

BuyseTest: Assessing a treatment effect based on multiple outcomes using generalized pairwise comparisons

Brice Ozenne, Julien Peron, . . . , Marc Buyse

December 22, 2017

```
library(BuyseTest)
```

1 Functionalities

Function	effect
simulBT	simulate outcomes for two groups of observations.
powerBT	power analysis using GPC.
constStrata	create a single strata variable from several categorical variables.
BuyseTest	perform GPC computations.
summary	display the output from GPC.
sensitivityBT	sensitivity analysis on choice of the thresholds of the GPC.

2 Thresholds of clinical relevance

2.1 Binary outcomes

Thresholds are not relevant for binary variables. This is why it is not possible to specify them through the formula interface.

Internally, since binary outcomes are treated as continuous outcomes, any threshold strictly small than 1 and strictly greater than 0 would be valid. However to avoid confusion with the continuous case, only thresholds equaling 1/2 are accepted. Specifying NA is also possible; in such case the threshold will be automatically converted to 1/2.

```
BuyseTest:::initThreshold(threshold = NA, type = 1, D = 1, endpoint = c("Y1"))
```

[1] 0.5

This is because if $Y = 1$ and $X = 0$ then $|Y - X| \geq 1/2$ while if $Y = X$ then $|Y - X| \leq 1/2$.

2.2 Continuous and time to event outcomes

Threshold for continuous outcomes must be strictly positive. Whenever a threshold is set to 0, it will be automatically reassigned to 10^{-12} :

```
BuyseTest:::initThreshold(threshold = 0, type = 2, D = 1, endpoint = c("Y1"))
```

```
[1] 1e-12
```

This ensure that when $Y = 1$ and $X = 1.01$ then $|Y - X| \geq \tau = 10^{-12}$ while whenever $Y = X$ then $|Y - X| \leq \tau = 10^{-12}$

2.3 Time to event variables

- cannot have twice the same pair (threshold, outcome)
- thresholds corresponding to time to event variables must be decreasing

```
[1] 5e-01 1e-12 1e-12
```

3 Diagram



Hello World!