Joe Brew

PHC 6053 – Assignment 8

Part 1: SAS outputs (for each question

Part 2: SAS and R code

Part 3: Full SAS output

*Note: I used R as a supplement to SAS for this assignment. I did the entirety of the assignment in both, and code is side by side. Because I have find certain dataset manipulations to be hard in SAS (subsetting, dealing with categorical data, etc.), I relied largely on R for number 5. I'm worse at SAS than I am at R, and make a note of when I know my SAS output is incorrect (but my R output is correct)

PART 1: SAS OUTPUT FOR HOMEWORK

1. NA

2. **AGE**

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-5.4506	0.7277	56.0984	<.0001
AGE	1	0.0877	0.0119	54.0266	<.0001

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
AGE	1.092	1.066	1.118

BMI

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-2.0949	0.7054	8.8191	0.0030
BMI	1	0.0745	0.0268	7.7077	0.0055

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
BMI	1.077	1.022	1.136

BMIGROUP

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-0.4875	0.1439	11.4827	0.0007
BMIGROUP	3	1	0.5323	0.1966	7.3334	0.0068
BMIGROUP	4	1	0.6698	0.2860	5.4840	0.0192

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
BMIGROUP 3 vs 2	1.703	1.158	2.503
BMIGROUP 4 vs 2	1.954	1.115	3.423

Given my initial difficulty with this one, I wanted to confirm my answer in R.

Category	Estimate	Std. Error	Z	P	OR	95% CI
Intercept	-0.4875	0.1439	-3.389	0.0007	0.614	0.462-0.812
Overweight	0.5323	0.1966	2.708	0.006768	1.703	1.160-2.509
Obese	0.6698	0.2860	2.342	0.0192	1.954	1.117-3.440

SEX

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-0.0382	0.2990	0.0163	0.8983
SEX	1	-0.0740	0.1821	0.1651	0.6845

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
SEX	0.929	0.650	1.327

BPMEDS

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-0.3995	0.1000	15.9502	<.0001
BPMEDS	1	1.6771	0.2919	33.0049	<.0001

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
BPMEDS	5.350	3.019	9.481

PREVSTRK

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-0.2138	0.0919	5.4094	0.0200
PREVSTRK	1	2.8526	1.0391	7.5368	0.0060

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
PREVSTRK	17.332	2.262	132.832

3.

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-2.4486	0.7671	10.1885	0.0014
BMI		1	0.0791	0.0293	7.3009	0.0069
BPMEDS	1	1	7.4604	2.7204	7.5207	0.0061
intBMI_BPMEDS		1	-0.2158	0.0984	4.8141	0.0282

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
BMI	1.082	1.022	1.146
BPMEDS 1 vs 0	>999.999	8.402	>999.999
intBMI_BPMEDS	0.806	0.665	0.977

4.

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-8.5994	1.2702	45.8354	<.0001
AGE		1	0.0884	0.0129	47.0424	<.0001
SEX	2	1	-0.1323	0.2070	0.4085	0.5227
PREVSTRK	1	1	1.9337	1.0817	3.1959	0.0738
BMI		1	0.1124	0.0324	12.0083	0.0005
BPMEDS	1	1	8.1861	2.6862	9.2868	0.0023
intBMI_BPMEDS		1	-0.2479	0.0974	6.4735	0.0109

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
AGE	1.092	1.065	1.120
SEX 2 vs 1	0.876	0.584	1.314
PREVSTRK 1 vs 0	6.915	0.830	57.610
BMI	1.119	1.050	1.192
BPMEDS 1 vs 0	>999.999	18.563	>999.999
intBMI_BPMEDS	0.780	0.645	0.945

5.

