Suction in Ureteroscopy

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Contents

1 Setup

```
knitr::opts_chunk$set(echo = TRUE)
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.4.4     v tibble    3.2.1
## v lubridate 1.9.2     v tidyr     1.3.0
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(gt)
library(gtExtras)
```

```r
library(meta)
```

```
## Loading 'meta' package (version 6.5-0).
## 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
```

```r
library(metafor)
```

```
## Loading required package: Matrix
##
## Attaching package: 'Matrix'
##
## The following objects are masked from 'package:tidyr':
##
##     expand, pack, unpack
##
## Loading required package: metadat
## Loading required package: numDeriv
##
## Loading the 'metafor' package (version 4.2-0). For an
## introduction to the package please type: help(metafor)
```

```r
library(janitor)
```

```
##
## Attaching package: 'janitor'
##
## The following objects are masked from 'package:stats':
##
##     chisq.test, fisher.test
```

```r
library(DataExplorer)
library(forestplot)
```

```
## Loading required package: grid
## Loading required package: checkmate
## Loading required package: abind
```

```r
suction_data <- read.csv("~/Desktop/Somani/Suction/suction_urs.csv") %>% as_tibble() %>% janitor::clean_
```

1.1 Data Encoding

```
#Define Demographics
suction_data$design <- as.factor(suction_data$design)
suction_data$number_of_surgeons_control <- as.integer(suction_data$number_of_surgeons_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$number_of_surgeons_suction<- as.integer(suction_data$number_of_surgeons_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$age_mean_control <- as.numeric(suction_data$age_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$age_sd_control <- as.numeric(suction_data$age_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$age_mean_suction <- as.numeric(suction_data$age_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$age_sd_suction <- as.numeric(suction_data$age_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$male_n_control <- as.integer(suction_data$male_n_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$male_n_suction <- as.integer(suction_data$male_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$bmi_mean_control <- as.numeric(suction_data$bmi_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$bmi_sd_control <- as.numeric(suction_data$bmi_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$bmi_mean_suction <- as.numeric(suction_data$bmi_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$bmi_sd_suction <- as.numeric(suction_data$bmi_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$hu_mean_control <- as.numeric(suction_data$hu_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$hu_sd_control <- as.numeric(suction_data$hu_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$hu_mean_suction <- as.numeric(suction_data$hu_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$hu_sd_suction <- as.numeric(suction_data$hu_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_size_mm_mean_control <- as.numeric(suction_data$stone_size_mm_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_size_mm_sd_control <- as.numeric(suction_data$stone_size_mm_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_size_mm_mean_suction <- as.numeric(suction_data$stone_size_mm_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_size_mm_sd_suction <- as.numeric(suction_data$stone_size_mm_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_surface_mm2_mean_control <- as.numeric(suction_data$stone_surface_mm2_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_surface_mm2_sd_control <- as.numeric(suction_data$stone_surface_mm2_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_surface_mm2_mean_suction <- as.numeric(suction_data$stone_surface_mm2_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_surface_mm2_sd_suction <- as.numeric(suction_data$stone_surface_mm2_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_burden_mm3_mean_control <- as.numeric(suction_data$stone_burden_mm3_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_burden_mm3_sd_control <- as.numeric(suction_data$stone_burden_mm3_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_burden_mm3_mean_suction <- as.numeric(suction_data$stone_burden_mm3_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stone_burden_mm3_sd_suction <- as.numeric(suction_data$stone_burden_mm3_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$upper_ureter_n_control <- as.integer(suction_data$upper_ureter_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$upper_ureter_n_suction <- as.integer(suction_data$upper_ureter_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$mid_ureter_n_control <- as.integer(suction_data$mid_ureter_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$mid_ureter_n_suction <- as.integer(suction_data$mid_ureter_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$distal_ureter_n_control <- as.integer(suction_data$distal_ureter_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$distal_ureter_n_suction <- as.integer(suction_data$distal_ureter_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$renal_pelvis_n_control <- as.integer(suction_data$renal_pelvis_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$renal_pelvis_n_suction <- as.integer(suction_data$renal_pelvis_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$upper_calyx_n_control <- as.integer(suction_data$upper_calyx_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$upper_calyx_n_suction <- as.integer(suction_data$upper_calyx_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$middle_calyx_n_control <- as.integer(suction_data$middle_calyx_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$middle_calyx_n_suction <- as.integer(suction_data$middle_calyx_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$lower_calyx_n_control <- as.integer(suction_data$lower_calyx_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$lower_calxy_n_suction <- as.integer(suction_data$lower_calxy_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
# Define Outcomes
suction_data$sfr_immediate_n_control <- as.integer(suction_data$sfr_immediate_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$sfr_immediate_n_suction <- as.integer(suction_data$sfr_immediate_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$sfr_final_n_control <- as.integer(suction_data$sfr_final_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$sfr_final_n_suction <- as.integer(suction_data$sfr_final_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$auxillary_tx_n_control <- as.integer(suction_data$auxillary_tx_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$auxillary_tx_n_suction <- as.integer(suction_data$auxillary_tx_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$or_time_min_mean_control <- as.numeric(suction_data$or_time_min_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$or_time_min_sd_control <- as.numeric(suction_data$or_time_min_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$or_time_min_mean_suction <- as.numeric(suction_data$or_time_min_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$or_time_min_sd_suction <- as.numeric(suction_data$or_time_min_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fragmentation_time_min_mean_control <- as.numeric(suction_data$fragmentation_time_min_mean_
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fragmentation_time_min_sd_control <- as.numeric(suction_data$fragmentation_time_min_sd_con
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fragmentation_time_min_mean_suction <- as.numeric(suction_data$fragmentation_time_min_mean_
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fragmentation_time_min_sd_suction <- as.numeric(suction_data$fragmentation_time_min_sd_suc
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fluoroscopy_time_sec_mean_control <- as.numeric(suction_data$fluoroscopy_time_sec_mean_con
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fluoroscopy_time_sec_sd_control <- as.numeric(suction_data$fluoroscopy_time_sec_sd_control
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fluoroscopy_time_sec_mean_suction <- as.numeric(suction_data$fluoroscopy_time_sec_mean_suc
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$fluoroscopy_time_sec_sd_suction <- as.numeric(suction_data$fluoroscopy_time_sec_sd_suction
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$use_of_baskets_n_control <- as.integer(suction_data$use_of_baskets_n_control)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$use_of_baskets_n_suction <- as.integer(suction_data$use_of_baskets_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$intrapelvic_pressure_mm_hg_mean_control <- as.numeric(suction_data$intrapelvic_pressure_mm_
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$intrapelvic_pressure_mm_hg_mean_suction <- as.numeric(suction_data$intrapelvic_pressure_mm_
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$los_days_mean_control <- as.numeric(suction_data$los_days_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$los_days_sd_control <- as.numeric(suction_data$los_days_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$los_days_mean_suction <- as.numeric(suction_data$los_days_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$los_days_sd_suction <- as.numeric(suction_data$los_days_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$complications_postop_overall_n_control <- as.integer(suction_data$complications_postop_ove
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$complications_postop_overall_n_suction <- as.integer(suction_data$complications_postop_ove
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$infection_n_control <- as.integer(suction_data$infection_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$infection_n_suction <- as.integer(suction_data$infection_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$fever_n_control <- as.integer(suction_data$fever_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$fever_n_suction <- as.integer(suction_data$fever_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$abscess_n_control <- as.integer(suction_data$abscess_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$abscess_n_suction <- as.integer(suction_data$abscess_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$sepsis_n_control <- as.integer(suction_data$sepsis_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$sepsis_n_suction <- as.integer(suction_data$sepsis_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$pain_n_control <- as.integer(suction_data$pain_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$pain_n_suction <- as.integer(suction_data$pain_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```
suction_data$hematoma_n_control <- as.integer(suction_data$hematoma_n_control)

## Warning: NAs introduced by coercion

suction_data$hematoma_n_suction <- as.integer(suction_data$hematoma_n_suction)

## Warning: NAs introduced by coercion

suction_data$transfusion_n_control <- as.integer(suction_data$transfusion_n_control)

## Warning: NAs introduced by coercion

suction_data$transfusion_n_suction <- as.integer(suction_data$transfusion_n_suction)

## Warning: NAs introduced by coercion

suction_data$embolism_ir_intervention_n_control <- as.integer(suction_data$embolism_ir_intervention_n_c

## Warning: NAs introduced by coercion

suction_data$embolism_ir_intervention_n_suction <- as.integer(suction_data$embolism_ir_intervention_n_su

## Warning: NAs introduced by coercion

suction_data$cost_us_dollars_mean_control <- as.numeric(suction_data$cost_us_dollars_mean_control)

## Warning: NAs introduced by coercion

suction_data$cost_us_dollars_sd_control <- as.numeric(suction_data$cost_us_dollars_sd_control)

## Warning: NAs introduced by coercion

suction_data$cost_us_dollars_mean_suction <- as.numeric(suction_data$cost_us_dollars_mean_suction)

## Warning: NAs introduced by coercion

suction_data$cost_us_dollars_sd_suction <- as.numeric(suction_data$cost_us_dollars_sd_suction)

## Warning: NAs introduced by coercion

suction_data$clavien_i_n_control <- as.integer(suction_data$clavien_i_n_control)

## Warning: NAs introduced by coercion

suction_data$clavien_ii_n_control <- as.integer(suction_data$clavien_ii_n_control)

## Warning: NAs introduced by coercion

suction_data$clavien_iii_n_control <- as.integer(suction_data$clavien_iii_n_control)

## Warning: NAs introduced by coercion

suction_data$clavien_iv_n_control <- as.integer(suction_data$clavien_iv_n_control)

## Warning: NAs introduced by coercion

suction_data$clavien_v_n_control <- as.integer(suction_data$clavien_v_n_control)
suction_data$clavien_i_n_suction <- as.integer(suction_data$clavien_i_n_suction)

## Warning: NAs introduced by coercion

suction_data$clavien_ii_n_suction <- as.integer(suction_data$clavien_ii_n_suction)

## Warning: NAs introduced by coercion
```

```r
suction_data$clavien_iii_n_suction <- as.integer(suction_data$clavien_iii_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$clavien_iv_n_suction <- as.integer(suction_data$clavien_iv_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$clavien_v_n_suction <- as.integer(suction_data$clavien_v_n_suction)
suction_data$death_n_control <- as.integer(suction_data$death_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$death_n_suction <- as.integer(suction_data$death_n_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$vas_score_mean_suction <- as.numeric(suction_data$vas_score_mean_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$vas_score_sd_suction <-as.numeric(suction_data$vas_score_sd_suction)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$vas_score_mean_control <- as.numeric(suction_data$vas_score_mean_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$vas_score_sd_control <-as.numeric(suction_data$vas_score_sd_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stricture_n_control <- as.integer(suction_data$stricture_n_control)
```

```
## Warning: NAs introduced by coercion
```

```r
suction_data$stricture_n_suction <- as.integer(suction_data$stricture_n_suction)
```

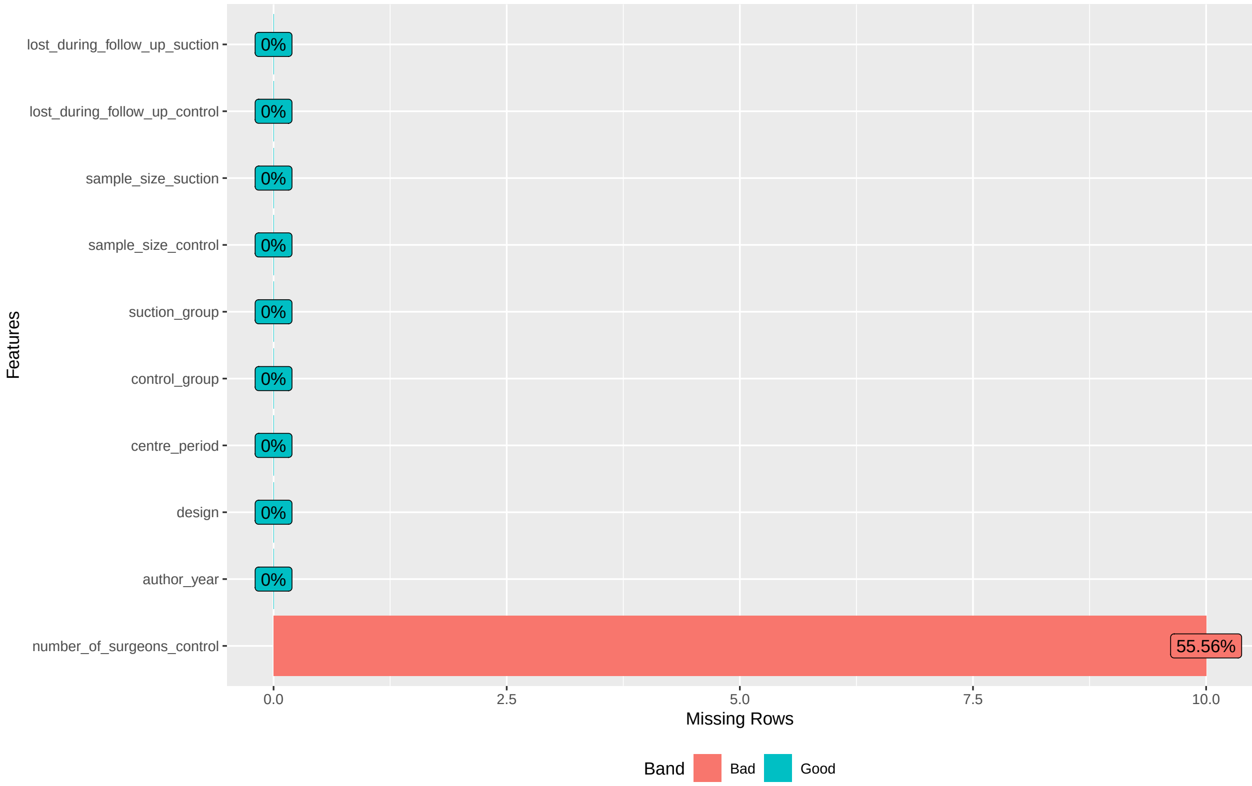
```
## Warning: NAs introduced by coercion
```

1.2 Make new columns combining CD

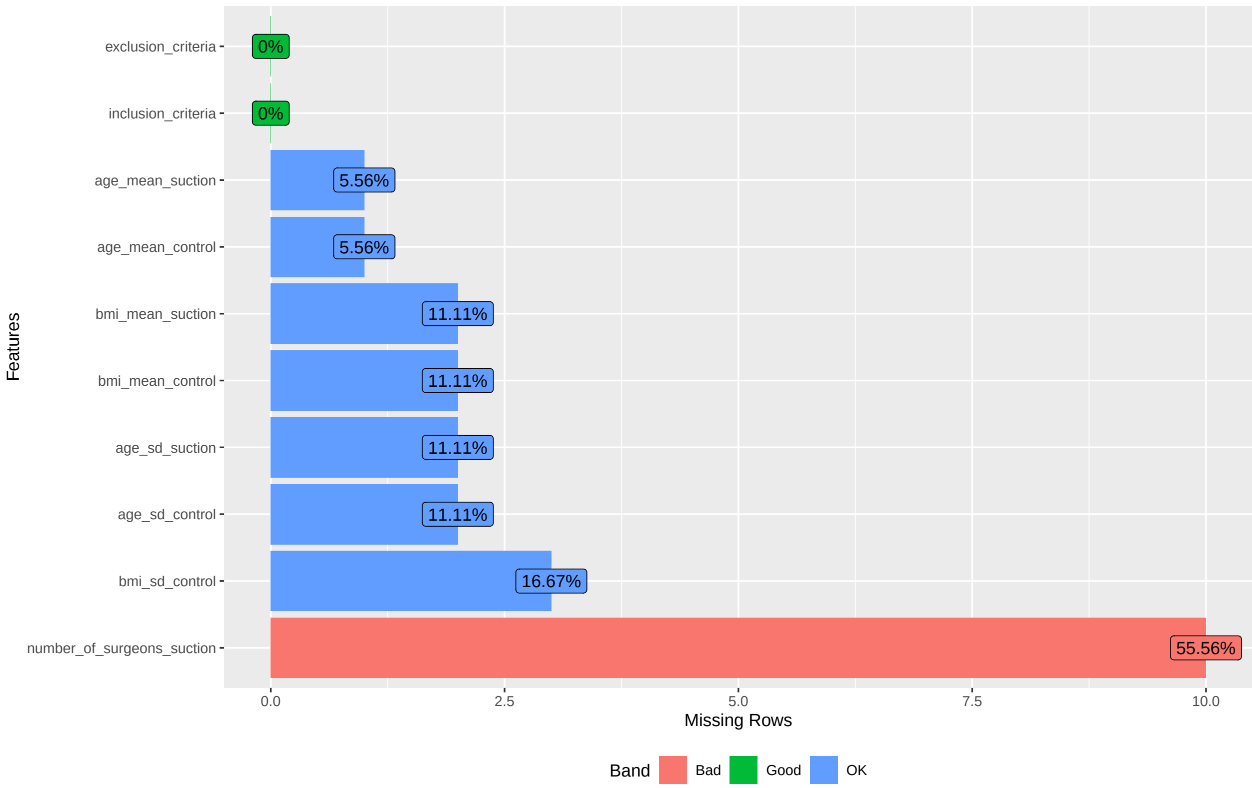
```
suction_data <- suction_data %>% mutate(
  clav_i_ii_n_control = clavien_i_n_control + clavien_ii_n_control,
  clav_i_ii_n_suction = clavien_i_n_suction + clavien_ii_n_suction,
  clav_iii_v_n_control = clavien_iii_n_control + clavien_iv_n_control + clavien_v_n_control,
  clav_iii_v_n_suction = clavien_iii_n_suction + clavien_iv_n_suction + clavien_v_n_suction
)
```

2 Data Exploration

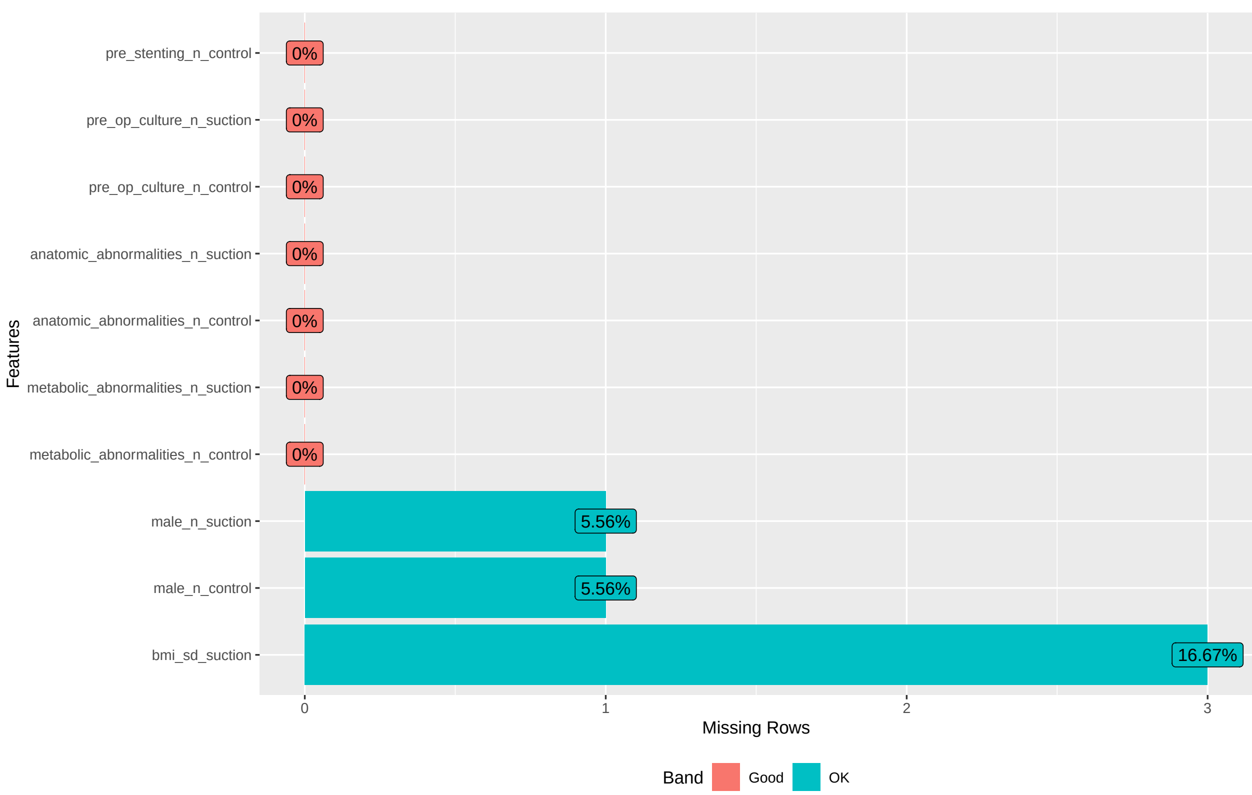
```
plot_missing(suction_data[1:10])
```



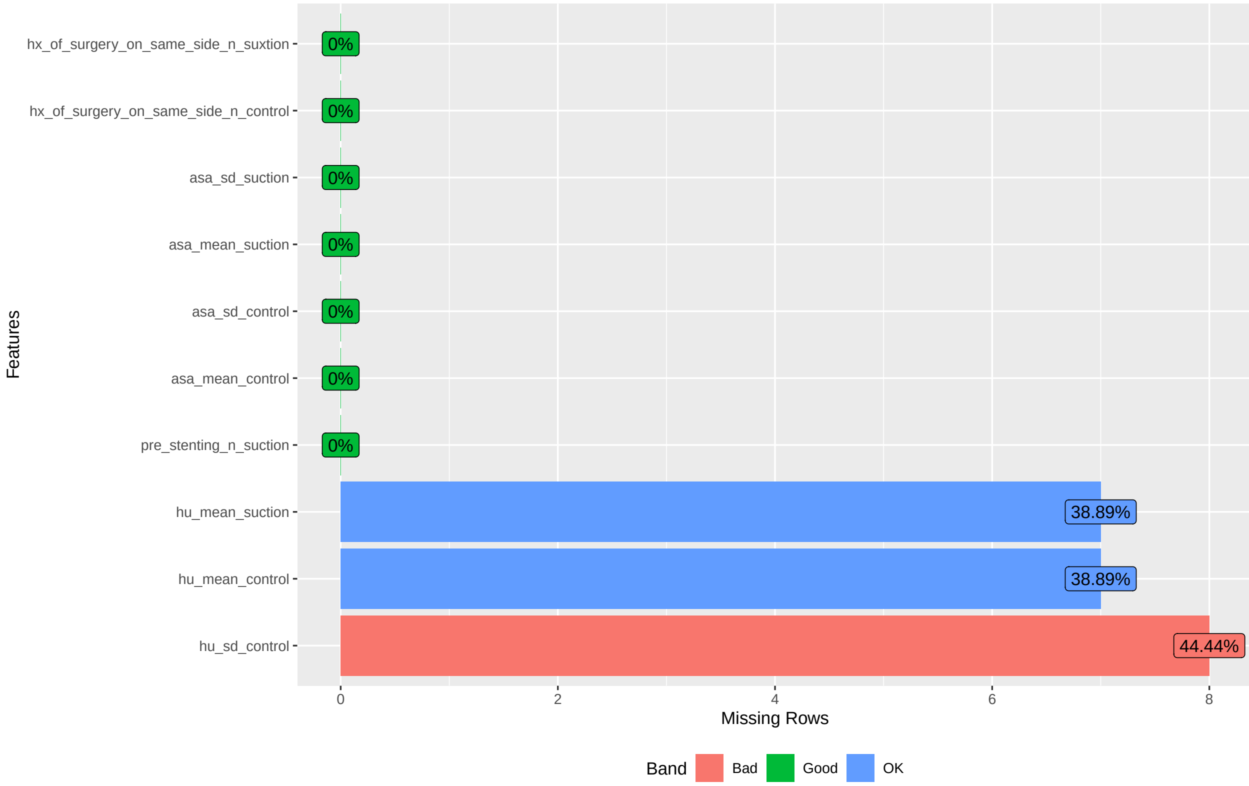

```
plot_missing(suction_data[11:20])
```



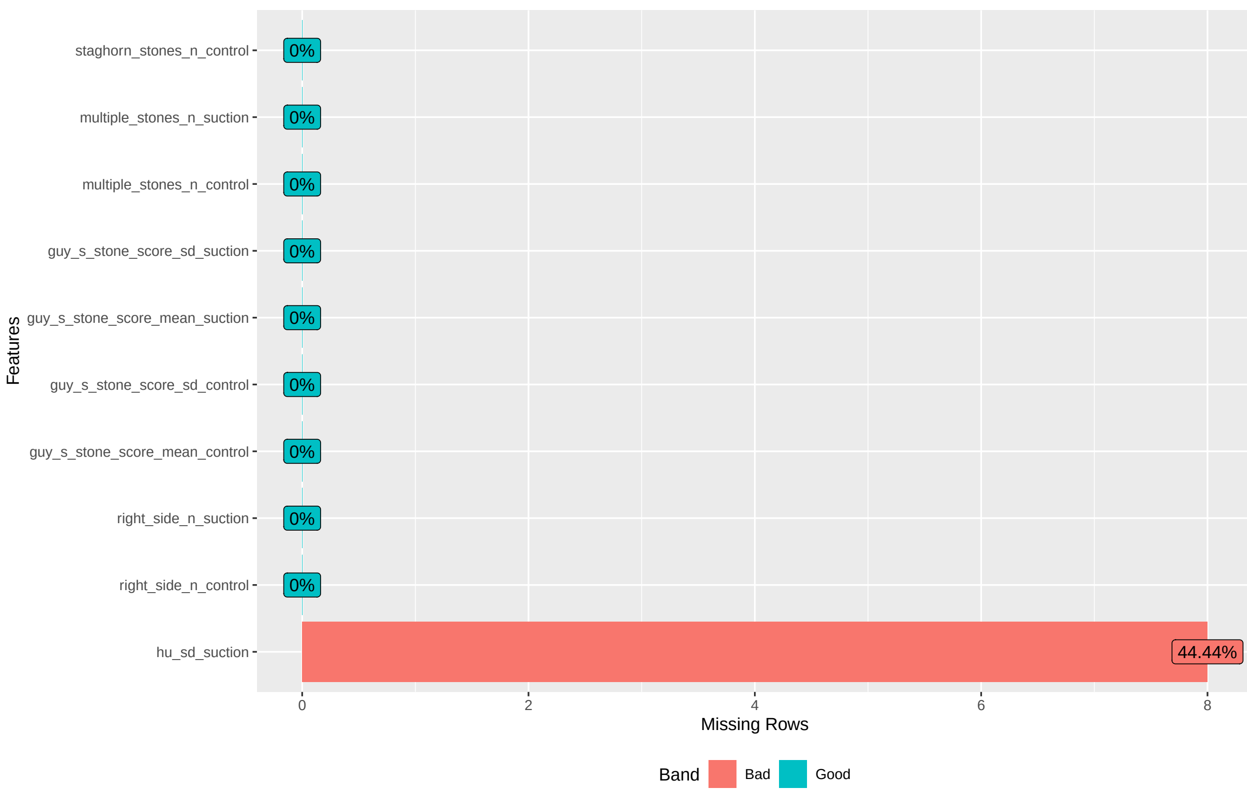

```r
plot_missing(suction_data[21:30])
```



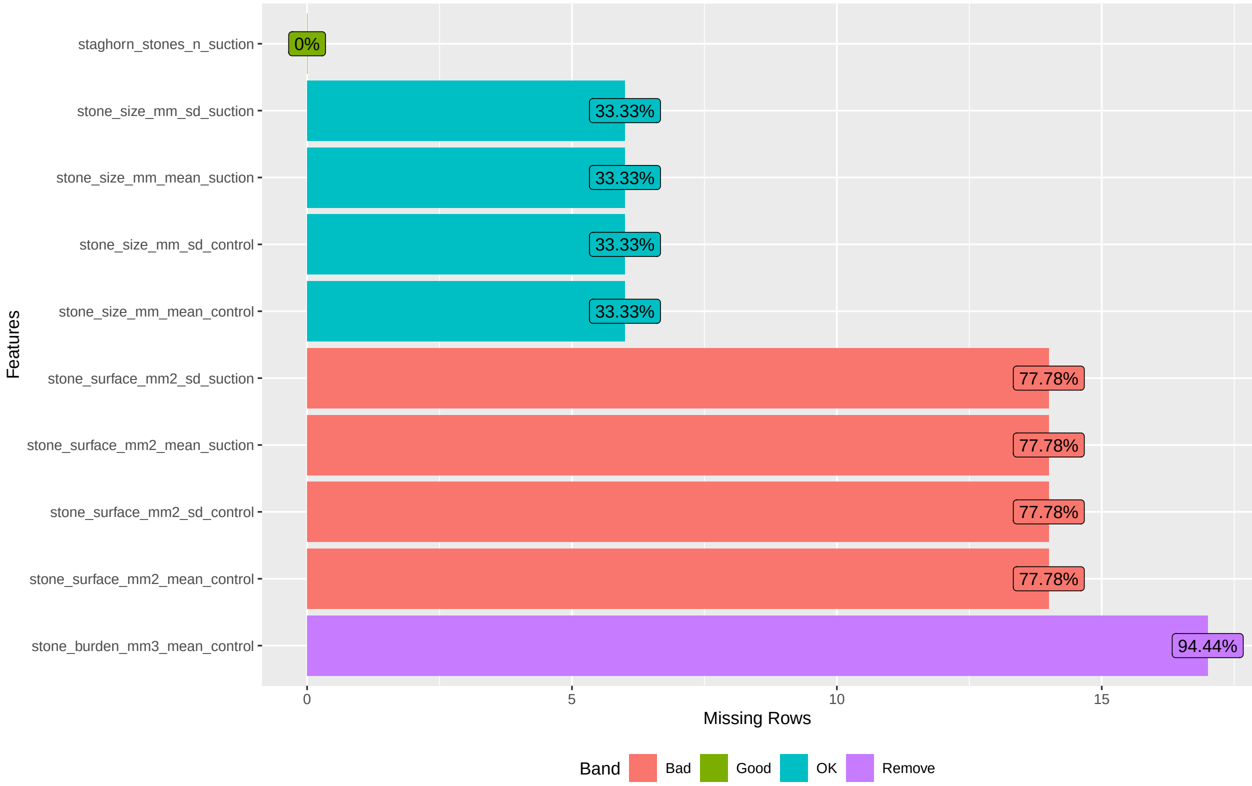
```r
plot_missing(suction_data[31:40])
```



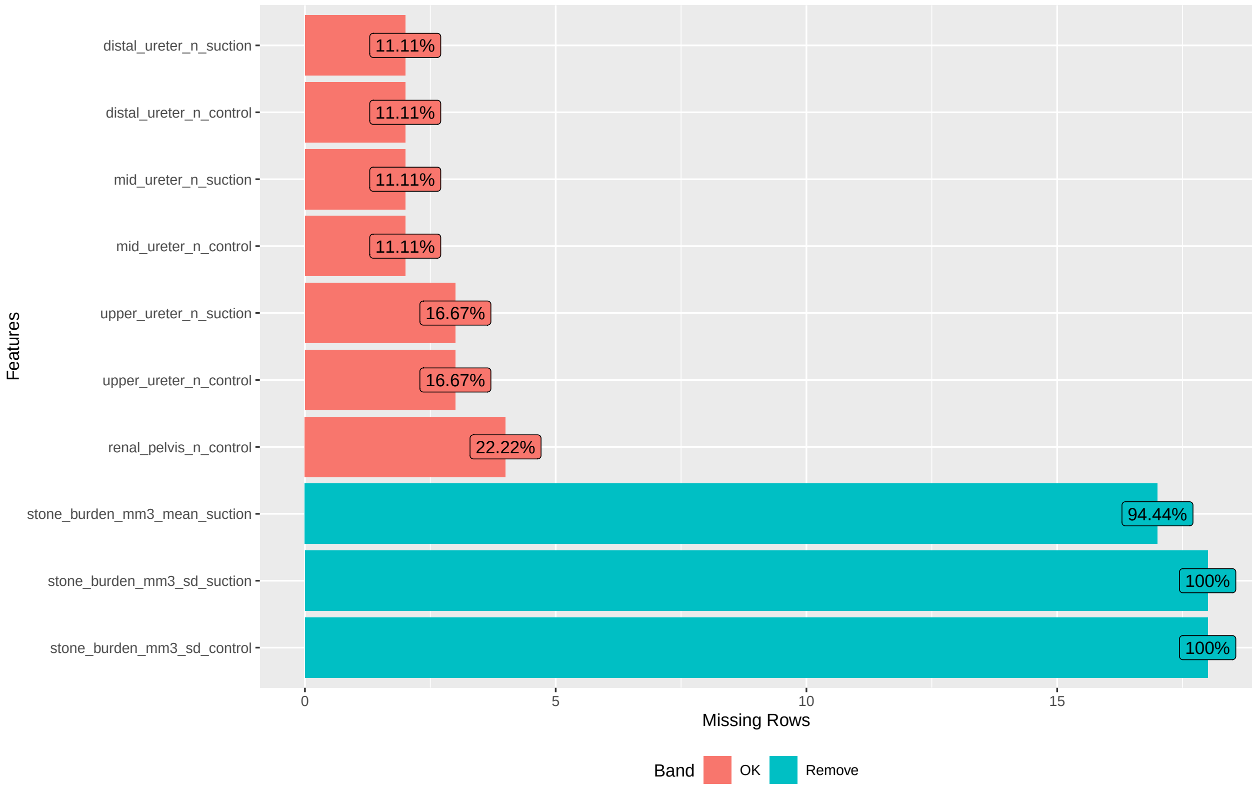

```r
plot_missing(suction_data[41:50])
```



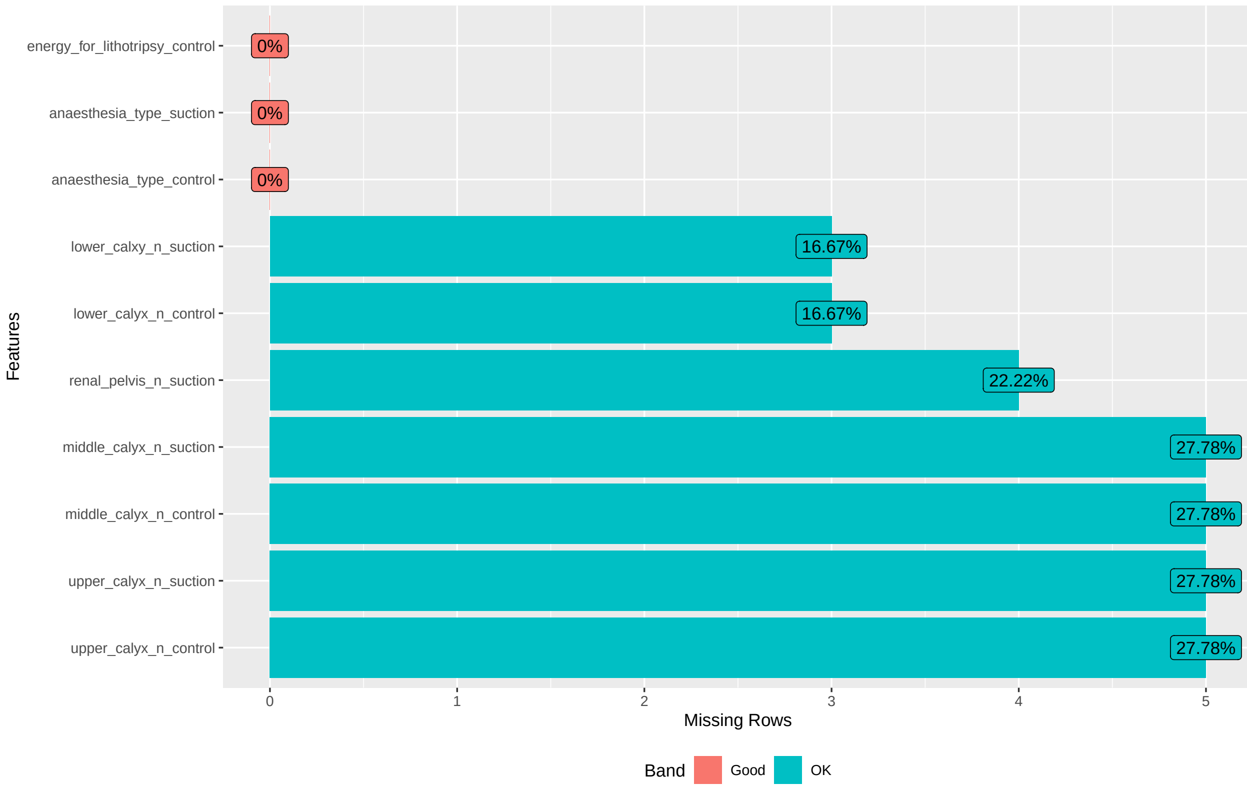
```r
plot_missing(suction_data[51:60])
```



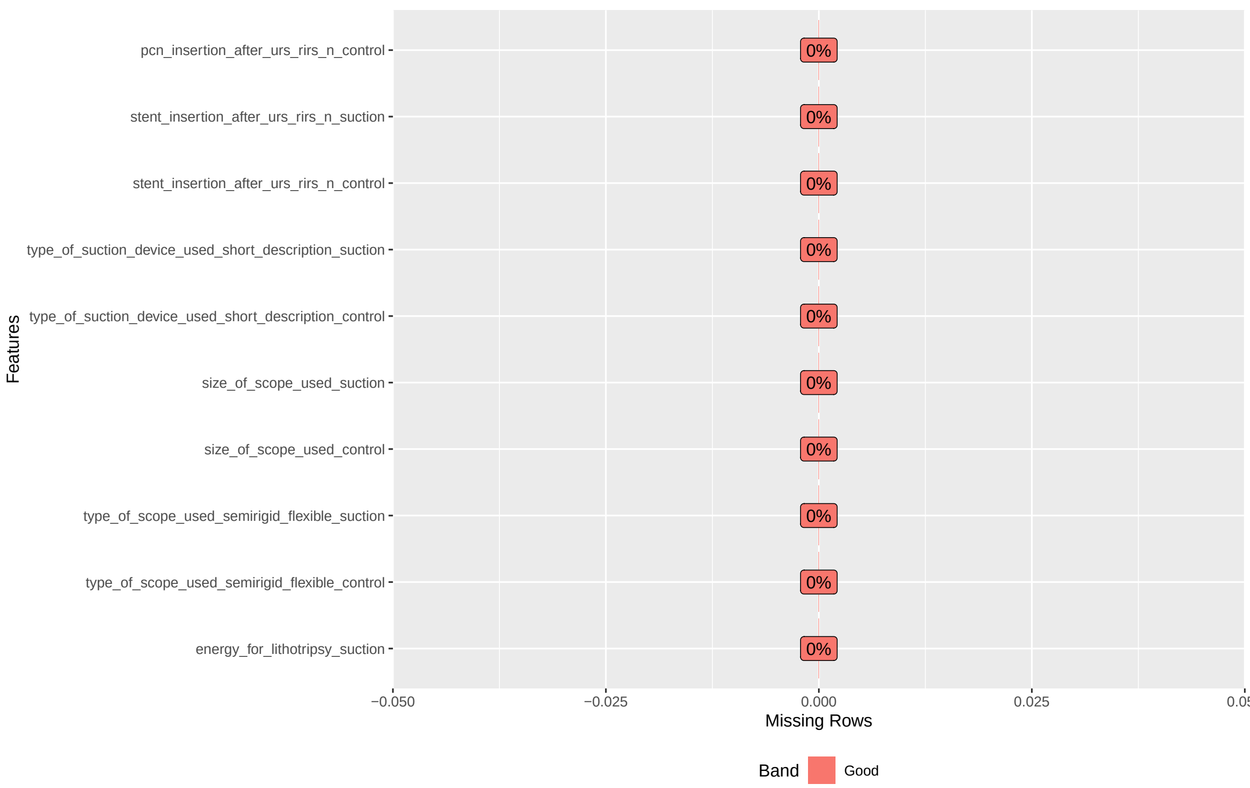

```r
plot_missing(suction_data[61:70])
```



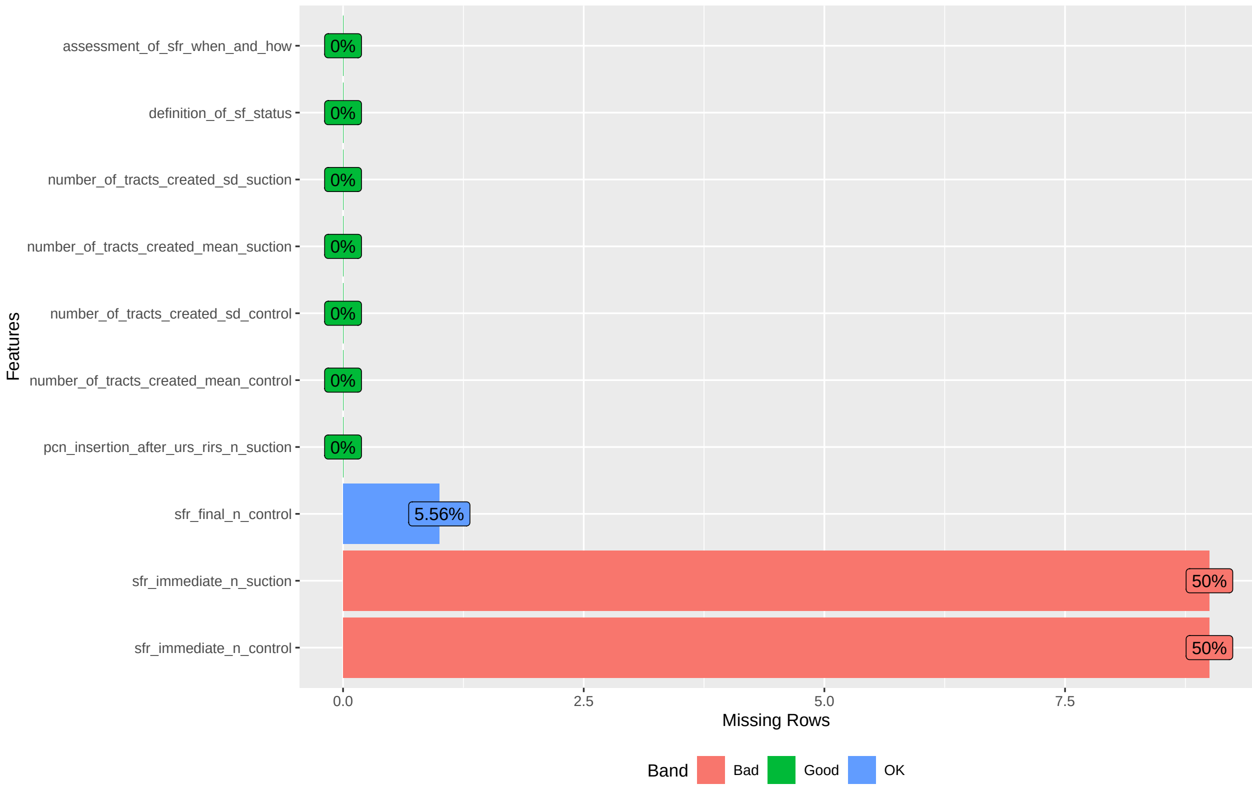
```r
plot_missing(suction_data[71:80])
```



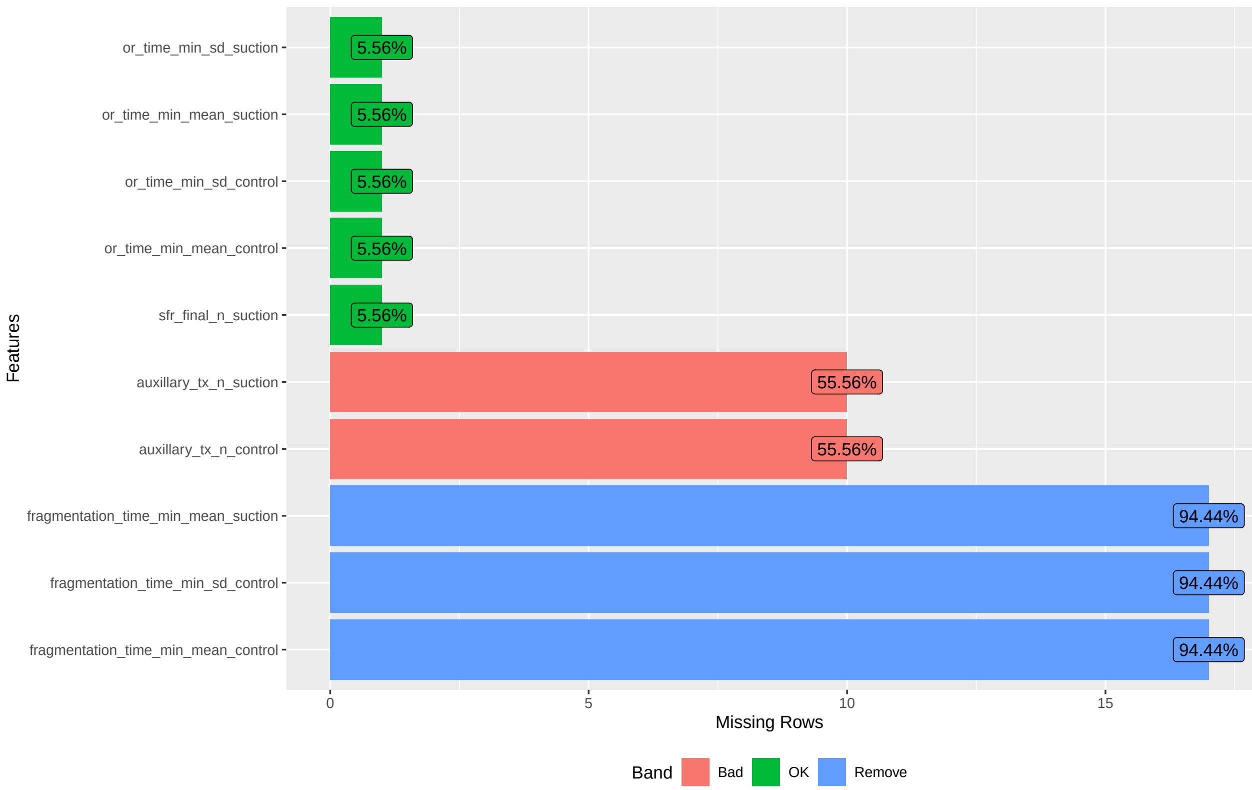

```r
plot_missing(suction_data[81:90])
```



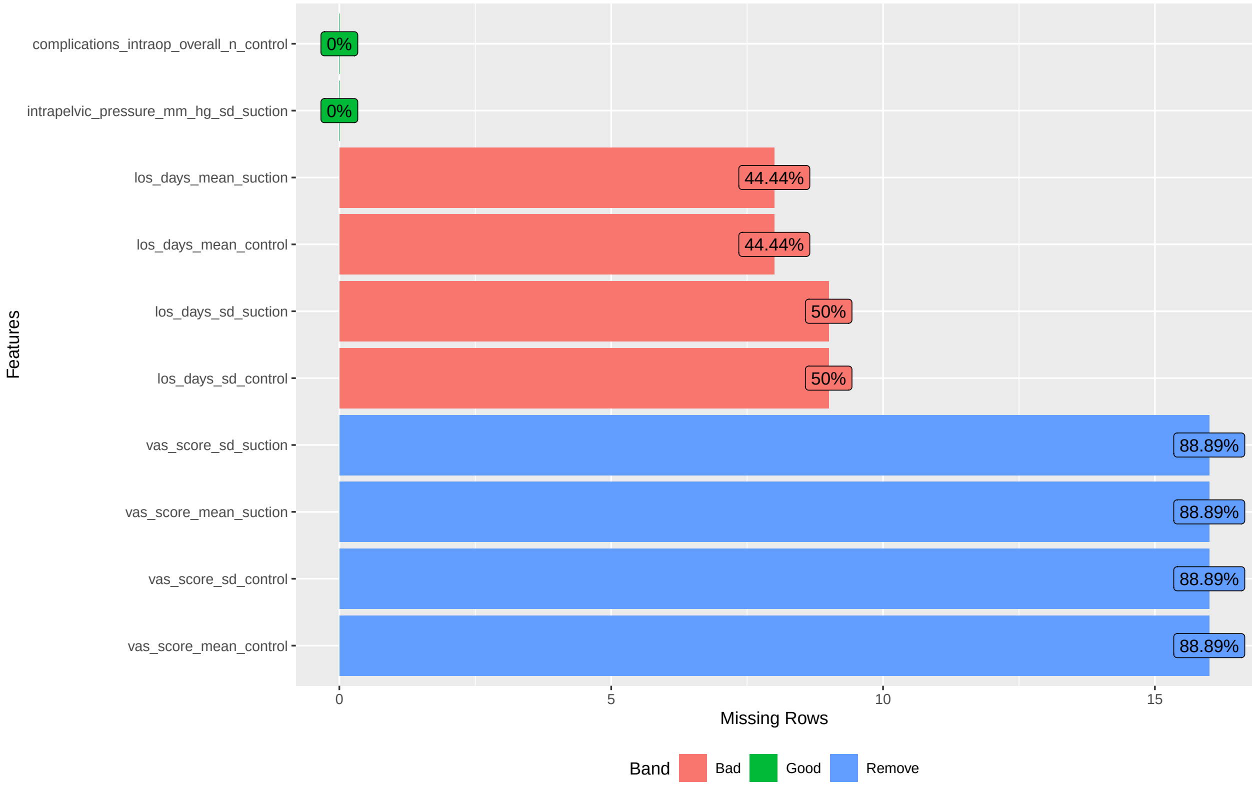
```r
plot_missing(suction_data[91:100])
```



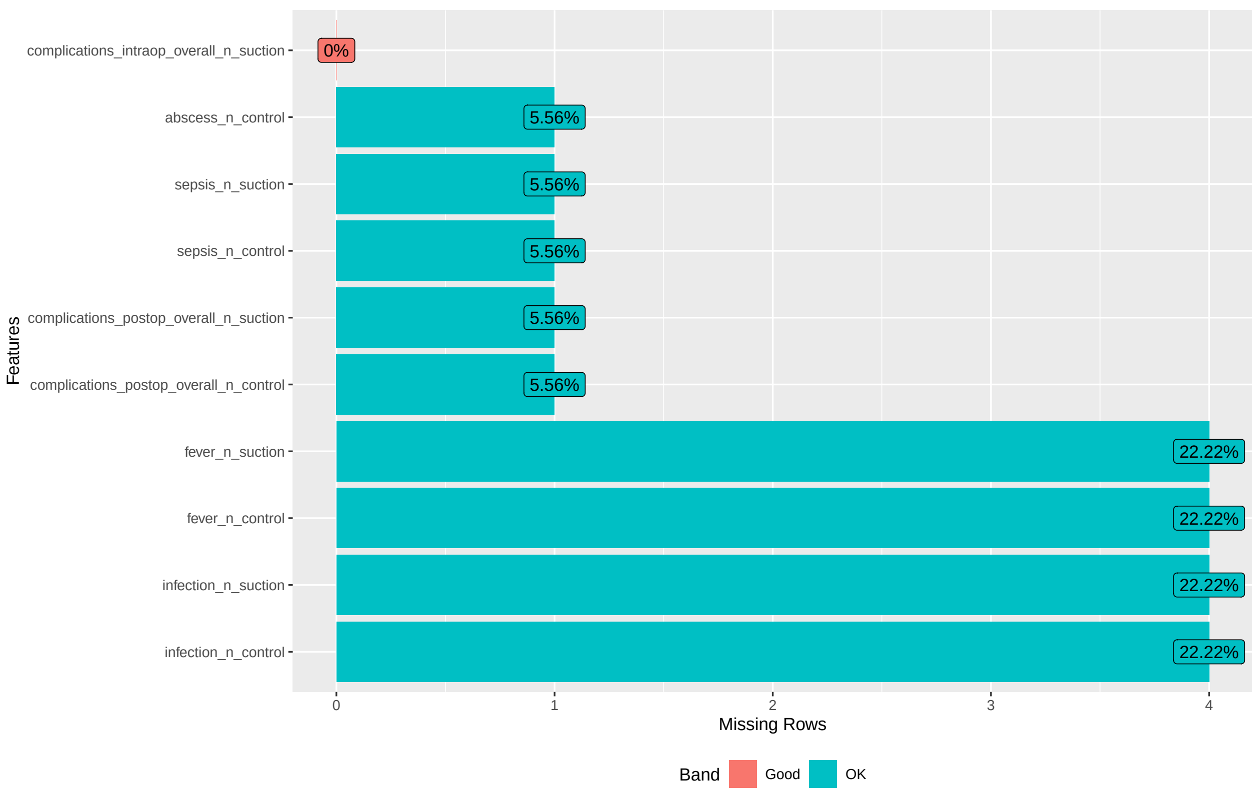

```r
plot_missing(suction_data[101:110])
```



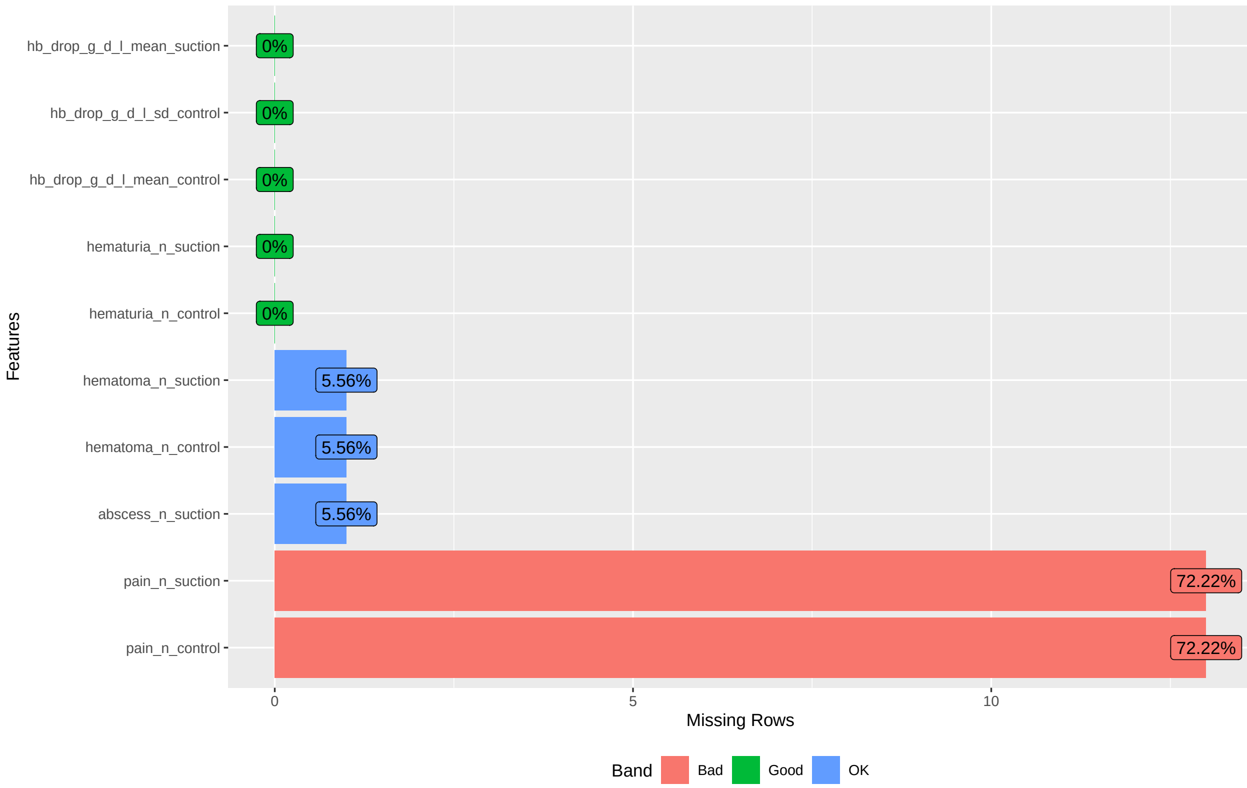
```r
plot_missing(suction_data[121:130])
```



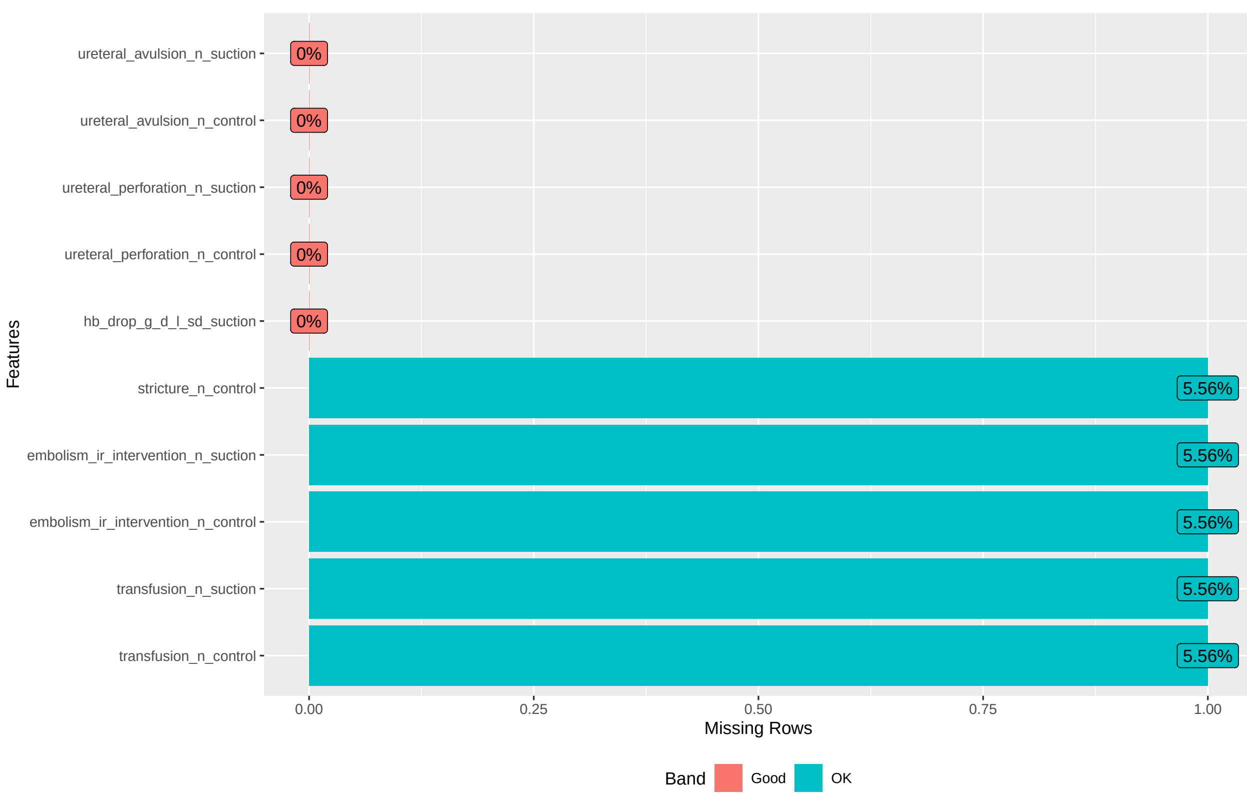

```r
plot_missing(suction_data[131:140])
```



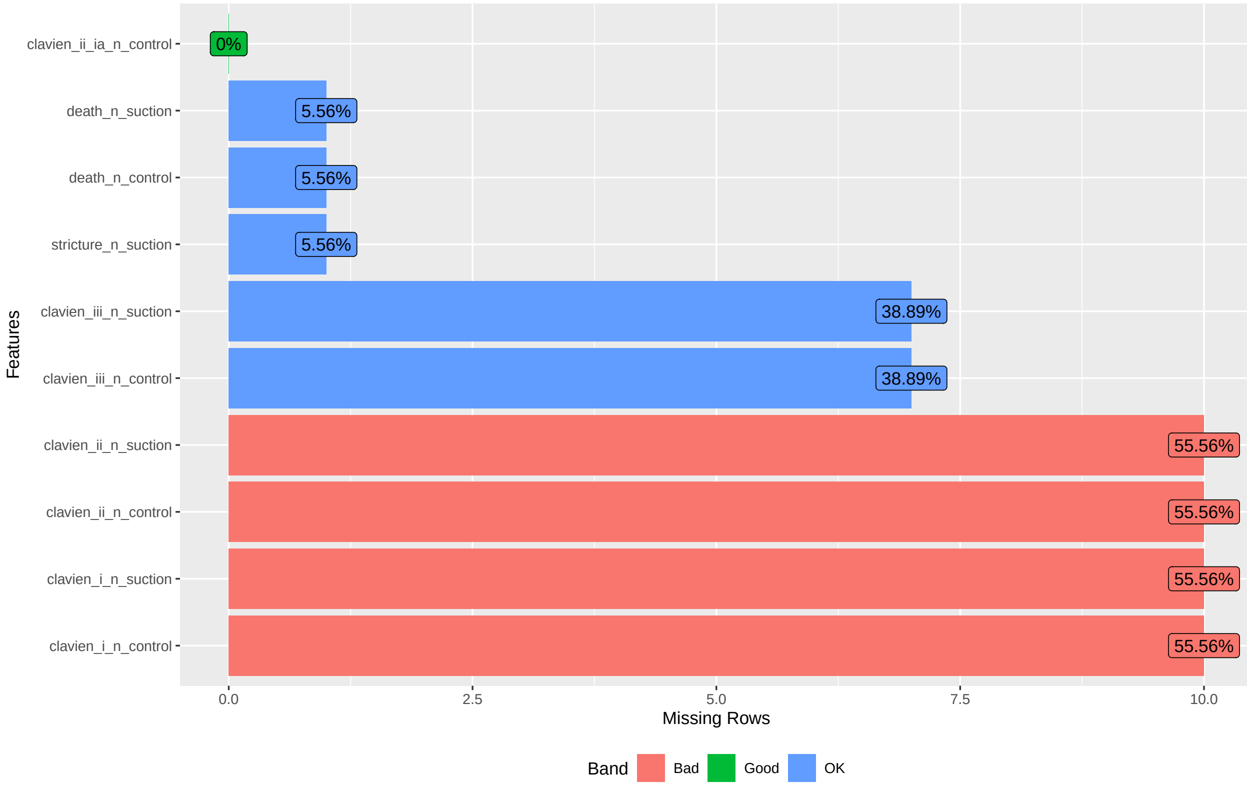
```
plot_missing(suction_data[141:150])
```



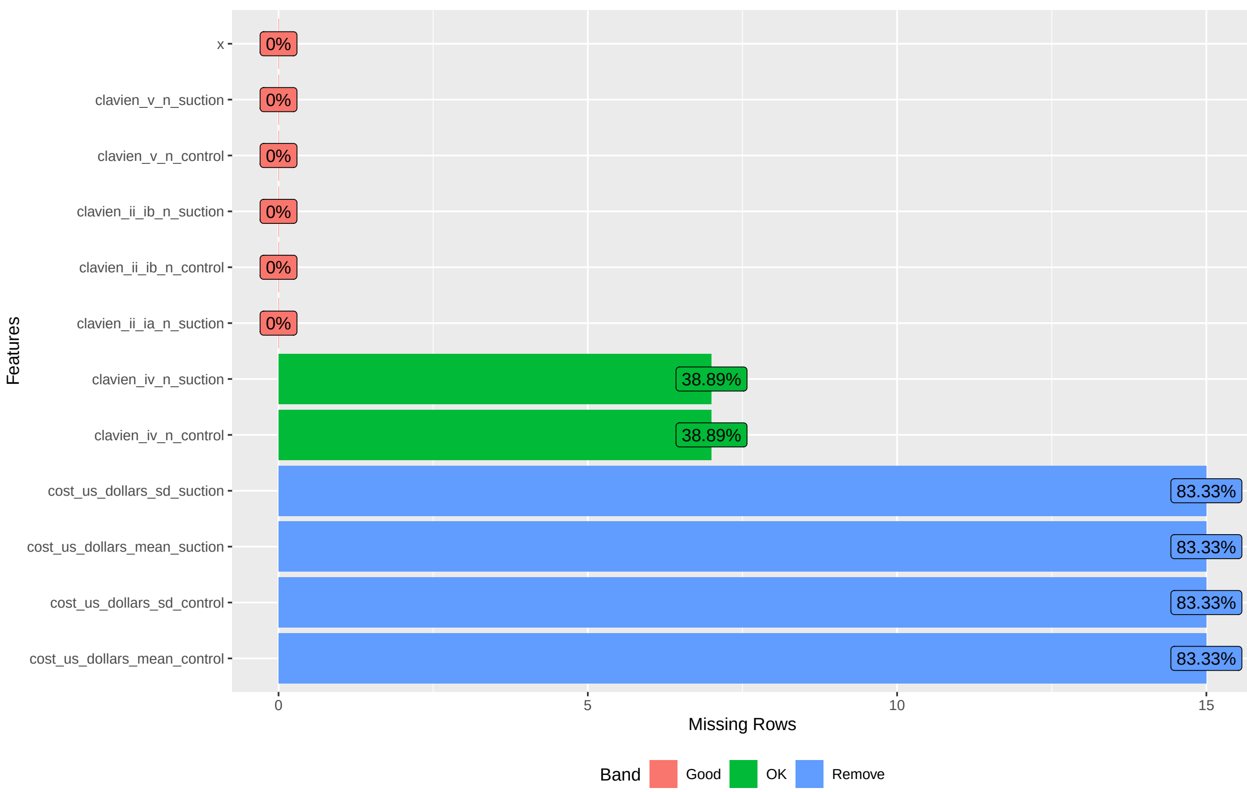

```
plot_missing(suction_data[151:160])
```



```r
plot_missing(suction_data[161:170])
```




```r
plot_missing(suction_data[171:182])
```



3 Demographic information

3.1 Number of Patients

```
total_n <- c(
  "Total",
  sum(suction_data$sample_size_control),
  sum(suction_data$sample_size_suction)
)

suction_data %>% subset(select = c(author_year,
                                   sample_size_control,
                                   sample_size_suction)) %>% rbind(total_n) %>% gt() %>% cols_label(
                                     author_year = "Study",
                                     sample_size_control = "Control, N",
                                     sample_size_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	8	9
Tang 2023	87	86
Chen 2019	45	44
Du 2019	60	62
Lai 2020	56	28
Zhu 2018	165	165
Zhang 2021	50	56
Zhang 2021	54	56
Lechevallier 2003	14	11
Huang 2023	103	103
Wu 2022	82	76
Ding 2023	61	138
Zhai 2023	60	60
Zhai 2023	60	60
Qian 2022	81	81
Zhang 2022	30	30
Deng 2022	70	57
AlSmadi 2019	60	43
Total	1146	1165

3.2 Number of Surgeons

```
median_surgeons_n <- c(
  "Median",
  median(na.omit(suction_data$number_of_surgeons_control)),
  median(na.omit(suction_data$number_of_surgeons_suction))
)

suction_data %>% subset(select = c(author_year,
                                   number_of_surgeons_control,
                                   number_of_surgeons_suction)) %>% na.omit() %>% rbind(median_surgeons_
                                     author_year = "Study",
                                     number_of_surgeons_control = "Control, N",
                                     number_of_surgeons_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	4	4
Tang 2023	1	1
Du 2019	1	1
Zhu 2018	3	3
Lechevallier 2003	1	1
Huang 2023	1	1
Zhai 2023	1	1
Zhai 2023	1	1
Median	1	1

3.3 Number of Male Patients

```
total_surgeons_n <- c(
  "Total",
  median(na.omit(suction_data$male_n_control)),
  median(na.omit(suction_data$male_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   male_n_control,
                                   male_n_suction)) %>% na.omit() %>% rbind(total_surgeons_n) %>% gt() %
                                     author_year = "Study",
                                     male_n_control = "Control, N",
                                     male_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	5	8
Tang 2023	41	37
Chen 2019	23	21
Du 2019	36	37
Lai 2020	26	16
Zhu 2018	109	109
Zhang 2021	25	34
Zhang 2021	37	34
Huang 2023	68	71
Wu 2022	46	43
Ding 2023	39	89
Zhai 2023	32	34
Zhai 2023	32	35
Qian 2022	56	52
Zhang 2022	19	17
Deng 2022	47	32
AlSmadi 2019	24	18
Total	36	34

3.4 Comparisons - type of intervention

```
suction_data %>% subset(select = c(author_year,
                                   design,
                                   control_group,
                                   suction_group
                                   )) %>% gt()
```

author_year	design	control_group	suction_group
Sur 2022	RCT	Flexible URS	Flexible URS with suction
Tang 2023	RCT	mini-PCNL	Flexible URS with suction
Chen 2019	Retrospective	mini-PCNL	Flexible URS with suction
Du 2019	RCT	Semi-rigid URS	Semi-rigid URS with suction
Lai 2020	Retrospective	mini-PCNL	Flexible URS with suction
Zhu 2018	Retrospective	Flexible URS	Flexible URS with suction
Zhang 2021	Retrospective	Semi-rigid URS	Semi-rigid URS with suction
Zhang 2021	Retrospective	Flexible URS	Flexible URS with suction
Lechevallier 2003	RCT	Semi-rigid URS	Semi-rigid URS with suction
Huang 2023	Retrospective	Flexible URS	Flexible URS with suction
Wu 2022	Retrospective	Semi-rigid URS	Semi-rigid URS with suction
Ding 2023	Retrospective	Flexible URS	Flexible URS with suction
Zhai 2023	Retrospective	Semi-rigid URS	Semi-rigid URS with suction
Zhai 2023	Retrospective	Semi-rigid URS	Semi-rigid URS with suction
Qian 2022	Retrospective	Flexible URS	Flexible URS with suction
Zhang 2022	RCT	Flexible URS	Semi-rigid URS with suction (combined with flexible standard URS)
Deng 2022	Retrospective	mini-PCNL	Flexible URS with suction
AlSmadi 2019	Retrospective	Semi-rigid URS	Semi-rigid URS with suction

3.5 Age

```
suction_data %>% subset(select = c(author_year,
                                   age_mean_control,
                                   age_sd_control,
                                   age_mean_suction,
                                   age_sd_suction)) %>% gt() %>% cols_merge(columns = c(age_mean_contro
                                                                                         age_sd_control)
                                                                          pattern = "{1}±{2}") %>% co
                                                                                         age_sd_suction)
                                                                          pattern = "{1}±{2}") %>% co
```

Study	Control Age ± SD	Suction Age ± SD
Sur 2022	37.0±NA	42.0±NA
Tang 2023	51.3±8.2	52.7±9.3
Chen 2019	39.4±17.9	45.7±11.9
Du 2019	47.0±15.7	47.4±13.2
Lai 2020	49.6±12.2	45.2±10.4
Zhu 2018	51.7±15.8	53.9±13.4
Zhang 2021	54.3±11.6	53.8±12.1
Zhang 2021	55.2±10.2	53.8±12.1
Lechevallier 2003	NA±NA	NA±NA
Huang 2023	54.7±10.7	54.5±11.0
Wu 2022	44.9±12.7	48.5±12.4
Ding 2023	55.7±13.1	57.6±13.7
Zhai 2023	46.2±6.9	45.7±6.5
Zhai 2023	46.2±6.9	47.2±4.5
Qian 2022	50.0±10.6	50.0±11.3
Zhang 2022	55.7±10.8	53.5±12.9
Deng 2022	47.4±7.8	51.9±10.9
AlSmadi 2019	48.2±11.0	51.9±13.2

3.6 BMI

```
suction_data %>% subset(select = c(author_year,
                                   bmi_mean_control,
                                   bmi_sd_control,
                                   bmi_mean_suction,
                                   bmi_sd_suction)) %>% gt() %>% cols_merge(columns = c(bmi_mean_contro
                                                                                     bmi_sd_control)
                                                                           pattern = "{1}±{2}") %>% co
                                                                                     bmi_sd_suction)
                                                                           pattern = "{1}±{2}") %>% co
```

Study	Control BMI ± SD	Suction BMI ± SD
Sur 2022	23.4±NA	22.3±NA
Tang 2023	22.6±3.2	23.1±3.9
Chen 2019	27.3±4.4	28.2±8.2
Du 2019	NA±NA	NA±NA
Lai 2020	25.3±4.1	25.0±3.5
Zhu 2018	23.1±3.4	22.9±2.6
Zhang 2021	21.8±3.4	20.8±3.4
Zhang 2021	21.9±3.5	20.8±3.4
Lechevallier 2003	NA±NA	NA±NA
Huang 2023	26.5±4.9	26.3±4.2
Wu 2022	24.6±2.8	23.9±2.0
Ding 2023	24.0±2.6	24.6±3.2
Zhai 2023	26.2±4.1	25.0±3.4
Zhai 2023	26.2±4.1	24.9±3.1
Qian 2022	24.1±3.4	24.0±3.0
Zhang 2022	25.5±2.9	25.2±3.2
Deng 2022	19.8±5.7	20.3±4.4
AlSmadi 2019	24.0±1.7	22.8±1.5

3.7 HU

```
suction_data %>% subset(select = c(author_year,
                                   hu_mean_control,
                                   hu_sd_control,
                                   hu_mean_suction,
                                   hu_sd_suction)) %>% gt() %>% cols_merge(columns = c(hu_mean_control,
                                                                                        hu_sd_control),
                                                                             pattern = "{1}±{2}") %>% co
                                                                                        hu_sd_suction),
                                                                             pattern = "{1}±{2}") %>% co
```

Study	Control HU ± SD	Suction HU ± SD
Sur 2022	926.0±NA	786.0±NA
Tang 2023	NA±NA	NA±NA
Chen 2019	NA±NA	NA±NA
Du 2019	984.5±226.8	1022.8±215.3
Lai 2020	845.2±240.2	894.3±232.2
Zhu 2018	1023.0±175.0	1049.0±196.0
Zhang 2021	665.0±309.6	708.6±343.7
Zhang 2021	684.2±376.3	708.6±343.7
Lechevallier 2003	NA±NA	NA±NA
Huang 2023	NA±NA	NA±NA
Wu 2022	916.4±80.7	937.7±85.0
Ding 2023	715.3±340.8	751.6±429.3
Zhai 2023	912.3±52.9	906.5±63.5
Zhai 2023	912.3±52.9	897.1±94.2
Qian 2022	NA±NA	NA±NA
Zhang 2022	NA±NA	NA±NA
Deng 2022	NA±NA	NA±NA
AlSmadi 2019	776.5±120.1	895.6±70.4

3.8 Size Metrics

3.8.1 Size (mm) - missing data removed

```
suction_data %>% subset(select = c(author_year,
                                   stone_size_mm_mean_control,
                                   stone_size_mm_sd_control,
                                   stone_size_mm_mean_suction,
                                   stone_size_mm_sd_suction)) %>% drop_na(stone_size_mm_mean_control) %
                                                                                     stone_size_mm_s
                                                                        pattern = "{1}±{2}") %>% co
                                                                                     stone_size_mm_s
                                                                        pattern = "{1}±{2}") %>% co
```

Study	Control Size (mm) ± SD	Suction Size (mm) ± SD
Tang 2023	15.0±5.0	16.0±4.0
Du 2019	21.4±3.6	21.9±4.9
Lai 2020	38.2±5.4	35.3±6.3
Zhu 2018	17.4±4.7	18.2±5.2
Zhang 2021	12.5±4.9	13.9±4.7
Zhang 2021	12.7±5.5	13.9±4.7
Huang 2023	17.0±5.0	17.0±6.0
Ding 2023	13.4±5.2	13.0±6.9
Qian 2022	20.0±4.5	19.7±4.5
Zhang 2022	18.5±5.6	18.2±5.3
Deng 2022	24.9±7.9	23.1±6.5
AlSmadi 2019	14.9±1.8	12.7±1.2

3.8.2 Area (mm^2) - missing data removed

```
suction_data %>% subset(select = c(author_year,
                                   stone_surface_mm2_mean_control,
                                   stone_surface_mm2_sd_control,
                                   stone_surface_mm2_mean_suction,
                                   stone_surface_mm2_sd_suction)) %>% drop_na(stone_surface_mm2_mean_co
                                                                               stone_surface_m
                                                                     pattern = "{1}±{2}") %>% co
                                                                               stone_surface_m
                                                                     pattern = "{1}±{2}") %>% co
```

Study	Control Area (mm^2) ± SD	Suction Area (mm^2) ± SD
Lai 2020	729.0±83.7	676.1±42.2
Wu 2022	157.0±34.6	165.3±33.4
Zhai 2023	131.8±25.1	136.5±26.6
Zhai 2023	131.8±25.1	135.9±24.8

3.8.3 Volume (mm^3) - missing data removed

```
suction_data %>% subset(select = c(author_year,
                                   stone_burden_mm3_mean_control,
                                   stone_burden_mm3_sd_control,
                                   stone_burden_mm3_mean_suction,
                                   stone_burden_mm3_sd_suction)) %>% drop_na(stone_burden_mm3_mean_cont
                                                                              stone_burden_mm3
                                                                 pattern = "{1}±{2}") %>% co
                                                                              stone_burden_mm3
                                                                 pattern = "{1}±{2}") %>% co
```

Study	Control Volume (mm^3) ± SD	Suction Volume (mm^3) ± SD
Sur 2022	210±NA	267±NA

3.9 Stone Location

3.9.1 Distal Ureter

```
total_distal_n <- c(
  "Total",
  sum(na.omit(suction_data$distal_ureter_n_control)),
  sum(na.omit(suction_data$distal_ureter_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   distal_ureter_n_control,
                                   distal_ureter_n_suction)) %>% na.omit() %>% rbind(total_distal_n) %>%
                                     author_year = "Study",
                                     distal_ureter_n_control = "Control, N",
                                     distal_ureter_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	0	0
Tang 2023	0	0
Chen 2019	0	0
Du 2019	27	26
Lai 2020	0	0
Zhang 2021	0	0
Zhang 2021	0	0
Huang 2023	0	0
Wu 2022	0	0
Ding 2023	0	0
Zhai 2023	30	30
Zhai 2023	30	20
Qian 2022	0	0
Zhang 2022	0	0
Deng 2022	0	0
AlSmadi 2019	0	0
Total	87	76

3.9.2 Mid Ureter

```
total_mid_n <- c(
  "Total",
  sum(na.omit(suction_data$mid_ureter_n_control)),
  sum(na.omit(suction_data$mid_ureter_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   mid_ureter_n_control,
                                   mid_ureter_n_suction)) %>% na.omit() %>% rbind(total_mid_n) %>% gt()
                                     author_year = "Study",
                                     mid_ureter_n_control = "Control, N",
                                     mid_ureter_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	0	0
Tang 2023	0	0
Chen 2019	0	0
Du 2019	13	15
Lai 2020	0	0
Zhang 2021	0	0
Zhang 2021	0	0
Huang 2023	0	0
Wu 2022	0	0
Ding 2023	0	0
Zhai 2023	17	18
Zhai 2023	17	28
Qian 2022	0	0
Zhang 2022	0	0
Deng 2022	0	0
AlSmadi 2019	0	0
Total	47	61

3.9.3 Upper Ureter

```
total_upper_n <- c(
  "Total",
  sum(na.omit(suction_data$upper_ureter_n_control)),
  sum(na.omit(suction_data$upper_ureter_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   upper_ureter_n_control,
                                   upper_ureter_n_suction)) %>% na.omit() %>% rbind(total_upper_n) %>% g
                                     author_year = "Study",
                                     upper_ureter_n_control = "Control, N",
                                     upper_ureter_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	0	0
Tang 2023	87	86
Chen 2019	0	0
Du 2019	20	21
Lai 2020	0	0
Zhang 2021	50	56
Zhang 2021	54	56
Wu 2022	82	76
Ding 2023	13	26
Zhai 2023	13	12
Zhai 2023	13	12
Qian 2022	0	0
Zhang 2022	0	0
Deng 2022	0	0
AlSmadi 2019	60	43
Total	392	388

3.9.4 Renal Pelvis

```
total_renal_pelvis_n <- c(
  "Total",
  sum(na.omit(suction_data$renal_pelvis_n_control)),
  sum(na.omit(suction_data$renal_pelvis_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   renal_pelvis_n_control,
                                   renal_pelvis_n_suction)) %>% na.omit() %>% rbind(total_renal_pelvis_n
                                     author_year = "Study",
                                     renal_pelvis_n_control = "Control, N",
                                     renal_pelvis_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Tang 2023	0	0
Chen 2019	0	0
Du 2019	0	0
Lai 2020	56	28
Zhu 2018	23	29
Zhang 2021	0	0
Zhang 2021	0	0
Wu 2022	0	0
Ding 2023	35	98
Zhai 2023	0	0
Zhai 2023	0	0
Qian 2022	0	0
Deng 2022	5	6
AlSmadi 2019	0	0
Total	119	161

3.9.5 Lower Calyx

```
total_lower_calyx_n <- c(
  "Total",
  sum(na.omit(suction_data$lower_calyx_n_control)),
  sum(na.omit(suction_data$lower_calxy_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   lower_calyx_n_control,
                                   lower_calxy_n_suction)) %>% na.omit() %>% rbind(total_lower_calyx_n)
                                     author_year = "Study",
                                     lower_calyx_n_control = "Control, N",
                                     lower_calxy_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Sur 2022	5	7
Tang 2023	0	0
Chen 2019	13	11
Du 2019	0	0
Lai 2020	22	11
Zhu 2018	42	40
Zhang 2021	0	0
Zhang 2021	0	0
Wu 2022	0	0
Ding 2023	29	64
Zhai 2023	0	0
Zhai 2023	0	0
Qian 2022	25	34
Deng 2022	5	3
AlSmadi 2019	0	0
Total	141	170

3.9.6 middle Calyx

```
total_middle_calyx_n <- c(
  "Total",
  sum(na.omit(suction_data$middle_calyx_n_control)),
  sum(na.omit(suction_data$middle_calyx_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   middle_calyx_n_control,
                                   middle_calyx_n_suction)) %>% na.omit() %>% rbind(total_middle_calyx_n
                                     author_year = "Study",
                                     middle_calyx_n_control = "Control, N",
                                     middle_calyx_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Tang 2023	0	0
Chen 2019	16	18
Du 2019	0	0
Lai 2020	28	15
Zhu 2018	35	27
Zhang 2021	0	0
Zhang 2021	0	0
Wu 2022	0	0
Ding 2023	5	11
Zhai 2023	0	0
Zhai 2023	0	0
Deng 2022	7	4
AlSmadi 2019	0	0
Total	91	75

3.9.7 Upper Calyx

```
total_upper_calyx_n <- c(
  "Total",
  sum(na.omit(suction_data$upper_calyx_n_control)),
  sum(na.omit(suction_data$upper_calyx_n_suction))
)

suction_data %>% subset(select = c(author_year,
                                   upper_calyx_n_control,
                                   upper_calyx_n_suction)) %>% na.omit() %>% rbind(total_upper_calyx_n)
                                     author_year = "Study",
                                     upper_calyx_n_control = "Control, N",
                                     upper_calyx_n_suction = "Suction, N"
                                   )
```

Study	Control, N	Suction, N
Tang 2023	0	0
Chen 2019	16	17
Du 2019	0	0
Lai 2020	22	13
Zhu 2018	18	14
Zhang 2021	0	0
Zhang 2021	0	0
Wu 2022	0	0
Ding 2023	2	3
Zhai 2023	0	0
Zhai 2023	0	0
Deng 2022	14	15
AlSmadi 2019	0	0
Total	72	62

4 Overall Meta-Analysis Outcomes

4.1 Immediate SFR

4.1.1 Meta-analysis

```
immediate_sfr_metabin <- metabin(data = suction_data,
                         event.c = sfr_immediate_n_control,
                       n.c = sample_size_control,
                       event.e = sfr_immediate_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
immediate_sfr_metabin
```

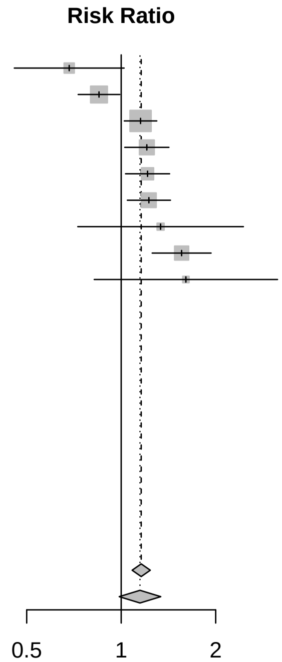
```
## Number of studies: k = 9
## Number of observations: o = 2311
## Number of events: e = 979
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1581 [1.0834; 1.2380] 4.31 < 0.0001
## Random effects model 1.1478 [0.9854; 1.3370] 1.77   0.0765
##
## Quantifying heterogeneity:
##  tau^2 = 0.0365 [0.0088; 0.2318]; tau = 0.1910 [0.0939; 0.4814]
##  I^2 = 74.6% [50.9%; 86.9%]; H = 1.99 [1.43; 2.76]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  31.55    8  0.0001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

4.1.2 Forest plot

```r
forest(immediate_sfr_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Lai 2020	14	28	41	56	0.68	[0.46; 1.02]	6.1%	7.7%
Tang 2023	63	86	75	87	0.85	[0.73; 0.99]	16.6%	14.2%
Zhu 2018	136	165	118	165	1.15	[1.02; 1.30]	26.3%	15.1%
Qian 2022	70	81	58	81	1.21	[1.03; 1.42]	12.9%	14.0%
AlSmadi 2019	40	43	46	60	1.21	[1.03; 1.43]	8.6%	14.0%
Wu 2022	67	76	59	82	1.23	[1.05; 1.44]	12.6%	14.1%
Zhang 2021	18	56	13	54	1.34	[0.73; 2.45]	2.9%	4.6%
Huang 2023	81	103	52	103	1.56	[1.25; 1.93]	11.6%	12.5%
Zhang 2021	18	56	10	50	1.61	[0.82; 3.15]	2.4%	3.9%
Sur 2022	.	9	.	8			0.0%	0.0%
Chen 2019	.	44	.	45			0.0%	0.0%
Du 2019	.	62	.	60			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Ding 2023	.	138	.	61			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhang 2022	.	30	.	30			0.0%	0.0%
Deng 2022	.	57	.	70			0.0%	0.0%
Common effect model		**1165**		**1146**	**1.16**	**[1.08; 1.24]**	**100.0%**	**−−**
Random effects model					**1.15**	**[0.99; 1.34]**	**−−**	**100.0%**

Heterogeneity: $I^2 = 75\%$, $\tau^2 = 0.0365$, $p < 0.01$



4.1.3 Trim and Fill

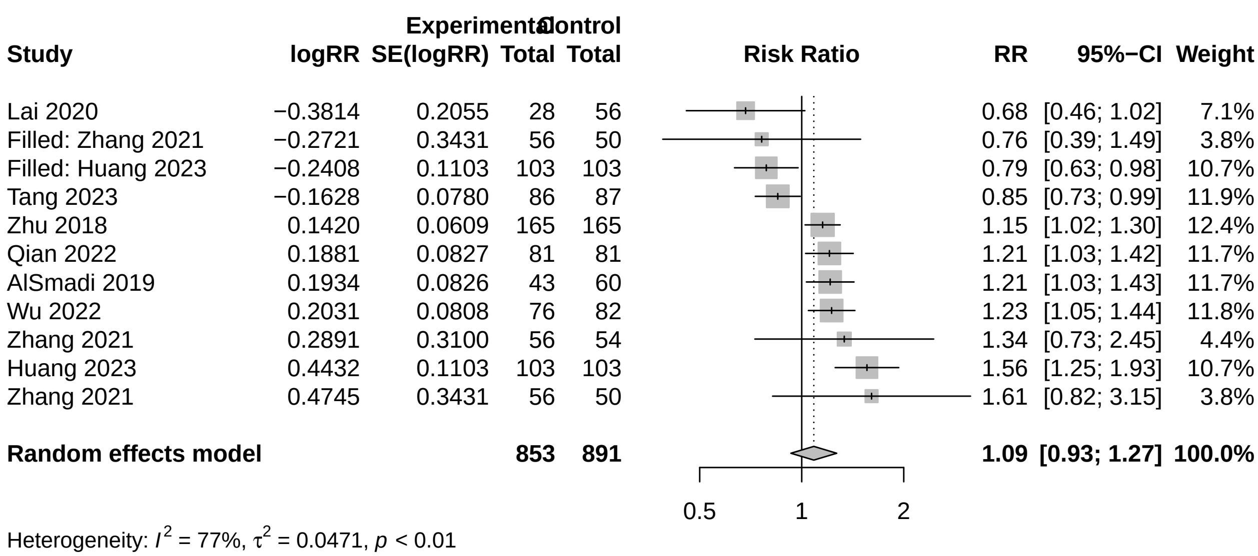
```r
trimfill(immediate_sfr_metabin)
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```

```
## Number of studies: k = 11 (with 2 added studies)
## Number of observations: o = 1744
## Number of events: e = 1140
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0855 [0.9289; 1.2685] 1.03  0.3019
##
## Quantifying heterogeneity:
##  tau^2 = 0.0471 [0.0138; 0.2196]; tau = 0.2170 [0.1173; 0.4686]
##  I^2 = 76.9% [58.8%; 87.1%]; H = 2.08 [1.56; 2.78]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  43.33   10 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(immediate_sfr_metabin),
       sortvar = TE)
```

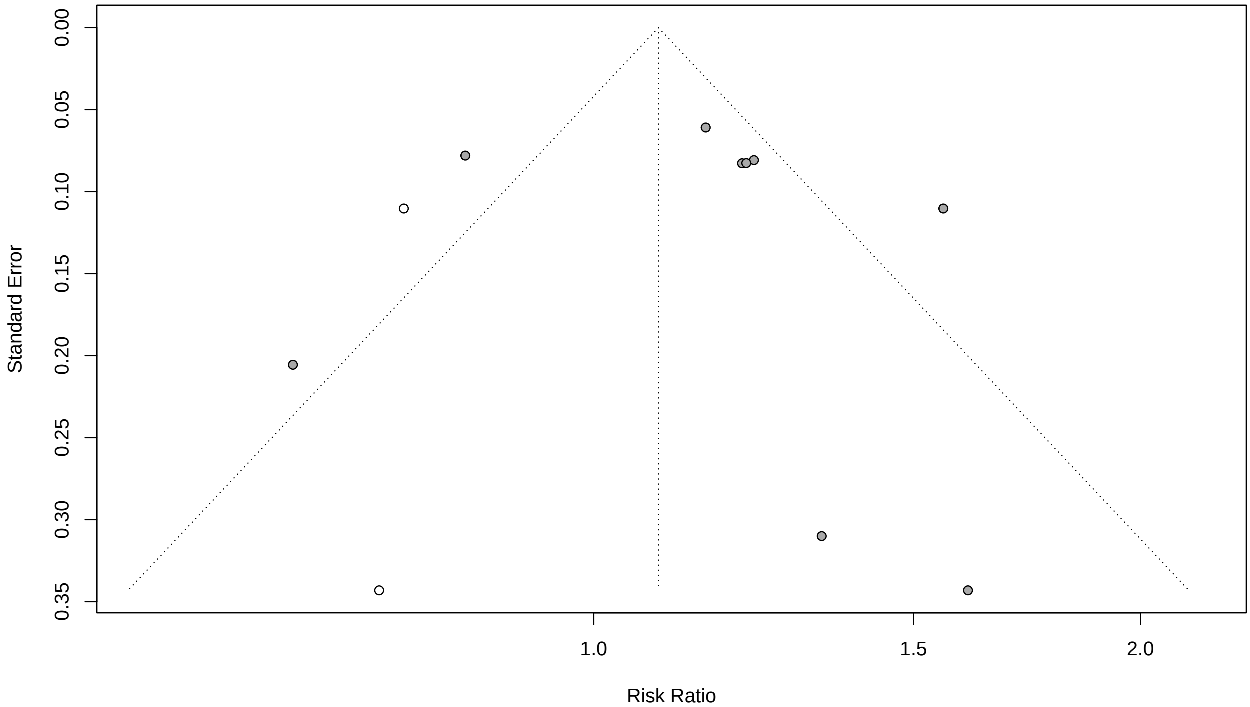
```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



4.1.4 Funnel plot

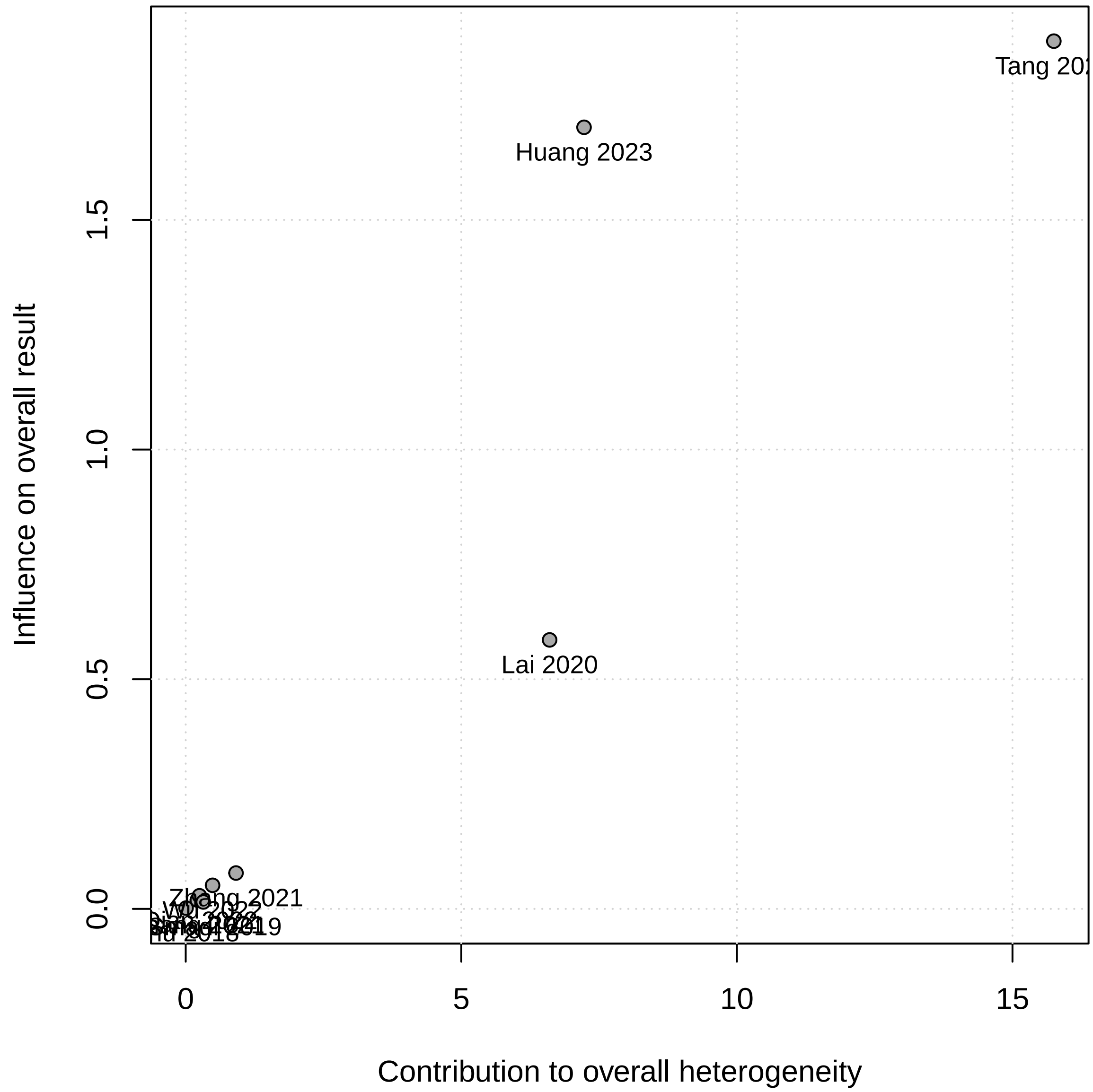
```
funnel(trimfill(immediate_sfr_metabin))
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



4.1.5 Baujat

```r
baujat(immediate_sfr_metabin, pos = 1)
```



4.1.6 Leave one out

```r
metainf(immediate_sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI  p-value   tau^2     tau
## Omitting Sur 2022            1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Tang 2023           1.2195 [1.1329; 1.3128] < 0.0001  0.0076  0.0873
## Omitting Chen 2019           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Du 2019             1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Lai 2020            1.1889 [1.1116; 1.2716] < 0.0001  0.0258  0.1607
## Omitting Zhu 2018            1.1601 [1.0710; 1.2565]   0.0003  0.0482  0.2196
## Omitting Zhang 2021          1.1473 [1.0741; 1.2254] < 0.0001  0.0376  0.1938
## Omitting Zhang 2021          1.1527 [1.0791; 1.2313] < 0.0001  0.0396  0.1990
## Omitting Lechevallier 2003   1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Huang 2023          1.1057 [1.0315; 1.1853]   0.0046  0.0246  0.1568
## Omitting Wu 2022             1.1484 [1.0676; 1.2353]   0.0002  0.0464  0.2153
## Omitting Ding 2023           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Qian 2022           1.1508 [1.0700; 1.2377]   0.0002  0.0468  0.2164
## Omitting Zhang 2022          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Deng 2022           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting AlSmadi 2019        1.1529 [1.0734; 1.2383] < 0.0001  0.0467  0.2160
##
## Pooled estimate              1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
##                                 I^2
## Omitting Sur 2022             74.6%
## Omitting Tang 2023            51.5%
## Omitting Chen 2019            74.6%
## Omitting Du 2019              74.6%
## Omitting Lai 2020             72.2%
## Omitting Zhu 2018             77.8%
## Omitting Zhang 2021           77.1%
## Omitting Zhang 2021           77.6%
## Omitting Lechevallier 2003    74.6%
## Omitting Huang 2023           69.4%
## Omitting Wu 2022              77.2%
## Omitting Ding 2023            74.6%
## Omitting Zhai 2023            74.6%
## Omitting Zhai 2023            74.6%
## Omitting Qian 2022            77.4%
## Omitting Zhang 2022           74.6%
## Omitting Deng 2022            74.6%
## Omitting AlSmadi 2019         77.4%
##
## Pooled estimate               74.6%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.2 Final SFR

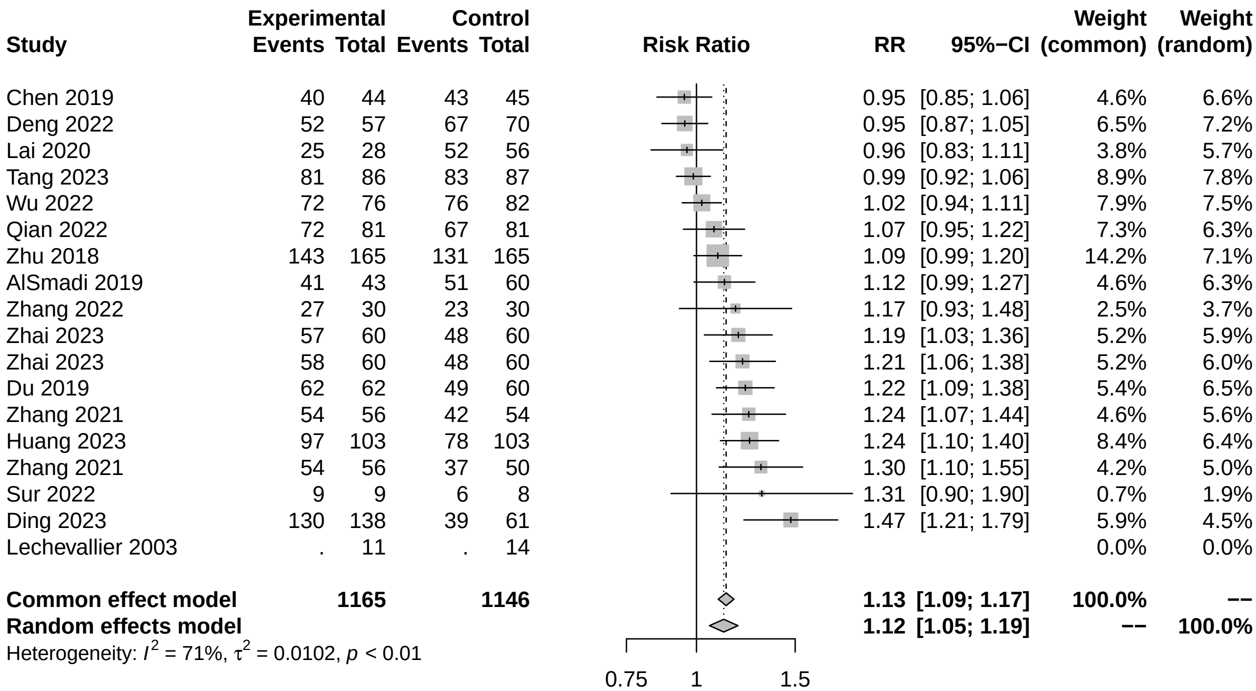
4.2.1 Meta-analysis

```
sfr_metabin <- metabin(data = suction_data,
                         event.c = sfr_final_n_control,
                       n.c = sample_size_control,
                       event.e = sfr_final_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sfr_metabin
```

```
## Number of studies: k = 17
## Number of observations: o = 2311
## Number of events: e = 2014
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1295 [1.0935; 1.1666] 7.38 < 0.0001
## Random effects model 1.1185 [1.0547; 1.1862] 3.74   0.0002
##
## Quantifying heterogeneity:
##  tau^2 = 0.0102 [0.0036; 0.0310]; tau = 0.1011 [0.0597; 0.1760]
##  I^2 = 71.3% [53.1%; 82.4%]; H = 1.87 [1.46; 2.38]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  55.71   16 < 0.0001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.2.2 Forest plot

```r
forest(sfr_metabin,
       sortvar = TE)
```



