

# The catmap Package

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**Title** Case-control And Tdt Meta-Analysis Package

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**Description** catmap is an R package that conducts fixed-effects (inverse variance) and random-effects (DerSimonian and Laird, 1986) meta-analyses of case-control or family-based (TDT) genetic data; in addition, it performs meta-analyses combining these two types of study designs. The fixed-effects model was first described by Kazeem and Farrell (2005); the random-effects model is described in Nicodemus (submitted).

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## Description

catmap is an R package that conducts fixed-effects (inverse variance) and random-effects (DerSimonian and Laird, 1986) meta-analyses of case-control or family-based (TDT) genetic data; in addition, it performs meta-analyses combining these two types of study designs. The fixed-effects model was first described by Kazeem and Farrall (2005); the random-effects model is described in Nicodemus (submitted) and saves a text file to the current working directory of all results printed to screen (use `getwd()` to find `cwd`).

## Usage

```
catmapobject<-catmap(dataset, ci, printout, print.all)
```

## Arguments

|           |   |
|-----------|---|
| dataset   | A text file containing a header with the following column names: <b>name, study, t, nt, caserisk, controlrisk, casenotrisk, controlnotrisk</b> in tab-delimited format. Note that the header must be exactly as specified and that all cells in the table must have an entry, even if the entry is 0 or missing (NA). See for example: <code>data(catmapdata)</code> . <b>The dataset argument to catmap should be either the example data or a file containing the data for catmap, not an R object.</b> |
| ci        | The confidence level for confidence intervals; $0 < ci < 1$ . The default is 0.95   |
| printout  | Logical. Should a text file of the fixed- and random-effects models and Q statistic results be saved to the current working directory? Output files are saved with the default name of <b>dataset.output.txt</b> where dataset is the name of the file given as the first argument to catmap. Default = TRUE.   |
| print.all | Logical. Should individual-study ORs, CIs and weights be printed to screen and appended to <b>dataset.output.txt</b> ? Default = FALSE.   |

## Details

catmap is an R package that conducts fixed-effects (inverse variance) and random-effects (DerSimonian and Laird, 1986) meta-analyses of case-control or family-based (TDT) genetic data; in addition, it performs meta-analyses combining these two types of study designs. The fixed-effects model was first described by Kazeem and Farrall (2005); the random-effects model is described in Nicodemus (submitted). Cumulative meta-analyses over time and leave-one-out sensitivity analyses may be performed using either fixed- or random-effects estimates or both estimates may be calculated; both produce a .txt file and an optional .pdf plot as output. A funnel plot graphic is implemented; however, no formal test of publication bias is available (see Ioannidis & Trikalinos, 2007). If users request a file to be created containing the results the file will be saved to the current working directory, which users can find by using `>getwd()`. **Note that a catmap object must be created on the first call to catmap. If you do not create a catmap object you will not be able to use any of the other functions AND you will get a printout of the entire contents to screen**

**Author(s)**

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**See Also**

[catmap.forest](#), [catmap.sense](#), [catmap.cumulative](#), [catmap.funnel](#).

**Examples**

```
## Not run:
data(catmapdata)
#Incorrect usage: catmap(catmapdata, 0.95, TRUE, TRUE)
#Correct usage:
catmapobject1<-catmap(catmapdata, 0.95, TRUE, TRUE)
## End(Not run)
```

---

catmap.cumulative *Cumulative Meta-Analyses and Plots using either Fixed- or Random-Effects*

---

**Description**

catmap.cumulative conducts cumulative meta-analyses and creates plots of the ORs and confidence intervals using either fixed- or random-effects analyses, and saves text files and plot files to the current working directory (use getwd() to obtain the current working directory). The plots are not created in the R Graphics device.

**Usage**

```
catmap.cumulative(catmapobject, fe.cumulative, re.cumulative, fe.cumplot,
re.cumplot)
```

**Arguments**

catmapobject The catmap object created by a previous call to catmap

fe.cumulative

Logical. Should a cumulative meta-analysis be performed using fixed-effects estimates? catmap assumes the order in which the studies are listed is the chronological ordering. Automatic output result file is saved with the default name of **dataset.fixed.effects.cumulative.txt**, where dataset is the name of the file given as the first argument to catmap. Note that repeated runs of the same input file will be appended to the default output file.

re.cumulative

Logical. Should a cumulative meta-analysis be performed using random-effects estimates? catmap assumes the order in which the studies are listed is the chronological ordering. Automatic output result file is saved with the default name of **dataset.random.effects.cumulative.txt**, where dataset is the name of

the file given as the first argument to catmap. Note that repeated runs of the same input file will be appended to the default output file. Also note that random-effects estimates are undefined for a single study; calculations begin with the first 2 studies and then adds studies to them in a cumulative fashion. The OR and CI for the first study may be found using the fixed effects estimates.

