Survival analysis HW 1

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library(KMsurv)

## Warning: package 'KMsurv' was built under R version 3.5.2

library(survival)

## Warning: package 'survival' was built under R version 3.5.2

library(ciTools)

## Warning: package 'ciTools' was built under R version 3.5.3

## ciTools version 0.5.1 (C) Institute for Defense Analyses

data(bfeed)  
{  
bfeed$white=0  
bfeed$white[which(bfeed$race==1)]=1  
bfeed$black=0  
bfeed$black[which(bfeed$race==2)]=1  
bfeed$other=0  
bfeed$other[which(bfeed$race==3)]=1  
}

#############  
model=survreg(Surv(duration)~poverty+yschool+white+black+other,data=bfeed,dist="weibull")

## 第1題

summary(model)

##   
## Call:  
## survreg(formula = Surv(duration) ~ poverty + yschool + white +   
## black + other, data = bfeed, dist = "weibull")  
## Value Std. Error z p  
## (Intercept) 2.1093 0.2408 8.76 <2e-16  
## poverty 0.1878 0.0936 2.01 0.0448  
## yschool 0.0344 0.0189 1.82 0.0690  
## white 0.2545 0.0959 2.65 0.0079  
## black 0.1183 0.1291 0.92 0.3595  
## other 0.0000 0.0000 NA NA  
## Log(scale) 0.0333 0.0250 1.33 0.1829  
##   
## Scale= 1.03   
##   
## Weibull distribution  
## Loglik(model)= -3499.3 Loglik(intercept only)= -3506.1  
## Chisq= 13.51 on 5 degrees of freedom, p= 0.019   
## Number of Newton-Raphson Iterations: 5   
## n= 927

## 第2題

coef(model)

## (Intercept) poverty yschool white black other   
## 2.10926527 0.18781489 0.03436885 0.25447229 0.11830121 0.00000000

If mother’s years of school increases one year,the mean log survival time will increases weeks.

## 第3題

summary(model)

##   
## Call:  
## survreg(formula = Surv(duration) ~ poverty + yschool + white +   
## black + other, data = bfeed, dist = "weibull")  
## Value Std. Error z p  
## (Intercept) 2.1093 0.2408 8.76 <2e-16  
## poverty 0.1878 0.0936 2.01 0.0448  
## yschool 0.0344 0.0189 1.82 0.0690  
## white 0.2545 0.0959 2.65 0.0079  
## black 0.1183 0.1291 0.92 0.3595  
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## Scale= 1.03   
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## Weibull distribution  
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The poverty has significant effect of breast feeding.

## 第4題

The mother’s education level has no significant effect of breast feeding.

## 第5題

msu=add\_ci(bfeed,model, alpha = 0.1, names = NULL, yhatName = "mean\_pred")  
meansurvival=mean(msu$mean\_pred)  
mediansurvival=median(msu$mean\_pred)  
c(meansurvival,mediansurvival)

## [1] 16.16437 16.29467

The mean of survival time is , and median of survival time is .

## 第6題

red=survreg(Surv(duration)~poverty+yschool,data=bfeed,dist="weibull")  
anova(red,model)

## Terms Resid. Df -2\*LL Test Df  
## 1 poverty + yschool 923 7006.158 NA  
## 2 poverty + yschool + white + black + other 920 6998.679 = 3  
## Deviance Pr(>Chi)  
## 1 NA NA  
## 2 7.479031 0.05809969

The mother’s race has no significant effect of breast feeding.

## 第7題

confint(model)

## 2.5 % 97.5 %  
## (Intercept) 1.637394916 2.58113562  
## poverty 0.004354705 0.37127507  
## yschool -0.002673555 0.07141125  
## white 0.066559232 0.44238536  
## black -0.134714305 0.37131672  
## other 0.000000000 0.00000000

The confidence interval for the regression coefficient for poverty is