Variable	**Unadjusted OR (95% CI)**	**Adjusted OR (95% CI)**
AGE	1.092 (1.066-1.118)	1.092 (1.066-1.121)
SEX	0.929 (0.650-1.327)	0.876 (0.583-1.314)
PREVSTRK	17.332 (2.262-132.832)	6.923 (0.583-1.314)
BMI (BPMEDS=No)	1.082 (1.022-1.470)	1.116 (1.048-1.190)
BMI (BPMEDS=Yes)	0.872 (0.719-1.044)	0.866 (0.713-1.037)

(The following table uses values obtained from the models from question 2 only)

Variable	**Unadjusted OR (95% CI)**
BMI (single variable model)	1.077 (1.023-1.136)
BPMEDS (single variable model)	5.350 (3.084-9.746)
Obese vs. Normal	1.954 (1.117-3.344)
Overweight vs. Normal	1.703 (1.160-2.509)

Joe Brew – SAS and R code

PHC 6053 – Assignment 8

Question	SAS	R
Prep	*READ IN THE DATA FROM ASSIGNMENT 1; LIBNAME ass8 'C:\Users\BrewJR\Desktop\ass8'; DATA ass8.mydata; SET ass8.fghm122; RUN; *ASSIGN THE DATA TO &DAT; %let dat=ass8.mydata; RUN; /* TAKE A LOOK AT THE DATA */ proc print data=&dat (obs=7); run; *OPTIONAL: OUTPUT DIRECTLY AS A PDF FILE/; ods pdf file = "C:\Users\BrewJR\Desktop\ass8\ass8.pdf" notoc;	setwd("C:/Users/BrewJR/Desktop/ass8") library(sas7bdat) library(foreign) dat <- read.ssd("C:/Users/BrewJR/Desktop/ass8", "fghm122", sascmd="C:/Program Files/SASHome93/SASFoundation/9.3/sas.exe"))

1	/* 1(a) CREATE A BMIGROUP VARIABLE*/ data &dat; set &dat; BMIGROUP=.; if BMI<18.5 then BMIGROUP=1; if BMI >= 18.5 & BMI < 25 then BMIGROUP = 2; if BMI >= 25 & BMI < 30 then BMIGROUP = 3; if BMI >= 30 then BMIGROUP = 4; RUN; /* 1(b) CREATE HBP */ data &dat; set &dat; HBP=.; if SYSBP >=0 & SYSBP < 140 then HBP = 0; if SYSBP >= 140 then HBP = 1; RUN; /* 1(c) Remove all the individuals in the underweight BMI group AND all the individuals with a BMI which is 40 or larger*/ data dat2; set &dat; if BMIGROUP = 1 then delete; if BMI > 40 then delete; run;	# 1(a) CREATE A BMIGROUP VARIABLE*/ dat$BMIGROUP <- ifelse(dat$BMI<18.5, 1, ifelse(dat$BMI >= 18.5 & dat$BMI < 25, 2, ifelse(dat$BMI >= 25 & dat$BMI < 30, 3, ifelse(dat$BMI >= 30, 4, NA)))) # 1(b) CREATE HBP */ dat$HBP <- ifelse(dat$SYSBP >=0 & dat$SYSBP < 140, 0, ifelse(dat$SYSBP >= 140, 1, NA)) # 1(c) Remove all the individuals in the underweight BMI group AND #all the individuals with a BMI which is 40 or larger*/ dat2 <-dat[which(dat$BMIGROUP != 1 & dat$BMI <=40),]

2	``` /* AGE */ proc logistic data = dat2; model HBP(event="1") = AGE; run; /* BMI */ proc logistic data = dat2; model HBP(event="1") = BMI; run; /* BMIGROUP */ proc logistic data = dat2; class BMIGROUP (ref="2") / param=ref; model HBP(event="1") = BMIGROUP; run; /* SEX */ proc logistic data = dat2; model HBP(event="1") = SEX; run; /* BPMEDS */ proc logistic data = dat2; model HBP(event="1") = BPMEDS; run; /* PREVSTRK */ proc logistic data = dat2; model HBP(event="1") = PREVSTRK; run; ```	``` # AGE */ modelAGE <- glm(dat2$HBP ~ dat2$AGE, family="binomial") exp(cbind(OR = coef(modelAGE), confint(modelAGE))) # BMI */ modelBMI <- glm(dat2$HBP ~ dat2$BMI, family="binomial") exp(cbind(OR = coef(modelBMI), confint(modelBMI))) # BMIGROUP */ dat2$BMIGROUP <- factor(dat2$BMIGROUP, levels=c(2,3,4)) modelBMIGROUP <- glm(dat2$HBP ~ dat2$BMIGROUP, family="binomial") exp(cbind(OR = coef(modelBMIGROUP), confint(modelBMIGROUP))) # SEX */ modelSEX <- glm(dat2$HBP ~ dat2$SEX, family="binomial") exp(cbind(OR = coef(modelSEX), confint(modelSEX))) # BPMEDS */ modelBPMEDS <- glm(dat2$HBP ~ dat2$BPMEDS, family="binomial") exp(cbind(OR = coef(modelBPMEDS), confint(modelBPMEDS))) # PREVSTRK */ modelPREVSTRK <- glm(dat2$HBP ~ dat2$PREVSTRK, family="binomial") exp(cbind(OR = coef(modelPREVSTRK), confint(modelPREVSTRK))) ```