4.2.3 Trim and Fill

```r
trimfill(sfr_metabin)
```

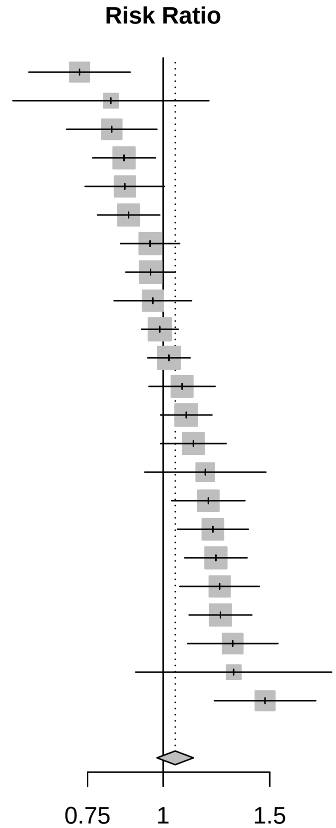
```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 23 (with 6 added studies)
## Number of observations: o = 3046
## Number of events: e = 2671
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0468 [0.9768; 1.1219] 1.29  0.1955
##
## Quantifying heterogeneity:
##  tau^2 = 0.0225 [0.0114; 0.0571]; tau = 0.1499 [0.1070; 0.2389]
##  I^2 = 79.5% [70.0%; 86.1%]; H = 2.21 [1.82; 2.68]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  107.46   22 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(sfr_metabin),
       sortvar = TE)
```

```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```

Study	logRR	SE(logRR)	Experimental Total	Control Total	RR	95%−CI	Weight
Filled: Ding 2023	−0.3184	0.0985	138	61	0.73	[0.60; 0.88]	3.9%
Filled: Sur 2022	−0.1991	0.1903	9	8	0.82	[0.56; 1.19]	2.1%
Filled: Zhang 2021	−0.1956	0.0877	56	50	0.82	[0.69; 0.98]	4.1%
Filled: Huang 2023	−0.1488	0.0609	103	103	0.86	[0.76; 0.97]	4.8%
Filled: Zhang 2021	−0.1458	0.0772	56	54	0.86	[0.74; 1.01]	4.4%
Filled: Du 2019	−0.1315	0.0606	62	60	0.88	[0.78; 0.99]	4.8%
Chen 2019	−0.0498	0.0575	44	45	0.95	[0.85; 1.06]	4.8%
Deng 2022	−0.0480	0.0482	57	70	0.95	[0.87; 1.05]	5.0%
Lai 2020	−0.0392	0.0752	28	56	0.96	[0.83; 1.11]	4.4%
Tang 2023	−0.0128	0.0357	86	87	0.99	[0.92; 1.06]	5.3%
Wu 2022	0.0219	0.0412	76	82	1.02	[0.94; 1.11]	5.2%
Qian 2022	0.0720	0.0642	81	81	1.07	[0.95; 1.22]	4.7%
Zhu 2018	0.0876	0.0501	165	165	1.09	[0.99; 1.20]	5.0%
AlSmadi 2019	0.1149	0.0638	43	60	1.12	[0.99; 1.27]	4.7%
Zhang 2022	0.1603	0.1177	30	30	1.17	[0.93; 1.48]	3.4%
Zhai 2023	0.1719	0.0710	60	60	1.19	[1.03; 1.36]	4.5%
Zhai 2023	0.1892	0.0689	60	60	1.21	[1.06; 1.38]	4.6%
Du 2019	0.2007	0.0606	62	60	1.22	[1.09; 1.38]	4.8%
Zhang 2021	0.2149	0.0772	56	54	1.24	[1.07; 1.44]	4.4%
Huang 2023	0.2180	0.0609	103	103	1.24	[1.10; 1.40]	4.8%
Zhang 2021	0.2647	0.0877	56	50	1.30	[1.10; 1.55]	4.1%
Sur 2022	0.2683	0.1903	9	8	1.31	[0.90; 1.90]	2.1%
Ding 2023	0.3876	0.0985	138	61	1.47	[1.21; 1.79]	3.9%
Random effects model			**1578**	**1468**	**1.05**	**[0.98; 1.12]**	**100.0%**

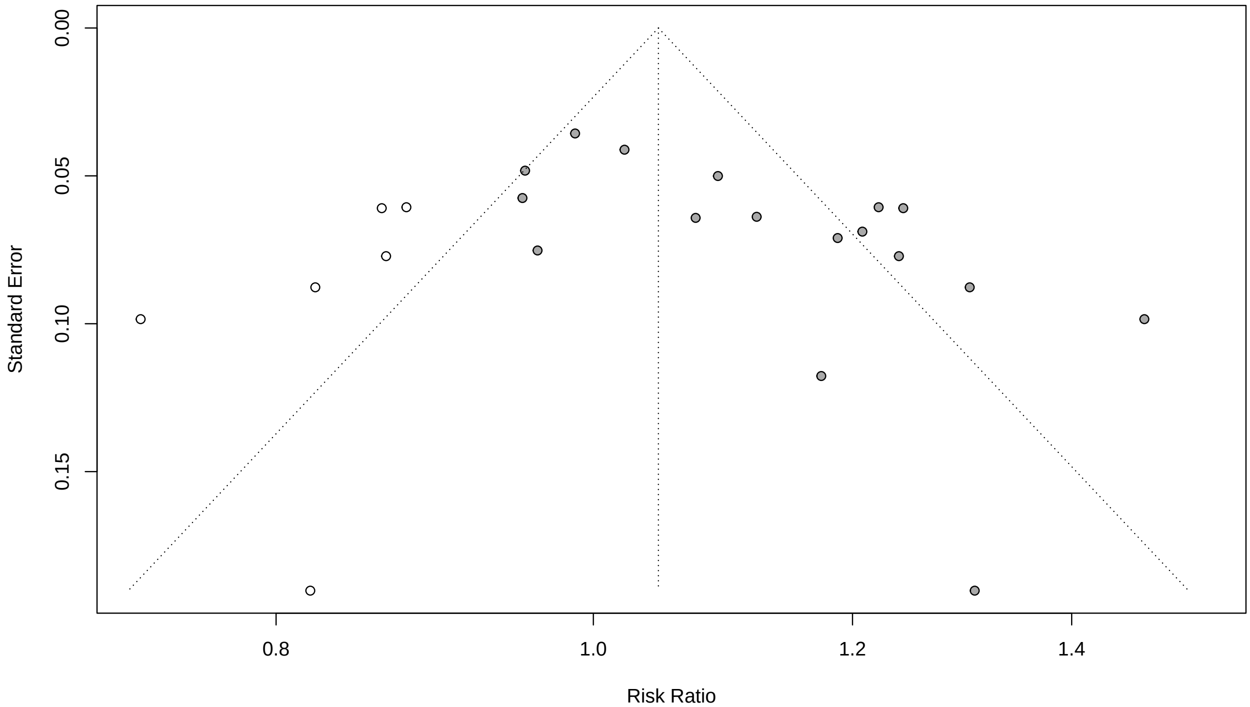


Heterogeneity: $I^2 = 80\%$, $\tau^2 = 0.0225$, $p < 0.01$

4.2.4 Funnel plot

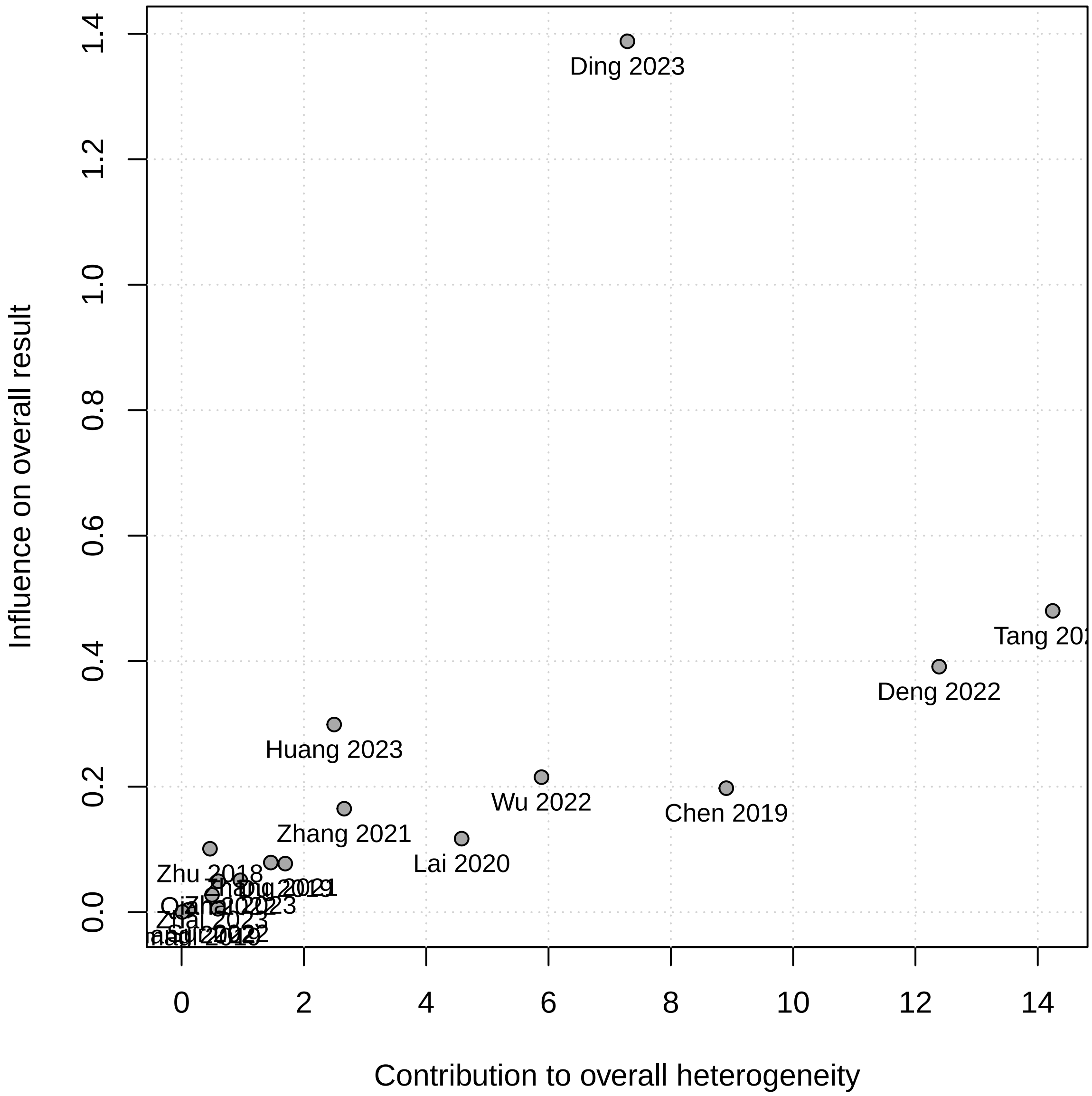
```
funnel(trimfill(sfr_metabin))
```

```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```



4.2.5 Baujat

```
baujat(sfr_metabin, pos = 1)
```



4.2.6 Leave one out

```r
metainf(sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR            95%-CI  p-value   tau^2     tau
## Omitting Sur 2022             1.1281 [1.0921; 1.1653] < 0.0001  0.0103  0.1015
## Omitting Tang 2023            1.1434 [1.1044; 1.1839] < 0.0001  0.0099  0.0994
## Omitting Chen 2019            1.1381 [1.1007; 1.1768] < 0.0001  0.0094  0.0969
## Omitting Du 2019              1.1241 [1.0871; 1.1624] < 0.0001  0.0105  0.1023
## Omitting Lai 2020             1.1360 [1.0990; 1.1743] < 0.0001  0.0100  0.1002
## Omitting Zhu 2018             1.1357 [1.0977; 1.1751] < 0.0001  0.0114  0.1069
## Omitting Zhang 2021           1.1218 [1.0855; 1.1593] < 0.0001  0.0097  0.0983
## Omitting Zhang 2021           1.1241 [1.0875; 1.1620] < 0.0001  0.0103  0.1016
## Omitting Lechevallier 2003    1.1295 [1.0935; 1.1666] < 0.0001  0.0102  0.1011
## Omitting Huang 2023           1.1190 [1.0820; 1.1571] < 0.0001  0.0101  0.1006
## Omitting Wu 2022              1.1387 [1.1002; 1.1785] < 0.0001  0.0108  0.1038
## Omitting Ding 2023            1.1081 [1.0734; 1.1439] < 0.0001  0.0078  0.0882
## Omitting Zhai 2023            1.1252 [1.0883; 1.1633] < 0.0001  0.0107  0.1033
## Omitting Zhai 2023            1.1263 [1.0895; 1.1644] < 0.0001  0.0109  0.1043
## Omitting Qian 2022            1.1338 [1.0965; 1.1724] < 0.0001  0.0113  0.1061
## Omitting Zhang 2022           1.1284 [1.0921; 1.1658] < 0.0001  0.0108  0.1037
## Omitting Deng 2022            1.1418 [1.1037; 1.1811] < 0.0001  0.0091  0.0955
## Omitting AlSmadi 2019         1.1299 [1.0928; 1.1682] < 0.0001  0.0113  0.1063
##
## Pooled estimate               1.1295 [1.0935; 1.1666] < 0.0001  0.0102  0.1011
##                                  I^2
## Omitting Sur 2022              72.6%
## Omitting Tang 2023             68.8%
## Omitting Chen 2019             70.3%
## Omitting Du 2019               70.8%
## Omitting Lai 2020              71.8%
## Omitting Zhu 2018              73.1%
## Omitting Zhang 2021            70.6%
## Omitting Zhang 2021            71.4%
## Omitting Lechevallier 2003     71.3%
## Omitting Huang 2023            70.0%
## Omitting Wu 2022               72.0%
## Omitting Ding 2023             67.1%
## Omitting Zhai 2023             71.7%
## Omitting Zhai 2023             72.2%
## Omitting Qian 2022             73.1%
## Omitting Zhang 2022            72.8%
## Omitting Deng 2022             68.9%
## Omitting AlSmadi 2019          72.9%
##
## Pooled estimate                71.3%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.3 OR time

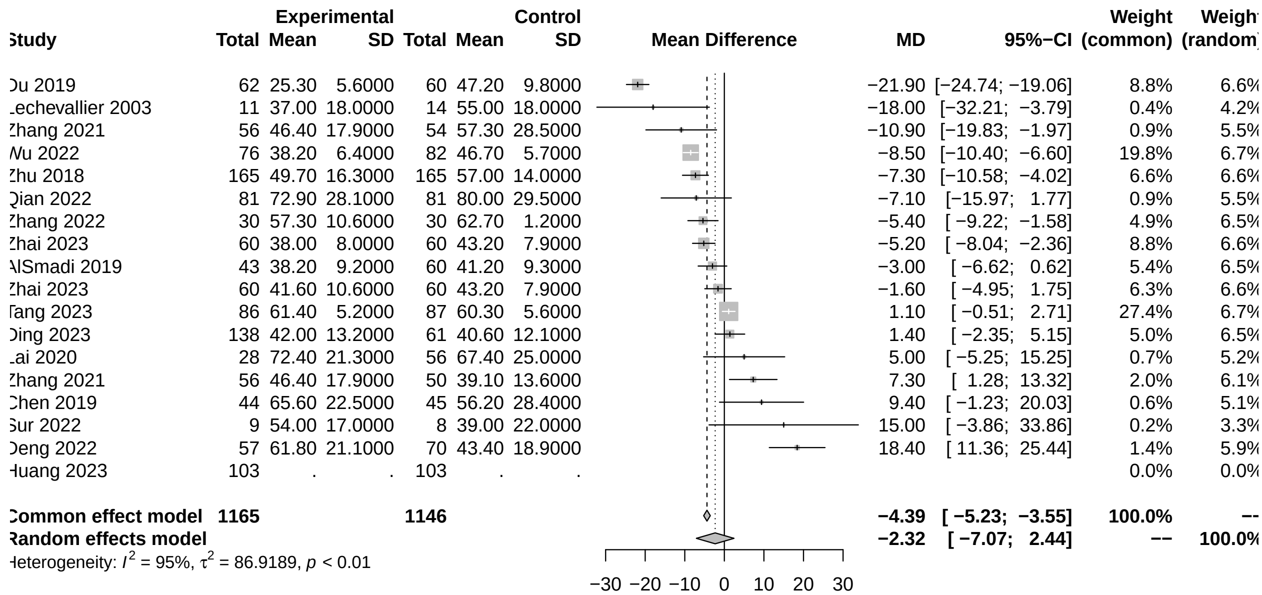
4.3.1 Meta-analysis

```
or_time_metacont <- metacont(data = suction_data,
                             mean.c = or_time_min_mean_control,
                             sd.c = or_time_min_sd_control,
                             mean.e = or_time_min_mean_suction,
                             sd.e = or_time_min_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
or_time_metacont
```

```
## Number of studies: k = 17
## Number of observations: o = 2311
##
##                             MD             95%-CI      z  p-value
## Common effect model  -4.3890 [-5.2316; -3.5465] -10.21 < 0.0001
## Random effects model -2.3165 [-7.0736;  2.4406]  -0.95   0.3399
##
## Quantifying heterogeneity:
##  tau^2 = 86.9189 [43.8218; 240.2239]; tau = 9.3230 [6.6198; 15.4992]
##  I^2 = 94.6% [92.7%; 96.0%]; H = 4.32 [3.71; 5.03]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  298.66   16 < 0.0001
##
## 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
```

4.3.2 Forest plot

```r
forest(or_time_metacont,
       sortvar = TE)
```



4.3.3 Trim and Fill

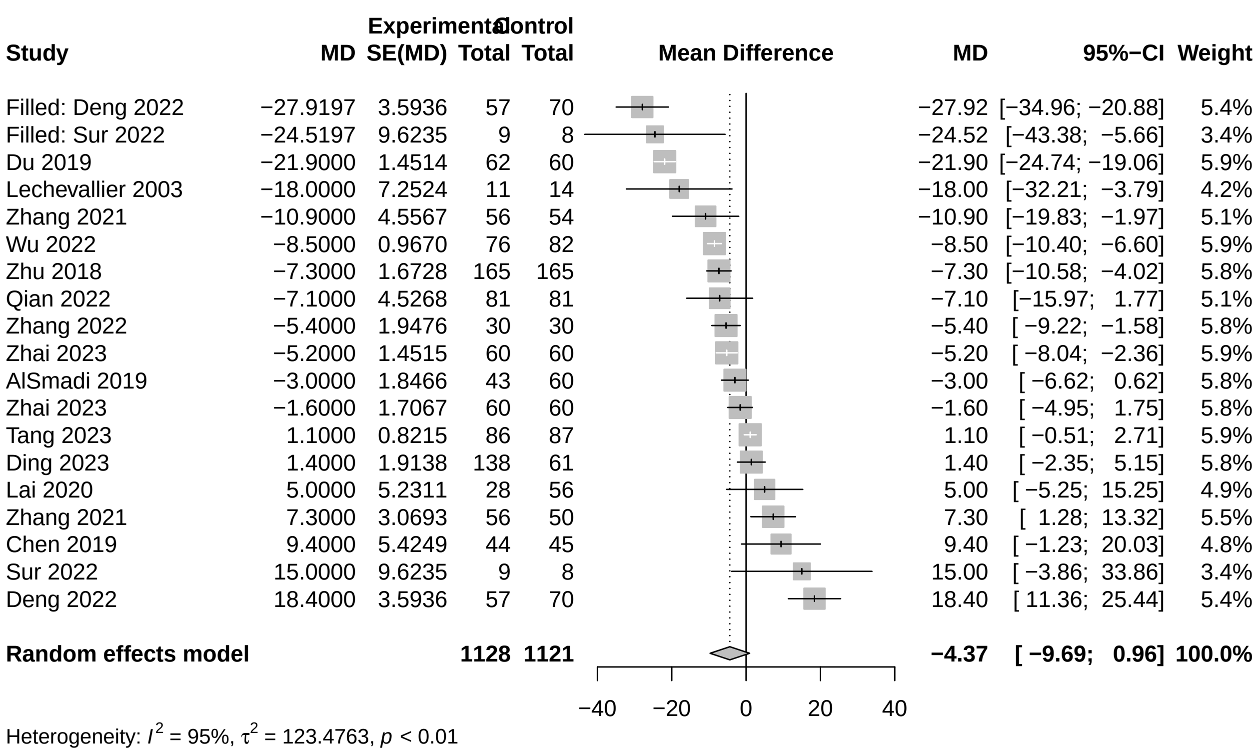
```r
trimfill(or_time_metacont)
```

```
## Warning in trimfill.meta(or_time_metacont): 1 observation(s) dropped due to
## missing values

## Number of studies: k = 19 (with 2 added studies)
## Number of observations: o = 2249
##
##                           MD             95%-CI     z p-value
## Random effects model -4.3665 [-9.6885; 0.9556] -1.61  0.1078
##
## Quantifying heterogeneity:
##  tau^2 = 123.4763 [65.6084; 320.2203]; tau = 11.1120 [8.0999; 17.8947]
##  I^2 = 94.8% [93.1%; 96.1%]; H = 4.38 [3.80; 5.05]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  345.16   18 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(or_time_metacont),
       sortvar = TE)
```

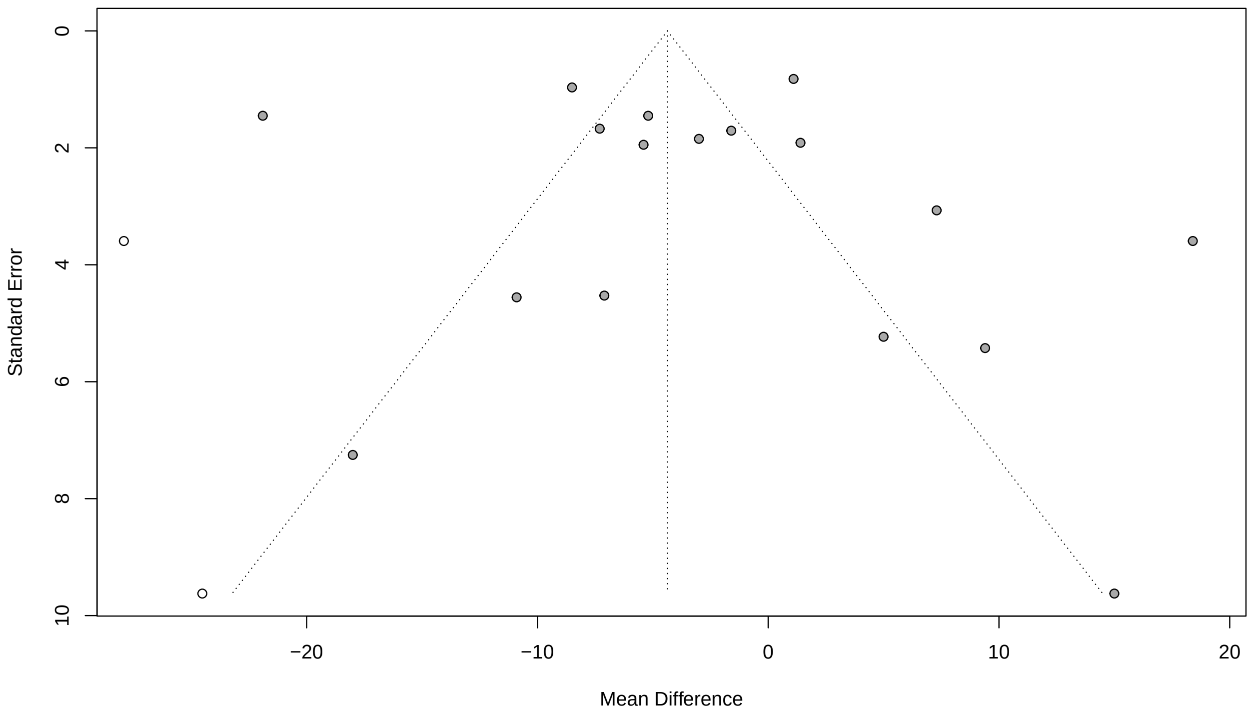
```
## Warning in trimfill.meta(or_time_metacont): 1 observation(s) dropped due to
## missing values
```



4.3.4 Funnel plot

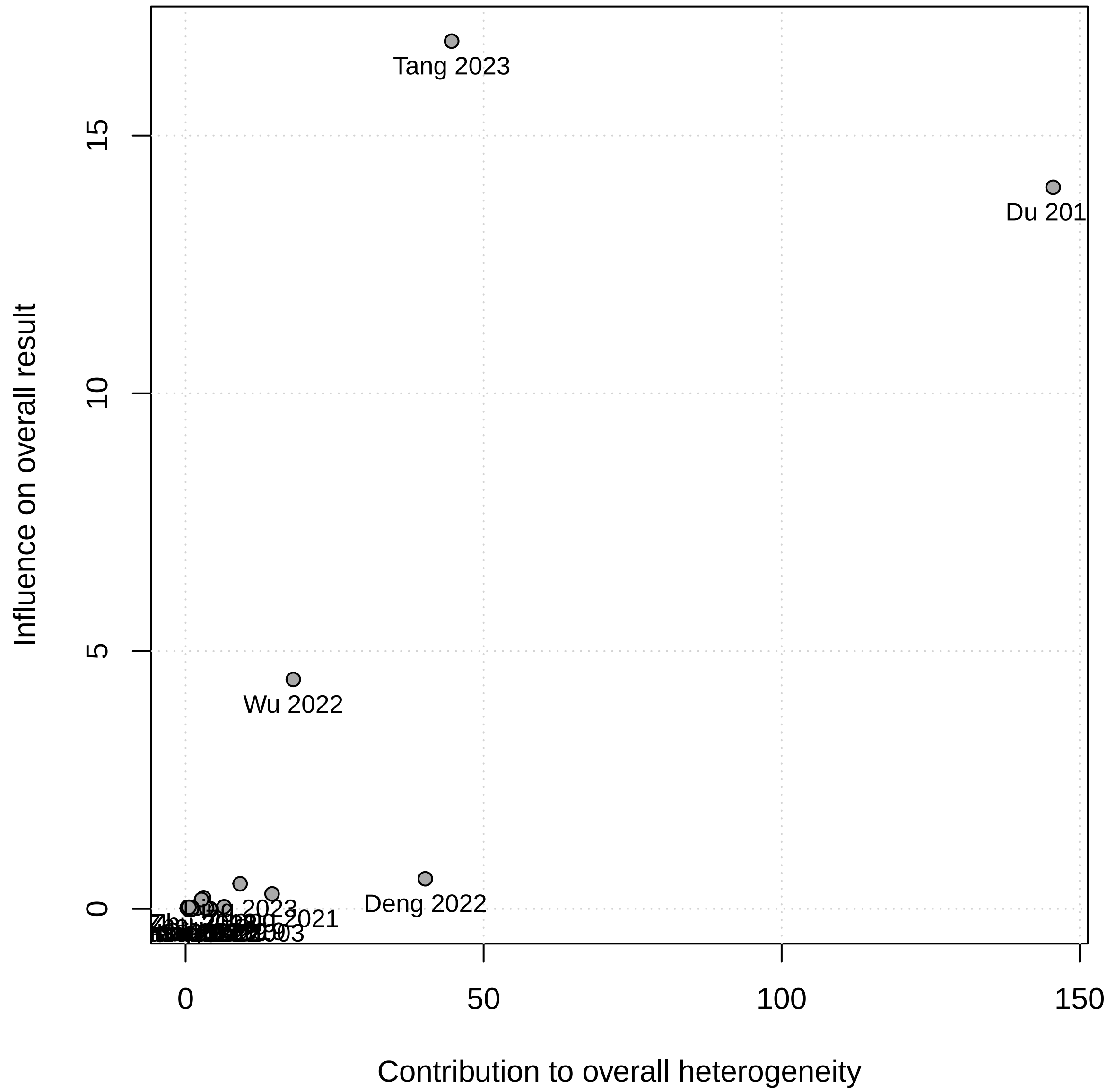
```
funnel(trimfill(or_time_metacont))
```

```
## Warning in trimfill.meta(or_time_metacont): 1 observation(s) dropped due to
## missing values
```



4.3.5 Baujat

```r
baujat(or_time_metacont, pos = 1)
```



4.3.6 Leave one out

```
metainf(or_time_metacont)
```

```
## Influential analysis (common effect model)
##
##                                     MD             95%-CI  p-value    tau^2
## Omitting Sur 2022              -4.4278 [-5.2712; -3.5845] < 0.0001  84.0556
## Omitting Tang 2023             -6.4585 [-7.4472; -5.4699] < 0.0001  93.6182
## Omitting Chen 2019             -4.4762 [-5.3213; -3.6310] < 0.0001  85.0733
## Omitting Du 2019               -2.7053 [-3.5874; -1.8232] < 0.0001  56.3894
## Omitting Lai 2020              -4.4529 [-5.2982; -3.6075] < 0.0001  89.7887
## Omitting Zhu 2018              -4.1832 [-5.0550; -3.3114] < 0.0001  92.7198
## Omitting Zhang 2021            -4.6229 [-5.4738; -3.7720] < 0.0001  86.1904
## Omitting Zhang 2021            -4.3306 [-5.1769; -3.4843] < 0.0001  89.2014
## Omitting Lechevallier 2003     -4.3411 [-5.1851; -3.4971] < 0.0001  83.7396
## Omitting Huang 2023            -4.3890 [-5.2316; -3.5465] < 0.0001  86.9189
## Omitting Wu 2022               -3.3768 [-4.3173; -2.4362] < 0.0001  91.5327
## Omitting Ding 2023             -4.6966 [-5.5612; -3.8320] < 0.0001  93.2403
## Omitting Zhai 2023             -4.5780 [-5.4485; -3.7074] < 0.0001  94.6806
## Omitting Zhai 2023             -4.3111 [-5.1932; -3.4290] < 0.0001  94.1958
## Omitting Qian 2022             -4.3644 [-5.2107; -3.5181] < 0.0001  92.2874
## Omitting Zhang 2022            -4.3373 [-5.2011; -3.4735] < 0.0001  93.9887
## Omitting Deng 2022             -4.7199 [-5.5685; -3.8713] < 0.0001  60.3555
## Omitting AlSmadi 2019          -4.4686 [-5.3349; -3.6023] < 0.0001  94.7187
##
## Pooled estimate                -4.3890 [-5.2316; -3.5465] < 0.0001  86.9189
##                                    tau    I^2
## Omitting Sur 2022               9.1682  94.9%
## Omitting Tang 2023              9.6756  93.7%
## Omitting Chen 2019              9.2235  94.9%
## Omitting Du 2019                7.5093  89.2%
## Omitting Lai 2020               9.4757  94.9%
## Omitting Zhu 2018               9.6291  94.9%
## Omitting Zhang 2021             9.2839  94.7%
## Omitting Zhang 2021             9.4446  94.9%
## Omitting Lechevallier 2003      9.1509  94.9%
## Omitting Huang 2023             9.3230  94.6%
## Omitting Wu 2022                9.5673  94.6%
## Omitting Ding 2023              9.6561  94.8%
## Omitting Zhai 2023              9.7304  94.9%
## Omitting Zhai 2023              9.7055  95.0%
## Omitting Qian 2022              9.6066  95.0%
## Omitting Zhang 2022             9.6948  95.0%
## Omitting Deng 2022              7.7689  94.2%
## Omitting AlSmadi 2019           9.7324  95.0%
##
## Pooled estimate                 9.3230  94.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.4 Auxiliary Treatments

4.4.1 Meta-analysis

```
aux_rx_metabin <- metabin(data = suction_data,
                         event.c = auxillary_tx_n_control,
                       n.c = sample_size_control,
                       event.e = auxillary_tx_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
aux_rx_metabin
```

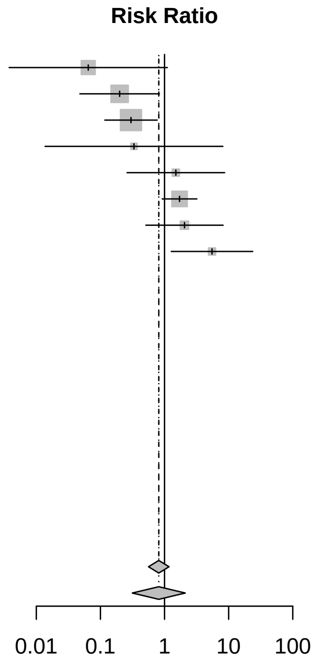
```
## Number of studies: k = 8
## Number of observations: o = 2311
## Number of events: e = 99
##
##                          RR           95%-CI     z p-value
## Common effect model  0.8130 [0.5619; 1.1762] -1.10  0.2718
## Random effects model 0.8131 [0.3143; 2.1030] -0.43  0.6695
##
## Quantifying heterogeneity:
##  tau^2 = 1.2043 [0.2081; 7.9665]; tau = 1.0974 [0.4562; 2.8225]
##  I^2 = 71.5% [41.2%; 86.2%]; H = 1.87 [1.30; 2.69]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  24.54    7  0.0009
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.4.2 Forest plot

```r
forest(aux_rx_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Du 2019	0	62	7	60	0.06	[0.00; 1.11]	14.1%	7.1%
AlSmadi 2019	2	43	14	60	0.20	[0.05; 0.83]	21.6%	13.5%
Wu 2022	5	76	18	82	0.30	[0.12; 0.77]	32.0%	16.4%
Zhu 2018	0	165	1	165	0.33	[0.01; 8.12]	2.8%	6.1%
Zhai 2023	3	60	2	60	1.50	[0.26; 8.66]	3.7%	11.7%
Lai 2020	12	28	14	56	1.71	[0.92; 3.20]	17.2%	18.0%
Deng 2022	5	57	3	70	2.05	[0.51; 8.20]	5.0%	13.8%
Zhai 2023	11	60	2	60	5.50	[1.27; 23.77]	3.7%	13.3%
Sur 2022	.	9	.	8			0.0%	0.0%
Tang 2023	.	86	.	87			0.0%	0.0%
Chen 2019	.	44	.	45			0.0%	0.0%
Zhang 2021	.	56	.	50			0.0%	0.0%
Zhang 2021	.	56	.	54			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Huang 2023	.	103	.	103			0.0%	0.0%
Ding 2023	.	138	.	61			0.0%	0.0%
Qian 2022	.	81	.	81			0.0%	0.0%
Zhang 2022	.	30	.	30			0.0%	0.0%
Common effect model		**1165**		**1146**	**0.81**	**[0.56; 1.18]**	**100.0%**	**−−**
Random effects model					**0.81**	**[0.31; 2.10]**	**−−**	**100.0%**

Heterogeneity: $I^2 = 71\%$, $\tau^2 = 1.2043$, $p < 0.01$



4.4.3 Trim and Fill

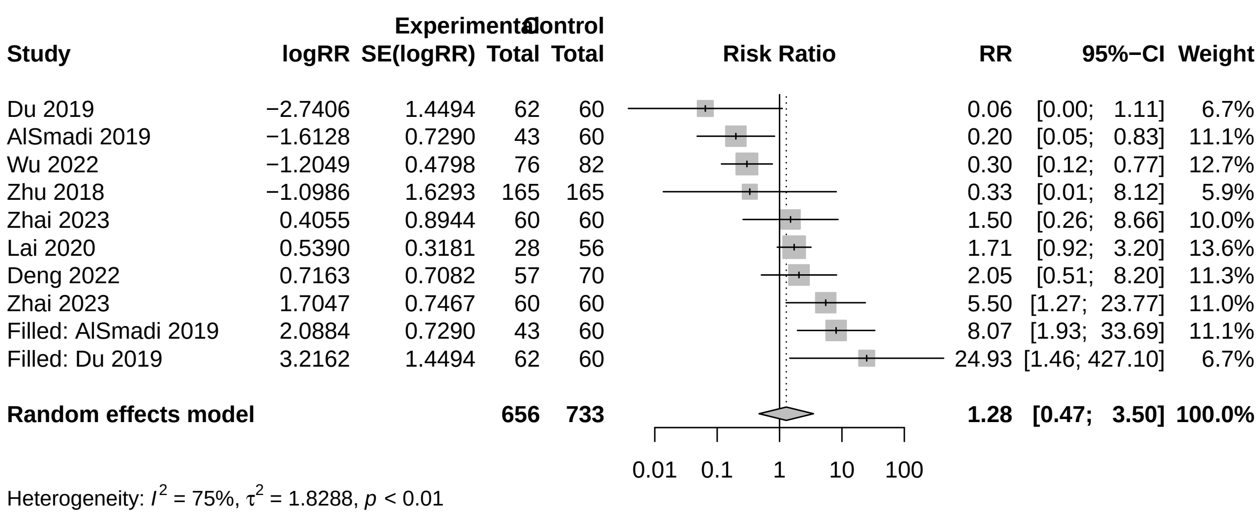
```r
trimfill(aux_rx_metabin)
```

```
## Warning in trimfill.meta(aux_rx_metabin): 10 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 10 (with 2 added studies)
## Number of observations: o = 1389
## Number of events: e = 122
##
##                          RR           95%-CI    z p-value
## Random effects model 1.2822 [0.4699; 3.4990] 0.49  0.6274
##
## Quantifying heterogeneity:
##  tau^2 = 1.8288 [0.5190; 9.9900]; tau = 1.3523 [0.7204; 3.1607]
##  I^2 = 75.2% [53.8%; 86.7%]; H = 2.01 [1.47; 2.74]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  36.29    9 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(aux_rx_metabin),
       sortvar = TE)
```

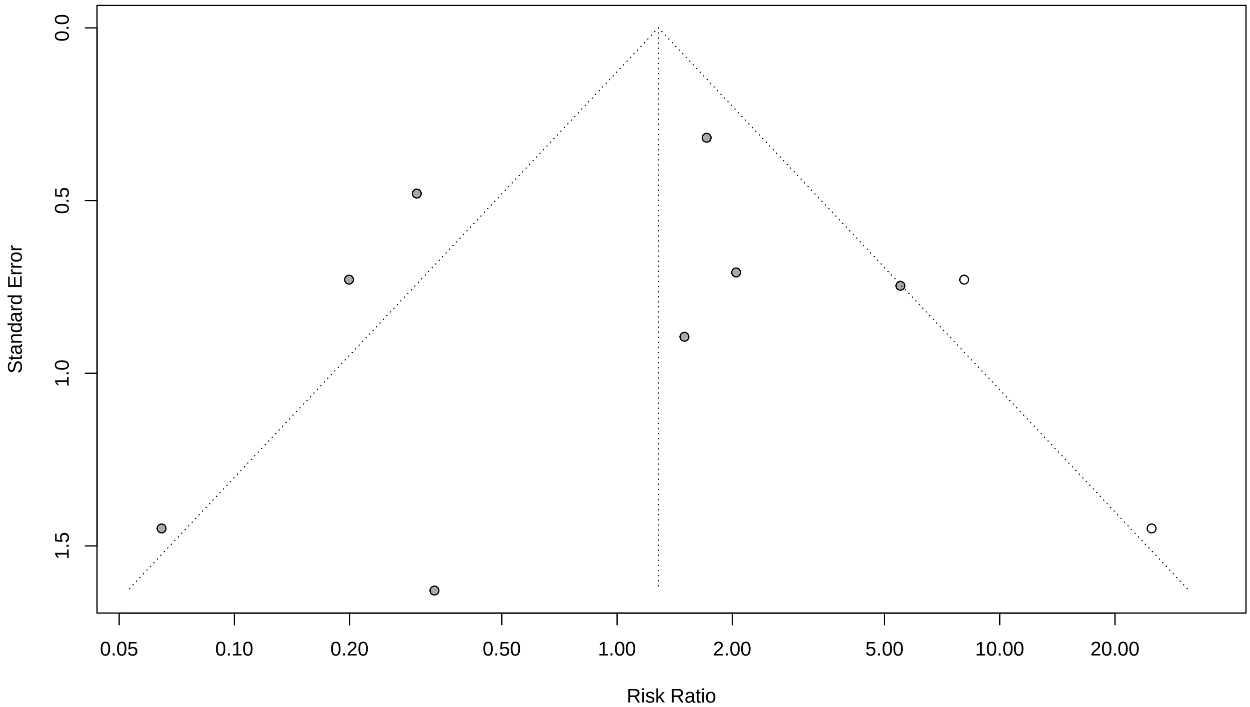
```
## Warning in trimfill.meta(aux_rx_metabin): 10 observation(s) dropped due to
## missing values
```



4.4.4 Funnel plot

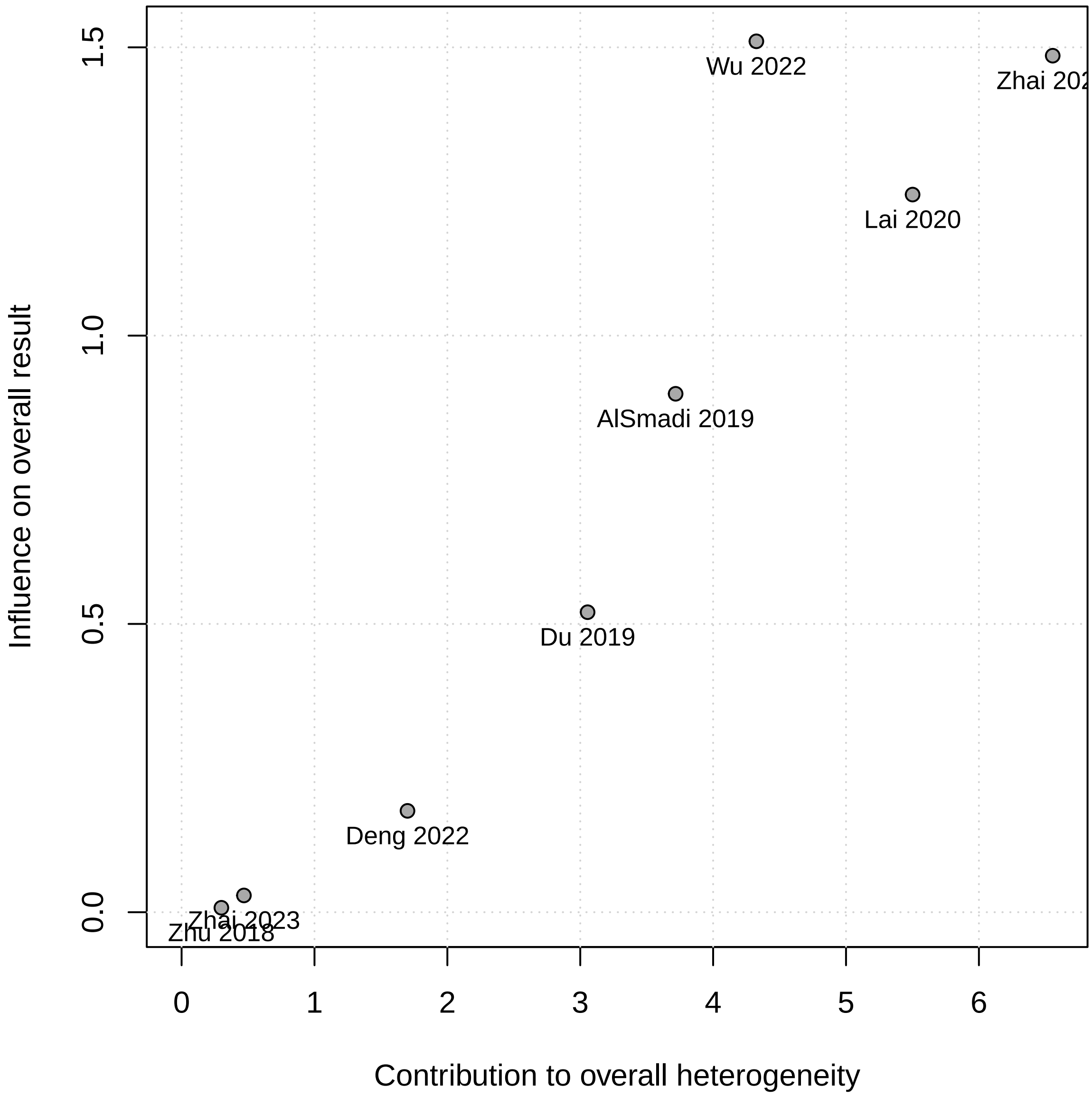
```r
funnel(trimfill(aux_rx_metabin))
```

```
## Warning in trimfill.meta(aux_rx_metabin): 10 observation(s) dropped due to
## missing values
```



4.4.5 Baujat

```r
baujat(aux_rx_metabin, pos = 1)
```



4.4.6 Leave one out

```r
metainf(aux_rx_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022            0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Tang 2023           0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Chen 2019           0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Du 2019             0.9355 [0.6388; 1.3702]  0.7321  1.0233  1.0116
## Omitting Lai 2020            0.6253 [0.3942; 0.9916]  0.0460  1.4577  1.2074
## Omitting Zhu 2018            0.8266 [0.5697; 1.1994]  0.3161  1.3166  1.1475
## Omitting Zhang 2021          0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Zhang 2021          0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Lechevallier 2003   0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Huang 2023          0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Wu 2022             1.0542 [0.6965; 1.5956]  0.8028  1.1805  1.0865
## Omitting Ding 2023           0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Zhai 2023           0.6332 [0.4237; 0.9464]  0.0258  0.8648  0.9300
## Omitting Zhai 2023           0.7866 [0.5387; 1.1487]  0.2141  1.4761  1.2149
## Omitting Qian 2022           0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Zhang 2022          0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
## Omitting Deng 2022           0.7484 [0.5083; 1.1019]  0.1420  1.4007  1.1835
## Omitting AlSmadi 2019        0.9819 [0.6646; 1.4505]  0.9268  1.0099  1.0049
##
## Pooled estimate              0.8130 [0.5619; 1.1762]  0.2718  1.2043  1.0974
##                                 I^2
## Omitting Sur 2022             71.5%
## Omitting Tang 2023            71.5%
## Omitting Chen 2019            71.5%
## Omitting Du 2019              71.2%
## Omitting Lai 2020             69.4%
## Omitting Zhu 2018             75.1%
## Omitting Zhang 2021           71.5%
## Omitting Zhang 2021           71.5%
## Omitting Lechevallier 2003    71.5%
## Omitting Huang 2023           71.5%
## Omitting Wu 2022              63.6%
## Omitting Ding 2023            71.5%
## Omitting Zhai 2023            68.4%
## Omitting Zhai 2023            75.3%
## Omitting Qian 2022            71.5%
## Omitting Zhang 2022           71.5%
## Omitting Deng 2022            74.4%
## Omitting AlSmadi 2019         68.6%
##
## Pooled estimate               71.5%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.5 VAS

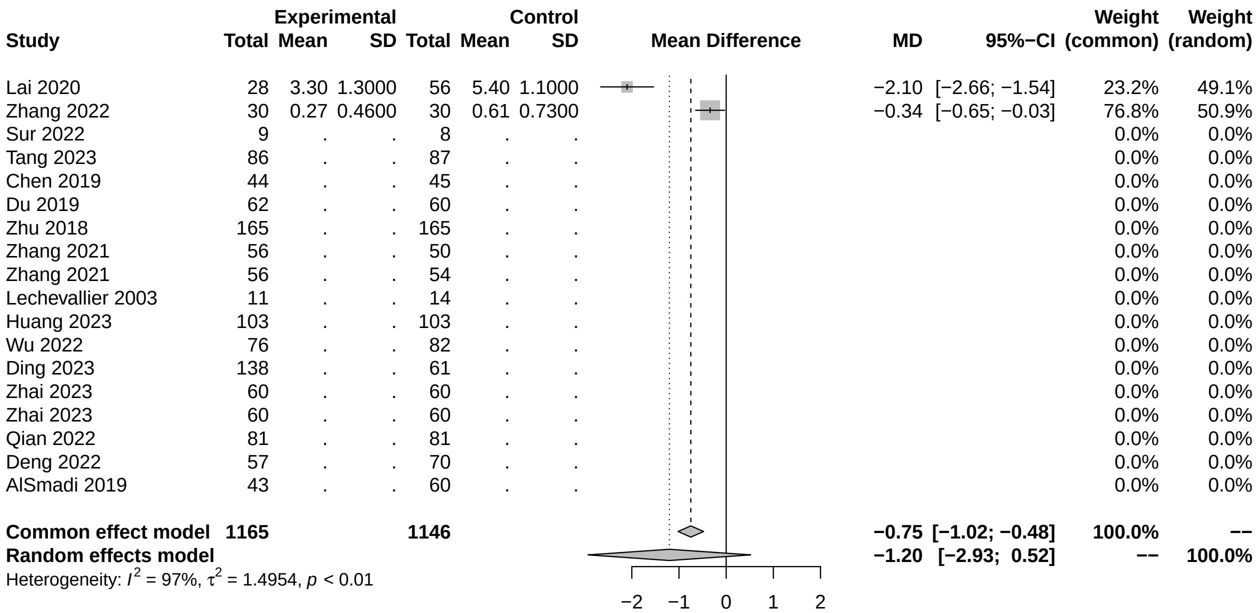
4.5.1 Meta-analysis

```
vas_metacont <- metacont(data = suction_data,
                             mean.c = vas_score_mean_control,
                             sd.c = vas_score_sd_control,
                             mean.e = vas_score_mean_suction,
                             sd.e = vas_score_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
vas_metacont
```

```
## Number of studies: k = 2
## Number of observations: o = 2311
##
##                              MD             95%-CI     z  p-value
## Common effect model  -0.7490 [-1.0195; -0.4785] -5.43 < 0.0001
## Random effects model -1.2038 [-2.9282;  0.5207] -1.37   0.1713
##
## Quantifying heterogeneity:
##  tau^2 = 1.4954; tau = 1.2229; I^2 = 96.6% [90.7%; 98.7%]; H = 5.39 [3.27; 8.87]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  29.01    1 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.5.2 Forest plot

```r
forest(vas_metacont,
       sortvar = TE)
```

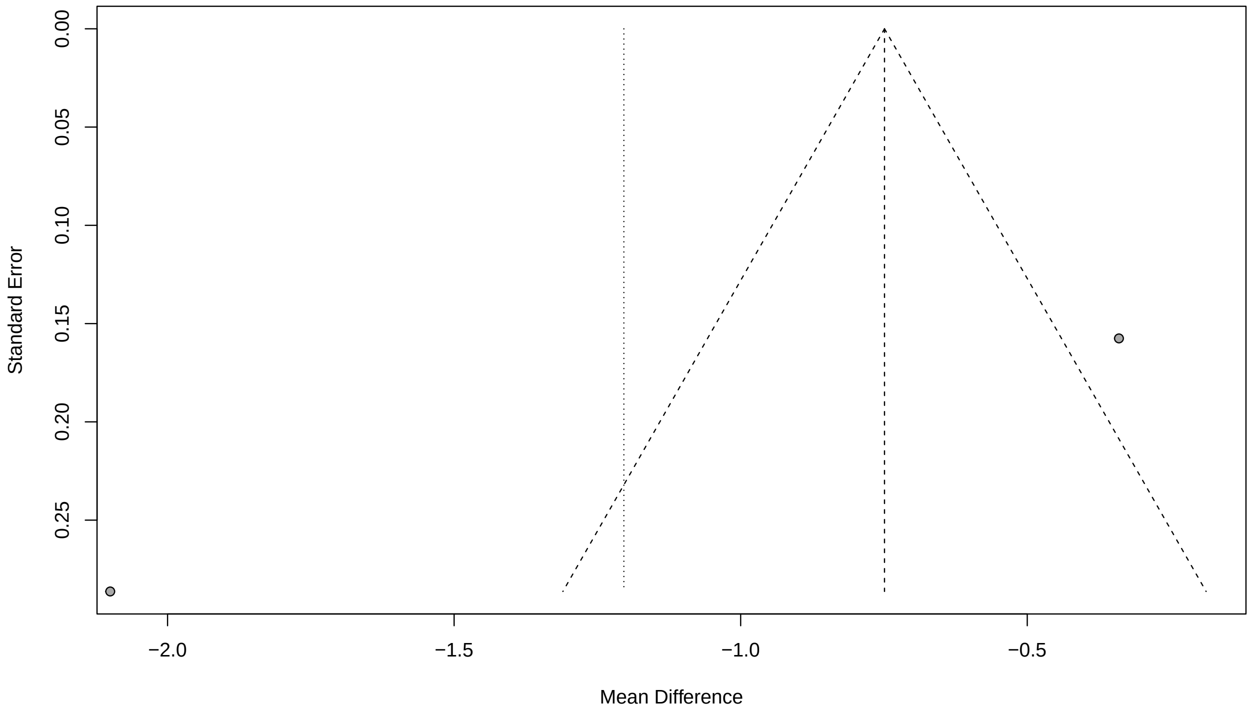


4.5.3 Trim and Fill

```
#trimfill(vas_metacont)
#forest(trimfill(vas_metacont))
```

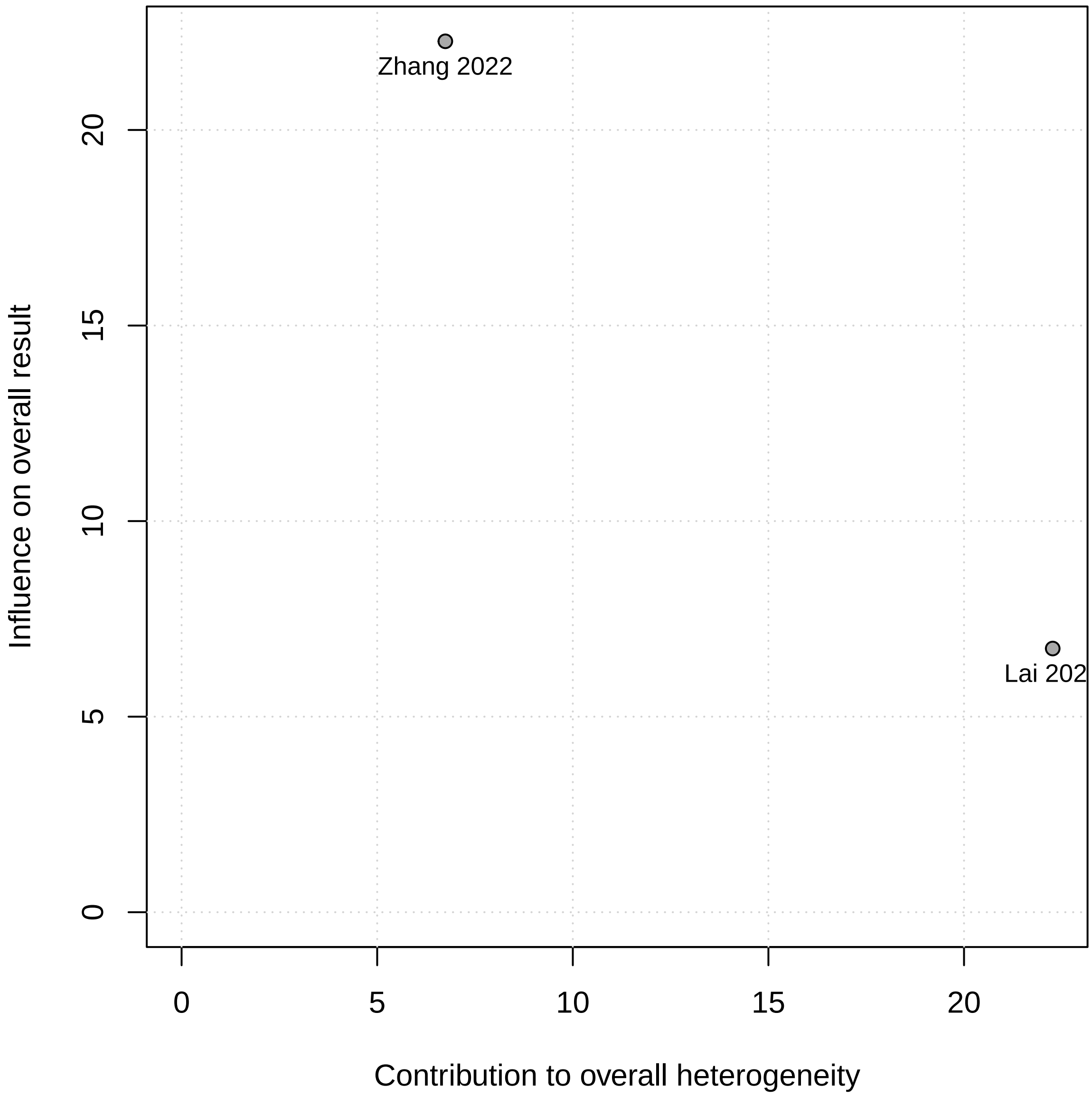
4.5.4 Funnel plot

```
funnel((vas_metacont))
```



4.5.5 Baujat

```
baujat(vas_metacont, pos = 1)
```



4.5.6 Leave one out

```
metainf(vas_metacont)
```

```
## Influential analysis (common effect model)
##
##                                    MD             95%-CI  p-value   tau^2
## Omitting Sur 2022            -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Tang 2023           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Chen 2019           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Du 2019             -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Lai 2020            -0.3400 [-0.6488; -0.0312]   0.0309
## Omitting Zhu 2018            -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Zhang 2021          -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Zhang 2021          -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Lechevallier 2003   -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Huang 2023          -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Wu 2022             -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Ding 2023           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Zhai 2023           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Zhai 2023           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Qian 2022           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting Zhang 2022          -2.1000 [-2.6611; -1.5389] < 0.0001
## Omitting Deng 2022           -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
## Omitting AlSmadi 2019        -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
##
## Pooled estimate              -0.7490 [-1.0195; -0.4785] < 0.0001  1.4954
##                                  tau    I^2
## Omitting Sur 2022             1.2229  96.6%
## Omitting Tang 2023            1.2229  96.6%
## Omitting Chen 2019            1.2229  96.6%
## Omitting Du 2019              1.2229  96.6%
## Omitting Lai 2020
## Omitting Zhu 2018             1.2229  96.6%
## Omitting Zhang 2021           1.2229  96.6%
## Omitting Zhang 2021           1.2229  96.6%
## Omitting Lechevallier 2003    1.2229  96.6%
## Omitting Huang 2023           1.2229  96.6%
## Omitting Wu 2022              1.2229  96.6%
## Omitting Ding 2023            1.2229  96.6%
## Omitting Zhai 2023            1.2229  96.6%
## Omitting Zhai 2023            1.2229  96.6%
## Omitting Qian 2022            1.2229  96.6%
## Omitting Zhang 2022
## Omitting Deng 2022            1.2229  96.6%
## Omitting AlSmadi 2019         1.2229  96.6%
##
## Pooled estimate               1.2229  96.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.6 LoS

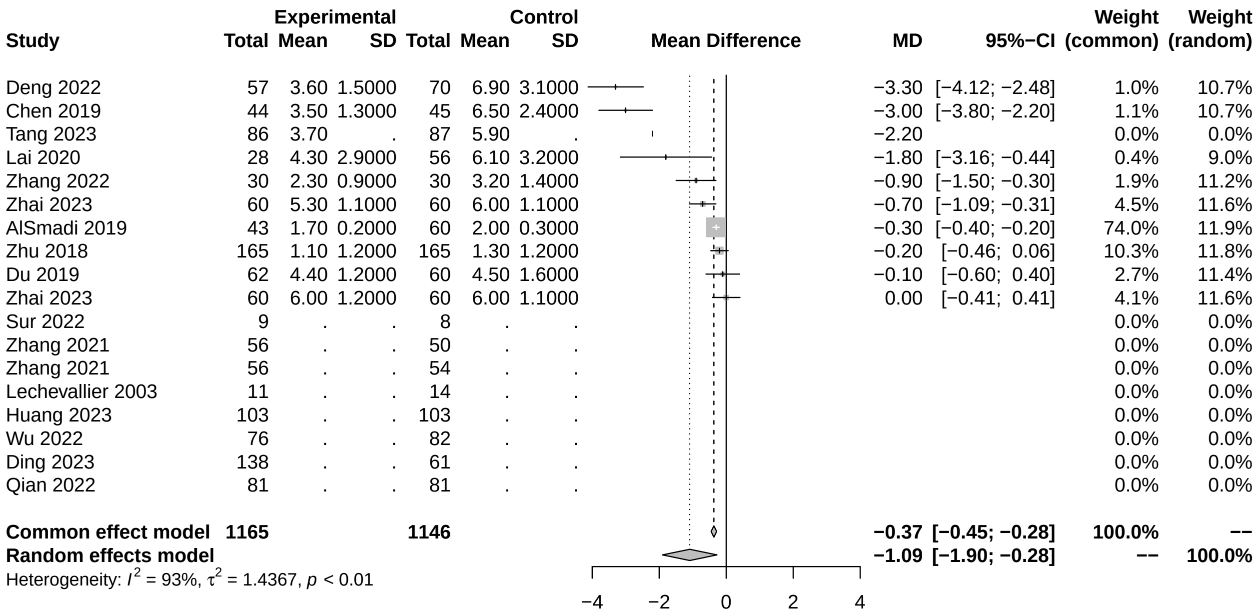
4.6.1 Meta-analysis

```
los_metacont <- metacont(data = suction_data,
                             mean.c = los_days_mean_control,
                             sd.c = los_days_sd_control,
                             mean.e = los_days_mean_suction,
                             sd.e = los_days_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
los_metacont
```

```
## Number of studies: k = 9
## Number of observations: o = 2311
##
##                          MD             95%-CI     z  p-value
## Common effect model  -0.3668 [-0.4500; -0.2837] -8.65 < 0.0001
## Random effects model -1.0877 [-1.9003; -0.2752] -2.62   0.0087
##
## Quantifying heterogeneity:
##  tau^2 = 1.4367 [0.5938; 5.7266]; tau = 1.1986 [0.7706; 2.3930]
##  I^2 = 92.6% [88.1%; 95.4%]; H = 3.67 [2.90; 4.65]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  107.98    8 < 0.0001
##
## 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
```

4.6.2 Forest plot

```r
forest(los_metacont,
       sortvar = TE)
```



4.6.3 Trim and Fill

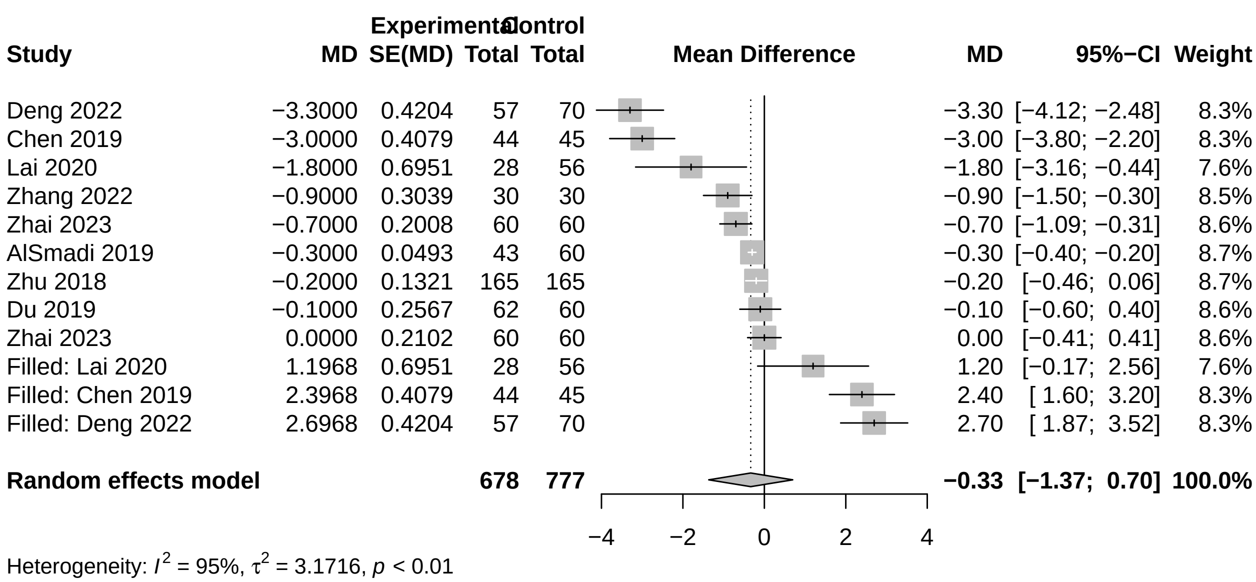
```r
trimfill(los_metacont)
```

```
## Warning in trimfill.meta(los_metacont): 9 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 12 (with 3 added studies)
## Number of observations: o = 1455
## 
##                             MD             95%-CI     z p-value
## Random effects model -0.3345 [-1.3661; 0.6970] -0.64  0.5250
## 
## Quantifying heterogeneity:
##  tau^2 = 3.1716 [1.5169; 9.6686]; tau = 1.7809 [1.2316; 3.1094]
##  I^2 = 94.8% [92.5%; 96.4%]; H = 4.37 [3.64; 5.24]
## 
## Test of heterogeneity:
##       Q d.f.  p-value
##  209.61   11 < 0.0001
## 
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(los_metacont),
       sortvar = TE)
```

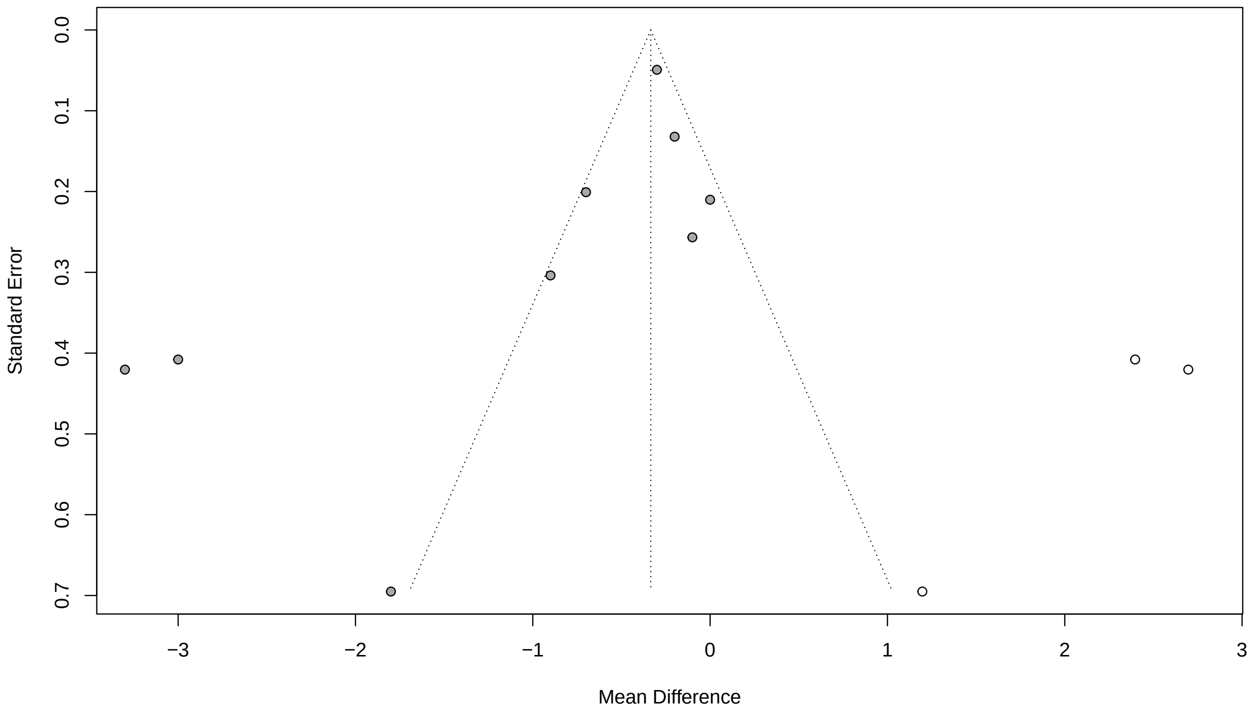
```
## Warning in trimfill.meta(los_metacont): 9 observation(s) dropped due to missing
## values
```



4.6.4 Funnel plot

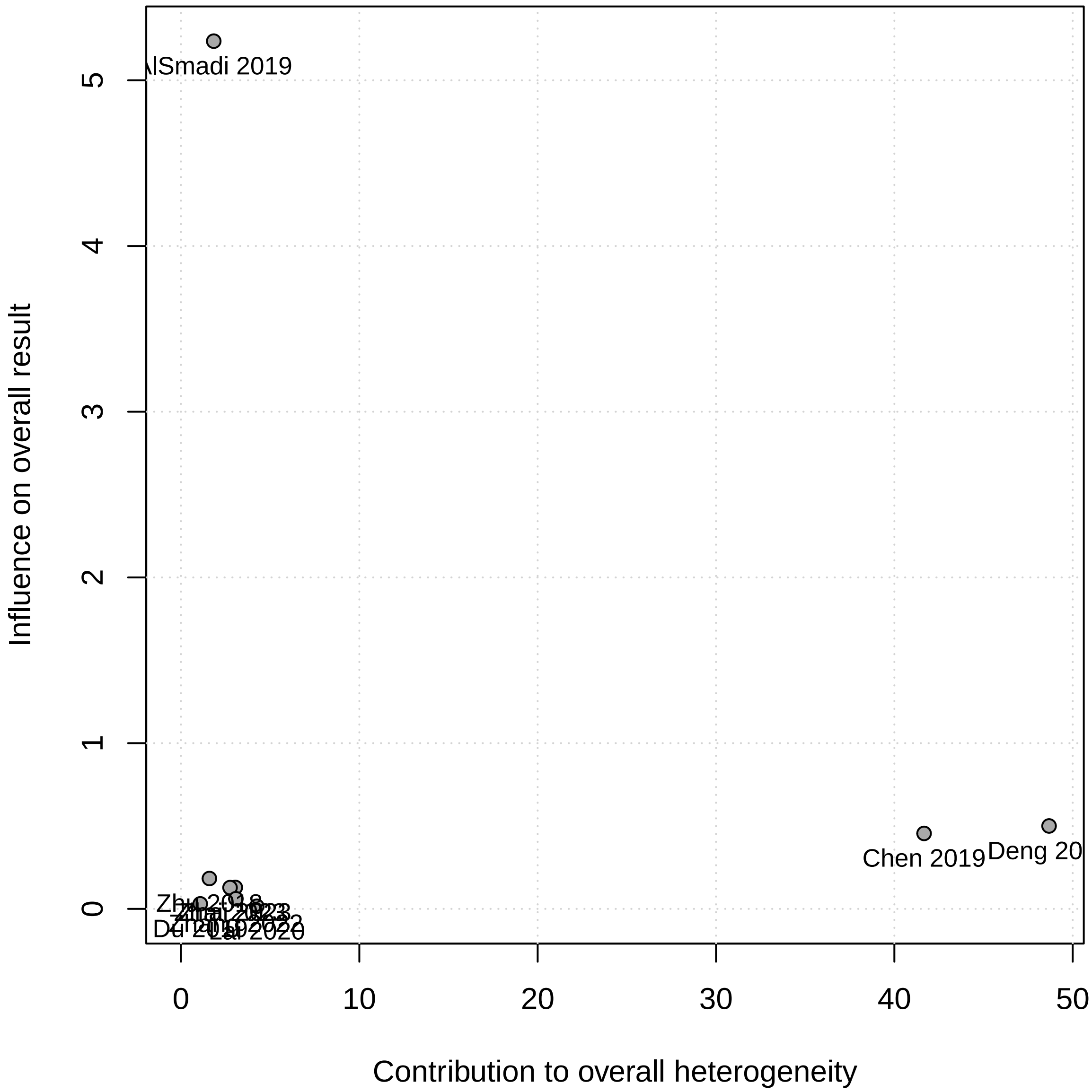
```
funnel(trimfill(los_metacont))
```

```
## Warning in trimfill.meta(los_metacont): 9 observation(s) dropped due to missing
## values
```



4.6.5 Baujat

```
baujat(los_metacont, pos = 1)
```



4.6.6 Leave one out

```r
metainf(los_metacont)
```

```
## Influential analysis (common effect model)
##
##                                    MD             95%-CI  p-value   tau^2
## Omitting Sur 2022             -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Tang 2023            -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Chen 2019            -0.3381 [-0.4216; -0.2545] < 0.0001  1.0516
## Omitting Du 2019              -0.3743 [-0.4586; -0.2900] < 0.0001  1.5161
## Omitting Lai 2020             -0.3615 [-0.4448; -0.2782] < 0.0001  1.5628
## Omitting Zhu 2018             -0.3860 [-0.4738; -0.2982] < 0.0001  1.5445
## Omitting Zhang 2021           -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Zhang 2021           -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Lechevallier 2003    -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Huang 2023           -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Wu 2022              -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Ding 2023            -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Zhai 2023            -0.3824 [-0.4673; -0.2975] < 0.0001  1.4780
## Omitting Zhai 2023            -0.3513 [-0.4363; -0.2662] < 0.0001  1.6539
## Omitting Qian 2022            -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
## Omitting Zhang 2022           -0.3562 [-0.4402; -0.2723] < 0.0001  1.6652
## Omitting Deng 2022            -0.3367 [-0.4202; -0.2531] < 0.0001  0.8633
## Omitting AlSmadi 2019         -0.5572 [-0.7203; -0.3942] < 0.0001  1.5741
##
## Pooled estimate               -0.3668 [-0.4500; -0.2837] < 0.0001  1.4367
##                                  tau    I^2
## Omitting Sur 2022             1.1986  92.6%
## Omitting Tang 2023            1.1986  92.6%
## Omitting Chen 2019            1.0255  89.4%
## Omitting Du 2019              1.2313  93.4%
## Omitting Lai 2020             1.2501  93.3%
## Omitting Zhu 2018             1.2428  93.4%
## Omitting Zhang 2021           1.1986  92.6%
## Omitting Zhang 2021           1.1986  92.6%
## Omitting Lechevallier 2003    1.1986  92.6%
## Omitting Huang 2023           1.1986  92.6%
## Omitting Wu 2022              1.1986  92.6%
## Omitting Ding 2023            1.1986  92.6%
## Omitting Zhai 2023            1.2157  93.3%
## Omitting Zhai 2023            1.2860  93.3%
## Omitting Qian 2022            1.1986  92.6%
## Omitting Zhang 2022           1.2904  93.3%
## Omitting Deng 2022            0.9292  88.1%
## Omitting AlSmadi 2019         1.2546  93.1%
##
## Pooled estimate               1.1986  92.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.7 Complications - All

4.7.1 Meta-analysis

```
comp_metabin <- metabin(data = suction_data,
                          event.c = complications_postop_overall_n_control,
                        n.c = sample_size_control,
                        event.e = complications_postop_overall_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
comp_metabin
```

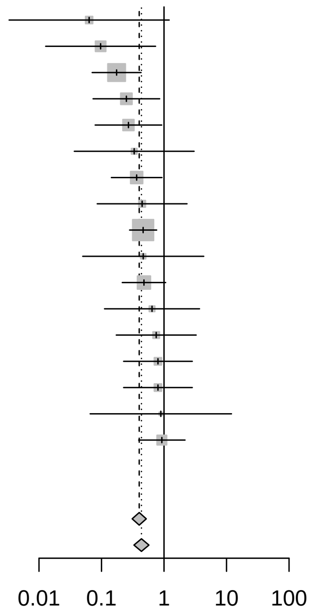
```
## Number of studies: k = 17
## Number of observations: o = 2311
## Number of events: e = 247
##
##                          RR           95%-CI     z  p-value
## Common effect model  0.4012 [0.3092; 0.5205] -6.88 < 0.0001
## Random effects model 0.4353 [0.3303; 0.5736] -5.91 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0.0095 [0.0000; 0.4976]; tau = 0.0975 [0.0000; 0.7054]
##  I^2 = 0.0% [0.0%; 51.1%]; H = 1.00 [1.00; 1.43]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  15.15   16  0.5137
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.7.2 Forest plot

```r
forest(comp_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Ding 2023	0	138	3	61	0.06	[0.00; 1.21]	2.8%	0.9%
Du 2019	1	62	10	60	0.10	[0.01; 0.73]	5.8%	1.8%
Tang 2023	5	86	29	87	0.17	[0.07; 0.43]	16.5%	9.0%
Qian 2022	3	81	12	81	0.25	[0.07; 0.85]	6.9%	4.9%
Wu 2022	3	76	12	82	0.27	[0.08; 0.92]	6.6%	4.9%
Zhang 2022	1	30	3	30	0.33	[0.04; 3.03]	1.7%	1.6%
Chen 2019	5	44	14	45	0.37	[0.14; 0.93]	7.9%	8.4%
Zhang 2021	2	56	4	50	0.45	[0.09; 2.33]	2.4%	2.7%
Zhu 2018	19	165	41	165	0.46	[0.28; 0.76]	23.4%	26.7%
AlSmadi 2019	1	43	3	60	0.47	[0.05; 4.32]	1.4%	1.5%
Deng 2022	7	57	18	70	0.48	[0.21; 1.06]	9.2%	11.3%
Zhang 2021	2	56	3	54	0.64	[0.11; 3.70]	1.7%	2.5%
Huang 2023	3	103	4	103	0.75	[0.17; 3.27]	2.3%	3.5%
Zhai 2023	4	60	5	60	0.80	[0.23; 2.83]	2.9%	4.7%
Zhai 2023	4	60	5	60	0.80	[0.23; 2.83]	2.9%	4.7%
Sur 2022	1	9	1	8	0.89	[0.07; 12.00]	0.6%	1.1%
Lai 2020	6	28	13	56	0.92	[0.39; 2.17]	5.0%	9.9%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Common effect model		**1165**		**1146**	**0.40**	**[0.31; 0.52]**	**100.0%**	**--**
Random effects model					**0.44**	**[0.33; 0.57]**	**--**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0.0095$, $p = 0.51$



4.7.3 Trim and Fill

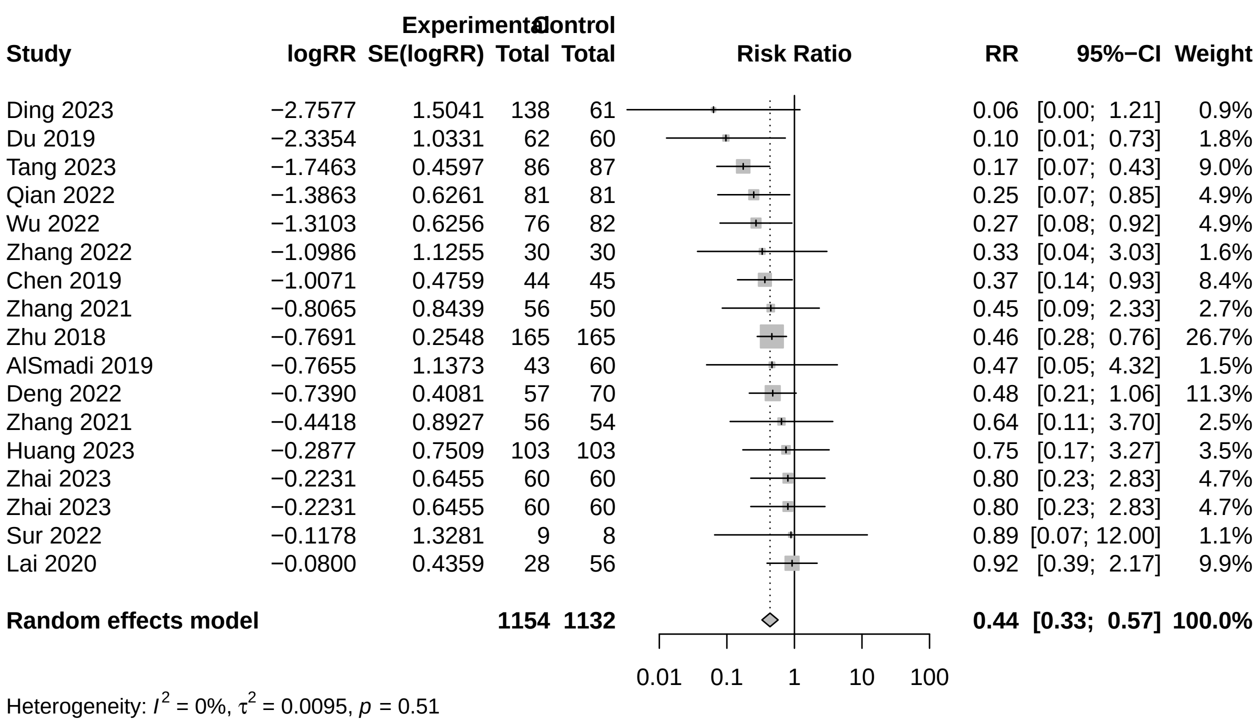
```
trimfill(comp_metabin)
```

```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 17 (with 0 added studies)
## Number of observations: o = 2286
## Number of events: e = 247
##
##                          RR           95%-CI     z  p-value
## Random effects model 0.4353 [0.3303; 0.5736] -5.91 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0.0095 [0.0000; 0.4976]; tau = 0.0975 [0.0000; 0.7054]
##  I^2 = 0.0% [0.0%; 51.1%]; H = 1.00 [1.00; 1.43]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  15.15   16  0.5137
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```
forest(trimfill(comp_metabin),
       sortvar = TE)
```

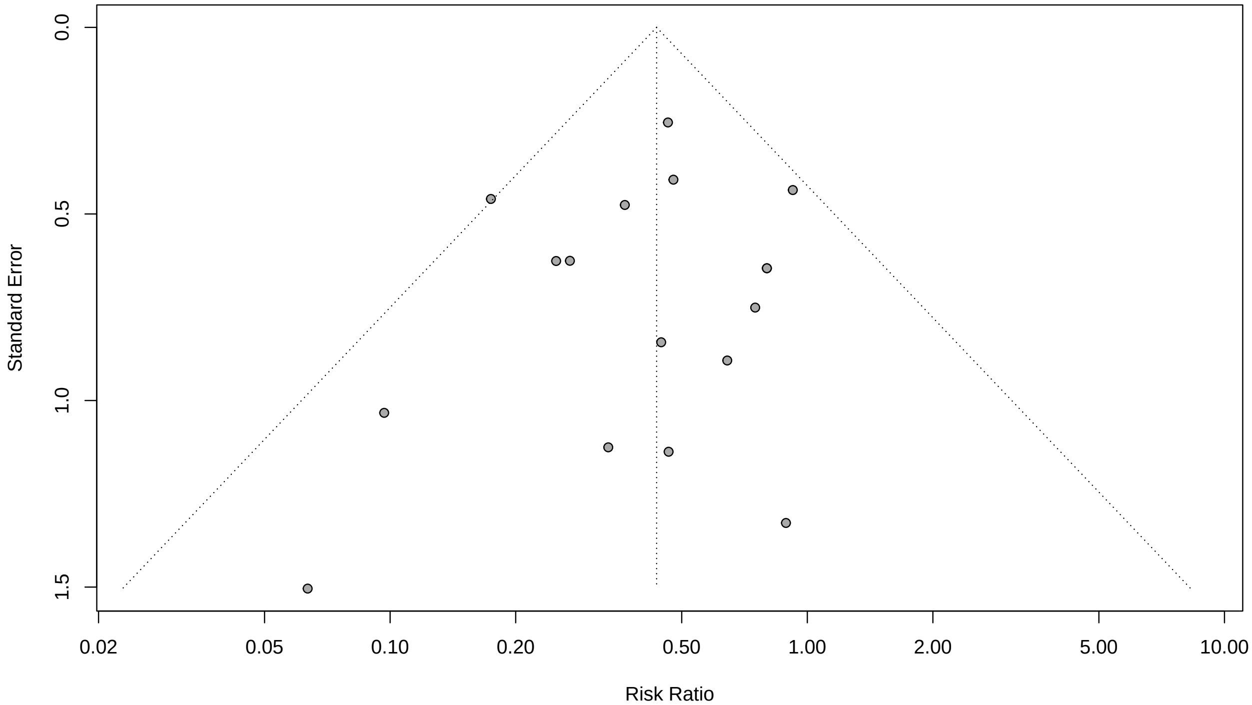
```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```



4.7.4 Funnel plot

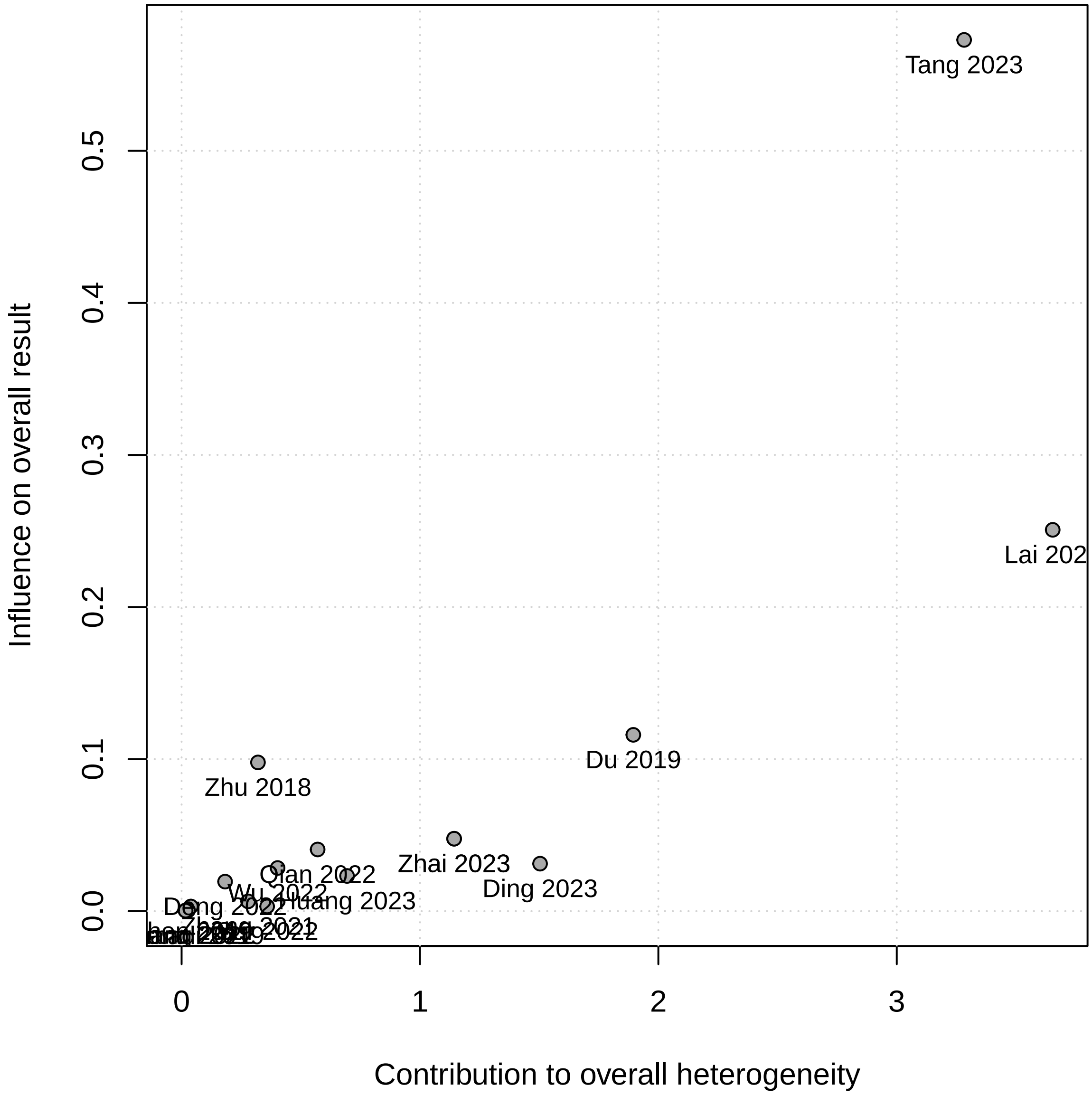
```
funnel(trimfill(comp_metabin))
```

```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```



4.7.5 Baujat

```
baujat(comp_metabin, pos = 1)
```



4.7.6 Leave one out

```r
metainf(comp_metabin)
```

```
## Influential analysis (common effect model)
##
##                                    RR           95%-CI  p-value   tau^2    tau
## Omitting Sur 2022              0.3982 [0.3065; 0.5174] < 0.0001  0.0146  0.1208
## Omitting Tang 2023             0.4459 [0.3391; 0.5865] < 0.0001  0.0000  0.0000
## Omitting Chen 2019             0.4043 [0.3083; 0.5302] < 0.0001  0.0376  0.1938
## Omitting Du 2019               0.4200 [0.3227; 0.5465] < 0.0001  0.0000  0.0000
## Omitting Lai 2020              0.3740 [0.2841; 0.4923] < 0.0001  0.0000  0.0000
## Omitting Zhu 2018              0.3821 [0.2817; 0.5184] < 0.0001  0.0760  0.2757
## Omitting Zhang 2021            0.4001 [0.3074; 0.5207] < 0.0001  0.0215  0.1467
## Omitting Zhang 2021            0.3969 [0.3050; 0.5165] < 0.0001  0.0201  0.1417
## Omitting Lechevallier 2003     0.4012 [0.3092; 0.5205] < 0.0001  0.0095  0.0975
## Omitting Huang 2023            0.3930 [0.3016; 0.5122] < 0.0001  0.0208  0.1444
## Omitting Wu 2022               0.4105 [0.3145; 0.5358] < 0.0001  0.0151  0.1230
## Omitting Ding 2023             0.4108 [0.3160; 0.5341] < 0.0001  0.0052  0.0719
## Omitting Zhai 2023             0.3894 [0.2983; 0.5085] < 0.0001  0.0187  0.1368
## Omitting Zhai 2023             0.3894 [0.2983; 0.5085] < 0.0001  0.0187  0.1368
## Omitting Qian 2022             0.4123 [0.3158; 0.5383] < 0.0001  0.0105  0.1023
## Omitting Zhang 2022            0.4024 [0.3096; 0.5230] < 0.0001  0.0151  0.1230
## Omitting Deng 2022             0.3934 [0.2987; 0.5181] < 0.0001  0.0521  0.2282
## Omitting AlSmadi 2019          0.4003 [0.3080; 0.5202] < 0.0001  0.0162  0.1273
##
## Pooled estimate                0.4012 [0.3092; 0.5205] < 0.0001  0.0095  0.0975
##                                  I^2
## Omitting Sur 2022               0.0%
## Omitting Tang 2023              0.0%
## Omitting Chen 2019              0.0%
## Omitting Du 2019                0.0%
## Omitting Lai 2020               0.0%
## Omitting Zhu 2018               0.5%
## Omitting Zhang 2021             1.0%
## Omitting Zhang 2021             0.0%
## Omitting Lechevallier 2003      0.0%
## Omitting Huang 2023             0.0%
## Omitting Wu 2022                0.0%
## Omitting Ding 2023              0.0%
## Omitting Zhai 2023              0.0%
## Omitting Zhai 2023              0.0%
## Omitting Qian 2022              0.0%
## Omitting Zhang 2022             0.6%
## Omitting Deng 2022              0.6%
## Omitting AlSmadi 2019           1.0%
##
## Pooled estimate                 0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.8 Fever

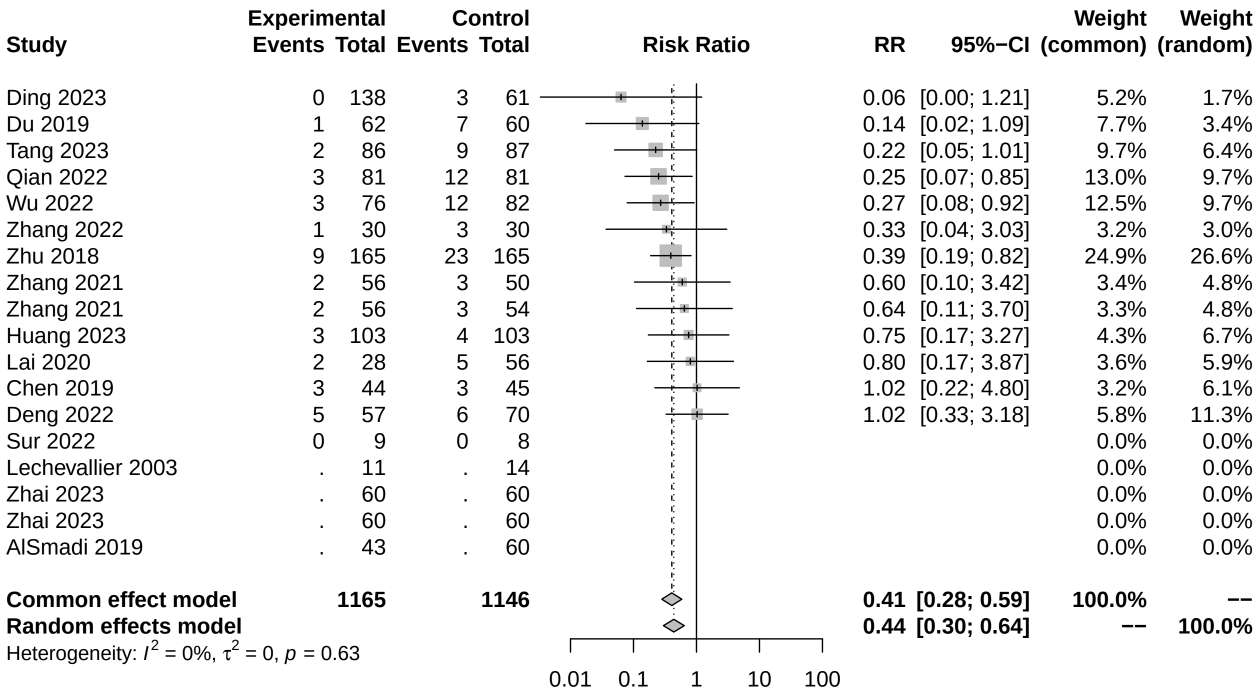
4.8.1 Meta-analysis

```
fever_metabin <- metabin(data = suction_data,
                          event.c = fever_n_control,
                        n.c = sample_size_control,
                        event.e = fever_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
fever_metabin
```

```
## Number of studies: k = 13
## Number of observations: o = 2311
## Number of events: e = 129
##
##                          RR           95%-CI     z  p-value
## Common effect model  0.4058 [0.2814; 0.5852] -4.83 < 0.0001
## Random effects model 0.4371 [0.2985; 0.6402] -4.25 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.8333]; tau = 0 [0.0000; 0.9129]
##  I^2 = 0.0% [0.0%; 56.6%]; H = 1.00 [1.00; 1.52]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  9.84   12  0.6299
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.8.2 Forest plot

```r
forest(fever_metabin,
       sortvar = TE)
```



4.8.3 Trim and Fill

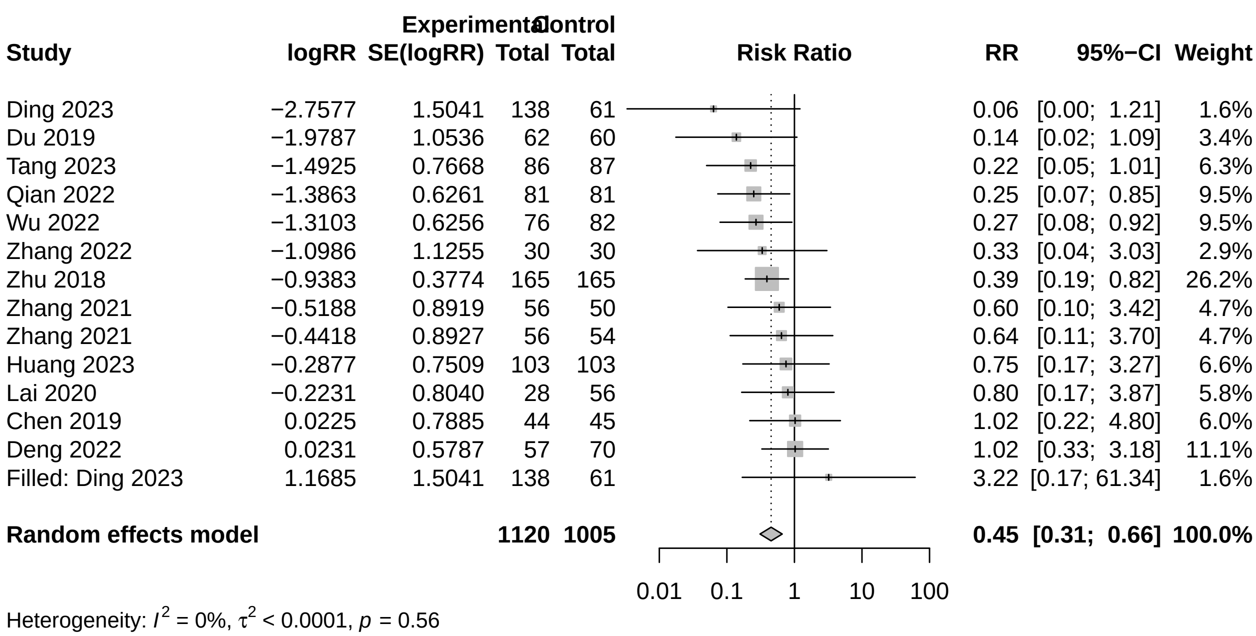
```r
trimfill(fever_metabin)
```

```
## Warning in trimfill.meta(fever_metabin): 5 observation(s) dropped due to
## missing values

## Number of studies: k = 14 (with 1 added studies)
## Number of observations: o = 2125
## Number of events: e = 132
##
##                             RR           95%-CI      z  p-value
## Random effects model 0.4517 [0.3094; 0.6595] -4.12 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 < 0.0001 [0.0000; 1.0892]; tau = 0.0025 [0.0000; 1.0436]
##  I^2 = 0.0% [0.0%; 55.0%]; H = 1.00 [1.00; 1.49]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  11.57   13  0.5630
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(fever_metabin),
       sortvar = TE)
```

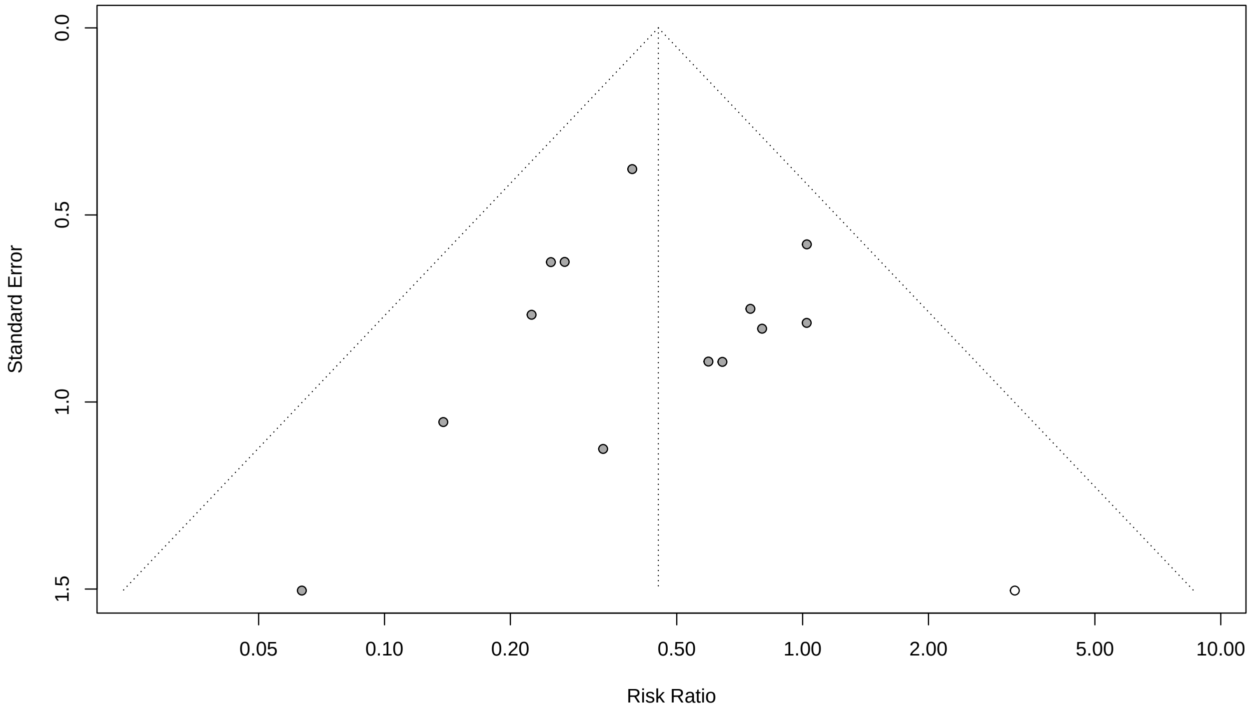
```
## Warning in trimfill.meta(fever_metabin): 5 observation(s) dropped due to
## missing values
```



4.8.4 Funnel plot

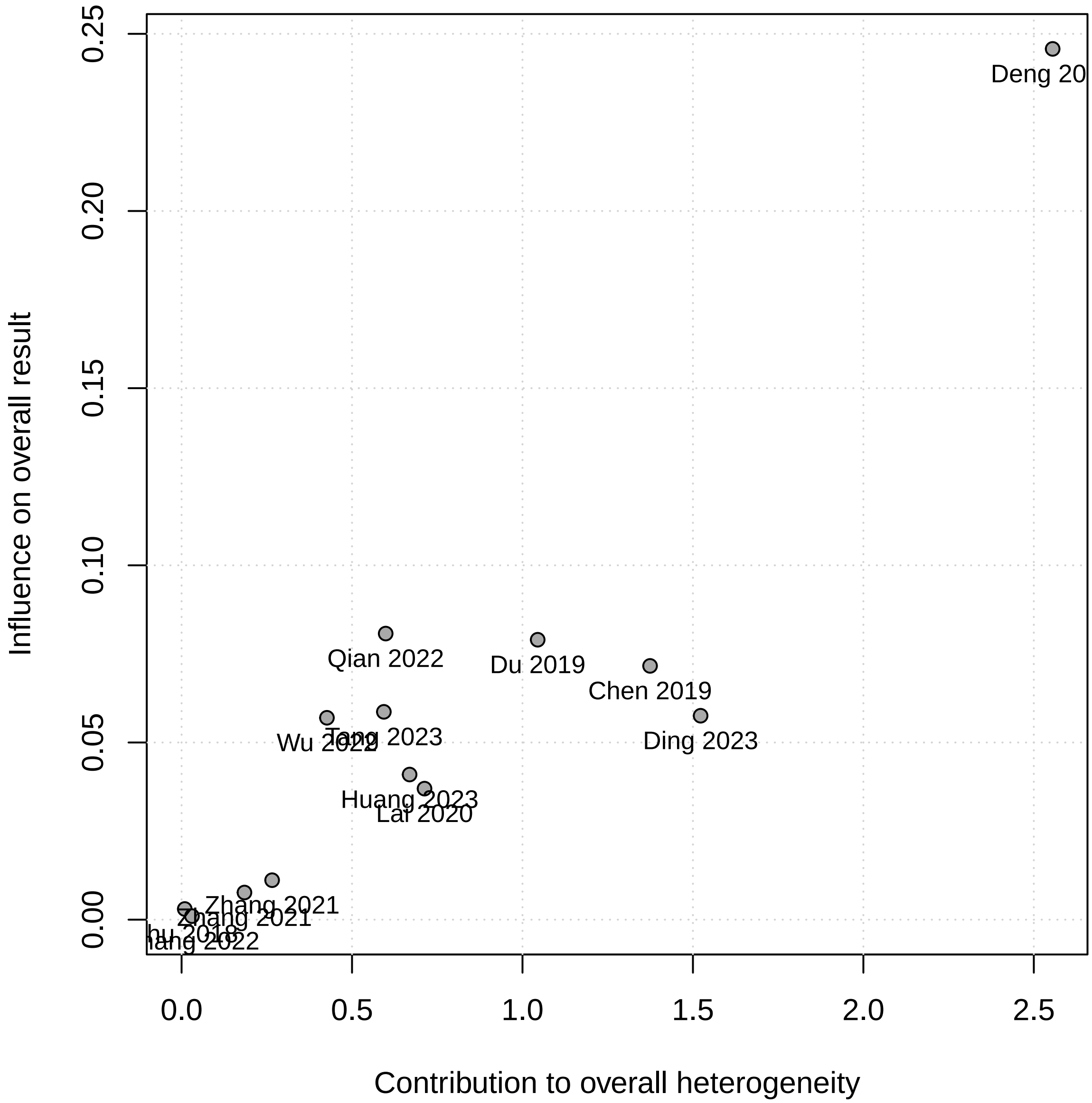
```
funnel(trimfill(fever_metabin))
```

```
## Warning in trimfill.meta(fever_metabin): 5 observation(s) dropped due to
## missing values
```



