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options notes nosource;
proc datasets lib=work nolist memtype=data kill; quit;
* macro to save output and log to appropriate areas ;
%_mprintto;
%put NOTE:
=====;
%put NOTE: Covance Study Number : 000000106326;
%put NOTE: Client Protocol ID : ZRHM-PK-05-JP;
%put NOTE: Program Name : d_2ADEX.sas;
%put NOTE: Purpose : create ADEX dataset;
%put NOTE: ;
%put NOTE: Input Data : STDLIB.ADEX SDTM.EX ADAM.ADSL
SDTM.SUPPEX SDTM.FA;
%put NOTE: Output : ADAM.ADEX;
%put NOTE: Macros Called : _MPRINTTO _MTOTPER _MPERALL _SCRAMBLE;
%put NOTE: ;
%put NOTE: Programmed by : cvn_jhardman;
%put NOTE: Creation Date : 2014-01-03;
%put NOTE: SAS Version : 9.3;
%put NOTE: ;
%put NOTE: == Latest Run
=====;
%put NOTE: Run by : &sysuserid;
%put NOTE: Date/Time :
%sysfunc(putn(%sysfunc(date()),e8601da.))T%sysfunc(putn(%sysfunc(time()),
e86011z.));
%put NOTE: ;
%put NOTE: == Modification History
=====;
%put NOTE: Date Initials No. Reason;
%put NOTE: 11Jan2014 KB 1) Added warning for PARAMCDs;
%put NOTE: 11Jan2014 KB 2) Amended AVALCAT1 to match specs;
%put NOTE: 11Jan2014 KB 3) Accounted for missing PRODDURs;
%put NOTE: 11Jan2014 KB 4) Added in AVALU for NRT gum;
%put NOTE: 11Jan2014 KB 5) Amended FASCAT to pull out correct
data;
%put NOTE: 11Jan2014 KB 6) Amended PARAM;
%put NOTE: 11Jan2014 KB 7) Amended EXCAT;
%put NOTE: 11Jan2014 KB 8) Added a and b to merge;
%put NOTE: 11Jan2014 KB 9) Amended derivation of PRODRTTM for
NRT;
%put NOTE: 15Jan2014 JMH 10) Amended derivation of DESC and
added wa-rning;
%put NOTE: 12Apr2014 KB 11) Amended format of ASTDTM and
AENDTM;
%put NOTE: 12Apr2014 KB 12) Added ASTTMF and AENTMF;
%put NOTE: 12Apr2014 KB 13) Amended PARAM;
%put NOTE: 12Apr2014 KB 14) Removed AVALU for NRT gum as it is
in FA SDTM;
%put NOTE: 12Apr2014 KB 15) Added QLABEL and QNAM to keep
statement;
%put NOTE: 12Apr2014 KB 16) Amended PRODRTTM;
%put NOTE: 12Apr2014 KB 17) Created PRODDUR parameter;
%put NOTE: 12Apr2014 KB 18) Amended sorting by key variables;

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%put NOTE: 12Apr2014    KB          19) Added variables to scramble macro;
%put NOTE: 12Apr2014    KB          20) Added PRODDUR to drop;
%put NOTE: 05Aug2014    KB          21) Added EXNOTRFL and TRTSTMF to keep;
%put NOTE: 05Aug2014    KB          22) Amended format issue;
%put NOTE: 05Aug2014    KB          23) Amended sorting by key variables;
%put NOTE: 05Aug2014    KB          24) Removed EXSPID as no longer exists;
%put NOTE: 05Aug2014    KB          25) Removed formats from RETDTC and
DISDTC;
%put NOTE:
=====;
options notes source source2 nofullstimer validvarname=upcase missing='
';
ods _all_ close;
ods listing;

