

## Binary Logistic Regression: Abnormal vs Normal

### Full Model with 5 Predictors

#### The LOGISTIC Procedure

<b>Model Information</b>		
<b>Data Set</b>	WORK.FETAL_CLEAN	
<b>Response Variable</b>	abnormal	Abnormal (Suspect or Pathological)
<b>Number of Response Levels</b>	2	
<b>Model</b>	binary logit	
<b>Optimization Technique</b>	Fisher's scoring	

<b>Number of Observations Read</b>	2126
<b>Number of Observations Used</b>	2126

<b>Response Profile</b>		
Ordered Value	abnormal	Total Frequency
1	1	471
2	0	1655

Probability modeled is abnormal=1.

<b>Model Convergence Status</b>		
Convergence criterion (GCONV=1E-8) satisfied.		

<b>Model Fit Statistics</b>		
Criterion	Intercept Only	Intercept and Covariates
AIC	2250.686	1473.492
SC	2256.348	1507.464
-2 Log L	2248.686	1461.492

<b>R-Square</b>	0.3095	<b>Max-rescaled R-Square</b>	0.4741
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<b>Testing Global Null Hypothesis: BETA=0</b>				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	787.1936	5	<.0001	
Score	546.3310	5	<.0001	
Wald	317.9188	5	<.0001	

<b>Analysis of Maximum Likelihood Estimates</b>					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-7.5005	0.9419	63.4076	<.0001
baseline_value	1	0.0586	0.00687	72.7609	<.0001
accelerations	1	-754.7	59.0005	163.6055	<.0001
fetal_movement	1	6.3548	1.3716	21.4656	<.0001
uterine_contractions	1	-192.6	22.7666	71.5338	<.0001
severe_decelerations	1	3285.3	1132.0	8.4232	0.0037

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Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
<b>baseline_value</b>	1.060	1.046	1.075
<b>accelerations</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
<b>fetal_movement</b>	575.238	39.114	>999.999
<b>uterine_contractions</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
<b>severe_decelerations</b>	>999.999	>999.999	>999.999

Association of Predicted Probabilities and Observed Responses			
<b>Percent Concordant</b>	88.1	<b>Somers' D</b>	0.762
<b>Percent Discordant</b>	11.9	<b>Gamma</b>	0.762
<b>Percent Tied</b>	0.0	<b>Tau-a</b>	0.263
<b>Pairs</b>	779505	<b>c</b>	0.881

Partition for the Hosmer and Lemeshow Test					
Group	Total	abnormal = 1		abnormal = 0	
		Observed	Expected	Observed	Expected
<b>1</b>	213	0	0.04	213	212.96
<b>2</b>	213	1	0.35	212	212.65
<b>3</b>	213	4	1.74	209	211.26
<b>4</b>	213	9	6.55	204	206.45
<b>5</b>	213	21	18.52	192	194.48
<b>6</b>	215	36	38.18	179	176.82
<b>7</b>	213	54	56.51	159	156.49
<b>8</b>	213	75	81.37	138	131.63
<b>9</b>	214	106	116.12	108	97.88
<b>10</b>	206	165	151.61	41	54.39

Hosmer and Lemeshow Goodness-of-Fit Test		
Chi-Square	DF	Pr > ChiSq
13.0190	8	0.1112

**Parameter Estimates - Binary Model**

Variable	DF	Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Estimation Type
Intercept	1	-7.5005	0.9419	63.4076	<.0001	MLE
baseline_value	1	0.0586	0.00687	72.7609	<.0001	MLE
accelerations	1	-754.7	59.0005	163.6055	<.0001	MLE
fetal_movement	1	6.3548	1.3716	21.4656	<.0001	MLE
uterine_contractions	1	-192.6	22.7666	71.5338	<.0001	MLE
severe_decelerations	1	3285.3	1132.0	8.4232	0.0037	MLE

**Odds Ratios with 95% Confidence Intervals**

Effect	Odds Ratio Estimate	Lower 95% Confidence Limit for Odds Ratio	Upper 95% Confidence Limit for Odds Ratio
baseline_value	1.060	1.046	1.075
accelerations	<0.001	<0.001	<0.001
fetal_movement	575.238	39.114	>999.999
uterine_contractions	<0.001	<0.001	<0.001
severe_decelerations	>999.999	>999.999	>999.999

**Association Statistics (AUC)**

Label1	cValue1	nValue1	Label2	cValue2	nValue2
Percent Concordant	88.1	88.078332	Somers' D	0.762	0.761885
Percent Discordant	11.9	11.889853	Gamma	0.762	0.762127
Percent Tied	0.0	0.031815	Tau-a	0.263	0.262915
Pairs	779505	779505	c	0.881	0.880942