

lec5q17

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January 24, 2019

```
library(binom)
library(PropCIs)
```

1.

```
#Time-out group
w.v <- 10
n.v <- 16
# No Time-out group
w.p <- 22
n.p <- 26
```

c.

```
pi.hat.v <- w.v/n.v
pi.hat.p <- w.p/n.p
pi.hat.v/pi.hat.p #Relative risk
```

```
## [1] 0.7386364
```

The success rate of time-out group is 0.7386 times as high as the no time-out group.

```
riskscoreci(x1=w.v, n1=n.v, x2=w.p, n2=n.p, conf.level = 0.95) #Score CI
```

```
##
##
##
## data:
##
## 95 percent confidence interval:
## 0.4480251 1.0600376
```

We expect 95% of similarly constructed intervals to contain the true relative risk of the time-out group to make a successful kick.

d.

```
(w.v * (n.p-w.p)) / (w.p * (n.v-w.v)) #Odds Ratio
```

```
## [1] 0.3030303
```

The odds of making a successful kick of time-out group are 0.3030 times as high as they are in no time-out group.

```
orscoreci(x1=w.v, n1=n.v, x2=w.p, n2=n.p, conf.level = 0.95) #Score CI of odds ratio
```

```
##
##
##
## data:
##
## 95 percent confidence interval:
## 0.0726889 1.2696219
```

We expect 95% of all similarly constructed intervals to contain the odds ratio between 2 groups.

e. Use Score test to testify whether 2 groups have the same rate of success. $H_0: \pi_1 - \pi_2 = 0$, $H_a: \pi_1 - \pi_2 < 0$, $\alpha = 0.05$.

```
prop.test(x=c(w.v, w.p), n=c(n.v, n.p), alternative="less", correct=FALSE)
```

```
## Warning in prop.test(x = c(w.v, w.p), n = c(n.v, n.p), alternative =
## "less", : Chi-squared approximation may be incorrect
```

```
##  
## 2-sample test for equality of proportions without continuity  
## correction  
##  
## data: c(w.v, w.p) out of c(n.v, n.p)  
## X-squared = 2.6704, df = 1, p-value = 0.05111  
## alternative hypothesis: less  
## 95 percent confidence interval:  
## -1.000000000 0.009450086  
## sample estimates:  
## prop 1 prop 2  
## 0.6250000 0.8461538
```

Based on p value we do not reject null hypothesis, so icing the kicker may not be a good strategy, but the sample sizes are small, so there may exist bias.