*=====;
* START OF PROGRAM CODE                                     ;
*=====;
*****;
* bring in ADSL ;
*****;

data adsl;
    set adam.adsl;
    keep studyid usubjid subjid: siteid age sex: race height weightb1
bmi ucpdgr: nicogr: targr:
        enrfl scrffl saffl pprotfl randfl trt01: tr01: trt02: tr02:
trtsdtm trtsdt trtsday
        trtedtm trtedt trteday dthfl enfl exfl complfl fupfl trtseq:
analgr: EXNOTRFL TRTSTMF; /* 21) KB 05Aug2014 */
run;

*****;
* bring in EX      ;
*****;

data ex;
    set sdtm.ex(where = (not missing(exstdtc)));
    format param $100. paramcd $8. astdtm aendtm
/*datetime13.*/DATETIME16. astdt aendt date9. proddur 8. avalcat1 $40.
/*aval best. avalu $10.*/      /* 11) KB 12Apr2014 */
        ASTTMF AENTMF $1.; /* 12) KB 12Apr2014 */

    /* 13) START KB 12Apr2014 */
    /* param = trim(excat);*/
        IF EXCAT NE 'MENTHOL CONVENTIONAL CIGARETTES' THEN
PARAM=STRIP(EXCAT)|| ' - NRT GUM'; /* 13) KB 12Apr2014 */
        ELSE PARAM=STRIP(EXCAT); /* 13) KB 12Apr2014 */

        if param='MENTHOL CONVENTIONAL CIGARETTES' then paramcd='MCC';
        else if param=/'NICOTINE REPLACEMENT THERAPY'*/'NICOTINE
REPLACEMENT THERAPY - NRT GUM' then paramcd='NRTGUM'; /* 13) KB 12Apr2014
*/
        ELSE PUT "WARN" "ING: Check PARAMs" param=; /* 1) KB 11Jan2014 */

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/* 12) START KB 12Apr2014 */
    IF LENGTH(SCAN(EXSTDTC,2,'T'))=8 THEN DO;
/*      if not missing(exstdtc) and length(exstdtc) gt 10 then astdtm
= input(exstdtc,e8601dt.);*/
        IF NOT MISSING(EXSTDTC) AND LENGTH(EXSTDTC) GT 10 THEN ASTDTM =
DHMS(INPUT(SCAN(EXSTDTC,1,'T'),YYMMDD10.),HOUR(INPUT(SCAN(EXSTDTC,2,'T'),
TIME8.)),MINUTE(INPUT(SCAN(EXSTDTC,2,'T'),TIME8.)),SECOND(INPUT(SCAN(EXST
DTC,2,'T'),TIME8.)))); /* 22) KB 05Aug2014 */
        END;
        ELSE IF LENGTH(SCAN(EXSTDTC,2,'T'))=5 THEN DO;
            TMST1=CATS(EXSTDTC,':30');
            ASTTMF='S';
/*      ASTDTM=INPUT(TMST1,E8601DT.);*/

ASTDTM=DHMS(INPUT(SCAN(TMST1,1,'T'),YYMMDD10.),HOUR(INPUT(SCAN(TMST1,2,'T
'),TIME8.)),MINUTE(INPUT(SCAN(TMST1,2,'T'),TIME8.)),SECOND(INPUT(SCAN(TMS
T1,2,'T'),TIME8.)))); /* 22) KB 05Aug2014 */
        END;
/* 12) END KB 12Apr2014 */
        if not missing(astdtm) then astdt = datepart(astdtm);
        else if missing(astdtm) and length(exstdtc) = 10 then astdt =
input(exstdtc,yyymmdd10.);

/* 12) START KB 12Apr2014 */
    IF LENGTH(SCAN(EXENDTC,2,'T'))=8 THEN DO;
/*      if not missing(exendtc) and length(exendtc) gt 10 then aendtm
= input(exendtc,e8601dt.);*/
        IF NOT MISSING(EXENDTC) AND LENGTH(EXENDTC) GT 10 THEN AENDTM =
DHMS(INPUT(SCAN(EXENDTC,1,'T'),YYMMDD10.),HOUR(INPUT(SCAN(EXENDTC,2,'T'),
TIME8.)),MINUTE(INPUT(SCAN(EXENDTC,2,'T'),TIME8.)),SECOND(INPUT(SCAN(EXEN
DTC,2,'T'),TIME8.)))); /* 22) KB 05Aug2014 */
        END;
        ELSE IF LENGTH(SCAN(EXENDTC,2,'T'))=5 THEN DO;
            TMEN1=CATS(EXENDTC,':30');
            AENTMF='S';
/*      AENDTM=INPUT(TMEN1,E8601DT.);*/

