

```

%_mprintto;
options notes nosource;
proc datasets lib=work nolist memtype=data kill; quit;
/* Standard - leave this */
%let TFL_Part=%scan(&_SASPROGRAMFILE,-3,%str(/));

/* Standard - leave this */
data _null_;
    tmp="%TFL_Part";
    if tmp not in ("dev" "qc") then call symput("TFL_Part", "prod");
    call symput('TFLpath', compress("&_SASPROGRAMFILE",""));
run;
%put NOTE:
=====;
%put NOTE: Covance Study Number : 000000106324;
%put NOTE: Client Protocol ID   : ZRHR-REXC-03-EU;
%put NOTE: Program Name        : tl_anluexcbiosafas.sas;
%put NOTE: Purpose              : Analysis of Primary Biomarkers of
Exposure as excreted amount over 24 h;
%put NOTE:                      : on Day 5, FAS;
%put NOTE: Input Data          : ADAM.ADBX;
%put NOTE: Output              : L_15_04_04_02 (UEXCBIOSA)
T_15_02_04_02 (UEXCBIOSA) ;
%put NOTE: Macros Called       : _MPRINTTO;
%put NOTE: ;
%put NOTE: Programmed by       : cvn_vmurray;
%put NOTE: Creation Date       : 2014-06-06;
%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: 10JUN2014  VM        1) Remove duplication on 'NOTE' in
first footnote and remove non breaking spaces;
%put NOTE:                      2) Add N=X to headers;
%put NOTE: 19JUN2014  VM        3) Amend rounding of CI and CV;
%put NOTE:                      4) Amend ANOVA TO ANCOVA;
%put NOTE: 23JUN2014  APH       5) Add baseline footnote;
%put NOTE: 24JUN2014  APH       6) Ameend units;
%put NOTE: 24JUN2014  APH       7) centre output;
%put NOTE: 01Aug2014  AMH       8) add where clause used on dataset;
%put NOTE: 01Aug2014  AMH       9) use and rather than , in appendix
reference;
%put NOTE: 15SEP2014  APH       10) Amend baseline footnote;
%put NOTE:                      11) Present SE instead of CV and show
footnote;

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%put NOTE:
=====;
options notes source source2 nofullstimer validvarname=upcase missing=' '
NOQUOTELENMAX/*turn off warnings about quoted strings too long*/;
ods _all_ close;
ods listing;

/*formats macro and appendix output macros*/
%include
"/cvn/projects/prj/development/000000106324/dev/adhoc/TMPLTMIX.sas";

*=====;
* START OF PROGRAM CODE ;
*=====;

*****;
* read in data ;
*****;
*****;
/* Calculate totals for products */

%macro table(paramcd,title,pop,popfl,tab,tabout,var);

/*2) VM10JUN2014*/

DATA ADSL;
    SET ADAM.ADSL(WHERE=(&popfl='Y'));
    IF INDEX(TRT01A,'THS 2.2') THEN COLORD=1;
    OUTPUT;
    IF INDEX(TRT01A,'CC') THEN COLORD=2;
    OUTPUT;
    IF INDEX(TRT01A,'SA') THEN COLORD=3;
    OUTPUT;
RUN;

PROC SORT DATA=ADSL NODUPKEY OUT=ADSL1;
    BY COLORD SUBJID;
RUN;

PROC FREQ DATA=ADSL1(WHERE=(NOT MISSING(COLORD))) NOPRINT;
    TABLE COLORD/ OUT =TOTALS2(DROP=PERCENT RENAME=(COUNT=TOTAL));
RUN;

DATA _NULL_;
    SET TOTALS2;
    CALL SYMPUT('TOT'||STRIP(PUT(COLORD,BEST.)),STRIP(PUT(TOTAL,BEST.)));
RUN;

proc sort data=adam.adbx(where=(anl02fl='Y' and &popfl='Y' and paramcd
in ('UMHBM24U' 'U3HPM24U' 'USPMA24U') and avisitn=105))
    out=adbxin;
    by SUBJID;
run;

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data adbx1 missing;
  set adbxin;
  if aval not in (.,0) then do;
    logaval=log(aval);
    logbase=log(base);
    output adbx1;
  end;
  else output missing;
  if atpt not in ('08:00-10:00 PM' '') then delete;
run;

%fmt(datain=adbx1, start=trtan, label=trta, name=trt);

data adbx;
