Exploring the metafor package for meta-analysis

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Authors

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Documentation in Vignettes

An Introduction is presented in vignettes, expecially in the root directory:

metafor/Conducting Meta-Analyses in R with the metafor.pdf

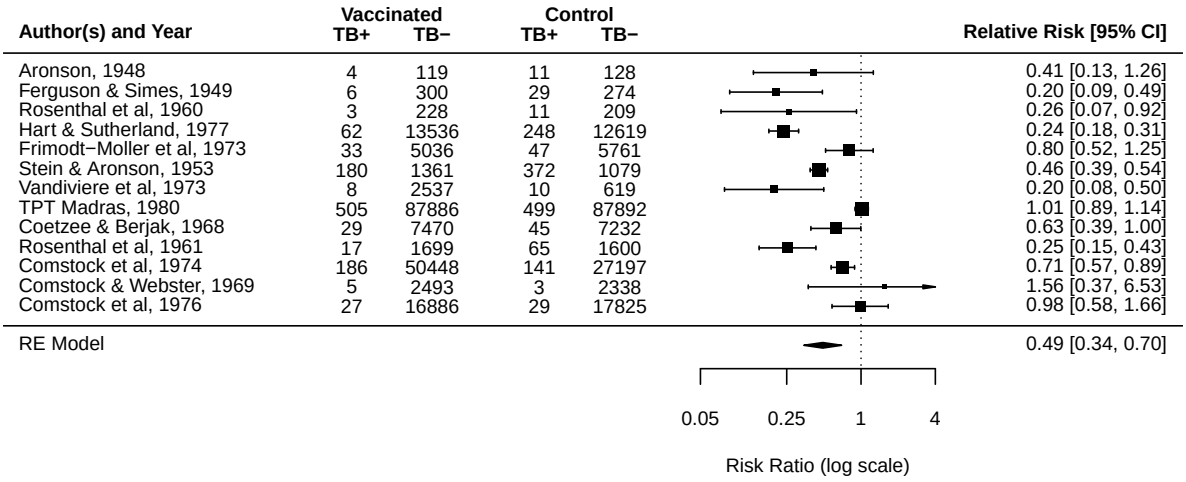
```
browseVignettes("metafor")
```

Reproducing the example

trial	author	year	tpos	tneg	cpos	cneg	ablat	alloc	yi	vi
1	Aronson	1948	4	119	11	128	44	random	-0.8893113	0.3255848
2	Ferguson & Simes	1949	6	300	29	274	55	random	-1.5853887	0.1945811
3	Rosenthal et al	1960	3	228	11	209	42	random	-1.3480731	0.4153680
4	Hart & Sutherland	1977	62	13536	248	12619	52	random	-1.4415512	0.0200100
5	Frimodt-Moller et al	1973	33	5036	47	5761	13	alternate	-0.2175473	0.0512102
6	Stein & Aronson	1953	180	1361	372	1079	44	alternate	-0.7861156	0.0069056
7	Vandiviere et al	1973	8	2537	10	619	19	random	-1.6208982	0.2230172
8	TPT Madras	1980	505	87886	499	87892	13	random	0.0119523	0.0039616
9	Coetzee & Berjak	1968	29	7470	45	7232	27	random	-0.4694176	0.0564342
10	Rosenthal et al	1961	17	1699	65	1600	42	systematic	-1.3713448	0.0730248
11	Comstock et al	1974	186	50448	141	27197	18	systematic	-0.3393588	0.0124122
12	Comstock & Webster	1969	5	2493	3	2338	33	systematic	0.4459134	0.5325058
13	Comstock et al	1976	27	16886	29	17825	33	systematic	-0.0173139	0.0714047

```
##
## Random-Effects Model (k = 13; tau^2 estimator: REML)
##
## tau^2 (estimated amount of total heterogeneity): 0.3132 (SE = 0.1664)
## tau (square root of estimated tau^2 value):      0.5597
## I^2 (total heterogeneity / total variability):   92.22%
## H^2 (total variability / sampling variability):  12.86
##
## Test for Heterogeneity:
## Q(df = 12) = 152.2330, p-val < .0001
##
## Model Results:
##
## estimate      se     zval    pval    ci.lb    ci.ub
##  -0.7145  0.1798  -3.9744  <.0001  -1.0669  -0.3622  ***
```

```
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```



Cochrane review analysis Regional Anesthesia for Persistent Pain

We import and clean the data extracted during the systematic review and save it as a .Rdata file

```
library(readxl)
ACE151_raw <- read_excel("C:/Users/mandreae/Dropbox/Cochrane/revision 2014/Updated Search 2016/Overview c
save(ACE151_raw, file="data/ACE151_raw.Rdata")
rm(ACE151_raw)
```

Import and clean Breast Data

```
library(tidyverse)
load(file="data/ACE151_raw.Rdata")
ACE151_Breast <- ACE151_raw %>%
  filter(`Surgery Group` == "Breast") %>%
  transmute(author = factor(Author),
            year = Year,
            regional = factor(`Anesthesia Technique`),
            endpoint =as.numeric(`Follow Up (months)`),
            ai = as.numeric(`Events (experimental group)`),
            bi = as.numeric(`N (experimental group)`) - ai,
            ci = as.numeric(`Events (control group)`),
            di = as.numeric(`N (control group)`) - ci,
            singleshot = as.factor(`Single Shot or Continuous`))

kable(ACE151_Breast)
```

```r
save(ACE151_Breast, file = "results/ACE151_Breast.Rdata")
rm(ACE151_raw, ACE151_Breast)
```

Compute Breast data

Computing OR for breast studies with follow up at 3 months yields the same results as in Revman.

```
##
## Random-Effects Model (k = 11; tau^2 estimator: REML)
##
## tau^2 (estimated amount of total heterogeneity): 0.6112 (SE = 0.4185)
## tau (square root of estimated tau^2 value):      0.7818
## I^2 (total heterogeneity / total variability):   70.20%
## H^2 (total variability / sampling variability):  3.36
##
## Test for Heterogeneity:
## Q(df = 10) = 35.3643, p-val = 0.0001
##
## Model Results:
##
## estimate      se     zval    pval    ci.lb    ci.ub
##  -1.0800  0.2943  -3.6702  0.0002  -1.6568  -0.5033  ***
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```