Package 'WinsCRT'

June 18, 2026

Title Win Statistics Inference for Cluster-Randomized Trials

Version 0.1.0

Description Provides estimation and inference for win statistics in cluster-randomized trials with prioritized (hierarchical) composite outcomes. Supported summaries include the win ratio, win odds, net benefit, and desirability of outcome ranking (DOOR), with variance estimation and testing procedures that account for within-cluster correlation. Methods are described in the accompanying manuscript (2026) <doi:10.48550/arXiv.2604.18341>.

License GPL-3

Encoding UTF-8

Depends R (>= 2.10)

Imports Rcpp, stats

LinkingTo Rcpp

RoxygenNote 7.3.2

NeedsCompilation yes

Author Xi Fang [aut, cre],
Fan Li [aut]

Maintainer Xi Fang <x.fang@yale.edu>

Repository CRAN

Date/Publication 2026-06-18 13:40:07 UTC

Contents

dat — *Example prioritized event-log dataset*

Description

`dat` is an example longitudinal event-log dataset for demonstrating `WinsCRT()`.

Usage

```
data(dat)
```

Format

A data frame with columns `clu`, `id`, `trt`, `t`, `st`.

Details

Status coding convention:

- `st` = `0`: censoring / terminal no event
- positive integers denote event types
- larger positive value indicates higher priority

Columns:

- `clu`: cluster ID
- `id`: subject ID within cluster
- `trt`: cluster treatment indicator (0/1)
- `t`: event/censoring time
- `st`: event status / priority code

WinsCRT — *WinsCRT: Win-statistics inference for CRT prioritized event logs*

Description

Computes one requested estimand and performs inference using one requested method. Input must be longitudinal event-log data with cluster-level treatment.

Status convention:

- status = 0 means censor/no event
- for positive statuses, larger value means higher priority (smaller value means lower priority)

Usage

```
WinsCRT(
  data,
  cluster,
  subject,
  trt,
  time,
  status,
  method = c("wald_score", "wald_u", "wald_jk", "perm", "fs", "jel"),
  estimand = c("WD", "WR", "WO", "DOOR"),
  null = NULL,
  alternative = c("two.sided", "greater", "less"),
  alpha = 0.05,
  use_t = TRUE,
  B = 2000L,
  seed = NULL,
  keep = NULL,
  strict = TRUE
)
```

Arguments

data	data.frame in long event-log format.
cluster	character: cluster id column.
subject	character: subject id column.
trt	character: treatment column (0/1), constant within cluster.
time	character: event/censoring time column (numeric).
status	character: status/priority column (integer >=0).
method	one of "wald_score","wald_u","wald_jk","perm","fs","jel".
estimand	one of "WD","WR","WO","DOOR".
null	optional null value; default is canonical by estimand.
alternative	"two.sided","greater","less" where applicable.
alpha	confidence level is 1-alpha (default 0.05).
use_t	logical; t-reference where implemented.
B	integer; resamples for perm and optional fs randomization p-value.
seed	optional integer seed.
keep	optional vector of cluster IDs to include.
strict	logical passed to C++ kernels.

Value

Object of class "WinsCRT".

Examples

```
ex_dat <- data.frame(
  clu = rep(1:4, each = 2),
  id = rep(1:2, times = 4),
  trt = rep(c(0, 0, 1, 1), each = 2),
  t = c(5, 4, 6, 7, 6, 5, 7, 8),
  st = c(0, 1, 0, 1, 0, 1, 0, 1)
)

fit <- WinsCRT(
  data = ex_dat,
  cluster = "clu",
  subject = "id",
  trt = "trt",
  time = "t",
  status = "st",
  method = "perm",
  estimand = "WD",
  B = 19L,
  seed = 1
)
fit
summary(fit)
```

Index