



Atherosclerosis Risk in Communities Study

Cohort Surveillance

Incident Events Derived Variable Dictionary

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This file is somewhat misnamed, in that for many of the events included, the variables designate the first post-Exam 1 event of a given type regardless of whether the event was preceded by an event of the same type prior to Exam 1.

To get truly incident events, the prevalent cases at Exam 1 must be excluded. For prevalent CHD, see the Exam 1 Derived file (DERIVE13), Section 3, on Prevalent Disease at Exam 1 (PRVCHD05). For prevalent stroke at baseline, consider using either hom10d (self-reported stroke) from the Exam 1 HOM dataset, and/or tiab01 (told by physician had stroke or TIA) from the Exam 1 TIAB03 dataset.

Users of this dataset should carefully consider the definition of censoring. Versions of the dataset prior to event year 2009 included the censoring variable CENSDAT6; in event year 2010 the variable CENSDAT7 has been added. The Coordinating Center recommends use of CENSDAT7_FollowUpDays for all endpoints other than death; this includes events identified through cohort surveillance, cohort follow-up and linkage with registries. A fuller explanation is provided in the descriptions of CENSDAT6 and CENSDAT7. Analysis of death as an endpoint should be censored at the end date of the most recent NDI search, which lags events by one year. This censoring has been built into the variable FUTIMED.

For each event type included in this file there is a 0/1 indicator variable for whether the event has occurred in follow-up, and a follow-up time variable for the particular event type (the difference between the end of follow-up variable and the date of Exam 1 (V1DATE01)).

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1. Incident/Death Event

1.1. DEAD23

Purpose

To determine if a person died prior to 31DEC23.

Description

DEAD23=1 if a cohort participant died before 31DEC23.
Follow up for death events is censored at December 31, 2023.

Algorithm

DEAD23	Description
1	If death indicated in DTH, in National Death Index (NDI) database or in Annual Follow Up (AFU), and death date is prior to 31DEC23.
0	Otherwise

if 0<dated23<="31DEC23"d then dead23=1;
else dead23 = 0;

Related Variables

DTH09, AFU04, DATED23

1.2. C7_INC_BY23

Purpose

To determine if a person has a hospitalized MI or fatal CHD prior to CENSDAT7.

Description

C7_INC_BY23=1 if there was a definite or probable MI or fatal CHD before CENSDAT7. NOTE: the history variable (PRVCHD05) is not used for defining C7_INC_BY23 so that each researcher can determine defining missing history events as incident events or not.

Algorithm

C7_INC_BY23	Description
1	if (CMIDX='DEFMI' or 'PROBMI') or (CFATALDX='DEFFATMI' or 'DEFFATCHD'), for an event date (CEVTDAT2*) before CENSDAT7
0	Otherwise

* CEVTDAT2=CMIDATE if definite or probable MI,
= DTH09 if not definite or probable MI, but definite fatal CHD.

Related Variables

CFATALDX, CMIDX, CMIDATE, DTH09, C7_IN_23S, C7_IN_23SP, C7_IN_BY23P, PRVCHD05

1.3. C7_IN_BY23P

Purpose

To determine if a person has a hospitalized MI, fatal CHD or cardiac procedure prior to CENSDAT7.

Description

C7_IN_BY23P=1 if there was a definite or probable MI, fatal CHD or cardiac procedure before 31DEC23. NOTE: the history variable (PRVCHD05) is not used for defining C7_IN_BY23P so that each researcher can determine defining missing history events as incident events or not.

Algorithm

C7_IN_BY23P	Description
1	if C7_INC_BY23=1 or cardiac procedure ((ICD-9 codes in CEL form contain 36.0, 36.1 or 36.2) or (ICD-10 in CEL form containing ICD-10 matching codes to 36.0, 36.1 or 36.2)) for an event date (CEVTDAT2* or CEL04) before CENSDAT7
0	otherwise

* CEVTDAT2=CMIDATE if definite or probable MI,
= DTH09 if not definite or probable MI, but definite fatal CHD.

if C7_cardproc = 1 & .z<dateproc<=censdat7 then C7_in_by23p= 1;
else C7_in_by23p =C7_inc_by23;

Related Variables

CEL04, C7_IN_23S, C7_IN_23SP, C7_INC_BY23, PRVCHD05

1.4. C7_IN_23S

Purpose

To determine if a person has a hospitalized MI, fatal CHD or ECG MI (serial changes) prior to CENSDAT7.

Description

C7_IN_23S=1 if there was a definite or probable MI, fatal CHD, or ECG MI before CENSDAT7.
NOTE: the history variable (PRVCHD05) is not used for defining C7_IN_23S so that each researcher can determine defining missing history events as incident events or not.

Algorithm

C7_IN_23S	Description
1	if (C7_INC_BY23=1 or C7_SMI_BY23=1) for an event date (CEVTDAT2* or SMIDATE) before CENSDAT7
0	Otherwise

* CEVTDAT2=CMIDATE if definite or probable MI,
= DTH09 if not definite or probable MI, but definite fatal CHD.

if c7_inc_by23=1 then C7_in_23s=C7_inc_by23;
else if C7_inc_by23=0 then C7_in_23s= C7_smi_by23;

Related Variables

C7_INC_BY23, C7_IN_BY23P, C7_IN_23SP, C7_SMI_BY23, SMIDATE

1.5. C7_IN_23SP

Purpose

To determine if a person has a hospitalized MI, fatal CHD, cardiac procedure or ECG MI (serial changes) prior to CENSDAT7.

Description

C7_IN_23SP=1 if there was a definite or probable MI, fatal CHD, cardiac procedure or ECG MI before CENSDAT7. NOTE: the history variable (PRVCHD05) is not used for defining IN_23SP so that each researcher can determine defining missing history events as incident events or not. See cautionary note about SMIDATE.

