**data** cholst;

input ID cholst sex age time;

age\_at\_meas = time + age;

datalines;

1 175 1 32 0

……………………Data omitted……………

200 252 0 46 10

;

**run**;





**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex Age/ s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9964.2 |
| **AIC (Smaller is Better)** | 9976.2 |
| **AICC (Smaller is Better)** | 9976.3 |
| **BIC (Smaller is Better)** | 9996.0 |

| **Solution for Fixed Effects** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Effect** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** | 157.39 | 15.0938 | 197 | 10.43 | <.0001 |
| **time** | 2.8255 | 0.2022 | 843 | 13.98 | <.0001 |
| **sex** | -1.3253 | 5.4953 | 843 | -0.24 | 0.8095 |
| **age** | 1.5011 | 0.3488 | 843 | 4.30 | <.0001 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex l\_age/ s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9963.6 |
| **AIC (Smaller is Better)** | 9975.6 |
| **AICC (Smaller is Better)** | 9975.6 |
| **BIC (Smaller is Better)** | 9995.4 |

| **Solution for Fixed Effects** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Effect** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** | -24.3834 | 55.9129 | 197 | -0.44 | 0.6632 |
| **time** | 2.8264 | 0.2022 | 843 | 13.98 | <.0001 |
| **sex** | -1.2215 | 5.4833 | 843 | -0.22 | 0.8238 |
| **l\_age** | 65.7737 | 15.0094 | 843 | 4.38 | <.0001 |

(\*a 1 unit difference in log age is going from 20.1 to 54.6 years old)

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex Age Time\*Age / s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9947.2 |
| **AIC (Smaller is Better)** | 9961.2 |
| **AICC (Smaller is Better)** | 9961.3 |
| **BIC (Smaller is Better)** | 9984.3 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex l\_age Time\*l\_age / s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9947.7 |
| **AIC (Smaller is Better)** | 9961.7 |
| **AICC (Smaller is Better)** | 9961.8 |
| **BIC (Smaller is Better)** | 9984.8 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex Age Time\*Sex / s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9948.3 |
| **AIC (Smaller is Better)** | 9962.3 |
| **AICC (Smaller is Better)** | 9962.4 |
| **BIC (Smaller is Better)** | 9985.3 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex l\_age Time\*Sex / s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9947.6 |
| **AIC (Smaller is Better)** | 9961.6 |
| **AICC (Smaller is Better)** | 9961.7 |
| **BIC (Smaller is Better)** | 9984.7 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9927.0 |
| **AIC (Smaller is Better)** | 9943.0 |
| **AICC (Smaller is Better)** | 9943.1 |
| **BIC (Smaller is Better)** | 9969.4 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex l\_age Time\*Sex Time\*l\_age/ s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9927.9 |
| **AIC (Smaller is Better)** | 9943.9 |
| **AICC (Smaller is Better)** | 9944.0 |
| **BIC (Smaller is Better)** | 9970.3 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept/subject=ID;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9925.1 |
| **AIC (Smaller is Better)** | 9929.1 |
| **AICC (Smaller is Better)** | 9929.1 |
| **BIC (Smaller is Better)** | 9935.7 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept Time/type=UN subject=ID g gcorr v vcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9907.9 |
| **AIC (Smaller is Better)** | 9915.9 |
| **AICC (Smaller is Better)** | 9915.9 |
| **BIC (Smaller is Better)** | 9929.1 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept Age/type=UN subject=ID g gcorr v vcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9918.7 |
| **AIC (Smaller is Better)** | 9926.7 |
| **AICC (Smaller is Better)** | 9926.7 |
| **BIC (Smaller is Better)** | 9939.9 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept Time Age/type=UN subject=ID g gcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9901.4 |
| **AIC (Smaller is Better)** | 9915.4 |
| **AICC (Smaller is Better)** | 9915.5 |
| **BIC (Smaller is Better)** | 9938.5 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept Time/type=UN subject=ID g gcorr v vcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9910.3 |
| **AIC (Smaller is Better)** | 9930.3 |
| **AICC (Smaller is Better)** | 9930.5 |
| **BIC (Smaller is Better)** | 9963.3 |

