**Example:** The data are from a randomized, double-blind, parallel-group, multicenter study comparing two oral treatments (denoted A and B) for toe-nail infection. Patients were evaluated for the degree of onycholysis (the degree of separation of the nail plate from the nail-bed) at baseline (week 0) and at weeks 4, 8, 12, 24, 36, and 48 thereafter. The onycholysis outcome variable is binary (none or mild versus moderate or severe). The binary outcome was evaluated on 294 patients comprising a total of 1908 measurements.

**data** toenail;

input ID Response Treatment Month Visit;

rd\_month = round(Month);

datalines;

1 1 1 0 1

1 1 1 0.8571428571 2

1 1 1 3.5357142857 3

1 0 1 4.5357142857 4

1 0 1 7.5357142857 5

1 0 1 10.035714286 6

1 0 1 13.071428571 7

2 0 0 0 1

………………….

;

proc sort data = toenail;

by treatment rd\_month;

run;

proc means data = toenail noprint;

by treatment rd\_month;

var Response;

output out=mn\_dat mean=res\_mn;

run;

proc print data=mn\_dat;

run;

| **Obs** | **Treatment** | **rd\_month** | **\_TYPE\_** | **\_FREQ\_** | **res\_mn** |
| --- | --- | --- | --- | --- | --- |
| **1** | 0 | 0 | 0 | 146 | 0.36986 |
| **2** | 0 | 1 | 0 | 137 | 0.33577 |
| **3** | 0 | 2 | 0 | 136 | 0.32353 |
| **4** | 0 | 3 | 0 | 124 | 0.25000 |
| **5** | 0 | 4 | 0 | 13 | 0.07692 |
| **6** | 0 | 5 | 0 | 4 | 0.25000 |
| **7** | 0 | 6 | 0 | 92 | 0.09783 |
| **8** | 0 | 7 | 0 | 29 | 0.10345 |
| **9** | 0 | 8 | 0 | 7 | 0.14286 |
| **10** | 0 | 9 | 0 | 80 | 0.10000 |
| **11** | 0 | 10 | 0 | 31 | 0.06452 |
| **12** | 0 | 11 | 0 | 8 | 0.12500 |
| **13** | 0 | 12 | 0 | 75 | 0.08000 |
| **14** | 0 | 13 | 0 | 39 | 0.12821 |
| **15** | 0 | 14 | 0 | 10 | 0.10000 |
| **16** | 0 | 15 | 0 | 2 | 0.50000 |
| **17** | 0 | 16 | 0 | 4 | 0.00000 |
| **18** | 1 | 0 | 0 | 148 | 0.37162 |
| **19** | 1 | 1 | 0 | 146 | 0.32877 |
| **20** | 1 | 2 | 0 | 140 | 0.26429 |
| **21** | 1 | 3 | 0 | 132 | 0.21212 |
| **22** | 1 | 4 | 0 | 13 | 0.23077 |
| **23** | 1 | 5 | 0 | 4 | 0.25000 |
| **24** | 1 | 6 | 0 | 96 | 0.04167 |
| **25** | 1 | 7 | 0 | 30 | 0.10000 |
| **26** | 1 | 8 | 0 | 10 | 0.10000 |
| **27** | 1 | 9 | 0 | 77 | 0.05195 |
| **28** | 1 | 10 | 0 | 37 | 0.08108 |
| **29** | 1 | 11 | 0 | 8 | 0.12500 |
| **30** | 1 | 12 | 0 | 85 | 0.03529 |
| **31** | 1 | 13 | 0 | 34 | 0.08824 |
| **32** | 1 | 14 | 0 | 7 | 0.00000 |
| **33** | 1 | 15 | 0 | 2 | 0.00000 |
| **34** | 1 | 16 | 0 | 1 | 0.00000 |
| **35** | 1 | 19 | 0 | 1 | 0.00000 |

proc sgplot data=mn\_dat;

series x = rd\_month y = res\_mn/ group=treatment;

run;

Chart, line chart

Description automatically generated

proc loess data=toenail plots=none;

ods output outputstatistics=out\_low;

by treatment;

model Response=Month;

run;

proc sort data=out\_low;

by treatment Month;

run;

proc sgplot data=out\_low;

series x=Month y=pred/ group = treatment;

run;

Chart, line chart

Description automatically generated

data out\_low2;

set out\_low;

logit\_pred = log(pred/(1-pred));

run;

proc sgplot data=out\_low2;

series x=Month y=logit\_pred/ group = treatment;

run;

