Atherosclerosis Risk in Communities Study

EXAM 5 NCS Stages 1/2/3

DERIVED VARIABLE DICTIONARY
STATUS51 SAS DATASET
VERSION 51
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1. ADMINISTRATIVE

1.1 SUBJECTID (Subject ID)

Type: character; length: $7.

1.2 CENTER (Field Center)

Character variable with four possible values derived from the enrollment site:

F: Forsyth County, North Carolina
J: The city of Jackson, Mississippi
M: Selected northwestern suburbs of Minneapolis, Minnesota
W: Washington County, Maryland

Algorithm: First letter of the subject ID.

Type: character; length: $1.

1.3 ID (ARIC ID - same as SUBJECTID)

The historical participant identifier from visits 1-4 is ID. The value of ID is the same value as SUBJECTID. Use ID when merging visit 5/NCS stage 1 data with datasets from previous visits necessary for longitudinal analyses.

Type: character; length: $7.

2. ARIC VISIT COMPLETION AND STUDY STATUS VARIABLES

2.1 DATEOFDEATH (Date of Death)

Date variable indicating date of death compiled from previous visit dates and ARIC surveillance data.

Type: Date

2.2 KNWNDEADBYVISIT21 (Participant is known to be dead at visit 2)

Numeric indicator variable indicating that participant is known to be dead by the start of visit 2 (February 5, 1990): 0=No, 1=Yes.

Algorithm: if .z<dateofdeath<='05Feb1990'd then knwndeadbyvisit21=1;
else knwndeadbyvisit21=0;

Type: numeric

Source variable(s): dateofdeath

2.3 KNWNDEADBYVISIT31 (Participant is known to be dead at visit 3)

Numeric indicator variable indicating that participant is known to be dead by the start of visit 3 (March 16, 1993): 0=No, 1=Yes.

Algorithm: if .z<dateofdeath<='16Mar1993'd then knwndeadbyvisit31=1;
else knwndeadbyvisit31=0;

Type: numeric

Source variable(s): dateofdeath

2.4 KNWNDEADBYVISIT41 (Participant is known to be dead at visit 4)

Numeric indicator variable indicating that participant is known to be dead by the start of visit 4 (February 1, 1996): 0=No, 1=Yes.

Algorithm: if .z<dateofdeath<='01Feb1996'd then knwndeadbyvisit41=1;
else knwndeadbyvisit41=0;

Type: numeric

Source variable(s): dateofdeath

2.5 KNWNDEADBYVISIT51 (Participant is known to be dead at visit 5)

Numeric indicator variable indicating that participant is known to be dead by the start of visit 5 (June 1, 2011): 0=No, 1=Yes.

Algorithm: if .z<dateofdeath<='01Jun2011'd then knwndeadbyvisit51=1;
else knwndeadbyvisit51=0;

Type: numeric

Source variable(s): dateofdeath

2.6 RESPOND21 (Participant completed visit 2)

Categorical variable providing information on completion of visit 2: 0=Died prior to visit, 1=Completed visit, 2=Eligible for visit but died before completed, 3=Refused visit, lost, or did not get examined.

Algorithm: if knwndeadbyvisit21=1 then respond21=0;
else if v2date21>.z then respond21=1;
else if '5Feb1990'd<=dateofdeath<='15Mar1993'd then respond21=2;
else respond21=3;

Type: numeric.

Source variable(s): dateofdeath, knwndeadbyvisit21, v2date21

2.7 RESPOND31 (Participant completed visit 3)

Categorical variable providing information on completion of visit 3: : 0=Died prior to visit, 1=Completed visit, 2=Eligible for visit but died before completed, 3=Refused visit, lost, or did not get examined.

Algorithm: if knwndeadbyvisit31=1 then respond31=0;
else if v3date31>.z then respond31=1;
else if '16Mar1993'd<=dateofdeath<='31Jan1996'd then respond31=2;
else respond31=3;

Type: numeric.

Source variable(s): dateofdeath, knwndeadbyvisit31, v3date31

2.8 RESPOND41 (Participant completed visit 4)

Categorical variable providing information on completion of visit 4: 0=Died prior to visit, 1=Completed visit, 2=Eligible for visit but died before completed, 3=Refused visit, lost, or did not get examined.

Algorithm: if knwndeadbyvisit41=1 then respond41=0;
else if v4date41>.z then respon41=1;
else if '1Feb1996'd<=dateofdeath<='30Jan1999'd then respond41=2;
else respond41=3;

Type: numeric.

Source variable(s): dateofdeath, knwndeadbyvisit41, v4date41

2.9 RESPOND51 (Participant completed visit 5)

Categorical variable providing information on completion of visit 5: 0=Died prior to visit, 1=Completed visit, 2=Eligible for visit but died before completed, 3=Refused visit, lost, or did not get examined..

Algorithm: if STAGE_1_COMPLETE=1 then respond51=1;
else if knwndeadbyvisit51=1 then respond51=0;
else if '01Jun2011'd<=dateofdeath<='01Sep2013'd then respond51=2;
else respond51=3;

Type: numeric.

Source variable(s): dateofdeath, knwndeadbyvisit51, Stage_1_complete

2.10 RESPOND22 (Participant completed visit 2 (yes or no))

Indicator variable indicating completion of visit 2: 0=no, 1=yes.

Algorithm: if RESPOND21=1 then Respond22=1;
Else respond22=0;

Type: numeric.

Source variable(s): respond21

2.11 RESPOND32 (Participant completed visit 3 (yes or no))

Indicator variable indicating completion of visit 3:0=did not complete visit 3: 0=no, 1=yes.

Algorithm: if RESPOND31=1 then Respond32=1;
Else respond32=0;

Type: numeric.

Source variable(s): respond31

2.12 RESPOND42 (Participant completed visit 4 (yes or no))

Indicator variable indicating completion of visit 4: 0=no, 1=yes.

Algorithm: if RESPOND41=1 then Respond42=1;
Else respond42=0;

Type: numeric.

Source variable(s): respond41

2.13 RESPOND52 (Participant completed visit 5 (yes or no))

Indicator variable indicating completion of visit 5: 0=no, 1=yes.

Algorithm: if RESPOND51=1 then Respond52=1;
Else respond52=0;

Type: numeric.

Source variable(s): respond51

2.14 STATUSDATE21 (Either death date, date of visit 2 exam OR 05Feb1990)

Date variable with status as of visit 2. Date is either date of completion of visit 2, date of death if dead by the start of visit 2, or the date that visit 2 began (05Feb1990).

Algorithm: if v2date21>.z then statusdate21=v2date21;
else if knwndeadbyvisit21=1 then statusdate21=dateofdeath;
else statusdate21='05Feb1990'd;

Type: date.

Source variable(s): v2date21, knowndeadbyvisit2, dateofdeath

2.15 STATUSDATE31 (Either death date, date of visit 3 exam OR 16Mar1993)

Date variable with status as of visit 3. Date is either date of completion of visit 3, date of death if dead by the start of visit 3, or the date that visit 3 began (16Mar1993).

Algorithm: if v3date31>.z then statusdate31=v3date31;
else if knwndeadbyvisit31=1 then statusdate31=dateofdeath;
else statusdate31='16Mar1993'd;

Type: date.

Source variable(s): v3date31, knowndeadbyvisit3, dateofdeath

2.16 STATUSDATE41 (Either death date, date of visit 4 exam OR 01Feb1996)

Date variable with status as of visit 4. Date is either date of completion of visit 4, date of death if dead by the start of visit 4, or the date that visit 4 began (01Feb1996).

Algorithm: if v4date41>.z then statusdate41=v4date41;
else if knwndeadbyvisit41=1 then statusdate41=dateofdeath;
else statusdate41='01Feb1996'd;

Type: date.

Source variable(s): v4date41, knowndeadbyvisit4, dateofdeath

2.17 STATUSDATE51 (Either death date, date of visit 5 exam OR 01Jun2011)

Date variable with status as of visit 5. Date is either date of completion of visit 5, date of death if dead by the start of visit 5, or the date that visit 5 began (01Jun2011).

Algorithm: if v5date51>**.z** then statusdate51=v5date51;
else if knwndeadbyvisit51=**1** then statusdate51=dateofdeath;
else statusdate51=**'01Jun2011'd**;

Type: date.

Source variable(s): v5date51, knowndeadbyvisit5, dateofdeath

2.18 STATUSHFDATE51 (Either death date, date of visit 5 exam OR 01Jun2011)

Date variable with either the date of visit 5 or the date that visit 5 began (01Jun2011).

