

# Package ‘rateratio.test’

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**Type** Package

**Title** Exact Rate Ratio Test

**Version** 1.1

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

**Description** Performs exact rate ratio tests.

**License** GPL-3

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

## Usage

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

**Arguments**

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

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

See [poisson.exact](#) in the [exactci](#) package, which gives the same 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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