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*****;
* Project          : ZRHM-REXA-07-JP
*
* Program name     : F15010101_ZRHM_REXA_07_V1.sas
*
* Author          : L. Yan
*
* Date created     : 05/20/2015
*
* Purpose         : F15010101
*
* Revision History :
*
* Date          Author      Ref      Revision (Date in YYYYMMDD format)
*
*****;

options sasautos=("W:\pmp07\macros" sasautos) notes;
%*init(delivery=1);
%init(delivery=9);

%let prgname=F15010101_ZRHM_REXA_07_JP_V1;

%titlecsv(prgname=&prgname., version=3);

%put &title1;
%put &title2;
%put &APPENDIX;
%put &endpoint;
%put &outname.;

options missing="";

%macro cal_sumary_pvalue_bk(wher=, outnum=, var=, in=, pflg=, method=, decimal=1);

proc sort data=&in. out=anadt_&outnum.;
by usbjid;
where &wher. ;
run;

proc sort data=anadt_&outnum.;
by trtcd;
run;

%if &method = 1 %then %do;
proc means data = anadt_&outnum. noprint;
by trtcd;
var &var.;
output out=xlab_&outnum. n=n mean=mean median=med std=sd min=min max=max q1=q1 q3=q3 lclm=lclm uclm=uclm;
run;
%end;

%if &method = 2 %then %do;
proc means data = anadt_&outnum. noprint;
by trtcd;
var aval;
output out=xlab_&outnum. n=n mean=mean median=med std=sd min=min max=max q1=q1 q3=q3 lclm=lclm uclm=uclm;
run;
%end;

data xlab_&outnum.;
set xlab_&outnum.;
n1 = trim(left(compress(put(n, 8.))));
%if &decimal=1 %then %do;
if sd > . then mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' ( '||trim(left(compress(put(ceil(sd*
1000)/1000, 8.%eval(&decimal+2))))))||')';
else mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' (NA)';
%end;
%if &decimal=0 %then %do;
if sd > . then mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' ( '||trim(left(compress(put(ceil(sd*
100)/100, 8.%eval(&decimal+2))))))||')';
else mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' (NA)';
%end;

ci1=trim(left(compress(put(floor(lclm*100)/100, 8.%eval(&decimal+1))))||', '||trim(left(compress(put(ceil(uclm*100)/1
00, 8.%eval(&decimal+1))))));
median1 = trim(left(compress(put(med, 8.%eval(&decimal+1)))));
q1q3 = trim(left(compress(put(q1, 8.%eval(&decimal+1))))||', '||trim(left(compress(put(q3, 8.%eval(&decimal+1))))));
;
min1 = trim(left(compress(put(min, 8.%eval(&decimal+0))))||', '||trim(left(compress(put(max, 8.%eval(&decimal+0)))
));
run;

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proc mixed data=anadt_&outnum.;

Class trtcd sex UCPDGR1;

Model logaval = logbase sex UCPDGR1 trtcd / outp=pred;

lsmeans trtcd / pdiff =control('mCC') alpha=0.05 cl;

ods output lsmeans=lsmeans_&outnum. (keep=trtcd lower upper estimate); *each arm;

ods output diffs=LSMeanDiffCL&outnum. (keep=trtcd lower upper probt estimate); * lsmean and C.I. for ratios;

ods output covparms=ROOTMSE&outnum.(rename=(estimate=mse)); *MSE;

run;
*/

proc glm data=anadt_&outnum.;
class trtp sex UCPDGR1;
%if &method = 1 %then %do;
model logaval = logbase sex UCPDGR1 trtp;
%end;
%if &method = 2 %then %do;
model aval = base sex UCPDGR1 trtp;
%end;
lsmeans trtp / pdiff =control('mCC') alpha=0.05 cl adjust=t;
lsmeans trtp / pdiff =control('SA') alpha=0.05 cl adjust=t;
ods output LSMeans=pval&outnum. (keep=ProbtDiff trtp where=(TRTP in ("THSm2.2"))); *p-value;
ods output LSMeanCL=lsmeans_&outnum. (keep=trtp lowercl uppercl lsmean); *lsmean, C.I. for each arm;
ods output LSMeanDiffCL=LSMeanDiffCL&outnum. (keep=trtp _trtp lowercl uppercl difference where=(TRTP in ("THSm2.2"))); *
lsmean and C.I. for ratios;
ods output FitStatistics=ROOTMSE&outnum. (keep=rootmse); *RootMSE;
run;quit;

ods output close;

data lsmeans_&outnum.;
set lsmeans_&outnum.;
if TRTP="THSm2.2" then trtcd=1;
else if TRTP="mCC" then trtcd=2;
else if TRTP="SA" then trtcd=3;

%if &method = 1 %then %do;
Estimate1 = exp(lsmean); /* Ratio of geometric mean */
LowerCL = exp(lowercl); /* 95% CI lower bound */
UpperCL = exp(uppercl); /* 95% CI upper bound */
%end;
%if &method = 2 %then %do;
Estimate1 = lsmean; /* Ratio of geometric mean */
LowerCL = lowercl; /* 95% CI lower bound */
UpperCL = uppercl; /* 95% CI upper bound */
%end;
run;

data ROOTMSE&outnum.;
set ROOTMSE&outnum.;
CVperc=100*sqrt(exp(rootmse**2)-1);
run;

proc sort data=lsmeans_&outnum. nodupkey;
by trtcd;
run;

data lsmeans_&outnum.;
length geomean geoci $100;
set lsmeans_&outnum.;
geomean=strip(put(ESTIMATE1, 8.2));
geoci=strip(put(floor(LowerCL*100)/100, 8.2)||", "||strip(put(ceil(UpperCL*100)/100, 8.2)));
keep trtcd geomean geoci;
run;

proc sort data=LSMeanDiffCL&outnum. nodup;
by TRTP _TRTP;
run;

data LSMeanDiffCL&outnum.;
set LSMeanDiffCL&outnum.;
myord=1;
run;

data ROOTMSE&outnum.;
set ROOTMSE&outnum.;
myord=1;
run;

data LSMeanDiffCL&outnum.;
merge LSMeanDiffCL&outnum. ROOTMSE&outnum.;

