

# Package ‘orsk’

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**Type** Package

**Title** Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information

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**Description** Convert odds ratio to relative risk in cohort studies with partial data information (Wang (2013) <[doi:10.18637/jss.v055.i05](https://doi.org/10.18637/jss.v055.i05)>).

**Imports** BB, BHH2

**Suggests** setRNG

**License** GPL (>= 2)

**LazyLoad** yes

**NeedsCompilation** yes

**Repository** CRAN

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## R topics documented:

orsk . . . . .	2
zy . . . . .	4
<b>Index</b>	<b>5</b>

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orsk *Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information*

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## Description

Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information

## Usage

```
orsk(nctr, ntrt, a=NA, al=NA, au=NA, level = 0.95, type="two-sided",
method = c("grid","optim"), d=1e-4)
## S3 method for class 'orsk'
plot(x, type=c("RR", "OR"), digits=2, factor=1, amount=NULL, ...)
## S3 method for class 'orsk'
print(x, ...)
## S3 method for class 'orsk'
summary(object, nlist=1:5, ...)
```

## Arguments

nctr	sample size of control group from a published study
ntrt	sample size of treatment group from a published study
a	estimated odds ratio from a published study
al	lower bound of confidence interval from a published study
au	upper bound of confidence interval from a published study
level	level of confidence interval with default 95%
method	method for converting the odds ratio to the relative risk with default value "grid"
d	threshold value (delta in the vignette) to filter out solutions if sum of squares > d. Only used with method="grid"
type	type of the objective function with default value "two-sided"; or the type of risk to be plotted. For type="RR", distribution of relative risk among scenarios for which the calculated odds ratio and confidence interval coincide with the published values. For type="OR", distribution of risk of the outcome among scenarios for which the calculated odds ratio and confidence interval coincide with the published values.
x	object of class orsk
object	object of class orsk
nlist	maximum number of solutions displayed
digits	rounding accuracy for all the numbers given in the published study, with default value 2
factor, amount	arguments for scatter plot, see ?jitter function
...	additional arguments for print, summary.

## Details

Investigators of medical and epidemiological studies are often interested in comparing a risk of a binary outcome between a treatment and control group, or between exposed and unexposed. Such an outcome can be an onset of a disease or a dichotomized length of labor duration.

From a published study, suppose we are given the information on sample size of control group `nctr`, sample size of treatment group `ntrt`, estimated odds ratio `a`, and confidence interval (`al`, `au`), how to estimate the relative risk, when the original 2 by 2 contingency table is not directly available? Two methods are proposed to estimate the cells of the contingency table, and to estimate the relative risk.

## Value

An object of class `orsk` is returned. The algorithm estimates the number of outcome in control group `ctr_yes`, number of outcome free in control group `ctr_no`, number of outcome in treatment group `trt_yes` and number of outcome free in treatment group `trt_no`. Also the results include the corresponding estimated odds ratio with confidence interval, and relative risk and confidence interval, based on the estimated contingency table.

## Author(s)

Zhu Wang

## References

Wang, Zhu (2013). Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information. *Journal of Statistical Software*, 55(5), 1–11.  
doi: [10.18637/jss.v055.i05](https://doi.org/10.18637/jss.v055.i05)

Morris, J.A. and Gardner, MJ (1988). Calculating confidence intervals for relative risks (odds ratios) and standardised ratios and rates. *British Medical Journal*, 296(6632), 1313–1316.

## Examples

```
## Not run:
res1 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, au= 3.03, method="grid")
summary(res1)
res2 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, au= 3.03, method="optim")
summary(res2)
res3 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, type="lower", method="grid")
summary(res3)
res4 <- orsk(nctr=1636, ntrt=2601, a=2.61, au=3.03, type="upper", method="grid")
summary(res4)
res5 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, au=3.03, type="ci-only",
method="grid")
summary(res5)

## End(Not run)
```

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zy

*Estimating the Relative Risk Based on the Odds Ratio*

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### Description

Estimating the relative risk based on the (adjusted) Odds Ratio from multiple logistic regression or other multiple regression models. The method was based on Zhang and Yu (JAMA, 1998)

### Usage

```
zy(risk, oddsratio)
```

### Arguments

risk	the risk rate of having a positive outcome in the control or unexposed group
oddsratio	odds ratio estimated from multiple logistic regression or other multiple regression models

### Details

Primarily for the adjusted odds ratio, the estimated relative risk is given by:  
$$\text{odds ratio} / (1 - \text{risk} + \text{risk} * \text{odds ratio})$$

### Value

the estimated relative risk

### Author(s)

Zhu Wang

### References

Zhang J, Yu KF (1998). What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA*, 280(19), 1690-1.

### Examples

```
zy(risk=0.18, oddsratio=2.25)
```

# Index

\* **odds ratio**

orsk, [2](#)

zy, [4](#)

\* **relative risk**

orsk, [2](#)

zy, [4](#)

orsk, [2](#)

plot.orsk (orsk), [2](#)

print.orsk (orsk), [2](#)

summary.orsk (orsk), [2](#)

zy, [4](#)