Algorithm

C7_IN_23SP	Description
1	if (C7_IN_BY23P=1 or C7_SMI_BY23=1) and event date (CEVTDAT2*, CEL04 or SMIDATE) was before CENSDAT7
0	otherwise

* CEVTDAT2=CMIDATE if definite or probable MI,
= DTH09 if not definite or probable MI, but definite fatal CHD.

if C7_in_23s=1 then C7_in_23sp=C7_in_23s;
else if C7_in_23s=0 then C7_in_23sp= C7_cardproc;

Related Variables

CEL04, C7_IN_BY23P, C7_INC_BY23, PRVCHD05, SMI_BY23, SMIDATE, C7_CARDPROC

1.6. C7_CARDPROC

Purpose

To determine if a person has a cardiac procedure prior to CENSDAT7.

Description

C7_CARDPROC=1 if there was a cardiac procedure before CENSDAT7. NOTE: the history variable (PRVCHD05) is not used for defining C7_CARDPROC so that each researcher can determine defining missing history events as incident events or not.

Algorithm

C7_CARDPROC	Description
1	if ((ICD-9 codes in CEL form contain 36.0, 36.1 or 36.2) or (ICD-10 in CEL form containing ICD-10 matching codes to 36.0, 36.1 or 36.2)), and CEL04 was before CENSDAT7
0	otherwise

```
if proc=1 then C7_cardproc=1;
  if (C7_cardproc & dateproc<=.z) then do;
    dateproc=celb04;
  end;
  if not(.z<dateproc<="31DEC&year"d) then do;
    C7_cardproc=0;
    dateproc=.;
  end;
  if C7_cardproc=1 & proc_id=' ' then proc_id=id;
```

Related Variables

CEL04, C7_INC_BY23, C7_IN_23SP, PRVCHD05, DATEPROC (CEL04 date if CARDPROC=1)

1.7. C7_SMI_BY23

Purpose

To determine if MI was detected by ECG serial changes.

Description

C7_SMI_BY23 is the indicator of MI which is determined by ECG serial changes.

Algorithm

C7_SMI_BY23	Description
1	If (ECGMI_V2=1 or ECGMI_V3=1 or ECGMI_V4=1 or ECGMI_V5=1) and SMIDATE is prior to CENSDAT7
0	If not above

```
C7_smi_by23 = (ecgmi_v2=1 | ecgmi_v3=1 | ecgmi_v4=1|ecgmi_v5=1);  
if smidate>"31DEC2023"d then do;  
    smidate="31DEC2023"d;  
    C7_smi_by23=0;  
end;
```

Related Variables

ECGMI_V2, ECGMI_V3, ECGMI_V4, ECGMI_V5, SMIDATE

1.8. C7_MI23

Purpose

To determine if a person has a hospitalized MI prior to CENSDAT7.

Description

C7_MI23=1 if there was a definite or probable MI before CENSDAT7. NOTE: the history variable (PRVCHD05) is not used for defining C7_MI23 so that each researcher can determine defining missing history events as incident events or not.

Algorithm

C7_MI23	Description
1	if (CMIDX='DEFMI' or 'PROBMI') for an event date (CEVTDAT2) before CENSDAT7
0	Otherwise

* CEVTDAT2= CMIDATE if definite or probable MI,
= DTH09 if not definite or probable MI, but definite fatal CHD.

```
if mi3 = 1 (cmidx =DEFMI or PROBMI) & .z<datemi (event date for first MI)<=censdat7
then C7_mi23= 1;
else C7_mi23= 0;
```

Related Variables

CFATALDX, CMIDX, CMIDATE, DTH09, C7_IN_23S, C7_IN_23SP, C7_IN_BY23P, PRVCHD05

1.9. C7_FATCHD23

Purpose

To determine if a person has a fatal CHD prior to CENSDAT7.

Description

C7_FATCHD23=1 if there was a definite fatal CHD before CENSDAT7.

Algorithm

C7_FATCHD23	Description
1	If (CFATALDX='DEFFATCHD' or 'DEFFATMI') for a death date before CENSDAT7
0	Otherwise

```
if fatchd3= 1 & .z<datechd<=censdat7 then C7_fatchd23= 1;  
else C7_fatchd23 = 0;
```

Related Variables

CFATALDX, DTH09

1.10. ECGMI_VX (X=2, 3, 4 or 5)

Purpose

To determine if ECG MI was detected at visit X where X=2, 3, 4 or 5.

Description

ECGMI_VX is the indicator of MI detected at visit X, which is determined by ECG serial changes.

Algorithm

ECGMI_VX	Description
1	If (any of ESMC126-ESMC132 is yes OR any of ESMC153 is 1-3) for visit 2-4; if ECG137 is Q1-Q8 for visit 5
0	If not above

Related Variables

ESMC126-ESMC132, ESMC153 (Visit 2-4) ECG137 (Visit 5)

1.11. ECGBV_VX (X= 3, 4 or 5)

Purpose

To determine the baseline visit whose ECG was compared with the ECG at Visit X for determining ECG MI detected at visit X (X = 3, 4 or 5).

Description

ECGBV_VX is 1 if visit 1 ECG is available for serial change comparison, is 2 if visit 1 ECG is not available and visit 2 ECG is available for serial change comparison, and is 3 if visit 1 & visit 2 ECGs are not available and visit 3 ECG is available for serial change comparison and X=4.

Algorithm

ECGBV_VX	Description
1	If baseline visit is Visit 1
2	If baseline visit is Visit 2
3	If baseline visit is Visit 3
4	If baseline visit is Visit 4 and X=5
Missing	If records did not pass the criteria for serial change comparison

Related Variables

ECGMI_V3, ECGMI_V4, ECGMI_V5

1.12. C7_IN23DP

Purpose

To determine if a person has a definite, probable incident stroke.

Description

C7_IN23DP is an indicator of definite or probable incident stroke. C7_IN23DP=1 if first definite or probable stroke, and the date of admission (STR12) is before CENSDAT7. NOTE: the history variable (HOM10D) is not used for defining incident events so that each researcher can determine defining missing HOM10D as incident events or not.

