cda10 月 15 日课堂

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- 1

```r
library(cdabookdb)
data('afterlife1')
addmargins(afterlife1)
```

```
##          Belief
## Gender     Yes No or Undecided  Sum
##   Females  509             116  625
##   Males    398             104  502
##   Sum      907             220 1127
```

```r
prop.table(afterlife1,margin = 1)
```

```
##          Belief
## Gender          Yes No or Undecided
##   Females 0.8144000       0.1856000
##   Males   0.7928287       0.2071713
```

```r
prop.table(afterlife1,margin = 2)
```

```
##          Belief
## Gender          Yes No or Undecided
##   Females 0.5611907       0.5272727
##   Males   0.4388093       0.4727273
```

```r
prop.test(afterlife1,alternative = 'less')
```

```
##
##  2-sample test for equality of proportions with continuity
##  correction
##
## data:  afterlife1
## X-squared = 0.69298, df = 1, p-value = 0.7974
## alternative hypothesis: less
## 95 percent confidence interval:
##  -1.00000000  0.06260453
## sample estimates:
##    prop 1    prop 2
## 0.8144000 0.7928287
```

- 2

```r
library(cdabookfunc)
data('aspirin')
aspirin
```

```
##          MI
## Group         Y     N
##   Placebo   189 10845
##   Aspirin   104 10933
```

```r
theta <- oddsratio(aspirin);theta
```

```
##   oddsratio
## 1  1.832054
```

```r
theta <- log(theta);theta
```

```
##   oddsratio
## 1 0.6054377
```

```r
se <- sqrt(1/189+1/104+1/10845+1/10933)
interval <- c(theta-1.96*se,theta+1.96*se)
interval
```

```
## $oddsratio
## [1] 0.3646681
##
## $oddsratio
## [1] 0.8462073
```

- 3

```r
data('gender_party')
gender_party
```

```
##          Party
## Gender    Democrat Independent Republican
##   Females      762         327        468
##   Males        484         239        477
```

```r
x2 <- chisq.test(gender_party);x2
```

```
##
##  Pearson's Chi-squared test
##
## data:  gender_party
## X-squared = 30.07, df = 2, p-value = 2.954e-07
```

```r
gender_party_expected <- x2$expected # obtaining the mean under the independence hypothes
gender_party_expected
```

```
##          Party
## Gender    Democrat Independent Republican
##   Females 703.6714    319.6453   533.6834
##   Males   542.3286    246.3547   411.3166
```

```r
Gsq <- 2 * sum(gender_party * log(gender_party / gender_party_expected))
pvalue <- 1 - pchisq(Gsq, 2)
Gsq; pvalue
```

```
## [1] 30.01669
```

```
## [1] 3.033598e-07
```

```r
#residuals
residual <- gender_party - gender_party_expected;residual
```

```
##          Party
## Gender      Democrat Independent Republican
##   Females  58.328618    7.354733 -65.683351
##   Males   -58.328618   -7.354733  65.683351
```

- 4

```r
library(cdabookdb)
library(cdabookfunc)
data('malformation');malformation
```

```
##        Malformation
## Alcohol Absent Present
##     0    17066      48
##     <1   14464      38
##     1-2    788       5
##     3-5    126       1
##     >=6     37       1
```

```r
x2 <- chisq.test(malformation);x2
```

```
## 
##  Pearson's Chi-squared test
## 
## data:  malformation
## X-squared = 12.082, df = 4, p-value = 0.01675
```

```r
independent_test_of_table(malformation,'X2')
```

```
## $method
## [1] "X2"
##
## $statistic
## [1] 12.08205
##
## $df
## [1] 4
##
## $p.value
## [1] 0.0167514
```

```r
independent_test_of_table(malformation,'G2')
```

```
## $method
## [1] "G2"
##
## $statistic
## [1] 6.201998
##
## $df
## [1] 4
##
## $p.value
## [1] 0.1845623
```

```r
independent_test_of_table(malformation,"all",c(0,0.5,1.5,4,7),0:1)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   6.569932  1  0.01037159
```

```
independent_test_of_table(malformation,"all",c((1+17114)/2,(17115+14502)/2,(17114+14502+1
```

```
##      method statistic  df p.value
## [1,] "X2"   12.08205   4  0.0167514
## [2,] "G2"   6.201998   4  0.1845623
## [3,] "M2"   0.05289788 1  0.8180954
```

```
independent_test_of_table(malformation,"all",c(0,1,2,3,4),0:1)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   1.82776   1  0.1763924
```

```
independent_test_of_table(malformation,"all",c(1,2,3,4,5),0:1)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   1.82776   1  0.1763924
```

```
independent_test_of_table(malformation,"all",c(0,1,2,3,4),1:0)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   1.82776   1  0.1763924
```

```
independent_test_of_table(malformation,"all",c(2,4,6,8,10),0:1)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   1.82776   1  0.1763924
```

```r
independent_test_of_table(malformation,"all",c(2,4,6,8,10),1:2)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   1.82776   1  0.1763924
```

```r
independent_test_of_table(malformation,"all",c(2,4,6,8,10),3:4)
```

```
##      method statistic df p.value
## [1,] "X2"   12.08205  4  0.0167514
## [2,] "G2"   6.201998  4  0.1845623
## [3,] "M2"   1.82776   1  0.1763924
```

- 5

```r
tea_tasting <- matrix(c(4,1,4,1),nrow = 2)
fisher.test(tea_tasting,alternative ='g')#alternative greater
```

```
##
##  Fisher's Exact Test for Count Data
##
## data:  tea_tasting
## p-value = 0.7778
## alternative hypothesis: true odds ratio is greater than 1
## 95 percent confidence interval:
##  0.02087826        Inf
## sample estimates:
## odds ratio
##          1
```

```r
fisher.test(tea_tasting,alternative = 't')#alternative not equal
```

```
##
##  Fisher's Exact Test for Count Data
##
## data:  tea_tasting
```

```
## p-value = 1
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##   0.01022439 97.80533740
## sample estimates:
## odds ratio
##          1
```