Heart Data study

The MEANS Procedure

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
age	AGE AT ENTRY TO STUDY	239	47.8033473	4.1372246	40.0000000	54.0000000
bloodpressure	AVERAGE DIASTOLIC BLOOD PRESSURE IN 1958	238	88.8151261	13.0719956	65.0000000	160.0000000
ed	YEARS OF EDUCATION	212	11.6603774	2.7739027	6.0000000	18.0000000
Choles	SERUM CHOLESTEROL IN 1958 -- MG PER DL	239	264.3305439	52.5692375	106.0000000	515.0000000
numcigarettes	NUMBER OF CIGARETTES PER DAY IN 1958	238	11.6302521	12.2611290	0	60.0000000
Stature	STATURE, 1958 -- TO NEAREST 0.1 INCH	239	68.5242678	2.6695444	60.9000000	77.0000000
bweight	BODY WEIGHT, 1958 -- IN POUNDS	239	173.3765690	24.7683477	123.0000000	278.0000000

Heart Data study

The FREQ Procedure

FAMILY HISTORY OF CORONARY HEART DISEASE				
familyHistory	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	177	74.06	177	74.06
Yes	62	25.94	239	100.00

HAVE CORONARY HEART DISEASE				
havehd	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	119	49.79	119	49.79
Yes	120	50.21	239	100.00

ALIVE 10 YEARS AFTER ENTERING STUDY				
alive	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Alive	178	74.48	178	74.48
Dead	61	25.52	239	100.00

DAY OF DEATH				
dayDeath	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Sunday	19	7.95	19	7.95
Monday	11	4.60	30	12.55
Tuesday	19	7.95	49	20.50
Wednesday	17	7.11	66	27.62
Thursday	15	6.28	81	33.89
Friday	13	5.44	94	39.33
Saturday	16	6.69	110	46.03
Missing	129	53.97	239	100.00

FIRST CORONARY HEART DISEASE EVENT				
heartDisease	Frequency	Percent	Cumulative Frequency	Cumulative Percent
NO CHD	119	49.79	119	49.79
SUDDEN DEATH	36	15.06	155	64.85
NONFATALMI	72	30.13	227	94.98
FATAL MI	9	3.77	236	98.74
OTHER CHD	3	1.26	239	100.00

new	Frequency	Percent	Cumulative Frequency	Cumulative Percent
DiedFirstHA	45	18.83	45	18.83
DiedNextTenYears	16	6.69	61	25.52
AliveTenYearsLater	178	74.48	239	100.00

Frequency

Table of heartDisease by new

heartDisease(FIRST CORONARY HEART DISEASE EVENT)	new			
	DiedFirstHA	DiedNextTenYears	AliveTenYearsLater	Total
NO CHD	0	0	119	119
SUDDEN DEATH	36	0	0	36
NONFATALMI	0	13	59	72
FATAL MI	9	0	0	9
OTHER CHD	0	3	0	3
Total	45	16	178	239

Frequency

Table of alive by new

alive(ALIVE 10 YEARS AFTER ENTERING STUDY)	new			
	DiedFirstHA	DiedNextTenYears	AliveTenYearsLater	Total
Alive	0	0	178	178
Dead	45	16	0	61
Total	45	16	178	239

Frequency

Table of havehd by heartDisease

havehd(HAVE CORONARY HEART DISEASE)	heartDisease(FIRST CORONARY HEART DISEASE EVENT)					
	NO CHD	SUDDEN DEATH	NONFATALMI	FATAL MI	OTHER CHD	Total
No	119	0	0	0	0	119
Yes	0	36	72	9	3	120
Total	119	36	72	9	3	239

Frequency

Table of alive by heartDisease

alive(ALIVE 10 YEARS AFTER ENTERING STUDY)	heartDisease(FIRST CORONARY HEART DISEASE EVENT)					
	NO CHD	SUDDEN DEATH	NONFATALMI	FATAL MI	OTHER CHD	Total
Alive	119	0	59	0	0	178
Dead	0	36	13	9	3	61
Total	119	36	72	9	3	239

Heart Data study

The LOGISTIC Procedure

Model Information	
Data Set	WORK.HEART
Response Variable	new
Number of Response Levels	3
Model	generalized logit
Optimization Technique	Newton-Raphson

Number of Observations Read	239
Number of Observations Used	237

Response Profile		
Ordered Value	new	Total Frequency
1	AliveTenYearsLater	176
2	DiedFirstHA	45
3	DiedNextTenYears	16

Logits modeled use new='AliveTenYearsLater' as the reference category.

