

```

*****
* Project      : ZRHM-REXA-07-JP
*
* Program name  : F15010210.sas
*
* Author       : L. Yan
*
* Date created  : 05/20/2015
*
* Purpose      : F15010210
*
* Revision History :
*
* Date      Author   Ref   Revision (Date in YYYYMMDD format)
* 14Dec2015  N Lama      Change from difference to geomean the original Wu code
                        modified so that it runs in PMI environment
*****

/* OUTPUT IN
\\Pmichlausas03\pass\ZRH\Unblinded Data - Team 2\ZRHM-REXA-07-JP\OUTPUT\Final
*/

%let root=\\Pmichlausas03\PASS\ZRH\Unblinded Data - Team 2;
%let study=ZRHM-REXA-07-JP;

```

```
%let MPATH=ZRHM-REXA-07-JP\transfer-Wu\20150806 Wu\05Aug2015\macros;
```

```
%let SDTMP=&root.\&study.\data\sdtm;
```

```
%let ADAMP=&root.\&study.\data\adam;
```

```
%let opath=&root.\&study.\output\final;
```

```
%let odata=&root.\&study.\output\data;
```

```
%let csvdata=&root.\&study.\output\excel;
```

```
libname sdtm "&root.\&study\data\sdtm";
```

```
libname adam "&root.\&study\data\adam";
```

```
libname odata "&root.\&study\output\data";
```

```
/** pre-setting **/;
```

```
options missing=' ' nocenter ls=132 ps=45
```

```
formchar='|_---|+|---+=|-/<>*' charcode nodate nonumber;
```

```
run;
```

```
options nofmterr;
```

```
options papersize=letter orientation=landscape nodate nonumber center missing="" nobyline;*/
```

```
%global fdate;
```

```
options nofmterr;
```

```
data _null_;
```

```

    call symput("fdate",left(put("&sysdate"d, date9.)));

run;


%let prgname=F15010210_ZRHM_REXA_07_JP_V1;


options mprint;


/*options sasautos=("W:\pmp07\macros" sasautos) notes; */

options sasautos=("\\Pmichlausas03\PASS\ZRH\Unblinded Data - Team 2\ZRHM-REXA-07-JP\transfer-
Wu\20150806 Wu\05Aug2015\macros" sasautos) notes;


/*%init(delivery=9); NL 14DEC2015 */

%include "F:\PASS\ZRH\Unblinded Data - Team 2\POOLING\titlecsv.sas";


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

%let outname=f1501021001-ZRHM-REXA-07-JP-hst-v1.0;

%put &title1;

%put &title2;

%put &APPENDIX;

%put &endpoint;

%put &outname.;

%let title1=Figure 15.1.2.10.1; /* Hardcoding NL 14DEC2015 */

%let title2=HST Parameters Averaged Over the Visit Geometric Mean and 95% CI - PP Set; /* Hardcoding
NL 16DEC2015 */

```

```
%let appendix=Appendix: 15.2.4.42.1;
```

```
options missing="";
```

```
proc sort data=adam.ADXT out=check (keep=paramcd paramn param) nodupkey;
```

```
by paramn paramcd param;
```

```
where paramcd in ("AAVGDI", "AAVGII", "AAVGPCI", "AAVGPMI", "AAVGQCI", "AAVGQMI", "AAVGVI",  
"AAVGWI", "ANPC",
```

```
"APFEQ", "APTI", "ASMINT", "ATDFI" , "ATDI", "ATII" , "ATVOL", "ATWI");
```

```
run;
```

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

```
data adpc;
```

```
set adam.ADXT;
```

```
if trta in ("mCC" "THSm2.2") 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 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;  
  
param=scan(param, 1, "(");  
  
    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;
```

```
by trtcd avisitn;
```

```
run;
```

```
proc means data = adpc noprint;
```

```
by trtcd avisitn paramn;
```

```
/*var aval; NL 15DEC2015*/
```

```
var logaval;
```

```
output out=xlab1 n=n mean=mean lclm=lclm uclm=uclm std=std;
```

```
run;
```

```
data xlab1 ;
```

```
set xlab1;
```

```
Estimate1 = exp(mean); /* NL 15DEC2015 Ratio of geometric mean */
```

```
LowerCL = exp(lclm); /* NL 15DEC2015 95% CI lower bound */
```

```
UpperCL = exp(uclm); /* NL 15DEC2015 95% CI upper bound */
```

```
run;
```

```
/* 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;
```

```
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;

%let annopos=6;

%let xpos=60;

%let yypos=9.5;

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;


```
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;
```

```
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;  
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'; x=3.1; y=27.9-&yypos.+0.3; 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;  
  
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;
```

```
run;
```

```
data anno5;  
  
set 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;


run;


data anno_&paramn._&outn;

set anno3 anno4 anno5 anno8;

run;


%mend;


%mainloop(paramn=50, outn=1, sizen=1000, ypos=95, flg=fasfl, where=1);

%mainloop(paramn=51, outn=1, sizen=1000, ypos=95, flg=fasfl, where=1);

%mainloop(paramn=52, outn=1, sizen=0.18, ypos=95, flg=fasfl, where=1);

%mainloop(paramn=53, outn=1, sizen=180, ypos=95, flg=fasfl, where=1);

%mainloop(paramn=54, outn=1, sizen=0.18, ypos=95, flg=fasfl, where=1);

