

```
/*  
Example, using ITC-SEA (Thailand & Malaysia) data, of Sudaan multilog  
for workshop on Complex Survey Data
```

```
C. Boudreau  
Last updated: September 22, 2008  
*/
```

```
proc multilog data=_notice r=exchangeable semethod=zeger;  
  class wlnotice sex agegrp urban income educ ethnic daily  
    cpd ryo country wave / dir=descending nofreq;  
  nest strata psu uniqid / psulev=2;  
  model wlnotice = sex agegrp urban income educ ethnic daily  
    cpd ryo country wave country*wave/ genlogit;  
  test waldchi;  
  weight _ONE_; /* sampling weights have yet to be computed;  
                weight _ONE_ assumes unweighted analysis */  
  effects country*wave / name="Interaction";  
  effects wave / country=2 name="TH: Wave 2-1";  
  effects wave / country=1 name="MY: Wave 2-1";  
  effects country / wave=1 name="TH vs MY, Wave 1";  
run;
```

S U D A A N  
 Software for the Statistical Analysis of Correlated Data  
 Copyright Research Triangle Institute November 2005  
 Release 9.0.2

Independence parameters have converged in 5 iterations

Step 1 parameters have converged in 4 iterations.

Number of observations read : 4588 Weighted count: 4588  
 Observations used in the analysis : 4588 Weighted count: 4588  
 Denominator degrees of freedom : 43

Maximum number of estimable parameters for the model is 20

File \_NOTICE contains 2294 Clusters  
 2294 clusters were used to fit the model  
 Maximum cluster size is 2 records  
 Minimum cluster size is 2 records

Sample and Population Counts for Response Variable WLNOTICE

1: Sample Count	2666	Population Count	2666
0: Sample Count	1922	Population Count	1922

Date: 09-22-2008  
 Time: 13:56:39

Research Triangle Institute  
 The MULTLOG Procedure

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Variance Estimation Method: Taylor Series (WR)  
 SE Method: Robust (Zeger-Liang, 1986)  
 Working Correlations: Exchangeable  
 Link Function: Generalized Logit  
 Response variable WLNOTICE: WLNOTICE  
 by: WLNOTICE (log-odds), Independent Variables and Effects.

WLNOTICE (log-odds)	Independent Variables and Effects							
	Intercept	sex = 2. Women	sex = 1. Men	Age Group (categori- cal) = 4. 55+	Age Group (categori- cal) = 3. 40-54	Age Group (categori- cal) = 2. 25-39	Age Group (categori- cal) = 1. 18-24	
1 vs 0	Beta Coeff.	-0.10	-0.22	0.00	-0.54	0.01	0.31	0.00
	SE Beta	0.27	0.17	0.00	0.14	0.15	0.12	0.00
	Lower 95% Limit							
	Beta	-0.66	-0.57	0.00	-0.82	-0.30	0.06	0.00
	Upper 95% Limit							
	Beta	0.45	0.13	0.00	-0.25	0.31	0.56	0.00
	T-Test B=0	-0.37	-1.26	.	-3.81	0.06	2.53	.
	P-value T-Test							
	B=0	0.7121	0.2130	.	0.0004	0.9561	0.0151	.

Variance Estimation Method: Taylor Series (WR)  
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Response variable WLNOTICE: WLNOTICE  
by: WLNOTICE (log-odds), Independent Variables and Effects.

WLNOTICE (log-odds)	Independent Variables and Effects							
	urban/rural = 1. Urban	urban/rural = 0. Rural	Rank for Variable = 9. Not reported	Rank for Variable = 2. High	Rank for Variable = 1. Moderate	Rank for Variable = 0. Low	EDUC = 1. Less than secondary	
1 vs 0	Beta Coeff.	-0.33	0.00	-0.30	0.04	-0.00	0.00	0.05
	SE Beta	0.14	0.00	0.16	0.09	0.07	0.00	0.09
	Lower 95% Limit							
	Beta	-0.62	0.00	-0.62	-0.14	-0.15	0.00	-0.14
	Upper 95% Limit							
	Beta	-0.04	0.00	0.03	0.22	0.14	0.00	0.24
	T-Test B=0	-2.27	.	-1.83	0.41	-0.07	.	0.52
	P-value T-Test B=0	0.0283	.	0.0739	0.6852	0.9484	.	0.6065

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Response variable WLNOTICE: WLNOTICE  
by: WLNOTICE (log-odds), Independent Variables and Effects.