- `fe.cumplot` Logical. Should a .pdf plot of the ORs and CIs from the cumulative meta-analysis using fixed-effects be output? Can be TRUE only if `fe.cumulative=TRUE`. Output plot file is saved with the default name of **dataset.fixed. effects.cumulative.plot.pdf** where dataset is the name of the file given as the first argument to catmap.
- `re.cumplot` Logical. Should a .pdf plot of the ORs and CIs from the cumulative meta-analysis using random-effects be output? Can be TRUE only if `re.cumulative=TRUE`. Output plot file is saved with the default name of **dataset.random. effects .cumulative.plot.pdf** where dataset is the name of the file given as the first argument to catmap.

### Details

`catmap.cumulative` conducts cumulative meta-analyses and creates .pdf files of plots of the ORs and CIs using either the fixed-effect or the random-effect estimates. **NOTE: The studies should be listed in chronological order in the input file. catmap.cumulative does not re-order studies by publication year.**

### Author(s)

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### See Also

[catmap](#), [catmap.forest](#), [catmap.sense](#), [catmap.funnel](#).

### Examples

```
## Not run:
data(catmapdata)
catmapobject1<-catmap(catmapdata, 0.95, TRUE)
catmap.cumulative(catmapobject1, TRUE, TRUE, TRUE, TRUE)
## End(Not run)
```

---

|                            |  |
|----------------------------|--|
| <code>catmap.forest</code> | <i>Forest Plots using either Fixed- or Random-Effects Pooled ORs and CIs</i> |
|----------------------------|--|

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### Description

`catmap.forest` creates forest plots of the individual study ORs and CIs and the fixed or random effects pooled OR and CI and saves them to the current working directory (use `getwd()` to view `cwd`). The plots are not created in the R Graphics device.

## Usage

```
catmap.forest(catmapobject, fe.forest, re.forest)
```

## Arguments

`catmapobject` The catmap object created by a previous call to `catmap`

`fe.forest` Logical. Should a forest plot be created using the fixed-effects estimates? Plots are saved with the default name of **dataset.fixed.effects.forest.pdf**, where `dataset` is the name of the file given as the first argument to `catmap`.

`re.forest` Logical. Should a forest plot be created using the random-effects estimates? Plots are saved with the default name of **dataset.random.effects.forest.pdf** where `dataset` is the name of the file given as the first argument to `catmap`.

## Details

`catmap.forest` creates forest plots of individual study ORs and CIs plus the pooled estimate of the fixed- or random-effects pooled OR and CI. Plots are not created in the R Graphics device window, but are instead saved to a .pdf file in the current working directory, which can be found using `getwd()`

## Author(s)

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## See Also

[catmap](#), [catmap.cumulative](#), [catmap.sense](#), [catmap.funnel](#).

## Examples

```
## Not run:
data(catmapdata)
catmapobject1<-catmap(catmapdata, 0.95, TRUE)
catmap.cumulative(catmapobject1, TRUE, TRUE, TRUE, TRUE)
## End(Not run)
```

---

`catmap.funnel` *Funnel Plots for catmap*

---

## Description

`catmap.funnel` creates a funnel plot of the individual ORs against the se and saves the file to the current working directory (use `getwd()` to view). The plots are not created in the R Graphics device.

## Usage

```
catmap.funnel(catmapobject, funnel)
```

**Arguments**

`catmapobject` The catmap object created by a previous call to `catmap`

`funnel` Logical. Should a funnel plot be produced? Funnel plots plot standard error of the log ORs against the ORs along with a solid line at 1.0 and a dotted line at the overall pooled OR. Used to assess publication bias. Output plot file is saved with the default name of **dataset.funnel.plot.pdf** where dataset is the name of the file given as the first argument to `catmap`.

**Details**

`catmap.funnel` creates a .pdf file of the funnel plot. Plots are not created in the R Graphics device window, but are instead saved to a .pdf file in the current working directory.

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**See Also**

[catmap](#), [catmap.sense](#), [catmap.cumulative](#), [catmap.forest](#).

