MV

NLP

7/18/2017

This analysis was performed on Fri Jul 28 15:11:43 2017.

This analysis used the metafor package (list(title = “Conducting meta-analyses in {R} with the {metafor} package”, author = list(list(given = “Wolfgang”, family = “Viechtbauer”, role = NULL, email = NULL, comment = NULL)), journal = “Journal of Statistical Software”, year = “2010”, volume = “36”, number = “3”, pages = “1–48”, url = “http://www.jstatsoft.org/v36/i03/”)).

This analysis used the R platform (list(title = “R: A Language and Environment for Statistical Computing”, author = list(list(given = “R Core Team”, family = NULL, role = NULL, email = NULL, comment = NULL)), organization = “R Foundation for Statistical Computing”, address = “Vienna, Austria”, year = “2017”, url = “https://www.R-project.org/”)).

Dataset

```
##           studyName  mean    sd   n group        yi           vi
## 1        Arici 2009 35.73  5.24  27   Exp  3.575991 7.965862e-04
## 2        Arici 2009 62.93  8.67  27   Ctl  4.142023 7.030059e-04
## 3       Arslan 2011  4.25  2.03  20   Exp  1.446919 1.140734e-02
## 4       Arslan 2011 11.25  5.03  20   Ctl  2.420368 9.995417e-03
## 5       Arslan 2013  5.15  4.29 100   Exp  1.638997 6.939052e-03
## 6       Arslan 2013  9.10  4.68 100   Ctl  2.208274 2.644898e-03
## 7      Aydogan 2008  0.27  0.08  40   Exp -1.309333 2.194787e-03
## 8      Aydogan 2008  0.35  0.09  40   Ctl -1.049822 1.653061e-03
## 9        Cakan 2008 11.00  2.00  20   Exp  2.397895 1.652893e-03
## 10       Cakan 2008 12.00  2.00  20   Ctl  2.484907 1.388889e-03
## 11       Cobby 1999 35.00 20.40  24   Exp  3.555348 1.415510e-02
## 12       Cobby 1999 54.90 28.30  21   Ctl  4.005513 1.265345e-02
## 13        Dahl 1997 21.20  7.88  22   Exp  3.054001 6.279977e-03
## 14        Dahl 1997 18.70  5.90  21   Ctl  2.928524 4.740253e-03
## 15      Dilmen 2010 18.10 13.93  20   Exp  2.895912 2.961523e-02
## 16      Dilmen 2010 30.00 11.32  19   Ctl  3.401197 7.493708e-03
## 17      Durmus 2007 30.50 11.55  25   Exp  3.417727 5.736200e-03
## 18      Durmus 2007 42.74 12.33  25   Ctl  3.755135 3.329025e-03
## 19        Emir 2010  7.65  0.78  30   Exp  2.034706 3.465334e-04
## 20        Emir 2010 13.80  2.26  30   Ctl  2.624669 8.939999e-04
## 21       Fayaz 2004 12.00  6.00  17   Exp  2.484907 1.470588e-02
## 22       Fayaz 2004 22.00 13.00  17   Ctl  3.091042 2.053962e-02
## 23      Jokela 2010 38.85 16.80  40   Exp  3.659708 4.674945e-03
## 24      Jokela 2010 45.15 18.90  40   Ctl  3.809990 4.380746e-03
## 25     Khalili 2013  3.00  2.28  25   Exp  1.098612 2.310400e-02
## 26     Khalili 2013  4.20  1.57  25   Ctl  1.435085 5.589342e-03
## 27  Kilieaslan 2010 20.56  0.40  25   Exp  3.023347 1.514027e-05
## 28  Kilieaslan 2010 28.60  0.35  25   Ctl  3.353407 5.990513e-06
## 29     Koppert 2006 17.00 22.00  25   Exp  2.833213 6.698962e-02
## 30     Koppert 2006 38.00 22.00  25   Ctl  3.637586 1.340720e-02
## 31    Kvalsvik 2003 16.00  5.00  30   Exp  2.772589 3.255208e-03
## 32    Kvalsvik 2003 20.00  6.00  30   Ctl  2.995732 3.000000e-03
## 33  Montgomery 1996 27.10 27.00  19   Exp  3.299534 5.224387e-02
## 34  Montgomery 1996 34.50 15.10  20   Ctl  3.540959 9.578240e-03
## 35        Moon 2011  8.70  5.40  36   Exp  2.163323 1.070155e-02
## 36        Moon 2011 12.60  6.90  35   Ctl  2.533697 8.568189e-03
## 37 Munishankar 2008 33.80 23.80  25   Exp  3.520461 1.983264e-02
## 38 Munishankar 2008 44.10 24.40  25   Ctl  3.786460 1.224510e-02
## 39     Sinatra 2005 38.30 35.10  49   Exp  3.645450 1.714039e-02
## 40     Sinatra 2005 57.40 52.30  52   Ctl  4.050044 1.596527e-02
## 41        Syal 2010  9.53  1.88  30   Exp  2.254445 1.297205e-03
## 42        Syal 2010 10.19  2.08  30   Ctl  2.321407 1.388855e-03
## 43      Toygar 2008 16.50 11.10  30   Exp  2.803360 1.508540e-02
## 44      Toygar 2008 34.30 11.80  30   Ctl  3.535145 3.945068e-03
## 45      Yalcin 2012 48.53 12.40  26   Exp  3.882182 2.511016e-03
## 46      Yalcin 2012 73.03 22.41  27   Ctl  4.290870 3.487525e-03
```

