

# plot\_display

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## Data processing

```
data<-read.xlsx("Final Studies_Meta Analysis_1.3.xlsx",startRow = 2)
meta <- data[,c(1,3,6:8,10:12)]
names(meta) <- c("StudyID","Author" ,"Size", "MeanDiff_SBP", "MeanDiff_DBP", "SE_SBP", "SE_DBP", "Duration_M")

# add study ID and Author to 2nd 3rd row
meta[2:3,1:2]=meta[1,1:2]
# add duration
meta[c(2,6),'Duration_M']=c('2','6')
# input nan in SE_SBP and SE_DBP
tmp_sbp<-str_extract_all(meta$SE_SBP,"-*\\d+\\.\\d+")%>% map(~`[,2]` %>% unlist() %>% na.omit())
meta$SE_SBP[c(2,7)]=tmp_sbp
tmp_dbp<-str_extract_all(meta$SE_DBP,"-*\\d+\\.\\d+")%>% map(~`[,2]` %>% unlist() %>% na.omit())
meta$SE_DBP[c(2,7)]=tmp_dbp
# manually change Mean_Diff_SBP& DBP of study ID 5:
meta[7,c('MeanDiff_SBP','MeanDiff_DBP')]=c('-2.54','-3.95')
# extract the first number and omit the content after \n
meta<-meta %>% mutate_at(c('MeanDiff_SBP','MeanDiff_DBP','SE_SBP','SE_DBP'),~str_extract(., "-*\\d+\\.\\d+"))
# drop na columns
meta<-meta[c(!is.na(meta$SE_DBP)),]
# delete et al
meta$Author<-str_extract(meta$Author,'\\w+')
meta
```

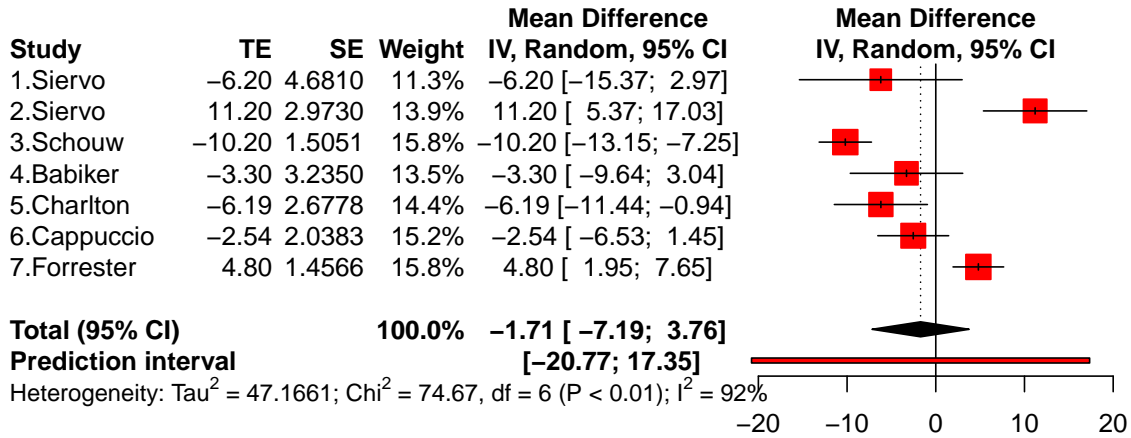
	StudyID	Author	Size	MeanDiff_SBP	MeanDiff_DBP	SE_SBP	SE_DBP	Duration_M
## 1	1	Siervo	11	-6.20	1.800	4.6810	2.7140	2
## 2	1	Siervo	12	11.20	4.900	2.9730	1.6170	2
## 4	2	Schouw	137	-10.20	-3.900	1.5051	1.0204	24
## 5	3	Babiker	91	-3.30	-1.780	3.2350	1.9680	3
## 6	4	Charlton	80	-6.19	-0.595	2.6778	1.2367	6
## 7	5	Cappuccio	1013	-2.54	-3.950	2.0383	2.0127	3,6
## 8	6	Forrester	114	4.80	3.200	1.4566	1.0204	1.5

## forest plot & funnel plot

```
rownames(meta)<-seq(1:dim(meta)[1])
meta$Author=paste(rownames(meta),meta$Author,sep='.')
# ?metagen
# ?funnel.meta
meta_SBP <- metagen(TE = MeanDiff_SBP, seTE = SE_SBP, studlab = Author,data = meta, sm = "MD", comb.fixed=TRUE)
forest_SBP <- forest.meta(meta_SBP, layout = "RevMan5")
```