Type

Stroke incidence

Algorithm

Classifies first Definite/Probable Incident Stroke before CENSDAT7.

C7_IN23DP	Description
1	if first definite or probable stroke (FINALDX=A - H) and admission date is before CENSDAT7
0	otherwise

```
if strc12<=censdat7 then do;  
  if ('A' <= finaldx <= 'H') and skip5=0 then do;  
    C7_in23dp=1;
```

Related Variables

CENSDAT7, FINALDX, HOM10D (reported history of stroke at Cohort Visit 1), STR12 (date of admission)

1.13. C7_IN23DPP

Purpose

To determine if a person has a definite, probable or possible incident stroke.

Description

C7_IN23DPP is an indicator of definite, probable or possible incident stroke. C7_IN23DPP=1 if first definite, probable or possible stroke, and the date of admission (STR12 is before CENSDAT7.

NOTE: the history variable (HOM10D) is not used for defining incident events so that each researcher can determine defining missing HOM10D as incident events or not.

Type

Stroke incidence

Algorithm

Classifies a definite/Probable/Possible Incident stroke before CENSDAT7

C7_IN23DPP	Description
1	if first definite or probable or possible stroke (FINALDX=A - I) and admission date is before CENSDAT7
0	otherwise

```
if strc12<=censdat7 then do;  
  if ('A' <= finaldx <= 'I') and skip1=0 then do;  
    C7_in23dpp=1;
```

Related Variables

CENSDAT7, FINALDX, HOM10D (reported history of stroke at Cohort Visit 1), STR12 (date of admission)

1.14. C7_IN23ISC

Purpose

To determine if a person has a definite or probable ischemic incident strokes.

Description

C7_IN23ISC is an indicator of definite or probable ischemic incident stroke. C7_IN23ISC=1 if first ischemic stroke, and the date of admission (STR12) is before CENSDAT7. NOTE: the history variable (HOM10D) is not used for defining incident events so that each researcher can determine defining missing HOM10D as incident events or not.

Type

Stroke incidence

Algorithm

Classifies a Definite/Probable Ischemic Incident before 12/31/2023

C7_IN23ISC	Description
1	if first definite or probable TIB or EIB (FINALDX = C, D, G or H) and admission date is before CENSDAT7
0	otherwise

```
if strc12<=censdat7 then do;  
  if finaldx in ('C','D','G','H') and skip2=0 then do;  
    C7_in23isc=1;
```

Related Variables

CENSDAT7, FINALDX, HOM10D (reported history of stroke at Cohort Visit 1), STR12 (date of admission)

1.15. C7_IN23HEM

Purpose

To determine if a person has a definite or probable hemorrhagic incident strokes (not including SAH).

Description

C7_IN23HEM is an indicator of definite or probable hemorrhagic incident stroke (not including SAH). C7_IN23HEM=1 if first hemorrhagic stroke, and the date of admission (STR12) is before CENSDAT7. NOTE: the history variable (HOM10D) is not used for defining incident events so that each researcher can determine defining missing HOM10D as incident events or not.

Type

Stroke incidence

Algorithm

Classifies a Definite/Probable Brain Hemorrhagic Incident stroke before 12/31/2023

C7_IN23HEM	Description
1	if first definite or probable IPH (FINALDX = B or F) and admission date is before CENSDAT7
0	otherwise

Related Variables

CENSDAT7, FINALDX, HOM10D (reported history of stroke at Cohort Visit 1), STR12 (date of admission)

1.16. C7_IN23CHM

Purpose

To determine if a person has a definite or probable hemorrhagic incident strokes (including SAH).

Description

C7_IN23CHM is an indicator of definite or probable hemorrhagic incident stroke (including SAH). C7_IN23CHM=1 if first hemorrhagic stroke, and the date of admission (STR12) is before CENSDAT7. NOTE: the history variable (HOM10D) is not used for defining incident events so that each researcher can determine defining missing HOM10D as incident events or not.

Type

Stroke incidence

Algorithm

Classifies a Definite/Probable Brain/SAH Hemorrhagic Incident Stroke before 12/31/2023

C7_IN23CHM	Description
1	if first definite or probable SAH or IPH (FINALDX = A, B, E or F) and admission date is before CENSDAT7
0	otherwise

Related Variables

CENSDAT7, FINALDX, HOM10D (reported history of stroke at Cohort Visit 1), STR12 (date of admission).

1.17. C7_INCHF23

Purpose:

Determine if a participant had an incident heart failure prior to CENS DAT7

Description:

If a participant did not have prevalent heart failure at Visit1 and either died or was hospitalized with an ICD code for heart failure prior to CENS DAT7 (428 in any position or corresponding ICD-10 code), then C7_INCHF23 takes a value of '1' for 'yes'.

Algorithm:

```
C7_INCHF23 = 0;  
if hf_v1_23 = 1 AND prevhf01 = 0 AND date_firsthf23 <= CENS DAT7 then C7_INCHF23 = 1;  
if prevhf01 = 1 OR prevhf01 = . then C7_INCHF23 = .;
```

Related Variables:

C7_Date_INCHF23, C7_FUTIMEHF

Analysis Notes:

When conducting analyses of incident heart failure (HF), it is important to note that there are two main variables you can use, which have different baseline values and definitions of the outcome. The first variable is C7_INCHF23, which uses V1 as the baseline and considers an event as a hospitalization with an ICD discharge diagnosis code indicating HF in any position. ICD codes are used because ARIC did not originally conduct cohort surveillance for HF. However, beginning in 2005, ARIC began conducting cohort surveillance for hospitalized HF. Therefore, the second variable that you can use for incident HF is C7_INCHF_P_V5, which uses V5 as the baseline and considers an event as an adjudicated definite or probable hospitalization for acute decompensated HF. V5 is used as baseline for this variable in order to guarantee that all HF events after that date would be assessed using cohort surveillance procedures, as opposed to ICD codes. The choice between these two variables should be informed by your scientific question, preference for outcome definition, and needed sample size.