Chart, line chart

Description automatically generated

proc glimmix data=toenail method=quad(qpoints=20);

class ID treatment;

model Response=Treatment Month Treatment\*Month /dist=bin link=logit solution;

random intercept /type=UN G Gcorr subject=ID;

run;

**The GLIMMIX Procedure**

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.TOENAIL |
| **Response Variable** | Response |
| **Response Distribution** | Binomial |
| **Link Function** | Logit |
| **Variance Function** | Default |
| **Variance Matrix Blocked By** | ID |
| **Estimation Technique** | Maximum Likelihood |
| **Likelihood Approximation** | Gauss-Hermite Quadrature |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **ID** | 294 | 1 2 3 4 6 7 ………….. 383 |
| **Treatment** | 2 | 0 1 |

|  |  |
| --- | --- |
| **Number of Observations Read** | 1908 |
| **Number of Observations Used** | 1908 |

| **Dimensions** | |
| --- | --- |
| **G-side Cov. Parameters** | 1 |
| **Columns in X** | 6 |
| **Columns in Z per Subject** | 1 |
| **Subjects (Blocks in V)** | 294 |
| **Max Obs per Subject** | 7 |

| **Optimization Information** | |
| --- | --- |
| **Optimization Technique** | Dual Quasi-Newton |
| **Parameters in Optimization** | 5 |
| **Lower Boundaries** | 1 |
| **Upper Boundaries** | 0 |
| **Fixed Effects** | Not Profiled |
| **Starting From** | GLM estimates |
| **Quadrature Points** | 20 |

| **Iteration History** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Iteration** | **Restarts** | **Evaluations** | **Objective Function** | **Change** | **Max Gradient** |
| **0** | **0** | 4 | 1382.811832 | . | 760.0019 |
| **1** | **0** | 3 | 1360.0584047 | 22.75342732 | 354.5137 |
| **2** | **0** | 2 | 1346.5901737 | 13.46823101 | 216.5517 |
| **3** | **0** | 4 | 1311.8479066 | 34.74226708 | 104.2334 |
| **4** | **0** | 4 | 1300.4845975 | 11.36330908 | 64.07118 |
| **5** | **0** | 4 | 1266.4231807 | 34.06141680 | 36.71963 |
| **6** | **0** | 3 | 1253.002871 | 13.42030971 | 21.88316 |
| **7** | **0** | 3 | 1251.6637539 | 1.33911708 | 23.20562 |
| **8** | **0** | 3 | 1251.2528465 | 0.41090746 | 5.629866 |
| **9** | **0** | 3 | 1251.0146277 | 0.23821877 | 2.107496 |
| **10** | **0** | 3 | 1250.9244053 | 0.09022241 | 5.329818 |
| **11** | **0** | 2 | 1250.7762193 | 0.14818599 | 0.797992 |
| **12** | **0** | 3 | 1250.7515826 | 0.02463673 | 1.153387 |
| **13** | **0** | 3 | 1250.7506018 | 0.00098080 | 0.192758 |
| **14** | **0** | 3 | 1250.7505464 | 0.00005535 | 0.006712 |
| **15** | **0** | 3 | 1250.7505462 | 0.00000019 | 0.000682 |

|  |
| --- |
| Convergence criterion (GCONV=1E-8) satisfied. |

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 1250.75 |
| **AIC (smaller is better)** | 1260.75 |
| **AICC (smaller is better)** | 1260.78 |
| **BIC (smaller is better)** | 1279.17 |
| **CAIC (smaller is better)** | 1284.17 |
| **HQIC (smaller is better)** | 1268.13 |

| **Fit Statistics for Conditional Distribution** | |
| --- | --- |
| **-2 log L(Response | r. effects)** | 630.87 |
| **Pearson Chi-Square** | 4331.92 |
| **Pearson Chi-Square / DF** | 2.27 |

| **Estimated G Matrix** | | |
| --- | --- | --- |
| **Effect** | **Row** | **Col1** |
| Intercept | **1** | 16.0297 |

| **Covariance Parameter Estimates** | | | |
| --- | --- | --- | --- |
| **Cov Parm** | **Subject** | **Estimate** | **Standard Error** |
| **UN(1,1)** | ID | 16.0297 | 3.0011 |