3	/* FIRST, CREATE AN INTERACTION TERM BETWEEN BMI AND BPMEDS */ **data** dat2; set dat2; intBMI_BPMEDS = BMI * BPMEDS; run; /*NOW RUN THE MODEL */ **proc logistic** data = dat2; class BPMEDS(ref="0") / param=ref; model HBP(event="1") = BMI BPMEDS intBMI_BPMEDS; **run**;	dat2$intBMI_BPMEDS <- dat2$BMI*dat2$BPMEDS #NOW RUN THE MODEL */ model3 <- glm(dat2$HBP ~ dat2$BMI + dat2$BPMEDS + dat2$intBMI_BPMEDS, family="binomial") exp(cbind(OR = coef(model3), confint(model3)))
4	**proc logistic** data = dat2; class BPMEDS(ref="0") / param=ref; class SEX(ref="1") / param=ref; class PREVSTRK(ref="0") / param=ref; model HBP(event="1") = AGE SEX PREVSTRK BMI BPMEDS intBMI_BPMEDS; **run**; ods pdf close;	model4 <- glm(dat2$HBP ~ dat2$AGE + dat2$SEX + dat2$PREVSTRK + dat2$BMI + dat2$BPMEDS + dat2$intBMI_BPMEDS, family="binomial") exp(cbind(OR = coef(model4), confint(model4)))

5		#Subset dat2 into bpmeds=yes and bpmeds=no dat2y <- dat2[which(dat2$BPMEDS == 1),] dat2n <- dat2[which(dat2$BPMEDS == 0),] #GET UNADJSUTED FOR BOTH #BPMEDS=Yes modelBMI_BPMEDSY <- glm(dat2y$HBP ~ dat2y$BMI, family="binomial") exp(cbind(OR = coef(modelBMI_BPMEDSY), confint(modelBMI_BPMEDSY))) #BPMEDS-No modelBMI_BPMEDSN <- glm(dat2n$HBP ~ dat2n$BMI, family="binomial") exp(cbind(OR = coef(modelBMI_BPMEDSN), confint(modelBMI_BPMEDSN))) #GET ADJUSTED FOR BOTH #BPMEDS=YES modelBMI_BPMEDSYadj <- glm(dat2y$HBP ~ dat2y$AGE + dat2y$SEX + dat2y$PREVSTRK + dat2y$BMI, family="binomial") exp(cbind(OR = coef(modelBMI_BPMEDSYadj), confint(modelBMI_BPMEDSYadj))) #BPMEDS=NO modelBMI_BPMEDSNadj <- glm(dat2n$HBP ~ dat2n$AGE + dat2n$SEX + dat2n$PREVSTRK + dat2n$BMI, family="binomial") exp(cbind(OR = coef(modelBMI_BPMEDSNadj), confint(modelBMI_BPMEDSNadj)))

Obs	SEX	RANDID	TOTCHOL	AGE	SYSBP	DIABP	CURSMOKE	CIGPDAY	BMI
1	2	6238	237	58	108	66	0	0	28.5
2	1	14367	280	64	168	100	0	0	25.72
3	1	16365	211	55	173	123	0	0	29.11
4	1	82425	226	67	157	95	0	0	29.86
5	1	101990	230	49	142	90.5	1	35	24.33
6	2	123622	241	51	145	85	1	20	25.66
7	1	147250	229	68	145	77	1	20	23.09

