Purpose: Calibrate indicators for health conditions for institutionalized population building upon calibrated health indicators for community population for each of the 5 multiply imputed institutionalized datasets.

Run programs in the following order:

1.derive analysis multiples 09.sas

2.calibration09.sas

3.aggregate table 09.sas

```
/*****************************************************************
Program: 'derive_analysis_multiples_09.sas'
Purpose: Create analysis data sets for MCBS INST Calibration,
stacks calibrated community data and institutionalized data sets
Data in: Insert path for input datasets
Data out: Insert path for output dataset
*****************************************************************/

/*build data set for propensity modeling*/
libname sharedi "Insert file path";
libname analysis "Insert file path";
libname shared "Insert file path";

/*create temporary institutionalized data set from within imputed set-all 5
mults*/
data inst;
set sharedi.Inst_MCBS_i09;
I=1;
where pure = 1;
run;

proc freq data=inst;
table _mult_;
run;


%macro rename;
/*temporary imputed non-instutionalized*/
data noninst;
set shared.calibr3_mcbs09;
i = 0;
%do j = 1 %to 125;
cgar&j = cgar_cl&j;
%end;
drop cgar_cl1-cgar_cl125;
run;
%mend rename;
%rename;

proc means data=noninst nolabels;
run;

data ni_costs;
set shared.mcbs_ni09 (keep=baseid faccost instcost);
run;
```

```
proc sort data=ni_costs;
by baseid;
run;

/*sort for merging*/
proc sort data=inst;
by baseid;
run;

proc sort data=noninst;
by baseid;
run;

data noninst2;
merge noninst (in=a) ni_costs;
by baseid;
if a;
run;


/*stack institionalized and non institutionalized for analysis*/
data shared.ad_prop_mcbs_09;
set inst noninst2;
/*derive cost variable: cost - (faccost + instcost)*/
 newcost = cost - (faccost + instcost);
run;

%macro missing;
data shared.ad_prop_mcbs_09;
set shared.ad_prop_mcbs_09;
%do j = 1 %to 125;
if cgar&j = . then cgar&j = 0;
if i = 0 and cgar_ccl&j = . then cgar_ccl&j = 0;
%end;
run;
%mend missing;
%missing;

proc means data=shared.ad_prop_mcbs_09 nolabels;
run;

/*derive individual analysis data sets!*/
%macro analysis;
 %do j = 1 %to 5;
data analysis.mcbs09_mult&j;
set shared.ad_prop_mcbs_09;
```

```
where _mult_ = &j;
run;
%end;
%mend analysis;

%analysis;
```

```
/*****************************************************************
Program: 'calibration09.sas'
Purpose: Calibrate disease variables for institutionalized population
by multiple set
Data in: Insert path for input datasets
Data out: Insert path for output dataset
*****************************************************************/

libname analysis "Insert file path";
libname outfinal "Insert file path" ;
libname out1 "Insert file path";
libname out2 "Insert file path";
libname out3 "Insert file path";
libname out4 "Insert file path";
libname out5 "Insert file path";

proc printto log='Insert file path\macrolog09.log'
                        print='Insert file path\output09.output';
run;

%macro discrim;

%let iterate = 5; *set number of overall iterations;
%let nimp = 125; *# of cgars to calibrate;

%do mult=1 %to 5; *counter for multiples;

      data out&mult..working_full;
      set analysis.mcbs09_mult&mult;
      run;

%do iter = 1 %to &iterate; *start overall iterations;
%do k = 1 %to &nimp; *start cgar iterations;


/*1. subset data*/
/*2. compute principal components of Xs
            - conditional execution based on gender*/

            /*non gender specific subsets
                  -run for all vars that are not gender specific*/
            %if  &k ^= 9 and &k ^= 10 and &k ^=84 and &k ^= 85 and &k ^= 86
and &k ^= 102 and &k ^= 105 /*female*/
            and &k ^= 11 and &k ^= 82 and &k ^= 104 /*male*/
            %then %do;
```

```
                  data out&mult..sub0 out&mult..sub1;
                  set out&mult..working_full;
                        if cgar&k = 0 then output out&mult..sub0;
                        else if cgar&k = 1 then output out&mult..sub1;
                  run;

                  *screening for infectious disease. exclude flushot
pneushot;
                  %if &k = 4 %then %do;
                  proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
                  var newcost cgarsr43 povcat priv_insur mammogram hyst
pap_smear psa1yr prb_eat prb_dres dif_walk
                              dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat height
                              ed5 maritals didserv race age male died
inpatnights inpatstays comphealth;
                        ods output eigenvalues=out&mult..eigenx1;
                        ods select eigenvalues;
                  run;
                  %end;

                  *cataract, eye disorders. exclude cgarsr43;
                  %if &k = 43 or &k = 45 %then %do;
                  proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
                  var newcost povcat priv_insur mammogram hyst pap_smear
psa1yr prb_eat prb_dres dif_walk
                              dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                              ed5 maritals didserv race age male died
inpatnights inpatstays comphealth;
                        ods output eigenvalues=out&mult..eigenx1;
                        ods select eigenvalues;
                  run;
                  %end;

                  *all others;
                  %if &k ^= 4 and &k ^=43 and &k ^= 45 %then %do;
                  proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
                  var newcost cgarsr43 povcat priv_insur mammogram hyst
pap_smear psa1yr prb_eat prb_dres dif_walk
                              dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
```

```
                              ed5 maritals didserv race age male died
inpatnights inpatstays comphealth;
                        ods output eigenvalues=out&mult..eigenx1;
                        ods select eigenvalues;
                  run;
                  %end;

                  /*count # of eigein values*/
                  data out&mult..nprinx;
                        set out&mult..eigenx1;
                        if proportion>0;
                        count = 1;
                  run;

                  proc sql;
                        select n(count) into: nprinx from out&mult..nprinx;
                  quit;

            %end;


                  /*female gender specific subsets
                  - exclude males*/
            %if &k = 9 or &k = 10 or &k = 84 or &k = 85 or &k = 86 or &k =
102 or &k = 105 %then %do;

                  data out&mult..sub0 out&mult..sub1;
                  set out&mult..working_full;
                        if cgar&k = 0 and male = 0 then output
out&mult..sub0;
                        else output out&mult..sub1;
                  run;

                  /*female gender specific PCs of x covariates*/
                  *Breast cancer. exclude male, mammogram, psa1yr;
                  %if &k = 9 %then %do ;
                  proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur hyst pap_smear prb_eat
prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                  ods output eigenvalues=out&mult..eigenx1;
                  ods select eigenvalues;
```

```
                run;
                %end;

                *cervical cancer. exclude male, hyst, psa1yr pap_smear;
                %if &k = 10 %then %do;
                proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur mammogram prb_eat prb_dres
dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                ods output eigenvalues=out&mult..eigenx1;
                ods select eigenvalues;
                run;
                %end;

                *preg and child, contracept and procr. exclude male,
psa1yr, hyst;
                %if &k = 84 or &k = 86 %then %do;
                proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur mammogram pap_smear
prb_eat prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                ods output eigenvalues=out&mult..eigenx1;
                ods select eigenvalues;
                run;
                %end;

                *menopause. exclude male, psa1yr;
                %if &k = 85 %then %do;
                proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur mammogram hyst pap_smear
prb_eat prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                ods output eigenvalues=out&mult..eigenx1;
                ods select eigenvalues;
```

```
                run;
                %end;

                *screening breast cancer. exclude male, mammogram, psa1yr;
                %if &k = 102 %then %do;
                proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur hyst pap_smear  prb_eat
prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                ods output eigenvalues=out&mult..eigenx1;
                ods select eigenvalues;
                run;
                %end;

                *screening cervical cancer. exclude male, pap_smear,
psa1yr, hyst;
                %if &k = 105 %then %do;
                proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur mammogram pap_smear
prb_eat prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                ods output eigenvalues=out&mult..eigenx1;
                ods select eigenvalues;
                run;
                %end;

                /*count # of eigein values*/
                data out&mult..nprinx;
                      set out&mult..eigenx1;
                      if proportion>0;
                      count = 1;
                run;

                proc sql;
                      select n(count) into: nprinx from out&mult..nprinx;
                quit;

            %end;
```

```
            /*male gender specific subsets
                  - exclude females*/
            %if &k = 11 or &k = 82 or &k = 104 %then %do;

                  data out&mult..sub0 out&mult..sub1;
                  set out&mult..working_full;
                        if cgar&k = 0 and male = 1 then output
out&mult..sub0;
                        else output out&mult..sub1;
                  run;

                  /*male gender specific PCs of x covariates*/
                  *prostate cancer. exclude male, psa1yr, hyst, mammogram,
pap_smear;
                  %if &k = 11 %then %do;
                        proc princomp data=out&mult..sub0
out=out&mult..princomp prefix=prinx ;
                  var newcost cgarsr43 povcat priv_insur prb_eat prb_dres
dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                        ods output eigenvalues=out&mult..eigenx1;
                        ods select eigenvalues;
                        run;
                  %end;

                  *hyperplasia of prostate. exclude male, hyst, mammogram,
psa1yr,papsmear;
                  %if &k = 82 %then %do;
                  proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur prb_eat prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age  died inpatnights
