

```

%_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_anlhst.sas;
%put NOTE: Purpose              : Analysis of HST parameters versus CC
for fas;
%put NOTE: ;
%put NOTE: Input Data           : ADAM.ADBX;
%put NOTE: Output               : L_15_04_04_59(HST) T_15_02_04_59(HST) ;
%put NOTE: Macros Called        : _MPRINTTO;
%put NOTE: ;
%put NOTE: Programmed by        : cvn_vmurray;
%put NOTE: Creation Date        : 2014-06-12;
%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: 16JUN2014  VM        1) Correct n numbers;
%put NOTE:           AMH        2) Round up CV%;
%put NOTE: 01Aug2014  AMH        3) Center output;
%put NOTE: 01Aug2014  AMH        4) Add where clause used to dataset;
%put NOTE: 11Sep2014  APH        5) Add baseline footnote;
%put NOTE:           6) Amend column widths to stop text
wrapping;
%put NOTE:
=====;
options notes source source2 nofullstimer validvarname=upcase missing=' '
NOQUOTELNMAX/*turn off warnings about quoted strings too long*/;
ods _all_ close;
ods listing;

/*formats macro and appendix output macros*/

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%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);

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.adxt(where=(anl02fl='Y' and &popfl='Y' and avisitn
in (101 104)))
    out=adxтин;
    by SUBJID;
run;

data adxt1 missing;
    set adxtин;
    if aval not in (.,0) then do;
        logaval=log(aval);
        logbase=log(base);
        output adxt1;
    end;
    else output missing;

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run;

%fmt(datain=adxt1, start=trtan, label=trta, name=trt);

data adxt;
  set adxt1;
  format trtan trt.;
  if trta not in ('THS 2.2' 'CC') then delete;
  if not index(param,'(average over visit)') then delete;
run;

proc sort data=adxt;by paramn paramn avisit;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.adxt: &popfl.='Y'
and anl02fl='Y'";
%let tflno=L_15_04&tabout(HST);

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

proc mixed data=adxt method=reml maxiter=200 order=internal;
  by paramn param avisit;
  class trtan sexc ucpdgr1;
  model logaval = logbase trtan sexc ucpdgr1 / outp=pred;
  lsmeans trtan / pdiff=control('CC') alpha=0.05 cl;
  ods output lsmeans=lsmeans;
  ods output diffs=diffs;
  ods output covparms=covparms(rename=(estimate=residual));

run;

data diffs2;
merge diffs covparms;
by paramn param avisit;
run;

/*Residual Plots*/
title3 j=1 'Residual Plots';
options ps=27; /*change this for proc plot*/

proc rank data=pred out=resid normal=vw ;
  by paramn param avisit;
  ranks nscore;
  var resid;
run;

proc plot data=resid hpercent=50;
  by paramn param avisit;
  plot resid*pred / vref=0;
  plot resid*nscore;

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run;
quit;

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

/*data counts*/
/*timepoints*/
proc univariate data=adxt(WHERE=(LOGBASE NE .)) noprint; /*1)
VM16JUN2014*/
    by paramn param avisit;
    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(in=b) num1(in=c);
    /*ordering columns of treatments*/
    if b then colord=3;
    else if trtan=1 then colord=1;
    else if trtan in (2) then colord=2;

    /* N row*/
    if c then do;
        ord=1;
        stat='n';
        out=compress(put(n1,best.));
        output;
    end;

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

/*Gmean (CV%) row*/
        ord=2;
        stat='Geometric LS Mean (CV%)';
        out=compress(put(round(estimatee,0.01),8.2));
        output;
/*95% CI row*/
        ord=3;
        stat='95% CI';
        out=compress(put(floor(100*lowere)/100,8.2)||',
'||compress(put(ceil(100*uppere)/100,8.2));
        output;
    end;

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        if b then do;
        /*Back transformation*/
        estimatee=exp(estimate);
        lower=exp(lower)*100;
        upper=exp(upper)*100;
        geocv=sqrt((exp(residual)-1)*100**2);
/*Gmean (CV%) row*/
        ord=2;
        stat='Geometric LS Mean (CV%)';
        out=compress(put(round(100*estimatee,0.01),8.2))||'
('||COMPRESS(PUT(CEIL(100*GEOCV)/100,8.2))||')';    /*2) VM16JUN2014*/
        output;
        /*95% CI row*/
        ord=3;
        stat='95% CI';
        out=compress(put(floor(100*lower)/100,8.2))||',
'||compress(put(ceil(100*upper)/100,8.2));
        output;

        end;
run;

/*Add labels for all number variables*/
/*_____*/
data tabout1;
    set tabout;

/*Variable label*/
var=param;
run;

/*transpose for output*/
proc sort data=tabout1;
    by var paramn avisit ord stat;
run;

proc transpose data=tabout1 out=ttabout(drop=_NAME_) prefix=col;
    by var paramn avisit ord stat;
    id colord;
    var out;
run;

/* Standard - macro for paging */
%macro outrtf(blankn=68, halfblnk=N, ref=);

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

        %let tflno=T_15_02&tabout(HST);

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

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/* 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;

proc sort data=ttabout;by paramn;run;

/*page numbers*/
data paging;
set ttabout;

page=paramn-49;

call symput('tpage',put(page,2.));

var=tranwrd(var,'(average over visit)','');
run;

/* Standard - leave this */
options number nodate orientation=landscape papersize=&p_pgsz missing='
' NOQUOTELNMAX/*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 ord;run;

data comp;
set paging end=eof;
by ord;
where page=&i;
flag=1;

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        _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;;
    column flag page var avisit ord stat coll col2 col3;

    define flag / order noprint;
        define page          / order order = internal noprint;
        define var           / group style={just=left cellwidth=2.5cm} "Variable
(units)";
        define avisit        / group style={just=left cellwidth=1.8cm}
"Timepoint"; /* APH 6) 11SEP2014 */

        define ord           / order order=internal noprint;
        define stat          / display style={just=left cellwidth=3.7cm}
"Statistic"; /* APH 6) 11SEP2014 */

        define coll          / display style={just=C/*d*/ cellwidth=3cm}
style(header)={just=center} "THS 2.2#(N=&tot1)";
        define col2         / display style={just=C/*d*/ cellwidth=3cm}
style(header)={just=center} "CC#(N=&tot2)";
        define col3         / display style={just=C/*d*/ cellwidth=3cm}
style(header)={just=center} "THS : CC Ratio (%)"; /* 3) AMH 01Aug2014 */

        break after var / 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 after avisit / style={protectspecialchars=off};

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        line " ";
    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 _page_ / style={just=left protectspecialchars=off
pretext="&linetop."};
        line "Note: CC = Conventional cigarettes; THS = Tobacco Heating
System.";
        line "Note: Adjusted geometric least squares (LS) means and
confidence intervals (CIs) from an ANCOVA model conducted on log-
transformed 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 Day
1 product use"; /* APH 5) 11SEP2014 */
        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=15.4.&tab);

%mend table;

%table(paramcd=,title=%str(Analysis of HST Parameters (Averaged over all
Cigarettes per Day)),
pop=FAS,popfl=fasfl,tab=4.59,tabout=_04_59,var=);

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

```