WLNOTICE (log-odds)	Independent Variables and Effects							
	EDUC = 0. Secondary / more	majority group = 1. Major group	majority group = 0. Minor group	DAILY = 1. Daily smoker	DAILY = 0. Nondaily smoker	CPD = 3. 31+ cpd	CPD = 2. 21 to 30 cpd	
1 vs 0	Beta Coeff.	0.00	0.39	0.00	0.39	0.00	-0.14	0.22
	SE Beta	0.00	0.15	0.00	0.18	0.00	0.25	0.18
	Lower 95% Limit							
	Beta	0.00	0.09	0.00	0.02	0.00	-0.65	-0.14
	Upper 95% Limit							
	Beta	0.00	0.69	0.00	0.76	0.00	0.37	0.58
	T-Test B=0	.	2.61	.	2.13	.	-0.56	1.22
	P-value T-Test B=0	.	0.0125	.	0.0391	.	0.5769	0.2273

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WLNOTICE (log-odds)	Independent Variables and Effects							
	CPD = 1. 11 to 20 cpd	CPD = 0. 0 to 10 cpd	RYO = 3. Roll-your-own	RYO = 2. Both	RYO = 1. Factory made	Country = 2. Thailand	Country = 1. Malaysia	
1 vs 0	Beta Coeff.	-0.03	0.00	-1.43	-0.64	0.00	0.63	0.00
	SE Beta	0.08	0.00	0.10	0.13	0.00	0.20	0.00
	Lower 95% Limit							
	Beta	-0.18	0.00	-1.63	-0.91	0.00	0.22	0.00
	Upper 95% Limit							
	Beta	0.13	0.00	-1.23	-0.38	0.00	1.04	0.00
	T-Test B=0	-0.34	.	-14.40	-4.89	.	3.08	.
	P-value T-Test							
	B=0	0.7336	.	0.0000	0.0000	.	0.0036	.

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Response variable WLNOTICE: WLNOTICE  
by: WLNOTICE (log-odds), Independent Variables and Effects.

WLNOTICE (log-odds)	Independent Variables and Effects							
	WAVE = 2	WAVE = 1	Country, WAVE = 2. Thailand, 2	Country, WAVE = 2. Thailand, 1	Country, WAVE = 1. Malaysia, 2	Country, WAVE = 1. Malaysia, 1		
1 vs 0	Beta Coeff.	-0.53	0.00	0.81	0.00	0.00	0.00	0.00
	SE Beta	0.21	0.00	0.23	0.00	0.00	0.00	0.00
	Lower 95% Limit							
	Beta	-0.94	0.00	0.33	0.00	0.00	0.00	0.00
	Upper 95% Limit							
	Beta	-0.12	0.00	1.28	0.00	0.00	0.00	0.00
	T-Test B=0	-2.58	.	3.44	.	.	.	.
	P-value T-Test							
	B=0	0.0132	.	0.0013	.	.	.	.

Variance Estimation Method: Taylor Series (WR)  
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 Working Correlations: Exchangeable  
 Link Function: Generalized Logit  
 Response variable WLNOTICE: WLNOTICE  
 by: Contrast.