**proc** **mixed** data=cholst method = ml;

class ID;

model cholst = Time Sex l\_age Time\*Sex Time\*l\_age/ s;

random intercept Time/type=UN subject=ID g gcorr v vcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 9911.0 |
| **AIC (Smaller is Better)** | 9931.0 |
| **AICC (Smaller is Better)** | 9931.2 |
| **BIC (Smaller is Better)** | 9964.0 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex l\_age Time\*Sex Time\*l\_age/ s;

random intercept l\_age/type=UN subject=ID g gcorr v vcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9905.3 |
| **AIC (Smaller is Better)** | 9913.3 |
| **AICC (Smaller is Better)** | 9913.4 |
| **BIC (Smaller is Better)** | 9926.5 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex l\_age Time\*Sex Time\*l\_age/ s;

random intercept l\_age Time/type=UN subject=ID g gcorr v vcorr;

**run**;

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9887.7 |
| **AIC (Smaller is Better)** | 9901.7 |
| **AICC (Smaller is Better)** | 9901.8 |
| **BIC (Smaller is Better)** | 9924.8 |

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex Age Time\*Sex Time\*Age/ s;

random intercept Time/type=UN subject=ID g gcorr v=**26**,**34** vcorr=**26**,**34**;

\* ID 26 is 56 years old;

\* ID 34 is 31 years old;

**run**;

|  |
| --- |
| The SAS System |

The Mixed Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.CHOLST |
| **Dependent Variable** | cholst |
| **Covariance Structure** | Unstructured |
| **Subject Effect** | ID |
| **Estimation Method** | REML |
| **Residual Variance Method** | Profile |
| **Fixed Effects SE Method** | Model-Based |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **ID** | 200 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 4 |
| **Columns in X** | 6 |
| **Columns in Z per Subject** | 2 |
| **Subjects** | 200 |
| **Max Obs per Subject** | 6 |

| **Number of Observations** | |
| --- | --- |
| **Number of Observations Read** | 1044 |
| **Number of Observations Used** | 1044 |
| **Number of Observations Not Used** | 0 |

| **Iteration History** | | | |
| --- | --- | --- | --- |
| **Iteration** | **Evaluations** | **-2 Res Log Like** | **Criterion** |
| **0** | 1 | 10813.99587154 |  |
| **1** | 2 | 9907.91171335 | 0.00001167 |
| **2** | 1 | 9907.86372303 | 0.00000002 |
| **3** | 1 | 9907.86363199 | 0.00000000 |

|  |
| --- |
| Convergence criteria met. |

| **Estimated G Matrix** | | | | |
| --- | --- | --- | --- | --- |
| **Row** | **Effect** | **ID** | **Col1** | **Col2** |
| **1** | Intercept | 1 | 1210.21 | 13.5403 |
| **2** | time | 1 | 13.5403 | 2.5226 |

| **Estimated G Correlation Matrix** | | | | |
| --- | --- | --- | --- | --- |
| **Row** | **Effect** | **ID** | **Col1** | **Col2** |
| **1** | Intercept | 1 | 1.0000 | 0.2451 |
| **2** | time | 1 | 0.2451 | 1.0000 |

| **Estimated V Matrix for ID 26** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1644.38 | 1237.29 | 1264.37 | 1291.45 | 1318.53 | 1345.61 |
| **2** | 1237.29 | 1708.63 | 1311.63 | 1348.81 | 1385.98 | 1423.15 |
| **3** | 1264.37 | 1311.63 | 1793.06 | 1406.16 | 1453.42 | 1500.68 |
| **4** | 1291.45 | 1348.81 | 1406.16 | 1897.67 | 1520.86 | 1578.21 |
| **5** | 1318.53 | 1385.98 | 1453.42 | 1520.86 | 2022.47 | 1655.74 |
| **6** | 1345.61 | 1423.15 | 1500.68 | 1578.21 | 1655.74 | 2167.44 |