| **Solutions for Fixed Effects** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **Treatment** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** |  | -1.7790 | 0.4456 | 292 | -3.99 | <.0001 |
| **Treatment** | 0 | 0.1608 | 0.5837 | 1612 | 0.28 | 0.7830 |
| **Treatment** | 1 | 0 | . | . | . | . |
| **Month** |  | -0.5276 | 0.05614 | 1612 | -9.40 | <.0001 |
| **Month\*Treatment** | 0 | 0.1367 | 0.06799 | 1612 | 2.01 | 0.0445 |
| **Month\*Treatment** | 1 | 0 | . | . | . | . |

proc glimmix data=toenail method=quad(qpoints=20);

class ID treatment;

model Response=Treatment Month Treatment\*Month /dist=bin link=logit solution;

random intercept Month/type=UN G Gcorr subject=ID;

run;

**The GLIMMIX Procedure**

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.TOENAIL |
| **Response Variable** | Response |
| **Response Distribution** | Binomial |
| **Link Function** | Logit |
| **Variance Function** | Default |
| **Variance Matrix Blocked By** | ID |
| **Estimation Technique** | Maximum Likelihood |
| **Likelihood Approximation** | Gauss-Hermite Quadrature |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **ID** | 294 | 1 2 3 4 6 7 9 ………. 383 |
| **Treatment** | 2 | 0 1 |

|  |  |
| --- | --- |
| **Number of Observations Read** | 1908 |
| **Number of Observations Used** | 1908 |

| **Dimensions** | |
| --- | --- |
| **G-side Cov. Parameters** | 3 |
| **Columns in X** | 6 |
| **Columns in Z per Subject** | 2 |
| **Subjects (Blocks in V)** | 294 |
| **Max Obs per Subject** | 7 |

| **Optimization Information** | |
| --- | --- |
| **Optimization Technique** | Dual Quasi-Newton |
| **Parameters in Optimization** | 7 |
| **Lower Boundaries** | 2 |
| **Upper Boundaries** | 0 |
| **Fixed Effects** | Not Profiled |
| **Starting From** | GLM estimates |
| **Quadrature Points** | 20 |

| **Iteration History** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Iteration** | **Restarts** | **Evaluations** | **Objective Function** | **Change** | **Max Gradient** |
| **0** | **0** | 4 | 1357.2654985 | . | 663.6751 |
| **1** | **0** | 5 | 1273.5404156 | 83.72508294 | 603.5629 |
| **2** | **0** | 3 | 1250.4812363 | 23.05917929 | 48.31572 |
| **3** | **0** | 2 | 1239.2396062 | 11.24163014 | 172.2946 |
| **4** | **0** | 2 | 1225.7780618 | 13.46154434 | 26.50946 |
| **5** | **0** | 4 | 1219.1122881 | 6.66577371 | 31.47332 |
| **6** | **0** | 4 | 1187.0563511 | 32.05593705 | 69.63307 |
| **7** | **0** | 2 | 1147.5214642 | 39.53488687 | 89.05815 |
| **8** | **0** | 2 | 1106.4960705 | 41.02539371 | 15.20876 |
| **9** | **0** | 3 | 1104.2147554 | 2.28131508 | 37.86331 |
| **10** | **0** | 2 | 1102.1667677 | 2.04798774 | 11.0414 |
| **11** | **0** | 3 | 1100.8565981 | 1.31016953 | 12.38747 |
| **12** | **0** | 3 | 1100.231008 | 0.62559013 | 10.07158 |
| **13** | **0** | 2 | 1099.70387 | 0.52713799 | 14.05279 |
| **14** | **0** | 2 | 1099.2255531 | 0.47831689 | 6.291872 |
| **15** | **0** | 4 | 1098.1906834 | 1.03486976 | 6.480524 |
| **16** | **0** | 3 | 1098.1100468 | 0.08063652 | 7.260189 |
| **17** | **0** | 2 | 1098.0881544 | 0.02189240 | 4.598288 |
| **18** | **0** | 4 | 1097.9730844 | 0.11507009 | 7.278862 |
| **19** | **0** | 4 | 1097.5948136 | 0.37827071 | 6.452527 |
| **20** | **0** | 2 | 1097.1305365 | 0.46427718 | 13.12123 |
| **21** | **0** | 4 | 1095.7207883 | 1.40974816 | 9.20452 |
| **22** | **0** | 3 | 1095.5910619 | 0.12972637 | 4.183606 |
| **23** | **0** | 3 | 1095.501975 | 0.08908693 | 2.010579 |
| **24** | **0** | 2 | 1095.4509368 | 0.05103822 | 1.105105 |
| **25** | **0** | 4 | 1095.1917269 | 0.25920985 | 1.790633 |
| **26** | **0** | 3 | 1095.1452936 | 0.04643336 | 2.490579 |
| **27** | **0** | 2 | 1095.0980008 | 0.04729278 | 2.098409 |
| **28** | **0** | 4 | 1094.6892416 | 0.40875924 | 3.650669 |
| **29** | **0** | 2 | 1094.1974159 | 0.49182565 | 1.592913 |
| **30** | **0** | 3 | 1094.182318 | 0.01509796 | 1.4832 |
| **31** | **0** | 3 | 1094.180643 | 0.00167501 | 1.891713 |
| **32** | **0** | 4 | 1094.1695906 | 0.01105232 | 1.780044 |
| **33** | **0** | 4 | 1094.0512919 | 0.11829876 | 1.550915 |
| **34** | **0** | 3 | 1094.0427298 | 0.00856206 | 0.131013 |
| **35** | **0** | 3 | 1094.0425468 | 0.00018303 | 0.01737 |
| **36** | **0** | 3 | 1094.042538 | 0.00000874 | 0.000568 |
| **37** | **0** | 3 | 1094.042538 | 0.00000002 | 0.000113 |

