MPLUS Analysis Examples Replication Chapter 11

Mplus includes all input code and output in the *.out file. This document contains selected output from each analysis for Chapter 11, where possible in Mplus 7.4. All data preparation and management was done using SAS and then read into Mplus v7.4 using a text file format produced by SAS.

Notes on the process used and other details are included in the Mplus syntax/output.

Mplus VERSION 7.4
MUTHEN & MUTHEN
08/03/2017 11:25 AM

INPUT INSTRUCTIONS

  TITLE: ASDA 2 EXAMPLE 11.3.1 COMPLETE CASE ANALYSIS 1 WAVE OF DATA

    ! USE CHAPTER 11 WAVE 1 CC DATA SET PREPARED IN SAS
    DATA:
    FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_1wave_mplus.txt";
    VARIABLE:
    NAMES ARE kwgtr stratum numsecu ln_inc08 ;
    USEVARIABLES ARE kwgtr stratum numsecu ln_inc08 ;
    missing are . ;
    WEIGHT IS kwgtr ;
    stratification is stratum ;
    cluster is numsecu ;
    ANALYSIS:
    type is complex;
    estimator=mlr ;
    ! Obtain mean from linear regression model ;
    Model:
    ln_inc08 ;
    Output:
    cint ;

*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
*** WARNING
  Data set contains cases with missing on all variables.
  These cases were not included in the analysis.
  Number of cases with missing on all variables: 1215
   2 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS

ASDA 2 EXAMPLE 11.3.1 COMPLETE CASE ANALYSIS 1 WAVE OF DATA

SUMMARY OF ANALYSIS

Number of groups   1
Number of observations   10574

Number of dependent variables   1
Number of independent variables   0
Number of continuous latent variables   0

Observed dependent variables

  Continuous
   LN_INC08

Variables with special functions

  Stratification   STRATUM
  Cluster variable   NUMSECU
  Weight variable   KWGTR

Estimator   MLR
Information matrix   OBSERVED
Maximum number of iterations   1000

```
Convergence criterion                               0.500D-04
Maximum number of steepest descent iterations            20
Maximum number of iterations for H1                    2000
Convergence criterion for H1                        0.100D-03


Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_1wave_mplus.tx


Input data format  FREE



SUMMARY OF DATA

     Number of missing data patterns           1
     Number of strata                 56
     Number of clusters              112



COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value   0.100


        PROPORTION OF DATA PRESENT


           Covariance Coverage
              LN_INCO8

              _____
  LN_INCO8       1.000




THE MODEL ESTIMATION TERMINATED NORMALLY



MODEL FIT INFORMATION

Number of Free Parameters                    2

Loglikelihood

        H0 Value                   -18958.863
        H0 Scaling Correction Factor    13.7981
          for MLR
        H1 Value                   -18958.863
        H1 Scaling Correction Factor    13.7981
          for MLR

Information Criteria

        Akaike (AIC)               37921.726
        Bayesian (BIC)             37936.259
        Sample-Size Adjusted BIC   37929.903
          (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

        Value                         0.000*
        Degrees of Freedom               0
```

```
             P-Value                        0.0000
             Scaling Correction Factor      1.0000
                for MLR


*    The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
     for chi-square difference testing in the regular way.  MLM, MLR and WLSM
     chi-square difference testing is described on the Mplus website.  MLMV, WLSMV,
     and ULSMV difference testing is done using the DIFFTEST option.


RMSEA (Root Mean Square Error Of Approximation)

             Estimate                       0.000
             90 Percent C.I.                0.000  0.000
             Probability RMSEA <= .05       0.000


CFI/TLI

             CFI                            0.000
             TLI                            1.000


Chi-Square Test of Model Fit for the Baseline Model

             Value                          0.000
             Degrees of Freedom                 0
             P-Value                        0.0000


SRMR (Standardized Root Mean Square Residual)

             Value                          0.000




MODEL RESULTS

                                                      Two-Tailed
                        Estimate       S.E.  Est./S.E.    P-Value


    Means
       LN_INCO8          10.441       0.026    397.050      0.000


    Variances
       LN_INCO8           2.113       0.143     14.800      0.000



QUALITY OF NUMERICAL RESULTS

    Condition Number for the Information Matrix          0.969E-02
        (ratio of smallest to largest eigenvalue)



CONFIDENCE INTERVALS OF MODEL RESULTS

                Lower .5% Lower 2.5%  Lower 5%   Estimate   Upper 5% Upper 2.5%  Upper .5%


    Means
       LN_INCO8    10.373    10.389    10.397     10.441     10.484    10.492     10.508


    Variances
       LN_INCO8     1.745     1.833     1.878      2.113      2.348     2.393      2.481
```

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Mplus VERSION 7.4
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08/03/2017 11:34 AM

INPUT INSTRUCTIONS

  TITLE: ASDA 2 EXAMPLE 11.3.1 ADJUSTED WEIGHT 1 WAVE OF DATA

  ! USE CHAPTER 11 WAVE 1 ADJUSTED WEIGHT DATA SET PREPARED IN SAS
  DATA:
  FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
  adj_wgt_1wave_mplus.txt";
  VARIABLE:
  NAMES ARE adj_kwgtr stratum numsecu ln_inc08 ;
  USEVARIABLES ARE adj_kwgtr stratum numsecu ln_inc08 ;
  missing are . ;
  WEIGHT IS adj_kwgtr ;
  stratification is stratum ;
  cluster is numsecu ;
  ANALYSIS:
  type is complex;
  estimator=mlr ;
  ! Obtain mean from linear regression model ;
  Model:
  ln_inc08 ;
  Output:
  cint ;

*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
*** WARNING
  Data set contains cases with missing on all variables.
  These cases were not included in the analysis.
  Number of cases with missing on all variables: 1215
   2 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS

ASDA 2 EXAMPLE 11.3.1 ADJUSTED WEIGHT 1 WAVE OF DATA

SUMMARY OF ANALYSIS

Number of groups   1
Number of observations   10574

Number of dependent variables   1
Number of independent variables   0
Number of continuous latent variables   0

Observed dependent variables

  Continuous
   LN_INC08

Variables with special functions

  Stratification   STRATUM
  Cluster variable   NUMSECU
  Weight variable   ADJ_KWGT

Estimator   MLR
Information matrix   OBSERVED

```
Maximum number of iterations                          1000
Convergence criterion                          0.500D-04
Maximum number of steepest descent iterations          20
Maximum number of iterations for H1                    2000
Convergence criterion for H1                   0.100D-03


Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\adj_wgt_1wave_mpl


Input data format  FREE



SUMMARY OF DATA

    Number of missing data patterns          1
    Number of strata                56
    Number of clusters             112



COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value   0.100


        PROPORTION OF DATA PRESENT


          Covariance Coverage
            LN_INCO8

             _____
  LN_INCO8      1.000



THE MODEL ESTIMATION TERMINATED NORMALLY



MODEL FIT INFORMATION

Number of Free Parameters                       2

Loglikelihood

        H0 Value                   -18988.466
        H0 Scaling Correction Factor    13.8002
          for MLR
        H1 Value                   -18988.466
        H1 Scaling Correction Factor    13.8002
          for MLR

Information Criteria

        Akaike (AIC)                37980.932
        Bayesian (BIC)              37995.464
        Sample-Size Adjusted BIC    37989.108
          (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

        Value                       0.000*
```

```
          Degrees of Freedom                     0
          P-Value                            0.0000
          Scaling Correction Factor          1.0000
             for MLR
*    The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
     for chi-square difference testing in the regular way.  MLM, MLR and WLSM
     chi-square difference testing is described on the Mplus website.  MLMV, WLSMV,
     and ULSMV difference testing is done using the DIFFTEST option.


RMSEA (Root Mean Square Error Of Approximation)

          Estimate                           0.000
          90 Percent C.I.                    0.000  0.000
          Probability RMSEA <= .05           0.000


CFI/TLI

          CFI                                0.000
          TLI                                1.000


Chi-Square Test of Model Fit for the Baseline Model

          Value                              0.000
          Degrees of Freedom                     0
          P-Value                            0.0000


SRMR (Standardized Root Mean Square Residual)

          Value                              0.000
```

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
Means				
LN_INCO8	10.414	0.027	391.321	0.000
Variances				
LN_INCO8	2.125	0.143	14.819	0.000

QUALITY OF NUMERICAL RESULTS

```
     Condition Number for the Information Matrix            0.980E-02
        (ratio of smallest to largest eigenvalue)
```

CONFIDENCE INTERVALS OF MODEL RESULTS

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
Means							
LN_INCO8	10.345	10.361	10.370	10.414	10.457	10.466	10.482
Variances							
LN_INCO8	1.755	1.844	1.889	2.125	2.361	2.406	2.494

```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/03/2017   1:24 PM
INPUT INSTRUCTIONS
  TITLE: ASDA 2 EXAMPLE 11.3.1 1 WAVE MULTIPLE IMPUTATION MISSING DATA
  DATA:
  FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
  mi_1wave_mplus.txt";
  VARIABLE:
  NAMES ARE
  STRATUM NUMSECU arthritis_06 diabetes_06 age_06 kwgtr_dec kwgtr ln_inc06 ln_inc08
  ed011 ed12 ed1315 ed16 married prevmar nevmar hisp white black other
  excellent verygood good fair poor ;
  ! order of variables in output data sets will match usevariables,auxiliary from impute
  USEVARIABLES ARE STRATUM NUMSECU arthritis_06 diabetes_06 age_06
  kwgtr_dec ln_inc06 ln_inc08
  ed12 ed1315 ed16
  prevmar nevmar
  white black other
  verygood good fair poor ;
  AUXILIARY IS kwgtr ;
  missing are . ;
  DATA IMPUTATION:
  IMPUTE=LN_INC08 ;
  NDATASETS=5 ;
  MODEL=SEQUENTIAL ;
  SAVE= IMP*.DAT ;


*** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
   2 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS
```

```
ASDA 2 EXAMPLE 11.3.1 1 WAVE MULTIPLE IMPUTATION MISSING DATA
SUMMARY OF ANALYSIS
Number of groups                                                1
Average number of observations                              11789
Number of replications
    Requested                                                   5
    Completed                                                   5
Number of dependent variables                                  20
Number of independent variables                                 0
Number of continuous latent variables                           0
Observed dependent variables
  Continuous
   STRATUM     NUMSECU     ARTHRITIS_  DIABETES_O  AGE_06      KWGTR_DEC
   LN_INC06    LN_INC08    ED12        ED1315      ED16        PREVMAR
   NEVMAR      WHITE       BLACK       OTHER       VERYGOOD    GOOD
   FAIR        POOR
Observed auxiliary variables
   KWGTR
Variables used for imputation
  Variables imputed as continuous
   LN_INC08
Estimator                                                      ML
Information matrix                                        OBSERVED
```

