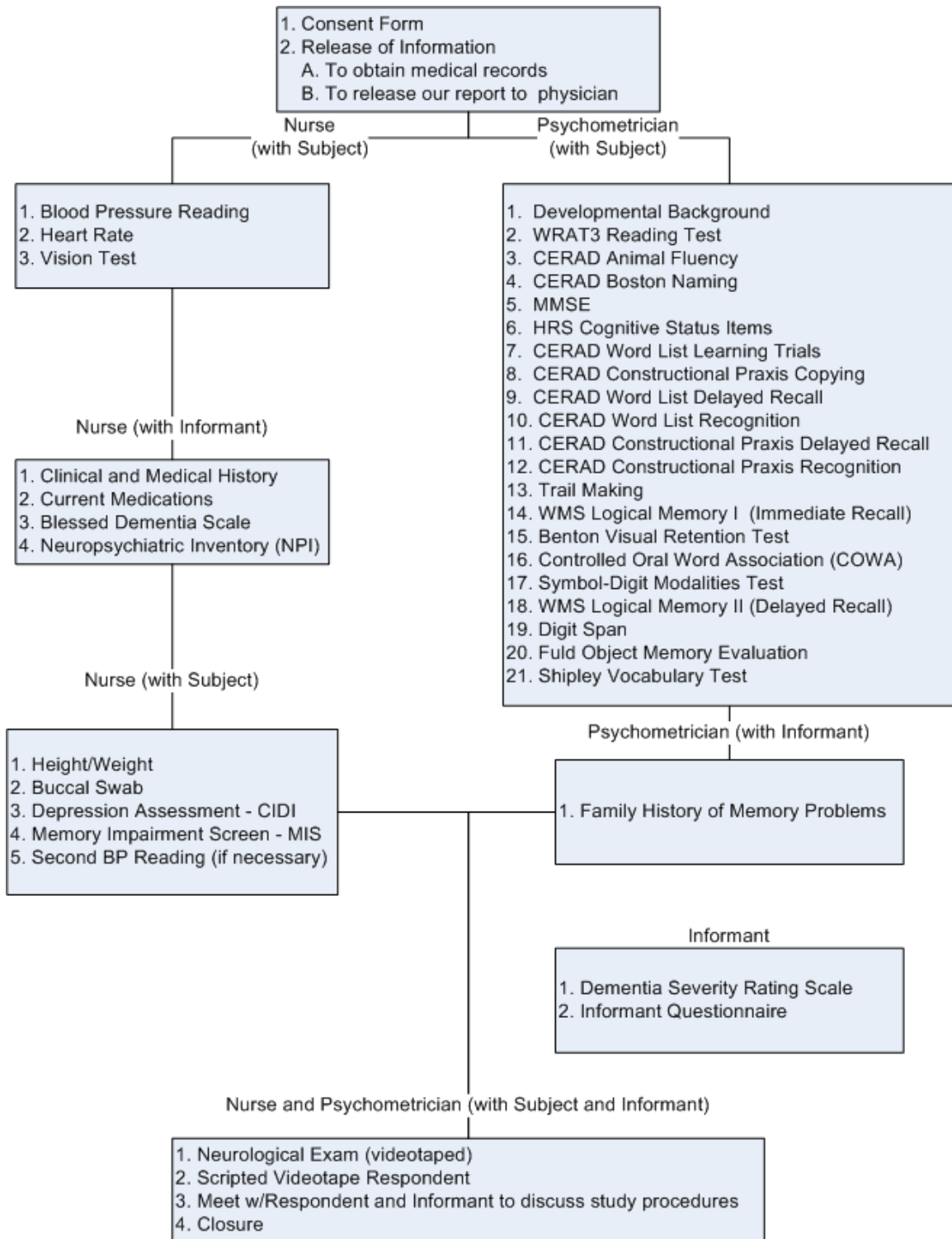
### **1e. ADAMS Clinical Assessment Protocol**

The ADAMS in-person evaluation was a 3- to 4-hour structured assessment conducted in the subject's residence by a nurse and neuropsychology technician, both specially trained in data collection for dementia evaluation. This protocol required participation of both the HRS respondent (subject) and an informant who was familiar with the subject's daily activities and medical history. A close family member (e.g., spouse or child) usually served as the informant. After obtaining consent, the neuropsychology technician administered the neuropsychological test battery to the subject and the nurse met separately with the informant to obtain detailed information about the subject, including cognitive and functional changes, medical and psychiatric history, current medication use, and current behavioral and psychiatric symptoms. The nurse measured the subject's blood pressure and heart rate. The nurse next performed a standardized neurological examination with the subject and collected a buccal tissue sample for DNA testing of the ApoE genotype, while the neuropsychology technician met with the informant to obtain information on the family history of memory impairment and also asked the informant to complete a dementia severity measure for collection of information on the severity of the subject's symptoms. The Wave B follow-up assessment protocol was essentially the same as the initial (Wave A) assessment protocol.

In addition, a self-administered paper-and-pencil caregiver questionnaire was completed by informants. This questionnaire included measures about activities in which the subject is involved, the IQCODE, functional limitations of the subject, out-of-pocket medical expenditures, caregiver wellbeing (including depressive symptoms, caregiving strain, and positive aspects of the caregiving experience), and employment and demographic information for the informant.

The ADAMS neuropsychology technicians were from Duke University and were trained by a PhD-level clinical neuropsychologist. The supervising neuropsychologist accompanied new staff on initial visits to certify level of performance, conducted reviews of audiotapes of the visit for quality assurance, and also reviewed the raw neuropsychological test data from each visit. All testing was scored by the original technician and scored again by a second technician before final review by the supervising neuropsychologist. For more information, please refer to the Langa et al. (2005) ADAMS design and methods paper.

**Figure 2. The ADAMS Assessment Procedure**



## **1f. Diagnostic Evaluation**

A Duke University geropsychiatrist, neurologist, neuropsychologist, and cognitive neuroscientist reviewed all information collected during the in-home assessment, and assigned a preliminary research diagnosis regarding cognitive status; this preliminary diagnostic process is referred to as case staffing. Subsequently, the study geropsychiatrist reviewed available medical records and revised the preliminary research diagnosis when justified by this additional medical information. Diagnoses fell within the three general categories of normal cognitive function, cognitive impairment, not demented (CIND), and dementia. Within the CIND and dementia categories, there were several subcategories to denote etiology of cognitive impairment:

### **DEMENTED**

#### Alzheimer's Disease (AD)

Probable AD  
Possible AD

#### Vascular Dementia

Probable Vascular Dementia  
Possible Vascular Dementia

#### Subcortical Dementias

Parkinson's Disease  
Huntington's Disease  
Progressive Supranuclear Palsy  
Normal Pressure Hydrocephalus

#### Other Dementias

Dementia of undetermined etiology  
Frontal lobe dementia  
Severe head trauma  
Alcoholic dementia  
ALS with dementia  
Hypoperfusion dementia  
Lewy Body dementia  
Post-encephalitic dementia

### **COGNITIVE IMPAIRMENT, NOT DEMENTED (CIND)**

Mild-ambiguous  
Mild Cognitive Impairment  
Cognitive Impairment secondary to vascular disease  
Stroke  
Other Neurological conditions  
Other Medical conditions  
Depression  
Psychiatric Disorder  
Low Baseline Intellect / Mental Retardation  
Alcohol Abuse (past)  
Alcohol Abuse (current)  
CIND, non-specified

### **NORMAL COGNITIVE FUNCTION**

Normal/Non-case

Diagnostic criteria were established prior to the start of the ADAMS and were based on published criteria. For dementia, criteria were based on the DSM-III-R and DSM-IV. To capture the likely range of etiologies and clinical presentations of CIND, we defined CIND broadly as functional impairment reported by the ADAMS subject or informant that did not meet criteria for dementia, or performance on neuropsychological measures that was below expectation and  $\geq 1.5$  standard deviations below published norms on any test within a cognitive domain (e.g., memory, orientation, language, executive function,

praxis). Final diagnoses were assigned by a consensus expert panel made up of neuropsychologists, neurologists, geropsychiatrists, and internists. The Duke University researchers and the consensus diagnosis panel were blind to the HRS cognitive stratum from which the individual was drawn. For more information, please see Langa et al. (2005).

### **1g. Sample Weights**

Three respondent-level sampling weights have been developed for use with the ADAMS data and are available in the ADAMS1TRK\_R data file.

1. The first sample weight variable is called AASAMPWT\_F, and should be used for all cross-sectional analysis of the ADAMS Wave A data. The reference population for this weight is the July 1, 2002 U.S. adult population age 71+. Please note that subjects who were not assessed as part of ADAMS (ASSESS ≠ 1) do not have a sampling weight.

AASAMPWT\_F was updated in June, 2009. *If you have a previous version of the dataset (ADAMS 4.0 or earlier), it is important to obtain the current file, ADAMS1TRK\_R, to obtain the current sample weights.* For a description of how the weights were changed, please refer to the sample weight technical documentation (Heeringa et al., 2010).

2. The second sample weight, ACLONGWT, has been constructed specifically for prospective analysis of the Wave A ADAMS sample cohort. ACLONGWT is designed to allow the analyst to look forward from July 1, 2002 and track each Wave A sample members to a final disposition at Wave C. Data users who are conducting a longitudinal analysis of the ADAMS data are encouraged to use ACLONGWT for estimating transitions over time.

Two other variables were constructed in the development of the ACLONGWT sample weight and are available to data users. The variable, OUTCOME\_C, indicates the respondent's status as of Wave C and can be used for longitudinal tracking. The variable CCOHORTWT was used to create ACLONGWT. The reference population for this weight is non-random and we *do not* advocate analysis of the Wave C data on its own.

3. The third sample weight, ADLONGWT, has been constructed specifically for prospective analysis of the Wave A ADAMS sample cohort. ADLONGWT is designed to allow the analyst to look forward from July 1, 2002 and track each Wave A sample members to a final disposition at Wave D. Data users who are conducting a longitudinal analysis of the ADAMS data are encouraged to use ADLONGWT for estimating transitions over time.

OUTCOMED was constructed in the development of the ADLONGWT sample weight and is available to data users. OUTCOMED indicates the respondent's status as of Wave D and can be used for longitudinal tracking.

For technical documentation describing how the sampling weights were developed, please see the report entitled *Aging, Demographics And Memory Study (ADAMS): Sample Design, Weighting and Analysis for ADAMS*, available on the HRS website.

## 1h. Overview of Content of ADAMS Sections

The ADAMS data includes the following content by section:

<p style="text-align: center;"><b>Tracker</b></p> <hr/> <p>ADAMS Tracker File – Demographics and Field Outcomes for Waves A-C</p> <p style="text-align: center;"><b>Section B</b></p> <hr/> <p>Neuropsychiatric Inventory (NPI) Composite International Diagnostic Interview (CIDI depression screen) Blood pressure and heart rate</p> <p style="text-align: center;"><b>Section C</b></p> <hr/> <p>Clinical History</p> <p style="text-align: center;"><b>Section D</b></p> <hr/> <p>ADAMS Consensus conference research diagnoses for dementia Clinical Dementia Rating (CDR) Scale Dementia Severity Rating Scale (DSRS) Modified Hachinski Ischemic Score Apolipoprotein E genotype Blessed Dementia Scale Medical History (some)</p>	<p style="text-align: center;"><b>Section E</b></p> <hr/> <p>Medications</p> <p style="text-align: center;"><b>Section F</b></p> <hr/> <p>Family History</p> <p style="text-align: center;"><b>Section G</b></p> <hr/> <p>Informant Questionnaire</p> <ul style="list-style-type: none"> <li>▪ Jorm IQCODE</li> <li>▪ Report of subject’s activities</li> <li>▪ Functional Limitations (ADLs/IADLs)</li> <li>▪ Out-of-pocket medical expenditures</li> <li>▪ Caregiver well-being (abbreviated CES-D, caregiving strain, positive aspects of caregiving experience)</li> <li>▪ Informant employment</li> </ul> <p>Informant demographic information</p> <p style="text-align: center;"><b>Section H</b></p> <hr/> <p>Medical Conditions</p> <p style="text-align: center;"><b>Section J</b></p> <hr/> <p>Dementia Checklist Neurological Exam</p> <p style="text-align: center;"><b>Section M</b></p> <hr/> <p>Medical History</p> <p style="text-align: center;"><b>Section N</b></p> <hr/> <p>Memory Impairment Screen (MIS) HRS Self-report of memory problem questions</p>	<p>Neuropsychological Measures:</p> <ul style="list-style-type: none"> <li>▪ CERAD Animal Fluency</li> <li>▪ CERAD Abbreviated Boston Naming Test</li> <li>▪ Mini-Mental State Exam</li> <li>▪ CERAD Word List Three Trial Learning, Delayed Recall, and Recognition</li> <li>▪ CERAD Constructional Praxis Copying, Delayed Recall, and Recognition</li> <li>▪ Reitan Trail Making Test Part A and B</li> <li>▪ Benton Visual Retention Test</li> <li>▪ Wechsler Memory Scale – Revised Logical memory I (immediate) and Logical Memory II (delayed)</li> <li>▪ Controlled Oral Word Association</li> <li>▪ Symbol Digit Modality Test</li> <li>▪ Digit Span</li> <li>▪ Fuld Object Memory Test</li> <li>▪ Shipley Vocabulary Test (Shipley Institute of Living Scale)</li> <li>▪ WRAT 3 Blue Reading Test (literacy)</li> <li>▪ HRS self-respondent cognitive measures (modified TICS)</li> </ul>
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### 1i. Levels of ADAMS Wave A, B, C, and D Data Files

All files are at the individual (respondent/subject) level, except for medications drug-level data, medical conditions condition-level data, and family history child-level and sibling-level data. A detailed description of the contents of these sections follows in [3. ADAMS Data File Content](#).

**Table 1. Content and Level of Waves A, B, C, and D Data Files**

Content	Level	Wave A	Wave B	Wave C	Wave D
Assessment Data Part I	Respondent	AB_R	BB_R	CB_R	DB_R
Clinical History	Respondent	AC_R	BC_R	CC_R	DC_R
Assessment Data Part II: Dementia Diagnoses/Summary Scores	Respondent	AD_R	BD_R	CD_R	DD_R
Medications	Respondent	AE_R	BE_R	CE_R	DE_R
Medications	Drug	AE_D	BE_D	CE_D	DE_D
Family History	Respondent	AF_R	BF_R	CF_R	DF_R
Family History	Sibling	AF_SB	BF_SB	CF_SB	DF_SB
Family History	Child	AF_CH	BF_CH	CF_CH	DF_CH
Informant Caregiving Questionnaire	Respondent	AG_R	BG_R	CG_R	DG_R
Medical Conditions	Respondent	AH_R	BH_R	CH_R	DH_R
Medical Conditions	Condition	AH_C	BH_C	CH_C	DH_C
Dementia Checklist & Neurological Exam	Respondent	AJ_R	BJ_R	CJ_R	DJ_R
Medical History	Respondent	AM_R	BM_R	CM_R	DM_R
Assessment Data Part III: Neuropsychological Exam	Respondent	AN_R	BN_R	CN_R	DN_R

## 2. What's New in Release 8.0

Release 8.0 includes all the remaining data sections for Waves C and D, completing the public release of all data collected on this sample of ADAMS. Release 8.0 contains two separate files for downloading: 1) ADAMS Wave C files and 2) ADAMS Wave D files. No changes were made to the ADAMS Tracker file as part of this data release.

The most current version of the ADAMS Tracker file was included in Release 7.0. See [7a. Distribution Files](#) for more information about the download files. Table 2 lists the data release, date of data release, section, and content of all ADAMS data files.



**Table 2. Release, Date of Release, Section, and Content of All ADAMS Data**

Release	Date	Wave	Section	Content
1	Jan 07 & Nov 07	A, B	A <sup>1</sup>	Demographics and Field Outcomes
1	Jan 07	A, B	B	Assessment Data Part I
1	Jan 07 & Jun 09	A, B	D	Assessment Data Part II: Dementia Diagnoses/Summary Scores
1	Jan 07	A, B	G	Informant Caregiving Questionnaire
1	Jan 07	A, B	N	Assessment Data Part III: Neuropsychological Exam
2	Aug 08	A, B	E	Medications
3	Nov 08	A, B	H	Medical Conditions
3	Nov 08	A, B	M	Medical History
4	Jan 09	A, B	F	Family History
4	Jan 09	A, B	J	Dementia Checklist & Neurological Exam
5	Jun 09	A, B, C	TRK	Demographics and Field Outcomes
5	Jun 09	C	D	Assessment Data Part II: Dementia Diagnoses/Summary Scores
6	Sep 09	A, B, C	C	Clinical History
7	Dec 10	D	D	Assessment Data Part II: Dementia Diagnoses/Summary Scores
7	Dec 10	A, B, C, D	TRK	Demographics and Field Outcomes
8	Apr 13	C, D	B	Assessment Data Part I
8	Apr 13	D	C	Clinical History
8	Apr 13	C, D	E	Medications
8	Apr 13	C, D	F	Family History
8	Apr 13	C, D	G	Informant Caregiving Questionnaire
8	Apr 13	C, D	H	Medical Conditions
8	Apr 13	C, D	J	Dementia Checklist & Neurological Exam
8	Apr 13	C, D	M	Medical History
8	Apr 13	C, D	N	Assessment Data Part III: Neuropsychological Exam

### 3. ADAMS Data File Content

In the following sections you will find a detailed description of the contents of the [ADAMS tracker file](#), the [Wave A](#), [Wave B](#), [Wave C](#), and [Wave D](#) files.

<sup>1</sup>This file has now been replaced by ADAMS1TRK\_R.

### 3a. ADAMS Tracker File

ADAMS1TRK\_R includes 120 variables with one record for each HRS respondent selected for the ADAMS (N=1,770).

This file contains:

- Respondent-level identifiers to facilitate file merging: HHID, PN, GSUBHH, HSUBHH, and ADAMSSID
- Flag variable to indicate whether a subject changed households between HRS 2000 and 2002 (SUBHHFLG)
- ADAMS variables including:
  - Respondent-level sampling error cluster (SECLUST) and stratum (SESTRAT) and Wave A sample weight (AASAMPWT\_F) variables.

\*\* Please note: It is important that you use AASAMPWT\_F available in the ADAMS1TRK\_R file, and not the version in ADAMS1AA\_R from an earlier release. See p. 23-28 of the technical report on *Sample Design, Weighting and Analysis for ADAMS* on the Web site for information about how AASAMPWT\_F was created as well as modified in 2009.

- ACLONGWT, the respondent-level prospective analysis sample weight. Please refer to section 1g for more information pertaining to how and when this weight variable should be used. CCOHORTWT and OUTCOMECC, which were used in the development of ACLONGWT, are also included here.
- ADLONGWT, the respondent-level prospective analysis sample weight. Please refer to section 1g for more information pertaining to how and when this weight variable should be used. OUTCOMED, which was used in the development of ADLONGWT, is also included here.
- HRS wave in which subjects were initially selected for ADAMS (2000 vs. 2002; WAVESEL)
- Type of HRS interview pertaining to HRS wave prior to ADAMS selection (PROXY)
- Subject nursing home residence status in HRS wave prior to ADAMS selection (NURSEHM)
- Composite scores on the HRS cognitive measures that were used to select subjects (SELFCOG, PROXCOG) and the cognitive strata used for sample selection (AACOGSTR, AASAMSTR)
- Whether a subject was targeted for a Wave C assessment (CWAVE).
- Whether a subject was targeted for a follow-up assessment after Wave A (FOLUPSEL) or a follow-up assessment after Wave C (CFOLUPSEL)
- Fieldwork result codes for ADAMS Wave A, B, and C assessments (AFRESULT, BFRESULT, CFRESULT, DFRESULT)
- Whether a subject was deceased before an assessment could be conducted (VITSTAT, CVITSTAT, DVITSTAT)
- Whether a Wave A, B, or C assessment was completed (AASSESS, BASSESS, CASSESS, DASSESS)

- Month and year of initial and follow-up assessments (AMONTH, AYEAR, BMONTH, BYEAR, CMONTH, CYEAR, DMONTH, DYEAR)
- Location of the ADAMS assessments (AALOCEXM, BALOCEXM, CALOCEXM, DALOCEXM)
- Native language of ADAMS subject (AALANG, AALANGSP) and whether the demographic questions were asked in Spanish (AADEMSPN).
- Whether an informant questionnaire was returned following Wave A and B assessments (AINFQUES, BINFQUES), and whether there was a change of informant between the Wave A and Wave B visit (if applicable; AINFCHG)
- Demographic variables from the HRS Tracker File (2004, version 1.0) such as GENDER, RACE, HISPANIC type, LANGUAGE, educational background (DEGREE), and month and year of birth (BIRTHMO, BIRTHYR).

Please note that BIRTHYR was updated in ADAMS Release 7.0 for three cases based on newly available information. These cases include:

HHID=023486 PN=011

HHID=062108 PN=011

HHID=202527 PN=010

(The HRS tracker file is updated on an on-going basis. The most up-to-date version of the HRS Cross-Wave Tracker File is available on the HRS Web site.)

- Years of education (EDYRS). This is based on SCHLYRS from the HRS tracker file, with the exception of values for 2 respondents who indicated 12 years of education at the ADAMS assessment, although this differs from the HRS Tracker file. We recommend using this variable rather than SCHLYRS in the HRS tracker file to make this correction.
- Information about the type of area in which the subject lives (AREGION, AURBRUR), from HRS data.
- Although education level was available from HRS data in most instances, the ADAMS team collected additional educational information to aid interpretation of the neuropsychological test data. This information includes
  - How well the subject performed in school (AAEDPERF)
  - Whether the subject ever failed a subject in school (AAEVFAIL)
  - Whether the subject was ever held back or tutored (AAHLDBCK, AAEDUCCM)
  - The reason for not completing school/a degree (if applicable; AAEDUCR)
  - Source of this demographic data from ADAMS (ADEMSOURCE). Specifically, this is the source of data provided in AAEDPERF, AAEVFAIL, AAHLDBCK, AAEDUCCM, and AAEDUCR.
- Constructed demographic variables including subject age at date of Wave A assessment (AAGE), Wave B (BAGE), Wave C (CAGE), Wave D (DAGE), and 10-year age brackets for date of assessment (AAGEBKT, BAGEBKT,

CAGEBKT, DAGEBKT), age at time of selection into the ADAM sample (AAAGESEL), and subject ethnicity (ETHNIC).