inpatstays comphealth;
                  ods output eigenvalues=out&mult..eigenx1;
                  ods select eigenvalues;
                  run;
                  %end;

                  *prostate screening. exclude male, psa1yr, hyst, mammogram,
pap_smear;
```

```
                %if &k = 104 %then %do;
                proc princomp data=out&mult..sub0 out=out&mult..princomp
prefix=prinx ;
            var newcost cgarsr43 povcat priv_insur prb_eat prb_dres dif_walk
                        dif_stoop dif_lift weightkg smokenow eversmoke
hearingaid healthstat pneushot flushot height
                        ed5 maritals didserv race age died inpatnights
inpatstays comphealth;
                ods output eigenvalues=out&mult..eigenx1;
                ods select eigenvalues;
                run;
                %end;


                /*count # of eigein values*/
                data out&mult..nprinx;
                      set out&mult..eigenx1;
                      if proportion>0;
                      count = 1;
                run;

                proc sql;
                      select n(count) into: nprinx from out&mult..nprinx;
                quit;


            %end;


/*3. PCs of claims/calibrated claims
                - conditional execution
                      - complements
                      - gender*/

            %if &k ^= 4 and &k ^= 6
            and &k ^= 8 and &k ^= 9 and &k ^= 10 and &k ^= 11
            and &k ^= 17 and &k ^= 19 and &k ^= 43 and &k ^= 44
            and &k ^= 45 and &k ^= 49 and &k ^= 50 and &k ^= 65 and &k ^= 69
        and &k ^= 70 and &k ^= 71 and &k ^= 77 and &k ^= 82 and &k ^= 84
            and &k ^= 85 and &k ^= 86 and &k ^= 102 and &k ^= 104 and &k ^=
105
            %then %do;

            /*Z:compute PC of combination of claims and calibrated claims*/
                  proc princomp data=out&mult..sub0 out=out&mult..princomp2
prefix = princ;
```

```
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
```

```
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;

                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                              %end;
                        %end;
                        %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
```

```
                                                  and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                  and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                  and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                  and &cg ^=121 and &cg ^=&k
%then %do;

                                            cgar_ccl&cg
                                            %end;
                                      %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
      %end;

            /*screening for infectious disease. exclude other infectious
disease*/
      %if &k = 4 %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
```

```
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=5  %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=5  %then %do;

                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
```

```
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=5  %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                    %end;
                    %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=5  %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                ;
                ods output eigenvalues=out&mult..eigenc;
                ods select eigenvalues eigenvectors;
                run;
                %end;
```

```
            /*colon cancer. exclude screening*/
            %if &k = 6 %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3
and &cg ^=10 and  &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=103  %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
```

```
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=103  %then %do;

                                                cgar&cg
                                                %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=103  %then %do;

                                                cgar_ccl&cg
                                                %end;
                                    %end;
                              %end;
                        %end;
                        %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
```

```
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                        and &cg ^=103  %then %do;

                                        cgar_ccl&cg
                                        %end;
                                  %end;
            %end;
      ;
      ods output eigenvalues=out&mult..eigenc;
      ods select eigenvalues eigenvectors;
      run;
      %end;


      /*skin cancer. exclude other dermatologic diseases*/
      %if &k = 8 %then %do;
            /*Z:compute PC of combination of claims and
calibrated claims*/
      proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
            var   /*select cgar's for 1st iteration*/
            %if &iter = 1 %then %do;
                  %if &k = 1 %then %do;
                        %do cg = &k+1 %to &nimp;
                              %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                              and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
```

```
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=87  %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=87  %then %do;


                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
```

```
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                        and &cg ^=87  %then %do;

                                        cgar_ccl&cg
                                        %end;
                                  %end;
                        %end;
                  %end;
                  %if &iter > 1 %then %do;
                                  %do cg = 1 %to &nimp;
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                  and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                        and &cg ^=87  %then %do;

                                        cgar_ccl&cg
                                        %end;
                                  %end;
                        %end;
            ;
```

```
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;

            /*undiagnosed diabetes. exclude diabetes*/
            %if &k = 17 %then %do;
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 16
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;
                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 16
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
```

```
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
%then %do;

                                                      cgar&cg
                                                      %end;
                                                %end;
                                                %do cg = 1 %to (&k-1);
                                                      %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 16
                                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                      and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                      &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
%then %do;

                                                      cgar_ccl&cg
                                                      %end;
                                                %end;
                        %end;
                  %end;
                  %if &iter > 1 %then %do;

                        %do cg = 1 %to &nimp;
                              %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and &cg
^=10 and &cg ^= 16
```

```
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;

                                    cgar_ccl&cg
                              %end;
                        %end;
                  %end;

            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;

            %if &k = 19 %then %do;
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k =1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 18    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
```

```
                                                  and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                  and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                  and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                  and &cg ^=121 and &cg ^=&k
%then %do;
                                        cgar&cg
                                        %end;
                                  %end;
                            %end;
                            /*select combination of cgar and cgar_ccl for
                            remaining iterations*/
                            %if &k > 1 %then %do;

                                        %do cg = &k+1 %to &nimp;
                                              %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                        and &cg ^= 18    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
%then %do;

                                              cgar&cg
                                              %end;
                                        %end;
                                        %do cg = 1 %to (&k-1);
                                              %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                        and &cg ^= 18    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
```

```
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
%then %do;

                                                cgar_ccl&cg
                                                %end;
                                          %end;
                        %end;
                  %end;
                  %if &iter > 1 %then %do;
                        %do cg = 1 %to &nimp;
                              %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and &cg
^=10 and &cg ^= 17
                                    and &cg ^= 18    and &cg ^= 32 and &cg ^=
33
                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                          and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                          and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                          and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                          and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                          and &cg ^=121 and &cg ^=&k
%then %do;

                                    cgar_ccl&cg
                                    %end;
                        %end;
                  %end;

            ;
            ods output eigenvalues=out&mult..eigenc;
```

```