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```
Maximum number of iterations                         1000
Convergence criterion                            0.500D-04
Maximum number of steepest descent iterations          20
Maximum number of iterations for H1                  2000
Convergence criterion for H1                     0.100D-03
Specifications for Bayesian Estimation
  Point estimate                                     MEDIAN
  Number of Markov chain Monte Carlo (MCMC) chains        2
  Random seed for the first chain                         0
  Starting value information                     UNPERTURBED
  Treatment of categorical mediator                   LATENT
  Algorithm used for Markov chain Monte Carlo     GIBBS(PX1)
  Convergence criterion                            0.500D-01
  Maximum number of iterations                        50000
  K-th iteration used for thinning                        1
Specifications for Data Imputation
  Number of imputed data sets                             5
  H1 imputation model type                        SEQUENTIAL
  Iteration intervals for thinning                      100
Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\mi_1wave_mplus.tx
Input data format  FREE
SUMMARY OF DATA FOR THE FIRST DATA SET
     Number of missing data patterns              1
SUMMARY OF MISSING DATA PATTERNS FOR THE FIRST DATA SET
     MISSING DATA PATTERNS (x = not missing)
          1
 STRATUM   x
 NUMSECU   x
 ARTHRITI  x
 DIABETES  x
 AGE_06    x
 KWGTR_DE  x
 LN_INCO6  x
 LN_INCO8  x
 ED12      x
 ED1315    x
 ED16      x
 PREVMAR   x
 NEVMAR    x
 WHITE     x
 BLACK     x
 OTHER     x
 VERYGOOD  x
 GOOD      x
 FAIR      x
 POOR      x
     MISSING DATA PATTERN FREQUENCIES
    Pattern   Frequency
        1       11789
COVARIANCE COVERAGE OF DATA FOR THE FIRST DATA SET
Minimum covariance coverage value   0.100
     PROPORTION OF DATA PRESENT
          Covariance Coverage
            STRATUM      NUMSECU      ARTHRITI     DIABETES     AGE_06
            _____     _____     _____     _____     _____
 STRATUM     1.000
 NUMSECU     1.000        1.000
 ARTHRITI    1.000        1.000        1.000
 DIABETES    1.000        1.000        1.000        1.000
 AGE_06      1.000        1.000        1.000        1.000        1.000
```

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
KWGTR_DE	1.000	1.000	1.000	1.000	1.000
LN_INCO6	1.000	1.000	1.000	1.000	1.000
LN_INCO8	1.000	1.000	1.000	1.000	1.000
ED12	1.000	1.000	1.000	1.000	1.000
ED1315	1.000	1.000	1.000	1.000	1.000
ED16	1.000	1.000	1.000	1.000	1.000
PREVMAR	1.000	1.000	1.000	1.000	1.000
NEVMAR	1.000	1.000	1.000	1.000	1.000
WHITE	1.000	1.000	1.000	1.000	1.000
BLACK	1.000	1.000	1.000	1.000	1.000
OTHER	1.000	1.000	1.000	1.000	1.000
VERYGOOD	1.000	1.000	1.000	1.000	1.000
GOOD	1.000	1.000	1.000	1.000	1.000
FAIR	1.000	1.000	1.000	1.000	1.000
POOR	1.000	1.000	1.000	1.000	1.000

Covariance Coverage

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
KWGTR_DE	1.000				
LN_INCO6	1.000	1.000			
LN_INCO8	1.000	1.000	1.000		
ED12	1.000	1.000	1.000	1.000	
ED1315	1.000	1.000	1.000	1.000	1.000
ED16	1.000	1.000	1.000	1.000	1.000
PREVMAR	1.000	1.000	1.000	1.000	1.000
NEVMAR	1.000	1.000	1.000	1.000	1.000
WHITE	1.000	1.000	1.000	1.000	1.000
BLACK	1.000	1.000	1.000	1.000	1.000
OTHER	1.000	1.000	1.000	1.000	1.000
VERYGOOD	1.000	1.000	1.000	1.000	1.000
GOOD	1.000	1.000	1.000	1.000	1.000
FAIR	1.000	1.000	1.000	1.000	1.000
POOR	1.000	1.000	1.000	1.000	1.000

Covariance Coverage

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
ED16	1.000				
PREVMAR	1.000	1.000			
NEVMAR	1.000	1.000	1.000		
WHITE	1.000	1.000	1.000	1.000	
BLACK	1.000	1.000	1.000	1.000	1.000
OTHER	1.000	1.000	1.000	1.000	1.000
VERYGOOD	1.000	1.000	1.000	1.000	1.000
GOOD	1.000	1.000	1.000	1.000	1.000
FAIR	1.000	1.000	1.000	1.000	1.000
POOR	1.000	1.000	1.000	1.000	1.000

Covariance Coverage

	OTHER	VERYGOOD	GOOD	FAIR	POOR
OTHER	1.000				
VERYGOOD	1.000	1.000			
GOOD	1.000	1.000	1.000		
FAIR	1.000	1.000	1.000	1.000	
POOR	1.000	1.000	1.000	1.000	1.000

SAMPLE STATISTICS

NOTE: These are average results over 5 data sets.

SAMPLE STATISTICS

Means

	STRATUM	NUMSECU	ARTHRITI	DIABETES	AGE_O6
1	30.634	60.772	0.625	0.213	69.519

Means

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
1	4.485	10.291	10.298	0.331	0.207

Means

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
1	0.217	0.492	0.041	0.732	0.158

Means

	OTHER	VERYGOOD	GOOD	FAIR	POOR
1	0.022	0.279	0.306	0.223	0.090

Covariances

	STRATUM	NUMSECU	ARTHRITI	DIABETES	AGE_06
STRATUM	224.135				
NUMSECU	448.369	897.186			
ARTHRITI	0.229	0.462	0.234		
DIABETES	-0.020	-0.038	0.020	0.168	
AGE_06	-2.700	-5.403	1.016	0.008	106.779
KWGTR_DE	1.248	2.486	-0.175	-0.097	-10.667
LN_INCO6	-0.250	-0.496	-0.073	-0.048	-2.209
LN_INCO8	-0.300	-0.592	-0.064	-0.041	-2.299
ED12	0.095	0.193	0.007	-0.002	0.157
ED1315	-0.023	-0.050	-0.002	-0.006	-0.374
ED16	-0.331	-0.661	-0.025	-0.011	-0.472
PREVMAR	-0.240	-0.479	0.026	0.004	1.203
NEVMAR	-0.136	-0.271	-0.003	-0.001	-0.199
WHITE	1.047	2.093	0.002	-0.025	0.497
BLACK	-0.925	-1.843	0.004	0.015	-0.255
OTHER	-0.023	-0.045	-0.002	0.002	-0.067
VERYGOOD	0.078	0.155	-0.024	-0.027	-0.292
GOOD	-0.055	-0.108	0.007	0.003	0.164
FAIR	0.003	0.003	0.028	0.027	0.360
POOR	0.119	0.239	0.015	0.013	0.100

Covariances

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
KWGTR_DE	8.300				
LN_INCO6	0.536	1.716			
LN_INCO8	0.529	1.061	1.862		
ED12	-0.024	-0.032	-0.027	0.221	
ED1315	0.089	0.047	0.049	-0.068	0.164
ED16	0.166	0.158	0.156	-0.072	-0.045
PREVMAR	-0.127	-0.235	-0.230	0.009	-0.006
NEVMAR	0.049	-0.019	-0.014	-0.002	0.000
WHITE	0.348	0.148	0.155	0.022	0.007
BLACK	-0.283	-0.073	-0.079	-0.006	-0.003
OTHER	0.016	-0.002	-0.003	-0.003	0.001
VERYGOOD	0.082	0.091	0.081	0.002	0.006
GOOD	-0.026	0.018	0.020	0.008	0.007
FAIR	-0.098	-0.102	-0.102	-0.002	-0.008
POOR	-0.031	-0.064	-0.060	-0.002	-0.007

Covariances

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
ED16	0.170				
PREVMAR	-0.034	0.250			
NEVMAR	0.003	-0.020	0.039		
WHITE	0.024	-0.025	-0.004	0.196	
BLACK	-0.014	0.024	0.004	-0.116	0.133

OTHER	0.003	0.000	0.000	-0.016	-0.003
VERYGOOD	0.022	-0.016	0.000	0.026	-0.013
GOOD	-0.005	-0.001	-0.001	0.001	0.004
FAIR	-0.024	0.019	0.001	-0.027	0.012
POOR	-0.010	0.009	0.000	-0.011	0.005

Covariances

	OTHER	VERYGOOD	GOOD	FAIR	POOR
OTHER	0.022				
VERYGOOD	0.001	0.201			
GOOD	0.000	-0.085	0.212		
FAIR	-0.001	-0.062	-0.068	0.173	
POOR	0.001	-0.025	-0.027	-0.020	0.082

Correlations

	STRATUM	NUMSECU	ARTHRITI	DIABETES	AGE_06
STRATUM	1.000				
NUMSECU	1.000	1.000			
ARTHRITI	0.032	0.032	1.000		
DIABETES	-0.003	-0.003	0.099	1.000	
AGE_06	-0.017	-0.017	0.203	0.002	1.000
KWGTR_DE	0.029	0.029	-0.125	-0.082	-0.358
LN_INCO6	-0.013	-0.013	-0.115	-0.089	-0.163
LN_INCO8	-0.015	-0.014	-0.097	-0.073	-0.163
ED12	0.014	0.014	0.033	-0.009	0.032
ED1315	-0.004	-0.004	-0.011	-0.034	-0.089
ED16	-0.054	-0.054	-0.123	-0.063	-0.111
PREVMAR	-0.032	-0.032	0.108	0.018	0.233
NEVMAR	-0.046	-0.046	-0.031	-0.009	-0.097
WHITE	0.158	0.158	0.010	-0.139	0.109
BLACK	-0.169	-0.169	0.023	0.102	-0.068
OTHER	-0.010	-0.010	-0.025	0.028	-0.044
VERYGOOD	0.012	0.012	-0.111	-0.148	-0.063
GOOD	-0.008	-0.008	0.033	0.016	0.034
FAIR	0.000	0.000	0.138	0.160	0.084
POOR	0.028	0.028	0.112	0.115	0.034

Correlations

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
KWGTR_DE	1.000				
LN_INCO6	0.142	1.000			
LN_INCO8	0.135	0.593	1.000		
ED12	-0.017	-0.051	-0.042	1.000	
ED1315	0.076	0.089	0.089	-0.359	1.000
ED16	0.139	0.293	0.277	-0.370	-0.269
PREVMAR	-0.088	-0.358	-0.337	0.038	-0.028
NEVMAR	0.086	-0.072	-0.052	-0.021	0.006
WHITE	0.273	0.256	0.257	0.107	0.042
BLACK	-0.269	-0.154	-0.159	-0.034	-0.019
OTHER	0.038	-0.010	-0.017	-0.039	0.012
VERYGOOD	0.063	0.154	0.132	0.011	0.032
GOOD	-0.020	0.030	0.032	0.036	0.040
FAIR	-0.082	-0.187	-0.179	-0.010	-0.047
POOR	-0.038	-0.171	-0.154	-0.016	-0.061

Correlations

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
ED16	1.000				
PREVMAR	-0.165	1.000			
NEVMAR	0.041	-0.204	1.000		
WHITE	0.133	-0.114	-0.041	1.000	

```
BLACK       -0.090      0.130       0.055      -0.716       1.000
OTHER        0.043     -0.005       0.013      -0.248      -0.065
VERYGOOD     0.119     -0.072       0.005       0.131      -0.080
GOOD        -0.028     -0.005      -0.014       0.005       0.022
FAIR        -0.137      0.092       0.010      -0.147       0.079
POOR        -0.088      0.066       0.007      -0.085       0.051
           Correlations
             OTHER      VERYGOOD     GOOD        FAIR        POOR

           _____    _____    _____    _____    _____

OTHER        1.000
VERYGOOD     0.010       1.000
GOOD        -0.007      -0.413       1.000
FAIR        -0.008      -0.333      -0.356       1.000
POOR         0.028      -0.195      -0.208      -0.168       1.000
```

MODEL FIT INFORMATION

Number of Free Parameters   40

Loglikelihood

          H0 Value   -289298.371
          H1 Value   -213977.278

*   The loglikelihood cannot be used directly for chi-square testing with
     imputed data.

Information Criteria

          Akaike (AIC)   578676.741
          Bayesian (BIC)   578971.738
          Sample-Size Adjusted BIC   578844.623
            (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

          Value   147164.405
          Degrees of Freedom   190
          P-Value   0.0000

RMSEA (Root Mean Square Error Of Approximation)

          Estimate   0.256
          90 Percent C.I.   0.255 0.257
          Probability RMSEA <= .05   0.000

CFI/TLI

          CFI   0.000
          TLI   0.000

Chi-Square Test of Model Fit for the Baseline Model

          Value   147164.405
          Degrees of Freedom   190
          P-Value   0.0000

SRMR (Standardized Root Mean Square Residual)

          Value   0.144

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value	Rate of Missing
Means					
STRATUM	30.634	0.138	222.118	0.000	0.001
NUMSECU	60.772	0.276	220.245	0.000	0.000
ARTHRITIS_	0.625	0.004	140.308	0.000	-0.001
DIABETES_O	0.213	0.004	56.475	0.000	0.000
AGE_06	69.519	0.094	741.553	0.000	-0.031
KWGTR_DEC	4.485	0.027	169.032	0.000	0.000
LN_INCO6	10.291	0.012	839.176	0.000	0.032
LN_INCO8	10.298	0.013	798.380	0.000	0.052
ED12	0.331	0.004	76.374	0.000	0.000
ED1315	0.207	0.004	55.436	0.000	0.000
ED16	0.217	0.004	57.169	0.000	0.000

```
        PREVMAR            0.492      0.005    106.859      0.000      0.001
        NEVMAR             0.041      0.002     22.490      0.000      0.000
        WHITE              0.732      0.004    179.347      0.000      0.000
        BLACK              0.158      0.003     47.040      0.000      0.000
        OTHER              0.022      0.001     16.305      0.000      0.000
        VERYGOOD           0.279      0.004     67.480      0.000      0.000
        GOOD               0.306      0.004     72.140      0.000      0.000
        FAIR               0.223      0.004     58.123      0.000      0.000
        POOR               0.090      0.003     34.075      0.000      0.000
    Variances
        STRATUM          224.135      2.919     76.779      0.000      0.000
        NUMSECU          897.186     11.686     76.777      0.000      0.000
        ARTHRITIS_         0.234      0.003     76.773      0.000      0.000
        DIABETES_O         0.168      0.002     76.775      0.000      0.000
        AGE_06           106.779      1.391     76.780      0.000      0.000
        KWGTR_DEC          8.300      0.108     76.772      0.000      0.000
        LN_INCO6           1.716      0.022     76.776      0.000      0.000
        LN_INCO8           1.862      0.025     73.562      0.000      0.085
        ED12               0.221      0.003     76.780      0.000      0.000
        ED1315             0.164      0.002     76.782      0.000      0.000
        ED16               0.170      0.002     76.784      0.000      0.000
        PREVMAR            0.250      0.003     76.776      0.000      0.000
        NEVMAR             0.039      0.001     76.779      0.000      0.000
        WHITE              0.196      0.003     76.773      0.000      0.000
        BLACK              0.133      0.002     76.781      0.000      0.000
        OTHER              0.022      0.000     76.772      0.000      0.000
        VERYGOOD           0.201      0.003     76.786      0.000      0.000
        GOOD               0.212      0.003     76.774      0.000      0.000
        FAIR               0.173      0.002     76.779      0.000      0.000
        POOR               0.082      0.001     76.774      0.000      0.000
QUALITY OF NUMERICAL RESULTS
     Average Condition Number for the Information Matrix     0.116E-03
        (ratio of smallest to largest eigenvalue)
TECHNICAL 1 OUTPUT
     PARAMETER SPECIFICATION
          NU
              STRATUM      NUMSECU     ARTHRITI     DIABETES      AGE_06

