

The NLMIXED Procedure

Specifications	
Data Set	WORK.B
Dependent Variable	y
Distribution for Dependent Variable	Binary
Random Effects	b
Distribution for Random Effects	Normal
Subject Variable	id
Optimization Technique	Dual Quasi-Newton
Integration Method	Adaptive Gaussian Quadrature

Dimensions	
Observations Used	555
Observations Not Used	0
Total Observations	555
Subjects	111
Max Obs per Subject	5
Parameters	11
Quadrature Points	50

Initial Parameters											
int_	t1_	t2_	t3_	t4_	c2_	t1c2_	t2c2_	t3c2_	t4c2_	logsigma	Negative Log Likelihood
-1.5	1.2	1.2	1.6	0.5	2	-0.2	-0.9	-1	0.2	1	295.946116

Iteration History					
Iteration	Calls	Negative Log Likelihood	Difference	Maximum Gradient	Slope
1	5	295.6868	0.259331	0.23999	-27.5033
2	9	295.6832	0.003615	0.32168	-0.00336
3	11	295.6794	0.003765	0.11958	-0.00556
4	15	295.6748	0.004584	0.21018	-0.00418
5	19	295.6730	0.001852	0.031885	-0.00210
6	22	295.6729	0.000048	0.010487	-0.00008
7	25	295.6729	0.000031	0.013528	-0.00001
8	28	295.6729	0.000018	0.002669	-0.00002
9	30	295.6729	4.761E-6	0.005813	-7.57E-7

The NLMIXED Procedure

NOTE: GCONV convergence criterion satisfied.

Fit Statistics	
-2 Log Likelihood	591.3
AIC (smaller is better)	613.3
AICC (smaller is better)	613.8
BIC (smaller is better)	643.2

Parameter Estimates								
Parameter	Estimate	Standard Error	DF	t Value	Pr >  t	95% Confidence Limits		Gradient
int_	-1.4663	0.5416	110	-2.71	0.0079	-2.5398	-0.3929	-0.00223
t1_	1.1892	0.5599	110	2.12	0.0359	0.07964	2.2988	0.000984
t2_	1.1891	0.5599	110	2.12	0.0359	0.07962	2.2987	-0.00119
t3_	1.6179	0.5681	110	2.85	0.0053	0.4920	2.7438	0.001560
t4_	0.4592	0.5568	110	0.82	0.4114	-0.6444	1.5627	-0.00581
c2_	2.0206	0.7454	110	2.71	0.0078	0.5433	3.4979	-0.00262
t1c2_	-0.1949	0.7740	110	-0.25	0.8017	-1.7287	1.3389	0.002455
t2c2_	-0.9194	0.7616	110	-1.21	0.2299	-2.4288	0.5899	0.001003
t3c2_	-1.0694	0.7707	110	-1.39	0.1681	-2.5967	0.4580	0.002252
t4c2_	0.2332	0.7668	110	0.30	0.7616	-1.2864	1.7528	-0.00107
logsigma	0.9079	0.1359	110	6.68	<.0001	0.6385	1.1772	-0.00533

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Optimization Technique	Dual Quasi-Newton
Integration Method	Adaptive Gaussian Quadrature

Dimensions	
Observations Used	555
Observations Not Used	0
Total Observations	555
Subjects	111
Max Obs per Subject	5
Parameters	15
Quadrature Points	50

Initial Parameters															
int_	t1_	t2_	t3_	t4_	c2_	t1c2_	t2c2_	t3c2_	t4c2_	t1trt_	t2trt_	t3trt_	t4trt_	logsigma	Negative Log Likelihood
-1.5	0.4	-0.1	0.55	-0.3	2	-0.1	-0.8	-1	0.3	1.6	2.6	2.3	1.4	1	285.51744

Iteration History					
Iteration	Calls	Negative Log Likelihood	Difference	Maximum Gradient	Slope
1	5	285.2482	0.269263	0.53559	-28.6956
2	9	285.2191	0.029089	0.64597	-0.02158
3	11	285.2132	0.005914	0.74787	-0.02519
4	15	285.1975	0.015697	0.38455	-0.01549
5	19	285.1914	0.006082	0.047281	-0.00687
6	22	285.1911	0.000247	0.026117	-0.00029
7	26	285.1906	0.000533	0.006922	-0.00017
8	29	285.1906	0.000017	0.005337	-0.00003
9	31	285.1906	0.00003	0.002738	-6.77E-6
10	34	285.1906	8.562E-6	0.004707	-0.00001

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Iteration History					
Iteration	Calls	Negative Log Likelihood	Difference	Maximum Gradient	Slope
11	38	285.1905	0.000021	0.002719	-3.5E-6
12	41	285.1905	1.195E-6	0.002971	-5.32E-7

NOTE: GCONV convergence criterion satisfied.