Please note that the Wave A and/or Wave B age and age bracket variables were updated in ADAMS Release 7.0 for three participants to reflect corrected BIRTHYR data recently obtained by HRS. These cases include:

HHID=023486 PN=011

HHID=062108 PN=011

HHID=202527 PN=010

- Additional variables from the HRS Tracker File regarding respondents' background or fieldwork status in the HRS, including STUDY, FIRSTIW, AIWWAVE, BIWWAVE, CIWWAVE, DIWWAVE, EIWWAVE, FIWWAVE, GIWWAVE, HIWWAVE.
- Specific variables from the HRS Tracker File (2004, v. 1.0) pertaining to the HRS 2000 ("G") and 2002 ("H") waves of data collection, including:
  - result codes (GRESCODE, HRESCODE)
  - vital status (GALIVE, HALIVE)
  - interview dates (GIWMONTH, HIWMONTH, GIWYEAR, HIWYEAR)
  - interview type (GIWTYPE, HIWTYPE)
  - whether a proxy reporter completed the interview (GPROXY, HPROXY)
  - type of proxy (GPROXTYP, HPROXTYP)
  - family/financial respondent type (GFAMR, GFINR, HFAMR, HFINR)
  - subject coupleness (GCOUPLE, HCOUPLE)
  - subject nursing home status (GNURSHM, HNURSHM)
  - sample weights (GWGTR, HWGTR)
- Additional demographic variables from the ADAMS, including
  - Subject's marital status at the time of the ADAMS assessment (AAMARRD, BAMARRD, CAMARRD, DAMARRD)
  - Subject's work status at the time of the assessment (AACURRWK, BACURRWK)
    - If the subject worked outside the home for a short period of time (even if it was early in adult life) and has not worked since, work status was coded as *retired*. If the subject retired from his/her primary job because he/she wanted to retire, but has now sought a part-time job in a different type of work to stay busy, work status was also coded as *retired*.
    - If the subject was forced to retire because the company closed and he/she was seeking either part-time or full-time employment, work status was coded as *unemployed*.
    - If the subject retired due to memory problems, work status was coded as *disabled*.
    - If the subject had reduced the number of hours he/she works each week, work status was coded as *semi-retired*.

- Much of the information regarding subjects' occupational history was collected in HRS as part of the Employment and Employment History sections of the survey. Please refer to the core HRS data to obtain this information.
- VERSION of this particular data section.

Additional ADAMS demographic variables include information about the informant, which can be found as part of the NPI (section B) as well as in the caregiving questionnaire (section G)

There are some additional sample tracking variables in the HRS 2008 tracker file that may be of interest in understanding a bit more about the status of ADAMS participants. Such variables include *month and year of death* (from the National Death Index (NDI) for individuals deceased as of the HRS 2006 wave, and data from the HRS exit interview for persons not matched to the NDI). In addition, the HRS tracker file includes variables with the *month and year of HRS 2006 interview* if alive at that date. Data from the HRS Tracker file can be merged with ADAMS data using the HHID PN identifiers. For more information about the HRS Tracker file, please refer to the HRS Web site.

### **3b. Wave A**

Initial ADAMS assessments, Wave A, were completed for 856 subjects. In the following sections you will find a detailed description of the contents of the Wave A files.

### **AB\_R. Assessment Data Part I**

Section AB\_R has 228 variables with one record for each subject who completed a Wave A assessment (n=856). Data in this section include the Physical Examination, the Composite International Diagnostic Interview (CIDI-SF), the Neuropsychiatric Inventory (NPI), and the Post-Examination Comments by CRN.

### **Physical Examination**

- Weight (ABWEIGHT): The nurse recorded the subject's weight in pounds based on the subject's self report. If the subject was unable to provide this information him or herself, there was an option to obtain it from the informant if the nurse believed the informant could provide reliable information.
- Height: The nurse recorded the subject's height in feet (ABHEIGHT1) and inches (ABHEIGHT2) based on the subject's self-report. If the subject was unable to provide this information him or herself, there was an option to obtain it from the informant if the nurse believed the informant could provide reliable information.
- Blood pressure cuff size (ABCUFSIZ)
- Blood Pressure:
- To obtain the blood pressure reading, the blood pressure cuff was inflated to a pressure 30 mm above the point where the radial pulse was no longer felt. Both the pulse obliteration pressure (ABPULSE) and the peak inflation level (ABPEAK) were recorded. The first blood pressure reading was taken during the initial part of the examination. A second blood pressure reading was taken later in the examination if the systolic reading (ABBPSYS1) was > 165 or the diastolic

- (ABBPDIA1) reading was > 100. Second readings were coded as ABBPSYS2 and ABBPDIA2.
- **Pulse:** The subject's pulse is taken by the nurse from the wrist, and was recorded in beats per minute (ABPBEAT).
  - **Vision:** The nurse assessed visual acuity using a pocket Snellen card. Based on standard procedures, ABVISN1 is always 20, and ABVISN2 represents the lower number of the subject's visual acuity relative to the standard of ABVISN1. For instance, if the subject has 20/50 vision as assessed using the Snellen card, they are estimated to be able to see at 20 feet what a person with normal vision can see at 50 feet. Coding would be reflected as ABVISN1= 20 and ABVISN2= 50 (i.e., 20/50 vision).

### **Composite International Diagnostic Interview-Short Form (CIDI-SF)**

The CIDI-SF is a brief self-report of depressive symptomatology that may be used to estimate probable diagnosis of a major depressive episode. The CIDI-SF has been previously used in HRS. Specifically, the original HRS cohort (individuals born between 1931 and 1941) was asked the CIDI-SF in the third wave of HRS (1996), and the AHEAD cohort (individuals born in 1923 or earlier) was asked the CIDI-SF in the second wave of AHEAD (1995). Other cohorts added to the survey when the HRS and AHEAD studies were merged were asked the CIDI-SF in their baseline HRS interview.

The CIDI-SF elicits information relating to symptoms and duration of major depressive episodes as spelled out in the Revised 3<sup>rd</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R).

The version of the CIDI used in the ADAMS was comprised of 3 screening questions about presence and duration of symptoms of major depressive episodes followed by a series of sub-questions to collect additional details about any reported symptoms. Please see the HRS/AHEAD documentation report *Documentation of Affective Functioning Measures in the Health and Retirement Study* by Steffick (2000) for additional information about the use of the CIDI-SF in HRS.

<http://hrsonline.isr.umich.edu/sitedocs/userg/dr-005.pdf>

### **Neuropsychiatric Inventory (NPI)**

The purpose of the NPI (Cummings et al., 1994) is to obtain information on the presence of behavioral and psychiatric disturbances that are often present among individuals with Alzheimer's disease and other dementias. The NPI surveys behaviors and symptoms occurring during the previous month as reported by the informant.

The behaviors and symptoms include: delusions (ABNPA), hallucinations (ABNPB), agitation/aggression (ABNPC), depression (ABNPD), apathy (ABNPE), elation (ABNPF), anxiety (ABNPG), disinhibition (ABNPH), irritability/lability (ABNPJ), and aberrant motor behavior (ABNPK). The section on depression was modified to obtain information sufficient to determine whether the subject meets DSM criteria for major depression. These modifications are not part of the original NPI; their variable names are

as follows: ABNPD1, ABNPD4, ABNPD5, ABNPD6, ABNPD7, ABNPD11, ABNPD13, and ABNPD15.

Because the NPI is administered to the informants of both cognitively intact and cognitively impaired subjects, we have also added a series of questions that ask about other symptoms and behaviors that are sometimes present as individual's age, such as appetite loss, weight loss, and sleep disturbance (ABNPL1 – ABNPL18). The time frame for these questions is the previous year.

For the standard NPI domains, each domain begins with a screening question to determine if the behavioral symptom was present or absent (see above: ABNPA, ABNPB, etc.). If the answer to the screening question was negative, the nurse interviewer proceeded to the screening question for the next domain. If the screening question was answered in the affirmative, then a series of follow-up questions was asked. For instance, if the Informant endorsed ABNPA as positive (1), the follow-up questions would include specific symptoms (ABNPA1 – ABNPA9), frequency of delusions (ABNPA10), severity of delusions (ABNPA11), and change from previous self (ABNPA12). Other NPI categories would receive similar follow-up questions if endorsed as positive.

When determining frequency and severity of a given behavior, the nurse used the behavior identified by the follow-up questions as most aberrant. The change from previous behavior items was a modification for this study, and similar to the frequency and severity questions, the focus was also on the most aberrant behavior. This modification allowed us to differentiate between subjects with life-long psychiatric symptoms (e.g., depression, anxiety) from those with only more recent symptoms.

Among very impaired subjects or those with special medical circumstances, a particular set of questions may not have been applicable. For example, bed-bound patients may have exhibited hallucinations or agitation, but could not exhibit aberrant motor behavior. If the nurse or informant believed that the questions were inappropriate, then the section was marked NA (upper right hand corner of each section), and no further data were recorded for that section. If the clinician believed that the responses were invalid (e.g., the caregiver did not seem to understand the particular set of questions asked), then Invalid (IV) was marked for the section (upper right hand corner of the section).

### **Post-Examination Comments by CRN**

This form is used by the nurse to note any aspects of physical or mental status that may have influenced reliability of the informant's responses. These factors include:

- hearing impairment (ABHEAR)
- speech impairment (ABSPEECH)
- alertness (ABAWAKE)
- orientation/understanding of questions (ABORIENT), and
- motivation/cooperation in answering questions (ABANSW)

## **AC\_R. Clinical History**

Section AC\_R has 212 variables with one record for each subject who completed a Wave A assessment (n=856). The clinical history is a semi-structured interview. The purpose of the clinical interview is to identify: 1) presence of cognitive problems, 2) type of cognitive problems, 3) current status of cognitive ability, 4) when cognitive problems began, and 5) when cognitive problems interfered with ability to function. The focus of the interview is on changes in cognitive and functional ability from adult baseline level of performance. The interview has been designed to collect the information necessary to assign a diagnosis of dementia using DSM criteria. The clinical history is obtained from an individual, referred to here as the informant, who has regular contact with the subject. Most often, this is a spouse or adult child of the subject.

The clinical history covers the following areas of function:

- Memory
- Orientation
- Language and comprehension
  - The assessment of language also includes 3 questions related to the subject's baseline level of reading ability (i.e., literacy). These items are AC58, AC59, and AC60. These questions on literacy were added after initial assessments had begun and therefore were not completed on all subjects at their initial visits.
- Daily activities inside the home and hobbies
- Activities outside the home
- Judgment and problem solving
- Personal care
- Personality
- Current work status and retirement history
- Description of typical day and current activities

Due to the semi-structured nature of this interview, the decision of whether to ask some questions was left up to the clinical judgment of the clinical research nurse administering the instrument. This was the case for variables AC179, AC181, AC184, and AC186. Some or all of this series of questions were asked if the nurse had the perception that the informant was reporting notable changes in the subject's cognition.

## **AD\_R. Assessment Data Part II: Dementia Diagnoses/Summary Scores**

Section AD\_R has 101 variables with one record for each subject who completed a Wave A assessment (n=856). Data in this section include Assessment Outcomes, the Clinical Dementia Rating (CDR), the Hachinski Scale, Dementia Severity Rating Scale (DSRS), and the Blessed Dementia Rating



## **Assessment Outcomes**

The assessment outcomes provide a serial history of all cognition-related diagnoses assigned to a subject throughout the ADAMS study. Diagnoses for the 856 participants who completed clinical assessments are included.

The AD assessment outcome file includes research diagnoses from all assessments and reviews based on the initial (Wave A) assessment, in date order. Up to three diagnoses (i.e., primary, secondary and tertiary) were assigned after each assessment or review session. The type of assessment or review is noted in the variable name and variable label. The types of assessments/reviews were: initial visit consensus conference without medical record review (ADCC: ADCCDX1, ADCCDX2, ADCCDX3), initial visit consensus conference with medical record review (ADCCM: ADCCMDX1, ADCCMDX2, ADCCMDX3), and final diagnoses (ADFDX1, ADFDX2, and ADFDX3). Subjects with a diagnosis of dementia were assigned a dementia age of onset (ADONSET).

When the diagnosis of Possible AD was assigned, a subcode was also assigned to denote the reason the subject was classified as Possible AD rather than Probable AD. The subcodes were as follows: 1) symptoms consistent with AD, but no report of neuroimaging or standard laboratory tests for dementia having been done, 2) symptoms consistent with AD, but still very mild dementia. Longitudinal follow-up required to assign diagnosis of Probable AD, 3) presence of other medical factors that may be contributing to the cognitive impairment, 4) AD is the secondary diagnosis and another type of dementia is the primary diagnosis, 5) symptoms or course of disease was atypical for Probable AD, or 6) two or more of the above subcodes.

## **Clinical Dementia Rating Scale (CDR)**

The CDR (Hughes et al., 1982; Morris et al., 1989) quantifies severity of dementia in several different areas of functioning:

- Memory (ADCDRS1),
- Orientation (ADCDRS2),
- Judgment and problem solving (ADCDRS3),
- Community affairs (ADCDRS4),
- Home and hobbies (ADCDRS5), and
- Personal care (ADCDRS6)

The CDR reflects an indirect evaluation of cognition and functional performance based on information obtained from both the informant and subject during the course of the evaluation. The CDR rating was assigned for all subjects, regardless of dementia status, at the time of Case Staffing based on all available information. Possible impairment ratings and numeric correlates for each area are: 1) none (0), 2) questionable (0.5), 3) mild (1.0), 4) moderate (2.0), and 5) severe (3.0). The Personal Care category does not have a 0.5 rating option. A total CDR staging score (ADCDRSTG) is calculated based on an algorithm developed at Washington University, St. Louis (Morris, 1993). The total score can range from 0 –5. General guidelines for interpreting the total score are as follows:

- A. No dementia (0)
- B. Mild cognitive impairment or questionable/very mild dementia (0.5)
- C. Mild dementia (1.0)
- D. Moderate dementia (2.0)
- E. Severe dementia (3.0)
- F. Profound dementia (4.0)
- G. Terminal dementia (5.0)

Ratings F (profound dementia) and G (terminal dementia) are not based on individual subcategory scores, but rather are assigned based on a set of characteristics consistent with the latter stages of severe dementia. They are used to distinguish additional levels of impairment in advanced dementia. Note that there is no rating of 0.5 (mild cognitive impairment) for item 6, personal care (ADCDRS6).

The CDR was initially designed to assess severity of AD. However, it can be used effectively to estimate the severity of cognitive impairment and dementia due to other etiologies. To use the CDR to estimate severity of vascular dementia or other cognitive conditions that often have accompanying physical limitations, one must assign the ratings for the various functional categories excluding any limitations attributable solely to physical impairment.

### **Modified Hachinski Scale**

The Modified Hachinski Scale (Rosen et al., 1980) is designed to assess a number of risk factors for vascular dementia. This form was only completed if a diagnosis of dementia was assigned to a subject.

- Abrupt onset (ADHACH1): Denotes sudden change in cognitive function. Such a change in cognition would usually be linked to a physical event like a stroke, surgery, or traumatic injury.
- Stepwise deterioration (ADHACH2): Denotes a pattern of abrupt declines in cognitive function occurring after periods of stable function. Abrupt declines are generally associated with acute events, like strokes.
- Somatic Complaints (ADHACH3): Complaints about physical ailments (aches and pains) that do not appear to have a clear physiological basis.
- Emotional incontinence (ADHACH4): This denotes pattern of expressing extreme emotion, usually crying, for no apparent reason. Typically this behavior must be observed at the time of the clinical assessment to be coded as ‘Yes’; however, if the informant provides a good history of these symptoms, it may be sufficient to code this item positively.
- History of hypertension (ADHACH5): This is coded ‘Yes’ if there was a history of hypertension and/or the subject was being treating for hypertension. It was not coded ‘Yes’ based solely on a high reading of blood pressure at the time of the visit.
- History of stroke or TIA (ADHACH6): This was coded as ‘Yes’ if the informant reported an episode with stroke-like symptoms that medical personnel diagnosed as a stroke, or if there was evidence of a stroke on neuroimaging. If the informant

- reported “spells” that had never been fully evaluated by medical personnel, this Item was usually coded ‘No’.
- Focal neurological symptoms (ADHACH7): This item was coded as ‘Yes’ if the subject or informant reported changes in motor control, sensation or speech/language following a ‘stroke-like event’ or that appeared to be unilateral (e.g. right-sided hemiparesis ).
  - Focal neurological signs (ADHACH8): This item was coded as ‘Yes’ if there were consistent findings on the neurological exam that suggested a focal CNS lesion.

The total score for the Modified Hachinski Scale is represented as ADHACHSC. The higher the score, the higher the probability that the dementia has a vascular etiology. Rough guidelines for interpreting the score are: if score < 4, then likely AD; if score ≥, then likely vascular dementia; and if score = 5 or 6, then likely mixed AD and vascular dementia (Hachinski et al., 1975; Molsa et al., 1985; and Rosen et al., 1980).

**Dementia Severity Rating Scale (DSRS)** (Clark and Ewbank, 1996)

The DSRS is an informant-completed multiple-choice questionnaire that assesses severity of cognitive and functional impairment in domains that are typically affected by Alzheimer’s disease (AD). There are 12 items assessing the following domains:

- Memory (ADDRS1)
- Orientation (ADDRS2)
- Judgment (ADDRS3)
- Social interactions/community affairs (ADDRS4)
- Home activities/responsibilities (ADDRS5)
- Personal care (ADDRS6)
- Speech/language (ADDRS7)
- Recognition of others (ADDRS8)
- Feeding (ADDRS9)
- Incontinence (ADDRS10)
- Mobility/walking (ADDRS11)
- Informant-perceived stress (ADDRS12)

The total score for the DSRS is obtained from the summed score across all items (ADDRSSCR). Item 11 (mobility/walking) is sometimes skipped by informants because a pre-existing mobility impairment in the subject can make it difficult to estimate how cognitive decline affects his or her mobility in the community. Users are advised to examine completion of individual items before using the composite score, ADDRSSCR.

Item 12 (informant-perceived stress) differs from the Items 1-11 because it is based on the informant’s report of how the subject’s functional status affects the informant’s ability to maintain his or her normal lifestyle. The response is on a 10-point Likert-type scale that is reflected as a percentage. For example, a response of 5 is interpreted clinically as a 50% stress rating out of a total of 100%.

**Blessed Dementia Rating Scale – CERAD (BDRS-CERAD)** (Morris et al., 1989; Blessed et al., 1968) The BDRS-CERAD is a standardized research instrument that characterizes performance of activities of daily living that are often affected by dementia. It was completed even when the informant did not report cognitive problems in the Clinical History.

The informant was instructed to rate whether the subject had no loss, some loss or severe loss of ability in a number of areas of cognition and everyday activities. For three items assessing activities of daily living (i.e., eating, dressing, toileting), the informant reported the level of assistance the subject needed on a three-point scale. For all items, the informant also noted whether the loss of ability or the need for assistance in each area was due to mental (i.e. cognitive) and/or physical reasons. The score is weighted based on the severity of the loss. The only items counted in the score are losses for which the cause is ‘Mental’ or ‘Both’ (Mental and Physical).

BDRS - Section B: Endpoints Associated with Late Dementia.

This section of the Blessed Dementia Rating Scale was completed if the subject had advanced dementia. The nurse determined whether to administer this section based on his/her clinical judgment whether these behaviors were relevant for a subject given his/her level of impairment.

- Item 3. ADBL33 - If subject was bedridden and obviously doesn't wander, code NONE and comment.
- Item 6. ADBL36 - Own home or nursing home.
- Item 8. ADBL38 - If subject was in nursing home, YES was coded.
- Item 9. ADBL39 - If subject in nursing home, DK was coded unless informant has knowledge of subject's sleep pattern.

The variable ADBLSCOR was updated in release 5.0 to correct an error in Release 1.0 in which scores ending in .5 were inadvertently rounded to the nearest whole number.

### **AE\_D. Medications (Drug Level)**

Section AE\_D has 14 variables with one record for each medication taken by a particular subject as reported at the initial visit (n=5765). Some subjects have multiple records and some have none. Primary ID variables on this file include HHID, PN, and AEMENNUM. AEMENNUM is the “mention” of the medication. For example, a respondent who was reported as taking five medications will have a value of “1” for AEMENNUM for the first medication reported, a value of “2” for the second medication, “3” for the third medication, “4” for the fourth medication, and “5” for the fifth medication.

For information on aggregating from drug-level to respondent-level files, refer to Appendix 2.

## Medication codes

The medication data were coded using Druglook, a computerized database developed at the Duke Aging Center by Joseph T. Hanlon, PharmD, MS and colleagues that assigns unique numeric codes to drugs. Additionally, in the original database each code had a therapeutic category based on the condition or body system that it treated. Over the past few years, the staffs of the Duke Program in Epidemiology of Dementia and the Cache County Memory and Aging Study have assigned codes for newer medications and nutritional supplements. Many of these newer codes have not had a therapeutic category code assigned to them.

## Medications Protocol

Respondents were mailed a medication form prior to the visit and asked to have this information available when the assessment team arrived. Information collected on the form included names and dosages of prescription medication, vitamins/supplements, and other over-the-counter items taken in the previous two weeks. Other information included the purpose for which the medication was being taken, and how long the respondent had taken it. At the time of the clinical assessment, the nurse examined all medication containers to confirm the medication information.

In addition to the identification variables, the Medications (drug level) file contains the following variables:

- Drug name code (AEDCODE)
- Drug name - specify (if drug code is 'other' (AEDSPC)
- Whether drug was prescribed (Rx) or over the counter (OTC) (AERX)
- Age subject began taking medication (AEAGE) For medical conditions that are treated episodically, but recur on a regular or frequent basis (e.g., allergies), AEAGE is recorded based on when the respondent first started using the medication regularly if he or she takes it "regularly" for long periods of time each year. If the respondent takes a drug for an infection that he or she has taken before, but never regularly, AEAGE is coded for most recent course of medication (e.g., an antibiotic for an infection)
- Dosage strength of medication (AESTR)
- Drug – dosage strength unit (AEUNIT) (e.g., milligrams, micrograms, milliliters, etc.)
- Drug – dosage form (AEFORM) (e.g., pill, liquid, topical, injection, etc.)
- Drug – dosage form – specify if 'AEFORM' is "other" (AEFSPC)
- Drug – frequency taken (AEFREQ)
- Drug – how many taken (AEPILL)

With regard to the frequency taken, how much of a medication the respondent gets per given time period was calculated by multiplying strength by 'how many taken'. Thus, the actual amount is the same even if strength is divided into smaller amounts to fit the form options. For example, for a medication taken in two doses of 5 mg. each per day, the total daily dose would be 5 mg. x 2 doses per day = 10 mg per day. In the data it would appear as AESTR=10, AEUNIT=2, and AEFREQ=1.

For drugs that are taken in different doses on alternating days (e.g., Coumadin-alternating dosage), total dose over a given time period was used to calculate an average daily or weekly dose. Here is an example for a medication taken as different doses on alternating days, where a subject takes two 25mg pills one day and one 25mg pill on the alternate day. The daily dose was calculated as follows:  $(2 \text{ pills} * 4 \text{ days}) + (1 \text{ pill} * 3 \text{ days}) = 11 \text{ pills per week} * 25 \text{ mg. per pill} = 275 \text{ mg. per week} / 7 \text{ days per week} = 39.3 \text{ mg. per day}$ . In the data it would appear as AESTR=39.3, AEUNIT=2, and AEFREQ=1.