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by myord;
run;

data LSMeanDiffCL&outnum.;
length geomean geoci $100;
set LSMeanDiffCL&outnum.;
if _TRTP eq "mCC" then trtcd=4;
if _TRTP eq "SA" then trtcd=5;
%if &method = 1 %then %do;

    difference = 100*exp(difference); /* Ratio of geometric mean */
    lowercl = 100*exp(lowercl); /* 95% CI lower bound */
    uppercl = 100*exp(uppercl); /* 95% CI upper bound */
%end;

%if &method = 2 %then %do;

    difference =difference; /* Ratio of geometric mean */
    lowercl = lowercl; /* 95% CI lower bound */
    uppercl = uppercl; /* 95% CI upper bound */
%end;

%if &method = 1 %then %do;
geomean=strip(put(difference, 8.2))||" ("||strip(put(ceil(CVperc*100)/100, 8.2)) ||")";
%end;
%if &method = 2 %then %do;
geomean=strip(put(difference, 8.2))*" ("||strip(put(CVperc, 8.1)) ||")"/;
%end;

geoci=strip(put(floor(lowercl*100)/100, 8.2))||", "||strip(put(ceil(uppercl*100)/100, 8.2));
keep trtcd geomean geoci difference;
run;

data pval&outnum.;
set pval&outnum.;
if _n_=1;
trtcd=4;
keep trtcd ProbtDiff;
format ProbtDiff PVALUE6.3;
run;

proc sort data=LSMeanDiffCL&outnum.;
by trtcd;
run;

data LSMeanDiffCL&outnum.;
merge LSMeanDiffCL&outnum. pval&outnum.;
by trtcd;
run;

data LSMeanDiffCL&outnum.;
set LSMeanDiffCL&outnum.;
%if &method = 1 %then %do;
if (difference < 100) then ProbtDiff=ProbtDiff/2;
else ProbtDiff=1-ProbtDiff/2;
%end;
%if &method = 2 %then %do;
if (difference < 0) then ProbtDiff=ProbtDiff/2;
else ProbtDiff=1-ProbtDiff/2;
%end;
run;

data mrep_&outnum.;
set lsmeans_&outnum. LSMeanDiffCL&outnum.;
run;

proc sort data=mrep_&outnum.;
by trtcd;
run;

proc sort data=xlab_&outnum.;
by trtcd;
run;

data xlab_&outnum.;
merge xlab_&outnum.(in=a) mrep_&outnum.;
by trtcd;
run;

data xlab_&outnum.;
set xlab_&outnum.;
if geoci ne "";
run;

proc transpose data = xlab_&outnum. out=xlab_1_&outnum.;
id trtcd;
var n1 geomean geoci ProbtDiff;

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run;

data rep_&outnum.;
length _name_ _1 _2 _3 ord1 $100;
set xlab_1_&outnum.;
ord1=&outnum;
ordnum=input(ord1, best.);
if upcase(_name_)="N1" then do; _name_="n"; sord=0; end;
%if &method = 1 %then %do;
if upcase(_name_)="GEOMEAN" then do; _name_="Geometric LS Mean (CV%)"; sord=1; end;
%end;
%if &method = 2 %then %do;
if upcase(_name_)="GEOMEAN" then do; _name_="LS Mean"; sord=1; end;
%end;

if upcase(_name_)="GEOCI" then do; _name_="95% CI"; sord=2; end;

if upcase(_name_)="MEAN1" then do; _name_="Mean (SD)"; sord=3; end;
if upcase(_name_)="CI1" then do; _name_="95% CI"; sord=4; end;
if upcase(_name_)="MEDIAN1" then do; _name_="Median"; sord=5; end;
if upcase(_name_)="Q1Q3" then do; _name_="Q25, Q75"; sord=6; end;
if upcase(_name_)="MIN1" then do; _name_="Min, Max"; sord=7; end;
if upcase(_name_)="PROBTDIFF" then do; _name_="p-value (one-sided)"; sord=9; end;
run;

data rep;
set rep rep_&outnum.;
run;

%mend;

%macro cal_summary_pvalue(where=, outnum=, var=, in=, pflg=, method=, decimal=1);

proc sort data=&in. out=anadt_&outnum.;
by usbjid;
where &where. ;
run;

proc sort data=anadt_&outnum.;
by trtcd;
run;

proc means data= anadt_&outnum. noprint;
by trtcd;
var &var.;
output out=xlab_&outnum. n=n mean=mean median=med std=sd min=min max=max q1=q1 q3=q3 lclm=lclm uclm=uclm;
run;

data xlab_&outnum.;
set xlab_&outnum.;
n1 = trim(left(compress(put(n, 8.))));
%if &decimal=1 %then %do;
if sd > . then mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' ( '|trim(left(compress(put(ceil(sd*1000)/1000, 8.%eval(&decimal+2))))))||')';
else mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' (NA)';
%end;
%if &decimal=0 %then %do;
if sd > . then mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' ( '|trim(left(compress(put(ceil(sd*100)/100, 8.%eval(&decimal+2))))))||')';
else mean1 = (trim(left(compress(put(mean, 8.%eval(&decimal+1))))))||' (NA)';
%end;

ci1=trim(left(compress(put(floor(lclm*100)/100, 8.%eval(&decimal+1))))))||' ( '|trim(left(compress(put(ceil(uclm*100)/100, 8.%eval(&decimal+1))))))||')';
median1 = trim(left(compress(put(med, 8.%eval(&decimal+1)))));
q1q3 = trim(left(compress(put(q1, 8.%eval(&decimal+1))))))||' ( '|trim(left(compress(put(q3, 8.%eval(&decimal+1))))))||')';
;
min1 = trim(left(compress(put(min, 8.%eval(&decimal+0))))))||' ( '|trim(left(compress(put(max, 8.%eval(&decimal+0))))))||')';
run;