  set adbx1;
  format trtan trt. ;
/*   if trta not in ('THS 2.2' 'SA') then delete;*/
run;

title1 j=1 "PAGESPLIT"; /*do not change*/
title2 j=1 'Proc Mixed Procedure';
TITLE3 J=L "The where clause used on the dataset adam.adbx: &popfl.='Y'
and anl02fl='Y'"; /* 8) AMH 01Aug2014 */
%let tflno=L_15_04&tabout(UEXCBIOSA);

%mixout1(fileout=/cvn/projects/prj/data/000000106324/TFL/&TFL_Part./&tfln
o);
options ps=20;

proc sort data=adbx;by paramcd;run;

options byline;

proc mixed data=adbx method=reml maxiter=200 order=internal;
  by paramcd;
  class trtan sexc ucpdgr1;
  model logaval = logbase trtan sexc ucpdgr1 / outp=pred;
  lsmeans trtan / pdiff=control('SA') alpha=0.05 cl;
  lsmeans trtan / pdiff=control('CC') alpha=0.05 cl;

  ods output lsmeans=lsmeans;
  ods output diffs=diffs(where=(trtan=1));
  ods output covparms=covparms(rename=(estimate=residual));

run;

data diffs;
set diffs;
dum=1;
run;

data covparms;

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set covparms;
dum=1;
run;

data diffs2;
merge diffs(where=(trtan=1)) covparms;
by paramcd dum;
run;

/*Residual Plots*/
title4 j=1 'Residual Plots';
options ps=27; /*change this for proc plot*/

proc rank data=pred out=resid normal=vw ;
  by paramcd;
  ranks nscore;
  var resid;
run;

proc plot data=resid hpercent=50;
  by paramcd;
  plot resid*pred / vref=0;
  plot resid*nscore;
run;
quit;

%mixout2(blankn=60, halfblnk=N,title=Listing 15.4.&tab &title - &pop);

/*data counts*/
/*timepoints*/
proc univariate data=adbx noprint;
  by paramcd;
  class trtan;
  var logaval;
  output out=num1 n=n1;
run;

/*Manipulate datasets for output all relevent stats on each row*/
/*_____*/
data tabout;
  length out $100 stat $100;
  set lsmeans(in=a) diffs2 num1(in=c);
  /*ordering columns of treatments*/
  if _trtan=2 then colord=4;
  else if _trtan=3 then colord=5;
  else if trtan=1 then colord=1;
  else if trtan=2 then colord=2;
  else if trtan=3 then colord=3;
  /* N row*/
  if c or d then do;
    ord=1;

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        stat='n';
        out=compress(put(n1,best.));
        output;
    end;

    if a then do;
        /*Back transformation*/
        estimatee=exp(estimate);
        lower=exp(lower);
        uppere=exp(upper);

/*Gmean (CV%) row*/
        ord=2;
        stat='Geometric LS Mean (SE)`{SUPER 1}'; /* 11) APH 15SEP2014 */
        out=compress(put(round(estimatee,0.01),8.2));
        output;
/*95% CI row*/
        ord=3;
        stat='95% CI';
        out=compress(put(floor(100*lower)/100,8.2))||',
'||compress(put(ceil(100*uppere)/100,8.2)); /*3) VM19JUN2014*/
        output;
    end;
    if colord in (4 5) then do;
        /*Back transformation*/
        estimatee=exp(estimate);
        lower=exp(lower)*100; /*3) VM19JUN2014*/
        uppere=exp(upper)*100; /*3) VM19JUN2014*/
        geocv=sqrt((exp(residual)-1)*100**2);
/*Gmean (CV%) row*/
        ord=2;
        stat='Geometric LS Mean (SE)`{SUPER 1}'; /* 11) APH 15SEP2014 */
        out=compress(put(round(100*estimatee,0.01),8.2))||'
('||COMPRESS(PUT(CEIL(1000*STDERR)/1000,8.3))||')'; /* 11) APH 15SEP2014
*/ /*3) VM19JUN2014*/
        output;
/*95% CI row*/
        ord=3;
        stat='95% CI';
        out=compress(put(floor(100*lower)/100,8.2))||',
'||compress(put(ceil(100*uppere)/100,8.2)); /*3) VM19JUN2014*/
        output;
    end;