%mainloop(paramn=55, outn=1, sizen=18, ypos=95, flg=fasfl, where=1);

```

```
%mainloop(paramn=56, outn=1, size=0.18, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=57, outn=1, size=18, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=58, outn=1, size=180, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=59, outn=1, size=18, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=60, outn=1, size=180, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=61, outn=1, size=1.8, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=62, outn=1, size=18, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=63, outn=1, size=1.8, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=64, outn=1, size=18, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=65, outn=1, size=180, ypos=95, flg=fasfl, where=1);  
%mainloop(paramn=66, outn=1, size=180, ypos=95, flg=fasfl, where=1);
```

```
data ototals;
```

```
run;
```

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

```
%macro excelloop(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;
```

```
%mend;
```

```
%excelloop(paramn=50, pagen=1);
```

```
%excelloop(paramn=51, pagen=2);
```

```
%excelloop(paramn=52, pagen=3);
```

```
%excelloop(paramn=53, pagen=4);
```

```
%excelloop(paramn=54, pagen=5);
```

```
%excelloop(paramn=55, pagen=6);
```

```
%excelloop(paramn=56, pagen=7);
```

```
%excelloop(paramn=57, pagen=8);
```

```
%excelloop(paramn=58, pagen=9);
```

```
%excelloop(paramn=59, pagen=10);
```

```
%excelloop(paramn=60, pagen=11);
```

```
%excelloop(paramn=61, pagen=12);
```

```
%excelloop(paramn=62, pagen=13);
```

```
%excelloop(paramn=63, pagen=14);
```

```
%excelloop(paramn=64, pagen=15);
```

```
%excelloop(paramn=65, pagen=16);
```

```
%excelloop(paramn=66, pagen=17);
```

```
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 cal1(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( iclC))*2.58);
%if &hunit=IN or &hunit=INCH %then %let hsize=%sysevalf(%scan(&hsize,1,%str( iclC))*2.58);

%if &vunit=CM          %then %let vsize=%sysevalf(%scan(&vsize,1,%str( iclC))*1);
%if &hunit=CM          %then %let hsize=%sysevalf(%scan(&hsize,1,%str( iclC))*1);


ods listing 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*/htext=1.5 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.*/order=0 to &ymax. by &by.

;
```

```
axis3 /*length=4.8 in */

width=1 minor=none /*order=&ymin. to &ymax. by &by.*/ major=none

;
```

```
/* Define the symbol characteristics */
```

```
symbol1 interpol=hiplotj color=blue line=1 w=1 ;
```

```
symbol2 interpol=hiplotj color=red line=3 w=1 ;
```



```

symbol3 interpol=hiplotj color=green line=33 w=1.5 ;

/* 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=50, outputn=1, hsize=4 in, vsize=6 in, innum=1, innum1=5, outn=1, xmin=0, xmax=20,  
ymin=10, ymax=22, by= 2);
```

```
%cal1(paramn=51, outputn=2, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=500, ymax=1200, by=200);
```

```
%cal1(paramn=52, outputn=3, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=30, ymax=70, by=10);
```

```
%cal1(paramn=53, outputn=4, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=1.2, ymax=2.2, by=0.2);
```

```
%cal1(paramn=54, outputn=5, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=10, ymax=40, by=10);
```

```
%cal1(paramn=55, outputn=6, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=20, ymax=40, by=5);
```

```
%cal1(paramn=56, outputn=7, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=30, ymax=60, by=10);
```

```
%cal1(paramn=57, outputn=8, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=140, ymax=240, by=20);
```

```
%cal1(paramn=58, outputn=9, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=8, ymax=18, by=2);
```

```
%cal1(paramn=59, outputn=10, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=160, ymax=280, by=20);
```

```
%cal1(paramn=60, outputn=11, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20,  
ymin=1200, ymax=3400, by=200);
```

```
%cal1(paramn=61, outputn=12, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=80, ymax=200, by=20);
```

```
%cal1(paramn=62, outputn=13, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=160, ymax=380, by=20);
```

```
%cal1(paramn=63, outputn=14, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=300, ymax=600, by=100);
```

```
%cal1(paramn=64, outputn=15, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=2, ymax=6, by=1);
```

```
%cal1(paramn=65, outputn=16, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=8, ymax=22, by=2);
```

```
%cal1(paramn=66, outputn=17, hsize=4 in, vsize=6 in, innum=3, innum1=7, outn=1, xmin=0, xmax=20, ymin=3, ymax=7, by=1);
```

```
%macro rtfoutput;
```

```
option nobyline nodate nonumber orientation=landscape;
```

```
ods listing close;
```

```
%trtrtf_fig(pgmname=&outname., pgmid=1, new=0, style=, bookmark=%lowercase(&outname.));
```

```
/* ods escapechar="é";NL 15Dec2015 */
```

```
%let fprgname=t1501021001_ZRHM-REXA-07_JP_v1_PMI; /* NL 15Dec2015 */
```

```
%let repversion=Final v1.0; /* -- NL Draft v0.1 Dec2015 */
```

```
title;
```

```
%let n_plots=17;

%let orient=landscape;


data _rmtext;

  format text $12.;

  /*text = 'éR"\par\ "'; NL 15Dec2015 */

  text = " ";

  %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;

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 Menthol.";

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: HST parameters are averaged over the visit day.";

line @1 " ";

line @1 "&APPENDIX.";

line @1 "Study ID: ZRHM-REXA-07-JP";

line @1 "Program: &fprgname..sas    Status: &repversion./&fdate.    Page &i. of 17";

```

```
endcomp;
```

```
run;
```

```
%end;
```

```
/*
```

```
proc datasets nolist;
```

```
    delete _rmtext;
```

```
quit;
```

```
*/
```

```
ods rtf close;
```

```
ods listing;
```

```
%mend;
```

```
%rtfoutput;
```