Algorithm: If v5date51>. then statusHFdate51=v5datev51
else statusHFdate51='01Jun2011'd

Type: date.

Source variable(s): v5date51

2.19 LASTFUINTERVIEW_DATE51 (Date of last completed follow-up interview)

Date variable reporting the last completed AFU contact before the end of V5 data collection, 30AUG13.

Algorithm: the max value of AFUcomp1_A among the records for a single ID where AFUcomp2_A indicates that the interview was accomplished (AFUcomp2_a in ('A','C','D'))

Type: numeric.

Source variable(s): AFUcomp1_A, AFUcomp2_A

3. RETROSPECTIVE DEMENTIA SURVEILLANCE AND DEMENTIA DIAGNOSES

The retrospective ascertainment of potential cases of dementia targeted ARIC cohort members who were not examined at ARIC visit 5/NCS and declined (or were unable) to complete the TICS, and for whom cognitive impairment was suspected based on any of the following sources:

- an interviewer's assessment recorded on the ARIC Contact Information Update (CIU) form (starting with Visit 5 recruitment)
- an ICD-9 dementia hospital discharge code (defined in Appendix A) recorded on the Cohort Eligibility (CEL) form at any point since the start of cohort surveillance
- a self-report of dementia diagnosis on the semi-annual follow-up interview (starting with the introduction of the question on the GEN v1 on January 1, 2012)
- the reliance on a proxy or other contact for the annual or semiannual follow-up interview (based on most recent interview prior to data retrieval)
- the lack of a TICS attributed to hearing loss. A random sample (n~100) of all others who declined the TICS also was included.

Cohort participants who died before attending the visit were selected for the retrospective ascertainment of dementia if known to have died on or after January 1, 2004 and having no V5 data, if cognitive impairment was suspected based on a CEL form with an ICD-9 dementia discharge code or a DTH (Death Certificate) form with an ICD-9 or ICD-10 death code. A random sample of 100 other participants who died on or after January 1, 2004 and before attending ARIC's visit 5 examination also was included. Deceased participants identified through CEL were included in the lists distributed in July and November 2013. A set of lists of deceased participants identified through DTH was distributed in March 2014 based on data retrieved March 26, 2014. (Excerpt from ARIC Manual 19).
The variables used to identify the PPTs eligible for dementia surveillance are identified with the suffix '_RDS'. The '_RDS' variables were created for not only those PPTs who were included in retrospective dementia surveillance, but where possible, for the rest of the cohort as well. The values of these variables for those PPTs who were identified for dementia surveillance are exactly the values that were known at the specific time a PPT was added to the dementia surveillance list. All '_RDS' variables except DEMDTH_RDS are MISSING for the 91 PPTs identified using DTH data.

The following '_RDS' variable definitions make a reference to a censor date. The censor date varies between July 2013 and March 2014 for the surveillance-eligible PPTs who were alive at the time the dementia surveillance lists were created. For those alive PPTs not eligible for RDS, the censor date is either the V5 visit date or 01SEP2013, depending on whether or not the PPT attended V5. The PPT date of death is the censor date for those PPTs who died prior to the lists being created.

3.1 REFUSED_V5_RDS (Retrospective Dementia Surveillance: Firm Refusal for V5 in RTS)

Indicator identifying that the PPT refused to participate in V5; (1=Yes, 0=No, MISSING).

Algorithm: REFUSED_V5_RDS =1 if (RTS4='N'); REFUSED_V5_RDS =0 otherwise

Type: numeric.

Source variable(s): RTS1

3.2 TIC_STAT_RDS (Retrospective Dementia Surveillance: TICS Status 0=No TICS, 1=TICS refused, 2=TICS Complete)

Numeric variable indicating TICS status; (0=No TICS, 1=TICS refused, 2=TICS complete)

Algorithm: TIC_STAT_RDS=2 if subject has a record in TICS data set and it is NOT permanently missing;
TIC_STAT_RDS =1 if subject has any record in TICS data set and (it is permanently missing);
TIC_STAT_RDS =0 if subject has no record in TICS data set.

Type: numeric

Source variable(s): TICS dataset (TIC)

3.3 IMPCIU_RDS (Retrospective Dementia Surveillance: Impairment indicated in CIU)

Indicator for presence of dementia recorded on the ARIC Follow-Up (AFU) form, CIU Contact Information Update collected during AFU contacts; (1=Yes, 0=No, MISSING).

Algorithm: If CIU0a='Y' AND CIU0a <= censor date then IMPCIU_RDS=1, ELSE IMPCIU_RDS=0;

Type: numeric

Source variable(s): CIU0a, CIU0d

3.4 IMPGEN_RDS (Retrospective Dementia Surveillance: Impairment indicated in GEN)

Indicator for presence of dementia recorded on the (AFU) form, GEN Semi-annual Follow-Up General Interview (1=Yes, 0=No, MISSING), collected during semi-annual AFU contacts; (1=Yes, 0=No, MISSING).

Algorithm: If GEN1a or GEN1c or GEN1d is Yes AND GEN0a <= censor date in any AFU record, then IMPGEN_RDS=1; Else IMPGEN_RDS=0;

Type: numeric

Source variable(s): GEN0a, GEN1a, GEN1c, GEN1d

3.5 Hearing_IMP_RDS (Retrospective Dementia Surveillance: Hearing Impairment Indicated in CIU)

Indicator for identifying hearing impairment reported in the CIU Contact Information Update (1=Yes, 0=No, MISSING).

Algorithm: Hearing_IMP_RDS=1 if CIU0c='Y' AND CIU0a<censor date;
Hearing_IMP_RDS=0 otherwise;

Type: numeric

Source variable(s): CIU0a, CIU0c

3.6 PROXY_OTHER_AFU_RDS (Retrospective Dementia Surveillance: Use of proxy indicated during follow-up interview)

Indicator identifying that the proxy stated the PPT was alive at the time of the most recent follow up call before the censor date; (1=Yes, 0=No, MISSING).

Algorithm: Proxy_other_AFU_RDS =1 if (AFU02='R' or RTS4 in ('Y','R')) AND (RTS0a or AFU0a)<censor date; Proxy_other_AFU_RDS =0 otherwise;

Type: numeric.

Source variable(s): AFU0a, AFU2, RTS0a, RTS4

3.7 DEMENTEDCEL_DATE (Date of the first occurrence of a CEL with dementia code)

Date variable that corresponds to the earliest date of data collection (CEL0a) among CEL Cohort Event Eligibility records by PPT; where the codes contain a dementia code. (See DEMCEL_RDS for list of eligible dementia codes considered for retrospective dementia surveillance.)

3.8 DEMENTEDDTH_DATE (Date of death for PPT with a dementia death code)

Date variable that corresponds to the death date for the PPT when a dementia code is found on the death record. (See DEMDTH_RDS for list of eligible dementia codes considered for retrospective dementia surveillance.)

3.9 DEMCEL_RDS (Retrospective Dementia Surveillance: Dementia codes in CEL)

Indicator for presence of ICD 9 Dementia Code on the Cohort Event Eligibility form (1=Yes, 0=No, MISSING). The variable is used to identify the PPTs for dementia surveillance from hospitalization discharge codes.

Algorithm:

DEMCEL_RDS=1 if any of CEL10a through CEL10z contains any one of the following codes: 290.xx, 294.0, 294.1, 294.10, 294.11, 294.2, 294.20, 294.21, 294.9, 331.0, 331.1, 331.11, 331.19, 331.2, 331.7, 331.8, 331.82, 331.83, 331.89, or 331.9

AND

One of the following criteria regarding timing are met:

1. For those PPTs who came to the visit, DEMENTEDCEL_DATE comes before the V5 date: DEMENTEDCEL_DATE<DERIVE51[V5DATE51]
2. For those PPTs who did not come to the visit but have a TICS, DEMENTEDCEL_DATE comes before the TICS date: DEMENTEDCEL_DATE<STATUS51[TICS_date]
3. For remaining PPTs, DEMENTEDCEL_DATE comes before 01SEP2013.

Type: numeric

Source variable(s): DEMENTEDCEL_DATE, CEL10a-CEL10z
* Note, 294 and 331 codes not captured at the time the proxy lists were compiled.

3.10 DEMDTH_RDS (Retrospective Dementia Surveillance: Dementia codes in DTH)

Indicator for presence of dementia codes in the DTH data (1=Yes, 0=No, MISSING). The variable is used to identify the PPTs for dementia surveillance using death codes when the PPT did not attend the visit, does not have a TICs and died prior to the end of V5 data collection.