| **Estimated V Correlation Matrix for ID 26** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1.0000 | 0.7382 | 0.7363 | 0.7311 | 0.7230 | 0.7128 |
| **2** | 0.7382 | 1.0000 | 0.7494 | 0.7491 | 0.7456 | 0.7395 |
| **3** | 0.7363 | 0.7494 | 1.0000 | 0.7623 | 0.7632 | 0.7612 |
| **4** | 0.7311 | 0.7491 | 0.7623 | 1.0000 | 0.7763 | 0.7782 |
| **5** | 0.7230 | 0.7456 | 0.7632 | 0.7763 | 1.0000 | 0.7908 |
| **6** | 0.7128 | 0.7395 | 0.7612 | 0.7782 | 0.7908 | 1.0000 |

| **Estimated V Matrix for ID 34** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1644.38 | 1237.29 | 1264.37 | 1291.45 | 1318.53 | 1345.61 |
| **2** | 1237.29 | 1708.63 | 1311.63 | 1348.81 | 1385.98 | 1423.15 |
| **3** | 1264.37 | 1311.63 | 1793.06 | 1406.16 | 1453.42 | 1500.68 |
| **4** | 1291.45 | 1348.81 | 1406.16 | 1897.67 | 1520.86 | 1578.21 |
| **5** | 1318.53 | 1385.98 | 1453.42 | 1520.86 | 2022.47 | 1655.74 |
| **6** | 1345.61 | 1423.15 | 1500.68 | 1578.21 | 1655.74 | 2167.44 |

| **Estimated V Correlation Matrix for ID 34** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1.0000 | 0.7382 | 0.7363 | 0.7311 | 0.7230 | 0.7128 |
| **2** | 0.7382 | 1.0000 | 0.7494 | 0.7491 | 0.7456 | 0.7395 |
| **3** | 0.7363 | 0.7494 | 1.0000 | 0.7623 | 0.7632 | 0.7612 |
| **4** | 0.7311 | 0.7491 | 0.7623 | 1.0000 | 0.7763 | 0.7782 |
| **5** | 0.7230 | 0.7456 | 0.7632 | 0.7763 | 1.0000 | 0.7908 |
| **6** | 0.7128 | 0.7395 | 0.7612 | 0.7782 | 0.7908 | 1.0000 |

| **Covariance Parameter Estimates** | | |
| --- | --- | --- |
| **Cov Parm** | **Subject** | **Estimate** |
| **UN(1,1)** | **ID** | 1210.21 |
| **UN(2,1)** | **ID** | 13.5403 |
| **UN(2,2)** | **ID** | 2.5226 |
| **Residual** |  | 434.17 |

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9907.9 |
| **AIC (Smaller is Better)** | 9915.9 |
| **AICC (Smaller is Better)** | 9915.9 |
| **BIC (Smaller is Better)** | 9929.1 |

| **Null Model Likelihood Ratio Test** | | |
| --- | --- | --- |
| **DF** | **Chi-Square** | **Pr > ChiSq** |
| 3 | 906.13 | <.0001 |

| **Solution for Fixed Effects** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Effect** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** | 138.18 | 14.9165 | 197 | 9.26 | <.0001 |
| **time** | 6.8003 | 1.2230 | 190 | 5.56 | <.0001 |
| **sex** | -9.6393 | 5.4358 | 651 | -1.77 | 0.0766 |
| **age** | 2.0509 | 0.3454 | 651 | 5.94 | <.0001 |
| **time\*sex** | 1.7995 | 0.4536 | 651 | 3.97 | <.0001 |
| **time\*age** | -0.1145 | 0.02835 | 651 | -4.04 | <.0001 |

| **Type 3 Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **time** | 1 | 190 | 30.92 | <.0001 |
| **sex** | 1 | 651 | 3.14 | 0.0766 |
| **age** | 1 | 651 | 35.25 | <.0001 |
| **time\*sex** | 1 | 651 | 15.73 | <.0001 |
| **time\*age** | 1 | 651 | 16.30 | <.0001 |

**Model with log(baseline age) as a random effect.**

**proc** **mixed** data=cholst;

class ID;

model cholst = Time Sex l\_age Time\*Sex Time\*l\_age/ s;

random intercept l\_age Time/type=UN subject=ID g gcorr v=**26**,**34** vcorr=**26**,**34** s;

