

```

%_mprintto;
options notes nosource;
proc datasets lib=work nolist memtype=data kill; quit;
%put NOTE:
=====
=;
%put NOTE: Covance Study Number : 000000106324;
%put NOTE: Client Protocol ID : ZRHR-REXC-03-EU;
%put NOTE: Program Name : t_co.sas;
%put NOTE: Purpose : table decriptive stats of co ;
%put NOTE: ;
%put NOTE: Input Data : ADAM.ADBX ADAM.ADSL;
%put NOTE: Output : t_15_2_4_7(co);
%put NOTE: Macros Called : _MPRINTTO;
%put NOTE: ;
%put NOTE: Programmed by : cvn_jhardman;
%put NOTE: Creation Date : 2014-07-29;
%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: 29Aug2014 JMH 1) Added NMISS to PROC MEANS to check
for missing data;
%put NOTE: 18Sep2014 JMH 2) Created an unformatted varaibel and
amended dual programming dataset;
%put NOTE: 19Sep2014 KB 3) Amended quartiles to use floor & ceil
functions;
%put NOTE: 25Sep2014 JMH 4) Amended BLQ calculations and
presentation;
%put NOTE: 21Apr2016 KB 5) Added arithmetic mean;
%put NOTE:
=====
=;
options notes source source2 nofullstimer validvarname=upcase missing='
';
ods _all_ close;
ods listing;

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

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%let tflno=T_15_02_04_07(co);

%let TFL_Part=%scan(&_SASPROGRAMFILE,-3,%str(/));

data _null_;
    tmp="%TFL_Part";
    if tmp not in ("dev" "qc") then call symput("TFL_Part", "prod");
    call symput('TFLpath', compress("&_SASPROGRAMFILE",""));
run;

*****;
* read in data ;
*****;

/*Use ADSL to get N values for column headers*/
data adsl;
    set adam.adsl(where=(fasfl='Y'));
run;

proc sort data=adsl nodupkey out=adsl1;
    by trt01an trt01a subjid;
run;

proc freq data=adsl1(where=(not missing(trt01an))) noprint;
    table trt01an*trt01a/ out =tot(drop=percent rename=(count=total));
run;

data tot2;
    set tot;
    call symput('trt' || compress(put(trt01an,best.)),
compress(total));
run;

/*Bring in appropriate data from ADBX*/
data adbx1;
    set adam.adbx(where=(anl02fl='Y' and fasfl ='Y' and paramcd in
('CO')));
run;

data adbx;
    set adbx1;
run;

data adbx_orig;
    set adbx;
    type='abs';
    statval=aval;
run;

proc sort data=adbx_orig;
    by type trtan trta avisitn avisit atptn atpt;
run;

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proc means data=adbx_orig noprint;
  var statval;
  by type trtan trta avisitn avisit atptn atpt;
  output out=results02 NMISS=MISS1 n=n1 mean=mean1 std=std1
  median=median1 min=min1 max=max1 q1=q1 q3=q3 lclm=lci1 uclm=uci1; /* 1)
JMH 29Aug2014 */
run;

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data results03;
  set results02;
  attrib meansd length=$20.
           minmax length=$20.
           n length=$20.
           median length=$20.