Fit Statistics	
-2 Log Likelihood	570.4
AIC (smaller is better)	600.4
AICC (smaller is better)	601.3
BIC (smaller is better)	641.0

Parameter Estimates								
Parameter	Estimate	Standard Error	DF	t Value	Pr >  t	95% Confidence Limits		Gradient
int_	-1.4709	0.5461	110	-2.69	0.0082	-2.5531	-0.3887	-0.00297
t1_	0.3672	0.6547	110	0.56	0.5760	-0.9303	1.6648	0.000949
t2_	-0.1001	0.6649	110	-0.15	0.8806	-1.4178	1.2175	0.000621
t3_	0.5550	0.6581	110	0.84	0.4009	-0.7492	1.8592	-0.00215
t4_	-0.2812	0.6627	110	-0.42	0.6722	-1.5946	1.0322	0.000033
c2_	2.0234	0.7480	110	2.71	0.0079	0.5410	3.5058	-0.00004
t1c2_	-0.1181	0.7898	110	-0.15	0.8814	-1.6834	1.4471	-0.00018
t2c2_	-0.7780	0.7929	110	-0.98	0.3287	-2.3494	0.7934	-0.00062
t3c2_	-0.9729	0.7951	110	-1.22	0.2237	-2.5486	0.6028	-0.00223
t4c2_	0.2951	0.7824	110	0.38	0.7068	-1.2555	1.8456	-0.00061
t1trt_	1.6854	0.6902	110	2.44	0.0162	0.3176	3.0531	0.000932
t2trt_	2.5982	0.7006	110	3.71	0.0003	1.2098	3.9866	0.000713
t3trt_	2.1978	0.6944	110	3.17	0.0020	0.8217	3.5739	-0.00071
t4trt_	1.4891	0.6803	110	2.19	0.0307	0.1409	2.8374	0.000303
logsigma	0.9082	0.1381	110	6.58	<.0001	0.6346	1.1818	0.000128

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Integration Method	Adaptive Gaussian Quadrature

Dimensions	
Observations Used	555
Observations Not Used	0
Total Observations	555
Subjects	111
Max Obs per Subject	5
Parameters	19
Quadrature Points	50

Initial Parameters																	
int_	t1_	t2_	t3_	t4_	c2_	t1c2_	t2c2_	t3c2_	t4c2_	t1trt_	t2trt_	t3trt_	t4trt_	t1c2trt_	t2c2trt_	t3c2trt_	t4c2trt_
-1.5	0.8	0.2	0.8	-0.1	2	-1	-1.4	-1.5	-0.1	0.7	1.9	1.6	1	2	1.4	1.2	0.8

Initial Parameters	
logsigma	Negative Log Likelihood
1	284.181175

Iteration History					
Iteration	Calls	Negative Log Likelihood	Difference	Maximum Gradient	Slope
1	5	283.8836	0.297574	0.67034	-30.4429
2	9	283.8594	0.02419	0.60511	-0.02180
3	11	283.8566	0.002844	0.46697	-0.01407
4	13	283.8534	0.003134	0.086122	-0.00482
5	17	283.8510	0.002472	0.28035	-0.00220
6	20	283.8495	0.001434	0.014317	-0.00140
7	22	283.8494	0.000168	0.027162	-0.00003

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Iteration History					
Iteration	Calls	Negative Log Likelihood	Difference	Maximum Gradient	Slope
8	25	283.8492	0.000115	0.009952	-0.00010
9	28	283.8492	0.000044	0.020889	-0.00002
10	32	283.8491	0.000116	0.004633	-0.00005
11	35	283.8491	7.66E-6	0.006293	-3.81E-6
12	39	283.8490	0.000037	0.004797	-7.24E-6
13	42	283.8490	3.553E-6	0.001745	-5.49E-6
14	44	283.8490	5.352E-6	0.001448	-8.97E-7

NOTE: GCONV convergence criterion satisfied.