|  |
| --- |
| Convergence criterion (GCONV=1E-8) satisfied. |

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 1094.04 |
| **AIC (smaller is better)** | 1108.04 |
| **AICC (smaller is better)** | 1108.10 |
| **BIC (smaller is better)** | 1133.83 |
| **CAIC (smaller is better)** | 1140.83 |
| **HQIC (smaller is better)** | 1118.37 |

| **Fit Statistics for Conditional Distribution** | |
| --- | --- |
| **-2 log L(Response | r. effects)** | 209.63 |
| **Pearson Chi-Square** | 157.07 |
| **Pearson Chi-Square / DF** | 0.08 |

| **Estimated G Matrix** | | | |
| --- | --- | --- | --- |
| **Effect** | **Row** | **Col1** | **Col2** |
| Intercept | **1** | 179.91 | -13.4085 |
| Month | **2** | -13.4085 | 2.1557 |

| **Estimated G Correlation Matrix** | | | |
| --- | --- | --- | --- |
| **Effect** | **Row** | **Col1** | **Col2** |
| Intercept | **1** | 1.0000 | -0.6809 |
| Month | **2** | -0.6809 | 1.0000 |

| **Covariance Parameter Estimates** | | | |
| --- | --- | --- | --- |
| **Cov Parm** | **Subject** | **Estimate** | **Standard Error** |
| **UN(1,1)** | ID | 179.91 | 51.2582 |
| **UN(2,1)** | ID | -13.4085 | 4.3381 |
| **UN(2,2)** | ID | 2.1557 | 0.6291 |

| **Solutions for Fixed Effects** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **Treatment** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** |  | -5.5757 | 1.4840 | 292 | -3.76 | 0.0002 |
| **Treatment** | 0 | 0.2160 | 1.6621 | 1325 | 0.13 | 0.8966 |
| **Treatment** | 1 | 0 | . | . | . | . |
| **Month** |  | -1.4701 | 0.3141 | 287 | -4.68 | <.0001 |
| **Month\*Treatment** | 0 | 0.5754 | 0.2400 | 1325 | 2.40 | 0.0167 |
| **Month\*Treatment** | 1 | 0 | . | . | . | . |

proc glimmix data=toenail method=quad(qpoints=20);

class ID treatment;

model Response=Treatment Month Treatment\*Month Month\*Month Treatment\*Month\*Month/dist=bin link=logit solution;

random intercept Month/type=UN G Gcorr subject=ID;

run;