/*
proc mixed data=anadt_&outnum.;

Class trtcd sex UCPDGR1;

Model logaval = logbase sex UCPDGR1 trtcd / outp=pred;

lsmeans trtcd / pdiff =control('mCC') alpha=0.05 cl;

ods output lsmeans=lsmeans_&outnum. (keep=trtcd lower upper estimate); *each arm;

ods output diffs=LSMeanDiffCL&outnum. (keep=trtcd lower upper probt estimate); * lsmean and C.I. for ratios;

ods output covparms=ROOTMSE&outnum.(rename=(estimate=mse)); *MSE;

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run;
*/

proc glm data=anadt_&outnum.;
class trtp sex UCPDGR1;
model logaval = logbase sex UCPDGR1 trtp;
lsmeans trtp / pdiff =control('mCC') alpha=0.05 cl adjust=t;
lsmeans trtp / pdiff =control('SA') alpha=0.05 cl adjust=t;
ods output LSMeans=pval&outnum. (keep=ProbtDiff trtp where=(TRTP in ("THSm2.2"))); *p-value;
ods output LSMeansCL=lsmeans_&outnum. (keep=trtp lowercl uppercl lsmean); *lsmean, C.I. for each arm;
ods output LSMeansDiffCL=LSMeansDiffCL&outnum. (keep=trtp _trtp lowercl uppercl difference where=(TRTP in ("THSm2.2"))); *
lsmean and C.I. for ratios;
ods output FitStatistics=ROOTMSE&outnum. (keep=rootmse); *RootMSE;
run;quit;

ods output close;

data lsmeans_&outnum.;
set lsmeans_&outnum.;
if TRTP="THSm2.2" then trtcd=1;
else if TRTP="mCC" then trtcd=2;
else if TRTP="SA" then trtcd=3;

    Estimate1 = exp(lsmean); /* Ratio of geometric mean */
    LowerCL   = exp(lowercl); /* 95% CI lower bound */
    UpperCL   = exp(uppercl); /* 95% CI upper bound */
run;

data ROOTMSE&outnum.;
set ROOTMSE&outnum.;
CVperc=100*sqrt(exp(rootmse**2)-1);
run;

proc sort data=lsmeans_&outnum. nodupkey;
by trtcd;
run;

data lsmeans_&outnum.;
length geomean geoci $100;
set lsmeans_&outnum.;
geomean=strip(put(ESTIMATE1, 8.2));
geoci=strip(put(floor(LowerCL*100)/100, 8.2)||", "||strip(put(ceil(UpperCL*100)/100, 8.2)));
keep trtcd geomean geoci;
run;

proc sort data=LSMeansDiffCL&outnum. nodup;
by TRTP _TRTP;
run;

data LSMeansDiffCL&outnum.;
set LSMeansDiffCL&outnum.;
myord=1;
run;

data ROOTMSE&outnum.;
set ROOTMSE&outnum.;
myord=1;
run;

data LSMeansDiffCL&outnum.;
merge LSMeansDiffCL&outnum. ROOTMSE&outnum.;
by myord;
run;

data LSMeansDiffCL&outnum.;
length geomean geoci $100;
set LSMeansDiffCL&outnum.;
if _TRTP eq "mCC" then trtcd=4;
if _TRTP eq "SA" then trtcd=5;

    difference = 100*exp(difference); /* Ratio of geometric mean */
    lowercl    = 100*exp(lowercl); /* 95% CI lower bound */
    uppercl    = 100*exp(uppercl); /* 95% CI upper bound */

geomean=strip(put(difference, 8.2))||" ("||strip(put(ceil(CVperc*100)/100, 8.2)) ||")";
geoci=strip(put(floor(lowercl*100)/100, 8.2))||", "||strip(put(ceil(uppercl*100)/100, 8.2)));
keep trtcd geomean geoci;
run;

data pval&outnum.;
set pval&outnum.;
if _n_=1;
trtcd=4;
keep trtcd ProbtDiff;
format ProbtDiff PVALUE6.3;
run;

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proc sort data=LSMeanDiffCL&outnum.;
by trtcd;
run;

data LSMeanDiffCL&outnum.;
merge LSMeanDiffCL&outnum. pval&outnum.;
by trtcd;
run;

data mrep_&outnum.;
set lsmeans_&outnum. LSMeanDiffCL&outnum.;
run;

proc sort data=mrep_&outnum.;
by trtcd;
run;

proc sort data=xlab_&outnum.;
by trtcd;
run;

data xlab_&outnum.;
merge xlab_&outnum.(in=a) mrep_&outnum.;
by trtcd;
run;

data xlab_&outnum.;
set xlab_&outnum.;
if geoci ne "";
run;

proc transpose data = xlab_&outnum. out=xlab_1_&outnum.;
id trtcd;
var n1 geomean geoci ProbtDiff;
run;

data rep_&outnum.;
length _name_ _1 _2 _3 ord1 $100;
set xlab_1_&outnum.;
ord1="&outnum.";
ordnum=input(ord1, best.);
if upcase(_name_)="N1" then do; _name_="n"; sord=0; end;
if upcase(_name_)="GEOMEAN" then do; _name_="Geometric LS Mean (CV%)"; sord=1; end;
if upcase(_name_)="GEOCI" then do; _name_="95% CI"; sord=2; end;

if upcase(_name_)="MEAN1" then do; _name_="Mean (SD)"; sord=3; end;
if upcase(_name_)="CI1" then do; _name_="95% CI"; sord=4; end;
if upcase(_name_)="MEDIAN1" then do; _name_="Median"; sord=5; end;
if upcase(_name_)="Q1Q3" then do; _name_="Q25, Q75"; sord=6; end;
if upcase(_name_)="MIN1" then do; _name_="Min, Max"; sord=7; end;
if upcase(_name_)="PROBTDIFF" then do; _name_="p-value (one-sided)"; sord=9; end;
run;

data rep;
set rep rep_&outnum.;
run;

