GHS implementation status individual stats analysis

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# Pairwise statistical tests for relationship between indicators and GHS status (yes / no)

## 0. load data

library(knitr)  
library(Hmisc)  
library(car)  
library(pander)  
d <- read.csv(file.path('..', outdir,'data.csv'), check.names=F, strings=F)  
  
d$ghs <- d$GHS >= 1 # partial GHS considered 'full'

## WTO (chi squared test)

m <- table( 'ghs' = d$ghs, 'wto' = d$`WTO membership`)  
colnames(m) <- rev(c('WTO', 'Non WTO'))  
rownames(m) <- rev(c('implemented', 'non implemented'))  
kable(m)

|  |  |  |
| --- | --- | --- |
|  | Non WTO | WTO |
| non implemented | 29 | 99 |
| implemented | 5 | 60 |

chisq.test(m)

##   
## Pearson's Chi-squared test with Yates' continuity correction  
##   
## data: m  
## X-squared = 5.66, df = 1, p-value = 0.01736

## ILO ratification (chi squared test)

m <- matrix( c(23, 94, 29 +10 + 4, 28 +4 +1), 2, 2)  
colnames(m) <- c('0 convention', '>1 convention')  
rownames(m) <- c('implemented', 'non-implemented')  
m

## 0 convention >1 convention  
## implemented 23 43  
## non-implemented 94 33

chisq.test(m)

##   
## Pearson's Chi-squared test with Yates' continuity correction  
##   
## data: m  
## X-squared = 26.2929, df = 1, p-value = 2.934e-07

## SAICM (chi squared test)

d$saicm <- rowSums(d[, c("Sthlm ratification", "Rotterdam ratificaiton","Basel ratification","SAICM focal point in place=1")])  
  
m <- table( d$ghs,cut(d$saicm, c(-1,2,3,4)))  
print(m)

##   
## (-1,2] (2,3] (3,4]  
## FALSE 14 21 93  
## TRUE 2 9 54

chisq.test(m)

##   
## Pearson's Chi-squared test  
##   
## data: m  
## X-squared = 4.0094, df = 2, p-value = 0.1347

# Trade open-ness index (t-test)

d$trade <- as.numeric(as.character(d$`Trade Open-ness for 2013`))

## Warning: NAs introduced by coercion

i <- which(d$ghs)  
tst <- t.test(d$trade[i], d$trade[-i])  
print(tst$statistic)

## t   
## 1.803267

print(tst$parameter)

## df   
## 87.40828

print(' p = ')

## [1] " p = "

print(tst$p.value)

## [1] 0.074792

# Kof political globalization index (t-test)

#globalization  
d$kof <- d[['KOF sub-index C']]  
tst <- t.test(d$kof[i], d$kof[-i])  
tst

##   
## Welch Two Sample t-test  
##   
## data: d$kof[i] and d$kof[-i]  
## t = 7.852, df = 144.792, p-value = 8.377e-13  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 15.43027 25.81153  
## sample estimates:  
## mean of x mean of y   
## 79.91174 59.29084

# GDP per person

d$GDPP <- d$`GDP per Capita PPP for 2015`  
tst <- t.test(d$GDPP[i], d$GDPP[-i])  
tst

##   
## Welch Two Sample t-test  
##   
## data: d$GDPP[i] and d$GDPP[-i]  
## t = 6.3564, df = 119.919, p-value = 3.887e-09  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 13108.28 24968.97  
## sample estimates:  
## mean of x mean of y   
## 31365.32 12326.69

# GDP Total

d$GDPT <- d$`Total GDP, PPP, for 2015`  
tst <- t.test(d$GDPT[i], d$GDPT[-i])  
tst

##   
## Welch Two Sample t-test  
##   
## data: d$GDPT[i] and d$GDPT[-i]  
## t = 2.7529, df = 64.254, p-value = 0.007671  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 3.322447e+11 2.089684e+12  
## sample estimates:  
## mean of x mean of y   
## 1.411332e+12 2.003671e+11

# Regulation

tst <- t.test(d$RegulatoryQuality[i], d$RegulatoryQuality[-i])  
tst

##   
## Welch Two Sample t-test  
##   
## data: d$RegulatoryQuality[i] and d$RegulatoryQuality[-i]  
## t = 10.8786, df = 113.355, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 1.078728 1.559105  
## sample estimates:  
## mean of x mean of y   
## 0.7858766 -0.5330397

# Governance

tst <- t.test(d$GovernmentEffectiveness[i], d$GovernmentEffectiveness[-i])  
tst

##   
## Welch Two Sample t-test  
##   
## data: d$GovernmentEffectiveness[i] and d$GovernmentEffectiveness[-i]  
## t = 11.4137, df = 115.719, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 1.129970 1.604496  
## sample estimates:  
## mean of x mean of y   
## 0.8291092 -0.5381241