**run**;

|  |
| --- |
| The SAS System |

The Mixed Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.CHOLST |
| **Dependent Variable** | cholst |
| **Covariance Structure** | Unstructured |
| **Subject Effect** | ID |
| **Estimation Method** | REML |
| **Residual Variance Method** | Profile |
| **Fixed Effects SE Method** | Model-Based |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **ID** | 200 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 7 |
| **Columns in X** | 6 |
| **Columns in Z per Subject** | 3 |
| **Subjects** | 200 |
| **Max Obs per Subject** | 6 |

| **Number of Observations** | |
| --- | --- |
| **Number of Observations Read** | 1044 |
| **Number of Observations Used** | 1044 |
| **Number of Observations Not Used** | 0 |

| **Iteration History** | | | |
| --- | --- | --- | --- |
| **Iteration** | **Evaluations** | **-2 Res Log Like** | **Criterion** |
| **0** | 1 | 10796.64307098 |  |
| **1** | 2 | 9887.79574856 | 0.00001911 |
| **2** | 1 | 9887.71615647 | 0.00000010 |
| **3** | 1 | 9887.71576269 | 0.00000000 |

|  |
| --- |
| Convergence criteria met. |

| **Estimated G Matrix** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Row** | **Effect** | **ID** | **Col1** | **Col2** | **Col3** |
| **1** | Intercept | 1 | 111197 | -30186 | 21.7122 |
| **2** | l\_age | 1 | -30186 | 8260.16 | -2.5019 |
| **3** | time | 1 | 21.7122 | -2.5019 | 2.6018 |

| **Estimated G Correlation Matrix** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Row** | **Effect** | **ID** | **Col1** | **Col2** | **Col3** |
| **1** | Intercept | 1 | 1.0000 | -0.9960 | 0.04037 |
| **2** | l\_age | 1 | -0.9960 | 1.0000 | -0.01707 |
| **3** | time | 1 | 0.04037 | -0.01707 | 1.0000 |

| **Estimated V Matrix for ID 26** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 2457.94 | 2047.33 | 2070.61 | 2093.89 | 2117.18 | 2140.46 |
| **2** | 2047.33 | 2514.91 | 2114.71 | 2148.40 | 2182.09 | 2215.77 |
| **3** | 2070.61 | 2114.71 | 2592.70 | 2202.90 | 2247.00 | 2291.09 |
| **4** | 2093.89 | 2148.40 | 2202.90 | 2691.30 | 2311.91 | 2366.41 |
| **5** | 2117.18 | 2182.09 | 2247.00 | 2311.91 | 2810.71 | 2441.73 |
| **6** | 2140.46 | 2215.77 | 2291.09 | 2366.41 | 2441.73 | 2950.94 |

| **Estimated V Correlation Matrix for ID 26** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1.0000 | 0.8235 | 0.8202 | 0.8141 | 0.8055 | 0.7948 |
| **2** | 0.8235 | 1.0000 | 0.8282 | 0.8258 | 0.8207 | 0.8134 |
| **3** | 0.8202 | 0.8282 | 1.0000 | 0.8339 | 0.8324 | 0.8283 |
| **4** | 0.8141 | 0.8258 | 0.8339 | 1.0000 | 0.8406 | 0.8397 |
| **5** | 0.8055 | 0.8207 | 0.8324 | 0.8406 | 1.0000 | 0.8478 |
| **6** | 0.7948 | 0.8134 | 0.8283 | 0.8397 | 0.8478 | 1.0000 |

| **Estimated V Matrix for ID 34** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1722.27 | 1314.61 | 1340.85 | 1367.09 | 1393.33 | 1419.58 |
| **2** | 1314.61 | 1785.16 | 1387.91 | 1424.56 | 1461.20 | 1497.85 |
| **3** | 1340.85 | 1387.91 | 1868.86 | 1482.02 | 1529.07 | 1576.13 |
| **4** | 1367.09 | 1424.56 | 1482.02 | 1973.38 | 1596.94 | 1654.41 |
| **5** | 1393.33 | 1461.20 | 1529.07 | 1596.94 | 2098.71 | 1732.68 |
| **6** | 1419.58 | 1497.85 | 1576.13 | 1654.41 | 1732.68 | 2244.85 |