Algorithm:

DEMDTH_RDS= 1 If any of DTHA19A through DTHA19J contains any one of the following codes: {290.xx, 294.0, 294.1, 294.10, 294.11, 294.2, 294.20, 294.21, 294.9, 331.0, 331.1, 331.11, 331.19, 331.2, 331.7, 331.8, 331.82, 331.83, 331.89, or 331.9*

OR

'F00', 'F00.0', 'F00.1', 'F00.2', 'F00.9', 'F01', 'F01.0', 'F01.1', 'F01.2', 'F01.3', 'F01.5', 'F01.50', 'F01.51', 'F01.8', 'F00.9', 'F02', 'F02.0', 'F02.1', 'F02.2', 'F02.3', 'F02.4', 'F02.8', 'F02.80', 'F02.81', 'F03', 'F03.9', 'F03.90', 'F03.91', 'F05.1', 'F06.7', 'G31.0', 'G31.1', 'G31.01', 'G31.09', 'G31.83', 'G31.84', 'G30', 'G30.0', 'G30.1', 'G30.8', 'G30.9'}

AND DEMENTEDDTH_DATE comes before 01SEP2013.

Type: numeric

Source variable(s): DEMENTEDDTH_DATE, DTHA19A-DTHA19J
* Note, 294 and 331 codes not captured at the time the proxy lists were compiled.

3.11 TIC_EDUC51 (V5 Education-adjusted TICS Subtotal Correct)

Numeric score for telephone interview cognitive status adjusted for education.

Algorithm: if 0<HOM54<8 then TIC_EDUC51=TIC23+5;
else if 8<=HOM54<=10 then TIC_EDUC51=TIC23+2;
else if 11<=HOM54<=19 then TIC_EDUC51=TIC23;
else if 20<=HOM54<99 then TIC_EDUC51=TIC23-2;
else TIC_EDUC51=TIC23;

Type: numeric, theoretical possible values range from -2 to 53.

Source variable(s): V1FINAL.HOM54 (Education Level) and TIC23 (total telephone interview cognitive score)

3.12 TICSDEMDX51 (Dementia dx by education-adjusted TICS (<=23),1=DEM, 0=No DEM)

Indicator variable for dementia diagnosis based on an education adjusted TICS score. Cut off for dementia is <=23 items correct on the TICS.

Algorithm: if TIC_EDUC51>. then do;
if TIC_EDUC51<=23 then TICSDEMDX51=1; else TICSDEMDX51=0; end;

Type: numeric

Source variable(s): TIC_EDUC51

3.13 RDSVITSTAT51 (Retrospective Dementia Surveillance: Vital Status at Time of Selection)

Categorical variable indicating if participant was alive, per AFU data, at the time of selection for proxy contact: 0=alive, 1=dead.

Algorithm: RDSVITSTAT51 =1 if COHORT5\131120\ADER_131120[DEAD]=1
Else RDSVITSTAT51 =0 IF COHORT5\131120\ADER_131120[DEAD]=0

Type: numeric

Source variable(s): ADER dataset

3.14 RDSSELECTED_PROXY (Retrospective Dementia Surveillance: PPT's Proxy Selected for Interview Using DRD/DRL)

Categorical variable indicating selection of participant for proxy call to determine dementia status: 0=not selected, 1=selected.

Algorithm: The variable is defined as 1 if the PPT is included on the dementia ascertainment lists and 0 otherwise.

Type: numeric

Source variable(s): ADER dataset

3.15 PXYCONSUC51 (Retrospective Dementia Surveillance: Proxy Contact Successful)

Indicator variable for successful contact of a proxy for an informant interview. Used in retrospective dementia surveillance. Format: 1=yes, 0=no.

Algorithm: PROXCONSUC51=1 if DRD33>. OR DRD41>. OR DRL33>. OR DRL41>.
ELSE PROXCONSUC51=0 if DRD33,DRD41,DRL33,DRL41 are all missing but DRD or DRL form is present
ELSE PROXCONSUC51=.

Type: numeric

Source variable(s): DRD33, DRD41, DRL33, DRL41

3.16 PXYDEMDX51 (Dementia DX determined by proxy on DRD or DRL, 1=DEM, 0=NO DEM)

Indicator variable for dementia determined from an informant interview: 0=no dementia, 1=dementia.

Algorithm: if *FAQ* (sum of DRD(L)14, DRD(L)15, DRD(L)18, DRD(L)22, DRD(L)22, DRD(L)23, DRD(L)24, DRD(L)9, DRD(L)8, DRD(L)12)>5 OR DRD(L)(L)40>3 then PXYDEMDX51=1;

if .z<*FAQ*<=5 and .z<DRD(L)<=3 then PXYDEMDX51=0; otherwise =missing.

Type: numeric

Source variable(s): FAQ and CDRsb from DRD/DRL

LEVELED DEMENTIA DIAGNOSES

Following data collection for V5/NCS, three leveled dementia diagnosis variables were defined for as much of the cohort as possible using all relevant ARIC data: neuropsychological data collected at V5, TICS (Telephone Interview for Cognitive Status) interviews, informant interviews, and ARIC surveillance. The different diagnoses may be used to examine dementia among

1) PPTs who attended V5
2) PPTs who refused V5 but agreed to be interviewed using the TICS or informant interviews
3) PPTs who did not refuse V5 and did not attend V5.

DEMENTIA VARIABLES

Level 1

The level 1 variable for dementia diagnosis (**DEMDXL1_51**) is complete for those PPTs who attended V5 and completed the neuropsychological assessments. The evaluation procedure for determining cognitive status at V5 is detailed in Manual 17. Briefly, cognitive, behavioral, and functional assessments were completed for all participants at V5. A subset of the 6538 PPTs were invited for more detailed assessments. An algorithmic profile was employed to assign cognitive status, and where the algorithmic profiles were concordant or discordant for MCI or dementia (see **Manual 17** for the profile definitions), reviewers evaluated all diagnostic materials and rendered a syndromic diagnosis. The reviewer diagnosis superseded the algorithmic diagnosis when both are present.

The level 1 variable has etiology information that was assigned during the classification review. These variables are found in the DERIVE_NCS51 dataset.

Level 2

For those PPTs who were alive at the time of V5 but who declined to be seen in person, dementia was determined using the education-adjusted TICS score or informant ratings for the CDR and FAQ. The level 2 dementia diagnosis variable, **DEMDXL2_51**, is equal to **DEMDXL1_51** when the level 1 variable is non-missing. If level 1 is not present, the TICS score is considered. When TICS is not available, the value assigned was based on the informant interview.

Level 3

Dementia hospitalization discharge codes and diagnostic codes from death certificates were used to assess dementia for the PPTs who had no V5 NCS assessments and no TICS/informant interviews. Level 3 dementia diagnosis, **DEMDXL3_51**, is assigned as the level 1 diagnosis when available else the level 2 diagnosis when available; dementia hospitalization codes are then considered followed by dementia codes found on the death certificate. The sequential order of available sources for dementia diagnosis assignment

are 1) reviewer diagnosis, 2) algorithmic diagnosis, 3) TICS result, 4) informant result, 5) hospitalization discharge codes, and lastly, 6) death certificate codes. Manuscript #2120c contains survival analysis on time to dementia based primarily on the Level 3 variable. Additional variables used in those analyses are listed in the next section, SURVIVAL ANALYSIS VARIABLES.

Each of the leveled diagnosis variables has an associated date of diagnosis. If the PPT has a dementia diagnosis, then the date corresponds to the earliest date that dementia was detected. If the PPT has no dementia diagnosis, the corresponding date will be gleaned from V5 NCS date, TICS date, or the informant date. When **DEMDXL3_51**=0 in the absence of levels 1 and 2 variables, the date variable is missing.

3.17 DEMDXL1_51 (Dementia diagnosis level 1)

Indicator variable for dementia based on both reviewer diagnosis and algorithmic syndromic diagnosis; reviewer diagnosis is given higher priority: 0=No, 1= Yes.

Algorithm: If REVIEWERSYND51=”D” then DEMDXL1_51=1;
Else if REVIEWERSYND51=”M” or “N” then DEMDXL1_51=0;
Else if REVIEWERSYND51=”” and REVISEDSYNDDIAG51 in (4,6), then DEMDXL1_51=1;
Else if REVIEWERSYND51=”” and REVISEDSYNDDIAG51 in (0,1,2,3,5), then DEMDXL1_51=0;
Else DEMDXL1_51=.