           quart aci length=$20.;

  n = left(compress(put(n1,8.)));
  * differing DP per biomarker ;
  * CO has 0dp;
  if not missing(median1) then median =
left(compress(put(round(median1,0.1),8.1)));
  if not missing(mean1) and not missing(std1) then meansd =
left(compress(put(round(mean1,0.1),8.1))) || ' (' ||
left(compress(put(0.01*ceil(std1/0.01),8.2))) || ')';
  if not missing(min1) and not missing(max1) then minmax =
left(compress(put(round(min1,1),8.0))) || ', ' ||
left(compress(put(round(max1,1),8.0)));
  if not missing(lci1) and not missing(uci1) then aci =
strip(put(0.1*floor(lci1/0.1),8.1)) || ', ' ||
strip(put(0.1*ceil(uci1/0.1),8.1));
/* if not missing(q1) and not missing(q3) then quart =
strip(strip(put(round(q1,0.1),8.1)) || ', ' ||
strip(put(round(q3,0.1),8.1)));*/
  IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART =
STRIP(PUT(0.1*FLOOR(Q1*10),10.1)) || ', ' ||
STRIP(PUT(0.1*CEIL(Q3*10),10.1)); /* 3) KB 19Sep2014 */

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  drop /*n1*/ mean1 std1 median1 min1 max1 q1 q3 uci1 lci1 ; /* 4) JMH
25Sep2014 */
run;

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/*Obtain subjects with values BLOQ*/
data adbx_blq;
  set adbx;
  where bloqfl='Y';
  statval=aval;
  type='abs';
run;

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proc freq data=adbx_blq noprint;
    table type*trtan*trta*avisitn*avisit*atptn*atpt/ out
=blq(drop=percent);
run;

%macro outrtf(blankn=, halfblnk=);

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

%let dsid=%sysfunc(open(blq));
%let nsum=%sysfunc(attrn(&dsid.,nobs));
%let rc=%sysfunc(close(&dsid.));

%put "Check " &nsum.;

%if &nsum. lt 1 %then %do;
    proc sort data=adbx_orig nodupkey out=tpts(keep=type avisitn
avisit atptn atpt trtan trta);
        by trtan trta type avisitn avisit atptn atpt;
    run;

    data blq1;
        set tpts;
        attrib blq length=$50.;
        blq='0';
    run;

%end;

%else %do;
    /* 4) start JMH 25Sep2014 */
    /*      data blq1;*/
    /*          attrib blq length=$50.;*/
    /*          merge blq(in=a) tot;*/
    /*          by trtan trta avisitn avisit atptn atpt;*/
    /*          if not a then do;*/
    /*              count=0;*/
    /*          end;*/
    /*          percent=count/total*100;*/
    /*          */
    /*          if count=0 then blq='0';*/
    /*          else if percent=100 then blq= put(count,3.)||' (100%)' ;*/
    /*          else blq=put(count,3.)||' ('||put(percent,3.)||'%)' ;*/
    /*          run;*/

PROC SORT DATA=ADBX_ORIG NODUPKEY OUT=TPTS(KEEP=TYPE PARAMN PARAM
AVISITN AVISIT ATPTN ATPT TRTAN TRTA);
    BY TRTAN TRTA TYPE PARAMN PARAM AVISITN AVISIT ATPTN ATPT;
RUN;

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DATA BLQTOTS;
    SET RESULTS03 (RENAME=(N1=TOTAL));
    KEEP TYPE PARAM: TR: AVISIT: ATPT: TOTAL;
RUN;

PROC SORT DATA=BLQTOTS; BY TYPE TRTAN TRTA PARAMN PARAM AVISITN
AVISIT; RUN;
PROC SORT DATA=TPTS; BY TYPE TRTAN TRTA PARAMN PARAM AVISITN
AVISIT; RUN;

DATA TOT_BLQ;
    MERGE TPTS BLQTOTS;
    BY TYPE TRTAN TRTA PARAMN PARAM AVISITN AVISIT;
RUN;

PROC SORT DATA=TOT_BLQ;
    BY TYPE PARAMN PARAM TRTAN TRTA AVISITN AVISIT ATPTN ATPT;
RUN;

DATA BLQ1;
    ATTRIB BLQ LENGTH=$50.;
    MERGE BLQ (IN=A) TOT_BLQ;
    BY TYPE PARAMN PARAM TRTAN TRTA AVISITN AVISIT ATPTN ATPT;
    IF NOT A THEN DO;
        COUNT=0;
    END;
    PERCENT=COUNT/TOTAL*100;

    IF COUNT=0 THEN BLQ='0';
    ELSE IF PERCENT=100 THEN BLQ= PUT (COUNT,3.) || ' (100%)';
    ELSE BLQ=PUT (COUNT,3.) || '
(' || LEFT (STRIP (PUT (ROUND (PERCENT,0.1),5.1))) || '%' );

    IF TYPE='pch' THEN BLQ='';
RUN;
/* 4) end JMH 25Sep2014 */
%end;

/*Obtain the geometric mean*/

data gmean;
    set adbx_orig(where=(type='abs'));
    statvall=statval;
    if aval gt 0 then ln_statvall=log(statvall);
run;

proc means data=gmean noprint;
    output out=gmean1 mean=mean std=std1 lclm=lci1 uclm=uci1 nmiss=miss;
    var ln_statvall;
    by trtan trta type avisitn avisit atptn atpt;
run;