%mend;

proc sort data=adam.adsl out=trt;
by usbjid;
where PPROT1FL="Y";
run;

data trt;
set trt;
if TRT01A="THSm2.2" then trtcd=1;
else if TRT01A="mCC" then trtcd=2;
else if TRT01A="SA" then trtcd=3;
run;

/*
*) ADBX.PARAMCD="CARBXHGB" and ATPT="DAY 5 - 20:00 - 21:30" and PPROT1FL="Y"
*) ADBX.PARAMCD in ("UMHBMCRE", "U3HPMCRE", "USPMACRE", "UNNALCRE") and AVISIT in "DAY 5" and PPROT1FL="Y"
*) ADBX.PARAMCD in ("CARBXHGB", "UMHBMCRE", "U3HPMCRE", "USPMACRE", "UNNALCRE") and AVISIT in "DAY 90" and PPR
OT4FL="Y"
ANL02FL="Y"
*/

data anldata1;
set adam.ADBX;

/*

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where anl02f1='Y';
if PARAMCD in ("CO", "CARBXHGB") and ATPT="DAY 5 - 20:00 - 21:30" and PPROT1FL="Y" then output;
else if PARAMCD in ("UMHBMCRE", "U3HPMCRE", "USPMACRE","UNNALCRE") and AVISIT eq "DAY 5" and PPROT1FL="Y" then output;
else if PARAMCD in ("CO", "CARBXHGB", "UMHBMCRE", "U3HPMCRE", "USPMACRE","UNNALCRE") and AVISIT eq "DAY 90" and PPROT4
FL="Y" then output;
else if (AVISIT ="DAY 5" and PPROT1FL="Y") or (AVISIT="DAY 90" and PPROT4FL="Y") then do;
  if paramcd in (
    "U1OHPCRE", "UNNALCRE", "U4ABPCRE", "U1NACRE", "U2NACRE", "UOTOLCRE", "UCEMACRE", "UHEMACRE", "UBAPCRE", "UHMPMCRE", "
USBMACRE", "UNEQCRE",
    "U3HPM24U", "UMHBM24U", "USPMA24U", "UNNAL24U", "U1OHP24U" , "UNNN24U", "U4ABP24U", "U1NA24U","U2NA24U","UOTOL24U", "UC
EMA24U",
    "UHEMA24U", "UBAP24U", "UHMPM24U", "USBMA24U", "UNEQ24U", "UNNNCRE") then output;
end;
*/

where anl02f1='Y';
if PARAMCD in ("CO", "CARBXHGB") and ATPT="DAY 5 - 20:00 - 21:30" and PPROT1FL="Y" then output;
else if PARAMCD in ("UMHBMCRE", "U3HPMCRE", "USPMACRE","UNNALCRE") and upcase(avisit) eq "DAY 5" and PPROT1FL="Y" then
output;
else if PARAMCD in ("CO", "CARBXHGB", "UMHBMCRE", "U3HPMCRE", "USPMACRE","UNNALCRE") and upcase(avisit) eq "DAY 90" an
d PPROT4FL="Y" then output;
else if (upcase(avisit) ="DAY 5" and PPROT1FL="Y") or (upcase(avisit)="DAY 90" and PPROT4FL="Y") then do;
  if paramcd in (
    "U1OHPCRE", "UNNNCRE", "U4ABPCRE", "U1NACRE", "U2NACRE", "UOTOLCRE", "UCEMACRE", "UHEMACRE", "UBAPCRE", "UHMPMCRE", "U
SBMACRE", "UNEQCRE",
    "U3HPM24U", "UMHBM24U", "USPMA24U", "UNNAL24U", "U1OHP24U" , "UNNN24U", "U4ABP24U", "U1NA24U","U2NA24U","UOTOL24U", "UC
EMA24U", "UHEMA24U", "UBAP24U",
    "UHMPM24U", "USBMA24U", "UNEQ24U", "UNNNCRE") then output;
end;

/*****
where anl02f1='Y';

if ((AVISIT ="DAY 5" and PPROT1FL="Y") or (AVISIT="DAY 90" and PPROT4FL="Y")) and paramcd in
("U1OHPCRE", "U4ABPCRE", "U1NACRE", "U2NACRE", "UOTOLCRE", "UCEMACRE", "UHEMACRE", "UBAPCRE", "UHMPMCRE", "USBMACRE", "
UNEQCRE",
"U3HPM24U", "UMHBM24U", "USPMA24U", "UNNAL24U", "U1OHP24U" , "UNNN24U", "U4ABP24U", "U1NA24U","U2NA24U","UOTOL24U",
"UCEMA24U", "UHEMA24U", "UBAP24U", "UHMPM24U", "USBMA24U", "UNEQ24U" "UNNNCRE") then output;

  if PARAMCD in ("CO") and ATPT="DAY 5 - 20:00 - 21:30" and PPROT1FL="Y" then output;
  if PARAMCD in ("CO") and (AVISIT="DAY 90" and PPROT4FL="Y") then output;
*****/

run;