Type: numeric

Source variables both located in DERIVE51 dataset:
REVIEWERSYND51, REVISEDSYNDDIAG51

3.18 DATE_DEMDXL1_51 (Date for dementia diagnosis level 1)

Date of diagnosis when the value of DEMDXL1_51=1 or the last date of assessment when DEMDXL1_51=0. When DEMDXL1_51=. then the date will also be missing. For those PPTs with a dementia diagnosis, the diagnosis date assigned will either be the date of the earliest hospitalization date with a dementia code or the V5 NCS exam date.

Algorithm: For those PPTs with DEMDXL1_51 is non-missing:
When DEMDXL1_51=1 then DATE_DEMDXL1_51=minimum value of V5DATE51 and DEMENTEDCEL_DATE)
When DEMDXL1_51=0 then DATE_DEMDXL1_51=V5DATE51
When DEMDXL1_51=. then DATE_DEMDXL1_51=missing

Type: date

Source variable(s): V5DATE51, DEMDXL1_51

3.19 SOURCE_DEMDXL1_51 (Diagnosis and date source for DATE_DEMDXL1_51)

Source variable created to indicate the diagnosis and date source for DATE_DEMDXL1_51

Algorithm: If DEMDXL1_51 = missing then SOURCE_DEMDXL1_51 should be set to missing
ELSE = "V5" if DATE_DEMDXL1_51 took on Visit 5 date

OR ="V5+HOSP" if DATE_DEMDXL1_51 took on DEMENTEDCEL_DATE

Type: character

Source variables: DATE_DEMDXL1_51

3.20 DEMDXL2_51 (Dementia diagnosis level 2)

Indicator variable for dementia based on reviewer diagnosis, algorithmic syndromic diagnosis, TICS (telephone interview for cognitive status) and proxy interview. Diagnoses are prioritized, with the reviewer diagnosis being given highest priority, then the algorithmic syndromic diagnosis, TICS and finally the proxy interview: 0=No, 1= Yes.

Algorithm: For the PPTs with non-missing DEMDXL1_51:
DEMDXL2_51=DEMDXL1_51;

For the PPTs with missing DEMDXL1_51 and TICS is present:
If TICSDEMDX51=1, then DEMDXL2_51=1;
If TICSDEMDX51=0, then DEMDXL2_51=0;

For the PPTs with missing DEMDXL1_51 and TICS not present:
If PXYDEMDX51=1, then DEMDXL2_51=1;
if PXYDEMDX51=0, then DEMDXL2_51=0;
if PXYDEMDX51=missing, then DEMDXL2_51=missing.

Type: numeric

Source variable(s): DEMDXL1_51, TICSDEMDX51, PXYDEMDX51

3.21 DATE_DEMDXL2_51 (Date for dementia diagnosis level 2)

Date of diagnosis when the value of DEMDXL2_51=1 or the last date of assessment when DEMDXL2_51=0. When DEMDXL2_51=. then the date will also be missing. Recall that the level 2 dementia variable will take on the level 1 value when it exists. The same is true for the level 2 date value. For those PPTs with a dementia diagnosis, the diagnosis date assigned will either be the date of the earliest hospitalization date with a dementia code or the V5 NCS exam date if level 1 is non-missing or the date the TICS was executed or the date of the informant interview.

Date of dementia diagnosis based on DEMDXL2_51; this variable only has a value when DEMDXL2_51=1.

Algorithm:

If DEMDXL2_51 = missing then DATE_DEMDXL2_51 should be set to missing.

Otherwise: if DEMDXL1_51 ne missing then DATE_DEMDXL2_51 = DATE_DEMDXL1_51

if [(TICSDEMDX51=1 and (date_demcel = . or date_demcel ge tic0a)) or TICSDEMDX51=0] then DATE_DEMDXL2_51 = tic0a

ELSE IF TICSDEMDX51=1 and .z < date_demcel < tic0a then DATE_DEMDXL2_51 = date_demcel;

ELSE If PXYDEMDX51=1 and (date_demcel = . or date_demcel ge min(DRD0a,DRL0a)) and (date_demdth = . or date_demdth ge min(DRD0a,DRL0a))) or PXYDEMDX51=0 AND . < date_dth le min(DRD0a,DRL0a) THEN DATE_DEMDXL2_51 = date_dth

ELSE = dementedcel_date if PXYDEMDX51=1 and <.z<dementedcel_date < proxy call date{ DRD0a or DRL0a}

ELSE = dementeddth_date if PXYDEMDX51=1 and <.z<DEMENTEDDTH_DATE < proxy call date{ max(DRD0a,DRL0a)}

Type: date

Source variable(s): DATE_DEMDXL1_51, TIC0a, TICSDEMDX51, PXYDEMDX51, dementedCEL, dementedDTH, DRD0a, DRL0a

3.22 SOURCE_DEMDXL2_51 (Diagnosis and date source for DATE_DEMDXL2_51)

Source variable created to indicate the diagnosis and data source for DATE_DEMDXL2_51

Algorithm: If DEMDXL2_51 = missing then SOURCE_DEMDXL2_51 should be set to missing

ELSE = SOURCE_DEMDXL1_51 if demdxl1_51 ne missing

ELSE = “TICS” if [(TICSDEMDX51=1 and dementedcel_date is missing) or TICSDEMDX51=0]

ELSE = “TICS+HOSP” if TICSDEMDX51=1 and <.z<dementedcel_date <TICS_date

ELSE = “RDS” if [PXYDEMDX51=1 and (dementedcel_date and DEMENTEDDTH_DATE are both missing) or PXYDEMDX51=0]

ELSE = “RDS+HOSP” if PXYDEMDX51=1 and <.z<dementedcel_date < proxy call date{ DRD0a or DRL0a}

ELSE = “RDS+DTH” if PXYDEMDX51=1 and <.z<DEMENTEDDTH_DATE < proxy call date{ DRD0a or DRL0a}

Type: character

3.23 DEMDXL3_51 (Dementia diagnosis level 3)

Indicator variable for dementia based on reviewer diagnosis, algorithmic syndromic diagnosis, TICS (telephone interview for cognitive status), proxy interview, dementia codes on the cohort eligibility form (CEL), and dementia codes on the death certificate form (DTH). Diagnoses are prioritized, with the reviewer diagnosis being given highest priority, then the algorithmic syndromic diagnosis, TICS, the proxy interview, CEL dementia codes and finally the DTH form. Format: 0=No, 1= Yes.

Algorithm: For the PPTs with non-missing DEMDXL2_51:
DEMDXL3_51=DEMDXL2_51;

For the PPTs with missing DEMDXL2_51:
If DEMENTEDCEL=1 or DEMENTEDDTH=1 and the hospitalization/death occurred before '01SEP2013'd, then DEMDXL3_51=1;
Otherwise DEMDXL3_51=0;

Type: numeric

Source variable(s): DEMDXL1_51, DEMDXL2_51, DEMENTEDCEL, DEMENTEDDTH

3.24 DATE_DEMDXL3_51 (Date for dementia diagnosis level 3)

Date of diagnosis when the value of DEMDXL3_51=1 or the last date of assessment when DEMDXL3_51=0. When DEMDXL3_51=0 and DEMDXL2_51 is missing then the date will also be missing. Recall that the level 3 dementia variable will take on the level 2 value when it exists. The same is true for the level 3 date value. For those PPTs with a dementia diagnosis, the diagnosis date assigned will either be the date of the earliest hospitalization

date with a dementia code or date of death for PPTs with a dementia death code or the V5 NCS exam date if level 2 is non-missing or the date the TICS was executed or the date of the informant interview.

NOTE: This date variable is not to be used for calculating time to dementia in survival analysis. See **COXDATE_DEMDXL3**.