Obs	DIABETES	BPMEDS	HEARTRTE	GLUCOSE	PREVCHD	PREVAP	PREVMI
1	0	0	80	71	0	0	0
2	0	0	92	82	0	0	0
3	0	1	75	85	0	0	0
4	0	0	88	99	0	0	0
5	0	0	70	61	0	0	0
6	0	0	96	102	0	0	0
7	0	0	72	83	0	0	0

Obs	PREVSTRK	PREVHYP	PERIOD	HDLC	LDLC	BMIGROUP	HBP
1	0	0	3	54	141	3	0
2	0	1	3	44	236	3	1
3	0	1	3	48	163	3	1
4	0	1	3	61	165	3	1
5	0	1	3	30	200	2	1
6	0	0	3	68	173	3	1
7	0	0	3	39	170	2	1

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	625.023
SC	688.106	633.428
-2 Log L	681.903	621.023

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	60.8803	1	<.0001
Score	58.7136	1	<.0001
Wald	54.0266	1	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-5.4506	0.7277	56.0984	<.0001
AGE	1	0.0877	0.0119	54.0266	<.0001

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
AGE	1.092	1.066	1.118

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	67.9	**Somers' D**	0.390
Percent Discordant	29.0	**Gamma**	0.402
Percent Tied	3.1	**Tau-a**	0.194
Pairs	60648	**c**	0.695

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	678.029
SC	688.106	686.434
-2 Log L	681.903	674.029

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	7.8744	1	0.0050
Score	7.8323	1	0.0051
Wald	7.7077	1	0.0055

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-2.0949	0.7054	8.8191	0.0030
BMI	1	0.0745	0.0268	7.7077	0.0055

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
BMI	1.077	1.022	1.136

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	56.7	**Somers' D**	0.141
Percent Discordant	42.5	**Gamma**	0.143
Percent Tied	0.8	**Tau-a**	0.070
Pairs	60648	**c**	0.571

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

Class Level Information			
Class	**Value**	**Design Variables**	
BMIGROUP	**2**	0	0
	3	1	0
	4	0	1

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	678.345
SC	688.106	690.952
-2 Log L	681.903	672.345

The LOGISTIC Procedure

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	9.5587	2	0.0084
Score	9.5029	2	0.0086
Wald	9.4260	2	0.0090

Type 3 Analysis of Effects			
Effect	**DF**	**Wald Chi-Square**	**Pr > ChiSq**
BMIGROUP	2	9.4260	0.0090

Analysis of Maximum Likelihood Estimates						
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-0.4875	0.1439	11.4827	0.0007
BMIGROUP	**3**	1	0.5323	0.1966	7.3334	0.0068
BMIGROUP	**4**	1	0.6698	0.2860	5.4840	0.0192

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
BMIGROUP 3 vs 2	1.703	1.158	2.503
BMIGROUP 4 vs 2	1.954	1.115	3.423

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	37.9	**Somers' D**	0.144
Percent Discordant	23.5	**Gamma**	0.234
Percent Tied	38.6	**Tau-a**	0.072
Pairs	60648	**c**	0.572

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	685.738
SC	688.106	694.143
-2 Log L	681.903	681.738

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	0.1651	1	0.6845
Score	0.1651	1	0.6845
Wald	0.1651	1	0.6845

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-0.0382	0.2990	0.0163	0.8983
SEX	1	-0.0740	0.1821	0.1651	0.6845

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
SEX	0.929	0.650	1.327

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	25.5	**Somers' D**	0.018
Percent Discordant	23.7	**Gamma**	0.037
Percent Tied	50.9	**Tau-a**	0.009
Pairs	60648	**c**	0.509

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	646.219
SC	688.106	654.624
-2 Log L	681.903	642.219

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	39.6841	1	<.0001
Score	38.2875	1	<.0001
Wald	33.0049	1	<.0001

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-0.3995	0.1000	15.9502	<.0001
BPMEDS	1	1.6771	0.2919	33.0049	<.0001

