

```
OPTIONS AUTOSIGNON=YES CONNECTWAIT=NO SASCMD="!SASCMD";
```

```
PROC PRINTTO LOG='C:\SPACE\MSLT_SIMxCOV_M_DX.LOG';
```

```
LIBNAME S 'C:\SPACE';
```

```
%INCLUDE 'C:\SPACE\MSLT_SIMxCOV_S.SAS';
```

```
*** POINT ESTIMATES USING THE FULL SAMPLE ***;
```

```
%MSLT(DATA=S.SAMPLE,S=0,VAR=HSQ,NS=3,COV=SEX RACE EDU,NC=3,STRATA=STRATA,  
PSU=PSU,WGT=WEIGHT,LOI=1,BEG=65,END=150,SIMSIZE=10000);
```

```
DATA S.MSLT_SIMxCOV_LE;
```

```
BS=0;
```

```
SET S.BSLE0;
```

```
RUN;
```

```
%MACRO BOOTSTRP(BSIZE=,VAR=,NS=,STRATA=,PSU=,WGT=);
```

```
*** THE BOOTSTRAP PART ***;
```

```
PROC SORT DATA=S.SAMPLE OUT=SAMPLE3;
```

```
BY &STRATA &PSU;
```

```
RUN;
```

```
DATA BS1;
```

```
SET S.SAMPLE(KEEP=ID &STRATA &PSU);
```

```
BY ID;
```

```
IF FIRST.ID;
```

```
RUN;
```

```
PROC SORT NODUPKEY OUT=BS2;
```

```
BY &STRATA &PSU;
```

```
RUN;
```

```
DATA BS3(DROP=&PSU);
```

```
SET BS2(DROP=ID);
```

```
BY &STRATA &PSU;
```

```
IF FIRST.&STRATA THEN NU=0;
```

```
NU+1;
```

```
IF LAST.&STRATA THEN OUTPUT;
```

```
RUN;
```

```
%DO I=1 %TO &BSIZE %BY 4;
```

```
%DO J=&I %TO &I+3;
```

```
PROC IML;
```

```
USE BS2;
```

```
READ ALL VAR {&PSU} INTO X;
```

```
CLOSE BS2;
```

```
USE BS3;
```

```
READ ALL VAR {&STRATA NU} INTO Y;
```

```
CLOSE BS3;
```

```
CUMS=J(1,1,0);
```

```

DO I=1 TO NROW(Y);
  CUMS=CUMS+Y[I,2];
  RS=X[CUMS-Y[I,2]+1:CUMS];

  IF Y[I,2]=1 THEN DO;
    NEWSU[,1]=Y[I,1];
    NEWSU[,2]=RS;          *** SINGLE PSU IS SELECTED WITH CERTAINTY ***;
    NEWSU[,3]=Y[I,2];
  END;
  ELSE DO;
    NEWSU=J(Y[I,2]-1,3,0);
    NEWSU[,1]=Y[I,1];
    NEWSU[,3]=Y[I,2];      *** # OF PSU IN EACH STRATUM ***;
    DO J=1 TO Y[I,2]-1;
      NEWSU[J,2]=RS[ROUND(RANUNI(ROUND(DATETIME()))*Y[I,2]+0.5)];
    END;
  END;
  BSU=BSU//NEWSU;
END;

VAR={"&STRATA" "&PSU" "PS"};
CREATE NBSU FROM BSU [COLNAME=VAR];
APPEND FROM BSU;
CLOSE NBSU;
QUIT;

PROC SORT DATA=NBSU;
  BY &STRATA &PSU;
RUN;

DATA NBSU2;
  SET NBSU;
  BY &STRATA &PSU;
  IF FIRST.&PSU THEN NU=0;
  NU+1;
  IF LAST.&PSU THEN OUTPUT;
RUN;

DATA S.BSMPL%EVAL(&J-(&I-1));
  MERGE NBSU2(IN=SU2) SAMPLE3;
  BY &STRATA &PSU;
  IF SU2;
  IF PS>1 THEN &WGT=&WGT*NU*(PS/(PS-1));
RUN;
%END;