Note: 2 observations were deleted due to missing values for the response or explanatory variables.

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

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	344.528	341.874
SC	351.464	376.554
-2 Log L	340.528	321.874

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	18.6540	8	0.0168
Score	18.2258	8	0.0196
Wald	16.6442	8	0.0340

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
age	2	7.6413	0.0219
bloodpressure	2	7.9777	0.0185
numcigarettes	2	3.4299	0.1800
familyHistory	2	0.7151	0.6994

Analysis of Maximum Likelihood Estimates						
Parameter	new	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	DiedFirstHA	1	-8.2463	2.5300	10.6241	0.0011
Intercept	DiedNextTenYears	1	-14.2147	4.3408	10.7233	0.0011
age	DiedFirstHA	1	0.0956	0.0438	4.7762	0.0289
age	DiedNextTenYears	1	0.1463	0.0734	3.9780	0.0461
bloodpressure	DiedFirstHA	1	0.0234	0.0129	3.2848	0.0699
bloodpressure	DiedNextTenYears	1	0.0464	0.0185	6.2695	0.0123
numcigarettes	DiedFirstHA	1	0.0195	0.0135	2.0928	0.1480
numcigarettes	DiedNextTenYears	1	0.0291	0.0200	2.1113	0.1462
familyHistory	DiedFirstHA	1	-0.1939	0.3998	0.2352	0.6277
familyHistory	DiedNextTenYears	1	0.3370	0.5660	0.3545	0.5516

Odds Ratio Estimates				
Effect	new	Point Estimate	95% Wald Confidence Limits	
age	DiedFirstHA	1.100	1.010	1.199
age	DiedNextTenYears	1.158	1.003	1.337
bloodpressure	DiedFirstHA	1.024	0.998	1.050

Odds Ratio Estimates				
Effect	new	Point Estimate	95% Wald Confidence Limits	
bloodpressure	DiedNextTenYears	1.047	1.010	1.086
numcigarettes	DiedFirstHA	1.020	0.993	1.047
numcigarettes	DiedNextTenYears	1.030	0.990	1.071
familyHistory	DiedFirstHA	0.824	0.376	1.803
familyHistory	DiedNextTenYears	1.401	0.462	4.248

Heart Data study

The LOGISTIC Procedure

Model Information	
Data Set	WORK.HEART
Response Variable	new
Number of Response Levels	3
Model	generalized logit
Optimization Technique	Newton-Raphson

Number of Observations Read	239
Number of Observations Used	237

Response Profile		
Ordered Value	new	Total Frequency
1	AliveTenYearsLater	176
2	DiedFirstHA	45
3	DiedNextTenYears	16

Logits modeled use new='AliveTenYearsLater' as the reference category.

Note: 2 observations were deleted due to missing values for the response or explanatory variables.

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

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	344.528	341.874
SC	351.464	376.554
-2 Log L	340.528	321.874

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	18.6540	8	0.0168
Score	18.2258	8	0.0196
Wald	16.6442	8	0.0340

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
age	2	7.6413	0.0219
bloodpressure	2	7.9777	0.0185
numcigarettes	2	3.4299	0.1800
familyHistory	2	0.7151	0.6994