/*****
data anldata_1;
set adam.ADBX;
if PARAMCD="CARBXHGB" and ATPT="DAY 5 - 20:00 - 21:30" and PPROT1FL="Y" and anl02f1="Y";
run;

data anldata11;
set adam.ADBX;
if PARAMCD="CARBXHGB" and AVISIT="DAY 90" and PPROT4FL="Y" and anl02f1="Y";
run;

data anldata2;
set adam.ADBX;
if PARAMCD in ("UMHBMCRE", "U3HPMCRE", "USPMACRE","UNNALCRE") and AVISIT="DAY 5" and PPROT1FL="Y" and anl02f1="Y" ;
run;

data anldata3;
set adam.ADBX;
if PARAMCD in ("UMHBMCRE", "U3HPMCRE", "USPMACRE","UNNALCRE") and AVISIT="DAY 90" and PPROT4FL="Y" and anl02f1="Y";
run;
*****/
data anldata1;
set anldata1 /*anldata_1 anldata11 anldata2 anldata3*/;
if paramcd ="CO" then method=2;
else method=1;
if aval>0 then logaval=log(aval);
if base>0 then logbase=log(base);
run;

data anldata1;
set anldata1;
if paramcd="CO" then delete;
run;

data anldata1;
set anldata1;
  if paramcd='UMHBMCRE' then paramn=100;
else if paramcd='U3HPMCRE' then paramn=99;
else if paramcd='USPMACRE' then paramn=98;

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else if paramcd='CARBXHGB' then paramn=97;
else if paramcd='UNNALCRE' then paramn=96;
else if paramcd='U10HPCRE' then paramn=95;
else if paramcd='UNNNCRE' then paramn=94;
else if paramcd='U4ABPCRE' then paramn=93;
else if paramcd='U1NACRE' then paramn=92;
else if paramcd='U2NACRE' then paramn=91;
else if paramcd='UOTOLCRE' then paramn=90;
else if paramcd='UCEMACRE' then paramn=89;
else if paramcd='UHEMACRE' then paramn=88;
else if paramcd='UBAPCRE' then paramn=87;
else if paramcd='UHMPMCRE' then paramn=86;
else if paramcd='USBMACRE' then paramn=85;
else if paramcd='UNEQCRE' then paramn=84;

else if paramcd='UMHBM24U' then paramn=100-50;
else if paramcd='U3HPM24U' then paramn=99-50;
else if paramcd='USPMA24U' then paramn=98-50;
else if paramcd='UNNAL24U' then paramn=96-50;
else if paramcd='U10HP24U' then paramn=95-50;
else if paramcd='UNNN24U' then paramn=94-50;
else if paramcd='U4ABP24U' then paramn=93-50;
else if paramcd='U1NA24U' then paramn=92-50;
else if paramcd='U2NA24U' then paramn=91-50;
else if paramcd='UOTOL24U' then paramn=90-50;
else if paramcd='UCEMA24U' then paramn=89-50;
else if paramcd='UHEMA24U' then paramn=88-50;
else if paramcd='UBAP24U' then paramn=87-50;
else if paramcd='UHMPM24U' then paramn=86-50;
else if paramcd='USBMA24U' then paramn=85-50;
else if paramcd='UNEQ24U' then paramn=84-50;
else paramn=9999;

run;

proc sort data=anldata1 out=check(keep=paramn avisitn avisit param paramcd method) nodupkey;
by paramn avisitn avisit;
run;

data trt_1;
set trt;
run;

data anldata1;
set anldata1;
if TRTP="THSm2.2" then trtcd=1;
else if TRTP="mCC" then trtcd=2;
else if TRTP="SA" then trtcd=3;
run;

data check;
set check;
ord=_n_;
run;

proc sort data=check;
by ord;
run;

%*cal_summary_pvalue(wher=1, outnum=1, var=aval, in=anldata1, pflg=1);

data rep;
run;

data _null_;
set check;
call execute ('%cal_summary_pvalue(wher=%str(avisitn='||avisitn||' and paramn='||paramn||' ), outnum='||ord||', var
=logaval, in=anldata1, method='||method||');');
run;

data frep;
set rep;
ord=ORDNUM;
run;

data frep;
merge frep(in=a) check;
by ord;
if a;
if avisitn>.;
run;

data frep;
set frep;
if sord in (1, 2);
keep param paramn paramcd avisit avisitn _4 _5 sord ordnum;
run;

```



```

proc transpose data=frep out=frep_1 prefix=r1_;
by ordnum paramn param paramcd avisitn avisit;
id sord;
var _4;
run;

proc transpose data=frep out=frep_2 prefix=r2_;
by ordnum paramn param paramcd avisitn avisit;
id sord;
var _5;
run;

data final;
merge frep_1 frep_2;
by ordnum paramn param paramcd avisitn avisit;
run;

data final1;
set final;
rate1=input(scan(r1_1, 1, "("), best.);
rate2=input(scan(r2_1, 1, "("), best.);
low1=input(scan(r1_2, 1, "("), best.);
low2=input(scan(r2_2, 1, "("), best.);
up1=input(scan(r1_2, 2, "("), best.);
up2=input(scan(r2_2, 2, "("), best.);

if param="NEQ (mg)" then param="NEQ (mg)"          ";
run;

data odata.&prgname;
set final1;
run;
/*
ods csv file="%csvdata.&outname..csv";

proc print data= odata.&prgname;
run;

ods csv close;
*/

data fig1;
*length param $60;
set final1;
if avisitn=105 and ((index(param, "creat"))) or paramcd="CARBXHGB";
run;

data fig2;
*length param $60;
set final1;
if avisitn=105 and not ((index(param, "creat"))) or paramcd="CARBXHGB";
run;

data fig3;
*length param $60;
set final1;
if avisitn=190 and ((index(param, "creat"))) or paramcd="CARBXHGB";
run;

data fig4;
*length param $60;
set final1;
if avisitn=190 and not ((index(param, "creat"))) or paramcd="CARBXHGB";
run;

