

Course: HS237C, Spring 2005

Instructor: Ettner

Lecture: Multi-level models

The SAS System

The Mixed Procedure

Model Information

Data Set	WORK._DS
Dependent Variable	_z
Weight Variable	_w
Covariance Structure	Variance Components
Subject Effect	ohealthplan
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Prasad-Rao-Jeske- Kackar-Harville
Degrees of Freedom Method	Kenward-Roger

Class Level Information

Class	Levels	Values
cluster	23	6001 6002 6003 6004 6005 6006
		6007 6008 6009 6010 6011 6012
		6013 6014 6015 6016 6017 6018
		6019 6021 6025 6026 6027
		601 602 603 604
ohealthplan	4	

Dimensions

Covariance Parameters	3
Columns in X	4
Columns in Z Per Subject	24
Subjects	4
Max Obs Per Subject	328
Observations Used	980
Observations Not Used	0
Total Observations	980

Parameter Search

CovP1	CovP2	CovP3	Variance	Res Log Like
0.1192	0.1028	0.9814	0.9814	-2205.8586

Parameter
Search

-2 Res Log Like

4411.7172

Iteration History

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Iteration	Evaluations	-2 Res Log Like	Criterion
1	1	4411.71723416	0.00000000

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Convergence criteria met.

Covariance Parameter Estimates

Cov Parm	Subject	Estimate	Standard Error	Z Value	Pr > Z
Intercept	ohealthplan	0.1192	0.1332	0.89	0.1855
cluster	ohealthplan	0.1028	0.08291	1.24	0.1074
Residual		0.9814	0.04485	21.88	<.0001

Fit Statistics

-2 Res Log Likelihood	4411.7
AIC (smaller is better)	4417.7
AICC (smaller is better)	4417.7
BIC (smaller is better)	4415.9

PARMS Model Likelihood Ratio Test

DF	Chi-Square	Pr > ChiSq
2	0.00	1.0000

Solution for Fixed Effects

Effect	Estimate	Standard Error	DF	t Value	Pr > t
Intercept	1.1360	0.5016	99.4	2.26	0.0257
sex_r	-0.1664	0.1486	964	-1.12	0.2630
age	-0.00141	0.006494	969	-0.22	0.8285
latino	-0.01636	0.1700	538	-0.10	0.9234

Covariance Matrix for Fixed Effects

Row	Effect	Col1	Col2	Col3	Col4
1	Intercept	0.2516	-0.00677	-0.00285	-0.02298
2	sex_r	-0.00677	0.02207	-0.00009	-0.00112
3	age	-0.00285	-0.00009	0.000042	0.000114
4	latino	-0.02298	-0.00112	0.000114	0.02891

Type 3 Tests of Fixed Effects

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Effect	Num DF	Den DF	F Value	Pr > F
sex_r	1	964	1.25	0.2630
age	1	969	0.05	0.8285
latino	1	538	0.01	0.9234

GLIMMIX Model Statistics

Description	Value
Deviance	1106.3765
Scaled Deviance	1127.3700
Pearson Chi-Square	948.8361
Scaled Pearson Chi-Square	966.8403
Extra-Dispersion Scale	0.9814

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Number of observations in the sample

NUMOBS

980

Number of covariates in the model including the intercept

K

4

Estimated coefficients, standard errors, t-statistics and p-values

	ORIGINAL_ESTIMATE			
	COEF	STDERR	TSTAT	PVALUE
ONE	1.1360	0.5016	2.2649	0.0257
SEX_R	-0.1664	0.1486	-1.1200	0.2630
AGE	-0.0014	0.0065	-0.2167	0.8285
LATINO	-0.0164	0.1700	-0.0962	0.9234

Number of Simulations=

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NUMSIM

200

Number of Parameter Estimates=

NUMPARM

4

Dependent Variable is Lipid Profile Assessment

Configuration 0 is female, configuration 1 is male

The SAS System

5

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Predicted probabilities, difference in comparing men to women

Predicted probabilities and RR

LOWERCL	MEAN_RISK_0 RISK0	UPPERCL
0.64	0.74	0.81

LOWERCL	MEAN_RISK_1 RISK1	UPPERCL
0.60	0.70	0.79

LOWERCL	MEAN_DIFF_IN_RISK RISKDIFF	UPPERCL
-0.09	-0.03	0.02

LOWERCL	MEAN_RELATIVE_RISK RR	UPPERCL
0.88	0.95	1.03