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```

data gmean2;
  set gmean1;
  gmean1=exp(mean);
  gmean=left(compress(put(round(gmean1,0.1),8.1))); * cant derived
gmean if zero values ;
  gcv=compress(put(0.1*ceil((sqrt(exp(std1*std1)-1)*100)/0.1),8.1));
  glci=exp(lcil);
  guci=exp(ucil);
  keep trtan trta avisitn avisit atptn atpt gmean gcv glci guci std1
miss;
run;

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/*Combine the Gmean and BLQ with other stats*/
proc sort data=results03;
  by trtan trta type avisitn avisit atptn atpt;
run;

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```

data results04;
  merge results03 gmean2 blq1;
  attrib gmeancv length=$20.;
  by trtan trta type avisitn avisit atptn atpt;
  if not missing(gcv) then gmeancv=left(trim(gmean)) || ' (' ||
left(trim(gcv))||'%)';
  else gmeancv=left(trim(gmean));
  if not missing(glci) and not missing(guci) then ci =
strip(strip(put(0.1*floor(glci/0.1),8.1)) || ', ' ||
strip(put(0.1*ceil(guci/0.1),8.1)));
run;

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```

proc sort data=results04;
  by trtan trta type avisitn avisit atptn atpt;
run;

```

```

proc sort data=blq1;
  by trtan trta type avisitn avisit atptn atpt;
run;

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data results05;
  merge results04 blq1;
  by trtan trta type avisitn avisit atptn atpt;
run;

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```

proc sort data=results05;
  by type avisitn avisit atptn atpt;
run;

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proc transpose data=results05(where=(type='abs')) out=results06 prefix=r
name=varname;
  by avisitn avisit atptn atpt;

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var n meansd median minmax aci quart blq gmeancv ci;
id trtan;
idlabel trta;
run;

proc sort data=results06;
  by avisitn avisit atptn atpt varname;
run;

data results07;
  set results06;
  by avisitn avisit atptn atpt varname;
  attrib stat variable length = $100.;
  varname=upcase(varname);

  if not missing(atpt) then variable=compbl(trim(avisit) ||', '|| atpt);
  else variable=compbl(avisit);

      VARIABLE1=VARIABLE; /* 2) JMH 18Sep2014 */
  if index(atpt,'T0') then variable=tranwrd(variable,'T0','T${sub
0}');

  if varname='N' then do;
    statord=1;
    stat='n';
  end;
  else if varname='BLQ' then do;
    statord=2;
    stat='BLOQ - n (%)';
    /*delete;*/          * not required for this output; /* 4) JMH
25Sep2014 */
  end;
  else if varname='GMEANCV' then do;
    statord=3;
    stat='Geometric Mean (CV%)';
  end;
  else if varname='CI' then do;
    statord=4;
    stat='95% CI';
  end;
  else if varname='MEDIAN' then do;
    statord=/*5*/7; /* 5) KB 21Apr2016 */
    stat='Median';
  end;
  else if varname='QUART' then do;
    statord=/*6*/8; /* 5) KB 21Apr2016 */
    stat='Q25, Q75';
  end;
  else if varname='MINMAX' then do;
    statord=/*7*/9; /* 5) KB 21Apr2016 */
    stat='Min, Max';

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end;
else if varname='MEANS'D then do;
    statord=/*8*/5; /* 5) KB 21Apr2016 */
    stat='Mean (SD)';
    /* delete;*/ /* 5) KB 21Apr2016 */
end;
else if varname='ACI' then do;
    statord=/*9*/6; /* 5) KB 21Apr2016 */
    stat='95% CI';
    /* delete;*/ /* 5) KB 21Apr2016 */
end;
drop varname;
run;

data results08;
set results07;
if stat='n' then do;
    * havent set changes to missing as not expected ;
    if missing(r1) then r1='0';
    if missing(r2) then r2='0';
    if missing(r3) then r3='0';
end;
run;

data labels;
set results08;
attrib r1 label = "THS 2.2$(N=&trt1)"
        r2 label = "CC$(N=&trt2)"
        r3 label = "SA$(N=&trt3)";

                                flag=1;
run;

proc sql noprint;
    create table table.T_15_02_04_07 as
    select avisitn, atpt, variable, VARIABLE1, statord, stat, r1, r2, r3
/* 2) JMH 18Sep2014 */
    from labels
    order by avisitn, atptn, statord;
quit;

proc sort data=labels;
    by avisitn atptn statord;
run;

data paging;