Algorithm: For the PPTs with non-missing DEMDXL1_51:
DATE_DEMDXL3_51= DATE_DEMDXL1_51;

For the PPTs with non-missing DEMDXL2_51 and TICS:
If TICSDEMDX51=1 then DATE_DEMDXL3_51 is the minimum value of TICS date and DEMENTEDCEL_DATE
If TICSDEMDX51=0 then DATE_DEMDXL3_51 is the TICS date

For the PPTs with non-missing DEMDXL2_51 and informant interview:
If PXYDEMDX51=1 then DATE_DEMDXL3_51 is the minimum value of proxy interview date, DEMENTEDCEL_DATE or DEMENTEDDTH_DATE
If PXYDEMDX51=0 then DATE_DEMDXL3_51 is the informant interview date

For the PPTs with missing DEMDXL2_51 and who have dementia hospitalizations or death codes that occurred before '01SEP2013'd:
DATE_DEMDXL3_51=DEMENTEDCEL_DATE or DEMENTEDDTH_DATE
Otherwise DATE_DEMDXL3_51=. (DEMDXL3_51=0)

Type: date

Source variable(s): DATE_DEMDXL2_51, DATE_DEMDXL3_51, DEMENTEDCEL_DATE, DEMENTEDDTH_DATE

3.25 SOURCE_DEMDXL3_51 (Diagnosis and date source for DATE_DEMDXL3_51)

Source variable created to indicate the diagnosis and data source for DATE_DEMDXL3_51

Algorithm: = SOURCE_DEMDXL2_51 if demdxl2_51=1

ELSE = “HOSP” if dementedcel=1

ELSE = “DTH” if dementeddth=1

ELSE =”NO CODE”

SURVIVAL ANALYSIS VARIABLES

The variables described in this section are designed to be used for analysis of time to level 3 dementia.

CENSDAT7, used in some definitions in this section, is a surveillance variable created by the CC for use in survival analyses where the endpoint is anything other than death. The variable is found in the dataset, INCBY13, and is used in the creation of the related variable, **CENSDAT7MS2120**. A description of CENSDAT7 is found in the derived variable dictionary for INCBY13.

3.26 DEMDXL3CENS (Censored level 3 dementia diagnosis)

Description: Censored level 3 dementia diagnosis is level 3 dementia diagnosis (DEMDXL3_51), excluding discharge or death certificate codes that occurred after the date of last visit/phone contact in which hospitalization information was collected for PPTs lost to follow-up (CENSDAT7). There are no missing values for censored level 3 dementia diagnosis: 48 lost to follow-up PPTs with a hospital or death code after lost to follow-up and before September 1, 2013 are set to 0 (no dementia).

NOTE: For survival analysis of time to dementia, use this variable as the censoring variable with the time to dementia variable, **COXYEARDEML3**, defined below.

Algorithm: For PPTs with non-missing DEMDXL2_51:
DEMDXL3CENS = DEMDXL2_51

Else for PPTs with non-missing DATE_DEMDXL3_51 and
DATE_DEMDXL3_51 ≤ CENSDAT7:
DEMDXL3CENS = DEMDXL3_51

Else:
DEMDXL3CENS = 0

Type: numeric

Source variable(s): DEMDXL2_51, DATE_DEMDXL3_51, CENSDAT7 (INC_BY13 data set)

3.27 CENSDAT7MS2120 (CENSDAT7 with 2 data corrections)

Description: This variable is CENSDAT7 with corrections made to two specific SUBJECTIDs, and it was used to calculate DEMDXL3_EXCL_LTFU for MS2120c (defined below).

Algorithm: For SUBJECTIDs “M161313” and “M245415”
CENSDAT7MS2120 = DEMENTEDDTH_DATE

Else:
CENSDAT7MS2120 = CENSDAT7

Type: date

Source variable(s): SUBJECTID, DEMENTEDDTH_DATE, CENSDAT7 (INCBY13 dataset)

Comparison of CENSDAT7 versus CENSDAT7MS2120 for above IDs

CENSDAT7	DATEOFDEATH	DEMENTEDDTH_DATE	CENSDAT7MS2120
20-May-10	20-May-10	21-May-10	5/21/2010
21-Nov-04	21-Nov-04	25-Nov-04	11/25/2004

3.28 DEMDXL3_EXCL_LTFU (Level 3 Dementia Diagnosis excluding PPTs who are lost to follow-up and had a dementia code after lost to follow-up)

Description: DEMDXL3_EXCL_LTFU is the same as the censored level 3 dementia diagnosis (DEMDXL3CENS) except that here 55 lost to follow up PPTs with a hospital or death code after lost to follow up and before September 1, 2013 are set to missing. These PPTs are censored at lost to follow-up and so the events are not counted in time-to-event analyses in MS2120c because of ascertainment bias: events for lost to follow up PPTs cannot be systematically identified.

NOTE: Use this variable for analysis of **incidence** of level 3 dementia (although such analysis is discouraged in favor of analysis of time to dementia) , use this variable as the censoring variable with the time to dementia variable, **COXYEARDEML3**, defined below.

Algorithm: For PPTs with DATE_DEMDXL3_51 after CENSDAT7MS2120 and missing DEMDXL2_51:
DEMDXL3_EXCL_LTFU = .

Else:
DEMDXL3_EXCL_LTFU = DEMDXL3_51

Type: numeric

Source variable(s): DATE_DEMDXL3_51, CENSDAT7MS2120, DEMDXL2_51, DEMDXL3_51

3.29 DATE_DEMDXL3CENS (Date of censored level 3 dementia diagnosis)

Date of censored diagnosis is the earliest date indicated from Visit 5, TICS, Informant interview date, hospital discharge code or death code, and it is only defined for PPTs with Level 3 Diagnosis = Yes. For PPTs with DEMDXL3CENS = Yes, it is the earliest date that dementia criteria were met from Visit 5, TICS, Informant interview date, hospital discharge

code or death code. For PPTs with DEMDXL3CENS = No, it is the date of visit 5, TICS, or Informant interview. For PPTs who died, were lost to follow-up, or refused, it is the ARIC censoring date (CENSDAT7, if prior to September 1, 2013); otherwise the date is set to September 13, 2013.

NOTE: This variable contains programming for an interim step and should not be used for analysis.

Algorithm: For PPTs with non-missing DEMDXL2_51 and non-missing DATE_DEMDXL2_51:
DATE_DEMDXL3CENS = DATE_DEMDXL2_51

Else for PPTs with non-missing DEMDXL2_51 and missing DATE_DEMDXL2_51:
DATE_DEMDXL3CENS = '01SEP2013'

Else for PPTs with non-missing DATE_DEMDXL3_51 and DATE_DEMDXL3_51 ≤ CENSDAT7:
DATE_DEMDXL3CENS = DATE_DEMDXL3_51

Else:
DATE_DEMDXL3CENS = CENSDAT7

Type: date

Source variable(s): DEMDXL2_51, DATE_DEMDXL2_51, CENSDAT7

3.30 YEAR_DEMDXL3 (Year of censored level 3 dementia diagnosis)

Description: Year of censored level 3 dementia diagnosis

Algorithm: YEAR_DEMDXL3 = YEAR(DATE_DEMDXL3CENS)

Type: numeric

Source variable(s): DATE_DEMDXL3CENS

3.31 COXDATE_DEMDXL3 (adjusted date of censored level 3 dementia diagnosis)

Date of censored level 3 dementia diagnosis (DATE_DEMDXL3CENS) adjusted for data collected from informant interview, hospital discharge code, or death code. Subtracting 180 days from DATE_DEMDXL3CENS assumes that the dementia started midpoint within a year prior to the date.

NOTE: This is an interim step and should not be used for analysis.

Algorithm: if SOURCE_DEMDXL3_51 in ("RDS Live", "RDS Dead", "V5+HOSP", "TICS+HOSP", "RDS+HOSP", "RDS+DTH", "HOSP" "DTH") then COXDATE_DEMDXL3 = DATE_DEMDXL3CENS - 180

else COXDATE_DEMDXL3 = DATE_DEMDXL3CENS

Type: date

Source variable(s): SOURCE_DEMDXL3_51, DATE_DEMDXL3CENS

3.32 COXYEARDEML3 (Adjusted time to censored level 3 dementia diagnosis in years)

Number of years on a continuous scale from visit 1 to adjusted date of Level 3 Dementia diagnosis or the visit 5 censoring date (i.e. time to Level 3 dementia or censoring). Use as time variable in survival analysis of time to dementia.