            ods select eigenvalues eigenvectors;
            run;
            %end;


            /*cataract. exclude eye disorders*/
            %if &k = 43 or &k = 44 %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=45  %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
```

```
                                        and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
^=50   and &cg ^=84 and
and &cg ^=100
and &cg ^=107 and &cg ^=108
and &cg ^=111 and &cg ^=112
and &cg ^=115 and &cg ^=116
and &cg ^=119 and &cg ^=120
                                              and &cg ^= 34 and &cg ^= 38 and &cg
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
                                                    and &cg ^=101 and &cg ^=106
                                                    and &cg ^=109 and &cg ^=110
                                                    and &cg ^=113 and &cg ^=114
                                                    and &cg ^=117 and &cg ^=118
                                                    and &cg ^=121 and &cg ^=&k
                                              and &cg ^=45  %then %do;

                                              cgar&cg
                                              %end;
                                        %end;
                                        %do cg = 1 %to (&k-1);
                                              %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                        and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
^=50   and &cg ^=84 and
and &cg ^=100
and &cg ^=107 and &cg ^=108
and &cg ^=111 and &cg ^=112
and &cg ^=115 and &cg ^=116
and &cg ^=119 and &cg ^=120
                                              and &cg ^= 34 and &cg ^= 38 and &cg
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
                                                    and &cg ^=101 and &cg ^=106
                                                    and &cg ^=109 and &cg ^=110
                                                    and &cg ^=113 and &cg ^=114
                                                    and &cg ^=117 and &cg ^=118
                                                    and &cg ^=121 and &cg ^=&k
                                              and &cg ^=45  %then %do;

                                              cgar_ccl&cg
                                              %end;
                                        %end;
                                              %end;
                                  %end;
                                  %if &iter > 1 %then %do;
```

```
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^=45  %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            /*eye disorders*/
            %if &k = 45  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
```

```
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
                                                and &cg ^=43 and &cg ^= 44  %then
%do;

                                          cgar&cg
                                          %end;
                                    %end;
                              %end;
                              /*select combination of cgar and cgar_ccl for
                              remaining iterations*/
                              %if &k > 1 %then %do;

                                          %do cg = &k+1 %to &nimp;
                                                %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                          and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
                                                and &cg ^=43 and &cg ^= 44  %then
%do;

                                                cgar&cg
```

```
                                        %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                            and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                            and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                            and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                            and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                            and &cg ^=121 and &cg ^=&k
                                        and &cg ^=43 and &cg ^= 44  %then
%do;

                                        cgar_ccl&cg
                                        %end;
                                    %end;
                        %end;
                %end;
                %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                            and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                            and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                            and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                            and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
```

```
                                                and &cg ^=121 and &cg ^=&k
                                              and &cg ^=43 and &cg ^= 44  %then
%do;

                                              cgar_ccl&cg
                                              %end;
                                        %end;
                    %end;
              ;
              ods output eigenvalues=out&mult..eigenc;
              ods select eigenvalues eigenvectors;
              run;
              %end;



              %if &k = 49 %then %do;
              proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                    var

                          %if &iter = 1 %then %do;
                          %if &k =1 %then %do;
                                %do cg = &k+1 %to &nimp;
                                      %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                      and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                            and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                            &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                  and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                  and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                  and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                  and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                  and &cg ^=121 and &cg ^=&k
%then %do;


                                      cgar&cg
                                      %end;
```

```
                        %end;
                    %end;
                    /*select combination of cgar and cgar_ccl for
                    remaining iterations*/
                    %if &k > 1 %then %do;

                                %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                        and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                        and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                        and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                        and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                        and &cg ^=121 and &cg ^=&k
%then %do;


                                    cgar&cg
                                    %end;
                                %end;
                                %do cg = 1 %to (&k-1);
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                        and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                        and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                        and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
```

```
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;



                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                    %end;
                    %if &iter > 1 %then %do;
                          %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;



                                    cgar_ccl&cg
                                    %end;
                          %end;
                    %end;

               ;
               ods output eigenvalues=out&mult..eigenc;
               ods select eigenvalues eigenvectors;
               run;
               %end;

               %if &k = 50 %then %do;
```

```
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k =1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=49   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;
                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=49   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
```

```
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;

                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=49   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
%then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                        %end;
                  %end;
                  %if &iter > 1 %then %do;
                        %do cg = 1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=49   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
```

```
                                                  and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                  and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                  and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                  and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                  and &cg ^=121 and &cg ^=&k
%then %do;

                                        cgar_ccl&cg
                                        %end;
                        %end;
                %end;


            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;

            /*pneumonia*/
            %if &k = 65  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                var   /*select cgar's for 1st iteration*/
                %if &iter = 1 %then %do;
                      %if &k = 1 %then %do;
                            %do cg = &k+1 %to &nimp;
                                  %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                  and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                        and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                        and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
```

```
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                              and &cg ^=5 and &cg ^= 70 %then
%do;

                                     cgar&cg
                                     %end;
                               %end;
                          %end;
                          /*select combination of cgar and cgar_ccl for
                          remaining iterations*/
                          %if &k > 1 %then %do;

                                     %do cg = &k+1 %to &nimp;
