\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

\* Program: H:\Practicum\tidal\_volume\workprogram2\_xzhao.sas \*;

\* Date: 11/18/2015 \*;

\* Programmer: Xinyi Zhao \*;

\* Purpose: This program is for the analysis of the scores data \*;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

libname score "H:\Practicum\tidal\_volume\final analysis";

**PROC** **IMPORT** OUT= WORK.icu

DATAFILE= "H:\Practicum\tidal\_volume\final analysis\Overall

patient safety domains by ICU\_xzhao 8.9.xlsx"

DBMS=EXCEL REPLACE;

RANGE="Sheet1$";

GETNAMES=YES;

MIXED=NO;

SCANTEXT=YES;

USEDATE=YES;

SCANTIME=YES;

**RUN**;

**proc** **transpose** data=icu out=icut;

by icu;

id safety\_domain;

var pct\_positive\_response;

**run**;

**data** icut1;

set icut;

keep icu average\_across\_domains;

rename average\_across\_domains=scr;

label average\_across\_domains="Patient Safety Score";

**run**;

**proc** **sort** data=score.scores;

by icu studyid;

**run**;

\*------------------------------------------------------------------;

\* Merge patient safety score data into the main study dataset ;

\*------------------------------------------------------------------;

**data** score2;

merge score.scores(in=a) icut1(in=b);

by icu;

if a;

blackrace=**0**;

otherrace=**0**;

if race="Black" then blackrace=**1**; /\*create dummy variables for race\*/

if race="Other" then otherrace=**1**;

if race=" " then do;

blackrace=**.**;

otherrace=**.**;

end;

if scr ge **60** then highsafe=**1**;

if scr ge **0** and scr lt **60** then highsafe=**0**; /\*dichotomize safety score as high vs. low\*/

**run**;

**proc** **freq** data=score2;

tables race\*blackrace\*otherrace/list;

**run**;

**proc** **freq** data=score2;

tables scr\*highsafe/list;

**run**;

**proc** **contents** data=score2;

**run**;

**proc** **freq** data=score2;

tables icu\*scr/list;

**run**;

**proc** **freq** data=score2;

tables highsafe sex race CHF CPD liver renal DM pressors RBC PLT FFP anysed anynarc;

**run**;

**proc** **univariate** data=score2;

var scr age cci sofa tvpbw;

histogram;

**run**;

\* Test of linear trend;

**proc** **logistic** data=score2 descending;

model vae = scr/aggregate;

**run**;

**proc** **logistic** data=score2 descending;

model vae = highsafe/aggregate;

**run**;

\* continuous scale significantly better;

\*-----------------------------;

\* Modeling ;

\*-----------------------------;

filename collin "H:/collin\_2011.sas";

%include collin;

\*\*\*\* full model;

**proc** **glimmix** data=score2 empirical;

class icu;

model vae(event="1") = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw

/dist=bin link=logit;

random \_residual\_/subject=icu;

random intercept /subject=icu g s vcorr;

covtest 'R=specified G=0' zerog;

nloptions tech = nrridg;

\*ods output glimmix.covb=GLIMMIX1;

**run**;

%***collin***(covdsn=GLIMMIX1, procdr=GLIMMIX, output=col);

\* random effect not signifciant;

**proc** **logistic** data=score2 descending covout outest=info;

model vae = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw

scr\*age scr\*sex scr\*blackrace scr\*otherrace scr\*CHF scr\*CPD scr\*CCI scr\*liver scr\*renal scr\*DM scr\*sofa scr\*pressors scr\*RBC scr\*PLT scr\*FFP scr\*anysed scr\*anynarc scr\*tvpbw/rl covb;

**run**;

%***collin***(covdsn=info, output=col);

\* drop scr\*anynarc;

**proc** **logistic** data=score2 descending covout outest=info;

model vae = scr age sex blackrace otherrace CHF CPD CCI liver renal DM sofa pressors RBC PLT FFP anysed anynarc tvpbw

scr\*age scr\*sex scr\*blackrace scr\*otherrace scr\*CHF scr\*CPD scr\*CCI scr\*liver scr\*renal scr\*DM scr\*sofa scr\*pressors scr\*RBC scr\*PLT scr\*FFP scr\*anysed scr\*tvpbw/rl covb;

**run**;

%***collin***(covdsn=info, output=col);

**proc** **logistic** data=score2 descending covout outest=info;

model vae = scr sex blackrace otherrace CHF CPD CCI liver renal DM pressors RBC PLT

scr\*FFP /rl covb;

**run**;

%***collin***(covdsn=info, output=col);

**proc** **means** data=score2;

var scr;

**run**;

**data** score3;

set score2;

scrc=scr-**60.8983607**;

**run**;

**proc** **logistic** data=score3 descending covout outest=info;

model vae = scrc sex blackrace otherrace CHF CPD CCI liver renal DM pressors RBC PLT

scr\*FFP /rl covb;

**run**;

%***collin***(covdsn=info, output=col);

\*------------------------------------------------;

\* Model Selection (predictor screening) ;

\*------------------------------------------------;

\* backwards elimination method;

**proc** **logistic** data=score3 descending;

model vae = scrc sex blackrace otherrace CHF CPD CCI liver renal DM pressors RBC PLT scr\*FFP/ include=**1** selection=backward slstay=**0.1**;

**run**;

\* forward selection method;

**proc** **logistic** data=score3 descending;

model vae = scrc sex blackrace otherrace CHF CPD CCI liver renal DM pressors RBC PLT scr\*FFP/ include=**1** selection=forward slentry=**0.1**;

**run**;

\* stepwise selection method;

**proc** **logistic** data=score3 descending;

model vae = scrc sex blackrace otherrace CHF CPD CCI liver renal DM pressors RBC PLT scr\*FFP/ include=**1** selection=stepwise slstay=**0.1** slentry=**0.1**;

**run**;

\*----------------------------------------;

\* Final adjusted Model ;

\*----------------------------------------;

**proc** **logistic** data=score3 descending;

model vae = scrc blackrace otherrace RBC/rl;

**run**;