Analysis of Maximum Likelihood Estimates						
Parameter	new	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	DiedFirstHA	1	-8.2463	2.5300	10.6241	0.0011
Intercept	DiedNextTenYears	1	-14.2147	4.3408	10.7233	0.0011
age	DiedFirstHA	1	0.0956	0.0438	4.7762	0.0289
age	DiedNextTenYears	1	0.1463	0.0734	3.9780	0.0461
bloodpressure	DiedFirstHA	1	0.0234	0.0129	3.2848	0.0699
bloodpressure	DiedNextTenYears	1	0.0464	0.0185	6.2695	0.0123
numcigarettes	DiedFirstHA	1	0.0195	0.0135	2.0928	0.1480
numcigarettes	DiedNextTenYears	1	0.0291	0.0200	2.1113	0.1462
familyHistory	DiedFirstHA	1	-0.1939	0.3998	0.2352	0.6277
familyHistory	DiedNextTenYears	1	0.3370	0.5660	0.3545	0.5516

Odds Ratio Estimates				
Effect	new	Point Estimate	95% Wald Confidence Limits	
age	DiedFirstHA	1.100	1.010	1.199
age	DiedNextTenYears	1.158	1.003	1.337
bloodpressure	DiedFirstHA	1.024	0.998	1.050
bloodpressure	DiedNextTenYears	1.047	1.010	1.086
numcigarettes	DiedFirstHA	1.020	0.993	1.047
numcigarettes	DiedNextTenYears	1.030	0.990	1.071
familyHistory	DiedFirstHA	0.824	0.376	1.803
familyHistory	DiedNextTenYears	1.401	0.462	4.248

Contrast Test Results			
Contrast	DF	Wald Chi-Square	Pr > ChiSq
numcigarettes and familyHistory	4	4.0963	0.3931

Linear Hypotheses Testing Results			
Label	Wald Chi-Square	DF	Pr > ChiSq
numcigarettes_n_familyhistory	4.0963	4	0.3931

Heart Data study

The LOGISTIC Procedure

Model Information	
Data Set	WORK.HEART
Response Variable	new
Number of Response Levels	3
Model	generalized logit
Optimization Technique	Newton-Raphson

Number of Observations Read	239
Number of Observations Used	238

Response Profile		
Ordered Value	new	Total Frequency
1	AliveTenYearsLater	177
2	DiedFirstHA	45
3	DiedNextTenYears	16

Logits modeled use new='AliveTenYearsLater' as the reference category.

Note: 1 observation was deleted due to missing values for the response or explanatory variables.

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	345.121	338.248
SC	352.066	359.081
-2 Log L	341.121	326.248

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	14.8736	4	0.0050
Score	14.6726	4	0.0054
Wald	13.5576	4	0.0088

Type 3 Analysis of Effects			
Effect	**DF**	**Wald Chi-Square**	**Pr > ChiSq**
age	2	7.4315	0.0243
bloodpressure	2	7.7685	0.0206

Analysis of Maximum Likelihood Estimates						
Parameter	**new**	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	**DiedFirstHA**	1	-7.6634	2.4500	9.7836	0.0018
Intercept	**DiedNextTenYears**	1	-13.5278	4.1884	10.4319	0.0012
age	**DiedFirstHA**	1	0.0901	0.0429	4.4103	0.0357
age	**DiedNextTenYears**	1	0.1450	0.0715	4.1097	0.0426
bloodpressure	**DiedFirstHA**	1	0.0219	0.0127	2.9701	0.0848
bloodpressure	**DiedNextTenYears**	1	0.0448	0.0178	6.3492	0.0117

Odds Ratio Estimates				
Effect	**new**	**Point Estimate**	**95% Wald Confidence Limits**	
age	**DiedFirstHA**	1.094	1.006	1.190
age	**DiedNextTenYears**	1.156	1.005	1.330
bloodpressure	**DiedFirstHA**	1.022	0.997	1.048
bloodpressure	**DiedNextTenYears**	1.046	1.010	1.083

Heart Data study

For a 50 year old with a diastolic blood pressure of 100

DeadFirstHA	DeadTenYears	Alive
0.2456979	0.1072007	0.6471013

For a 5 year old with a diastolic blood pressure of 400

DeadFirstHA	DeadTenYears	Alive
0.0272235	0.9669816	0.0057949