                                           %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                     and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                           and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                           &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^=5 and &cg ^= 70  %then
%do;


                                           cgar&cg
                                           %end;
                                     %end;
                                     %do cg = 1 %to (&k-1);
                                           %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                     and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
```

```
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                        and &cg ^=43 and &cg ^= 44  %then
%do;

                                              cgar_ccl&cg
                                              %end;
                                  %end;
                        %end;
                %end;
                %if &iter > 1 %then %do;
                                  %do cg = 1 %to &nimp;
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                  and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                        and &cg ^=5 and &cg ^= 70  %then
%do;

                                              cgar_ccl&cg
                                              %end;
                                  %end;
```

```
                %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            /*respiratory infection*/
            %if &k = 69  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 70 %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
```

```
3 and &cg ^=10 and &cg ^= 17

33

^=50   and &cg ^=84 and

and &cg ^=100

and &cg ^=107 and &cg ^=108

and &cg ^=111 and &cg ^=112

and &cg ^=115 and &cg ^=116

and &cg ^=119 and &cg ^=120
```

```
3 and &cg ^=10 and &cg ^= 17

33

^=50   and &cg ^=84 and

and &cg ^=100

and &cg ^=107 and &cg ^=108

and &cg ^=111 and &cg ^=112

and &cg ^=115 and &cg ^=116

and &cg ^=119 and &cg ^=120
```

```
                        %end;
```

```
      %if &cg ^=1 and &cg ^= 2 and &cg ^=

and &cg ^= 19    and &cg ^= 32 and &cg ^=

      and &cg ^= 34 and &cg ^= 38 and &cg

      &cg ^=86 and &cg ^=94 and &cg ^=99

            and &cg ^=101 and &cg ^=106

            and &cg ^=109 and &cg ^=110

            and &cg ^=113 and &cg ^=114

            and &cg ^=117 and &cg ^=118

            and &cg ^=121 and &cg ^=&k
       and &cg ^= 70 %then %do;

      cgar&cg
      %end;
%end;
%do cg = 1 %to (&k-1);
      %if &cg ^=1 and &cg ^= 2 and &cg ^=

and &cg ^= 19    and &cg ^= 32 and &cg ^=

      and &cg ^= 34 and &cg ^= 38 and &cg

      &cg ^=86 and &cg ^=94 and &cg ^=99

            and &cg ^=101 and &cg ^=106

            and &cg ^=109 and &cg ^=110

            and &cg ^=113 and &cg ^=114

            and &cg ^=117 and &cg ^=118

            and &cg ^=121 and &cg ^=&k
       and &cg ^= 70 %then %do;

      cgar_ccl&cg
      %end;
%end;
```

```
                %end;
                %if &iter > 1 %then %do;
                                %do cg = 1 %to &nimp;
                                      %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                      and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                      &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                            and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                            and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                            and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                            and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                            and &cg ^=121 and &cg ^=&k
                                 and &cg ^= 70  %then %do;

                                      cgar_ccl&cg
                                      %end;
                                %end;
                %end;
          ;
          ods output eigenvalues=out&mult..eigenc;
          ods select eigenvalues eigenvectors;
          run;
          %end;


          /*respiratory symptoms*/
          %if &k = 70  %then %do;
                      /*Z:compute PC of combination of claims and
calibrated claims*/
          proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                var   /*select cgar's for 1st iteration*/
                %if &iter = 1 %then %do;
                      %if &k = 1 %then %do;
                            %do cg = &k+1 %to &nimp;
                                  %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
```

```
                                        and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
                                                and &cg ^= 71 and &cg ^= 69 %then
%do;

                                              cgar&cg
                                              %end;
                                        %end;
                                  %end;
                                  /*select combination of cgar and cgar_ccl for
                                  remaining iterations*/
                                  %if &k > 1 %then %do;

                                              %do cg = &k+1 %to &nimp;
                                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                              and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                          and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                          and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                          and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                          and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                          and &cg ^=121 and &cg ^=&k
                                                     and &cg ^= 71 and &cg ^= 69 %then
%do;
```

```
                                        cgar&cg
                                        %end;
                                  %end;
                                  %do cg = 1 %to (&k-1);
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                  and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                         and &cg ^= 71 and &cg ^= 69 %then
%do;

                                        cgar_ccl&cg
                                        %end;
                                  %end;
                        %end;
                  %end;
                  %if &iter > 1 %then %do;
                                  %do cg = 1 %to &nimp;
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                  and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
```

```
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                             and &cg ^= 71 and &cg ^= 69  %then
%do;

                                            cgar_ccl&cg
                                            %end;
                                      %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            /*other respiratory*/
            %if &k = 71  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 70 and &cg ^= 69 %then
%do;
```

```
                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^= 70 and &cg ^= 69 %then
%do;


                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
```

```
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                             and &cg ^= 70 and &cg ^= 69 %then
%do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                    %end;
                    %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                             and &cg ^= 70 and &cg ^= 69  %then
%do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                ;
                ods output eigenvalues=out&mult..eigenc;
                ods select eigenvalues eigenvectors;
                run;
                %end;
```

```
            /*Renal failure*/
            %if &k = 77  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 78 and &cg ^= 79 %then
%do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
```

```
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                         and &cg ^= 78 and &cg ^= 79 %then
%do;

                                              cgar&cg
                                              %end;
                                       %end;
                                       %do cg = 1 %to (&k-1);
                                              %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                       and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                              and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                              and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                              and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                              and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                              and &cg ^=121 and &cg ^=&k
                                         and &cg ^= 78 and &cg ^= 79 %then
%do;

                                              cgar_ccl&cg
                                              %end;
                                       %end;
                                %end;
                         %end;
                         %if &iter > 1 %then %do;
                                       %do cg = 1 %to &nimp;
```

```
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^= 78 and &cg ^= 79  %then
%do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            /*female specific
                  - additionally exclude 11,82,104 */
       %if &k = 9 or &k = 10 or &k = 84 or &k = 85 or &k = 86 or &k = 102 or
&k = 105 %then %do;


            %if &k = 9  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
```

```
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                        and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
                                              and &cg ^= 102 and &cg ^= 82 and &cg
^= 11 and &cg ^= 104 %then %do;

                                        cgar&cg
                                        %end;
                                  %end;
                            %end;
                            /*select combination of cgar and cgar_ccl for
                            remaining iterations*/
                            %if &k > 1 %then %do;

                                        %do cg = &k+1 %to &nimp;
                                              %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                        and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
```

```
                                        and &cg ^= 102 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                    cgar&cg
                                    %end;
                                %end;
                                %do cg = 1 %to (&k-1);