set labels;
by avisitn atptn statord;
if ((first.avisitn or first.atptn) and ln gt 8) or ln > 16 then ln=1;
/*Amend to look presentable, and avoid page overflows*/

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        else ln+1;
        if ln=1 then page+1;
        call symput("page",compress(put(page,best.)));
run;

options number nodate orientation=landscape papersize=&p_pgsize missing='
';
ods escapechar='$';
%let linetop = \brdrt\brdrs\brdrw30;  * needs to be 1.5pt so calculated
in twips (1/20 pt) ;
%let linebot = \brdrb\brdrs\brdrw30;

ods path stdlib.t106324 (read) ;
ods results off;
ods rtf toc_data
file="/cvn/projects/prj/data/000000106324/TFL/&TFL_Part./&tflno..rtf"
style=t106324 startpage=yes headery=1440 footery=1440 ;
ods noproctitle;

%do i=1 %to &page;

title ;
footnote;
%let wd=0;

data comp;
    set paging end=eof;
    where page=&i;

    /* Amend title as needed */
    _firtitl="Table 15.2.4.7 Descriptive Statistics of Exhaled CO (ppm)
- FAS";
    _upcas=(length("Path:
&TFLpath.")-length(compress("Path:&TFLpath.",'ABCDEFGHIJKLMNOPQRSTUVWXYZ
YZ')))/2;
    len=&blankn.-length("(page &i of &page)");
    if eof then do;
        call symput('_FSRTITL', trim(left(_firtitl)));
        call symput('_blankn', compress(put(len,best.)));
    end;

    drop _firtitl _upcas len;
run;

ods proclabel = ' ';
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;

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```

* data arial 10pt;
* headers to be central, text values left aligned and numeric centered
around decimal point;
proc report data = comp missing headline headskip missing nowd split = '$'
%if &i=1 %then %do; contents=' ' %end; %else %do; contents='' %end;;
    column flag page avisitn atptn variable statord stat r1 r2 r3 ;

    define flag          / order order = internal noprint;
    define page          / order order = internal noprint;
    define avisitn       / order order=internal noprint;
    define atptn         / order order=internal noprint;
    define variable      / group style={just=left cellwidth=3cm}
style(header)={just=center} "Timepoint";
    define statord       / order order = internal noprint;
    define stat          / display style={just=left cellwidth=2cm}
style(header)={just=center} "Statistic";
    define r1            / display style={just=c cellwidth=1.5cm}
style(header)={just=center};
    define r2            / display style={just=c cellwidth=1.5cm}
style(header)={just=center};
    define r3            / display style={just=c cellwidth=1.5cm}
style(header)={just=center};

    break before flag / page %if &i=1 %then %do;
    contents="%_fsrtitl" %end; %else %do; contents='' %end;;

    break after page / page;

    compute after variable;
        line " ";
    endcomp;

    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 _page_ / style={just=left protectspecialchars=off
pretext="&linetop."};
        line 'Note: CC = Conventional cigarettes; SA = Smoking
abstinence; THS = Tobacco Heating System.';
        line 'Note: Geometric: mean, CV% and 95% confidence interval
(CI) are reported.';
        line "Note: T${sub 0} = Time of first product use on study day.";
        %if &nsum. ge 1 %then %do;

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        line 'Note: LOQ = XX %'; /*Update this value if required*/
    %end;
    LINE "Note: No BLOQ values recorded for this parameter."; /* 4) JMH
25Sep2014 */
        line ' ';
        line 'Appendix 15.3.3.2';
        line "Path: &TFLpath." &_blankn.*"\~\~" "(Page &i of &page)";
        line "Program Run: &sysdate   &sysuserid   Program Status:
&status";
        endcomp;
run;
%end;
ods rtf close;
ods results on;
ods path sashelp.tmplmst (read);

%mend ;

%outtrtf(blankn=70, halfblnk=N);
ods listing;
proc printto print = "&table./T_15_02_04_07.lst" new;
run;

proc contents data = table.T_15_02_04_07 varnum;
run;
ods listing close;
proc printto ; run;
*=====
;
* END OF PROGRAM CODE                                     ;
*=====
;

```