Zinc supplementation on Prediabetes

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Preparation

Load package

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.4.1     v purrr   1.0.1
## v tibble  3.1.8     v dplyr   1.1.0
## v tidyr   1.3.0     v stringr 1.5.0
## v readr   2.1.4     v forcats 1.0.0
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(meta)
```

```
## Loading 'meta' package (version 6.2-1).
## Type 'help(meta)' for a brief overview.
## Readers of 'Meta-Analysis with R (Use R!)' should install
## older version of 'meta' package: https://tinyurl.com/dt4y5drs
```

```
library(googlesheets4)
```

Import Data

Import data & save locally

```
data <- read_csv("data.csv")
```

Import data from local storage

```
## Rows: 4 Columns: 29
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (2): author, title
## dbl (27): year, total_placebo, total_zinc, mean_fpg_placebo, sd_fpg_placebo,...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
attach(data)
```

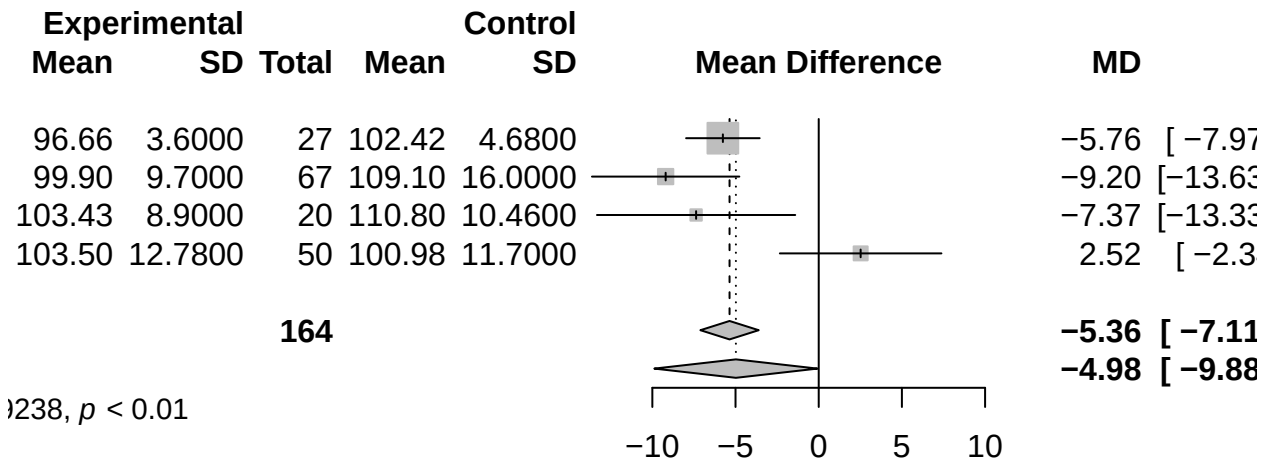
Analysis

```
fpg <- metacont(n.e = total_zinc,
                mean.e = mean_fpg_zinc,
                sd.e = sd_fpg_zinc,
                n.c = total_placebo,
                mean.c = mean_fpg_placebo,
                sd.c = sd_fpg_placebo,
                data = data,
                studlab = paste0(author,",",year))
print(summary(fpg), digits = 2)
```

Metanalysis Fasting Plasma Glucose

```
##                            MD          95%-CI %W(common) %W(random)
## Islam et al,2016      -5.76 [ -7.97; -3.55]       62.7       29.5
## Ranasinghe et al,2018 -9.20 [-13.63; -4.77]       15.6       25.0
## Karandish et al,2021  -7.37 [-13.33; -1.41]        8.6       21.5
## Attia et al,2022       2.52 [ -2.34;  7.38]       13.0       24.0
##
## Number of studies combined: k = 4
## Number of observations: o = 334
##
##                          MD         95%-CI     z  p-value
## Common effect model  -5.36 [-7.11; -3.61] -6.00 < 0.0001
## Random effects model -4.98 [-9.88; -0.07] -1.99   0.0466
##
## Quantifying heterogeneity:
##  tau^2 = 19.9238 [2.6198; >199.2383]; tau = 4.4636 [1.6186; >14.1152]
##  I^2 = 77.9% [40.2%; 91.8%]; H = 2.13 [1.29; 3.50]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  13.56    3  0.0036
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

```
meta::forest(fpg,
             digits = 2,
             sortvar = year)
```


Experimental
Mean SD Total
Control
Mean SD
Mean Difference
MD
96.66 3.6000 27 102.42 4.6800 −5.76 [−7.97
99.90 9.7000 67 109.10 16.0000 −9.20 [−13.63
103.43 8.9000 20 110.80 10.4600 −7.37 [−13.33
103.50 12.7800 50 100.98 11.7000 2.52 [−2.3
164 −5.36 [−7.11
−4.98 [−9.88
)238, p < 0.01
−10 −5 0 5 10