

```

*****;
* Project          : ZRHM-REXA-07-JP
*
* Program name     : F15010102.sas
*
* Author           : L. Yan
*
* Date created      : 05/20/2015
*
* Purpose          : F15010102
*
* Revision History :
*
* Date            Author      Ref      Revision (Date in YYYYMMDD format)
*
*****;

%let prgname=F15010102_ZRHM_REXA_07_JP_V1;

options mprint;

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

%titlecsv(prgname=&prgname., version=5);

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

options missing="";

proc sort data=adam.adbx out=check (keep=paramcd paramn param) nodupkey;
by paramn paramcd param;
where paramcd in (
"CARBXHGB"
"UMHBMCRE"
"U3HPMCRE"
"USPMACRE"
"UNNALCRE"
"U10HPCRE"
"UNNCRE"
"U4ABPCRE"
"U1NACRE"
"U2NACRE"
"UOTOLCRE"
"UCEMACRE"
"UHEMACRE"
"UBAPCRE"
"UHMPMCRE"
"USBMACRE"
"UNEQCRE"
"CO"
);
run;

data check;
set check;
    if paramcd='UMHBMCRE' then order=1;
else if paramcd='U3HPMCRE' then order=2;
else if paramcd='USPMACRE' then order=3;
else if paramcd='CARBXHGB' then order=4;
else if paramcd='UNNALCRE' then order=5;
else if paramcd='CO' then order=6;
else if paramcd='U10HPCRE' then order=7;
else if paramcd='UNNCRE' then order=8;
else if paramcd='U4ABPCRE' then order=9;
else if paramcd='U1NACRE' then order=10;
else if paramcd='U2NACRE' then order=11;
else if paramcd='UOTOLCRE' then order=12;
else if paramcd='UCEMACRE' then order=13;
else if paramcd='UHEMACRE' then order=14;
else if paramcd='UBAPCRE' then order=15;
else if paramcd='UHMPMCRE' then order=16;
else if paramcd='USBMACRE' then order=17;
else if paramcd='UNEQCRE' then order=18;
keep paramn order;
run;

proc print data=check;
run ;

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%macro mainloop(paramn=, outn=, sizn=, ypos=, flg=, where=);

data adpc;
set adam.adbx;
if (trta in ("mCC" "THSm2.2" "SA") and aval>. ) and paramn in (&paramn.) and (anl02fl="Y"
and ((PPROT1FL="Y" and 100<avisitn<=105 and anl02fl="Y") or (PPROT1FL="Y" and 100=avisitn and anl02fl="Y")
or (PPROT2FL="Y" and 130=avisitn and anl02fl="Y") or (PPROT3FL="Y" and 160=avisitn and anl02fl="Y")
or (PPROT4FL="Y" and 190=avisitn and anl02fl="Y")));
run;

data adpc;
set adpc;
if paramn= 1 and atpt ne "DAY 0 - 20:00 - 21:30" and avisitn=100 then delete;
if paramn= 1 and atpt ne "DAY 1 - 20:00 - 21:30" and avisitn=101 then delete;
if paramn= 1 and atpt ne "DAY 2 - 20:00 - 21:30" and avisitn=102 then delete;
if paramn= 1 and atpt ne "DAY 3 - 20:00 - 21:30" and avisitn=103 then delete;
if paramn= 1 and atpt ne "DAY 4 - 20:00 - 21:30" and avisitn=104 then delete;
if paramn= 1 and atpt ne "DAY 5 - 20:00 - 21:30" and avisitn=105 then delete;

*if basetype ne "TIME MATCHED DAY 0 (2)" and paramcd ="CO" then delete;
if paramn= 2 and atpt ne "DAY 5 - 20:00 - 21:30" and avisitn=105 then delete;
if ANL02FL="" and avisitn=105 then delete;
if aval>0 then logaval=log(aval);
run;

proc sort data=adpc out=param(keep=param) nodupkey;
by param;
run;

%global param_&paramn.;

data param;
set param;
call symput("param_&paramn.", strip(param));
run;

data adpc;
set adpc;
if aval>0 then logaval=log(aval);
run;

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

proc sort data=adpc out=adpc1;
by trtcd avisitn;
where paramcd ne "CO";
run;

proc means data = adpc1 noprint;
by trtcd avisitn paramn;
var logaval;
output out=xlab1 n=n mean=mean lclm=lclm uclm=uclm std=std;
run;

data xlab1 ;
set xlab1;
Estimate1 = exp(mean); /* Ratio of geometric mean */
LowerCL = exp(lclm); /* 95% CI lower bound */
UpperCL = exp(uclm); /* 95% CI upper bound */
run;

proc sort data=adpc out=adpc2;
by trtcd avisitn;
where paramcd eq "CO";
run;

proc means data = adpc2 noprint;
by trtcd avisitn paramn;
var aval;
output out=xlab1_ n=n mean=mean lclm=lclm uclm=uclm std=std;
run;

data xlab1_ ;
set xlab1_;
Estimate1 = mean; /* Ratio of geometric mean */
LowerCL = lclm; /* 95% CI lower bound */