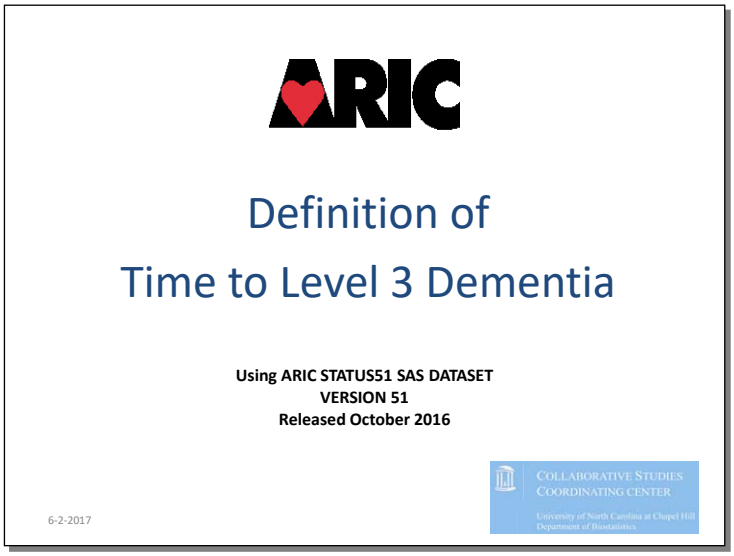
NOTE: For survival analysis of time to dementia, use this variable as the time to dementia with the censoring variable, **DEMDXL3_51** defined above.

Algorithm: = (COXDATE_DEMDXL3 – V1DATE01)/365.25

Type: numeric

Source variable(s): COXDATE_DEMDXL3, V1DATE01

3.33 ARIC Definition of Time to Level 3 Dementia Presentation Slides



Analysis Variables for Time to Level 3 Dementia

Item	Variable Name
Level 3 Dementia censored (1=dementia/0=censored) Use as censoring variable in survival analyses	DEMDXL3CENS
Time to Level 3 Dementia (in years from visit 1 date) Use as time variable in survival analyses	CoxYearDEML3

Sample Proportional Hazards SAS Code:

```
proc phreg;
      title "Cox model of time to Level 3 dementia";
      model CoxYearDemL3 * demdxl3cens(0) = <covariates> /RISKLIMITS=Wald;
run;
```

Used in MS2120c Gottesman et al JAMA Neurology 2017

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Other Important Variables

Item	Variable Name
Level 3 Dementia Diagnosis (1=yes/0=no) This variable=1 for ALL dementias diagnosed up to visit 5. Do NOT use for analyses of time to incident dementia or incidence of dementia	DEMDXL3_51
Level 3 Dementia Excluding Lost to Follow-up Cases (1=yes/0=no) This created variable sets DEMDXL3_51 **to missing** for all cases of level 3 dementia that were identified after lost to follow-up. This is appropriate to use for incidence of dementia, although *analysis of incidence of dementia is strongly discouraged* in favor of time to dementia.	DEMDXL3_EXCL_LTFU

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Supporting Variables used in derivation steps but never used for analyses

Item	Variable Name
Date of level 3 dementia diagnosis Do NOT use for time to incident dementia	DATE_DEMDXL3_51
Date of Level 3 dementia Incidence or censoring	CoxDate_DEMDXL3

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The following slides provide detail of the derivation of each variable

4-26-16 5

V5 Level 3 Dementia Diagnosis

1. At Visit 5 (level 1)
2. TICS or Informant Interviews (level 2)
3. Hospital Discharge code
4. Death Certificate Code

   The following discharge or death certificate codes are NOT used:
   - Occurred after Visit 5 date for PPTs who came to Visit 5
   - Occurred after September 1 2013 for PPTs who did NOT come to Visit 5
5. If all sources are negative, L3 dementia is set to No

There are no missing values for level 3 dementia diagnosis.

Total Count Variable DEMDXL3_51

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V5 Level 3 Dementia Diagnosis Censored

1. At Visit 5 (level 1)
2. TICS or Informant Interviews (level 2)
3. Hospital Discharge code
4. Death Certificate Code

   The following discharge or death certificate codes are NOT used:
   - Occurred after Visit 5 date for PPTs who came to Visit 5
   - Occurred after September 1 2013 for PPTs who did NOT come to Visit 5
   - Occurred **after Date of Last Visit/Phone Contact in which hospitalization information was collected (CENSDAT7) for PPTs lost to follow-up (LTFU)**
5. If all sources are negative, L3 dementia is set to No

There are no missing values for level 3 dementia diagnosis censored.
55 LTFU PPTs with a Hospital or Death Code indicating dementia after LTFU and before Sept 1 2013 are set to 0 (no dementia).

Survival Analysis Censoring Variable DEMDXL3CENS

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V5 Level 3 Dementia Diagnosis Excluding LTFU events

1. At Visit 5 (level 1)
2. TICS or Informant Interviews (level 2)
3. Hospital Discharge code
4. Death Certificate Code

   The following discharge or death certificate codes are NOT used:
   - Occurred after Visit 5 date for PPTs who came to Visit 5
   - Occurred after September 1 2013 for PPTs who did NOT come to Visit 5
   - Occurred after Date of Last Visit/Phone Contact in which hospitalization information was collected (CENSDAT7) for PPTs lost to follow-up (LTFU)
5. If all sources are negative, L3 dementia is set to No

55 LTFU PPTs with a Hospital or Death Code indicating dementia after LTFU and before Sept 1 2013 are set to missing.
These PPT are to be EXCLUDED in any *incidence* analysis because of ascertainment bias: events for LTFU PPTs are not systematically identified

Incidence Variable DEMDXL3_EXCL_LTFU

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Date of Level 3 Dementia Diagnosis

Earliest date criteria was met from :

Visit 5
TICS
Informant interview date
Hospital discharge code
Death code

(If DEMDXL3_51=No, this variable is either missing or equal to the date of V5/TICS/informant interview)

Observed Date Variable DATE_DEMDXL3_51

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Date of Level 3 Dementia Diagnosis or Censoring

If DEMDXL3CENS = Yes:

Earliest date criteria was met from :

Visit 5
TICS
Informant interview date
Hospital discharge code
Death code

If DEMDXL3CENS = No: see next slide

Interim Step: not for analysis DATE_DEMDXL3CENS

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Date of Level 3 Dementia Diagnosis or Censoring

If DEMDXL3CENS = No:

= Date of Visit 5, TICS, or Informant interview

For PPT who died, LTFU or refused:

= ARIC censoring date (CENSDAT7), if prior to Sept 1, 2013
= Otherwise set to Sept 1, 2013

CENSDAT7 is the last known date for data collection on the PPT.
It may be the death date or last known follow-up date.
Sept 1, 2013 is the last date of ARIC Visit 5

Interim Step: not for analysis DATE_DEMDXL3CENS

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Date of Level 3 Dementia Diagnosis or Censoring Adjusted

If DEMDXL3CENS = Yes:

Earliest date criteria was met from :

- Visit 5
- TICS
- Informant interview date -180 days *
- Hospital discharge code -180 days *
- Death code -180 days *

* Assumption that the dementia started midpoint within a year prior to the date

Set to Sept. 1 2013 for 3 PPTs with missing TICS date

Interim Step: not for analysis COXDATE_DEMDXL3

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Time to Level 3 Dementia or Censoring Adjusted

= number of years from visit 1 to adjusted date of Level 3 dementia diagnosis or the visit 5 censoring date, from previous slide

= (CoxDate_DEMDXL3 - Visit 1 date)/365.25

Survival Analysis Time Variable COXYEARDEML3

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Summary of Variable Names (STATUS51)

Purpose	Item	Variable Name
Observed count	Level 3 Dementia Diagnosis (1=yes/0=no) Do NOT use for time to incident dementia	DEMDXL3_51
Observed date	Date of level 3 dementia diagnosis Do NOT use for time to incident dementia	DATE_DEMDXL3_51
Survival analysis censoring	Level 3 Dementia censored (1=yes/0=no) Use as censoring variable in survival analyses	DEMDXL3CENS
Date supporting survival analysis	Date of Level 3 dementia Incidence or censoring	CoxDate_DEMDXL3
Survival analysis time to event	Time to Level 3 Dementia (in years from visit 1 date) Use as time variable in survival analyses	CoxYearDEML3
Indicator for Incidence analysis (excludes cases after LTFU)	Level 3 Dementia excluding cases after LTFU (1=yes/0=no) Use only for incidence of level 3 dementia analyses (not for time to event)	DEMDXL3_EXCL_LTFU

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MS2120c counts of DEMDXL3CENS for ARIC White or Black participants (other races excluded from MS2120c)

Number (%) Dementia Diagnoses by Assessment Type					
	Visit 5 (n=6471)	TICS-m (n=1461)	Informant call (n=826)	Surveillance (n=6986)	Total (n=15744)
	Dementia	Dementia	Dementia	Dementia	Dementia
Overall	342 (5%)	100 (7%)	575 (70%)	499 (7%)	1516 (10%)