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
BPMEDS	5.350	3.019	9.481

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	25.0	**Somers' D**	0.204
Percent Discordant	4.7	**Gamma**	0.685
Percent Tied	70.3	**Tau-a**	0.101
Pairs	60648	**c**	0.602

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	669.943
SC	688.106	678.348
-2 Log L	681.903	665.943

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	15.9609	1	<.0001
Score	13.8556	1	0.0002
Wald	7.5368	1	0.0060

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-0.2138	0.0919	5.4094	0.0200
PREVSTRK	1	2.8526	1.0391	7.5368	0.0060

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
PREVSTRK	17.332	2.262	132.832

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	6.1	**Somers' D**	0.058
Percent Discordant	0.4	**Gamma**	0.891
Percent Tied	93.5	**Tau-a**	0.029
Pairs	60648	**c**	0.529

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

Class Level Information		
Class	**Value**	**Design Variables**
BPMEDS	**0**	0
	1	1

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

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	683.903	640.563
SC	688.106	657.373
-2 Log L	681.903	632.563

The LOGISTIC Procedure

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	49.3403	3	<.0001
Score	46.9814	3	<.0001
Wald	39.6163	3	<.0001

Type 3 Analysis of Effects			
Effect	**DF**	**Wald Chi-Square**	**Pr > ChiSq**
BMI	1	7.3009	0.0069
BPMEDS	1	7.5207	0.0061
intBMI_BPMEDS	1	4.8141	0.0282

Analysis of Maximum Likelihood Estimates						
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-2.4486	0.7671	10.1885	0.0014
BMI		1	0.0791	0.0293	7.3009	0.0069
BPMEDS	**1**	1	7.4604	2.7204	7.5207	0.0061
intBMI_BPMEDS		1	-0.2158	0.0984	4.8141	0.0282

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
BMI	1.082	1.022	1.146
BPMEDS 1 vs 0	>999.999	8.402	>999.999
intBMI_BPMEDS	0.806	0.665	0.977

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	65.3	**Somers' D**	0.311
Percent Discordant	34.2	**Gamma**	0.313
Percent Tied	0.6	**Tau-a**	0.155
Pairs	60648	**c**	0.655

The LOGISTIC Procedure

Model Information	
Data Set	WORK.DAT2
Response Variable	HBP
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	494
Number of Observations Used	494

Response Profile		
Ordered Value	**HBP**	**Total Frequency**
1	0	266
2	1	228

Probability modeled is HBP=1.

Class Level Information		
Class	**Value**	**Design Variables**
BPMEDS	**0**	0
	1	1
SEX	**1**	0
	2	1
PREVSTRK	**0**	0
	1	1

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

The LOGISTIC Procedure

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	683.903	582.454
SC	688.106	611.872
-2 Log L	681.903	568.454

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	113.4495	6	<.0001
Score	100.9107	6	<.0001
Wald	79.2805	6	<.0001

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
AGE	1	47.0424	<.0001
SEX	1	0.4085	0.5227
PREVSTRK	1	3.1959	0.0738
BMI	1	12.0083	0.0005
BPMEDS	1	9.2868	0.0023
intBMI_BPMEDS	1	6.4735	0.0109

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-8.5994	1.2702	45.8354	<.0001
AGE		1	0.0884	0.0129	47.0424	<.0001
SEX	2	1	-0.1323	0.2070	0.4085	0.5227
PREVSTRK	1	1	1.9337	1.0817	3.1959	0.0738
BMI		1	0.1124	0.0324	12.0083	0.0005
BPMEDS	1	1	8.1861	2.6862	9.2868	0.0023
intBMI_BPMEDS		1	-0.2479	0.0974	6.4735	0.0109

The LOGISTIC Procedure

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
AGE	1.092	1.065	1.120
SEX 2 vs 1	0.876	0.584	1.314
PREVSTRK 1 vs 0	6.915	0.830	57.610
BMI	1.119	1.050	1.192
BPMEDS 1 vs 0	>999.999	18.563	>999.999
intBMI_BPMEDS	0.780	0.645	0.945

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	75.2	**Somers' D**	0.506
Percent Discordant	24.6	**Gamma**	0.507
Percent Tied	0.2	**Tau-a**	0.252
Pairs	60648	**c**	0.753