4.8.5 Baujat

```
baujat(fever_metabin, pos = 1)
```



4.8.6 Leave one out

```r
metainf(fever_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR            95%-CI  p-value   tau^2     tau
## Omitting Sur 2022             0.4058 [0.2814; 0.5852] < 0.0001  0.0000  0.0000
## Omitting Tang 2023            0.4252 [0.2913; 0.6207] < 0.0001  0.0000  0.0000
## Omitting Chen 2019            0.3853 [0.2638; 0.5630] < 0.0001  0.0000  0.0000
## Omitting Du 2019              0.4281 [0.2947; 0.6221] < 0.0001  0.0000  0.0000
## Omitting Lai 2020             0.3911 [0.2681; 0.5705] < 0.0001  0.0000  0.0000
## Omitting Zhu 2018             0.4106 [0.2694; 0.6258] < 0.0001  0.0000  0.0000
## Omitting Zhang 2021           0.3991 [0.2744; 0.5805] < 0.0001  0.0000  0.0000
## Omitting Zhang 2021           0.3977 [0.2734; 0.5786] < 0.0001  0.0000  0.0000
## Omitting Lechevallier 2003    0.4058 [0.2814; 0.5852] < 0.0001  0.0000  0.0000
## Omitting Huang 2023           0.3902 [0.2671; 0.5702] < 0.0001  0.0000  0.0000
## Omitting Wu 2022              0.4253 [0.2896; 0.6245] < 0.0001  0.0000  0.0000
## Omitting Ding 2023            0.4247 [0.2927; 0.6163] < 0.0001  0.0000  0.0000
## Omitting Zhai 2023            0.4058 [0.2814; 0.5852] < 0.0001  0.0000  0.0000
## Omitting Zhai 2023            0.4058 [0.2814; 0.5852] < 0.0001  0.0000  0.0000
## Omitting Qian 2022            0.4291 [0.2921; 0.6303] < 0.0001  0.0000  0.0000
## Omitting Zhang 2022           0.4082 [0.2816; 0.5918] < 0.0001  0.0000  0.0019
## Omitting Deng 2022            0.3676 [0.2485; 0.5436] < 0.0001  0.0000  0.0000
## Omitting AlSmadi 2019         0.4058 [0.2814; 0.5852] < 0.0001  0.0000  0.0000
##
## Pooled estimate               0.4058 [0.2814; 0.5852] < 0.0001  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Chen 2019             0.0%
## Omitting Du 2019               0.0%
## Omitting Lai 2020              0.0%
## Omitting Zhu 2018              0.0%
## Omitting Zhang 2021            0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Huang 2023            0.0%
## Omitting Wu 2022               0.0%
## Omitting Ding 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Qian 2022             0.0%
## Omitting Zhang 2022            0.0%
## Omitting Deng 2022             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.9 Infections

4.9.1 Meta-analysis

```
infection_metabin <- metabin(data = suction_data,
                             event.c = infection_n_control,
                           n.c = sample_size_control,
                           event.e = infection_n_suction,
                           n.e = sample_size_suction,
                           studlab = author_year)
infection_metabin
```

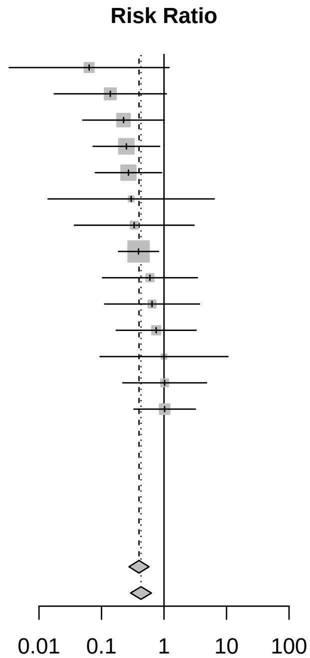
```
## Number of studies: k = 14
## Number of observations: o = 2311
## Number of events: e = 126
##
##                          RR           95%-CI     z  p-value
## Common effect model  0.3983 [0.2754; 0.5762] -4.89 < 0.0001
## Random effects model 0.4285 [0.2916; 0.6296] -4.32 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.6581]; tau = 0 [0.0000; 0.8113]
##  I^2 = 0.0% [0.0%; 55.0%]; H = 1.00 [1.00; 1.49]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  9.80   13  0.7103
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.9.2 Forest plot

```r
forest(infection_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Ding 2023	0	138	3	61	0.06	[0.00; 1.21]	5.3%	1.7%
Du 2019	1	62	7	60	0.14	[0.02; 1.09]	7.7%	3.5%
Tang 2023	2	86	9	87	0.22	[0.05; 1.01]	9.7%	6.6%
Qian 2022	3	81	12	81	0.25	[0.07; 0.85]	13.1%	9.8%
Wu 2022	3	76	12	82	0.27	[0.08; 0.92]	12.6%	9.9%
Sur 2022	0	9	1	8	0.30	[0.01; 6.39]	1.7%	1.6%
Zhang 2022	1	30	3	30	0.33	[0.04; 3.03]	3.3%	3.0%
Zhu 2018	9	165	23	165	0.39	[0.19; 0.82]	25.0%	27.1%
Zhang 2021	2	56	3	50	0.60	[0.10; 3.42]	3.4%	4.8%
Zhang 2021	2	56	3	54	0.64	[0.11; 3.70]	3.3%	4.8%
Huang 2023	3	103	4	103	0.75	[0.17; 3.27]	4.4%	6.8%
Lai 2020	1	28	2	56	1.00	[0.09; 10.56]	1.5%	2.7%
Chen 2019	3	44	3	45	1.02	[0.22; 4.80]	3.2%	6.2%
Deng 2022	5	57	6	70	1.02	[0.33; 3.18]	5.9%	11.5%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
AlSmadi 2019	.	43	.	60			0.0%	0.0%
Common effect model		**1165**		**1146**	**0.40**	**[0.28; 0.58]**	**100.0%**	**--**
Random effects model					**0.43**	**[0.29; 0.63]**	**--**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.71$



4.9.3 Trim and Fill

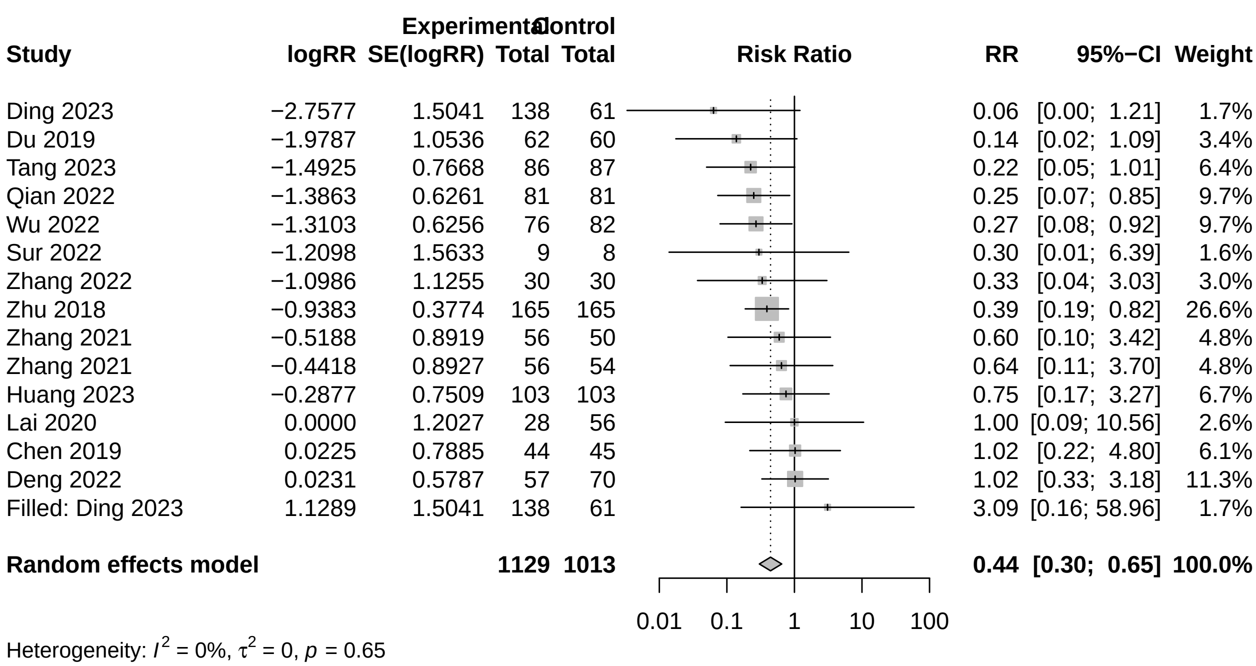
```r
trimfill(infection_metabin)
```

```
## Warning in trimfill.meta(infection_metabin): 4 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 15 (with 1 added studies)
## Number of observations: o = 2142
## Number of events: e = 129
##
##                             RR           95%-CI     z  p-value
## Random effects model 0.4429 [0.3024; 0.6487] -4.18 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.8711]; tau = 0 [0.0000; 0.9333]
##  I^2 = 0.0% [0.0%; 53.6%]; H = 1.00 [1.00; 1.47]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  11.50   14  0.6467
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(infection_metabin),
       sortvar = TE)
```

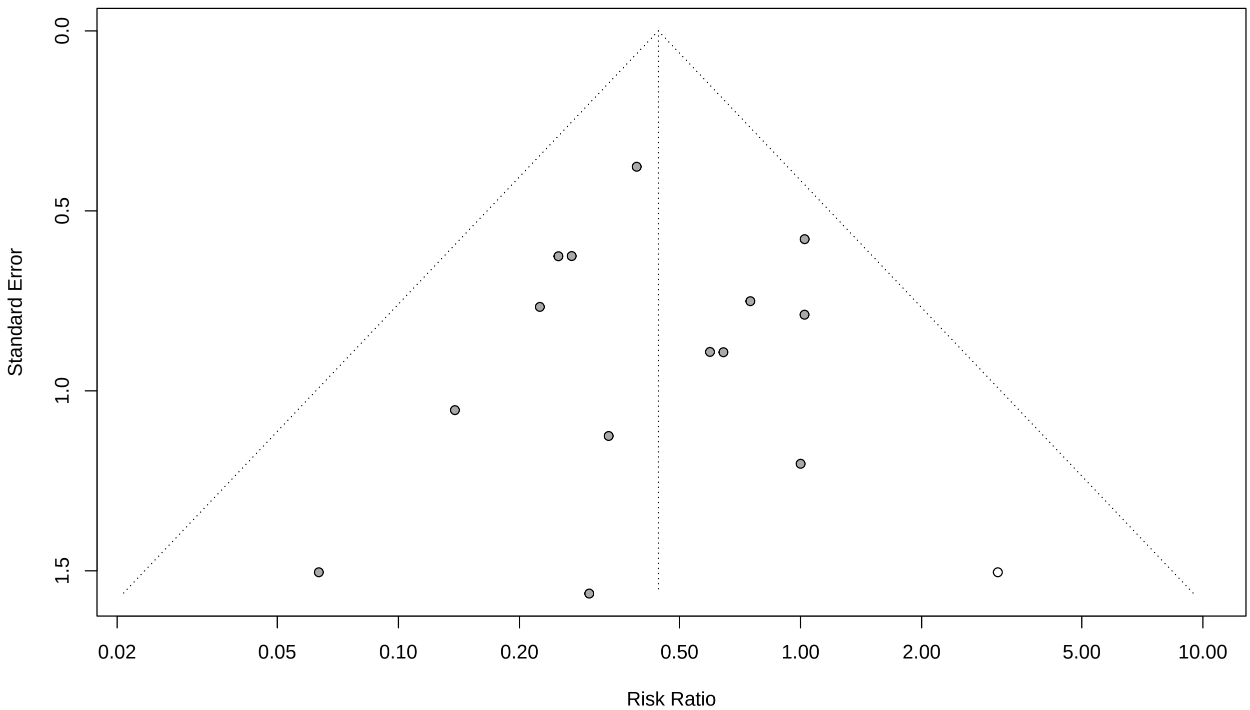
```
## Warning in trimfill.meta(infection_metabin): 4 observation(s) dropped due to
## missing values
```



4.9.4 Funnel plot

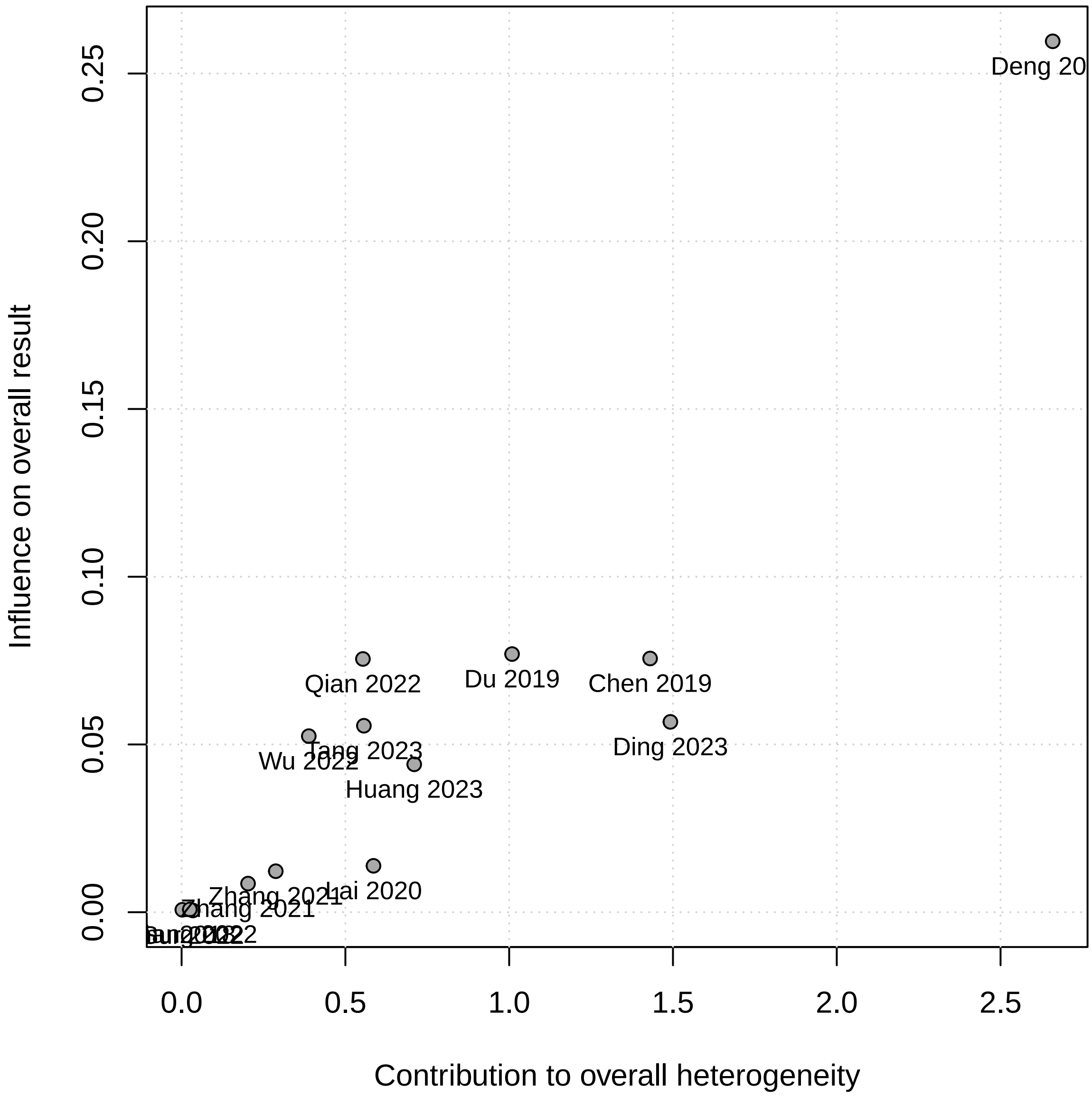
```r
funnel(trimfill(infection_metabin))
```

```
## Warning in trimfill.meta(infection_metabin): 4 observation(s) dropped due to
## missing values
```



4.9.5 Baujat

```
baujat(infection_metabin, pos = 1)
```



4.9.6 Leave one out

```
metainf(infection_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR           95%-CI  p-value   tau^2     tau
## Omitting Sur 2022             0.4000 [0.2758; 0.5803] < 0.0001  0.0000  0.0000
## Omitting Tang 2023            0.4170 [0.2847; 0.6108] < 0.0001  0.0000  0.0000
## Omitting Chen 2019            0.3775 [0.2575; 0.5534] < 0.0001  0.0000  0.0000
## Omitting Du 2019              0.4201 [0.2883; 0.6124] < 0.0001  0.0000  0.0000
## Omitting Lai 2020             0.3895 [0.2677; 0.5665] < 0.0001  0.0000  0.0000
## Omitting Zhu 2018             0.4007 [0.2617; 0.6135] < 0.0001  0.0000  0.0000
## Omitting Zhang 2021           0.3913 [0.2681; 0.5710] < 0.0001  0.0000  0.0000
## Omitting Zhang 2021           0.3899 [0.2671; 0.5691] < 0.0001  0.0000  0.0000
## Omitting Lechevallier 2003    0.3983 [0.2754; 0.5762] < 0.0001  0.0000  0.0000
## Omitting Huang 2023           0.3823 [0.2608; 0.5605] < 0.0001  0.0000  0.0000
## Omitting Wu 2022              0.4168 [0.2829; 0.6142] < 0.0001  0.0000  0.0000
## Omitting Ding 2023            0.4169 [0.2864; 0.6069] < 0.0001  0.0000  0.0000
## Omitting Zhai 2023            0.3983 [0.2754; 0.5762] < 0.0001  0.0000  0.0000
## Omitting Zhai 2023            0.3983 [0.2754; 0.5762] < 0.0001  0.0000  0.0000
## Omitting Qian 2022            0.4206 [0.2853; 0.6200] < 0.0001  0.0000  0.0000
## Omitting Zhang 2022           0.4005 [0.2754; 0.5824] < 0.0001  0.0000  0.0000
## Omitting Deng 2022            0.3594 [0.2421; 0.5337] < 0.0001  0.0000  0.0000
## Omitting AlSmadi 2019         0.3983 [0.2754; 0.5762] < 0.0001  0.0000  0.0000
##
## Pooled estimate               0.3983 [0.2754; 0.5762] < 0.0001  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Chen 2019             0.0%
## Omitting Du 2019               0.0%
## Omitting Lai 2020              0.0%
## Omitting Zhu 2018              0.0%
## Omitting Zhang 2021            0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Huang 2023            0.0%
## Omitting Wu 2022               0.0%
## Omitting Ding 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Qian 2022             0.0%
## Omitting Zhang 2022            0.0%
## Omitting Deng 2022             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.10 Sepsis

4.10.1 Meta-analysis

```
sepsis_metabin <- metabin(data = suction_data,
                           event.c = sepsis_n_control,
                         n.c = sample_size_control,
                         event.e = sepsis_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
sepsis_metabin
```

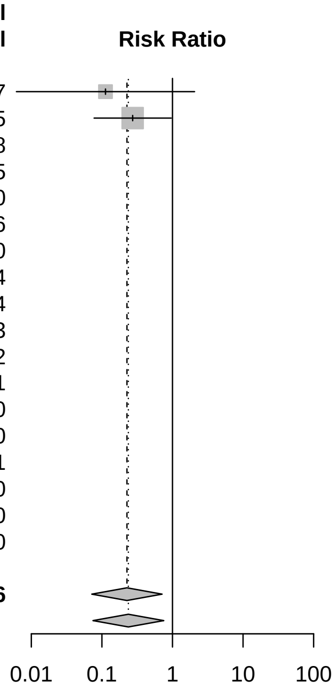
```
## Number of studies: k = 2
## Number of observations: o = 2311
## Number of events: e = 18
##
##                          RR           95%-CI     z p-value
## Common effect model  0.2264 [0.0719; 0.7124] -2.54  0.0111
## Random effects model 0.2371 [0.0747; 0.7524] -2.44  0.0146
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.30    1  0.5833
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.10.2 Forest plot

```r
forest(sepsis_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Tang 2023	0	86	4	87	0.11	[0.01; 2.06]	28.9%	15.8%
Zhu 2018	3	165	11	165	0.27	[0.08; 0.96]	71.1%	84.2%
Sur 2022	0	9	0	8			0.0%	0.0%
Chen 2019	0	44	0	45			0.0%	0.0%
Du 2019	0	62	0	60			0.0%	0.0%
Lai 2020	0	28	0	56			0.0%	0.0%
Zhang 2021	0	56	0	50			0.0%	0.0%
Zhang 2021	0	56	0	54			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Huang 2023	0	103	0	103			0.0%	0.0%
Wu 2022	0	76	0	82			0.0%	0.0%
Ding 2023	0	138	0	61			0.0%	0.0%
Zhai 2023	0	60	0	60			0.0%	0.0%
Zhai 2023	0	60	0	60			0.0%	0.0%
Qian 2022	0	81	0	81			0.0%	0.0%
Zhang 2022	0	30	0	30			0.0%	0.0%
Deng 2022	0	57	0	70			0.0%	0.0%
AlSmadi 2019	0	43	0	60			0.0%	0.0%
Common effect model		**1165**		**1146**	**0.23**	**[0.07; 0.71]**	**100.0%**	**--**
Random effects model					**0.24**	**[0.07; 0.75]**	**--**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.58$

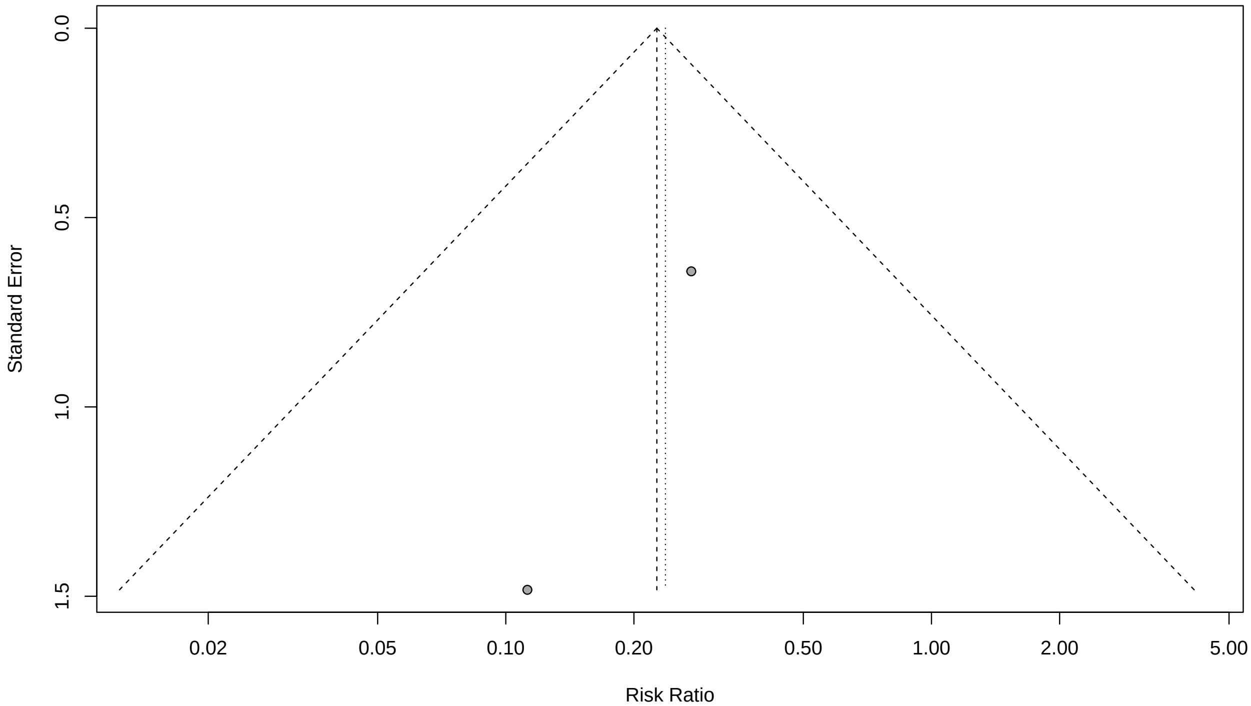


4.10.3 Trim and Fill

```
#trimfill(sepsis_metabin)
#forest(trimfill(sepsis_metabin),
#       sortvar = TE)
```

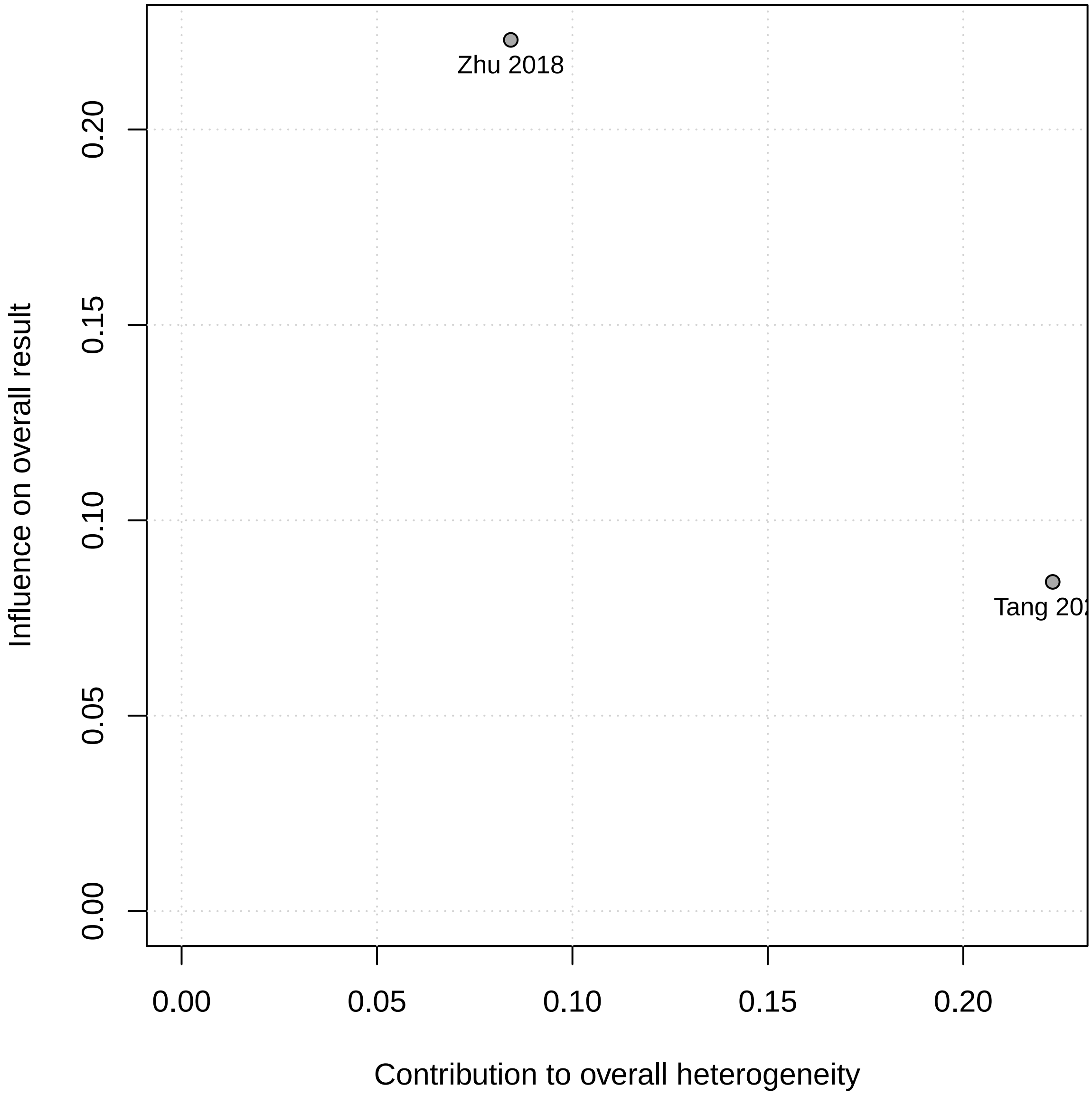
4.10.4 Funnel plot

```
funnel((sepsis_metabin))
```



4.10.5 Baujat

```
baujat(sepsis_metabin, pos = 1)
```



4.10.6 Leave one out

```
metainf(sepsis_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Sur 2022            0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Tang 2023           0.2727 [0.0775; 0.9598]  0.0430
## Omitting Chen 2019           0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Du 2019             0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Lai 2020            0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Zhu 2018            0.1124 [0.0061; 2.0562]  0.1405
## Omitting Zhang 2021          0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Zhang 2021          0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Lechevallier 2003   0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Huang 2023          0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Wu 2022             0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Ding 2023           0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Zhai 2023           0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Zhai 2023           0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Qian 2022           0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Zhang 2022          0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting Deng 2022           0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
## Omitting AlSmadi 2019        0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
##
## Pooled estimate              0.2264 [0.0719; 0.7124]  0.0111  0.0000  0.0000
##                                I^2
## Omitting Sur 2022             0.0%
## Omitting Tang 2023
## Omitting Chen 2019            0.0%
## Omitting Du 2019              0.0%
## Omitting Lai 2020             0.0%
## Omitting Zhu 2018
## Omitting Zhang 2021           0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Huang 2023           0.0%
## Omitting Wu 2022              0.0%
## Omitting Ding 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Qian 2022            0.0%
## Omitting Zhang 2022           0.0%
## Omitting Deng 2022            0.0%
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.11 Abscess

4.11.1 Meta-analysis

```
abscess_metabin <- metabin(data = suction_data,
                          event.c = abscess_n_control,
                        n.c = sample_size_control,
                        event.e = abscess_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
abscess_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 2311
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA         --      --
## Random effects model NA         --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.11.2 Forest plot

```r
forest(abscess_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	Risk Ratio	RR	95%−CI	Weight (common)	Weight (random)
Sur 2022	0	9	0	8				0.0%	0.0%
Tang 2023	0	86	0	87				0.0%	0.0%
Chen 2019	0	44	0	45				0.0%	0.0%
Du 2019	0	62	0	60				0.0%	0.0%
Lai 2020	0	28	0	56				0.0%	0.0%
Zhu 2018	0	165	0	165				0.0%	0.0%
Zhang 2021	0	56	0	50				0.0%	0.0%
Zhang 2021	0	56	0	54				0.0%	0.0%
Lechevallier 2003	.	11	.	14				0.0%	0.0%
Huang 2023	0	103	0	103				0.0%	0.0%
Wu 2022	0	76	0	82				0.0%	0.0%
Ding 2023	0	138	0	61				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Qian 2022	0	81	0	81				0.0%	0.0%
Zhang 2022	0	30	0	30				0.0%	0.0%
Deng 2022	0	57	0	70				0.0%	0.0%
AlSmadi 2019	0	43	0	60				0.0%	0.0%
Common effect model		**1165**		**1146**				**100.0%**	**−−**
Random effects model								**−−**	**100.0%**

Heterogeneity: I^2 = NA%, τ^2 = NA, p = NA

0.75 1 1.5

4.11.3 Trim and Fill

```
#trimfill(abscess_metabin)
#forest(trimfill(abscess_metabin),
#       sortvar = TE)
```

4.11.4 Funnel plot

```
#funnel((abscess_metabin))
```

4.11.5 Baujat

```
#baujat(abscess_metabin, pos = 1)
```

4.11.6 Leave one out

```
#metainf(abscess_metabin)
```

4.12 Haematoma

4.12.1 Meta-analysis

```
haematoma_metabin <- metabin(data = suction_data,
                            event.c = hematoma_n_control,
                          n.c = sample_size_control,
                          event.e = hematoma_n_suction,
                          n.e = sample_size_suction,
                          studlab = author_year)
haematoma_metabin
```

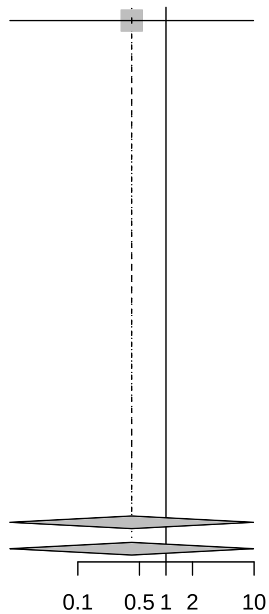
```
## Number of studies: k = 1
## Number of observations: o = 2311
## Number of events: e = 1
##
##                          RR           95%-CI     z p-value
## Common effect model  0.4080 [0.0169; 9.8294] -0.55  0.5808
## Random effects model 0.4087 [0.0170; 9.8436] -0.55  0.5815
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.12.2 Forest plot

```r
forest(haematoma_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	Risk Ratio	RR	95%−CI	Weight (common)	Weight (random)
Deng 2022	0	57	1	70		0.41	[0.02; 9.84]	100.0%	100.0%
Sur 2022	0	9	0	8				0.0%	0.0%
Tang 2023	0	86	0	87				0.0%	0.0%
Chen 2019	0	44	0	45				0.0%	0.0%
Du 2019	0	62	0	60				0.0%	0.0%
Lai 2020	0	28	0	56				0.0%	0.0%
Zhu 2018	0	165	0	165				0.0%	0.0%
Zhang 2021	0	56	0	50				0.0%	0.0%
Zhang 2021	0	56	0	54				0.0%	0.0%
Lechevallier 2003	.	11	.	14				0.0%	0.0%
Huang 2023	0	103	0	103				0.0%	0.0%
Wu 2022	0	76	0	82				0.0%	0.0%
Ding 2023	0	138	0	61				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Qian 2022	0	81	0	81				0.0%	0.0%
Zhang 2022	0	30	0	30				0.0%	0.0%
AlSmadi 2019	0	43	0	60				0.0%	0.0%
Common effect model		**1165**		**1146**		**0.41**	**[0.02; 9.83]**	**100.0%**	**−−**
Random effects model						**0.41**	**[0.02; 9.84]**	**−−**	**100.0%**

Heterogeneity: I^2 = NA%, τ^2 = NA, p = NA

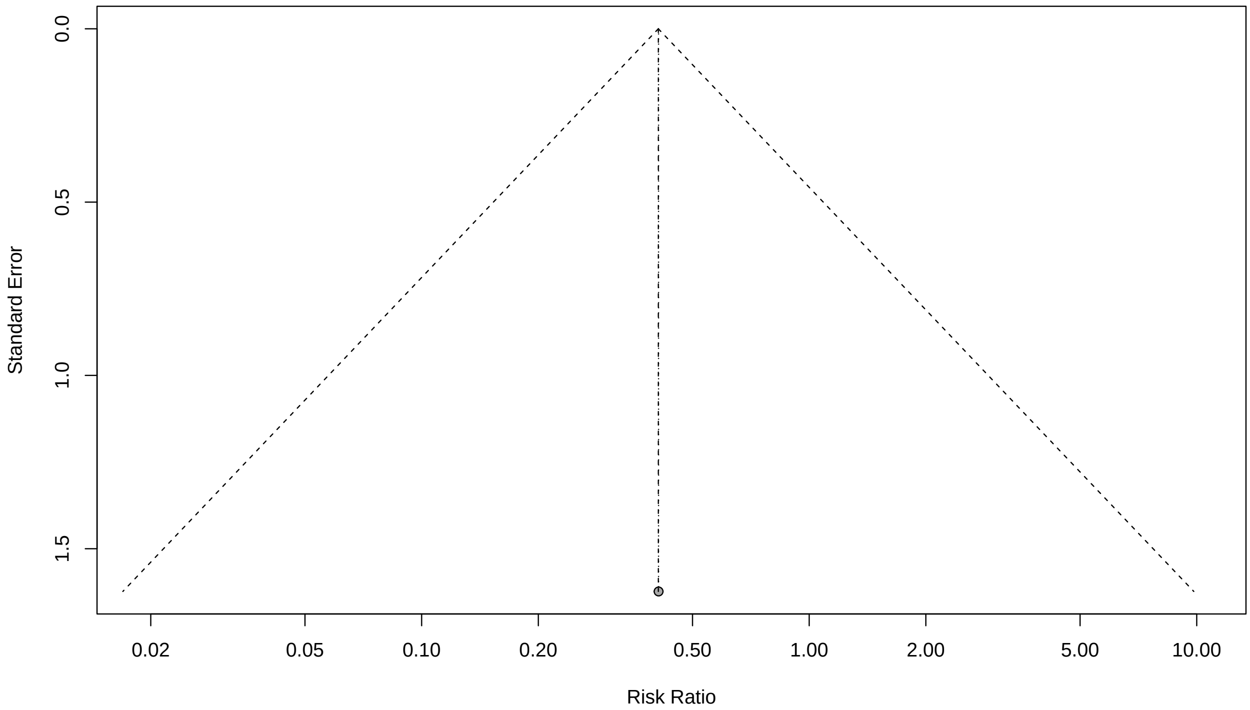


4.12.3 Trim and Fill

```
#trimfill(haematoma_metabin)
#forest(trimfill(haematoma_metabin),
#       sortvar = TE)
```

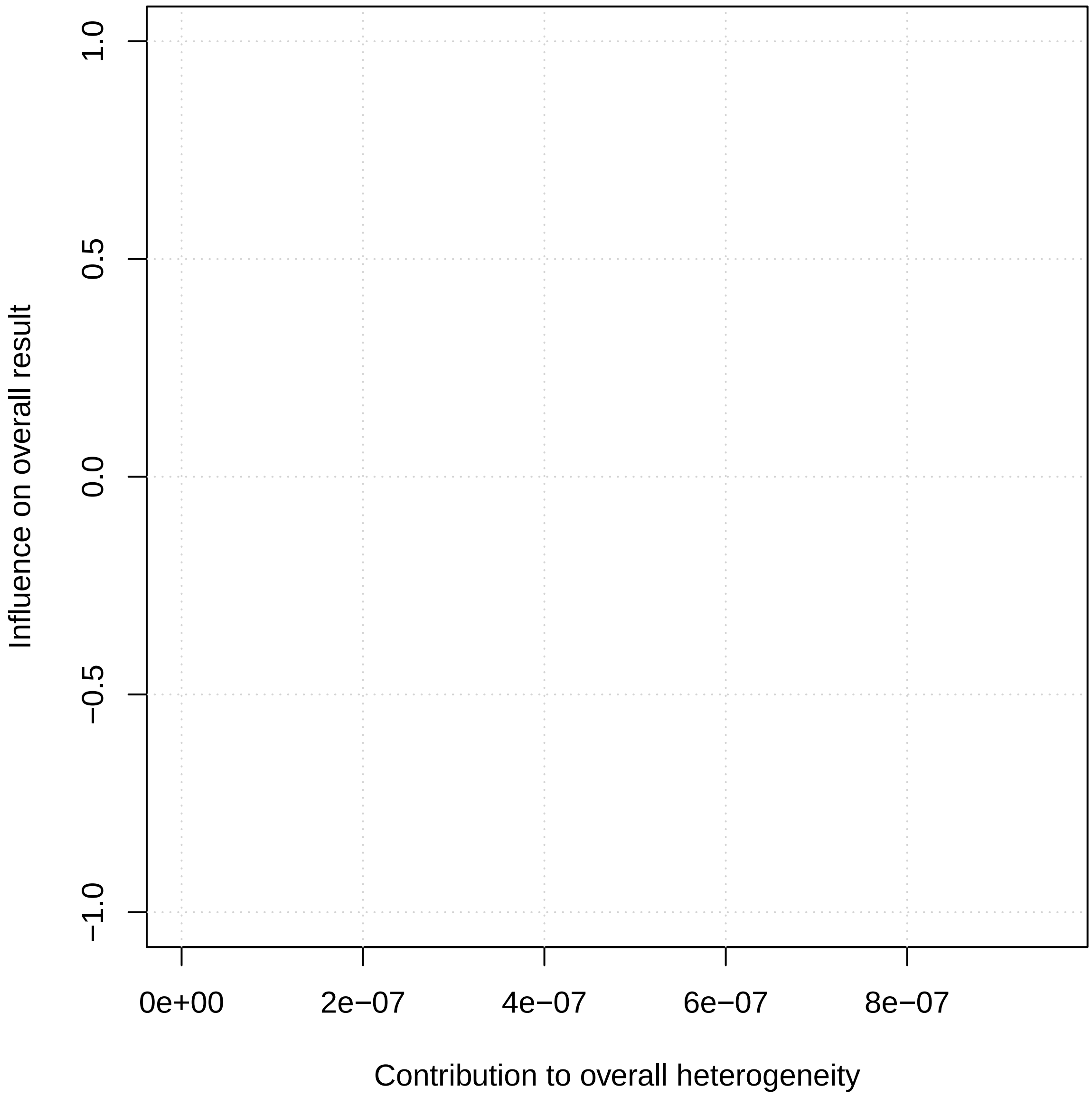
4.12.4 Funnel plot

```r
funnel((haematoma_metabin))
```



4.12.5 Baujat

```
baujat(haematoma_metabin, pos = 1)
```



4.12.6 Leave one out

```
metainf(haematoma_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022           0.4080 [0.0169; 9.8294]  0.5808
## Omitting Tang 2023          0.4080 [0.0169; 9.8294]  0.5808
## Omitting Chen 2019          0.4080 [0.0169; 9.8294]  0.5808
## Omitting Du 2019            0.4080 [0.0169; 9.8294]  0.5808
## Omitting Lai 2020           0.4080 [0.0169; 9.8294]  0.5808
## Omitting Zhu 2018           0.4080 [0.0169; 9.8294]  0.5808
## Omitting Zhang 2021         0.4080 [0.0169; 9.8294]  0.5808
## Omitting Zhang 2021         0.4080 [0.0169; 9.8294]  0.5808
## Omitting Lechevallier 2003  0.4080 [0.0169; 9.8294]  0.5808
## Omitting Huang 2023         0.4080 [0.0169; 9.8294]  0.5808
## Omitting Wu 2022            0.4080 [0.0169; 9.8294]  0.5808
## Omitting Ding 2023          0.4080 [0.0169; 9.8294]  0.5808
## Omitting Zhai 2023          0.4080 [0.0169; 9.8294]  0.5808
## Omitting Zhai 2023          0.4080 [0.0169; 9.8294]  0.5808
## Omitting Qian 2022          0.4080 [0.0169; 9.8294]  0.5808
## Omitting Zhang 2022         0.4080 [0.0169; 9.8294]  0.5808
## Omitting Deng 2022
## Omitting AlSmadi 2019       0.4080 [0.0169; 9.8294]  0.5808
##
## Pooled estimate             0.4080 [0.0169; 9.8294]  0.5808
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.13 Pain

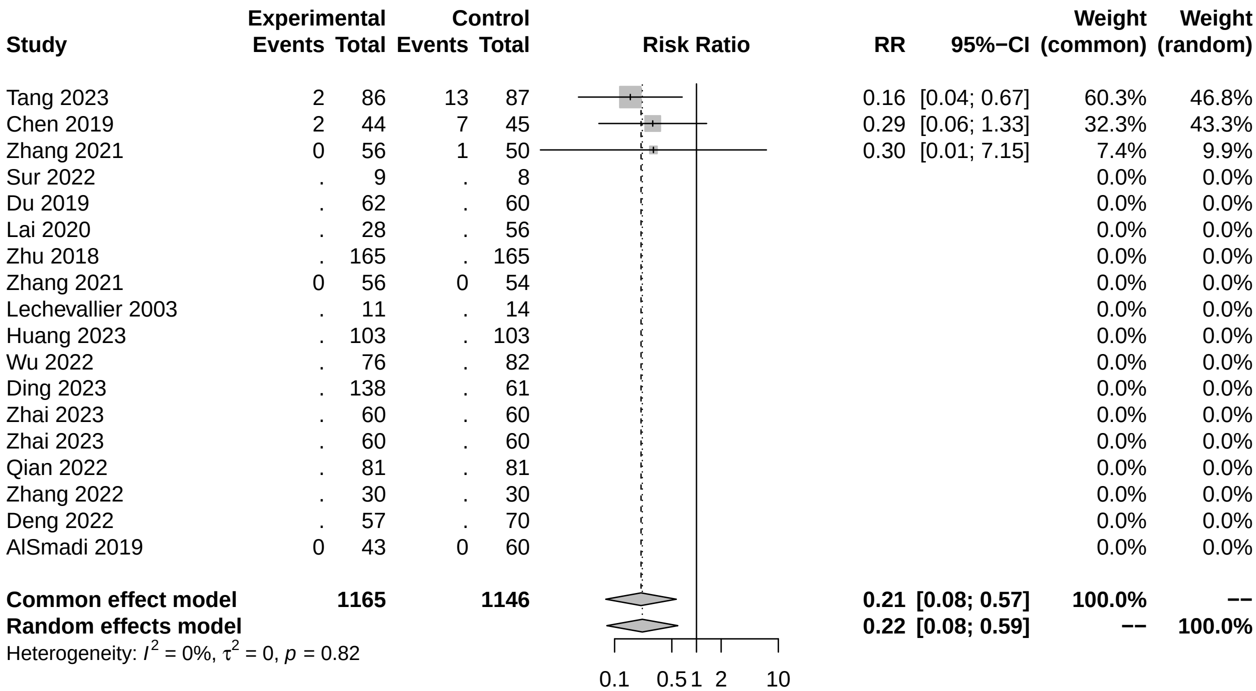
4.13.1 Meta-analysis

```
pain_metabin <- metabin(data = suction_data,
                          event.c = pain_n_control,
                        n.c = sample_size_control,
                        event.e = pain_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
pain_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 2311
## Number of events: e = 25
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2103 [0.0780; 0.5670] -3.08  0.0021
## Random effects model 0.2180 [0.0804; 0.5913] -2.99  0.0028
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 4.5123]; tau = 0 [0.0000; 2.1242]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.39    2  0.8246
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.13.2 Forest plot

```r
forest(pain_metabin,
       sortvar = TE)
```



4.13.3 Trim and Fill

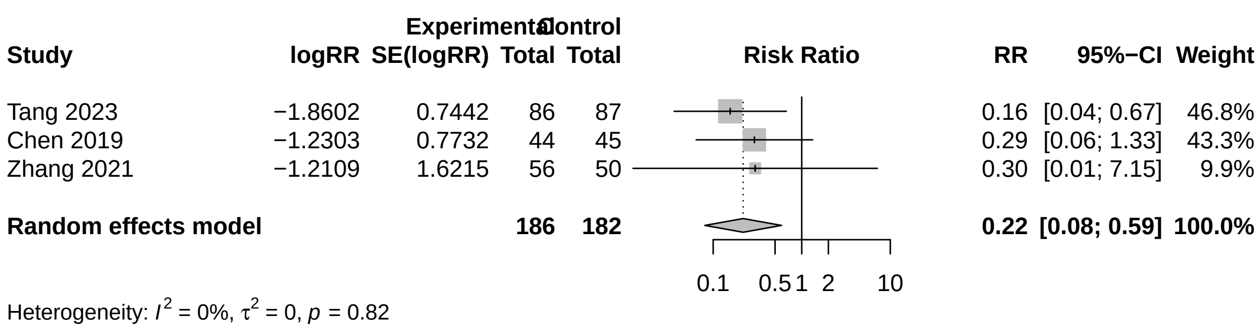
```r
trimfill(pain_metabin)
```

```
## Warning in trimfill.meta(pain_metabin): 15 observation(s) dropped due to
## missing values

## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 368
## Number of events: e = 25
##
##                          RR           95%-CI     z p-value
## Random effects model 0.2180 [0.0804; 0.5913] -2.99  0.0028
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 4.5123]; tau = 0 [0.0000; 2.1242]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.39    2  0.8246
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(pain_metabin),
       sortvar = TE)
```

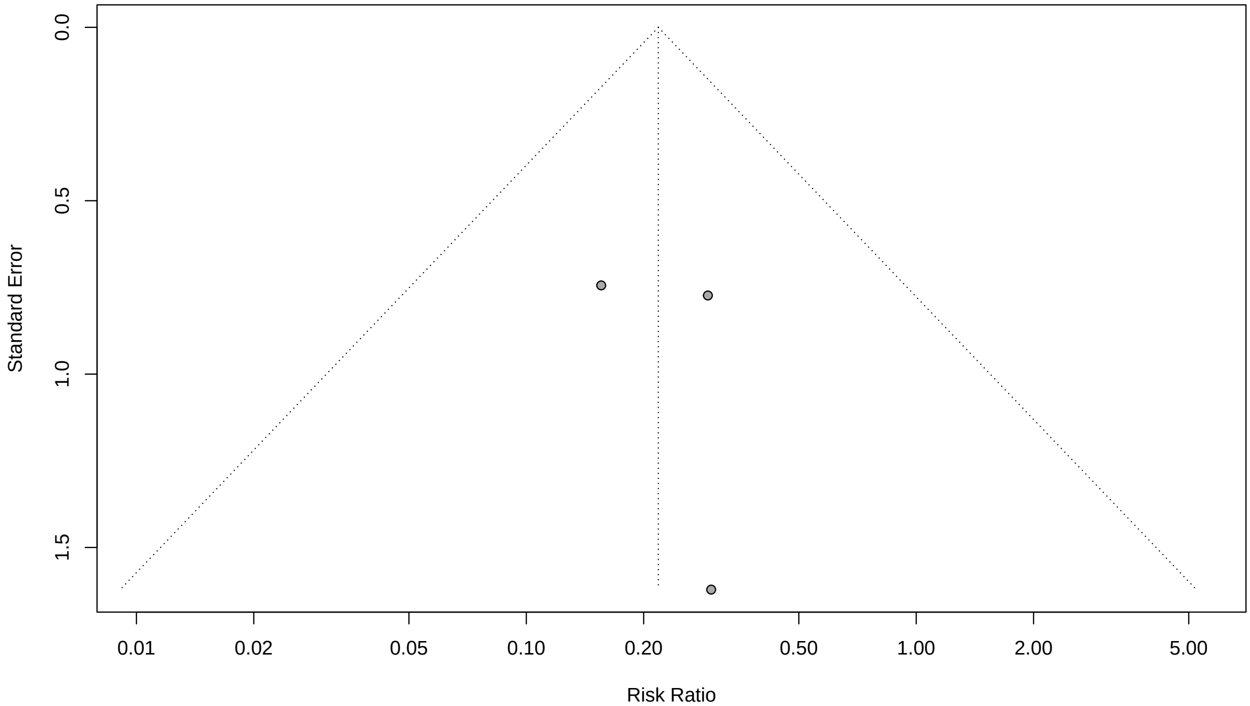
```
## Warning in trimfill.meta(pain_metabin): 15 observation(s) dropped due to
## missing values
```



4.13.4 Funnel plot

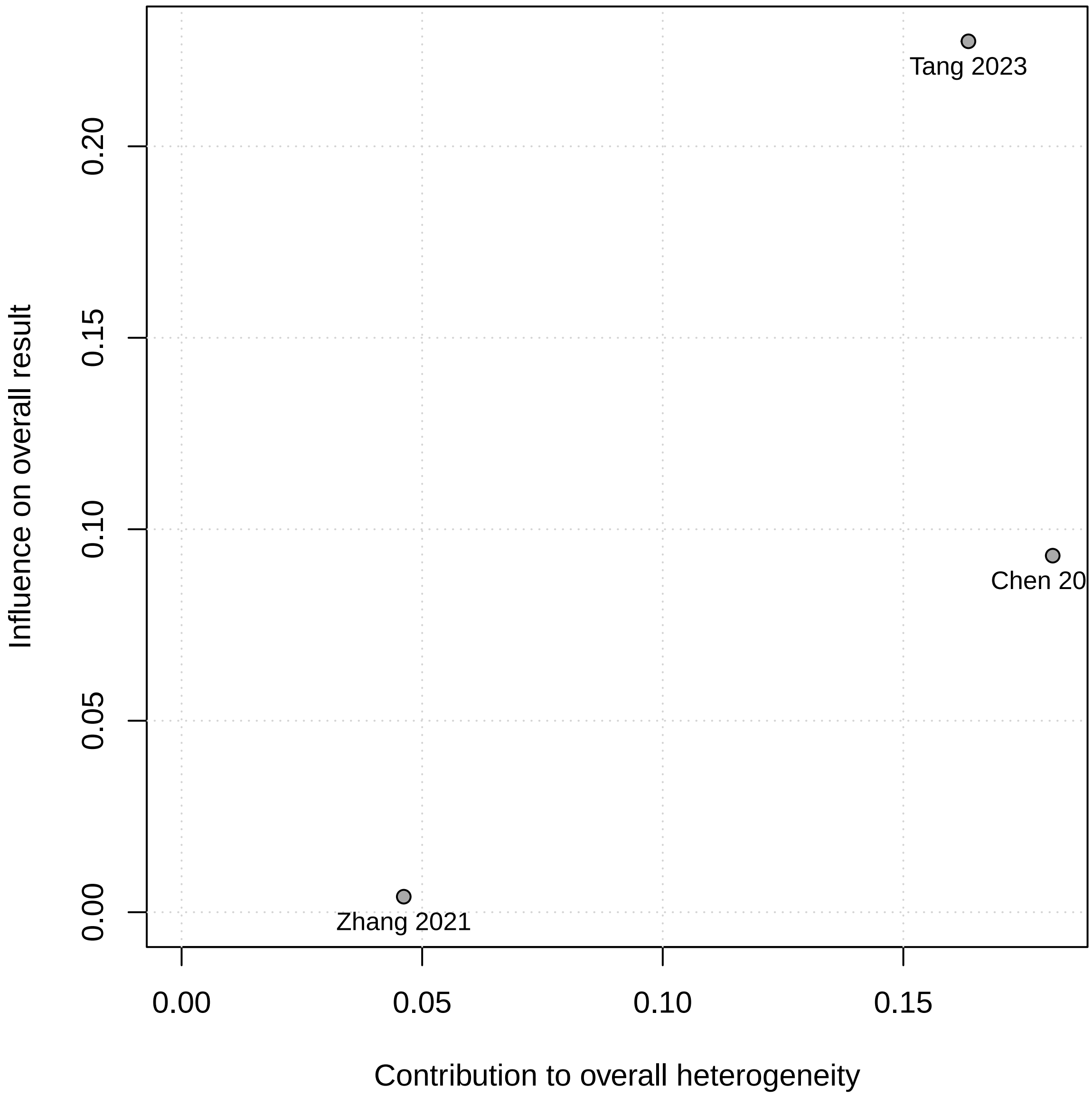
```
funnel(trimfill(pain_metabin))
```

```
## Warning in trimfill.meta(pain_metabin): 15 observation(s) dropped due to
## missing values
```



4.13.5 Baujat

```
baujat(pain_metabin, pos = 1)
```



4.13.6 Leave one out

```r
metainf(pain_metabin, pos = 1)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022            0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Tang 2023           0.2933 [0.0747; 1.1520]  0.0789  0.0000  0.0000
## Omitting Chen 2019           0.1712 [0.0457; 0.6414]  0.0088  0.0000  0.0000
## Omitting Du 2019             0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Lai 2020            0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Zhu 2018            0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Zhang 2021          0.2033 [0.0715; 0.5781]  0.0028  0.0000  0.0000
## Omitting Zhang 2021          0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Lechevallier 2003   0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Huang 2023          0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Wu 2022             0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Ding 2023           0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Zhai 2023           0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Zhai 2023           0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Qian 2022           0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Zhang 2022          0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting Deng 2022           0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
## Omitting AlSmadi 2019        0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
##
## Pooled estimate              0.2103 [0.0780; 0.5670]  0.0021  0.0000  0.0000
##                                I^2
## Omitting Sur 2022             0.0%
## Omitting Tang 2023            0.0%
## Omitting Chen 2019            0.0%
## Omitting Du 2019              0.0%
## Omitting Lai 2020             0.0%
## Omitting Zhu 2018             0.0%
## Omitting Zhang 2021           0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Huang 2023           0.0%
## Omitting Wu 2022              0.0%
## Omitting Ding 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Qian 2022            0.0%
## Omitting Zhang 2022           0.0%
## Omitting Deng 2022            0.0%
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.14 Stricture

4.14.1 Meta-analysis

```r
stricture_metabin <- metabin(data = suction_data,
                         event.c = stricture_n_control,
                       n.c = sample_size_control,
                       event.e = stricture_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
stricture_metabin
```

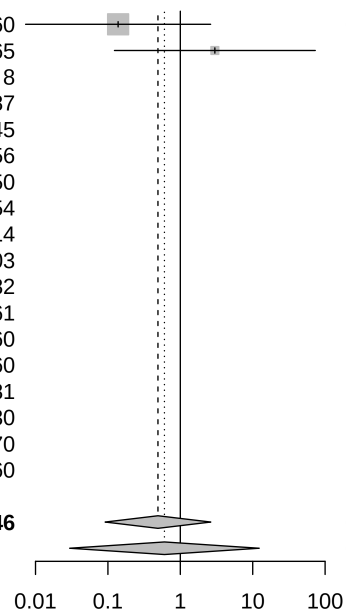
```
## Number of studies: k = 2
## Number of observations: o = 2311
## Number of events: e = 4
##
##                          RR            95%-CI     z p-value
## Common effect model  0.4911 [0.0916;  2.6336] -0.83  0.4066
## Random effects model 0.6034 [0.0297; 12.2755] -0.33  0.7424
##
## Quantifying heterogeneity:
##  tau^2 = 2.2802; tau = 1.5100; I^2 = 48.2%; H = 1.39
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.93    1  0.1648
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.14.2 Forest plot

```r
forest(stricture_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	Risk Ratio	RR	95%−CI	Weight (common)	Weight (random)
Du 2019	0	62	3	60		0.14	[0.01; 2.62]	87.7%	52.1%
Zhu 2018	1	165	0	165		3.00	[0.12; 73.11]	12.3%	47.9%
Sur 2022	0	9	0	8				0.0%	0.0%
Tang 2023	0	86	0	87				0.0%	0.0%
Chen 2019	0	44	0	45				0.0%	0.0%
Lai 2020	0	28	0	56				0.0%	0.0%
Zhang 2021	0	56	0	50				0.0%	0.0%
Zhang 2021	0	56	0	54				0.0%	0.0%
Lechevallier 2003	.	11	.	14				0.0%	0.0%
Huang 2023	0	103	0	103				0.0%	0.0%
Wu 2022	0	76	0	82				0.0%	0.0%
Ding 2023	0	138	0	61				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Qian 2022	0	81	0	81				0.0%	0.0%
Zhang 2022	0	30	0	30				0.0%	0.0%
Deng 2022	0	57	0	70				0.0%	0.0%
AlSmadi 2019	0	43	0	60				0.0%	0.0%
Common effect model		**1165**		**1146**		**0.49**	**[0.09; 2.63]**	**100.0%**	**--**
Random effects model						**0.60**	**[0.03; 12.28]**	**--**	**100.0%**

Heterogeneity: $I^2 = 48\%$, $\tau^2 = 2.2802$, $p = 0.16$

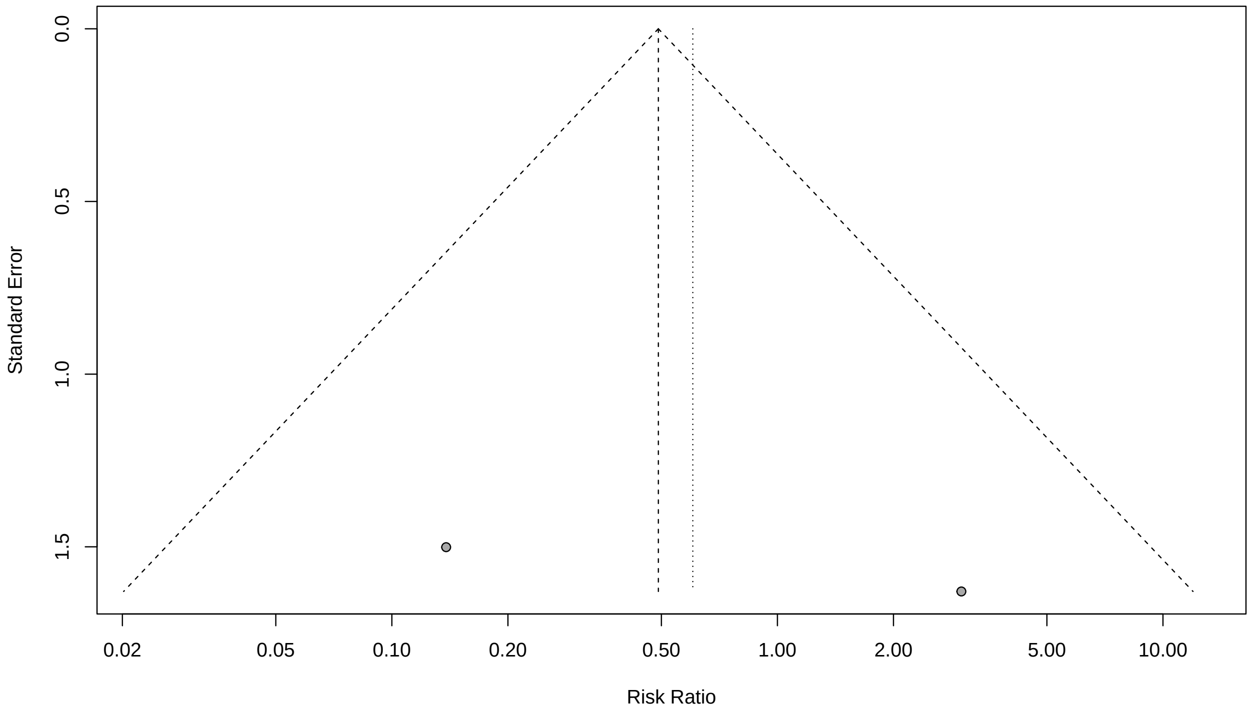


4.14.3 Trim and Fill

```
#trimfill(stricture_metabin)
#forest(trimfill(stricture_metabin),
#       sortvar = TE)
```

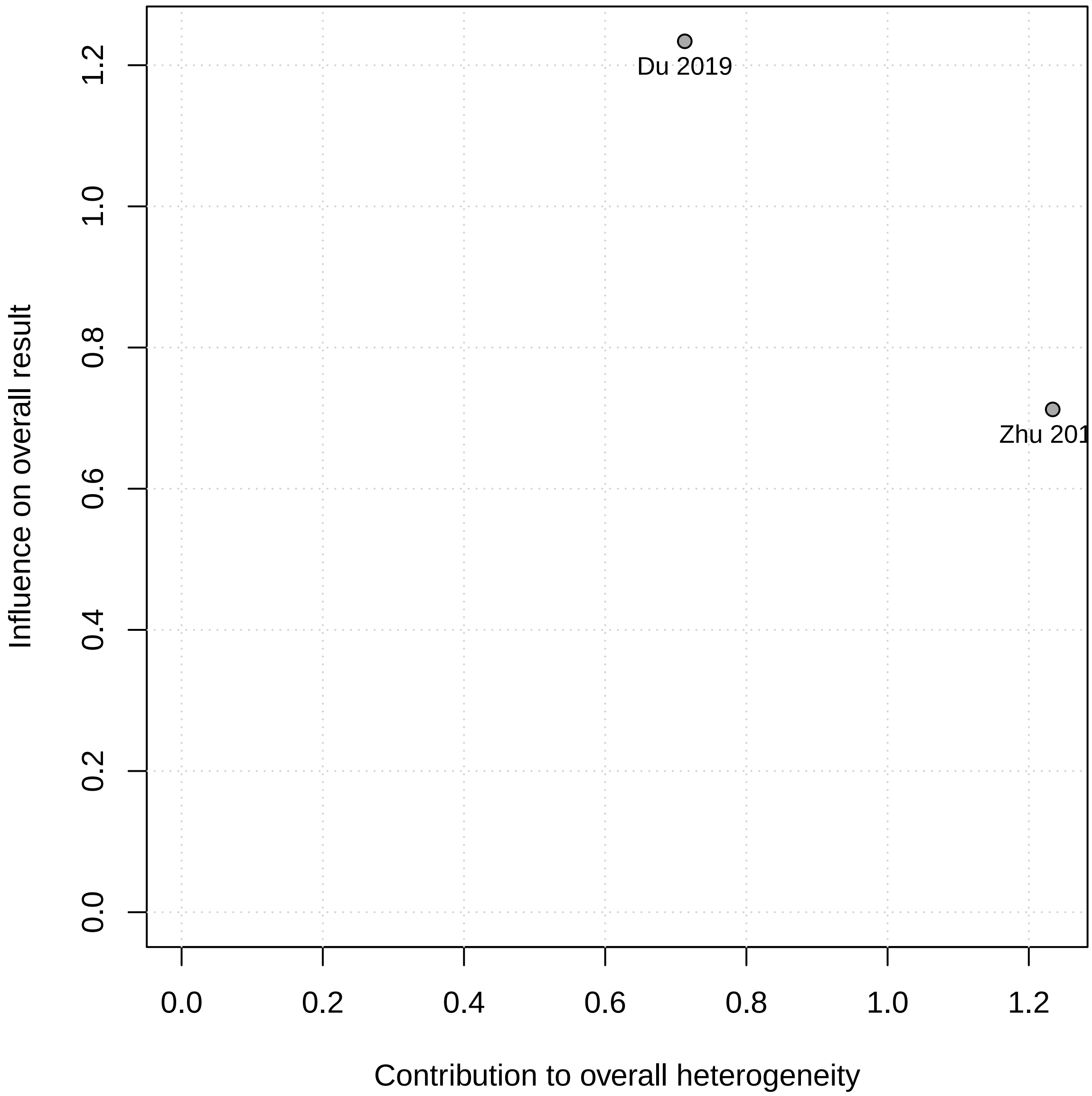
4.14.4 Funnel plot

```
funnel((stricture_metabin))
```



4.14.5 Baujat

```
baujat(stricture_metabin, pos = 1)
```



4.14.6 Leave one out

```r
metainf(stricture_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR            95%-CI p-value   tau^2     tau
## Omitting Sur 2022            0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Tang 2023           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Chen 2019           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Du 2019             3.0000 [0.1231; 73.1112]  0.5001
## Omitting Lai 2020            0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Zhu 2018            0.1383 [0.0073;  2.6222]  0.1876
## Omitting Zhang 2021          0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Zhang 2021          0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Lechevallier 2003   0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Huang 2023          0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Wu 2022             0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Ding 2023           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Zhai 2023           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Zhai 2023           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Qian 2022           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Zhang 2022          0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting Deng 2022           0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
## Omitting AlSmadi 2019        0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
##
## Pooled estimate              0.4911 [0.0916;  2.6336]  0.4066  2.2802  1.5100
##                                 I^2
## Omitting Sur 2022             48.2%
## Omitting Tang 2023            48.2%
## Omitting Chen 2019            48.2%
## Omitting Du 2019
## Omitting Lai 2020             48.2%
## Omitting Zhu 2018
## Omitting Zhang 2021           48.2%
## Omitting Zhang 2021           48.2%
## Omitting Lechevallier 2003    48.2%
## Omitting Huang 2023           48.2%
## Omitting Wu 2022              48.2%
## Omitting Ding 2023            48.2%
## Omitting Zhai 2023            48.2%
## Omitting Zhai 2023            48.2%
## Omitting Qian 2022            48.2%
## Omitting Zhang 2022           48.2%
## Omitting Deng 2022            48.2%
## Omitting AlSmadi 2019         48.2%
##
## Pooled estimate               48.2%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.15 Embolisation required

4.15.1 Meta-analysis

```
ir_embolisation_metabin <- metabin(data = suction_data,
                         event.c = embolism_ir_intervention_n_control,
                       n.c = sample_size_control,
                       event.e = embolism_ir_intervention_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
ir_embolisation_metabin
```

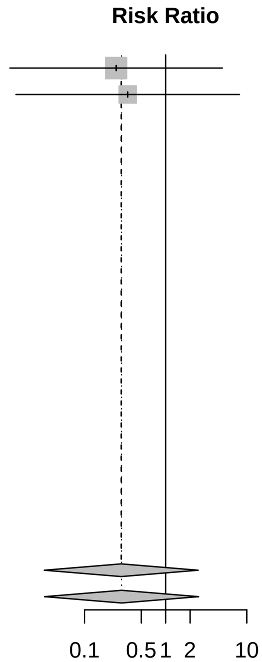
```
## Number of studies: k = 2
## Number of observations: o = 2311
## Number of events: e = 3
##
##                          RR           95%-CI     z p-value
## Common effect model  0.2830 [0.0318; 2.5161] -1.13  0.2575
## Random effects model 0.2867 [0.0322; 2.5524] -1.12  0.2627
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.02    1  0.8828
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.15.2 Forest plot

```r
forest(ir_embolisation_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Deng 2022	0	57	2	70	0.25	[0.01; 5.01]	60.2%	52.5%
Chen 2019	0	44	1	45	0.34	[0.01; 8.15]	39.8%	47.5%
Sur 2022	0	9	0	8			0.0%	0.0%
Tang 2023	0	86	0	87			0.0%	0.0%
Du 2019	0	62	0	60			0.0%	0.0%
Lai 2020	0	28	0	56			0.0%	0.0%
Zhu 2018	0	165	0	165			0.0%	0.0%
Zhang 2021	0	56	0	50			0.0%	0.0%
Zhang 2021	0	56	0	54			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Huang 2023	0	103	0	103			0.0%	0.0%
Wu 2022	0	76	0	82			0.0%	0.0%
Ding 2023	0	138	0	61			0.0%	0.0%
Zhai 2023	0	60	0	60			0.0%	0.0%
Zhai 2023	0	60	0	60			0.0%	0.0%
Qian 2022	0	81	0	81			0.0%	0.0%
Zhang 2022	0	30	0	30			0.0%	0.0%
AlSmadi 2019	0	43	0	60			0.0%	0.0%
Common effect model		**1165**		**1146**	**0.28**	**[0.03; 2.52]**	**100.0%**	**--**
Random effects model					**0.29**	**[0.03; 2.55]**	**--**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.88$

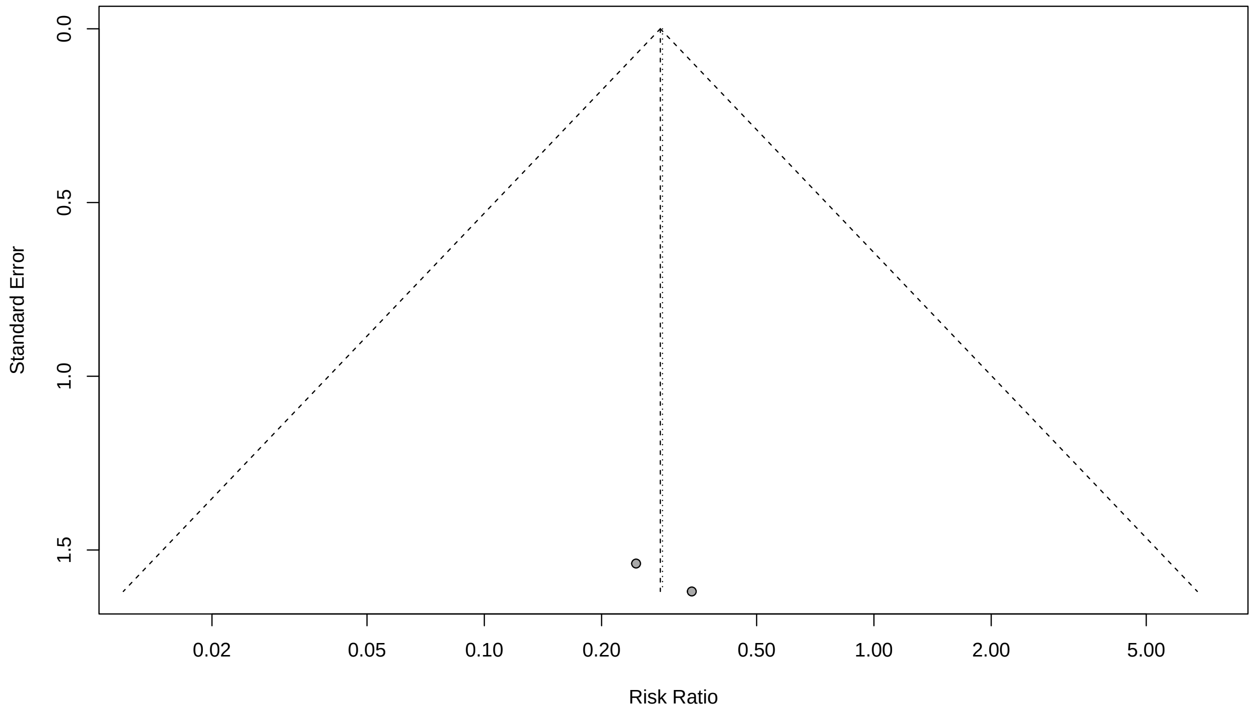


4.15.3 Trim and Fill

```
#trimfill(ir_embolisation_metabin)
#forest(trimfill(ir_embolisation_metabin),
#       sortvar = TE)
```

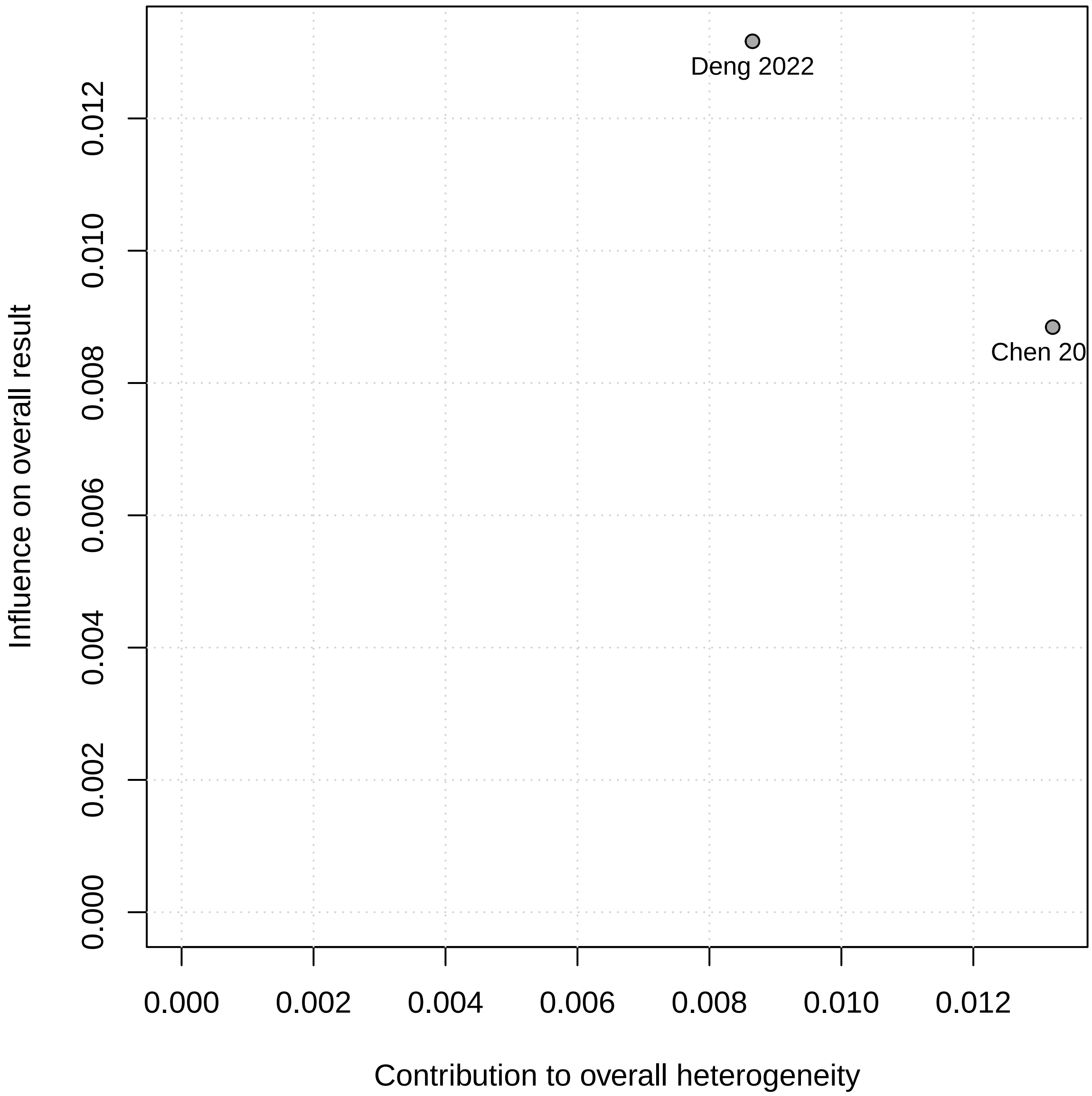
4.15.4 Funnel plot

```
funnel((ir_embolisation_metabin))
```



4.15.5 Baujat

```
baujat(ir_embolisation_metabin, pos = 1)
```



4.15.6 Leave one out

```
metainf(ir_embolisation_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Sur 2022            0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Tang 2023           0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Chen 2019           0.2448 [0.0120; 4.9992]  0.3605
## Omitting Du 2019             0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Lai 2020            0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Zhu 2018            0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Zhang 2021          0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Zhang 2021          0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Lechevallier 2003   0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Huang 2023          0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Wu 2022             0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Ding 2023           0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Zhai 2023           0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Zhai 2023           0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Qian 2022           0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Zhang 2022          0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
## Omitting Deng 2022           0.3407 [0.0143; 8.1456]  0.5062
## Omitting AlSmadi 2019        0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
##
## Pooled estimate              0.2830 [0.0318; 2.5161]  0.2575  0.0000  0.0000
##                                I^2
## Omitting Sur 2022             0.0%
## Omitting Tang 2023            0.0%
## Omitting Chen 2019
## Omitting Du 2019              0.0%
## Omitting Lai 2020             0.0%
## Omitting Zhu 2018             0.0%
## Omitting Zhang 2021           0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Huang 2023           0.0%
## Omitting Wu 2022              0.0%
## Omitting Ding 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Qian 2022            0.0%
## Omitting Zhang 2022           0.0%
## Omitting Deng 2022
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.16 Transfusion

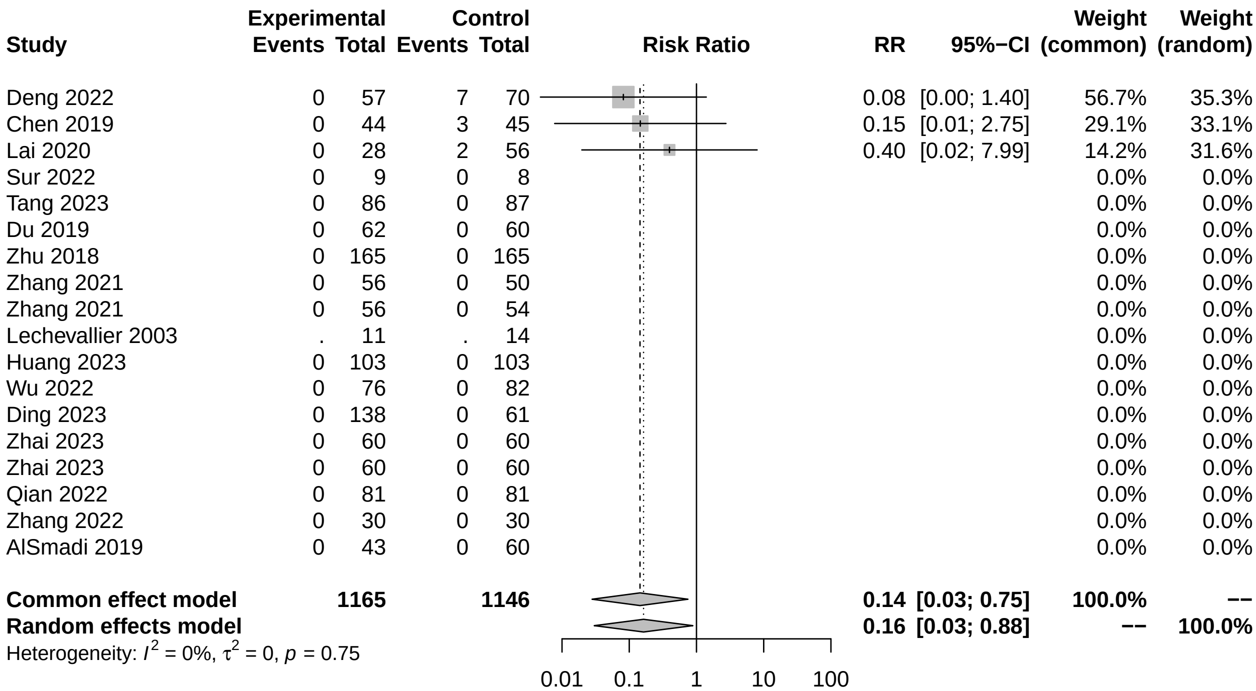
4.16.1 Meta-analysis

```
transfusion_metabin <- metabin(data = suction_data,
                           event.c = transfusion_n_control,
                         n.c = sample_size_control,
                         event.e = transfusion_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
transfusion_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 2311
## Number of events: e = 12
##
##                           RR           95%-CI     z p-value
## Common effect model  0.1445 [0.0280; 0.7467] -2.31  0.0210
## Random effects model 0.1632 [0.0302; 0.8826] -2.10  0.0353
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 22.9527]; tau = 0 [0.0000; 4.7909]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.57    2  0.7525
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.16.2 Forest plot

```r
forest(transfusion_metabin,
       sortvar = TE)
```



4.16.3 Trim and Fill

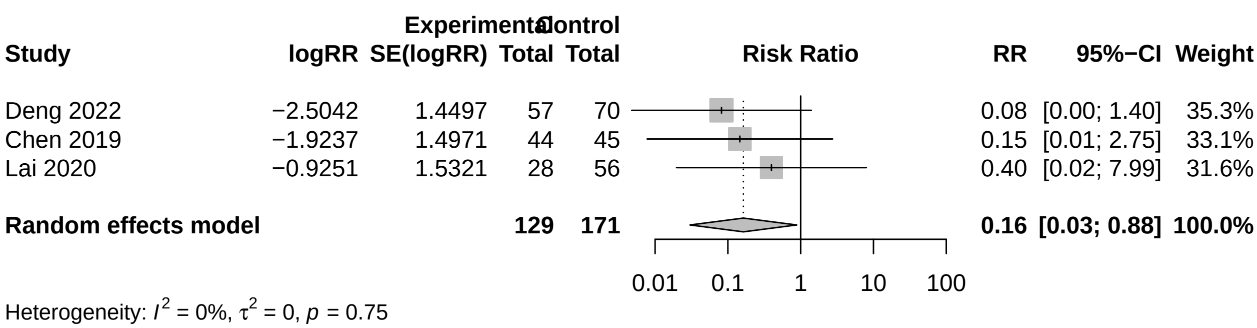
```r
trimfill(transfusion_metabin)
```

```
## Warning in trimfill.meta(transfusion_metabin): 15 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 300
## Number of events: e = 12
##
##                          RR           95%-CI     z p-value
## Random effects model 0.1632 [0.0302; 0.8826] -2.10  0.0353
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 22.9527]; tau = 0 [0.0000; 4.7909]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.57    2  0.7525
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(transfusion_metabin),
       sortvar = TE)
```

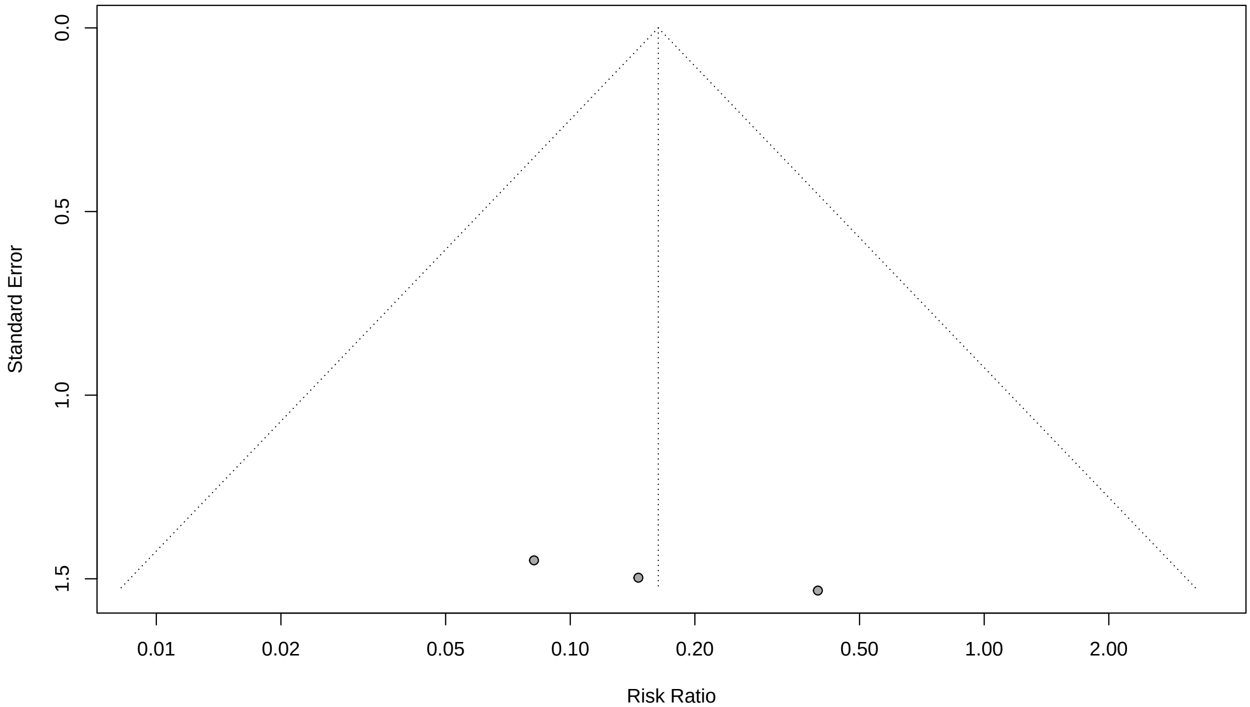
```
## Warning in trimfill.meta(transfusion_metabin): 15 observation(s) dropped due to
## missing values
```



4.16.4 Funnel plot

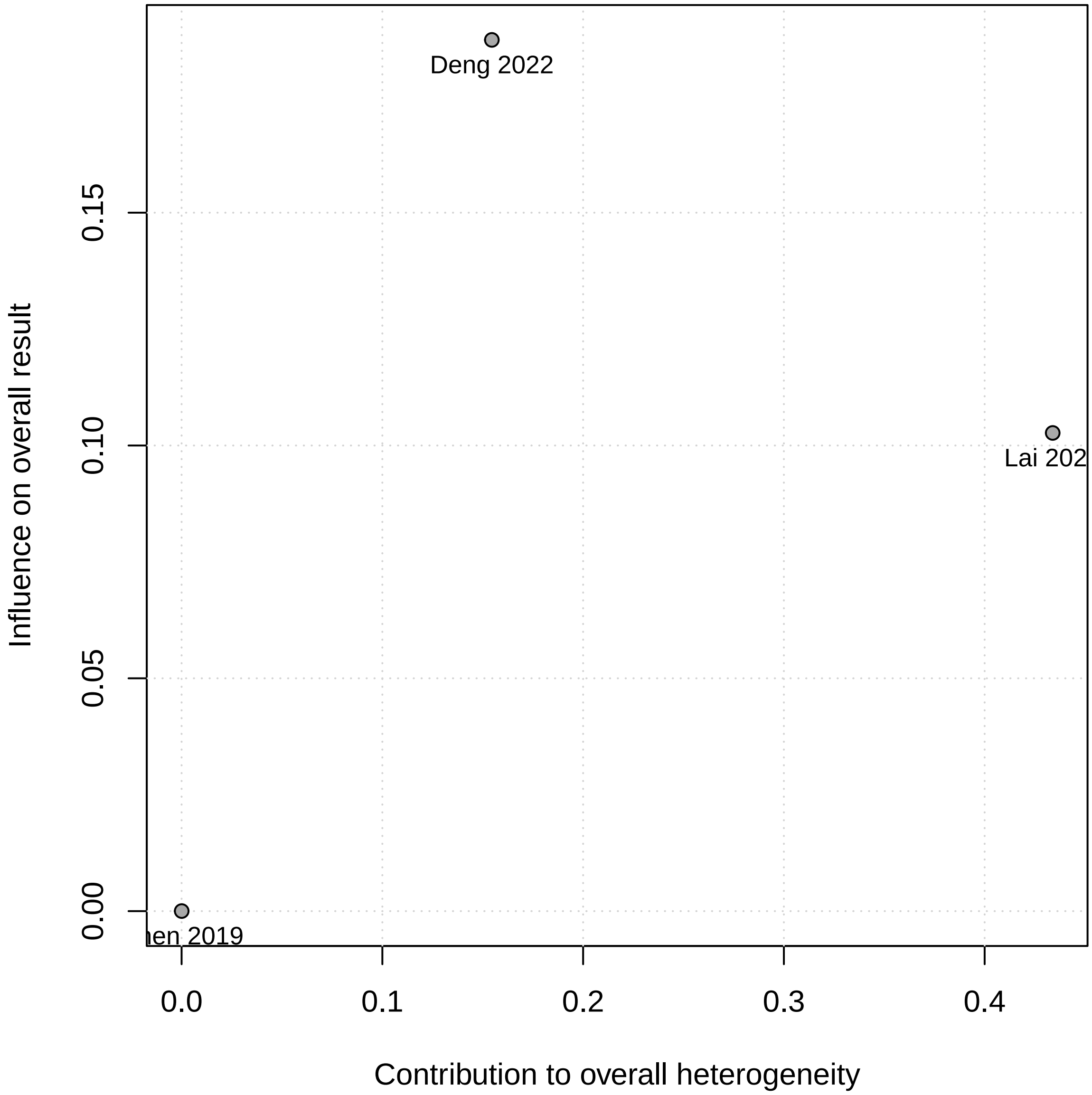
```r
funnel(trimfill(transfusion_metabin))
```

```
## Warning in trimfill.meta(transfusion_metabin): 15 observation(s) dropped due to
## missing values
```



4.16.5 Baujat

```
baujat(transfusion_metabin, pos = 1)
```



4.16.6 Leave one out

```r
metainf(transfusion_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022             0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Tang 2023            0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Chen 2019            0.1439 [0.0199; 1.0412]  0.0549  0.0000  0.0000
## Omitting Du 2019              0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Lai 2020             0.1035 [0.0134; 0.7992]  0.0296  0.0000  0.0000
## Omitting Zhu 2018             0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Zhang 2021           0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Zhang 2021           0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Lechevallier 2003    0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Huang 2023           0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Wu 2022              0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Ding 2023            0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Zhai 2023            0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Zhai 2023            0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Qian 2022            0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Zhang 2022           0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
## Omitting Deng 2022            0.2270 [0.0294; 1.7540]  0.1552  0.0000  0.0000
## Omitting AlSmadi 2019         0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
##
## Pooled estimate               0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Chen 2019             0.0%
## Omitting Du 2019               0.0%
## Omitting Lai 2020              0.0%
## Omitting Zhu 2018              0.0%
## Omitting Zhang 2021            0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Huang 2023            0.0%
## Omitting Wu 2022               0.0%
## Omitting Ding 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Qian 2022             0.0%
## Omitting Zhang 2022            0.0%
## Omitting Deng 2022             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.17 Clavien I

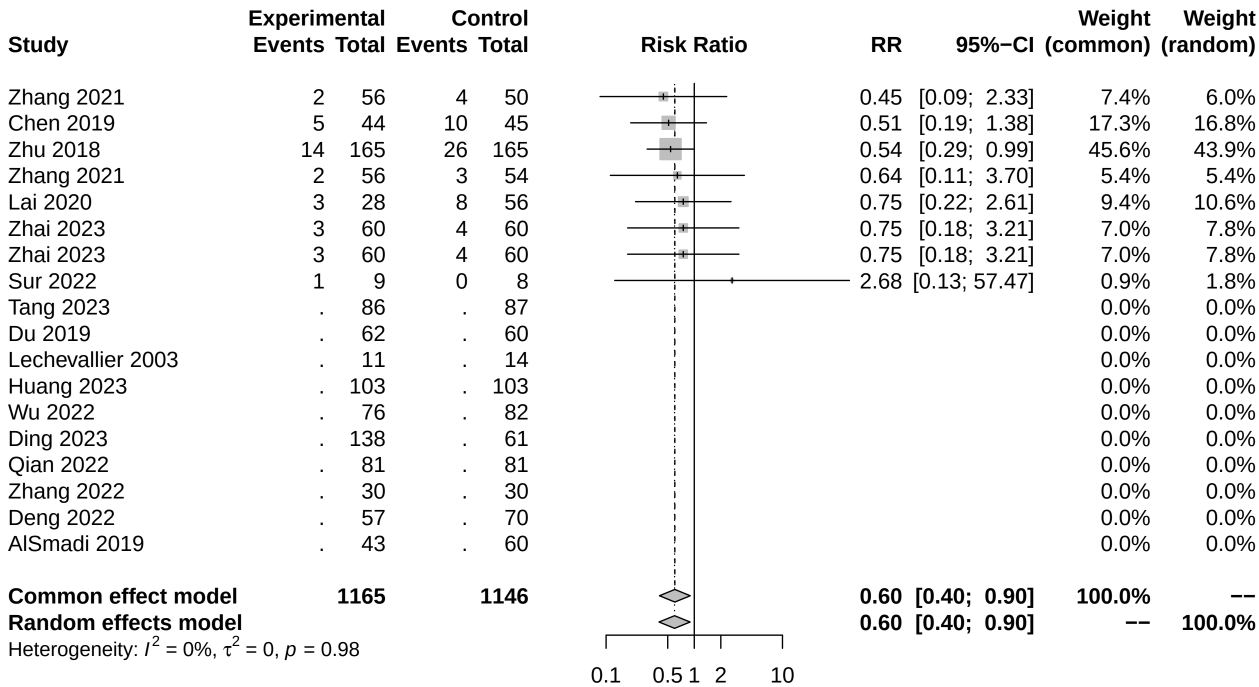
4.17.1 Meta-analysis

```r
clav_i_metabin <- metabin(data = suction_data,
                          event.c = clavien_i_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_i_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_i_metabin
```

```
## Number of studies: k = 8
## Number of observations: o = 2311
## Number of events: e = 92
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6019 [0.4026; 0.9000] -2.47  0.0134
## Random effects model 0.5978 [0.3984; 0.8970] -2.48  0.0130
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0% [0.0%; 67.6%]; H = 1.00 [1.00; 1.76]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.57    7  0.9798
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.17.2 Forest plot

```r
forest(clav_i_metabin,
       sortvar = TE)
```



4.17.3 Trim and Fill

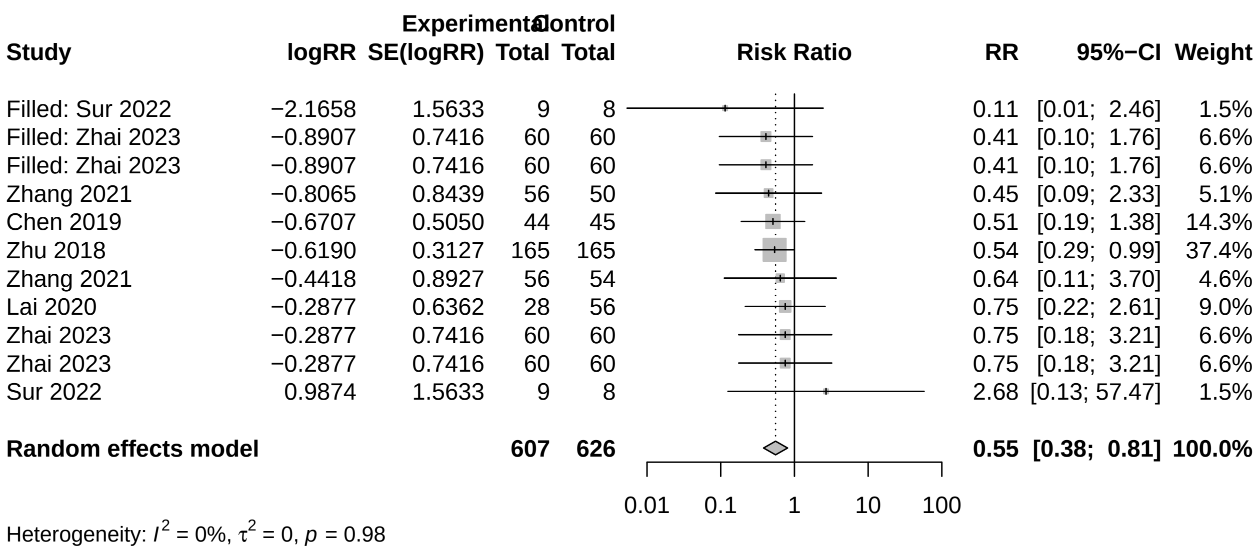
```r
trimfill(clav_i_metabin)
```

```
## Warning in trimfill.meta(clav_i_metabin): 10 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 11 (with 3 added studies)
## Number of observations: o = 1233
## Number of events: e = 107
##
##                          RR           95%-CI     z p-value
## Random effects model 0.5548 [0.3814; 0.8069] -3.08  0.0021
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0% [0.0%; 60.2%]; H = 1.00 [1.00; 1.59]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.05   10  0.9803
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(clav_i_metabin),
       sortvar = TE)
```

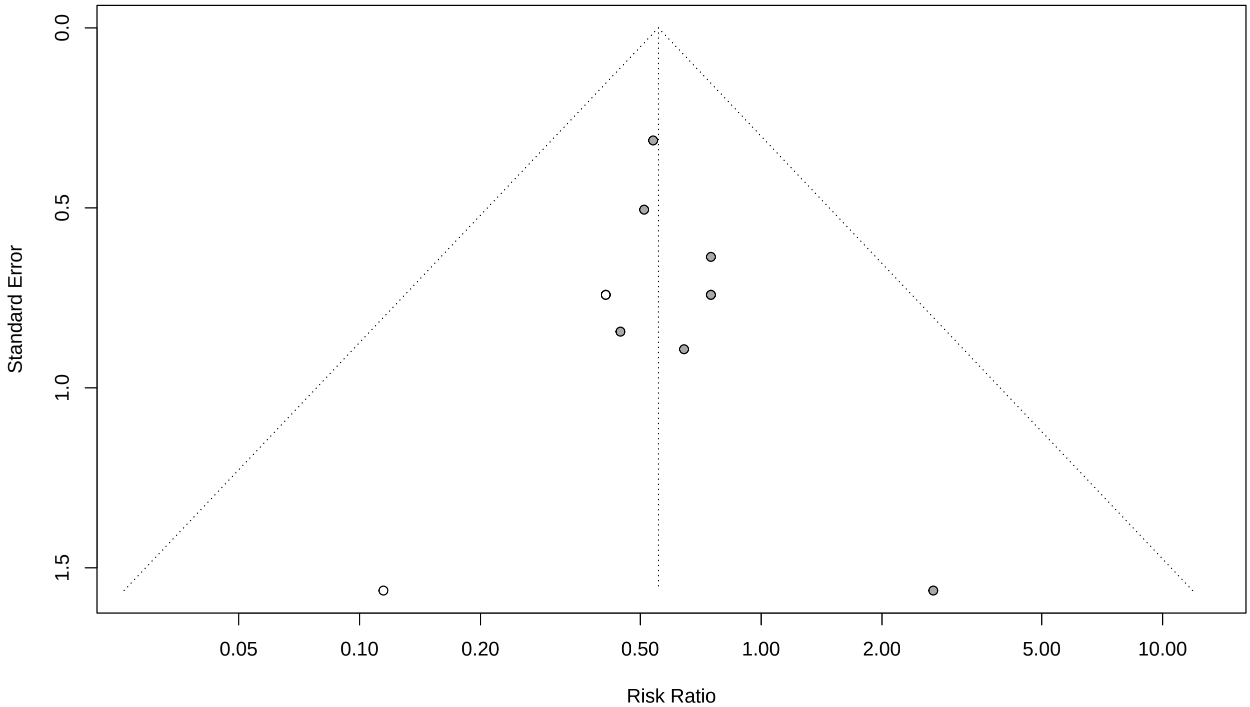
```
## Warning in trimfill.meta(clav_i_metabin): 10 observation(s) dropped due to
## missing values
```



4.17.4 Funnel plot

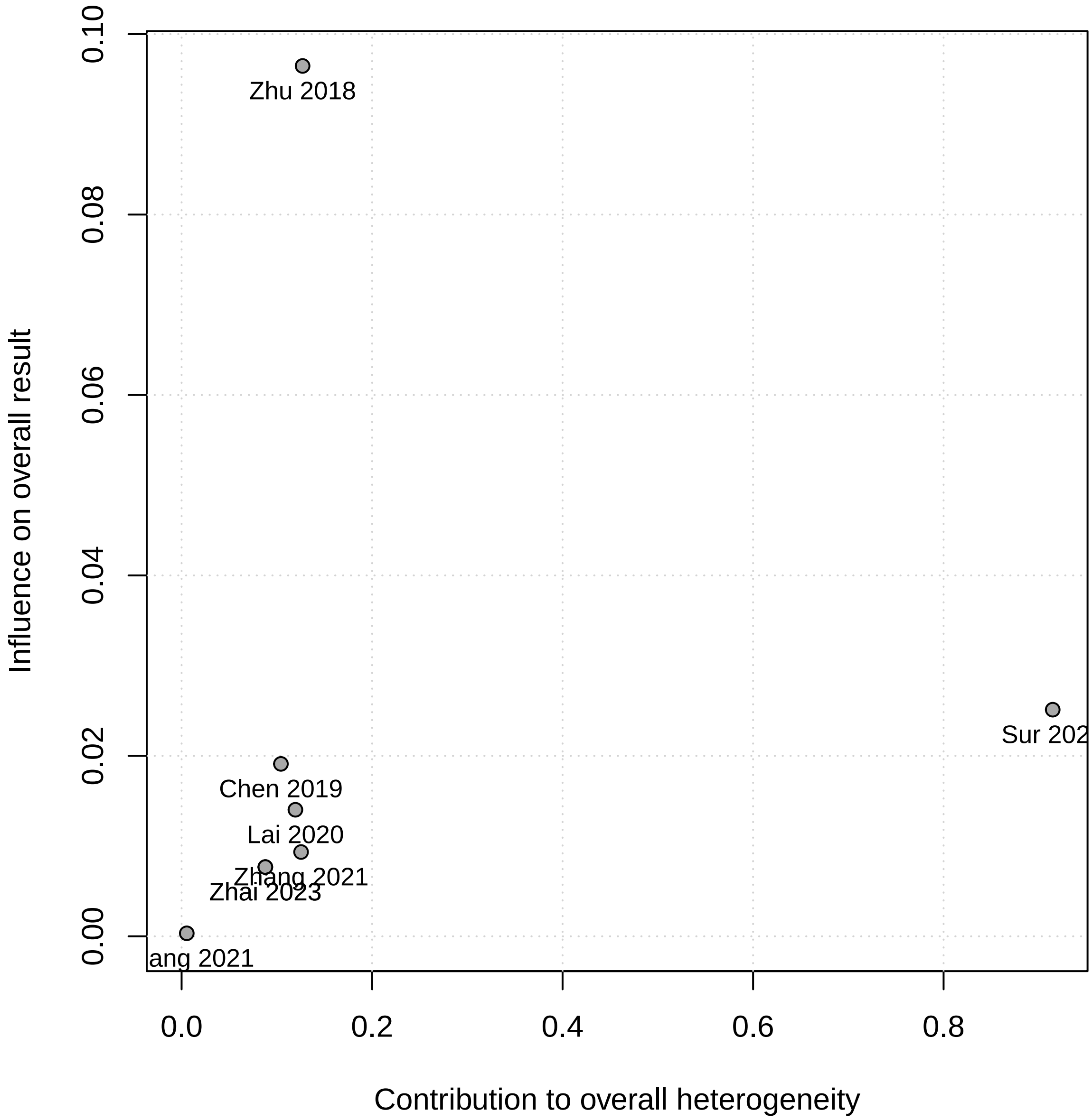
```r
funnel(trimfill(clav_i_metabin))
```

```
## Warning in trimfill.meta(clav_i_metabin): 10 observation(s) dropped due to
## missing values
```



4.17.5 Baujat

