

# Package ‘rateratio.test’

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**Type** Package

**Title** Exact rate ratio test

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**Depends** R (>= 2.4.1), stats

**Description** A function which performs exact rate ratio tests and returns an object of class htest.

**License** GPL

**NeedsCompilation** no

**Repository** CRAN

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rateratio.test      *An Exact Rate Ratio Test Assuming Poisson Counts*

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### Description

Performs the uniformly most powerful unbiased test on the ratio of rates of two Poisson counts with given time (e.g., persons-years) at risk for each count.

### Usage

```
rateratio.test(x, n, RR = 1,
               alternative = c("two.sided", "less", "greater"),
               conf.level = 0.95)
```

### Arguments

|             |   |
|-------------|---|
| x           | a vector of length 2 with counts for the two rates  |
| n           | a vector of length 2 with time at risk in each rate   |
| RR          | the null rate ratio (two.sided) or the rate ratio on boundary between null and alternative  |
| alternative | a character string specifying the alternative hypothesis, must be one of "two.sided" (default), "greater" or "less". You can specify just the initial letter. |
| conf.level  | confidence level of the returned confidence interval. Must be a single number between 0 and 1.  |

### Details

The `rateratio.test` tests whether the ratio of the first rate (estimated by  $x[1]/n[1]$ ) over the second rate (estimated by  $x[2]/n[2]$ ) is either equal to, less, or greater than `RR`. Exact confidence intervals come directly from `binom.test`. The two-sided p-value is defined as either 1 or twice the minimum of the one-sided p-values. See Lehmann (1986, p. 152) or `vignette("rateratio.test")`.

For full discussion of the p-value and confidence interval consistency of inferences, see Fay (2010) and `exactci` package.

### Value

An object of class 'htest' containing the following components:

|             |  |
|-------------|--|
| p.value     | the p-value of the test  |
| estimate    | a vector with the rate ratio and the two individual rates                                  |
| null.value  | the null rate ratio (two.sided) or the rate ratio on boundary between null and alternative |
| conf.int    | confidence interval  |
| alternative | type of alternative hypothesis   |
| method      | description of method  |
| data.name   | description of data  |

**Note**

Much of the error checking code was taken from prop.test.

**Author(s)**

Michael Fay

**References**

Fay, M. P. (2010). Two-sided exact tests and matching confidence intervals for discrete data. R Journal, 2(1), 53-58.

Lehmann, E.L. (1986). Testing Statistical Hypotheses (second edition). Wadsworth and Brooks/Cole, Pacific Grove, California.

**See Also**

[prop.test](#), [binom.test](#)

**Examples**

```
### p values and confidence intervals are defined the same way
### so there is consistency in inferences
rateratio.test(c(2,9),c(17877,16660))
### Small counts and large time values will give results similar to Fisher's exact test
### since in that case the rate ratio is approximately equal to the odds ratio
### However, for the Fisher's exact test, the two-sided p-value is defined differently from
### the way the confidence intervals are defined and may imply different inferences
### i.e., p-value may say reject OR=1, but confidence interval says not to reject OR=1
fisher.test(matrix(c(2,9,17877-2,16660-9),2,2))
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