run;

/*Add labels for all number variables*/
/*_____*/
data tabout1;
attrib varc length=$75.;/* 6) APH 24JUN2014 */
set tabout;

/*Variable label*/
if paramcd='UMHBM24U' then do;var=2;varc="Urinary Quantity Excreted of
MHBMA over 24 hours (ng) ";end; /* 6) APH 24JUN2014 */

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if paramcd='U3HPM24U' then do;var=3;varc="Urinary Quantity Excreted of 3-
HPMA over 24 hours (µg)";end; /* 6) APH 24JUN2014 */
if paramcd='USPMA24U' then do;var=4;varc="Urinary Quantity Excreted of S-
PMA over 24 hours (ng) ";end; /* 6) APH 24JUN2014 */
VARC=TRANWRD(VARC,'µ','\uc2\u956 mu');/* 6) APH 24JUN2014 */
run;

/*transpose for output*/
proc sort data=tabout1 nodupkey;
    by paramcd var varc ord colord out stat;
run;

proc transpose data=tabout1(WHERE=(NOT MISSING(COLORD)))
out=ttabout(drop=_NAME_) prefix=col;
    by paramcd var varc ord stat;
    id colord;
    var out;
run;

/* Standard - macro for paging */
%macro outrtf(blankn=60, halfblnk=N, ref=);

%if &halfblnk=N %then %let halfblnk=;
%else %if &halfblnk=Y %then %let halfblnk=~;

/* Standard - just change the number to match the listing you're working
on. Also change the letters in the*/
/* bracket, eg ccb = current cigarette brands. Make sure to do this at
the top of the code too. */

    %let tflno=T_15_02&tabout(UEXCBIOSA);

/* Standard - leave this */
%let TFL_Part=%scan(&_SASPROGRAMFILE,-3,%str(/));

/* Standard - leave this */
data _null_;
    tmp="&TFL_Part";
    if tmp not in ("dev" "qc") then call symput("TFL_Part", "prod");
    call symput('TFLpath', compress("&_SASPROGRAMFILE",""));
run;

/*page numbers*/
data paging;
    set ttabout;
page=1;
%let tpage=1;
run;

/* Standard - leave this */

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options number nodate orientation=landscape papersize=&p_pgsz missing='
' NOQUOTELENMAX/*turn off warnings about quoted strings too long*/;
ods escapechar='`';
%let linetop = \brdrt\brdrs\brdrw30; * needs to be 1.5pt so calculated
in twips (1/20 pt) ;
%let linebot = \brdrb\brdrs\brdrw30;
%let linebot2 = \brdrb\brdrs\brdrw15;

ods path stdlib.tl06324 (read) ;
ods results off;
ods rtf toc_data/* contents*/
file="/cvn/projects/prj/data/000000106324/TFL/&TFL_Part./&tflno..rtf"
style=tl06324 startpage=yes headery=1440 footery=1440 ;
ods noproctitle;

%do i=1 %to &tpage;

ODS PROCLABEL = ' ';
title ;
footnote;
%let wd=0;

proc sort data=paging;by paramcd ord;run;

data comp;
    set paging end=eof;
    by paramcd ord;
    where page=&i;
    flag=1;
    _firtitl="Table 15.2.&tab    &title - &pop";
    _upcas=(length(_firtitl)-
length(compress(_firtitl,'ABCDEFGHIJKLMNOPQRSTUVWXYZ')))/2;
    len=&blankn.-length("(Page &i of &tpage)");
    if eof then do;
        call symput('_FSRTITL', trim(left(_firtitl)));
        call symput('_blankn', compress(put(len,best.)));
    end;
    drop _firtitl _upcas len;
run;

ods listing close;

* most set up in template others below;
* title arial 12pt bold with 12pt paragraph space below;
* all headers to be arial 11pt bold;
* data arial 10pt;
* headers to be central, text values left aligned and numeric centered
around decimal point;
/* Update with your variables as needed */
proc report data = comp headline headskip missing nowd spanrows split =
'#'
%IF &I=1 %THEN %DO; CONTENTS=' ' %END; %ELSE %DO; CONTENTS='' %END;;