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                        and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                        and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                        and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                        and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                        and &cg ^=121 and &cg ^=&k
                                     and &cg ^= 102 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                    cgar_ccl&cg
                                    %end;
                                %end;
                        %end;
                %end;
                %if &iter > 1 %then %do;
                                %do cg = 1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                        and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                        and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
```

```
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^= 102 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                           cgar_ccl&cg
                                           %end;
                                      %end;
                 %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;

            %if &k = 10  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 105 and &cg ^= 82 and &cg
^= 11 and &cg ^= 104 %then %do;
```

```
                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                    %do cg = &k+1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^= 105 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
```

```
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                             and &cg ^= 105 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                    %end;
                    %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 105 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
               ;
               ods output eigenvalues=out&mult..eigenc;
               ods select eigenvalues eigenvectors;
               run;
               %end;
```

```
            %if &k = 84 or &k = 85 or &k = 86  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
             proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                   var   /*select cgar's for 1st iteration*/
                   %if &iter = 1 %then %do;
                         %if &k = 1 %then %do;
                               %do cg = &k+1 %to &nimp;
                                     %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                     and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                           and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                           &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                 and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                 and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                 and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                 and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                 and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 82 and &cg ^= 11 and &cg
^= 104 %then %do;

                                     cgar&cg
                                     %end;
                               %end;
                         %end;
                         /*select combination of cgar and cgar_ccl for
                         remaining iterations*/
                         %if &k > 1 %then %do;

                                     %do cg = &k+1 %to &nimp;
                                           %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                     and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                           and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                           &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
```

```
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
                                                  and &cg ^= 82 and &cg ^= 11 and

&cg ^= 104 %then %do;

                                                    cgar&cg
                                                    %end;
                                                %end;
                                                %do cg = 1 %to (&k-1);
                                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                                and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                    and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                    &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
                                                  and &cg ^= 82 and &cg ^= 11 and

&cg ^= 104 %then %do;

                                                    cgar_ccl&cg
                                                    %end;
                                                %end;
                        %end;
                %end;
                %if &iter > 1 %then %do;
                                                %do cg = 1 %to &nimp;
                                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
```

```
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^= 82 and &cg ^= 11 and
&cg ^= 104 %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            %if &k = 102  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
```

```
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
                                                and &cg ^= 9 and &cg ^= 82 and &cg
^= 11 and &cg ^= 104 %then %do;

                                        cgar&cg
                                        %end;
                                %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                        %do cg = &k+1 %to &nimp;
                                              %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                        and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                              and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                              &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                    and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                    and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                    and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                    and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                    and &cg ^=121 and &cg ^=&k
                                                  and &cg ^= 9 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                              cgar&cg
                                              %end;
                                        %end;
                                        %do cg = 1 %to (&k-1);
```

```
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                            and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                            and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                            and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                            and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                            and &cg ^=121 and &cg ^=&k
                                       and &cg ^= 9 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                        cgar_ccl&cg
                                        %end;
                                    %end;
                        %end;
                %end;
                %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                        %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                        and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                        &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                            and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                            and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                            and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                            and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                            and &cg ^=121 and &cg ^=&k
                                       and &cg ^= 9 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;
```

```
                                        cgar_ccl&cg
                                        %end;
                                  %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            %if &k = 105  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 10 and &cg ^= 82 and &cg
^= 11 and &cg ^= 104 %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
```

```
                        remaining iterations*/
                        %if &k > 1 %then %do;

                                          %do cg = &k+1 %to &nimp;
                                                %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                          and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
                                                and &cg ^= 10 and &cg ^= 82 and &cg
^= 11 and &cg ^= 104 %then %do;

                                                cgar&cg
                                                %end;
                                          %end;
                                          %do cg = 1 %to (&k-1);
                                                %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                          and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
```

```
                                                and &cg ^= 10 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                                cgar_ccl&cg
                                                %end;
                                          %end;
                               %end;
                         %end;
                         %if &iter > 1 %then %do;
                                          %do cg = 1 %to &nimp;
                                                %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                          and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                      and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                      and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                      and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                      and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                      and &cg ^=121 and &cg ^=&k
                                                 and &cg ^= 10 and &cg ^= 82 and
&cg ^= 11 and &cg ^= 104 %then %do;

                                                cgar_ccl&cg
                                                %end;
                                          %end;