```r
baujat(clav_i_metabin, pos = 1)
```



4.17.6 Leave one out

```r
metainf(clav_i_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022             0.5824 [0.3872; 0.8760]  0.0094  0.0000  0.0000
## Omitting Tang 2023            0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Chen 2019            0.6209 [0.3997; 0.9647]  0.0340  0.0000  0.0000
## Omitting Du 2019              0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Lai 2020             0.5867 [0.3834; 0.8977]  0.0140  0.0000  0.0000
## Omitting Zhu 2018             0.6551 [0.3839; 1.1179]  0.1208  0.0000  0.0000
## Omitting Zhang 2021           0.6144 [0.4057; 0.9304]  0.0214  0.0000  0.0000
## Omitting Zhang 2021           0.5996 [0.3966; 0.9065]  0.0153  0.0000  0.0000
## Omitting Lechevallier 2003    0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Huang 2023           0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Wu 2022              0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Ding 2023            0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Zhai 2023            0.5908 [0.3886; 0.8981]  0.0138  0.0000  0.0000
## Omitting Zhai 2023            0.5908 [0.3886; 0.8981]  0.0138  0.0000  0.0000
## Omitting Qian 2022            0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Zhang 2022           0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting Deng 2022            0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
## Omitting AlSmadi 2019         0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
##
## Pooled estimate               0.6019 [0.4026; 0.9000]  0.0134  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Chen 2019             0.0%
## Omitting Du 2019               0.0%
## Omitting Lai 2020              0.0%
## Omitting Zhu 2018              0.0%
## Omitting Zhang 2021            0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Huang 2023            0.0%
## Omitting Wu 2022               0.0%
## Omitting Ding 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Qian 2022             0.0%
## Omitting Zhang 2022            0.0%
## Omitting Deng 2022             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.18 Clavien II

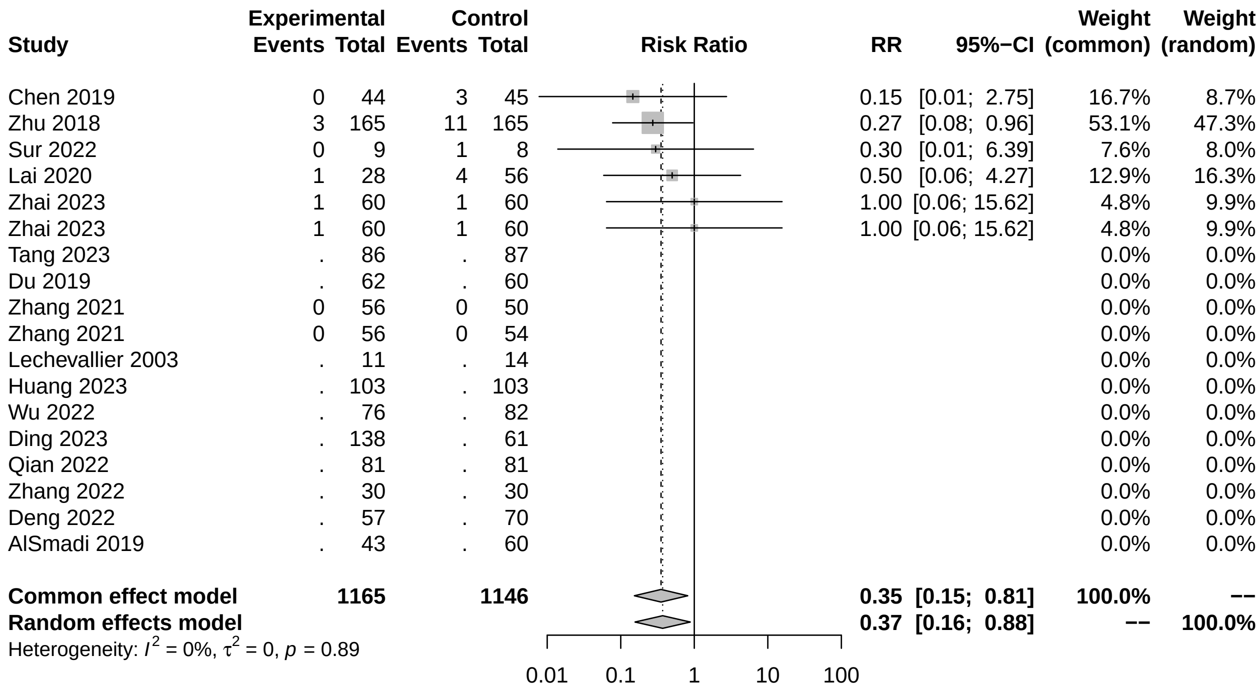
4.18.1 Meta-analysis

```r
clav_ii_metabin <- metabin(data = suction_data,
                           event.c = clavien_ii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_ii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_ii_metabin
```

```
## Number of studies: k = 6
## Number of observations: o = 2311
## Number of events: e = 27
##
##                           RR           95%-CI     z p-value
## Common effect model  0.3531 [0.1531; 0.8147] -2.44  0.0147
## Random effects model 0.3714 [0.1564; 0.8821] -2.24  0.0248
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 1.6543]; tau = 0 [0.0000; 1.2862]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.71    5  0.8875
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.18.2 Forest plot

```r
forest(clav_ii_metabin,
       sortvar = TE)
```



4.18.3 Trim and Fill

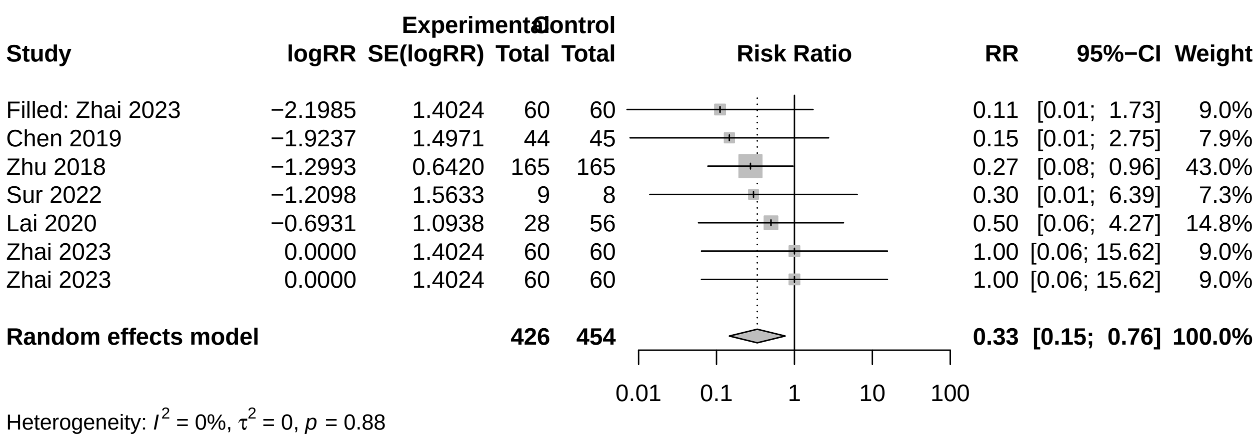
```r
trimfill(clav_ii_metabin)
```

```
## Warning in trimfill.meta(clav_ii_metabin): 12 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 7 (with 1 added studies)
## Number of observations: o = 880
## Number of events: e = 29
##
##                          RR           95%-CI     z p-value
## Random effects model 0.3331 [0.1460; 0.7602] -2.61  0.0090
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 1.6913]; tau = 0 [0.0000; 1.3005]
##  I^2 = 0.0% [0.0%; 70.8%]; H = 1.00 [1.00; 1.85]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.39    6  0.8809
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(clav_ii_metabin),
       sortvar = TE)
```

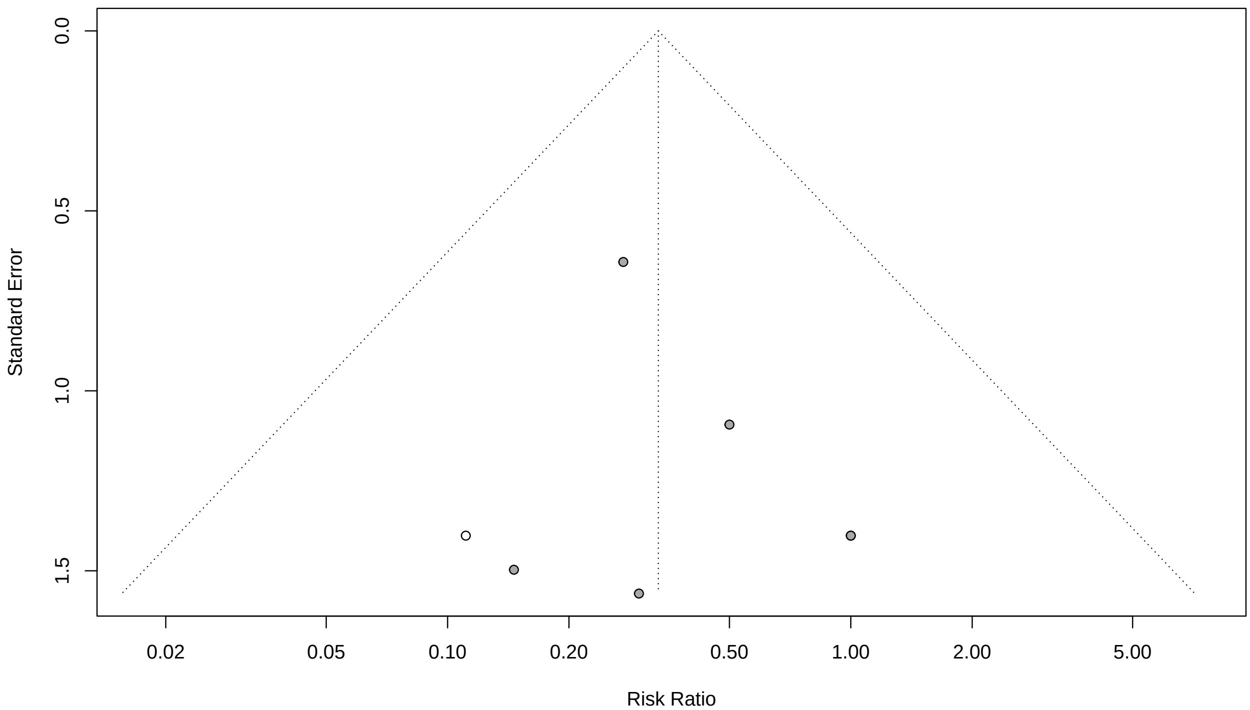
```
## Warning in trimfill.meta(clav_ii_metabin): 12 observation(s) dropped due to
## missing values
```



4.18.4 Funnel plot

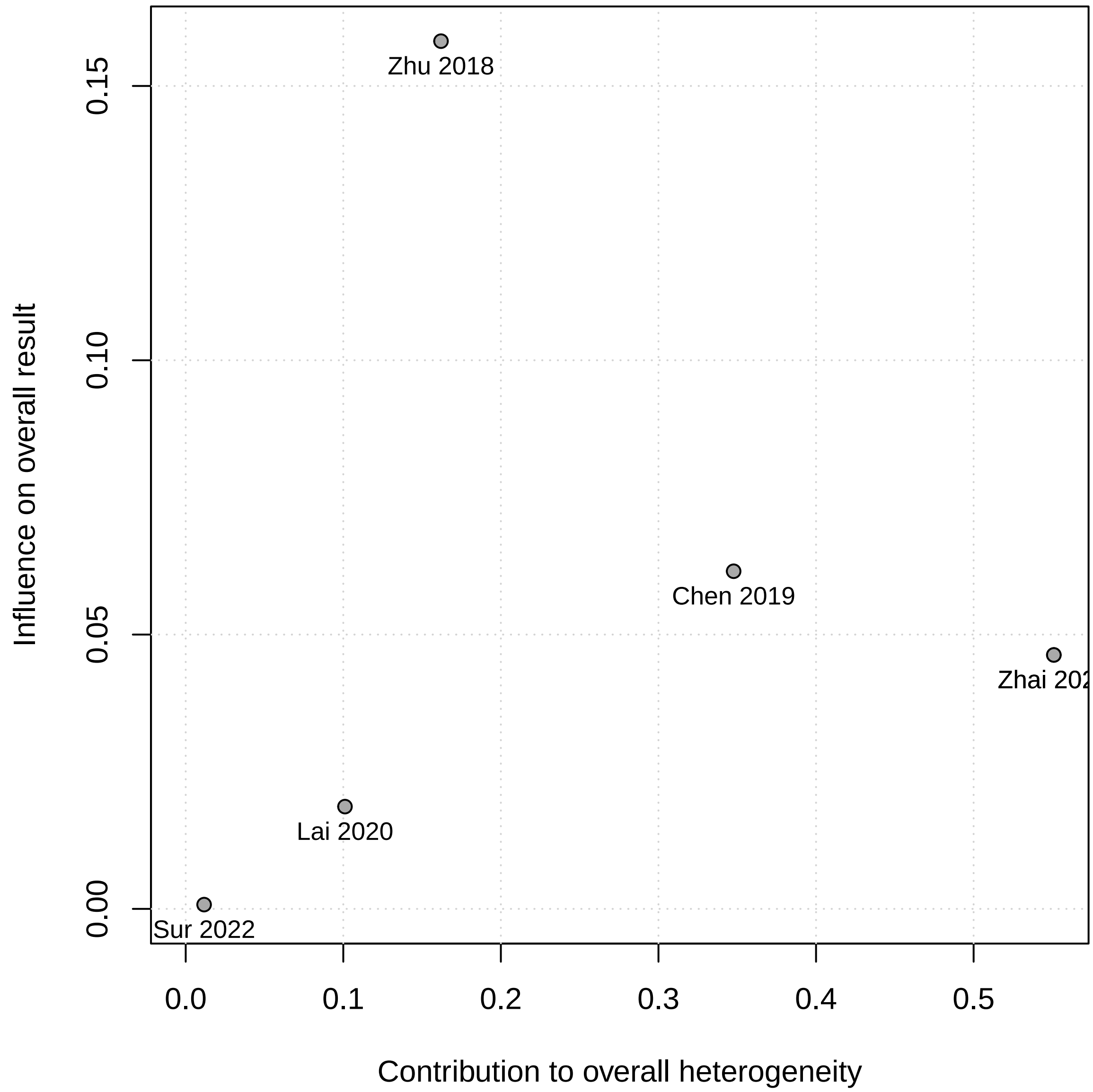
```
funnel(trimfill(clav_ii_metabin))
```

```
## Warning in trimfill.meta(clav_ii_metabin): 12 observation(s) dropped due to
## missing values
```



4.18.5 Baujat

```
baujat(clav_ii_metabin, pos = 1)
```



4.18.6 Leave one out

```r
metainf(clav_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022             0.3575 [0.1500; 0.8524]  0.0203  0.0000 0.0000
## Omitting Tang 2023            0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Chen 2019            0.3947 [0.1638; 0.9509]  0.0382  0.0000 0.0000
## Omitting Du 2019              0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Lai 2020             0.3314 [0.1333; 0.8240]  0.0175  0.0000 0.0000
## Omitting Zhu 2018             0.4443 [0.1433; 1.3770]  0.1598  0.0000 0.0000
## Omitting Zhang 2021           0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Zhang 2021           0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Lechevallier 2003    0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Huang 2023           0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Wu 2022              0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Ding 2023            0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Zhai 2023            0.3203 [0.1317; 0.7790]  0.0121  0.0000 0.0000
## Omitting Zhai 2023            0.3203 [0.1317; 0.7790]  0.0121  0.0000 0.0000
## Omitting Qian 2022            0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Zhang 2022           0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting Deng 2022            0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
## Omitting AlSmadi 2019         0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
##
## Pooled estimate               0.3531 [0.1531; 0.8147]  0.0147  0.0000 0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Chen 2019             0.0%
## Omitting Du 2019               0.0%
## Omitting Lai 2020              0.0%
## Omitting Zhu 2018              0.0%
## Omitting Zhang 2021            0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Huang 2023            0.0%
## Omitting Wu 2022               0.0%
## Omitting Ding 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Qian 2022             0.0%
## Omitting Zhang 2022            0.0%
## Omitting Deng 2022             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.19 Clavien III

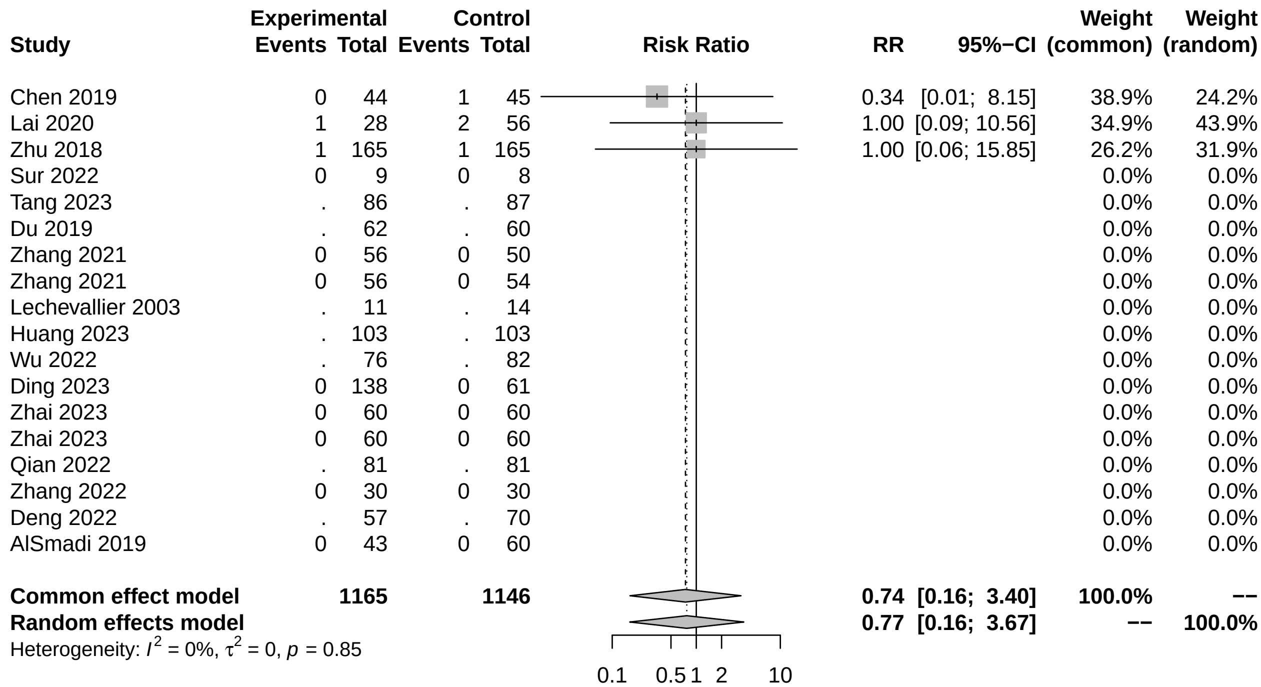
4.19.1 Meta-analysis

```
clav_iii_metabin <- metabin(data = suction_data,
                         event.c = clavien_iii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_iii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 2311
## Number of events: e = 6
##
##                           RR           95%-CI     z p-value
## Common effect model  0.7438 [0.1625; 3.4043] -0.38  0.7029
## Random effects model 0.7707 [0.1617; 3.6724] -0.33  0.7437
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 12.9354]; tau = 0 [0.0000; 3.5966]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.33    2  0.8458
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.19.2 Forest plot

```r
forest(clav_iii_metabin,
       sortvar = TE)
```



4.19.3 Trim and Fill

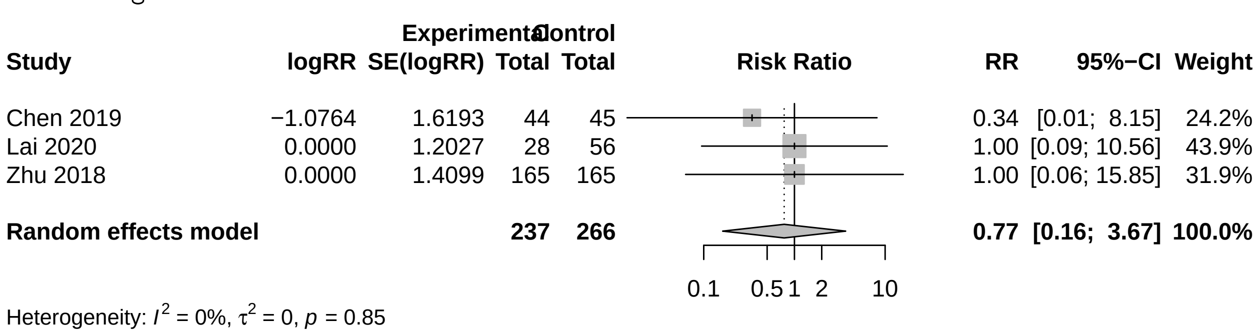
```r
trimfill(clav_iii_metabin)
```

```
## Warning in trimfill.meta(clav_iii_metabin): 15 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 503
## Number of events: e = 6
##
##                           RR           95%-CI     z p-value
## Random effects model 0.7707 [0.1617; 3.6724] -0.33  0.7437
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 12.9354]; tau = 0 [0.0000; 3.5966]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.33    2  0.8458
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(clav_iii_metabin),
       sortvar = TE)
```

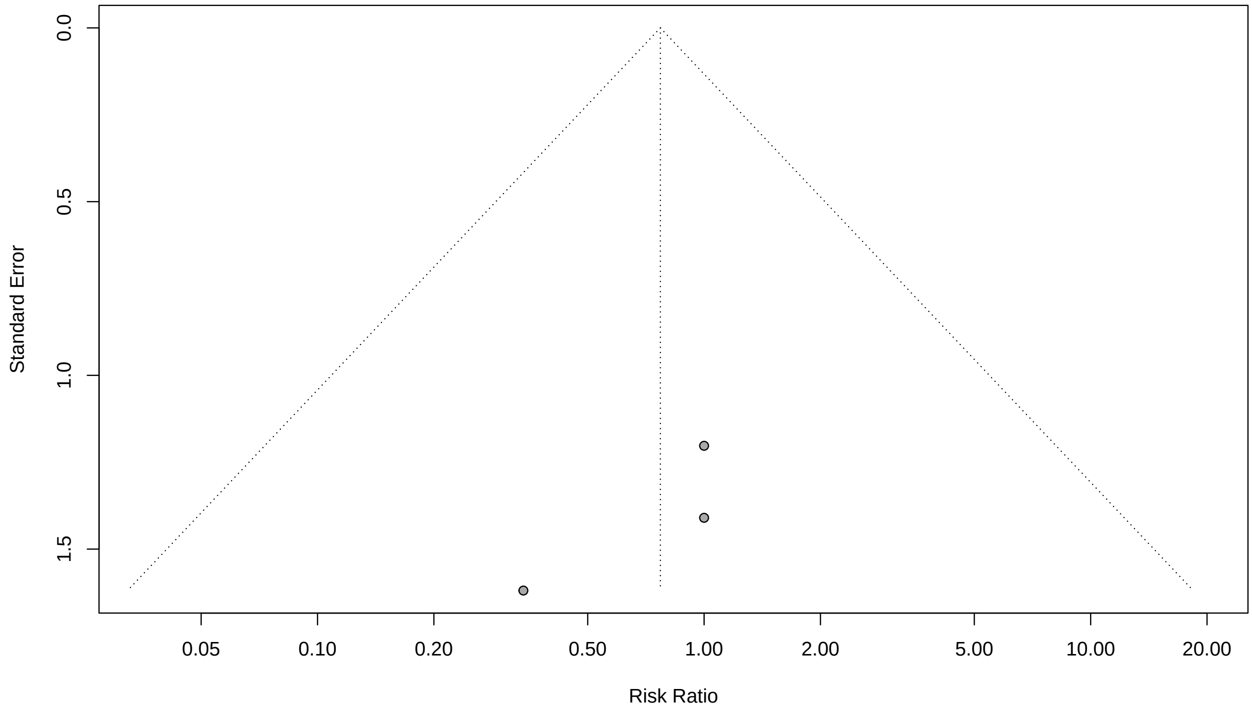
```
## Warning in trimfill.meta(clav_iii_metabin): 15 observation(s) dropped due to
## missing values
```



4.19.4 Funnel plot

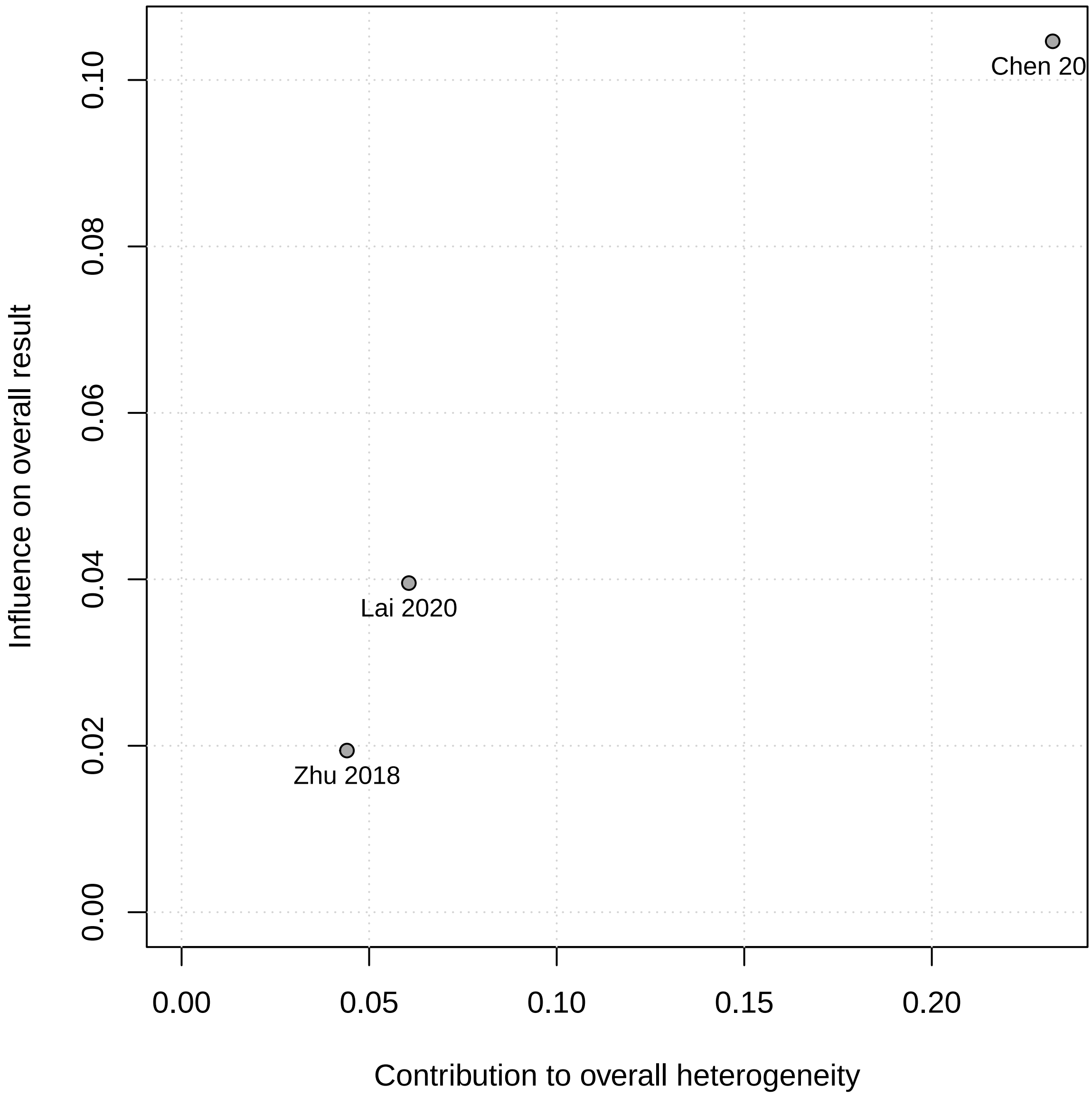
```
funnel(trimfill(clav_iii_metabin))
```

```
## Warning in trimfill.meta(clav_iii_metabin): 15 observation(s) dropped due to
## missing values
```



4.19.5 Baujat

```
baujat(clav_iii_metabin, pos = 1)
```



4.19.6 Leave one out

```r
metainf(clav_iii_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Sur 2022            0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Tang 2023           0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Chen 2019           1.0000 [0.1664; 6.0109]  1.0000  0.0000  0.0000
## Omitting Du 2019             0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Lai 2020            0.6062 [0.0808; 4.5502]  0.6265  0.0000  0.0000
## Omitting Zhu 2018            0.6528 [0.1042; 4.0882]  0.6487  0.0000  0.0000
## Omitting Zhang 2021          0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Zhang 2021          0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Lechevallier 2003   0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Huang 2023          0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Wu 2022             0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Ding 2023           0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Zhai 2023           0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Zhai 2023           0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Qian 2022           0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Zhang 2022          0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting Deng 2022           0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
## Omitting AlSmadi 2019        0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
##
## Pooled estimate              0.7438 [0.1625; 3.4043]  0.7029  0.0000  0.0000
##                                I^2
## Omitting Sur 2022             0.0%
## Omitting Tang 2023            0.0%
## Omitting Chen 2019            0.0%
## Omitting Du 2019              0.0%
## Omitting Lai 2020             0.0%
## Omitting Zhu 2018             0.0%
## Omitting Zhang 2021           0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Huang 2023           0.0%
## Omitting Wu 2022              0.0%
## Omitting Ding 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Qian 2022            0.0%
## Omitting Zhang 2022           0.0%
## Omitting Deng 2022            0.0%
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.20 Clavien IV

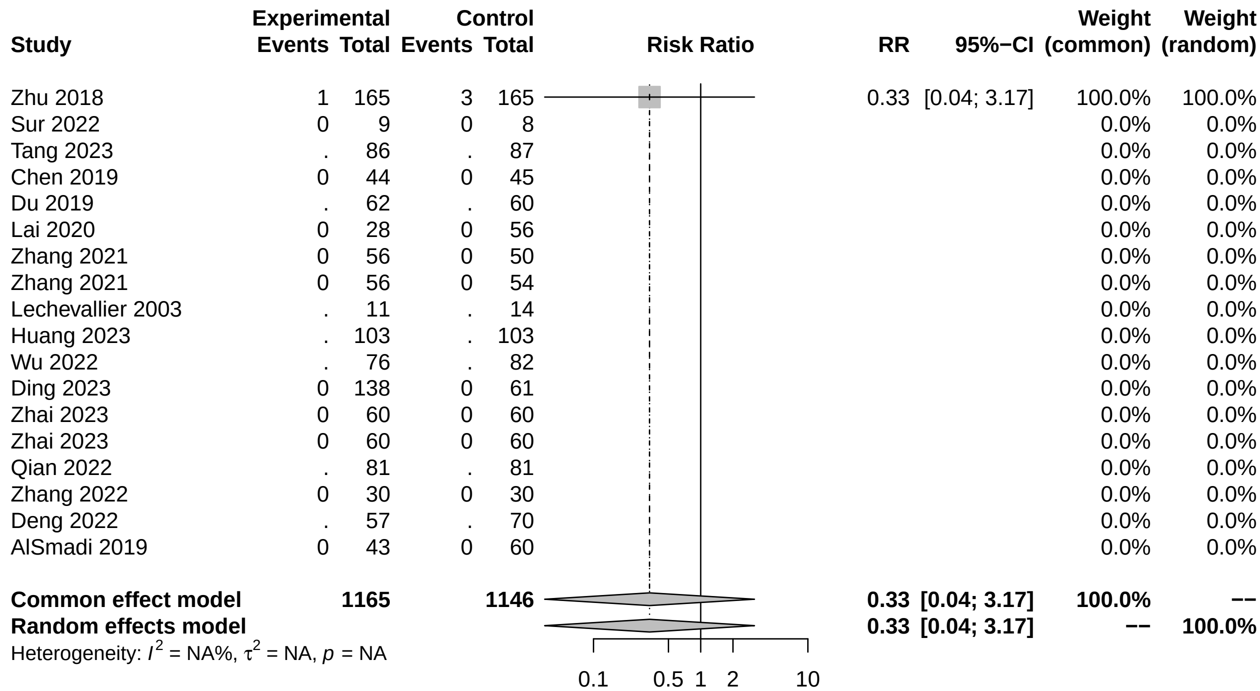
4.20.1 Meta-analysis

```
clav_iv_metabin <- metabin(data = suction_data,
                          event.c = clavien_iv_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_iv_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_iv_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 2311
## Number of events: e = 4
##
##                          RR           95%-CI     z p-value
## Common effect model  0.3333 [0.0350; 3.1716] -0.96  0.3392
## Random effects model 0.3333 [0.0350; 3.1716] -0.96  0.3392
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.20.2 Forest plot

```r
forest(clav_iv_metabin,
       sortvar = TE)
```

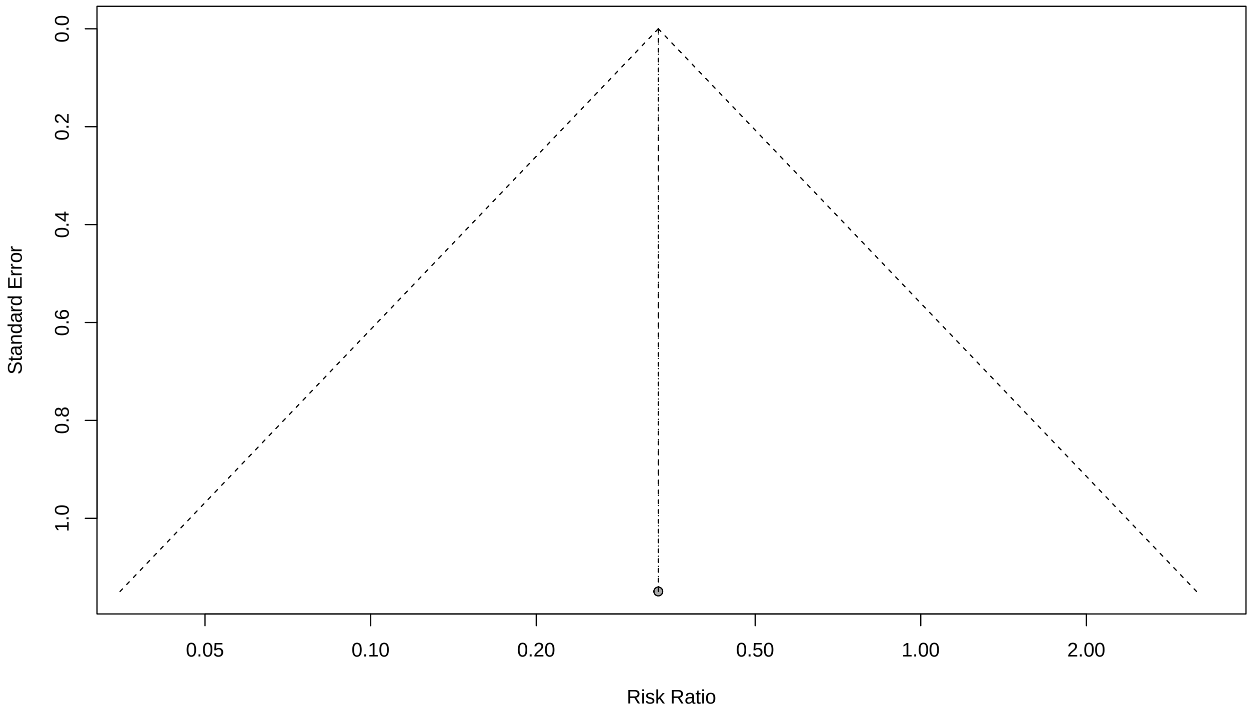


4.20.3 Trim and Fill

```
#trimfill(clav_iv_metabin)
#forest(trimfill(clav_iv_metabin),
#       sortvar = TE)
```

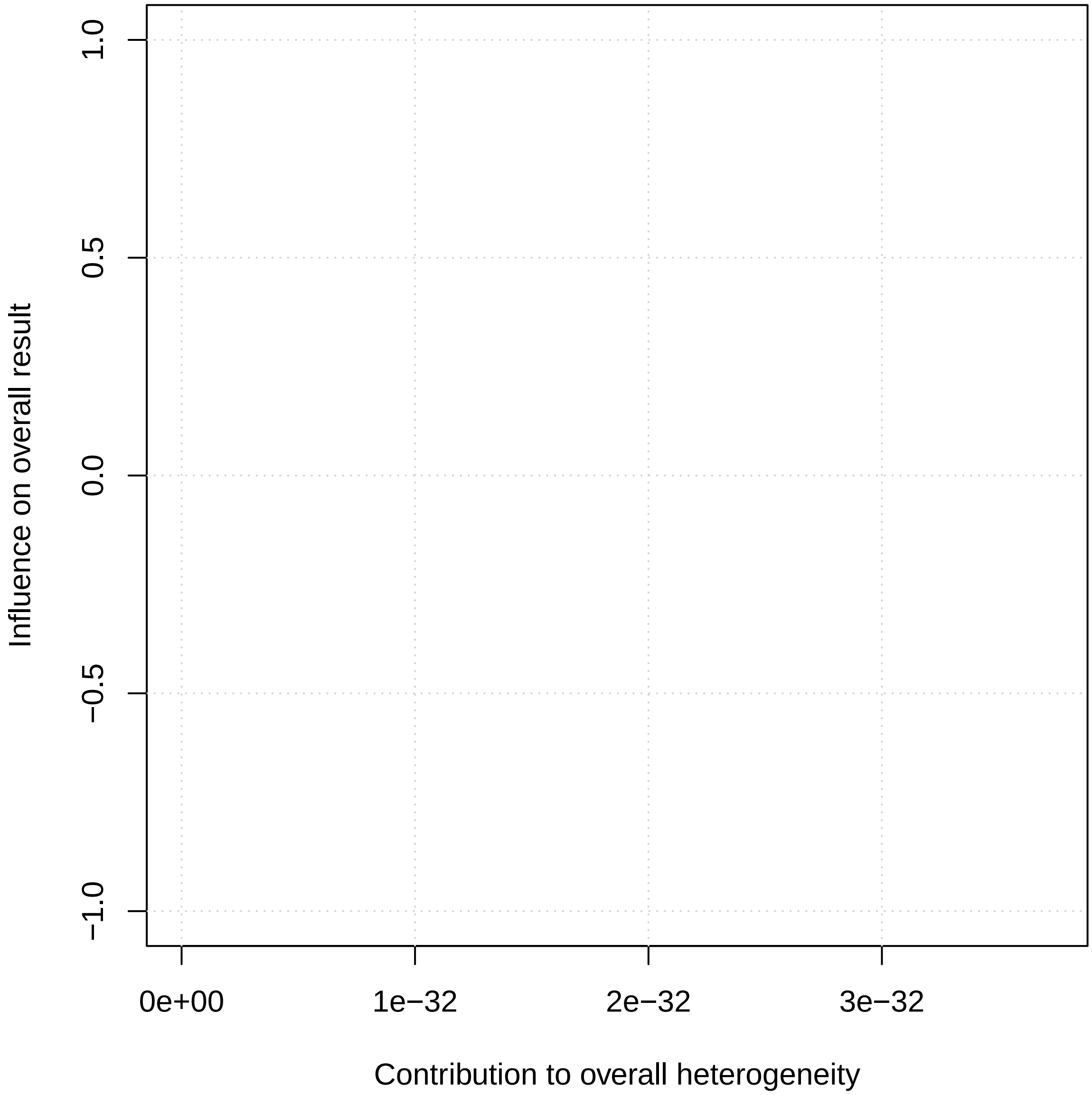
4.20.4 Funnel plot

```
funnel((clav_iv_metabin))
```



4.20.5 Baujat

```r
baujat(clav_iv_metabin, pos = 1)
```



4.20.6 Leave one out

```
metainf(clav_iv_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022            0.3333 [0.0350; 3.1716]  0.3392
## Omitting Tang 2023           0.3333 [0.0350; 3.1716]  0.3392
## Omitting Chen 2019           0.3333 [0.0350; 3.1716]  0.3392
## Omitting Du 2019             0.3333 [0.0350; 3.1716]  0.3392
## Omitting Lai 2020            0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhu 2018
## Omitting Zhang 2021          0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhang 2021          0.3333 [0.0350; 3.1716]  0.3392
## Omitting Lechevallier 2003   0.3333 [0.0350; 3.1716]  0.3392
## Omitting Huang 2023          0.3333 [0.0350; 3.1716]  0.3392
## Omitting Wu 2022             0.3333 [0.0350; 3.1716]  0.3392
## Omitting Ding 2023           0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhai 2023           0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhai 2023           0.3333 [0.0350; 3.1716]  0.3392
## Omitting Qian 2022           0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhang 2022          0.3333 [0.0350; 3.1716]  0.3392
## Omitting Deng 2022           0.3333 [0.0350; 3.1716]  0.3392
## Omitting AlSmadi 2019        0.3333 [0.0350; 3.1716]  0.3392
##
## Pooled estimate              0.3333 [0.0350; 3.1716]  0.3392
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.21 Clavien V

4.21.1 Meta-analysis

```
clav_v_metabin <- metabin(data = suction_data,
                           event.c = clavien_v_n_control,
                         n.c = sample_size_control,
                         event.e = clavien_v_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
clav_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 2311
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA         --      --
## Random effects model NA         --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

4.21.2 Forest plot

```
#forest(clav_v_metabin,
#       sortvar = TE)
```

4.21.3 Trim and Fill

```
#trimfill(clav_v_metabin)
#forest(trimfill(clav_v_metabin),
#       sortvar = TE)
```

4.21.4 Funnel plot

```
#funnel(trimfill(clav_v_metabin))
```

4.21.5 Baujat

```
#baujat(clav_v_metabin, pos = 1)
```

4.21.6 Leave one out

```
#metainf(clav_v_metabin)
```

4.22 Clavien I-II

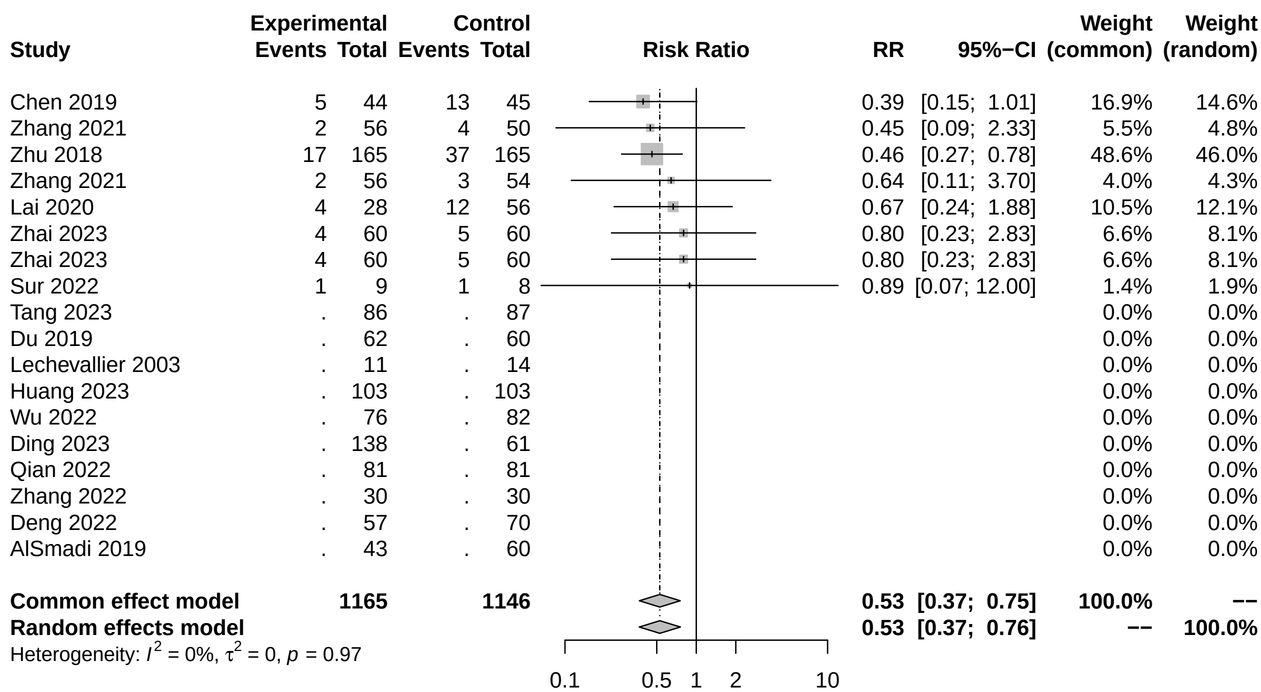
4.22.1 Meta-analysis

```
clav_i_ii_metabin <- metabin(data = suction_data,
                              event.c = clav_i_ii_n_control,
                            n.c = sample_size_control,
                            event.e = clav_i_ii_n_suction,
                            n.e = sample_size_suction,
                            studlab = author_year)
clav_i_ii_metabin
```

```
## Number of studies: k = 8
## Number of observations: o = 2311
## Number of events: e = 119
##
##                           RR           95%-CI     z p-value
## Common effect model  0.5274 [0.3686; 0.7545] -3.50  0.0005
## Random effects model 0.5276 [0.3677; 0.7570] -3.47  0.0005
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.0306]; tau = 0 [0.0000; 0.1749]
##  I^2 = 0.0% [0.0%; 67.6%]; H = 1.00 [1.00; 1.76]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.90    7  0.9651
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

4.22.2 Forest plot

```r
forest(clav_i_ii_metabin,
       sortvar = TE)
```



4.22.3 Trim and Fill

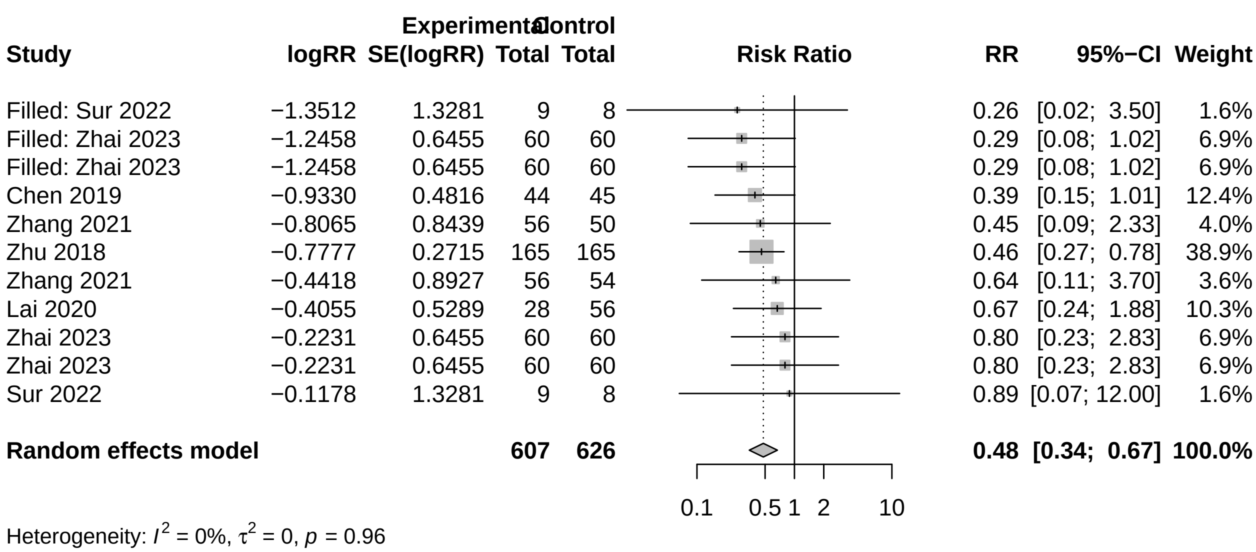
```r
trimfill(clav_i_ii_metabin)
```

```
## Warning in trimfill.meta(clav_i_ii_metabin): 10 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 11 (with 3 added studies)
## Number of observations: o = 1233
## Number of events: e = 139
##
##                          RR           95%-CI     z  p-value
## Random effects model 0.4798 [0.3442; 0.6687] -4.34 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.0505]; tau = 0 [0.0000; 0.2246]
##  I^2 = 0.0% [0.0%; 60.2%]; H = 1.00 [1.00; 1.59]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.64   10  0.9622
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(clav_i_ii_metabin),
       sortvar = TE)
```

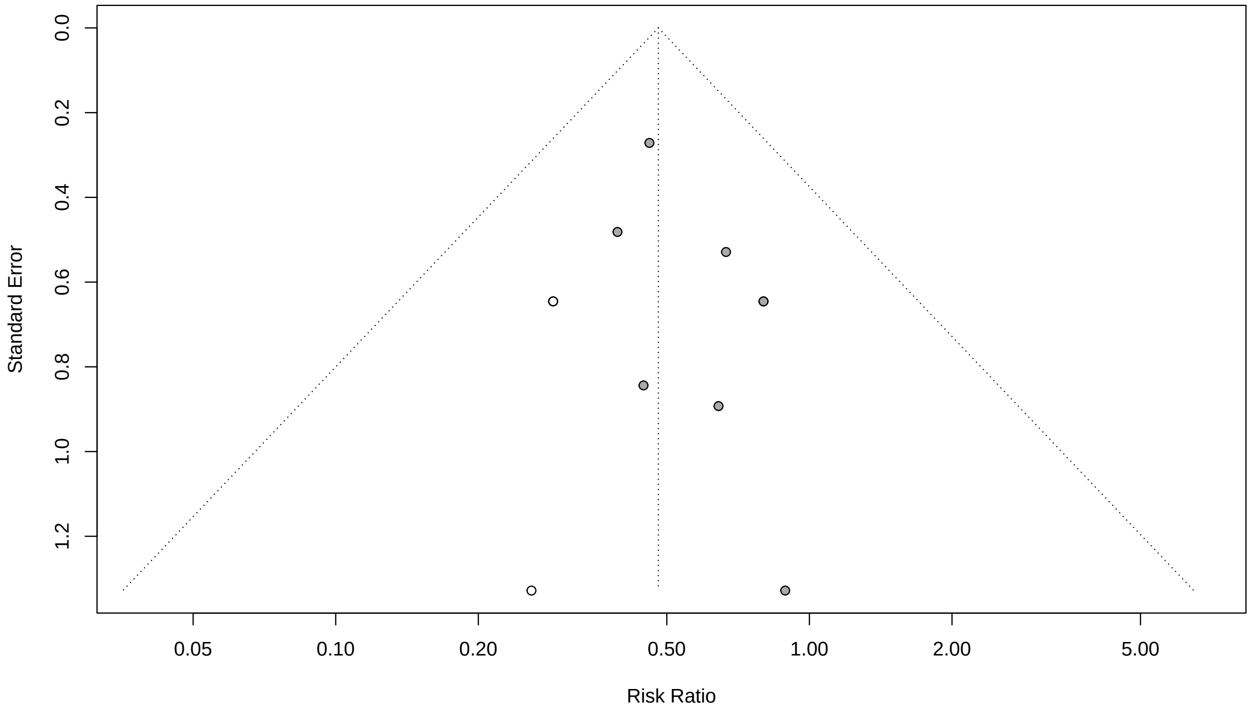
```
## Warning in trimfill.meta(clav_i_ii_metabin): 10 observation(s) dropped due to
## missing values
```



4.22.4 Funnel plot

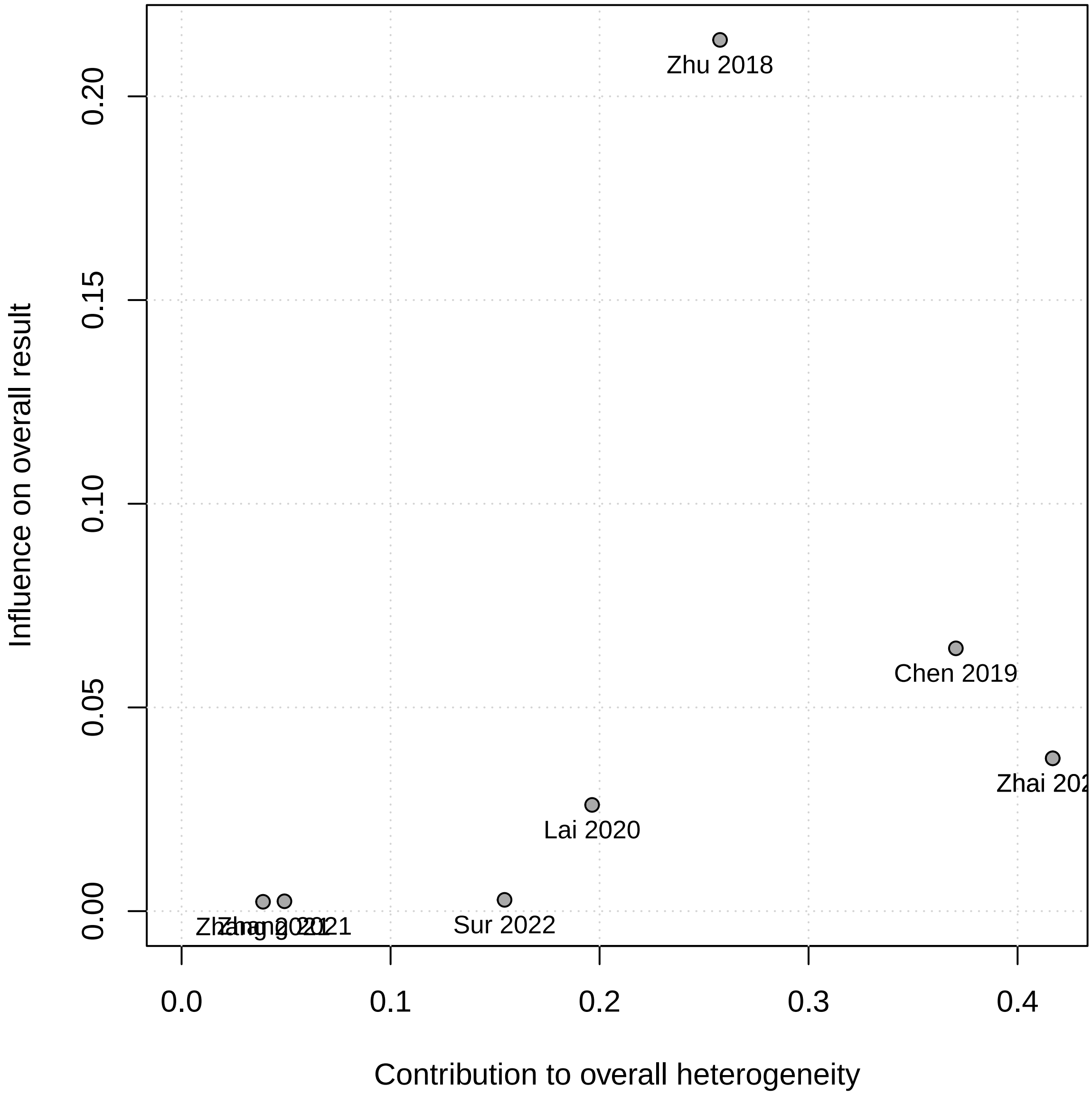
```r
funnel(trimfill(clav_i_ii_metabin))
```

```
## Warning in trimfill.meta(clav_i_ii_metabin): 10 observation(s) dropped due to
## missing values
```



4.22.5 Baujat

```
baujat(clav_i_ii_metabin, pos = 1)
```



4.22.6 Leave one out

```r
metainf(clav_i_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022             0.5223 [0.3637; 0.7500]  0.0004  0.0000  0.0000
## Omitting Tang 2023            0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Chen 2019            0.5545 [0.3762; 0.8174]  0.0029  0.0000  0.0000
## Omitting Du 2019              0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Lai 2020             0.5110 [0.3487; 0.7488]  0.0006  0.0000  0.0000
## Omitting Zhu 2018             0.5914 [0.3637; 0.9617]  0.0342  0.0000  0.0000
## Omitting Zhang 2021           0.5321 [0.3687; 0.7680]  0.0008  0.0000  0.0000
## Omitting Zhang 2021           0.5225 [0.3624; 0.7535]  0.0005  0.0000  0.0000
## Omitting Lechevallier 2003    0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Huang 2023           0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Wu 2022              0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Ding 2023            0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Zhai 2023            0.5082 [0.3495; 0.7389]  0.0004  0.0000  0.0000
## Omitting Zhai 2023            0.5082 [0.3495; 0.7389]  0.0004  0.0000  0.0000
## Omitting Qian 2022            0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Zhang 2022           0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting Deng 2022            0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
## Omitting AlSmadi 2019         0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
##
## Pooled estimate               0.5274 [0.3686; 0.7545]  0.0005  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Chen 2019             0.0%
## Omitting Du 2019               0.0%
## Omitting Lai 2020              0.0%
## Omitting Zhu 2018              0.0%
## Omitting Zhang 2021            0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Huang 2023            0.0%
## Omitting Wu 2022               0.0%
## Omitting Ding 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting Qian 2022             0.0%
## Omitting Zhang 2022            0.0%
## Omitting Deng 2022             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

4.23 Clavien III-V

4.23.1 Meta-analysis

```
clav_iii_v_metabin <- metabin(data = suction_data,
                          event.c = clav_iii_v_n_control,
                        n.c = sample_size_control,
                        event.e = clav_iii_v_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_iii_v_metabin
```

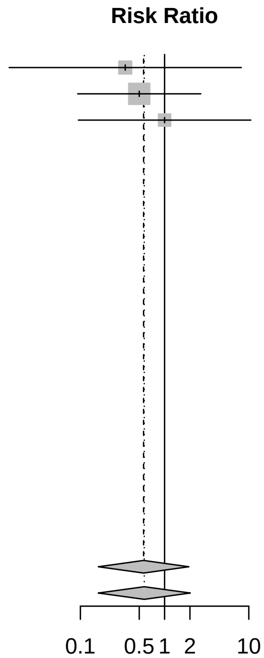
```
## Number of studies: k = 3
## Number of observations: o = 2311
## Number of events: e = 10
##
##                           RR           95%-CI     z p-value
## Common effect model  0.5631 [0.1633; 1.9422] -0.91  0.3633
## Random effects model 0.5735 [0.1630; 2.0175] -0.87  0.3863
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 9.8745]; tau = 0 [0.0000; 3.1424]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.34    2  0.8426
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

4.23.2 Forest plot

```r
forest(clav_iii_v_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Chen 2019	0	44	1	45	0.34	[0.01; 8.15]	21.8%	15.7%
Zhu 2018	2	165	4	165	0.50	[0.09; 2.69]	58.7%	55.8%
Lai 2020	1	28	2	56	1.00	[0.09; 10.56]	19.6%	28.5%
Sur 2022	0	9	0	8			0.0%	0.0%
Tang 2023	.	86	.	87			0.0%	0.0%
Du 2019	.	62	.	60			0.0%	0.0%
Zhang 2021	0	56	0	50			0.0%	0.0%
Zhang 2021	0	56	0	54			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Huang 2023	.	103	.	103			0.0%	0.0%
Wu 2022	.	76	.	82			0.0%	0.0%
Ding 2023	0	138	0	61			0.0%	0.0%
Zhai 2023	0	60	0	60			0.0%	0.0%
Zhai 2023	0	60	0	60			0.0%	0.0%
Qian 2022	.	81	.	81			0.0%	0.0%
Zhang 2022	0	30	0	30			0.0%	0.0%
Deng 2022	.	57	.	70			0.0%	0.0%
AlSmadi 2019	0	43	0	60			0.0%	0.0%
Common effect model		**1165**		**1146**	**0.56**	**[0.16; 1.94]**	**100.0%**	**--**
Random effects model					**0.57**	**[0.16; 2.02]**	**--**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.84$



4.23.3 Trim and Fill

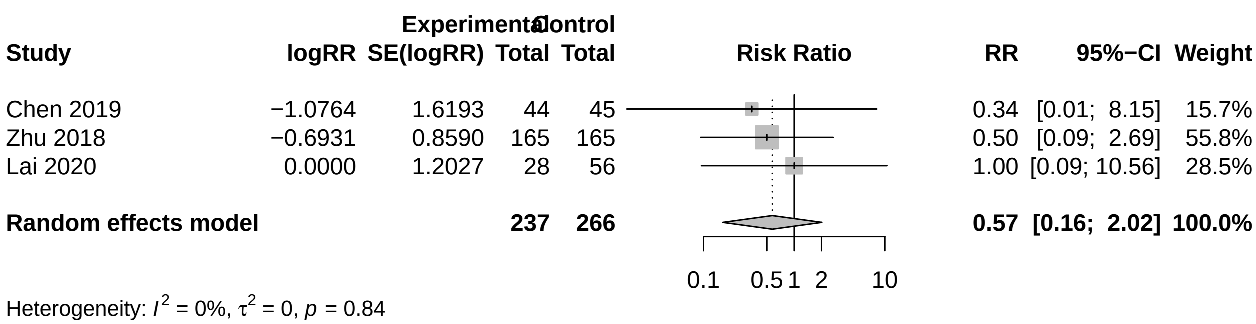
```r
trimfill(clav_iii_v_metabin)
```

```
## Warning in trimfill.meta(clav_iii_v_metabin): 15 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 503
## Number of events: e = 10
##
##                          RR           95%-CI     z p-value
## Random effects model 0.5735 [0.1630; 2.0175] -0.87  0.3863
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 9.8745]; tau = 0 [0.0000; 3.1424]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.34    2  0.8426
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(clav_iii_v_metabin),
       sortvar = TE)
```

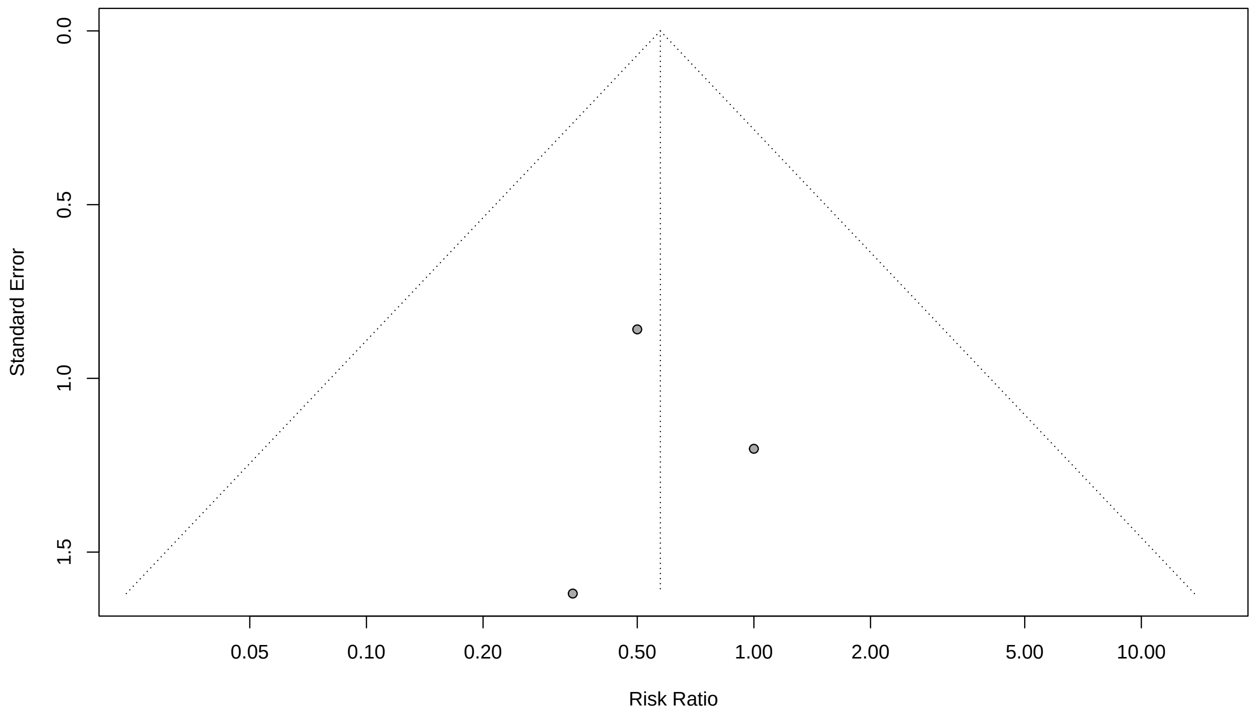
```
## Warning in trimfill.meta(clav_iii_v_metabin): 15 observation(s) dropped due to
## missing values
```



4.23.4 Funnel plot

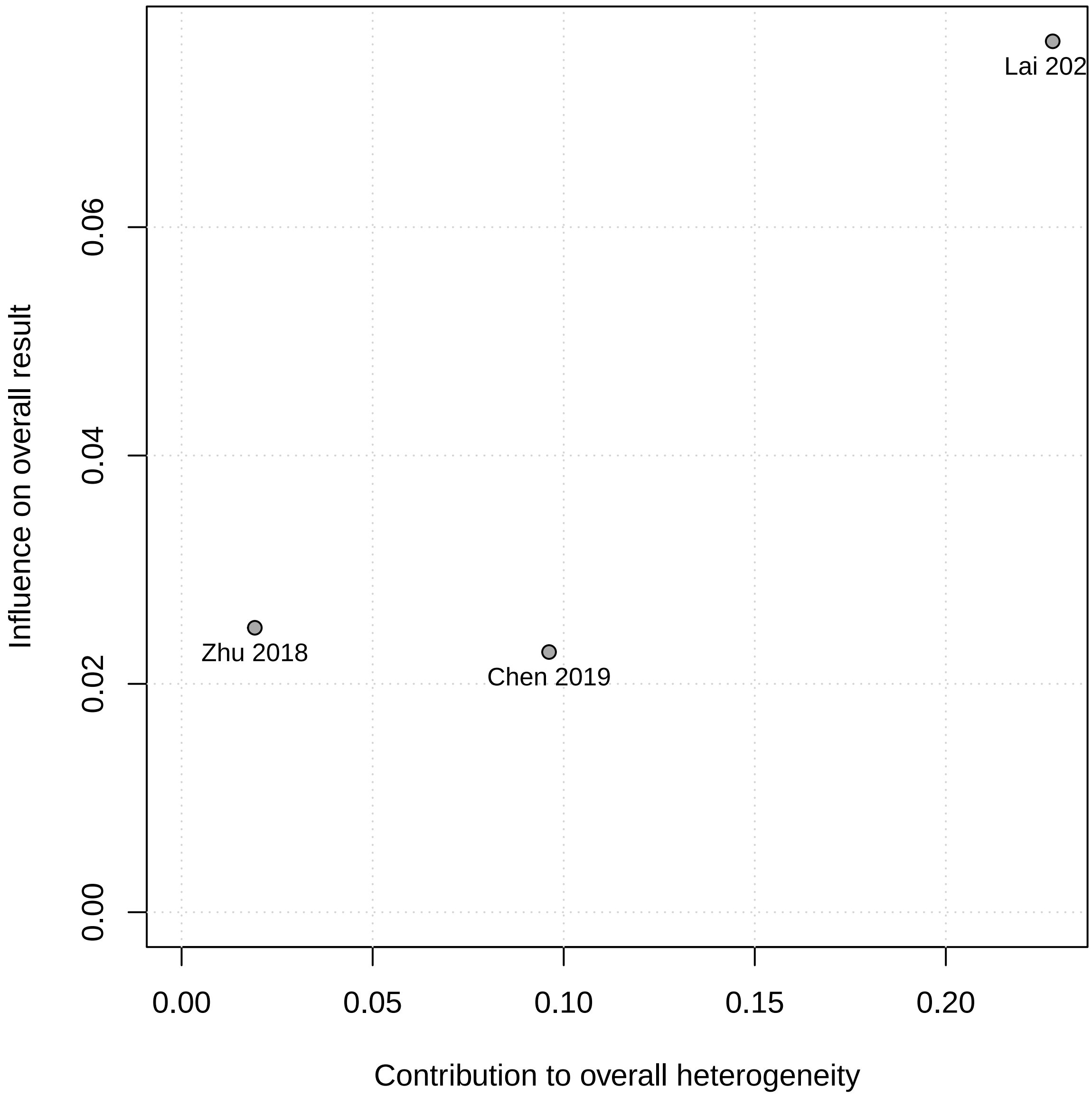
```
funnel(trimfill(clav_iii_v_metabin))
```

```
## Warning in trimfill.meta(clav_iii_v_metabin): 15 observation(s) dropped due to
## missing values
```



4.23.5 Baujat

```
baujat(clav_iii_v_metabin, pos = 1)
```



4.23.6 Leave one out

```r
metainf(clav_iii_v_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022            0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Tang 2023           0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Chen 2019           0.6250 [0.1615; 2.4186]  0.4960  0.0000 0.0000
## Omitting Du 2019             0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Lai 2020            0.4569 [0.1037; 2.0140]  0.3007  0.0000 0.0000
## Omitting Zhu 2018            0.6528 [0.1042; 4.0882]  0.6487  0.0000 0.0000
## Omitting Zhang 2021          0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Zhang 2021          0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Lechevallier 2003   0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Huang 2023          0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Wu 2022             0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Ding 2023           0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Zhai 2023           0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Zhai 2023           0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Qian 2022           0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Zhang 2022          0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting Deng 2022           0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
## Omitting AlSmadi 2019        0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
##
## Pooled estimate              0.5631 [0.1633; 1.9422]  0.3633  0.0000 0.0000
##                                I^2
## Omitting Sur 2022             0.0%
## Omitting Tang 2023            0.0%
## Omitting Chen 2019            0.0%
## Omitting Du 2019              0.0%
## Omitting Lai 2020             0.0%
## Omitting Zhu 2018             0.0%
## Omitting Zhang 2021           0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Huang 2023           0.0%
## Omitting Wu 2022              0.0%
## Omitting Ding 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting Qian 2022            0.0%
## Omitting Zhang 2022           0.0%
## Omitting Deng 2022            0.0%
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

5 Overall Summary Forest plots

```
overall <- cbind(
  "Outcome" = c(
    "Immediate SFR",
    "Final SFR",
    "Auxiliary Treatment",
    "Overall Complications",
    "Fever",
    "Infection",
    "Sepsis",
    "Abscess",
    "Haematoma",
    "Pain",
    "Stricture",
    "Embolisation",
    "Transfusion",
    "CD I",
    "CD II",
    "CD III",
    "CD IV",
    "CD I-II",
    "CD III-V",
    "Operative time",
    "VAS",
    "Length of Stay"
  ),
  "type" = c(
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "cont",
    "cont",
    "cont"
  ),
  "n_studies" = c(
    immediate_sfr_metabin$k,
```

```
  sfr_metabin$k,
aux_rx_metabin$k,
comp_metabin$k,
fever_metabin$k,
infection_metabin$k,
sepsis_metabin$k,
abscess_metabin$k,
haematoma_metabin$k,
pain_metabin$k,
stricture_metabin$k,
ir_embolisation_metabin$k,
transfusion_metabin$k,
clav_i_metabin$k,
clav_ii_metabin$k,
clav_iii_metabin$k,
clav_iv_metabin$k,
clav_i_ii_metabin$k,
clav_iii_v_metabin$k,
or_time_metacont$k,
vas_metacont$k,
los_metacont$k),
"es" = c(
  immediate_sfr_metabin$TE.random %>% exp(),
  sfr_metabin$TE.random %>% exp(),
aux_rx_metabin$TE.random %>% exp(),
comp_metabin$TE.random %>% exp(),
fever_metabin$TE.random %>% exp(),
infection_metabin$TE.random %>% exp(),
sepsis_metabin$TE.random %>% exp(),
abscess_metabin$TE.random %>% exp(),
haematoma_metabin$TE.random %>% exp(),
pain_metabin$TE.random %>% exp(),
stricture_metabin$TE.random %>% exp(),
ir_embolisation_metabin$TE.random %>% exp(),
transfusion_metabin$TE.random %>% exp(),
clav_i_metabin$TE.random %>% exp(),
clav_ii_metabin$TE.random %>% exp(),
clav_iii_metabin$TE.random %>% exp(),
clav_iv_metabin$TE.random %>% exp(),
clav_i_ii_metabin$TE.random %>% exp(),
clav_iii_v_metabin$TE.random %>% exp(),
or_time_metacont$TE.random,
vas_metacont$TE.random,
los_metacont$TE.random),
"lower_ci" = c(
  immediate_sfr_metabin$lower.random %>% exp(),
  sfr_metabin$lower.random %>% exp(),
aux_rx_metabin$lower.random %>% exp(),
comp_metabin$lower.random %>% exp(),
fever_metabin$lower.random %>% exp(),
infection_metabin$lower.random %>% exp(),
sepsis_metabin$lower.random %>% exp(),
abscess_metabin$lower.random %>% exp(),
```

```
haematoma_metabin$lower.random %>% exp(),
pain_metabin$lower.random %>% exp(),
stricture_metabin$lower.random %>% exp(),
ir_embolisation_metabin$lower.random %>% exp(),
transfusion_metabin$lower.random %>% exp(),
clav_i_metabin$lower.random %>% exp(),
clav_ii_metabin$lower.random %>% exp(),
clav_iii_metabin$lower.random %>% exp(),
clav_iv_metabin$lower.random %>% exp(),
clav_i_ii_metabin$lower.random %>% exp(),
clav_iii_v_metabin$lower.random %>% exp(),
or_time_metacont$lower.random,
vas_metacont$lower.random,
los_metacont$lower.random),
"upper_ci" = c(immediate_sfr_metabin$upper.random %>% exp(),
               sfr_metabin$upper.random %>% exp(),
aux_rx_metabin$upper.random %>% exp(),
comp_metabin$upper.random %>% exp(),
fever_metabin$upper.random %>% exp(),
infection_metabin$upper.random %>% exp(),
sepsis_metabin$upper.random %>% exp(),
abscess_metabin$upper.random %>% exp(),
haematoma_metabin$upper.random %>% exp(),
pain_metabin$upper.random %>% exp(),
stricture_metabin$upper.random %>% exp(),
ir_embolisation_metabin$upper.random %>% exp(),
transfusion_metabin$upper.random %>% exp(),
clav_i_metabin$upper.random %>% exp(),
clav_ii_metabin$upper.random %>% exp(),
clav_iii_metabin$upper.random %>% exp(),
clav_iv_metabin$upper.random %>% exp(),
clav_i_ii_metabin$upper.random %>% exp(),
clav_iii_v_metabin$upper.random %>% exp(),
or_time_metacont$upper.random,
vas_metacont$upper.random,
los_metacont$upper.random),
"p" = c(
  immediate_sfr_metabin$pval.random,
  sfr_metabin$pval.random,
aux_rx_metabin$pval.random,
comp_metabin$pval.random,
fever_metabin$pval.random,
infection_metabin$pval.random,
sepsis_metabin$pval.random,
abscess_metabin$pval.random,
haematoma_metabin$pval.random,
pain_metabin$pval.random,
stricture_metabin$pval.random,
ir_embolisation_metabin$pval.random,
transfusion_metabin$pval.random,
clav_i_metabin$pval.random,
clav_ii_metabin$pval.random,
clav_iii_metabin$pval.random,
```

```r
clav_iv_metabin$pval.random,
clav_i_ii_metabin$pval.random,
clav_iii_v_metabin$pval.random,
or_time_metacont$pval.random,
vas_metacont$pval.random,
los_metacont$pval.random)) %>% as_tibble() %>% drop_na(es)

overall$es <- as.numeric(overall$es)
overall$es <- round(overall$es, digits = 2)

overall$lower_ci <- as.numeric(overall$lower_ci)
overall$lower_ci <- round(overall$lower_ci, digits = 2)

overall$upper_ci <- as.numeric(overall$upper_ci)
overall$upper_ci <- round(overall$upper_ci, digits = 2)

overall$p <- as.numeric(overall$p)
overall$p <- round(overall$p, digits = 2)
overall$p <- ifelse(overall$p<0.001, "<0.001", overall$p)
```

5.1 Summary Table of number of studies for each outcome included in meta-analysis

```
overall %>% subset(select = c(Outcome, n_studies)) %>% gt() %>% tab_header(title = "Summary table of Nu
```

Summary table of Number of Studies for Each Outcome Meta-Analyis

Outcome	Studies, n
Immediate SFR	9
Final SFR	17
Auxiliary Treatment	8
Overall Complications	17
Fever	13
Infection	14
Sepsis	2
Haematoma	1
Pain	3
Stricture	2
Embolisation	2
Transfusion	3
CD I	8
CD II	6
CD III	3
CD IV	1
CD I-II	8
CD III-V	3
Operative time	17
VAS	2
Length of Stay	9

5.2 Summary Forest plot of Continuous outcomes

5.2.1 Continuous Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

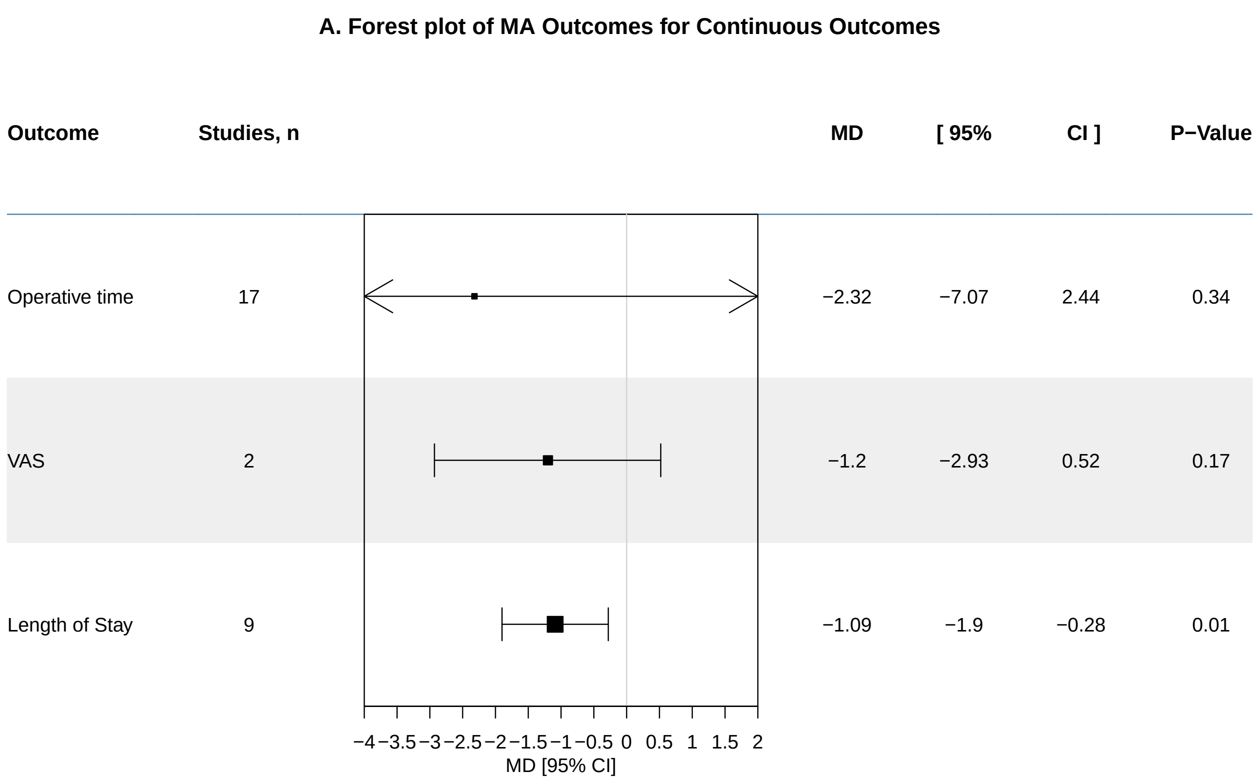
```
overall_continuous <-
  overall %>% subset(type ==  "cont") %>% subset(select = c(Outcome,
                                                           n_studies,
                                                           es,
                                                           lower_ci,
                                                           upper_ci,
                                                           p)) %>% as_tibble()
overall_continuous %>% gt() %>% tab_header(title = "Summary Table for Continuous Outcomes") %>% cols_me
```

Summary Table for Continuous Outcomes

Outcome	Studies, n	MD (95% CI)	p
Operative time	17	-2.32 (-7.07-2.44)	0.34
VAS	2	-1.20 (-2.93-0.52)	0.17
Length of Stay	9	-1.09 (-1.90–0.28)	0.01

5.2.2 Continuous Forest plot

```
continuous_plot <- overall_continuous %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 0,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Continuous Outcomes",
  clip = c(-4, 2),
  xlab = "MD [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "MD",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
continuous_plot
```



5.3 Summary Forest plot of Binary outcomes

5.3.1 Binary Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

```
overall_binary <-
  overall %>% subset(type ==  "binary") %>% subset(select = c(Outcome,
                                                             n_studies,
                                                             es,
                                                             lower_ci,
                                                             upper_ci,
                                                             p)) %>% as_tibble()
overall_binary %>% gt() %>% tab_header(title = "Summary Table for Binary Outcomes") %>% cols_merge(colu
```

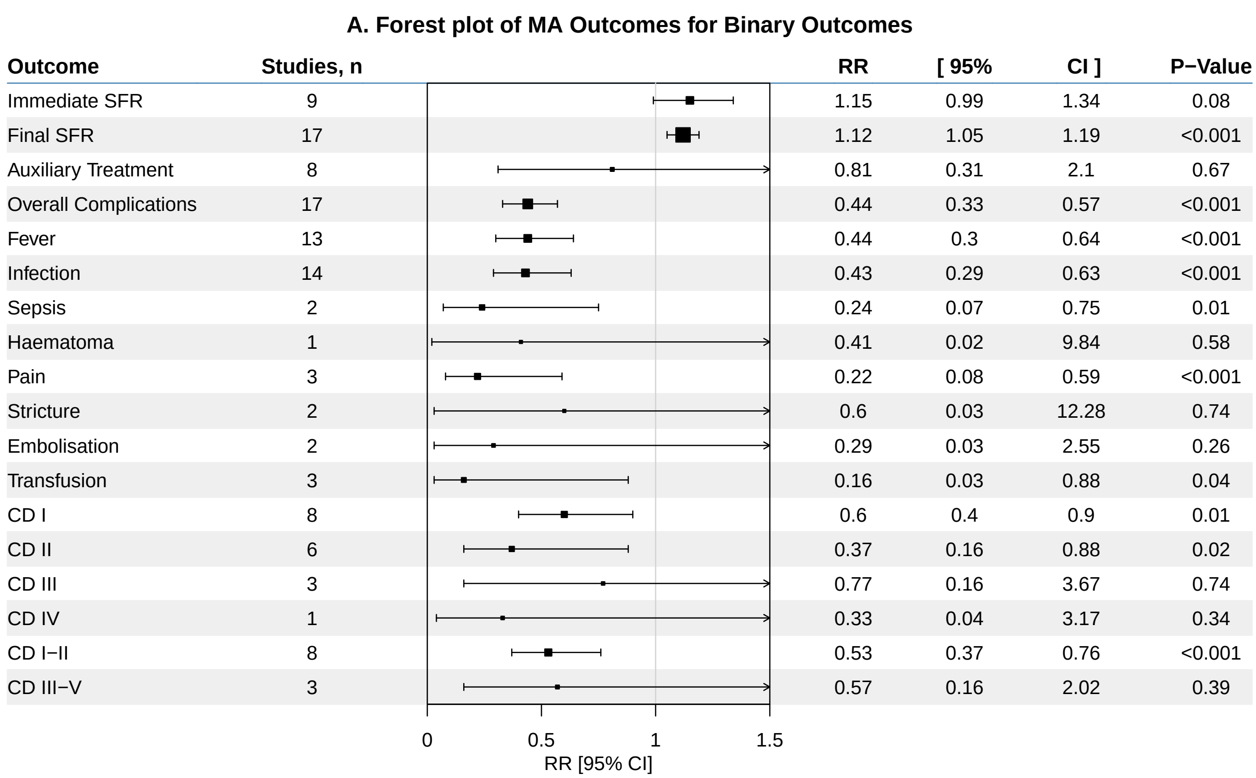
Summary Table for Binary Outcomes

Outcome	Studies, n	RR (95% CI)	p
Immediate SFR	9	1.15 (0.99-1.34)	0.08
Final SFR	17	1.12 (1.05-1.19)	<0.001
Auxiliary Treatment	8	0.81 (0.31-2.10)	0.67
Overall Complications	17	0.44 (0.33-0.57)	<0.001
Fever	13	0.44 (0.30-0.64)	<0.001
Infection	14	0.43 (0.29-0.63)	<0.001
Sepsis	2	0.24 (0.07-0.75)	0.01
Haematoma	1	0.41 (0.02-9.84)	0.58
Pain	3	0.22 (0.08-0.59)	<0.001
Stricture	2	0.60 (0.03-12.28)	0.74
Embolisation	2	0.29 (0.03-2.55)	0.26
Transfusion	3	0.16 (0.03-0.88)	0.04
CD I	8	0.60 (0.40-0.90)	0.01
CD II	6	0.37 (0.16-0.88)	0.02
CD III	3	0.77 (0.16-3.67)	0.74
CD IV	1	0.33 (0.04-3.17)	0.34
CD I-II	8	0.53 (0.37-0.76)	<0.001
CD III-V	3	0.57 (0.16-2.02)	0.39

5.3.2 Binary Forest plot - Meta-Analysis

Reference = No Suction

```
binary_plot <- overall_binary %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    zero = 1,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Binary Outcomes",
  clip = c(-1.5, 1.5),
  xlab = "RR [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "RR",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
binary_plot
```



6 RCT only Meta-Analysis Outcomes

```
rct_only <- suction_data %>% subset(design == "RCT")
```

6.1 Immediate SFR

6.1.1 Meta-analysis

```
immediate_sfr_metabin <- metabin(data = suction_data,
                         event.c = sfr_immediate_n_control,
                       n.c = sample_size_control,
                       event.e = sfr_immediate_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
immediate_sfr_metabin
```

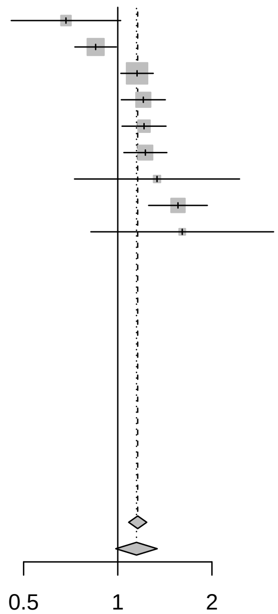
```
## Number of studies: k = 9
## Number of observations: o = 2311
## Number of events: e = 979
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1581 [1.0834; 1.2380] 4.31 < 0.0001
## Random effects model 1.1478 [0.9854; 1.3370] 1.77   0.0765
##
## Quantifying heterogeneity:
##  tau^2 = 0.0365 [0.0088; 0.2318]; tau = 0.1910 [0.0939; 0.4814]
##  I^2 = 74.6% [50.9%; 86.9%]; H = 1.99 [1.43; 2.76]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  31.55    8  0.0001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

6.1.2 Forest plot

```r
forest(immediate_sfr_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Lai 2020	14	28	41	56	0.68	[0.46; 1.02]	6.1%	7.7%
Tang 2023	63	86	75	87	0.85	[0.73; 0.99]	16.6%	14.2%
Zhu 2018	136	165	118	165	1.15	[1.02; 1.30]	26.3%	15.1%
Qian 2022	70	81	58	81	1.21	[1.03; 1.42]	12.9%	14.0%
AlSmadi 2019	40	43	46	60	1.21	[1.03; 1.43]	8.6%	14.0%
Wu 2022	67	76	59	82	1.23	[1.05; 1.44]	12.6%	14.1%
Zhang 2021	18	56	13	54	1.34	[0.73; 2.45]	2.9%	4.6%
Huang 2023	81	103	52	103	1.56	[1.25; 1.93]	11.6%	12.5%
Zhang 2021	18	56	10	50	1.61	[0.82; 3.15]	2.4%	3.9%
Sur 2022	.	9	.	8			0.0%	0.0%
Chen 2019	.	44	.	45			0.0%	0.0%
Du 2019	.	62	.	60			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Ding 2023	.	138	.	61			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhang 2022	.	30	.	30			0.0%	0.0%
Deng 2022	.	57	.	70			0.0%	0.0%
Common effect model		**1165**		**1146**	**1.16**	**[1.08; 1.24]**	**100.0%**	**−−**
Random effects model					**1.15**	**[0.99; 1.34]**	**−−**	**100.0%**

Heterogeneity: $I^2 = 75\%$, $\tau^2 = 0.0365$, $p < 0.01$



6.1.3 Trim and Fill

```r
trimfill(immediate_sfr_metabin)
```

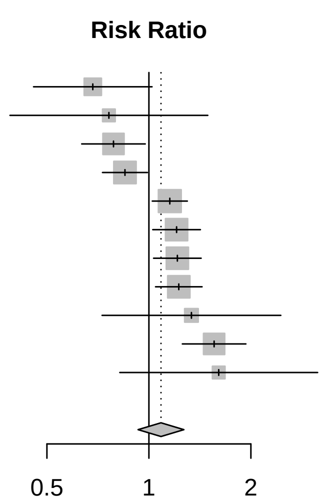
```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```

```
## Number of studies: k = 11 (with 2 added studies)
## Number of observations: o = 1744
## Number of events: e = 1140
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0855 [0.9289; 1.2685] 1.03  0.3019
##
## Quantifying heterogeneity:
##  tau^2 = 0.0471 [0.0138; 0.2196]; tau = 0.2170 [0.1173; 0.4686]
##  I^2 = 76.9% [58.8%; 87.1%]; H = 2.08 [1.56; 2.78]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  43.33   10 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(immediate_sfr_metabin),
       sortvar = TE)
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```

Study	logRR	SE(logRR)	Experimental Total	Control Total	RR	95%−CI	Weight
Lai 2020	−0.3814	0.2055	28	56	0.68	[0.46; 1.02]	7.1%
Filled: Zhang 2021	−0.2721	0.3431	56	50	0.76	[0.39; 1.49]	3.8%
Filled: Huang 2023	−0.2408	0.1103	103	103	0.79	[0.63; 0.98]	10.7%
Tang 2023	−0.1628	0.0780	86	87	0.85	[0.73; 0.99]	11.9%
Zhu 2018	0.1420	0.0609	165	165	1.15	[1.02; 1.30]	12.4%
Qian 2022	0.1881	0.0827	81	81	1.21	[1.03; 1.42]	11.7%
AlSmadi 2019	0.1934	0.0826	43	60	1.21	[1.03; 1.43]	11.7%
Wu 2022	0.2031	0.0808	76	82	1.23	[1.05; 1.44]	11.8%
Zhang 2021	0.2891	0.3100	56	54	1.34	[0.73; 2.45]	4.4%
Huang 2023	0.4432	0.1103	103	103	1.56	[1.25; 1.93]	10.7%
Zhang 2021	0.4745	0.3431	56	50	1.61	[0.82; 3.15]	3.8%
Random effects model			**853**	**891**	**1.09**	**[0.93; 1.27]**	**100.0%**

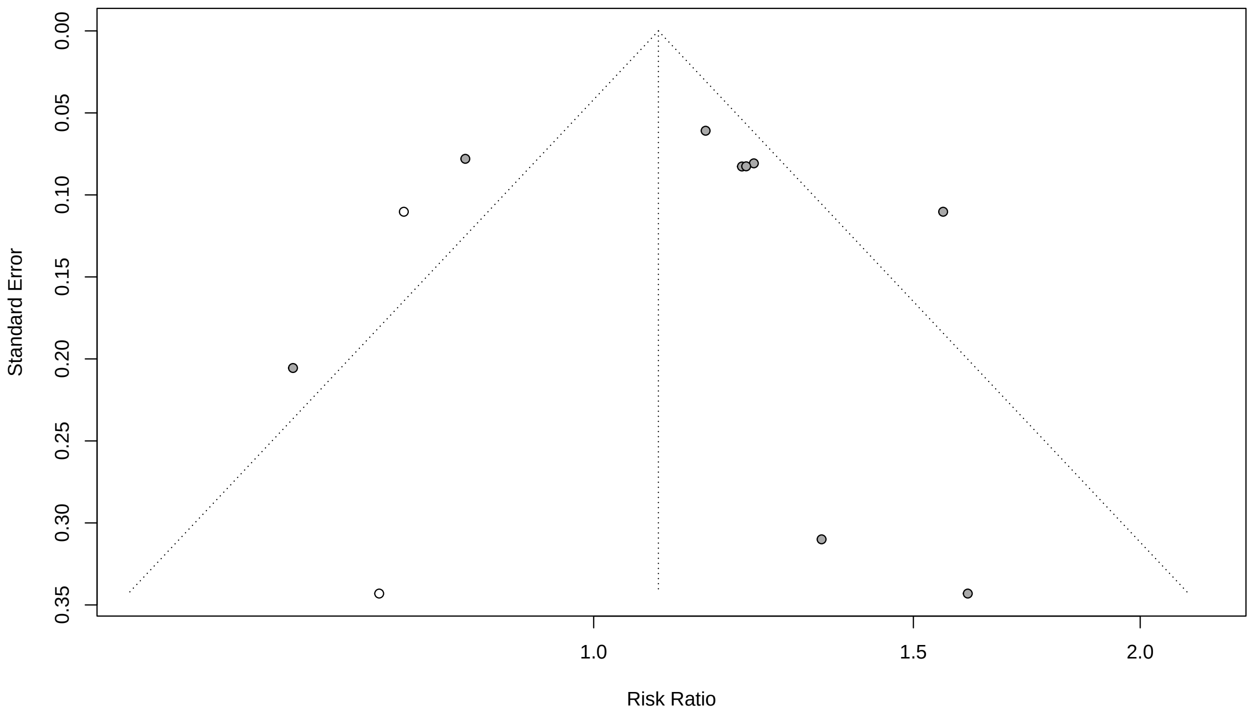


Heterogeneity: $I^2 = 77\%$, $\tau^2 = 0.0471$, $p < 0.01$

6.1.4 Funnel plot

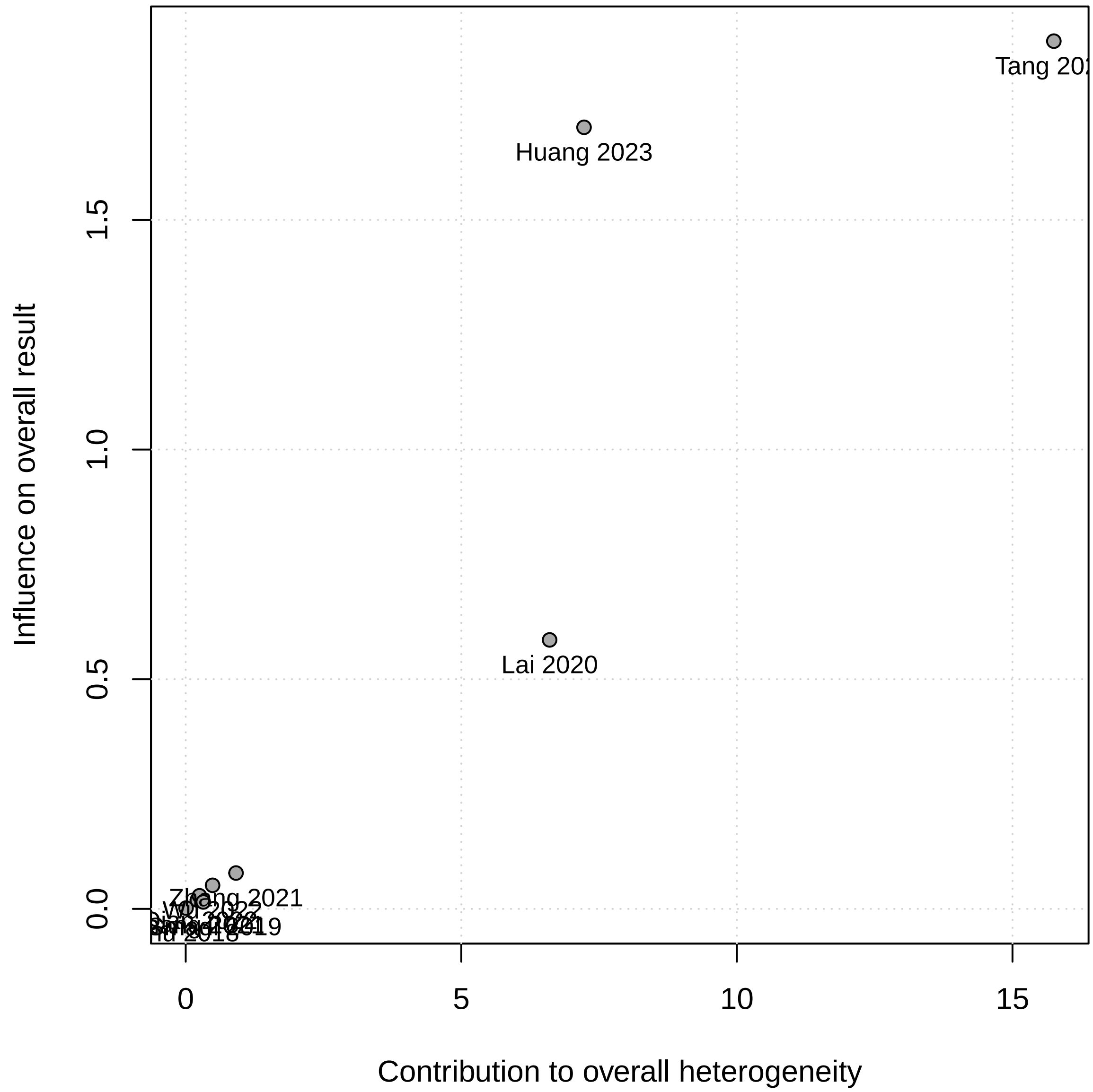
```
funnel(trimfill(immediate_sfr_metabin))
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



6.1.5 Baujat

```
baujat(immediate_sfr_metabin, pos = 1)
```



6.1.6 Leave one out

```
metainf(immediate_sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                RR           95%-CI  p-value   tau^2    tau
## Omitting Sur 2022          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Tang 2023         1.2195 [1.1329; 1.3128] < 0.0001  0.0076  0.0873
## Omitting Chen 2019         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Du 2019           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Lai 2020          1.1889 [1.1116; 1.2716] < 0.0001  0.0258  0.1607
## Omitting Zhu 2018          1.1601 [1.0710; 1.2565]   0.0003  0.0482  0.2196
## Omitting Zhang 2021        1.1473 [1.0741; 1.2254] < 0.0001  0.0376  0.1938
## Omitting Zhang 2021        1.1527 [1.0791; 1.2313] < 0.0001  0.0396  0.1990
## Omitting Lechevallier 2003   1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Huang 2023        1.1057 [1.0315; 1.1853]   0.0046  0.0246  0.1568
## Omitting Wu 2022           1.1484 [1.0676; 1.2353]   0.0002  0.0464  0.2153
## Omitting Ding 2023         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Qian 2022         1.1508 [1.0700; 1.2377]   0.0002  0.0468  0.2164
## Omitting Zhang 2022        1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Deng 2022         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting AlSmadi 2019      1.1529 [1.0734; 1.2383] < 0.0001  0.0467  0.2160
##
## Pooled estimate            1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
##                               I^2
## Omitting Sur 2022           74.6%
## Omitting Tang 2023          51.5%
## Omitting Chen 2019          74.6%
## Omitting Du 2019            74.6%
## Omitting Lai 2020           72.2%
## Omitting Zhu 2018           77.8%
## Omitting Zhang 2021         77.1%
## Omitting Zhang 2021         77.6%
## Omitting Lechevallier 2003    74.6%
## Omitting Huang 2023         69.4%
## Omitting Wu 2022            77.2%
## Omitting Ding 2023          74.6%
## Omitting Zhai 2023          74.6%
## Omitting Zhai 2023          74.6%
## Omitting Qian 2022          77.4%
## Omitting Zhang 2022         74.6%
## Omitting Deng 2022          74.6%
## Omitting AlSmadi 2019       77.4%
##
## Pooled estimate             74.6%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.2 Final SFR

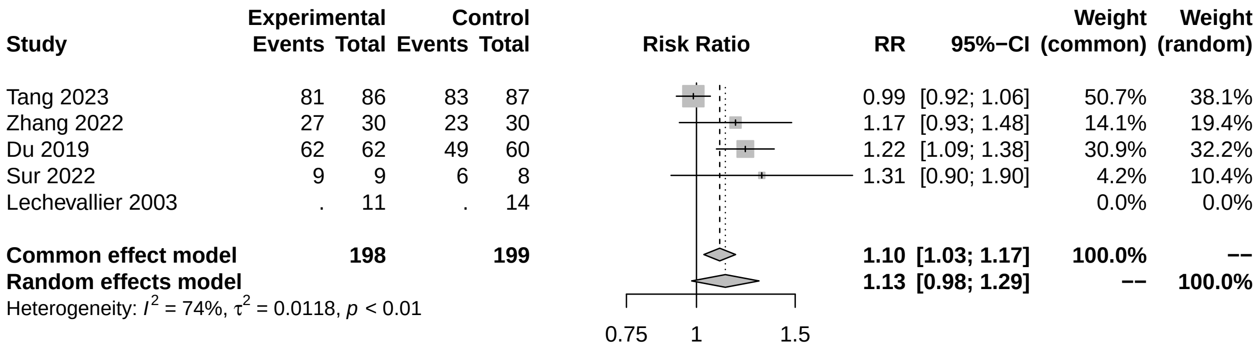
6.2.1 Meta-analysis

```
sfr_metabin <- metabin(data = rct_only,
                        event.c = sfr_final_n_control,
                       n.c = sfr_final_n_control,
                       event.e = sfr_final_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sfr_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 397
## Number of events: e = 340
##
##                          RR           95%-CI    z p-value
## Common effect model  1.1002 [1.0307; 1.1744] 2.87  0.0041
## Random effects model 1.1259 [0.9804; 1.2930] 1.68  0.0929
##
## Quantifying heterogeneity:
##  tau^2 = 0.0118 [0.0006; 0.1885]; tau = 0.1087 [0.0239; 0.4342]
##  I^2 = 73.8% [26.7%; 90.6%]; H = 1.95 [1.17; 3.27]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  11.45    3  0.0095
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.2.2 Forest plot

```r
forest(sfr_metabin,
       sortvar = TE)
```



6.2.3 Trim and Fill

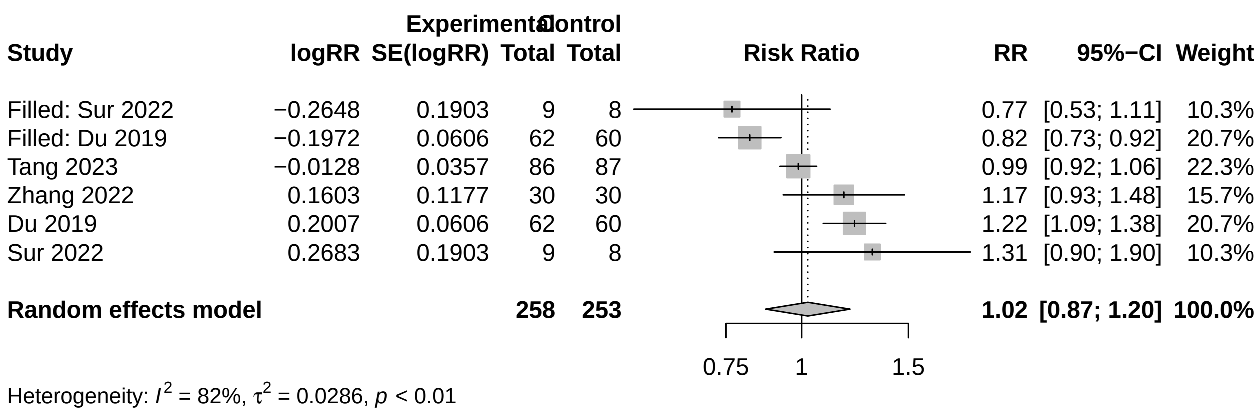
```r
trimfill(sfr_metabin)
```