| **Estimated V Correlation Matrix for ID 34** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Col1** | **Col2** | **Col3** | **Col4** | **Col5** | **Col6** |
| **1** | 1.0000 | 0.7497 | 0.7474 | 0.7416 | 0.7329 | 0.7220 |
| **2** | 0.7497 | 1.0000 | 0.7599 | 0.7590 | 0.7549 | 0.7482 |
| **3** | 0.7474 | 0.7599 | 1.0000 | 0.7717 | 0.7721 | 0.7695 |
| **4** | 0.7416 | 0.7590 | 0.7717 | 1.0000 | 0.7847 | 0.7860 |
| **5** | 0.7329 | 0.7549 | 0.7721 | 0.7847 | 1.0000 | 0.7983 |
| **6** | 0.7220 | 0.7482 | 0.7695 | 0.7860 | 0.7983 | 1.0000 |

| **Covariance Parameter Estimates** | | |
| --- | --- | --- |
| **Cov Parm** | **Subject** | **Estimate** |
| **UN(1,1)** | **ID** | 111197 |
| **UN(2,1)** | **ID** | -30186 |
| **UN(2,2)** | **ID** | 8260.16 |
| **UN(3,1)** | **ID** | 21.7122 |
| **UN(3,2)** | **ID** | -2.5019 |
| **UN(3,3)** | **ID** | 2.6018 |
| **Residual** |  | 433.90 |

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 9887.7 |
| **AIC (Smaller is Better)** | 9901.7 |
| **AICC (Smaller is Better)** | 9901.8 |
| **BIC (Smaller is Better)** | 9924.8 |

| **Null Model Likelihood Ratio Test** | | |
| --- | --- | --- |
| **DF** | **Chi-Square** | **Pr > ChiSq** |
| 6 | 908.93 | <.0001 |

| **Solution for Fixed Effects** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Effect** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** | -103.98 | 58.8262 | 197 | -1.77 | 0.0787 |
| **time** | 19.7675 | 4.5805 | 189 | 4.32 | <.0001 |
| **sex** | -11.9582 | 5.2892 | 652 | -2.26 | 0.0241 |
| **l\_age** | 88.5397 | 15.8994 | 0 | 5.57 | . |
| **time\*sex** | 1.7804 | 0.4551 | 652 | 3.91 | 0.0001 |
| **time\*l\_age** | -4.7745 | 1.2303 | 652 | -3.88 | 0.0001 |

| **Solution for Random Effects** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **ID** | **Estimate** | **Std Err Pred** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** | **1** | -35.3196 | 282.56 | 652 | -0.12 | 0.9006 |
| **l\_age** | **1** | 7.9757 | 80.7260 | 652 | 0.10 | 0.9213 |
| **time** | **1** | -0.4447 | 1.2698 | 652 | -0.35 | 0.7263 |
| **Intercept** | **2** | 427.27 | 305.05 | 652 | 1.40 | 0.1618 |
| **l\_age** | **2** | -93.4309 | 85.8740 | 652 | -1.09 | 0.2770 |
| **time** | **2** | 2.9678 | 1.2692 | 652 | 2.34 | 0.0197 |
| **Intercept** | **3** | -28.6208 | 332.40 | 652 | -0.09 | 0.9314 |
| **l\_age** | **3** | 14.5309 | 89.7224 | 652 | 0.16 | 0.8714 |
| **time** | **3** | 0.07610 | 1.2468 | 652 | 0.06 | 0.9513 |
| **Intercept** | **200** | -87.6297 | 311.78 | 652 | -0.28 | 0.7787 |
| **l\_age** | **200** | 28.7091 | 82.0249 | 652 | 0.35 | 0.7264 |
| **time** | **200** | 0.1658 | 1.2687 | 652 | 0.13 | 0.8961 |

| **Type 3 Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **time** | 1 | 189 | 18.62 | <.0001 |
| **sex** | 1 | 652 | 5.11 | 0.0241 |
| **l\_age** | 1 | 0 | 31.01 | . |
| **time\*sex** | 1 | 652 | 15.30 | 0.0001 |
| **time\*l\_age** | 1 | 652 | 15.06 | 0.0001 |