                               %end;
                    ;
                    ods output eigenvalues=out&mult..eigenc;
                    ods select eigenvalues eigenvectors;
                    run;
                    %end;

%end;

                    /*male specific
                          - additionally exclude 9,10,85,102,105*/
                     %if &k = 11 or &k = 82 or &k = 104 %then %do;
```

```
            %if &k = 11  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
             proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                   var   /*select cgar's for 1st iteration*/
                   %if &iter = 1 %then %do;
                         %if &k = 1 %then %do;
                               %do cg = &k+1 %to &nimp;
                                     %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                     and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                      and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                     &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                           and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                           and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                           and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                           and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                           and &cg ^=121 and &cg ^=&k
                                    and &cg ^= 82 and &cg ^= 85 and &cg
^= 9 and &cg ^= 102
                                           and &cg ^= 10 and &cg ^= 105
%then %do;

                                     cgar&cg
                                     %end;
                               %end;
                         %end;
                         /*select combination of cgar and cgar_ccl for
                         remaining iterations*/
                         %if &k > 1 %then %do;

                                     %do cg = &k+1 %to &nimp;
                                      %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                     and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
```

```
^=50   and &cg ^=84 and

and &cg ^=100

and &cg ^=107 and &cg ^=108

and &cg ^=111 and &cg ^=112

and &cg ^=115 and &cg ^=116

and &cg ^=119 and &cg ^=120


^= 9 and &cg ^= 102

%then %do;




3 and &cg ^=10 and &cg ^= 17

33

^=50   and &cg ^=84 and

and &cg ^=100

and &cg ^=107 and &cg ^=108

and &cg ^=111 and &cg ^=112

and &cg ^=115 and &cg ^=116

and &cg ^=119 and &cg ^=120


^= 9 and &cg ^= 102

%then %do;
```

```
      and &cg ^= 34 and &cg ^= 38 and &cg

      &cg ^=86 and &cg ^=94 and &cg ^=99

            and &cg ^=101 and &cg ^=106

            and &cg ^=109 and &cg ^=110

            and &cg ^=113 and &cg ^=114

            and &cg ^=117 and &cg ^=118

            and &cg ^=121 and &cg ^=&k
    and &cg ^= 82 and &cg ^= 85 and &cg

            and &cg ^= 10 and &cg ^= 105


      cgar&cg
      %end;
%end;
%do cg = 1 %to (&k-1);
      %if &cg ^=1 and &cg ^= 2 and &cg ^=

and &cg ^= 19    and &cg ^= 32 and &cg ^=

      and &cg ^= 34 and &cg ^= 38 and &cg

      &cg ^=86 and &cg ^=94 and &cg ^=99

            and &cg ^=101 and &cg ^=106

            and &cg ^=109 and &cg ^=110

            and &cg ^=113 and &cg ^=114

            and &cg ^=117 and &cg ^=118

            and &cg ^=121 and &cg ^=&k
    and &cg ^= 82 and &cg ^= 85 and &cg

            and &cg ^= 10 and &cg ^= 105


      cgar_ccl&cg
      %end;
```

```
                                    %end;
                          %end;
                    %end;
                    %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                    and &cg ^= 82 and &cg ^= 85 and &cg
^= 9 and &cg ^= 102
                                                and &cg ^= 10 and &cg ^= 105
%then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                          %end;
                    ;
                    ods output eigenvalues=out&mult..eigenc;
                    ods select eigenvalues eigenvectors;
                    run;
                    %end;



                    %if &k = 82  %then %do;
                              /*Z:compute PC of combination of claims and
calibrated claims*/
                    proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                          var   /*select cgar's for 1st iteration*/
```

```
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 11  and &cg ^= 85 and &cg
^= 9 and
                                          &cg ^= 102 and &cg ^= 10 and &cg ^=
105  %then %do;

                                    cgar&cg
                                    %end;
                              %end;
                        %end;
                        /*select combination of cgar and cgar_ccl for
                        remaining iterations*/
                        %if &k > 1 %then %do;

                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
```

```
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 11  and &cg ^= 85 and
&cg ^= 9 and
                                          &cg ^= 102 and &cg ^= 10 and &cg ^=
105  %then %do;

                                          cgar&cg
                                          %end;
                                    %end;
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                          and &cg ^= 11  and &cg ^= 85 and
&cg ^= 9 and
                                          &cg ^= 102 and &cg ^= 10 and &cg ^=
105  %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                         %end;
                %end;
                %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
```

```
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                           and &cg ^= 11  and &cg ^= 85 and
&cg ^= 9 and
                                          &cg ^= 102 and &cg ^= 10 and &cg ^=
105  %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                  %end;
            ;
            ods output eigenvalues=out&mult..eigenc;
            ods select eigenvalues eigenvectors;
            run;
            %end;


            %if &k = 104  %then %do;
                        /*Z:compute PC of combination of claims and
calibrated claims*/
            proc princomp data=out&mult..sub0 out=out&mult..princomp2 prefix
= princ;
                  var   /*select cgar's for 1st iteration*/
                  %if &iter = 1 %then %do;
                        %if &k = 1 %then %do;
                              %do cg = &k+1 %to &nimp;
                                    %if &cg ^=1 and &cg ^= 2 and &cg ^= 3 and
&cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
```

```
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                             and &cg ^= 11 and &cg ^= 85 and &cg
^= 10 and &cg ^= 82 and &cg ^= 105 and &cg ^= 102  %then %do;

                                       cgar&cg
                                       %end;
                                 %end;
                           %end;
                           /*select combination of cgar and cgar_ccl for
                           remaining iterations*/
                           %if &k > 1 %then %do;

                                       %do cg = &k+1 %to &nimp;
                                             %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                       and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                                and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                                &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                              and &cg ^= 11 and &cg ^= 85 and
&cg ^= 10 and &cg ^= 82 and &cg ^= 105 and &cg ^= 102   %then %do;

                                                cgar&cg
                                                %end;
                                       %end;
```

```
                                    %do cg = 1 %to (&k-1);
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
                                      and &cg ^= 11 and &cg ^= 85 and
&cg ^= 10 and &cg ^= 82 and &cg ^= 105 and &cg ^= 102   %then %do;

                                          cgar_ccl&cg
                                          %end;
                                    %end;
                         %end;
                   %end;
                   %if &iter > 1 %then %do;
                                    %do cg = 1 %to &nimp;
                                          %if &cg ^=1 and &cg ^= 2 and &cg ^=
3 and &cg ^=10 and &cg ^= 17
                                    and &cg ^= 19    and &cg ^= 32 and &cg ^=
33
                                          and &cg ^= 34 and &cg ^= 38 and &cg
^=50   and &cg ^=84 and
                                          &cg ^=86 and &cg ^=94 and &cg ^=99
and &cg ^=100
                                                and &cg ^=101 and &cg ^=106
and &cg ^=107 and &cg ^=108
                                                and &cg ^=109 and &cg ^=110
and &cg ^=111 and &cg ^=112
                                                and &cg ^=113 and &cg ^=114
and &cg ^=115 and &cg ^=116
                                                and &cg ^=117 and &cg ^=118
and &cg ^=119 and &cg ^=120
                                                and &cg ^=121 and &cg ^=&k
```

```
                                                and &cg ^= 11 and &cg ^= 85 and
&cg ^= 10 and &cg ^= 82 and &cg ^= 105 and &cg ^= 102   %then %do;

                                              cgar_ccl&cg
                                              %end;
                                        %end;
                    %end;
             ;
             ods output eigenvalues=out&mult..eigenc;
             ods select eigenvalues eigenvectors;
             run;
             %end;
%end;

             /*count number of principal components for logistic model*/
             Data out&mult..nprinc;
             Set out&mult..eigenc;
                   If proportion>0;
                   count=1;
              Run;

             Proc sql;
                    Select n(count) into: nprinc from out&mult..nprinc;
             Quit;

      /*assign macro  variable for # of PCs     */
             %put nprinx = &nprinx;
             %put nprinc= &nprinc;
             %put nk = &k;

             proc sort data=out&mult..princomp;
             by baseid;
             run;

             proc sort data=out&mult..princomp2;
             by baseid;
             run;

             /*combine principal components of X,Z*/
             data out&mult..princomp_full;
                   merge out&mult..princomp out&mult..princomp2;
                   by baseid;
             run;

/*4. fit propensity model based on above PCs with forward selection*/
```

```
            /* Propensity of being institutionalized based on X,Z
                  Forward selection on X,Z simultaneously