              _____    _____    _____    _____    _____
      1           1           2           3           4           5
          NU
              KWGTR_DE     LN_INCO6    LN_INCO8     ED12         ED1315

              _____    _____    _____    _____    _____
      1           6           7           8           9          10
          NU
              ED16         PREVMAR     NEVMAR       WHITE        BLACK

              _____    _____    _____    _____    _____
      1          11          12          13          14          15
          NU
              OTHER        VERYGOOD    GOOD         FAIR         POOR

              _____    _____    _____    _____    _____
      1          16          17          18          19          20
          THETA
              STRATUM      NUMSECU     ARTHRITI     DIABETES      AGE_06

              _____    _____    _____    _____    _____
 STRATUM          21
 NUMSECU           0          22
 ARTHRITI          0           0          23
 DIABETES          0           0           0          24
 AGE_06            0           0           0           0          25
 KWGTR_DE          0           0           0           0           0
 LN_INCO6          0           0           0           0           0
```

14

	LN_INCO8				
LN_INCO8	0	0	0	0	0
ED12	0	0	0	0	0
ED1315	0	0	0	0	0
ED16	0	0	0	0	0
PREVMAR	0	0	0	0	0
NEVMAR	0	0	0	0	0
WHITE	0	0	0	0	0
BLACK	0	0	0	0	0
OTHER	0	0	0	0	0
VERYGOOD	0	0	0	0	0
GOOD	0	0	0	0	0
FAIR	0	0	0	0	0
POOR	0	0	0	0	0

THETA

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
	_____	_____	_____	_____	_____
KWGTR_DE	26				
LN_INCO6	0	27			
LN_INCO8	0	0	28		
ED12	0	0	0	29	
ED1315	0	0	0	0	30
ED16	0	0	0	0	0
PREVMAR	0	0	0	0	0
NEVMAR	0	0	0	0	0
WHITE	0	0	0	0	0
BLACK	0	0	0	0	0
OTHER	0	0	0	0	0
VERYGOOD	0	0	0	0	0
GOOD	0	0	0	0	0
FAIR	0	0	0	0	0
POOR	0	0	0	0	0

THETA

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
	_____	_____	_____	_____	_____
ED16	31				
PREVMAR	0	32			
NEVMAR	0	0	33		
WHITE	0	0	0	34	
BLACK	0	0	0	0	35
OTHER	0	0	0	0	0
VERYGOOD	0	0	0	0	0
GOOD	0	0	0	0	0
FAIR	0	0	0	0	0
POOR	0	0	0	0	0

THETA

	OTHER	VERYGOOD	GOOD	FAIR	POOR
	_____	_____	_____	_____	_____
OTHER	36				
VERYGOOD	0	37			
GOOD	0	0	38		
FAIR	0	0	0	39	
POOR	0	0	0	0	40

STARTING VALUES

NU

	STRATUM	NUMSECU	ARTHRITI	DIABETES	AGE_06
	_____	_____	_____	_____	_____
1	0.000	0.000	0.000	0.000	0.000

NU

	KWGTR_DE	LN_INCO6	LN_INCO8	ED12	ED1315
	_____	_____	_____	_____	_____
1	0.000	0.000	0.000	0.000	0.000

```
          NU
          ED16      PREVMAR    NEVMAR     WHITE      BLACK
          _____  _____   _____   _____   _____
    1      0.000     0.000      0.000      0.000      0.000
          NU
          OTHER     VERYGOOD   GOOD       FAIR       POOR
          _____  _____   _____   _____   _____
    1      0.000     0.000      0.000      0.000      0.000
          THETA
          STRATUM   NUMSECU    ARTHRITI   DIABETES   AGE_06
          _____  _____   _____   _____   _____
STRATUM   112.068
NUMSECU     0.000   448.593
ARTHRITI    0.000     0.000      0.117
DIABETES    0.000     0.000      0.000      0.084
AGE_06      0.000     0.000      0.000      0.000     53.389
KWGTR_DE    0.000     0.000      0.000      0.000      0.000
LN_INCO6    0.000     0.000      0.000      0.000      0.000
LN_INCO8    0.000     0.000      0.000      0.000      0.000
ED12        0.000     0.000      0.000      0.000      0.000
ED1315      0.000     0.000      0.000      0.000      0.000
ED16        0.000     0.000      0.000      0.000      0.000
PREVMAR     0.000     0.000      0.000      0.000      0.000
NEVMAR      0.000     0.000      0.000      0.000      0.000
WHITE       0.000     0.000      0.000      0.000      0.000
BLACK       0.000     0.000      0.000      0.000      0.000
OTHER       0.000     0.000      0.000      0.000      0.000
VERYGOOD    0.000     0.000      0.000      0.000      0.000
GOOD        0.000     0.000      0.000      0.000      0.000
FAIR        0.000     0.000      0.000      0.000      0.000
POOR        0.000     0.000      0.000      0.000      0.000
          THETA
          KWGTR_DE  LN_INCO6   LN_INCO8   ED12       ED1315
          _____  _____   _____   _____   _____
KWGTR_DE    4.150
LN_INCO6    0.000     0.858
LN_INCO8    0.000     0.000      0.928
ED12        0.000     0.000      0.000      0.111
ED1315      0.000     0.000      0.000      0.000      0.082
ED16        0.000     0.000      0.000      0.000      0.000
PREVMAR     0.000     0.000      0.000      0.000      0.000
NEVMAR      0.000     0.000      0.000      0.000      0.000
WHITE       0.000     0.000      0.000      0.000      0.000
BLACK       0.000     0.000      0.000      0.000      0.000
OTHER       0.000     0.000      0.000      0.000      0.000
VERYGOOD    0.000     0.000      0.000      0.000      0.000
GOOD        0.000     0.000      0.000      0.000      0.000
FAIR        0.000     0.000      0.000      0.000      0.000
POOR        0.000     0.000      0.000      0.000      0.000
          THETA
          ED16      PREVMAR    NEVMAR     WHITE      BLACK
          _____  _____   _____   _____   _____
ED16        0.085
PREVMAR     0.000     0.125
NEVMAR      0.000     0.000      0.020
WHITE       0.000     0.000      0.000      0.098
BLACK       0.000     0.000      0.000      0.000      0.067
OTHER       0.000     0.000      0.000      0.000      0.000
VERYGOOD    0.000     0.000      0.000      0.000      0.000
GOOD        0.000     0.000      0.000      0.000      0.000
FAIR        0.000     0.000      0.000      0.000      0.000
```

POOR	0.000	0.000	0.000	0.000	0.000

THETA

	OTHER	VERYGOOD	GOOD	FAIR	POOR
	_____	_____	_____	_____	_____
OTHER	0.011				
VERYGOOD	0.000	0.101			
GOOD	0.000	0.000	0.106		
FAIR	0.000	0.000	0.000	0.087	
POOR	0.000	0.000	0.000	0.000	0.041

SAVEDATA INFORMATION

  Save file
    IMP*.DAT
  Order of variables
    STRATUM
    NUMSECU
    ARTHRITI
    DIABETES
    AGE_O6
    KWGTR_DE
    LN_INCO6
    LN_INCO8
    ED12
    ED1315
    ED16
    PREVMAR
    NEVMAR
    WHITE
    BLACK
    OTHER
    VERYGOOD
    GOOD
    FAIR
    POOR
    KWGTR
  Save file format   Free
  Save file record length   10000

```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/03/2017   1:35 PM
INPUT INSTRUCTIONS
  TITLE: ASDA 2 EXAMPLE 11.3.1 ANALYSIS OF MI DATA SETS FROM MPLUS
  1 WAVE OF DATA
  ! USE IMPUTED DATA SETS FROM IMPUTE COMMAND OF MPLUS
  DATA:
  FILE IS "P:\ASDA 2\Analysis Example Replication\MPLUS\Chapter 11\
  implist.dat";
  TYPE = IMPUTATION ;
  ! order must match that given in usevar and auxilliary list from imputation
  VARIABLE:
  NAMES ARE
  STRATUM NUMSECU arthritis_06 diabetes_06 age_06
    kwgtr_dec ln_inc06 ln_inc08
    ed12 ed1315 ed16
    prevmar nevmar
    white black other
    verygood good fair poor kwgtr ;
  USEVARIABLES ARE STRATUM numsecu KWGTR ln_inc08 ;
  WEIGHT = kwgtr ;
  missing are . ;
  STRATIFICATION IS STRATUM ;
  CLUSTER IS NUMSECU ;
  ANALYSIS:
  type is complex ;
  estimator = mlr ;
  MODEL:
  ln_inc08 ;
  output:
  cint ;


*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
    1 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS


ASDA 2 EXAMPLE 11.3.1 ANALYSIS OF MI DATA SETS FROM MPLUS
1 WAVE OF DATA
SUMMARY OF ANALYSIS
Number of groups                                         1
Average number of observations                       11789
Number of replications
    Requested                                          5
    Completed                                          5
Number of dependent variables                          1
Number of independent variables                        0
Number of continuous latent variables                  0
Observed dependent variables
  Continuous
    LN_INC08
Variables with special functions
  Stratification        STRATUM
  Cluster variable      NUMSECU
  Weight variable       KWGTR
Estimator                                             MLR
Information matrix                                OBSERVED
Maximum number of iterations                         1000
Convergence criterion                           0.500D-04
Maximum number of steepest descent iterations         20
```

```
Maximum number of iterations for H1                           2000
Convergence criterion for H1                        0.100D-03
Input data file(s)
  Multiple data files from
    P:\ASDA 2\Analysis Example Replication\MPLUS\Chapter 11\implist.dat
Input data format  FREE
SUMMARY OF DATA FOR THE FIRST DATA SET
     Number of missing data patterns          1
     Number of strata                 56
     Number of clusters              112
SUMMARY OF MISSING DATA PATTERNS FOR THE FIRST DATA SET
     MISSING DATA PATTERNS (x = not missing)
         1
 LN_INCO8  x
     MISSING DATA PATTERN FREQUENCIES
    Pattern   Frequency
        1      11789
COVARIANCE COVERAGE OF DATA FOR THE FIRST DATA SET
Minimum covariance coverage value   0.100
     PROPORTION OF DATA PRESENT
          Covariance Coverage
            LN_INCO8
            _____
 LN_INCO8     1.000
SAMPLE STATISTICS
NOTE:  These are average results over 5 data sets.
     ESTIMATED SAMPLE STATISTICS
          Means
            LN_INCO8
            _____
 1            10.415
          Covariances
            LN_INCO8
            _____
 LN_INCO8     2.107
          Correlations
            LN_INCO8
            _____
 LN_INCO8     1.000
MODEL FIT INFORMATION
Number of Free Parameters                         2
Loglikelihood
    H0 Value
        Mean                           -21120.107
        Std Dev                            18.706
        Number of successful computations        5
          Proportions                 Percentiles
        Expected    Observed        Expected      Observed
          0.990      1.000        -21163.623    -21140.494
          0.980      1.000        -21158.524    -21140.494
          0.950      1.000        -21150.877    -21140.494
          0.900      1.000        -21144.081    -21140.494
          0.800      0.600        -21135.850    -21140.494
          0.700      0.600        -21129.916    -21140.494
          0.500      0.400        -21120.107    -21136.962
          0.300      0.200        -21110.297    -21122.623
          0.200      0.200        -21104.363    -21111.478
          0.100      0.200        -21096.132    -21111.478
          0.050      0.200        -21089.336    -21111.478
          0.020      0.000        -21081.689    -21111.478
          0.010      0.000        -21076.590    -21111.478
```