```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 6 (with 2 added studies)
## Number of observations: o = 511
## Number of events: e = 466
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0237 [0.8722; 1.2015] 0.29  0.7745
##
## Quantifying heterogeneity:
##  tau^2 = 0.0286 [0.0059; 0.2698]; tau = 0.1692 [0.0771; 0.5194]
##  I^2 = 81.8% [61.2%; 91.5%]; H = 2.34 [1.61; 3.42]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  27.46    5 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(sfr_metabin),
       sortvar = TE)
```

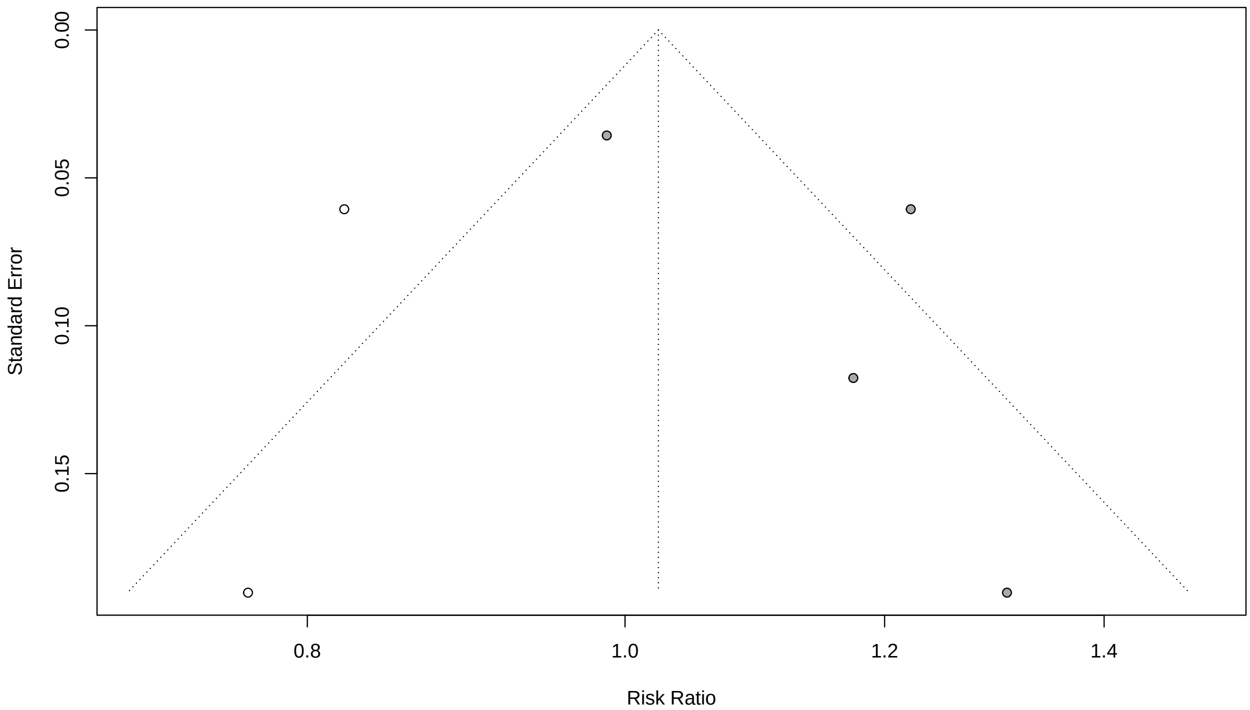
```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```



6.2.4 Funnel plot

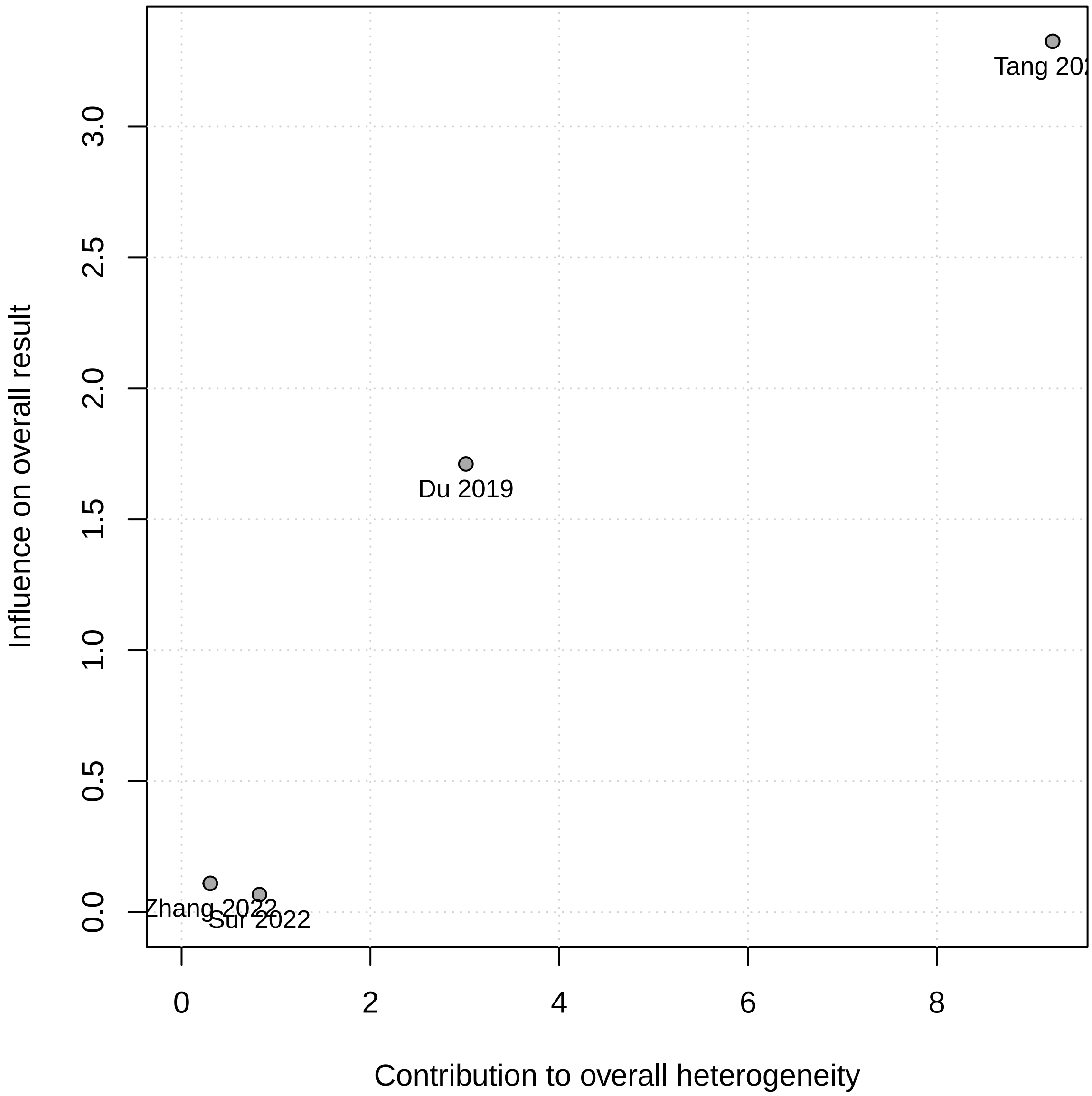
```
funnel(trimfill(sfr_metabin))
```

```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```



6.2.5 Baujat

```
baujat(sfr_metabin, pos = 1)
```



6.2.6 Leave one out

```
metainf(sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI p-value   tau^2    tau
## Omitting Sur 2022           1.0908 [1.0219; 1.1643]  0.0090  0.0125  0.1120
## Omitting Tang 2023          1.2165 [1.0920; 1.3553]  0.0004  0.0000  0.0000
## Omitting Du 2019            1.0454 [0.9685; 1.1285]  0.2549  0.0109  0.1046
## Omitting Lechevallier 2003  1.1002 [1.0307; 1.1744]  0.0041  0.0118  0.1087
## Omitting Zhang 2022         1.0881 [1.0191; 1.1617]  0.0115  0.0168  0.1296
##
## Pooled estimate             1.1002 [1.0307; 1.1744]  0.0041  0.0118  0.1087
##                                I^2
## Omitting Sur 2022            80.3%
## Omitting Tang 2023            0.0%
## Omitting Du 2019             48.5%
## Omitting Lechevallier 2003   73.8%
## Omitting Zhang 2022          81.1%
##
## Pooled estimate              73.8%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.3 OR time

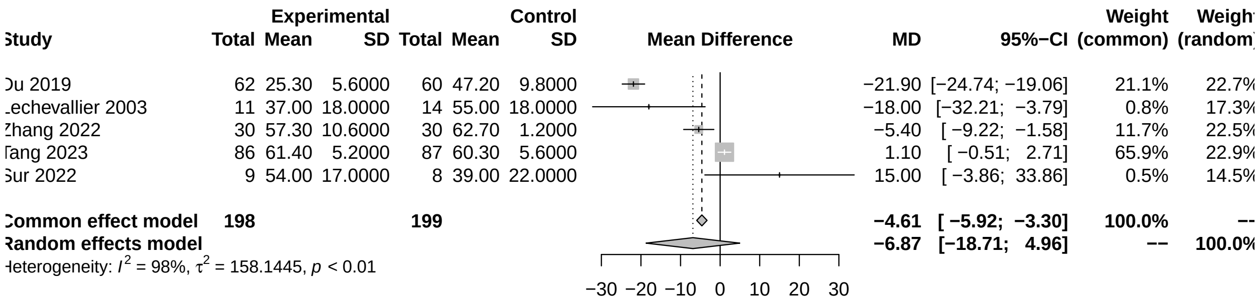
6.3.1 Meta-analysis

```
or_time_metacont <- metacont(data = rct_only,
                             mean.c = or_time_min_mean_control,
                             sd.c = or_time_min_sd_control,
                             mean.e = or_time_min_mean_suction,
                             sd.e = or_time_min_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
or_time_metacont
```

```
## Number of studies: k = 5
## Number of observations: o = 397
##
##                            MD               95%-CI     z  p-value
## Common effect model  -4.6093 [ -5.9159; -3.3026] -6.91 < 0.0001
## Random effects model -6.8746 [-18.7055;  4.9562] -1.14   0.2548
##
## Quantifying heterogeneity:
##  tau^2 = 158.1445 [43.6831; >1581.4445]; tau = 12.5755 [6.6093; >39.7674]
##  I^2 = 98.0% [96.9%; 98.7%]; H = 7.03 [5.64; 8.78]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  197.95    4 < 0.0001
##
## 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
```

6.3.2 Forest plot

```r
forest(or_time_metacont,
       sortvar = TE)
```

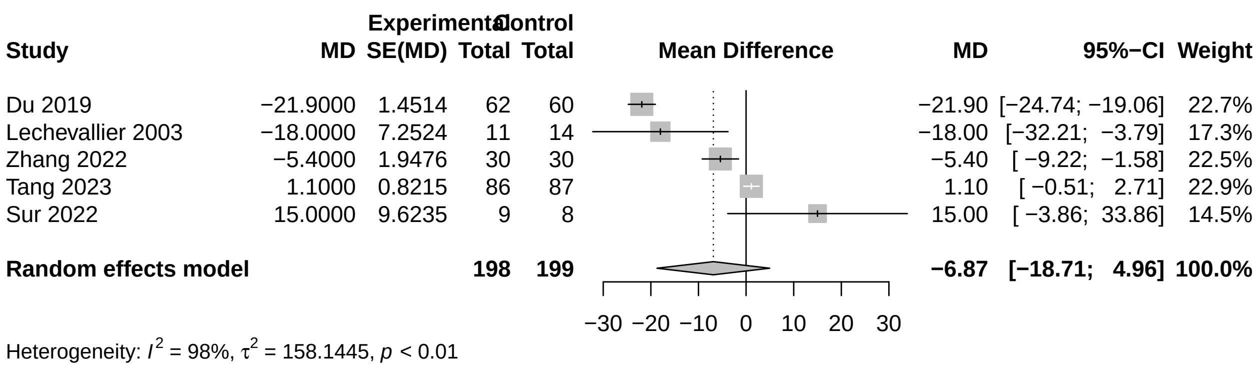


6.3.3 Trim and Fill

```r
trimfill(or_time_metacont)
```

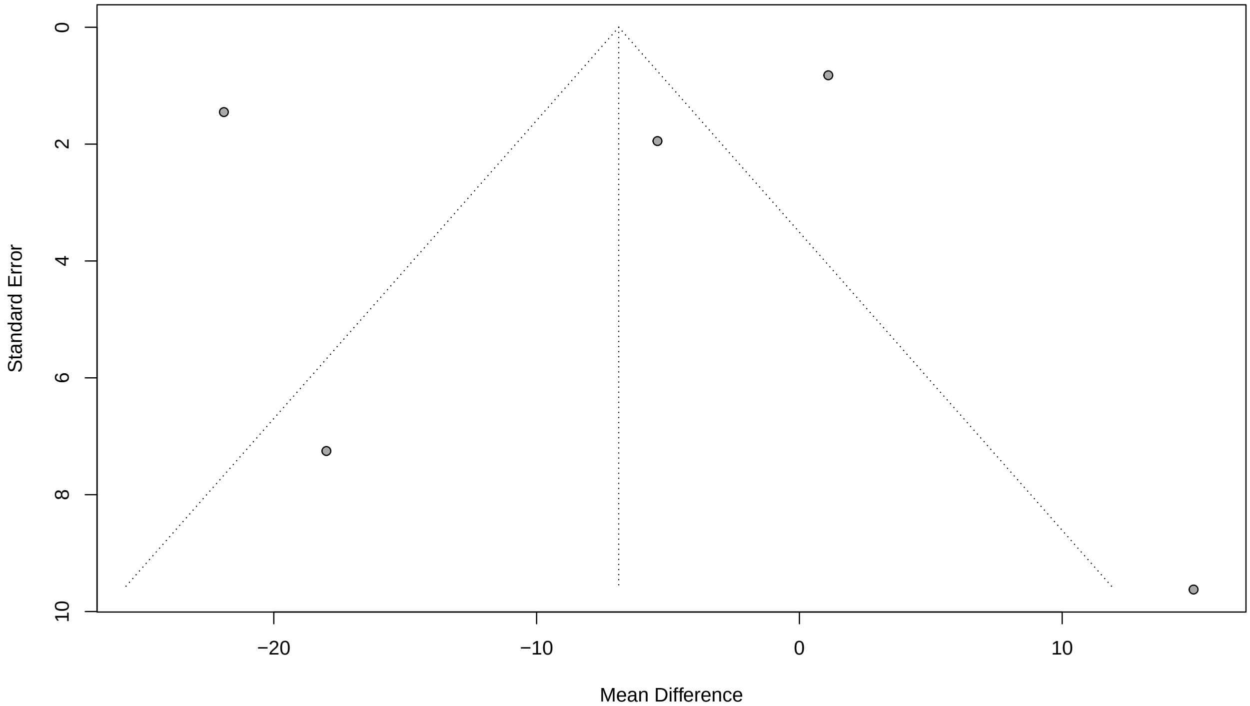
```
## Number of studies: k = 5 (with 0 added studies)
## Number of observations: o = 397
##
##                           MD              95%-CI     z p-value
## Random effects model -6.8746 [-18.7055; 4.9562] -1.14  0.2548
##
## Quantifying heterogeneity:
##  tau^2 = 158.1445 [43.6831; >1581.4445]; tau = 12.5755 [6.6093; >39.7674]
##  I^2 = 98.0% [96.9%; 98.7%]; H = 7.03 [5.64; 8.78]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  197.95    4 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(or_time_metacont),
       sortvar = TE)
```



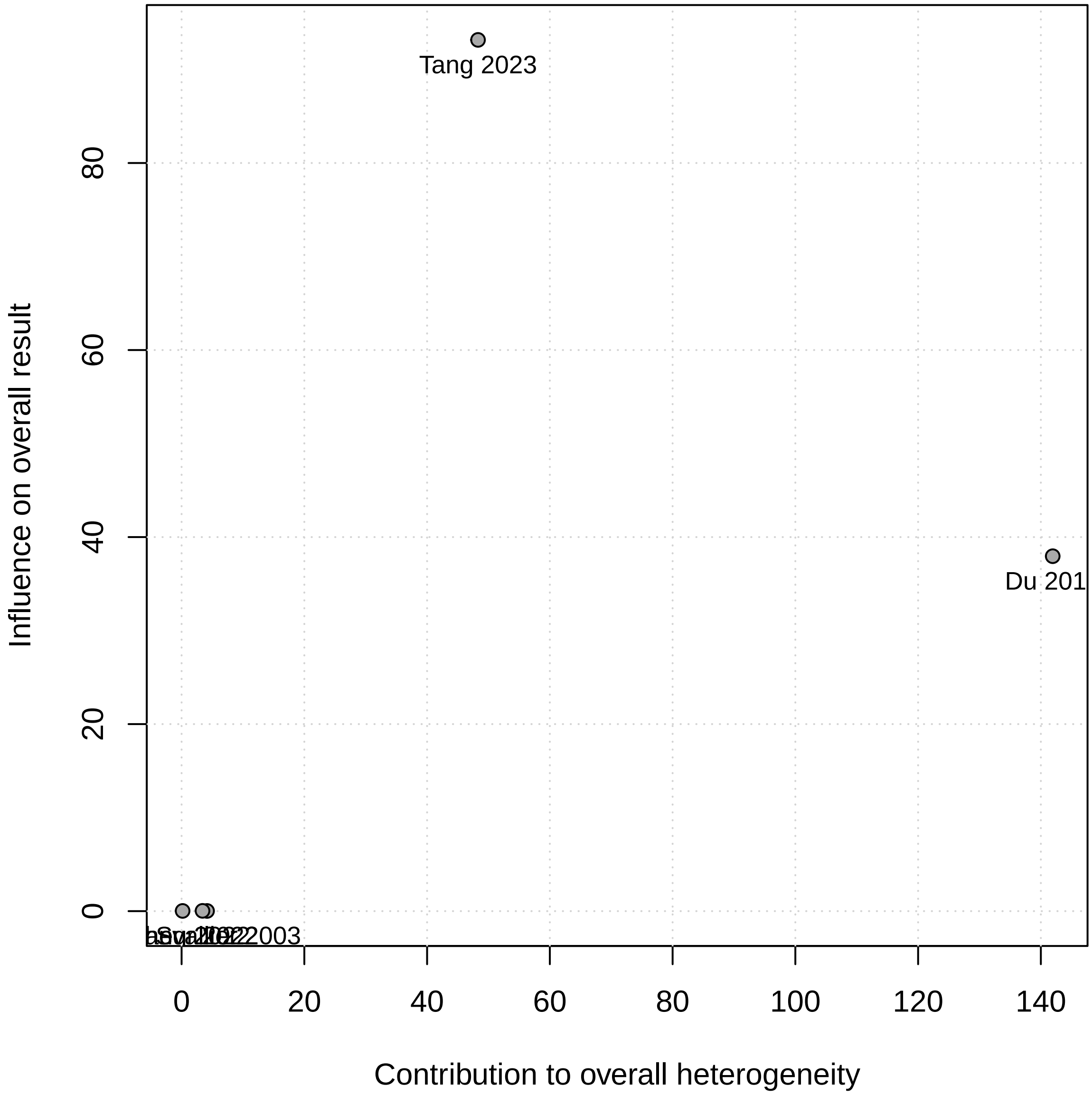
6.3.4 Funnel plot

```
funnel(trimfill(or_time_metacont))
```



6.3.5 Baujat

```
baujat(or_time_metacont, pos = 1)
```



6.3.6 Leave one out

```
metainf(or_time_metacont)
```

```
## Influential analysis (common effect model)
##
##                                    MD               95%-CI  p-value    tau^2
## Omitting Sur 2022             -4.7038 [ -6.0136;  -3.3940] < 0.0001  114.2692
## Omitting Tang 2023           -15.6222 [-17.8585; -13.3860] < 0.0001  190.4982
## Omitting Du 2019               0.0147 [ -1.4563;   1.4858]   0.9844   77.7955
## Omitting Lechevallier 2003    -4.4951 [ -5.8074;  -3.1829] < 0.0001  184.0636
## Omitting Zhang 2022           -4.5043 [ -5.8950;  -3.1136] < 0.0001  233.2375
##
## Pooled estimate               -4.6093 [ -5.9159;  -3.3026] < 0.0001  158.1445
##                                   tau    I^2
## Omitting Sur 2022             10.6897  98.5%
## Omitting Tang 2023            13.8021  94.7%
## Omitting Du 2019               8.8202  83.4%
## Omitting Lechevallier 2003    13.5670  98.5%
## Omitting Zhang 2022           15.2721  98.5%
##
## Pooled estimate               12.5755  98.0%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.4 Auxiliary Treatments

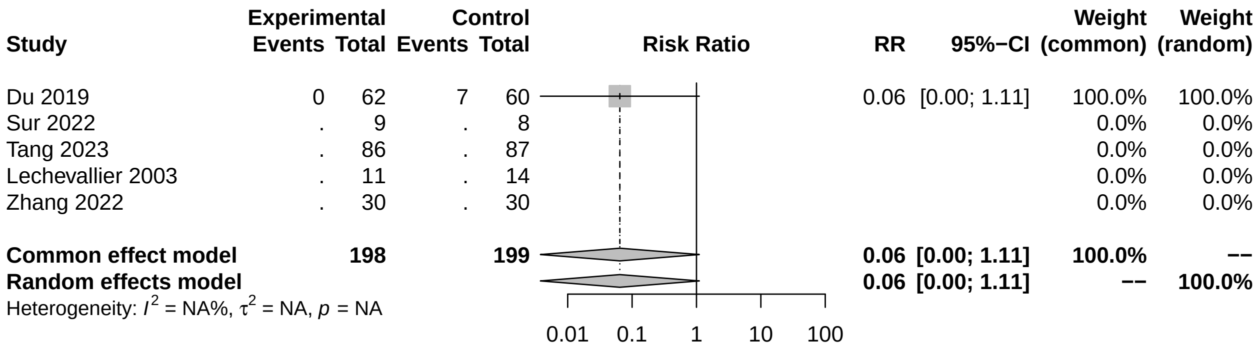
6.4.1 Meta-analysis

```
aux_rx_metabin <- metabin(data = rct_only,
                           event.c = auxillary_tx_n_control,
                         n.c = sample_size_control,
                         event.e = auxillary_tx_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
aux_rx_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 7
##
##                          RR           95%-CI     z p-value
## Common effect model  0.0646 [0.0038; 1.1059] -1.89  0.0587
## Random effects model 0.0645 [0.0038; 1.1054] -1.89  0.0586
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.4.2 Forest plot

```r
forest(aux_rx_metabin,
       sortvar = TE)
```

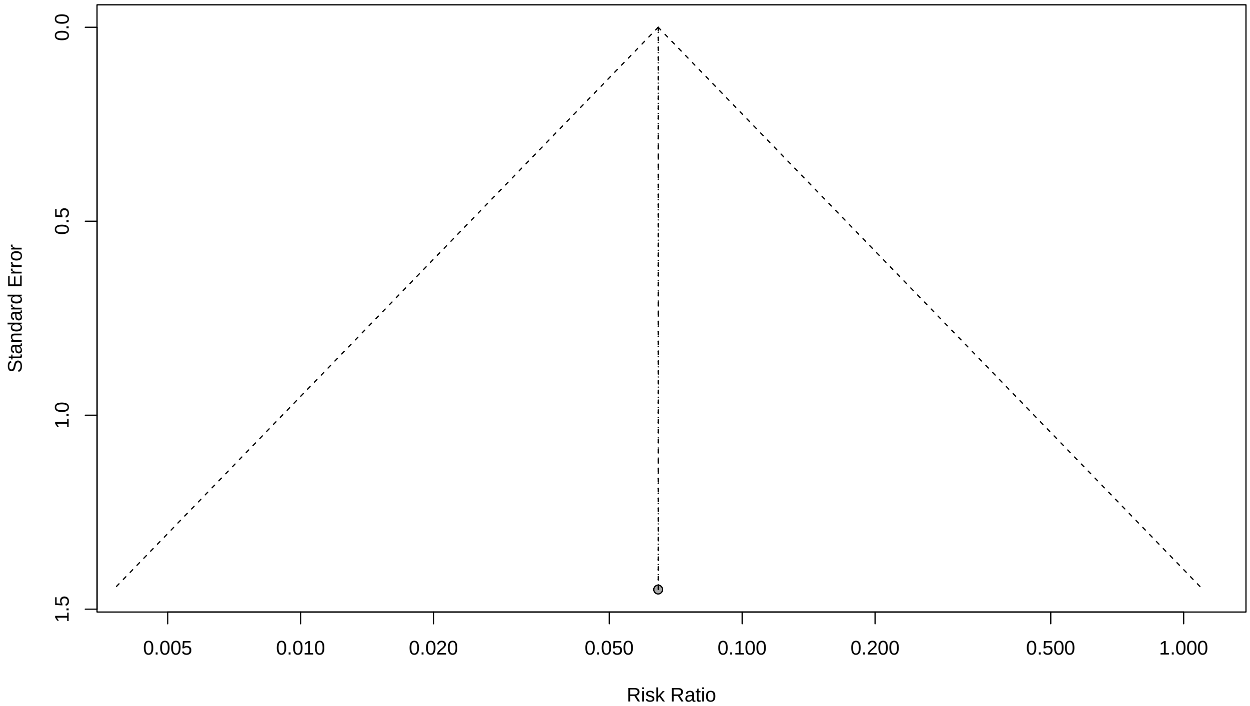


6.4.3 Trim and Fill

```
#trimfill(aux_rx_metabin)
#forest(trimfill(aux_rx_metabin),
#       sortvar = TE)
```

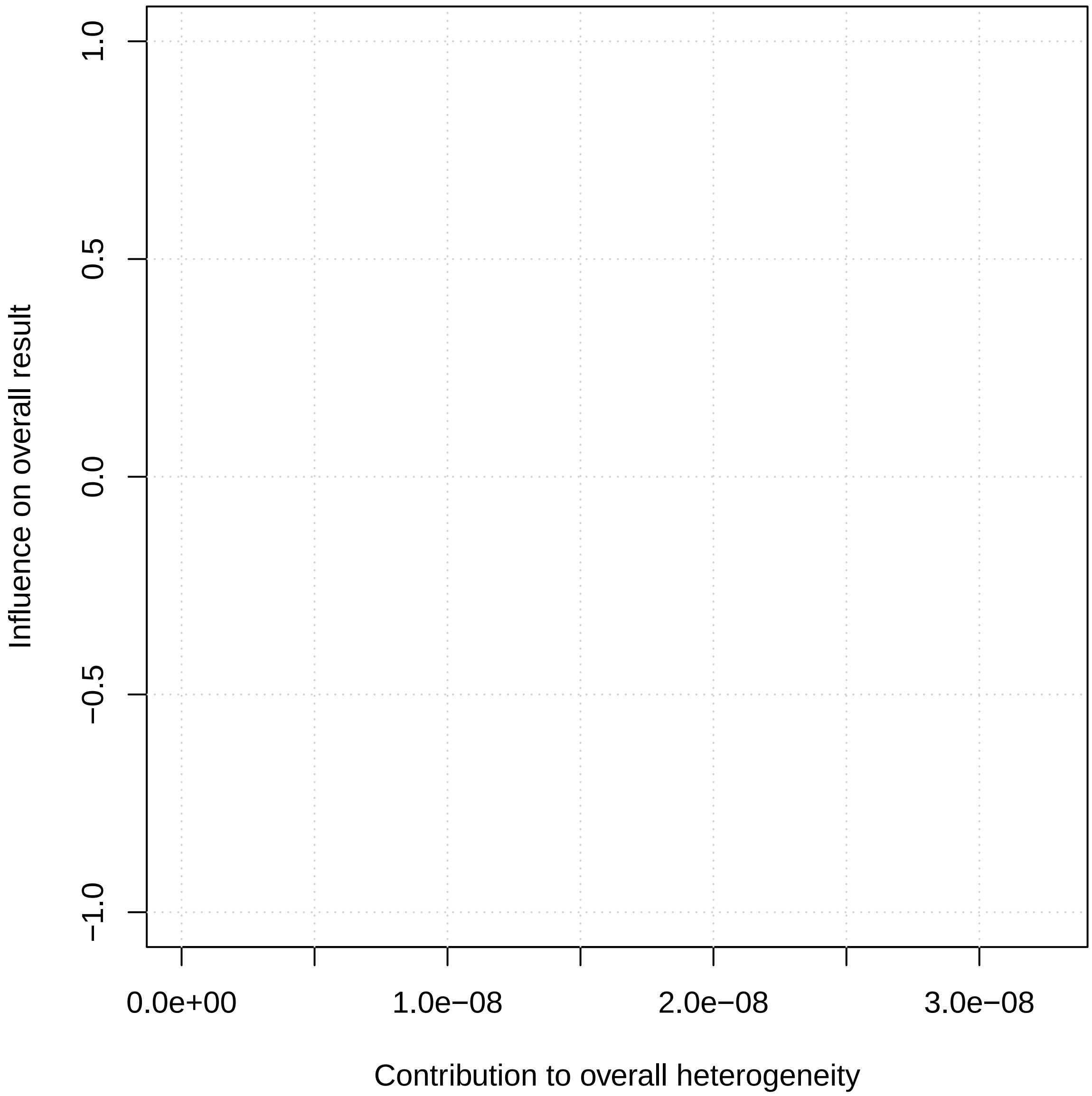
6.4.4 Funnel plot

```
funnel((aux_rx_metabin))
```



6.4.5 Baujat

```
baujat(aux_rx_metabin, pos = 1)
```



6.4.6 Leave one out

```
metainf(aux_rx_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022            0.0646 [0.0038; 1.1059]  0.0587
## Omitting Tang 2023           0.0646 [0.0038; 1.1059]  0.0587
## Omitting Du 2019
## Omitting Lechevallier 2003   0.0646 [0.0038; 1.1059]  0.0587
## Omitting Zhang 2022          0.0646 [0.0038; 1.1059]  0.0587
##
## Pooled estimate              0.0646 [0.0038; 1.1059]  0.0587
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.5 VAS

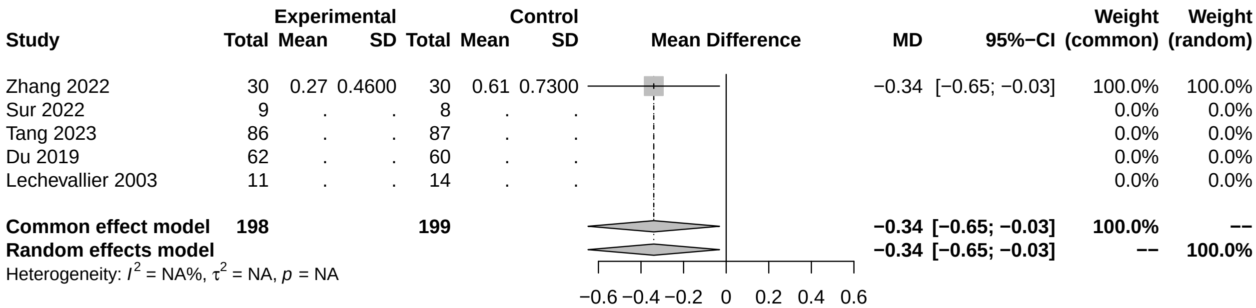
6.5.1 Meta-analysis

```
vas_metacont <- metacont(data = rct_only,
                             mean.c = vas_score_mean_control,
                             sd.c = vas_score_sd_control,
                             mean.e = vas_score_mean_suction,
                             sd.e = vas_score_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
vas_metacont
```

```
## Number of studies: k = 1
## Number of observations: o = 397
##
##                             MD             95%-CI     z p-value
## Common effect model  -0.3400 [-0.6488; -0.0312] -2.16  0.0309
## Random effects model -0.3400 [-0.6488; -0.0312] -2.16  0.0309
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.5.2 Forest plot

```r
forest(vas_metacont,
       sortvar = TE)
```

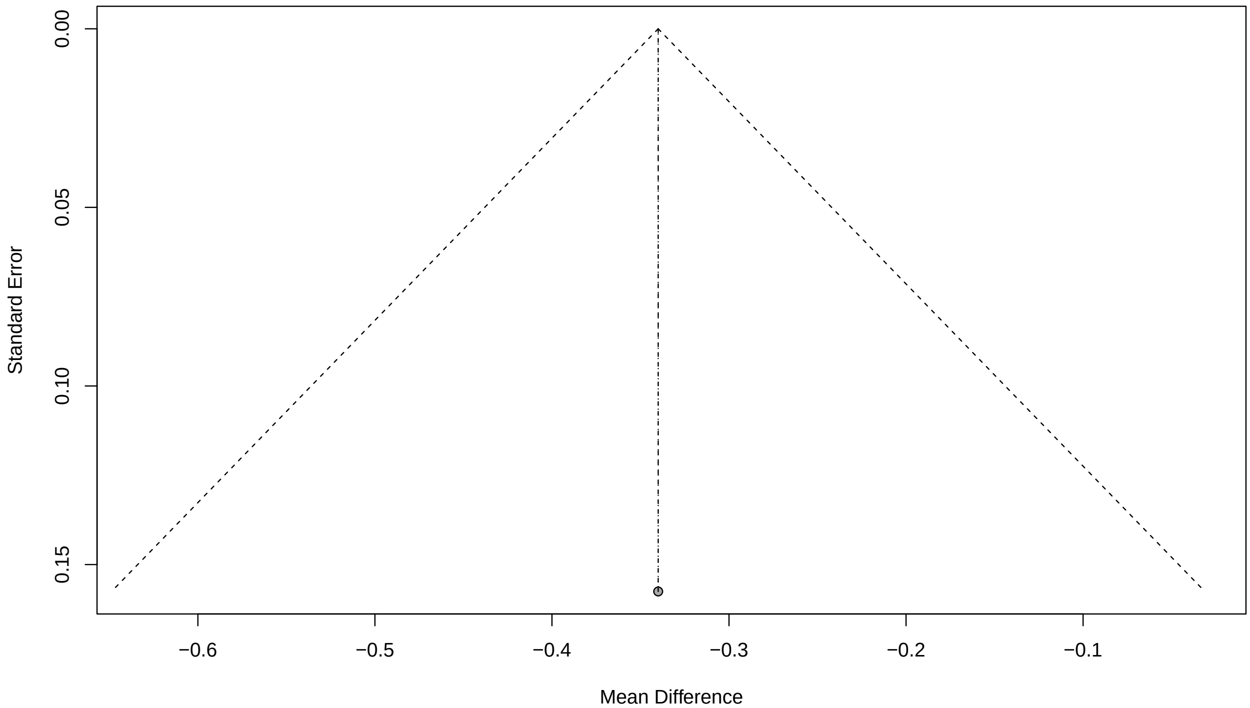


6.5.3 Trim and Fill

```
#trimfill(vas_metacont)
#forest(trimfill(vas_metacont))
```

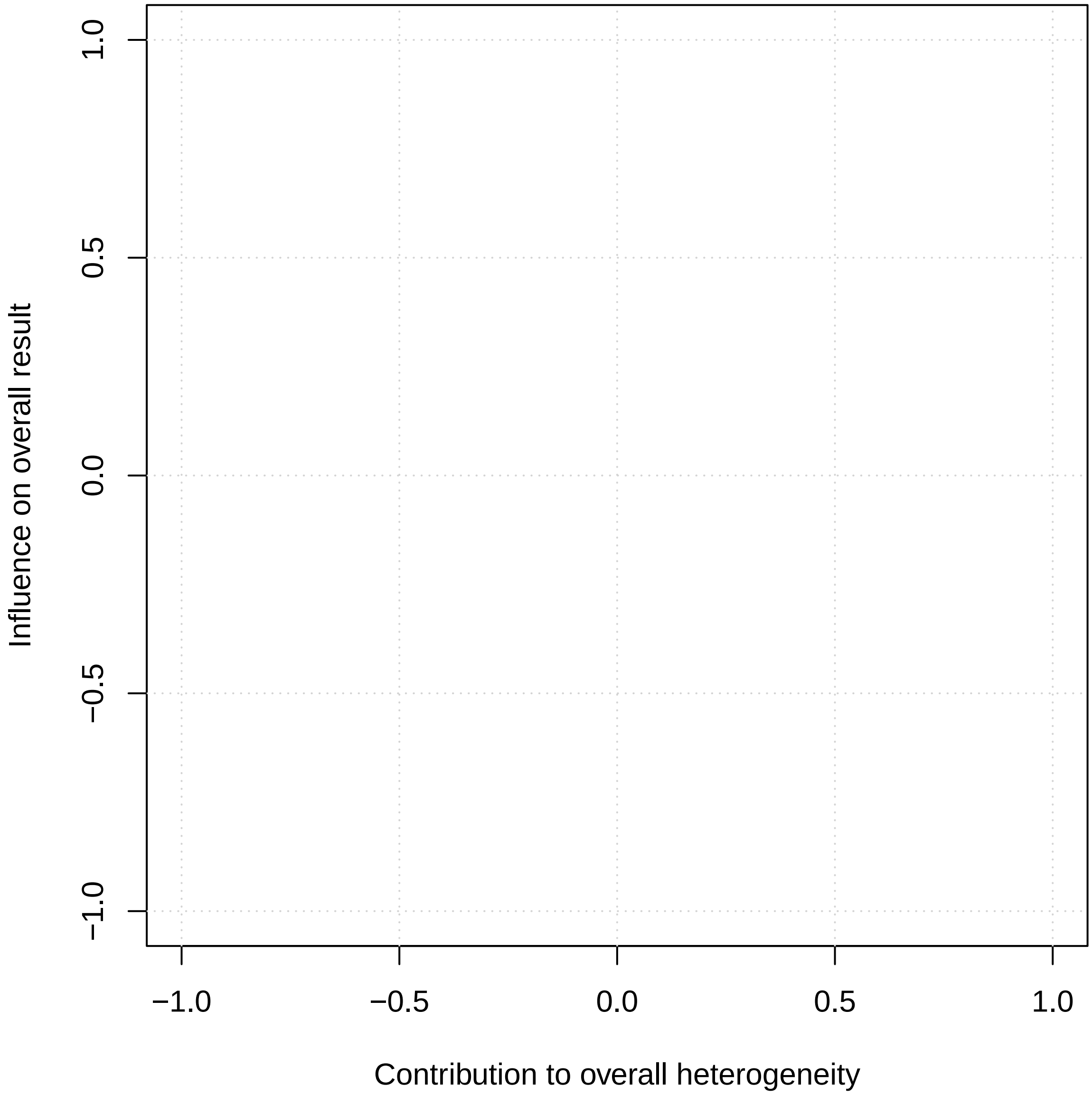
6.5.4 Funnel plot

```
funnel((vas_metacont))
```



6.5.5 Baujat

```
baujat(vas_metacont, pos = 1)
```



6.5.6 Leave one out

```r
metainf(vas_metacont)
```

```
## Influential analysis (common effect model)
##
##                                     MD             95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022            -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Tang 2023           -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Du 2019             -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Lechevallier 2003   -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Zhang 2022
##
## Pooled estimate              -0.3400 [-0.6488; -0.0312]  0.0309
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.6 LoS

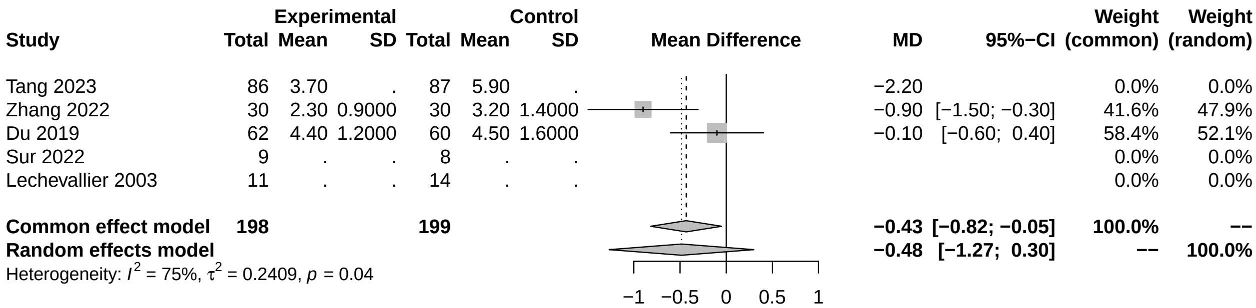
6.6.1 Meta-analysis

```
los_metacont <- metacont(data = rct_only,
                             mean.c = los_days_mean_control,
                             sd.c = los_days_sd_control,
                             mean.e = los_days_mean_suction,
                             sd.e = los_days_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
los_metacont
```

```
## Number of studies: k = 2
## Number of observations: o = 397
##
##                              MD             95%-CI     z p-value
## Common effect model  -0.4332 [-0.8175; -0.0488] -2.21  0.0272
## Random effects model -0.4835 [-1.2668;  0.2998] -1.21  0.2264
##
## Quantifying heterogeneity:
##  tau^2 = 0.2409; tau = 0.4908; I^2 = 75.3% [0.0%; 94.4%]; H = 2.01 [1.00; 4.23]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  4.04    1  0.0443
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.6.2 Forest plot

```r
forest(los_metacont,
       sortvar = TE)
```

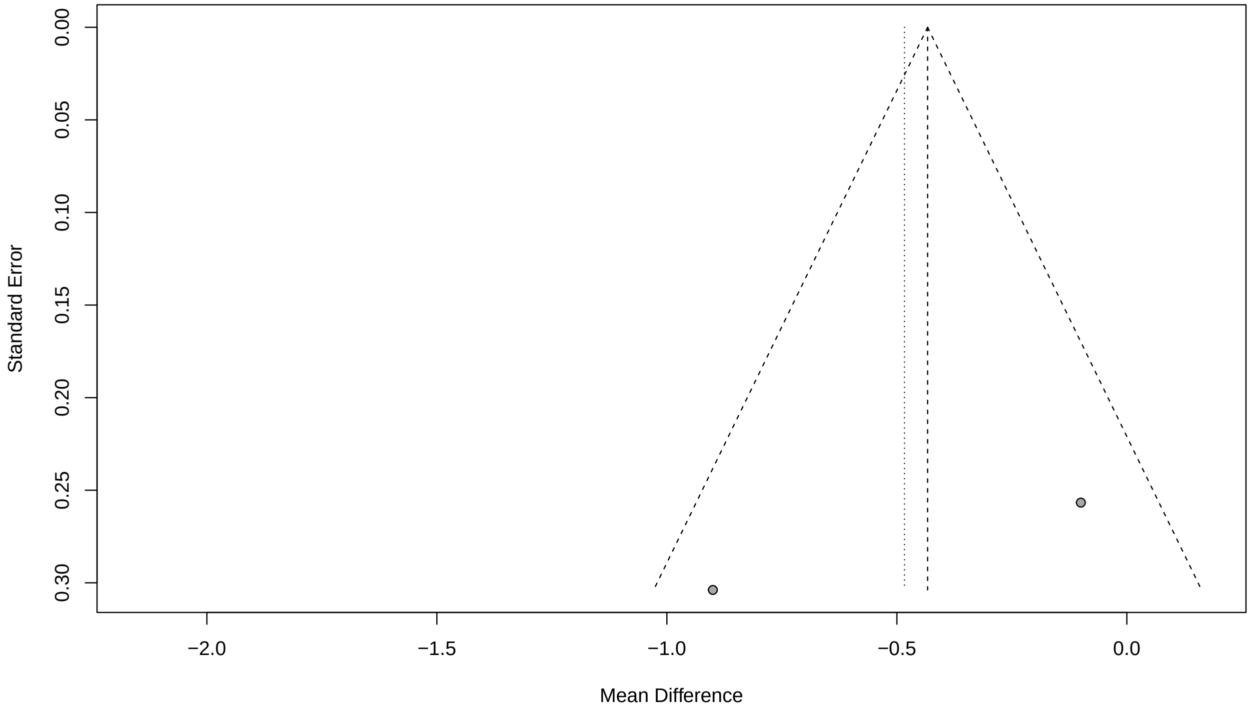


6.6.3 Trim and Fill

```r
#trimfill(los_metacont)
#forest(trimfill(los_metacont),
#       sortvar = TE)
```

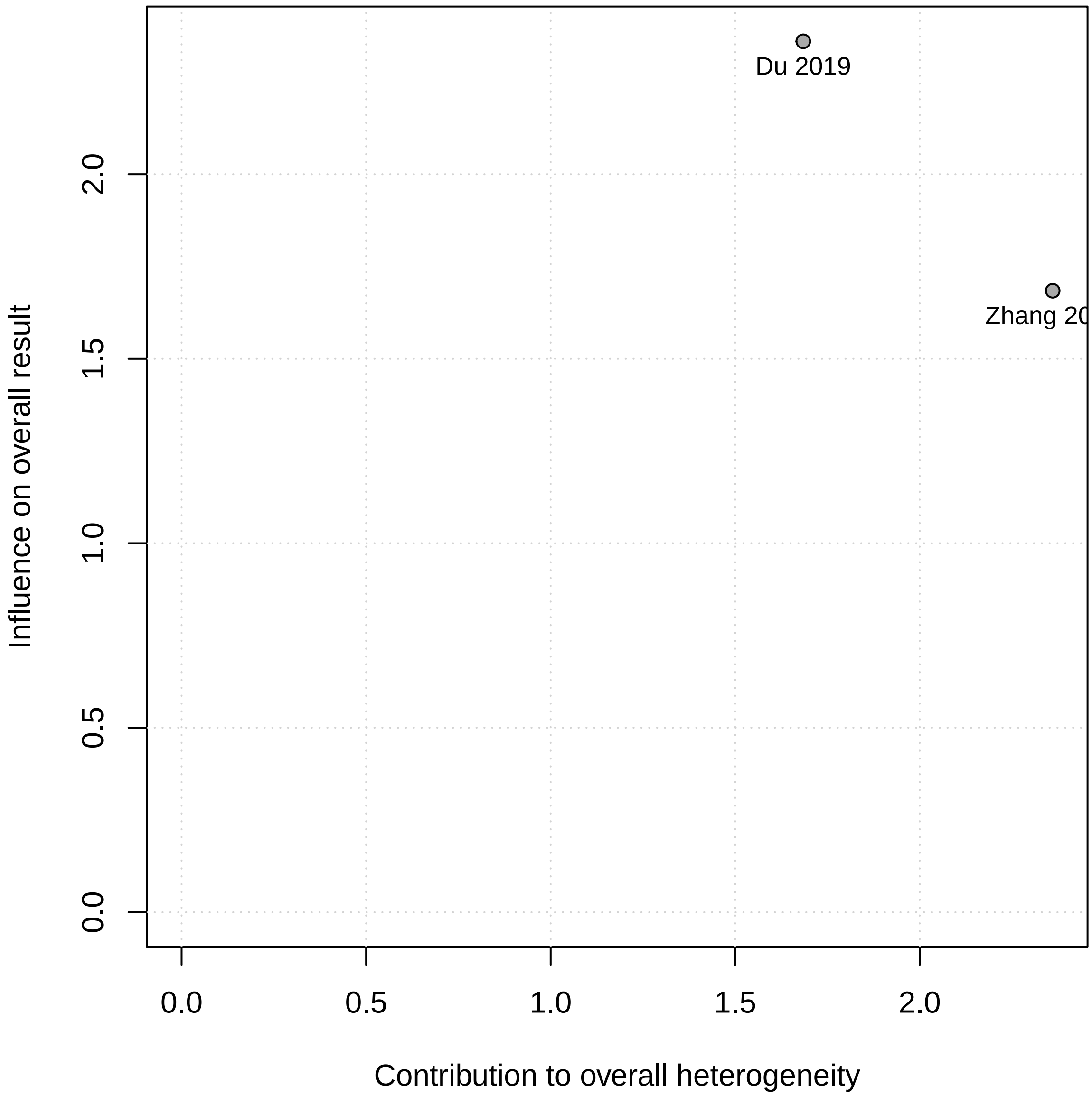
6.6.4 Funnel plot

```r
funnel((los_metacont))
```



6.6.5 Baujat

```
baujat(los_metacont, pos = 1)
```



6.6.6 Leave one out

```
metainf(los_metacont)
```

```
## Influential analysis (common effect model)
##
##                                    MD             95%-CI p-value   tau^2    tau
## Omitting Sur 2022             -0.4332 [-0.8175; -0.0488]  0.0272  0.2409  0.4908
## Omitting Tang 2023            -0.4332 [-0.8175; -0.0488]  0.0272  0.2409  0.4908
## Omitting Du 2019              -0.9000 [-1.4956; -0.3044]  0.0031
## Omitting Lechevallier 2003   -0.4332 [-0.8175; -0.0488]  0.0272  0.2409  0.4908
## Omitting Zhang 2022           -0.1000 [-0.6031;  0.4031]  0.6969
##
## Pooled estimate               -0.4332 [-0.8175; -0.0488]  0.0272  0.2409  0.4908
##                                  I^2
## Omitting Sur 2022              75.3%
## Omitting Tang 2023             75.3%
## Omitting Du 2019
## Omitting Lechevallier 2003    75.3%
## Omitting Zhang 2022
##
## Pooled estimate                75.3%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.7 Complications - All

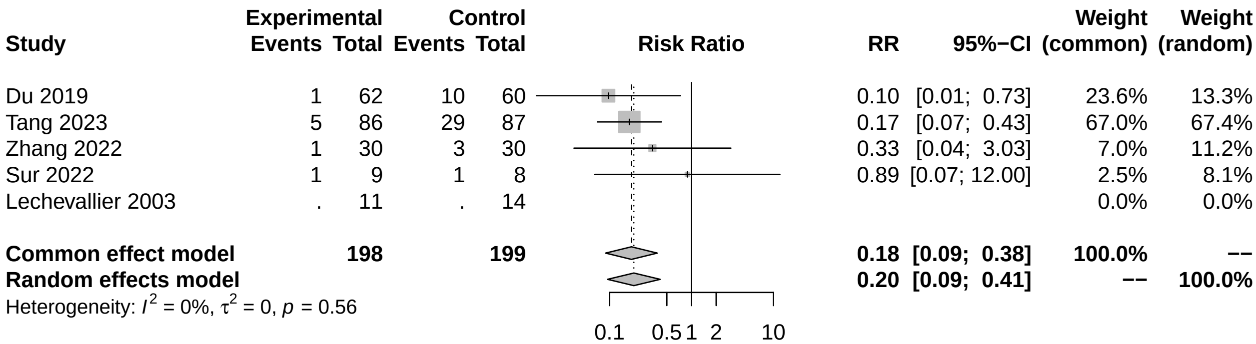
6.7.1 Meta-analysis

```
comp_metabin <- metabin(data = rct_only,
                          event.c = complications_postop_overall_n_control,
                        n.c = sample_size_control,
                        event.e = complications_postop_overall_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
comp_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 397
## Number of events: e = 51
##
##                          RR           95%-CI     z  p-value
## Common effect model  0.1847 [0.0895; 0.3815] -4.56 < 0.0001
## Random effects model 0.1978 [0.0944; 0.4143] -4.30 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 11.1598]; tau = 0 [0.0000; 3.3406]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.05    3  0.5623
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

6.7.2 Forest plot

```r
forest(comp_metabin,
       sortvar = TE)
```



6.7.3 Trim and Fill

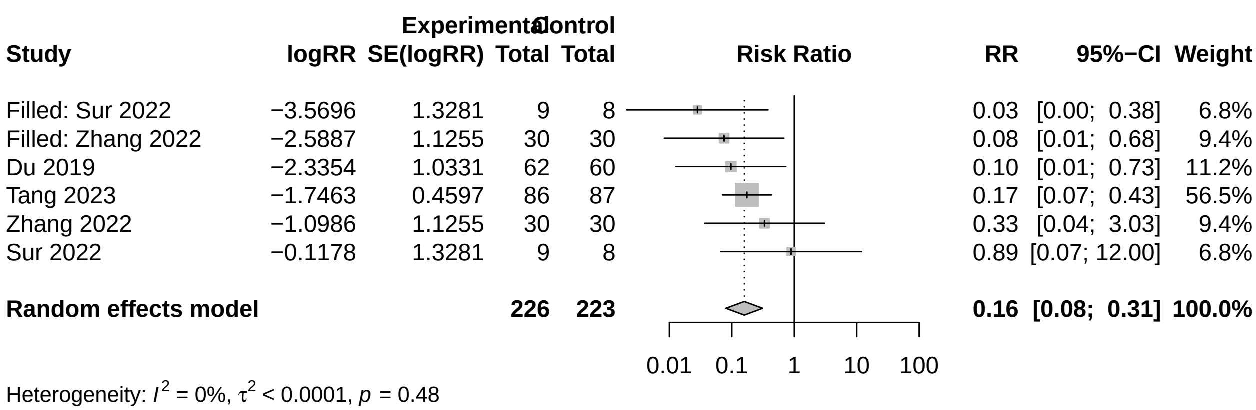
```r
trimfill(comp_metabin)
```

```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 6 (with 2 added studies)
## Number of observations: o = 449
## Number of events: e = 57
##
##                         RR           95%-CI     z  p-value
## Random effects model 0.1582 [0.0804; 0.3114] -5.34 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 < 0.0001 [0.0000; 7.1152]; tau = 0.0019 [0.0000; 2.6674]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  4.53    5  0.4765
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(comp_metabin),
       sortvar = TE)
```

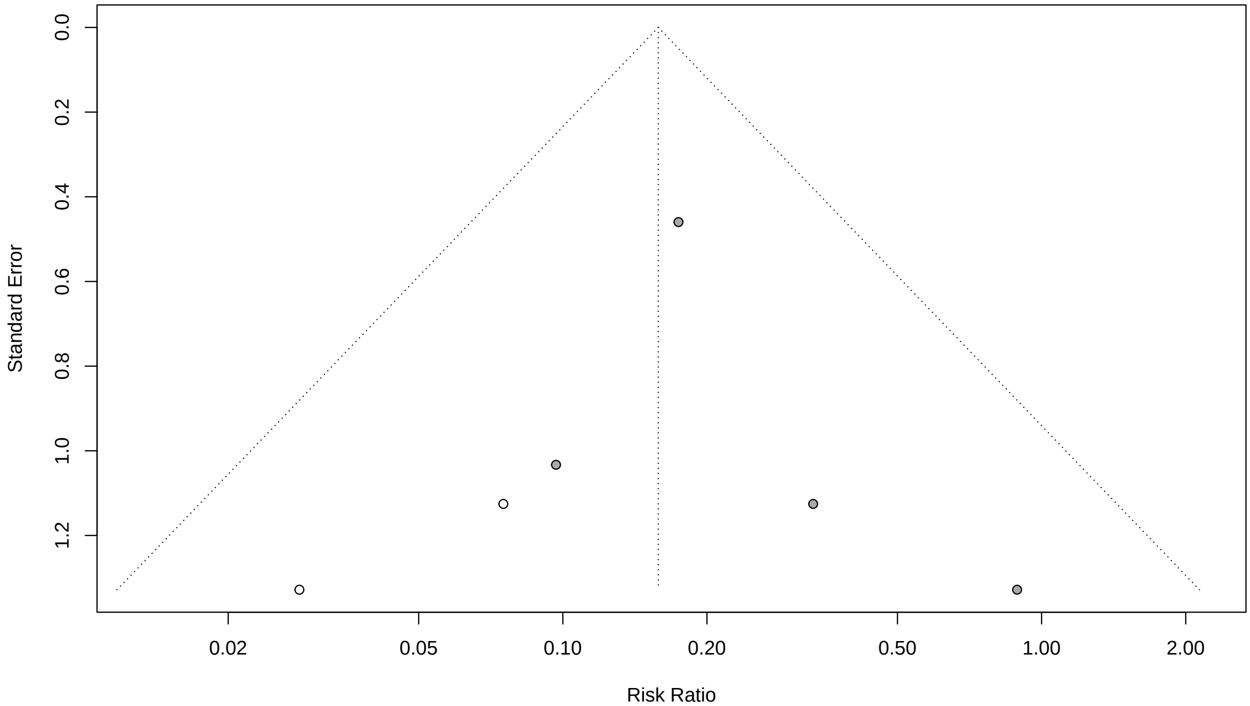
```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```



6.7.4 Funnel plot

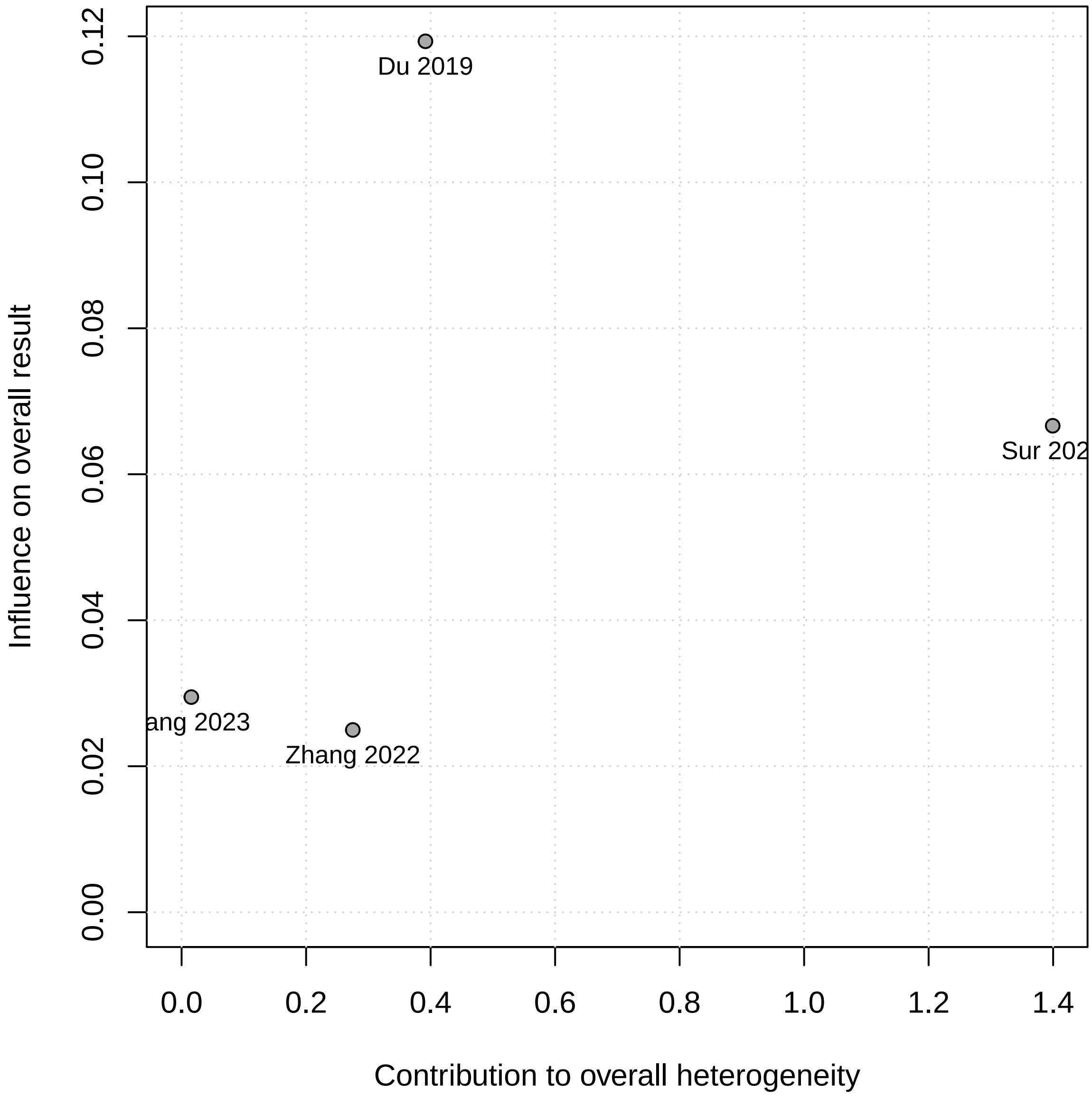
```
funnel(trimfill(comp_metabin))
```

```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```



6.7.5 Baujat

```r
baujat(comp_metabin, pos = 1)
```



6.7.6 Leave one out

```
metainf(comp_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI  p-value   tau^2     tau
## Omitting Sur 2022            0.1670 [0.0775; 0.3596] < 0.0001  0.0000  0.0000
## Omitting Tang 2023           0.2056 [0.0605; 0.6994]   0.0113  0.0000  0.0000
## Omitting Du 2019             0.2119 [0.0973; 0.4618] < 0.0001  0.0000  0.0000
## Omitting Lechevallier 2003   0.1847 [0.0895; 0.3815] < 0.0001  0.0000  0.0000
## Omitting Zhang 2022          0.1736 [0.0803; 0.3752] < 0.0001  0.0000  0.0012
##
## Pooled estimate              0.1847 [0.0895; 0.3815] < 0.0001  0.0000  0.0000
##                                I^2
## Omitting Sur 2022             0.0%
## Omitting Tang 2023            0.0%
## Omitting Du 2019              0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Zhang 2022           0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.8 Fever

6.8.1 Meta-analysis

```
fever_metabin <- metabin(data = rct_only,
                         event.c = fever_n_control,
                       n.c = sample_size_control,
                       event.e = fever_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
fever_metabin
```

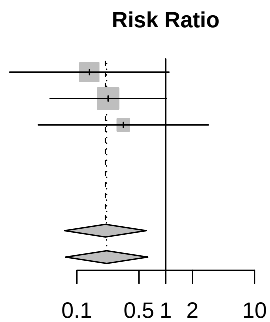
```
## Number of studies: k = 3
## Number of observations: o = 397
## Number of events: e = 23
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2096 [0.0728; 0.6031] -2.90  0.0038
## Random effects model 0.2165 [0.0747; 0.6277] -2.82  0.0048
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 6.4956]; tau = 0 [0.0000; 2.5486]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.33    2  0.8476
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

6.8.2 Forest plot

```r
forest(fever_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Du 2019	1	62	7	60	0.14	[0.02; 1.09]	37.3%	26.6%
Tang 2023	2	86	9	87	0.22	[0.05; 1.01]	46.9%	50.2%
Zhang 2022	1	30	3	30	0.33	[0.04; 3.03]	15.7%	23.3%
Sur 2022	0	9	0	8			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Common effect model		**198**		**199**	**0.21**	**[0.07; 0.60]**	**100.0%**	**−−**
Random effects model					**0.22**	**[0.07; 0.63]**	**−−**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.85$



6.8.3 Trim and Fill

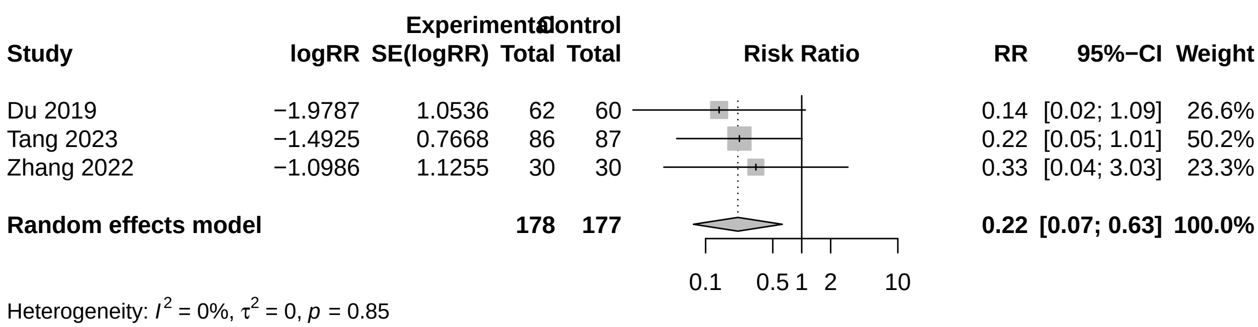
```r
trimfill(fever_metabin)
```

```
## Warning in trimfill.meta(fever_metabin): 2 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 355
## Number of events: e = 23
##
##                          RR           95%-CI     z p-value
## Random effects model 0.2165 [0.0747; 0.6277] -2.82  0.0048
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 6.4956]; tau = 0 [0.0000; 2.5486]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.33    2  0.8476
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(fever_metabin),
       sortvar = TE)
```

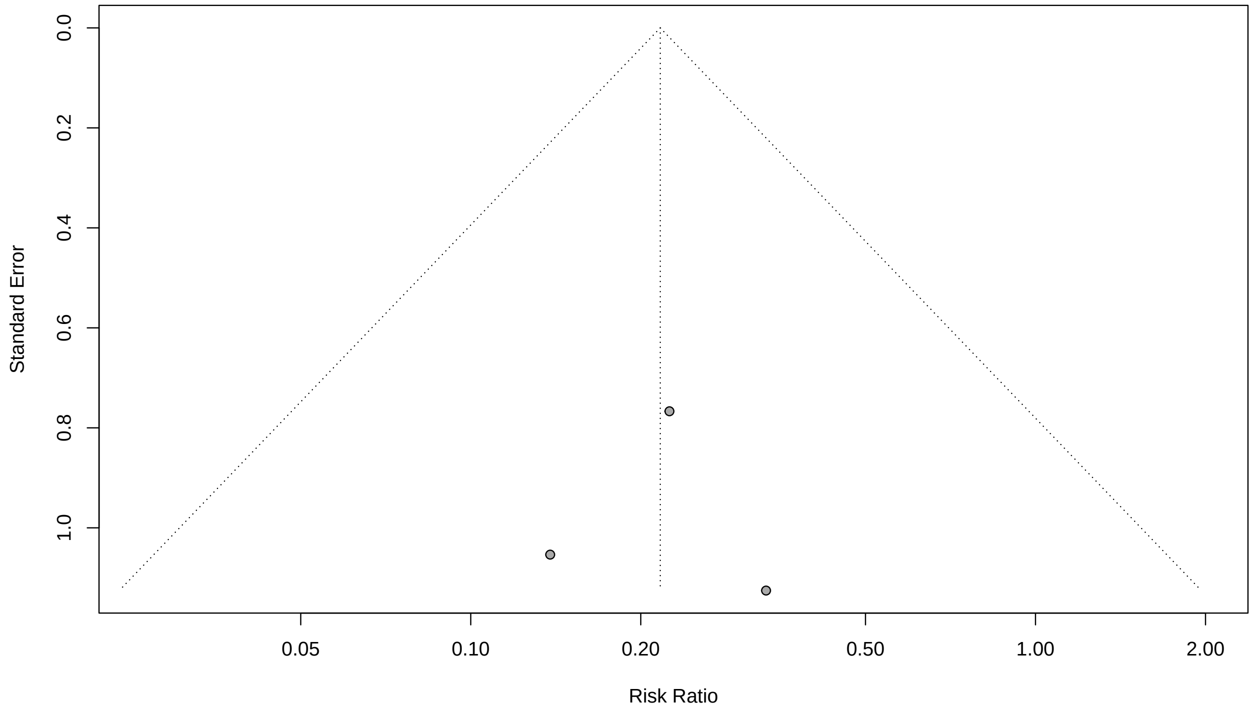
```
## Warning in trimfill.meta(fever_metabin): 2 observation(s) dropped due to
## missing values
```



6.8.4 Funnel plot

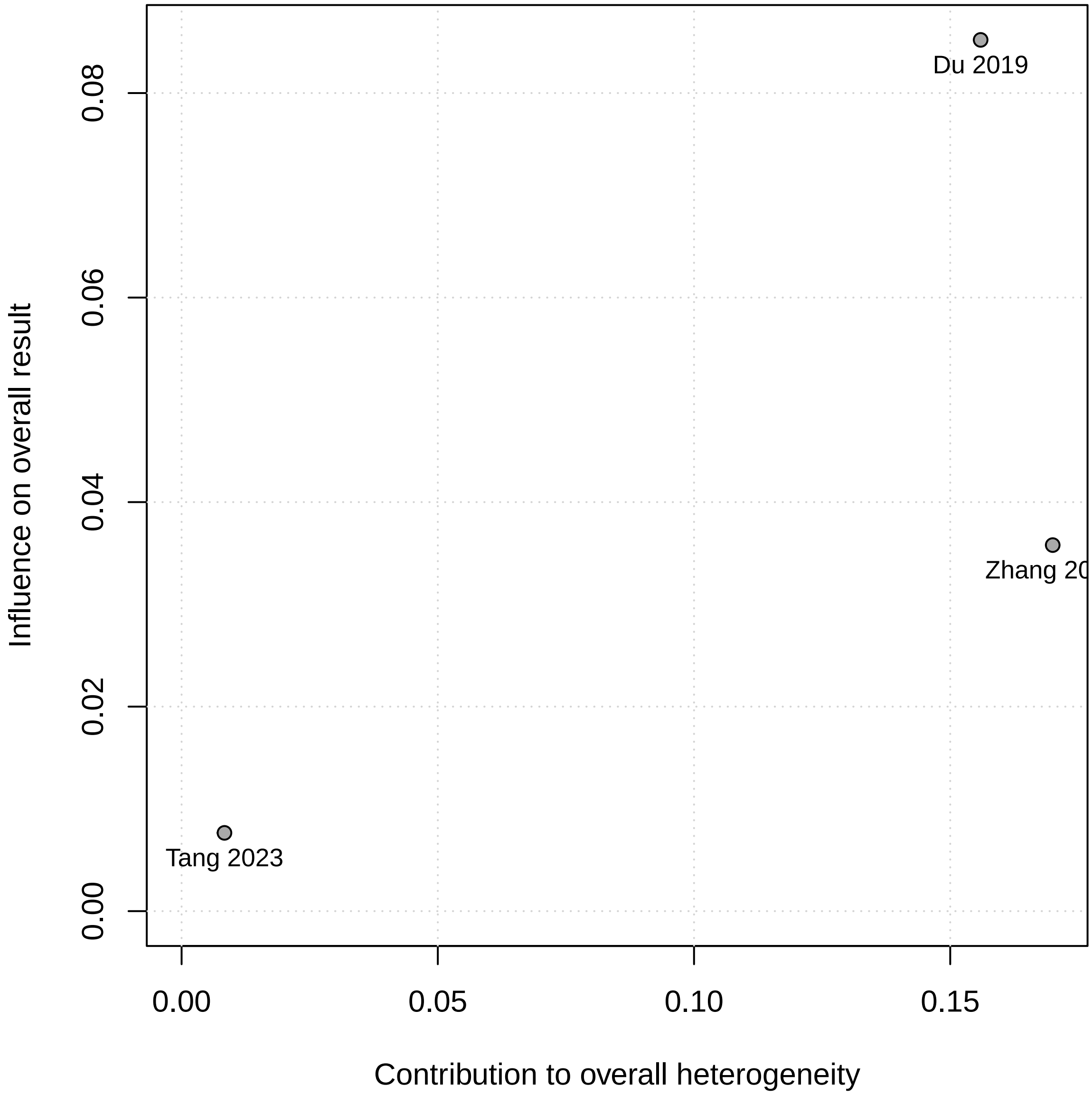
```
funnel(trimfill(fever_metabin))
```

```
## Warning in trimfill.meta(fever_metabin): 2 observation(s) dropped due to
## missing values
```



6.8.5 Baujat

```
baujat(fever_metabin, pos = 1)
```



6.8.6 Leave one out

```
metainf(fever_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Sur 2022            0.2096 [0.0728; 0.6031]  0.0038  0.0000  0.0000
## Omitting Tang 2023           0.1961 [0.0443; 0.8686]  0.0319  0.0000  0.0000
## Omitting Du 2019             0.2521 [0.0730; 0.8703]  0.0293  0.0000  0.0000
## Omitting Lechevallier 2003   0.2096 [0.0728; 0.6031]  0.0038  0.0000  0.0000
## Omitting Zhang 2022          0.1865 [0.0556; 0.6256]  0.0065  0.0000  0.0000
##
## Pooled estimate              0.2096 [0.0728; 0.6031]  0.0038  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Du 2019               0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Zhang 2022            0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.9 Infections

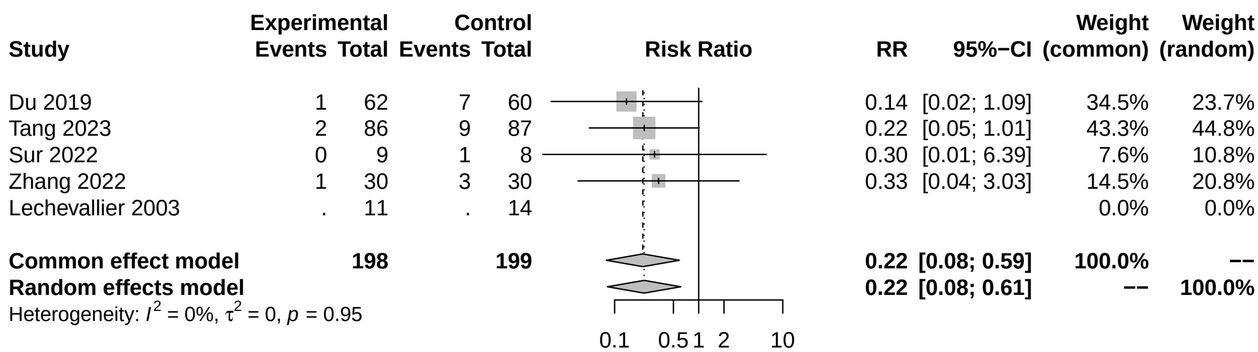
6.9.1 Meta-analysis

```
infection_metabin <- metabin(data = rct_only,
                         event.c = infection_n_control,
                       n.c = sample_size_control,
                       event.e = infection_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
infection_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 397
## Number of events: e = 24
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2165 [0.0797; 0.5882] -3.00  0.0027
## Random effects model 0.2241 [0.0820; 0.6126] -2.92  0.0036
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.8702]; tau = 0 [0.0000; 0.9328]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.37    3  0.9468
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.9.2 Forest plot

```r
forest(infection_metabin,
       sortvar = TE)
```



6.9.3 Trim and Fill

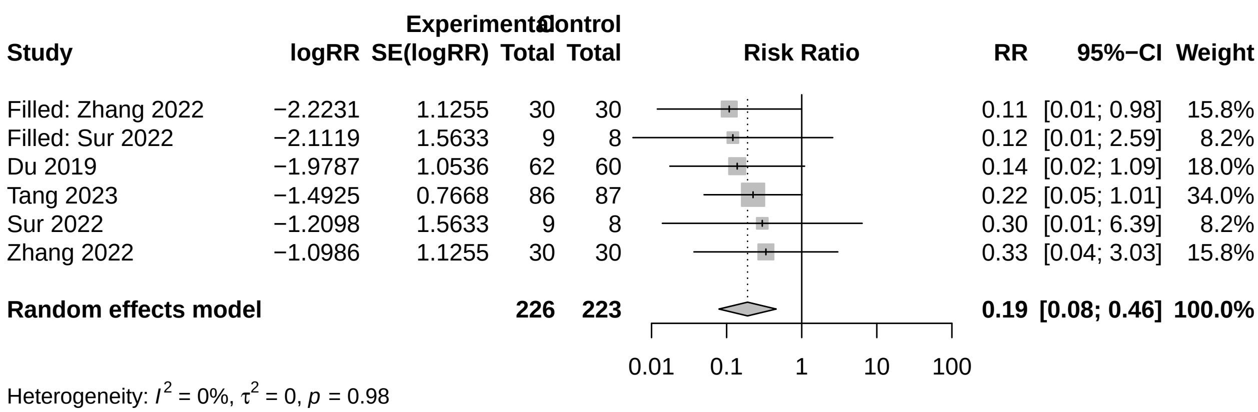
```r
trimfill(infection_metabin)
```

```
## Warning in trimfill.meta(infection_metabin): 1 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 6 (with 2 added studies)
## Number of observations: o = 449
## Number of events: e = 29
## 
##                          RR           95%-CI     z p-value
## Random effects model 0.1900 [0.0791; 0.4565] -3.71  0.0002
## 
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
## 
## Test of heterogeneity:
##     Q d.f. p-value
##  0.80    5  0.9767
## 
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(infection_metabin),
       sortvar = TE)
```

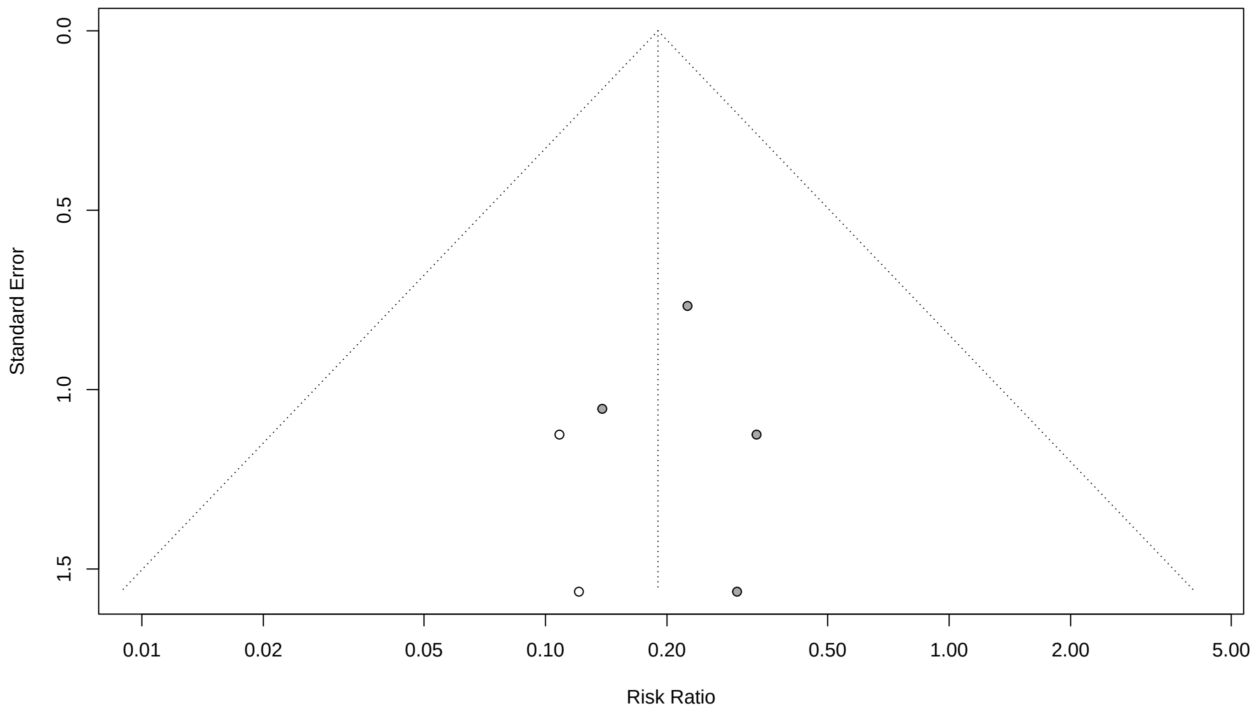
```
## Warning in trimfill.meta(infection_metabin): 1 observation(s) dropped due to
## missing values
```



6.9.4 Funnel plot

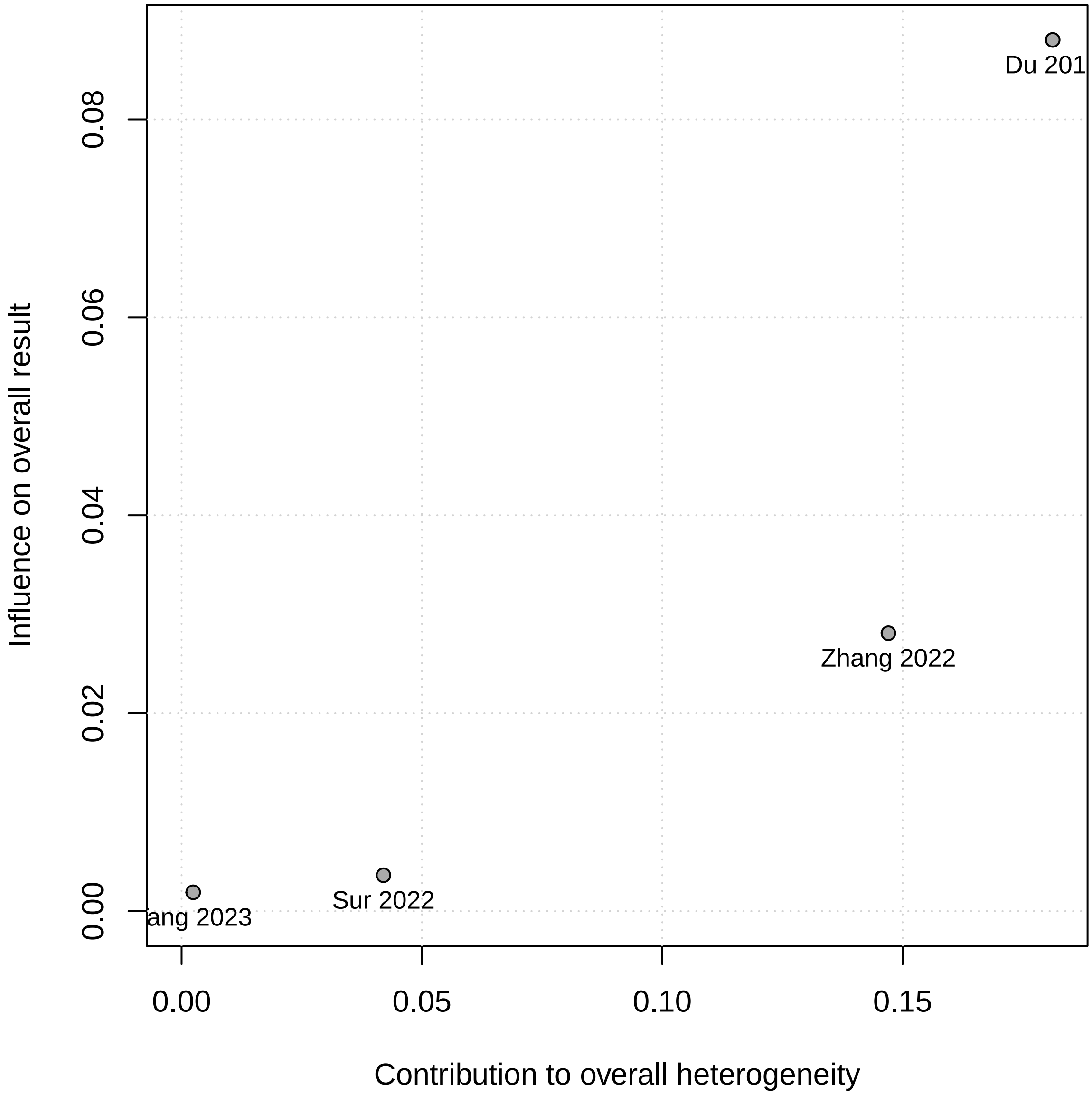
```
funnel(trimfill(infection_metabin))
```

```
## Warning in trimfill.meta(infection_metabin): 1 observation(s) dropped due to
## missing values
```



6.9.5 Baujat

```
baujat(infection_metabin, pos = 1)
```



6.9.6 Leave one out

```r
metainf(infection_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Sur 2022            0.2096 [0.0728; 0.6031]  0.0038  0.0000  0.0000
## Omitting Tang 2023           0.2101 [0.0551; 0.8015]  0.0224  0.0000  0.0000
## Omitting Du 2019             0.2577 [0.0816; 0.8134]  0.0208  0.0000  0.0000
## Omitting Lechevallier 2003   0.2165 [0.0797; 0.5882]  0.0027  0.0000  0.0000
## Omitting Zhang 2022          0.1966 [0.0638; 0.6061]  0.0046  0.0000  0.0000
##
## Pooled estimate              0.2165 [0.0797; 0.5882]  0.0027  0.0000  0.0000
##                                 I^2
## Omitting Sur 2022              0.0%
## Omitting Tang 2023             0.0%
## Omitting Du 2019               0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Zhang 2022            0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.10 Sepsis

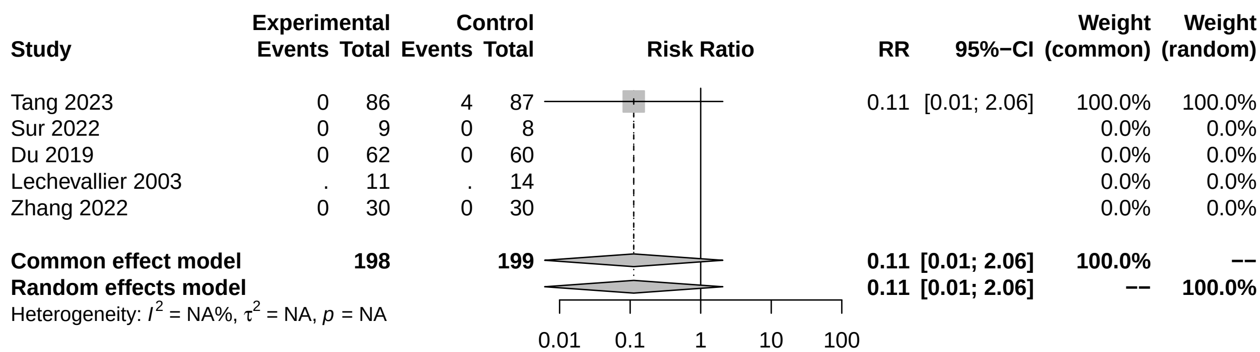
6.10.1 Meta-analysis

```r
sepsis_metabin <- metabin(data = rct_only,
                          event.c = sepsis_n_control,
                        n.c = sample_size_control,
                        event.e = sepsis_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
sepsis_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 4
##
##                          RR           95%-CI     z p-value
## Common effect model  0.1124 [0.0061; 2.0562] -1.47  0.1405
## Random effects model 0.1124 [0.0061; 2.0562] -1.47  0.1405
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.10.2 Forest plot

```r
forest(sepsis_metabin,
       sortvar = TE)
```

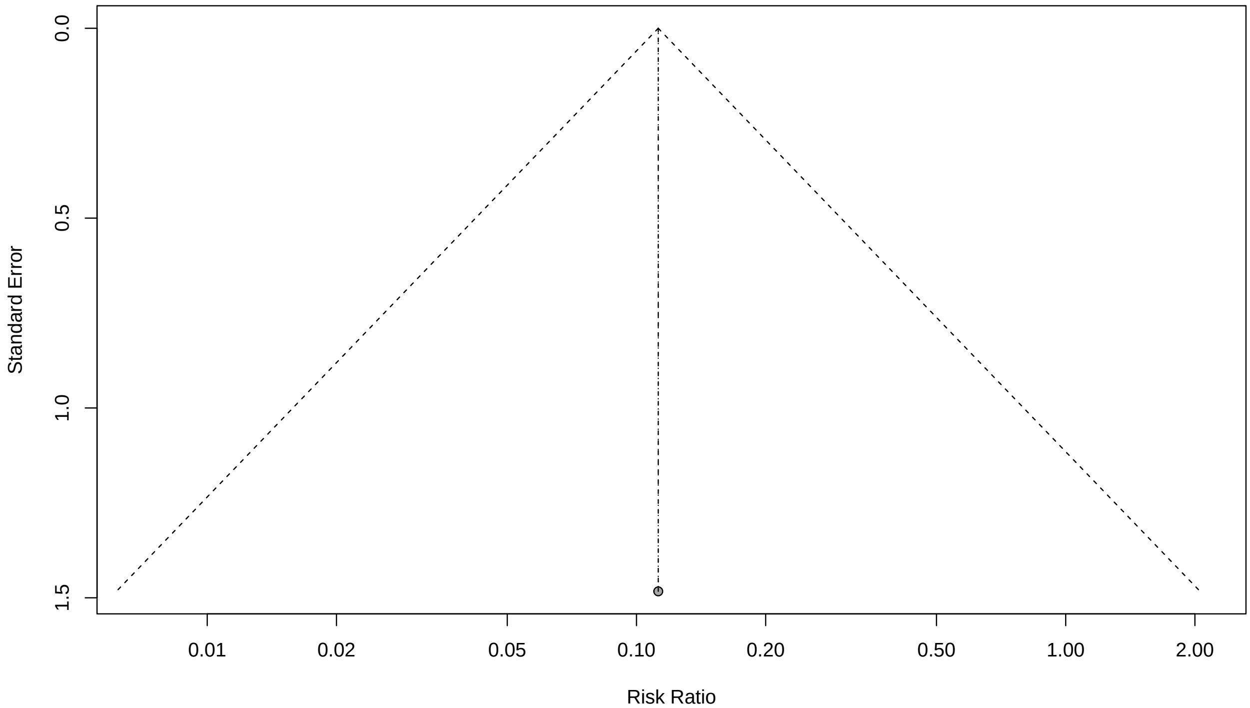


6.10.3 Trim and Fill

```
#trimfill(sepsis_metabin)
#forest(trimfill(sepsis_metabin),
#       sortvar = TE)
```

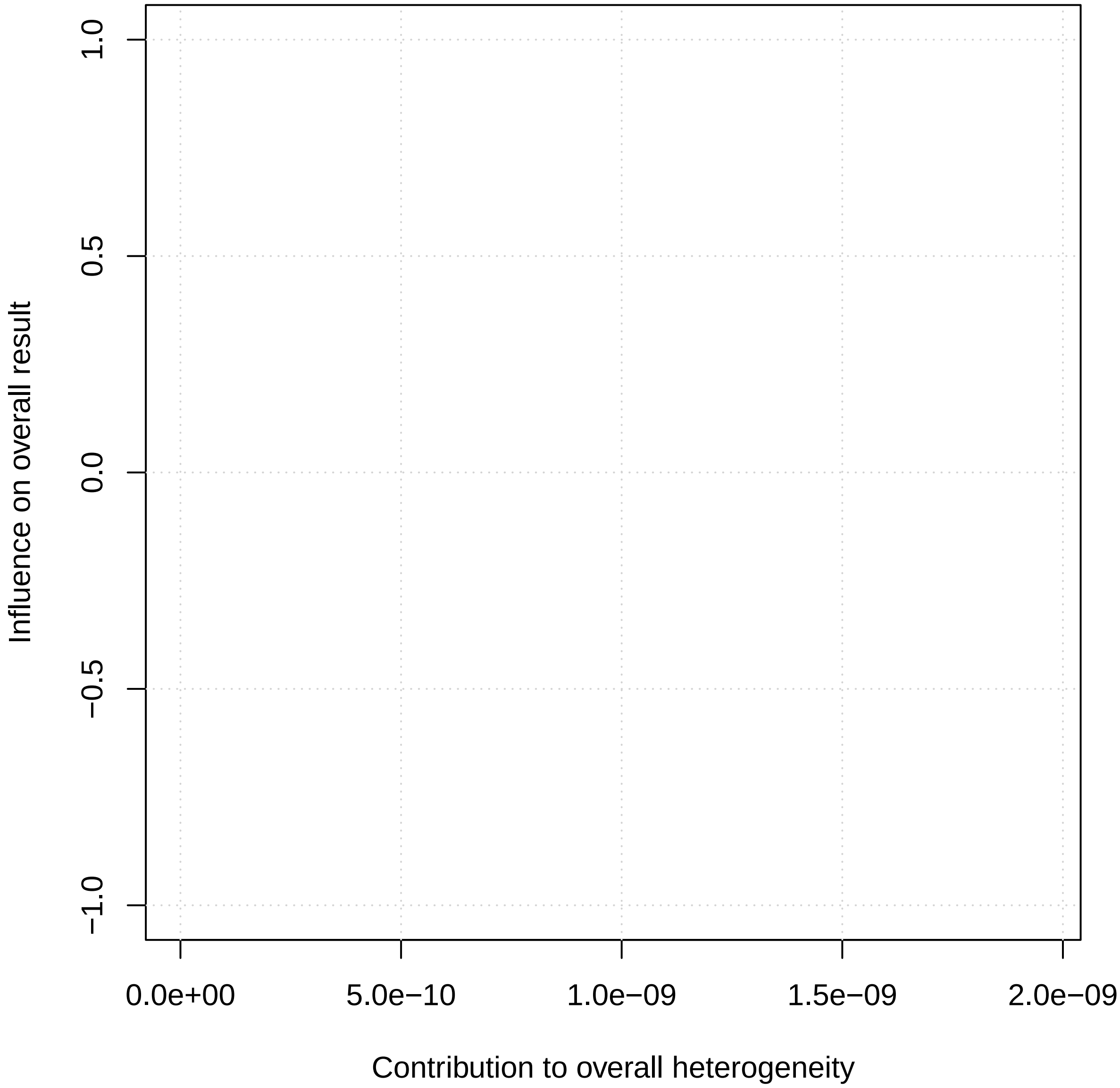
6.10.4 Funnel plot

```
funnel((sepsis_metabin))
```



6.10.5 Baujat

```
baujat(sepsis_metabin, pos = 1)
```



6.10.6 Leave one out

```r
metainf(sepsis_metabin)
```

```
## Influential analysis (common effect model)
## 
##                                   RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022             0.1124 [0.0061; 2.0562]  0.1405              
## Omitting Tang 2023                                                         
## Omitting Du 2019              0.1124 [0.0061; 2.0562]  0.1405              
## Omitting Lechevallier 2003   0.1124 [0.0061; 2.0562]  0.1405              
## Omitting Zhang 2022           0.1124 [0.0061; 2.0562]  0.1405              
## 
## Pooled estimate               0.1124 [0.0061; 2.0562]  0.1405              
## 
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.11 Abscess

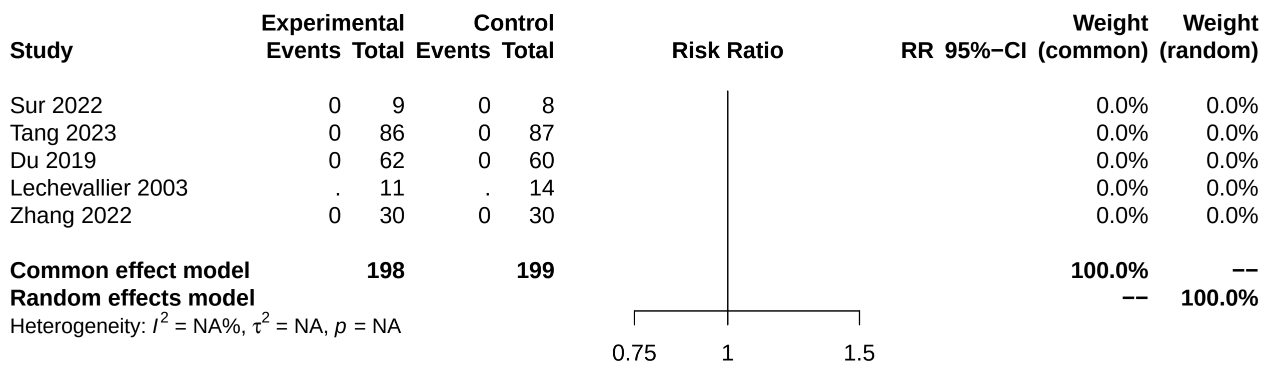
6.11.1 Meta-analysis

```
abscess_metabin <- metabin(data = rct_only,
                         event.c = abscess_n_control,
                       n.c = sample_size_control,
                       event.e = abscess_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
abscess_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.11.2 Forest plot

```r
forest(abscess_metabin,
       sortvar = TE)
```



6.11.3 Trim and Fill

```
#trimfill(abscess_metabin)
#forest(trimfill(abscess_metabin),
#       sortvar = TE)
```

6.11.4 Funnel plot

```
#funnel((abscess_metabin))
```

6.11.5 Baujat

```
#baujat(abscess_metabin, pos = 1)
```

6.11.6 Leave one out

```
#metainf(abscess_metabin)
```

6.12 Haematoma

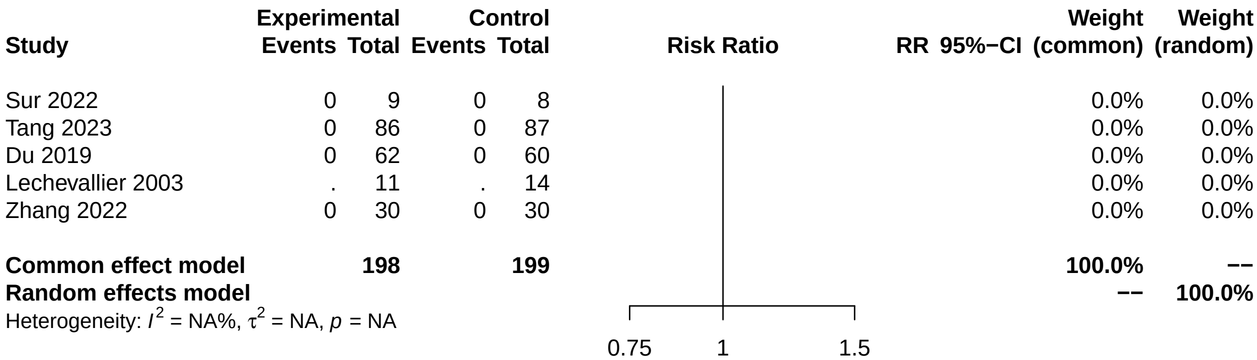
6.12.1 Meta-analysis

```r
haematoma_metabin <- metabin(data = rct_only,
                         event.c = hematoma_n_control,
                       n.c = sample_size_control,
                       event.e = hematoma_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
haematoma_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.12.2 Forest plot

```r
forest(haematoma_metabin,
       sortvar = TE)
```



6.12.3 Trim and Fill

```
#trimfill(haematoma_metabin)
#forest(trimfill(haematoma_metabin),
#       sortvar = TE)
```

6.12.4 Funnel plot

```
#funnel((haematoma_metabin))
```

6.12.5 Baujat

```
#baujat(haematoma_metabin, pos = 1)
```

6.12.6 Leave one out

```
#metainf(haematoma_metabin)
```

6.13 Pain

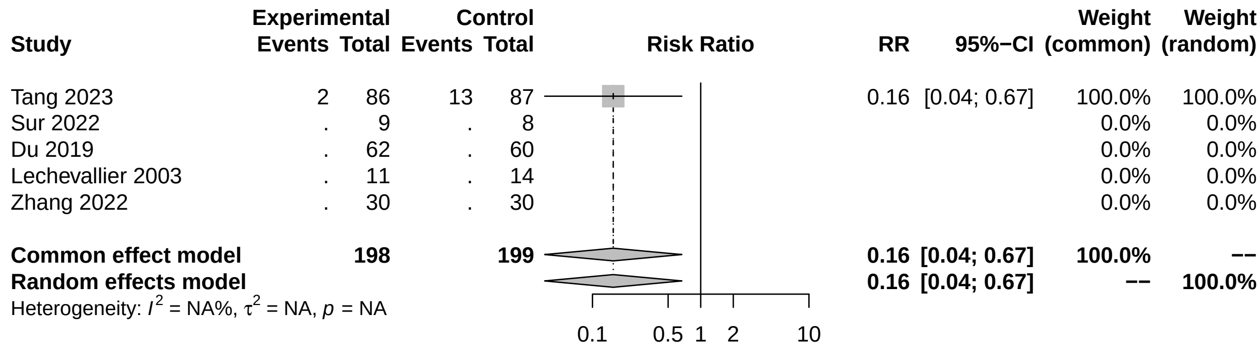
6.13.1 Meta-analysis

```
pain_metabin <- metabin(data = rct_only,
                          event.c = pain_n_control,
                        n.c = sample_size_control,
                        event.e = pain_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
pain_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 15
##
##                           RR           95%-CI     z p-value
## Common effect model  0.1556 [0.0362; 0.6692] -2.50  0.0124
## Random effects model 0.1556 [0.0362; 0.6692] -2.50  0.0124
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.13.2 Forest plot

```r
forest(pain_metabin,
       sortvar = TE)
```

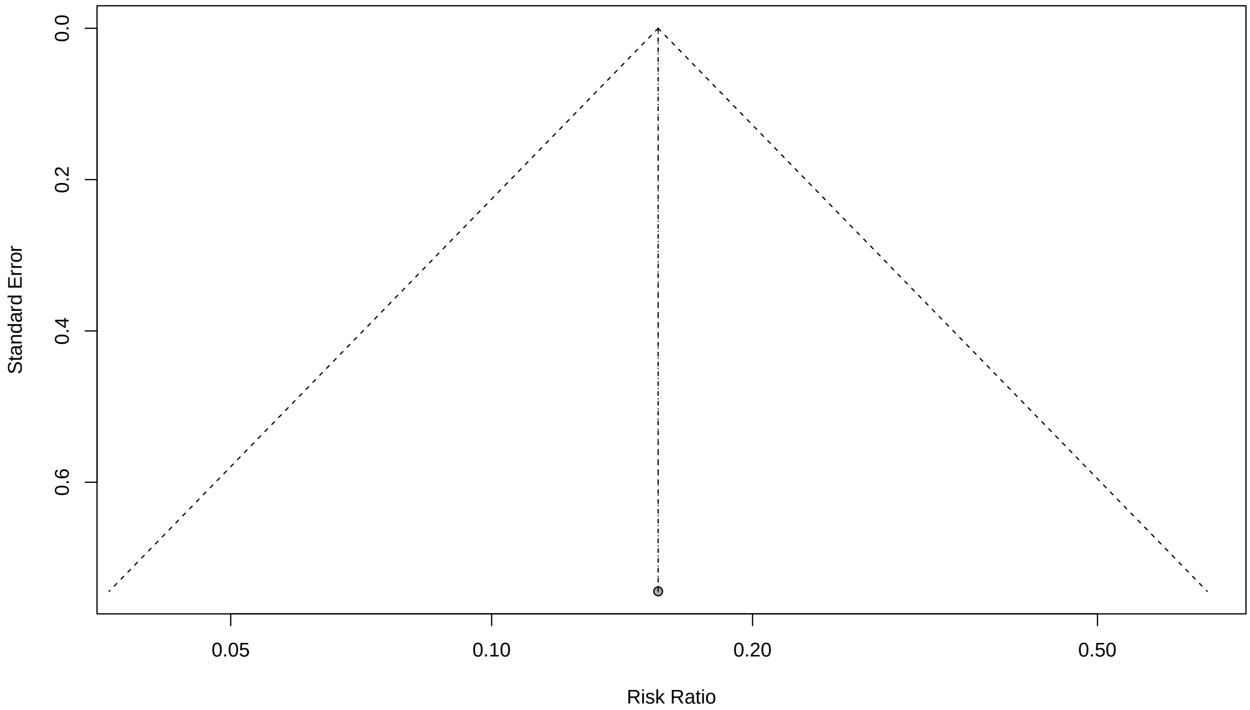


6.13.3 Trim and Fill