The safest way to perform a valid survival analysis using time to HF event is to pick one source or the other. However, recently there has been interest in using the ICD code information from 1987 – 2004, then switching to the MMCC information from 2005 until the current event year. The CSCC emphasizes that if you would like to go this route, that you use nonlinear, time-varying hazard ratios for your exposure of interest. A good method for allowing for nonlinearity is to use restricted cubic splines, with a knot located at January 1, 2005. The best way to accomplish this is to set time 0 in the survival analysis to be the date of the first ARIC participant visit, then use a “start/stop” coding method for the follow up for each participant. For example, if you set baseline to be November 14th, 1986 (the date of the first participant visit), and another participant was enrolled on November 20th, 1986, then that participant would have start = 6 and stop = min(event, censoring). This method of setting up the dataset allows you to: (1) place a knot for the restricted cubic splines

specifically at January 1, 2005; and (2) avoid including immortal person time for participants when they have not yet been enrolled in the study.

Once the dataset is created, you could use the `rms` package in the R software environment to perform a survival analysis. Some example code would look like

```
fit <- rms::cph(Surv(start, stop, hf) ~ AGE * rcs(stop, knots = c(quantile(data$stop, probs = 0.1),  
6623, quantile(data$stop, probs = 0.9)), data = data)
```

Please contact arichelp@unc.edu if you have already searched for answers on Google or Stack Overflow, but still have questions.

1.18. C7_INCHF_P_MI

Purpose:

Determine if a participant had an incident heart failure post MI

Description:

C7_INCHF_P_MI= 1 if there was a first definite or probable HF after an incident MI.

It is 0 if the participant had an incident MI but not a subsequent incident HF event

It is missing if the participant did not have an incident MI, or there was a heart failure event before their incident MI.

Algorithm:

. if (C7_MI23 NE 1) or (C7_DateMI >= HFEVTDATE)

1 if C7_DateMI <HFEVTDATE <= Censdat7

0 if C7_DateMI < Censdat7 < HFEVTDATE

Related Variables:

C7_Date_INCHF_P_MI, C7_FT_INCHF_P_MI

1.20 C7_INCHF_P_MI_PROC

Purpose:

Determine if a participant had an incident heart failure post MI or Cardiac Procedure

Description

C7_INCHF_P_MI_PROC= 1 if there was a first definite or probable HF after an incident MI or cardiac procedure.

It is 0 if the participant had an incident MI or cardiac procedure but not a subsequent incident HF event.

It is missing if the participant did not have an incident MI or cardiac procedure, or there was a heart failure event before their incident MI or cardiac procedure.

Algorithm

Let earlier = MIN(C7_DateProc, C7_DateMI)

. if (C7_MI23 NE 1 and C7_Cardproc NE 1) or earlier >= HFEVTDAT

1 if earlier < HFEVTDAT <= Censdat7

0 if earlier < Censdat7 < HFEVTDAT

Related Variables

C7_Date_INCHF_P_MI_PROC, C7_FT_INCHF_P_MI_PROC

1.20 C7_INCHF_P_V5

Purpose:

Determine if a participant had an incident heart failure post Visit 5

Description

C7_INCHF_P_V5= 1 if there was a first definite or probable HF after visit 5.

It is 0 if no heart failure occurred after visit 5.

It is missing if visit 5 is missing or a heart failure event occurred prior to their visit 5 date.

Algorithm

```
. if (HFEVTDAT < V5date51) ) or V5date51 missing  
1 if V5date51 <= HFEVTDAT <= Censdat7  
0 if V5date51 < Censdat7 < HFEVTDAT
```

Analysis Notes:

When conducting analyses of incident heart failure (HF), it is important to note that there are two main variables you can use, which have different baseline values and definitions of the outcome. The first variable is C7_INCHF23, which uses V1 as the baseline and considers an event as a hospitalization with an ICD discharge diagnosis code indicating HF in any position. ICD codes are used because ARIC did not originally conduct cohort surveillance for HF. However, beginning in 2005, ARIC began conducting cohort surveillance for hospitalized HF. Therefore, the second variable that you can use for incident HF is C7_INCHF_P_V5, which uses V5 as the baseline and considers an event as an adjudicated definite or probable hospitalization for acute decompensated HF. V5 is used as baseline for this variable in order to guarantee that all HF events after that date would be assessed using cohort surveillance procedures, as opposed to ICD codes. The choice between these two variables should be informed by your scientific question, preference for outcome definition, and needed sample size.

2. Follow-up Time

2.1. CENSDAT7_FollowUpDays

Purpose

To determine the days from visit 1 to censoring date for follow up time of cohort participants for events identified through cohort surveillance, cohort follow-up or linkage with registries.

Description

CENSDAT7 is the date of the last known status for all cohort participants for follow-up of any type of event, except death. It is determined by the last date of contact with the participant or proxy: date of visit 2, date of visit 3, date of visit 4, date of visit 5, date of visit 6, date of visit 7, date of visit 8, date of visit 9, date of visit 10, date of visit 11 or from the interview date of the annual or semi-annual follow up. Annual and semi-annual follow-up interviews are counted only if hospitalization information was collected. If the participant has died and the date of last contact occurred within a year prior to death, then follow-up is censored at the death date. Otherwise, follow-up is censored at the last contact, as previously described.

This variable should be used to censor time-to-event analysis of events identified through cohort surveillance (CEL), cohort follow-up (SAFU, AFU) or linkage with registries. Follow-up for time-to-death analysis may be continued beyond last contact; see the description for DATED23.

CENSDAT7 is a modification of CENSDAT6, which additionally allowed for follow-up through last event date for events identified through cohort surveillance, or death date as identified through cohort surveillance, NDI linkage or annual follow-up. However, there are two problems with this definition:

- Censoring on last event date includes participants lost to follow-up in the risk set through the date of last hospitalization if the hospitalization occurred in an ARIC community hospital. Participants lost to follow-up with no hospitalizations or hospitalizations outside of ARIC catchment will be excluded from the risk set. Once a participant is lost to follow-up they would continue in the risk set only if a hospitalization is identified, i.e. they contribute to the denominator only if they contribute to the numerator. This differential follow-up may bias time-to-event analysis.
- Censoring on death date implies that hospitalization information is available until time of death. This will not be the case for participants with deaths identified through the NDI search who have moved out of the community and are not participating in cohort follow-up.