                  - fit model with lower slentry for cgar49 (small sample)*/


                  %if &k ^= 49 and &k ^= 99 and &k ^= 82 and &k ^= 56 and &k
^= 70 and &k ^=71 and &k ^= 76
                  and &k ^= 92 and &k ^= 18 and &k ^= 54 and &k ^= 55 and &k
^= 67 and &k ^= 104 and &k ^= 11
                  and &k ^= 4 and &k ^= 102 %then %do;
            Proc logistic Data=out&mult..princomp_full descending;

                  model i= %do n = 1 %to &nprinx; prinx&n %end;
                              %do nn = 1 %to &nprinc; princ&nn %end;
                  /lackfit selection=forward slentry=.075;
                  output out=out&mult..modelx p=pred_x;
                  ods select responseprofile parameterestimates lackfitchisq;
                  ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                  parameterestimates=out&mult..parms&k;
            Run;
            %end;


            %if &k = 4 or &k = 18 or &k = 54 or &k = 55 or &k = 67 %then %do;
            Proc logistic Data=out&mult..princomp_full descending;

                  model i= %do n = 1 %to &nprinx; prinx&n %end;
                              %do nn = 1 %to &nprinc; princ&nn %end;
                  /lackfit selection=forward slentry=.125;
                  output out=out&mult..modelx p=pred_x;
                  ods select responseprofile parameterestimates lackfitchisq;
                  ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                  parameterestimates=out&mult..parms&k;
            Run;
            %end;


            %if &k = 56 or &k = 70 or &k = 71 or &k = 76 %then %do;
            Proc logistic Data=out&mult..princomp_full descending;

                  model i= %do n = 1 %to &nprinx; prinx&n %end;
                              %do nn = 1 %to &nprinc; princ&nn %end;
                  /lackfit selection=forward slentry=.15;
                  output out=out&mult..modelx p=pred_x;
```

```
                ods select responseprofile parameterestimates lackfitchisq;
                ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                parameterestimates=out&mult..parms&k;
          Run;
          %end;


          %if &k = 104 or &k = 11 or &k = 102 %then %do;
          Proc logistic Data=out&mult..princomp_full descending;

                model i= %do n = 1 %to &nprinx; prinx&n %end;
                            %do nn = 1 %to &nprinc; princ&nn %end;
                /lackfit selection=forward slentry=.05;
                output out=out&mult..modelx p=pred_x;
                ods select responseprofile parameterestimates lackfitchisq;
                ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                parameterestimates=out&mult..parms&k;
          Run;
          %end;

          %if &k = 92 %then %do;
          Proc logistic Data=out&mult..princomp_full descending;

                model i= %do n = 1 %to &nprinx; prinx&n %end;
                            %do nn = 1 %to &nprinc; princ&nn %end;
                /lackfit selection=forward slentry=.025;
                output out=out&mult..modelx p=pred_x;
                ods select responseprofile parameterestimates lackfitchisq;
                ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                parameterestimates=out&mult..parms&k;
          Run;
          %end;


          %if &k = 49 %then %do;
          Proc logistic Data=out&mult..princomp_full descending;

                model i= %do n = 1 %to &nprinx; prinx&n %end;
                            %do nn = 1 %to &nprinc; princ&nn %end;
                /lackfit selection=forward slentry=.01;
                output out=out&mult..modelx p=pred_x;
                ods select responseprofile parameterestimates lackfitchisq;
```

```
                  ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                  parameterestimates=out&mult..parms&k;
            Run;
            %end;

            %if &k = 82 %then %do;
            Proc logistic Data=out&mult..princomp_full descending;

                  model i= %do n = 1 %to &nprinx; prinx&n %end;
                              %do nn = 1 %to &nprinc; princ&nn %end;
                  /lackfit selection=forward slentry=.02;
                  output out=out&mult..modelx p=pred_x;
                  ods select responseprofile parameterestimates lackfitchisq;
                  ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                  parameterestimates=out&mult..parms&k;
            Run;
            %end;


            %if &k = 99 %then %do;
            Proc logistic Data=out&mult..princomp_full descending;

                  model i= %do n = 1 %to &nprinx; prinx&n %end;
                              %do nn = 1 %to &nprinc; princ&nn %end;
                  /lackfit selection=forward slentry=.01;
                  output out=out&mult..modelx p=pred_x;
                  ods select responseprofile parameterestimates lackfitchisq;
                  ods output lackfitchisq=out&mult..hosmer&k
responseprofile=out&mult..response&k
                  parameterestimates=out&mult..parms&k;
            Run;
            %end;

      %if &iter = 1 %then %do;

            data out&mult..modelx;
            set out&mult..modelx;
            if pred_x <1 then logit = log(pred_x/(1-pred_x));
            else if pred_x = 1 then logit = log(.99999/(1-.99999));
            run;

            data suba;
            set out&mult..modelx;
                  where cgar&k = 0 and cgar_ccl&k = 1;
```

```
run;

data subb;
set out&mult..modelx;
      where cgar&k = 0 and cgar_ccl&k = 0;
run;

/*compute mean and variance of logit      */
proc means data=out&mult..modelx mean var;
      var logit;
      where cgar&k = 0 and cgar_ccl&k = 1;
      output out=mean mean=xbara var=sa2;
run;

/*create variables for xbarA, SA2, NA          */
proc sql;
      select xbara into: xbara from mean;
      select sa2 into: sa2 from mean;
      select n(baseid) into: na from suba;
quit;

%put xbara = &xbara;
%put sa2 = &sa2;
%put na = &na;


/*compute mean and variance for logit2         */
proc means data=out&mult..modelx mean var;
      var logit;
      where cgar&k = 0 and cgar_ccl&k = 0;
      output out=mean2 mean=xbarb var=sb2;
run;

/*macro variables*/
proc sql;
      select xbarb into: xbarb from mean2;
      select sb2 into: sb2 from mean2;
      select n(baseid) into: nb from subb;
quit;

%put xbarb = &xbarb;
%put sb2 = &sb2;
%put nb = &nb;


/*assign statistics
```

```
                  compute pooled variance
                  compute pa,pb
                  compute posterior probability*/
            data out&mult..discrim&k;
                  merge out&mult..modelx;
                  by baseid;

                  xbara = &xbara;
                  xbarb = &xbarb;
                  var1 = &sa2;
                  var2 = &sb2;

                  pooledvar = (((&na - 1)*(&sa2)) + ((&nb -
1)*(&sb2)))/(&na+&nb-1);

                  pa = (&na)/((&na+&nb));
                  pb = (&nb)/((&na+&nb));


                  norm1 = PDF('NORMAL',logit,&xbara,pooledvar);
                  norm2 = PDF('NORMAL',logit,&xbara,pooledvar);
                  norm3 = PDF('NORMAL',logit,&xbarb,pooledvar);

                  proba = (pa * norm1)/ ((pa * norm1) + (pb*norm3));

            run;


            /*merge back subset where claim = 1
                  - drop extraneous variables*/
            data out&mult..working_full;
            set out&mult..discrim&k out&mult..sub1;

                  /*drop extraneous variable*/
                  drop pred_x _level_
                  %do n = 1 %to &nprinx;
                        prinx&n
                  %end;
                  %do nn = 1 %to &nprinc;
                        princ&nn
                  %end;
                  ;
            run;

            /* set calibrated claim = 1 if claim =1
                  make comparison and impute*/
```

```
            data out&mult..working_full;
            set out&mult..working_full;

                  if cgar&k = 1 then cgar_ccl&k = 1;

                  /*generate uniform rv*/
                  u = ranuni(-1);

                  /*make comparison and impute*/
                  if i = 1 and cgar&k = 0 and cgar_ccl&k = . and  proba > u
then cgar_ccl&k = 1;
                  if i = 1 and cgar&k = 0 and cgar_ccl&k = . and  proba < u
then cgar_ccl&k = 0;
            run;

      %end; *end iterate = 1 loop;

      %if &iter > 1 %then %do;

            data out&mult..modelx;
            set out&mult..modelx;
            if pred_x <1 then logit = log(pred_x/(1-pred_x));
            else if pred_x = 1 then logit = log(.99999/(1-.99999));
            run;

            data suba;
            set out&mult..modelx;
                  where cgar&k = 0 and cgar_ccl&k = 1;
                  run;

                  data subb;
            set out&mult..modelx;
                  where cgar&k = 0 and cgar_ccl&k = 0;
                  run;

            /*compute mean and variance of logit      */
            proc means data=out&mult..modelx mean var;
            var logit;
            where cgar&k = 0 and cgar_ccl&k = 1;
            output out=mean mean=xbara var=sa2;
            run;

            /*create variables for xbarA, SA2, NA          */
            proc sql;
                  select xbara into: xbara from mean;
                  select sa2 into: sa2 from mean;
```

```
      select n(baseid) into: na from suba;
quit;

%put xbara = &xbara;
%put sa2 = &sa2;
%put na = &na;


/*compute mean and variance for logit2          */
proc means data=out&mult..modelx mean var;
      var logit;
      where cgar&k = 0 and cgar_ccl&k = 0;
      output out=mean2 mean=xbarb var=sb2;
run;

/*macro variables*/
proc sql;
      select xbarb into: xbarb from mean2;
      select sb2 into: sb2 from mean2;
      select n(baseid) into: nb from subb;
quit;

%put xbarb = &xbarb;
%put sb2 = &sb2;
%put nb = &nb;

data out&mult..discrim&k;
      set out&mult..modelx;


      xbara = &xbara;
      xbarb = &xbarb;
      var1 = &sa2;
      var2 = &sb2;
      pooledvar = (((&na - 1)*(&sa2)) + ((&nb -
1)*(&sb2)))/(&na+&nb-1);

      pa = (&na)/((&na+&nb));
      pb = (&nb)/((&na+&nb));


      norm1 = PDF('NORMAL',logit,&xbara,pooledvar);
      norm2 = PDF('NORMAL',logit,&xbara,pooledvar);
      norm3 = PDF('NORMAL',logit,&xbarb,pooledvar);

      proba = (pa * norm1)/ ((pa * norm1) + (pb*norm3));
```

```
            run;


            /*merge back subset where claim = 1
                  - drop extraneous variables*/
            data out&mult..working_full;
            set out&mult..discrim&k out&mult..sub1;

                  /*reset calibrated claims for i = 0 to missing for
imputation            */
                  if i = 1 then cgar_ccl&k = .;

                  /*drop extraneous variable*/
                  drop pred_x _level_
                  %do n = 1 %to &nprinx;
                        prinx&n
                  %end;
                  %do nn = 1 %to &nprinc;