```

```

RSUBMIT TASK1 WAIT=NO;
%INCLUDE 'C:\SPACE\MSLT_SIMxCOV_1.SAS';
ENDRSUBMIT;

```



```

RSUBMIT TASK2 WAIT=NO;
%INCLUDE 'C:\SPACE\MSLT_SIMxCOV_2.SAS';
ENDRSUBMIT;

```

```
RSUBMIT TASK3 WAIT=NO;
%INCLUDE 'C:\SPACE\MSLT_SIMxCOV_3.SAS';
ENDRSUBMIT;
```

```
RSUBMIT TASK4 WAIT=NO;
%INCLUDE 'C:\SPACE\MSLT_SIMxCOV_4.SAS';
ENDRSUBMIT;
```

```
WAITFOR _ALL_ TASK1 TASK2 TASK3 TASK4;
```

```
RGET TASK1;
SIGNOFF TASK1;
```

```
RGET TASK2;
SIGNOFF TASK2;
```

```
RGET TASK3;
SIGNOFF TASK3;
```

```
RGET TASK4;
SIGNOFF TASK4;
```

```
%DO S=0 %TO 3;
  DATA LE%EVAL(&I+&S);
    BS=%EVAL(&I+&S);
    SET S.BSLE%EVAL(&S+1);
  RUN;
%END;

DATA BSLE;
  SET LE%EVAL(&I) LE%EVAL(&I+1) LE%EVAL(&I+2) LE%EVAL(&I+3);
RUN;
```



```
DATA S.MSLT_SIMxCOV_LE;
  SET S.MSLT_SIMxCOV_LE BSLE;
  IF BS NE . & BS<=250;
RUN;
```

```
%END;
%MEND;
```

```
%BOOTSTRP(BSIZE=4,VAR=HSQ,NS=3,STRATA=STRATA,PSU=PSU,WGT=WEIGHT);
```

```
PROC FORMAT;
  VALUE SEX 1='MALE'
          2='FEMALE';

  VALUE RACE 1='WHITE'
            2='BLACK';

  VALUE STATE 0='ALL'
              1='ACTIVE'
              2='DISABLED';
```

RUN;

*** PCT LE & STD ERR ***;

```
PROC MEANS DATA=S.MSLT_SIMxCOV_LE STD NOPRINT;  
  VAR TLE ALE DLE TLY25 ALY25 DLY25 TLY50 ALY50 DLY50 TLY75 ALY75 DLY75;  
  CLASS IAGE SEX RACE STATE;  
  WHERE BS>0;  
  OUTPUT OUT=TLEMEAN STD=TLE_STD ALE_STD DLE_STD TLY25_STD ALY25_STD DLY25_STD  
          TLY50_STD ALY50_STD DLY50_STD TLY75_STD ALY75_STD DLY75_STD;
```

RUN;



```
DATA BOOT_TLE;  
  SET TLEMEAN(WHERE=( _TYPE_ =15));  
  DROP _TYPE_ _FREQ_;
```

RUN;

```
DATA S.MSLT_SIMxCOV_LESTD;  
  MERGE S.MSLT_SIMxCOV_LE(WHERE=(BS=0)) BOOT_TLE;  
  DROP BS;  
  FORMAT SEX SEX. RACE RACE. STATE STATE.  
          TLE ALE DLE TLY25 ALY25 DLY25 TLY50 ALY50 DLY50 TLY75 ALY75 DLY75 6.2  
          TLE_STD ALE_STD DLE_STD TLY25_STD ALY25_STD DLY25_STD  
          TLY50_STD ALY50_STD DLY50_STD TLY75_STD ALY75_STD DLY75_STD 5.2;
```

RUN;