**The GLIMMIX Procedure**

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.TOENAIL |
| **Response Variable** | Response |
| **Response Distribution** | Binomial |
| **Link Function** | Logit |
| **Variance Function** | Default |
| **Variance Matrix Blocked By** | ID |
| **Estimation Technique** | Maximum Likelihood |
| **Likelihood Approximation** | Gauss-Hermite Quadrature |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **ID** | 294 | 1 2 3 4 6 7 …..383 |
| **Treatment** | 2 | 0 1 |

|  |  |
| --- | --- |
| **Number of Observations Read** | 1908 |
| **Number of Observations Used** | 1908 |

| **Dimensions** | |
| --- | --- |
| **G-side Cov. Parameters** | 3 |
| **Columns in X** | 9 |
| **Columns in Z per Subject** | 2 |
| **Subjects (Blocks in V)** | 294 |
| **Max Obs per Subject** | 7 |

| **Optimization Information** | |
| --- | --- |
| **Optimization Technique** | Dual Quasi-Newton |
| **Parameters in Optimization** | 9 |
| **Lower Boundaries** | 2 |
| **Upper Boundaries** | 0 |
| **Fixed Effects** | Not Profiled |
| **Starting From** | GLM estimates |
| **Quadrature Points** | 20 |

| **Iteration History** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Iteration** | **Restarts** | **Evaluations** | **Objective Function** | **Change** | **Max Gradient** |
| **0** | **0** | 4 | 1349.0996888 | . | 6887.951 |
| **1** | **0** | 5 | 1309.6625753 | 39.43711350 | 2775.242 |
| **2** | **0** | 4 | 1284.3319512 | 25.33062406 | 1684.391 |
| **3** | **0** | 3 | 1270.2980856 | 14.03386561 | 1155.441 |
| **4** | **0** | 2 | 1248.1134807 | 22.18460493 | 987.126 |
| **5** | **0** | 2 | 1241.2795609 | 6.83391982 | 671.7117 |
| **6** | **0** | 4 | 1223.0714383 | 18.20812253 | 395.9117 |
| **7** | **0** | 2 | 1215.6365366 | 7.43490176 | 1519.667 |
| **8** | **0** | 2 | 1203.1228054 | 12.51373114 | 704.0746 |
| **9** | **0** | 2 | 1184.4503158 | 18.67248969 | 57.78881 |
| **10** | **0** | 2 | 1157.8368027 | 26.61351301 | 384.9929 |
| **11** | **0** | 2 | 1131.7093405 | 26.12746229 | 361.7153 |
| **12** | **0** | 2 | 1119.2743167 | 12.43502380 | 326.2166 |
| **13** | **0** | 3 | 1116.7586526 | 2.51566407 | 207.7557 |
| **14** | **0** | 2 | 1114.0124883 | 2.74616431 | 211.4221 |
| **15** | **0** | 2 | 1113.2399465 | 0.77254180 | 206.3449 |
| **16** | **0** | 4 | 1110.6946466 | 2.54529991 | 194.798 |
| **17** | **0** | 3 | 1109.5625143 | 1.13213222 | 85.41736 |
| **18** | **0** | 2 | 1107.9770686 | 1.58544577 | 91.82533 |
| **19** | **0** | 3 | 1107.3530798 | 0.62398874 | 30.8557 |
| **20** | **0** | 2 | 1107.1081906 | 0.24488921 | 189.276 |
| **21** | **0** | 4 | 1106.5738833 | 0.53430736 | 14.69111 |
| **22** | **0** | 2 | 1106.2350111 | 0.33887213 | 46.62949 |
| **23** | **0** | 2 | 1105.8142925 | 0.42071860 | 14.24222 |
| **24** | **0** | 2 | 1105.0976694 | 0.71662316 | 35.13131 |
| **25** | **0** | 3 | 1104.6646041 | 0.43306522 | 14.67025 |
| **26** | **0** | 3 | 1104.5358741 | 0.12873003 | 52.01641 |
| **27** | **0** | 4 | 1104.1682093 | 0.36766482 | 41.04924 |
| **28** | **0** | 3 | 1103.9810963 | 0.18711303 | 18.28475 |
| **29** | **0** | 2 | 1103.7543293 | 0.22676695 | 40.89876 |
| **30** | **0** | 3 | 1103.6655646 | 0.08876468 | 35.83084 |
| **31** | **0** | 3 | 1103.6096007 | 0.05596388 | 40.13425 |
| **32** | **0** | 4 | 1103.4736423 | 0.13595842 | 16.89848 |
| **33** | **0** | 4 | 1102.3441533 | 1.12948906 | 67.58993 |
| **34** | **0** | 2 | 1100.6404334 | 1.70371990 | 118.1592 |
| **35** | **0** | 3 | 1099.6003444 | 1.04008893 | 23.20402 |
| **36** | **0** | 5 | 1099.2599481 | 0.34039632 | 34.17144 |
| **37** | **0** | 3 | 1099.170154 | 0.08979412 | 40.32876 |
| **38** | **0** | 2 | 1099.0714631 | 0.09869085 | 38.89982 |
| **39** | **0** | 4 | 1098.8265031 | 0.24496002 | 35.36252 |
| **40** | **0** | 2 | 1098.6322386 | 0.19426457 | 30.27343 |
| **41** | **0** | 4 | 1098.2238525 | 0.40838604 | 92.55832 |
| **42** | **0** | 4 | 1095.2666835 | 2.95716905 | 27.54393 |
| **43** | **0** | 2 | 1091.6372564 | 3.62942709 | 201.0628 |
| **44** | **0** | 3 | 1089.5952929 | 2.04196348 | 41.20429 |
| **45** | **0** | 3 | 1089.1745021 | 0.42079076 | 31.70512 |
| **46** | **0** | 3 | 1089.0306963 | 0.14380588 | 14.23121 |
| **47** | **0** | 3 | 1089.0164576 | 0.01423870 | 4.437206 |
| **48** | **0** | 2 | 1088.9960089 | 0.02044869 | 7.404377 |
| **49** | **0** | 4 | 1088.9415123 | 0.05449658 | 11.6282 |
| **50** | **0** | 4 | 1088.5490563 | 0.39245598 | 140.0475 |
| **51** | **0** | 4 | 1087.7975492 | 0.75150715 | 64.59582 |
| **52** | **0** | 3 | 1087.466678 | 0.33087115 | 13.68005 |
| **53** | **0** | 3 | 1087.4431032 | 0.02357483 | 5.759942 |
| **54** | **0** | 3 | 1087.4410662 | 0.00203703 | 0.176205 |
| **55** | **0** | 3 | 1087.441036 | 0.00003019 | 0.09476 |
| **56** | **0** | 3 | 1087.4410349 | 0.00000105 | 0.007995 |