*Note about using SPSS with these data:* some of the values in these variables (e.g., AEPILL, AESTR) have one (.5) or three decimal places (e.g., .004). In SPSS, you will need to go to the 'Variable View' tab in the data window, and set Decimals=3 for AESTR and =1 for AEPILL in order to have results display the values correctly.

### **AE\_R. Medications (Respondent Level)**

Section AE\_R has 4 variables with one record for each subject who completed a Wave A assessment (n=856). This file may be used in conjunction with AE\_D. See Appendix 2 for instructions on how to aggregate data from the drug level to the respondent level.

The four variables on this file include ID variables HHID, PN, AETOTNUM, and ADAMSSID. AETOTNUM indicates the total number of drugs reported for each subject.

### **AF\_R. Family History (Respondent Level)**

Section AF\_R has 45 variables with one record for each subject who completed a Wave A assessment (n=856). This file may be used in conjunction with AF\_CH and/or AF\_SB, the child and sibling-level data files.

The purpose of this section is to obtain information about the subject and his/her biological first-degree family members, including details about any memory problems. The family history interview is usually conducted with the informant. In some circumstances, the subject completed the family history; this is noted in the variable AFREL1. ID variables in this file are HHID and PN. ADAMSSID is also included in the data file. Other variables include:

- Whether the subject was adopted (AFADOPT)
- Informant relationship to subject (AFREL1, AFREL2)
- How long informant has known the subject (AFLONG1, AFLONG2)
- How often the informant saw the subject in the last year (AFSEE1, AFSEE2)
- Father's vital status (AFLIVF), age/age at death (AFAGF), history of medical problems (AFMDSF), and whether an autopsy was performed on father (AFAUTF)
- Father's history of memory problems (AFMMF, AFAPF, AFSDf, AFWRF, AFLMF, AFDDF, AFDXSPECCDF)
- Mother's vital status (AFLIVM), age/age at death (AFAGM), history of medical problems (AFMDSM), and whether an autopsy was performed on mother (AFAUTM)

- Mother’s history of memory problems (AFMMM, AFAPM, AFSDM, AFWRM, AFLMM, AFDDM, AFDXSPECCDM)
- Any relatives with Alzheimer’s disease (AFADDX), Parkinson’s disease (AFPDDX), Down’s syndrome (AFDWNDX), Senile dementia (AFSENDX), hardening of the arteries (AFARTDX), mini-strokes or TIAs (AFTIADX), arteriosclerosis of brain (AFSCLDX), other neurological condition (AFOTHDX)
- Count of siblings (AFCNTSB)
- Count of children (AFCNTCH)

At times there are discrepancies in the information collected on the family history at the Wave A visit compared to the Wave B visit. This may include differences in the number of siblings and the living/deceased status of a family member. We attempt to resolve these discrepancies. However, if we are not able to do so with confidence, we have left the data from the two visits as discrepant.

The family history form is available as a separate document, the ADAMS Section H: Family History Form

< <http://hrsonline.isr.umich.edu/index.php?p=kwsearch&terms=adams>>

### **AF\_CH. Family History (Child Level)**

Section AF\_CH has 17 variables with one record for each child reported in the family history section (n=2443). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and AFCNUM. AFCNUM is the “mention” of the child. For example, a subject with three children will have a value of “1” for AFCNUM for the first child reported, a value of “2” for the second child reported, and “3” for the third child. See Appendix 2 for instructions on how to aggregate child level data to the respondent level.

Other variables include:

- Child’s vital status (AFCLIVING), age/age at death (AFCAGE), history of medical problems (AFCMEDPX), and whether an autopsy was performed on the child (AFCAUTOP)
- Child’s history of memory problems (AFCMEMPX, AFCAGEPX, AFCSUDDEN, AFCWORSEN, AFCLIMITS, AFCDRDX, AND AFDXSPECCD)
- AFCHILD is the child number as coded on the chart, and AFCRELAT is the relationship of the child to the subject.

### **AF\_SB. Family History (Sibling Level)**

Section AF\_SB has 17 variables with one record for each sibling reported in the family history section (n=4215). Some subjects have multiple records and some have none. Primary ID variables on this file include HHID, PN, and AFSNUM. AFSNUM is the “mention” of the sibling. For example, a subject with five siblings will have a value of “1” for AFSNUM for the first sibling reported, a value of “2” for the second sibling reported, “3” for the third sibling and “4” for the fourth sibling, and “5” for the fifth

sibling. See Appendix 2 for instructions on how to aggregate sibling-level data to the respondent level.

Other variables include:

- Sibling's vital status (AFSLIVING), age/age at death (AFSAGE), history of medical problems (AFSMEDPX), and whether an autopsy was performed on father (AFSAUTOP)
- Sibling's history of memory problems (AFSMEMPX, AFSAGEPX, AFSSUDDEN, AFSWORSEN, AFSLIMITS, AFSDRDX, AND AFSDXSPECCD)
- AFSIB is the child number as coded on the chart, and AFSRELAT is the relationship of the child to the subject.

## **AG\_R. Caregiving Questionnaire**

Section AG\_R has 140 variables with one record for each informant who completed the self-administered caregiving questionnaire at the time of the initial (Wave A) assessment (n=746). The self-administered informant questionnaire was completed by the ADAMS informant to obtain additional information on the cognitive and physical function of the ADAMS subject, as well as information on caregiving activities performed by the informant. This instrument included questions on:

- Typical leisure activities performed by the ADAMS subject (e.g., watching TV, reading books, doing crafts)
- Assessment of memory and cognitive function compared to 2 years ago (the Jorm IQCODE);
- Assessment of difficulties with ADLs and IADLs
- Caregiving activities and time (for both active help and supervision)
- Physical and emotional strain associated with caregiving (questions taken from the Caregiver Health Effects Study (Schulz, Newsom, Mittelmark, Burton, Hirsch, & Jackson, 1997; Schulz & Beach, 1999)
- Positive aspects of caregiving
- The impact of caregiving on work and leisure activities
- Health care utilization and out-of-pocket expenditures for the ADAMS subject
- Current physical and emotional health of the informant
- Demographics of the informant.

## **AH\_C. Medical Conditions (Condition Level)**

Section AH\_C has 8 variables with one record for each medical condition indicated for a particular subject as reported at the initial visit (n=6060). Some subjects have multiple records and a few have none. Primary ID variables on this file are HHID, PN, and AHCNUM. AHCNUM is the "mention" of the medical condition. For example, a respondent who was reported as having five medical conditions will have a value of "1" for AHCNUM for the first condition reported, a value of "2" for the second condition, "3" for the third condition, "4" for the fourth condition, and "5" for the fifth condition. Up to 40 medical conditions were coded.



The data may be aggregated from condition level to respondent level in much the same manner that medication data (sections AE\_D and AE\_R) can be aggregated from drug level to respondent level files as shown in Appendix 2.

The medical conditions were coded to capture lifetime medical history based on informant report at the time of the ADAMS assessment. Entered codes correspond to codes from the International Classification of Diseases, 9<sup>th</sup> Revision (ICD-9), which is a widely used coding system.

In addition to the identification variables, the Medical Conditions (condition level) file contains the following variables:

- Medical Condition – ICD-9 Code (AHCODE)
- Type of ICD-9 Code (AHCDTYPE)
- Medical Condition Subcode (AHSCODE)  
For some ICD-9 codes, a subcode (AHSCODE) that is unique to this study was assigned. The subcode reflects more detailed information than the ICD-9 code. The subcodes were added to capture characteristics, such as treatment or sequelae of the medical condition that might be useful in interpreting the data. If the ICD-9 codes are the same but the subcodes are different, then the conditions are considered to be different. Subcodes were assigned if medical condition code was 436.0, 435.9, 294.8, 412, 427.9, 496, or 250.00
- A condition Status code (AHCSTATUS) indicates whether a coded medical condition is a current condition (AHCSTATUS = 1), a past condition (AHCSTATUS = 2), or a chronic condition (both present and past, AHCSTATUS = 3). Current conditions are generally limited to those that are acute or have a very recent onset.

The ICD 9 codes provide a standardized coding system that is familiar to many medical professionals. However, it should be noted that in ADAMS, these codes were assigned based primarily on the description of the condition supplied by the informant report. In many instances documentation of the conditions in medical records was not available. In addition, information provided by the informant or respondent often lacked the necessary detail to assign ICD-9 codes at the most specific level. Therefore, often the ICD-9 codes assigned are fairly general. When both a condition was present and a procedure was done to correct the condition, either the condition or the procedure was coded. At times conditions are coded as the condition itself, other times as the procedure to correct the condition. This was often dependent on how the information was reported by the Informant. For example, cataract surgery was coded V45.61, but some individuals who have a code 366.9 for cataracts may have had surgery to treat the cataracts. If interested in a specific condition, researchers should cross reference any related surgical procedures. At Wave B, only new or ongoing medical conditions were noted; past conditions were not noted if they had previously been reported at the Initial visit.

Appendix 3 provides documentation for the specific ICD-9 codes (AHCODE) and subcodes (AHSCODE).

## **AH\_R. Medical Conditions (Respondent Level)**

Section AH\_R has 5 variables with one record per respondent who completed a Wave A assessment (n=856). This file may be used in conjunction with AH\_C. See section AH\_C and Appendix 2 for instructions on how to aggregate data from the condition level to the respondent level. (The general process is the same as aggregating drug level data in section AE\_D to the respondent level.)

The five variables on this file include: ID variables HHID, PN and AHCONDITIONS, AHTOTCOND, and ADAMSSID (the ADAMS sample identifier which is included on all files). AHCONDITIONS indicates whether medical conditions were present and AHTOTCOND is the total number of medical conditions reported for each subject. See section AH\_C above for more information with regard to the specific medical condition codes.

## **AJ\_R. Dementia Checklist and Neurological Exam**

Section AJ\_R has 287 variables with one record for each subject who completed a Wave A assessment (n=856). ID variables in this file are HHID, PN. ADAMSSID is also included in the data file.

### **Dementia Checklist**

The dementia checklist is completed at case staffing by Dr. Plassman for initial and follow up visits. Only those checklists that are relevant to assigning the primary research diagnosis are completed by Dr Plassman.

The dementia checklist is available as a separate document, the ADAMS Dementia Checklist Form

< <http://hrsonline.isr.umich.edu/index.php?p=kwsearch&terms=adams>>

### **Neurological Exam**

The purpose of the neurological examination is to assess for signs of focal lesions or degenerative processes that may account for changes in function or cognition. The neurological examination is also important for completion of the Hachinski Scale (see Section D). It was adapted from the CERAD neurological examination ((Morris *et al.*, 1989) Starting in Wave C, some of the neurological exam was changed and based on the UPDRS (Unified Parkinson's Disease Rating Scale; Fahn *et al.*, 1987).

The neurological exam assessed the following areas:

1. Cranial nerves
2. Motor function
3. Reflex function
4. Gait and stance
5. Sensory function

The neurological exam is conducted with the subject by the clinical research nurse as a standardized neurological examination. For each question, Can't Execute and Missing will mean the following:

CAN'T EXECUTE: Subject will not/cannot attempt task secondary to dementia.

MISSING: Examiner omits task, subject refuses (not secondary to dementia), or subject unable to do task secondary to physical reason.

The neurological exam form is available as a separate document, the ADAMS Neurological Exam Form

< <http://hrsonline.isr.umich.edu/index.php?p=kwsearch&terms=adams>>

### **AM\_R. Medical History (Respondent Level) – Initial Visit**

Section AM\_R has 468 variables with one record per respondent who completed a Wave A assessment (n=856). Data in this section are based on a medical history interview that the nurse completed with the informant. The medical history form, which contains all of the questions asked during the medical history interview, is available as a separate document, the ADAMS Medical History Form

< <http://hrsonline.isr.umich.edu/index.php?p=kwsearch&terms=adams>>

### **AN\_R. Assessment Data Part III: Neuropsychological Exam**

Section AN\_R has 434 variables with one record for each subject who completed a Wave A assessment (n=856). This section includes data from individual neuropsychological tests:

#### **Self Report Memory**

- This section is composed of 4 brief questions that the subject answered regarding his or her own memory.
- How would you rate your memory at the present time? Would you say it is excellent, very good, good, fair, or poor (ANSMEM1)?
- Compared to two years ago, would you say your memory is much better now, better now, about the same, worse now, or much worse now than it was then (ANSMEM2)?
- How is your memory compared to that of other people? Would you say excellent, very good, good, fair, or poor (ANSMEM3)?
- How often do memory problems interfere with your daily activities? Would you say rarely, occasionally, sometimes, often, or all of the time (ANSMEM4)?

#### **HRS Cognition Measures (TICS)**

The cognition measures administered to self-respondents in HRS was repeated as part of the ADAMS study. This set of measures is based on the Telephone Interview for

Cognitive Status (Brandt, Spencer, & Folstein, 1988). These measures include counting backwards from 20 and 86, the serial 7s subtraction task, object naming, and naming the president and vice president of the United States. A more detailed description of these measures is provided in the HRS cognitive functioning documentation report by Ofstedal, Fisher, & Herzog, 2005).

The items in ADAMS that most closely match the cognition items in the core HRS are as follows:

ANMSE1 - What is the year?  
ANMSE3 - What is the date?  
ANMSE4 - What is the day of the week?  
ANMSE5 - What is the month?  
ANBWC201  
ANBWC202  
ANSER7\_1  
ANSER7\_2  
ANSER7\_3  
ANSER7\_4  
ANSER7\_5  
ANSER7T  
ANSCISOR  
ANCACTUS  
ANPRES  
ANVCPRES  
ANIMMCR1  
ANDELCOR

## **Neuropsychological Examination**

The instruments that comprise the neuropsychological assessment represent multiple domains of neurocognitive functioning that are important in detecting and diagnosing cognitive and neurological disorders, including 1) verbal learning and memory (CERAD Word-List Learning, Delayed Recall and Recognition; Wechsler Memory Scale - Logical Memory); 2) visual memory (Benton Visual Retention Test; CERAD Constructional Praxis Recall and Recognition); 3) object memory (Fuld Object Memory Evaluation); 4) language (CERAD 15-item Boston Naming; Animal Naming; Controlled Oral Word Association); 5) drawing praxis (CERAD Constructional Praxis); 6) Attention, psychomotor processing, and cognitive flexibility (Reitan Trail Making Test; Symbol Digit Modalities Test, Digit Span); 7) premorbid achievement and intellect (Reading Recognition subtest of the Wide Range Achievement Test – 3, Shipley Vocabulary subtest); and 8) general cognitive status (Mini-Mental State Examination). The assessment also includes a handedness questionnaire, and questions to obtain relevant demographic information.

Administration and scoring procedures followed published guidelines. Many of the administration instructions and actual test items are under copyright and cannot be quoted

directly in this user guide. Sources for administration and test instructions are indicated in the following text and in an accompanying reference list.

Many tests in the neuropsychological assessment have codes for individual test items; however, many items cannot be presented verbatim due to copyright protection. Users are advised to consult the source references to match test item numbers in the Codebook to the actual test items.

Before analyzing the neuropsychological data, users should read the Codebook to familiarize themselves with the meaning of the completion codes that are associated with each individual test performance. These codes indicate whether standard administration occurred, or if a test was not administered or completed due to a specific reason. For example, tests were sometimes not administered or are discontinued due to cognitive difficulty.

Users should also review the section within this guide called “Neuropsychological Evaluation Post-Visit Report.” This section details issues with individual subject assessments that may be considered a confound to using a particular measure or measures in data analysis, such as vision or hearing impairments.

A number of the neuropsychological evaluations were conducted in Spanish. Each test has a flag variable that indicates whether the test was conducted in Spanish.

## **The CERAD Battery**

The procedures of the Consortium to Establish a Registry for Alzheimer’s Disease (CERAD) were developed for use in Alzheimer’s Disease assessment (Morris, et. al., 1989). The purpose of the CERAD neuropsychological test battery is to allow a brief, standardized assessment of many of the core, cognitive deficits characteristic of dementia. As such, the instrument includes tests of verbal fluency, visual naming, orientation, language production and comprehension, writing, memory and constructional praxis. Administration and scoring procedures followed those in the CERAD Clinical Assessment Packet (CERAD, 1987). The component tests in the battery are detailed as follows:

### **CERAD Animal Fluency**

Description: In the test assessment of semantic fluency, subjects were asked to name as many animals as possible in 1 minute. The total score is ANAFTOT.

Administration and scoring: Please see CERAD (1987).

### **CERAD Boston Naming Test (CERAD 15 item)**

Description: This test required the subject to name line drawings of common man-made and naturally occurring objects. The total score is ANBNTTOT.

Administration and scoring: Please see CERAD (1987).

## **Mini-Mental State Examination**

Description: The test consists of 22 items [orientation (10), language (8), and one item of each: registration, memory, spelling backward, and construction] with a maximal obtainable score of 30. The total score is ANMSETOT.

Administration and scoring: Please see Folstein et al. (2001).

User notes: Modifications to standard administration were developed to accommodate visual impairment and low-literacy level. Scores for modified items are noted in the data field for the specific item. Decisions to use or exclude these items for data analysis are the responsibility of the data user.

## **Vision impairment**

- Item 16: The stimulus object was placed in the subject's hand, and he/she was asked to identify the object ("WHAT IS THIS CALLED?"). A correct response was coded as ANMSE16= 2.
- Item 17: The stimulus object was placed in the subject's hand, and he/she was asked to identify the object ("WHAT IS THIS CALLED?"). A correct response was coded as ANMSE17 = 2.
- Item 19: The subject was given a spoken instruction rather than a written instruction. A correct response was coded as ANMSE19= 2.
- Item 21: Not administered.
- Item 22: Not administered.

## **Low literacy**

- Item 19: The subject was given a spoken instruction rather than a written instruction. A correct response was coded as ANMSE19= 2.
- Item 21. If subject cannot write a sentence due to illiteracy, the technician was allowed to obtain a signature as an alternative response. The item received credit if the subject's full name was spelled correctly. A correct response was coded as ANMSE21= 2.

## **CERAD Verbal learning and memory: Word List Learning**

Description: This task includes 10 high imagery words that are visually presented for 2 seconds each. The subject reads each word aloud as it was presented and is then tested on an immediate recall procedure. There are 3 trials with immediate recall (ANIMMCR1, ANIMMCR 2, and ANIMMCR3). There was one trial of delayed recall (ANDELCOR, administered after Constructional Praxis Copying), followed by a recognition trial of 10 target items (ANRECYES) appearing among 10 non-target foils (ANRECNO). In addition to words recalled, there is a field for recording the number for work intrusions for each trial, including delayed recall (ANIMMIN1, ANIMMIN2, ANIMMIN3, and ANDELINT). Intrusions are recorded when the subject provides a word during recall that was not among the actual words on the stimulus list. There are codes for individual words recalled within each of the immediate and delayed recall trials, as well as a total score for each trial, as noted above.

Administration and Scoring: Please see CERAD (1987).

User notes: If the subject was visually impaired or unable to read for other reasons (e.g., illiterate), the word list may be read to the subject. The subject was asked to repeat the words as they were read. If this occurs, the “Can’t read” field will be indicated (ANIMMNRD = 1).

A subject who was unable to correctly read more than three of the words was coded as being unable to read (ANIMMNRD = 5).

## **CERAD Constructional Praxis**

Description: The constructional praxis test in CERAD is adapted from Rosen’s assessment of constructional praxis (Rosen et al., 1984), and tests the ability of the subject to copy four geometric forms of varying difficulty (circle, overlapping rectangles, diamond and cube). The total score is ANCPSTOT. A delayed recall task is included in which the subject must draw from recall the four figures originally copied (ANDCPSTOT). This was administered directly after the Recognition Trial for the Word List Learning task. This was followed by a four-item recognition trial (Yuspeh, 1998). The code for this item is ANRCPTOT.

Administration and scoring: Please see CERAD, 1987; Yuspeh, 1998.

User notes: The time was recorded at the beginning (ANCPSTIM) and end (ANCPFTIM) of Constructional Praxis task, and the beginning of the delayed recall trial (ANDCPSTM). The difference in time between ANCPSTIM and ANCPFTIM allows calculation of the delay interval between the end of Word List learning trials and the delayed trial of this task. The difference between ANCPFTIM and ANDCPSTM provides the actual time of the delay interval between the end of Constructional Praxis copying and delayed praxis recall.

## **Trail Making Test**

Description: The test is administered in two parts, A and B. The Subject is asked to draw lines connecting consecutively numbered circles on a worksheet (Part A) and connect consecutively numbered and lettered circles on another worksheet (Part B) by alternating between the numbers and letters. The codes for time to complete Part A and Part B are ANTMASEC and ANTMBSEC.

Administration and scoring: Please see Reitan (1992).

User notes: Standard administration for the ADAMS assessment was to discontinue Part A or Part B at five errors (ANTMAERR and ANTMBERR, respectively), or if the time exceeds 5 minutes (300 seconds). We considered this to be a completed test, so the Completion Code (ANTMACP, ANTMBCP) was coded as 1. There were many instances, however, when discontinuation was judged to potentially diminish the Subject’s motivation to persist on subsequent tests in the assessment. In many cases, the Subject expressed a desire to continue beyond the time limit. This preference was accommodated by allowing the Subject to continue to completion of the

test, and the actual time was recorded. The Subjects who were discontinued after 300 seconds were designated with a “time expired” code of 301 (i.e., ANTMASEC or ANTMBSEC will appear as 301; no other Subjects had this as an actual completion time in seconds). To address this discrepancy in timing, the user may wish to prorate the time according to the method described in Heaton et al. (2004), which is based on the number of circles correctly completed prior to discontinuation. Circles Completed is available as a variable for Subjects where ANTMASEC or ANTMBSEC equals 301 (Part A = ANTMACIR, Part B = ANTMBCIR). Responsibility lies with the user to determine this or other approaches to analyzing the test.

If the Subject was severely visually or motorically impaired, an oral version of Trails A and B may have been administered (see ANTMATYP and ANTMBTYP). Oral administration was obtained largely for clinical purposes. For oral administration, ANTMATYP = 2 and ANTMBTYP = 2. Users should not include oral administration with standard administration in data analysis. Please see Ricker and Axelrod (1994) for administration and scoring procedures.

### **Logical Memory: Wechsler Memory Scale (WMS-R)**

Description: After each of two brief stories were read to the subject, he or she was asked to recall as much of the story as possible. The delayed recall task was administered following completion of the Symbol-Digit Modalities Test. The code for the immediate trial is ANWM1TOT, and the code for the delayed trial is ANWM2TOT.

Administration and scoring: Please see Wechsler (1987).

User notes: ANWM1T1 provides the clock time at the end of the Logical Memory I trial (immediate recall), whereas ANWM2T1 provides the clock time at the beginning of the Logical Memory II trial (delayed recall). Users can calculate the interval between immediate and delayed recall of the Logical Memory stories based on the difference between these two clock times.