                        princ&nn
                  %end;
                  ;
            run;

            /* set calibrated claim = 1 if claim =1         */
            data out&mult..working_full;
            set out&mult..working_full;

                  if cgar&k = 1 then cgar_ccl&k = 1;

                  /*generate uniform rv*/
                  u = ranuni(-1);

                  /*make comparison and impute*/
                  if i = 1 and cgar&k = 0 and cgar_ccl&k = . and  proba > u
then cgar_ccl&k = 1;
                  if i = 1 and cgar&k = 0 and cgar_ccl&k = . and  proba < u
then cgar_ccl&k = 0;
            run;

            /*
            data out&mult..review&k;
            set out&mult..working_full;
            keep i cgar&k cgar_ccl&k pa pb logit var1 var2 pooledvar proba u
cal_cnt;
                  if i = 1 and cgar&k = 0 and  proba > u then cal_cnt+1;
```

```
            run;
            */

      %end; *end iterate > 1 loop;


%end; *end k loop;

      data out&mult..discrim_&iter&mult;
                  set out&mult..working_full;
                  drop logit xbara xbarb var1 var2 pooledvar pa pb norm1
norm2 norm3 proba u;
                  run;


      %end; *end iteration loop;

                  /*output final data sets            */
                  data outfinal.discrim_mult&mult;
                  set out&mult..working_full;
                  drop logit xbara xbarb var1 var2 pooledvar pa pb norm1
norm2 norm3 proba u;
                  run;
      %end; *end mult;

%mend discrim;
options mprint ;
%discrim;

/*create permanent data set*/
libname final 'Insert file path';
libname outfinal 'Insert file path';

data outfinal.calibr_inst_mcbs09;
set outfinal.discrim_mult1 outfinal.discrim_mult2 outfinal.discrim_mult3
outfinal.discrim_mult4 outfinal.discrim_mult5;
where i = 1;
drop newcost havecare cgarsr57 cgarsr51 cgarsr6 cgarsr7  cgarsr8 cgarsr9
 cgarsr10  cgarsr11 cgarsr49 cgarsr16 cgarsr91 cgarsr96 cgarsr82  hasjob
hearing  cgarsr88   cgarsr89
 asthma_emphysema  cgarsr52 cgarsr37  cgarsr39 typen i cgar1-cgar125
bc_taken
 dwel nbrrooms  bp_taken cgarsr18 cgarsr56 cgarsr28;

If male=0 then do;
```

```
psa1yr = .;
cgar_cl11=. ;
Cgar_ccl11=.;
cgar_cl82=. ;
Cgar_ccl82=.;
cgar_cl104=. ;
Cgar_ccl104=.;
end;

If male=1 then do;
hyst=.;
pap_smear=.;
mammogram=.;
cgar_cl9=. ;
Cgar_ccl9=.;
cgar_cl10=. ;
Cgar_ccl10=.;
cgar_cl84 =.;
cgar_ccl84 = .;
cgar_cl85 = .;
cgar_ccl85 = .;
cgar_cl86 = .;
cgar_ccl86 = .;
cgar_cl102=. ;
Cgar_ccl102=.;
cgar_cl105=. ;
Cgar_ccl105=.;

end;
run;

libname sharedi 'Insert file path';
Data observed;
Set sharedi.inst_mcbs_09;
Run;

proc compare base=observed compare=outfinal.calibr_inst_mcbs09 briefsummary
listbasevar listcompvar novalues;
run;

data final.calibr_inst_mcbs09;
set outfinal.discrim_mult1 outfinal.discrim_mult2 outfinal.discrim_mult3
outfinal.discrim_mult4 outfinal.discrim_mult5;
where i = 1;
drop newcost havecare cgarsr57 cgarsr51 cgarsr6 cgarsr7  cgarsr8 cgarsr9
```

```
 cgarsr10  cgarsr11 cgarsr49 cgarsr16 cgarsr91 cgarsr96 cgarsr82  hasjob
hearing  cgarsr88   cgarsr89
 asthma_emphysema  cgarsr52 cgarsr37  cgarsr39 typen i cgar1-cgar125
bc_taken
 dwel nbrrooms  bp_taken cgarsr18 cgarsr56 cgarsr28;

If male=0 then do;

psa1yr = .;
cgar11=. ;
Cgar_ccl11=.;
cgar82=. ;
Cgar_ccl82=.;
cgar104=. ;
Cgar_ccl104=.;
end;

If male=1 then do;
hyst=.;
pap_smear=.;
mammogram=.;
cgar9=. ;
Cgar_ccl9=.;
cgar10=. ;
Cgar_ccl10=.;
cgar84 =.;
cgar_ccl84 = .;
cgar85 = .;
cgar_ccl85 = .;
cgar86 = .;
cgar_ccl86 = .;
cgar102=. ;
Cgar_ccl102=.;
cgar105=. ;
Cgar_ccl105=.;

end;
run;


data  final.calibr_inst_mcbs09_cl1  final.calibr_inst_mcbs09_cl2
final.calibr_inst_mcbs09_cl3
 final.calibr_inst_mcbs09_cl4  final.calibr_inst_mcbs09_cl5;
set final.calibr_inst_mcbs09;
      if _mult_ = 1 then output final.calibr_inst_mcbs09_cl1 ;
      else if _mult_ =2 then output final.calibr_inst_mcbs09_cl2;
```

```
      else if _mult_ =3 then output final.calibr_inst_mcbs09_cl3;
      else if _mult_ =4 then output final.calibr_inst_mcbs09_cl4;
      else if _mult_ =5 then output final.calibr_inst_mcbs09_cl5;
run;


libname mult1 'Insert file path';
libname mult2 'Insert file path';
libname mult3 'Insert file path';
libname mult4 'Insert file path';
libname mult5 'Insert file path';

%macro hosmer;
data hosmercomb1 (rename=(chisq=chisq1 probchisq=probchisq1));
set %do j = 1 %to 125; mult1.hosmer&j %end;;
cgar = _n_;
run;

data hosmercomb2 (rename=(chisq=chisq2 probchisq=probchisq2));
set %do j = 1 %to 125; mult2.hosmer&j %end;;
cgar = _n_;
run;

data hosmercomb3 (rename=(chisq=chisq3 probchisq=probchisq3));
set %do j = 1 %to 125; mult3.hosmer&j %end;;
cgar = _n_;
run;

data hosmercomb4 (rename=(chisq=chisq4 probchisq=probchisq4));
set %do j = 1 %to 125; mult4.hosmer&j %end;;
cgar = _n_;
run;

data hosmercomb5 (rename=(chisq=chisq5 probchisq=probchisq5));
set %do j = 1 %to 125; mult5.hosmer&j %end;;
cgar = _n_;
run;

data hosmer;
merge hosmercomb1 hosmercomb2 hosmercomb3 hosmercomb4 hosmercomb5;
by cgar;
run;

%mend hosmer;

%hosmer;
```

```
options orientation=landscape;
ods rtf file='Insert file path\hosmer.rtf';
proc print data=hosmer;
var cgar  probchisq1  probchisq2  probchisq3  probchisq4 probchisq5;
run;
ods rtf close;
```

```
/*****************************************************************
Program: 'aggregate_table_09.sas'
Purpose: Create table of calibrated and claim-based prevalences of
diseases for community and institutionalized populations
Data in: Insert path for input datasets
Data out: Insert path for output dataset
*****************************************************************/
libname outfinal "Insert file path";
libname names "Insert file path";
libname shared "Insert file path";

data all;
set outfinal.discrim_mult1 outfinal.discrim_mult2 outfinal.discrim_mult3
outfinal.discrim_mult4 outfinal.discrim_mult5;
run;

proc freq data=all;
table _mult_;
run;

**********Observed SR in NHANES*************************;
  proc sort data=shared.nhanes65_i0910 out=nhanes65_i0910;
  by _mult_;
  Run;

Data nhanes65_i0910;Set nhanes65_i0910;
If male=0 then do;
cgarsr11=. ;
cgarsr82=. ;
end;
If male=1 then do;
cgarsr10=.;
cgarsr9=.;
end;
Run;

proc contents data=nhanes65_i0910;
run;

proc surveyfreq data=nhanes65_i0910;
  by _mult_;
  table cgarsr6-cgarsr12 cgarsr16-cgarsr19 cgarsr49-cgarsr52
cgarsr57 cgarsr67 cgarsr68 cgarsr82 cgarsr88 cgarsr89 cgarsr91 cgarsr96;
  ods output OneWay=nha_sr;
      strata  STRat;
      cluster psu;
```

```
      weight  WGT;
Run;

Data SR_nha0(keep=clcgar percent stderr _mult_);
   Set nha_sr;
   length clcgar $7;
   clcgar=substr(table,13);

   array cgarsr (23) cgarsr6-cgarsr12 cgarsr16-cgarsr19 cgarsr49-cgarsr52
cgarsr57 cgarsr67 cgarsr68 cgarsr82 cgarsr88 cgarsr89 cgarsr91 cgarsr96 ;
do h = 1 to 23;

if cgarsr[h] = 1 then output;
end;

Run;

Proc sql;
   Create table sr_nha1 as
   select mean(percent) as percent, var(percent) as bvar, mean(stderr**2) as
wvar,clcgar
   from sr_nha0
   group by clcgar ;
Quit;

Data sr_nha2(keep=clcgar SR_NHANES);
  Set sr_nha1;
  mivar= wvar+bvar*6/5;
  mistderr=sqrt(mivar);
  SR_NHANES=trim(left(put(percent,5.2)))||'
('||trim(left(put(mistderr,4.2)))||')';
  Run;

**********************Calibrated claims rate in Non Inst
MCBS*************************;
proc sort data=all ; by _mult_ ; run ;
 proc surveyfreq data=all; * data all created above at top of program ! ;
    by _mult_;
    where i = 0;
    table cgar_ccl1-cgar_ccl125 ;
    ods output OneWay=mcbs_ccl;
      strata  STRat;
      cluster psu;
      weight  WGT;
run;
```

```
Data mcbs_ccl2(keep=clcgar _mult_ percent stderr);
   Set mcbs_ccl;;
   length clcgar $53;
   clcgar=substr(table,15);
   array cgar_ccl (125) cgar_ccl1-cgar_ccl125;

   do h=1 to 125;
    If cgar_ccl[h]=1 then output;
   end;
Run;

Proc sql;
   Create table parest as
   select mean(percent) as percent, var(percent) as bvar, mean(stderr**2) as
wvar,clcgar
   from mcbs_ccl2
   group by clcgar ;
Quit;

Data parest1(keep=clcgar CCl_MCBS_NI ccl_ni);
  Set parest;
  mivar= wvar+bvar*6/5;
  mistderr=sqrt(mivar);
  CCl_MCBS_NI=trim(left(put(percent,5.2)))||'
('||trim(left(put(mistderr,4.2)))||')';
  ccl_ni = percent;
  Run;


**********Claims rate in Non Inst
MCBS**********;
 proc surveyfreq data=all;
  where _mult_=1 and i = 0;
  table cgar1-cgar125;
  ods output OneWay=mcbs_cl_ni;
      strata  STRat;
      cluster psu;
      weight  WGT;
Run;

Data obs_mcbs(keep=clcgar CL_MCBS_NI cl_ni);
   Set mcbs_cl_ni;
   length clcgar $53;
   clcgar=substr(table,11);
   CL_MCBS_NI=trim(left(put(percent,5.2)))||'
('||trim(left(put(stderr,4.2)))||')';
```

```
   cl_ni = percent;

   array cgar (125) cgar1-cgar125;

    do m=1 to 125;
    If cgar[m]=1 then output;
   end;
Run;


************************Claims rate in  Inst
MCBS*************************;
proc surveyfreq data=all;
  where _mult_=1 and i = 1; * where multiple is 1 and i=1 (institutionalized)
;
  table cgar1-cgar125;
  ods output OneWay=mcbs_cl_i;
      strata  STRat;
      cluster psu;
      weight  WGT;
Run;

Data obs_mcbs_i(keep=clcgar CL_MCBS_INST cl_i);
   Set mcbs_cl_i;
   length clcgar $53;
   clcgar=substr(table,11);
   CL_MCBS_INST=trim(left(put(percent,5.2)))||'
('||trim(left(put(stderr,4.2)))||')';
   cl_i = percent;

   array cgar (125) cgar1-cgar125;

    do m=1 to 125;
    If cgar[m]=1 then output;
   end;
Run;

************************Calibrated claims rate Inst
MCBS*************************;
 proc surveyfreq data=all;
  by _mult_;
  where i = 1;
  table cgar_ccl1-cgar_ccl125 ; * list here refers to calibrated claims rates
;
  ods output OneWay=mcbs_ccl_i;
      strata  STRat;
```

```
      cluster psu;
      weight  WGT;
Run;

Data mcbs_ccl2_i(keep=clcgar _mult_ percent stderr);
   Set mcbs_ccl_i;
   length clcgar $53;
   clcgar=substr(table,15);
   array cgar_ccl (125) cgar_ccl1-cgar_ccl125;

   do h=1 to 125;
    If cgar_ccl[h]=1 then output;
   end;
Run;

Proc sql;
   Create table parest_i as
   select mean(percent) as percent, var(percent) as bvar, mean(stderr**2) as
wvar,clcgar
   from mcbs_ccl2_i
   group by clcgar ;
Quit;

Data parest1_i(keep=clcgar CCl_MCBS_INST ccl_i);
  Set parest_i;
  mivar= wvar+bvar*6/5;
  mistderr=sqrt(mivar);
  CCl_MCBS_INST=trim(left(put(percent,5.2)))||'
('||trim(left(put(mistderr,4.2)))||')';
  ccl_i = percent;
  Run;


proc sort data=sr_nha2;
by clcgar;
run;
proc sort data=obs_mcbs;
by clcgar;
proc sort data= parest1;
by clcgar;
proc sort data=obs_mcbs_i;
by clcgar;
proc sort data=parest1_i;
by clcgar;
proc sort data= names.names out=names;
by clcgar;
```

```
run;

Data comp;
  Merge names sr_nha2 obs_mcbs parest1 obs_mcbs_i parest1_i;
  by clcgar;
  cgar=clcgar+0;
  drop clcgar;
Run;

proc sort;
by cgar;
run;

ods rtf file='Insert file path\aggregate_mcbs09_10OCT2017.rtf';
title 'MCBS Aggregate Analysis of Community and Institution Data 2009';
proc print data=comp;
var cgar name sr_nhanes cl_mcbs_ni ccl_mcbs_ni cl_mcbs_inst ccl_mcbs_inst;
run;
ods rtf close;
```