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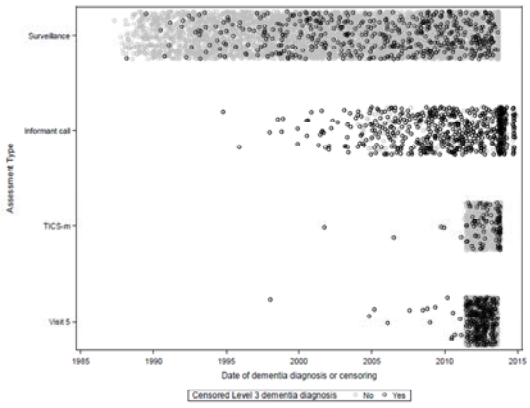
MS2120c Dates of Dementia Diagnosis DATE_DEMDXL3CENS for White & Black Race



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MS2120c study hypothesis

- **Midlife (ARIC V1) diabetes, hypertension, elevated plasma cholesterol, BMI and smoking history are related to risk for incident dementia, independent of APOE genotype and stroke prior to Visit 5**

Methods:

- **Cox Proportional Hazards, confirmed with numerous sensitivity analyses including competing risks**

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4. PHYSICAL VARIABLES AND INDICATORS

4.1 AGENATMENOPAUSEF (Age (years) at natural menopause)

Numeric variable indicating age in years at natural menopause.

Algorithm:
```
if menops01=4 then agenatmenopause=rhxa08
else if menops21=4 then agenatmenopause=hhxb19
else if menops31=4 then agenatmenopause=rhxb7
else if menops41=4 then agenatmenopause=rhxc7
else agenatmenopause=.
```

Type: numeric

Source variable(s): rhxa08, hhxb19, rhxb7, rhxc7, menops01, menops21, menops31, menops41

4.2 AGESRGMENOPAUSEF (Age (years) at surgical menopause)

Numeric variable indicating age in years at surgical menopause.

Algorithm:
```
if menops01=5 then agesrgmenopause=rhxa08
else if menops21=5 then agesrgmenopause=hhxb19
else if menops31=5 then agesrgmenopause=rhxb7
else if menops41=5 then agesrgmenopause=rhxc7
else agesrgmenopause=.
```

Type: numeric

Source variable(s): rhxa08, hhxb19, rhxb7, rhxc7, menops01, menops21, menops31, menops41

5. DISEASE PREVALENCE

5.1 PREVSELFREPHF51 (Self-report HF)

Numeric indicator variable indicating if the patient has ever self-reported heart failure and this self-report is not contradicted by a later no on the physician heart failure survey: 1=Yes, 0=No.

Algorithm: prevselfreportHF=1 if there exists a record from a study visit or follow-up interview such that a ppt has a response 'Y' to the question about diagnosed heart failure on one of the source variables listed below and there does not exist a later PHF record with a response 'N' to the question if the ppt had a heart failure.
prevselfreportHF=0 otherwise.

Type: numeric

Source variables: phxa8j (date in phxa63), phxb6b (date in phxb21), AFU versions G-K AFU7b, AFU8, AFU9, AFU10 (date is AFU1), AFU version 1: AFU30, AFU31 (date is AFUa), SAF4, 4a, 5, 5a (date is SFA0A), PHF variables from PHDFA1104 and visit 5 PHF.

5.2 PREVSELFREPHFMEDS51 (Self-report HF medications)

Numeric indicator variable indicating if the patient has ever self-reported taking medication for heart failure: 1=Yes, 0=No.

Algorithm: prevselfreportHFmed=1 if there exists a record from a study visit or a follow up interview such that a ppt has a response 'Y' to the question about taking medication for heart failure.
prevselfreportHFmed=0 otherwise.

Type: numeric

Source variables: mrsa08d, mrsb24d, mrsc24e, mrsd24e, mrsf33h, AFU46D, AFU65D

5.3 HF_BYPHF51 (PHF confirmed HF)

Numeric indicator variable reporting if heart failure has been confirmed by the physician heart failure survey : 1=Yes, 0=No.

Algorithm: If PHF1='Y' or PHFA1='Y' then HF_byPHF=1;
Else if PHF1='N' AND PHFA='N' then HF_byPHF=0;
Else HF_byPHF= . ;

.

Type: numeric

Source variables: PHF1, PHFA

5.4 PREVHFDEF_STATUS51 (V5 Prevalent Definite Heart Failure up to visit 5 (nonresponders) or through visit 5 (responders))

Type: numeric

To be drafted.

6. DISEASE INCIDENCE

6.1 INCSELFREPHBP51 (Self-Report Incident High Blood Pressure by SEP2013)

Numeric indicator variable reporting if the participant self-reported high blood pressure by September 2013. May be used in conjunction with INCSELFREPHBP_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPHBP51=1 if any of the records for a single ID have a Y value for either AFUcomp7c_G or AFUcomp14_M and
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPHBP51=0 if AFUcomp7c_G, AFUcomp14_M are (N,’’) or (‘’,N) respectively in all records for a single ID, where
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPHBP51=.T otherwise.

Type: numeric

Source variables: AFUcomp7c_G , AFUcomp14_M, AFUcomp1_A

6.2 INCSELFREPHBP_DATE51 (Self-Report Incident High Blood Pressure Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported high blood pressure (through August 30, 2013); if participant never self-reported high blood pressure (INCSELFREPHBP51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPHBP_DATE51 = earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp7c_G or AFUcomp14_M (as long as AFUcomp1_A is not greater than ”30AUG2013”d)
else use min(LASTFUINTERVIEW_DATE51,”30AUG2013”d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp7c_G , AFUcomp14_M, AFUcomp1_A

6.3 INCSELFREPDM51 (Self-Report Diabetes Mellitus by SEP2013)

Numeric indicator variable reporting if the participant self-reported diabetes mellitus by September 2013. May be used in conjunction with INCSELFREPDM_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPDM51=1 if any of the records for a single ID have a Y value for either AFUcomp7d_G or AFUcomp15_M and
.z<afucomp1_A<=”30AUG2013”d

INCSELFREPDM51=0 if AFUcomp7d_G, AFUcomp15_M are (N,'') or ('',N) respectively in all records for a single ID, where .z<afucomp1_A<="30AUG2013"d INCSELFREPDM51=.T otherwise.

Type: numeric

Source variables: AFUcomp7d_G , AFUcomp15_M, AFYcomp1_U

6.4 INCSELFREPDM_DATE51 (Self-Report Incident Diabetes Mellitus Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported diabetes mellitus (through August 30, 2013); if participant never self-reported diabetes mellitus (INCSELFREPDM51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPDM_DATE51 = earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp7d_G or AFUcomp14_M (as long as AFUcomp1_A is not greater than "30AUG2013"d)
else use min(LASTFUINTERVIEW_DATE51,"30AUG2013"d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp7d_G , AFUcomp15_M, AFYcomp1_U

6.5 INCSELFREPCLD51 (Self-Report Incident PVD or Claudication by SEP2013)

Numeric variable reporting if the participant self-reported incident PVD or claudication by September 2013. May be used in conjunction with INCSELFREPCLD_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPCLD51=1 if any of the records for a single ID have a Y value for either AFUcomp20c_L or AFUcomp20c_M and .z<afucomp1_A<="30AUG2013"d
INCSELFREPCLD51=0 if AFUcomp20c_L, AFUcomp20c_M are (N,'') or ('',N) respectively in all records for a single ID, where .z<afucomp1_A<="30AUG2013"d
INCSELFREPCLD51=.T otherwise.

Type: numeric

Source variables: AFUcomp20c_L, AFUcomp20c_M, AFUcomp1_a

6.6 INCSELFREPCLD_DATE51 (Self-Report Incident PVD or Claudication Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported incident PVD or claudication (through August 30, 2013); if participant never self-reported incident PVD or claudication (INCSELFREPCLD51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPCLD_DATE51= earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp20c_L or AFUcomp20c_M (as long as AFUcomp1_A is not greater than ”30AUG2013”d)
else use min(LASTFUINTERVIEW_DATE51,”30AUG2013”d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp20c_L, AFUcomp20c_M, AFUcomp1_a

6.7 INCSELFREPAST51 (Self-Report Asthma by SEP2013)

Numeric variable reporting if the participant self-reported asthma by September 2013. May be used in conjunction with INCSELFREPAST_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPAST51=1 if any of the records for a single ID have a Y value for either AFUcomp20a_L or AFUcomp7h_G and .z<afucomp1_A<=”30AUG2013”d
INCSELFREPAST51=0 if AFUcomp20a_L, AFUcomp7h_G are (N,’’) or (‘’,N) respectively in all records for a single ID, where .z<afucomp1_A<=”30AUG2013”d
INCSELFREPAST51=.T otherwise.