### **Benton Visual Retention Test (BVRT)**

Description: The subject was asked to reproduce designs following a 10-second exposure. There are 10 designs total. Form C was administered. The code for total correct items is ANVRTCOR, and the code for total errors is ANVRTERR.

Administration and scoring: Please see Sivan (1992).

### **Controlled Oral Word Association Test (COWA)**

Description: The COWA test was developed as part of the Multilingual Aphasia Examination and requires retrieval and oral production of spoken words beginning with a designated letter (Benton et al., 1983). The letters used in the ADAMS neuropsychological assessment were CFL. The letters used in Spanish-language administration were PSV (Jacobs et al., 1997). The code for the total raw score is ANCOWATO.



Administration and scoring: Please see Benton et al. (1983)

### **Symbol-Digit Modalities Test (SDMT)**

Description: The test requires the subject to substitute a number for randomized presentations of geometric figures. A printed key is provided which pairs the Arabic numbers 1-9 with a specific symbol so that each number has its own unique symbol. There are two methods of administration available, a written format and an oral format. The preferred method of testing is the written form; however, for subjects who were untestable in this format (e.g., major motor impairment such as hemiparesis, Parkinsonism, etc.), the oral version was available for alternative administration. Please see the data field for this measure to determine if oral administration occurred (ANSDMTYP). Users are advised against treating scores from written and oral administrations as equivalent. The code for total correct is ANSDMTOT, and the code for errors committed is ANSDMERR.

Administration and scoring: Please see Smith (1982).

### **Digit Span**

Description: Digit Span (Wechsler Adult Intelligence Scales, 3rd ed.; WAIS-III) includes separate tasks of both forward and backward repetition. On both tasks, the examiner read a series of number sequences to the examinee. For each Digits Forward item, the subject was required to repeat the number sequence in the same order as presented (code = ANDSSFT). For Digits Backward, the subject was required to repeat the number sequence in the reverse order (code = ANDSSBT). The code for the combined score of the forward and backward tasks is ANDSTOT.

Administration and scoring: Please see Wechsler, 1997.

### **Fuld Object Memory Evaluation (OME)**

Description: The Fuld OME is based on recall of ten common household objects, which the Subject first identifies by touch. The modified 3-trial version was used. As per standard instructions, the subject was selectively reminded of items he or she did not recall. Each recall trial was preceded by a distractor task requiring word generation. The code for the total score is ANFULTOT.

Administration and scoring: Please see Fuld (1977) and Lowenstein et al. (2001).

### **Shipley Vocabulary Test**

Description: The Shipley Vocabulary Test is a 40-item multiple choice vocabulary test.

Administration and scoring: Please see Zachary (1986).

User notes: If the Subject was severely visually impaired, the technician had the option to present the test orally (this modification was noted in the **COMMENTS** when

done). There was no Spanish version of the SVT, so it was not included in the Spanish-language administration.

### **WRAT-3 Reading Recognition Subtest**

Description: The Reading Recognition subtest of the Wide Range Achievement Test, 3<sup>rd</sup> edition (WRAT-3; Wilkinson, 1993) involves identifying letters and making correct pronunciation of a series of words. ANWRATTS is the total raw score, ANWRATLT is the total score for the letter identification subtest, ANWRATRT is the total score for the word reading subtest, and ANWRATG is the grade level of reading ability as assessed by the WRAT-3. There was no Spanish version of the WRAT-3, so it was not included in Spanish-language administrations. The user should note that this test was added to the battery of tests after the ADAMS fieldwork began. As a result, this instrument was not administered to all subjects.

Administration and scoring: Please see Wilkinson (1993).

### **Handedness**

- Do you consider yourself right-handed or left-handed? The variable is ANHANDED.
  
- Have you always been (right/left) handed, or were you ever forced to change your hand preference? The variable is ANHANDHX.
  - If the answer to this question is ‘Yes,’ we recorded the approximate age at which the Subject was forced to change hands. If the subject was forced to change hands as a child, then ANHANDHX was coded as changed; however, if they were forced to change in adult life due to an acquired medical or neurological condition (e.g., amputation, stroke), we used the best data available to determine handedness prior to the event that prompted the change. Changes occurring in late adulthood due to an acquired condition were coded as ‘Always the same’ (ANHANDHX= 2), and subsequent handedness questions were asked with respect to handedness prior to the change (i.e., the subject’s original handedness).
  
- Are there any other activities for which you use your non-preferred hand?  
Variable = ANHNDOTH

Edinburgh Handedness Inventory (Oldfield, 1971; modified). This questionnaire assesses the extent to which subjects used their right versus left hand on various tasks. Ten tasks are assessed, including writing, drawing, throwing, brushing teeth, and striking a match. For each task, the subject rated their handedness based on a 5 -point scale:

- Always right (+10)
- Usually right (+5)
- Either Hand (0)
- Usually Left (-5)

### Always Left (-10)

Although there is an item code for each of the 10 tasks, the numerical values of the responses are summed across all 10 tasks to arrive at the total scores, which range from –100 to +100 (ANHNDTOT).

**Familial Handedness:** This question obtains a report from the Subject on handedness in his or her family, including mother, father, sister(s), brother(s), child(ren), and spouse(s). The coding for mother and father has separate handedness variables for right, left, mixed, and “don’t know.” For sisters, brothers, children, and spouses, there is a variable that indicates the total number in each group, such as the total number of brothers (code = ANHANDB). The following example shows handedness information that might be collected on a visit:

	Left	Right	Mixed	Don’t know
Brothers	0	2	0	1
(How many = 3)				

Based on this example, there were three brothers (ANHANDB = 3). There were no left-handed brothers (ANHANDBL = 0), two right-handed brothers (ANHANDBR = 2), no mixed-handed brothers (ANHANDBM = 0), and one brother whose handedness was unknown

(ANHANDBD = 1). Note that the sum of ANHANDBL, ANHANDBR, ANHANDBM, and ANHANDBD is equal to the total number of ANHANDB reported.

Coding for sisters and children follow the same scoring pattern as described above. Responses to this question did not include half-siblings and adopted siblings.

### Neuropsychological Evaluation Post-Visit Report

The purpose of this form was to note for data users any factors or conditions associated with the evaluation that may potentially alter the interpretation or validity of the neuropsychological test performance. It also noted unusual or special circumstances associated with the evaluation. Categories include: 1) visual and hearing impairments, 2) motor impairments, 3) language impairments, 4) adverse test conditions, 5) physiological/health factors, 6) illiteracy, and 7) other. The form was completed by a neuropsychologist, based on clinical impressions after review of the subject’s information at Case Staffing, including specific review of the neuropsychological test material. Users may use this form to make decisions about inclusion of individual cases for data analysis, particularly the neuropsychological data. If there were no special issues, then ANPVCP= 5 (“No”). If ANPVCP= 1 (“Yes”), an issue or issues were noted, and the user is advised to consult the Codebook to determine the relevant variables and codes.

### Memory Impairment Screen (MIS)

The Memory Impairment Screen (MIS; Buschke et al., 1999) is a four-item delayed free- and cued-recall memory test. It was developed as a brief screening measure for dementia. The subject was presented with a pair of words to repeat, and was then asked a question about each word to encourage categorical encoding. The next pair was

presented following the same procedure. After a brief delay interval in which the Subject performs an oral distraction task, the Subject was asked to recall all 4 words. Full credit (2 points) was awarded for each word correctly recalled. Subjects were provided a category cue for any unrecalled words. Any words recalled after presentation of the category cue were awarded partial credit (1 point). The total score on the MIS was calculated as (2 x free recall + cued recall). The range on this score is 0-8. The code for this score is ANMISSCR.

### **3c. Wave B**

A total of 333 ADAMS subjects were targeted for a second (follow-up) visit – Wave B. Among these 333 subjects, 252 participated in Wave B. The file structure for these files is similar to the corresponding files for Wave A.

#### **BB\_R. Assessment Data Part I**

Section BB\_R has 228 variables with one record for each subject who completed Wave B (n=252). Data in this section include the Physical Examination, the Composite International Diagnostic Interview (CIDI-SF), the Neuropsychiatric Inventory (NPI), and the Post-Examination Comments by CRN from the follow-up assessment. Please see the description for section AB pertaining to the specific measures in this section.

#### **BC\_R. Clinical History**

Section BC\_R has 219 variables with one record for each subject who completed Wave B (n=252). Please see the description for section AC pertaining to the specific measures in this section. Seven additional variables are included in section BC that are not included in AC. These variables pertain to changes since the initial (Wave A) visit: BC24, BC47, BC73, BC97, BC139, BC146, and BC188.

#### **BD\_R. Assessment Data Part II: Dementia Diagnoses/Summary Scores**

Section BD\_R has 100 variables with one record for each subject who completed Wave B (n=252). Data in this section include Assessment Outcomes, the Clinical Dementia Rating (CDR), the Hachinski Scale, Dementia Severity Rating Scale (DSRS), and the Blessed Dementia Rating from the follow-up assessment. Please see the description for section AD pertaining to the specific measures in this section. The dementia age of onset variable in section BD (BDONSET) is the age of onset for dementia among the subjects who were diagnosed with some type of dementia at the time of the Wave B visit but did not have a prior research diagnosis of dementia.

The variable BDBLSCOR was updated in release 5.0 to correct an error in Release 1.0 in which scores ending in .5 were inadvertently rounded to the nearest whole number.

#### **BE\_D. Medications (Drug Level)**

Section BE\_D has 14 variables with one record for each medication taken by a particular subject as reported at the Wave B assessment (n=1793). Some subjects have multiple

records and some have none. ID variables on this file are HHID, PN, and BEMENNUM. BEMENNUM is the “mention” of the medication. For example, a respondent who was reported as taking five medications will have a value of “1” for BEMENNUM for the first medication reported, a value of “2” for the second medication, “3” for the third medication, 4 for the fourth medication, and 5 for the fifth medication.

For information on aggregating from drug-level to respondent-level files, refer to Appendix 2. Please see the description for section AE\_D pertaining to the specific measures in this section.

Note about using SPSS with these data: some of the values in these variables (e.g., BEPILL, BESTR) have one (.5) or three decimal places (e.g., .004). In SPSS, you will need to go to the ‘Variable View’ tab in the data window, and set Decimals=3 for BESTR and =1 for BEPILL in order to have results display the values correctly.

### **BE\_R. Medications (Respondent Level)**

Section BE\_R has 4 variables with one record for each subject who completed Wave B (n=252). This file may be used in conjunction with BE\_D. See Appendix 2 for instructions on how to aggregate data from the drug level to the respondent level.

The four variables on this file are ID variables HHID, PN; BETOTNUM, which refers to the total number of drugs reported for each subject, and ADAMSSID. Please see the description for section AE\_R pertaining to the specific measures in this section.

### **BF\_R. Family History (Respondent Level)**

Section BF\_R has 45 variables with one record for each subject who completed a Wave B assessment (n=252). This file may be used in conjunction with BF\_CH and/or BF\_SB, the child and sibling-level data files.

The purpose of this section is to obtain information about the Respondent and his/her biological first-degree family members, including details about any memory problems. The family history interview is usually conducted with the Informant. In some circumstances, the Respondent completed the Family History; this is noted in the variable BFREL1. ID variables in this file are HHID, PN. ADAMSSID is also included in the data file.

At times there are discrepancies in the information collected on the Family History at the Wave A visit compared to the Wave B (follow-up) visit. This may include differences in the number of siblings and the living/deceased status of a family member. We attempt to resolve these discrepancies. However, if we are not able to do so with confidence, we will leave the data from the two visits as discrepant.

### **BF\_CH. Family History (Child Level)**

Section BF\_CH has 17 variables with one record for each child reported in the family history section (n=876). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and BFCNUM. BFCNUM is the

“mention” of the child. For example, a subject with three children will have a value of “1” for BFCNUM for the first child reported, a value of “2” for the second child reported, and “3” for the third child. See Appendix 2 for instructions on how to aggregate child-level data to the respondent level. The file structure is identical to section AF\_CH.

### **BF\_SB. Family History (Sibling Level)**

Section BF\_SB has 17 variables with one record for each sibling reported in the family history section (n=1170). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and BFSNUM. BFSNUM is the “mention” of the sibling. For example, a subject with five siblings will have a value of “1” for BFSNUM for the first sibling reported, a value of “2” for the second sibling reported, “3” for the third sibling and “4” for the fourth sibling, and “5” for the fifth sibling. See Appendix 2 for instructions on how to aggregate sibling-level data to the respondent level. The file structure is identical to section AF\_SB.

### **BG\_R. Caregiving Questionnaire**

Section BG\_R has 140 variables, with one record for each informant who completed the self-administered caregiving questionnaire after the follow-up assessment (n=210). The self-administered informant questionnaire was completed by the ADAMS informant to obtain additional information on the cognitive and physical function of the ADAMS subject, as well as information on caregiving activities performed by the informant. The questionnaire administered at the Wave B visit was identical to the questionnaire administered at the initial visit.

All informants at the Wave B visit were asked to complete this questionnaire, regardless of whether they completed the questionnaire at the time of the initial (Wave A) assessment. It is also possible that the informant at the follow-up assessment was not the same informant who was present at the Wave A assessment.

### **BH\_C. Medical Conditions**

Section BH\_C has 8 variables with one record for each medical condition indicated for a particular subject as reported at the Wave B assessment (n=1358). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and BHCNUM. BHCNUM is the “mention” of the medical condition. For example, a respondent who was reported as having five medical conditions will have a value of “1” for BHCNUM for the first condition reported, a value of “2” for the second condition, “3” for the third condition, 4 for the fourth condition, and 5 for the fifth condition.

The data may be aggregated from condition level to respondent level in much the same manner that medication data (sections BE\_D and BE\_R) can be aggregated from drug-level to respondent-level files as shown in Appendix 2.

The medical conditions were coded to capture lifetime medical history based on informant report at the time of the ADAMS assessment. *At Wave B visits, only new or ongoing medical conditions were noted; past conditions were not noted if they had*

*previously been reported at the Initial visit.* In addition to the identification variables, the Medical Conditions (condition level) file contains the following variables:

- Medical Condition - ICD-9 Code (BHCODE)
- Type of ICD 9 Code (BHCTYPE)
- Medical Condition Subcode (BHSCODE)  
The subcodes were added to capture characteristics, such as treatment or sequelae of the medical condition that might be useful in interpreting the data. If the ICD-9 codes are the same but the subcodes are different, then the conditions are considered to be different. Subcodes were assigned if the medical condition code was 436.0, 435.9, 294.8, 412, 427.9, 496, or 250.00.
- A condition Status code (BHCSTATUS) indicates whether a coded medical condition is a current condition (BHCSTATUS = 1), a past condition (BHCSTATUS = 2), or a chronic condition (both present and past, BHCSTATUS = 3). Current conditions are generally limited to those that are acute or have a very recent onset.

Please see the description for section AH\_C pertaining to the ICD-9 codes used in this study. Appendix 3 provides additional documentation for the specific ICD-9 codes (BHCODE) and subcodes (BHSCODE).

## **BH\_R. Medical Conditions**

Section BH\_R has 5 variables with one record per respondent who completed a Wave B assessment (n=252). This file may be used in conjunction with BH\_C. See section AH\_C, BH\_C, and Appendix 2 for instructions on how to aggregate data from the condition level to the respondent level. (The general process is the same as aggregating drug-level data in section AE\_D to the respondent level.)

The five variables on this file include ID variables HHID, PN, BHCONDITIONS, BHTOTCOND, and ADAMSSID. BHCONDITIONS indicates whether medical conditions were present and BHTOTCOND is the total number of medical conditions reported for each subject. See section AH\_C and BH\_C for more information with regard to the specific medical condition codes.

## **BJ\_R. Dementia Checklist and Neurological Exam**

Section BJ\_R has 287 variables with one record for each subject who completed a Wave B assessment (n=252). ID variables in this file are HHID, PN. ADAMSSID is also included in the data file.

See the description for section AJ\_R for additional information about these measures. The file structure for this section is the same as section AJ\_R.

## **BM\_R. Medical History**

Section BM\_R has 468 variables with one record per respondent who completed a Wave B assessment (n=252). Data in this section are based on a medical history interview that

the Nurse completed with the informant. The medical history form, which contains all of the questions asked during the medical history interview, is available as a separate document.

### **BN\_R. Assessment Data Part III: Neuropsychological Exam**

Section BN\_R has 395 variables, with one record for each subject who completed a follow-up assessment (n=252). The neuropsychological evaluation at follow-up assessments was largely the same as for the Wave A assessment. One exception is that questions about education and handedness were not asked at the Wave B visit. Subjects were asked about their employment status, and addition questions were administered only if there was a change in status (i.e., BACURRWK). The WRAT-3 Reading Recognition subtest was not administered at the Wave B visit if it was obtained at the initial visit. It is also important to note that technicians were uninformed about the previous diagnoses and test performances of the subject.

### **3d. Wave C.**

A total of 466 ADAMS subjects were targeted for a Wave C (follow-up) visit. Among these 466 subjects, 315 participated in Wave C. The file structure for these files is similar to the corresponding files for Waves A and B.

### **CB\_R. Assessment Data Part I**

Section CB\_R has 253 variables with one record for each subject who completed Wave C (n=315). Data in this section include the Physical Examination, the PHQ-9, Visual Contrast, Hearing (pure tone thresholds), Composite International Diagnostic Interview (CIDI-SF), the Neuropsychiatric Inventory (NPI), and the Post-Examination Comments by CRN from the follow-up assessment. The PHQ-9 and hearing measures were new to ADAMS in Wave C. Details about these new measures are provided below.

### **PHQ-9**

The PHQ-9 is the nine item depression scale of the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999). The PHQ-9 is based directly on the diagnostic criteria for major depressive disorder in the Diagnostic and Statistical Manual Fourth Edition (DSM-IV). In ADAMS, the PHQ-9 was administered to the Respondent by the clinical research nurse conducting the assessment.

The clinical research nurse asks the Respondent: “Over the last 2 weeks, how often have you been bothered by any of the following problems?”

1. Little interest or pleasure in doing things? (CBPHQ1)
2. Feeling down, depressed, or hopeless? (CBPHQ2)
- 3a. Trouble falling or staying asleep? (CBPHQ3)
- 3b. Sleeping too much? (Include only higher score of 3a/3b in total) (CBPHQ4)
4. Feeling tired or having little energy? (CBPHQ5)
- 5a. Poor Appetite? (CBPHQ6)
- 5b. Overeating? (Include only higher score of 5a/5b in total) (CBPHQ7)



6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down? (CBPHQ8)
7. Trouble concentrating on things, such as reading the newspaper or watching television? (CBPHQ9)
- 8a. Moving or speaking so slowly that other people could have noticed? (CBPHQ10)
- 8b. Being so fidgety or restless that you have been moving around a lot more than usual? (Include only higher score of 8a/8bin total) (CBPHQ11)
9. Thoughts that you would be better off dead or of hurting yourself in some way? (CBPHQ12)

In the original version of the PHQ-9, Questions 3, 5, and 8 asked about opposite symptoms within the same question (e.g. Question 5: poor appetite or overeating). In the version of the PHQ-9 used in ADAMS, Questions 3, 5, and 8 were divided into two questions each (e.g. 3a and 3b) to be able to identify the specific symptom being endorsed. For each of the nine items, the score ranges from 0 to 3 denoting the frequency of the symptom during the past two weeks, with 0 = not present at all, 1 = present several days, 2 = present more than one-half of the days, and 3=present nearly every day.

If the score on any item was 1-3, then Question #10 (CBPHQDIFF) was asked; otherwise Question #10 was coded 96 (Skipped). Question #10 was “How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?” The response options for this question were: 3 = extremely difficult, 2 = very difficult, 1 = somewhat difficult, and 0 = not difficult at all.

The Total Score (CBPHQSCORE) for the PHQ was calculated as the sum of the scores (0- 3) for items #1, 2, 4, 6, 7, 9 and the score for the highest response among each of the two-item sets #3a & 3b, 5a & 5b, 8a & 8b. Only values less than 97 were included in the total score. If all items were scored ‘0’, then the total score would be 0. The total score ranges from 0 – 27. A site developed by Pfizer Inc.

(<http://www.phqscreeners.com/pdfs/PHQ9InstruxforUse.pdf>) provides the following guidelines for interpretation of the PHQ-9 total score:

<b>*Total Score</b>	<b>Depression Severity*</b>
0-4	None
5-9	Mild
10-14	Moderate
15-19	Moderately sever
20-27	Severe

Respondents were often able to complete it even when they have significant cognitive impairment. However, if it appeared that the respondent did not understand the questions, the administration was discontinued and the form was coded ‘Complete = No’.

## **Vision Contrast**

This test was first used in ADAMS in Wave C. It measures visual contrast sensitivity using the Mars Letter Contrast Sensitivity Test. The subject's log contrast sensitivity (CBVCCONSENSE) was calculated by subtracting the product of the number of errors multiplied by 0.04 (CBVCNM04) from the value of the final correct item (CBVCFINLET). It was also noted whether vision correction was used (CBVCCORRECT) and the distance of the eyes from the chart (CBVCEYEDIST).

## **Hearing – Pure Tone Thresholds**

Subjects' hearing level was assessed in Wave C using pure tone thresholds. Pure tone stimuli were used to screen for hearing impairment. Stimuli were presented at 500, 1000, 2000 and 4000 Hz at both 25 and 40 dB to the right and the left ear individually. A second trial was done for the dB level if the stimulus at any frequency was not heard missed.

## **Hearing – Hearing Handicap Inventory**

The screening version of the Hearing Handicap Inventory for the Elderly (HHIE-S) is a 10-item questionnaire developed to assess the extent to which hearing loss affects the Respondent's daily activities and how the individual perceives the social and emotional effects of hearing loss. The clinical research nurse reads the instructions to the Respondent and then the Respondent completes the form. If the Respondent is unable to read the form due to illiteracy or due to visual impairment, then the nurse reads each item to the Respondent. Each of the 10-items has three responses choices: 'Yes', 'Sometimes' or 'No'. The more items that are endorsed 'Yes' or "Sometimes' the greater the handicapping effect of the hearing impairment. Respondents are often able to complete it even when they have significant cognitive impairment. However, if it appears that the respondent does not understand the questions, discontinue administration and code 'Complete = No'. All endorsed items are totaled to obtain a total score (CBHHSCORE).

Please see the description for Section AB\_R pertaining to the other specific measures in this section (e.g., the Physical Exam, NPI, CIDI, and post-visit CRN comments).

## **CC\_R. Clinical History**

Section CC\_R has 271 variables with one record for each subject who completed Wave C (n=315). Please see the description for section AC pertaining to the specific measures in this section.

There are four variables in sections AC and BC that are not included in CC: AC11 (BC11), AC78A (BC78A), AC122A (BC122A), ACINFPHONE (BCINFPHONE).