AENDTM=DHMS(INPUT(SCAN(TMEN1,1,'T'),YYMMDD10.),HOUR(INPUT(SCAN(TMEN1,2,'T
'),TIME8.)),MINUTE(INPUT(SCAN(TMEN1,2,'T'),TIME8.)),SECOND(INPUT(SCAN(TME
N1,2,'T'),TIME8.)))); /* 22) KB 05Aug2014 */
        END;
/* 12) END KB 12Apr2014 */
        if not missing(aendtm) then aendt = datepart(aendtm);
        else if missing(aendtm) and length(exendtc) = 10 then aendt =
input(exendtc,yyymmdd10.);

        if param=/'NICOTINE REPLACEMENT THERAPY'/'NICOTINE REPLACEMENT
THERAPY - NRT GUM' then do; /* 13) KB 12Apr2014 */
/* 3) START KB 11Jan2014 */
            IF NOT MISSING(AENDTM) AND NOT MISSING(ASTDTM) THEN DO;
                proddur=(aendtm - astdtm)/60;
                if proddur < 10 then avalcat1 = /*'< 10 min'/'<10 min'; /*
2) KB 11Jan2014 */

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        else if proddur >= 10 and proddur < 30 then avalcat1 = '>=10
min and < 30 min';
        else if proddur >= 30 and proddur <= 40 then avalcat1 = '35
+/- 5 min';
        else if proddur > 40 then avalcat1 = '>40 min';
    END;
    ELSE DO;
        PRODDUR = .;
        AVALCAT1 = '';
        PUT "WARN" "ING: Missing PRODDUR " usubjid=;
    END;
/* 3) END KB 11Jan2014 */
end;

/* if paramcd='NRTGUM' then do;*/
/*     aval=exdose;*/
/*     avalu=exdosu;*/
/* end;*/

keep usubjid exseq extrt /*exspid*/ param: visitnum visit exstdtc
exendtc exstdy exendy /* 24) KB 05Aug2014 */
astdt: aend: epoch proddur avalcat1 /*aval avalu*/ ASTTMF
AENTMF; /* 12) KB 12Apr2014 */
run;

/* Creating AVAL */
data results;
    set sdtm.fa(where=((fatestcd='NYIELD' and fascat='MENTHOL CIGARETTE
BRAND'/'CIGARETTE BRAND'*/ and visit ne 'SCREENING') | (fatestcd='NDOSE'
and fascat='NRT GUM BRAND' and visit ne 'SCREENING'))); /* 5) KB
11Jan2014 */
    format aval best.
           avalu $10.
           PARAM $100.; /* 6) KB 11Jan2014 */

    aval=fastresn;
    avalu=faorresu;

    /* IF FATESTCD='NDOSE' THEN AVALU='mg'; *//* 4) KB 11Jan2014 */ /*
14) KB 12Apr2014 */

    if fatestcd='NDOSE' then param=/'NICOTINE REPLACEMENT
THERAPY'/'NICOTINE REPLACEMENT THERAPY - NRT GUM'; /* 13) KB 12Apr2014
*/
    else if fatestcd='NYIELD' then param=/'CONVENTIONAL
CIGARETTES'/'MENTHOL CONVENTIONAL CIGARETTES'; /* 6) KB 11Jan2014 */

    keep usubjid aval avalu /*visit*/ param;
run;

proc sort data=ex;
    by usubjid /*visit*/ param;
run;

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proc sort data=results;
  by usubjid /*visit*/ param;
run;

/* Creating AVISIT & AVISITN */
data exresults;
  merge ex(in=a) results;
  by usubjid /*visit*/ param;
  if a;
  format avisitn 8. avisit $40.;

  avisitn = visitnum;
  avisit = propcase(visit);
run;

