

```
%MACRO SIMDUR(AGE=,SIMSIZE=);
```

```
DATA PLY3;
```

```
COL1=.;
```

```
RUN;
```

```
%DO B=1 %TO &NS-1;
```

```
PROC IML;
```

```
NC=%EVAL(&NC);
```

```
NS=%EVAL(&NS);
```

This program performs the simulation. The simulated cohort can be used either to impute the unobserved R-values or to estimate the MSLT functions after the EM algorithm has converged.

```
USE HSPREV; 
```

```
READ ALL VAR {%DO F=1 %TO &NS-1; P&F %END;} INTO HSPREV WHERE (AGE=&AGE);
```

```
BTIMES=ROUND(&SIMSIZE*HSPREV[,&B]);
```

```
*** PREVALENCE OF COVARIATES BY AGE & HEALTH STATES ***;
```

```
USE COVPREV; 
```

```
%IF &AGE=55 %THEN %DO;
```

```
READ ALL VAR {%COV PCT} INTO PCNT WHERE (AGE=65 & &VAR=&B); *** &NR ROWS AND &NC+1 COL  
%END;
```

```
%ELSE %DO;
```

```
READ ALL VAR {%COV PCT} INTO PCNT WHERE (AGE=&AGE & &VAR=&B); *** &NR ROWS AND &NC+1 CC  
%END;
```

```
NR=NROW(PCNT);
```

```
USE TRANPR;
```

```
READ ALL VAR {%COV %DO U=1 %TO &NS; P&U %END;} INTO SRVP
```

```
WHERE (AGE>=%EVAL(&AGE-&RMAX)); *** NT ROWS AND &NS COLUMNS ***;
```

```
NT=NROW(SRVP);
```

```
DO VA=1 TO NT;
```

```
DO W=1 TO NS;
```

```
IF SRVP[VA,NC+W]<0 THEN SRVP[VA,NC+W]=0;
```

```
END;
```

```
SRVP[VA,NC+1:NC+NS]=SRVP[VA,NC+1:NC+NS]/SRVP[VA,NC+1:NC+NS][,+];
```

```
END;
```

```
USE B; 
```

```
READ ALL VAR {%COV RMEAN PERCENT} INTO PDUR WHERE (BEGST=&B);
```

```
NB=NROW(PDUR);
```


```
%DO MA=1 %TO &NC;
```

```
DO &&COV&MA=1 TO &&LC&MA;
```

```
%END;
```

```
S=J(1,NC,0);
```

```
%DO MA=1 %TO &NC;
```

```
S[,&MA]=&&COV&MA; 
```

```
%END;
```

```
DO G=1 TO NT;
```

```
IF SRVP[G,1:NC]=S THEN SRVP2=SRVP2//SRVP[G,NC+1:NCOL(SRVP)];
```

```
END;
```

```
DO F=1 TO NB;
```

```
IF PDUR[F,1:NC]=S THEN DO;
```

```

PDUR2=PDUR2//PDUR[F,NC+1:NCOL(PDUR)];
RM=RM//PDUR[F,NC+1];
END;
END;
RMX=RM[NROW(RM),1];
RPCT=J(NROW(PDUR2),1,0);
DO VB=1 TO NROW(PDUR2);
  RPCT[VB]=PDUR2[1:VB,2][+,];
END;

DO H=1 TO NR;
  IF PCNT[H,1:NC]=S THEN PCNT2=PCNT[H,NC+1:NCOL(PCNT)];
END;

CTIMES=ROUND(BTIMES*PCNT2);
PLY=J(CTIMES,100,0);
DO T=1 TO CTIMES;
  PLY[T,1]=100000000*&AGE+100000000*&B+T;
  PLY[T,2]=&AGE;

  ***S: RANDOMLY SELECTED COVARIATE SET ***;
  PLY[T,3:3+NC-1]=S;

  PR=PDUR2[MIN(LOC(RPCT>RANUNI(ROUND(DATETIME()))),1)];
  PLY[T,3+NC]=PR;

  SA=RMX-PR;
  IHS=&B;
  PLY[T,3+&NC+1]=IHS;

  DO WHILE (IHS^=NS);
    DO J=PR+1 TO 50;
      IF SA*(NS-1)*50+(J-1)*(NS-1)+IHS<=NROW(SRVP2) THEN DO;
        %DO D=1 %TO &NS;
          P&D=SRVP2[SA*(NS-1)*50+(J-1)*(NS-1)+IHS,&D];
        %END;
        HS=RANTBL(ROUND(DATETIME())%DO E=1 %TO &NS;,P&E %END;);
      END;
    ELSE HS=NS;

    *PRINT S T J IHS HS P1 P2 P3;

    IF SA+J-RMX+(3+NC+1)<=100 THEN PLY[T,SA+J-RMX+(3+NC+1)]=HS;
    ELSE DO;
      HS=NS;
      GOTO POINTA;
    END;

    IF J=50 | (J<50 & HS^=IHS) THEN DO;
      SA=SA+J;
      PR=0;
      GOTO POINTA;
    END;

```

END;

POINTA:

IHS=HS;

END;

END;

PLY2=PLY2//PLY;

FREE S SRVP2 PDUR2 RM;

%DO MA=1 %TO &NC;

END;

%END;

CREATE PLY2 FROM PLY2;

APPEND FROM PLY2;

CLOSE PLY2;

QUIT;

DATA PLY3;

SET PLY3 PLY2;

IF COL1=. THEN DELETE;

RUN;

%END;

%MEND;