There are 56 variables new to section CC that were not previously included in AC or BC. These variables are as follows: CCSUBRES, CC79, CC80, CC81, CC82, CC83, CC84,

CC85, CC86, CC87, CC88, CC89, CC90, CC91, CC92, CC98, CC110, CC111, CC131, CC132, CC194, CC100\_1-CC100\_13, CC101\_1- CC101\_13, and CC171\_1-CC171\_9.

## **CD\_R. Assessment Data Part II: Dementia Diagnoses/Summary Scores**

Section CD\_R has 96 variables with one record for each subject who completed a Wave C assessment (n=315). Data in this section include Assessment Outcomes, the Clinical Dementia Rating (CDR), the Hachinski Scale, Dementia Severity Rating Scale (DSRS), and the Blessed Dementia Rating from the Wave C follow-up assessment. Please see the description for section AD pertaining to the specific measures in this section. The dementia age of onset variable in section CD (CDONSET) is the age of onset for dementia among the subjects who were diagnosed with some type of dementia at the time of the Wave C assessment but did not have a prior research diagnosis of dementia.

*Important note:* The Dementia Severity Rating Scale (DSRS) measure used in Waves C & D differed from the DSRS used in Waves A and B. Please pay careful attention to the differences in item wording compared to the previous waves. Specific item wording is available in the codebook.

## **CE\_D. Medications (Drug Level)**

Section CE\_D has 14 variables with one record for each medication taken by a particular subject as reported at the Wave C assessment (n=2473). Some subjects have multiple records and some have none. ID variables on this file are HHID, PN, and CEMENNUM. CEMENNUM is the “mention” of the medication. For example, a respondent who was reported as taking five medications will have a value of “1” for CEMENNUM for the first medication reported, a value of “2” for the second medication, “3” for the third medication, 4 for the fourth medication, and 5 for the fifth medication.

For information on aggregating from drug-level to respondent-level files, refer to Appendix 2. Please see the description for section AE\_D pertaining to the specific measures in this section.

Note about using SPSS with these data: some of the values in these variables (e.g., CEPILL, CESTR) have one (.5) or three decimal places (e.g., .004). In SPSS, you will need to go to the ‘Variable View’ tab in the data window, and set Decimals=3 for BESTR and =1 for CEPILL in order to have results display the values correctly.

## **CE\_R. Medications (Respondent Level)**

Section CE\_R has 4 variables with one record for each subject who completed Wave C (n=315). This file may be used in conjunction with CE\_D. See Appendix 2 for instructions on how to aggregate data from the drug level to the respondent level.

The four variables on this file are ID variables HHID, PN; CETOTNUM, which refers to the total number of drugs reported for each subject, and ADAMSSID. Please see the description for section AE\_R pertaining to the specific measures in this section.

## **CF\_R. Family History (Respondent Level)**

Section CF\_R has 45 variables with one record for each subject who completed a Wave C assessment (n=315). This file may be used in conjunction with CF\_CH and/or CF\_SB, the child and sibling-level data files.

The purpose of this section is to obtain information about the Respondent and his/her biological first-degree family members, including details about any memory problems. The family history interview is usually conducted with the Informant. In some circumstances, the Respondent completed the Family History; this is noted in the variable CFREL1. ID variables in this file are HHID, PN. ADAMSSID is also included in the data file.

At times there are discrepancies in the information collected on the Family History at the Wave A and B visits compared to the Wave C (follow-up) visit. This may include differences in the number of siblings and the living/deceased status of a family member. We attempt to resolve these discrepancies. However, if we are not able to do so with confidence, we will leave the data from the two visits as discrepant.

## **CF\_CH. Family History (Child Level)**

Section CF\_CH has 17 variables with one record for each child reported in the family history section (n=1002). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and CFCNUM. CFCNUM is the “mention” of the child. For example, a subject with three children will have a value of “1” for CFCNUM for the first child reported, a value of “2” for the second child reported, and “3” for the third child. See Appendix 2 for instructions on how to aggregate child-level data to the respondent level. The file structure is identical to section AF\_CH.

## **CF\_SB. Family History (Sibling Level)**

Section CF\_SB has 17 variables with one record for each sibling reported in the family history section (n=1438). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and CFSNUM. CFSNUM is the “mention” of the sibling. For example, a subject with five siblings will have a value of “1” for CFSNUM for the first sibling reported, a value of “2” for the second sibling reported, “3” for the third sibling and “4” for the fourth sibling, and “5” for the fifth sibling. See Appendix 2 for instructions on how to aggregate sibling-level data to the respondent level. The file structure is identical to section AF\_SB.

## **CG\_R. Caregiving Questionnaire**

Section CG\_R has 157 variables, with one record for each informant who completed the self-administered caregiving questionnaire after the follow-up assessment (n=240). The self-administered informant questionnaire was completed by the ADAMS informant to obtain additional information on the cognitive and physical function of the ADAMS subject, as well as information on caregiving activities performed by the informant. The questionnaire administered at the Wave C visit asked the same questions compared to Waves A and B. However, a few new questions were added, including questions about the relationship between the informant and care recipient (CGQ53A - CQQ53G) and

information about whether the informant provides more or less care to the care recipient and the reason for the change in the amount of caregiving (CGQ69A, CGQ69B1-B6, and CGQ69C1-C6). Please refer to the Wave C codebook for the specific questions.

All informants at the Wave C visit were asked to complete this questionnaire, regardless of whether they completed the questionnaire at the time of any earlier assessments. It is also possible that the informant at the follow-up assessment was not the same informant who was present at the Wave A or B assessment.

## **CH\_C. Medical Conditions**

Section CH\_C has 8 variables with one record for each medical condition indicated for a particular subject as reported at the Wave C assessment (n=2003). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and CHCNUM. CHCNUM is the “mention” of the medical condition. For example, a respondent who was reported as having five medical conditions will have a value of “1” for BHCNUM for the first condition reported, a value of “2” for the second condition, “3” for the third condition, 4 for the fourth condition, and 5 for the fifth condition.

The data may be aggregated from condition level to respondent level in much the same manner that medication data (sections CE\_D and CE\_R) can be aggregated from drug-level to respondent-level files as shown in Appendix 2.

The medical conditions were coded to capture lifetime medical history based on informant report at the time of the ADAMS assessment. *At Wave C visits, only new or ongoing medical conditions were noted; past conditions were not noted if they had previously been reported at the Initial visit.* In addition to the identification variables, the Medical Conditions (condition level) file contains the following variables:

- Medical Condition - ICD-9 Code (CHCODE)
- Type of ICD 9 Code (CHCDTYPE)
- Medical Condition Subcode (CHSCODE)  
The subcodes were added to capture characteristics, such as treatment or sequelae of the medical condition that might be useful in interpreting the data. If the ICD-9 codes are the same but the subcodes are different, then the conditions are considered to be different. Subcodes were assigned if the medical condition code was 436.0, 435.9, 294.8, 412, 427.9, 496, or 250.00.
- A condition Status code (CHCSTATUS) indicates whether a coded medical condition is a current condition (CHCSTATUS = 1), a past condition (CHCSTATUS = 2), or a chronic condition (both present and past, CHCSTATUS = 3). Current conditions are generally limited to those that are acute or have a very recent onset.

Please see the description for section AH\_C pertaining to the ICD-9 codes used in this study. Appendix 3 provides additional documentation for the specific ICD-9 codes (CHCODE) and subcodes (CHSCODE).

## **CH\_R. Medical Conditions**

Section CH\_R has 5 variables with one record per respondent who completed a Wave C assessment (n=315). This file may be used in conjunction with CH\_C. See section AH\_C, BH\_C, and Appendix 2 for instructions on how to aggregate data from the condition level to the respondent level. (The general process is the same as aggregating drug-level data in section AE\_D to the respondent level.)

The five variables on this file include ID variables HHID, PN, CHCONDITIONS, CHTOTCOND, and ADAMSSID. CHCONDITIONS indicates whether medical conditions were present and CHTOTCOND is the total number of medical conditions reported for each subject. See section AH\_C and BH\_C for more information with regard to the specific medical condition codes.

## **CJ\_R. Dementia Checklist and Neurological Exam**

Section CJ\_R has 280 variables with one record for each subject who completed a Wave C assessment (n=315). ID variables in this file are HHID, PN. ADAMSSID is also included in the data file.

In Wave C, the neurological exam was updated to include items from the UPDRS (Unified Parkinson's Disease Rating Scale) (Fahn *et al.*, 1987). See the description for section AJ\_R for additional information about the neurological exam.

## **CM\_R. Medical History**

Section CM\_R has 375 variables with one record per respondent who completed a Wave C assessment (n=315). Data in this section are based on a medical history interview that the Nurse completed with the informant. The medical history form, which contains all of the questions asked during the medical history interview, is available as a separate document.

## **CN\_R. Assessment Data Part III: Neuropsychological Exam**

Section CN\_R has 415 variables, with one record for each subject who completed a follow-up assessment (n=315). The neuropsychological evaluation at follow-up assessments was largely the same as for the Wave A assessment. One exception is that questions about education and handedness were not asked at the Wave C visit. It is also important to note that technicians were uninformed about the previous diagnoses and test performances of the subject

In Wave C the Indiana University Tokens Test (IU Tokens) was added to the neuropsychological test battery. This test assesses oral comprehension and execution of two- and three-step commands. The variable containing the total score is CNIUTOKTOT.

Administration and scoring: Please see Unverzagt *et al.* (1996).

### **3e. Wave D.**

A total of 280 ADAMS subjects were targeted for a Wave D (follow-up) visit. Among these 280 subjects, 217 participated in Wave D. The file structure for these files is similar to the corresponding files for Waves A, B, & C.

#### **DB\_R. Assessment Data Part I**

Section DB\_R has 253 variables with one record for each subject who completed Wave D (n=217). Data in this section include the Physical Examination, the PHQ-9, Visual Contrast, Hearing (pure tone thresholds), Composite International Diagnostic Interview (CIDI-SF), the Neuropsychiatric Inventory (NPI), and the Post-Examination Comments by CRN from the follow-up assessment.

Please see the description for Section AB and CB pertaining to the specific information about the measures in this section.

#### **DC\_R. Clinical History**

Section DC\_R has 271 variables with one record for each subject who completed Wave D (n=217). Please see the description for section AC & CC pertaining to the specific measures in this section.

#### **DD\_R. Assessment Data Part II: Dementia Diagnoses/Summary Scores**

Section DD\_R has 96 variables with one record for each subject who completed a Wave D assessment (n=217). Data in this section include Assessment Outcomes, the Clinical Dementia Rating (CDR), the Hachinski Scale, Dementia Severity Rating Scale (DSRS), and the Blessed Dementia Rating from the Wave D follow-up assessment. Please see the description for sections AD pertaining to the specific measures in this section. The dementia age of onset variable in section DD (DDONSET) is the age of onset for dementia among the subjects who were diagnosed with some type of dementia at the time of the Wave D assessment but did not have a prior research diagnosis of dementia.

*Important note:* The Dementia Severity Rating Scale (DSRS) measure used in Waves C & D differed from the DSRS used in Waves A and B. Please pay careful attention to the differences in item wording compared to the previous waves. Specific item wording is available in the codebook.

#### **DE\_D. Medications (Drug Level)**

Section DE\_D has 14 variables with one record for each medication taken by a particular subject as reported at the Wave D assessment (n=1714). Some subjects have multiple records and some have none. ID variables on this file are HHID, PN, and DEMENNUM. DEMENNUM is the “mention” of the medication. For example, a respondent who was reported as taking five medications will have a value of “1” for DEMENNUM for the first medication reported, a value of “2” for the second medication, “3” for the third medication, 4 for the fourth medication, and 5 for the fifth medication.

For information on aggregating from drug-level to respondent-level files, refer to Appendix 2. Please see the description for section AE\_D pertaining to the specific measures in this section.

Note about using SPSS with these data: some of the values in these variables (e.g., CEPILL, CESTR) have one (.5) or three decimal places (e.g., .004). In SPSS, you will need to go to the 'Variable View' tab in the data window, and set Decimals=3 for BESTR and =1 for DEPILL in order to have results display the values correctly.

### **DE\_R. Medications (Respondent Level)**

Section DE\_R has 4 variables with one record for each subject who completed Wave C (n=217). This file may be used in conjunction with DE\_D. See Appendix 2 for instructions on how to aggregate data from the drug level to the respondent level.

The four variables on this file are ID variables HHID, PN; DETOTNUM, which refers to the total number of drugs reported for each subject, and ADAMSSID. Please see the description for section AE\_R pertaining to the specific measures in this section.

### **DF\_R. Family History (Respondent Level)**

Section DF\_R has 45 variables with one record for each subject who completed a Wave D assessment (n=217). This file may be used in conjunction with DF\_CH and/or DF\_SB, the child and sibling-level data files.

The purpose of this section is to obtain information about the Respondent and his/her biological first-degree family members, including details about any memory problems. The family history interview is usually conducted with the Informant. In some circumstances, the Respondent completed the Family History; this is noted in the variable DFREL1. ID variables in this file are HHID, PN. ADAMSSID is also included in the data file.

At times there are discrepancies in the information collected on the Family History at the visits across Waves A-D. This may include differences in the number of siblings and the living/deceased status of a family member. We attempt to resolve these discrepancies. However, if we are not able to do so with confidence, we will leave the data from the two visits as discrepant.

### **DF\_CH. Family History (Child Level)**

Section DF\_CH has 17 variables with one record for each child reported in the family history section (n=668). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and DFCNUM. DFCNUM is the "mention" of the child. For example, a subject with three children will have a value of "1" for DFCNUM for the first child reported, a value of "2" for the second child reported, and "3" for the third child. See Appendix 2 for instructions on how to aggregate child-level data to the respondent level. The file structure is identical to section AF\_CH.



## **DF\_SB. Family History (Sibling Level)**

Section DF\_SB has 17 variables with one record for each sibling reported in the family history section (n=1052). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and DFSNUM. DFSNUM is the “mention” of the sibling. For example, a subject with five siblings will have a value of “1” for DFSNUM for the first sibling reported, a value of “2” for the second sibling reported, “3” for the third sibling and “4” for the fourth sibling, and “5” for the fifth sibling. See Appendix 2 for instructions on how to aggregate sibling-level data to the respondent level. The file structure is identical to section AF\_SB.

## **DG\_R. Caregiving Questionnaire**

Section DG\_R has 157 variables, with one record for each informant who completed the self-administered caregiving questionnaire after the follow-up assessment (n=119). The self-administered informant questionnaire was completed by the ADAMS informant to obtain additional information on the cognitive and physical function of the ADAMS subject, as well as information on caregiving activities performed by the informant. The questionnaire administered at the Wave D visit asked the same questions compared to Wave C.

All informants at the Wave D visit were asked to complete this questionnaire, regardless of whether they completed the questionnaire at the time of any earlier assessments. It is also possible that the informant at the follow-up assessment was not the same informant who was present at any of the earlier assessments.

## **DH\_C. Medical Conditions**

Section DH\_C has 8 variables with one record for each medical condition indicated for a particular subject as reported at the Wave C assessment (n=1503). Some subjects have multiple records and some have none. Primary ID variables on this file are HHID, PN, and DHCNUM. DHCNUM is the “mention” of the medical condition. For example, a respondent who was reported as having five medical conditions will have a value of “1” for DHCNUM for the first condition reported, a value of “2” for the second condition, “3” for the third condition, 4 for the fourth condition, and 5 for the fifth condition.

The data may be aggregated from condition level to respondent level in much the same manner that medication data (sections DE\_D and DE\_R) can be aggregated from drug-level to respondent-level files as shown in Appendix 2.

The medical conditions were coded to capture lifetime medical history based on informant report at the time of the ADAMS assessment. *At Wave D visits, only new or ongoing medical conditions were noted; past conditions were not noted if they had previously been reported at the Initial visit.* In addition to the identification variables, the Medical Conditions (condition level) file contains the following variables:

- Medical Condition - ICD-9 Code (DHCODE)
- Type of ICD 9 Code (DHCTYPE)
- Medical Condition Subcode (DHSCODE)

- The subcodes were added to capture characteristics, such as treatment or sequelae of the medical condition that might be useful in interpreting the data. If the ICD-9 codes are the same but the subcodes are different, then the conditions are considered to be different. Subcodes were assigned if the medical condition code was 436.0, 435.9, 294.8, 412, 427.9, 496, or 250.00.
- A condition Status code (DHCSTATUS) indicates whether a coded medical condition is a current condition (DHCSTATUS = 1), a past condition (DHCSTATUS = 2), or a chronic condition (both present and past, DHCSTATUS = 3). Current conditions are generally limited to those that are acute or have a very recent onset.

Please see the description for section AH\_C pertaining to the ICD-9 codes used in this study. Appendix 3 provides additional documentation for the specific ICD-9 codes (DHCODE) and subcodes (DHSCODE).

### **DH\_R. Medical Conditions**

Section CH\_R has 5 variables with one record per respondent who completed a Wave D assessment (n=217). This file may be used in conjunction with DH\_C. See section AH\_C, BH\_C, and Appendix 2 for instructions on how to aggregate data from the condition level to the respondent level. (The general process is the same as aggregating drug-level data in section AE\_D to the respondent level.)

The five variables on this file include ID variables HHID, PN, DHCONDITIONS, DHTOTCOND, and ADAMSSID. DHCONDITIONS indicates whether medical conditions were present and DHTOTCOND is the total number of medical conditions reported for each subject. See section AH\_C and BH\_C for more information with regard to the specific medical condition codes.

### **DJ\_R. Dementia Checklist and Neurological Exam**

Section DJ\_R has 280 variables with one record for each subject who completed a Wave D assessment (n=217). ID variables in this file are HHID, PN, ADAMSSID is also included in the data file. The neurological exam used in Wave D was identical to the exam conducted in Wave C. Please refer to Sections AJ and CJ for more information.

### **DM\_R. Medical History**

Section DM\_R has 375 variables with one record per respondent who completed a Wave D assessment (n=217). Data in this section are based on a medical history interview that the Nurse completed with the informant. The medical history form, which contains all of the questions asked during the medical history interview, is available as a separate document.

### **DN\_R. Assessment Data Part III: Neuropsychological Exam**

Section DN\_R has 415 variables, with one record for each subject who completed a follow-up assessment (n=217). The neuropsychological evaluation at follow-up assessments was largely the same as for the Wave A assessment. One exception is that

questions about education and handedness were not asked at the Wave D visit. It is also important to note that technicians were uninformed about the previous diagnoses and test performances of the subject

## 4. File Naming Conventions

Files are named beginning with “ADAMS1” followed by the two letters designating the section, a separator “\_” and the letter designating the level of the files, e.g., ADAMS1AB\_R. Sections beginning with the letter “A” correspond to the first (Wave A) visit, sections beginning with the letter “B” correspond to the Wave B visit, and those beginning with the letter “C” correspond to the Wave C visit.

Data file extensions are as follows:

- \_R Respondent level
- \_D Drug level (Medications)
- \_C Condition level (Medical Conditions)
- \_CH Child level (Family History)
- \_SB Sibling level (Family History)

The following extensions are used for the six different types of files that are distributed:

- .da for data files,
- .sas for SAS program statements
- .sps for SPSS program statements
- .do for Stata do statements
- .dct for Stata dictionary statements, and
- .txt for codebook files

One of each of these file types is provided for each of the data files in the ADAMS data release. For example, for section AB, there are six files with the prefix ADAMS1AB\_R.

- |                |  |
|----------------|--|
| ADAMS1AB_R.da  | respondent-level/subject data from section AB,           |
| ADAMS1AB_R.sas | corresponding SAS program statements for section AB      |
| ADAMS1AB_R.sps | corresponding SPSS program statements for section AB     |
| ADAMS1AB_R.do  | corresponding Stata do statements for section AB         |
| ADAMS1AB_R.dct | corresponding Stata dictionary statements for section AB |
| ADAMS1AB_R.txt | the ASCII codebook                                       |

## 5. Data Files

ADAMS releases contain a total of 57 data files released in five parts:

### Release 8.0

- ADAMS Tracker (one data file)
- Wave A (14 data files)
- Wave B (14 data files)
- Wave C (14 data files)
- Wave D (14 data files)

The files are listed below along with the number of cases (N), number of variables (NV), and the primary identifiers (IDs). The records in the data files are sorted in order by these primary identifiers. To reduce the number of data files needed and to facilitate file merging, the demographic and fieldwork variables for Waves A, B, C and D are included in ADAMS1TRK\_R. (ADAMS1TRK\_R replaces ADAMS1AA\_R that was included in prior data releases.)

The ADAMS data are provided in ASCII format, with fixed-length records. Use associated SAS, SPSS, or Stata program statements to read the data into the analysis package of your choice.