UpperCL = uclm; /* 95% CI upper bound */
run;

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/* Reshape the data to contain three Y values for */
/* each X for use with the HILOC interpolation. */
data reshape_&paramn._&outn(keep=xvar yvar mean trtcd avisitn Estimate1 LowerCL UpperCL paramn);
  set xlab1 xlab1_;
  mean=Estimate1;
  if avisitn<=105 then xvar=avisitn-100;
  else if avisitn=130 then xvar=10;
  else if avisitn=160 then xvar=15;
  else if avisitn=190 then xvar=20;

  yvar=Estimate1;
  output;

  yvar=LowerCL;
  output;

  yvar=UpperCL;
  output;
run;

```

```

proc format;
value visitf
-1=" "
0=" "
6=" "
7=" "
8=" "
11=" "
12=" "
13=" "
14=" "
16=" "
17=" "
18=" "
19=" "
10="30"
15="60"
20="90"
9=" ";
run;

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%let annopos=6;
%let xpos=60;
%let yypos=9.5;

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```

data anno3;
length function color $ 8;
retain xsys hsys '3';
ysys="3"; size=0.3;
color="blue"; function='move'; x=30; y=&annopos.; line=1; output;
color="blue"; function='draw'; x=35; y=&annopos.; line=1; output;
color="red"; function='move'; x=50; y=&annopos.; line=3; output;
color="red"; function='draw'; x=55; y=&annopos.; line=3; output;
size=0.4;
color="green"; function='move'; x=65; y=&annopos.; line=33; output;
color="green"; function='draw'; x=70; y=&annopos.; line=33; output;
size=0.3;
color="black"; function='move'; x=28; y=&annopos.-2.5; line=1; output;
color="black"; function='draw'; x=77; y=&annopos.-2.5; line=1; output;
color="black"; function='draw'; x=77; y=&annopos.+2; line=1; output;
color="black"; function='draw'; x=28; y=&annopos.+2; line=1; output;
color="black"; function='draw'; x=28; y=&annopos.-2.5; line=1; output;
run;

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data anno8;
length function color $ 8;
retain xsys '2';
ysys="3"; hsys="3"; size=0.3;
color="black"; function='move'; x=0; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=0; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=1; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=1; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=2; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=2; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=3; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=3; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=4; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=4; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=5; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=5; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=10; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=10; y=29+1.05-&yypos.; line=1; output;

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color="black"; function='move'; x=15; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=15; y=29+1.05-&yypos.; line=1; output;
color="black"; function='move'; x=20; y=28.3+1.2-&yypos.; line=1; output;
color="black"; function='draw'; x=20; y=29+1.05-&yypos.; line=1; output;

run;

data anno4;
length function color $8 text style $80;
retain xsys hsys '3';
ysys="3"; position="6";

color="black"; function='label';
%if &paramn.=2 %then %do; x=2.2; %end;
%else %do; x=3.1; %end;
y=27.9-&yypos.+0.35; text="Baseline"; output;
function='label'; x=36; y=&annopos+0.5; color="black"; text="THSm2.2"; output;
function='label'; x=56; y=&annopos+0.5; color="black"; text="mCC"; output;
function='label'; x=72; y=&annopos+0.5; color="black"; text="SA"; output;
size=2.0; color="blue"; function='SYMBOL'; x=32.5; y=&annopos.; style='marker'; text='Z'; output;
size=2.5; color="red"; function='SYMBOL'; x=52.5; y=&annopos.; style='marker'; text='U'; output;
size=2.0; color="green"; function='SYMBOL'; x=67.5; y=&annopos.; style='marker'; text='C'; output;

run;

data anno5;
set xlab1 xlab1_;