Contrast	Degrees of Freedom	Wald ChiSq	P-value Wald ChiSq
OVERALL MODEL	20	1065.41	0.0000
MODEL MINUS INTERCEPT	19	676.37	0.0000
SEX	1	1.60	0.2062
AGEGRP	3	64.65	0.0000
URBAN	1	5.15	0.0232
INCOME	3	3.51	0.3193
EDUC	1	0.27	0.6038
ETHNIC	1	6.80	0.0091
DAILY	1	4.53	0.0334
CPD	3	2.24	0.5238
RYO	2	281.59	0.0000
COUNTRY	.	.	.
WAVE	.	.	.
COUNTRY * WAVE	1	11.81	0.0006
Interaction	1	11.81	0.0006
TH: Wave 2-1	1	6.00	0.0143
MY: Wave 2-1	1	6.68	0.0098
TH vs MY, Wave 1	1	9.47	0.0021

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WLNOTICE (log-odds)		Independent Variables and Effects							
		Intercept	sex = 2. Women	sex = 1. Men	Age Group (categorical) = 4. 55+	Age Group (categorical) = 3. 40-54	Age Group (categorical) = 2. 25-39	Age Group (categorical) = 1. 18-24	
1 vs 0	Odds Ratio	0.90	0.80	1.00	0.58	1.01	1.37	1.00	
	Lower 95% Limit								
	OR	0.52	0.56	1.00	0.44	0.74	1.07	1.00	
	Upper 95% Limit								
	OR	1.57	1.14	1.00	0.78	1.37	1.76	1.00	

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by: WLNOTICE (log-odds), Independent Variables and Effects.

WLNOTICE (log-odds)		Independent Variables and Effects							
		urban/rural = 1. Urban	urban/rural = 0. Rural	Rank for Variable 9. Not reported	Rank for Variable 2. High	Rank for Variable 1. Moderate	Rank for Variable 0. Low	EDUC = 1. Less than secondary	
1 vs 0	Odds Ratio	0.72	1.00	0.74	1.04	1.00	1.00	1.05	
	Lower 95% Limit								
	OR	0.54	1.00	0.54	0.87	0.86	1.00	0.87	
	Upper 95% Limit								
	OR	0.96	1.00	1.03	1.24	1.15	1.00	1.27	

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		EDUC = 0. Secondary/more	majority group = 1. Major group	majority group = 0. Minor group	DAILY = 1. Daily smoker	DAILY = 0. Nondaily smoker	CPD = 3. 31+ cpd	CPD = 2. 21 to 30 cpd	
1 vs 0	Odds Ratio	1.00	1.48	1.00	1.48	1.00	0.87	1.25	
	Lower 95% Limit								
	OR	1.00	1.09	1.00	1.02	1.00	0.52	0.87	
	Upper 95% Limit								
	OR	1.00	1.99	1.00	2.14	1.00	1.44	1.79	

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WLNOTICE (log-odds)		Independent Variables and Effects							
		CPD = 1.11 to 20 cpd	CPD = 0.0 to 10 cpd	RYO = 3.0 Roll-your-own	RYO = 2.0 Both	RYO = 1.0 Factory made	Country = 2. Thailand	Country = 1. Malaysia	
1 vs 0	Odds Ratio	0.97	1.00	0.24	0.53	1.00	1.87	1.00	
	Lower 95% Limit								
	OR	0.83	1.00	0.20	0.40	1.00	1.24	1.00	
	Upper 95% Limit								
	OR	1.14	1.00	0.29	0.69	1.00	2.82	1.00	

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WLNOTICE (log-odds)		Independent Variables and Effects							
		WAVE = 2	WAVE = 1	Country, WAVE = 2. Thailand, 2	Country, WAVE = 2. Thailand, 1	Country, WAVE = 1. Malaysia, 2	Country, WAVE = 1. Malaysia, 1		
1 vs 0	Odds Ratio	0.59	1.00	2.24	1.00	1.00	1.00	1.00	
	Lower 95% Limit								
	OR	0.39	1.00	1.40	1.00	1.00	1.00	1.00	
	Upper 95% Limit								
	OR	0.89	1.00	3.60	1.00	1.00	1.00	1.00	