**Table 3. ADAMS Data Files, Number of Cases, Number of Variables and Primary Identifiers**

<b>Tracker (Version 7.0)</b>			
Data File	Number of Cases	Number of Variables	Primary Identifiers
ADAMS1TRK_R	N=1770	NV= 120	IDs=HHID PN
<b>Wave A (Version 6.0)</b>			
Data File	Number of Cases	Number of Variables	Primary Identifiers
ADAMS1AB_R	N=856	NV=228	IDs=HHID PN
ADAMS1AC_R	N= 856	NV=212	IDs=HHID PN
ADAMS1AD_R	N=856	NV=101	IDs=HHID PN
ADAMS1AE_R	N=856	NV=4	IDs=HHID PN
ADAMS1AE_D	N=5765	NV=14	IDs=HHID PN AEMENNUM
ADAMS1AF_R	N=856	NV=45	IDs=HHID PN
ADAMS1AF_CH	N=2443	NV=17	IDs=HHID PN AFCNUM
ADAMS1AF_SB	N=4215	NV=17	IDs=HHID PN AFSNUM
ADAMS1AG_R	N=746	NV=140	IDs=HHID PN
ADAMS1AH_C	N=6060	NV=8	IDs=HHID PN AHCNUM
ADAMS1AH_R	N=856	NV=5	IDs=HHID PN

ADAMS1AJ_R	N=856	NV= 287	IDs=HHID PN
ADAMS1AM_R	N=856	NV=468	IDs=HHID PN
ADAMS1AN_R	N=856	NV=434	IDs=HHID PN
<b>Wave B (Version 6.0)</b>			
Data File	Number of Cases	Number of Variables	Primary Identifiers
ADAMS1BB_R	N=252	NV=228	IDs=HHID PN
ADAMS1BC_R	N=252	NV=219	IDs=HHID PN
ADAMS1BD_R	N=252	NV=100	IDs=HHID PN
ADAMS1BE_R	N=252	NV=4	IDs=HHID PN
ADAMS1BE_D	N=1793	NV=14	IDs=HHID PN BEMENNUM
ADAMS1BF_R	N=856	NV=45	IDs=HHID PN
ADAMS1BF_CH	N=876	NV=17	IDs=HHID PN BFCNUM
ADAMS1BF_SB	N=1170	NV=17	IDs=HHID PN BFSNUM
ADAMS1BG_R	N=205	NV=140	IDs=HHID PN
ADAMS1BH_C	N=1358	NV=8	IDs=HHID PN BHCNUM
ADAMS1BH_R	N=252	NV=5	IDs=HHID PN
ADAMS1BJ_R	N=252	NV=287	IDs=HHID PN
ADAMS1BM_R	N=252	NV=468	IDs=HHID PN
ADAMS1BN_R	N=252	NV=395	IDs=HHID PN
<b>Wave C (Version 6.0)*</b>			
Data File	Number of Cases	Number of Variables	Primary Identifiers
ADAMS1CC_R	N=315	NV=271	IDs=HHID PN
ADAMS1CD_R	N=315	NV= 96	IDs=HHID PN
<b>Wave D (Version 7.0)*</b>			
Data File	Number of Cases	Number of Variables	Primary Identifiers
ADAMS1DD_R	N=217	NV= 97	IDs=HHID PN
<b>Waves C &amp; D (Version 8.0)</b>			
Data File	Number of Cases	Number of Variables	Primary Identifiers
ADAMS1CB_R	N=315	NV=253	IDs=HHID PN
ADAMS1CE_R	N=315	NV=4	IDs=HHID PN
ADAMS1CE_D	N=2473	NV=14	IDs=HHID PN CEMENNUM
ADAMS1CF_R	N=315	NV=45	IDs=HHID PN
ADAMS1CF_CH	N=1002	NV=17	IDs=HHID PN CFCNUM

ADAMS1CF_SB	N=1438	NV=17	IDs=HHID PN CFSNUM
ADAMS1CG_R	N=240	NV=157	IDs=HHID PN
ADAMS1CH_C	N=2003	NV=8	IDs=HHID PN CHCNUM
ADAMS1CH_R	N=315	NV=5	IDs=HHID PN
ADAMS1CJ_R	N=315	NV=280	IDs=HHID PN
ADAMS1CM_R	N=315	NV=375	IDs=HHID PN
ADAMS1CN_R	N=315	NV=415	IDs=HHID PN
ADAMS1DB_R	N=217	NV=253	IDs=HHID PN
ADAMS1DC_R	N=217	NV=271	IDs=HHID PN
ADAMS1DE_R	N=217	NV=4	IDs=HHID PN
ADAMS1DE_D	N=1714	NV=14	IDs=HHID PN DEMENUM
ADAMS1DF_R	N=217	NV=45	IDs=HHID PN
ADAMS1DF_CH	N=668	NV=17	IDs=HHID PN DFCNUM
ADAMS1DF_SB	N=1052	NV=17	IDs=HHID PN DFSNUM
ADAMS1DG_R	N=119	NV=157	IDs=HHID PN
ADAMS1DH_C	N=1503	NV=8	IDs=HHID PN DHCNUM
ADAMS1DH_R	N=217	NV=5	IDs=HHID PN
ADAMS1DJ_R	N=217	NV=280	IDs=HHID PN
ADAMS1DM_R	N=217	NV=375	IDs=HHID PN
ADAMS1DN_R	N=217	NV=415	IDs=HHID PN

\*Wave C & D files originally included in Releases 6 & 7 were incorporated in Release 8 to keep all of the Wave C & D files together for downloading purposes.

## 6. Identification Variables

Identification variables in the ADAMS are stored in character format, consistent with the core HRS. There are two ways to uniquely identify an individual in the HRS-ADAMS, either by HHID PN *or* by ADAMSSID. We strongly recommend that you merge files by HHID and PN, two separate variables. The ID variables on the informant caregiving questionnaire data files match the IDs for the ADAMS subject, not the HRS ID variables associated with the informant, the subject's spouse, partner, or other household member. See the descriptions below for additional information.

### 6a. HHID

HHID is the Household Identification Number. In the initial wave of data collection in HRS, each sample household was assigned a Household Identifier. HHID is stable across waves of data collection and uniquely identifies the original household and any households derived from that household in subsequent waves of HRS data collection. The HHID from the HRS study was included on each of the ADAMS data files to facilitate file merging. HHID has six digits and is stored in character format.

### 6b. PN

In combination with HHID, PN uniquely identifies a subject or subject's spouse or partner. PNs are unique within an original household (HHID). HHID and PN, in

combination, allow merging of ADAMS respondent-level data with data from HRS core respondent-level files. The PN assigned to a particular respondent/subject does not change across waves. PN has three digits and is stored in character format.

### **6c. AEMENNUM, BEMENNUM, CEMENNUM, & DEMENNUM, in Drug-level Files**

- AEMENNUM, in conjunction with HHID and PN, uniquely identifies a record in the drug -level file, ADAMS1AE\_D.
- BEMENNUM, in conjunction with HHID and PN, uniquely identifies a record in the drug -level file, ADAMS1BE\_D.
- CEMENNUM, in conjunction with HHID and PN, uniquely identifies a record in the drug -level file, ADAMS1CE\_D.
- DEMENNUM, in conjunction with HHID and PN, uniquely identifies a record in the drug -level file, ADAMS1DE\_D.

These three variables can be used to aggregate data from the drug level to the respondent level, using the same logic that one would use to aggregate data from the drug level to the respondent level.

### **6d. AFCNUM, BFCNUM, CFCNUM, & DFCNUM in Child-level Files**

- AFCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave A child-level family history file, ADAMS1AF\_C.
- BFCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave B child-level family history file, ADAMS1BF\_C.
- CFCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave C child-level family history file, ADAMS1CF\_C.
- DFCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave D child-level family history file, ADAMS1DF\_C.

These three variables can be used to aggregate data from the child level to the respondent level, using the same logic that one would use to aggregate data from the drug level to the respondent level.

### **6e. AFSNUM, BFSNUM, CFSNUM, & DFSNUM in Sibling-level Files**

- AFSNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave A sibling-level family history file, ADAMS1AF\_SB.
- BFSNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave B sibling-level family history file, ADAMS1BF\_SB.
- CFSNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave C sibling-level family history file, ADAMS1CF\_SB.
- DFSNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave D sibling-level family history file, ADAMS1DF\_SB.

These three variables can be used to aggregate data from the sibling level to the respondent level, using the same logic that one would use to aggregate data from the drug level to the respondent level.

## **6f. AHCNUM, BHCNUM, CHCNUM, & DHCNUM in Condition-level Files**

- AHCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave A condition-level medical condition file, ADAMS1AH\_C.
- BHCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave B condition-level medical condition file, ADAMS1BH\_C.
- CHCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave C condition-level medical condition file, ADAMS1CH\_C.
- DHCNUM, in conjunction with HHID and PN, uniquely identifies a record in the Wave D condition-level medical condition file, ADAMS1DH\_C.

These three variables can be used to aggregate data from the condition level to the respondent level, using the same logic that one would use to aggregate data from the drug level to the respondent level.

## **6g. ADAMSSID**

ADAMSSID uniquely identifies an ADAMS subject/respondent. ADAMSSID has five digits and is stored in character format.

## **6h. GSUBHH and HSUBHH**

HHID and GSUBHH uniquely identify a household at the time of the HRS 2000 data collection. HHID and HSUBHH uniquely identify a household at the time of the HRS 2002 data collection. These variables allow linking to household-level core HRS data files. Sub-household identifiers can be different at each wave. More than one respondent may belong to a given 2000 or 2002 household. GSUBHH and HSUBHH each have one digit and are stored in character format.

# **7. Distribution Files and Directory Structure**

The ADAMS data are packaged in five separate download files for 1) the ADAMS Tracker file, 2) the Wave A files, 3) the Wave B files, 4) the Wave C files, and 5) the Wave D files.

## **7a. Distribution Files**

In order to keep the contents secure, the five download files are password-protected.

- For users working in a Microsoft Windows environment, self-decompressing .exe files, adams1a.exe, adams1b.exe, adams1c.exe, are distributed.
- For UNIX, Linux, and Macintosh users, standard .zip files, adams1a.zip, adams1b.zip, and adams1c.zip are provided.
- Users who require special file formats should contact the HRS Help Desk ([hrsquestions@umich.edu](mailto:hrsquestions@umich.edu)).

First create a directory to which you will download the distribution file, e.g., C:\adams1. Within this directory you may wish to create subdirectories to hold

- \data for the data files,



- \sas or \spss or \stata for the program statement files appropriate for your analysis package, and
- \codebook for the codebook files.

Extract the data files, the program statement files that match your analysis program, SAS, Stata, or SPSS, the data description (this file), and the codebook files.

### **7a-1. Windows Environment**

Download the distribution data file, e.g., ADAMS1A.exe, from the HRS Web site to the appropriate location on your local computer. Click on file, e.g., adams1a.exe, in Windows Explorer (or open the file from the command line). When prompted, specify the directory to which you want the files extracted, e.g., "C:\adams1". Click "Unzip". You will then be prompted for a password. Enter the character string you received via e-mail.

You should get several .pdf files and five .exe files:

- for data, adams1ada.exe
- for program statements, adams1asas.exe, adams1asta.exe, and adams1asps.exe
- for codebooks, adams1acb.exe

Next extract the files to the proper subdirectories, data files to \data, the appropriate program statement files to \sas or \spss or \stata, and the codebook files to \codebook. If you have problems, please contact the HRS Help Desk at [hqsquestions@umich.edu](mailto:hqsquestions@umich.edu).

### **7a-2. UNIX, Linux or Macintosh Environment**

Use the file decompression software installed on your system (i.e., .gunzip) to expand the downloaded file, e.g., adams1a.zip. When you are prompted for the pass-phrase, respond with the character string that you received via e-mail to output the files listed below.

You should get several .pdf files and five .zip files:

- for data, adams1ada.zip
- for program statements, adams1asas.zip, adams1asta.zip and adams1asps.zip
- for codebooks, adams1acb.zip

Next extract the data files, the appropriate program statement files, and the codebook files to the proper subdirectories. If you have problems, please contact the HRS Help Desk at [hqsquestions@umich.edu](mailto:hqsquestions@umich.edu).

### **7b. Directory Structure**

Although a particular setup is not required for using the HRS ADAMS files, we have typically suggested a directory structure for working with HRS files. By using this directory structure, you will not have to change the path name in your data descriptor files. If you prefer to use a different structure, just change the directory references in the program statement files. Download the Tracker, Wave A, Wave B, Wave C and Wave D

files to C:\adams1. This directory may contain subdirectories for data files, program statement files and codebook files. For example, for the Wave A files, the subdirectories could contain these types of files:

<u>Directory</u>	<u>Contents</u>
C:\adams1	Wave A files downloaded from Web site
C:\adams1\codebook	.txt codebook files
C:\adams1\data	.da Wave A data files
C:\adams1\sas	.sas Wave A program statement files for SAS
C:\adams1\spss	.sps Wave A program statement files for SPSS
C:\adams1\stata	.do and .dct Wave A program statement files for Stata

## 8. Program Statements

Each data file comes with associated SPSS, SAS, or Stata program statements to read the data. Files containing SPSS statements are named with a .sps extension, those with SAS statements with a .sas extension, and those with Stata statements with .do and .dct extensions.

The statement files are named beginning with the same prefix as the corresponding data file. For example, SAS statements in the file ADAMS1AB\_R.sas go with the ADAMS1AB\_R.da data file.

### **8a. Using the Files with SAS**

To create a SAS system file, two file types must be present -- .sas program statement files and .da data files.

To create a SAS system file, load the \*.sas file into the SAS Program Editor.

If the \*.sas file is located in "C:\adams1\sas" and the data file is located in "C:\adams1\data", you can run the file as is. A SAS system file (\*.sas7bdat) will be saved to directory "C:\adams1\sas".

If the files are not located in the specified directories, you will need to edit the \*.sas file to reflect the proper path names prior to running the file.

### **8b. Using the Files with SPSS**

To create an SPSS system file, two file types must be present -- .sps program statement files and .da data files.

To create an SPSS system file, open the \*.sps file in SPSS as an SPSS Syntax File.

If the \*.sps file is located in "C:\adams1\spss" and the data file is located in "C:\adams1\data", you can run the file as is. An SPSS system file (\*.sav) will be saved to directory "C:\adams1\spss".

If the files are not located in the specified directories, you will need to edit the \*.sps file to reflect the proper path names prior to running the file.

### **8c. Using the Files with Stata**

To use Stata, the following three file types must be present -- .dct files, .do files, and .da data files.

- Files with the suffix .da contain the raw data for Stata to read.
- Files with the suffix .dct are Stata dictionaries used by Stata to describe the data.
- Files with the suffix .do are short Stata programs ("do files") which you may use to read in the data. Load the .do file into Stata and then submit it.

If the \*.do and \*.dct files are located in "C:\adams1\stata" and the data file is located in "C:\adams1\data", you can run the .do file as is.

If the files are not located in these directories, you must edit the \*.do and \*.dct files to reflect the proper path names before you run the files.

Note that the variable names provided in the .dct files are uppercase. If you prefer lower case variable names, you may wish to convert the .dct files to lower case prior to use. You may do this by reading the .dct file into a text or word processing program and changing the case. For instance in Microsoft Word, Edit, Select All, Format, Change Case, lowercase.

## **9. Documentation**

### **9a. Questionnaires and Forms**

Links to all ADAMS documents, questionnaires and forms available on-line.

< <http://hrsonline.isr.umich.edu/index.php?p=kwsearch&terms=adams>>

### **9b. Codebooks**

The ADAMS codebooks are provided in five sets of ASCII text files with a separate codebook file corresponding to each data file:

- ADAMS Tracker, one file, ADAMS1TRK \_R.txt
- Wave A, fourteen files, e.g., ADAMS1AB\_R.txt, ADAMS1AD\_R.txt, etc.
- Wave B, fourteen files, e.g., ADAMS1BB\_R.txt, ADAMS1BD\_R.txt, etc.
- Wave C, fourteen files, ADAMS1BB\_R.txt, ADAMS1BD\_R.txt, etc.
- Wave D, fourteen one file, ADAMS1BB\_R.txt, ADAMS1BD\_R.txt, etc.

Also provided are combined codebook files containing all sections for each wave:

ADAMS1ACodeBk.txt for Wave A

- ADAMS1BCodeBk.txt for Wave B
- ADAMS1CCodeBk.txt for Wave C
- ADAMS1DCodeBk.txt for Wave D

Each variable has its own codebook entry. The format of the codebook is, for the most part, consistent with the codebooks for HRS. The “Ref” field is primarily for internal purposes only and can be ignored by data users. However, there are some variable labels which reference the ‘Ref’ field. The codebooks are also available on-line.

### **9b-1. Variable Names**

Variable names begin with a letter designating the wave of data collection (A for Wave A, B for Wave B, C for Wave C, and D for Wave D), followed by the section letter (A, B, C, D, E, F, G, H, J, M, N), and additional variable identifying information after that. For example, ADFDX1 where A=Wave A, D=section D, FDX1 = variable identification (final primary diagnosis).

### **9b-2. Masked Variables**

To protect the confidentiality of the information that respondents provide, geographical locations are recoded to a level no more detailed than U.S. Census Region and Division. Data on the highest educational degree earned have been further grouped together to increase cell sizes.

In addition, a number of variables are not included in the public release datasets, for example, day of birth, day of assessment, information on geographical location and similar variables.

## **10. Obtaining the Data**

The Health and Retirement Study strives to provide high quality data without compromising respondent confidentiality. Since respondent health data records are particularly sensitive, data products such as ADAMS are released only to researchers who qualify for access under the terms of a supplemental registration system. The application and download process is described below.

### ***10a. How to Apply***

1. Visit the HRS User Registration/File Download Web site. If you do not already have a username and password, you must register in order to enter the site. (Researchers with questions about this process may wish to examine the *Data Use Agreement* prior to registration.)
2. Identify the desired data (ADAMS, in this case) under “Requesting HRS Special Access File”.
3. Download and complete the *Data Use Agreement* in hardcopy format (see Appendix)
4. Send a signed copy of the agreement via surface mail to:

Health and Retirement Study  
DUA Review Committee  
426 Thompson Street, Room 3050 ISR  
Ann Arbor, Michigan 48104-2321

## **10b. The Approval Process**

The Health and Retirement Study will review your request, and based on the information that you provided when you registered at the HRS User Registration/File Download Web site, verify your identity and institutional affiliation. Once this authentication process has been completed to our satisfaction, we will authorize access to the desired data. You should receive a decision within 5 working days. We will communicate with you at the email address that you provided when you registered at the File Download Web site.

## **10c. How to Download**

1. Once you receive your approval notification, login at the HRS User Registration/File Download Web site
2. In the "HRS Special Access Files" box on the right hand side of the page you will now see links to the ADAMS data that you have requested.
3. Click on the appropriate link and follow instructions to download the file(s) you need.

## **10d. Publications Based on Sensitive Health Data**

You must inform HRS of any papers, publications, or presentations based on the HRS sensitive health data. Please send a copy of any such publications, with a bibliographical reference if appropriate, to this address:

Health and Retirement Study  
Attn: Papers and Publications  
The Institute for Social Research, Room 3050  
426 Thompson Street  
Ann Arbor, MI (USA) 48104

Papers and publications may also be submitted via electronic mail; send message and attachment(s) to [hqsquestions@umich.edu](mailto:hqsquestions@umich.edu). Please include "Attn: Papers and Publications" on the subject line.

The following citation should be included in any research reports, papers, or publications based on these data:

- In text: "The ADAMS study is a supplement to the Health and Retirement Study (HRS), which is sponsored by the National Institute of Aging (grant number NIA U01AG009740). It was conducted jointly by Duke University and the University of Michigan."
- In references: "ADAMS Supplement to the Health and Retirement Study, public use dataset. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740). Ann Arbor, MI, (2007)."

## **11. If You Need to Know More**

This document is intended to serve as a brief overview and to provide guidelines for using the ADAMS 1 data. If you have questions or concerns that are not adequately covered here or on our restricted data Web site, or if you have any comments, please contact us. We will do our best to provide answers.

### **11a. HRS Internet Sites**

Health and Retirement Study public release data and additional information about the study are available on the Internet. To access the data and other relevant information, point your Web browser to the HRS Web site at <http://hrsonline.isr.umich.edu/>.

### **11b. Contact Information**

If you need to contact us, you may do so by one of the methods listed below.

Internet: Help Desk at our Web site:  
<http://hrsonline.isr.umich.edu/index.php?p=helpdesk>

E-mail: [hrsquestions@umich.edu](mailto:hrsquestions@umich.edu)

Postal service: Health and Retirement Study  
The Institute for Social Research, Room 3050  
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# Appendix 1: Data Use Agreement

## Health and Retirement Study Sensitive Health Data Use Agreement

Data Set Requested: \_\_\_\_\_

By signing this form and obtaining the requested data set from HRS, the User agrees:

1. To use the data set solely for statistical reporting and analysis.
2. Not to share these data with, or provide copies of these data to, any other person or organization. Note: Each research assistant/associate, graduate student or undergraduate student, or other individual working on the research project must sign and submit his/her own form.
3. To return or destroy the data set, and any derivative data files, upon request from HRS.
4. To make no attempt to link this data set with individually identifiable records from any source, or in any other way attempt to identify the persons in this or other HRS data sets.
5. That if the identity of any person or establishment in this data set is inadvertently discovered, then (a) no use will be made of this knowledge, (b) the Director of HRS will be advised of this incident immediately, (c) the information that would identify any individual or establishment will be safeguarded or destroyed, as requested by HRS, and (d) no one else will be informed of the discovered identity.
6. To employ the following guidelines when producing tabulations for distribution:
  - Magnitude Data: Ensure that no cells/strata with  $n < 5$  are produced.
  - Frequency Data: Apply a marginal threshold of  $n \geq 5$  and cell threshold of  $n \geq 5$  to all tabulations.
  - Protecting against complementary disclosure: Additional cells may be suppressed, i.e., complementary disclosure, to make sure the primary suppressions cannot be derived by subtraction from published marginal totals.
7. Aggregate statistical summaries of the data and analyses (frequency tabulations, magnitude tabulations, means, variances, regression coefficients, and correlation coefficients): These are approved under this agreement and may be freely published by the User, subject to the provisions above.
8. To cite HRS as the data source in any publications or research based upon these data, and to provide a copy of any publications to the HRS. Please refer to the data description for the correct citation that should be included in any research reports, papers, or publications based on these data.
9. To maintain a secure computing environment for storage and use of this data set and any data sets derived from it.
10. To hold harmless and indemnify HRS and the University of Michigan, its agents and employees, for any claims of breaches of confidentiality arising out of his/her research, defined as failure to abide by any section of this agreement or any accidental or intentional violation of privacy of any contributor to any HRS data resource.

UserID (from HRS File Download site):

\_\_\_\_\_

Signature

\_\_\_\_\_

Title

\_\_\_\_\_

Name (printed or typed)

\_\_\_\_\_

Employer/Institutional Affiliation

\_\_\_\_\_

For Office Use Only	Date	Initials
Received		
Verified		
Approved		
Access Granted		

## Appendix 2: Aggregating from Drug-Level to Respondent-Level Files: An Example

The ADAMS drug data files have data at the “drug” level rather than the respondent level. Below you will find a description of how to aggregate drug-level files to create summary drug information at the respondent level. The process below describes how to create two new variables: the total number of prescribed drugs, RX, and the total number of over-the-counter drugs, OTC, for each respondent. The information needed to create these variables will be found in the file ADAMS1AE\_D in the variable AERX. A code of “1” indicates a prescription drug; a code of “2” indicates an over-the-counter drug; a code of “8” indicates it was not known whether the drug was a prescription or over-the-counter drug.

Q3 DRUG PRESCRIBED OR OTC

AERX	Frequency	Cumulative Frequency
1	4190	4190
2	1572	5762
8	3	5765

First, the file ADAMS1AE\_D should be sorted by HHID PN (and AEMENNUM -- it should already be in this order). There are 5,765 records in the file ADAMS1AE\_D, one record for each drug reported by a respondent. A respondent who reports seven drugs will have seven records in this file. A respondent who does not report any drugs will not have any records in this file.

Second, create an aggregate file. The SAS and Stata code for this requires several steps – initialization, accumulation, and outputting the summary record.

1. Initialize. If you have the first record for the HHID PN, initialize accumulating variables, RX and OTC, by setting the RX and OTC counter variables to 0.
2. Accumulate. Increment counter variables, RX and OTC, by adding 1 to the counter variables for each prescription drug or over-the-counter drug.
3. Output. If it is the last record for the HHD PN, output the record.

Instead of steps 1 – 3 described above, the SPSS example uses dummy variables and the AGGREGATE command to create the aggregated file.