length function color $8 text style $80 size 8;
retain xsys '2';
ysys="2"; hsys="3"; position="6";
y=Estimate1;
if avisitn<=105 then x=avisitn-100;
else if avisitn=130 then x=10;
else if avisitn=160 then x=15;
else if avisitn=190 then x=20;
size=2.0;
if trtcd=1 then do; color="blue"; function='SYMBOL'; style='marker'; text='Z'; output; end;
size=2.5;
if trtcd=2 then do; color="red"; function='SYMBOL'; style='marker'; text='U'; output; end;
size=2.0;
if trtcd=3 then do; color="green"; function='SYMBOL'; style='marker'; text='C'; output; end;

run;

data anno_&paramn._&outn;
set anno3 anno4 anno5 anno8;
run;

%mend;

%mainloop(paramn= 1, outn=1, size=1000, ypos=95, flg=fasfl, where=1);
%mainloop(paramn= 2, outn=1, size=1000, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=10, outn=1, size=0.18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=13, outn=1, size=180, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=16, outn=1, size=0.18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=19, outn=1, size=18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=22, outn=1, size=0.18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=25, outn=1, size=18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=38, outn=1, size=180, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=41, outn=1, size=18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=45, outn=1, size=180, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=47, outn=1, size=1.8, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=52, outn=1, size=18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=55, outn=1, size=1.8, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=58, outn=1, size=18, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=62, outn=1, size=180, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=66, outn=1, size=180, ypos=95, flg=fasfl, where=1);
%mainloop(paramn=85, outn=1, size=18, ypos=95, flg=fasfl, where=1);

data ototal;
run;

ods tagsets.ExcelXP path="&csvdata." file="&outname..xml" style=Printer;

%macro excellloop(paramn=, pagen=);

ods tagsets.ExcelXP options(sheet_name="Page &pagen.");

proc print data=Reshape_&paramn._1;
var trtcd avisitn paramn estimate1 lowercl uppercl xvar yvar;
run;
quit;

data ototal;
set ototal Reshape_&paramn._1;
run;

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%mend;

%excelloop(paramn= 1, pagen=6);
%excelloop(paramn= 2, pagen=4);
%excelloop(paramn=10, pagen=10);
%excelloop(paramn=13, pagen=7);
%excelloop(paramn=16, pagen=11);
%excelloop(paramn=19, pagen=2);
%excelloop(paramn=22, pagen=9);
%excelloop(paramn=25, pagen=13);
%excelloop(paramn=38, pagen=14);
%excelloop(paramn=41, pagen=16);
%excelloop(paramn=45, pagen=1);
%excelloop(paramn=47, pagen=18);
%excelloop(paramn=52, pagen=5);
%excelloop(paramn=55, pagen=8);
%excelloop(paramn=58, pagen=12);
%excelloop(paramn=62, pagen=17);
%excelloop(paramn=66, pagen=3);
%excelloop(paramn=85, pagen=15);

ods tagsets.ExcelXP close;

data odata.&prgname;
set ototal;
if paramn>.;
run;

proc format;
value yfmt
0.1=" "
1=" "
10=" "
100=" "
1000=" "
10000=" "
100000=" ";
run;

%macro call1(paramn=, outputn=, hsize=, vsize=, innum=, innum1=, outn=, xlabel=, xmin=, xmax=, ymin=, ymax=, by=);

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=100*/ gpath="&opath";
ods graphics on / imageName = "lineplot"
imagefmt = png
border = off
scale = no
reset = index
width = 6 cm
height = 4 cm;
ods escapechar="é";

filename graphout "&opath\&outname._&outputn..png";
goptions reset=all device=png gsfname=graphout ftext="Arial/bold" htext=2.5 hby=2.2 fby="Arial/bold" hsize=6.25 in vsize=4.9 in;

axis1 offset=(2 pct,2 pct) label=("Visit Day")
width=1 minor=none major=none origin=(, 1.0in) order=0 to &xmax. by 1
;
axis2 /*length=4.8 in */ label=(angle=90 "&param_&paramn")
width=1 minor=none order=&ymin. to &ymax. by &by.

