

# Package ‘orsk’

March 18, 2026

**Type** Package

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

**Version** 1.0-9

**Date** 2026-03-18

**Author** Zhu Wang [aut, cre] (ORCID: <<https://orcid.org/0000-0002-0773-0052>>)

**Maintainer** Zhu Wang <[zwang145@uthsc.edu](mailto:zwang145@uthsc.edu)>

**Description** Reconstructs plausible 2 by 2 contingency tables from published cohort-study summaries when the original cell counts are unavailable. Given group sample sizes and an odds ratio with partial confidence interval information, the package searches for compatible event counts, then derives corresponding relative risks and confidence intervals. It implements the methods described in Wang (2013) <[doi:10.18637/jss.v055.i05](https://doi.org/10.18637/jss.v055.i05)> and includes summary and plotting methods for reviewing admissible scenarios.

**Imports** BB

**Suggests** setRNG

**License** GPL (>= 2)

**LazyLoad** yes

**NeedsCompilation** yes

**Repository** CRAN

**Date/Publication** 2026-03-18 17:50:02 UTC

## Contents

|                |   |
|----------------|---|
| orsk . . . . . | 2 |
| zy . . . . .   | 4 |

|              |          |
|--------------|----------|
| <b>Index</b> | <b>5</b> |
|--------------|----------|

---

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

---

## 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)
```

---

zy

*Estimating the Relative Risk Based on the Odds Ratio*

---

### **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](#)