```
    H1 Value
        Mean                               -21120.107
        Std Dev                                18.706
        Number of successful computations        5
            Proportions                    Percentiles
        Expected    Observed        Expected        Observed
           0.990       1.000      -21163.623      -21140.494
           0.980       1.000      -21158.524      -21140.494
           0.950       1.000      -21150.877      -21140.494
           0.900       1.000      -21144.081      -21140.494
           0.800       0.600      -21135.850      -21140.494
           0.700       0.600      -21129.916      -21140.494
           0.500       0.400      -21120.107      -21136.962
           0.300       0.200      -21110.297      -21122.623
           0.200       0.200      -21104.363      -21111.478
           0.100       0.200      -21096.132      -21111.478
           0.050       0.200      -21089.336      -21111.478
           0.020       0.000      -21081.689      -21111.478
           0.010       0.000      -21076.590      -21111.478
Information Criteria
    Akaike (AIC)
        Mean                                42244.213
        Std Dev                                37.413
        Number of successful computations        5
            Proportions                    Percentiles
        Expected    Observed        Expected        Observed
           0.990       1.000       42157.180       42181.952
           0.980       1.000       42167.378       42181.952
           0.950       0.800       42182.673       42181.952
           0.900       0.800       42196.265       42181.952
           0.800       0.800       42212.726       42181.952
           0.700       0.800       42224.594       42181.952
           0.500       0.600       42244.213       42226.957
           0.300       0.400       42263.832       42249.245
           0.200       0.400       42275.700       42277.924
           0.100       0.000       42292.161       42277.924
           0.050       0.000       42305.753       42277.924
           0.020       0.000       42321.048       42277.924
           0.010       0.000       42331.246       42277.924
    Bayesian (BIC)
        Mean                                42258.963
        Std Dev                                37.413
        Number of successful computations        5
            Proportions                    Percentiles
        Expected    Observed        Expected        Observed
           0.990       1.000       42171.930       42196.702
           0.980       1.000       42182.128       42196.702
           0.950       0.800       42197.423       42196.702
           0.900       0.800       42211.015       42196.702
           0.800       0.800       42227.476       42196.702
           0.700       0.800       42239.344       42196.702
           0.500       0.600       42258.963       42241.707
           0.300       0.400       42278.582       42263.995
           0.200       0.400       42290.450       42292.673
           0.100       0.000       42306.911       42292.673
           0.050       0.000       42320.503       42292.673
           0.020       0.000       42335.798       42292.673
           0.010       0.000       42345.996       42292.673
    Sample-Size Adjusted BIC (n* = (n + 2) / 24)
        Mean                                42252.607
        Std Dev                                37.413
```

```
              Number of successful computations       5
                   Proportions                    Percentiles
          Expected     Observed         Expected          Observed
             0.990        1.000       42165.574        42190.346
             0.980        1.000       42175.773        42190.346
             0.950        0.800       42191.067        42190.346
             0.900        0.800       42204.659        42190.346
             0.800        0.800       42221.121        42190.346
             0.700        0.800       42232.988        42190.346
             0.500        0.600       42252.607        42235.351
             0.300        0.400       42272.226        42257.639
             0.200        0.400       42284.094        42286.318
             0.100        0.000       42300.555        42286.318
             0.050        0.000       42314.147        42286.318
             0.020        0.000       42329.442        42286.318
             0.010        0.000       42339.641        42286.318
Chi-Square Test of Model Fit
        Degrees of freedom                      0
        Mean                                0.000
        Std Dev                             0.000
        Number of successful computations       5
                   Proportions                    Percentiles
          Expected     Observed         Expected          Observed
             0.990        1.000           0.000             0.000
             0.980        1.000           0.000             0.000
             0.950        1.000           0.000             0.000
             0.900        1.000           0.000             0.000
             0.800        1.000           0.000             0.000
             0.700        1.000           0.000             0.000
             0.500        1.000           0.000             0.000
             0.300        1.000           0.000             0.000
             0.200        1.000           0.000             0.000
             0.100        1.000           0.000             0.000
             0.050        1.000           0.000             0.000
             0.020        1.000           0.000             0.000
             0.010        1.000           0.000             0.000
RMSEA (Root Mean Square Error Of Approximation)
        Mean                                0.000
        Std Dev                             0.000
        Number of successful computations       5
                   Proportions                    Percentiles
          Expected     Observed         Expected          Observed
             0.990        0.000           0.000             0.000
             0.980        0.000           0.000             0.000
             0.950        0.000           0.000             0.000
             0.900        0.000           0.000             0.000
             0.800        0.000           0.000             0.000
             0.700        0.000           0.000             0.000
             0.500        0.000           0.000             0.000
             0.300        0.000           0.000             0.000
             0.200        0.000           0.000             0.000
             0.100        0.000           0.000             0.000
             0.050        0.000           0.000             0.000
             0.020        0.000           0.000             0.000
             0.010        0.000           0.000             0.000
CFI/TLI
     CFI
        Mean                                0.000
        Std Dev                             0.000
        Number of successful computations       5
                   Proportions                    Percentiles
```

Expected	Observed	Expected	Observed
0.990	0.000	0.000	0.000
0.980	0.000	0.000	0.000
0.950	0.000	0.000	0.000
0.900	0.000	0.000	0.000
0.800	0.000	0.000	0.000
0.700	0.000	0.000	0.000
0.500	0.000	0.000	0.000
0.300	0.000	0.000	0.000
0.200	0.000	0.000	0.000
0.100	0.000	0.000	0.000
0.050	0.000	0.000	0.000
0.020	0.000	0.000	0.000
0.010	0.000	0.000	0.000

TLI

Mean		1.000	
Std Dev		0.000	
Number of successful computations		5	

Proportions		Percentiles	
Expected	Observed	Expected	Observed
0.990	0.000	1.000	1.000
0.980	0.000	1.000	1.000
0.950	0.000	1.000	1.000
0.900	0.000	1.000	1.000
0.800	0.000	1.000	1.000
0.700	0.000	1.000	1.000
0.500	0.000	1.000	1.000
0.300	0.000	1.000	1.000
0.200	0.000	1.000	1.000
0.100	0.000	1.000	1.000
0.050	0.000	1.000	1.000
0.020	0.000	1.000	1.000
0.010	0.000	1.000	1.000

SRMR (Standardized Root Mean Square Residual)

Mean		0.000	
Std Dev		0.000	
Number of successful computations		5	

Proportions		Percentiles	
Expected	Observed	Expected	Observed
0.990	1.000	0.000	0.000
0.980	1.000	0.000	0.000
0.950	1.000	0.000	0.000
0.900	1.000	0.000	0.000
0.800	1.000	0.000	0.000
0.700	1.000	0.000	0.000
0.500	0.200	0.000	0.000
0.300	0.200	0.000	0.000
0.200	0.200	0.000	0.000
0.100	0.200	0.000	0.000
0.050	0.200	0.000	0.000
0.020	0.000	0.000	0.000
0.010	0.000	0.000	0.000

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value	Rate of Missing
Means					
LN_INCO8	10.415	0.026	400.135	0.000	0.030
Variances					
LN_INCO8	2.107	0.129	16.287	0.000	0.004

QUALITY OF NUMERICAL RESULTS

```
     Average Condition Number for the Information Matrix      0.976E-02
        (ratio of smallest to largest eigenvalue)
CONFIDENCE INTERVALS OF MODEL RESULTS
                 Lower .5%  Lower 2.5%   Lower 5%    Estimate    Upper 5%  Upper 2.5%   Upper .5%
Means
   LN_INCO8       10.347      10.363     10.372      10.415      10.457      10.466      10.482
Variances
   LN_INCO8        1.774       1.853      1.894       2.107       2.320       2.360       2.440
```

*Note: Heckman model not fit here since there is evidence of negligible correlation between unique residuals for income reports for 2008. Mplus offers Diggle-Kenward and Pattern Mixture model approaches, see Chapter 11 of the Mplus documentation.

*Analysis of 2 Waves of Longitudinal Data

Mplus VERSION 7.4
MUTHEN & MUTHEN
08/05/2017   2:09 PM

INPUT INSTRUCTIONS

  TITLE: ASDA 2 EXAMPLE 11.3.1 COMPLETE CASE ANALYSIS 2 WAVES OF DATA

  ! USE CHAPTER 11 2 WAVES OF DATA,CC DATA SET PREPARED IN SAS
  DATA:
  FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
  cc_2waves_mplus.txt";

  VARIABLE:
  NAMES ARE kwgtr stratum numsecu incdiff_06_10 ;
  USEVARIABLES ARE kwgtr stratum numsecu n_incdiff_06_10 ;
  missing are . ;
  WEIGHT IS kwgtr ;
  stratification is stratum ;
  cluster is numsecu ;
  ! rescale income difference to meet variance restrictions of Mplus, in thousands
  DEFINE:
   n_incdiff_06_10 = incdiff_06_10/1000 ;
  ANALYSIS:
  type is complex;
  estimator=mlr ;
  ! Obtain mean from linear regression model ;
  Model:
  n_incdiff_06_10 ;
  Output:
  cint ;

*** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
*** WARNING
  Data set contains cases with missing on all variables.
  These cases were not included in the analysis.
  Number of cases with missing on all variables: 2387
   3 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS

ASDA 2 EXAMPLE 11.3.1 COMPLETE CASE ANALYSIS 2 WAVES OF DATA

SUMMARY OF ANALYSIS

Number of groups   1
Number of observations   9402

Number of dependent variables   1
Number of independent variables   0
Number of continuous latent variables   0

Observed dependent variables

  Continuous
   N_INCDIFF_

```
Variables with special functions

  Stratification        STRATUM
  Cluster variable      NUMSECU
  Weight variable       KWGTR


Estimator                                        MLR
Information matrix                          OBSERVED
Maximum number of iterations                    1000
Convergence criterion                      0.500D-04
Maximum number of steepest descent iterations     20
Maximum number of iterations for H1             2000
Convergence criterion for H1               0.100D-03


Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_2waves_mplus.t


Input data format  FREE



SUMMARY OF DATA

     Number of missing data patterns            1
     Number of strata                  56
     Number of clusters               112


COVARIANCE COVERAGE OF DATA
Minimum covariance coverage value   0.100

     PROPORTION OF DATA PRESENT
          Covariance Coverage
             N_INCDIF

             _____
 N_INCDIF       1.000




THE MODEL ESTIMATION TERMINATED NORMALLY

MODEL FIT INFORMATION

Number of Free Parameters                          2

Loglikelihood

        H0 Value                     -61848.676
        H0 Scaling Correction Factor    759.7914
          for MLR
        H1 Value                     -61848.676
        H1 Scaling Correction Factor    759.7914
          for MLR

Information Criteria

        Akaike (AIC)                 123701.353
        Bayesian (BIC)               123715.650
        Sample-Size Adjusted BIC     123709.295
          (n* = (n + 2) / 24)


Chi-Square Test of Model Fit
```

```
          Value                            0.000*
          Degrees of Freedom                   0
          P-Value                         0.0000
          Scaling Correction Factor       1.0000
            for MLR
*   The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
    for chi-square difference testing in the regular way.  MLM, MLR and WLSM
    chi-square difference testing is described on the Mplus website.  MLMV, WLSMV,
    and ULSMV difference testing is done using the DIFFTEST option.
RMSEA (Root Mean Square Error Of Approximation)

          Estimate                         0.000
          90 Percent C.I.                  0.000  0.000
          Probability RMSEA <= .05         0.000


CFI/TLI

          CFI                              0.000
          TLI                              1.000


Chi-Square Test of Model Fit for the Baseline Model

          Value                            0.000
          Degrees of Freedom                   0
          P-Value                         0.0000


SRMR (Standardized Root Mean Square Residual)

          Value                            0.000
```

MODEL RESULTS

```
                                                  Two-Tailed
                    Estimate       S.E.  Est./S.E.    P-Value


 Means
    N_INCDIFF_        -6.554      1.867     -3.510      0.000


 Variances
    N_INCDIFF_     30290.658  17215.186      1.760      0.078
```

QUALITY OF NUMERICAL RESULTS

```
     Condition Number for the Information Matrix              0.284E-02
       (ratio of smallest to largest eigenvalue)
```

CONFIDENCE INTERVALS OF MODEL RESULTS

```
                   Lower .5%  Lower 2.5%   Lower 5%    Estimate    Upper 5%  Upper 2.5%   Upper .5%


 Means
    N_INCDIF       -11.364     -10.214     -9.626      -6.554      -3.482      -2.894      -1.744