```
#trimfill(pain_metabin)
#forest(trimfill(pain_metabin),
#       sortvar = TE)
```

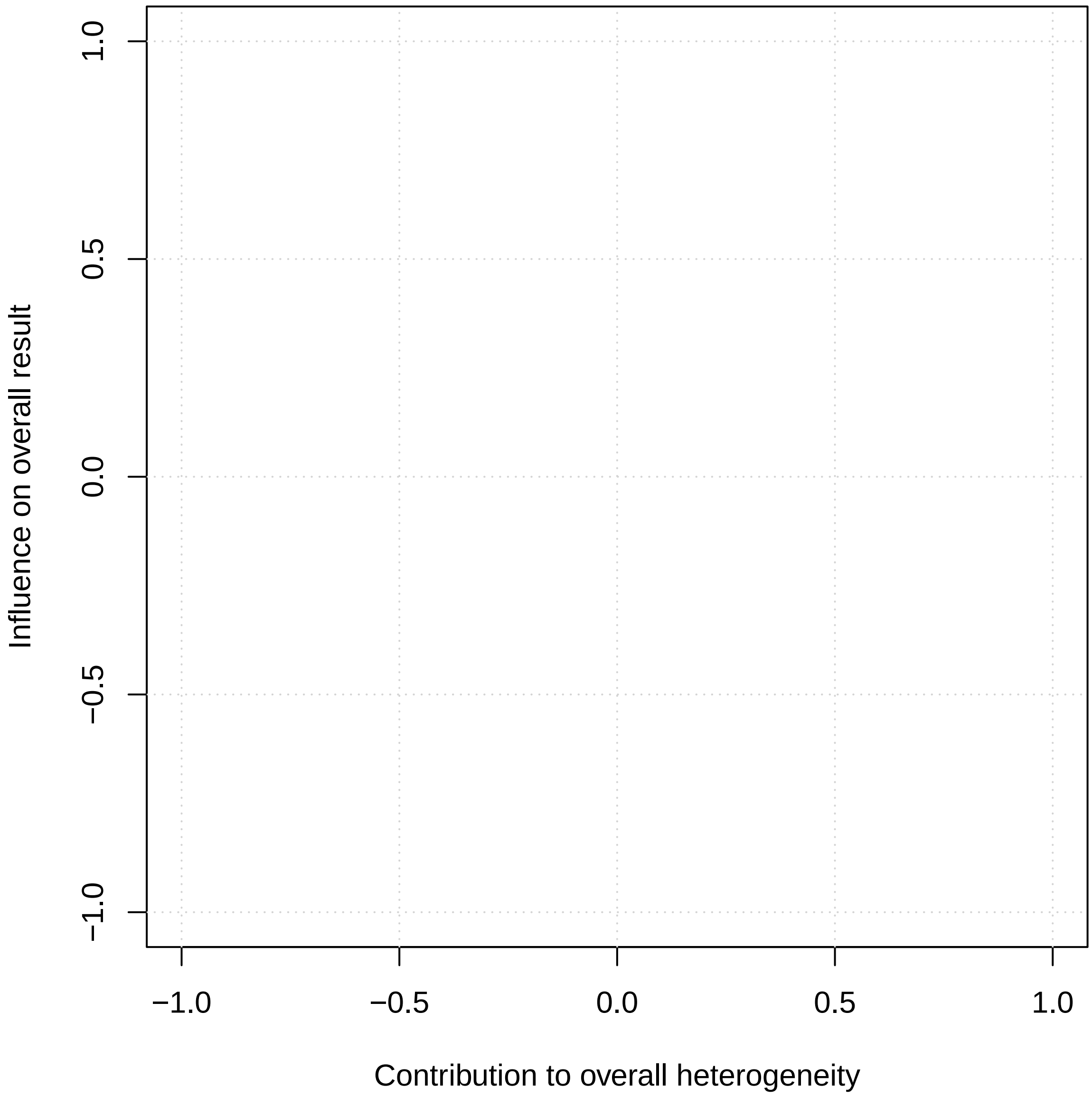
6.13.4 Funnel plot

```
funnel((pain_metabin))
```



6.13.5 Baujat

```
baujat(pain_metabin, pos = 1)
```



6.13.6 Leave one out

```
metainf(pain_metabin, pos = 1)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022            0.1556 [0.0362; 0.6692]  0.0124
## Omitting Tang 2023
## Omitting Du 2019             0.1556 [0.0362; 0.6692]  0.0124
## Omitting Lechevallier 2003   0.1556 [0.0362; 0.6692]  0.0124
## Omitting Zhang 2022          0.1556 [0.0362; 0.6692]  0.0124
##
## Pooled estimate              0.1556 [0.0362; 0.6692]  0.0124
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.14 Stricture

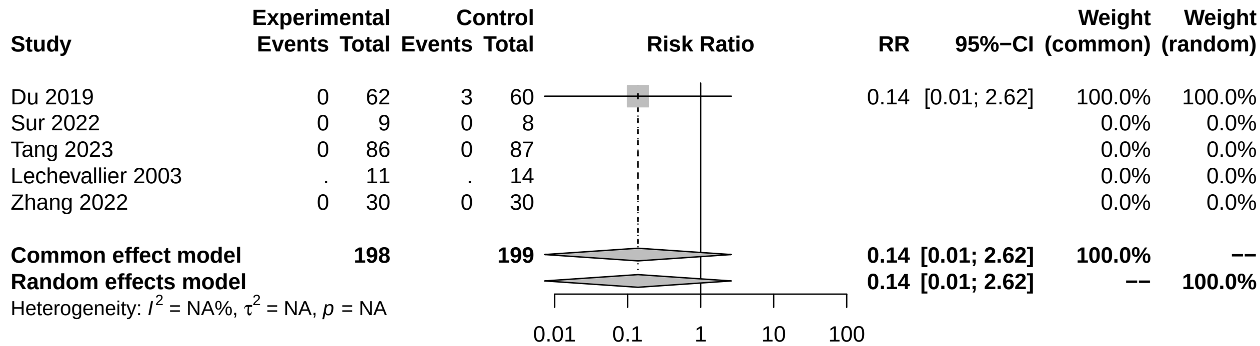
6.14.1 Meta-analysis

```
stricture_metabin <- metabin(data = rct_only,
                         event.c = stricture_n_control,
                       n.c = sample_size_control,
                       event.e = stricture_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
stricture_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 3
##
##                          RR           95%-CI     z p-value
## Common effect model  0.1383 [0.0073; 2.6222] -1.32  0.1876
## Random effects model 0.1383 [0.0073; 2.6211] -1.32  0.1875
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.14.2 Forest plot

```r
forest(stricture_metabin,
       sortvar = TE)
```

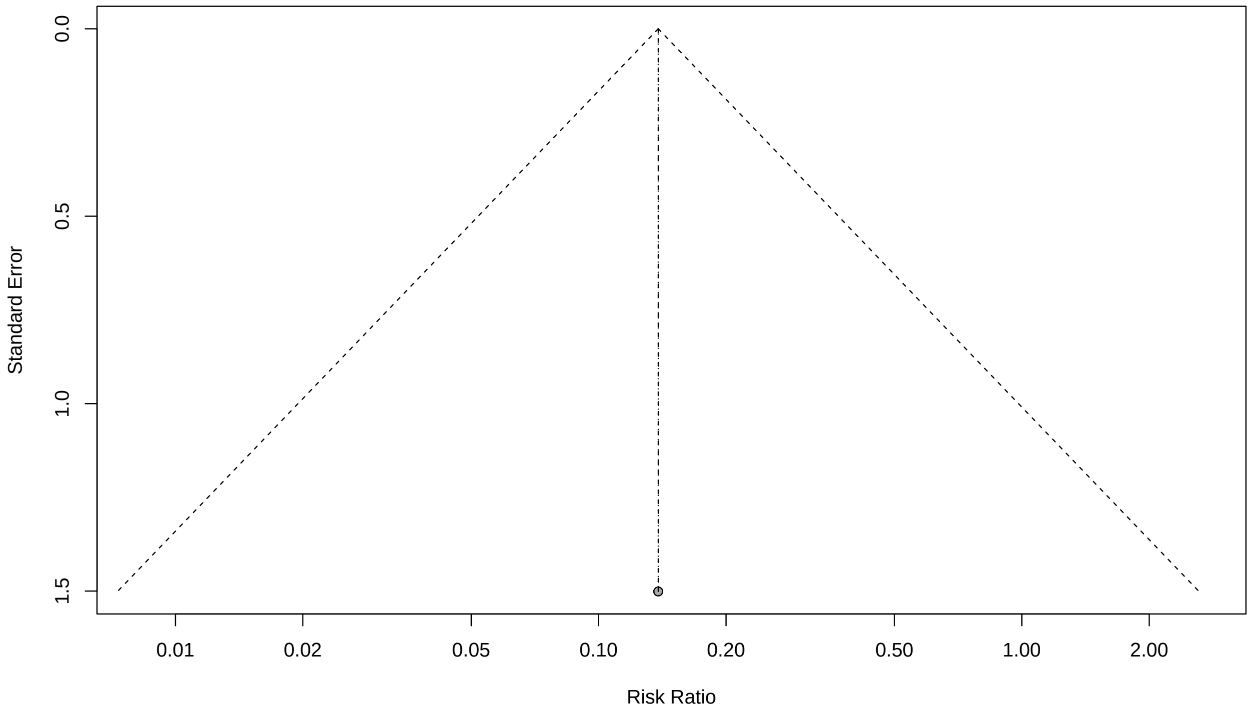


6.14.3 Trim and Fill

```
#trimfill(stricture_metabin)
#forest(trimfill(stricture_metabin),
#       sortvar = TE)
```

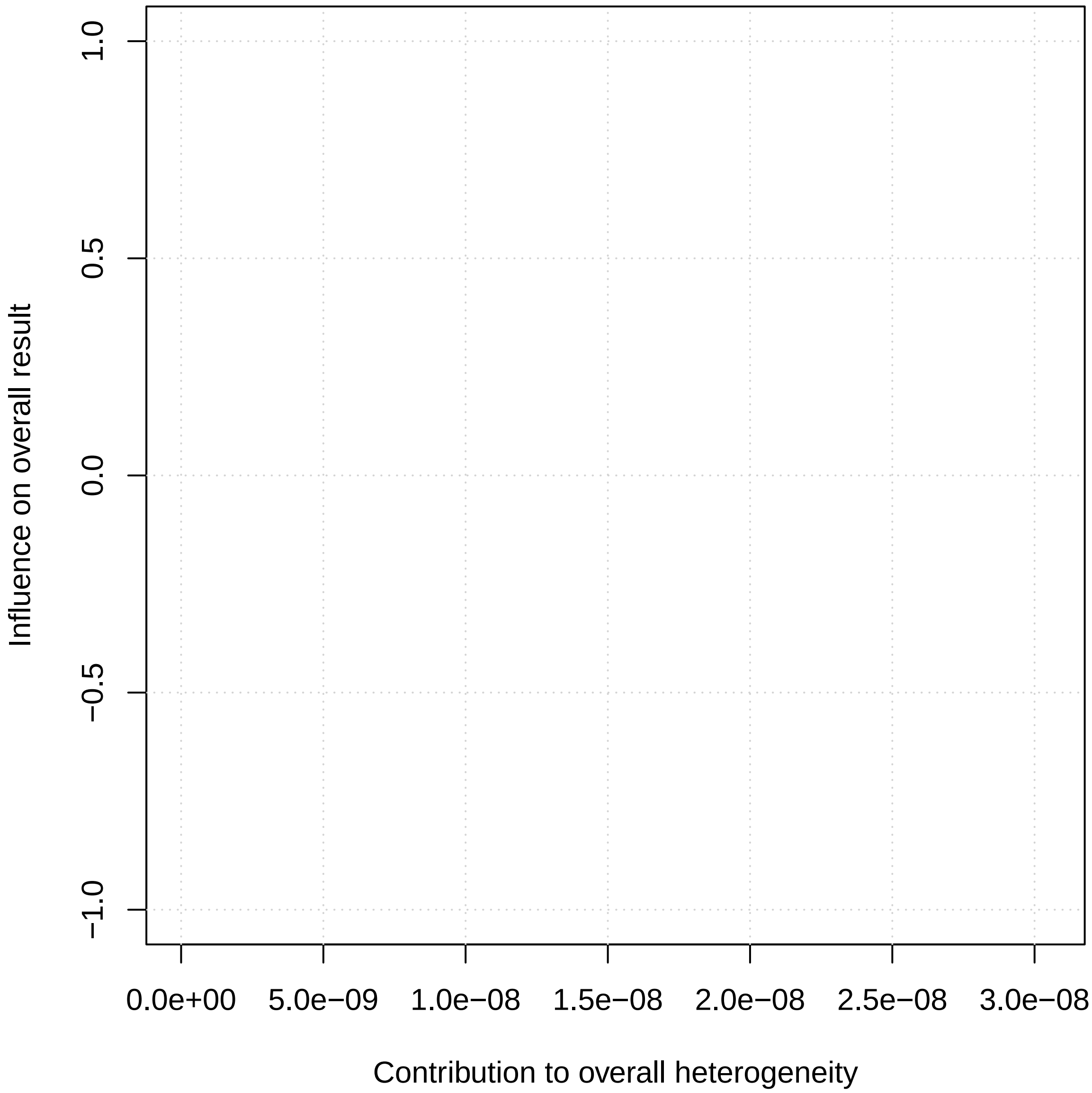
6.14.4 Funnel plot

```
funnel((stricture_metabin))
```



6.14.5 Baujat

```r
baujat(stricture_metabin, pos = 1)
```



6.14.6 Leave one out

```r
metainf(stricture_metabin)
```

```
## Influential analysis (common effect model)
##
##                                    RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022            0.1383 [0.0073; 2.6222]  0.1876
## Omitting Tang 2023           0.1383 [0.0073; 2.6222]  0.1876
## Omitting Du 2019
## Omitting Lechevallier 2003   0.1383 [0.0073; 2.6222]  0.1876
## Omitting Zhang 2022          0.1383 [0.0073; 2.6222]  0.1876
##
## Pooled estimate              0.1383 [0.0073; 2.6222]  0.1876
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.15 Embolisation required

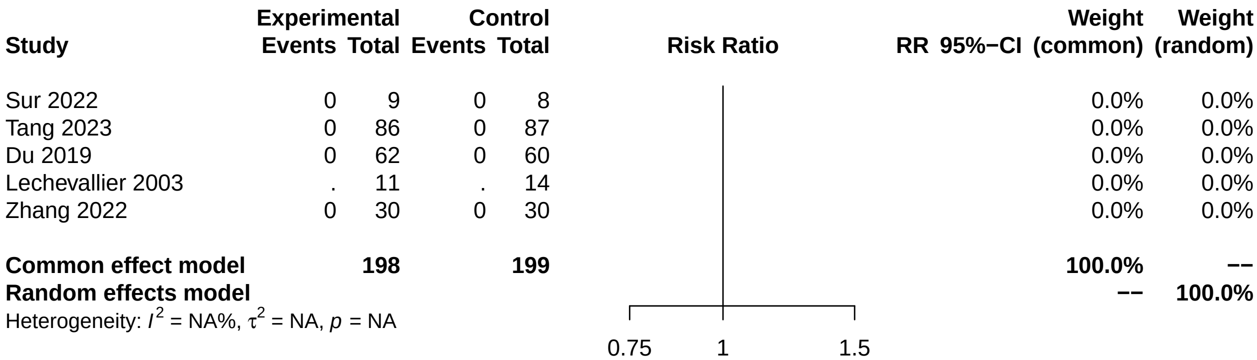
6.15.1 Meta-analysis

```
ir_embolisation_metabin <- metabin(data = rct_only,
                          event.c = embolism_ir_intervention_n_control,
                        n.c = sample_size_control,
                        event.e = embolism_ir_intervention_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
ir_embolisation_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                      RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.15.2 Forest plot

```
forest(ir_embolisation_metabin,
       sortvar = TE)
```



6.15.3 Trim and Fill

```
#trimfill(ir_embolisation_metabin)
#forest(trimfill(ir_embolisation_metabin),
#       sortvar = TE)
```

6.15.4 Funnel plot

```
#funnel((ir_embolisation_metabin))
```

6.15.5 Baujat

```
#baujat(ir_embolisation_metabin, pos = 1)
```

6.15.6 Leave one out

```
#metainf(ir_embolisation_metabin)
```

6.16 Transfusion

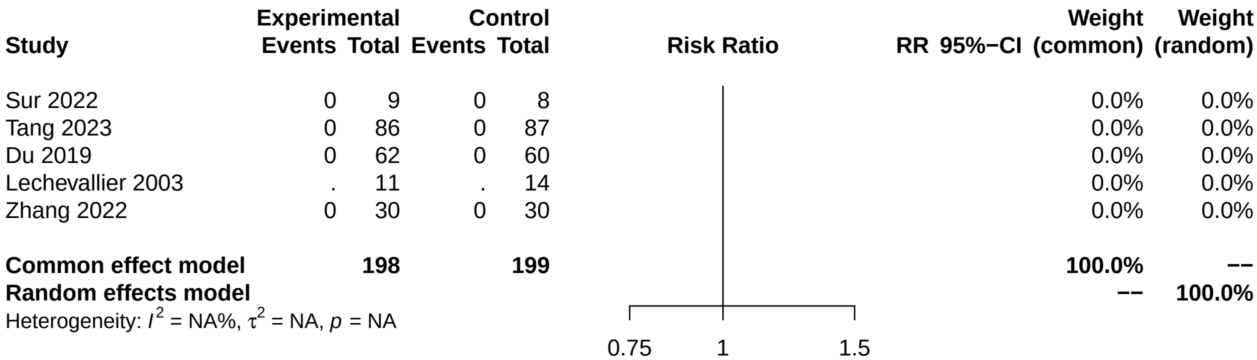
6.16.1 Meta-analysis

```r
transfusion_metabin <- metabin(data = rct_only,
                         event.c = transfusion_n_control,
                       n.c = sample_size_control,
                       event.e = transfusion_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
transfusion_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                      RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.16.2 Forest plot

```r
forest(transfusion_metabin,
       sortvar = TE)
```



6.16.3 Trim and Fill

```
#trimfill(transfusion_metabin)
#forest(trimfill(transfusion_metabin),
#       sortvar = TE)
```

6.16.4 Funnel plot

```
#funnel((transfusion_metabin))
```

6.16.5 Baujat

```
#baujat(transfusion_metabin, pos = 1)
```

6.16.6 Leave one out

```
#metainf(transfusion_metabin)
```

6.17 Clavien I

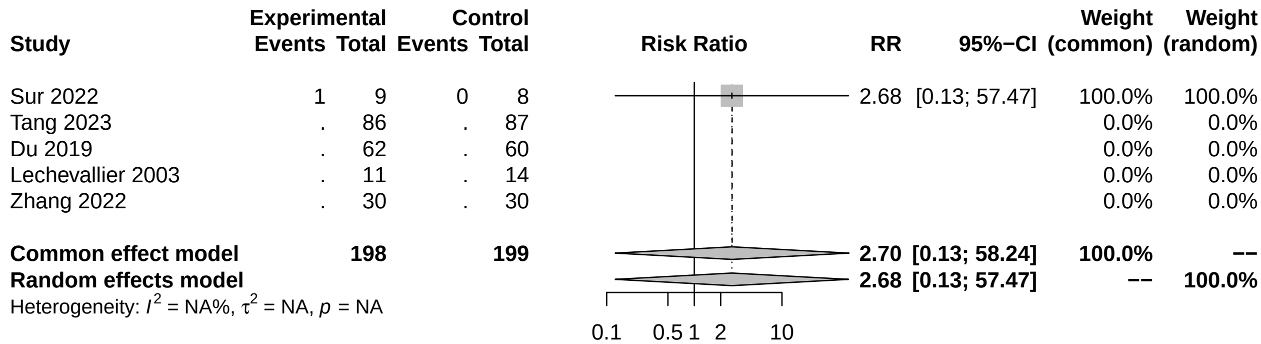
6.17.1 Meta-analysis

```
clav_i_metabin <- metabin(data = rct_only,
                           event.c = clavien_i_n_control,
                         n.c = sample_size_control,
                         event.e = clavien_i_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
clav_i_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 1
##
##                          RR            95%-CI    z p-value
## Common effect model  2.7000 [0.1252; 58.2391] 0.63  0.5262
## Random effects model 2.6842 [0.1254; 57.4724] 0.63  0.5276
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.17.2 Forest plot

```r
forest(clav_i_metabin,
       sortvar = TE)
```

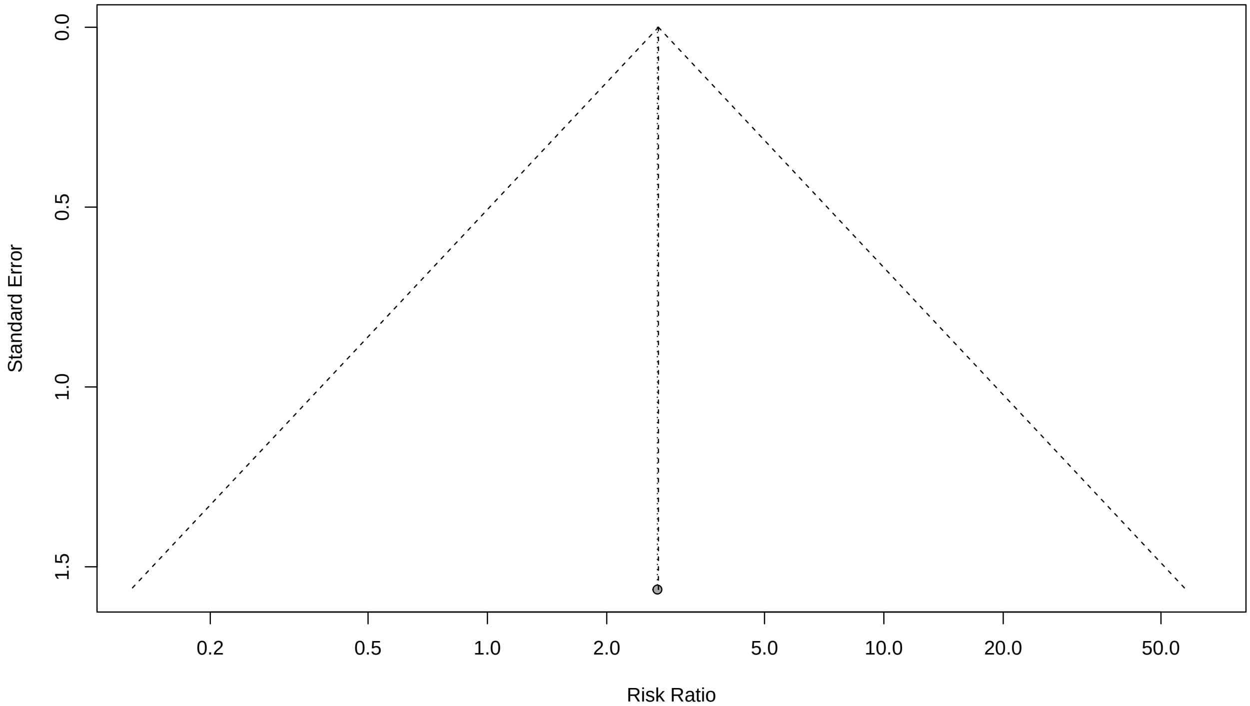


6.17.3 Trim and Fill

```
#trimfill(clav_i_metabin)
#forest(trimfill(clav_i_metabin),
#       sortvar = TE)
```

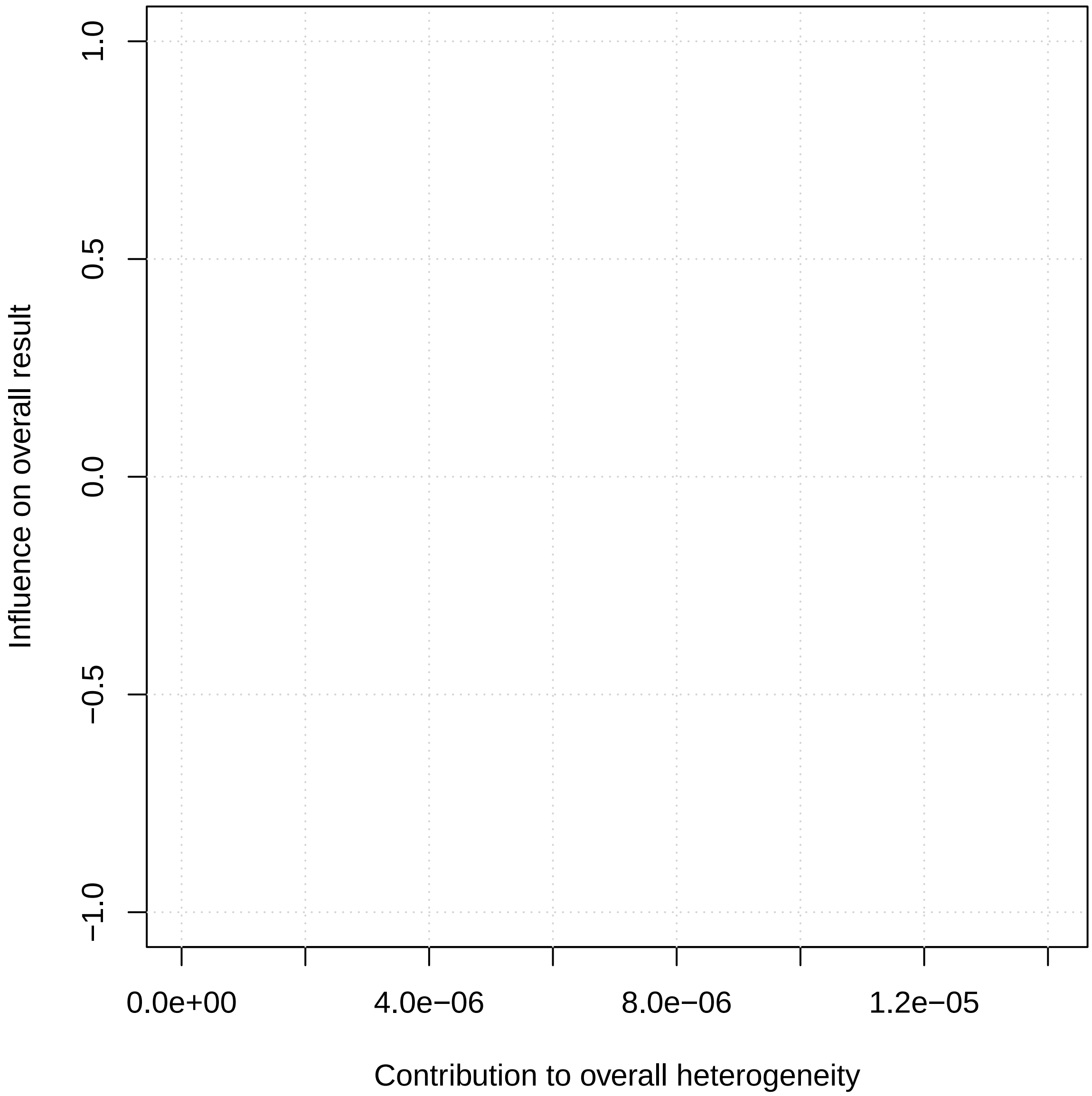
6.17.4 Funnel plot

```
funnel((clav_i_metabin))
```



6.17.5 Baujat

```
baujat(clav_i_metabin, pos = 1)
```



6.17.6 Leave one out

```
metainf(clav_i_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR            95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022
## Omitting Tang 2023           2.7000 [0.1252; 58.2391]  0.5262
## Omitting Du 2019             2.7000 [0.1252; 58.2391]  0.5262
## Omitting Lechevallier 2003   2.7000 [0.1252; 58.2391]  0.5262
## Omitting Zhang 2022          2.7000 [0.1252; 58.2391]  0.5262
##
## Pooled estimate              2.7000 [0.1252; 58.2391]  0.5262
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.18 Clavien II

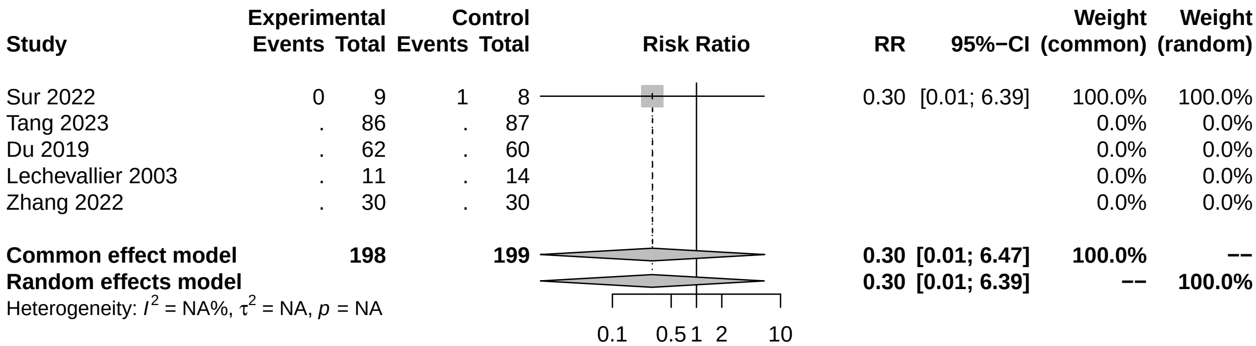
6.18.1 Meta-analysis

```
clav_ii_metabin <- metabin(data = rct_only,
                          event.c = clavien_ii_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_ii_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_ii_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 1
##
##                           RR           95%-CI     z p-value
## Common effect model  0.3000 [0.0139; 6.4710] -0.77  0.4423
## Random effects model 0.2982 [0.0139; 6.3858] -0.77  0.4390
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

6.18.2 Forest plot

```r
forest(clav_ii_metabin,
       sortvar = TE)
```

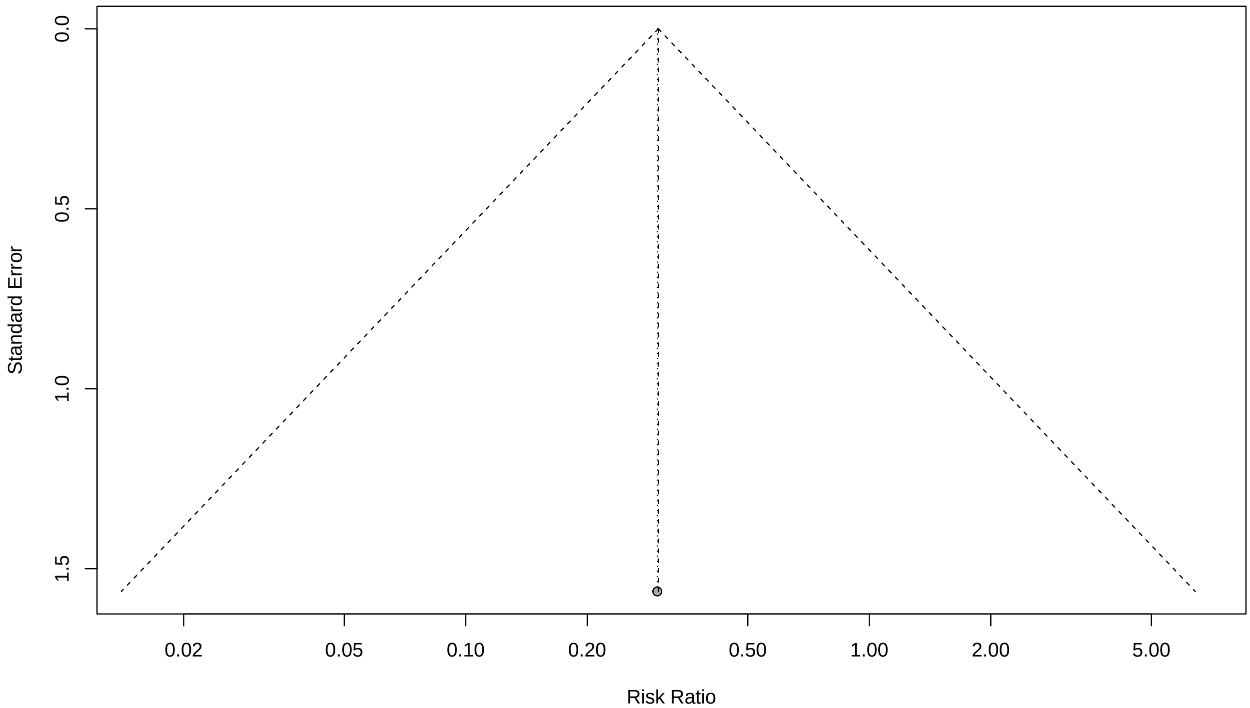


6.18.3 Trim and Fill

```
#trimfill(clav_ii_metabin)
#forest(trimfill(clav_ii_metabin),
#       sortvar = TE)
```

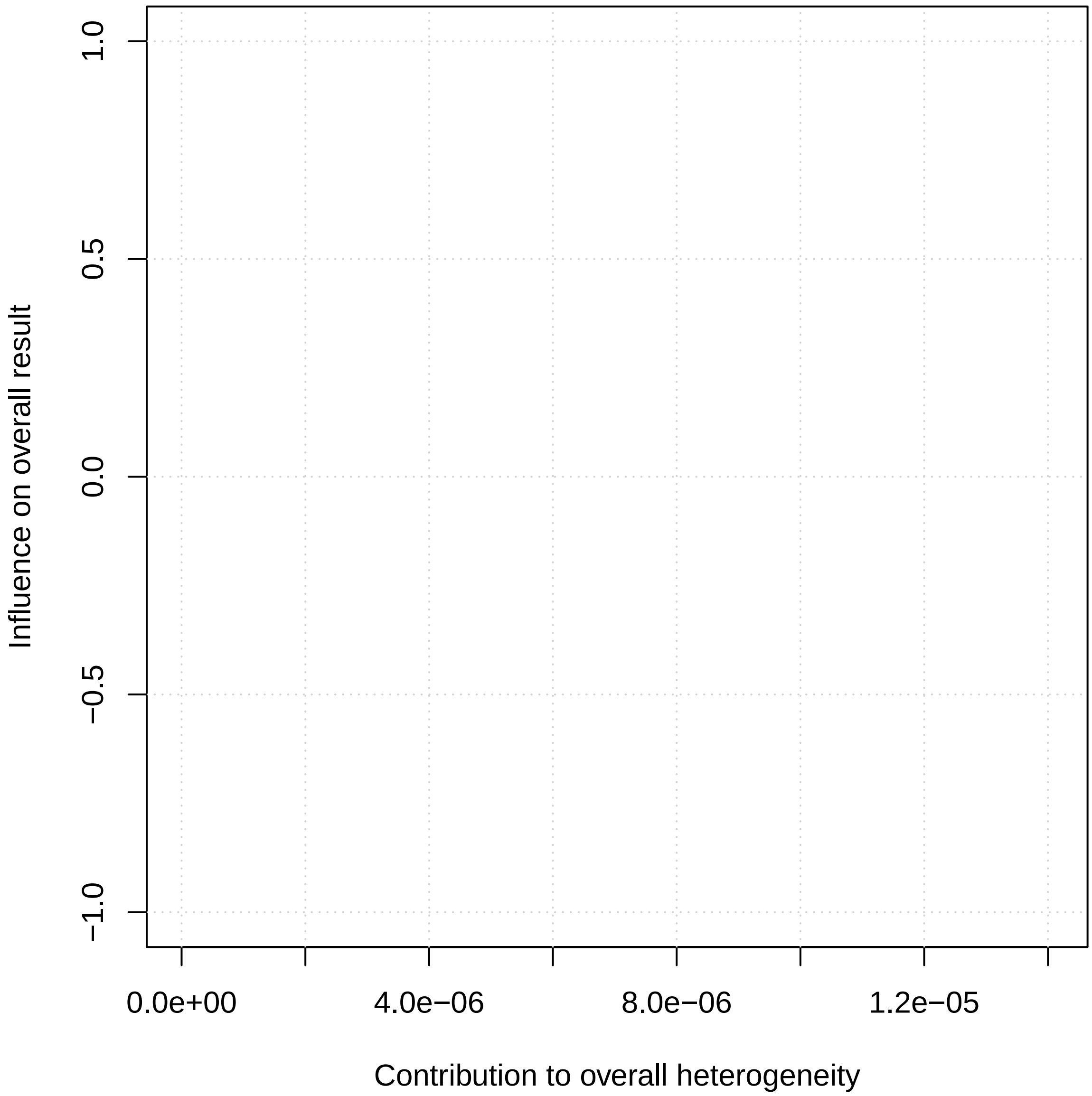
6.18.4 Funnel plot

```
funnel((clav_ii_metabin))
```



6.18.5 Baujat

```r
baujat(clav_ii_metabin, pos = 1)
```



6.18.6 Leave one out

```
metainf(clav_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022
## Omitting Tang 2023           0.3000 [0.0139; 6.4710]  0.4423
## Omitting Du 2019             0.3000 [0.0139; 6.4710]  0.4423
## Omitting Lechevallier 2003   0.3000 [0.0139; 6.4710]  0.4423
## Omitting Zhang 2022          0.3000 [0.0139; 6.4710]  0.4423
##
## Pooled estimate              0.3000 [0.0139; 6.4710]  0.4423
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

6.19 Clavien III

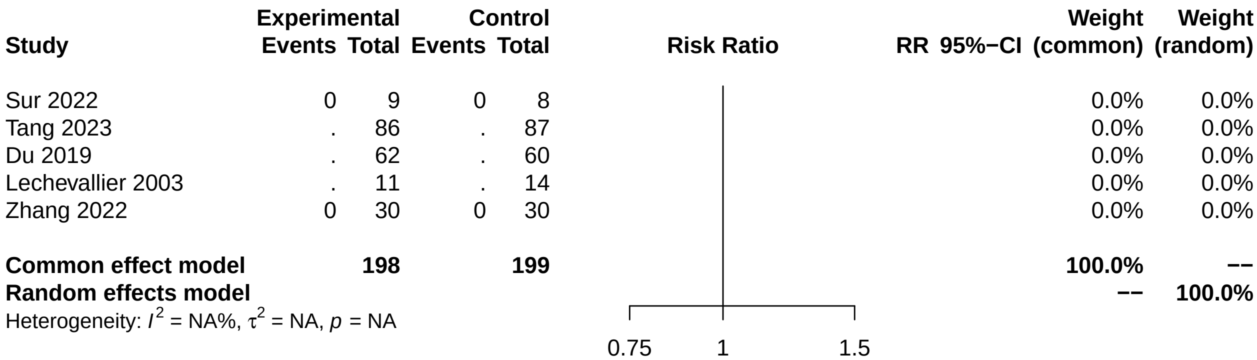
6.19.1 Meta-analysis

```
clav_iii_metabin <- metabin(data = rct_only,
                         event.c = clavien_iii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_iii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.19.2 Forest plot

```
forest(clav_iii_metabin,
       sortvar = TE)
```



6.19.3 Trim and Fill

```
#trimfill(clav_iii_metabin)
#forest(trimfill(clav_iii_metabin),
#       sortvar = TE)
```

6.19.4 Funnel plot

```
#funnel((clav_iii_metabin))
```

6.19.5 Baujat

```
#baujat(clav_iii_metabin, pos = 1)
```

6.19.6 Leave one out

```
#metainf(clav_iii_metabin)
```

6.20 Clavien IV

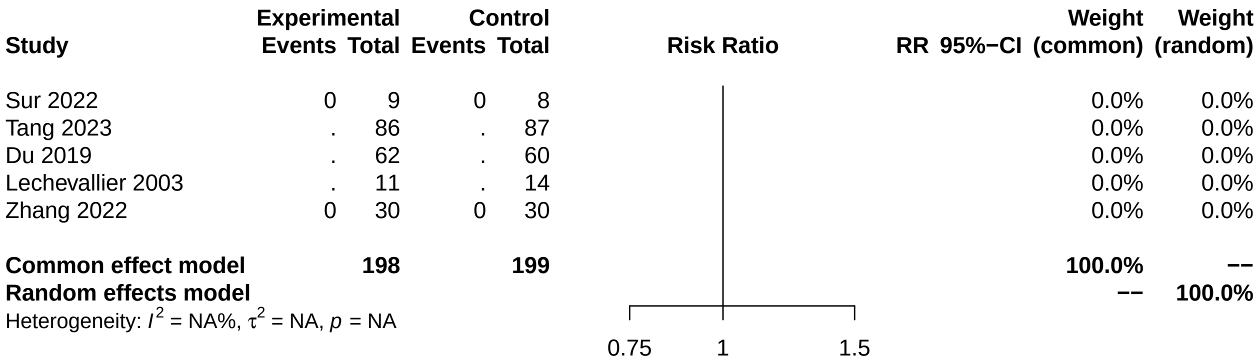
6.20.1 Meta-analysis

```
clav_iv_metabin <- metabin(data = rct_only,
                           event.c = clavien_iv_n_control,
                         n.c = sample_size_control,
                         event.e = clavien_iv_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
clav_iv_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.20.2 Forest plot

```r
forest(clav_iv_metabin,
       sortvar = TE)
```



6.20.3 Trim and Fill

```
#trimfill(clav_iv_metabin)
#forest(trimfill(clav_iv_metabin),
#       sortvar = TE)
```

6.20.4 Funnel plot

```
#funnel((clav_iv_metabin))
```

6.20.5 Baujat

```
#baujat(clav_iv_metabin, pos = 1)
```

6.20.6 Leave one out

```
#metainf(clav_iv_metabin)
```

6.21 Clavien V

6.21.1 Meta-analysis

```
clav_v_metabin <- metabin(data = rct_only,
                           event.c = clavien_v_n_control,
                         n.c = sample_size_control,
                         event.e = clavien_v_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
clav_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.21.2 Forest plot

```
#forest(clav_v_metabin,
#       sortvar = TE)
```

6.21.3 Trim and Fill

```
#trimfill(clav_v_metabin)
#forest(trimfill(clav_v_metabin),
#       sortvar = TE)
```

6.21.4 Funnel plot

```
#funnel(trimfill(clav_v_metabin))
```

6.21.5 Baujat

```
#baujat(clav_v_metabin, pos = 1)
```

6.21.6 Leave one out

```
#metainf(clav_v_metabin)
```

6.22 Clavien I-II

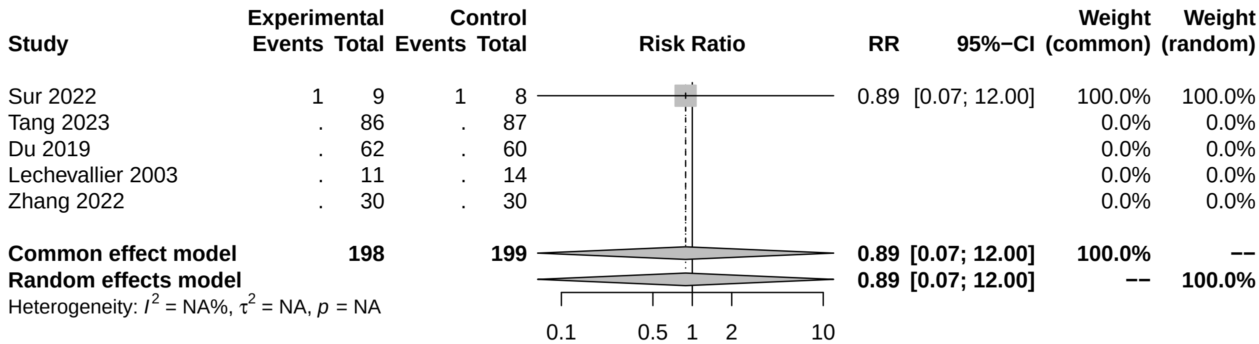
6.22.1 Meta-analysis

```r
clav_i_ii_metabin <- metabin(data = rct_only,
                           event.c = clav_i_ii_n_control,
                         n.c = sample_size_control,
                         event.e = clav_i_ii_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
clav_i_ii_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 397
## Number of events: e = 2
##
##                           RR            95%-CI     z p-value
## Common effect model  0.8889 [0.0658; 12.0044] -0.09  0.9293
## Random effects model 0.8889 [0.0658; 12.0044] -0.09  0.9293
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.22.2 Forest plot

```r
forest(clav_i_ii_metabin,
       sortvar = TE)
```



6.22.3 Trim and Fill

```
#trimfill(clav_i_ii_metabin)
#forest(trimfill(clav_i_ii_metabin),
#       sortvar = TE)
```

6.22.4 Funnel plot

```
#funnel(trimfill(clav_i_ii_metabin))
```

6.22.5 Baujat

```r
#baujat(clav_i_ii_metabin, pos = 1)
```

6.22.6 Leave one out

```
#metainf(clav_i_ii_metabin)
```

6.23 Clavien III-V

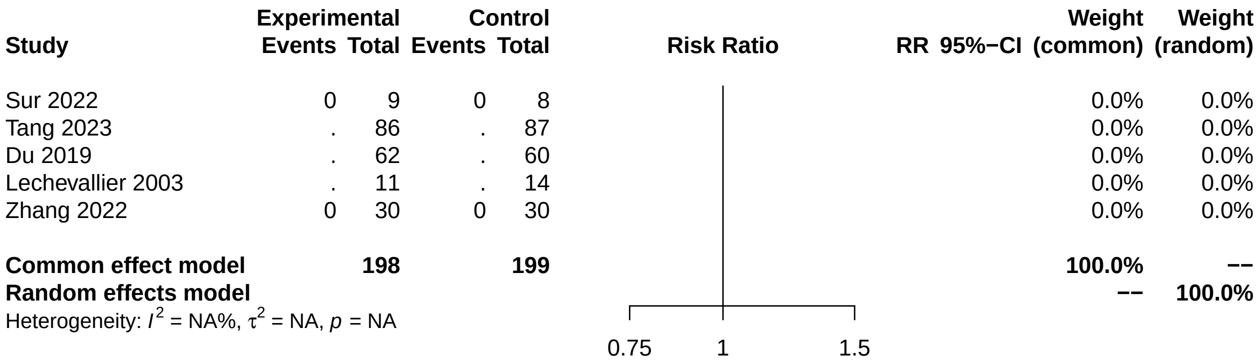
6.23.1 Meta-analysis

```
clav_iii_v_metabin <- metabin(data = rct_only,
                              event.c = clav_iii_v_n_control,
                            n.c = sample_size_control,
                            event.e = clav_iii_v_n_suction,
                            n.e = sample_size_suction,
                            studlab = author_year)
clav_iii_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 397
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model   NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

6.23.2 Forest plot

```r
forest(clav_iii_v_metabin,
       sortvar = TE)
```



6.23.3 Trim and Fill

```
#trimfill(clav_iii_v_metabin)
#forest(trimfill(clav_iii_v_metabin),
#       sortvar = TE)
```

6.23.4 Funnel plot

```
#funnel(trimfill(clav_iii_v_metabin))
```

6.23.5 Baujat

```
#baujat(clav_iii_v_metabin, pos = 1)
```

6.23.6 Leave one out

```
#metainf(clav_iii_v_metabin)
```

7 RCT Only Summary Forest plots

```
overall <- cbind(
  "Outcome" = c(
    "Immediate SFR",
    "Final SFR",
    "Auxiliary Treatment",
    "Overall Complications",
    "Fever",
    "Infection",
    "Sepsis",
    "Abscess",
    "Haematoma",
    "Pain",
    "Stricture",
    "Embolisation",
    "Transfusion",
    "CD I",
    "CD II",
    "CD III",
    "CD IV",
    "CD I-II",
    "CD III-V",
    "Operative time",
    "VAS",
    "Length of Stay"
  ),
  "type" = c(
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "cont",
    "cont",
    "cont"
  ),
  "n_studies" = c(
    immediate_sfr_metabin$k,
```

```
  sfr_metabin$k,
aux_rx_metabin$k,
comp_metabin$k,
fever_metabin$k,
infection_metabin$k,
sepsis_metabin$k,
abscess_metabin$k,
haematoma_metabin$k,
pain_metabin$k,
stricture_metabin$k,
ir_embolisation_metabin$k,
transfusion_metabin$k,
clav_i_metabin$k,
clav_ii_metabin$k,
clav_iii_metabin$k,
clav_iv_metabin$k,
clav_i_ii_metabin$k,
clav_iii_v_metabin$k,
or_time_metacont$k,
vas_metacont$k,
los_metacont$k),
"es" = c(
  immediate_sfr_metabin$TE.random %>% exp(),
  sfr_metabin$TE.random %>% exp(),
aux_rx_metabin$TE.random %>% exp(),
comp_metabin$TE.random %>% exp(),
fever_metabin$TE.random %>% exp(),
infection_metabin$TE.random %>% exp(),
sepsis_metabin$TE.random %>% exp(),
abscess_metabin$TE.random %>% exp(),
haematoma_metabin$TE.random %>% exp(),
pain_metabin$TE.random %>% exp(),
stricture_metabin$TE.random %>% exp(),
ir_embolisation_metabin$TE.random %>% exp(),
transfusion_metabin$TE.random %>% exp(),
clav_i_metabin$TE.random %>% exp(),
clav_ii_metabin$TE.random %>% exp(),
clav_iii_metabin$TE.random %>% exp(),
clav_iv_metabin$TE.random %>% exp(),
clav_i_ii_metabin$TE.random %>% exp(),
clav_iii_v_metabin$TE.random %>% exp(),
or_time_metacont$TE.random,
vas_metacont$TE.random,
los_metacont$TE.random),
"lower_ci" = c(
  immediate_sfr_metabin$lower.random %>% exp(),
  sfr_metabin$lower.random %>% exp(),
aux_rx_metabin$lower.random %>% exp(),
comp_metabin$lower.random %>% exp(),
fever_metabin$lower.random %>% exp(),
infection_metabin$lower.random %>% exp(),
sepsis_metabin$lower.random %>% exp(),
abscess_metabin$lower.random %>% exp(),
```

```
haematoma_metabin$lower.random %>% exp(),
pain_metabin$lower.random %>% exp(),
stricture_metabin$lower.random %>% exp(),
ir_embolisation_metabin$lower.random %>% exp(),
transfusion_metabin$lower.random %>% exp(),
clav_i_metabin$lower.random %>% exp(),
clav_ii_metabin$lower.random %>% exp(),
clav_iii_metabin$lower.random %>% exp(),
clav_iv_metabin$lower.random %>% exp(),
clav_i_ii_metabin$lower.random %>% exp(),
clav_iii_v_metabin$lower.random %>% exp(),
or_time_metacont$lower.random,
vas_metacont$lower.random,
los_metacont$lower.random),
"upper_ci" = c(immediate_sfr_metabin$upper.random %>% exp(),
               sfr_metabin$upper.random %>% exp(),
aux_rx_metabin$upper.random %>% exp(),
comp_metabin$upper.random %>% exp(),
fever_metabin$upper.random %>% exp(),
infection_metabin$upper.random %>% exp(),
sepsis_metabin$upper.random %>% exp(),
abscess_metabin$upper.random %>% exp(),
haematoma_metabin$upper.random %>% exp(),
pain_metabin$upper.random %>% exp(),
stricture_metabin$upper.random %>% exp(),
ir_embolisation_metabin$upper.random %>% exp(),
transfusion_metabin$upper.random %>% exp(),
clav_i_metabin$upper.random %>% exp(),
clav_ii_metabin$upper.random %>% exp(),
clav_iii_metabin$upper.random %>% exp(),
clav_iv_metabin$upper.random %>% exp(),
clav_i_ii_metabin$upper.random %>% exp(),
clav_iii_v_metabin$upper.random %>% exp(),
or_time_metacont$upper.random,
vas_metacont$upper.random,
los_metacont$upper.random),
"p" = c(
  immediate_sfr_metabin$pval.random,
  sfr_metabin$pval.random,
aux_rx_metabin$pval.random,
comp_metabin$pval.random,
fever_metabin$pval.random,
infection_metabin$pval.random,
sepsis_metabin$pval.random,
abscess_metabin$pval.random,
haematoma_metabin$pval.random,
pain_metabin$pval.random,
stricture_metabin$pval.random,
ir_embolisation_metabin$pval.random,
transfusion_metabin$pval.random,
clav_i_metabin$pval.random,
clav_ii_metabin$pval.random,
clav_iii_metabin$pval.random,
```

```r
clav_iv_metabin$pval.random,
clav_i_ii_metabin$pval.random,
clav_iii_v_metabin$pval.random,
or_time_metacont$pval.random,
vas_metacont$pval.random,
los_metacont$pval.random)) %>% as_tibble() %>% drop_na(es)

overall$es <- as.numeric(overall$es)
overall$es <- round(overall$es, digits = 2)

overall$lower_ci <- as.numeric(overall$lower_ci)
overall$lower_ci <- round(overall$lower_ci, digits = 2)

overall$upper_ci <- as.numeric(overall$upper_ci)
overall$upper_ci <- round(overall$upper_ci, digits = 2)

overall$p <- as.numeric(overall$p)
overall$p <- round(overall$p, digits = 2)
overall$p <- ifelse(overall$p<0.001, "<0.001", overall$p)
```

7.1 Summary Table of number of studies for each outcome included in meta-analysis

```
overall %>% subset(select = c(Outcome, n_studies)) %>% gt() %>% tab_header(title = "Summary table of Nu
```

Summary table of Number of Studies for Each Outcome Meta-Analyis

Outcome	Studies, n
Immediate SFR	9
Final SFR	4
Auxiliary Treatment	1
Overall Complications	4
Fever	3
Infection	4
Sepsis	1
Pain	1
Stricture	1
CD I	1
CD II	1
CD I-II	1
Operative time	5
VAS	1
Length of Stay	2

7.2 Summary Forest plot of Continuous outcomes

7.2.1 Continuous Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

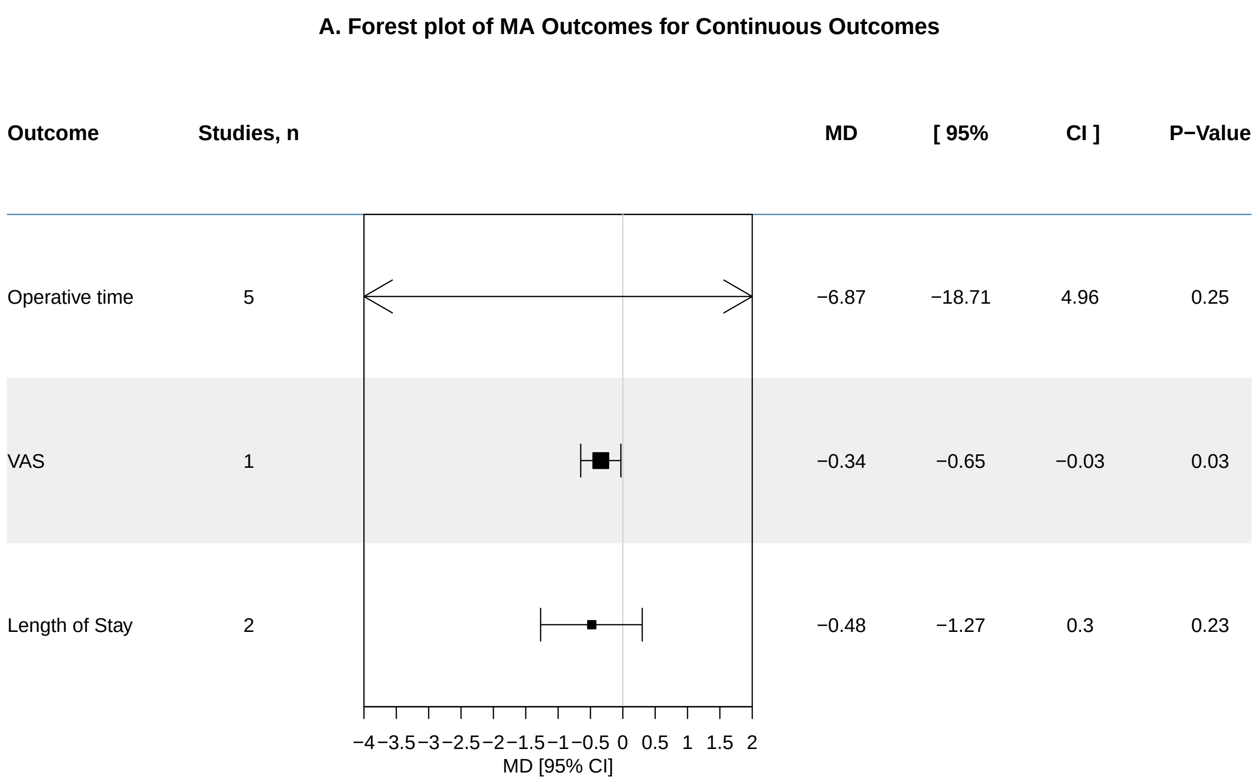
```
overall_continuous <-
  overall %>% subset(type ==  "cont") %>% subset(select = c(Outcome,
                                                             n_studies,
                                                             es,
                                                             lower_ci,
                                                             upper_ci,
                                                             p)) %>% as_tibble()
overall_continuous %>% gt() %>% tab_header(title = "Summary Table for Continuous Outcomes") %>% cols_me
```

Summary Table for Continuous Outcomes

Outcome	Studies, n	MD (95% CI)	p
Operative time	5	-6.87 (-18.71-4.96)	0.25
VAS	1	-0.34 (-0.65–0.03)	0.03
Length of Stay	2	-0.48 (-1.27-0.30)	0.23

7.2.2 Continuous Forest plot

```
continuous_plot <- overall_continuous %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 0,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Continuous Outcomes",
  clip = c(-4, 2),
  xlab = "MD [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "MD",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
continuous_plot
```



7.3 Summary Forest plot of Binary outcomes

7.3.1 Binary Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

```
overall_binary <-
  overall %>% subset(type ==  "binary") %>% subset(select = c(Outcome,
                                                             n_studies,
                                                             es,
                                                             lower_ci,
                                                             upper_ci,
                                                             p)) %>% as_tibble()
overall_binary %>% gt() %>% tab_header(title = "Summary Table for Binary Outcomes") %>% cols_merge(colu
```

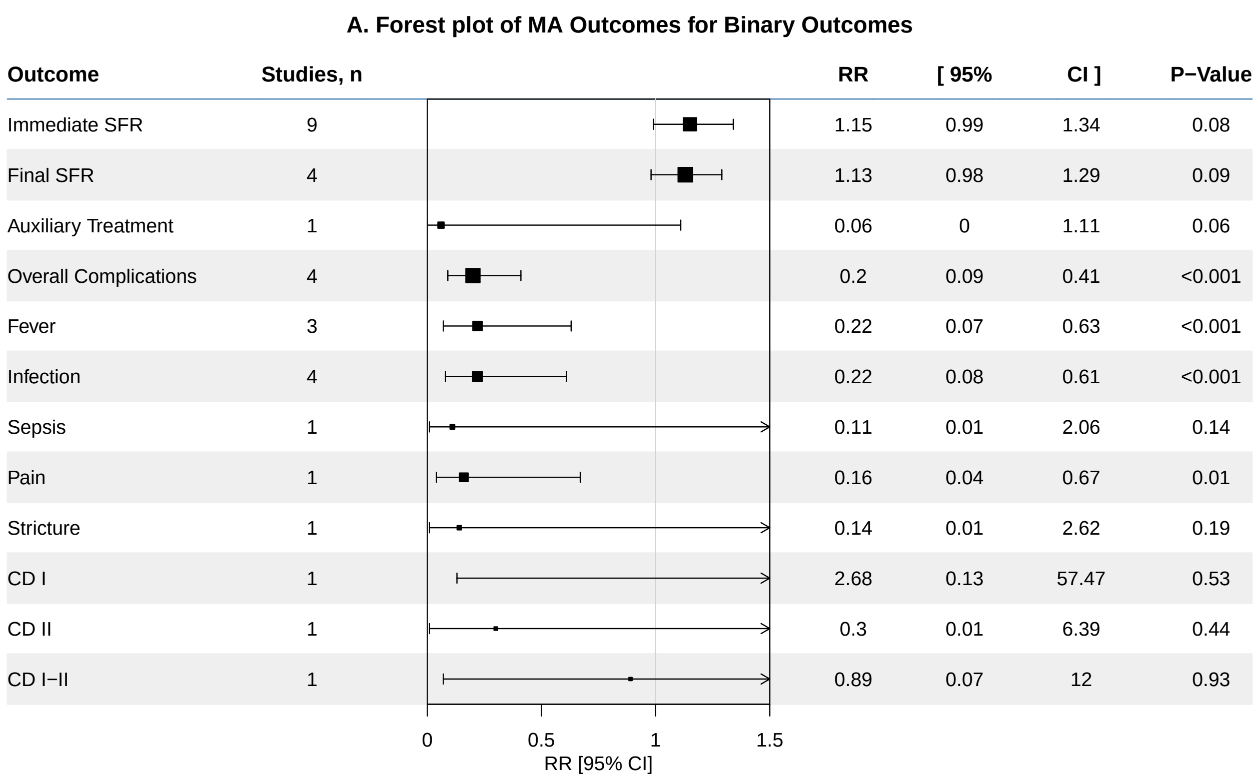
Summary Table for Binary Outcomes

Outcome	Studies, n	RR (95% CI)	p
Immediate SFR	9	1.15 (0.99-1.34)	0.08
Final SFR	4	1.13 (0.98-1.29)	0.09
Auxiliary Treatment	1	0.06 (0.00-1.11)	0.06
Overall Complications	4	0.20 (0.09-0.41)	<0.001
Fever	3	0.22 (0.07-0.63)	<0.001
Infection	4	0.22 (0.08-0.61)	<0.001
Sepsis	1	0.11 (0.01-2.06)	0.14
Pain	1	0.16 (0.04-0.67)	0.01
Stricture	1	0.14 (0.01-2.62)	0.19
CD I	1	2.68 (0.13-57.47)	0.53
CD II	1	0.30 (0.01-6.39)	0.44
CD I-II	1	0.89 (0.07-12.00)	0.93

7.3.2 Binary Forest plot - Meta-Analysis

Reference = No Suction

```
binary_plot <- overall_binary %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 1,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Binary Outcomes",
  clip = c(-1.5, 1.5),
  xlab = "RR [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "RR",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
binary_plot
```



8 Semi-rigid Only Meta-Analysis Outcomes

```
semirigid_only <- suction_data %>% subset(control_group == "Semi-rigid URS")
```

8.1 Immediate SFR

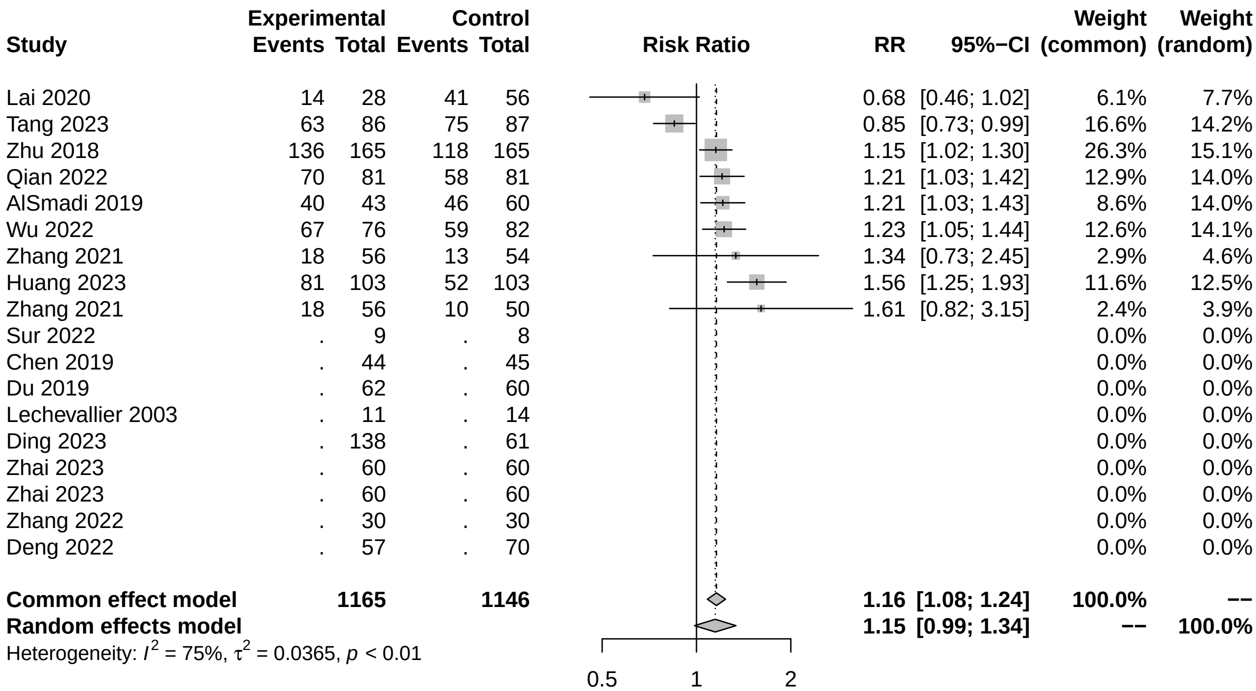
8.1.1 Meta-analysis

```
immediate_sfr_metabin <- metabin(data = suction_data,
                          event.c = sfr_immediate_n_control,
                        n.c = sample_size_control,
                        event.e = sfr_immediate_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
immediate_sfr_metabin
```

```
## Number of studies: k = 9
## Number of observations: o = 2311
## Number of events: e = 979
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1581 [1.0834; 1.2380] 4.31 < 0.0001
## Random effects model 1.1478 [0.9854; 1.3370] 1.77   0.0765
##
## Quantifying heterogeneity:
##  tau^2 = 0.0365 [0.0088; 0.2318]; tau = 0.1910 [0.0939; 0.4814]
##  I^2 = 74.6% [50.9%; 86.9%]; H = 1.99 [1.43; 2.76]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  31.55    8  0.0001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

8.1.2 Forest plot

```r
forest(immediate_sfr_metabin,
       sortvar = TE)
```



8.1.3 Trim and Fill

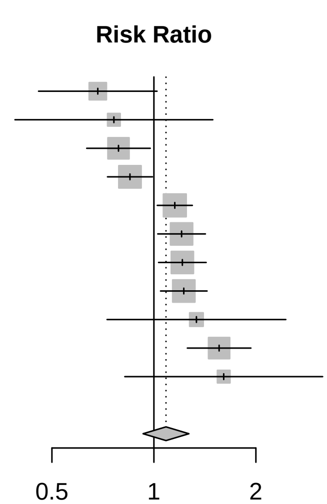
```r
trimfill(immediate_sfr_metabin)
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values

## Number of studies: k = 11 (with 2 added studies)
## Number of observations: o = 1744
## Number of events: e = 1140
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0855 [0.9289; 1.2685] 1.03  0.3019
##
## Quantifying heterogeneity:
##  tau^2 = 0.0471 [0.0138; 0.2196]; tau = 0.2170 [0.1173; 0.4686]
##  I^2 = 76.9% [58.8%; 87.1%]; H = 2.08 [1.56; 2.78]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  43.33   10 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(immediate_sfr_metabin),
       sortvar = TE)
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



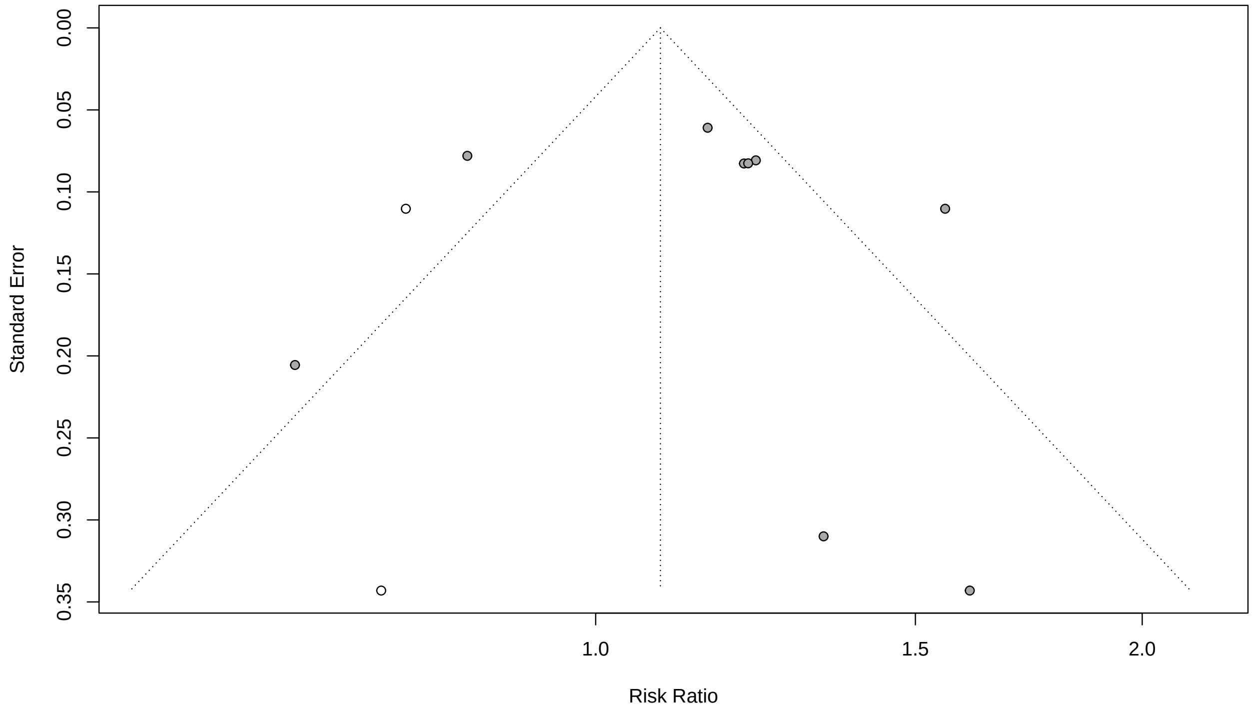
Study	logRR	SE(logRR)	Experimental Total	Control Total	RR	95%−CI	Weight
Lai 2020	−0.3814	0.2055	28	56	0.68	[0.46; 1.02]	7.1%
Filled: Zhang 2021	−0.2721	0.3431	56	50	0.76	[0.39; 1.49]	3.8%
Filled: Huang 2023	−0.2408	0.1103	103	103	0.79	[0.63; 0.98]	10.7%
Tang 2023	−0.1628	0.0780	86	87	0.85	[0.73; 0.99]	11.9%
Zhu 2018	0.1420	0.0609	165	165	1.15	[1.02; 1.30]	12.4%
Qian 2022	0.1881	0.0827	81	81	1.21	[1.03; 1.42]	11.7%
AlSmadi 2019	0.1934	0.0826	43	60	1.21	[1.03; 1.43]	11.7%
Wu 2022	0.2031	0.0808	76	82	1.23	[1.05; 1.44]	11.8%
Zhang 2021	0.2891	0.3100	56	54	1.34	[0.73; 2.45]	4.4%
Huang 2023	0.4432	0.1103	103	103	1.56	[1.25; 1.93]	10.7%
Zhang 2021	0.4745	0.3431	56	50	1.61	[0.82; 3.15]	3.8%
Random effects model			**853**	**891**	**1.09**	**[0.93; 1.27]**	**100.0%**

Heterogeneity: $I^2 = 77\%$, $\tau^2 = 0.0471$, $p < 0.01$

8.1.4 Funnel plot

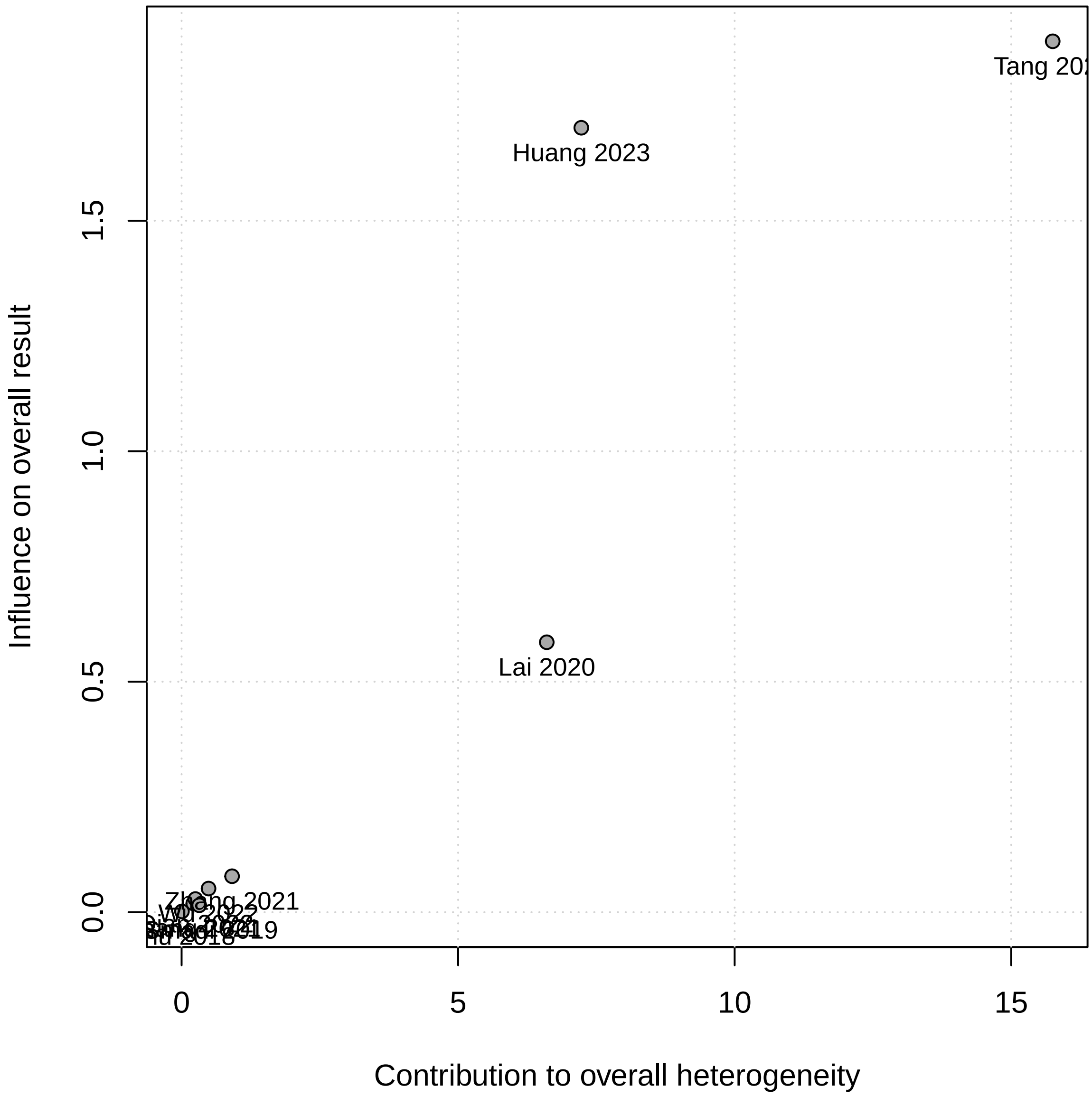
```
funnel(trimfill(immediate_sfr_metabin))
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



8.1.5 Baujat

```r
baujat(immediate_sfr_metabin, pos = 1)
```



8.1.6 Leave one out

```r
metainf(immediate_sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                RR           95%-CI  p-value   tau^2     tau
## Omitting Sur 2022          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Tang 2023         1.2195 [1.1329; 1.3128] < 0.0001  0.0076  0.0873
## Omitting Chen 2019         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Du 2019           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Lai 2020          1.1889 [1.1116; 1.2716] < 0.0001  0.0258  0.1607
## Omitting Zhu 2018          1.1601 [1.0710; 1.2565]   0.0003  0.0482  0.2196
## Omitting Zhang 2021        1.1473 [1.0741; 1.2254] < 0.0001  0.0376  0.1938
## Omitting Zhang 2021        1.1527 [1.0791; 1.2313] < 0.0001  0.0396  0.1990
## Omitting Lechevallier 2003 1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Huang 2023        1.1057 [1.0315; 1.1853]   0.0046  0.0246  0.1568
## Omitting Wu 2022           1.1484 [1.0676; 1.2353]   0.0002  0.0464  0.2153
## Omitting Ding 2023         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Qian 2022         1.1508 [1.0700; 1.2377]   0.0002  0.0468  0.2164
## Omitting Zhang 2022        1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Deng 2022         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting AlSmadi 2019      1.1529 [1.0734; 1.2383] < 0.0001  0.0467  0.2160
##
## Pooled estimate            1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
##                               I^2
## Omitting Sur 2022           74.6%
## Omitting Tang 2023          51.5%
## Omitting Chen 2019          74.6%
## Omitting Du 2019            74.6%
## Omitting Lai 2020           72.2%
## Omitting Zhu 2018           77.8%
## Omitting Zhang 2021         77.1%
## Omitting Zhang 2021         77.6%
## Omitting Lechevallier 2003  74.6%
## Omitting Huang 2023         69.4%
## Omitting Wu 2022            77.2%
## Omitting Ding 2023          74.6%
## Omitting Zhai 2023          74.6%
## Omitting Zhai 2023          74.6%
## Omitting Qian 2022          77.4%
## Omitting Zhang 2022         74.6%
## Omitting Deng 2022          74.6%
## Omitting AlSmadi 2019       77.4%
##
## Pooled estimate             74.6%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.2 Final SFR

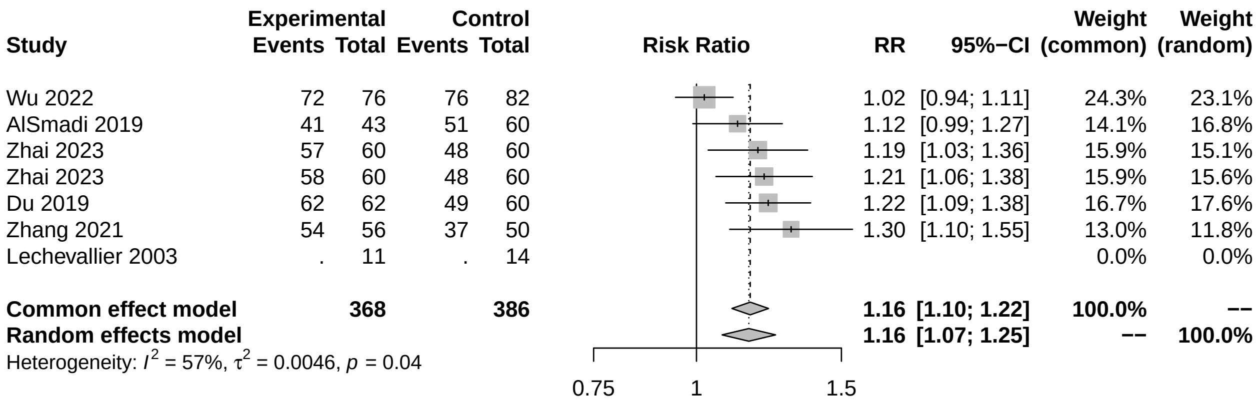
8.2.1 Meta-analysis

```
sfr_metabin <- metabin(data = semirigid_only,
                         event.c = sfr_final_n_control,
                       n.c = sample_size_control,
                       event.e = sfr_final_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sfr_metabin
```

```
## Number of studies: k = 6
## Number of observations: o = 754
## Number of events: e = 653
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1622 [1.1042; 1.2233] 5.75 < 0.0001
## Random effects model 1.1577 [1.0743; 1.2476] 3.84   0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0.0046 [0.0000; 0.0380]; tau = 0.0679 [0.0000; 0.1949]
##  I^2 = 57.3% [0.0%; 82.7%]; H = 1.53 [1.00; 2.41]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  11.70    5  0.0391
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

8.2.2 Forest plot

```r
forest(sfr_metabin,
       sortvar = TE)
```



8.2.3 Trim and Fill

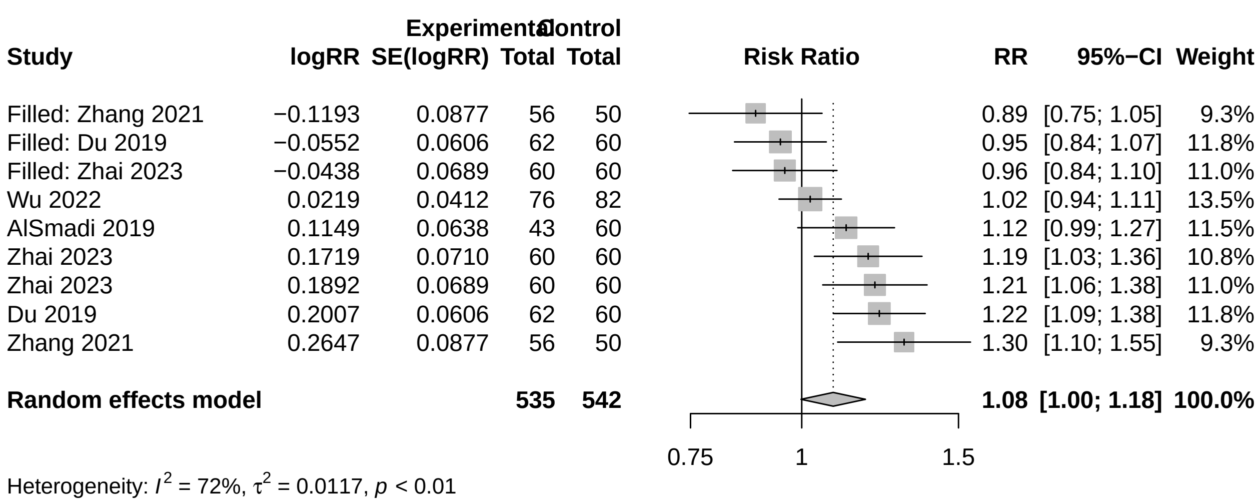
```r
trimfill(sfr_metabin)
```

```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values

## Number of studies: k = 9 (with 3 added studies)
## Number of observations: o = 1077
## Number of events: e = 961
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0848 [0.9981; 1.1791] 1.91  0.0555
##
## Quantifying heterogeneity:
##  tau^2 = 0.0117 [0.0029; 0.0615]; tau = 0.1081 [0.0538; 0.2480]
##  I^2 = 71.6% [43.9%; 85.6%]; H = 1.88 [1.34; 2.63]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  28.14    8  0.0004
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(sfr_metabin),
       sortvar = TE)
```

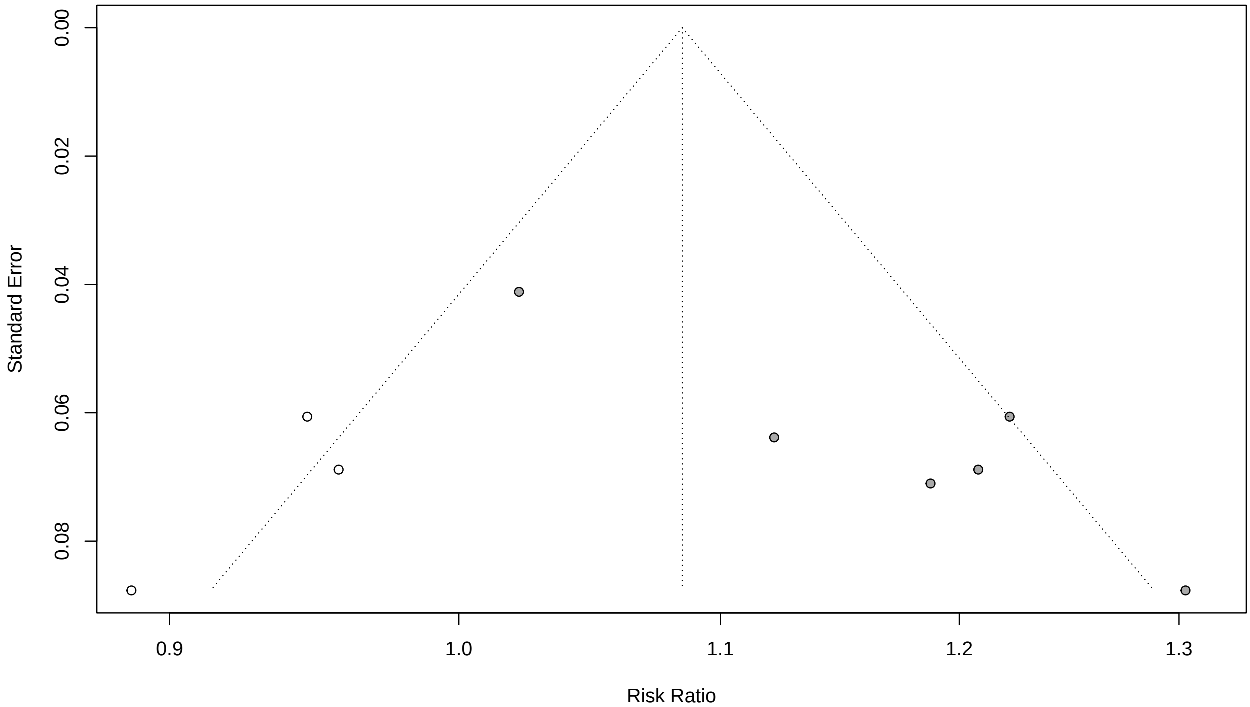
```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```



8.2.4 Funnel plot

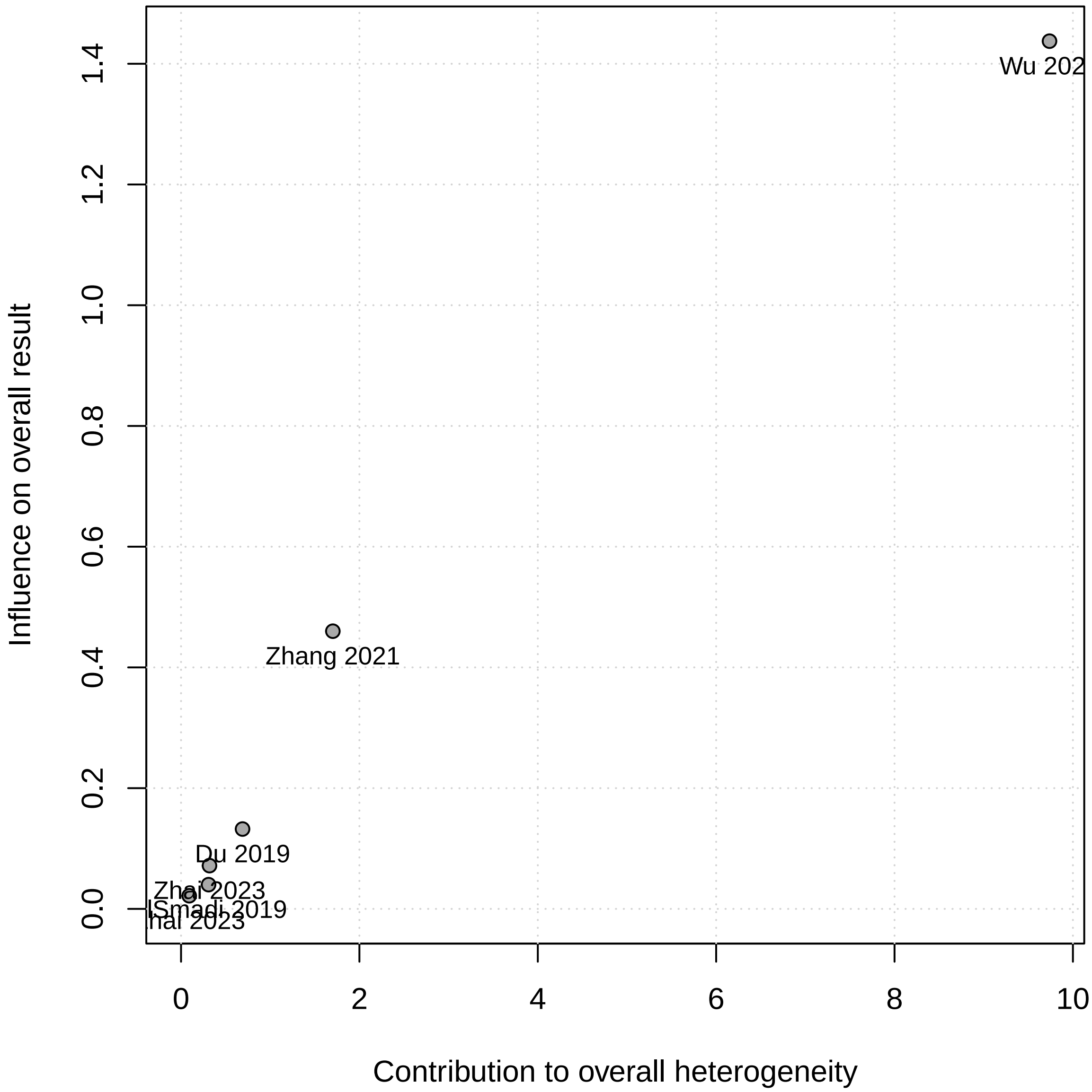
```
funnel(trimfill(sfr_metabin))
```

```
## Warning in trimfill.meta(sfr_metabin): 1 observation(s) dropped due to missing
## values
```



8.2.5 Baujat

```
baujat(sfr_metabin, pos = 1)
```



8.2.6 Leave one out

```
metainf(sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI  p-value   tau^2     tau
## Omitting Du 2019            1.1501 [1.0871; 1.2168] < 0.0001  0.0052  0.0723
## Omitting Zhang 2021         1.1412 [1.0826; 1.2030] < 0.0001  0.0040  0.0629
## Omitting Lechevallier 2003  1.1622 [1.1042; 1.2233] < 0.0001  0.0046  0.0679
## Omitting Wu 2022            1.2072 [1.1346; 1.2844] < 0.0001  0.0000  0.0000
## Omitting Zhai 2023          1.1535 [1.0914; 1.2191] < 0.0001  0.0056  0.0747
## Omitting Zhai 2023          1.1574 [1.0956; 1.2228] < 0.0001  0.0059  0.0768
## Omitting AlSmadi 2019       1.1689 [1.1053; 1.2362] < 0.0001  0.0062  0.0788
##
## Pooled estimate             1.1622 [1.1042; 1.2233] < 0.0001  0.0046  0.0679
##                                I^2
## Omitting Du 2019             59.1%
## Omitting Zhang 2021          55.1%
## Omitting Lechevallier 2003   57.3%
## Omitting Wu 2022              0.0%
## Omitting Zhai 2023           62.5%
## Omitting Zhai 2023           64.2%
## Omitting AlSmadi 2019        65.7%
##
## Pooled estimate              57.3%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.3 OR time

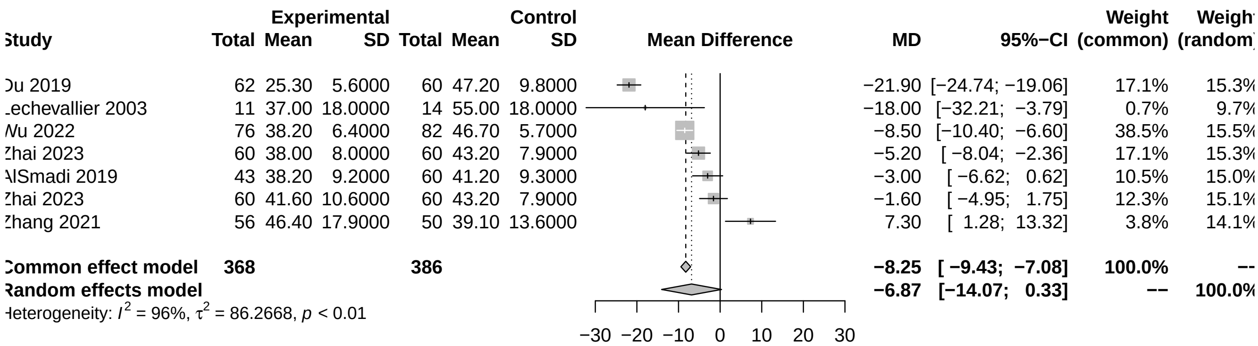
8.3.1 Meta-analysis

```
or_time_metacont <- metacont(data = semirigid_only,
                             mean.c = or_time_min_mean_control,
                             sd.c = or_time_min_sd_control,
                             mean.e = or_time_min_mean_suction,
                             sd.e = or_time_min_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
or_time_metacont
```

```
## Number of studies: k = 7
## Number of observations: o = 754
##
##                            MD               95%-CI      z  p-value
## Common effect model  -8.2542 [ -9.4297; -7.0788] -13.76 < 0.0001
## Random effects model -6.8657 [-14.0651;  0.3336]  -1.87   0.0616
##
## Quantifying heterogeneity:
##  tau^2 = 86.2668 [31.6285; 469.1099]; tau = 9.2880 [5.6239; 21.6589]
##  I^2 = 95.8% [93.4%; 97.4%]; H = 4.89 [3.89; 6.15]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  143.67    6 < 0.0001
##
## 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
```

8.3.2 Forest plot

```r
forest(or_time_metacont,
       sortvar = TE)
```

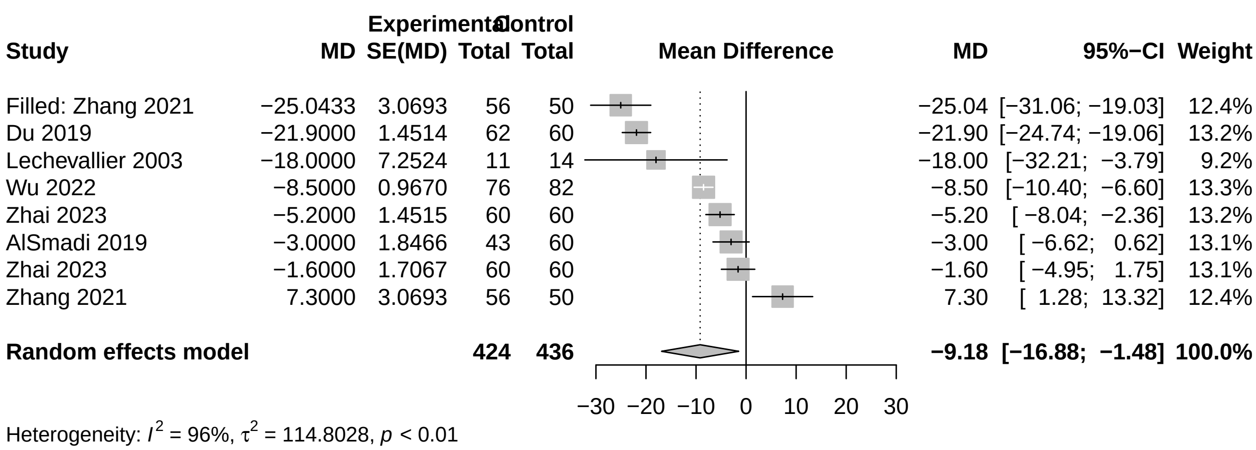


8.3.3 Trim and Fill

```r
trimfill(or_time_metacont)
```

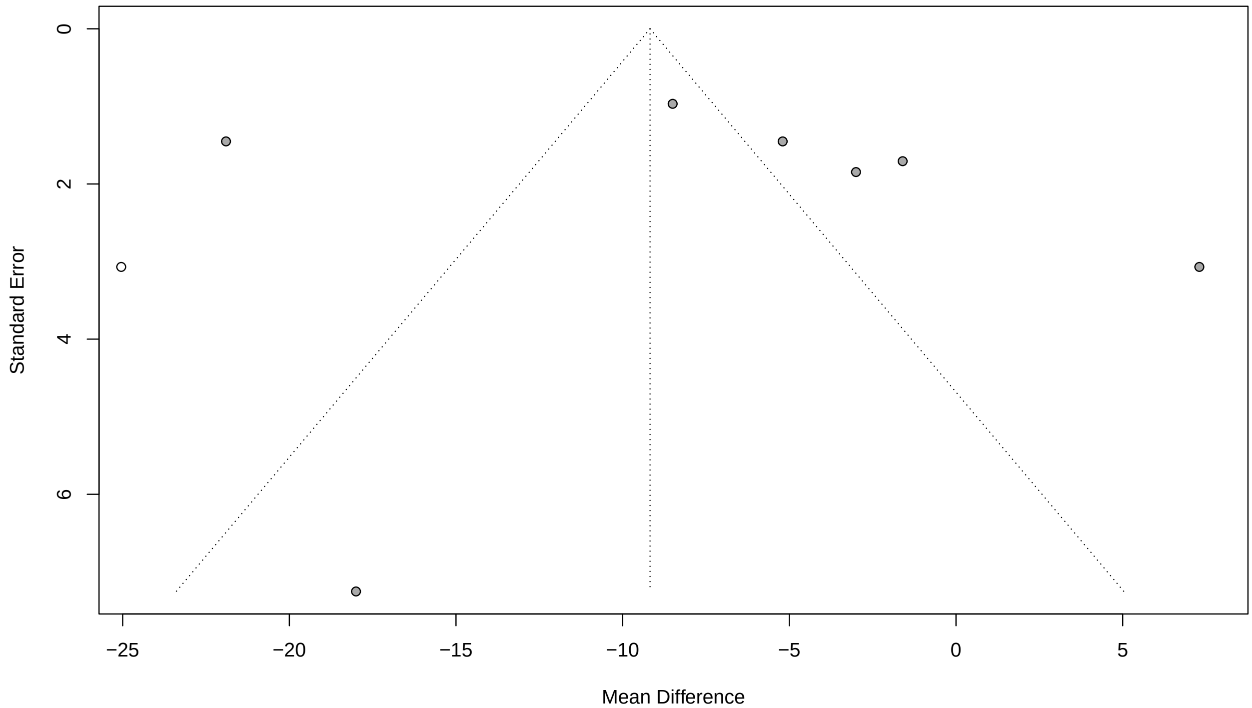
```
## Number of studies: k = 8 (with 1 added studies)
## Number of observations: o = 860
##
##                          MD             95%-CI     z p-value
## Random effects model -9.1790 [-16.8799; -1.4781] -2.34  0.0195
##
## Quantifying heterogeneity:
##  tau^2 = 114.8028 [45.5270; 506.6692]; tau = 10.7146 [6.7474; 22.5093]
##  I^2 = 95.9% [93.8%; 97.3%]; H = 4.96 [4.02; 6.12]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  172.49    7 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(or_time_metacont),
       sortvar = TE)
```



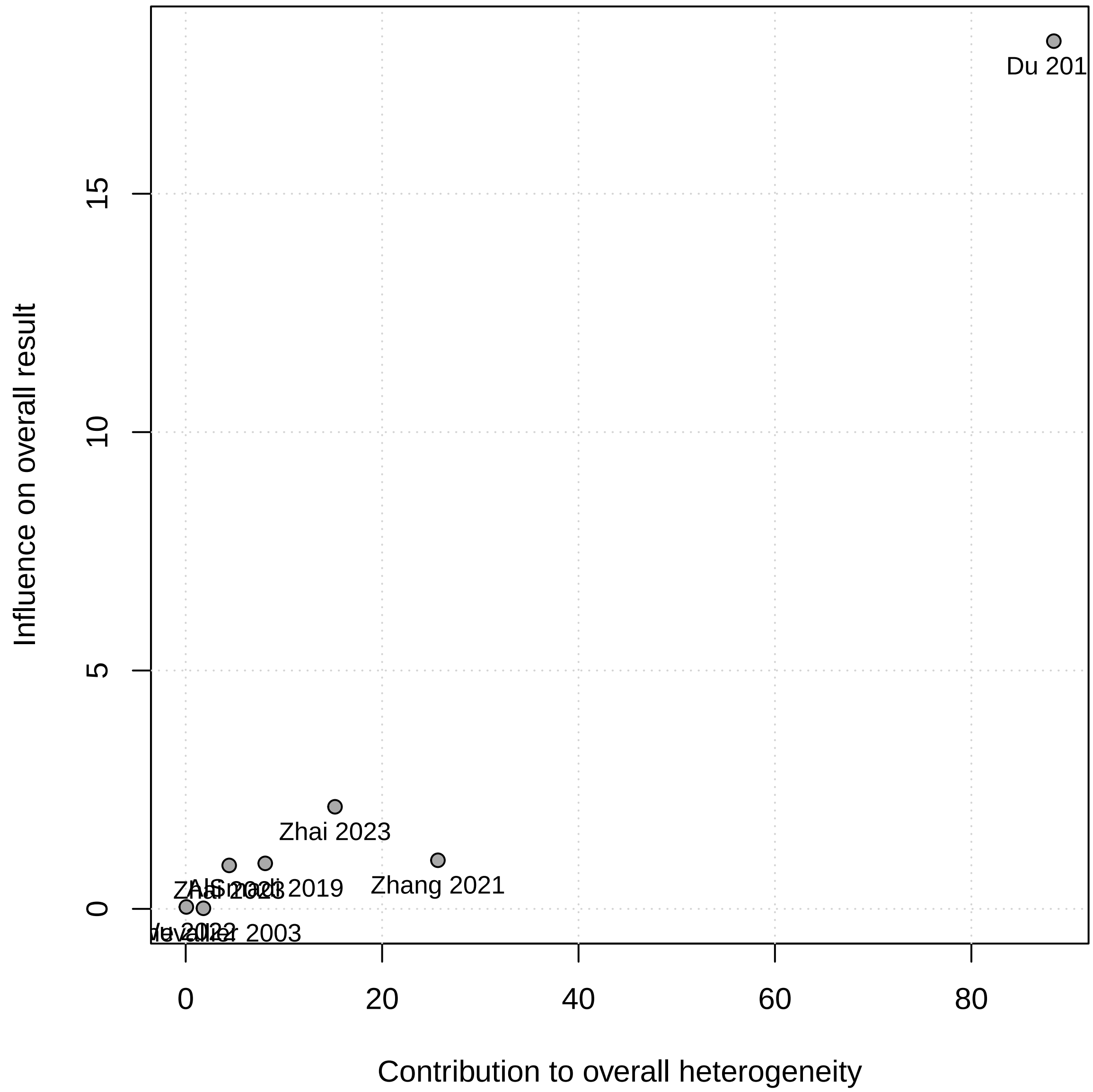
8.3.4 Funnel plot

```
funnel(trimfill(or_time_metacont))
```



8.3.5 Baujat

```
baujat(or_time_metacont, pos = 1)
```



8.3.6 Leave one out

```r
metainf(or_time_metacont)
```

```
## Influential analysis (common effect model)
##
##                                   MD              95%-CI  p-value     tau^2
## Omitting Du 2019             -5.4447 [ -6.7355; -4.1539] < 0.0001   32.4249
## Omitting Zhang 2021          -8.8716 [-10.0701; -7.6731] < 0.0001   62.0728
## Omitting Lechevallier 2003   -8.1871 [ -9.3666; -7.0077] < 0.0001   86.9262
## Omitting Wu 2022             -8.1007 [ -9.5990; -6.6023] < 0.0001  106.0931
## Omitting Zhai 2023           -9.1916 [-10.4471; -7.9361] < 0.0001   99.7092
## Omitting Zhai 2023           -8.8830 [-10.1737; -7.5922] < 0.0001  106.1781
## Omitting AlSmadi 2019        -8.8738 [-10.1166; -7.6310] < 0.0001  102.9498
##
## Pooled estimate              -8.2542 [ -9.4297; -7.0788] < 0.0001   86.2668
##                                  tau    I^2
## Omitting Du 2019              5.6943  86.5%
## Omitting Zhang 2021           7.8786  95.7%
## Omitting Lechevallier 2003    9.3234  96.5%
## Omitting Wu 2022             10.3002  96.5%
## Omitting Zhai 2023            9.9854  96.0%
## Omitting Zhai 2023           10.3043  96.4%
## Omitting AlSmadi 2019        10.1464  96.3%
##
## Pooled estimate               9.2880  95.8%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.4 Auxiliary Treatments

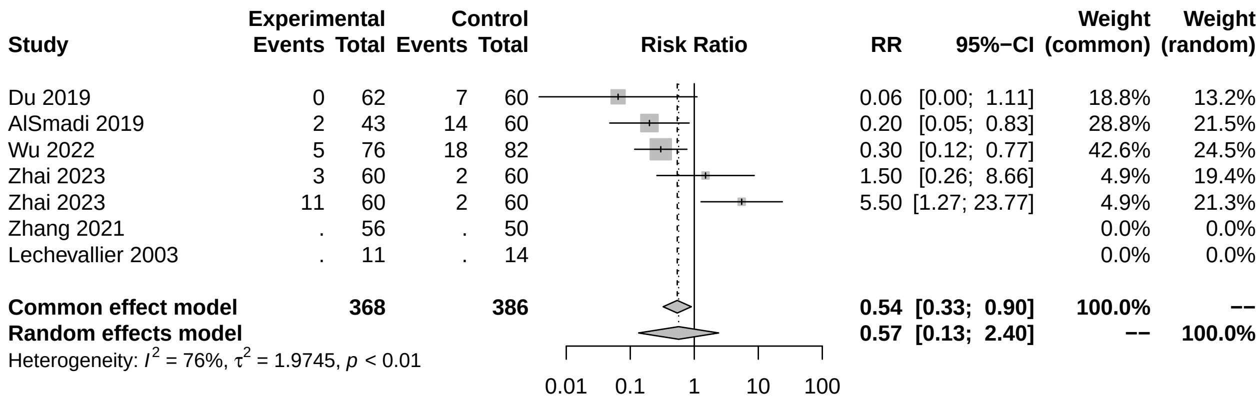
8.4.1 Meta-analysis