|  |
| --- |
| Convergence criterion (GCONV=1E-8) satisfied. |

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 1087.44 |
| **AIC (smaller is better)** | 1105.44 |
| **AICC (smaller is better)** | 1105.54 |
| **BIC (smaller is better)** | 1138.59 |
| **CAIC (smaller is better)** | 1147.59 |
| **HQIC (smaller is better)** | 1118.72 |

| **Fit Statistics for Conditional Distribution** | |
| --- | --- |
| **-2 log L(Response | r. effects)** | 179.47 |
| **Pearson Chi-Square** | 128.33 |
| **Pearson Chi-Square / DF** | 0.07 |

| **Estimated G Matrix** | | | |
| --- | --- | --- | --- |
| **Effect** | **Row** | **Col1** | **Col2** |
| Intercept | **1** | 218.06 | -17.4334 |
| Month | **2** | -17.4334 | 3.5962 |

| **Estimated G Correlation Matrix** | | | |
| --- | --- | --- | --- |
| **Effect** | **Row** | **Col1** | **Col2** |
| Intercept | **1** | 1.0000 | -0.6225 |
| Month | **2** | -0.6225 | 1.0000 |

| **Covariance Parameter Estimates** | | | |
| --- | --- | --- | --- |
| **Cov Parm** | **Subject** | **Estimate** | **Standard Error** |
| **UN(1,1)** | ID | 218.06 | 60.4933 |
| **UN(2,1)** | ID | -17.4334 | 5.4958 |
| **UN(2,2)** | ID | 3.5962 | 1.1940 |

| **Solutions for Fixed Effects** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **Treatment** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **Intercept** |  | -6.5412 | 1.5735 | 292 | -4.16 | <.0001 |
| **Treatment** | 0 | 0.5198 | 1.7881 | 1323 | 0.29 | 0.7713 |
| **Treatment** | 1 | 0 | . | . | . | . |
| **Month** |  | -1.0655 | 0.3930 | 287 | -2.71 | 0.0071 |
| **Month\*Treatment** | 0 | 0.06090 | 0.4638 | 1323 | 0.13 | 0.8955 |
| **Month\*Treatment** | 1 | 0 | . | . | . | . |
| **Month\*Month** |  | -0.09583 | 0.04372 | 1323 | -2.19 | 0.0286 |
| **Month\*Month\*Treatmen** | 0 | 0.06982 | 0.04236 | 1323 | 1.65 | 0.0995 |
| **Month\*Month\*Treatmen** | 1 | 0 | . | . | . | . |