Multivariate Analysis

```
arm.rma <- rma.mv(yi = yi, V = vi, mods = ~ group - 1,
                  random = ~ group | studyName,
                  struct = 'UN', method = 'ML',
                    data = arm.df)

arm.rma
```

```
##
## Multivariate Meta-Analysis Model (k = 46; method: ML)
##
## Variance Components:
##
## outer factor: studyName (nlvls = 23)
## inner factor: group     (nlvls = 2)
##
##             estim    sqrt  k.lvl  fixed  level
## tau^2.1    1.2453  1.1159     23     no    Exp
## tau^2.2    1.2682  1.1261     23     no    Ctl
##
##      rho.Exp  rho.Ctl    Exp  Ctl
## Exp        1   0.9821      -   no
## Ctl   0.9821        1     23    -
##
## Test for Residual Heterogeneity:
## QE(df = 44) = 29597.1389, p-val < .0001
##
## Test of Moderators (coefficient(s) 1:2):
## QM(df = 2) = 194.9149, p-val < .0001
##
## Model Results:
##
##           estimate      se     zval    pval   ci.lb   ci.ub
## groupExp    2.6283  0.2337  11.2476  <.0001  2.1703  3.0863  ***
## groupCtl    3.0068  0.2354  12.7749  <.0001  2.5455  3.4681  ***
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

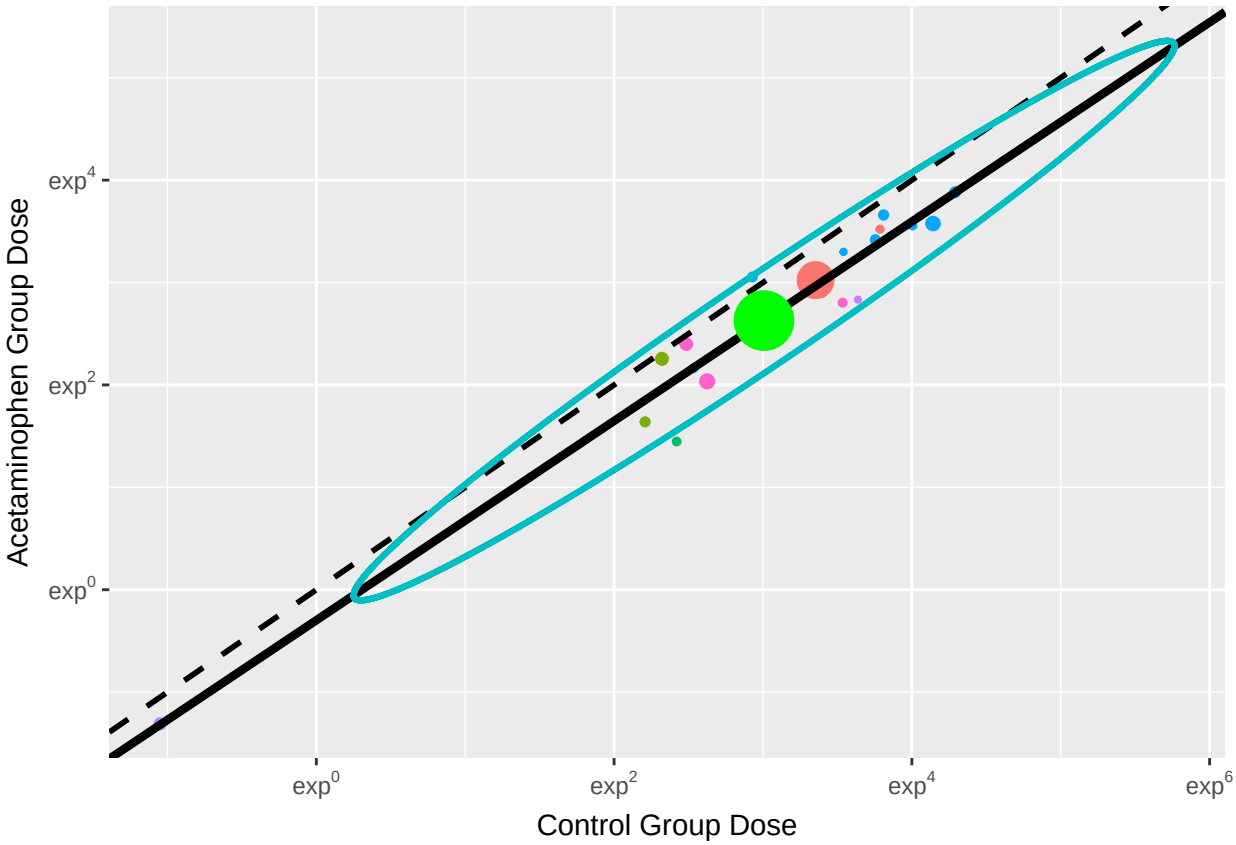
Multivariate Analysis (Releveled)