```
aux_rx_metabin <- metabin(data = semirigid_only,
                          event.c = auxillary_tx_n_control,
                        n.c = sample_size_control,
                        event.e = auxillary_tx_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
aux_rx_metabin
```

```
## Number of studies: k = 5
## Number of observations: o = 754
## Number of events: e = 64
##
##                          RR           95%-CI     z p-value
## Common effect model  0.5418 [0.3260; 0.9006] -2.36  0.0181
## Random effects model 0.5696 [0.1350; 2.4033] -0.77  0.4435
##
## Quantifying heterogeneity:
##  tau^2 = 1.9745 [0.2816; 24.2153]; tau = 1.4052 [0.5306; 4.9209]
##  I^2 = 75.7% [40.5%; 90.1%]; H = 2.03 [1.30; 3.18]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  16.49    4  0.0024
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

8.4.2 Forest plot

```r
forest(aux_rx_metabin,
       sortvar = TE)
```



8.4.3 Trim and Fill

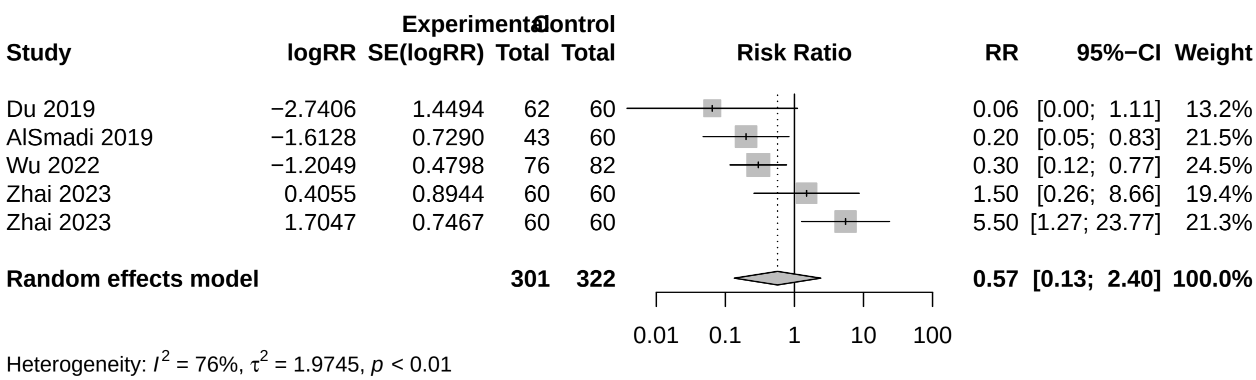
```r
trimfill(aux_rx_metabin)
```

```
## Warning in trimfill.meta(aux_rx_metabin): 2 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 5 (with 0 added studies)
## Number of observations: o = 623
## Number of events: e = 64
##
##                          RR           95%-CI     z p-value
## Random effects model 0.5696 [0.1350; 2.4033] -0.77  0.4435
##
## Quantifying heterogeneity:
##  tau^2 = 1.9745 [0.2816; 24.2153]; tau = 1.4052 [0.5306; 4.9209]
##  I^2 = 75.7% [40.5%; 90.1%]; H = 2.03 [1.30; 3.18]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  16.49    4  0.0024
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(aux_rx_metabin),
       sortvar = TE)
```

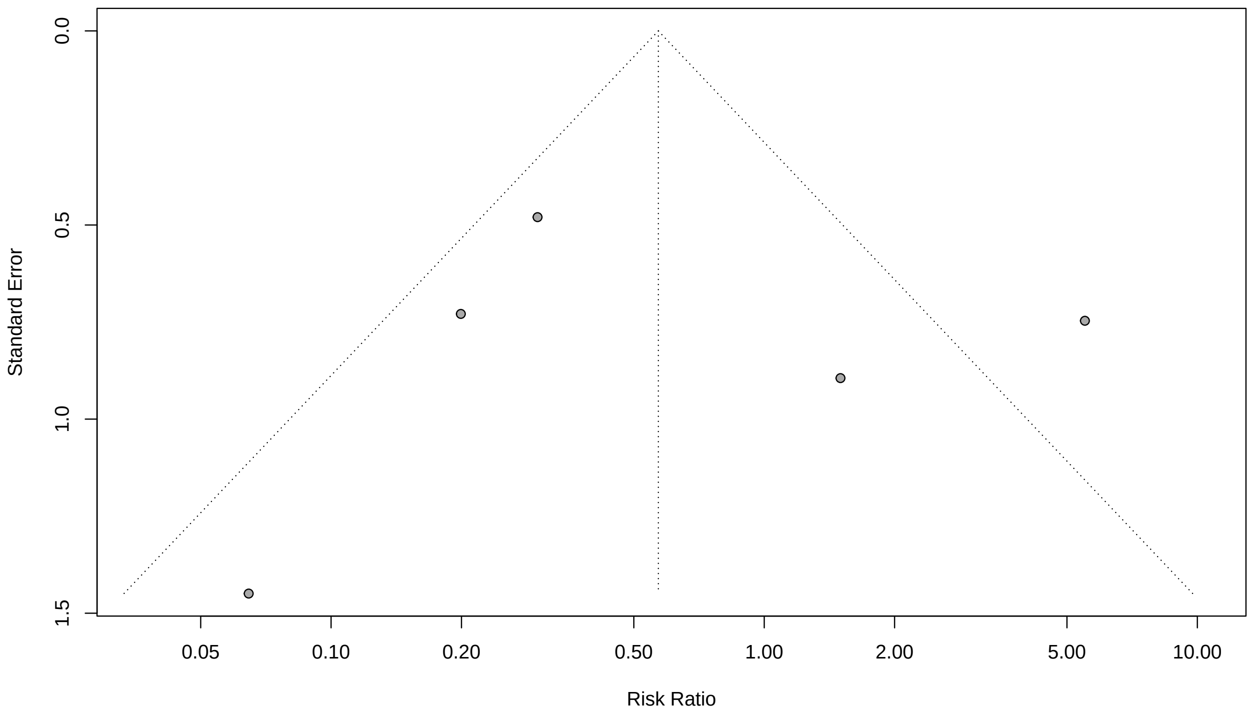
```
## Warning in trimfill.meta(aux_rx_metabin): 2 observation(s) dropped due to
## missing values
```



8.4.4 Funnel plot

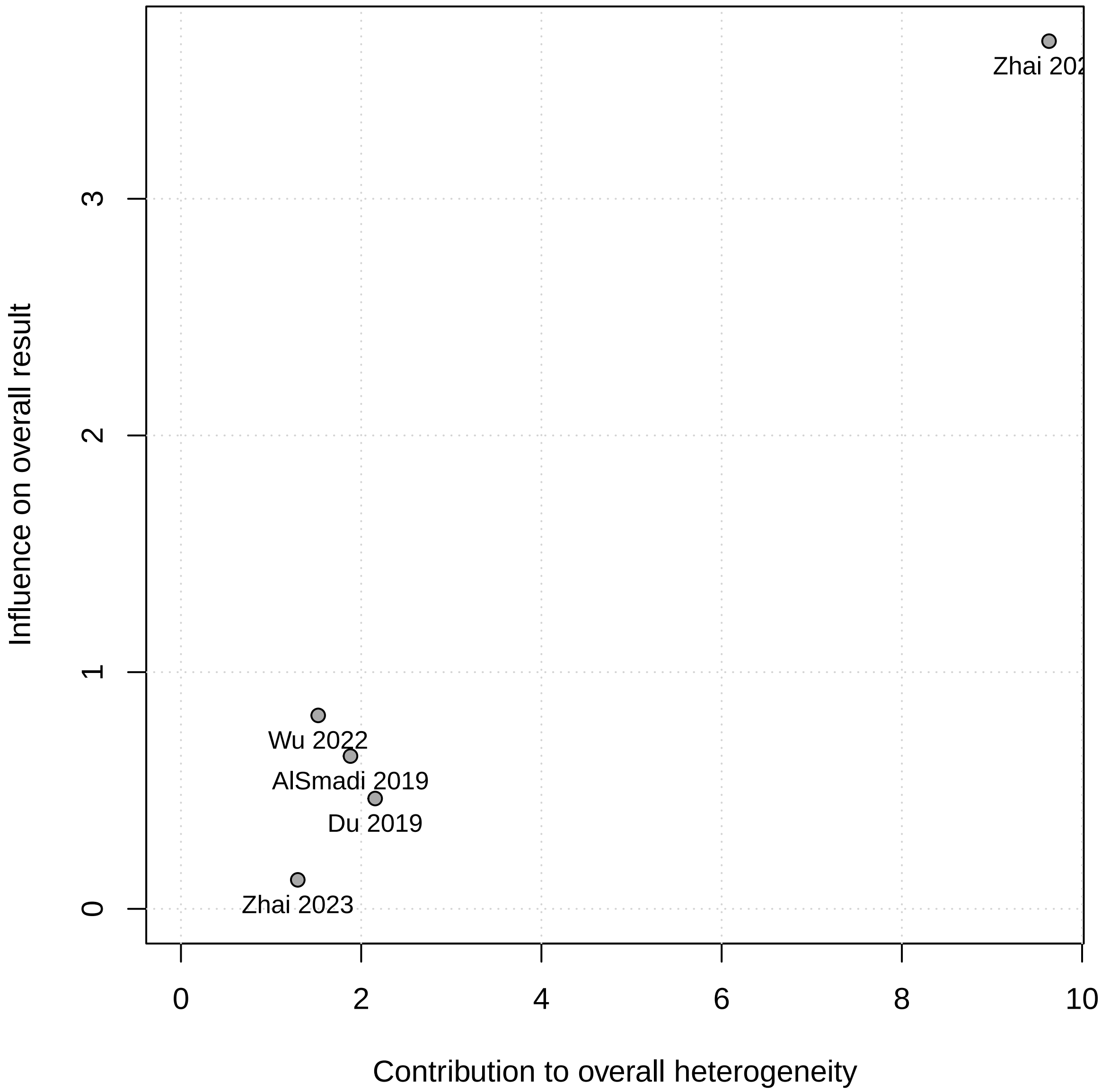
```
funnel(trimfill(aux_rx_metabin))
```

```
## Warning in trimfill.meta(aux_rx_metabin): 2 observation(s) dropped due to
## missing values
```



8.4.5 Baujat

```
baujat(aux_rx_metabin, pos = 1)
```



8.4.6 Leave one out

```r
metainf(aux_rx_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI p-value   tau^2    tau
## Omitting Du 2019             0.6520 [0.3832; 1.1094]  0.1147  1.8370  1.3554
## Omitting Zhang 2021          0.5418 [0.3260; 0.9006]  0.0181  1.9745  1.4052
## Omitting Lechevallier 2003   0.5418 [0.3260; 0.9006]  0.0181  1.9745  1.4052
## Omitting Wu 2022             0.7217 [0.3877; 1.3434]  0.3036  2.7940  1.6715
## Omitting Zhai 2023           0.2851 [0.1477; 0.5501]  0.0002  0.1125  0.3354
## Omitting Zhai 2023           0.4922 [0.2874; 0.8428]  0.0098  2.5861  1.6081
## Omitting AlSmadi 2019        0.6802 [0.3905; 1.1845]  0.1733  2.3649  1.5378
##
## Pooled estimate              0.5418 [0.3260; 0.9006]  0.0181  1.9745  1.4052
##                                I^2
## Omitting Du 2019             78.9%
## Omitting Zhang 2021          75.7%
## Omitting Lechevallier 2003   75.7%
## Omitting Wu 2022             78.2%
## Omitting Zhai 2023           35.4%
## Omitting Zhai 2023           80.0%
## Omitting AlSmadi 2019        78.8%
##
## Pooled estimate              75.7%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.5 VAS

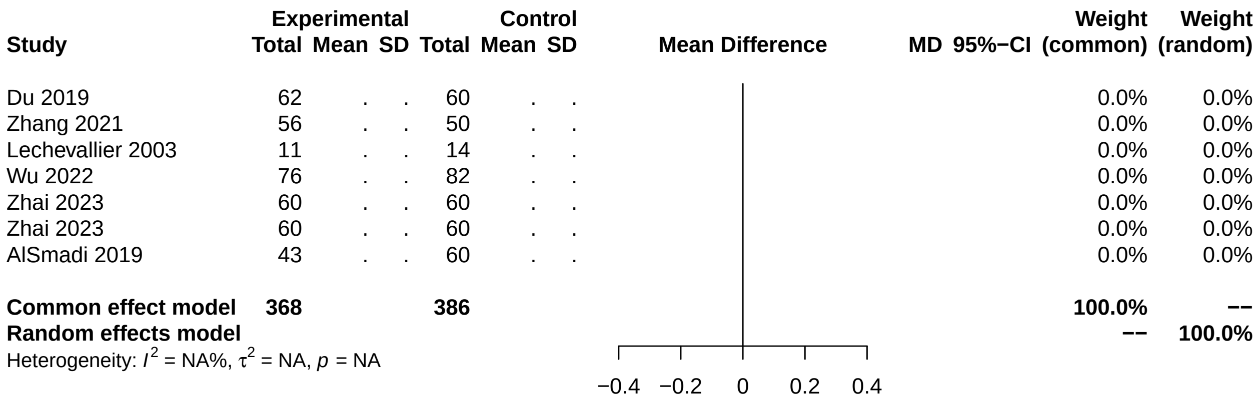
8.5.1 Meta-analysis

```
vas_metacont <- metacont(data = semirigid_only,
                             mean.c = vas_score_mean_control,
                             sd.c = vas_score_sd_control,
                             mean.e = vas_score_mean_suction,
                             sd.e = vas_score_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
vas_metacont
```

```
## Number of studies: k = 0
## Number of observations: o = 754
##
##                      MD 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.5.2 Forest plot

```r
forest(vas_metacont,
       sortvar = TE)
```



8.5.3 Trim and Fill

```
#trimfill(vas_metacont)
#forest(trimfill(vas_metacont))
```

8.5.4 Funnel plot

```
#funnel((vas_metacont))
```

8.5.5 Baujat

```
#baujat(vas_metacont, pos = 1)
```

8.5.6 Leave one out

```
metainf(vas_metacont)
```

```
## Influential analysis (common effect model)
##
##                              MD 95%-CI p-value tau^2 tau I^2
## Omitting Du 2019
## Omitting Zhang 2021
## Omitting Lechevallier 2003
## Omitting Wu 2022
## Omitting Zhai 2023
## Omitting Zhai 2023
## Omitting AlSmadi 2019
##
## Pooled estimate
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.6 LoS

8.6.1 Meta-analysis

```
los_metacont <- metacont(data = semirigid_only,
                             mean.c = los_days_mean_control,
                             sd.c = los_days_sd_control,
                             mean.e = los_days_mean_suction,
                             sd.e = los_days_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
los_metacont
```

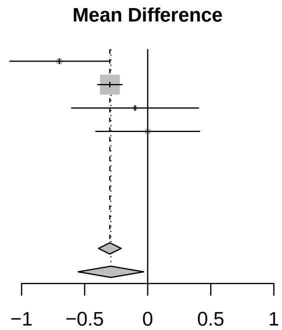
```
## Number of studies: k = 4
## Number of observations: o = 754
##
##                              MD             95%-CI     z  p-value
## Common effect model  -0.3002 [-0.3902; -0.2102] -6.54 < 0.0001
## Random effects model -0.2916 [-0.5517; -0.0316] -2.20   0.0280
##
## Quantifying heterogeneity:
##  tau^2 = 0.0406 [0.0000; 1.2883]; tau = 0.2015 [0.0000; 1.1350]
##  I^2 = 54.6% [0.0%; 85.0%]; H = 1.48 [1.00; 2.58]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  6.61    3  0.0854
##
## 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
```

8.6.2 Forest plot

```r
forest(los_metacont,
       sortvar = TE)
```

Study	Experimental Total	Experimental Mean	Experimental SD	Control Total	Control Mean	Control SD	MD	95%−CI	Weight (common)	Weight (random)
Zhai 2023	60	5.30	1.1000	60	6.00	1.1000	−0.70	[−1.09; −0.31]	5.2%	21.8%
AlSmadi 2019	43	1.70	0.2000	60	2.00	0.3000	−0.30	[−0.40; −0.20]	86.8%	40.9%
Du 2019	62	4.40	1.2000	60	4.50	1.6000	−0.10	[−0.60; 0.40]	3.2%	16.5%
Zhai 2023	60	6.00	1.2000	60	6.00	1.1000	0.00	[−0.41; 0.41]	4.8%	20.8%
Zhang 2021	56	.	.	50	.	.			0.0%	0.0%
Lechevallier 2003	11	.	.	14	.	.			0.0%	0.0%
Wu 2022	76	.	.	82	.	.			0.0%	0.0%
Common effect model	**368**			**386**			**−0.30**	**[−0.39; −0.21]**	**100.0%**	**−−**
Random effects model							**−0.29**	**[−0.55; −0.03]**	**−−**	**100.0%**

Heterogeneity: $I^2 = 55\%$, $\tau^2 = 0.0406$, $p = 0.09$



8.6.3 Trim and Fill

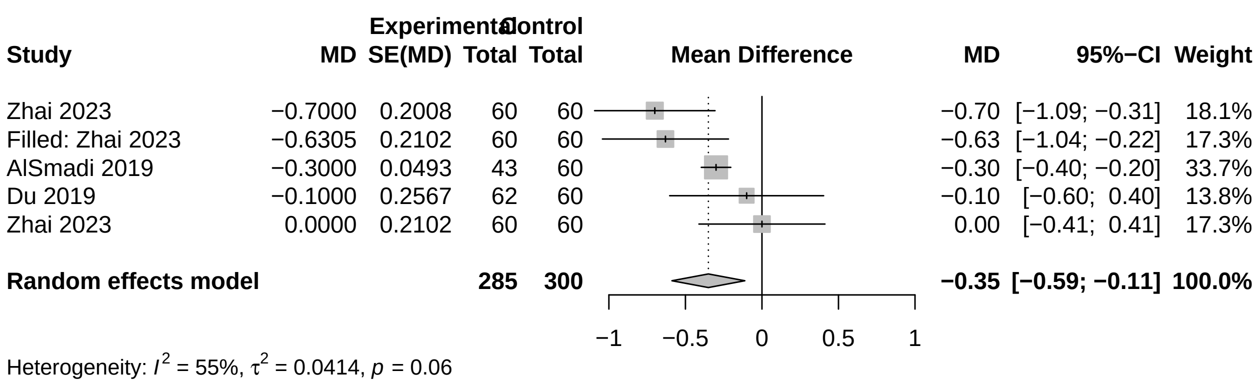
```r
trimfill(los_metacont)
```

```
## Warning in trimfill.meta(los_metacont): 3 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 5 (with 1 added studies)
## Number of observations: o = 585
##
##                           MD             95%-CI     z p-value
## Random effects model -0.3500 [-0.5882; -0.1118] -2.88  0.0040
##
## Quantifying heterogeneity:
##  tau^2 = 0.0414 [0.0000; 0.7562]; tau = 0.2035 [0.0000; 0.8696]
##  I^2 = 55.4% [0.0%; 83.5%]; H = 1.50 [1.00; 2.46]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  8.97    4  0.0619
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(los_metacont),
       sortvar = TE)
```

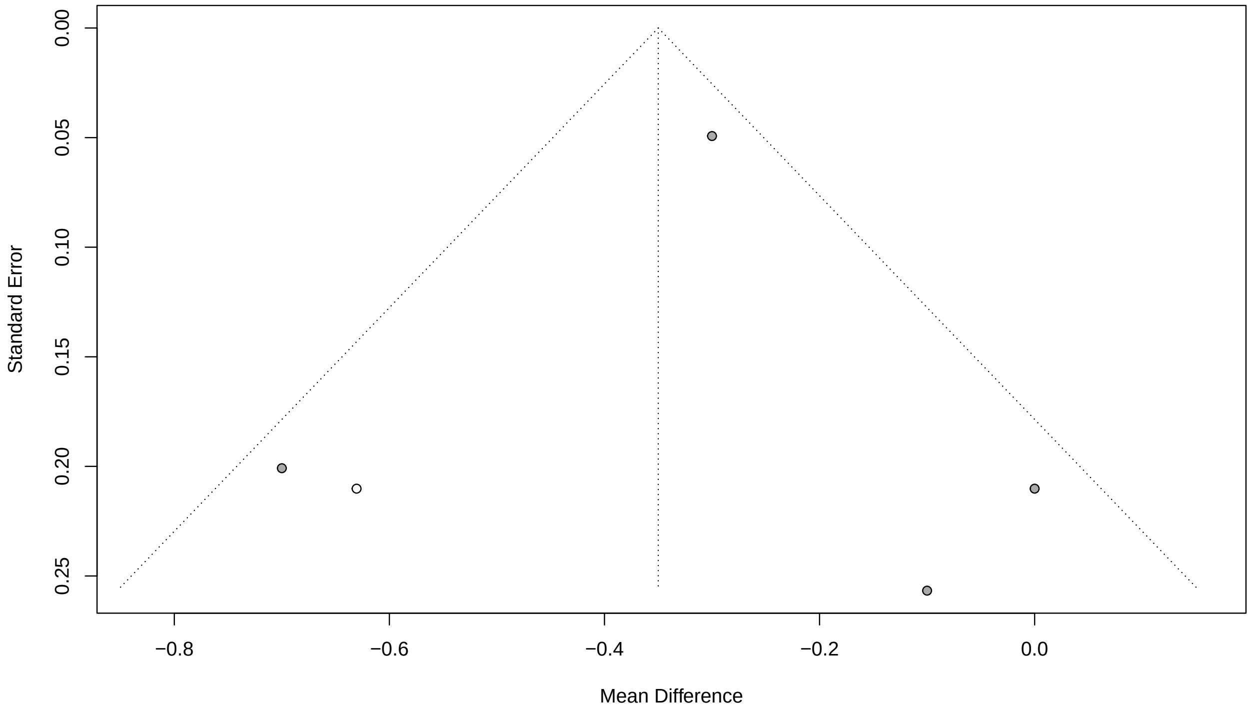
```
## Warning in trimfill.meta(los_metacont): 3 observation(s) dropped due to missing
## values
```



8.6.4 Funnel plot

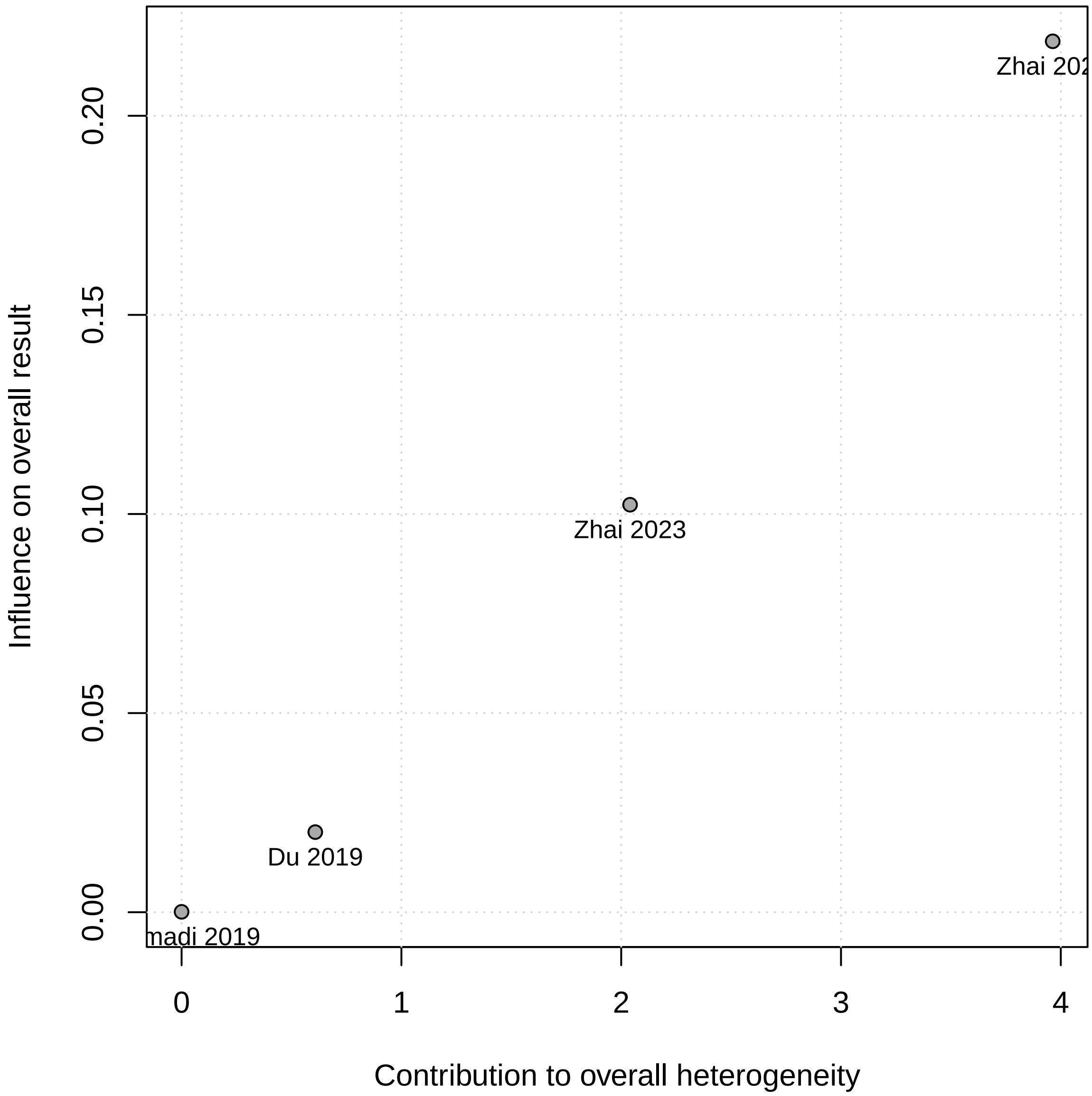
```
funnel(trimfill(los_metacont))
```

```
## Warning in trimfill.meta(los_metacont): 3 observation(s) dropped due to missing
## values
```



8.6.5 Baujat

```
baujat(los_metacont, pos = 1)
```



8.6.6 Leave one out

```r
metainf(los_metacont)
```

```
## Influential analysis (common effect model)
##
##                                    MD            95%-CI  p-value   tau^2
## Omitting Du 2019              -0.3068 [-0.3983; -0.2153] < 0.0001  0.0648
## Omitting Zhang 2021           -0.3002 [-0.3902; -0.2102] < 0.0001  0.0406
## Omitting Lechevallier 2003    -0.3002 [-0.3902; -0.2102] < 0.0001  0.0406
## Omitting Wu 2022              -0.3002 [-0.3902; -0.2102] < 0.0001  0.0406
## Omitting Zhai 2023            -0.3152 [-0.4075; -0.2230] < 0.0001  0.0340
## Omitting Zhai 2023            -0.2781 [-0.3706; -0.1857] < 0.0001  0.0125
## Omitting AlSmadi 2019         -0.3014 [-0.5491; -0.0537]   0.0171  0.1057
##
## Pooled estimate               -0.3002 [-0.3902; -0.2102] < 0.0001  0.0406
##                                   tau    I^2
## Omitting Du 2019               0.2545  66.6%
## Omitting Zhang 2021            0.2015  54.6%
## Omitting Lechevallier 2003     0.2015  54.6%
## Omitting Wu 2022               0.2015  54.6%
## Omitting Zhai 2023             0.1843  55.2%
## Omitting Zhai 2023             0.1118  17.7%
## Omitting AlSmadi 2019          0.3251  69.8%
##
## Pooled estimate                0.2015  54.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.7 Complications - All

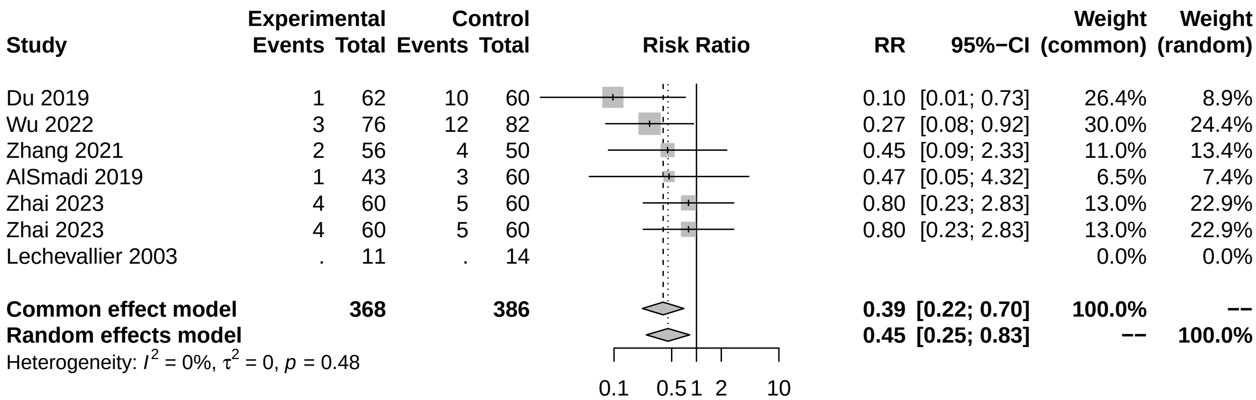
8.7.1 Meta-analysis

```
comp_metabin <- metabin(data = semirigid_only,
                          event.c = complications_postop_overall_n_control,
                        n.c = sample_size_control,
                        event.e = complications_postop_overall_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
comp_metabin
```

```
## Number of studies: k = 6
## Number of observations: o = 754
## Number of events: e = 54
##
##                          RR           95%-CI     z p-value
## Common effect model  0.3941 [0.2208; 0.7033] -3.15  0.0016
## Random effects model 0.4512 [0.2462; 0.8269] -2.58  0.0100
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.9976]; tau = 0 [0.0000; 1.7314]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  4.47    5  0.4836
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

8.7.2 Forest plot

```
forest(comp_metabin,
       sortvar = TE)
```



8.7.3 Trim and Fill

```r
trimfill(comp_metabin)
```

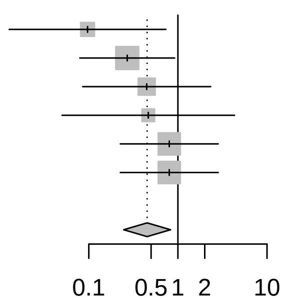
```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values

## Number of studies: k = 6 (with 0 added studies)
## Number of observations: o = 729
## Number of events: e = 54
##
##                          RR           95%-CI     z p-value
## Random effects model 0.4512 [0.2462; 0.8269] -2.58  0.0100
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.9976]; tau = 0 [0.0000; 1.7314]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  4.47    5  0.4836
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(comp_metabin),
       sortvar = TE)
```

```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```

Study	logRR	SE(logRR)	Experimental Total	Control Total	Risk Ratio	RR	95%−CI	Weight
Du 2019	−2.3354	1.0331	62	60		0.10	[0.01; 0.73]	8.9%
Wu 2022	−1.3103	0.6256	76	82		0.27	[0.08; 0.92]	24.4%
Zhang 2021	−0.8065	0.8439	56	50		0.45	[0.09; 2.33]	13.4%
AlSmadi 2019	−0.7655	1.1373	43	60		0.47	[0.05; 4.32]	7.4%
Zhai 2023	−0.2231	0.6455	60	60		0.80	[0.23; 2.83]	22.9%
Zhai 2023	−0.2231	0.6455	60	60		0.80	[0.23; 2.83]	22.9%
Random effects model			**357**	**372**		**0.45**	**[0.25; 0.83]**	**100.0%**

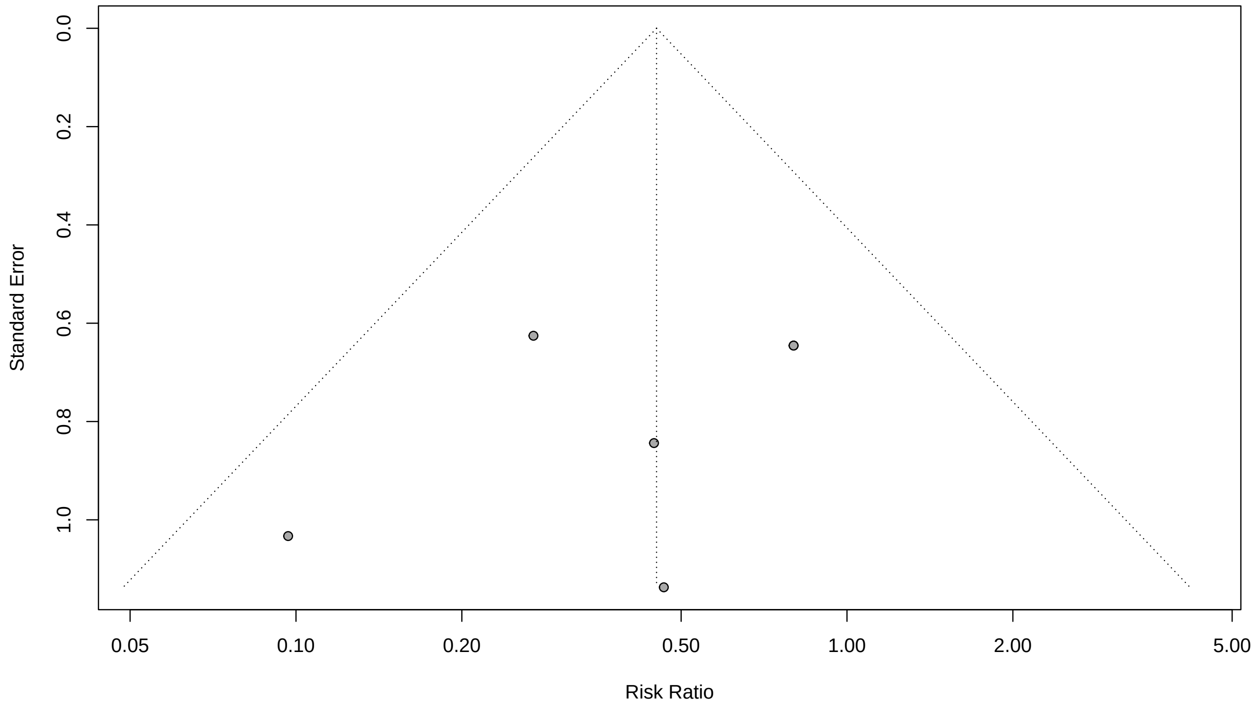


Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.48$

8.7.4 Funnel plot

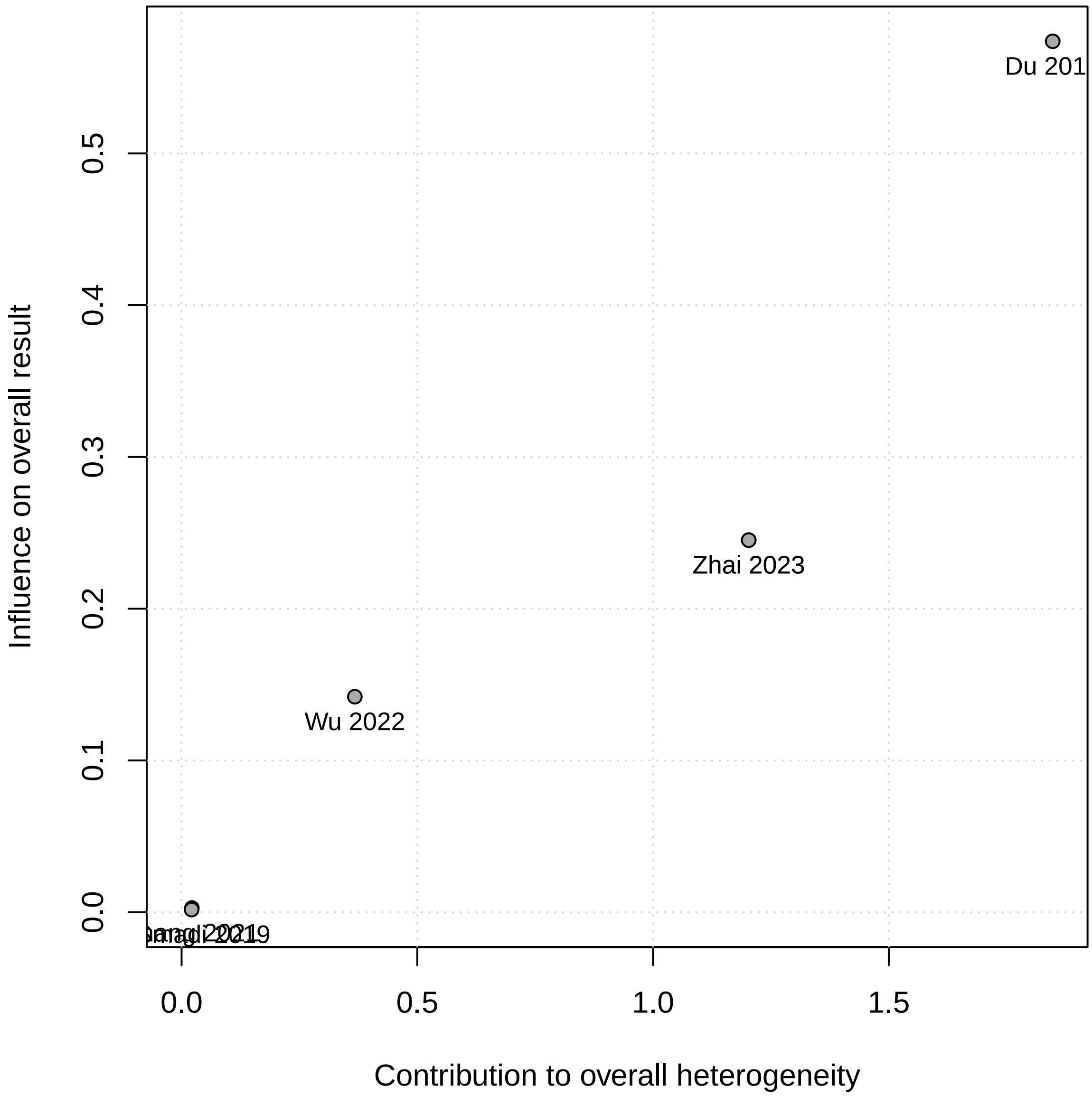
```
funnel(trimfill(comp_metabin))
```

```
## Warning in trimfill.meta(comp_metabin): 1 observation(s) dropped due to missing
## values
```



8.7.5 Baujat

```
baujat(comp_metabin, pos = 1)
```



8.7.6 Leave one out

```r
metainf(comp_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI p-value   tau^2     tau
## Omitting Du 2019            0.5010 [0.2693; 0.9321]  0.0291  0.0000  0.0000
## Omitting Zhang 2021         0.3876 [0.2089; 0.7195]  0.0027  0.0516  0.2271
## Omitting Lechevallier 2003  0.3941 [0.2208; 0.7033]  0.0016  0.0000  0.0000
## Omitting Wu 2022            0.4475 [0.2311; 0.8665]  0.0171  0.0000  0.0000
## Omitting Zhai 2023          0.3334 [0.1720; 0.6463]  0.0011  0.0000  0.0000
## Omitting Zhai 2023          0.3334 [0.1720; 0.6463]  0.0011  0.0000  0.0000
## Omitting AlSmadi 2019       0.3892 [0.2136; 0.7090]  0.0020  0.0039  0.0626
##
## Pooled estimate             0.3941 [0.2208; 0.7033]  0.0016  0.0000  0.0000
##                                I^2
## Omitting Du 2019              0.0%
## Omitting Zhang 2021          10.6%
## Omitting Lechevallier 2003    0.0%
## Omitting Wu 2022              0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting AlSmadi 2019        10.5%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.8 Fever

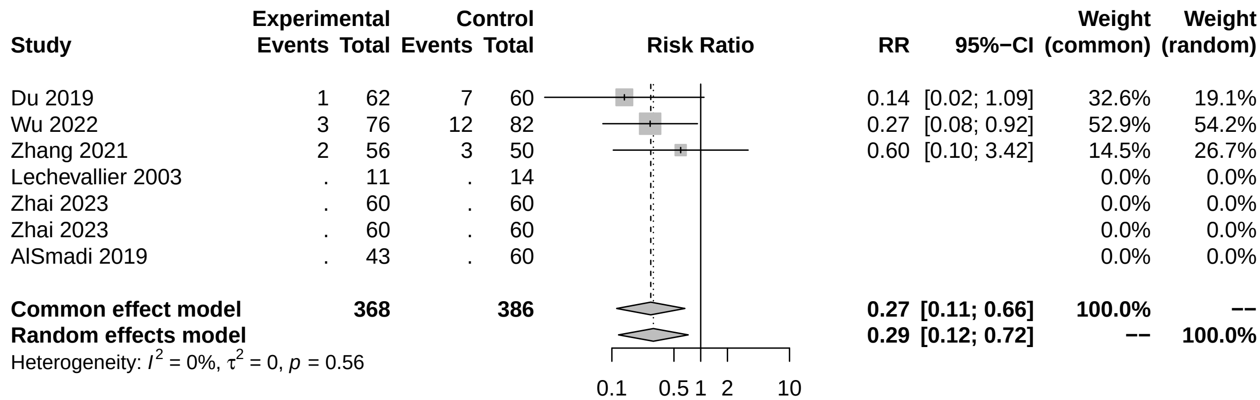
8.8.1 Meta-analysis

```
fever_metabin <- metabin(data = semirigid_only,
                         event.c = fever_n_control,
                       n.c = sample_size_control,
                       event.e = fever_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
fever_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 754
## Number of events: e = 28
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2741 [0.1132; 0.6638] -2.87  0.0041
## Random effects model 0.2932 [0.1189; 0.7231] -2.66  0.0077
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 20.1531]; tau = 0 [0.0000; 4.4892]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.16    2  0.5607
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

8.8.2 Forest plot

```r
forest(fever_metabin,
       sortvar = TE)
```



8.8.3 Trim and Fill

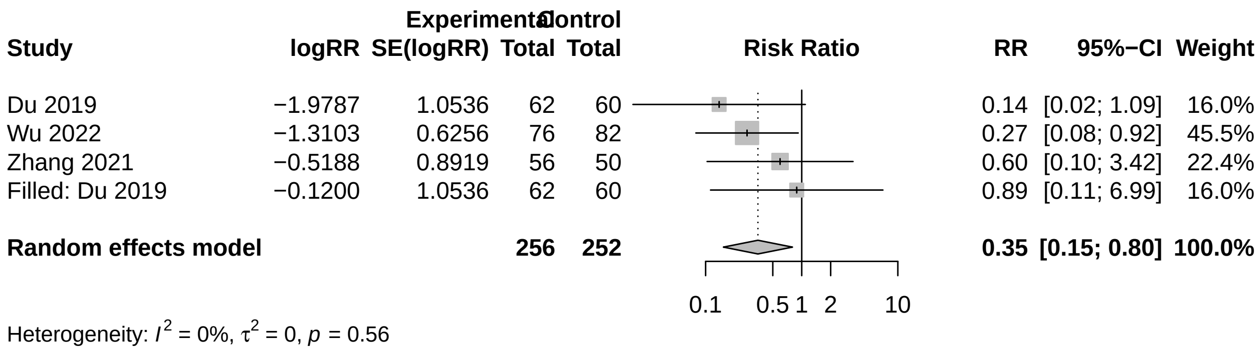
```r
trimfill(fever_metabin)
```

```
## Warning in trimfill.meta(fever_metabin): 4 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 4 (with 1 added studies)
## Number of observations: o = 508
## Number of events: e = 36
##
##                          RR           95%-CI     z p-value
## Random effects model 0.3502 [0.1531; 0.8008] -2.49  0.0129
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 8.5047]; tau = 0 [0.0000; 2.9163]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.08    3  0.5551
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(fever_metabin),
       sortvar = TE)
```

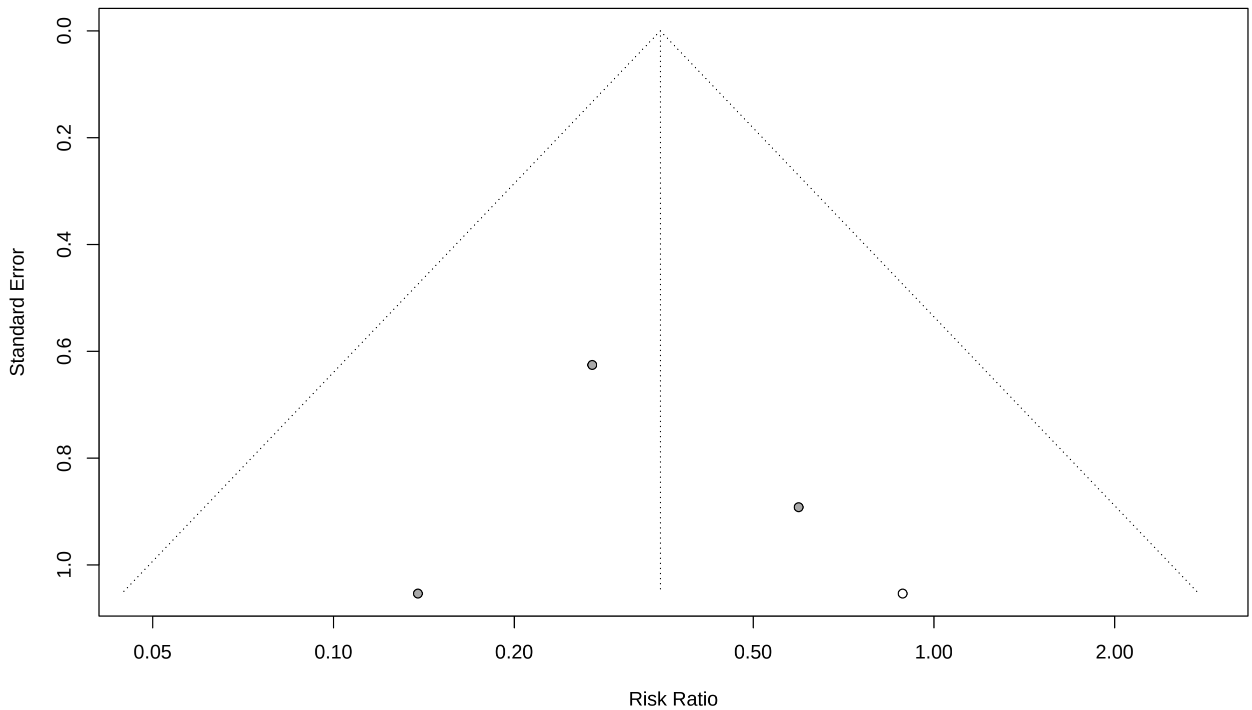
```
## Warning in trimfill.meta(fever_metabin): 4 observation(s) dropped due to
## missing values
```



8.8.4 Funnel plot

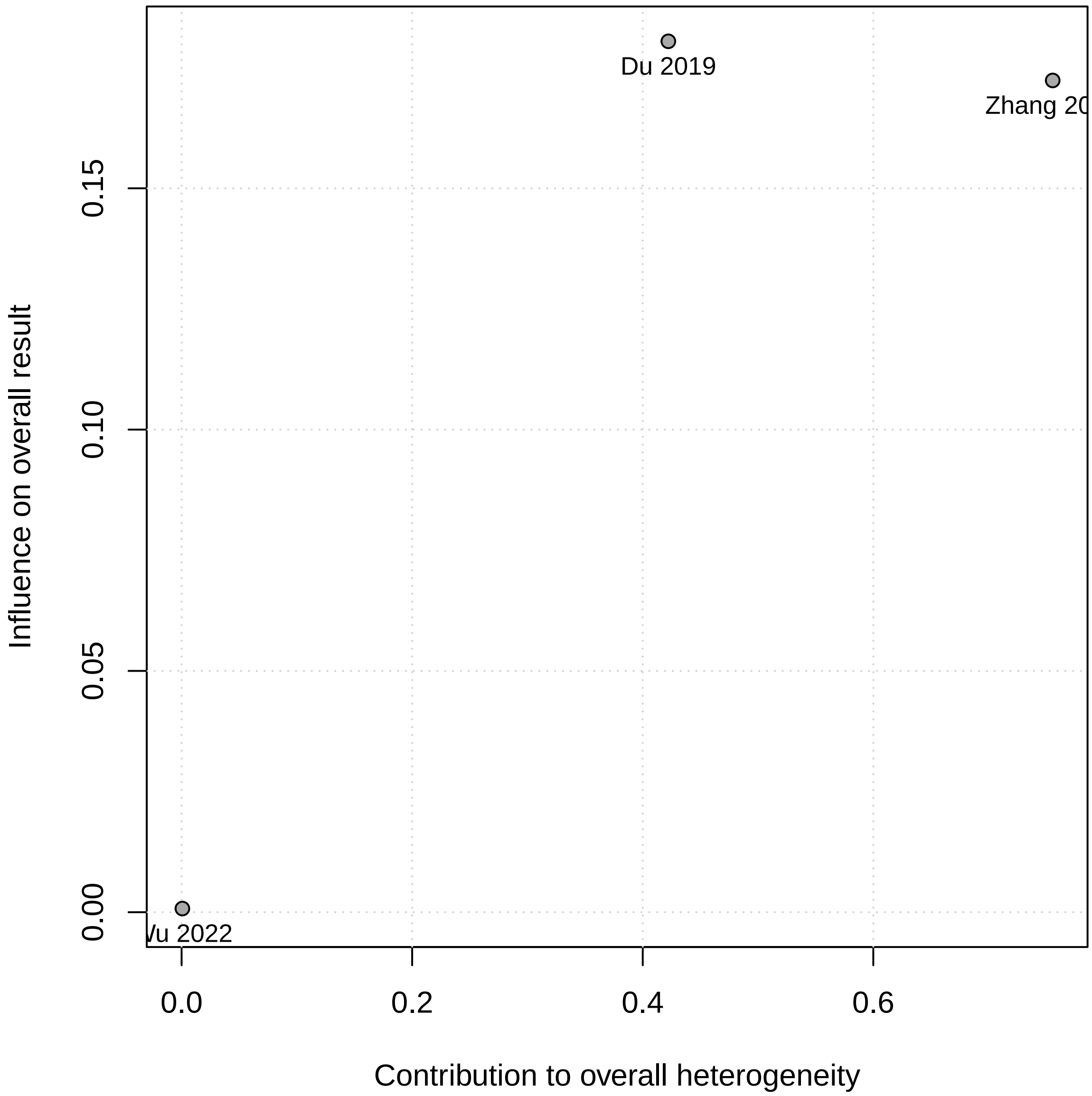
```
funnel(trimfill(fever_metabin))
```

```
## Warning in trimfill.meta(fever_metabin): 4 observation(s) dropped due to
## missing values
```



8.8.5 Baujat

```r
baujat(fever_metabin, pos = 1)
```



8.8.6 Leave one out

```r
metainf(fever_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Du 2019             0.3399 [0.1261; 0.9159]  0.0329  0.0000  0.0000
## Omitting Zhang 2021          0.2196 [0.0770; 0.6259]  0.0046  0.0000  0.0000
## Omitting Lechevallier 2003   0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
## Omitting Wu 2022             0.2791 [0.0779; 1.0005]  0.0501  0.1129  0.3360
## Omitting Zhai 2023           0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
## Omitting Zhai 2023           0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
## Omitting AlSmadi 2019        0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
##
## Pooled estimate              0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
##                                 I^2
## Omitting Du 2019               0.0%
## Omitting Zhang 2021            0.0%
## Omitting Lechevallier 2003     0.0%
## Omitting Wu 2022              10.6%
## Omitting Zhai 2023             0.0%
## Omitting Zhai 2023             0.0%
## Omitting AlSmadi 2019          0.0%
##
## Pooled estimate                0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.9 Infections

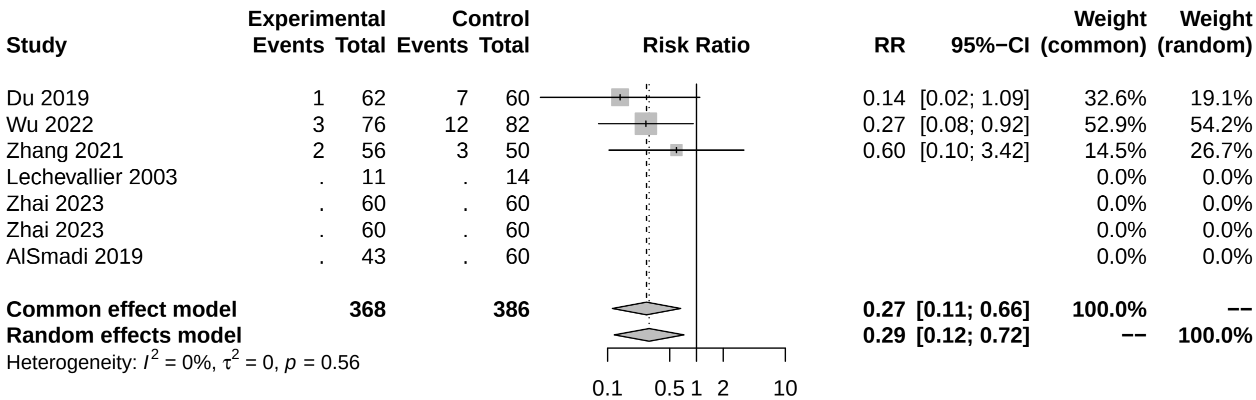
8.9.1 Meta-analysis

```
infection_metabin <- metabin(data = semirigid_only,
                         event.c = infection_n_control,
                       n.c = sample_size_control,
                       event.e = infection_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
infection_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 754
## Number of events: e = 28
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2741 [0.1132; 0.6638] -2.87  0.0041
## Random effects model 0.2932 [0.1189; 0.7231] -2.66  0.0077
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 20.1531]; tau = 0 [0.0000; 4.4892]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.16    2  0.5607
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

8.9.2 Forest plot

```r
forest(infection_metabin,
       sortvar = TE)
```



8.9.3 Trim and Fill

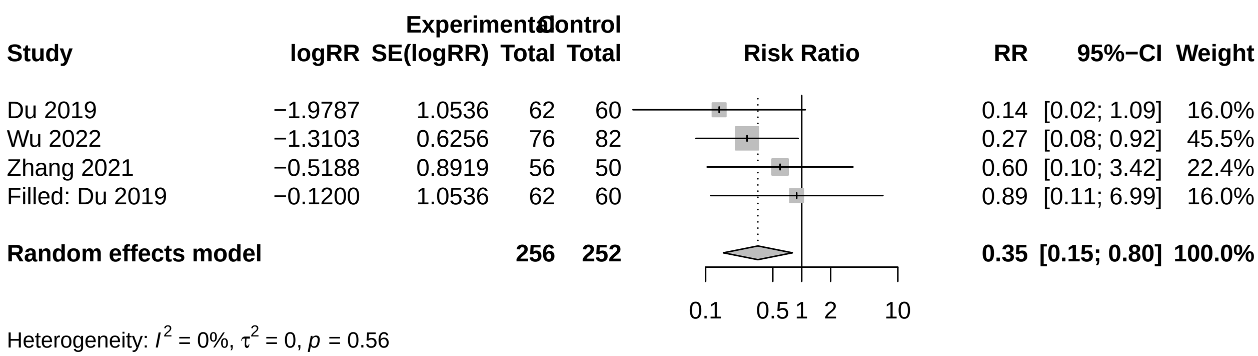
```r
trimfill(infection_metabin)
```

```
## Warning in trimfill.meta(infection_metabin): 4 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 4 (with 1 added studies)
## Number of observations: o = 508
## Number of events: e = 36
##
##                          RR           95%-CI     z p-value
## Random effects model 0.3502 [0.1531; 0.8008] -2.49  0.0129
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 8.5047]; tau = 0 [0.0000; 2.9163]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.08    3  0.5551
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(infection_metabin),
       sortvar = TE)
```

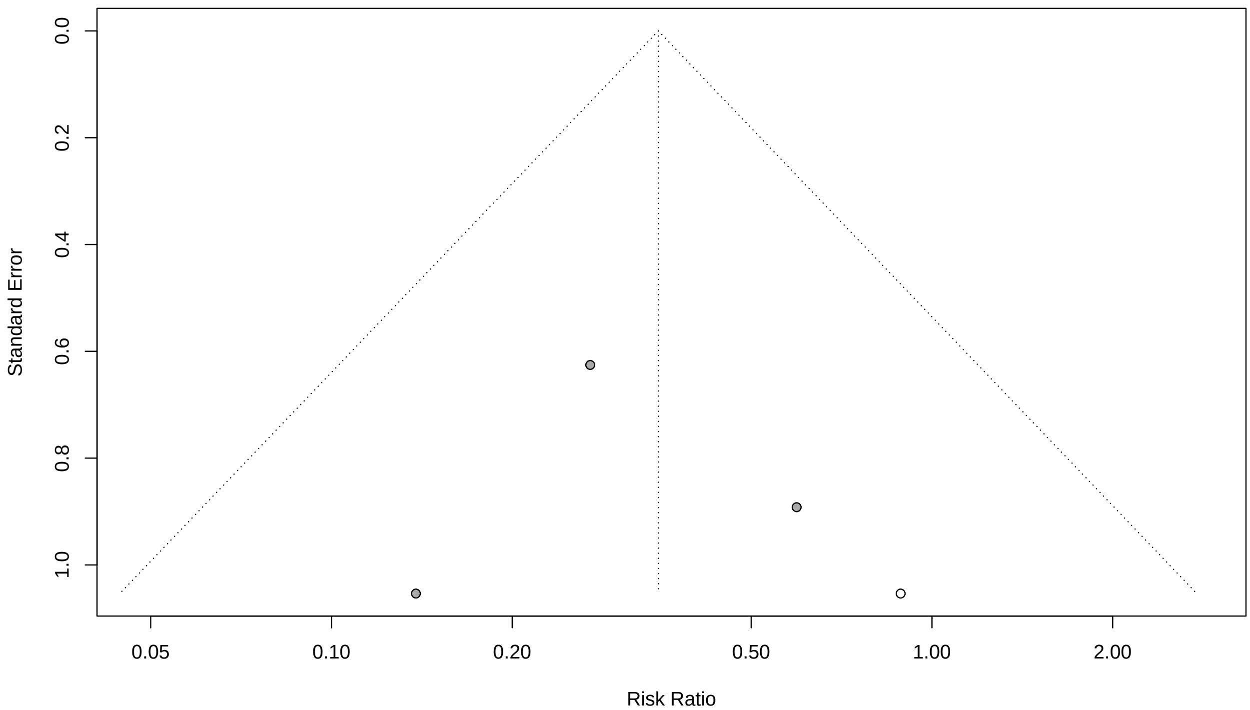
```
## Warning in trimfill.meta(infection_metabin): 4 observation(s) dropped due to
## missing values
```



8.9.4 Funnel plot

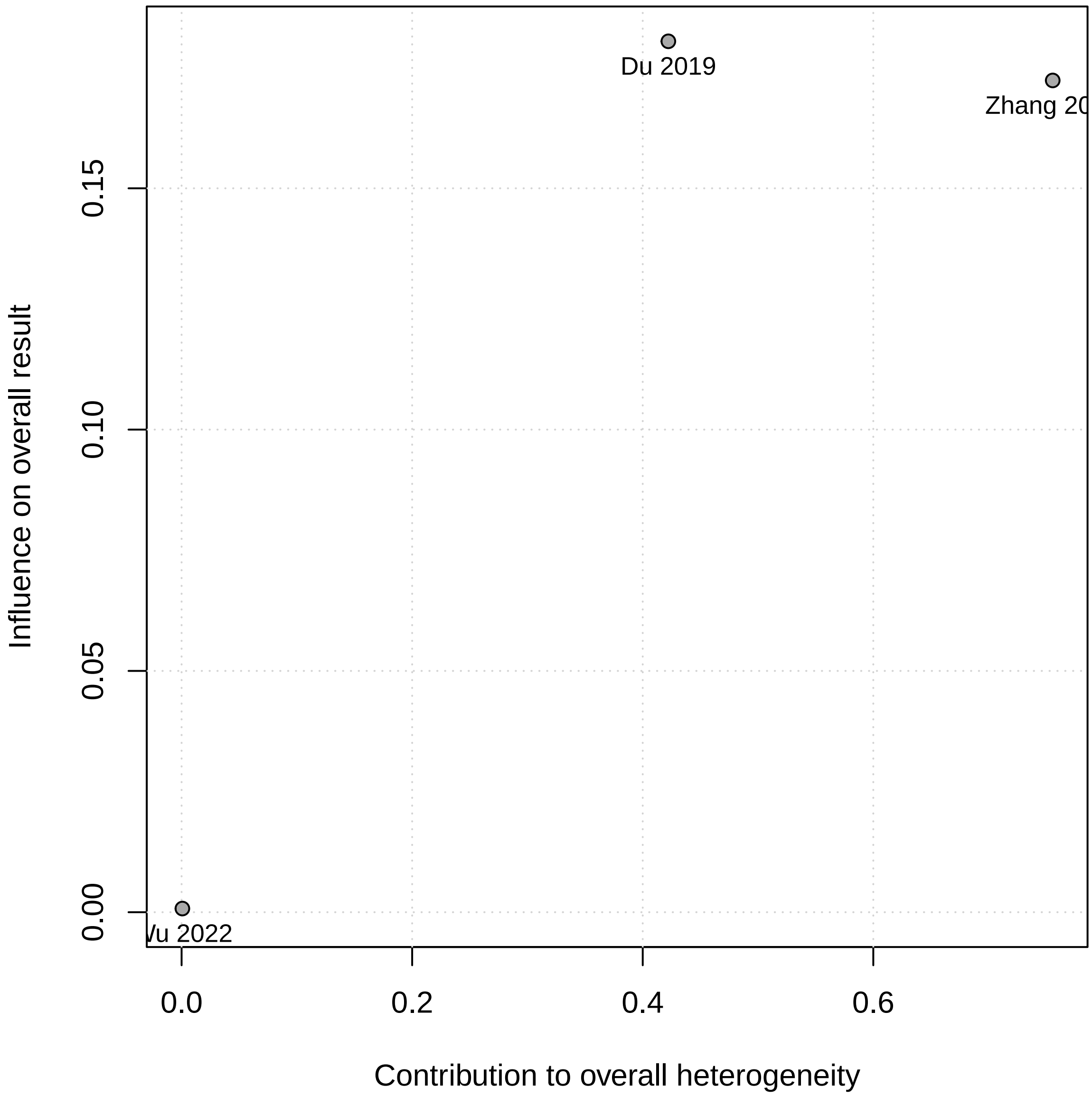
```
funnel(trimfill(infection_metabin))
```

```
## Warning in trimfill.meta(infection_metabin): 4 observation(s) dropped due to
## missing values
```



8.9.5 Baujat

```
baujat(infection_metabin, pos = 1)
```



8.9.6 Leave one out

```r
metainf(infection_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI p-value   tau^2     tau
## Omitting Du 2019            0.3399 [0.1261; 0.9159]  0.0329  0.0000  0.0000
## Omitting Zhang 2021         0.2196 [0.0770; 0.6259]  0.0046  0.0000  0.0000
## Omitting Lechevallier 2003  0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
## Omitting Wu 2022            0.2791 [0.0779; 1.0005]  0.0501  0.1129  0.3360
## Omitting Zhai 2023          0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
## Omitting Zhai 2023          0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
## Omitting AlSmadi 2019       0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
##
## Pooled estimate             0.2741 [0.1132; 0.6638]  0.0041  0.0000  0.0000
##                                I^2
## Omitting Du 2019              0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Wu 2022             10.6%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.10 Sepsis

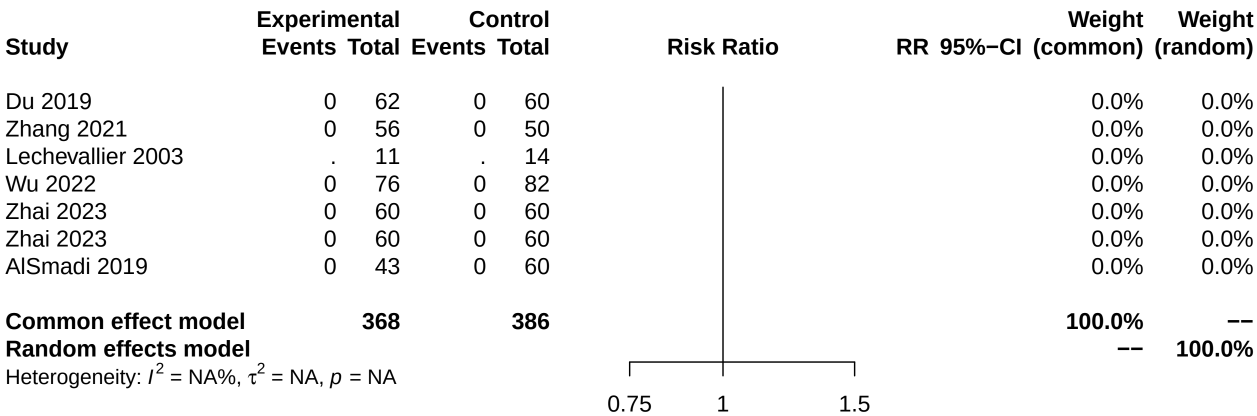
8.10.1 Meta-analysis

```
sepsis_metabin <- metabin(data = semirigid_only,
                         event.c = sepsis_n_control,
                       n.c = sample_size_control,
                       event.e = sepsis_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sepsis_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA         --      --
## Random effects model NA         --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.10.2 Forest plot

```r
forest(sepsis_metabin,
       sortvar = TE)
```



8.10.3 Trim and Fill

```
#trimfill(sepsis_metabin)
#forest(trimfill(sepsis_metabin),
#       sortvar = TE)
```

8.10.4 Funnel plot

```
#funnel((sepsis_metabin))
```

8.10.5 Baujat

```
#baujat(sepsis_metabin, pos = 1)
```

8.10.6 Leave one out

```r
metainf(sepsis_metabin)
```

```
## Influential analysis (common effect model)
##
##                               RR 95%-CI p-value tau^2 tau I^2
## Omitting Du 2019
## Omitting Zhang 2021
## Omitting Lechevallier 2003
## Omitting Wu 2022
## Omitting Zhai 2023
## Omitting Zhai 2023
## Omitting AlSmadi 2019
##
## Pooled estimate
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.11 Abscess

8.11.1 Meta-analysis

```r
abscess_metabin <- metabin(data = semirigid_only,
                             event.c = abscess_n_control,
                           n.c = sample_size_control,
                           event.e = abscess_n_suction,
                           n.e = sample_size_suction,
                           studlab = author_year)
abscess_metabin
```

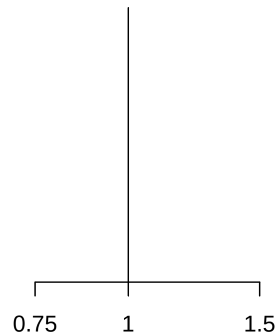
```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.11.2 Forest plot

```r
forest(abscess_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	Risk Ratio	RR	95%−CI	Weight (common)	Weight (random)
Du 2019	0	62	0	60				0.0%	0.0%
Zhang 2021	0	56	0	50				0.0%	0.0%
Lechevallier 2003	.	11	.	14				0.0%	0.0%
Wu 2022	0	76	0	82				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
AlSmadi 2019	0	43	0	60				0.0%	0.0%
Common effect model		**368**		**386**				**100.0%**	**−−**
Random effects model								**−−**	**100.0%**

Heterogeneity: I^2 = NA%, τ^2 = NA, p = NA



8.11.3 Trim and Fill

```
#trimfill(abscess_metabin)
#forest(trimfill(abscess_metabin),
#       sortvar = TE)
```

8.11.4 Funnel plot

```
#funnel((abscess_metabin))
```

8.11.5 Baujat

```
#baujat(abscess_metabin, pos = 1)
```

8.11.6 Leave one out

```
#metainf(abscess_metabin)
```

8.12 Haematoma

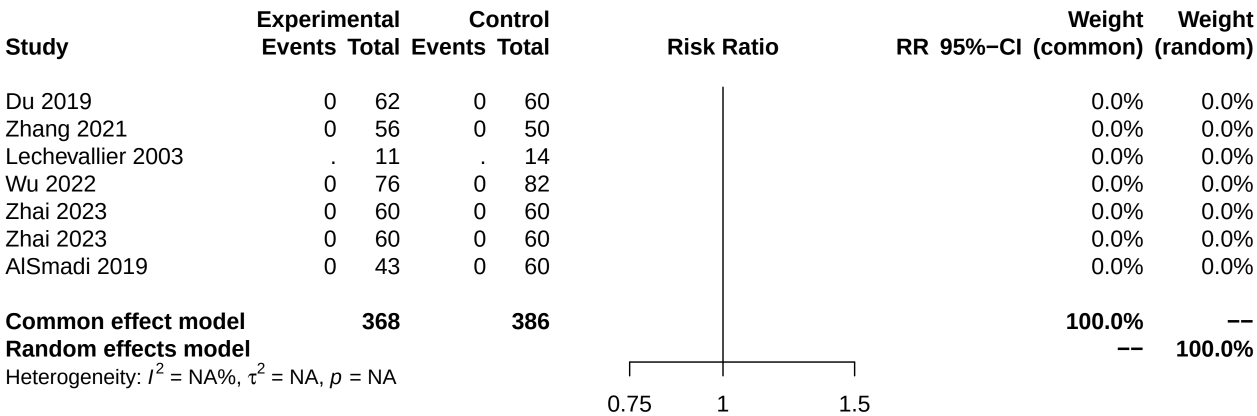
8.12.1 Meta-analysis

```
haematoma_metabin <- metabin(data = semirigid_only,
                         event.c = hematoma_n_control,
                       n.c = sample_size_control,
                       event.e = hematoma_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
haematoma_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.12.2 Forest plot

```r
forest(haematoma_metabin,
       sortvar = TE)
```



8.12.3 Trim and Fill

```
#trimfill(haematoma_metabin)
#forest(trimfill(haematoma_metabin),
#       sortvar = TE)
```

8.12.4 Funnel plot

```
#funnel((haematoma_metabin))
```

8.12.5 Baujat

```
#baujat(haematoma_metabin, pos = 1)
```

8.12.6 Leave one out

```
#metainf(haematoma_metabin)
```

8.13 Pain

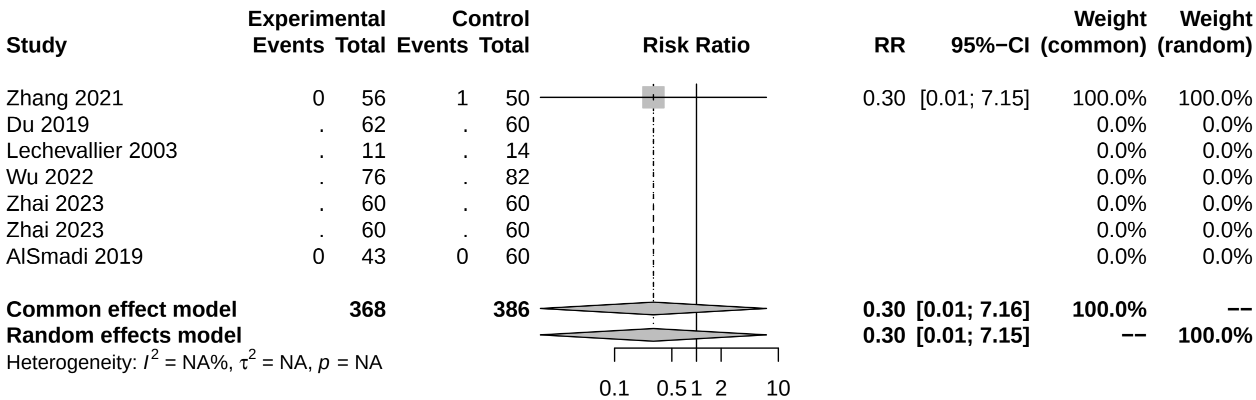
8.13.1 Meta-analysis

```
pain_metabin <- metabin(data = semirigid_only,
                         event.c = pain_n_control,
                       n.c = sample_size_control,
                       event.e = pain_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
pain_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 754
## Number of events: e = 1
##
##                          RR           95%-CI     z p-value
## Common effect model  0.2982 [0.0124; 7.1592] -0.75  0.4556
## Random effects model 0.2979 [0.0124; 7.1502] -0.75  0.4552
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

8.13.2 Forest plot

```
forest(pain_metabin,
       sortvar = TE)
```

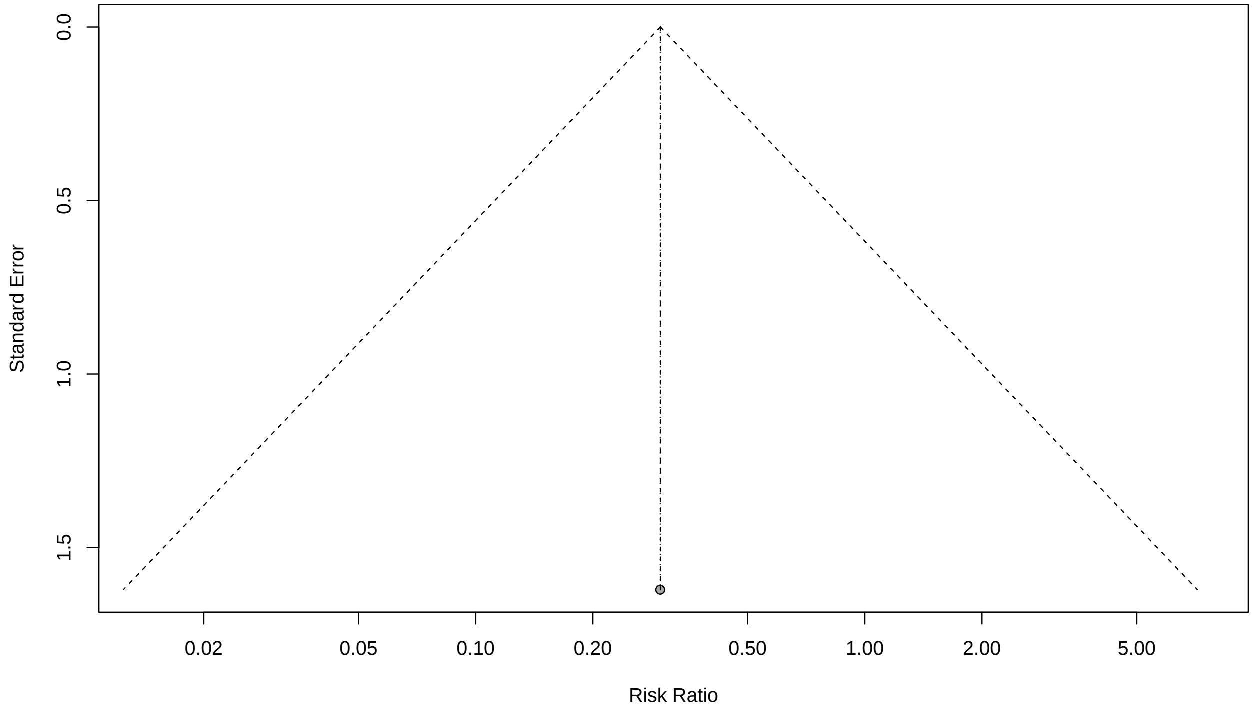


8.13.3 Trim and Fill

```
#trimfill(pain_metabin)
#forest(trimfill(pain_metabin),
#       sortvar = TE)
```

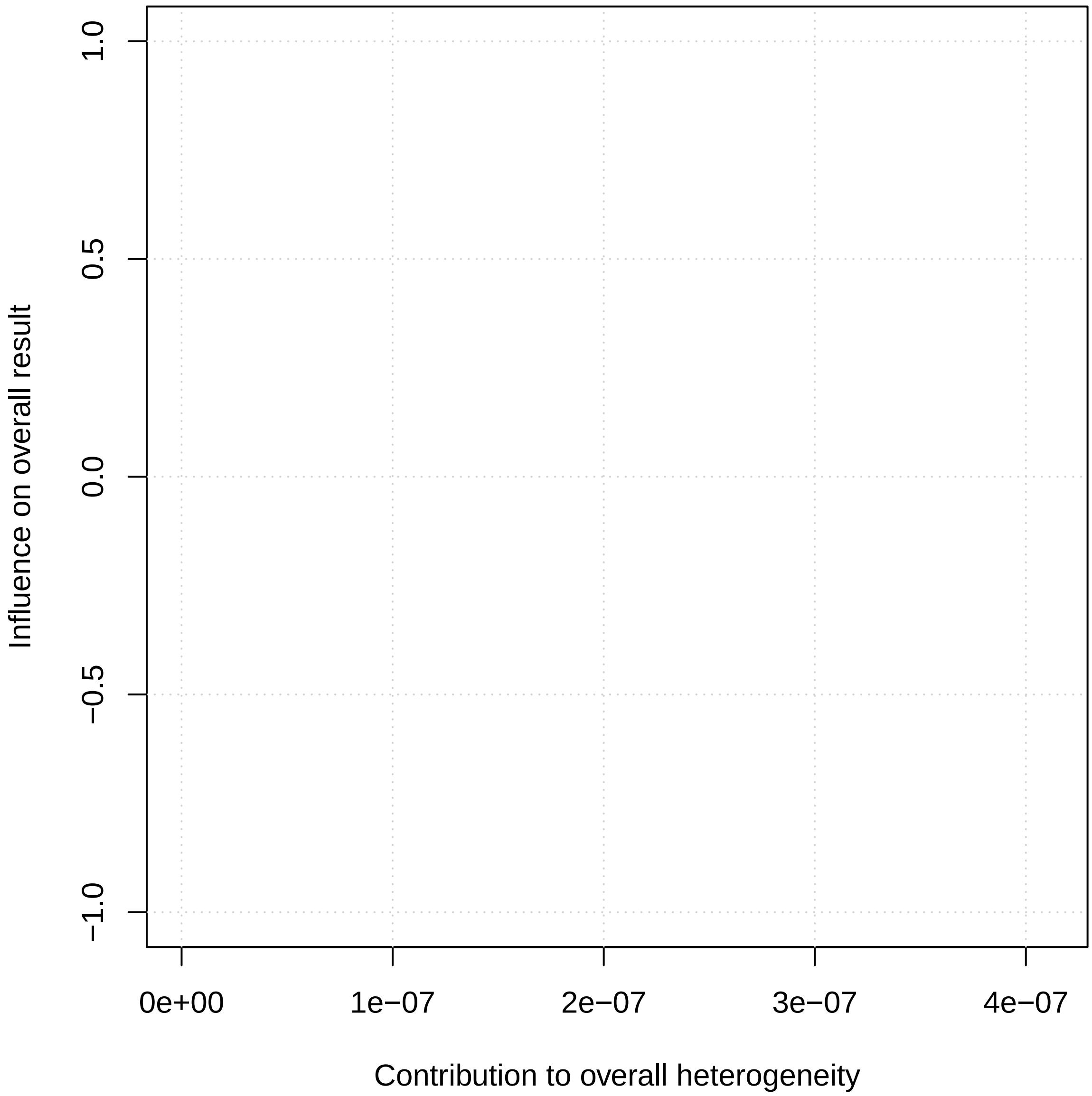
8.13.4 Funnel plot

```r
funnel((pain_metabin))
```



8.13.5 Baujat

```r
baujat(pain_metabin, pos = 1)
```



8.13.6 Leave one out

```r
metainf(pain_metabin, pos = 1)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value tau^2 tau I^2
## Omitting Du 2019             0.2982 [0.0124; 7.1592]  0.4556
## Omitting Zhang 2021
## Omitting Lechevallier 2003   0.2982 [0.0124; 7.1592]  0.4556
## Omitting Wu 2022             0.2982 [0.0124; 7.1592]  0.4556
## Omitting Zhai 2023           0.2982 [0.0124; 7.1592]  0.4556
## Omitting Zhai 2023           0.2982 [0.0124; 7.1592]  0.4556
## Omitting AlSmadi 2019        0.2982 [0.0124; 7.1592]  0.4556
##
## Pooled estimate              0.2982 [0.0124; 7.1592]  0.4556
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.14 Stricture

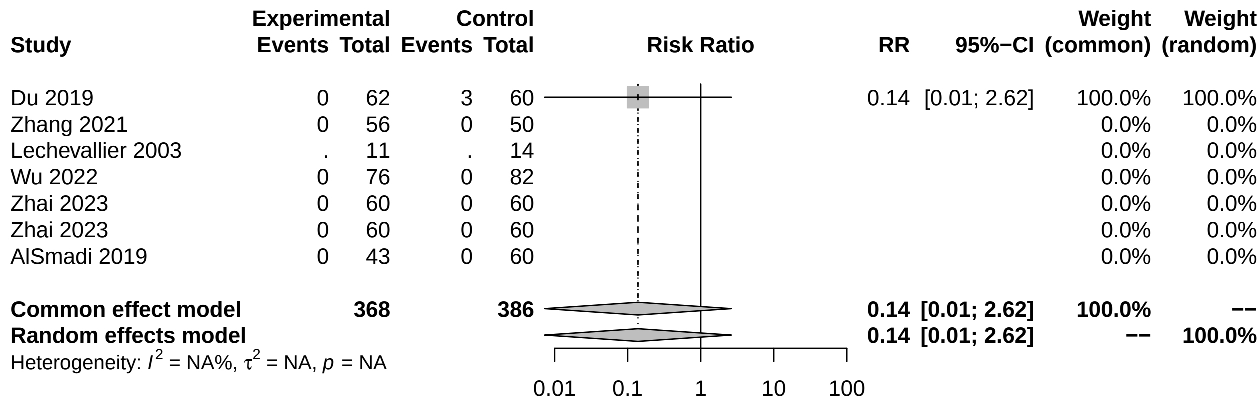
8.14.1 Meta-analysis

```
stricture_metabin <- metabin(data = semirigid_only,
                         event.c = stricture_n_control,
                       n.c = sample_size_control,
                       event.e = stricture_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
stricture_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 754
## Number of events: e = 3
##
##                          RR           95%-CI     z p-value
## Common effect model  0.1383 [0.0073; 2.6222] -1.32  0.1876
## Random effects model 0.1383 [0.0073; 2.6211] -1.32  0.1875
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

8.14.2 Forest plot

```r
forest(stricture_metabin,
       sortvar = TE)
```

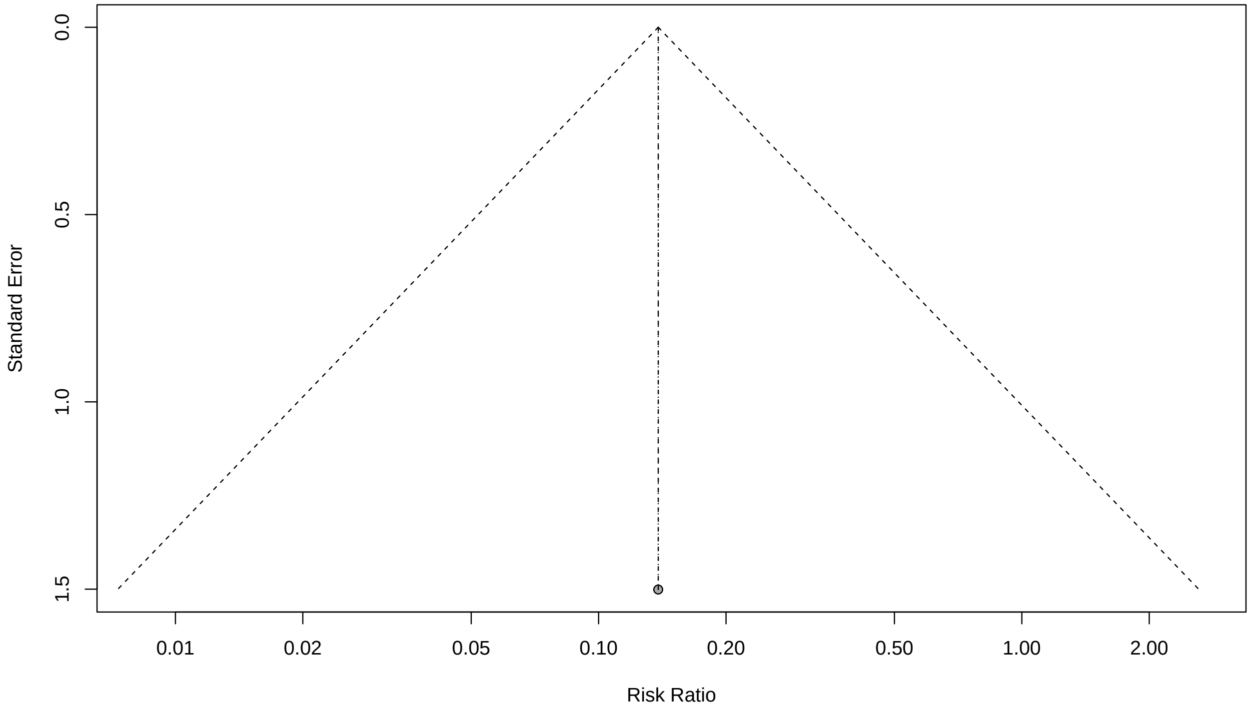


8.14.3 Trim and Fill

```
#trimfill(stricture_metabin)
#forest(trimfill(stricture_metabin),
#       sortvar = TE)
```

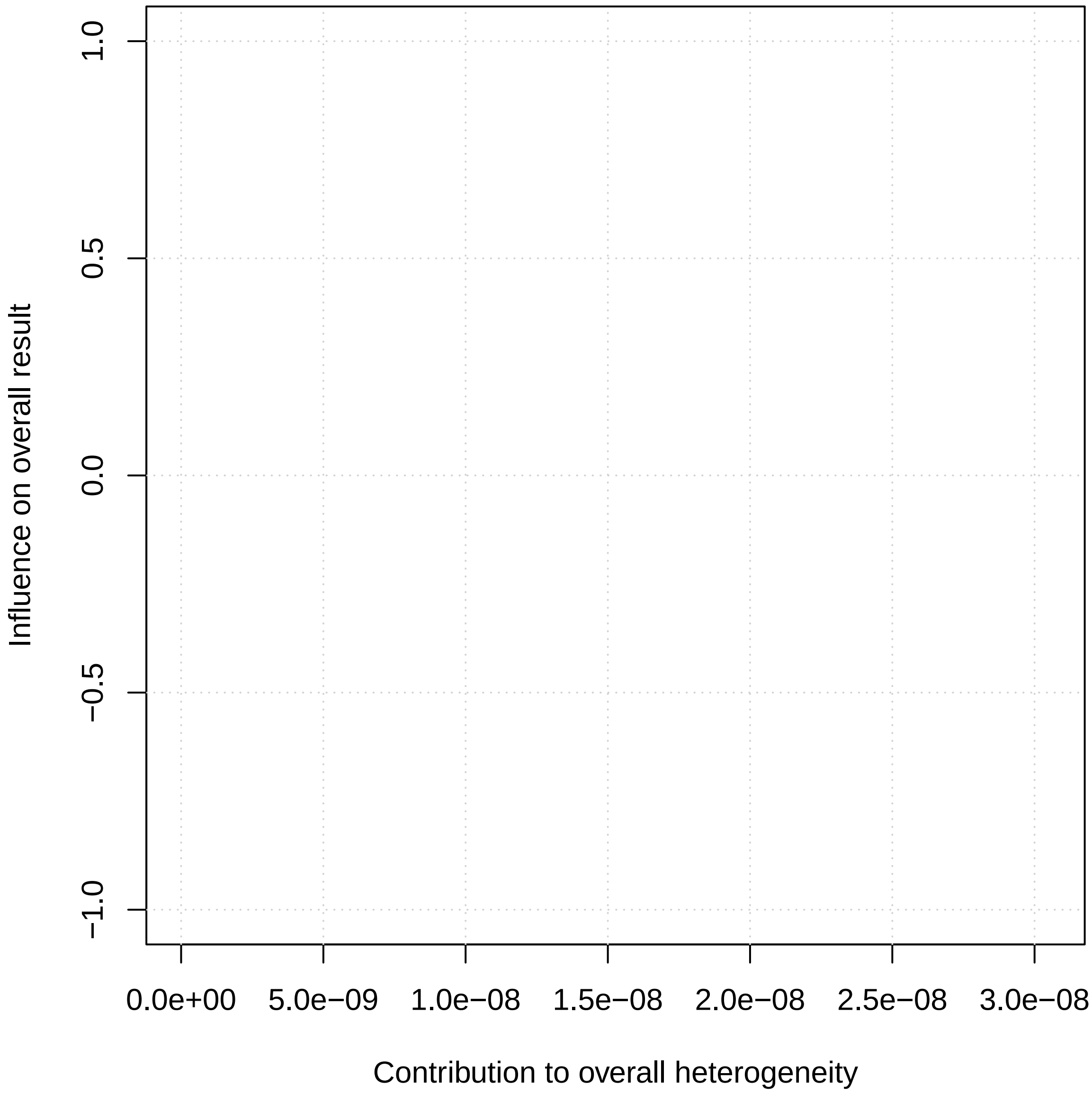
8.14.4 Funnel plot

```
funnel((stricture_metabin))
```



8.14.5 Baujat

```
baujat(stricture_metabin, pos = 1)
```



8.14.6 Leave one out

```
metainf(stricture_metabin)
```

```
## Influential analysis (common effect model)
##
##                                   RR           95%-CI p-value tau^2 tau I^2
## Omitting Du 2019
## Omitting Zhang 2021          0.1383 [0.0073; 2.6222]  0.1876
## Omitting Lechevallier 2003   0.1383 [0.0073; 2.6222]  0.1876
## Omitting Wu 2022             0.1383 [0.0073; 2.6222]  0.1876
## Omitting Zhai 2023           0.1383 [0.0073; 2.6222]  0.1876
## Omitting Zhai 2023           0.1383 [0.0073; 2.6222]  0.1876
## Omitting AlSmadi 2019        0.1383 [0.0073; 2.6222]  0.1876
##
## Pooled estimate              0.1383 [0.0073; 2.6222]  0.1876
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.15 Embolisation required

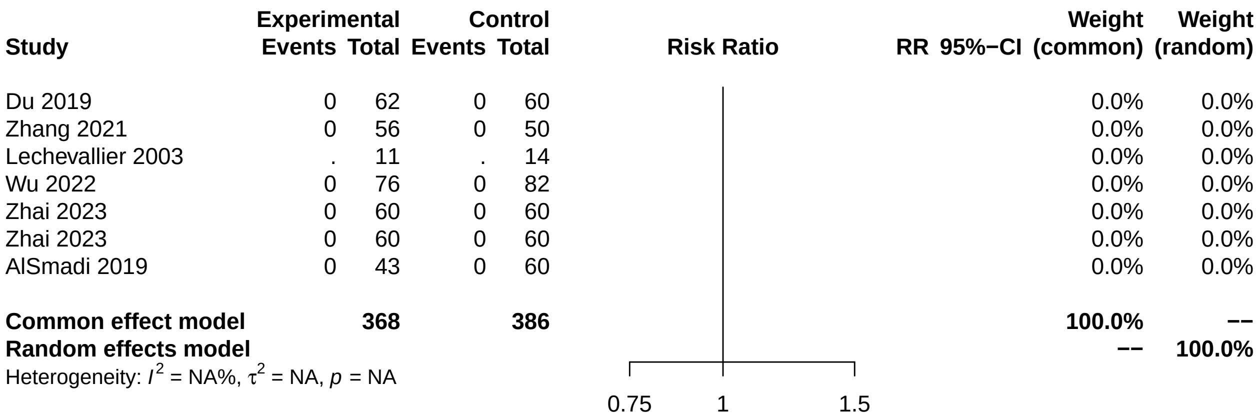
8.15.1 Meta-analysis

```
ir_embolisation_metabin <- metabin(data = semirigid_only,
                         event.c = embolism_ir_intervention_n_control,
                       n.c = sample_size_control,
                       event.e = embolism_ir_intervention_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
ir_embolisation_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                      RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.15.2 Forest plot

```r
forest(ir_embolisation_metabin,
       sortvar = TE)
```



8.15.3 Trim and Fill

```
#trimfill(ir_embolisation_metabin)
#forest(trimfill(ir_embolisation_metabin),
#       sortvar = TE)
```

8.15.4 Funnel plot

```
#funnel((ir_embolisation_metabin))
```

8.15.5 Baujat

```
#baujat(ir_embolisation_metabin, pos = 1)
```

8.15.6 Leave one out

```
#metainf(ir_embolisation_metabin)
```

8.16 Transfusion

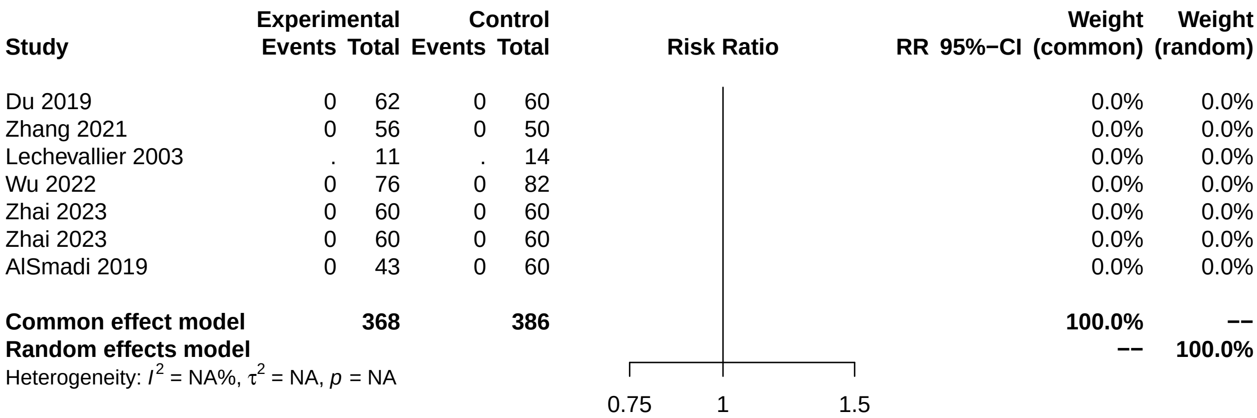
8.16.1 Meta-analysis

```
transfusion_metabin <- metabin(data = semirigid_only,
                          event.c = transfusion_n_control,
                        n.c = sample_size_control,
                        event.e = transfusion_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
transfusion_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.16.2 Forest plot

```r
forest(transfusion_metabin,
       sortvar = TE)
```



8.16.3 Trim and Fill

```
#trimfill(transfusion_metabin)
#forest(trimfill(transfusion_metabin),
#       sortvar = TE)
```

8.16.4 Funnel plot

```
#funnel(trimfill(transfusion_metabin))
```

8.16.5 Baujat

```
#baujat(transfusion_metabin, pos = 1)
```

8.16.6 Leave one out

```
#metainf(transfusion_metabin)
```

8.17 Clavien I

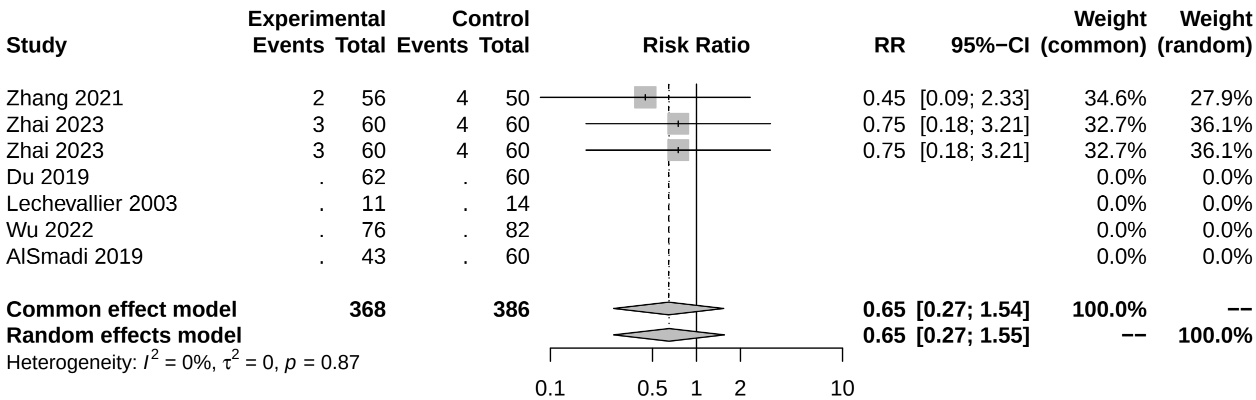
8.17.1 Meta-analysis

```
clav_i_metabin <- metabin(data = semirigid_only,
                         event.c = clavien_i_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_i_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_i_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 754
## Number of events: e = 20
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6451 [0.2710; 1.5355] -0.99  0.3218
## Random effects model 0.6491 [0.2711; 1.5539] -0.97  0.3319
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.8855]; tau = 0 [0.0000; 1.6987]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.27    2  0.8726
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

8.17.2 Forest plot

```r
forest(clav_i_metabin,
       sortvar = TE)
```



8.17.3 Trim and Fill

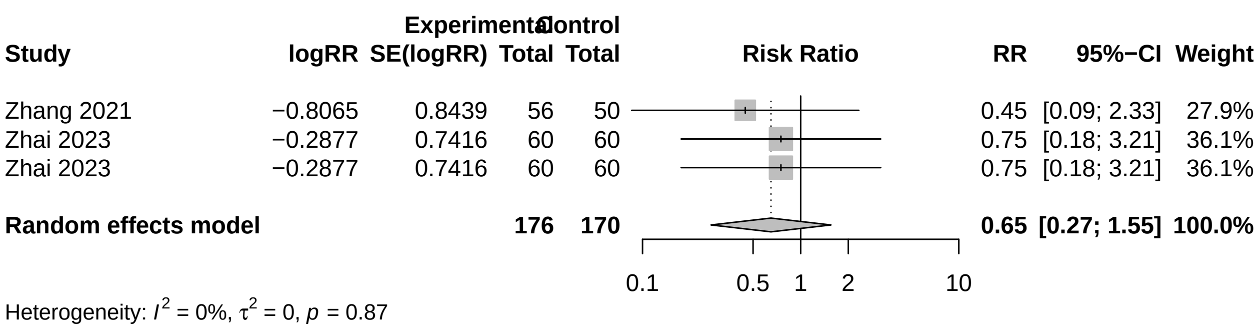
```
trimfill(clav_i_metabin)
```

```
## Warning in trimfill.meta(clav_i_metabin): 4 observation(s) dropped due to
## missing values

## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 346
## Number of events: e = 20
##
##                          RR           95%-CI     z p-value
## Random effects model 0.6491 [0.2711; 1.5539] -0.97  0.3319
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.8855]; tau = 0 [0.0000; 1.6987]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.27    2  0.8726
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```
forest(trimfill(clav_i_metabin),
       sortvar = TE)
```

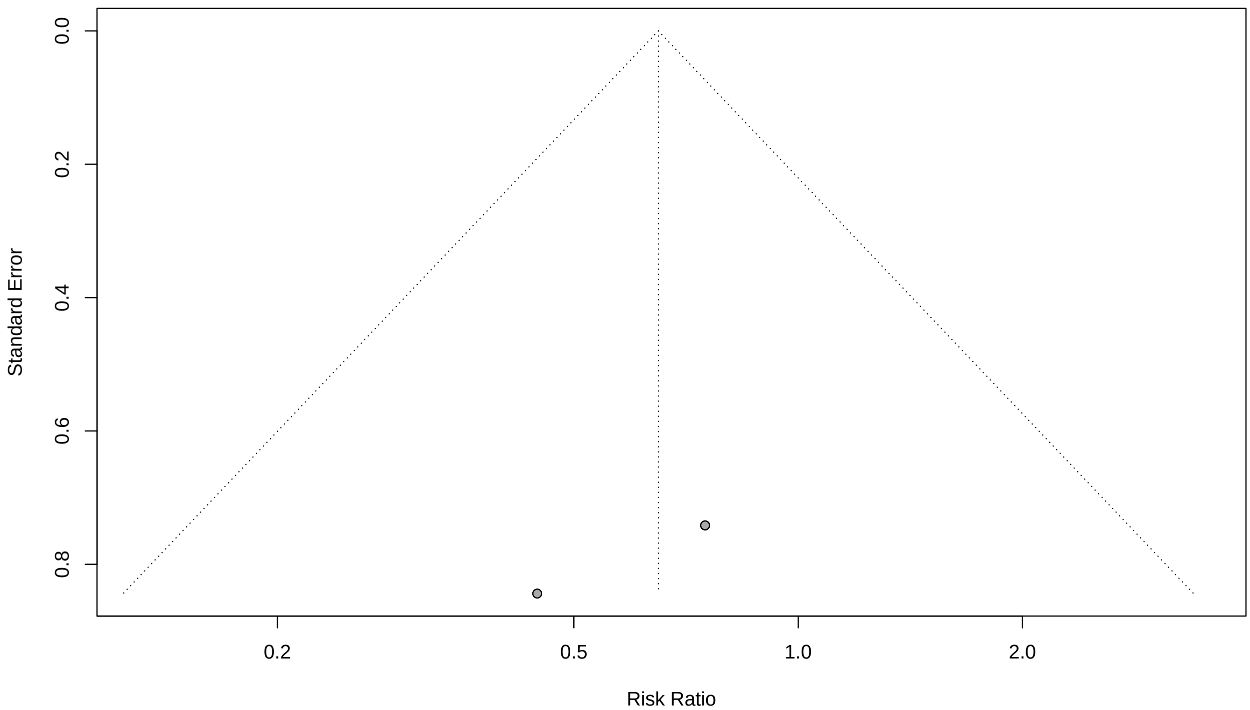
```
## Warning in trimfill.meta(clav_i_metabin): 4 observation(s) dropped due to
## missing values
```



8.17.4 Funnel plot

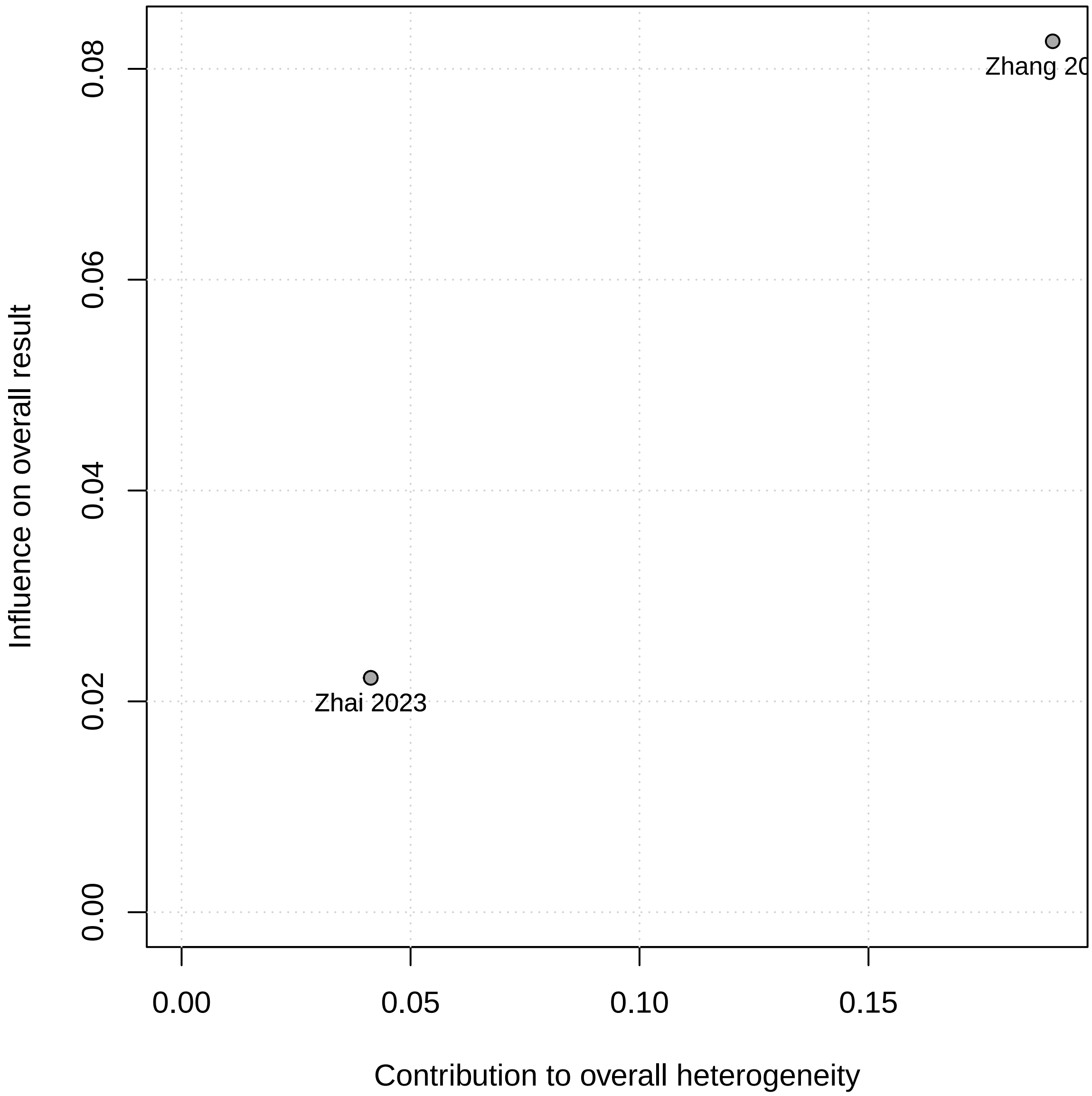
```
funnel(trimfill(clav_i_metabin))
```

