Meta-Analysis using Frequencies and Risk Differences

John Robert Torres

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1 Load required and new packages

```
if (!require("pacman")) install.packages("pacman")
```

```
## Loading required package: pacman
```

```
library(pacman)
pacman::p_load("rstudioapi", "readxl", "writexl", "dplyr", "tidyr", "rstatix")
pacman::p_load("meta", "stringr")

`%ni%` = Negate(`%in%`)
```

2 Set data paths and details

```
main.path = here::here()
data.path = file.path(main.path, "02 Data")
output.path = file.path(main.path, "04 Outputs")

file.name = "Final Data.xlsx"
sheet.name = "Final"
output.name = paste0(format(Sys.Date(), "%m%d%y"), "_OUTPUT", ".xlsx")
```

3 Load dataset

```
df = readxl::read_excel(file.path(data.path, file.name),
                        sheet = sheet.name)
```

4 Process data

```
df.final = df
```

5 Implement methodology

5.1 Meta-Analysis using Frequencies and Risk Differences

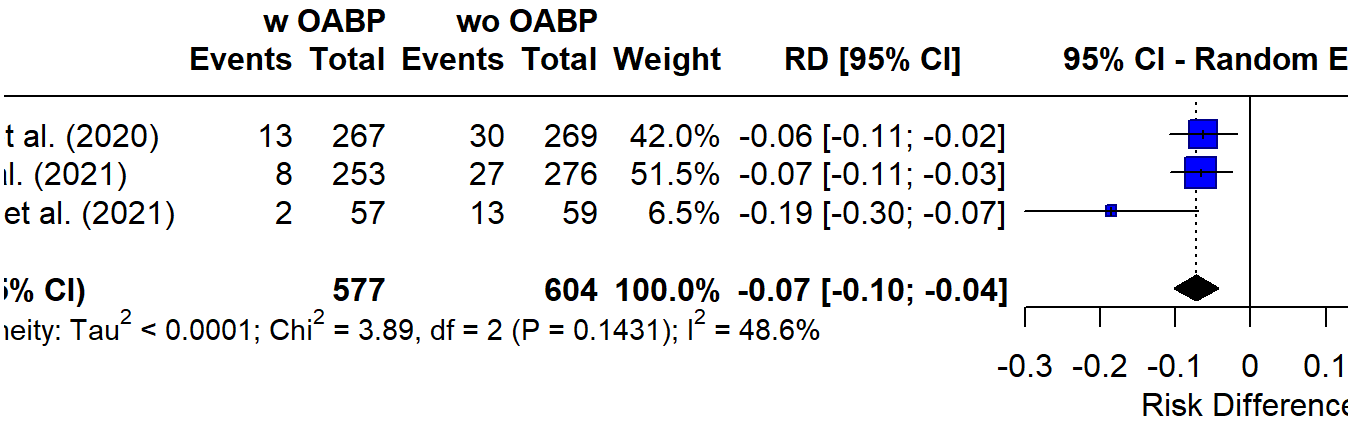
```
ssi_meta = meta::metabin(event.e = ssi_oabp_plus,
                         n.e = n_oabp_plus,
                         event.c = ssi_oabp_minus,
                         n.c = n_oabp_minus,
                         data = df.final,
                         sm = "RD",
                         method = "Inverse",
                         studlab = authors_year,
                         random = TRUE,
                         fixed = FALSE,
                         label.e = "w OABP",
                         label.c = "wo OABP")
```

```
## Warning: Use argument 'common' instead of 'fixed' (deprecated).
```