Type: numeric

Source variables: AFUcomp20a_L, AFUcomp7h_G, AFUcomp1_a

6.8 INCSELFREPAST_DATE51 (Self-Report Asthma Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported asthma (through August 30, 2013); if participant never self-reported asthma (INCSELFREPAST51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPAST_DATE51= earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp20a_L or

AFUcomp7h_G (as long as AFUcomp1_A is not greater than ”30AUG2013”d)
else use min(LASTFUINTERVIEW_DATE51,”30AUG2013”d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp20a_L, AFUcomp7h_G, AFUcomp1_a

6.9 INCSELFREPLUNG51 (Self-Report Chronic Lung Disease by SEP2013)

Numeric variable reporting if the participant self-reported chronic lung disease by September 2013. May be used in conjunction with INCSELFREPLUNG_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPLUNG51=1 if any of the records for a single ID have a Y value for either AFUcomp18b_L or AFUcomp7g_G and
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPLUNG51=0 if AFUcomp18b_L, AFUcomp7g_G are (N,’’) or (‘’,N) respectively in all records for a single ID, where
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPLUNG51=.T otherwise.

Type: numeric

Source variables: AFUcomp18b_L, AFUcomp7g_G, AFUcomp1_a

6.10 INCSELFREPLUNG_DATE51 (Self-Report Chronic Lung Disease Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported chronic lung disease (through August 30, 2013); if participant never self-reported chronic lung disease (INCSELFREPLUNG51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPLUNG_DATE51= earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp18b_L or AFUcomp7g_G (as long as AFUcomp1_A is not greater than ”30AUG2013”d)
else use min(LASTFUINTERVIEW_DATE51,”30AUG2013”d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp18b_L, AFUcomp7g_G, AFUcomp1_a

6.11 INCSELFREPHF51 (Self-Report Heart Failure by SEP2013)

Numeric variable reporting if the participant self-reported heart failure by September 2013. May be used in conjunction with INCSELFREPHF_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPHF51=1 if any of the records for a single ID have a Y value for any AFUcomp7b_G, AFUcomp8_L, AFUcomp9_L, AFUcomp10_L, AFUcomp10_M, and .z<afucomp1_A<="30AUG2013"d
ELSE INCSELFREPHF51=.T if all AFUcomp7b_G, AFUcomp8_L, AFUcomp9_L, AFUcomp10_L, AFUcomp10_M are all missing or 'U' for every record for a single ID, where z<afucomp1_A<="30AUG2013"d
ELSE INCSELFREPHF51=0

Type: numeric

Source variables: AFUcomp8_L, AFUcomp9_L, AFUcomp7b_G , AFUcomp10_M, AFUcomp10_L , AFUcomp1_a

6.12 INCSELFREPHF_DATE51 (Self-Report Heart failure Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported heart failure (through August 30, 2013); if participant never self-reported heart failure (INCSELFREPHF51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPHF_DATE51= = earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for any AFUcomp7b_G, AFUcomp8_L, AFUcomp9_L, AFUcomp10_L, AFUcomp10_M, (as long as AFUcomp1_A is not greater than "30AUG2013"d)
else use min(LASTFUINTERVIEW_DATE51,"30AUG2013"d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp8_L, AFUcomp9_L, AFUcomp7b_G , AFUcomp10_M, AFUcomp10_L , AFUcomp1_a

6.13 INCSELFREPAF51 (Self-Report Atrial Fibrillation by SEP2013)

Numeric variable reporting if the participant self-reported atrial fibrillation by September 2013. May be used in conjunction with INCSELFREPAF_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPAF51=1 if any of the records for a single ID have a Y value for either AFUcomp12_M or AFUcomp12_L and
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPAF51=0 if AFUcomp12_M, AFUcomp12_L are (N,’’) or (‘’,N) respectively in all records for a single ID, where
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPAF51=.T otherwise.

Type: numeric

Source variables: AFUcomp12_M, AFUcomp12_L, AFUcomp1_a

6.14 INCSELFREPAF_DATE51 (Self-Report Atrial Fibrillation Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported atrial fibrillation (through August 30, 2013); if participant never self-reported atrial fibrillation (INCSELFREPAF51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPAF_DATE51= earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp12_M or AFUcomp12_L (as long as AFUcomp1_A is not greater than ”30AUG2013”d)
else use min(LASTFUINTERVIEW_DATE51,”30AUG2013”d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp12_M, AFUcomp12_L, AFUcomp1_a

6.15 INCSELFREPSTK51 (Self-Report Stroke by SEP2013)

Numeric variable reporting if the participant self-reported stroke by September 2013. May be used in conjunction with INCSELFREPSTK_DATE51. Format : 1=Yes, 0=No, .T=Missing.

Algorithm: INCSELFREPSTK51=1 if any of the records for a single ID have a Y value for either AFUcomp29_A or AFUcomp8b_K and
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPSTK51=0 if AFUcomp29_A, AFUcomp8b_K are (N,’’) or (‘’,N) respectively in all records for a single ID, where
.z<afucomp1_A<=”30AUG2013”d
INCSELFREPSTK51=.T otherwise.

Type: numeric

Source variables: AFUcomp29_A, AFUcomp8b_K, AFUcomp1_a

6.16 INCSELFREPSTK_DATE51 (Self-Report Stroke Date or Last Follow-up Date)

Date variable with the date the first time a participant self-reported stroke (through August 30, 2013); if participant never self-reported stroke (INCSELFREPSTK51=0), then the date is either the most recent AFU or August 30, 2013, whichever is earlier. The variable is missing if there are no records for this ID.

Algorithm: INCSELFREPSTK_DATE51= earliest value of AFUcomp1_A within the records for a single ID where a Y value is found for either AFUcomp29_A or AFUcomp8b_K (as long as AFUcomp1_A is not greater than ”30AUG2013”d)
else use min(LASTFUINTERVIEW_DATE51,”30AUG2013”d)
else missing if no records are found for a single ID

Type: date

Source variables: AFUcomp29_A, AFUcomp8b_K, AFUcomp1_a

7. HEART FAILURE HOSPITALIZATIONS

7.1 HOSPHF_ANY428_PRE05_POST10_51 (Any HF code in any position before 2005 or after 2010)

Indicator variable for the presence of an ICD9 Medicare heart failure code in any position. The following codes are Medicare heart failure ICD codes: 398.91, 402.01, 402.11, 402.91, 404.01, 404.11, 404.91, 404.03, 404.13, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9. Format: 1=yes; 0=no.

Algorithm: hospHF_any428_pre05_post10_51 =1, if HAS428=1 AND (.z<CELB04 < 01/01/2005 or CELB04>12/31/2010 AND CELB04< statusHFdate51)
hospHF_any428_pre05_post10_51 =0, otherwise

Type: numeric

Source variables: HAS28, CELB04, statusHFdate51

7.2 HOSPHF_FIRST428_PRE05_POST10_51 (Any HF code in the first position before 2005 or after 2010)

Indicator variable for the presence of an ICD9 Medicare heart failure code in the first position. The following codes are Medicare heart failure ICD codes: 398.91, 402.01, 402.11, 402.91, 404.01, 404.11, 404.91, 404.03, 404.13, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9. Format: 1=yes; 0=no.

Algorithm: hospHF_any428_pre05_post10_51 =1, if HAS428_FIRST=1 AND (.z<CELB04 < 01/01/2005 or CELB04>12/31/2010 AND CELB04< statusHFdate51)
hospHF_any428_pre05_post10_51 =0, otherwise

Type: numeric

Source variables: HAS28_FIRST, CELB04, statusHFdate51

7.3 HOSPHF_2005_2010_51 (Hospitalization classified as A,B,C in 2005-10)

Indicator variable for a cardiac hospitalization classified as A, B, or C. Format: 1=yes; 0=no.

Algorithm: HOSPHF_2005_2010_51= 1, if CHFDIAG includes A, B, or C and (01/01/2005<=HFEVTDATE<=12/31/2010);
HOSPHF_2005_2010_51=0, otherwise
Type: numeric

Source variables: HFEVTDATE, CHFDIAG