 Variances
    N_INCDIF      *********   -3451.107   1971.678   30290.658   58609.641   64032.422   74633.531
```

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```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/06/2017   9:09 AM
INPUT INSTRUCTIONS
  TITLE: ASDA 2 EXAMPLE 11.3.2 ADJUSTED WEIGHT 2 WAVES OF DATA
  ! USE CHAPTER 11 2 WAVES OF DATA, ADJUSTED WGT DATA SET PREPARED IN SAS
  DATA:
  FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
  adj_wgt_2waves_mplus.txt";
  VARIABLE:
  NAMES ARE adj_kwgtr stratum numsecu incdiff_06_10 ;
  USEVARIABLES ARE adj_kwgtr stratum numsecu n_incdiff_06_10 ;
  missing are . ;
  WEIGHT IS adj_kwgtr ;
  stratification is stratum ;
  cluster is numsecu ;
 ! DIVIDE BY 1000 TO AVOID VARIANCE > 100000
  DEFINE:
   n_incdiff_06_10 = incdiff_06_10/1000 ;
  ANALYSIS:
  type is complex;
  estimator=mlr ;
  ! Obtain mean from linear regression model ;
  Model:
  n_incdiff_06_10 ;
  Output:
  cint ;


*** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
*** WARNING
  Data set contains cases with missing on all variables.
  These cases were not included in the analysis.
  Number of cases with missing on all variables:  2387
   3 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS


ASDA 2 EXAMPLE 11.3.2 ADJUSTED WEIGHT 2 WAVES OF DATA
SUMMARY OF ANALYSIS
Number of groups                                           1
Number of observations                                  9402
Number of dependent variables                              1
Number of independent variables                            0
Number of continuous latent variables                      0
Observed dependent variables
  Continuous
   N_INCDIFF_
Variables with special functions
  Stratification        STRATUM
  Cluster variable      NUMSECU
  Weight variable       ADJ_KWGT
Estimator                                                MLR
Information matrix                                   OBSERVED
Maximum number of iterations                            1000
Convergence criterion                              0.500D-04
Maximum number of steepest descent iterations             20
Maximum number of iterations for H1                     2000
Convergence criterion for H1                       0.100D-03
```

```
Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\adj_wgt_2waves_mp
Input data format  FREE
SUMMARY OF DATA
     Number of missing data patterns          1
     Number of strata                   56
     Number of clusters                112
COVARIANCE COVERAGE OF DATA
Minimum covariance coverage value   0.100
     PROPORTION OF DATA PRESENT
          Covariance Coverage
              N_INCDIF

              _____
  N_INCDIF        1.000


THE MODEL ESTIMATION TERMINATED NORMALLY


MODEL FIT INFORMATION
Number of Free Parameters                      2
Loglikelihood
          H0 Value                    -61431.350
          H0 Scaling Correction Factor    728.9374
            for MLR
          H1 Value                    -61431.350
          H1 Scaling Correction Factor    728.9374
            for MLR
Information Criteria
          Akaike (AIC)               122866.701
          Bayesian (BIC)             122880.998
          Sample-Size Adjusted BIC   122874.642
            (n* = (n + 2) / 24)
Chi-Square Test of Model Fit
          Value                          0.000*
          Degrees of Freedom                 0
          P-Value                       0.0000
          Scaling Correction Factor     1.0000
            for MLR
*   The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
    for chi-square difference testing in the regular way.  MLM, MLR and WLSM
    chi-square difference testing is described on the Mplus website.  MLMV, WLSMV,
    and ULSMV difference testing is done using the DIFFTEST option.
RMSEA (Root Mean Square Error Of Approximation)
          Estimate                       0.000
          90 Percent C.I.                0.000  0.000
          Probability RMSEA <= .05       0.000
CFI/TLI
          CFI                            0.000
          TLI                            1.000
Chi-Square Test of Model Fit for the Baseline Model
          Value                          0.000
          Degrees of Freedom                 0
          P-Value                       0.0000
SRMR (Standardized Root Mean Square Residual)
          Value                          0.000
```

```
MODEL RESULTS

                                           Two-Tailed
                 Estimate      S.E.   Est./S.E.    P-Value
 Means
   N_INCDIFF_      -6.120      1.703     -3.594      0.000
 Variances
   N_INCDIFF_   27718.162  15430.607      1.796      0.072
QUALITY OF NUMERICAL RESULTS
   Condition Number for the Information Matrix            0.270E-02
      (ratio of smallest to largest eigenvalue)
CONFIDENCE INTERVALS OF MODEL RESULTS
              Lower .5% Lower 2.5%  Lower 5%    Estimate    Upper 5% Upper 2.5%  Upper .5%
 Means
   N_INCDIF     -10.506     -9.457    -8.921      -6.120      -3.319     -2.782     -1.733
 Variances
   N_INCDIF   *********  -2525.828  2334.812   27718.162   53101.512  57962.152  67464.320
```

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```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/07/2017   9:45 AM
INPUT INSTRUCTIONS
  TITLE: ASDA 2 EXAMPLE 11.3.2 2 WAVES MULTIPLE IMPUTATION MISSING DATA
  ! Note this imputes ln_inc10 directly
  DATA:
  FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
  mi_2waves_mplus.txt";
  VARIABLE:
  NAMES ARE
  STRATUM NUMSECU arthritis_06 diabetes_06 age_06 kwgtr_dec kwgtr ln_inc06
  ln_inc10 incdiff_06_10
  ed011 ed12 ed1315 ed16 married prevmar nevmar hisp white black other
  excellent verygood good fair poor ;
  ! order of variables in output data sets will match usevariables,auxiliary from impute
  ! impute ln_inc10
  USEVARIABLES ARE
  STRATUM NUMSECU arthritis_06 diabetes_06 age_06
  kwgtr_dec
  ln_inc06
  ln_inc10
  ed12 ed1315 ed16
  prevmar nevmar
  white black other
  verygood good fair poor
  ;
  AUXILIARY IS kwgtr ;
  missing are . ;


  ! Impute with M=5 data set and Sequential Regression Imputation model
  DATA IMPUTATION:
  IMPUTE=ln_inc10 ;
  NDATASETS=5 ;
  MODEL=SEQUENTIAL ;
  SAVE= IMP2WAVES_inc10*.DAT ;


*** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
   2 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS
```

```
ASDA 2 EXAMPLE 11.3.2 2 WAVES MULTIPLE IMPUTATION MISSING DATA
SUMMARY OF ANALYSIS
Number of groups                                            1
Average number of observations                         11789
Number of replications
    Requested                                              5
    Completed                                              5
Number of dependent variables                             20
Number of independent variables                            0
Number of continuous latent variables                      0
Observed dependent variables
  Continuous
   STRATUM      NUMSECU     ARTHRITIS_  DIABETES_O  AGE_06      KWGTR_DEC
   LN_INC06     LN_INC10    ED12        ED1315      ED16        PREVMAR
   NEVMAR       WHITE       BLACK       OTHER       VERYGOOD    GOOD
   FAIR         POOR
Observed auxiliary variables
  KWGTR
Variables used for imputation
  Variables imputed as continuous
   LN_INC10
Estimator                                                 ML
Information matrix                                   OBSERVED
Maximum number of iterations                            1000
Convergence criterion                              0.500D-04
Maximum number of steepest descent iterations             20
Maximum number of iterations for H1                     2000
Convergence criterion for H1                       0.100D-03
Specifications for Bayesian Estimation
  Point estimate                                      MEDIAN
  Number of Markov chain Monte Carlo (MCMC) chains         2
  Random seed for the first chain                          0
  Starting value information                      UNPERTURBED
  Treatment of categorical mediator                   LATENT
  Algorithm used for Markov chain Monte Carlo     GIBBS(PX1)
  Convergence criterion                              0.500D-01
  Maximum number of iterations                           50000
  K-th iteration used for thinning                         1
Specifications for Data Imputation
  Number of imputed data sets                              5
  H1 imputation model type                        SEQUENTIAL
  Iteration intervals for thinning                       100
Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\mi_2waves_mplus.t
Input data format  FREE
SUMMARY OF DATA FOR THE FIRST DATA SET
    Number of missing data patterns            1
SUMMARY OF MISSING DATA PATTERNS FOR THE FIRST DATA SET
    MISSING DATA PATTERNS (x = not missing)
          1
 STRATUM    x
 NUMSECU    x
 ARTHRITI   x
 DIABETES   x
 AGE_06     x
 KWGTR_DE   x
 LN_INC06   x
 LN_INC10   x
 ED12       x
 ED1315     x
 ED16       x
```

```
PREVMAR    x
NEVMAR     x
WHITE      x
BLACK      x
OTHER      x
VERYGOOD   x
GOOD       x
FAIR       x
POOR       x
     MISSING DATA PATTERN FREQUENCIES
   Pattern    Frequency
       1        11789
COVARIANCE COVERAGE OF DATA FOR THE FIRST DATA SET
Minimum covariance coverage value   0.100
     PROPORTION OF DATA PRESENT
         Covariance Coverage
           STRATUM     NUMSECU    ARTHRITI    DIABETES     AGE_06
           _____    _____   _____    _____    _____

STRATUM     1.000
NUMSECU     1.000       1.000
ARTHRITI    1.000       1.000      1.000
DIABETES    1.000       1.000      1.000       1.000
AGE_06      1.000       1.000      1.000       1.000       1.000
KWGTR_DE    1.000       1.000      1.000       1.000       1.000
LN_INCO6    1.000       1.000      1.000       1.000       1.000
LN_INC10    1.000       1.000      1.000       1.000       1.000
ED12        1.000       1.000      1.000       1.000       1.000
ED1315      1.000       1.000      1.000       1.000       1.000
ED16        1.000       1.000      1.000       1.000       1.000
PREVMAR     1.000       1.000      1.000       1.000       1.000
NEVMAR      1.000       1.000      1.000       1.000       1.000
WHITE       1.000       1.000      1.000       1.000       1.000
BLACK       1.000       1.000      1.000       1.000       1.000
OTHER       1.000       1.000      1.000       1.000       1.000
VERYGOOD    1.000       1.000      1.000       1.000       1.000
GOOD        1.000       1.000      1.000       1.000       1.000
FAIR        1.000       1.000      1.000       1.000       1.000
POOR        1.000       1.000      1.000       1.000       1.000
         Covariance Coverage
           KWGTR_DE    LN_INCO6   LN_INC10    ED12        ED1315
           _____    _____   _____    _____    _____

KWGTR_DE    1.000
LN_INCO6    1.000       1.000
LN_INC10    1.000       1.000      1.000
ED12        1.000       1.000      1.000       1.000
ED1315      1.000       1.000      1.000       1.000       1.000
ED16        1.000       1.000      1.000       1.000       1.000
PREVMAR     1.000       1.000      1.000       1.000       1.000
NEVMAR      1.000       1.000      1.000       1.000       1.000
WHITE       1.000       1.000      1.000       1.000       1.000
BLACK       1.000       1.000      1.000       1.000       1.000
OTHER       1.000       1.000      1.000       1.000       1.000
VERYGOOD    1.000       1.000      1.000       1.000       1.000
GOOD        1.000       1.000      1.000       1.000       1.000
FAIR        1.000       1.000      1.000       1.000       1.000
POOR        1.000       1.000      1.000       1.000       1.000
```

```
        Covariance Coverage
            ED16        PREVMAR      NEVMAR       WHITE        BLACK
          _____    _____    _____    _____    _____
ED16        1.000
PREVMAR     1.000       1.000
NEVMAR      1.000       1.000       1.000
WHITE       1.000       1.000       1.000       1.000
BLACK       1.000       1.000       1.000       1.000       1.000
OTHER       1.000       1.000       1.000       1.000       1.000
VERYGOOD    1.000       1.000       1.000       1.000       1.000
GOOD        1.000       1.000       1.000       1.000       1.000
FAIR        1.000       1.000       1.000       1.000       1.000
POOR        1.000       1.000       1.000       1.000       1.000
        Covariance Coverage
            OTHER       VERYGOOD     GOOD         FAIR         POOR
          _____    _____    _____    _____    _____
OTHER       1.000
VERYGOOD    1.000       1.000
GOOD        1.000       1.000       1.000
FAIR        1.000       1.000       1.000       1.000
POOR        1.000       1.000       1.000       1.000       1.000