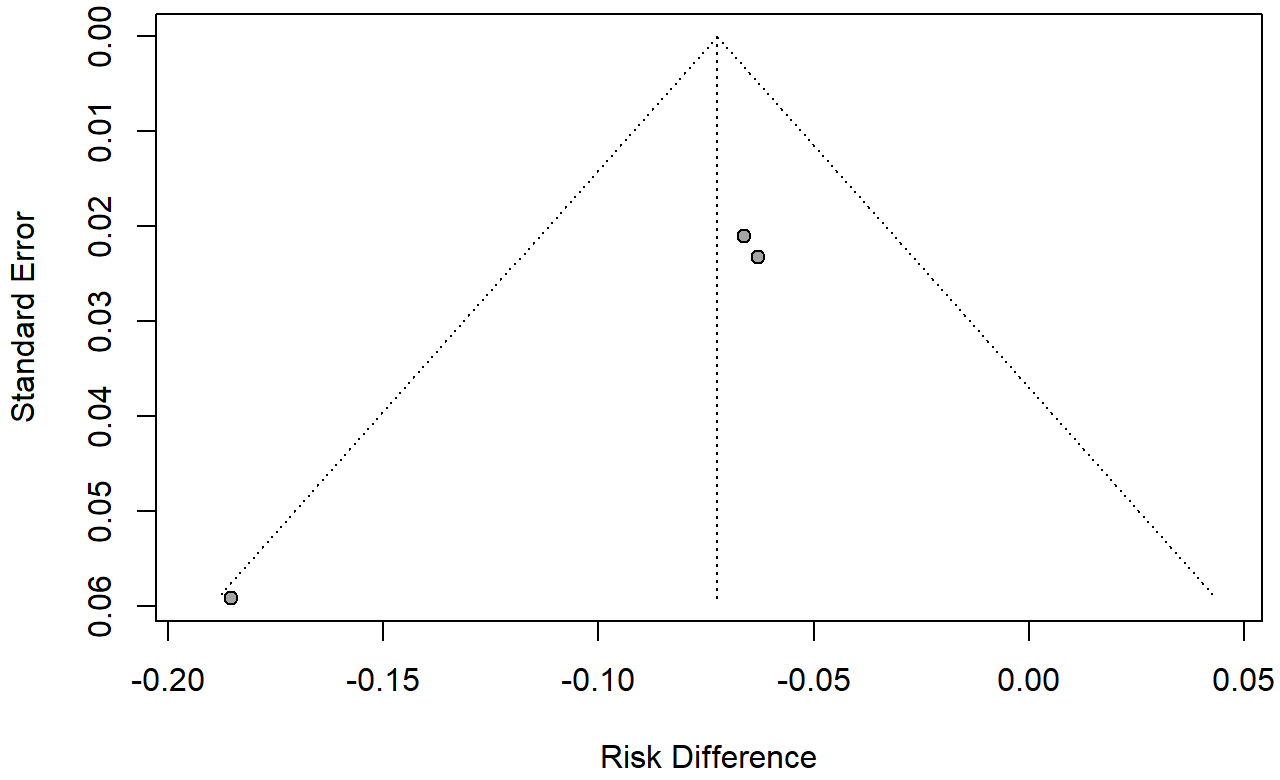
```
summary(ssi_meta)
```

```
##                            RD             95%-CI %W(random)
## Basany et al. (2020)  -0.0628 [-0.1085; -0.0172]       42.0
## Papp et al. (2021)    -0.0662 [-0.1074; -0.0251]       51.5
## Rybakov et al. (2021) -0.1853 [-0.3013; -0.0692]        6.5
##
## Number of studies: k = 3
## Number of observations: o = 1181 (o.e = 577, o.c = 604)
## Number of events: e = 93
##
##                           RD             95%-CI     z  p-value
## Random effects model -0.0725 [-0.1021; -0.0429] -4.80 < 0.0001
##
## Quantifying heterogeneity (with 95%-CIs):
##  tau^2 < 0.0001 [0.0000; 0.1895]; tau = 0.0011 [0.0000; 0.4353]
##  I^2 = 48.6% [0.0%; 85.0%]; H = 1.39 [1.00; 2.58]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.89    2  0.1431
##
## Details of meta-analysis methods:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Calculation of I^2 based on Q
```

```
meta::forest(ssi_meta,
             layout = "RevMan5",
             xlab = "Risk Difference",
             smlab = "95% CI - Random Effects")
```




```
meta::funnel(ssi_meta,
             xlab = "Risk Difference")
```



6 Export necessary data

```
export.list = list()

if(length(export.list) != 0){
  if (!file.exists(file.path(output.path, output.name))) {
    writexl::write_xlsx(export.list, file.path(output.path, output.name))
    cat(crayon::green("File successfully written."))
  } else {
    cat(crayon::red(glue::glue("Filename already used: {output.name}")))
    overwrite = readline(prompt = "Overwrite (1 for Yes, 0 for No): ")
    if (overwrite == "1") {
      writexl::write_xlsx(export.list, file.path(output.path, output.name))
      cat(crayon::green("File successfully overwritten"))
    } else {
      cat(crayon::red("File not overwritten"))
    }
  }
}
```