For these reasons, all time-to-event analysis (except time to death) should be censored at last contact as defined by CENSDAT7 and in corresponding variables with the prefix C7_. Events identified after CENSDAT7, including those identified through linkage with registries, should be excluded from analysis.

Algorithm

(a). If max (V2DATE21, V3DATE31, V4DATE41, V5DATE51, V6DATE61, V7DATE71, V8DATE81, V8TDATE8T1, V9DATE91, V10DATE101, V11DATE111, LAST_COMPLETE_INTERVIEW)>= 31DEC23 then C7_CENSDAT7=31DEC23.
(b). If not above then C7_CENSDAT7=max (V2DATE21, V3DATE31, V4DATE41, V5DATE51, V6DATE61, V7DATE71, V8DATE81, V8TDATE8T, V9DATE91, V10DATE101, V11DATE111, LAST_COMPLETE INTERVIEW).

Related Variables

V2DATE21 (cohort visit 2 date), V3DATE31 (cohort visit 3 date), V4DATE41 (cohort visit 4 date), V5DATE51 (cohort visit 5 date), V6DATE61 (cohort visit 6 date), V7DATE71 (cohort visit 7date), V8DATE81, V8TDATE8T1 (cohort visit 8 date), V9DATE91 (cohort visit 9 date), V10DATE101 (cohort visit 10 date), V11DATE111 (cohort visit 11 date), LAST_COMPLETE_INTERVIEW (Follow up Last Contact Date).

NOTE: LAST_COMPLETE INTERVIEW = the date of the last AFU interview or SAF interview where the participant/proxy was asked if the participant was hospitalized or not.

2.2. CENSDAT7_Year

Purpose

To determine the year of censoring date for follow up time of cohort participants for events identified through cohort surveillance, cohort follow-up or linkage with registries.

2.3. C7_DATEPROC_FollowUpDays

Purpose

To determine the days since visit 1 to the end date of follow-up for cardiac procedure.

Description

C7_DATEPROC is the end date of follow-up for C7_CARDPROC. C7_DATEPROC is the minimum event date for the first cardiac procedure without a MI in follow-up, and the censoring date for non-events.

Algorithm

C7_DATEPROC	Description
CEL04	if C7_CARDPROC=1 and the first event is cardiac procedure
CENSDAT7	if C7_CARDPROC=0

```
if (C7_cardproc & C7_dateproc<=.z) then do;  
    C7_dateproc=celb04;  
end;  
if not(.z<C7_dateproc<="31DEC2023"d) then do;  
    C7_cardproc=0;  
    C7_dateproc=.;  
end;
```

Related Variables

CEL04, CENSDAT7, C7_CARDPROC

2.4. C7_DATEPROC_Year

Purpose

To determine the year of the end date of follow-up for cardiac procedure.

2.5. C7_SMIDATE_FollowUpDays

Purpose

To determine the follow-up days since visit 1 to date for MI by ECG.

Description

C7_SMIDATE is the estimated date of MI based on ECG evidence. It assigns the middle date of visit 1 and visit 2 if MI was detected by ECG in visit 2, and similarly for visit 2 - visit 5.

Algorithm

C7_SMIDATE	Description
$(V1DATE01+V2DATE21)/2$	if ECGMI_V2=1
$(V1DATE01+V3DATE31)/2$	if ECGMI_V2=0 & ECGMI_V3=1 & V2DATE21=missing
$(V1DATE01+V4DATE41)/2$	if ECGMI_V2=0 & ECGMI_V3=0 & ECGMI_V4=1 & V3DATE31=missing & V2DATE21=missing
$(V1DATE01+V5DATE51)/2$	if ECGMI_V2=0 & ECGMI_V3=0 & ECGMI_V4=0 & ECGMI_V5=1 & V4DATE41=missing & V3DATE31=missing & V2DATE21=missing
$(V2DATE21+V3DATE31)/2$	if ECGMI_V2=0 & ECGMI_V3=1 & non-missing V2DATE21
$(V2DATE21+V4DATE41)/2$	if ECGMI_V2=0 & ECGMI_V3=0 & ECGMI_V4=1 & V3DATE31=missing & non-missing V2DATE21
$(V2DATE21+V5DATE51)/2$	if ECGMI_V2=0 & ECGMI_V3=0 & ECGMI_V4=0 & ECGMI_V5=1 & V4DATE41=missing & V3DATE31=missing & non-missing V2DATE21
$(V3DATE31+V4DATE41)/2$	if ECGMI_V2=0 & ECGMI_V3=0 & ECGMI_V4=1 & non-missing V3DATE31
$(V3DATE31+V5DATE51)/2$	if ECGMI_V2=0 & ECGMI_V3=0 & ECGMI_V4=0 & ECGMI_V5=1 & V4DATE41=missing & non-missing V3DATE31.
$(V4DATE41+V5DATE51)/2$	if ECGMI_V2=0 & ECGMI_V3=0 AND ECGMI_V4=0 & ECGMI_V5=1 & non-missing V4DATE41
CENSDAT7	If SMIBY23=0

Note: SMIDATE is truncated on CENSDAT7.

Related Variables

ECGMI_V2, ECGMI_V3, ECGMI_V4, ECGMI_V5, V1DATE01, V2DATE21, V3DATE31, V4DATE41, V5DATE51

2.6. C7_SMIDATE_Year

Purpose

To determine the year of date for MI by ECG.

2.7. C7_DATEMI_FollowUpDays

Purpose

To determine the follow-up time (in days) for hospitalized MI events.

Description

C7_DATEMI_FollowUpDays is the days between visit 1 and minimum MI date for hospitalized MI events and the censoring date

Algorithm

2.8. C7_DATEMI_Year

Purpose

To determine the year for hospitalized MI events.