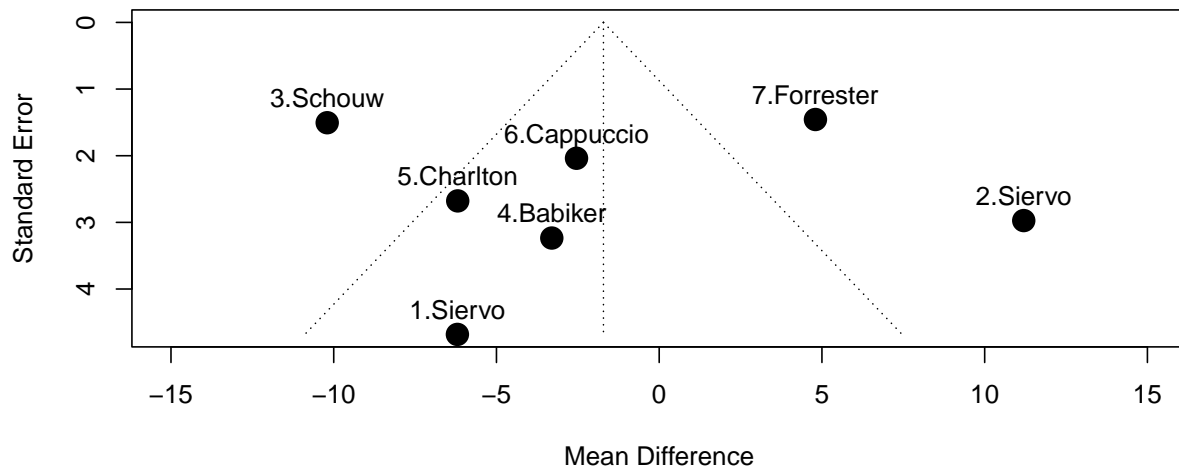
```
grid.text("SBP Forest Plot", .5, .9, gp=gpar(cex=1.5))
```

## SBP Forest Plot



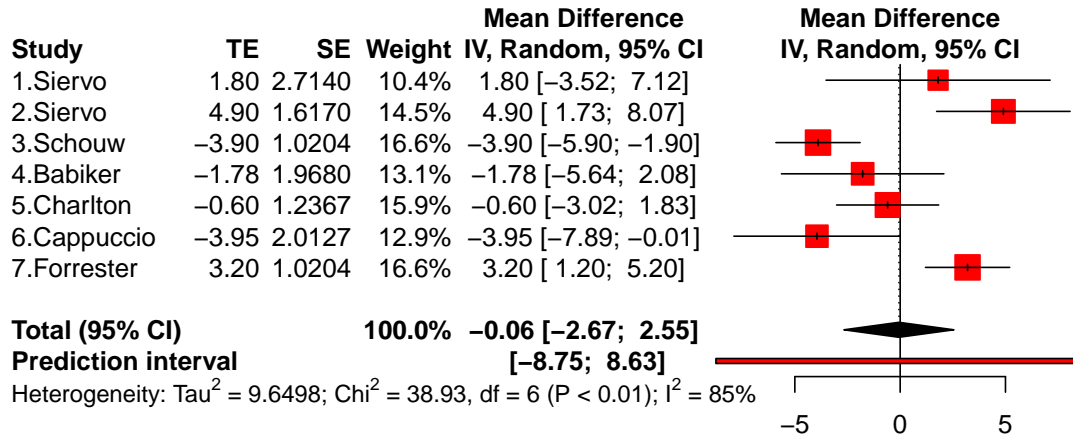
```
funnel.meta(meta_SBP, studlab = TRUE, cex.studlab = 1, cex = 2, pch=16, pos.studlab=3, xlim=c(-15,15))
title(main = "SBP Funnel Plot", cex.main = 1.5, font.main = 1)
```

## SBP Funnel Plot



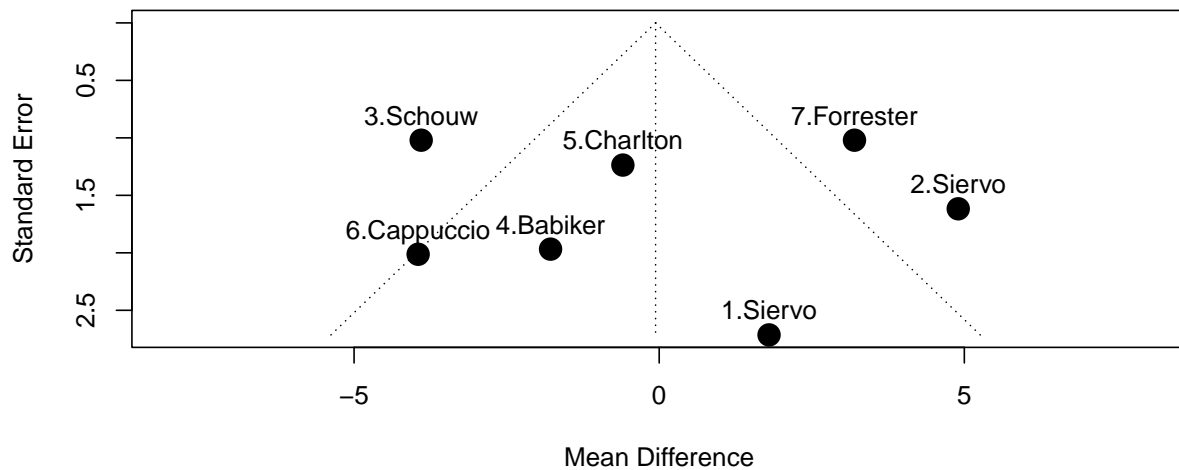
```
meta_DBP <- metagen(TE = MeanDiff_DBP, seTE = SE_DBP, studlab = Author, data = meta, sm = "MD", comb.fi
forest_DBP <- forest.meta(meta_DBP, layout = "RevMan5")
grid.text("DBP Forest Plot", .5, .9, gp=gpar(cex=1.5))
```