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column flag page var varc ord stat coll col2 col3 col4 col5;

define flag / order noprint;
  define page      / order order = internal noprint;
  define var       / order order = internal noprint;
  define varc      / group style={just=left cellwidth=2.5cm}
"Variable";
  define ord       / order order=internal noprint;
  define stat      / display style={just=left cellwidth=3.5cm}
"Statistic";
  /*2) VM10JUN2014*/
  define coll      / display style={just=*d*/c cellwidth=2.1cm}
style(header)={just=center} "THS 2.2#(N=&tot1)";/* 7) APH 24JUN2014 */
  define col2      / display style={just=*d*/c cellwidth=2.1cm}
style(header)={just=center} "CC#(N=&tot2)";/* 7) APH 24JUN2014 */
  define col3      / display style={just=*d*/c cellwidth=2.1cm}
style(header)={just=center} "SA#(N=&tot3)";/* 7) APH 24JUN2014 */
  define col4      / display style={just=*d*/c cellwidth=2.1cm}
style(header)={just=center} "THS : CC Ratio#(%)";/* 7) APH 24JUN2014 */
  define col5      / display style={just=*d*/c cellwidth=2.1cm}
style(header)={just=center} "THS : SA Ratio#(%)";/* 7) APH 24JUN2014 */

break after page / page;

break before flag / page %IF &I=1 %THEN %DO;
  CONTENTS="&_FSRTITL" %END; %ELSE %DO; CONTENTS='' %END;;

compute before page / style={protectspecialchars=off};
  line "&linetop";
endcomp;

compute before _page_ / style={just=left protectspecialchars=off};
  line "\b\fs24\sa24&_FSRTITL." ; * \b = bold, \fs24 is font
size 12pt, \sa24 is space after 12pt;
  line "&linebot";
endcomp;

compute after var;
  line ' ';
endcomp;

compute after _page_ / style={just=left protectspecialchars=off
pretext="&linetop."};
/*1) VM10JUN2014*/ /*4) VM19JUN2014*/
  line "Note: CC = Conventional cigarettes; SA = Smoking
abstinence; THS = Tobacco Heating System.";
  line "Note: Adjusted geometric least squares (LS) means and
confidence intervals (CIs) from an ANCOVA model conducted on log-
transformed Day 5 values with log-transformed baseline value, study arm,
sex and CC consumption reported at screening as fixed effect factors.
Geometrical CV% of the ratio is estimated from the residual mean
squares.";
/*
  line "Baseline is defined as the last assessment prior to
06:29 AM on Day 1"; */ /* 5) APH 23JUN2014 */ /* 10) APH 15SEP2014 */

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        LINE "Baseline is defined as the last assessment prior to Day 1
product use for THS 2.2 and CC subjects and prior to 06:29 AM on Day 1
for SA subjects."; /* 10) APH 15SEP2014 */
        LINE "Note: 1 = Standard errors presented from analysis performed
on the log`{SUB e} scale."; /* 11) APH 15SEP2014 */
        line "Note: Collection over 24 hours starting on the Day stated
in the title.";
        line "";
        line "Appendix &ref.";
        line "Path: &TFLpath." &_blankn.*"\~\~" "(Page &i of
&tpage)";
        line "Program Run: &sysdate   &sysuserid   Program Status:
&status";
        endcomp;

run;
%end;
ods rtf close;
ods results on;
ods path reset;

%mend outrtf;

%outrtf(blankn=60, halfblnk=N, ref=%str(15.4.&tab. and 15.3.3.2)); /* 9)
AMH 01Aug2014 */

%mend table;

%table(paramcd=,title=%str(Urinary Quantity Excreted of MHBMA, 3-HPMA and
S-PMA over 24 hours on Day 5),
pop=FAS,popfl=fasfl,tab=4.2,tabout=_04_02,var=);

*=====;
* END OF PROGRAM CODE                               ;
*=====;

```