**Examples**

```
## Not run:
data(catmapdata)
catmapobject1<-catmap(catmapdata, 0.95, TRUE)
catmap.funnel(catmapobject1, TRUE)
## End(Not run)
```

---

|                           |   |
|---------------------------|---|
| <code>catmap.sense</code> | <i>Leave-One-Out Sensitivity Analyses and Plots using either Fixed- or Random-Effects Estimates</i> |
|---------------------------|---|

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**Description**

`catmap.sense` conducts leave-one-out sensitivity analyses and creates plots of the ORs and confidence intervals using either fixed- or random-effects analyses, which are saved to the current working directory (use `getwd()` to view) but does not create the plots in the R Graphics device.

**Usage**

```
catmap.sense(catmapobject, fe.sense, re.sense, fe.senseplot, re.senseplot)
```

## Arguments

- `catmapobject` The `catmap` object created by a previous call to `catmap`
- `fe.sense` Logical. Should a leave-one-out sensitivity analysis be performed using fixed-effects estimates? Automatic output result files are saved with the default name of **dataset.fixed.effects.sensitivity.txt**, where `dataset` is the name of the file given as the first argument to `catmap`. Note that repeated runs of the same input file will be appended to the default output file names.
- `re.sense` Logical. Should a leave-one-out sensitivity analysis be performed using random-effects estimates? Automatic output result files are saved with the default name of **dataset.random.effects.sensitivity.txt**, where `dataset` is the name of the file given as the first argument to `catmap`. Note that repeated runs of the same input file will be appended to the default output file names.
- `fe.senseplot` Logical. Should a .pdf plot of the ORs and CIs from the sensitivity analysis using fixed-effects be output? Can be TRUE only if `fe.sense=TRUE`. Output plot file is saved with the default name of **dataset.fixed.effects.sensitivity.plot.pdf** where `dataset` is the name of the file given as the first argument to `catmap`.
- `re.senseplot` Logical. Should a .pdf plot of the ORs and CIs from the sensitivity analysis using random-effects be output? Can be TRUE only if `re.sense=TRUE`. Output plot file is saved with the default name of **dataset.random.effects.sensitivity.plot.pdf** where `dataset` is the name of the file given as the first argument to `catmap`.

## Details

`catmap.sense` conducts leave-one-out sensitivity analyses and creates .pdf files of plots of the ORs and CIs using either the fixed-effect or the random-effect estimates. Plots are not created in the R Graphics device window, but are instead saved to a .pdf file in the current working directory. Likewise the .txt files of results will be saved to the current working directory. To find the current working directory, use `getwd()`

## Author(s)

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## See Also

[catmap](#), [catmap.forest](#), [catmap.cumulative](#), [catmap.funnel](#).

## Examples

```
## Not run:
data(catmapdata)
catmapobject1<-catmap(catmapdata, 0.95, TRUE)
catmap.sense(catmapobject1, TRUE, TRUE, TRUE, TRUE)
## End(Not run)
```

---

`catmapdata`*An example data frame for use with catmap*

---

### Description

A file for use with `catmap` containing simulated data.

### Usage

```
data(catmapdata)
```

### Format

A data frame with 5 observations on the following 8 variables.

**name** a factor with study name and optionally year of publication. NOTE: if year of publication is included there must be no space between study name and year. A comma or underscore work nicely. Example: `Abrams, 2001 Peter, 2002 Todd, 2003 Wei, 2007 Yu, 2007`

**study** a numeric vector containing 1 if study is TDT and 2 if case-control

**t** a numeric vector containing counts of alleles transmitted in TDT study

**nt** a numeric vector containing counts of alleles not transmitted in TDT study

**caserisk** a numeric vector containing counts of risk alleles in cases

**controlrisk** a numeric vector containing counts of risk alleles in controls

**casenotrisk** a numeric vector containing counts of non-risk alleles in cases

**controlnotrisk** a numeric vector containing counts of non-risk alleles in controls

### Details

The header must be part of the file and either 0 or NA must be included for data not relevant for the particular study. For example, using a TDT study the `caserisk`, `controlrisk`, `casenotrisk` and `controlnotrisk` must have values of either 0 or NA.

### Author(s)

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### See Also

[catmap.forest](#), [catmap.sense](#), [catmap.cumulative](#), [catmap.funnel](#).

### Examples

```
data(catmapdata)
```

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