```r
install.packages("sandwich")
install.packages("lmtest")
install.packages("tidyverse")
library("sandwich")
library("lmtest")
library("tidyverse")
#データセット作成
id <- 1:3000
aspirin <- c(rep(1,500), rep(0,2500))
CHDhistory <- c(rep(1,300),rep(0,200),rep(1,200),rep(0,2300))
CHDevent <-
c(rep(1,30),rep(0,270),rep(1,2),rep(0,198),rep(1,60),rep(0,140),rep(1,69),rep(0,
2231))
df <- data.frame(id,aspirin,CHDhistory,CHDevent)
df$aspirin_lab <- factor(df$aspirin, levels = c(0,1), labels = c("No
Aspirin","Aspirin"))
df$CHDhistory_lab <- factor(df$CHDhistory, levels = c(0,1), labels = c("No
CHDhistory","CHDhistory"))
df$CHDevent_lab <- factor(df$CHDevent, levels = c(0,1), labels = c("No
CHDevent","CHDevent"))
#第4回 表1
df%>%
    filter (CHDhistory_lab == "No CHDhistory") -> df0
df%>%
    filter (CHDhistory_lab == "CHDhistory") -> df1
addmargins(table(df$aspirin_lab, df$CHDevent_lab))
32/500-129/5000
(32/500)/(129/2500)
addmargins(table(df1$aspirin_lab, df1$CHDevent_lab))
30/300-60/200
(30/300)/(60/200)
addmargins(table(df0$aspirin_lab, df0$CHDevent_lab))
2/200-69/2300
(2/200)/(69/2300)
#第5回 表2
#ロジスティック回帰モデル
model1 <- glm(CHDevent ~ aspirin + CHDhistory, family = binomial(link =
"logit"), data = df)
summary(model1)
estimate<-(summary(model1)$coefficients[2,"Estimate"]) %>% exp() %>% round(3)
ci.low<-(summary(model1)$coefficients[2,"Estimate"] +
qnorm(0.05/2)*summary(model1)$coefficients[2,"Std. Error"]) %>% exp() %>%
round(3)
ci.up<-(summary(model1)$coefficients[2,"Estimate"] +
qnorm(1-0.05/2)*summary(model1)$coefficients[2,"Std. Error"]) %>% exp() %>%
round(3)
paste("アスピリンのオッズ比：点推定値 (95%信頼区間下限，95%信頼区間上限)=",
estimate, " (", ci.low,",", ci.up, ")", sep="")
estimate<-(summary(model1)$coefficients[3,"Estimate"]) %>% exp() %>% round(3)
ci.low<-(summary(model1)$coefficients[3,"Estimate"] +
qnorm(0.05/2)*summary(model1)$coefficients[3,"Std. Error"]) %>% exp() %>%
round(3)
ci.up<-(summary(model1)$coefficients[3,"Estimate"] +
qnorm(1-0.05/2)*summary(model1)$coefficients[3,"Std. Error"]) %>% exp() %>%
round(3)
paste("冠動脈疾患既往のオッズ比：点推定値 (95%信頼区間下限，95%信頼区間上限)=",
estimate, " (", ci.low,",", ci.up, ")", sep="")
```

```r
#修正ポアソンモデル
model2 <- glm(CHDevent ~ aspirin + CHDhistory, family = poisson(link = "log"),
data = df)
summary(model2)
#ロバスト分散に基づいた信頼区間を求める
estimate<-coeftest(model2, vcov = sandwich)[2,1]%>% exp()%>% round(3)
ci.low<-(coeftest(model2, vcov = sandwich)[2,1] + qnorm(0.05/2)*coeftest(model2,
vcov = sandwich)[2,2]) %>% exp() %>% round(3)
ci.up<-(coeftest(model2, vcov = sandwich)[2,1]+ qnorm(1-0.05/2)*coeftest(model2,
vcov = sandwich)[2,2]) %>% exp() %>% round(3)
paste("アスピリンのリスク比：点推定値 (95%信頼区間下限，95%信頼区間上限)=",
estimate, " (", ci.low,",", ci.up, ")", sep="")
estimate<-coeftest(model2, vcov = sandwich)[3,1]%>% exp()%>% round(3)
ci.low<-(coeftest(model2, vcov = sandwich)[3,1] + qnorm(0.05/2)*coeftest(model2,
vcov = sandwich)[3,2]) %>% exp() %>% round(3)
ci.up<-(coeftest(model2, vcov = sandwich)[3,1]+ qnorm(1-0.05/2)*coeftest(model2,
vcov = sandwich)[3,2]) %>% exp() %>% round(3)
paste("冠動脈疾患既往のリスク比：点推定値 (95%信頼区間下限，95%信頼区間上限)=",
estimate, " (", ci.low,",", ci.up, ")", sep="")
```