*ods tagsets.ExcelXP path="%csvdata." file="%&outname..xls" STYLE = XLSANSRINTER RS = NONE;

ods listing close;

ods tagsets.excelxp file = "%csvdata.\&outname..xml" style = sansprinter;

ods tagsets.ExcelXP options(sheet_name='Page 1');

proc print data=fig1;
var param paramcd avisitn avisit rate1 low1 up1;
run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 2');

proc print data=fig3;
var param paramcd avisitn avisit rate1 low1 up1;

```

```

run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 3');

proc print data=fig2;
var param paramcd avisitn avisit rate1 low1 up1;
run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 4');

proc print data=fig4;
var param paramcd avisitn avisit rate1 low1 up1;
run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 5');

proc print data=fig1;
var param paramcd avisitn avisit rate2 low2 up2;
run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 6');

proc print data=fig3;
var param paramcd avisitn avisit rate2 low2 up2;
run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 7');

proc print data=fig2;
var param paramcd avisitn avisit rate2 low2 up2;
run;
quit;

ods tagsets.ExcelXP options(sheet_name='Page 8');

proc print data=fig4;
var param paramcd avisitn avisit rate2 low2 up2;
run;
quit;

ods tagsets.ExcelXP close;

%macro mainloop(innum=, outnum=, text=, upline=, indata=, grpid=);

data fig&innum.;
set fig&innum.;
%if &grpid = 1 %then %do;
yord=_n_;
yord1=_n_;
%end;
%if &grpid = 2 %then %do;
yord=_n_;
yord1=_n_;
%end;
run;

proc sort data=fig&innum. out=fmt/*(keep=yord param)*/ nodupkey;
by yord param;
run;

data fmt;
length param $200;
set fmt;
param1=strip(param)/'||': "||strip(put(RATE&indata., 8.2))||" ("||strip(put(LOW&indata., 8.2))||", "||strip(put(up&indata., 8.2))||")"*/;
keep yord param1;
run;

data fmt;
length label $200;
set fmt;
fmtname="grp&innum&indata.f";
start=yord;
label=param1;
run;

```

```

data top;
length label $200;
fmtname="grp&innum&indata.f";
start=0;
label="";
output;
start=1;
label="";
output;
start=2;
label="";
output;
start=3;
label="";
output;
start=4;
label="";
output;
start=5;
label="";
output;

start=16;
label="";
output;
start=17;
label="";
output;
start=18;
label="";
output;
run;

data fmt;
set top fmt;
run;

proc sort data=fmt;
by start label;
run;

data fmt;
set fmt;
by start label;
if last.start;
run;

proc format cntlin=fmt;
run;

proc sort data=fig&innum. out=fmt1/*(keep=yord param)*/ nodupkey;
by yord param;
run;

data fmt1;
length param $200;
set fmt1;
param1=strip(put(RATE&indata., 8.2))||" ("||strip(put(LOW&indata., 8.2))||", "||strip(put(up&indata., 8.2))||")";
keep yord param1;
run;

data fmt1;
length label $200;
set fmt1;
fmtname="lgrp&innum&indata.f";
start=yord;
label=param1;
run;

data top;
length label $200;
fmtname="lgrp&innum&indata.f";
start=0;
label="";
output;
start=1;
label="";
output;
start=2;
label="";
output;
start=3;
label="";
output;

```

```

start=4;
label="";
output;
start=5;
label="";
output;
start=16;
label="";
output;
start=17;
label="";
output;
start=18;
label="";
output;
run;

data fmt1;
set top fmt1;
run;

proc sort data=fmt1;
by start label;
run;

data fmt1;
set fmt1;
by start label;
if last.start;
run;

proc format cntlin=fmt1;
run;

data anno3;
set fig&innum.;
length function color $ 8;
retain xsys hsys '2';
ysys="2"; hsys="3"; size=0.42;
color="black"; function='move'; x=low&indata; y=yord; line=1; output;
color="black"; function='draw'; x=up&indata; y=yord; line=1; output;

run;

data anno3;
set anno3;
%if &indata = 1 %then %do;
if function='draw' and x>150 then do;
x=150;
output;
color="black"; function='move'; x=145; y=yord+0.4; line=1; output;
color="black"; function='draw'; x=150; y=yord; line=1; output;
color="black"; function='draw'; x=145; y=yord-0.4; line=1; output;
end;
else do;
output;
end;
%end;
%if &indata = 2 %then %do;
if function='move' and x>200 then x=200;
if function='draw' and x>200 then do;
x=200;
output;
color="black"; function='move'; x=195; y=yord+0.4; line=1; output;
color="black"; function='draw'; x=200; y=yord; line=1; output;
color="black"; function='draw'; x=195; y=yord-0.4; line=1; output;
end;
else do;
output;
end;
%end;

run;

data anno2;
length function color $ 8;
retain hsys '2';
ysys="2"; hsys="3"; size=0.45;
xsys="3";
color="black"; function='move'; x=0; y=0; line=1; output;
color="black"; function='draw'; x=98; y=0; line=1; output;
color="black"; function='move'; x=0; y="&upline."; line=1; output;
color="black"; function='draw'; x=98; y="&upline."; line=1; output;

```