/* Creating DESC */
data desc;
  set sdtm.supplex(where=(qnam='OTHER'));
  format desc $200.;

  desc=qval;
  idvarval2=input(idvarval,best.);

  keep usubjid desc idvarval2;
  rename idvarval2=exseq;
run;

data desc2;
  set sdtm.ex;
  format /*desc*/ DESC1 $200.; /*10) JMH 15Jan2014*/

/*   desc=extrt;*/
      DESC1=EXTRT; /*10) JMH 15Jan2014*/

  keep usubjid /*desc*/ DESC1 visit exseq; /*10) JMH 15Jan2014*/
run;

data DESC3A/*desc3*/; /*10) JMH 15Jan2014*/
  merge desc desc2;
  by usubjid exseq;
run;

DATA DESC3; /*10) JMH 15Jan2014*/
  SET DESC3A;
  IF NOT MISSING(DESC) THEN PUT "WA" "RNING: Check DESC as other
treatment has been given " USUBJID= DESC=;
  ELSE IF MISSING(DESC) THEN DESC=DESC1;
  DROP DESC1;
RUN;

proc sort data=desc3;
  by usubjid visit exseq;
run;

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proc sort data=exresults;
    by usubjid visit exseq;
run;

data exresults2;
    merge desc3 exresults(in=a);
    by usubjid visit exseq;
run;

*****;
* Combine ADSL and DX data *;
*****;
* find period;
*_mtotper;

data slex(drop = trt01: trt02: tr01: tr02: visit:);
    merge adsl exresults2(in = a);
    by usubjid;
    if a;          * only include subjects with EX data ;
    format astday aperiod trtan trtpn 8. trta trtp $40. aperiodc $8.;
    astday = astdt - trtsdt + 1;
    if astday in (0 1) then aperiod=1;
    else if astday in (2 3) then aperiod=2;
    * allocate treatment / period ;
    *_mperall(dvar1 = astdtm, dvar2 = astdt);

    if not missing(aperiod) then do;
        aperiodc = 'Period ' || put(aperiod,1.);
    end;
run;

data suppex1;
    set sdtm.supplex(where=(qnam='DISDTC'));
/*    format disdtc $200.;*/ /* 25) KB 05Aug2014 */

    disdtc=qval;

    idvarval2=input(idvarval,best.);
    rename idvarval2=exseq;

    keep usubjid idvarval2 disdtc;
run;

proc sort data=suppex1;
    by usubjid exseq;
run;

data suppex2;
    set sdtm.supplex(where=(qnam='RETDTC'));
/*    format retdtc $200.;*/ /* 25) KB 05Aug2014 */

    retdtc=qval;

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        idvarval2=input(idvarval,best.);
        rename idvarval2=exseq;

        keep usubjid idvarval2 retdtc;
run;

proc sort data=suppex2;
    by usubjid exseq;
run;

proc sort data=slex;
    by usubjid exseq;
run;

data suppex1a;
    merge suppex1 slex;
    by usubjid exseq;
run;

proc sort data=suppex1a;
    by usubjid exseq;
run;

data suppex2a;
    merge suppex1a suppex2;
    by usubjid exseq;
run;

proc sort data=suppex2a;
    by usubjid exseq;
run;

/* Creating PRODRTTM */
data prod1;
    set sdtm.ex(where=(excat=/'CONVENTIONAL CIGARETTES'/'MENTHOL
CONVENTIONAL CIGARETTES')); /* 7) KB 11Jan2014 */
    format prodrttm time5.;

    prodrttm=input(scan(exendtc,2,'T'),time5.);

    keep usubjid exseq prodrttm;
run;

data prod2;
    set sdtm.supplex(where=(qnam='RETDTC'));

    idvarval2=input(idvarval,best.);
    rename idvarval2=exseq;

    keep usubjid idvarval2 QVAL QNAM QLABEL; /* 9) KB 11Jan2014 */ /*
15) KB 12Apr2014 */
run;

proc sort data=prod2;