SAMPLE STATISTICS
NOTE:  These are average results over 5 data sets.
      SAMPLE STATISTICS
          Means
            STRATUM     NUMSECU      ARTHRITI     DIABETES     AGE_06
          _____    _____    _____    _____    _____
    1       30.634      60.772       0.625        0.213       69.519
          Means
            KWGTR_DE    LN_INC06     LN_INC10     ED12         ED1315
          _____    _____    _____    _____    _____
    1        4.485      10.291      10.200        0.331        0.207
          Means
            ED16        PREVMAR      NEVMAR       WHITE        BLACK
          _____    _____    _____    _____    _____
    1        0.217       0.492       0.041        0.732        0.158
          Means
            OTHER       VERYGOOD     GOOD         FAIR         POOR
          _____    _____    _____    _____    _____
    1        0.022       0.279       0.306        0.223        0.090
          Covariances
            STRATUM     NUMSECU      ARTHRITI     DIABETES     AGE_06
          _____    _____    _____    _____    _____
STRATUM     224.135
NUMSECU     448.369     897.186
ARTHRITI      0.229       0.462       0.234
DIABETES     -0.020      -0.038       0.020        0.168
AGE_06       -2.700      -5.403       1.016        0.008      106.779
KWGTR_DE      1.248       2.486      -0.175       -0.097      -10.667
LN_INC06     -0.250      -0.496      -0.073       -0.048       -2.209
LN_INC10     -0.263      -0.524      -0.066       -0.048       -2.254
ED12          0.095       0.193       0.007       -0.002        0.157
ED1315       -0.023      -0.050      -0.002       -0.006       -0.374
ED16         -0.331      -0.661      -0.025       -0.011       -0.472
PREVMAR      -0.240      -0.479       0.026        0.004        1.203
NEVMAR       -0.136      -0.271      -0.003       -0.001       -0.199
WHITE         1.047       2.093       0.002       -0.025        0.497
BLACK        -0.925      -1.843       0.004        0.015       -0.255
OTHER        -0.023      -0.045      -0.002        0.002       -0.067
VERYGOOD      0.078       0.155      -0.024       -0.027       -0.292
```

GOOD	-0.055	-0.108	0.007	0.003	0.164
FAIR	0.003	0.003	0.028	0.027	0.360
POOR	0.119	0.239	0.015	0.013	0.100

Covariances

	KWGTR_DE	LN_INC06	LN_INC10	ED12	ED1315
	_____	_____	_____	_____	_____
KWGTR_DE	8.300				
LN_INC06	0.536	1.716			
LN_INC10	0.603	0.936	2.247		
ED12	-0.024	-0.032	-0.022	0.221	
ED1315	0.089	0.047	0.047	-0.068	0.164
ED16	0.166	0.158	0.153	-0.072	-0.045
PREVMAR	-0.127	-0.235	-0.220	0.009	-0.006
NEVMAR	0.049	-0.019	-0.013	-0.002	0.000
WHITE	0.348	0.148	0.167	0.022	0.007
BLACK	-0.283	-0.073	-0.082	-0.006	-0.003
OTHER	0.016	-0.002	-0.001	-0.003	0.001
VERYGOOD	0.082	0.091	0.087	0.002	0.006
GOOD	-0.026	0.018	0.018	0.008	0.007
FAIR	-0.098	-0.102	-0.105	-0.002	-0.008
POOR	-0.031	-0.064	-0.059	-0.002	-0.007

Covariances

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
	_____	_____	_____	_____	_____
ED16	0.170				
PREVMAR	-0.034	0.250			
NEVMAR	0.003	-0.020	0.039		
WHITE	0.024	-0.025	-0.004	0.196	
BLACK	-0.014	0.024	0.004	-0.116	0.133
OTHER	0.003	0.000	0.000	-0.016	-0.003
VERYGOOD	0.022	-0.016	0.000	0.026	-0.013
GOOD	-0.005	-0.001	-0.001	0.001	0.004
FAIR	-0.024	0.019	0.001	-0.027	0.012
POOR	-0.010	0.009	0.000	-0.011	0.005

Covariances

	OTHER	VERYGOOD	GOOD	FAIR	POOR
	_____	_____	_____	_____	_____
OTHER	0.022				
VERYGOOD	0.001	0.201			
GOOD	0.000	-0.085	0.212		
FAIR	-0.001	-0.062	-0.068	0.173	
POOR	0.001	-0.025	-0.027	-0.020	0.082

Correlations

	STRATUM	NUMSECU	ARTHRITI	DIABETES	AGE_06
	_____	_____	_____	_____	_____
STRATUM	1.000				
NUMSECU	1.000	1.000			
ARTHRITI	0.032	0.032	1.000		
DIABETES	-0.003	-0.003	0.099	1.000	
AGE_06	-0.017	-0.017	0.203	0.002	1.000
KWGTR_DE	0.029	0.029	-0.125	-0.082	-0.358
LN_INC06	-0.013	-0.013	-0.115	-0.089	-0.163
LN_INC10	-0.012	-0.012	-0.091	-0.078	-0.146
ED12	0.014	0.014	0.033	-0.009	0.032
ED1315	-0.004	-0.004	-0.011	-0.034	-0.089
ED16	-0.054	-0.054	-0.123	-0.063	-0.111
PREVMAR	-0.032	-0.032	0.108	0.018	0.233
NEVMAR	-0.046	-0.046	-0.031	-0.009	-0.097
WHITE	0.158	0.158	0.010	-0.139	0.109
BLACK	-0.169	-0.169	0.023	0.102	-0.068
OTHER	-0.010	-0.010	-0.025	0.028	-0.044

	KWGTR_DE	LN_INCO6	LN_INC10	ED12	ED1315
VERYGOOD	0.012	0.012	-0.111	-0.148	-0.063
GOOD	-0.008	-0.008	0.033	0.016	0.034
FAIR	0.000	0.000	0.138	0.160	0.084
POOR	0.028	0.028	0.112	0.115	0.034

Correlations

	KWGTR_DE	LN_INCO6	LN_INC10	ED12	ED1315
KWGTR_DE	1.000				
LN_INCO6	0.142	1.000			
LN_INC10	0.140	0.477	1.000		
ED12	-0.017	-0.051	-0.031	1.000	
ED1315	0.076	0.089	0.077	-0.359	1.000
ED16	0.139	0.293	0.247	-0.370	-0.269
PREVMAR	-0.088	-0.358	-0.294	0.038	-0.028
NEVMAR	0.086	-0.072	-0.044	-0.021	0.006
WHITE	0.273	0.256	0.252	0.107	0.042
BLACK	-0.269	-0.154	-0.151	-0.034	-0.019
OTHER	0.038	-0.010	-0.003	-0.039	0.012
VERYGOOD	0.063	0.154	0.130	0.011	0.032
GOOD	-0.020	0.030	0.025	0.036	0.040
FAIR	-0.082	-0.187	-0.168	-0.010	-0.047
POOR	-0.038	-0.171	-0.138	-0.016	-0.061

Correlations

	ED16	PREVMAR	NEVMAR	WHITE	BLACK
ED16	1.000				
PREVMAR	-0.165	1.000			
NEVMAR	0.041	-0.204	1.000		
WHITE	0.133	-0.114	-0.041	1.000	
BLACK	-0.090	0.130	0.055	-0.716	1.000
OTHER	0.043	-0.005	0.013	-0.248	-0.065
VERYGOOD	0.119	-0.072	0.005	0.131	-0.080
GOOD	-0.028	-0.005	-0.014	0.005	0.022
FAIR	-0.137	0.092	0.010	-0.147	0.079
POOR	-0.088	0.066	0.007	-0.085	0.051

Correlations

	OTHER	VERYGOOD	GOOD	FAIR	POOR
OTHER	1.000				
VERYGOOD	0.010	1.000			
GOOD	-0.007	-0.413	1.000		
FAIR	-0.008	-0.333	-0.356	1.000	
POOR	0.028	-0.195	-0.208	-0.168	1.000

```
MODEL FIT INFORMATION
Number of Free Parameters                   40
Loglikelihood
        H0 Value                    -290405.502
        H1 Value                    -216130.191
*   The loglikelihood cannot be used directly for chi-square testing with
    imputed data.
Information Criteria
        Akaike (AIC)                 580891.003
        Bayesian (BIC)               581186.000
        Sample-Size Adjusted BIC     581058.885
          (n* = (n + 2) / 24)
Chi-Square Test of Model Fit
        Value                        143489.577
        Degrees of Freedom                  190
        P-Value                          0.0000
```

```
RMSEA (Root Mean Square Error Of Approximation)
        Estimate                        0.253
        90 Percent C.I.                 0.252  0.254
        Probability RMSEA <= .05        0.000
CFI/TLI
        CFI                             0.000
        TLI                             0.000
Chi-Square Test of Model Fit for the Baseline Model
        Value                       143489.582
        Degrees of Freedom              190
        P-Value                         0.0000
SRMR (Standardized Root Mean Square Residual)
        Value                           0.141
```

```
MODEL RESULTS
                                          Two-Tailed   Rate of
                   Estimate     S.E.   Est./S.E.   P-Value   Missing
  Means
    STRATUM          30.634    0.138    222.144     0.000     0.000
    NUMSECU          60.772    0.276    220.228     0.000     0.001
    ARTHRITIS_        0.625    0.004    140.276     0.000     0.000
    DIABETES_0        0.213    0.004     56.473     0.000     0.000
    AGE_06           69.519    0.094    740.704     0.000    -0.028
    KWGTR_DEC         4.485    0.027    169.111     0.000    -0.001
    LN_INC06         10.291    0.012    842.855     0.000     0.024
    LN_INC10         10.200    0.015    682.240     0.000     0.156
    ED12              0.331    0.004     76.374     0.000     0.000
    ED1315            0.207    0.004     55.436     0.000     0.000
    ED16              0.217    0.004     57.167     0.000     0.000
    PREVMAR           0.492    0.005    106.859     0.000     0.001
    NEVMAR            0.041    0.002     22.490     0.000     0.000
    WHITE             0.732    0.004    179.450     0.000    -0.001
    BLACK             0.158    0.003     47.039     0.000     0.000
    OTHER             0.022    0.001     16.305     0.000     0.000
    VERYGOOD          0.279    0.004     67.480     0.000     0.000
    GOOD              0.306    0.004     72.140     0.000     0.000
    FAIR              0.223    0.004     58.123     0.000     0.000
    POOR              0.090    0.003     34.075     0.000     0.000
  Variances
    STRATUM         224.137    2.919     76.779     0.000     0.000
    NUMSECU         897.180   11.684     76.784     0.000     0.000
    ARTHRITIS_        0.234    0.003     76.772     0.000     0.000
    DIABETES_0        0.168    0.002     76.776     0.000     0.000
    AGE_06          106.779    1.391     76.778     0.000     0.000
    KWGTR_DEC         8.300    0.108     76.769     0.000     0.000
    LN_INC06          1.716    0.022     76.776     0.000     0.000
    LN_INC10          2.247    0.037     61.223     0.000     0.402
    ED12              0.221    0.003     76.787     0.000     0.000
    ED1315            0.164    0.002     76.773     0.000     0.000
    ED16              0.170    0.002     76.775     0.000     0.000
    PREVMAR           0.250    0.003     76.776     0.000     0.000
    NEVMAR            0.039    0.001     76.774     0.000     0.000
    WHITE             0.196    0.003     76.780     0.000     0.000
    BLACK             0.133    0.002     76.778     0.000     0.000
    OTHER             0.022    0.000     76.773     0.000     0.000
    VERYGOOD          0.201    0.003     76.786     0.000     0.000
    GOOD              0.212    0.003     76.772     0.000     0.000
    FAIR              0.173    0.002     76.778     0.000     0.000
    POOR              0.082    0.001     76.775     0.000     0.000
```

QUALITY OF NUMERICAL RESULTS
     Average Condition Number for the Information Matrix   0.116E-03
       (ratio of smallest to largest eigenvalue)

SAVEDATA INFORMATION
  Save file
    IMP2WAVES_inc10*.DAT
  Order of variables
    STRATUM
    NUMSECU
    ARTHRITI
    DIABETES
    AGE_06
    KWGTR_DE
    LN_INCO6
    LN_INC10
    ED12
    ED1315
    ED16
    PREVMAR
    NEVMAR
    WHITE
    BLACK
    OTHER
    VERYGOOD
    GOOD
    FAIR
    POOR
    KWGTR
  Save file format   Free
  Save file record length   10000

```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/07/2017  10:18 AM
INPUT INSTRUCTIONS
  TITLE: ASDA 2 EXAMPLE 2 WAVES OF DATA, ANALYSIS OF MI DATA SETS FROM MPLUS
  ! USE IMPUTED DATA SETS FROM IMPUTE COMMAND OF MPLUS, IMPUTED LN_INC10
  DATA:
  FILE IS "P:\ASDA 2\Analysis Example Replication\MPLUS\Chapter 11\
  imp2waves_inc10list.dat";
  TYPE = IMPUTATION ;
  ! order must match that given in usevar and auxilliary list from imputation code
  VARIABLE:
  NAMES ARE
    STRATUM NUMSECU arthritis_06 diabetes_06 age_06
    kwgtr_dec
    ln_inc06
    ln_inc10
    ed12 ed1315 ed16
    prevmar nevmar
    white black other
    verygood good fair poor kwgtr ;
  USEVARIABLES ARE stratum numsecu kwgtr n_incdiff_06_10 t_incdiff_06_10 ;
  WEIGHT = kwgtr ;
  missing are . ;
  STRATIFICATION IS STRATUM ;
  CLUSTER IS NUMSECU ;
  ! define the difference of the exponent of each income variable
  ! and divide by 1000 to avoid variance > 1,000,000
  DEFINE:
   N_INCDIFF_06_10 = (EXP(LN_INC10) - EXP(LN_INC06)) / 1000 ;

  ! trim lower and upper tails of difference (in thousands)
   if n_incdiff_06_10 ge -12300  then t_incdiff_06_10=n_incdiff_06_10 ;
   if n_incdiff_06_10 lt -12300  then t_incdiff_06_10 = -12300 ;
   if n_incdiff_06_10 gt 2062 then t_incdiff_06_10 = 2062 ;
  ANALYSIS:
  type is complex ;
  estimator = mlr ;
  MODEL:
  n_incdiff_06_10 t_incdiff_06_10 ;
  output:
  cint ;
  sampstat ;


*** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
*** WARNING in OUTPUT command
  SAMPSTAT option is the default for multiple imputation.
   3 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS
```

```
ASDA 2 EXAMPLE 2 WAVES OF DATA, ANALYSIS OF MI DATA SETS FROM MPLUS
SUMMARY OF ANALYSIS
Number of groups                                          1
Average number of observations                       11789
Number of replications
    Requested                                            5
    Completed                                            5
Number of dependent variables                            2
Number of independent variables                          0
Number of continuous latent variables                    0
Observed dependent variables
  Continuous
   N_INCDIFF_  T_INCDIFF_
Variables with special functions
  Stratification        STRATUM
  Cluster variable      NUMSECU
  Weight variable       KWGTR
Estimator                                              MLR
Information matrix                                 OBSERVED
Maximum number of iterations                          1000
Convergence criterion                            0.500D-04
Maximum number of steepest descent iterations           20
Maximum number of iterations for H1                   2000
Convergence criterion for H1                     0.100D-03
Input data file(s)
  Multiple data files from
    P:\ASDA 2\Analysis Example Replication\MPLUS\Chapter 11\imp2waves_inc10list.
Input data format  FREE
SUMMARY OF DATA FOR THE FIRST DATA SET
    Number of missing data patterns            1
    Number of strata                  56
    Number of clusters               112
SUMMARY OF MISSING DATA PATTERNS FOR THE FIRST DATA SET
    MISSING DATA PATTERNS (x = not missing)
        1
 N_INCDIF  x
 T_INCDIF  x
    MISSING DATA PATTERN FREQUENCIES
   Pattern   Frequency
       1       11789
COVARIANCE COVERAGE OF DATA FOR THE FIRST DATA SET
Minimum covariance coverage value   0.100
    PROPORTION OF DATA PRESENT
        Covariance Coverage
          N_INCDIF      T_INCDIF
          _____      _____
 N_INCDIF    1.000
 T_INCDIF    1.000         1.000