2.9. FUTIMED

Purpose

To determine the follow-up time (in days) for death.

Description

FUTIMED is the follow-up time for DEAD23

Algorithm

```
IF DEAD23=1 THEN FUTIMED= DATED23-V1DATE01;  
IF DEAD23=0 THEN FUTIMED=CENSDAT7-V1DATE01
```

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
DATED23-max(V1DATE01, '01JAN87'd).
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

DATED23, DEAD23, V1DATE01, CENSDAT7

2.10. C7_FUTIME

Purpose

To determine the follow-up time (in days) for MI or fatal CHD.

Description

C7_FUTIME is the follow-up time for C7_INC_BY23

Algorithm

if (C7_enddate ne . & v1date01 ne .) then C7_FUTIME= C7_ENDDATE-V1DATE01

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_ENDDATE - \max(V1DATE01, '01JAN87'd)$.
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ENDDATE, C7_INC_BY23, V1DATE01

2.11. C7_FUTIMEP

Purpose

To determine the follow-up time (in days) for MI, fatal CHD or cardiac procedure.

Description

C7_FUTIMEP is the follow-up time for IN_BY23P

Algorithm

if (C7_enddatep ne . & v1date01 ne .) then C7_FUTIMEP= C7_ENDDATEP-V1DATE01

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_ENDDATEP - \max(V1DATE01, '01JAN87'd)$.
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ENDDATEP, C7_IN_BY23P, V1DATE01

2.12. C7_FUTIMES

Purpose

To determine the follow-up time (in days) for MI, fatal CHD or ECG MI (serial changes).

Description

C7_FUTIMES is the follow-up time for IN_23S

Algorithm

if (C7_dateis ne . & v1date01 ne .) then C7_FUTIMES= C7_DATEIS-V1DATE01

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_DATEIS - \max(V1DATE01, '01JAN87'd)$.
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_DATEIS, C7_IN_23S, V1DATE01

2.13. C7_FUTIMEA

Purpose

To determine the follow-up time (in days) for MI, fatal CHD, cardiac procedure or ECG MI (serial changes).

Description

C7_FUTIMEA is the follow-up time for IN_23SP

Algorithm

if (C7_dateisp ne . & v1date01 ne .) then C7_FUTIMEA= C7_DATEISP-V1DATE01

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_DATEISP - \max(V1DATE01, '01JAN87'd)$.
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_DATEISP, C7_IN_23SP, V1DATE01

2.14. C7_FT23DP

Purpose

To determine the follow-up time for definite or probable incident strokes.

Description

C7_FT23DP is the follow-up days for incident strokes (C7_IN23DP).

Type

Stroke incidence

Algorithm

$$C7_FT23DP = (C7_ED23DP - V1DATE01) / 365.25$$

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
$$C7_DATEISP - \max(V1DATE01, '01JAN87'd).$$
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ED23DP, C7_IN23DP, V1DATE01 (Cohort Visit 1 date)

2.15. C7_FT23DPP

Purpose

To determine the follow-up time for definite, probable or possible incident strokes.

Description

C7_FT23DPP is the follow-up days for incident strokes (C7_IN23DPP).

Type

Stroke incidence

Algorithm

$$C7_FT23DPP = (C7_ED23DPP - V1DATE01) / 365.25$$

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_DATEISP - \max(V1DATE01, '01JAN87')$
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ED23DPP, C7_IN23DPP, V1DATE01 (Cohort Visit 1 date)

2.16. C7_FT23ISC

Purpose

To determine the follow-up time for definite or probable ischemic incident strokes.

Description

C7_FT23ISC is the follow-up days for ischemic incident strokes.

Type

Stroke incidence

Algorithm

$$C7_FT23ISC = (C7_ED23ISC - V1DATE01) / 365.25$$

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_DATEISP - \max(V1DATE01, '01JAN87'd)$.
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ED23ISC, C7_IN23ISC, V1DATE01 (Cohort Visit 1 date), CENSDAT7

2.17. C7_FT23HEM

Purpose

To determine the follow-up time for definite or probable hemorrhagic incident strokes (not including SAH).

Description

C7_FT23DPP is the follow-up days for hemorrhagic incident strokes (not including SAH).

Type

Stroke incidence

Algorithm

$$C7_FT23HEM = (C7_ED23HEM - V1DATE01) / 365.25$$

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
$$C7_DATEISP - \max(V1DATE01, '01JAN87'd).$$
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ED23HEM, C7_IN23HEM, V1DATE01 (Cohort Visit 1 date), CENSDAT7

2.18. C7_FT23CHM

Purpose

To determine the follow-up time for definite or probable hemorrhagic incident strokes (including SAH).

Description

C7_FT23CHM is the follow-up days for brain or subarachnoid hemorrhagic incident strokes.

Type

Stroke incidence

Algorithm

$$C7_FT23CHM = (C7_ED23CHM - V1DATE01) / 365.25$$

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
$$C7_DATEISP - \max(V1DATE01, '01JAN87'd).$$
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_ED23CHM, C7_IN23CHM, V1DATE01 (Cohort Visit 1 date), CENSDAT7

2.19. C7_FUTIMEHF

Purpose

To determine the follow-up time (in days) for an incident Heart Failure.

Description

C7_FUTIMEHF is the follow-up time for C7_INCHF23

Algorithm

$C7_FUTIMEHF = C7_DATE_INCHF23 - V1DATE01$

Remarks

- (1) The following equation gives follow-up time excluding days prior to 1987:
 $C7_DATE_INCHF23 - \max(V1DATE01, '01JAN87'd)$.
- (2) Divided the number of follow-up days by 365.25 gives the follow-up years.

Related Variables

C7_DATE_INCHF23, V1DATE01, C7_INCHF23

2.16 C7_FT_INCHF_P_MI

Purpose

To determine the follow-up time (in days) for incident HF post MI

Description

C7_FT_INCHF_P_MI is the follow up time for Incident HF post MI.