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axis3          /*length=4.8 in */
               width=1 minor=none /*order=&ymin. to &ymax. by &by.*/ major=none
;

/* Define the symbol characteristics */
symbol1 interpol=hiloctj color=blue line=1 w=1 MODE=INCLUDE;
symbol2 interpol=hiloctj color=red line=3 w=1 MODE=INCLUDE;
symbol3 interpol=hiloctj color=green line=33 width=1.8 MODE=INCLUDE;

/* symbol4 interpol=none color=blue w=4 font=marker value=W;
symbol5 interpol=none color=red w=4 font=marker value=P;
symbol6 interpol=none color=green w=4 font=marker value=D;
*/

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

proc gplot data=reshape_&paramn._&outn;
    plot
        yvar*xvar=trtcd
        /haxis=axis1 vaxis=axis2 anno=anno_&paramn._&outn nolegend;
    format xvar visitf.;
    /* plot
        Estimate1*xvar=trtcd
        /haxis=axis1 vaxis=axis2 nolegend;
    format xvar visitf.;
*/
run;
quit;

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

ods listing close;
ods graphics off;

%mend;

%cal1(paramn= 1, outputn=6, hsize=4 in, vsize=6 in, innum=1, innum1=5, outn=1, xmin=0, xmax=20, ymin=0, ymax=26, by= 2
);
%cal1(paramn= 2, outputn=4, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=9, by=1);
%cal1(paramn=10, outputn=10, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=100, by=
10);
%cal1(paramn=13, outputn=7, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=220, by=2
0);
%cal1(paramn=16, outputn=11, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=26, by=2
);
%cal1(paramn=19, outputn=2, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=1000, by=
100);
%cal1(paramn=22, outputn=9, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=18, by=3)
;
%cal1(paramn=25, outputn=13, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=130, by=
10);
%cal1(paramn=38, outputn=14, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=6000, by
=1000);
%cal1(paramn=41, outputn=16, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=400, by=
50);
%cal1(paramn=45, outputn=1, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=1800, by=
200);
%cal1(paramn=47, outputn=18, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=11, by=1
);
%cal1(paramn=52, outputn=5, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=240, by=4
0);
%cal1(paramn=55, outputn=8, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=10, by=1)
;
%cal1(paramn=58, outputn=12, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=180, by=
30);
%cal1(paramn=62, outputn=17, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=7000, by
=1000);
%cal1(paramn=66, outputn=3, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=2400, by=
400);
%cal1(paramn=85, outputn=15, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=0, ymax=180, by=
30);

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

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

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title;

%let n_plots=18;
%let orient=landscape;

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

data _rmttext;
set _rmttext;
pagen=_n_;
run;

%local tblwidth;
%let tblwidth = 6.25;

%do i = 1 %to &n_plots;

proc report data = _rmttext 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;

compute before _page_ /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: Baseline is the last assessment prior to first product use in CC/THS 2.2 arms on Day 1 or last assessment
prior to 06:29 AM in SA arm on Day 1.";
line @1 "Baseline is summarized using the baseline data from the PP Set for Period 1.";
line @1 "Note: Arithmetic mean and 95% CI are plotted for Exhaled CO (ppm).";
line @1 " ";
line @1 "&APPENDIX.";
line @1 "Study ID: ZRHM-REXA-07-JP";
line @1 "Program: &fprgname..sas          Status: &repversion./&fdate.          Page &i. of 18";
endcomp;

run;

%end;

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

%mend;
%rtfoutput;

```