## DBP Forest Plot



```
funnel.meta(meta_DBP, studlab = TRUE, cex.studlab = 1, cex = 2, pch=16, pos.studlab=3, xlim=c(-8,8))
title(main = "DBP Funnel Plot", cex.main = 1.5, font.main = 1)
```

## DBP Funnel Plot



## Metareg

```
M<-meta$Duration_M%>% as.numeric()
duration <- M*30
duration_m <- M - 1
duration_m2 <- M - 2
duration_lg <- log(duration_m)
size <- meta$Size

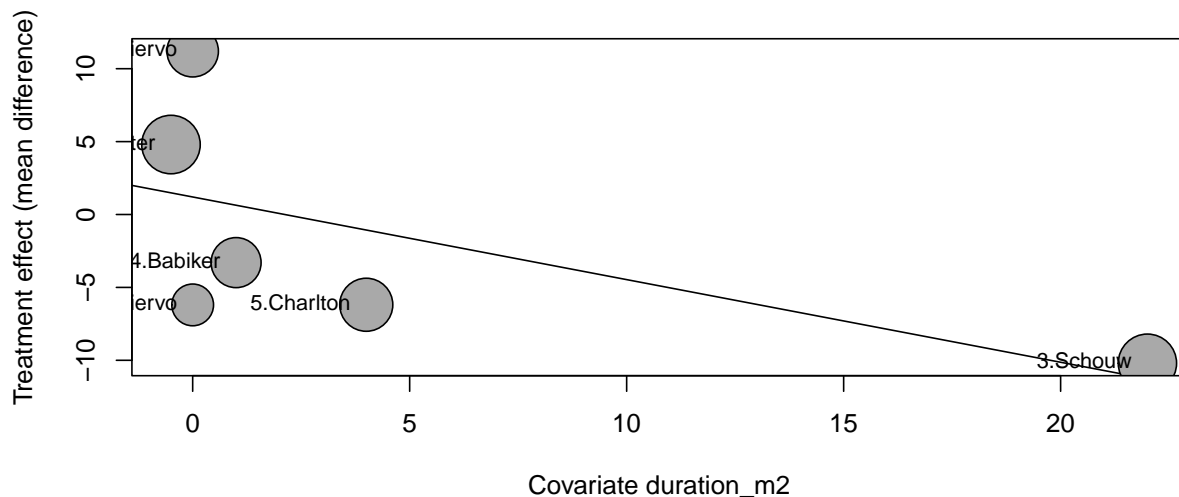
# SBP
```

```

meta_SBP_reg <- metareg(meta_SBP, ~duration_m2)
meta_SBP_reg

##
## Mixed-Effects Model (k = 6; tau^2 estimator: SJ)
##
## tau^2 (estimated amount of residual heterogeneity):      43.1668 (SE = 31.6806)
## tau (square root of estimated tau^2 value):             6.5701
## I^2 (residual heterogeneity / unaccounted variability): 85.47%
## H^2 (unaccounted variability / sampling variability):    6.88
## R^2 (amount of heterogeneity accounted for):             24.86%
##
## Test for Residual Heterogeneity:
## QE(df = 4) = 21.9593, p-val = 0.0002
##
## Test of Moderators (coefficient 2):
## QM(df = 1) = 2.6380, p-val = 0.1043
##
## Model Results:
##
##           estimate      se      zval      pval      ci.lb      ci.ub
## intrcpt          1.2023  3.3804   0.3557  0.7221  -5.4231   7.8277
## duration_m2     -0.5668  0.3490  -1.6242  0.1043  -1.2509   0.1172
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
bubble(meta_SBP_reg, studlab = TRUE)

```



```

# DBP
meta_DBP_reg <- metareg(meta_DBP, ~duration_m2)
meta_DBP_reg

##
## Mixed-Effects Model (k = 6; tau^2 estimator: SJ)

```

```
##
## tau^2 (estimated amount of residual heterogeneity):      4.4996 (SE = 3.9889)
## tau (square root of estimated tau^2 value):             2.1212
## I^2 (residual heterogeneity / unaccounted variability): 65.97%
## H^2 (unaccounted variability / sampling variability):    2.94
## R^2 (amount of heterogeneity accounted for):             49.42%
##
## Test for Residual Heterogeneity:
## QE(df = 4) = 8.8500, p-val = 0.0650
##
## Test of Moderators (coefficient 2):
## QM(df = 1) = 5.2700, p-val = 0.0217
##
## Model Results:
##
##              estimate      se      zval      pval      ci.lb      ci.ub
## intrcpt          1.9843  1.2599   1.5749  0.1153   -0.4851   4.4537
## duration_m2     -0.2843  0.1238  -2.2957  0.0217   -0.5270  -0.0416  *
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
bubble(meta_DBP_reg, studlab = TRUE)
```

