prr\_and\_chisq.R

# functions that calculate Chi-square Statistics and PRR  
  
# the function takes in data, which is a vector of length 4  
# data represent the four elements in a 2-by-2 contingency table (denoted by a11, a21, a12, and a22 respectively)  
# data[1] stands for a11, data[2] stands for a21, data[3] stands for a12, data[4] stands for a22  
# Note: aij stands for the element in ith row and jth column  
  
# data\_mat is a 2-by-2 matrix of data  
  
# the function returns a vector of length 2  
# the first element is PRR and the second element is chi-square statistics   
# Note: no correction since the sample size in our study is large enough  
  
# version 1  
prr\_and\_chisq <- function(data) {  
 prr <- (data[1]/(data[1]+data[2]))/(data[3]/(data[3]+data[4]))  
 data\_mat <- matrix(data, nrow = 2, ncol = 2)  
 x2 <- chisq.test(data\_mat, correct = FALSE)$statistic  
 return(c(prr, x2))  
}  
  
# version 2  
prr\_and\_chisq2 <- function(data) {  
 prr <- (data[1]/(data[1]+data[2]))/(data[3]/(data[3]+data[4]))  
 x2 <- (((data[1]\*data[4]-data[2]\*data[3])^2)\*(data[1]+data[2]+data[3]+data[4]))/((data[1]+data[3])\*(data[2]+data[4])\*(data[3]+data[4])\*(data[1]+data[2]))  
 return(c(prr, x2))  
}  
  
# the two versions above should return the same result