SAMPLE STATISTICS
NOTE:  These are average results over 5 data sets.
    ESTIMATED SAMPLE STATISTICS
        Means
          N_INCDIF      T_INCDIF
          _____      _____
 1          -5.613        -3.219
        Covariances
          N_INCDIF      T_INCDIF
          _____      _____
 N_INCDIF 155506.265
```

```
 T_INCDIF  90738.676     59011.183
          Correlations
           N_INCDIF      T_INCDIF

           _____     _____

 N_INCDIF    1.000
 T_INCDIF    0.947       1.000


MODEL FIT INFORMATION
Number of Free Parameters                    4
Loglikelihood
    H0 Value
        Mean                         -168674.100
        Std Dev                          133.129
        Number of successful computations      5
            Proportions              Percentiles
        Expected   Observed      Expected       Observed
          0.990      1.000     -168983.798    -168936.046
          0.980      1.000     -168947.507    -168936.046
          0.950      0.800     -168893.084    -168936.046
          0.900      0.800     -168844.718    -168936.046
          0.800      0.800     -168786.141    -168936.046
          0.700      0.800     -168743.913    -168936.046
          0.500      0.800     -168674.100    -168633.376
          0.300      0.200     -168604.287    -168621.299
          0.200      0.000     -168562.058    -168616.081
          0.100      0.000     -168503.481    -168616.081
          0.050      0.000     -168455.116    -168616.081
          0.020      0.000     -168400.692    -168616.081
          0.010      0.000     -168364.401    -168616.081
    H1 Value
        Mean                         -155257.603
        Std Dev                          251.046
        Number of successful computations      5
            Proportions              Percentiles
        Expected   Observed      Expected       Observed
          0.990      1.000     -155841.610    -155732.040
          0.980      1.000     -155773.175    -155732.040
          0.950      0.800     -155670.548    -155732.040
          0.900      0.800     -155579.343    -155732.040
          0.800      0.800     -155468.883    -155732.040
          0.700      0.800     -155389.251    -155732.040
          0.500      0.600     -155257.603    -155258.509
          0.300      0.200     -155125.954    -155165.942
          0.200      0.200     -155046.323    -155129.084
          0.100      0.000     -154935.862    -155129.084
          0.050      0.000     -154844.658    -155129.084
          0.020      0.000     -154742.030    -155129.084
          0.010      0.000     -154673.595    -155129.084
Information Criteria
    Akaike (AIC)
        Mean                          337356.200
        Std Dev                           266.258
        Number of successful computations      5
            Proportions              Percentiles
        Expected   Observed      Expected       Observed
          0.990      1.000      336736.803     337135.394
          0.980      1.000      336809.385     337135.394
          0.950      1.000      336918.231     337135.394
          0.900      1.000      337014.963     337135.394
          0.800      1.000      337132.116     337135.394
```

```
     0.700        0.800        337216.574        337135.394
     0.500        0.200        337356.200        337240.162
     0.300        0.200        337495.826        337250.597
     0.200        0.200        337580.283        337274.753
     0.100        0.200        337697.436        337274.753
     0.050        0.200        337794.168        337274.753
     0.020        0.000        337903.015        337274.753
     0.010        0.000        337975.597        337274.753
  Bayesian (BIC)
     Mean                           337385.699
     Std Dev                           266.258
     Number of successful computations      5
         Proportions                   Percentiles
     Expected     Observed        Expected        Observed
     0.990        1.000        336766.302        337164.894
     0.980        1.000        336838.884        337164.894
     0.950        1.000        336947.731        337164.894
     0.900        1.000        337044.462        337164.894
     0.800        1.000        337161.616        337164.894
     0.700        0.800        337246.073        337164.894
     0.500        0.200        337385.699        337269.661
     0.300        0.200        337525.325        337280.097
     0.200        0.200        337609.782        337304.253
     0.100        0.200        337726.936        337304.253
     0.050        0.200        337823.668        337304.253
     0.020        0.000        337932.514        337304.253
     0.010        0.000        338005.096        337304.253
  Sample-Size Adjusted BIC (n* = (n + 2) / 24)
     Mean                           337372.988
     Std Dev                           266.258
     Number of successful computations      5
         Proportions                   Percentiles
     Expected     Observed        Expected        Observed
     0.990        1.000        336753.591        337152.183
     0.980        1.000        336826.173        337152.183
     0.950        1.000        336935.019        337152.183
     0.900        1.000        337031.751        337152.183
     0.800        1.000        337148.905        337152.183
     0.700        0.800        337233.362        337152.183
     0.500        0.200        337372.988        337256.950
     0.300        0.200        337512.614        337267.386
     0.200        0.200        337597.071        337291.541
     0.100        0.200        337714.225        337291.541
     0.050        0.200        337810.956        337291.541
     0.020        0.000        337919.803        337291.541
     0.010        0.000        337992.385        337291.541
Chi-Square Test of Model Fit
     Degrees of freedom                    1
     Mean                               17.281
     Std Dev                             0.840
     Number of successful computations      5
         Proportions                   Percentiles
     Expected     Observed        Expected        Observed
     0.990        1.000           0.000          16.207
     0.980        1.000           0.001          16.207
     0.950        1.000           0.004          16.207
     0.900        1.000           0.016          16.207
     0.800        1.000           0.064          16.207
     0.700        1.000           0.148          16.207
     0.500        1.000           0.455          16.867
     0.300        1.000           1.074          17.240
```

```
         0.200         1.000         1.642        17.328
         0.100         1.000         2.706        17.328
         0.050         1.000         3.841        17.328
         0.020         1.000         5.412        17.328
         0.010         1.000         6.635        17.328
```
RMSEA (Root Mean Square Error Of Approximation)
```
       Mean                              0.037
       Std Dev                           0.001
       Number of successful computations     5
           Proportions               Percentiles
       Expected    Observed       Expected     Observed
         0.990       1.000         0.035        0.036
         0.980       1.000         0.035        0.036
         0.950       1.000         0.036        0.036
         0.900       0.800         0.036        0.036
         0.800       0.800         0.036        0.036
         0.700       0.800         0.037        0.036
         0.500       0.400         0.037        0.037
         0.300       0.200         0.038        0.037
         0.200       0.200         0.038        0.037
         0.100       0.200         0.038        0.037
         0.050       0.200         0.039        0.037
         0.020       0.000         0.039        0.037
         0.010       0.000         0.039        0.037
```
CFI/TLI
    CFI
```
       Mean                              0.000
       Std Dev                           0.000
       Number of successful computations     5
           Proportions               Percentiles
       Expected    Observed       Expected     Observed
         0.990       1.000         0.000        0.000
         0.980       1.000         0.000        0.000
         0.950       1.000         0.000        0.000
         0.900       1.000         0.000        0.000
         0.800       1.000         0.000        0.000
         0.700       0.400         0.000        0.000
         0.500       0.400         0.000        0.000
         0.300       0.200         0.000        0.000
         0.200       0.200         0.000        0.000
         0.100       0.200         0.000        0.000
         0.050       0.200         0.000        0.000
         0.020       0.000         0.000        0.000
         0.010       0.000         0.000        0.000
```
    TLI
```
       Mean                              0.000
       Std Dev                           0.000
       Number of successful computations     5
           Proportions               Percentiles
       Expected    Observed       Expected     Observed
         0.990       1.000         0.000        0.000
         0.980       1.000         0.000        0.000
         0.950       1.000         0.000        0.000
         0.900       1.000         0.000        0.000
         0.800       0.800         0.000        0.000
         0.700       0.400         0.000        0.000
         0.500       0.400         0.000        0.000
         0.300       0.200         0.000        0.000
         0.200       0.200         0.000        0.000
         0.100       0.200         0.000        0.000
         0.050       0.200         0.000        0.000
```

```
           0.020        0.000           0.000           0.000
           0.010        0.000           0.000           0.000
SRMR (Standardized Root Mean Square Residual)
        Mean                         0.424
        Std Dev                      0.001
        Number of successful computations      5
             Proportions                  Percentiles
        Expected    Observed         Expected        Observed
           0.990        1.000           0.422           0.423
           0.980        1.000           0.422           0.423
           0.950        1.000           0.423           0.423
           0.900        0.800           0.423           0.423
           0.800        0.800           0.423           0.423
           0.700        0.800           0.423           0.423
           0.500        0.600           0.424           0.423
           0.300        0.200           0.424           0.424
           0.200        0.200           0.424           0.424
           0.100        0.200           0.424           0.424
           0.050        0.000           0.425           0.424
           0.020        0.000           0.425           0.424
           0.010        0.000           0.425           0.424
```

MODEL RESULTS

```
                                            Two-Tailed   Rate of
                   Estimate       S.E.   Est./S.E.    P-Value   Missing
  Means
    N_INCDIFF_       -5.617      5.291      -1.062      0.288     0.026
    T_INCDIFF_       -3.218      3.060      -1.052      0.293     0.080
  Variances
    N_INCDIFF_    *********  *********       1.239      0.215     0.000
    T_INCDIFF_    59011.191  32903.977       1.793      0.073     0.001
```

QUALITY OF NUMERICAL RESULTS

```
     Average Condition Number for the Information Matrix      0.420E-03
        (ratio of smallest to largest eigenvalue)
```

CONFIDENCE INTERVALS OF MODEL RESULTS

```
                Lower .5%  Lower 2.5%   Lower 5%    Estimate    Upper 5%  Upper 2.5%   Upper .5%
  Means
    N_INCDIF      -19.247    -15.989    -14.322      -5.617       3.087       4.754       8.012
    T_INCDIF      -11.099     -9.215     -8.251      -3.218       1.815       2.778       4.663
  Variances
    N_INCDIF    *********  -90516.031  -50976.328  155508.703  361993.750  401533.438  478830.375
    T_INCDIF    *********   -5480.605    4884.152   59011.191  113138.234  123502.984  143765.250
```

```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/07/2017  12:07 PM

INPUT INSTRUCTIONS

  TITLE: ASDA 2 EXAMPLE 11.3.2 - 2 WAVES OF DATA, ANALYSIS OF CALIBRATION DATA

  DATA:
  FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
  cal_2waves_mplus.txt";

  VARIABLE:
  NAMES ARE
   STRATUM NUMSECU kwgtr_cal incdiff_06_10 ;
  usevariables are STRATUM NUMSECU kwgtr_cal n_incdiff_06_10 ;
   WEIGHT = kwgtr_cal ;
   missing are . ;
   STRATIFICATION IS STRATUM ;
   CLUSTER IS NUMSECU ;
  DEFINE:
   n_incdiff_06_10=incdiff_06_10/1000 ;
  ANALYSIS:
   type is complex ;
   estimator = mlr ;
  MODEL:
   n_incdiff_06_10 ;
  output:
  cint ;


*** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
*** WARNING in MODEL command
  All variables are uncorrelated with all other variables in the model.
  Check that this is what is intended.
*** WARNING
  Data set contains cases with missing on all variables.
  These cases were not included in the analysis.
  Number of cases with missing on all variables:  2387
   3 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS
```

ASDA 2 EXAMPLE 11.3.2 - 2 WAVES OF DATA, ANALYSIS OF CALIBRATION DATA

SUMMARY OF ANALYSIS

Number of groups   1
Number of observations   9402

Number of dependent variables   1
Number of independent variables   0
Number of continuous latent variables   0

Observed dependent variables

  Continuous
   N_INCDIFF_

Variables with special functions

  Stratification   STRATUM
  Cluster variable   NUMSECU
  Weight variable   KWGTR_CA

Estimator   MLR
Information matrix   OBSERVED
Maximum number of iterations   1000
Convergence criterion   0.500D-04
Maximum number of steepest descent iterations   20
Maximum number of iterations for H1   2000
Convergence criterion for H1   0.100D-03

Input data file(s)
  P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cal_2waves_mplus.

Input data format FREE

SUMMARY OF DATA

    Number of missing data patterns   1
    Number of strata   56
    Number of clusters   112

COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value   0.100

     PROPORTION OF DATA PRESENT

         Covariance Coverage
            N_INCDIF

            _____
 N_INCDIF   1.000

THE MODEL ESTIMATION TERMINATED NORMALLY

```
MODEL FIT INFORMATION

Number of Free Parameters                   2

Loglikelihood

        H0 Value                     -61608.891
        H0 Scaling Correction Factor    748.7533
          for MLR
        H1 Value                     -61608.891
        H1 Scaling Correction Factor    748.7533
          for MLR

Information Criteria

        Akaike (AIC)                 123221.783
        Bayesian (BIC)               123236.080
        Sample-Size Adjusted BIC     123229.724
          (n* = (n + 2) / 24)

Chi-Square Test of Model Fit

        Value                           0.000*
        Degrees of Freedom                   0
        P-Value                         0.0000
        Scaling Correction Factor       1.0000
            for MLR

*   The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
    for chi-square difference testing in the regular way.  MLM, MLR and WLSM
    chi-square difference testing is described on the Mplus website.  MLMV, WLSMV,
    and ULSMV difference testing is done using the DIFFTEST option.