Algorithm

If C7_INCHF_P_MI=1 then C7_FT_INCHF_P_MI= HFEVTDATE - C7_DateMI
If C7_INCHF_P_MI=0 then C7_FT_INCHF_P_MI= CENS DAT7 - C7_DateMI
. Otherwise

Related Variables

C7_INCHF_P_MI, C7_DATE_INCHF_P_MI

2.17 C7_FT_INCHF_P_MI_PROC

Purpose

To determine the follow-up time (in days) for incident HF post MI or cardiac procedure

Description

C7_FT_INCHF_P_MI_PROC is the follow up time for Incident HF post MI or Cardiac procedure.

Algorithm

Let earlier = MIN(C7_DateProc, C7_DateMI)

If C7_INCHF_P_MI_proc =1 then C7_FT_INCHF_P_MI_PROC=HFEVTDATE – earlier

If C7_INCHF_P_MI_proc =0 then C7_FT_INCHF_P_MI_PROC=CENSDAT7 – earlier
. otherwise

Related Variables

C7_INCHF_P_MI_PROC, C7_DATE_INCHF_P_MI_PROC

2.18 C7_FT_INCHF_P_V5

Purpose

To determine the follow-up time (in days) for incident HF post visit 5

Description

C7_FT_INCHF_P_V5 is the follow up time for Incident HF post visit 5.

Algorithm

```
If C7_INCHF_P_vi5= 1 then C7_FT_INCHF_P_v5 = C7_Date_INCHF_P_v5 - V5date51  
If C7_INCHF_P_v5 =0 then C7_FT_INCHF_P_v5 = CENS DAT7 - V5date51  
. otherwise
```

Related Variables

C7_INCHF_P_V5, C7_DATE_INCHF_P_V5

3. Source of Incident/Death Event

3.1. SOURCDTH

Purpose

To determine the source of death information.

Description

SOURCDTH indicates where the death dates is from. SOURCDTH is 'DTH' if death date in DTH file (DTH09) was not missing and was prior to 31DEC23. SOURCDTH is 'NDI' if death date was found by the National Death Index (NDI) and was prior to 31DEC23. SOURCDTH is 'AFU' if death date was not available in DTH09 or NDI search, but was in AFU04 and was prior to 31DEC23. SOURCDTH='IMPUTE' if AFU indicated dead but no death dates in DTH/NDI/AFU. If so, the mid-date of the 2 most recent AFU contact date was assigned.

Remarks

There is one ID whose SOURCEDTH='IMPUTE' for 2023 incident CHD file. You may compute your own end date of follow-up by using variable AFUDATES which provided the most recent 2 AFU contact dates for which death occurred in between.

Algorithm

SOURCDTH	Description
DTH	If .< DTH09 <= '31DEC23'd
NDI	If not above and a death date was found by the NDI search and is prior to 31DEC23.
AFU	If not above and .< AFU04 <= '31DEC23'd.
IMPUTE	If AFU04=D but no death dates in DTH/AFU/NDI.
Missing	Otherwise

Related Variables

DEAD23, DTHDAY23, DTH09, AFU04

3.2. C7_SOURCINC

Purpose

To determine the source of event when C7_INC_BY23=1.

Description

C7_SOURCINC is 'MI' if the event is definite or probable MI. C7_SOURCINC is 'FATCHD' if the event is definite fatal CHD (and not definite or probable MI).

Algorithm

C7_SOURCINC	Description
MI	if C7_INC_BY23=1 & CMIDX='DEFMI' or 'PROBMI'
FATCHD	if C7_INC_BY23=1 & CMIDX = ('DEFMI' or 'PROBMI'), and CFATALDX='DEFFATMI' or 'DEFFATCHD'
missing	if C7_INC_BY23=0

Related Variables

CMIDX, CFATALDX, C7_INC_BY23

3.3. C7_SOURCIP

Purpose

To determine the source of event when C7_IN_BY23P=1.

Description

If C7_IN_BY23P=1, C7_SOURCIP is 'MI' ('FATCHD') if there is no cardiac procedure or cardiac procedure is after the MI. C7_SOURCIP is 'PROC' if there is no MI or FATCHD but has cardiac procedure, or if cardiac procedure is earlier than MI.

Algorithm

C7_SOURCIP	Description
MI	if [(C7_INC_BY23=1 & C7_CARDPROC=0) or (C7_INC_BY23=1 & C7_CARDPROC=1 & C7_ENDDATE<=DATEPROC)] and C7_SOURCINC='MI'
FATCHD	if [(C7_INC_BY23=1 & C7_CARDPROC=0) or (C7_INC_BY23=1 & C7_CARDPROC=1 & C7_ENDDATE<=DATEPROC)] and SOURCINC='FATCHD'
PROC	if (C7_INC_BY23=0 & C7_CARDPROC=1) or (C7_INC_BY23=1 & C7_CARDPROC=1 & C7_ENDDATE>DATEPROC)
missing	if C7_IN_BY23P=0

Related Variables

C7_CARDPROC, DATEPROC, C7_ENDDATE, C7_INC_BY23, C7_SOURCINC

3.4. C7_SOURCIS

Purpose

To determine the source of event when C7_IN_23S=1.

Description

C7_SOURCIS is 'MI' ('FATCHD') if the event is definite or probable MI (definite fatal CHD) and either there is no ECG serial changes, or ECG serial changes is after MI. C7_SOURCIS is 'SMI' if the event is ECG MI (from serial changes) and either there is no MI/fatal CHD or MI/fatal CHD is after ECG evidence.