The aggregated file will contain four variables, the respondent-level identification variables, HHID and PN, and the two summary variables, RX, the total number of prescription drugs reported for the respondent, and OTC, the total number of over-the-counter drugs reported for the respondent. It will contain 821 records, one record for each respondent who reported one or more drugs. *It will not contain a record for the 35 respondents who did not report any drugs.*

Finally, merge the aggregated file with the respondent-level file ADAMS1AE\_R, by HHID PN. This is a one-to-one match, but the aggregated file contains fewer records,

821, than the respondent-level file which contains 856 records. The resulting file should contain 856 records, one for each respondent (including the 35 respondents who did not report any drugs). Change null values of RX and OTC to 0 for the 35 respondents who did not report any drugs.

Note that because of missing information in AERX (three reports of drugs with a value of “8”) in the file ADAMS1AE\_D, the sum of the two aggregated variables, RX and OTC, will not match exactly the total number of drugs reported for a respondent, AETOTNUM from the file ADAMS1AE\_R.

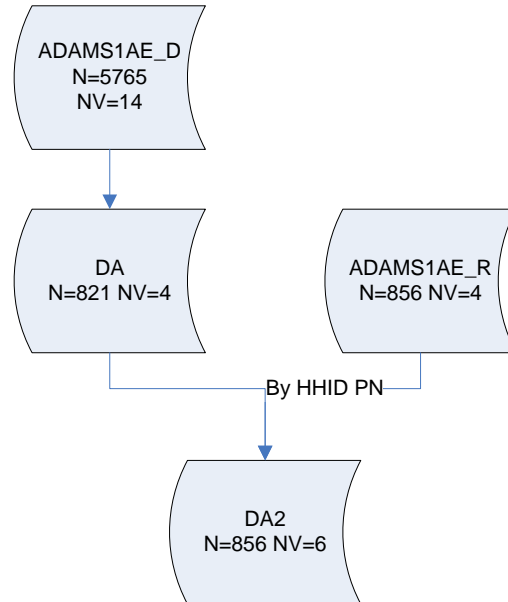
You should get frequencies that look like this.

RX	Frequency	Cumulative Frequency
0	77	77
1	69	146
2	100	246
3	102	348
4	107	455
5	91	546
6	57	603
7	67	670
8	59	729
9	30	759
10	29	788
11	21	809
12	12	821
13	13	834
14	7	841
15	7	848
16	1	849
17	4	853
18	1	854
19	1	855
21	1	856

OTC	Frequency	Cumulative Frequency
0	321	321
1	168	489
2	126	615
3	91	706
4	47	753
5	33	786
6	31	817
7	18	835
8	7	842
9	5	847
10	5	852
12	2	854
19	1	855
20	1	



For the visually oriented, here is an illustration of the process listing file names, number of cases (N), and number of variables (NV) at each step.



See sample code for SAS, Stata and SPSS below. You can use a similar method for other summary variables of interest.

## SAS Code

---

```
*      Sort input data by HHID PN;

*      Aggregate;
data da;
  set in.ADAMS1AE_D;
  by hhid pn;

  *      initialize;
  if first.pn then do;
    rx=0;
    otc=0;
  end;

  *      accumulate;
  retain rx otc;
  if AERX eq 1 then rx=rx+1;
  if AERX eq 2 then otc=otc+1;

  *      output;
  if last.pn then output;
  keep hhid pn rx otc;
run;

*      merge with respondent-level file;
data da2;
  merge in.ADAMS1AE_R(in=a) da(in=b);
  by hhid pn;

  *      change nulls to 0;
  if rx eq . then rx=0;
  if otc eq . then otc=0;
run;

proc freq data=da2;
  table rx otc
  / missing nopercnt;
run;
```

## SPSS Code (using the AGGREGATE procedure)

---

```
* Change path names as necessary.

* Get the ADAMS1AE_D File, and create a dichotomous variable, where 1 =
prescription.
GET
  FILE='C:\adams1\spss\ADAMS1AE_D.SAV'.

* Create dichotomous variable where 1 = rx.
COMPUTE rx1=0 .
IF (AERX = 1) rx1 = 1 .
EXECUTE .

* Create dichotomous variable where 1 = over-the-counter.
COMPUTE otc1=0.
IF (AERX = 2) otc1 = 1 .
EXECUTE .

* Run Frequencies.
FREQUENCIES
  VARIABLES=rx1 otc1
  /ORDER= ANALYSIS .

* Aggregate both dichotomous variables, and save outfile.
AGGREGATE
  /OUTFILE='C:\temp\da.sav'
  /BREAK=hhid pn
  /rx = SUM(rx1) /otc = SUM(otc1).
EXECUTE .

* Get outfile, and sort it by HHID & PN for merging.
GET
  FILE='C:\temp\da.sav'.
SORT CASES BY
  hhid (A) pn (A) .

* Get ADAMS1AE_R, and sort by HHID & PN for merging.
GET
  FILE='C:\adams1\spss\ADAMS1AE_R.SAV'.
SORT CASES BY
  hhid (A) pn (A) .

* Merge files together.
MATCH FILES /FILE=*
  /FILE='C:\temp\da.sav'
  /BY hhid pn.
EXECUTE.

*Recode missing values on rx and otc to be 0.
RECODE
  rx (MISSING=0) .
EXECUTE.
RECODE
  otc (MISSING=0) .
EXECUTE .

* Save file.
```

```
SAVE OUTFILE='C:\temp\da2.sav'  
/COMPRESSED.
```

```
* Run Frequencies.  
FREQUENCIES  
  VARIABLES=rx otc  
  /ORDER= ANALYSIS .
```

## Stata Code

---

```
*      Assume that you have the following two datasets in your working
directory
*      ADAMS1AE_D, and ADAMS1AE_R

clear
set mem 50m
use C:\adams1\stata\ADAMS1AE_D.dta
use C:\adams1\stata\ADAMS1AE_R.dta

*      Sort input data by identification variables
use ADAMS1AE_D
sort HHID PN
save da, replace

*      Initialize - assign the first RX or OTC for each respondent
by HHID PN: gen rx=(AERX==1) if _n==1
by HHID PN: gen otc=(AERX==2) if _n==1

*      Accumulate - increment counter variables, RX and OTC
by HHID PN: replace rx=rx[_n-1]+(AERX==1) if _n>1
by HHID PN: replace otc=otc[_n-1]+(AERX==2) if _n>1

*      Keep the last observation of each respondent
by HHID PN: keep if _n==_N
keep HHID PN ADAMSSID rx otc
sort HHID PN
save da, replace

*      Merge with respondent-level file
use ADAMS1AE_R
sort HHID PN
merge HHID PN using da
keep HHID PN rx otc
sort HHID PN
save da2, replace

*      Assign 0 for 35 subjects who did not report taking any drug
replace rx=0 if rx==.
replace otc=0 if otc==.

*      Label the variable name
la var rx "Number of Prescription Drugs"
la var otc "Number of Over the Counter Drugs"

sort HHID PN
save da2, replace

*      Run frequencies
tab rx otc
```

## Appendix 3: ICD 9 Codes and Sub-codes

In the table below, the numbers in the first four columns are frequencies for designated variables in the files ADAMS1AH\_C, ADAMS1AM\_R, ADAMS1BH\_C, and ADAMS1BM\_R, respectively. The values in the column “CODE” and “SUBCODE” are the values of the corresponding variables. Subcodes are provided if medical condition code is: 436.0, 435.9, 294.8, 412, 427.9, 496, or 250.00.

- The numbers in column “AHCODE & AHSCODE” are frequencies of the variables AHCODE and AHSCODE in the file ADAMS1AH\_C.
- The numbers in columns “AM251A - AM251K & AM251AS-AM251KS” are frequencies of variables AM251A - AM251K and AM251AS - AM251KS in the file ADAMS1AM\_R.
- The numbers in column “BHCODE & BHSCODE” are frequencies of the variables BHCODE and BHSCODE in the file ADAMS1BH\_C.
- The numbers in columns “BM251A - BM251K & BM251AS-BM251KS” are frequencies of variables BM251A - BM251K and BM251AS - BM251KS in the file ADAMS1BM\_R.

<b>Supplementary Classification of Factors Influencing Health Status and Contact with Health Services (V01-V83.89)</b>						
<i>AHCODE &amp; AHSCODE</i>	<i>AM251A-AM251K &amp; AM251AS-AM251KS</i>	<i>BHCODE &amp; BHSCODE</i>	<i>BM251A-BM251K &amp; BM251AS-BM251KS</i>	<i>CODE</i>	<i>SUBCODE</i>	<i>DESCRIPTION</i>
87	13	29	1	V41.2		Reported Hearing Loss
1				V43.0		Artificial Eye
2				V43.3		Replacement of Heart Valve
1	1	1	1	V43.61		Shoulder Replacement with Prosthesis
15	12	2		V43.64		Hip Replacement for Reasons Other Than Fracture
41	29	5	3	V43.65		Knee Replacement with Prosthesis
2	1			V44.2		Ileostomy
10	5	1		V44.3		Colostomy
1	1			V44.6		Ureterostomy
41	2	9	1	V45.0		Pacemaker Implanted
1	1			V45.2		Shunt Placement for Hydrocephalus
206	154	21	17	V45.61		Cataract Surgery - S/P
58		3		V45.81		CABG - S/P
2	1			V49.62		Acquired Absence of Finger
1	1			V49.70		Amputation of Leg at Unspecified Level/Acquired Absence of Leg
1	1			V50.2		Circumcision - Any Reason
39	7	8		V53.2		Prescription for Hearing Aids
3	3	3	1	V56.0		Renal Failure - on Hemodialysis
1	1			V56.8		Renal Failure - on Peritoneal Dialysis

<b>Procedure Codes (00.0-99.99)</b>						
AHCODE & AHSCODE	AM251A-AM251K & AM251AS-AM251KS	BHCODE & BHSCODE	BM251A-BM251K & BM251AS-BM251KS	CODE	SUBCODE	DESCRIPTION
		1		00.51		Defibrillator/AICD Device Implanted
1				01.24		Craniotomy
4	4			03.09		Laminectomy – Exploratory, Decompression
1				03.4		Laminectomy – Excision of Tumor
5	5	1	1	04.43		Carpal Tunnel Surgery
1	1			06.13		Biopsy Parathyroid Gland
7	2			06.39		Thyroidectomy - NEC, Partial, or Subtotal NEC
4				06.4		Thyroidectomy - Complete, Total
1	1			08.9		Operation on Eyelid(s)
11	4	1		11.60		Corneal Transplant
4	3			11.73		Keratoprosthesis
2	2			14.9		Retinal Operation – NEC
2	1			16.49		Other Enucleation of Eyeball
3	1			16.99		Laser Surgery of Eyeball/Photocoagulation of Eyeball – Non-Specified
				19.19		Other Stapedectomy
		1		20.01		Myringotomy with Insertion of Tube
1	1			20.59		Tympanectomy
4	3			20.99		Ear Operation – Middle or Inner, Unspecified
1	1			21.88		Septoplasty
1				26.0		Parotidectomy/Incision of Salivary Gland or Duct
1				27.62		Cleft Palate Repair
5	3			28		Tonsils or Adenoids – Any Operation
7	2			28.2		Tonsillectomy without Adenoids Removed
				28.3		Tonsillectomy with Adenoids Removed
1				30.3		Laryngectomy
1				31.29		Tracheotomy – Permanent
4				32.3		Lobectomy – Pulmonary, Partial
				32.4		Lobectomy – Pulmonary, Complete or Segmental
2	1			34.02		Thoracotomy
		1	1	34.91		Thoracentesis
1				35.21		Aortic Valve Replacement - with Tissue Graft
3				35.22		Aortic Valve Replacement – with Prosthesis
2				35.24		Mitral Valve Replacement
				36.0		Removal of Coronary Artery Obstruction and Insertion of Stent
				36.01		PTCA – Single Vessel
				36.06		Insertion of Non-Drug Eluting Coronary Artery Stent

<b>Procedure Codes (00.0-99.99)</b>						
<b>AHCODE &amp; AHSCODE</b>	<b>AM251A-AM251K &amp; AM251AS-AM251KS</b>	<b>BHCODE &amp; BHSCODE</b>	<b>BM251A-BM251K &amp; BM251AS-BM251KS</b>	<b>CODE</b>	<b>SUBCODE</b>	<b>DESCRIPTION</b>
6				37.2		Cardiac Diagnostic Procedure – Unspecified, Used for Cardiac Catheterization
2				37.33		Cardiac Ablation – Ventricular Ablation
1				37.34		Cardiac Ablation by Catheter
				37.71		Ventricular Device Placement
3		1		37.99		Defibrillar Implant
31				38.12		Carotid Endarterectomy – S/P
1				38.48		Resection of Vessel with Replacement – Lower Limb Arteries
7	5			38.5		Vein Ligation and Stripping for Varicose Veins
		1		39.27		Arteriovenostomy for Renal Dialysis
3	2			39.29		Femoral-Popliteal Bypass/Reversed Saphenous Vein
				39.50		Angioplasty – Renal, Carotid, or Any Non-Coronary Site
60	1	2		39.59		Angioplasty with or without Stent Placement
		1		39.90		Insertion of Non-Drug Eluting, Non-Coronary Artery Stent
1	1			39.99		Vascular Surgery – Unspecified
2	1			41.5		Splenectomy
1	1			42.85		Esophageal Stricture Repair
5	5	1		42.92		Esophageal Dilation
9	4	2	1	43.11		G Tube/Peg Tube Placement
				43.8		Partial Gastrectomy
1	1			43.9		Total Gastrectomy
1	1			44.39		Gastric Bypass – Surgery
1				45.00		Intestinal Incision/Any Excision/Anastomosis
3	2	1	1	45.42		Polypectomy – Colon
				45.72		Ileocecal Resection
				45.73		Colectomy – Right
8	1			45.79		Colectomy – Partial or Segmental Resection of Colon
2	2			45.8		Colectomy – Total
1	1			46.3		Other Enterostomy
5	4			46.79		Intestinal Repair – Unspecified
39	29	2	1	47.0		Appendectomy
15	11			49.46		Hemorrhoidectomy
				50.22		Hepatectomy – Partial, Sub-Total
83	62	1	1	51.22		Cholecystectomy – Total
1				51.51		Exploration of the Common Duct
16	14			53.00		Inguinal Hernia Repair – Unilateral
14	12	1		53.10		Inguinal Hernia Repair – Bilateral
3	3			53.49		Hernia Repair – Umbilical
6	4			53.59		Abdominal Hernia Repair



<b>Procedure Codes (00.0-99.99)</b>						
<i>AHCODE &amp; AHSCODE</i>	<i>AM251A-AM251K &amp; AM251AS-AM251KS</i>	<i>BHCODE &amp; BHSCODE</i>	<i>BM251A-BM251K &amp; BM251AS-BM251KS</i>	<i>CODE</i>	<i>SUBCODE</i>	<i>DESCRIPTION</i>
4	2			53.7		Hiatal Hernia – Surgery, Abdominal Approach
11	8			53.9		Hernia Repair – NEC
1	1			54.11		Exploratory Laparotomy
3	2			55.01		Nephrolithotomy
1				55.4		Nephrectomy - Partial
8	6			55.5		Nephrectomy – Complete
1	1			57.7		Cystectomy – Total
6	4	1	1	57.89		Bladder Repair NEC
5	3			59.79		Bladder Repair – Stress Incontinence NEC
17	14	1		60.2		Transurethral Prostatectomy (TURP)
1		1	1	60.21		Laser Surgery Ablation of Prostate
10	5			60.5		Prostatectomy – Any Approach
1	1			62.3		Orchiectomy – Unilateral
1	1			63.1		Hydrocele Repair – Spermatic Cord
1				65.2		Local Excision of Ovarian Lesion or Tissue
2				65.3		Oophorectomy – Unilateral
2				65.51		Oophorectomy – Bilateral
1	1			66.39		Other Bilateral Destruction or Occlusion of Fallopian Tubes
23				68.3		Hysterectomy – Partial, Subtotal Abdominal Hysterectomy
153	2	2		68.4		Hysterectomy – Total
1	1			69.02		D & C – Uterine, Post-Delivery or Abortion
5	3			69.09		D & C – Uterine, Diagnostic
1	1			69.29		Prolapsed Uterus – Repair
1	1			70.7		Other Vaginal Repair
9	8			77.59		Bunionectomy
1				78.49		Repair or Operations on Bone – Site Unspecified
2				78.55		Pinning - Internal Fixation of Femur
1	1			79.81		Open Reduction – Shoulder
1	1			80.09		Back Surgery
2	1			80.1		Arthrotomy/Other Operation on a Joint – Unknown Reason
3	3	2	1	80.26		Knee – Arthroscopy
11	9			80.51		Laminectomy for Herniated Disc
1	1			81.0		Spinal Fusion
1	1			81.40		Repair of Hip – Not Otherwise Classified
9	6			81.47		Knee – Other Repair, e.g. Tendon Repair
19	10	1	1	81.59		Hip Total Replacement with Prosthesis
3	2			81.81		Arthroplasty of Shoulder
1				81.83		Other Repair of Shoulder/Revision of Arthroplasty of Shoulder
7	7	1	1	83.63		Rotator Cuff Repair

<b>Procedure Codes (00.0-99.99)</b>						
<i>AHCODE &amp; AHSCODE</i>	<i>AM251A-AM251K &amp; AM251AS-AM251KS</i>	<i>BHCODE &amp; BHSCODE</i>	<i>BM251A- BM251K &amp; BM251AS- BM251KS</i>	<i>CODE</i>	<i>SUBCODE</i>	<i>DESCRIPTION</i>
6	5			85.0		Breast – Any Type Operation
9	4			85.21		Lumpectomy
5				85.41		Mastectomy – Simple, Unilateral
1				85.42		Mastectomy – Simple, Bilateral
13	1			85.45		Mastectomy – Radical, Unilateral
1				85.46		Mastectomy – Radical, Bilateral
2				94.27		Electroshock Therapy (EST)
7	5	1		98.51		Lithotripsy – ESWL Kidney, Bladder, or Ureter
1	1			98.52		Lithotripsy – ESWL Gallbladder
1	1			99.62		Cardioversion

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
2	2			002.0		Typhoid Fever
3	2			005.9		Food Poisoning - Unspecified
1	1			008.44		Yersinia Enterocolitica
		1	1	009		Intestinal Infection
8	3			011.9		Tuberculosis - Pulmonary, Unspecified
1	1			034.1		Scarlett Fever
				038.9		Septicemia - Nonspecific
		1	1	041.9		Bacterial Infection - Unspecified
1	1			050.9		Smallpox
				053.12		Postherpetic Trigeminal Neuralgia
12	9	4	3	053.9		Herpes Zoster - Shingles
1	1			056.9		Measles - German
1	1			070.1		Hepatitis A - Infectious, Acute
				070.51		Hepatitis C - Acute
1	1			084.6		Malaria - Unspecified
2				097.9		Syphilis - Unspecified
6	5	1		110.1		Onychomycosis - Toenail or Fingernail Fungus
1	1			110.4		Tinea Pedis/Athlete's Foot
1				110.8		Fungal Infection - Scrotum
2	1	1		111.9		Fungal Infection - Skin
				112.1		Candidiasis - Vulvo or Vaginal
1		1		135		Sarcoidosis - Heart or Lung
3	3			138.0		Polio - Residual or Old, with Deformity
1				140.9		Malignant Neoplasm of Lip - Unspecified
1		1	1	146.9		Oropharyngeal Cancer
4				149.0		Throat/Pharyngeal Cancer - Primary Site
1				149.9		Oral Cancer - Ill-Defined Type
1				150.9		Esophageal Cancer
1				151.9		Gastric Carcinoma
				153.4		Malignant Neoplasm of Colon/Cecum
33		3		153.9		Colon Carcinoma - Unspecified Site
1				154.1		Malignant Neoplasm of Rectum
3				161.9		Laryngeal Cancer
5		1		162.9		Pulmonary Carcinoma - Primary
5				172.8		Melanoma - Skin NEC
4				172.9		Malignant Melanoma
22		1		173.9		Basal Cell Carcinoma - Malignant, Unspecified Site(s)
32				174.9		Breast Cancer - Female
1				175.9		Breast Cancer - Male
8				179		Uterine Cancer
1				180.9		Cervical Cancer
3				183.0		Ovarian Cancer
45		7		185		Prostate Cancer
11		1		188.9		Bladder Cancer - Unspecified
4				189.0		Renal Carcinoma
2				195.0		Head or Neck Carcinoma
1				195.2		Abdominal Cancer - Ill-Defined Type
1				197.0		Metastatic Lung Cancer
1				197.7		Liver Cancer - Metastatic
13	1			199.1		Cancer - Unspecified Type or Site
2		1		202.4		Leukemia - Hairy Cell

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
				203.0		Multiple Myeloma /Kahler's Disease/ Myelomatosis
				204.1		Chronic Lymphoid Leukemia
				208.0		Acute Leukemia - Unspecified Cell Type
1				208.9		Leukemia - Unspecified
1	1			210.2		Benign Neoplasm - Major Salivary Glands
1	1			211.1		Benign Neoplasm - Stomach
6	4	1		211.3		Colon Polyps
1				211.4		Adenoma of Colon - Code as Benign Neoplasm
1				212.3		Lung Mass - Benign
4	2			214.9		Lipoma - Unspecified Site(s)
4				216.5		Benign Neoplasm of Skin
1	1			218.9		Uterine Fibroids - Unspecified
5	1	1		225.0		Brain Tumor - Non-Malignant
1				227.1		Parathyroid Tumor - Benign
				236.2		Neoplasm of Uncertain Behavior - Ovary
2		1		237.70		Neurofibromatosis - Multiple
29		1		238.2		Squamous Cell Carcinoma - Unspecified Site(s)
		1	1	238.4		Polycythemia
1				238.6		Neoplasm of Uncertain Behavior - Plasma Cells
3	3	1	1	239.2		Neoplasm of Unspecified Nature - Bone, Soft Tissue, or Skin
1		1	1	239.7		Meningioma - Unspecified
11	6	1	1	240.0		Goiter - Simple
				242.0		Grave's Disease/Toxic Goiter
10	2	1		242.9		Hyperthyroidism
4	2	2	1	244.0		Hypothyroidism - Post-Surgical
3	1	1		244.1		Hypothyroidism - due to Irradiation Therapy
120	1	34		244.9		Hypothyroidism - Acquired
1	1			246.2		Cyst of the Thyroid
5				246.9		Thyroid Disorder - Unspecified
21		7		250.00	1	Diabetes Mellitus - Diet-Controlled
98		41	1	250.00	2	Diabetes Mellitus - Oral Hypoglycemics
53		20		250.00	3	Diabetes Mellitus - Insulin-Dependent
5	5	3	2	250.5		Diabetic Retinopathy
1				250.6		Diabetic Gastroparesis
1	1			251.2		Hypoglycemia - Spontaneous
				252.0		Hyperparathyroidism
1	1			256.9		Ovarian Dysfunction - Unspecified
3	1			263.9		Malnutrition
4	1	3	1	266.2		B12 Deficiency
1	1			268.2		Osteomalacia
				270.4		Homocystinuria/Homocysteinemia
1				271.3		Lactose Intolerance
138	1	45		272.0		High Cholesterol
6				272.1		High Triglycerides/Hypertriglyceridemia
134	1	52		272.4		Hyperlipidemia
28	15	11	4	274.9		Gout
				275.42		Hypercalcemia
				276.1		Hyponatremia
		1		276.5		Dehydration
1				276.7		Hyperkalemia