```

xsy="2";
size=0.4;
%if &indata = 1 %then %do;
color="black"; function='move'; x=50; y=0; line=2; output;
color="black"; function='draw'; x=50; y="&upline."; line=2; output;
color="black"; function='move'; x=100; y=0; line=1; output;
color="black"; function='draw'; x=100; y="&upline."; line=1; output;
%end;
%if &indata = 2 %then %do;
color="black"; function='move'; x=100; y=0; line=1; output;
color="black"; function='draw'; x=100; y="&upline."; line=1; output;
%end;

run;

data anno1;
length function color $ 8 text $100;
retain xsy '2';
hsy="3"; size=3;
position="6";
ysy="3"; xsy="3";
function='label'; x=10; y=96; color="black"; text="Parameter"; output;
function='label'; x=50; y=96; color="black"; text="&text."; output;
function='label'; x=73; y=98.9; color="black"; text="Geometric Mean"; output;
function='label'; x=75; y=96; color="black"; text="Ratio (95% CI)"; output;
run;

data anno4;
set fig1;
length function color $ 8;
retain xsy hsy '2';
hsy="3"; size=0.6;
position="6";
ysy="2"; xsy="3"; size=0.5;
function='label'; x=2; y=yord; color="black"; text=strip(param); output;
run;

data anno_&outnum.;
set anno3 anno2 anno1/*anno4*/;
run;

proc format;
value vvvvf
-200=" "
-150=" "
-100=" "
-50=" ";
run;

%mend;

%mainloop(innum=1, outnum=1, text=Day 5, upline=18, indata=1, grpid=1);
%mainloop(innum=2, outnum=2, text=Day 5, upline=17, indata=1, grpid=2);
%mainloop(innum=3, outnum=3, text=Day 90, upline=18, indata=1, grpid=1);
%mainloop(innum=4, outnum=4, text=Day 90, upline=17, indata=1, grpid=2);

%mainloop(innum=1, outnum=5, text=Day 5, upline=18, indata=2, grpid=1);
%mainloop(innum=2, outnum=6, text=Day 5, upline=17, indata=2, grpid=2);
%mainloop(innum=3, outnum=7, text=Day 90, upline=18, indata=2, grpid=1);
%mainloop(innum=4, outnum=8, text=Day 90, upline=17, indata=2, grpid=2);

%macro cal(hsize=, vsize=, innum=, innum1=, outn=, xlabel=, xmin=, xmax=, ymax=);

options /*leftmargin=0.2cm topmargin=0.1cm rightmargin=0.2cm bottommargin=1cm*/
nodate nonumber nobyline;
ods results off;

%let startobs = 1;
%let eof = 0;
%let imageCnt = 1;

/*****
* handle graph size -> transform to cm when inches are specified
*****/;

%let vunit=%upcase(%scan(&vsize,-1,' 0123456789. '));
%let hunit=%upcase(%scan(&hsize,-1,' 0123456789. '));
%if &vunit=IN or &vunit=INCH %then %let vsize=%sysevalf(%scan(&vsize,1,%str( icIC))*2.58);
%if &hunit=IN or &hunit=INCH %then %let hsize=%sysevalf(%scan(&hsize,1,%str( icIC))*2.58);
%if &vunit=CM %then %let vsize=%sysevalf(%scan(&vsize,1,%str( icIC))*1);
%if &hunit=CM %then %let hsize=%sysevalf(%scan(&hsize,1,%str( icIC))*1);

```

```

ods listing /*image_dpi=50 */ gpath="&opath";
ods graphics on / imageName = "f_&outn."
                    imagefmt = png
                    border    = off
                    scale     = no
                    reset     = index
                    width     = 6 cm
                    height    = 4 cm;
ods escapechar="é";

filename graphout "&opath\&outname._&outn..png";
goptions reset=all device=png gsfname=graphout ftext="Arial/bold" htext=2 hsize=6.25 in vsize=4.9 in;

axis1 offset=(0, 0) label=("THSm2.2/mCC(%) " font="Bold")
                    width=1 minor=none major=none order=&xmin. to &xmax. by 50 /*origin=(0, 0)*/
                    ;
/* reformat=(angle=270 j=r 'xxxxxx') */
axis2 offset=(0, 0) length=3.8 in label=(angle=90 " " justify=left font="Arial") value=(justify=left font="Arial")
ial")
                    width=1 minor=none major=none order=0 to &ymin. by 1
                    ;
axis3 offset=(0, 0) /*length=4 in */ label=(angle=90 " " font="Arial") value=(justify=left font="Arial")
                    width=1 minor=none major=none order=0 to &ymin. by 1
                    ;

/*reformat=(j=1 " &title. = &refline. ")*/

/* Define the symbol characteristics */
symbol1 interpol=none color=black w=4 value=circle;
symbol2 interpol=none color=black w=4 value=circle;

/* Plot the error bars using the HILOCTJ interpolation */
/* and overlay symbols at the means. */

proc gplot data=fig&innum.;
plot
    yord*rate1
    /haxis=axis1 vaxis=axis2 anno=anno_&innum1. vref=0 &ymin. nolegend;
format rate1 vvvvf. yord grp&innum.1f.;
plot2
    yord1*rate1
    /vaxis=axis3;
format rate1 vvvvf. yord1 lgrp&innum.1f.;

run;
quit;

proc greplay igout=work.gseg nofs;
delete _all_;
run;
quit;

ods listing close;
ods graphics off;
%mend;

%cal(hsize=4 in, vsize=6 in, innum=1, innum1=1, outn=1, xmin=0, xmax=150, ymax=18);
%cal(hsize=4 in, vsize=6 in, innum=3, innum1=3, outn=2, xmin=0, xmax=150, ymax=18);
%cal(hsize=4 in, vsize=6 in, innum=2, innum1=2, outn=3, xmin=0, xmax=150, ymax=17);
%cal(hsize=4 in, vsize=6 in, innum=4, innum1=4, outn=4, xmin=0, xmax=150, ymax=17);