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        by usubjid exseq;
run;

/* 16) START KB 12Apr2014 */
PROC TRANSPOSE DATA=PROD2 OUT=PROD2A;
    BY USUBJID EXSEQ;
    VAR QVAL;
    ID QNAM;
    IDLABEL QLABEL;
RUN;
/* 16) END KB 12Apr2014 */

proc sort data=sdtm.ex(where=(excat='NICOTINE REPLACEMENT THERAPY'))
out=nrtex;
    by usubjid exseq;
run;

data prod3;
    merge nrtex(IN=A) /*prod2*/PROD2A(IN=B); /* 8) KB 11Jan2014 */ /*
16) KB 12Apr2014 */
    by usubjid exseq;
    IF A AND B; /* 8) KB 11Jan2014 */
    format prodrttm time5.;

    /*prodrttm=input(scan(exendtc,2,'T'),time5.);*/
    PRODRTTM=INPUT(/*QVAL*/RETDTCTIME5.); /* 9) KB 11Jan2014 */ /* 16)
KB 12Apr2014 */

    keep usubjid exseq prodrttm;
run;

data prod4;
    set prod1 prod3;
run;

proc sort data=prod4;
    by usubjid exseq;
run;

data suppex3;
    merge suppex2a prod4;
    by usubjid exseq;
run;

/* 17) START KB 12Apr2014 */
DATA SUPPEX4;
    SET SUPPEX3(WHERE=(NOT MISSING(PRODDUR)));
    FORMAT PARAMTYP $10. DTYPE $20.;

    PARAM=UPCASE('Product Use Duration');
    PARAMCD='PRODDUR';
    AVAL=PRODDUR;
    AVALU='min';
    PARAMTYP='DERIVED';

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        DTYPE='FUNCTION';

        DROP EXSEQ /*EXSPID*/ EPOCH EXTRT EXSTDTC EXENDTC EXSTDY EXENDY
RETDTTC; /* 24) KB 05Aug2014 */
RUN;

DATA SUPPEX5;
    SET SUPPEX3;

    IF PARAMCD='NRTGUM' THEN AVALCAT1='';
RUN;

DATA SUPPEX6;
    SET SUPPEX5 SUPPEX4;

    IF PARAMCD='PRODDUR' THEN DISDTC='';
RUN;

PROC SORT DATA=SUPPEX6;
    BY USUBJID AVISITN ASTDTM;
RUN;
/* 17) END KB 12Apr2014 */

*****;
* create output dataset ;
*****;

options replace;

data adex;
    set stdlib.adex /*supplex3*/SUPPEX6; /* 17) KB 12Apr2014 */
    label aperiodc = 'Period (C)';
    drop extrt PRODDUR; /* 20) KB 12Apr2014 */
run;

proc sort data = adex out = adam.adex(label= 'Exposure Analysis
Dataset');
/*    by usubjid avisitn astdtm;*/
/*BY USUBJID AVISITN PARAMCD EXSTDTC EXENDTC;*/ /* 18) KB 12Apr2014
*/
    BY USUBJID AVISITN PARAMCD ASTDTM; /* 23) KB 05Aug2014 */
run;

options noreplace;

%_scramble(set=adex, id=usubjid subjid subjidn age sex sexc sexn race
dthfl height weightbl bmi ucpdgr1 ucpdgrln nicogr1
        nicogrln targr1 targrln analgr1 analgrln, dates=trtsdtm
trtsdt trtsday trtedtm trtedt trteday,
        nullc=avalcat1 disdtc retdtc exstdtc exendtc trtp trta
trtseqp trtseqa ASTTMF AENTMF TRTSTMF, /* 19) KB 12Apr2014 */
        nulln=astdtm aendtm prodrttm aval trtpn trtan trtseqpn
trtseqan, nullcc=/*9*/12, nullnc=8); /* 19) KB 12Apr2014 */

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proc printto; run;  
*=====;  
* END OF PROGRAM CODE;  
*=====;
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