Fit Statistics	
-2 Log Likelihood	567.7
AIC (smaller is better)	605.7
AICC (smaller is better)	607.1
BIC (smaller is better)	657.2

Parameter Estimates								
Parameter	Estimate	Standard Error	DF	t Value	Pr >  t	95% Confidence Limits		Gradient
int_	-1.4565	0.5438	110	-2.68	0.0085	-2.5342	-0.3788	0.000064
t1_	0.8312	0.7282	110	1.14	0.2562	-0.6120	2.2744	0.000291
t2_	0.2267	0.7369	110	0.31	0.7589	-1.2337	1.6872	0.000380
t3_	0.8309	0.7264	110	1.14	0.2551	-0.6086	2.2705	-0.00079
t4_	-0.09157	0.7456	110	-0.12	0.9025	-1.5691	1.3860	-0.00037
c2_	2.0080	0.7480	110	2.68	0.0084	0.5257	3.4903	-0.00055
t1c2_	-0.9981	0.9918	110	-1.01	0.3165	-2.9636	0.9675	0.000988
t2c2_	-1.3953	1.0009	110	-1.39	0.1661	-3.3788	0.5881	0.000642
t3c2_	-1.5010	0.9899	110	-1.52	0.1323	-3.4626	0.4607	0.000167
t4c2_	-0.07492	1.0027	110	-0.07	0.9406	-2.0621	1.9123	0.001269
t1trt_	0.7216	0.9312	110	0.77	0.4401	-1.1239	2.5671	-0.00030
t2trt_	1.9011	0.9553	110	1.99	0.0491	0.007929	3.7943	0.000939
t3trt_	1.5916	0.9484	110	1.68	0.0961	-0.2879	3.4710	-0.00029
t4trt_	1.0741	0.9493	110	1.13	0.2603	-0.8072	2.9553	0.000575
t1c2trt_	2.0506	1.3996	110	1.47	0.1457	-0.7231	4.8242	-0.00016

The NLMIXED Procedure

Parameter Estimates								
Parameter	Estimate	Standard Error	DF	t Value	Pr >  t	95% Confidence Limits		Gradient
t2c2trt_	1.4043	1.3724	110	1.02	0.3084	-1.3154	4.1240	-0.00080
t3c2trt_	1.2154	1.3675	110	0.89	0.3761	-1.4948	3.9255	-0.00073
t4c2trt_	0.8262	1.3464	110	0.61	0.5407	-1.8421	3.4944	-0.00145
logsigma	0.9106	0.1380	110	6.60	<.0001	0.6371	1.1841	-0.00007

## The GENMOD Procedure

Model Information		
Data Set	WORK.B	
Distribution	Binomial	
Link Function	Logit	
Dependent Variable	y	Status (0=poor, 1=good)

Number of Observations Read	555
Number of Observations Used	555
Number of Events	298
Number of Trials	555

Class Level Information		
Class	Levels	Values
id	111	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 ...
time	5	0 1 2 3 4
clinic	2	1 2
treatment	2	A P

Response Profile		
Ordered Value	y	Total Frequency
1	1	298
2	0	257

PROC GENMOD is modeling the probability that y='1'.

Parameter Information	
Parameter	Effect
Prm1	Intercept
Prm2	t1
Prm3	t2
Prm4	t3
Prm5	t4
Prm6	c2
Prm7	t1*c2
Prm8	t2*c2
Prm9	t3*c2



The GENMOD Procedure

Parameter Information	
Parameter	Effect
Prm10	t4*c2
Prm11	t1*trt
Prm12	t2*trt
Prm13	t3*trt
Prm14	t4*trt

Algorithm converged.

GEE Model Information	
Log Odds Ratio Structure	Fully Parameterized Clusters
Within-Subject Effect	time (5 levels)
Subject Effect	id (111 levels)
Number of Clusters	111
Correlation Matrix Dimension	5
Maximum Cluster Size	5
Minimum Cluster Size	5

Log Odds Ratio Parameter Information	
Parameter	Group
Alpha1	(1, 2)
Alpha2	(1, 3)
Alpha3	(1, 4)
Alpha4	(1, 5)
Alpha5	(2, 3)
Alpha6	(2, 4)
Alpha7	(2, 5)
Alpha8	(3, 4)
Alpha9	(3, 5)
Alpha10	(4, 5)

Algorithm converged.