```
res.rma <- rma.mv(yi = yi, V = vi, mods = ~ relevel(group, ref = 'Ctl'),
                  random = ~ group | studyName,
                  struct = 'UN', method = 'ML',
                    data = arm.df)

res.rma
```

```
##
## Multivariate Meta-Analysis Model (k = 46; method: ML)
##
## Variance Components:
##
## outer factor: studyName (nlvls = 23)
## inner factor: group     (nlvls = 2)
##
##             estim    sqrt  k.lvl  fixed  level
## tau^2.1    1.2453  1.1159     23     no    Exp
## tau^2.2    1.2682  1.1261     23     no    Ctl
##
##      rho.Exp  rho.Ctl    Exp  Ctl
## Exp        1   0.9821      -   no
## Ctl   0.9821        1     23    -
##
## Test for Residual Heterogeneity:
## QE(df = 44) = 29597.1389, p-val < .0001
##
## Test of Moderators (coefficient(s) 2):
## QM(df = 1) = 54.5517, p-val < .0001
##
## Model Results:
##
##                                 estimate      se     zval    pval    ci.lb
## intrcpt                           3.0068  0.2354  12.7749  <.0001   2.5455
## relevel(group, ref = "Ctl")Exp   -0.3785  0.0512  -7.3859  <.0001  -0.4790
##                                    ci.ub
## intrcpt                           3.4681  ***
## relevel(group, ref = "Ctl")Exp   -0.2781  ***
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Scatter Plot



RoM percentage

Slope and slope SE regression line log(Exp Mean)/log(Ctl Mean)

```
## [1] "logRoM = log(meanExperimental/meanControl)"

## [1] "Variance-Convariance Matrix of Random Effects"

##          Exp      Ctl
## Exp 1.245291 1.234160
## Ctl 1.234160 1.268151

## [1] "logRoM Variance (amount of heterogeneity)"

## [1] 0.04512128

## [1] "Conditional Variance logExperimental or logRoM"

## [1] 0.0442102

## [1] "Percent between trials heterogeneity of dose reduction explained by baseline risk measured as logContr

## [1] 2.019183

## [1] "Average values - exp(logExperimental) and exp(logControl) - of studies"

## groupExp groupCtl
## 13.84995 20.22247

## [1] "RoM Percentage (100 * Experimental/Control)"

## relevel(group, ref = "Ctl")Exp
##                       68.48792

## [1] "RoM Percentage 95% lb"

## [1] 61.94292

## [1] "RoM Percentage 95% ub"

## [1] 75.72448

## [1] "slope logExperimental ~ logControl"

## [1] 0.9731964

## [1] "slope 95% lb"

## [1] 0.8933377

## [1] "slope 95% ub"

## [1] 1.053055

## [1] "slope statistics"

##      b1   se.b1       t    pval   lb.b1   ub.b1
##  0.9732  0.0407 23.8855  0.0000  0.8933  1.0531

## [1] "Correlation of true logmean in Experimental and Control"

## [1] 0.9820886
```