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
1	1			276.8		Hypokalemia
3	1			278.00		Obesity
1				278.01		Morbid Obesity
				278.8		Pickwickian Syndrome
5	1	1		280.9		Anemia - Iron Deficiency or Microcytic
5	4	2		281.0		Pernicious Anemia
1	1			282.5		Sickle Cell - Trait
1				284.9		Anemia - Aplastic
33	19	12	5	285.9		Anemia - Any Cause
				288.0		Leukopenia
				288.8		Leukocytosis
2	2			289.9		Blood Dyscrasia
4		1		290.0		Senile Dementia - Uncomplicated
4	1			290.4		Vascular Dementia - Hardening of the Arteries/Atherosclerotic Dementia
1	1			291.0		Delirium Tremens - Impending or Acute
1				291.2		Alcoholic Dementia
				291.81		Alcohol Withdrawal
33		4		294.8	1	Dementia
	1			294.8	2	Lewy Body Dementia
				294.8	3	Frontal Lobe Dementia
				294.8	4	Organic Brain Syndrome - Unspecified
3				295.9		Schizophrenia - Unspecified
104	1	15		296.2		Major Depressive Disorder - Single Episode
136	2	34		296.3		Major Depressive Disorder - Recurrent Episode
				296.7		Bipolar Disorder - Unspecified
				297.1		Paranoia
1		1		297.9		Delusions or Other Unspecified Paranoid State
16		1		298.9		Psychosis - Unspecified
24	5	10	1	300.0		Anxiety Disorder - Unspecified
1	1			300.01		Panic Attack
1	1			300.3		Obsessive Compulsive Neurosis
				300.4		Neurosis with Depressive Reaction
1				300.9		Breakdown - Nonpsychotic
6		2		303.9		Alcohol Abuse or Dependence
7		5		303.91		Alcohol Abuse or Dependence - Continuous
4				303.92		Alcohol Abuse or Dependence - Episodic
55		1		303.93		Alcohol Abuse or Dependence - In Remission
1	1			304.9		Substance Abuse or Dependence - Unspecified Drug
1	1			307.23		Tourette's Syndrome
				307.81		Headache - Tension
2				307.9		Agitation
1		1		309.81		Post Traumatic Stress Disorder (PTSD) - Chronic
3	2	2	2	322.9		Meningitis
1				323.9		Encephalitis/Cerebritis - Any Cause
48	1	1		331.0		Alzheimer's Disease
1				331.1		Pick's Disease
1				331.4		Normal Pressure Hydrocephalus
19		5		332.0		Parkinson's Disease
		1		332.1		Parkinsonism due to Drugs

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
6	4	4		333.1		Essential Tremor/Familial Tremor - Benign
1	1	1		333.99		Restless Leg Syndrome
1				334.3		Cerebellar Ataxia
				334.4		Ataxia due to Alcohol Abuse
1				340.0		Multiple Sclerosis
1		1		343.9		Cerebral Palsy - Nonspecific
5				345.9		Epilepsy - Unspecified
1	1			346.2		Headache - Allergic
9	6	2		346.9		Migraines - Unspecified
1	1			348.3		Encephalopathy - Any Cause
7	5	3		350.1		Tic Douloureux/Trigeminal Neuralgia
8	5	2		351.0		Bell's Palsy
5	4			354.0		Carpal Tunnel
1	1	1		356.1		Charcot-Marie-Tooth Disease
25	15	8	2	356.9		Peripheral Neuropathy
1				358.0		Myasthenia Gravis
				359.9		Myopathy - Unspecified
1	1	1		361.9		Retinal Detachment - Unspecified
51	32	25	9	362.5		Macular Degeneration
5	3	1		362.81		Retinal Hemorrhage - Preretinal, Deep, or Subretinal
1	1			363.3		Chorioretinal Scars
57	33	21	1	365.9		Glaucoma
92	66	11	5	366.9		Cataracts
3				368.16		Hallucination - Visual
				368.2		Diplopia
3				369.00		Blind - Unspecified, Both Eyes
26	2	12	1	369.2		Low Vision - Both Eyes
2	1	1		369.3		Unqualified Visual Loss - Both Eyes, Not Blindness
9	3	5		369.4		Legal Blindness
14	4	4		369.6		Blind/Impaired Vision - Unspecified, One Eye
2				369.7		Low Vision - One Eye
2				369.9		Vision - Defective, Impaired
		1		370		Keratits
1	1			371.41		Arcus Senilis
2	2			372.4		Pterygium
				373.00		Blepharitis - Unspecified
2	2	2		378.9		Strabismus - Non-Paralytic
2		2	1	382.9		Otitis Media
1	1			383.0		Mastoiditis - Acute or Subacute
				383.1		Mastoiditis - Chronic, Recurrent
1		1		386.0		Meniere's Disease
5	5	1		386.11		Vertigo - Benign Positional Paroxysmal
2	2			386.30		Otitis Interna - Labyrinthitis
1	1			388.30		Tinnitus - Unspecified
				390		Rheumatic Fever - without Cardiac Involvement
4	2			391.9		Rheumatic Fever - with Cardiac Involvement
5				394.9		Mitral Valve Disease - Unspecified
				396.3		Mitral Valve - Regurgitation, Not Congenital
521	4	179	4	401.9		Hypertension - Unspecified
				402.91		Hypertensive Cardiovascular Disease with Heart Failure

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
92		4		412	1	Myocardial Infarction - Single, Old, Healed
26		1		412	2	Myocardial Infarction - Multiple, Old, Healed
108	1	32		413.9		Angina - Unspecified
		1		414.0		Coronary Atherosclerosis
7	1			414.00		Coronary Arteries - Narrowing/Arteriosclerosis
1		1		414.11		Coronary Aneurysm
12	1	15		414.9		CAD - Unspecified
1	1	2		415.19		Pulmonary Embolism
		1		416.8		Pulmonary Hypertension
		1		423.9		Pericarditis - Unspecified
1				424.0		Mitral Valve Disorder/Aortic Stenosis
1		2		424.1		Aortic Valve Insufficiency, Stenosis, or Regurgitation
5		1		424.9		Valvular Heart Disease - Unspecified
2		2		425.4		Cardiomyopathy - Primary
				425.9		Cardiomyopathy - Secondary, Unspecified
				426.11		AV Block - 1st Degree
2				426.4		Bundle Branch Block - Right
				427.0		Paroxysmal Supraventricular Tachycardia
40		8		427.3		Atrial Fibrillation or Flutter
4				427.4		Ventricular Fibrillation and Flutter
8				427.5		Cardiac Arrest
1				427.81		Sick Sinus Syndrome
13		3		427.89		Bradycardia
56		19		427.9	1	Cardiac Arrhythmia - Unspecified
7		1		427.9	2	Other Unspecified Atrial Arrhythmia
5		1		427.9	3	Other Unspecified Ventricular Arrhythmia
100		36		428.0		Congestive Heart Failure (CHF)/Edema - Secondary To CHF
1		1	1	428.1		Dyspnea - from Cardiac
4				429.2		ASCVD
		1		429.3		Cardiomegaly
				429.4		Functional Disturbances Following Cardiac Surgery
				431.0		Intracerebral Hemorrhage
5	1	1		433.1		Carotid Arterial Disease
				434.91		Lacunar Infarct - Brain
				435.3		Vertebrobasilar Artery Syndrome
31		1		435.9	1	Transient Ischemic Attack (TIA) - Single
19				435.9	2	Transient Ischemic Attack (TIA) - Multiple
39		6		436.0	1	Stroke - Single, Uncomplicated
72	1	3		436.0	2	Stroke - Single with Aphasia or Hemiparesis
10		1		436.0	3	Strokes - Multiple, Uncomplicated
31		1		436.0	4	Strokes - Multiple with Aphasia or Hemiparesis
2				437.3		Cerebral Aneurysm
1				437.7		Transient Global Amnesia
				437.9		Cerebrovascular Insufficiency
2	2			440		Atherosclerosis
1	1			440.1		Stenosis - Renal Artery
8	7	1	1	441.4		Abdominal Aortic Aneurysm
3	2	2	2	441.9		Aortic Aneurysm
25	6	10	1	443.9		Peripheral Vascular Disease/Claudication
2				444.9		Arterial Thrombosis of Unspecified Artery

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCODE	AM251A-AM251K & AM251AS-AM251KS	BHCODE & BHSCODE	BM251A-BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
2	1			446.5		Temporal Arteritis
12	10	2	2	451.1		Venous Thrombosis - Deep Vessels of Lower Extremities/DVT
2	1			451.83		Thrombophlebitis - Arm, Deep
3	2	1		451.9		Phlebitis - Site Unspecified
1		1	1	454.1		Stasis Dermatitis
3	2			454.2		Stasis Dermatitis - with Ulcer
5	4	1		454.9		Varicose Veins
4	4			455.6		Hemorrhoid Condition
1				457.1		Edema - from Lymphatic Obstruction/Lymphedema
1		1	1	458.0		Hypotension - Orthostatic, Postural
1	1			458.1		Hypotension - Chronic
1				458.9		Hypotension - Arterial
				459.81		Venous Insufficiency - Unspecified
		1	1	461.9		Sinusitis - Acute
				462		Pharyngitis
		1	1	465		Upper Respiratory Infection
1	1	1	1	466.0		Bronchitis - Acute
2	1			471.0		Polyyps - Nasopharyngeal
7	3	3		473.9		Sinusitis - Chronic
37	19	13		477.9		Allergic Rhinitis/Hay Fever - Unspecified Cause
2	2			478.29		Polyyps - Pharynx
1	1			478.9		Throat Polyyps/Other Unspecified Diseases of the Upper Respiratory Track
46	23	14	11	486.0		Pneumonia
5		6	1	491.9		Chronic Bronchitis - Unspecified
23		9		492.8		Emphysema
33	1	13		493.9		Asthma - Unspecified
		1		494.0		Bronchiectasis
15		12		496	1	Chronic Obstructive Pulmonary Disease - Not O2-Dependent
17		5		496	2	Chronic Obstructive Pulmonary Disease - O2-Dependent
1				501		Asbestosis
4	4			507.0		Pneumonia - Aspiration
				511.9		Pleural Effusion
				512.8		Pneumothorax
1	1			514		Pulmonary Edema
				515		Pulmonary Fibrosis
1	1			518.0		Lung Collapse - Atelectasis
1				518.81		Respiratory Failure
1				519.1		Bronchospasm
2	2			523.4		Chronic Periodontitis
1	1			524.6		Temporomandibular Joint Disorders (TMJ)
		1	1	528.0		Stomatitis
110	49	51	6	530.1		GERD
1				530.2		Barrett's Syndrome/Ulcers of Esophagus
2	1			530.3		Esophageal Stricture - Corrosive, Peptic
1	1			530.6		Zenker's Diverticulum of Esophagus
2		1		530.89		Erosive Esophagitis
16	13	1	1	531.9		Ulcers - Stomach, Peptic, or Gastric
3	2			532.9		Duodenal Ulcers
				535.2		Erosive Gastritis/Gastric Mucosal



<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
						Hypertrophy
2		1	1	535.5		Gastritis - Unspecified
				535.60		Duodenitis Unspecified
				536.3		Gastroparesis - Non-Diabetic
4	3	1		536.8		Dyspepsia/Indigestion
8	2	4	1	536.9		PUD - Unspecified
				537.4		Gastic Fistula
2	1			540.0		Appendicitis with Rupture
				550.9		Inguinal Hernia - Nonspecific
1	1			553.1		Umbilical Hernia
1				553.20		Ventral Hernia
6	3	2	2	553.3		Hiatal Hernia - Sliding, Esophageal
1	1	1	1	553.8		Abdominal Hernia - Unspecified Site
2	2			555.9		Crohn?s Disease - Unspecified Site □
4	1	1		556.9		Colitis -Ulcerative, Unspecified Site
1	1			557.9		Ischemia Bowel - Transient
				558.9		Colitis - Chronic
2	1			560.30		Bowel Impaction
5	4	1	1	560.9		Bowel Obstruction
3	3			562.10		Diverticulosis
10	6	4		562.11		Diverticulitis
11	3	2		564.0		Constipation - Chronic
5	4	2		564.1		Irritable Bowel Syndrome/Spastic Colon
1				567.9		Peritonitis
		1		568.0		Adhesions of GI Tract - Post-Operative
				569.41		Rectal Ulcer
				569.84		Angiodysplasia
				571.5		Cirrhosis - Nonalcoholic
		1	1	574.2		Cholelithiasis
				574.4		Bile Duct Stones
				575.1		Cholecystitis
4	3	1	1	575.9		Gall Bladder Disease - Unspecified
2	1	2	2	577.0		Pancreatitis - Acute
1	1	1		577.1		Pancreatitis - Chronic
6	6	2	2	578.9		GI Bleed - Unspecified Site
1	1			579.0		Celiac Disease
				579.9		Malabsorption Syndrome
5	3	2		585		Renal Failure - Chronic
1	1	5	4	586		Renal Failure - Unspecified
3	4			590.80		Pyelonephritis - Unspecified
15	15	1		592.0		Nephrolithiasis/Staghorn Calculus/Kidney Stones
		1	1	593.1		Hypertrophy of Kidney
2	2			593.2		Renal Cyst - Acquired or Solitary
3	2	1		593.9		Chronic Renal Insufficiency/Renal Insufficiency
3	3			595.0		Cystitis - Occasional
23	12	3	1	595.2		Cystitis - Chronic or Recurrent
		1		596.0		Rupture of the Bladder/Bladder Obstruction
				596.4		Atonic Bladder
2	1			596.54		Neurogenic Bladder
5	3	6	4	599.0		Urinary Tract Infection/Urosepsis
				599.5		Urethra Prolapse
		1	1	599.7		Hematuria
50	32	22	3	600.0		Benign Prostatic Hypertrophy

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
1	1			601.0		Prostatitis - Acute
1				601.1		Prostatitis - Chronic
2	1	1	1	601.9		Prostatitis - Unspecified
1	1			603.9		Hydrocele
1	1	1		607.84		Erectile Dysfunction
1	1	1		610.1		Fibrocystic Breast Disease
1	1			610.2		Fibroadenosis of Breast - Cystic
1	1			611.72		Breast Lumps - Unspecified
1	1			616.2		Bartholin Cyst
2	2			618.0		Bladder Prolapse - Female
2	1			618.1		Prolapsed Uterus - without Repair Specified
1				621.3		Endometrial Hyperplasia
5	2	2		625.6		Incontinence - Stress, Females
	1	1	1	627.1		Uterine Bleeding
				627.3		Vaginitis - Atrophic, Postmenopausal
				654.4		Cystocele
				669.7		Cesarean Delivery
		1	1	680.6		Infected Boil - Leg
		1	1	682.0		Cellulitis - Face
		1		682.2		Abdominal Abscess
1	1			682.3		Cellulitis of Arm - Any Part Above Elbow
7	1	1		682.6		Cellulitis of Leg - Except Foot
		1	1	682.9		Cellulitis
1	1			685		Pilonidal Cyst
		1	1	686.9		Skin Infection
1				690.10		Dermatitis - Seborrheic
4	3	1		692.9		Contact Dermatitis
1				694.0		Dermatitis Herpetiformis
				695.1		Stevens-Johnson Syndrome
2				695.3		Rosacea
3	1	1	1	696.1		Psoriasis
1				698.9		Pruritis
1	1			701.9		Skin Tags
				702.0		Actinic Keratosis
				702.19		Keratosis - Seborrheic
1		1	1	706.2		Cyst - Ear, External
7	4			707.0		Decubitus
		1	1	707.1		Ulcer of the Lower Limb or Foot
2	1			710.0		Systemic Lupus Erythematosus
2	1	1		710.1		Scleroderma/CRST Syndrome/Cutaneous Systemic Sclerosis
22	12	4	1	714.0		Rheumatoid or Chronic Rheumatic Arthritis
323	157	104	7	715.9		Osteoarthritis/DJD - Unspecified Site(s)
2	1			718.49		Contractures of Multiple Joints
1				721		Spondylosis
				721.0		Cervical Spondylosis
2	2	1	1	721.8		Exostosis of Spine - Used for Spinal Bone Spur
3	2			722.2		Herniated Disk - Condition
6	1	3		722.6		Degenerative Disc Disease - Unspecified Site
				723.5		Torticollis - Unspecified
17	13	3		724.00		Spinal Stenosis
3	2	1	1	724.2		Backache - Lower Back Pain/Lumbago
2	1			724.3		Sciatica

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
3	3	3	2	724.5		Backache - Unspecified
		1	1	724.6		Backache - Sacroiliac
2	2	2		725		Polymyalgia Rheumatica
1	1			726.0		Adhesive Capsulitis of Shoulder
2	2	1		726.1		Rotator Cuff Strain
3	3			726.10		Bursitis - Shoulder
4	4			726.90		Tendonitis - Unspecified
3	3			726.91		Bone Spur
1	1			727.03		Trigger Finger
2	2	1		727.1		Bunion
				727.3		Bursitis - Unspecified
1	1			727.4		Ganglion Cyst on Wrist
				727.51		Baker's Cyst
3	1			729.1		Fibromyalgia
2	2			730.8		Osteomyelitis - Specified Site
1	1			731.0		Paget's Disease
1	1			732.1		Legg-Calve-Perthes - Bilateral
82	43	28	5	733.0		Osteoporosis
4	2	1		733.1		Compression Fracture - Non-Traumatic
7	1	1		733.13		Fracture - Compression Fracture of Vertebrae, Non-Traumatic
2		1		733.14		Fracture - Hip, Pathologic
2	1	1		733.90		Osteopenia
1	1	1		736.70		Foot Deformity - Acquired
2	2			737.1		Kyphosis
3				737.30		Scoliosis - Acquired, Postural, or Idiopathic
				742.59		Other Anomaly of the Spinal Cord/Myelodysplasia
1				746.9		Heart Valve Anomaly - Unspecified
2	1			753.1		Renal Cyst - Congenital or Multiple
1		1		754.30		Congenital Dislocation of Hip
1				754.70		Foot Deformity - Congenital, NEC
1				755.69		Hip Fusion
1		1		780.0		Loss of Consciousness - Unspecified Cause
5	1			780.01		Coma
6	1			780.09		Delirium
1				780.1		Hallucination - Auditory
4	1	3	2	780.2		Syncope/Transient Loss of Consciousness
32		7		780.3		Seizure Disorder
6	2			780.4		Dizziness
1	1			780.50		Sleep Disorder/Unspecified Sleep Disturbance
4	2			780.52		Insomnia
15	1	5		780.57		Sleep Apnea
1	1			780.71		Chronic Fatigue Syndrome
10	3	2	1	782.3		Edema of Legs/Dropsy
1	1			783.4		Failure to Thrive - Pediatric Usage
10	2	5	2	784.0		Headaches - Non-Specified
3	2	1	1	784.7		Epistaxis
10	2	2	1	785.0		Tachycardia - Unspecified
5		4		785.2		Murmur - Heart, Undiagnosed
4	2			785.4		Gangrene - Extremity, Upper or Lower
6	1	1		787.2		Dysphagia
29		2		787.6		Incontinence - Fecal
1	1			787.91		Chronic Diarrhea

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
2	1	1		788.20		Urinary Retention
70	1	10	1	788.3		Incontinence - Urinary
4	4	1		788.41		Urinary Frequency
1				790.2		Impaired Glucose Tolerance
1	1			790.6		Hyperuricemia
2	1			790.7		Bacteremia - Unspecified Type
1				802.2		Fracture - Mandible, Closed
2	1			802.3		Fracture - Mandible, Open
				803.0		Skull Fracture - Closed
1	1			805.6		Fracture - Coccyx, Closed
3	2			805.8		Spinal Fracture
10	5	1		807.00		Fracture - Rib(s), Unspecified
				807.01		Fracture - One Rib
1	1			807.09		Fracture - Ribs(s), Multiple, Unspecified Number
10	5			808		Fracture - Pelvic
3	1			810.0		Fracture - Clavicle, Closed
2	2			811.00		Fracture - Scapula, Closed, Unspecified
1	1			811.10		Fracture - Scapula, Open, Unspecified
		1	1	812.00		Shoulder Fracture - Upper End of Humerus
1	1	1		812.20		Fracture - Humerus, Closed
1				813.01		Fracture - Elbow, Closed
				813.81		Radial Fracture
7	3	1	1	814.00		Fracture - Wrist, Closed
14	9	1		818.0		Fracture - Arm, Closed
51	28	3	3	820.8		Fracture - Hip or Femur, Closed
1				820.9		Hip Fracture - Open
1	1			821.00		Fracture - Femur, Closed
1				822.0		Fracture Patella - Closed
				823.81		Fracture - Fibula, Closed
6	6			824.8		Ankle Fracture - Closed
6	3			825.20		Fracture - Foot, Unspecified Bones Except Toes, Closed
1	1			826.0		Fracture - Foot, One or More Phalanges Including Toes, Closed
10	2	1	1	827.0		Fracture - Leg, Closed
1	1			829.0		Fractures - Multiple, Sites Unspecified
4	1			831.0		Dislocation - Shoulder, Closed
1	1			840.4		Rotator Cuff Tear
7		1		850		Concussion - No LOC
17				850.5		Concussion - with LOC of Unspecified Duration
7				852.2		Subdural Hematoma
12		2		854.0		S/P Head Injury or Trauma
1	1			862.22		Esophageal Tear
1	1			866.03		Ruptured Kidney - Traumatic
1	1	1	1	879.8		Open Wound(s) - Site Unspecified without Complication
3	3			886.1		Amputation - Finger Alone, Either Hand, Traumatic
2		1	1	895.0		Amputation -Toe(s) Only, One or Both Feet, Non-Traumatic
3	2			897.0		Amputation of Leg - Below Knee
2	2			897.2		Amputation - Above Knee
2	2			897.6		Amputation of Legs - Bilateral

<b>Medical Conditions (001-799.9) and Supplemental Conditions – Injury and Poisoning (800-999.9)</b>						
AHCODE & AHSCOD E	AM251A- AM251K & AM251AS- AM251KS	BHCODE & BHSCOD E	BM251A- BM251K & BM251AS - BM251KS	CODE	SUB CODE	DESCRIPTION
1	1			942.14		First Degree Burns to Back
37		5	2	959.01		Head Injury - NEC
2				977.9		Drug Overdosage
1	1			986		Carbon Monoxide Poisoning
5	4			992.0		Heat Stroke
2	1			994.0		Lightning Strike Effects, Struck by
1	1			995.2		Drug Allergy
				997.01		Hypoxia from a Procedure