Algorithm

C7_SOURCIS	Description
MI	If (C7_INC_BY23=1 & C7_SOURCEINC='MI') and 1. C7_SMI_BY23=0) or 2. (C7_SMI_BY23=1 & missing < C7_ENDDATE ≤ V2DATE23) or 3. (C7_SMI_BY23=1 & V2DATE23 ≤ C7_ENDDATE ≤ V3DATE31 & ECGMI_V2=0) or 4. (C7_SMI_BY23=1 & V3DATE31 ≤ C7_ENDDATE ≤ V4DATE41 & no ECGMI by V3) or 5. (C7_SMI_BY23=1 & V4DATE41 ≤ C7_ENDDATE ≤ V5DATE51 & no ECGMI by V4) or 6. (C7_SMI_BY23=1 & V4DATE51 ≤ C7_ENDDATE ≤ V6DATE61 & no ECGMI by V5)
FATCHD	If (C7_INC_BY23=1 & C7_SOURCEINC='FATCHD') and 1. C7_SMI_BY23=0) or 2. (C7_SMI_BY23=1 & missing < C7_ENDDATE ≤ V2DATE21) or 3. (C7_SMI_BY23=1 & V2DATE23 ≤ C7_ENDDATE ≤ V3DATE31 & ECGMI_V2=0) or 4. (C7_SMI_BY23=1 & V3DATE31 ≤ C7_ENDDATE ≤ V4DATE41 & no ECGMI by V3) or 5. (C7_SMI_BY23=1 & V4DATE41 ≤ C7_ENDDATE ≤ V5DATE51 & no ECGMI by V4) or 6. (C7_SMI_BY23=1 & V4DATE51 ≤ C7_ENDDATE ≤ V6DATE61 & no ECGMI by V5)
SMI	If not above & C7_IN_23S=1
Missing	if C7_IN_23S=0

Related Variables

ECGMI_V2, ECGMI_V3, C7_ENDDATE, C7_INC_BY23, C7_SMI_BY23, V2DATE21, V3DATE31, V4DATE41, V5DATE51

3.5. C7_SOURCISP

Purpose

To determine the source of event when C7_IN_23SP=1.

Description

C7_SOURCISP is 'MI' ('FATCHD') if the event is definite or probable MI (definite fatal CHD) and either there is no cardiac procedure/ECG serial changes, or cardiac procedure/ECG serial changes is after MI. C7_SOURCISP is 'PROC' if the first event is a cardiac procedure. C7_SOURCISP is 'SMI' if the first event is ECG MI (from serial changes).

Algorithm

C7_SOURCISP	Description
MI	If (C7_IN_BY23P=1 & C7_SOURCEIP='MI') and 1. C7_SMI_BY23=0) or 2. (C7_SMI_BY23=1 & missing < C7_ENDDATEP ≤ V2DATE21) or 3. (C7_SMI_BY23=1 & V2DATE23 ≤ C7_ENDDATEP ≤ V3DATE31 & ECGMI_V2=0) or 4. (C7_SMI_BY23=1 & V3DATE31 ≤ C7_ENDDATEP ≤ V4DATE41 & no ECGMI by V3) or 5. (C7_SMI_BY23=1 & V4DATE41 ≤ C7_ENDDATEP ≤ V5DATE51 & no ECGMI by V4) or 6. (C7_SMI_BY23=1 & V5DATE51 ≤ C7_ENDDATEP ≤ V6DATE61 & no ECGMI by V5)
FATCHD	If (C7_IN_BY23P=1 & C7_SOURCEIP='FATCHD') and 1. C7_SMI_BY23=0) or 2. (C7_SMI_BY23=1 & missing < C7_ENDDATEP ≤ V2DATE21) or 3. (C7_SMI_BY23=1 & V2DATE23 ≤ C7_ENDDATEP ≤ V3DATE31 & ECGMI_V2=0) or 4. (C7_SMI_BY23=1 & V3DATE31 ≤ C7_ENDDATEP ≤ V4DATE41 & no ECGMI by V3) or 5. (C7_SMI_BY23=1 & V4DATE41 ≤ C7_ENDDATEP ≤ V5DATE51 & no ECGMI by V4) or 6. (C7_SMI_BY23=1 & V5DATE51 ≤ C7_ENDDATEP ≤ V6DATE61 & no ECGMI by V5)
PROC	If (C7_IN_BY23P=1 & C7_SOURCEIP='PROC') and 1. C7_SMI_BY23=0) or 2. (C7_SMI_BY23=1 & missing < C7_ENDDATEP ≤ V2DATE21) or 3. (C7_SMI_BY23=1 & V2DATE21 ≤ C7_ENDDATEP ≤ V3DATE31 & ECGMI_V2=0) or 4. (C7_SMI_BY23=1 & V3DATE31 ≤ C7_ENDDATEP ≤ V4DATE41 & no ECGMI by V3) or 5. (C7_SMI_BY23=1 & V4DATE41 ≤ C7_ENDDATEP ≤ V5DATE51 & no ECGMI by V4) or 6. (C7_SMI_BY23=1 & V5DATE51 ≤ C7_ENDDATEP ≤ V6DATE61 & no ECGMI by V5)
SMI	If not above & C7_IN_23SP=1
missing	if C7_IN_23SP=0

Related Variables

ECGMI_V2, ECGMI_V3, C7_ENDDATEP, C7_IN_BY23P, C7_SMI_BY23, V2DATE23, V3DATE31, V4DATE41, V5DATE51, V6DATE61

4.6 UCOD

Purpose

To determine the underlying cause of death when DEAD23=1.

Description

UCOD is derived from Death Certificate Form (DTH18) or NDI search.

Algorithm

UCOD =DTH23 if not missing.
UCOD = UCOD from NDI file when the DTH18 is missing.

Related Variables

DEAD23, DTH23, SOURCDTH

4. Prevalent Disease at Visit 1

5.1 PRVCHD05

Purpose

To determine prevalent coronary heart disease at visit 1.

Description

See visit 1 derived data dictionary for full description

5.2. PREVHF01

Purpose

To determine prevalent heart failure at visit 1.

Description

See visit 1 derived data dictionary for full description

5.3. TIAB01

Purpose

To determine prevalent stroke at visit 1.

Description

From TIA/Stroke Form question 1: "Have you ever been told by a physician that you had a stroke, slight stroke, transient ischemic attack or TIA?"