# The GENMOD Procedure

GEE Fit Criteria	
QIC	730.0903
QICu	731.3483

Analysis Of GEE Parameter Estimates						
Empirical Standard Error Estimates						
Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr >  Z
Intercept	-0.7710	0.2892	-1.3378	-0.2042	-2.67	0.0077
t1	0.2019	0.2948	-0.3759	0.7797	0.68	0.4935
t2	-0.0458	0.3303	-0.6933	0.6016	-0.14	0.8897
t3	0.2887	0.2972	-0.2937	0.8712	0.97	0.3313
t4	-0.1272	0.3556	-0.8241	0.5697	-0.36	0.7205
c2	1.1027	0.3997	0.3194	1.8860	2.76	0.0058
t1*c2	-0.0709	0.4166	-0.8874	0.7456	-0.17	0.8648
t2*c2	-0.4374	0.4695	-1.3577	0.4828	-0.93	0.3515
t3*c2	-0.5307	0.4281	-1.3697	0.3083	-1.24	0.2151
t4*c2	0.1533	0.4607	-0.7496	1.0563	0.33	0.7392
t1*trt	0.8923	0.3479	0.2104	1.5742	2.56	0.0103
t2*trt	1.3891	0.3888	0.6271	2.1511	3.57	0.0004
t3*trt	1.1951	0.3681	0.4737	1.9165	3.25	0.0012
t4*trt	0.7737	0.3800	0.0289	1.5184	2.04	0.0418
Alpha1	2.4431	0.4859	1.4907	3.3955	5.03	<.0001
Alpha2	1.5226	0.4644	0.6125	2.4328	3.28	0.0010
Alpha3	2.1960	0.4873	1.2408	3.1511	4.51	<.0001
Alpha4	1.5963	0.4514	0.7115	2.4810	3.54	0.0004
Alpha5	2.1570	0.4768	1.2224	3.0915	4.52	<.0001
Alpha6	1.7809	0.4552	0.8886	2.6731	3.91	<.0001
Alpha7	2.1085	0.4764	1.1748	3.0422	4.43	<.0001
Alpha8	2.5241	0.4972	1.5496	3.4986	5.08	<.0001
Alpha9	2.3474	0.4825	1.4017	3.2932	4.86	<.0001
Alpha10	2.8093	0.5530	1.7254	3.8931	5.08	<.0001

Contrast Results for GEE Analysis				
Contrast	DF	Chi-Square	Pr > ChiSq	Type
treatment * time interaction	4	17.27	0.0017	Wald

Obs	id	clinic	treatment	time	fitted
1	3	1	A	0	0.31626
2	3	1	A	1	0.58010
3	3	1	A	2	0.63928
4	3	1	A	3	0.67102
5	3	1	A	4	0.46890
6	1	1	P	0	0.31626
7	1	1	P	1	0.36144
8	1	1	P	2	0.30644
9	1	1	P	3	0.38171
10	1	1	P	4	0.28941
11	58	2	A	0	0.58218
12	58	2	A	1	0.79495
13	58	2	A	2	0.77513
14	58	2	A	3	0.78327
15	58	2	A	4	0.75611
16	57	2	P	0	0.58218
17	57	2	P	1	0.61366
18	57	2	P	2	0.46218
19	57	2	P	3	0.52242
20	57	2	P	4	0.58852

The FREQ Procedure

clinic=1

Frequency	Table of treatment by time						
	treatment(Treatment (P=placebo, A=Active))	time					Total
		0	1	2	3	4	
A		0.31626	0.5801	0.63928	0.67102	0.4689	2.67556
P		0.31626	0.36144	0.30644	0.38171	0.28941	1.65526
Total		0.63252	0.94154	0.94571	1.05273	0.75831	4.33082

The FREQ Procedure

clinic=2

Frequency	Table of treatment by time						
	treatment(Treatment (P=placebo, A=Active))	time					Total
		0	1	2	3	4	
	A	0.58218	0.79495	0.77513	0.78327	0.75611	3.69164
	P	0.58218	0.61366	0.46218	0.52242	0.58852	2.76895
	Total	1.16435	1.4086	1.23731	1.30569	1.34463	6.46058