%macro cal1(hsize=, vsize=, innum=, innum1=, outn=, xlabel=, xmin=, xmax=, ymax=);

options /*leftmargin=0.2cm topmargin=0.1cm rightmargin=0.2cm bottommargin=1cm*/
nodate nonumber nobyline;
ods results off;

%let startobs = 1;
%let eof      = 0;
%let imageCnt = 1;

/*****

* handle graph size -> transform to cm when inches are specified

*****/;

%let vunit=%upcase(%scan(&vsize,-1,' 0123456789. '));
%let hunit=%upcase(%scan(&hsize,-1,' 0123456789. '));
%if &vunit=IN or &vunit=INCH %then %let vsize=%sysevalf(%scan(&vsize,1,%str( icIC))*2.58);
%if &hunit=IN or &hunit=INCH %then %let hsize=%sysevalf(%scan(&hsize,1,%str( icIC))*2.58);
%if &vunit=CM %then %let vsize=%sysevalf(%scan(&vsize,1,%str( icIC))*1);
%if &hunit=CM %then %let hsize=%sysevalf(%scan(&hsize,1,%str( icIC))*1);

```

```

ods listing /*image_dpi=50*/ gpath="&opath";
ods graphics on / imageName = "f_&outn."
                imagefmt = png
                border   = off
                scale    = no
                reset    = index
                width     = 6 cm
                height    = 4 cm;

ods escapechar="é";

filename graphout "&opath\&outname._&outn..png";
goptions reset=all device=png gsfname=graphout ftext="Arial/bold" htext=2 hsize=6.25 in vsize=4.9 in;

axis1 offset=(0, 0) label=("THSm2.2/SA(%)" font="Bold")
      width=1 minor=none major=none order=&xmin. to &xmax. by 50 /*origin=(0, 0)*/
      ;
/* rellabel=(angle=270 j=r '        xxxxxx        ') */
axis2 offset=(0, 0) length=3.8 in label=(angle=90 " " justify=left font="Arial") value=(justify=left font="Ar
ial")
      width=1 minor=none major=none order=0 to &ymax. by 1
      ;
axis3 offset=(0, 0) /*length=4 in */ label=(angle=90 " " font="Arial") value=(justify=left font="Arial")
      width=1 minor=none major=none order=0 to &ymax. by 1
      ;

/*rellabel=(j=1 " &title. = &refline. ")*/

/* Define the symbol characteristics */
symbol1 interpol=none color=black w=4 value=circle;
symbol2 interpol=none color=black w=4 value=circle;

/* Plot the error bars using the HILOCTJ interpolation */
/* and overlay symbols at the means. */

proc gplot data=fig&innum.;
plot
  yord*rate2
  /haxis=axis1 vaxis=axis2 anno=anno_&innum1. vref=0 &ymax. nolegend;
format rate1 vvvvf. yord grp&innum.2f.;
plot2
  yord1*rate2
  /vaxis=axis3;
format rate1 vvvvf. yord1 lgrp&innum.2f.;

run;
quit;

proc greplay igout=work.gseg nofs;
delete _all_;
run;
quit;

ods listing close;
ods graphics off;
%mend;

%cal1(hsize=4 in, vsize=6 in, innum=1, innum1=5, outn=5, xmin=50, xmax=200, ymax=18);
%cal1(hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=6, xmin=50, xmax=200, ymax=18);
%cal1(hsize=4 in, vsize=6 in, innum=2, innum1=6, outn=7, xmin=50, xmax=200, ymax=17);
%cal1(hsize=4 in, vsize=6 in, innum=4, innum1=8, outn=8, xmin=50, xmax=200, ymax=17);

%macro rtfoutput;
option nobyline nodate nonumber orientation=portrait;

ods listing close;
%trtrtf_fig(pgmname=&outname., pgmid=1, new=0, style=, bookmark=%lowcase(&outname.));
ods escapechar="é";

title;

%let n_plots=8;
%let orient=portrait;

data _rmtext;
format text $12.;
text = 'éR"\par\ "';
%do i = 1 %to &n_plots;
output;
%end;
run;

data _rmtext;
set _rmtext;
pagen=_n_;

```

```

run;

%local tblwidth;
%let tblwidth = 6.25;

%do i = 1 %to &n_plots;

proc report data = _rmtext nowd;
  column pagen text;
  where pagen = &i;
  define pagen /order order=internal noprint;
  define text / display style(column)=[cellwidth=&tblwidth.in] ' ';
  compute text;
    *line_count + 1;
    * if line_count = &i then do;
      call define(_row_, 'STYLE', %str(%')STYLE=[just=center postimage="&opath\&&outname._&i..png"]%str(%'));
    * end;
  endcomp;

  break after pagen/page;

compute before pagen /style=[fontweight=bold fontsize=3.75];
line @1 "&title1 &title2";
endcomp;

compute after pagen /style=[fontsize=1.75];
line @1 "Note: mCC = Conventional menthol cigarettes; SA = Smoking abstinence; THSm2.2 = Tobacco Heating System 2.2 Ment
hol.";
line @1 "Note: Symbols < or > mark the estimate or CI is outside of the reporting scale.";
line @1 " ";
line @1 "&APPENDIX.";
line @1 "Study ID: ZRHM-REXA-07-JP";
line @1 "Program: &fprgname..sas      Status: &repversion./&fdate.      Page &i. of 8";
endcomp;

run;

%end;

/*
proc datasets nolist;
  delete _rmtext;
quit;
*/
ods rtf close;
ods listing;

%mend;
%rtfoutput;

```