

# Jonckherhee Terpstra Test on Prevalence

2023-07-05

Test on the trends in prevalence

Exploratory data analysis Jonckheere-Terpstra is a nonparametric test based on ranks to detect trends in the data from multiple timepoints

The null hypothesis ( $H_0$ ) I am testing is that we have a significant decreasing trend in the prevalence data.

I will perform the test for both sexes, men and women

Overall prevalence

```
# Sample data
data <- data.frame(t(data_b)) #####BOTH
covariate <- data

# Compute the differences between consecutive timepoints
differences <- covariate[, -1] - covariate[, -ncol(covariate)]

# Count the number of positive and negative differences
pos_diff <- sum(differences > 0)
neg_diff <- sum(differences < 0)

# Perform the Jonckheere-Terpstra test
result <- JonckheereTerpstraTest(covariate[, -1], nperm=10000, alternative=c('decreasing'))
```

```
## Warning in JonckheereTerpstraTest.default(covariate[, -1], nperm = 10000, : Sample size > 100 or data
## p-value based on normal approximation. Specify nperm for permutation p-value
```

```
# Print the results
cat("Jonckheere-Terpstra Test:\n")
```

```
## Jonckheere-Terpstra Test:
```

```
cat("Test statistic:", result$statistic, "\n")
```

```
## Test statistic: 11743
```

```
cat("p-value:", result$p.value, "\n")
```

```
## p-value: 1e-04
```

```

# Interpret the results
if (result$p.value < 0.05) {
  cat("There is a significant decreasing trend in the covariate across the timepoints.\n")
} else {
  cat("There is no significant trend in the covariate across the timepoints.\n")
}

```

```
## There is a significant decreasing trend in the covariate across the timepoints.
```

Male prevalence

```

# Sample data
data <- data.frame(t(data_m)) ###MALES
covariate <- data

# Compute the differences between consecutive timepoints
differences <- covariate[, -1] - covariate[, -ncol(covariate)]

# Count the number of positive and negative differences
pos_diff <- sum(differences > 0)
neg_diff <- sum(differences < 0)

# Perform the Jonckheere-Terpstra test
result <- JonckheereTerpstraTest(covariate[, -1], nperm=10000, alternative=c('decreasing'))

```

```
## Warning in JonckheereTerpstraTest.default(covariate[, -1], nperm = 10000, : Sample size > 100 or data
## p-value based on normal approximation. Specify nperm for permutation p-value
```

```

# Print the results
cat("Jonckheere-Terpstra Test:\n")

```

```
## Jonckheere-Terpstra Test:
```

```
cat("Test statistic:", result$statistic, "\n")
```

```
## Test statistic: 11981.5
```

```
cat("p-value:", result$p.value, "\n")
```

```
## p-value: 1e-04
```

```

# Interpret the results
if (result$p.value < 0.05) {
  cat("There is a significant decreasing trend in the covariate across the timepoints.\n")
} else {
  cat("There is no significant trend in the covariate across the timepoints.\n")
}

```

```
## There is a significant decreasing trend in the covariate across the timepoints.
```

Female prevalence

```
# Sample data
data <- data.frame(t(data_f)) ###FEMALES
covariate <- data

# Compute the differences between consecutive timepoints
differences <- covariate[, -1] - covariate[, -ncol(covariate)]

# Count the number of positive and negative differences
pos_diff <- sum(differences > 0)
neg_diff <- sum(differences < 0)

# Perform the Jonckheere-Terpstra test

# Perform the Jonckheere-Terpstra test
result <- JonckheereTerpstraTest(covariate[, -1], nperm=10000, alternative=c('decreasing'))
```

```
## Warning in JonckheereTerpstraTest.default(covariate[, -1], nperm = 10000, : Sample size > 100 or data
## p-value based on normal approximation. Specify nperm for permutation p-value
```

```
cat("Jonckheere-Terpstra Test:\n")
```

```
## Jonckheere-Terpstra Test:
```

```
cat("Test statistic:", result$statistic, "\n")
```

```
## Test statistic: 12555.5
```

```
cat("p-value:", result$p.value, "\n")
```

```
## p-value: 2e-04
```

Interpret the results

```
if (result$p.value < 0.05) {
  cat("There is a significant decreasing trend in the covariate across the timepoints.\n")
} else {
  cat("There is no significant trend in the covariate across the timepoints.\n")
}
```

```
## There is a significant decreasing trend in the covariate across the timepoints.
```