RMSEA (Root Mean Square Error Of Approximation)

        Estimate                        0.000
        90 Percent C.I.                 0.000  0.000
        Probability RMSEA <= .05        0.000

CFI/TLI

        CFI                             0.000
        TLI                             1.000

Chi-Square Test of Model Fit for the Baseline Model

        Value                           0.000
        Degrees of Freedom                   0
        P-Value                         0.0000

SRMR (Standardized Root Mean Square Residual)

        Value                           0.000

MODEL RESULTS
                                                Two-Tailed
                    Estimate     S.E.  Est./S.E.    P-Value
  Means
    N_INCDIFF_        -6.328     1.775     -3.566      0.000
  Variances
    N_INCDIFF_     28785.238 16240.995      1.772      0.076
```

QUALITY OF NUMERICAL RESULTS
     Condition Number for the Information Matrix   0.278E-02
        (ratio of smallest to largest eigenvalue)
CONFIDENCE INTERVALS OF MODEL RESULTS

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
Means							
N_INCDIF	-10.899	-9.807	-9.248	-6.328	-3.409	-2.850	-1.757
Variances							
N_INCDIF	*********	-3047.113	2068.801	28785.238	55501.676	60617.590	70618.797

*NOTE: Mplus does not offer the Viega method for estimation, not demonstrated here.

```
Mplus VERSION 7.4
MUTHEN & MUTHEN
08/09/2017   7:23 AM

INPUT INSTRUCTIONS
  TITLE: ASDA 2 EXAMPLE 11.3.3 - 3+ WAVES OF DATA, WEIGHTED MULTILEVEL MODEL
  Data:
   FILE IS "P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\
   wmultilevel_3pwaves_mplus.txt";
   Variable:
   NAMES ARE
   basewgt fem_yrs06sq fem_yrssince06 female level1wgt_r level2wgt ln_inc yrs06sq
   yrssince06 newid newid_num numsecu
   str_dum1 str_dum2 str_dum3 str_dum4 str_dum5 str_dum6 str_dum7 str_dum8 str_dum9
   str_dum10 str_dum11
   str_dum12 str_dum13 str_dum14 str_dum15 str_dum16 str_dum17 str_dum18
   str_dum19 str_dum20 str_dum21 str_dum22 str_dum23 str_dum24
   str_dum25 str_dum26 str_dum27 str_dum28 str_dum29 str_dum30
   str_dum31 str_dum32 str_dum33 str_dum34 str_dum35 str_dum36 str_dum37
   str_dum38 str_dum39 str_dum40 str_dum41 str_dum42 str_dum43
   str_dum44 str_dum45 str_dum46 str_dum47 str_dum48 str_dum49 str_dum50
   str_dum51 str_dum52 str_dum53 str_dum54 str_dum55 str_dum56 ;
   Missing are . ;
   weight = level1wgt_r ;
   wtscale=ecluster ;
   bweight = level2wgt ;
   bwtscale = sample ;
   usevar = ln_inc yrssince06 female yrs06sq str_dum2-str_dum56  level2wgt level1wgt_r
   numsecu newid_num fem_yrssince06 fem_yrs06sq ;
   within = female fem_yrssince06 fem_yrs06sq str_dum2-str_dum56 ;
   cluster = numsecu newid_num ;
   Analysis:
   type is twolevel random complex ;
   estimator=mlr ;
! Adjust convergence and H1 iterations suggested by Mplus log!
   mconvergence=.01 ;
   h1iterations = 3000 ;
   Model:
   %within%
   ln_inc on yrssince06 female fem_yrssince06 yrs06sq fem_yrs06sq str_dum2-str_dum56 ;
   %between%
   ln_inc yrssince06 yrs06sq ;

*NOTE: PARTIAL OUTPUT FROM MPLUS PROVIDED HERE!
 *** WARNING in VARIABLE command
  Note that only the first 8 characters of variable names are used in the output.
  Shorten variable names to avoid any confusion.
   1 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS


ASDA 2 EXAMPLE 11.3.3 - 3+ WAVES OF DATA, WEIGHTED MULTILEVEL MODEL
SUMMARY OF ANALYSIS
Number of groups                                          1
Number of observations                                40325
Number of dependent variables                             1
Number of independent variables                          60
Number of continuous latent variables                     0
Observed dependent variables
  Continuous
   LN_INC
Observed independent variables
   YRSSINCE    FEMALE      YRS06SQ     STR_DUM2     STR_DUM3     STR_DUM4
```

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```
        STR_DUM5      STR_DUM6      STR_DUM7      STR_DUM8      STR_DUM9      STR_DUM1
        STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM1
        STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM2      STR_DUM2      STR_DUM2
        STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2
        STR_DUM2      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3
        STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM4
        STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM4
        STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM5      STR_DUM5      STR_DUM5
        STR_DUM5      STR_DUM5      STR_DUM5      STR_DUM5      FEM_YRSS      FEM_YRS0
   Variables with special functions
     Cluster variables       NUMSECU    NEWID_NU
     Weight variable (effective cluster-size scaling)
       LEVEL1WG
     Between weight variable (sample-size scaling)
       LEVEL2WG
     Within variables
      FEMALE        STR_DUM2      STR_DUM3      STR_DUM4      STR_DUM5      STR_DUM6
      STR_DUM7      STR_DUM8      STR_DUM9      STR_DUM1      STR_DUM1      STR_DUM1
      STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM1      STR_DUM1
      STR_DUM1      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2
      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM2      STR_DUM3
      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM3
      STR_DUM3      STR_DUM3      STR_DUM3      STR_DUM4      STR_DUM4      STR_DUM4
      STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM4      STR_DUM4
      STR_DUM4      STR_DUM5      STR_DUM5      STR_DUM5      STR_DUM5      STR_DUM5
      STR_DUM5      STR_DUM5      FEM_YRSS      FEM_YRS0
   Estimator                                                   MLR
   Information matrix                                     OBSERVED
   Maximum number of iterations                                100
   Convergence criterion                                  0.100D-05
   Maximum number of EM iterations                             500
   Convergence criteria for the EM algorithm
     Loglikelihood change                                 0.100D-02
     Relative loglikelihood change                        0.100D-05
     Derivative                                           0.100D-01
   Minimum variance                                       0.100D-03
   Maximum number of steepest descent iterations               20
   Maximum number of iterations for H1                        3000
   Convergence criterion for H1                           0.100D-03
   Optimization algorithm                                      EMA
   Input data file(s)
     P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\wmultilevel_3pwav
   Input data format  FREE
   SUMMARY OF DATA
       Number of missing data patterns            1
       Number of NUMSECU clusters           112
       Number of NEWID_NUM clusters       11789
```
*NOTE: DESPITE THIS WARNING, RESULTS APPEAR SENSIBLE AND WE PROCEED!
```
       WARNING: THE MODEL ESTIMATION HAS REACHED A SADDLE POINT OR A POINT WHERE THE
       OBSERVED AND THE EXPECTED INFORMATION MATRICES DO NOT MATCH.
       AN ADJUSTMENT TO THE ESTIMATION OF THE INFORMATION MATRIX HAS BEEN MADE.
       THE CONDITION NUMBER IS      -0.839D-06.
       THE PROBLEM MAY ALSO BE RESOLVED BY DECREASING THE VALUE OF THE
       MCONVERGENCE OR LOGCRITERION OPTIONS OR BY CHANGING THE STARTING VALUES
       OR BY USING THE MLF ESTIMATOR.
   THE MODEL ESTIMATION TERMINATED NORMALLY
       THE H1 MODEL ESTIMATION DID NOT CONVERGE.  CHI-SQUARE TEST AND SAMPLE STATISTICS COULD NOT
       BE COMPUTED.  INCREASE THE NUMBER OF H1ITERATIONS.
       THE BASELINE MODEL ESTIMATION DID NOT CONVERGE.  THE CHI-SQUARE VALUE
       COULD NOT BE COMPUTED.  INCREASE THE NUMBER OF H1ITERATIONS.
   MODEL FIT INFORMATION
```

```
Number of Free Parameters                    69
Loglikelihood
        H0 Value                     -318808.039
        H0 Scaling Correction Factor     2.8047
          for MLR
Information Criteria
        Akaike (AIC)                  637754.077
        Bayesian (BIC)                638347.803
        Sample-Size Adjusted BIC      638128.521
          (n* = (n + 2) / 24)
```

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
Within Level				
LN_INC ON				
YRSSINCE06	0.030	0.014	2.059	0.040
FEMALE	-0.560	0.035	-16.001	0.000
FEM_YRSSIN	0.004	0.021	0.210	0.833
YRS06SQ	-0.011	0.003	-3.864	0.000
FEM_YRS06S	0.001	0.003	0.359	0.720
STR_DUM2	0.162	0.104	1.550	0.121
STR_DUM3	0.321	0.062	5.163	0.000
STR_DUM4	0.470	0.036	13.060	0.000
STR_DUM5	0.259	0.098	2.651	0.008
STR_DUM6	0.217	0.188	1.153	0.249
STR_DUM7	0.738	0.084	8.788	0.000
STR_DUM8	0.378	0.037	10.110	0.000
STR_DUM9	0.532	0.123	4.326	0.000
STR_DUM10	0.793	0.161	4.932	0.000
STR_DUM11	0.238	0.235	1.014	0.310
STR_DUM12	0.280	0.129	2.170	0.030
STR_DUM13	0.608	0.085	7.141	0.000
STR_DUM14	0.478	0.035	13.599	0.000
STR_DUM15	0.522	0.074	7.076	0.000
STR_DUM16	0.224	0.074	3.019	0.003
STR_DUM17	0.581	0.089	6.559	0.000
STR_DUM18	0.763	0.136	5.601	0.000
STR_DUM19	0.631	0.110	5.761	0.000
STR_DUM20	-0.152	0.160	-0.954	0.340
STR_DUM21	0.427	0.103	4.163	0.000
STR_DUM22	0.797	0.180	4.440	0.000
STR_DUM23	0.613	0.034	18.171	0.000
STR_DUM24	0.426	0.059	7.239	0.000
STR_DUM25	0.524	0.079	6.612	0.000
STR_DUM26	0.475	0.092	5.145	0.000
STR_DUM27	0.582	0.042	13.790	0.000
STR_DUM28	0.393	0.070	5.612	0.000
STR_DUM29	0.523	0.037	14.019	0.000
STR_DUM30	0.454	0.035	12.833	0.000
STR_DUM31	0.454	0.045	10.074	0.000
STR_DUM32	0.199	0.113	1.762	0.078
STR_DUM33	0.186	0.109	1.697	0.090
STR_DUM34	-0.023	0.273	-0.085	0.932
STR_DUM35	0.349	0.115	3.031	0.002
STR_DUM36	0.023	0.177	0.130	0.897
STR_DUM37	0.163	0.081	2.018	0.044
STR_DUM38	0.436	0.050	8.804	0.000
STR_DUM39	0.395	0.034	11.615	0.000
STR_DUM40	0.680	0.084	8.108	0.000
STR_DUM41	0.524	0.094	5.581	0.000

```
STR_DUM42          0.391      0.033     11.712      0.000
STR_DUM43          0.371      0.101      3.677      0.000
STR_DUM44          0.372      0.057      6.589      0.000
STR_DUM45          0.499      0.050     10.035      0.000
STR_DUM46          0.446      0.043     10.322      0.000
STR_DUM47          0.188      0.041      4.533      0.000
STR_DUM48          0.377      0.063      6.013      0.000
STR_DUM49          0.124      0.154      0.807      0.420
STR_DUM50          0.198      0.083      2.390      0.017
STR_DUM51          0.263      0.159      1.654      0.098
STR_DUM52         -0.784      0.173     -4.536      0.000
STR_DUM53          0.481      0.077      6.276      0.000
STR_DUM54         -0.530      0.359     -1.477      0.140
STR_DUM55          0.043      0.135      0.322      0.748
STR_DUM56          0.684      0.216      3.172      0.002
 Variances
   YRSSINCE06       4.963      0.029    173.905      0.000
   YRSO6SQ        184.092      1.215    151.536      0.000
 Residual Variances
   LN_INC           1.097      0.075     14.537      0.000
Between Level
 Means
   LN_INC          10.281      0.036    285.226      0.000
   YRSSINCE06       2.689      0.010    260.139      0.000
   YRSO6SQ         12.194      0.064    189.789      0.000
 Variances
   LN_INC           0.907      0.050     18.082      0.000
   YRSSINCE06       0.001      0.004      0.128      0.898
   YRSO6SQ          0.021      0.183      0.116      0.908


QUALITY OF NUMERICAL RESULTS
     Condition Number for the Information Matrix          -0.839E-06
       (ratio of smallest to largest eigenvalue)
DIAGRAM INFORMATION
  Mplus diagrams are currently not available for multilevel analysis.
  No diagram output was produced.
     Beginning Time:  07:23:17
        Ending Time:  15:31:22
        Elapsed Time:  08:08:05
```

*NOTE: Mplus does not offer a GEE estimation option. Please see this paper for additional information:
Muthén, B., du Toit, S.H.C., & Spisic, D. (1997). Robust inference using weighted least squares and quadratic estimating equations in latent variable modeling with categorical and continuous outcomes. Unpublished technical report.