Package 'CATTexact'

January 20, 2025

Type Package

Title Computation of the p-Value for the Exact Conditional Cochran-Armitage Trend Test

Version 0.1.1

Description
Provides functions for computing the one-sided p-values of the Cochran-Armitage trend test statistic for the asymptotic and the exact conditional test. The computation of the p-value for the exact test
is performed using an algorithm following an idea by Mehta, et al. (1992) <doi:10.2307/1390598>.

Depends R (>= 3.6.0)

License GPL-2 | GPL-3

LazyData TRUE

RoxygenNote 7.0.2

Suggests testthat

NeedsCompilation no

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Repository CRAN

Date/Publication 2020-06-25 15:40:14 UTC

Contents

catt_asy *Asymptotic Cochran-Armitage trend test*

Description

catt_asy calculates the Cochran-Armitage trend test statistic (Cochran (1954), Armitage (1955)) and the one-sided p-value for the corresponding asymptotic test. The exact form of used test statistic can be found in the paper by Portier and Hoel (1984).

Usage

```
catt_asy(dose.ratings, totals, cases)
```

Arguments

dose.ratings	A vector of dose ratings, the i-th entry corresponds to the dose-rating of the i-th group. This vector must be strictly monotonically increasing
totals	The vector of total individuals per group, the i-th entry corresponds to the total number of individuals in the i-th group
cases	The vector of incidences per groups, the i-th entry corresponds to the number of incidences in the i-th group

Value

A list containing the value of the Cochran-Armitage Trend Test Statistic and its asymptotic p-value.

References

Armitage, P. Tests for linear trends in proportions and frequencies. *Biometrics*, 11 (1955): 375-386.

Cochran, W. G. Some methods for strengthening the common χ^2 tests, *Biometrics*. 10 (1954): 417-451.

Portier, C., and Hoel D. Type 1 error of trend tests in proportions and the design of cancer screens. *Communications in Statistics-Theory and Methods*, 13 (1984): 1-14.

Examples

```
d <- c(1,2,3,4)
n <- rep(20,4)
r <- c(1,4,3,8)

catt_asy(d, n, r)
```

catt_exact *Conditional exact Cochran-Armitage trend test*

Description

catt_exact calculates the Cochran-Armitage trend test statistic (Cochran (1954), Armitage (1955)) and the one-sided p-value for the corresponding conditional exact test. The conditional exact test has been established by Williams (1988). The computation of its p-value is performed using an algorithm following an idea by Mehta, et al. (1992).

Usage

```
catt_exact(dose.ratings, totals, cases)
```

Arguments

dose.ratings	A vector of dose ratings, the i-th entry corresponds to the dose-rating of the i-th group. This vector must be strictly monotonically increasing
totals	The vector of total individuals per group, the i-th entry corresponds to the total number of individuals in the i-th group.
cases	The vector of incidences per groups, the i-th entry corresponds to the number of incidences in the i-th group.

Value

A list containing the value of the Cochran-Armitage Trend Test Statistic, its exact and asymptotic p-value.

References

Armitage, P. Tests for linear trends in proportions and frequencies. *Biometrics*, 11 (1955): 375-386.

Cochran, W. G. Some methods for strengthening the common χ^2 tests, *Biometrics*. 10 (1954): 417-451.

Mehta, C. R., Nitin P., and Pralay S. Exact stratified linear rank tests for ordered categorical and binary data. *Journal of Computational and Graphical Statistics*, 1 (1992): 21-40.

Portier, C., and Hoel D. Type 1 error of trend tests in proportions and the design of cancer screens. *Communications in Statistics-Theory and Methods*, 13 (1984): 1-14.

Williams, D. A. Tests for differences between several small proportions. *Applied Statistics*, 37 (1988): 421-434.

Examples

```
d <- c(1,2,3,4)
n <- rep(20,4)
r <- c(1,4,3,8)

catt_exact(d, n, r)
```

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