```
## Warning in trimfill.meta(clav_i_metabin): 4 observation(s) dropped due to
## missing values
```



8.17.5 Baujat

```
baujat(clav_i_metabin, pos = 1)
```



8.17.6 Leave one out

```
metainf(clav_i_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Du 2019             0.6451 [0.2710; 1.5355]  0.3218  0.0000  0.0000
## Omitting Zhang 2021          0.7500 [0.2683; 2.0962]  0.5833  0.0000  0.0000
## Omitting Lechevallier 2003   0.6451 [0.2710; 1.5355]  0.3218  0.0000  0.0000
## Omitting Wu 2022             0.6451 [0.2710; 1.5355]  0.3218  0.0000  0.0000
## Omitting Zhai 2023           0.5940 [0.2011; 1.7549]  0.3460  0.0000  0.0000
## Omitting Zhai 2023           0.5940 [0.2011; 1.7549]  0.3460  0.0000  0.0000
## Omitting AlSmadi 2019        0.6451 [0.2710; 1.5355]  0.3218  0.0000  0.0000
##
## Pooled estimate              0.6451 [0.2710; 1.5355]  0.3218  0.0000  0.0000
##                                I^2
## Omitting Du 2019              0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Wu 2022              0.0%
## Omitting Zhai 2023            0.0%
## Omitting Zhai 2023            0.0%
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.18 Clavien II

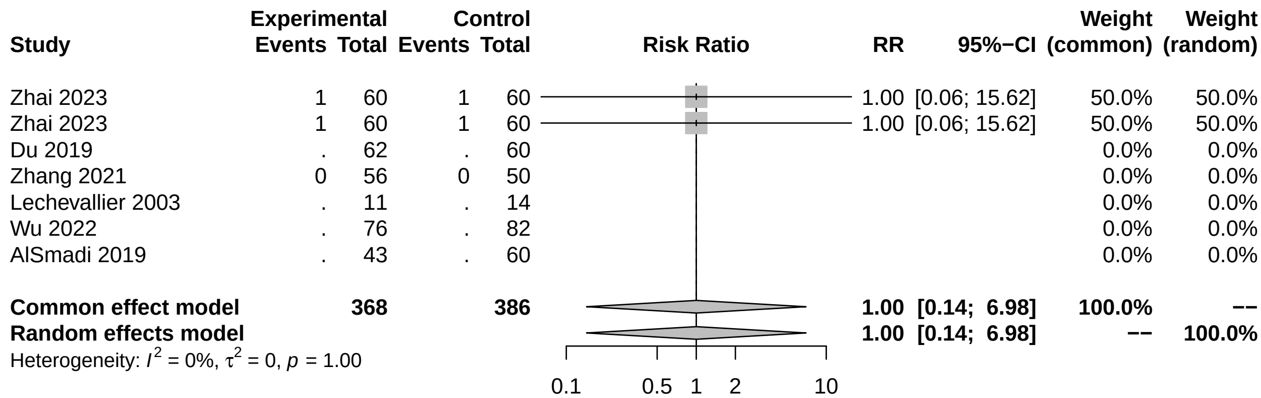
8.18.1 Meta-analysis

```
clav_ii_metabin <- metabin(data = semirigid_only,
                         event.c = clavien_ii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_ii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_ii_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 754
## Number of events: e = 4
##
##                          RR           95%-CI    z p-value
## Common effect model  1.0000 [0.1432; 6.9836] 0.00  1.0000
## Random effects model 1.0000 [0.1432; 6.9836] 0.00  1.0000
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.00    1  1.0000
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.18.2 Forest plot

```r
forest(clav_ii_metabin,
       sortvar = TE)
```

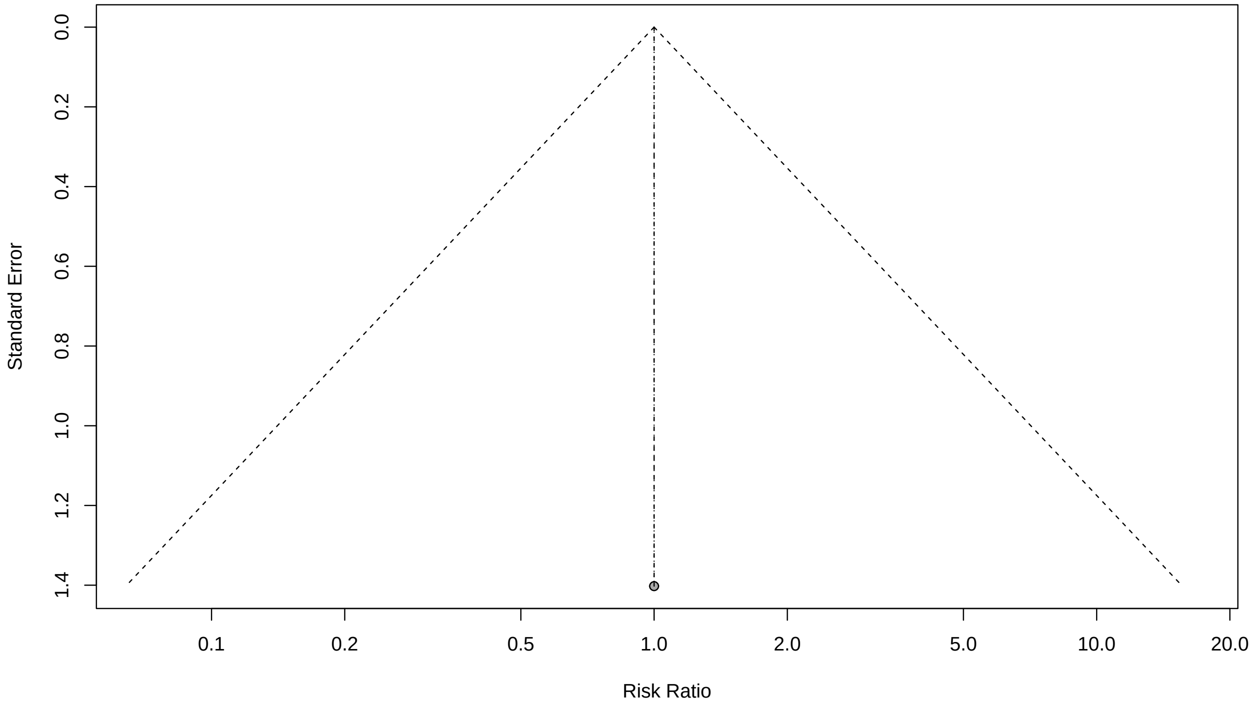


8.18.3 Trim and Fill

```
#trimfill(clav_ii_metabin)
#forest(trimfill(clav_ii_metabin),
#       sortvar = TE)
```

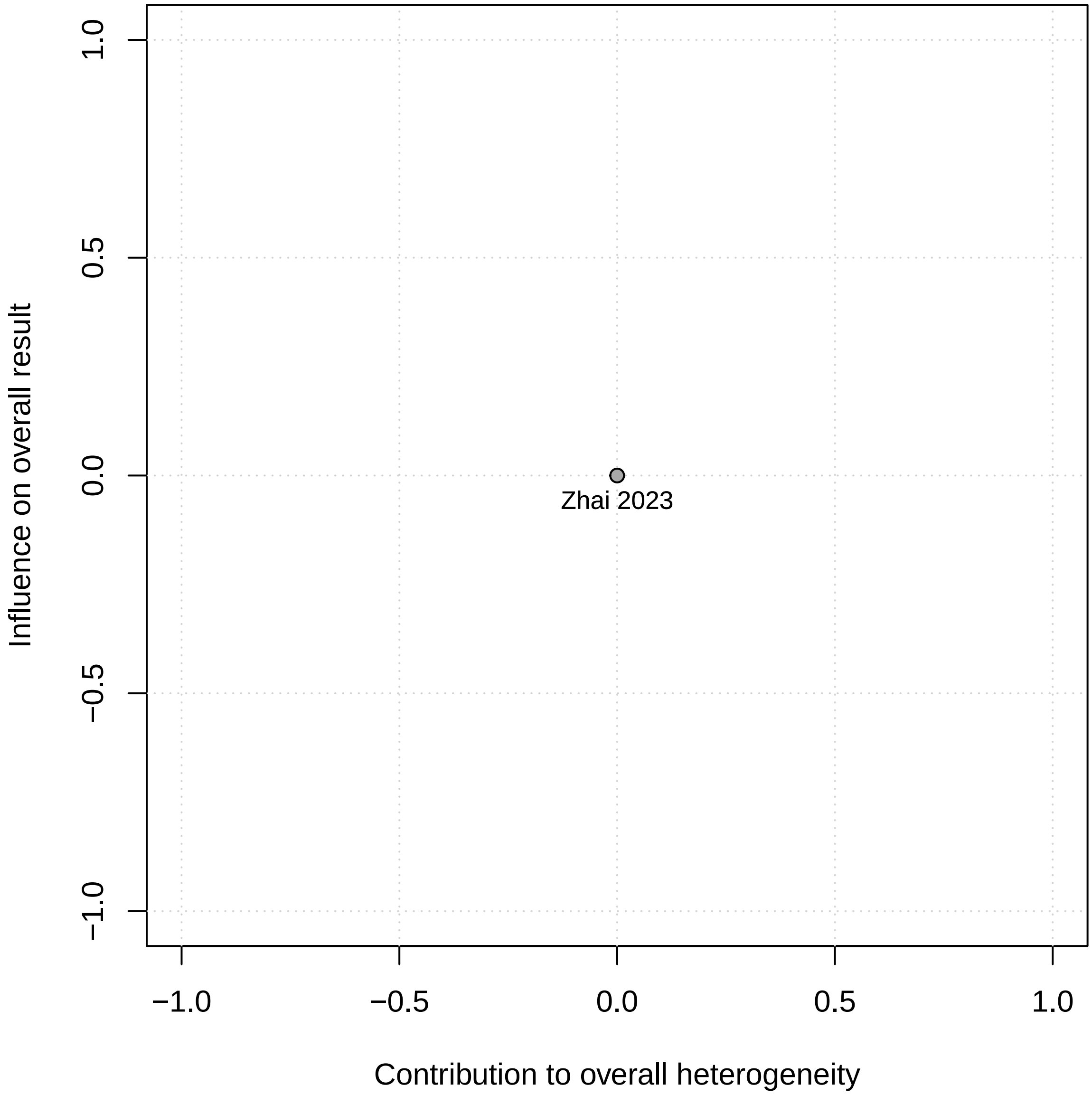
8.18.4 Funnel plot

```
funnel((clav_ii_metabin))
```



8.18.5 Baujat

```
baujat(clav_ii_metabin, pos = 1)
```



8.18.6 Leave one out

```
metainf(clav_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI p-value   tau^2     tau
## Omitting Du 2019             1.0000 [0.1432;  6.9836]  1.0000  0.0000  0.0000
## Omitting Zhang 2021          1.0000 [0.1432;  6.9836]  1.0000  0.0000  0.0000
## Omitting Lechevallier 2003   1.0000 [0.1432;  6.9836]  1.0000  0.0000  0.0000
## Omitting Wu 2022             1.0000 [0.1432;  6.9836]  1.0000  0.0000  0.0000
## Omitting Zhai 2023           1.0000 [0.0640; 15.6209]  1.0000
## Omitting Zhai 2023           1.0000 [0.0640; 15.6209]  1.0000
## Omitting AlSmadi 2019        1.0000 [0.1432;  6.9836]  1.0000  0.0000  0.0000
##
## Pooled estimate              1.0000 [0.1432;  6.9836]  1.0000  0.0000  0.0000
##                                I^2
## Omitting Du 2019              0.0%
## Omitting Zhang 2021           0.0%
## Omitting Lechevallier 2003    0.0%
## Omitting Wu 2022              0.0%
## Omitting Zhai 2023
## Omitting Zhai 2023
## Omitting AlSmadi 2019         0.0%
##
## Pooled estimate               0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.19 Clavien III

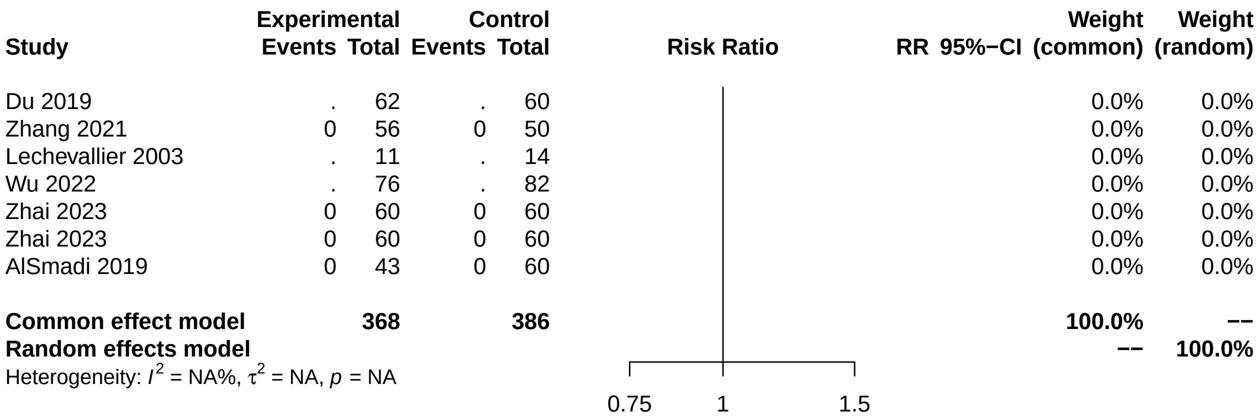
8.19.1 Meta-analysis

```
clav_iii_metabin <- metabin(data = semirigid_only,
                         event.c = clavien_iii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_iii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                        RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.19.2 Forest plot

```r
forest(clav_iii_metabin,
       sortvar = TE)
```



8.19.3 Trim and Fill

```r
#trimfill(clav_iii_metabin)
#forest(trimfill(clav_iii_metabin),
#       sortvar = TE)
```

8.19.4 Funnel plot

```
#funnel(trimfill(clav_iii_metabin))
```

8.19.5 Baujat

```
#baujat(clav_iii_metabin, pos = 1)
```

8.19.6 Leave one out

```
#metainf(clav_iii_metabin)
```

8.20 Clavien IV

8.20.1 Meta-analysis

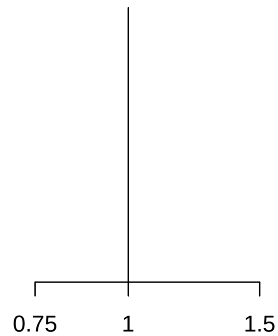
```
clav_iv_metabin <- metabin(data = semirigid_only,
                          event.c = clavien_iv_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_iv_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_iv_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.20.2 Forest plot

```r
forest(clav_iv_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	Risk Ratio	RR	95%−CI	Weight (common)	Weight (random)
Du 2019	.	62	.	60				0.0%	0.0%
Zhang 2021	0	56	0	50				0.0%	0.0%
Lechevallier 2003	.	11	.	14				0.0%	0.0%
Wu 2022	.	76	.	82				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
Zhai 2023	0	60	0	60				0.0%	0.0%
AlSmadi 2019	0	43	0	60				0.0%	0.0%
Common effect model		**368**		**386**				**100.0%**	**−−**
Random effects model								**−−**	**100.0%**



Heterogeneity: I^2 = NA%, τ^2 = NA, p = NA

8.20.3 Trim and Fill

```
#trimfill(clav_iv_metabin)
#forest(trimfill(clav_iv_metabin),
#       sortvar = TE)
```

8.20.4 Funnel plot

```
#funnel((clav_iv_metabin))
```

8.20.5 Baujat

```
#baujat(clav_iv_metabin, pos = 1)
```

8.20.6 Leave one out

```
#metainf(clav_iv_metabin)
```

8.21 Clavien V

8.21.1 Meta-analysis

```
clav_v_metabin <- metabin(data = semirigid_only,
                         event.c = clavien_v_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_v_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.21.2 Forest plot

```
#forest(clav_v_metabin,
#       sortvar = TE)
```

8.21.3 Trim and Fill

```
#trimfill(clav_v_metabin)
#forest(trimfill(clav_v_metabin),
#        sortvar = TE)
```

8.21.4 Funnel plot

```
#funnel(trimfill(clav_v_metabin))
```

8.21.5 Baujat

```
#baujat(clav_v_metabin, pos = 1)
```

8.21.6 Leave one out

```
#metainf(clav_v_metabin)
```

8.22 Clavien I-II

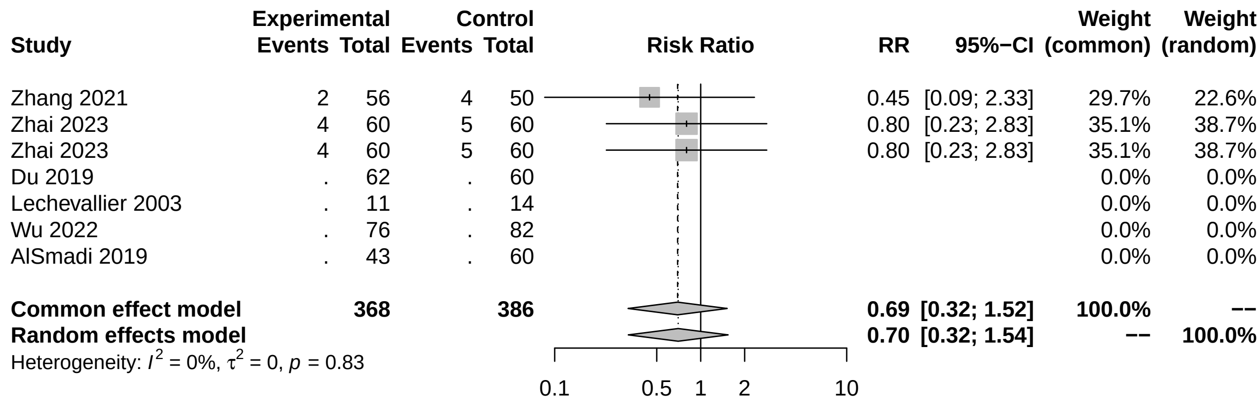
8.22.1 Meta-analysis

```
clav_i_ii_metabin <- metabin(data = semirigid_only,
                         event.c = clav_i_ii_n_control,
                       n.c = sample_size_control,
                       event.e = clav_i_ii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_i_ii_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 754
## Number of events: e = 24
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6950 [0.3182; 1.5179] -0.91  0.3613
## Random effects model 0.7011 [0.3192; 1.5399] -0.88  0.3763
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 3.8664]; tau = 0 [0.0000; 1.9663]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.37    2  0.8312
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

8.22.2 Forest plot

```
forest(clav_i_ii_metabin,
       sortvar = TE)
```



8.22.3 Trim and Fill

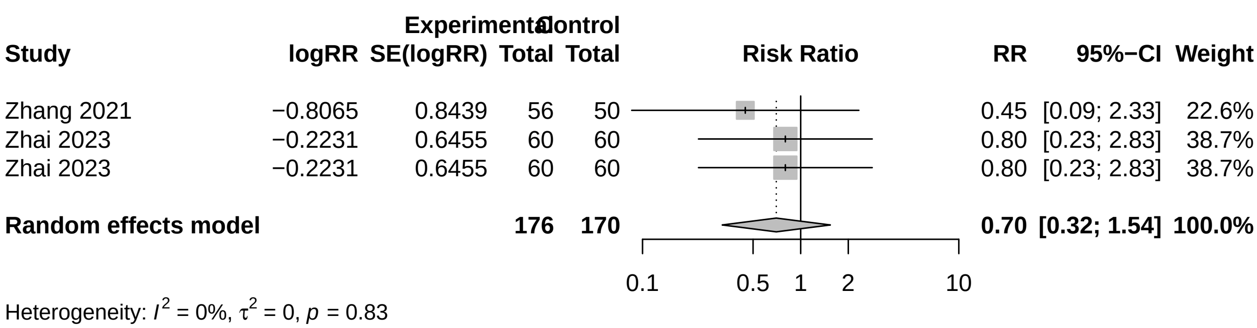
```
trimfill(clav_i_ii_metabin)
```

```
## Warning in trimfill.meta(clav_i_ii_metabin): 4 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 346
## Number of events: e = 24
##
##                          RR           95%-CI     z p-value
## Random effects model 0.7011 [0.3192; 1.5399] -0.88  0.3763
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 3.8664]; tau = 0 [0.0000; 1.9663]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.37    2  0.8312
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```
forest(trimfill(clav_i_ii_metabin),
       sortvar = TE)
```

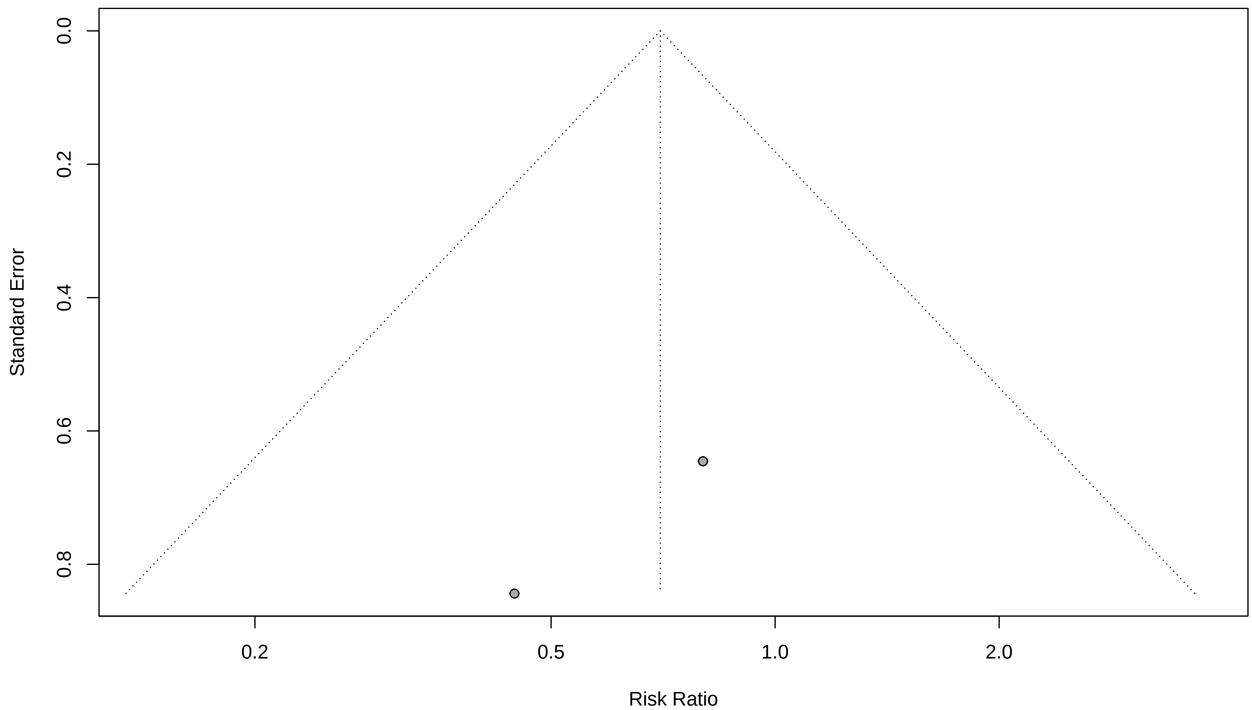
```
## Warning in trimfill.meta(clav_i_ii_metabin): 4 observation(s) dropped due to
## missing values
```



8.22.4 Funnel plot

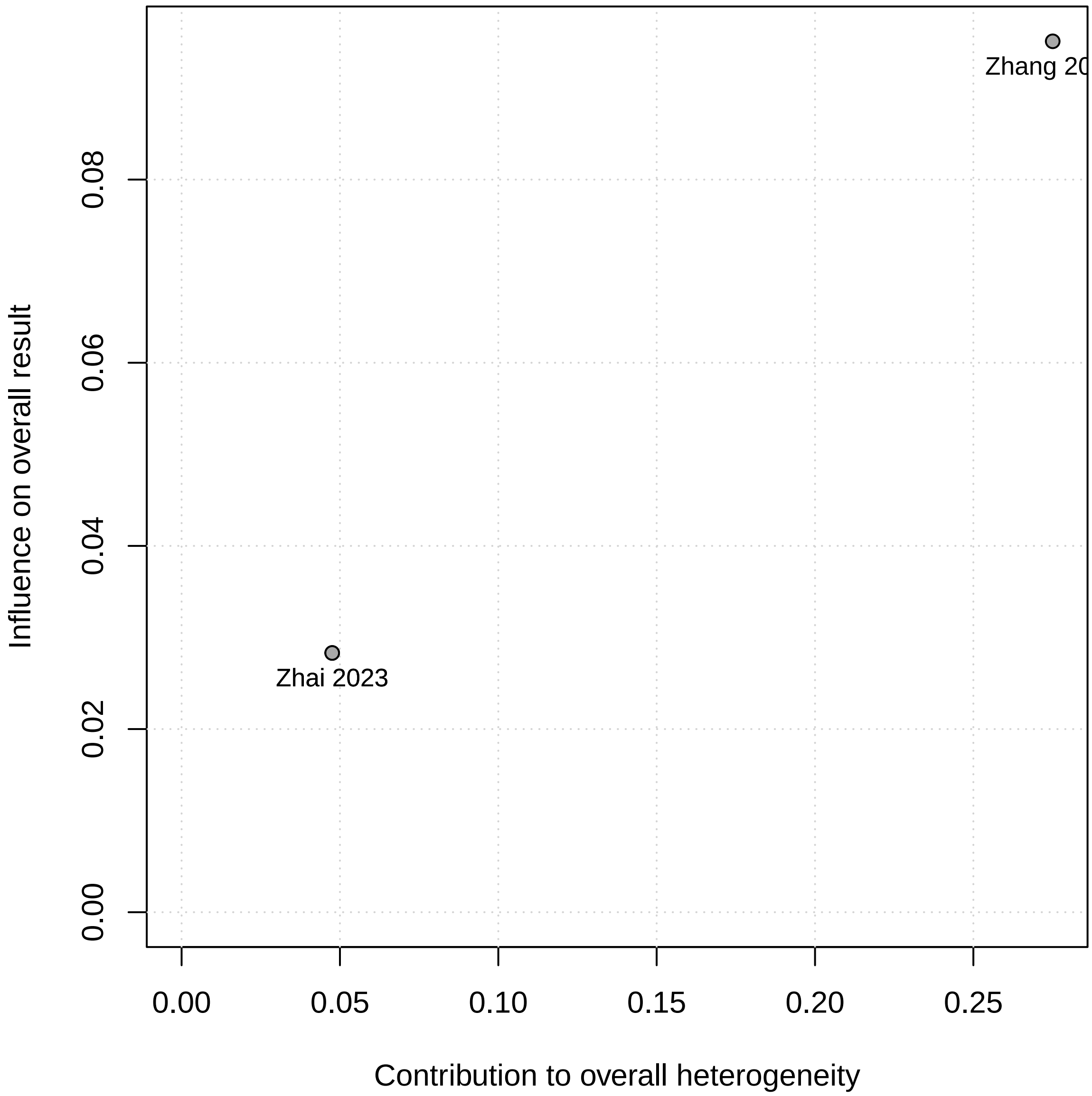
```
funnel(trimfill(clav_i_ii_metabin))
```

```
## Warning in trimfill.meta(clav_i_ii_metabin): 4 observation(s) dropped due to
## missing values
```



8.22.5 Baujat

```
baujat(clav_i_ii_metabin, pos = 1)
```



8.22.6 Leave one out

```r
metainf(clav_i_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                                RR           95%-CI p-value   tau^2     tau
## Omitting Du 2019           0.6950 [0.3182; 1.5179]  0.3613  0.0000  0.0000
## Omitting Zhang 2021        0.8000 [0.3270; 1.9571]  0.6249  0.0000  0.0000
## Omitting Lechevallier 2003  0.6950 [0.3182; 1.5179]  0.3613  0.0000  0.0000
## Omitting Wu 2022           0.6950 [0.3182; 1.5179]  0.3613  0.0000  0.0000
## Omitting Zhai 2023         0.6380 [0.2358; 1.7266]  0.3763  0.0000  0.0000
## Omitting Zhai 2023         0.6380 [0.2358; 1.7266]  0.3763  0.0000  0.0000
## Omitting AlSmadi 2019      0.6950 [0.3182; 1.5179]  0.3613  0.0000  0.0000
##
## Pooled estimate            0.6950 [0.3182; 1.5179]  0.3613  0.0000  0.0000
##                              I^2
## Omitting Du 2019            0.0%
## Omitting Zhang 2021         0.0%
## Omitting Lechevallier 2003  0.0%
## Omitting Wu 2022            0.0%
## Omitting Zhai 2023          0.0%
## Omitting Zhai 2023          0.0%
## Omitting AlSmadi 2019       0.0%
##
## Pooled estimate             0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

8.23 Clavien III-V

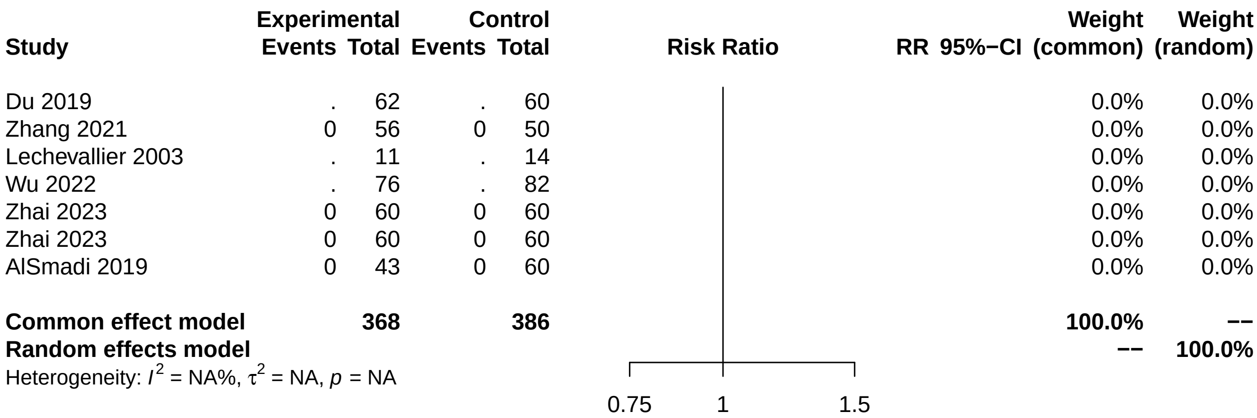
8.23.1 Meta-analysis

```
clav_iii_v_metabin <- metabin(data = semirigid_only,
                         event.c = clav_iii_v_n_control,
                       n.c = sample_size_control,
                       event.e = clav_iii_v_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 754
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

8.23.2 Forest plot

```r
forest(clav_iii_v_metabin,
       sortvar = TE)
```



8.23.3 Trim and Fill

```
#trimfill(clav_iii_v_metabin)
#forest(trimfill(clav_iii_v_metabin),
#       sortvar = TE)
```

8.23.4 Funnel plot

```
#funnel(trimfill(clav_iii_v_metabin))
```

8.23.5 Baujat

```
#baujat(clav_iii_v_metabin, pos = 1)
```

8.23.6 Leave one out

```
#metainf(clav_iii_v_metabin)
```

9 Semi-Rigid URS Only Summary Forest plots

```
overall <- cbind(
  "Outcome" = c(
    "Immediate SFR",
    "Final SFR",
    "Auxiliary Treatment",
    "Overall Complications",
    "Fever",
    "Infection",
    "Sepsis",
    "Abscess",
    "Haematoma",
    "Pain",
    "Stricture",
    "Embolisation",
    "Transfusion",
    "CD I",
    "CD II",
    "CD III",
    "CD IV",
    "CD I-II",
    "CD III-V",
    "Operative time",
    "VAS",
    "Length of Stay"
  ),
  "type" = c(
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "cont",
    "cont",
    "cont"
  ),
  "n_studies" = c(
    immediate_sfr_metabin$k,
```

```
  sfr_metabin$k,
aux_rx_metabin$k,
comp_metabin$k,
fever_metabin$k,
infection_metabin$k,
sepsis_metabin$k,
abscess_metabin$k,
haematoma_metabin$k,
pain_metabin$k,
stricture_metabin$k,
ir_embolisation_metabin$k,
transfusion_metabin$k,
clav_i_metabin$k,
clav_ii_metabin$k,
clav_iii_metabin$k,
clav_iv_metabin$k,
clav_i_ii_metabin$k,
clav_iii_v_metabin$k,
or_time_metacont$k,
vas_metacont$k,
los_metacont$k),
"es" = c(
  immediate_sfr_metabin$TE.random %>% exp(),
  sfr_metabin$TE.random %>% exp(),
aux_rx_metabin$TE.random %>% exp(),
comp_metabin$TE.random %>% exp(),
fever_metabin$TE.random %>% exp(),
infection_metabin$TE.random %>% exp(),
sepsis_metabin$TE.random %>% exp(),
abscess_metabin$TE.random %>% exp(),
haematoma_metabin$TE.random %>% exp(),
pain_metabin$TE.random %>% exp(),
stricture_metabin$TE.random %>% exp(),
ir_embolisation_metabin$TE.random %>% exp(),
transfusion_metabin$TE.random %>% exp(),
clav_i_metabin$TE.random %>% exp(),
clav_ii_metabin$TE.random %>% exp(),
clav_iii_metabin$TE.random %>% exp(),
clav_iv_metabin$TE.random %>% exp(),
clav_i_ii_metabin$TE.random %>% exp(),
clav_iii_v_metabin$TE.random %>% exp(),
or_time_metacont$TE.random,
vas_metacont$TE.random,
los_metacont$TE.random),
"lower_ci" = c(
  immediate_sfr_metabin$lower.random %>% exp(),
  sfr_metabin$lower.random %>% exp(),
aux_rx_metabin$lower.random %>% exp(),
comp_metabin$lower.random %>% exp(),
fever_metabin$lower.random %>% exp(),
infection_metabin$lower.random %>% exp(),
sepsis_metabin$lower.random %>% exp(),
abscess_metabin$lower.random %>% exp(),
```

```
haematoma_metabin$lower.random %>% exp(),
pain_metabin$lower.random %>% exp(),
stricture_metabin$lower.random %>% exp(),
ir_embolisation_metabin$lower.random %>% exp(),
transfusion_metabin$lower.random %>% exp(),
clav_i_metabin$lower.random %>% exp(),
clav_ii_metabin$lower.random %>% exp(),
clav_iii_metabin$lower.random %>% exp(),
clav_iv_metabin$lower.random %>% exp(),
clav_i_ii_metabin$lower.random %>% exp(),
clav_iii_v_metabin$lower.random %>% exp(),
or_time_metacont$lower.random,
vas_metacont$lower.random,
los_metacont$lower.random),
"upper_ci" = c(immediate_sfr_metabin$upper.random %>% exp(),
               sfr_metabin$upper.random %>% exp(),
aux_rx_metabin$upper.random %>% exp(),
comp_metabin$upper.random %>% exp(),
fever_metabin$upper.random %>% exp(),
infection_metabin$upper.random %>% exp(),
sepsis_metabin$upper.random %>% exp(),
abscess_metabin$upper.random %>% exp(),
haematoma_metabin$upper.random %>% exp(),
pain_metabin$upper.random %>% exp(),
stricture_metabin$upper.random %>% exp(),
ir_embolisation_metabin$upper.random %>% exp(),
transfusion_metabin$upper.random %>% exp(),
clav_i_metabin$upper.random %>% exp(),
clav_ii_metabin$upper.random %>% exp(),
clav_iii_metabin$upper.random %>% exp(),
clav_iv_metabin$upper.random %>% exp(),
clav_i_ii_metabin$upper.random %>% exp(),
clav_iii_v_metabin$upper.random %>% exp(),
or_time_metacont$upper.random,
vas_metacont$upper.random,
los_metacont$upper.random),
"p" = c(
  immediate_sfr_metabin$pval.random,
  sfr_metabin$pval.random,
aux_rx_metabin$pval.random,
comp_metabin$pval.random,
fever_metabin$pval.random,
infection_metabin$pval.random,
sepsis_metabin$pval.random,
abscess_metabin$pval.random,
haematoma_metabin$pval.random,
pain_metabin$pval.random,
stricture_metabin$pval.random,
ir_embolisation_metabin$pval.random,
transfusion_metabin$pval.random,
clav_i_metabin$pval.random,
clav_ii_metabin$pval.random,
clav_iii_metabin$pval.random,
```

```
clav_iv_metabin$pval.random,
clav_i_ii_metabin$pval.random,
clav_iii_v_metabin$pval.random,
or_time_metacont$pval.random,
vas_metacont$pval.random,
los_metacont$pval.random)) %>% as_tibble() %>% drop_na(es)

overall$es <- as.numeric(overall$es)
overall$es <- round(overall$es, digits = 2)

overall$lower_ci <- as.numeric(overall$lower_ci)
overall$lower_ci <- round(overall$lower_ci, digits = 2)

overall$upper_ci <- as.numeric(overall$upper_ci)
overall$upper_ci <- round(overall$upper_ci, digits = 2)

overall$p <- as.numeric(overall$p)
overall$p <- round(overall$p, digits = 2)
overall$p <- ifelse(overall$p<0.001, "<0.001", overall$p)
```

9.1 Summary Table of number of studies for each outcome included in meta-analysis

```
overall %>% subset(select = c(Outcome, n_studies)) %>% gt() %>% tab_header(title = "Summary table of Nu
```

Summary table of Number of Studies for Each Outcome Meta-Analyis

Outcome	Studies, n
Immediate SFR	9
Final SFR	6
Auxiliary Treatment	5
Overall Complications	6
Fever	3
Infection	3
Pain	1
Stricture	1
CD I	3
CD II	2
CD I-II	3
Operative time	7
Length of Stay	4

9.2 Summary Forest plot of Continuous outcomes

9.2.1 Continuous Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

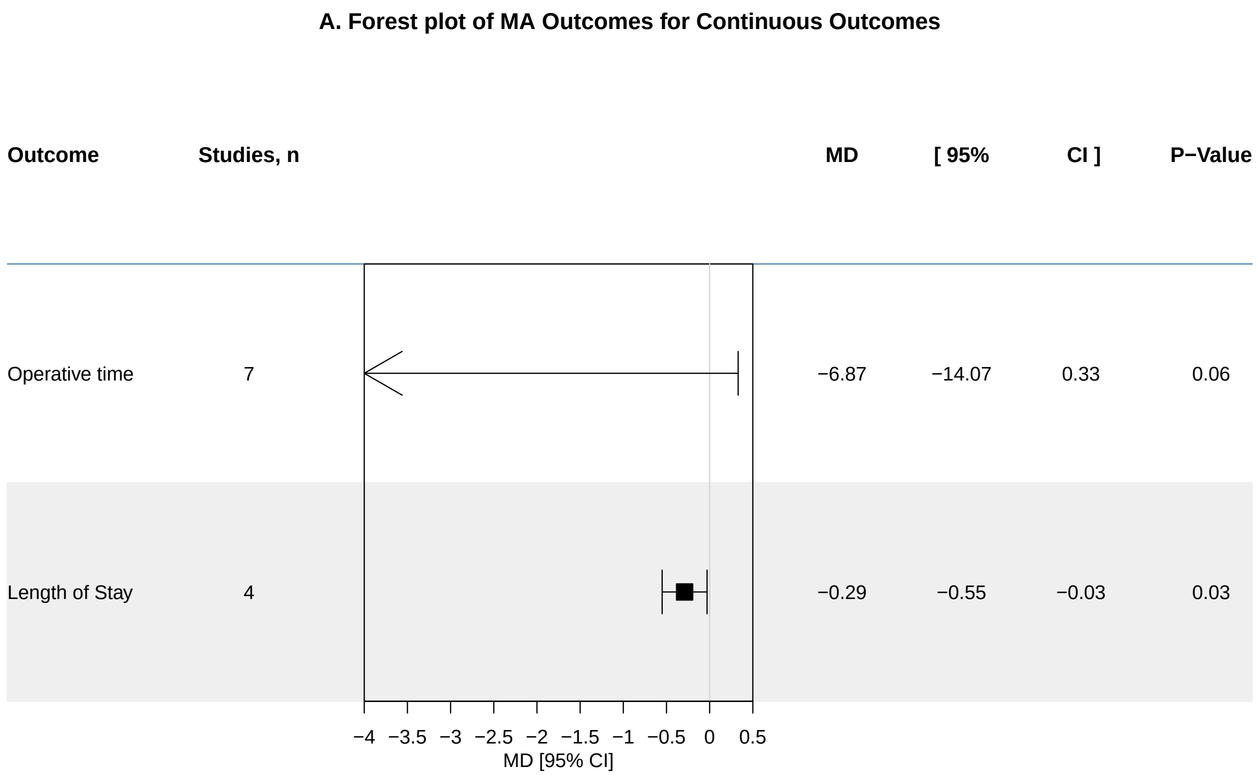
```
overall_continuous <-
  overall %>% subset(type ==  "cont") %>% subset(select = c(Outcome,
                                                            n_studies,
                                                            es,
                                                            lower_ci,
                                                            upper_ci,
                                                            p)) %>% as_tibble()
overall_continuous %>% gt() %>% tab_header(title = "Summary Table for Continuous Outcomes") %>% cols_me
```

Summary Table for Continuous Outcomes

Outcome	Studies, n	MD (95% CI)	p
Operative time	7	-6.87 (-14.07-0.33)	0.06
Length of Stay	4	-0.29 (-0.55–0.03)	0.03

9.2.2 Continuous Forest plot

```
continuous_plot <- overall_continuous %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 0,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Continuous Outcomes",
  clip = c(-4, 2),
  xlab = "MD [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "MD",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
continuous_plot
```



9.3 Summary Forest plot of Binary outcomes

9.3.1 Binary Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

```
overall_binary <-
  overall %>% subset(type ==  "binary") %>% subset(select = c(Outcome,
                                                              n_studies,
                                                              es,
                                                              lower_ci,
                                                              upper_ci,
                                                              p)) %>% as_tibble()
overall_binary %>% gt() %>% tab_header(title = "Summary Table for Binary Outcomes") %>% cols_merge(colu
```

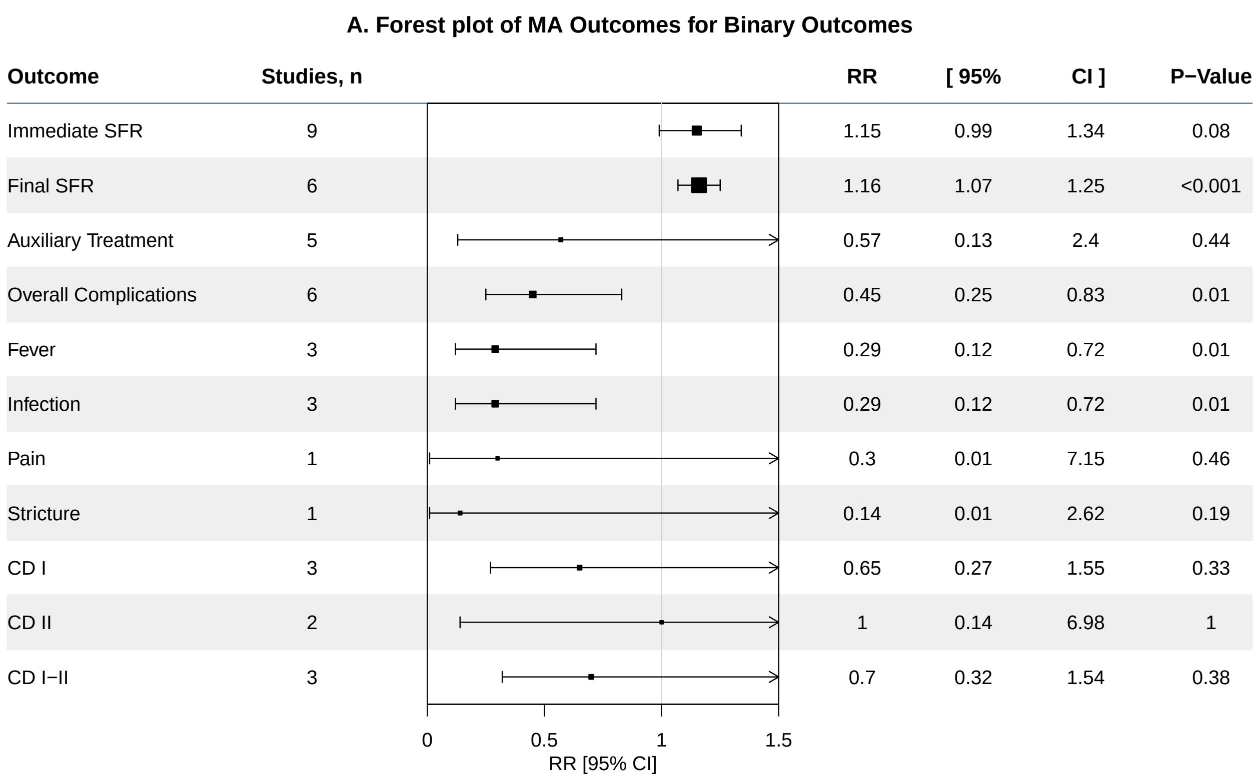
Summary Table for Binary Outcomes

Outcome	Studies, n	RR (95% CI)	p
Immediate SFR	9	1.15 (0.99-1.34)	0.08
Final SFR	6	1.16 (1.07-1.25)	<0.001
Auxiliary Treatment	5	0.57 (0.13-2.40)	0.44
Overall Complications	6	0.45 (0.25-0.83)	0.01
Fever	3	0.29 (0.12-0.72)	0.01
Infection	3	0.29 (0.12-0.72)	0.01
Pain	1	0.30 (0.01-7.15)	0.46
Stricture	1	0.14 (0.01-2.62)	0.19
CD I	3	0.65 (0.27-1.55)	0.33
CD II	2	1.00 (0.14-6.98)	1
CD I-II	3	0.70 (0.32-1.54)	0.38

9.3.2 Binary Forest plot - Meta-Analysis

Reference = No Suction

```
binary_plot <- overall_binary %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 1,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Binary Outcomes",
  clip = c(-1.5, 1.5),
  xlab = "RR [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "RR",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
binary_plot
```



10 Flexi URS Only Meta-Analysis Outcomes

```
flexiurs_only <- suction_data %>% subset(control_group == "Flexible URS")
```

10.1 Immediate SFR

10.1.1 Meta-analysis

```
immediate_sfr_metabin <- metabin(data = suction_data,
                           event.c = sfr_immediate_n_control,
                         n.c = sample_size_control,
                         event.e = sfr_immediate_n_suction,
                         n.e = sample_size_suction,
                         studlab = author_year)
immediate_sfr_metabin
```

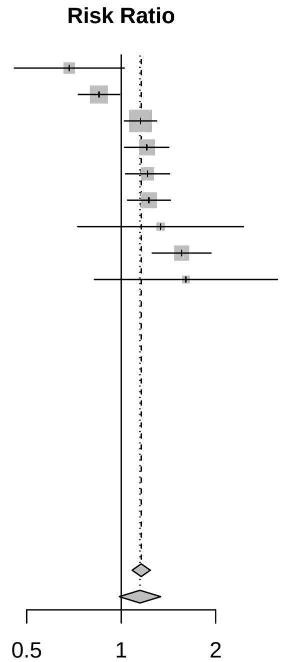
```
## Number of studies: k = 9
## Number of observations: o = 2311
## Number of events: e = 979
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1581 [1.0834; 1.2380] 4.31 < 0.0001
## Random effects model 1.1478 [0.9854; 1.3370] 1.77   0.0765
##
## Quantifying heterogeneity:
##  tau^2 = 0.0365 [0.0088; 0.2318]; tau = 0.1910 [0.0939; 0.4814]
##  I^2 = 74.6% [50.9%; 86.9%]; H = 1.99 [1.43; 2.76]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  31.55    8  0.0001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

10.1.2 Forest plot

```r
forest(immediate_sfr_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Lai 2020	14	28	41	56	0.68	[0.46; 1.02]	6.1%	7.7%
Tang 2023	63	86	75	87	0.85	[0.73; 0.99]	16.6%	14.2%
Zhu 2018	136	165	118	165	1.15	[1.02; 1.30]	26.3%	15.1%
Qian 2022	70	81	58	81	1.21	[1.03; 1.42]	12.9%	14.0%
AlSmadi 2019	40	43	46	60	1.21	[1.03; 1.43]	8.6%	14.0%
Wu 2022	67	76	59	82	1.23	[1.05; 1.44]	12.6%	14.1%
Zhang 2021	18	56	13	54	1.34	[0.73; 2.45]	2.9%	4.6%
Huang 2023	81	103	52	103	1.56	[1.25; 1.93]	11.6%	12.5%
Zhang 2021	18	56	10	50	1.61	[0.82; 3.15]	2.4%	3.9%
Sur 2022	.	9	.	8			0.0%	0.0%
Chen 2019	.	44	.	45			0.0%	0.0%
Du 2019	.	62	.	60			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Ding 2023	.	138	.	61			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhang 2022	.	30	.	30			0.0%	0.0%
Deng 2022	.	57	.	70			0.0%	0.0%
Common effect model		**1165**		**1146**	**1.16**	**[1.08; 1.24]**	**100.0%**	**--**
Random effects model					**1.15**	**[0.99; 1.34]**	**--**	**100.0%**

Heterogeneity: $I^2 = 75\%$, $\tau^2 = 0.0365$, $p < 0.01$



10.1.3 Trim and Fill

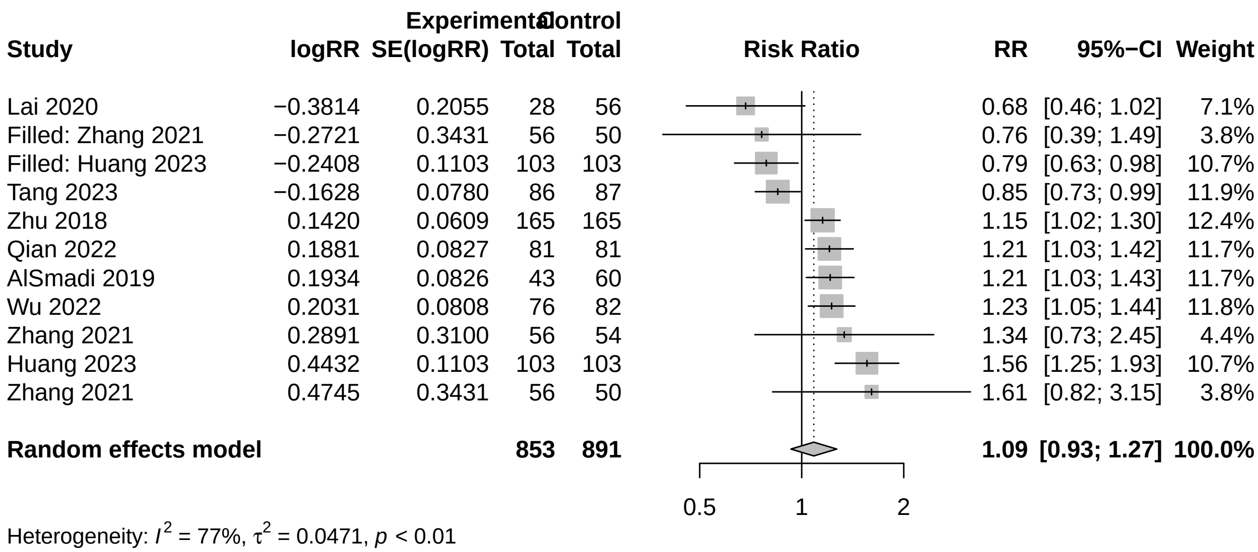
```r
trimfill(immediate_sfr_metabin)
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```

```
## Number of studies: k = 11 (with 2 added studies)
## Number of observations: o = 1744
## Number of events: e = 1140
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0855 [0.9289; 1.2685] 1.03  0.3019
##
## Quantifying heterogeneity:
##  tau^2 = 0.0471 [0.0138; 0.2196]; tau = 0.2170 [0.1173; 0.4686]
##  I^2 = 76.9% [58.8%; 87.1%]; H = 2.08 [1.56; 2.78]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  43.33   10 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(immediate_sfr_metabin),
       sortvar = TE)
```

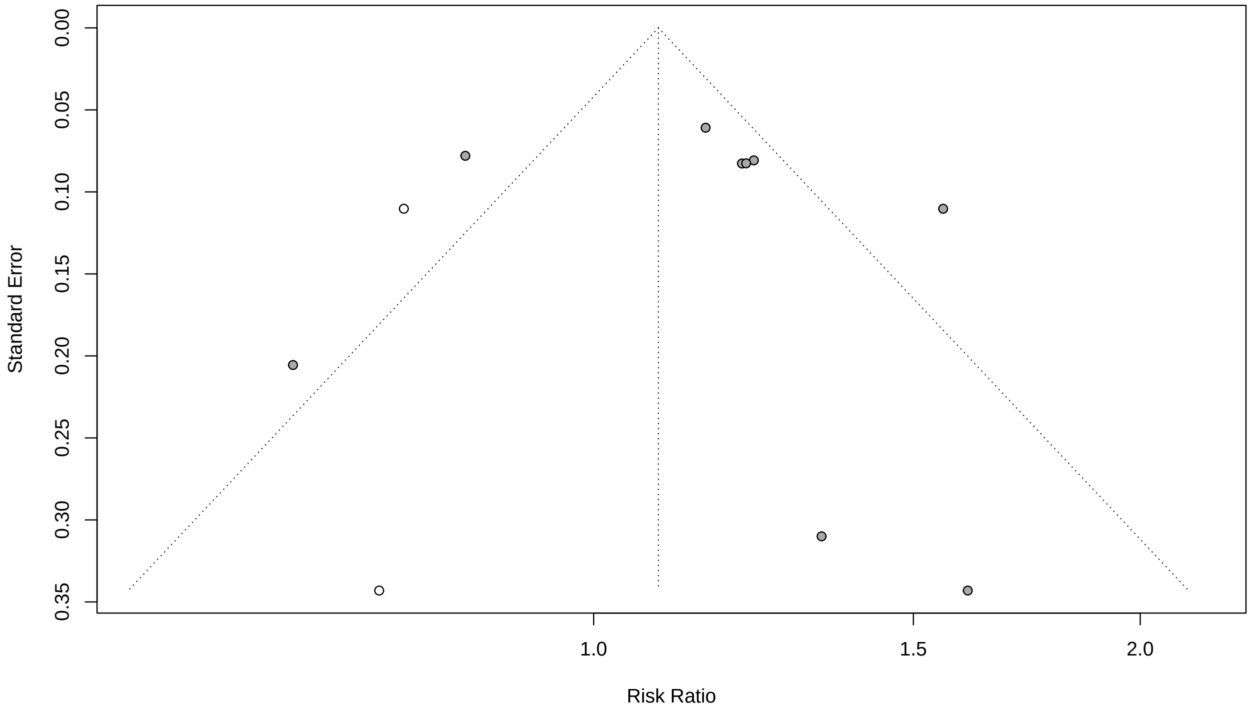
```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



10.1.4 Funnel plot

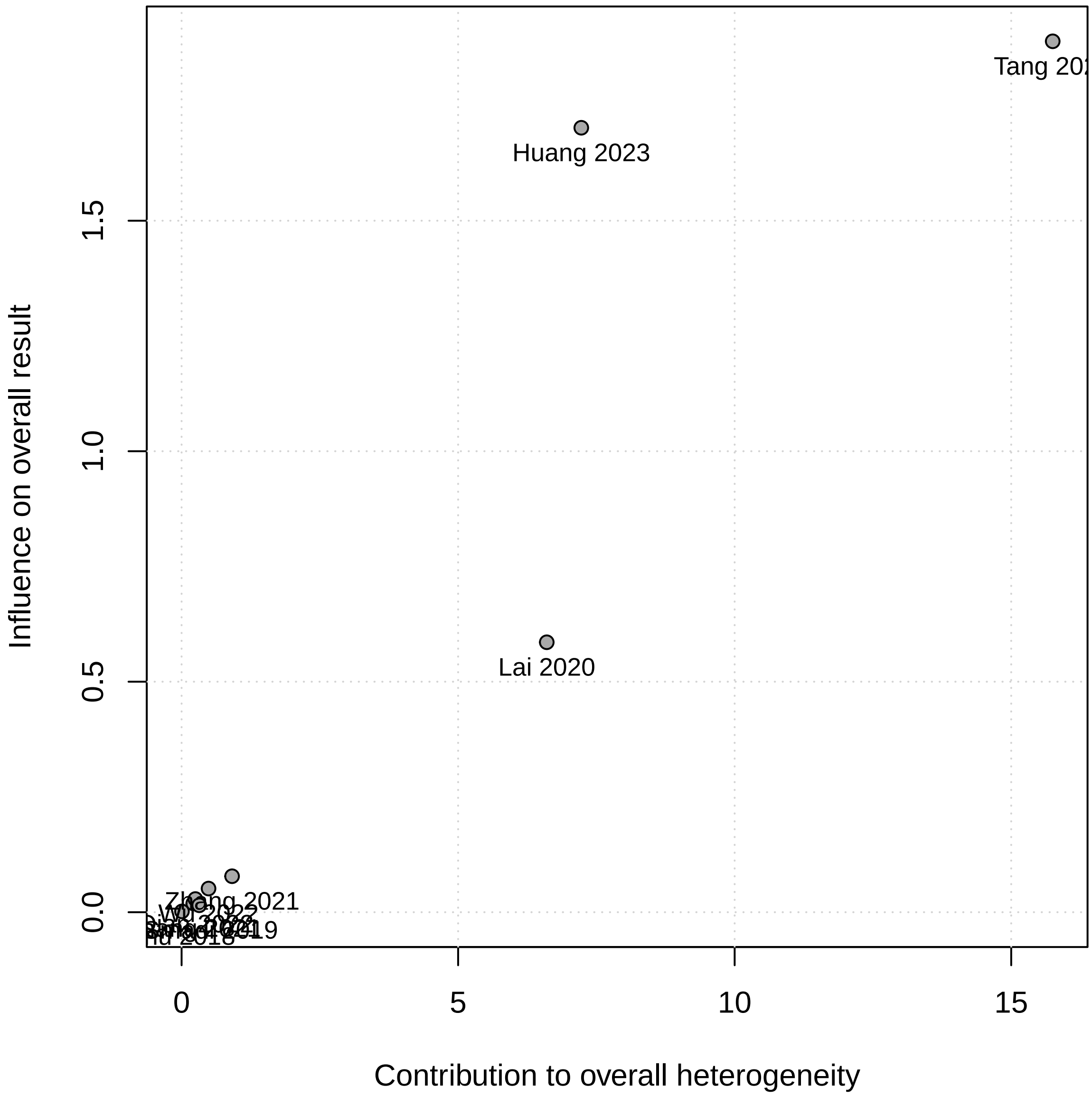
```
funnel(trimfill(immediate_sfr_metabin))
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



10.1.5 Baujat

```
baujat(immediate_sfr_metabin, pos = 1)
```



10.1.6 Leave one out

```r
metainf(immediate_sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                 RR           95%-CI  p-value   tau^2     tau
## Omitting Sur 2022           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Tang 2023          1.2195 [1.1329; 1.3128] < 0.0001  0.0076  0.0873
## Omitting Chen 2019          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Du 2019            1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Lai 2020           1.1889 [1.1116; 1.2716] < 0.0001  0.0258  0.1607
## Omitting Zhu 2018           1.1601 [1.0710; 1.2565]   0.0003  0.0482  0.2196
## Omitting Zhang 2021         1.1473 [1.0741; 1.2254] < 0.0001  0.0376  0.1938
## Omitting Zhang 2021         1.1527 [1.0791; 1.2313] < 0.0001  0.0396  0.1990
## Omitting Lechevallier 2003  1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Huang 2023         1.1057 [1.0315; 1.1853]   0.0046  0.0246  0.1568
## Omitting Wu 2022            1.1484 [1.0676; 1.2353]   0.0002  0.0464  0.2153
## Omitting Ding 2023          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Qian 2022          1.1508 [1.0700; 1.2377]   0.0002  0.0468  0.2164
## Omitting Zhang 2022         1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Deng 2022          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting AlSmadi 2019       1.1529 [1.0734; 1.2383] < 0.0001  0.0467  0.2160
##
## Pooled estimate             1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
##                                I^2
## Omitting Sur 2022            74.6%
## Omitting Tang 2023           51.5%
## Omitting Chen 2019           74.6%
## Omitting Du 2019             74.6%
## Omitting Lai 2020            72.2%
## Omitting Zhu 2018            77.8%
## Omitting Zhang 2021          77.1%
## Omitting Zhang 2021          77.6%
## Omitting Lechevallier 2003   74.6%
## Omitting Huang 2023          69.4%
## Omitting Wu 2022             77.2%
## Omitting Ding 2023           74.6%
## Omitting Zhai 2023           74.6%
## Omitting Zhai 2023           74.6%
## Omitting Qian 2022           77.4%
## Omitting Zhang 2022          74.6%
## Omitting Deng 2022           74.6%
## Omitting AlSmadi 2019        77.4%
##
## Pooled estimate              74.6%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.2 Final SFR

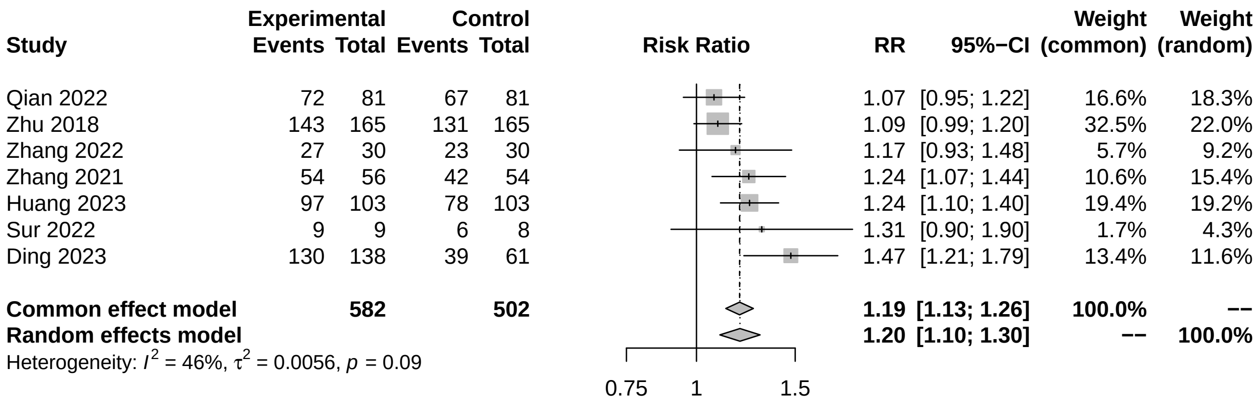
10.2.1 Meta-analysis

```
sfr_metabin <- metabin(data = flexiurs_only,
                         event.c = sfr_final_n_control,
                       n.c = sample_size_control,
                       event.e = sfr_final_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sfr_metabin
```

```
## Number of studies: k = 7
## Number of observations: o = 1084
## Number of events: e = 918
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1937 [1.1280; 1.2633] 6.13 < 0.0001
## Random effects model 1.1956 [1.1008; 1.2986] 4.24 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0.0056 [0.0000; 0.0491]; tau = 0.0746 [0.0000; 0.2216]
##  I^2 = 45.7% [0.0%; 77.1%]; H = 1.36 [1.00; 2.09]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  11.05    6  0.0869
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.2.2 Forest plot

```r
forest(sfr_metabin,
       sortvar = TE)
```



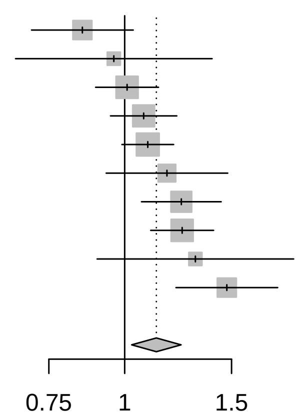
10.2.3 Trim and Fill

```r
trimfill(sfr_metabin)
```

```
## Number of studies: k = 10 (with 3 added studies)
## Number of observations: o = 1506
## Number of events: e = 1277
##
##                          RR           95%-CI    z p-value
## Random effects model 1.1277 [1.0267; 1.2385] 2.51  0.0120
##
## Quantifying heterogeneity:
##  tau^2 = 0.0141 [0.0024; 0.0736]; tau = 0.1188 [0.0486; 0.2713]
##  I^2 = 64.4% [29.9%; 81.9%]; H = 1.68 [1.19; 2.35]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  25.27    9  0.0027
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(sfr_metabin),
       sortvar = TE)
```

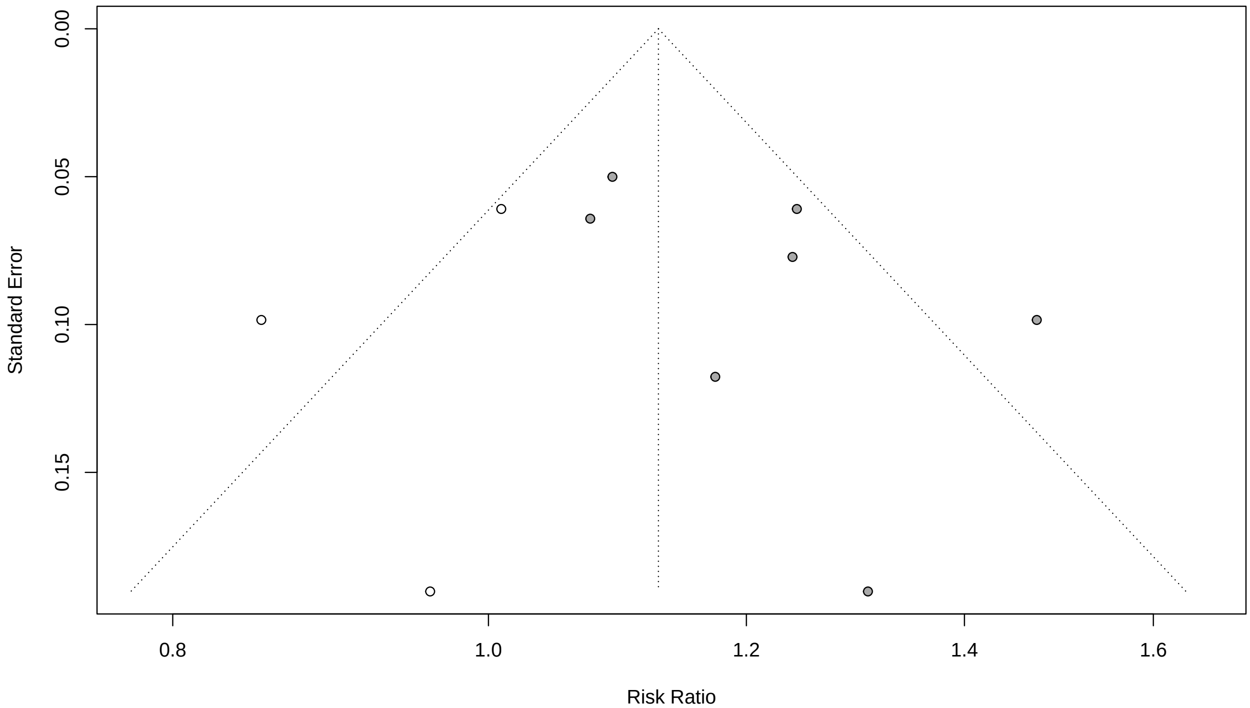
Study	logRR	SE(logRR)	Experimental Total	Control Total	Risk Ratio	RR	95%−CI	Weight
Filled: Ding 2023	−0.1605	0.0985	138	61		0.85	[0.70; 1.03]	9.6%
Filled: Sur 2022	−0.0412	0.1903	9	8		0.96	[0.66; 1.39]	4.6%
Filled: Huang 2023	0.0091	0.0609	103	103		1.01	[0.90; 1.14]	12.9%
Qian 2022	0.0720	0.0642	81	81		1.07	[0.95; 1.22]	12.6%
Zhu 2018	0.0876	0.0501	165	165		1.09	[0.99; 1.20]	13.8%
Zhang 2022	0.1603	0.1177	30	30		1.17	[0.93; 1.48]	8.2%
Zhang 2021	0.2149	0.0772	56	54		1.24	[1.07; 1.44]	11.4%
Huang 2023	0.2180	0.0609	103	103		1.24	[1.10; 1.40]	12.9%
Sur 2022	0.2683	0.1903	9	8		1.31	[0.90; 1.90]	4.6%
Ding 2023	0.3876	0.0985	138	61		1.47	[1.21; 1.79]	9.6%
Random effects model			**832**	**674**		**1.13**	**[1.03; 1.24]**	**100.0%**



Heterogeneity: I^2 = 64%, τ^2 = 0.0141, p < 0.01

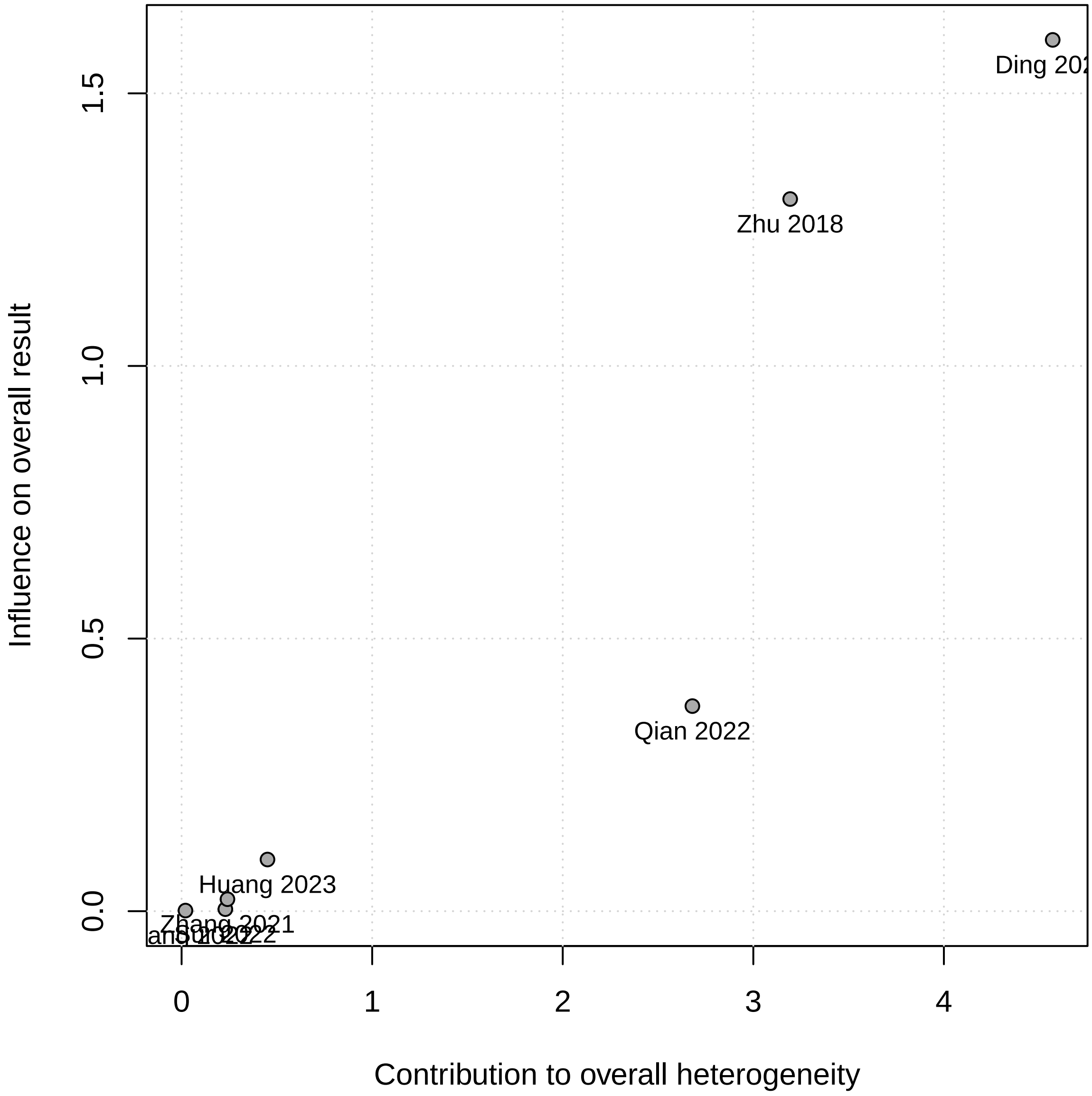
10.2.4 Funnel plot

```
funnel(trimfill(sfr_metabin))
```



10.2.5 Baujat

```
baujat(sfr_metabin, pos = 1)
```



10.2.6 Leave one out

```
metainf(sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI  p-value   tau^2     tau    I^2
## Omitting Sur 2022     1.1916 [1.1254; 1.2617] < 0.0001  0.0060  0.0774  53.4%
## Omitting Zhu 2018     1.2430 [1.1597; 1.3322] < 0.0001  0.0052  0.0719  37.0%
## Omitting Zhang 2021   1.1883 [1.1182; 1.2628] < 0.0001  0.0076  0.0872  52.3%
## Omitting Huang 2023   1.1818 [1.1083; 1.2601] < 0.0001  0.0077  0.0880  49.7%
## Omitting Ding 2023    1.1503 [1.0862; 1.2183] < 0.0001  0.0016  0.0395   5.3%
## Omitting Qian 2022    1.2175 [1.1432; 1.2967] < 0.0001  0.0054  0.0733  42.4%
## Omitting Zhang 2022   1.1949 [1.1271; 1.2669] < 0.0001  0.0073  0.0852  54.7%
##
## Pooled estimate       1.1937 [1.1280; 1.2633] < 0.0001  0.0056  0.0746  45.7%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.3 OR time

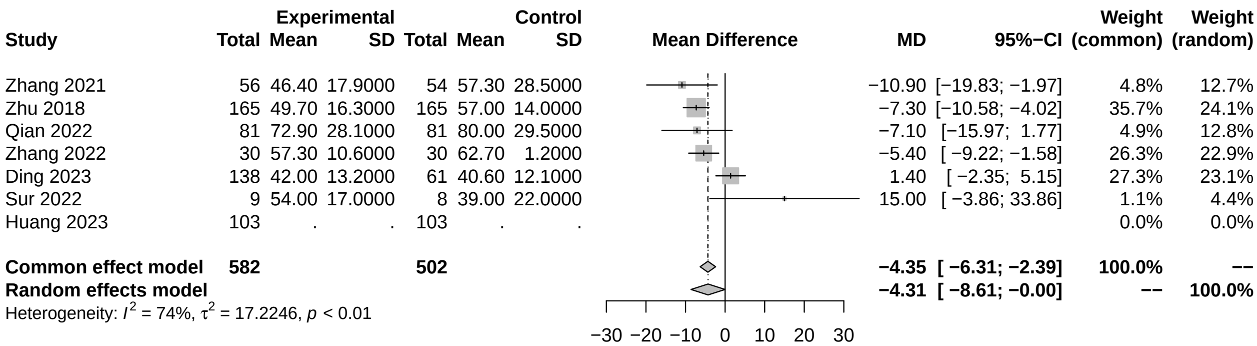
10.3.1 Meta-analysis

```
or_time_metacont <- metacont(data = flexiurs_only,
                             mean.c = or_time_min_mean_control,
                             sd.c = or_time_min_sd_control,
                             mean.e = or_time_min_mean_suction,
                             sd.e = or_time_min_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
or_time_metacont
```

```
## Number of studies: k = 6
## Number of observations: o = 1084
##
##                           MD             95%-CI     z  p-value
## Common effect model  -4.3519 [-6.3102; -2.3937] -4.36 < 0.0001
## Random effects model -4.3074 [-8.6117; -0.0031] -1.96   0.0498
##
## Quantifying heterogeneity:
##  tau^2 = 17.2246 [2.8614; >172.2459]; tau = 4.1503 [1.6916; >13.1242]
##  I^2 = 73.6% [39.5%; 88.4%]; H = 1.94 [1.29; 2.94]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  18.91    5  0.0020
##
## 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
```

10.3.2 Forest plot

```r
forest(or_time_metacont,
       sortvar = TE)
```



10.3.3 Trim and Fill

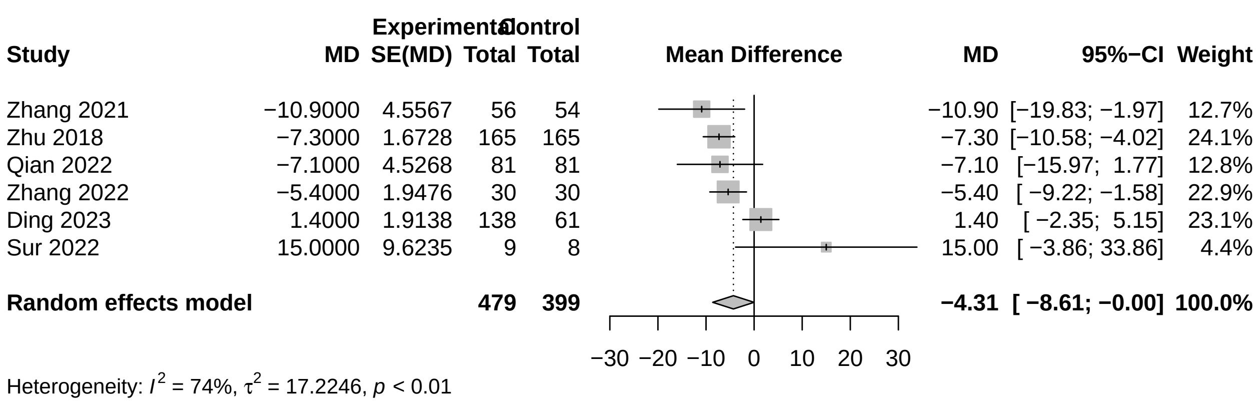
```r
trimfill(or_time_metacont)
```

```
## Warning in trimfill.meta(or_time_metacont): 1 observation(s) dropped due to
## missing values

## Number of studies: k = 6 (with 0 added studies)
## Number of observations: o = 878
##
##                             MD              95%-CI     z p-value
## Random effects model -4.3074 [-8.6117; -0.0031] -1.96  0.0498
##
## Quantifying heterogeneity:
##  tau^2 = 17.2246 [2.8614; >172.2459]; tau = 4.1503 [1.6916; >13.1242]
##  I^2 = 73.6% [39.5%; 88.4%]; H = 1.94 [1.29; 2.94]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  18.91    5  0.0020
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(or_time_metacont),
       sortvar = TE)
```

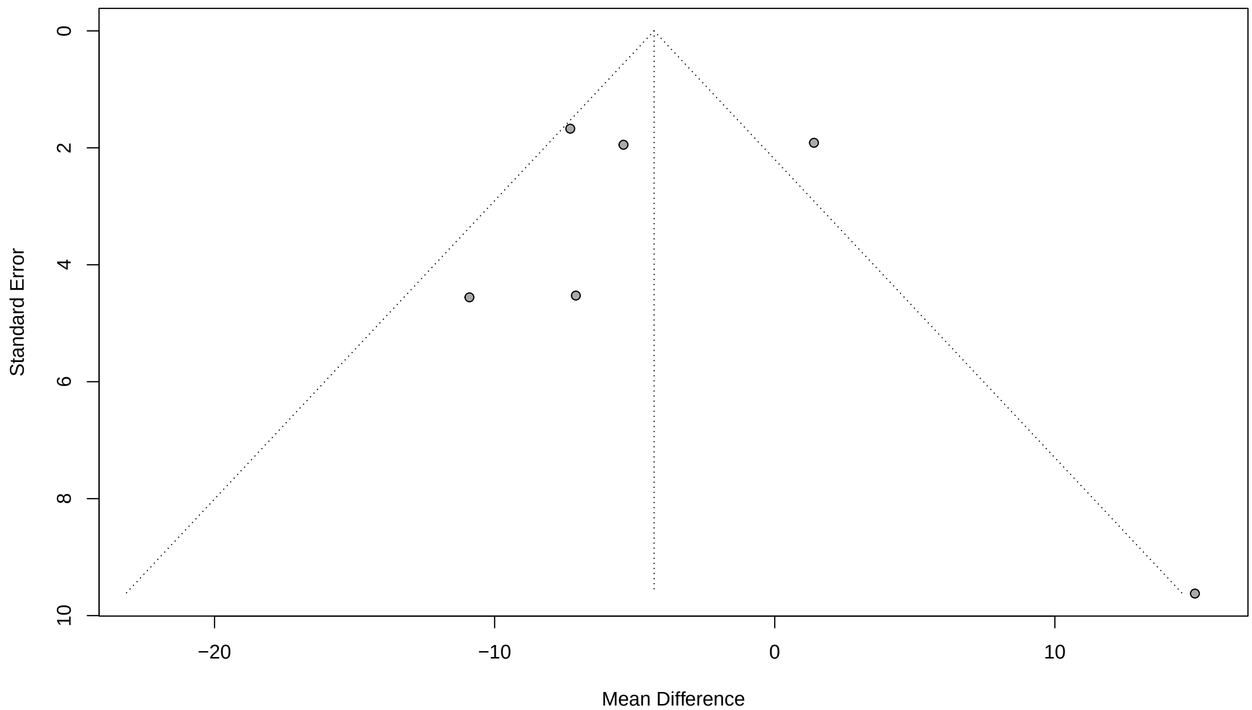
```
## Warning in trimfill.meta(or_time_metacont): 1 observation(s) dropped due to
## missing values
```



10.3.4 Funnel plot

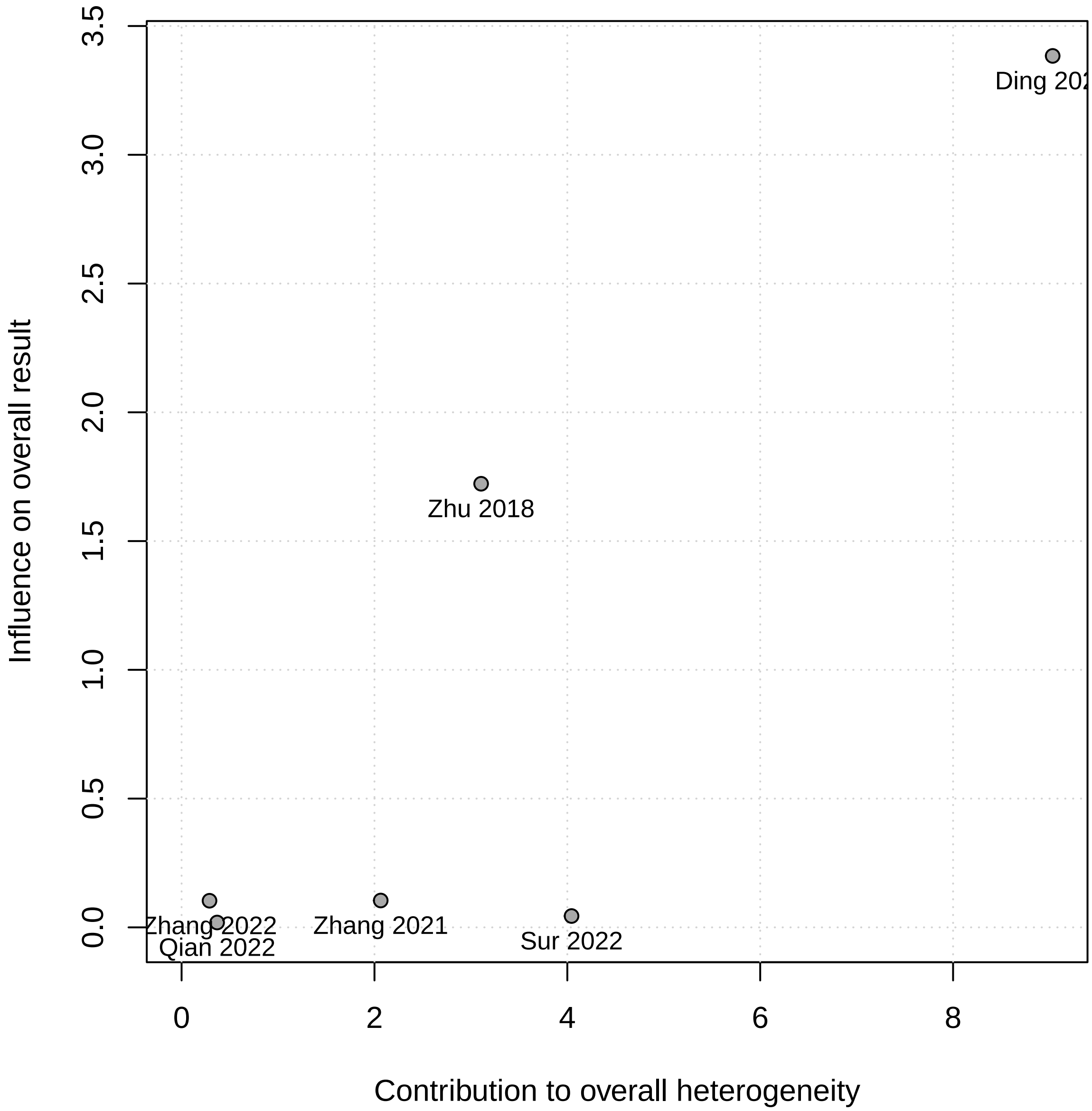
```
funnel(trimfill(or_time_metacont))
```

```
## Warning in trimfill.meta(or_time_metacont): 1 observation(s) dropped due to
## missing values
```



10.3.5 Baujat

```
baujat(or_time_metacont, pos = 1)
```



10.3.6 Leave one out

```
metainf(or_time_metacont)
```

```
## Influential analysis (common effect model)
##
##                            MD             95%-CI  p-value    tau^2     tau
## Omitting Sur 2022     -4.5628 [-6.5317; -2.5939] < 0.0001  14.4616  3.8028
## Omitting Zhu 2018     -2.7170 [-5.1585; -0.2754]   0.0292  23.5074  4.8484
## Omitting Zhang 2021   -4.0212 [-6.0283; -2.0142] < 0.0001  17.2725  4.1560
## Omitting Huang 2023   -4.3519 [-6.3102; -2.3937] < 0.0001  17.2246  4.1503
## Omitting Ding 2023    -6.5068 [-8.8027; -4.2109] < 0.0001   0.0000  0.0025
## Omitting Qian 2022    -4.2112 [-6.2190; -2.2035] < 0.0001  23.6032  4.8583
## Omitting Zhang 2022   -3.9777 [-6.2589; -1.6964]   0.0006  29.5130  5.4326
##
## Pooled estimate       -4.3519 [-6.3102; -2.3937] < 0.0001  17.2246  4.1503
##                         I^2
## Omitting Sur 2022      73.0%
## Omitting Zhu 2018      71.6%
## Omitting Zhang 2021    76.1%
## Omitting Huang 2023    73.6%
## Omitting Ding 2023     38.4%
## Omitting Qian 2022     78.4%
## Omitting Zhang 2022    78.4%
##
## Pooled estimate        73.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.4 Auxiliary Treatments

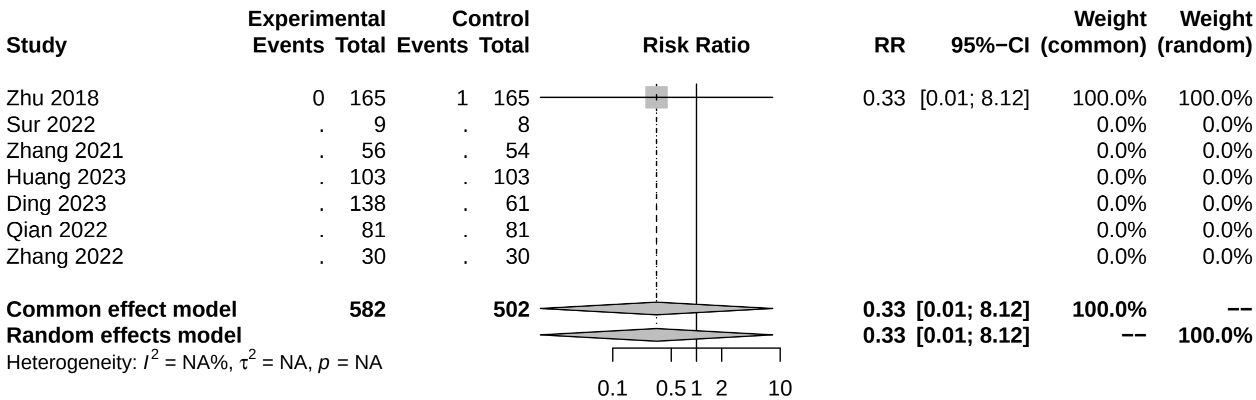
10.4.1 Meta-analysis

```
aux_rx_metabin <- metabin(data = flexiurs_only,
                          event.c = auxillary_tx_n_control,
                        n.c = sample_size_control,
                        event.e = auxillary_tx_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
aux_rx_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
## Number of events: e = 1
##
##                          RR           95%-CI     z p-value
## Common effect model  0.3333 [0.0137; 8.1235] -0.67  0.5001
## Random effects model 0.3333 [0.0137; 8.1233] -0.67  0.5001
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.4.2 Forest plot

```r
forest(aux_rx_metabin,
       sortvar = TE)
```



10.4.3 Trim and Fill

```
#trimfill(aux_rx_metabin)
#forest(trimfill(aux_rx_metabin),
 #      sortvar = TE)
```

10.4.4 Funnel plot

```
#funnel(trimfill(aux_rx_metabin))
```

10.4.5 Baujat

```
#baujat(aux_rx_metabin, pos = 1)
```

10.4.6 Leave one out

```
#metainf(aux_rx_metabin)
```

10.5 VAS

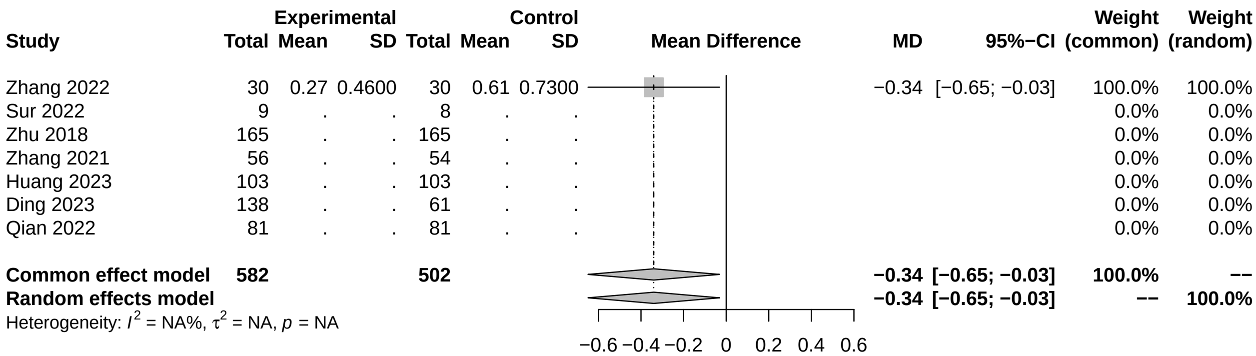
10.5.1 Meta-analysis

```
vas_metacont <- metacont(data = flexiurs_only,
                             mean.c = vas_score_mean_control,
                             sd.c = vas_score_sd_control,
                             mean.e = vas_score_mean_suction,
                             sd.e = vas_score_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
vas_metacont
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
##
##                             MD             95%-CI     z p-value
## Common effect model  -0.3400 [-0.6488; -0.0312] -2.16  0.0309
## Random effects model -0.3400 [-0.6488; -0.0312] -2.16  0.0309
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.5.2 Forest plot

```r
forest(vas_metacont,
       sortvar = TE)
```

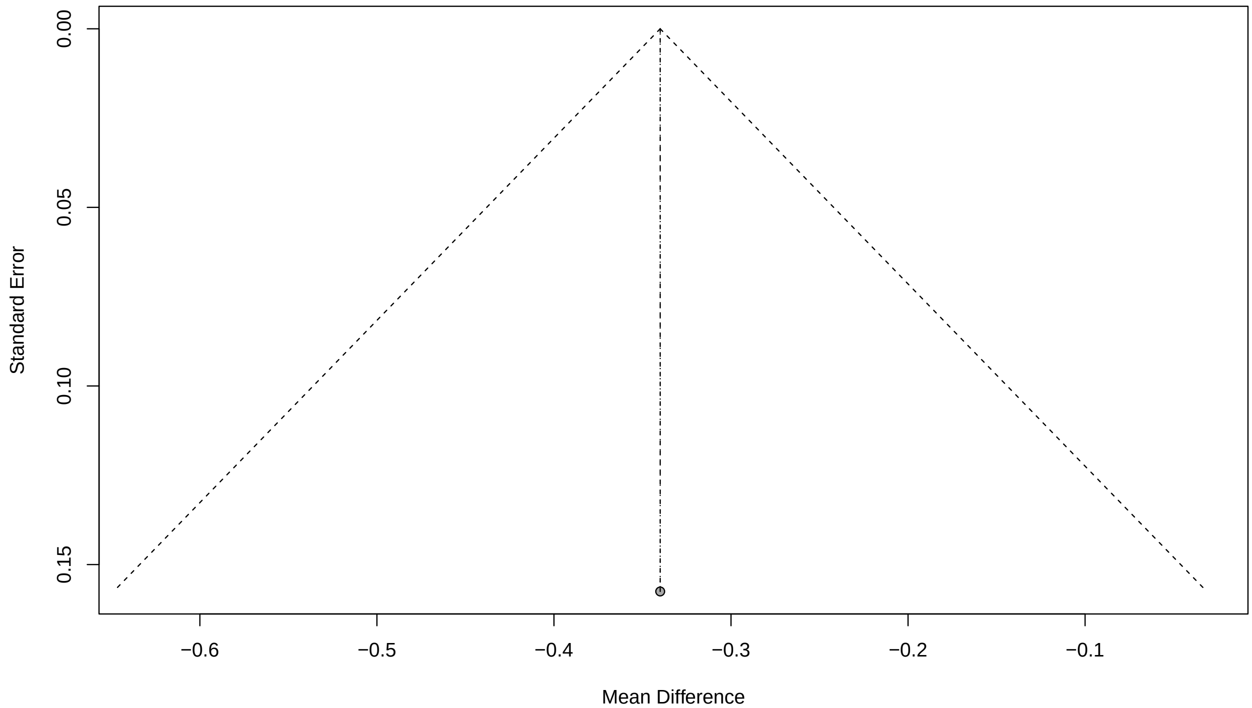


10.5.3 Trim and Fill

```
#trimfill(vas_metacont)
#forest(trimfill(vas_metacont))
```

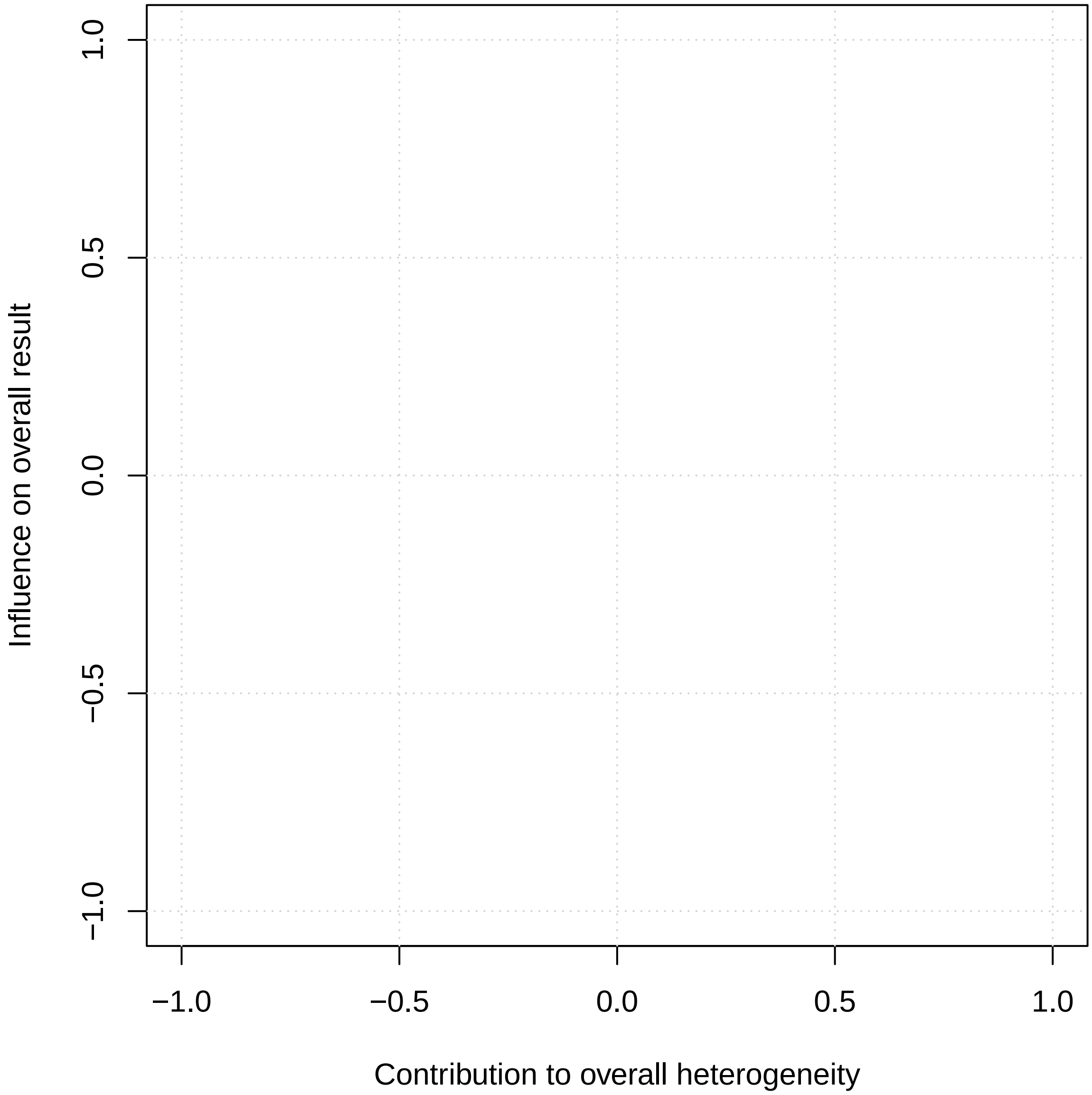
10.5.4 Funnel plot

```
funnel((vas_metacont))
```



10.5.5 Baujat

```r
baujat(vas_metacont, pos = 1)
```



10.5.6 Leave one out

```r
metainf(vas_metacont)
```

```
## Influential analysis (common effect model)
##
##                             MD            95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022     -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Zhu 2018     -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Zhang 2021   -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Huang 2023   -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Ding 2023    -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Qian 2022    -0.3400 [-0.6488; -0.0312]  0.0309
## Omitting Zhang 2022
##
## Pooled estimate       -0.3400 [-0.6488; -0.0312]  0.0309
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.6 LoS

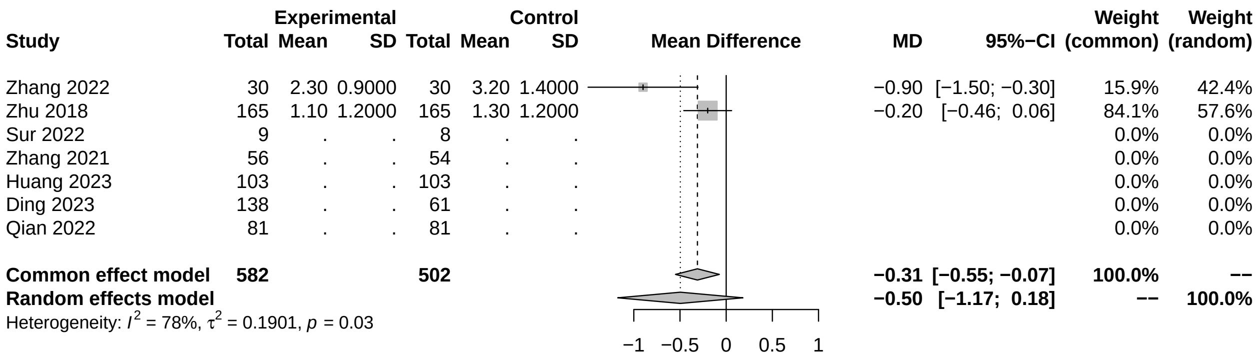
10.6.1 Meta-analysis

```
los_metacont <- metacont(data = flexiurs_only,
                             mean.c = los_days_mean_control,
                             sd.c = los_days_sd_control,
                             mean.e = los_days_mean_suction,
                             sd.e = los_days_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
los_metacont
```

```
## Number of studies: k = 2
## Number of observations: o = 1084
##
##                           MD             95%-CI     z p-value
## Common effect model  -0.3113 [-0.5488; -0.0738] -2.57  0.0102
## Random effects model -0.4965 [-1.1744;  0.1814] -1.44  0.1512
##
## Quantifying heterogeneity:
##  tau^2 = 0.1901; tau = 0.4360; I^2 = 77.6% [2.1%; 94.9%]; H = 2.11 [1.01; 4.42]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  4.46    1  0.0346
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.6.2 Forest plot

```r
forest(los_metacont,
       sortvar = TE)
```

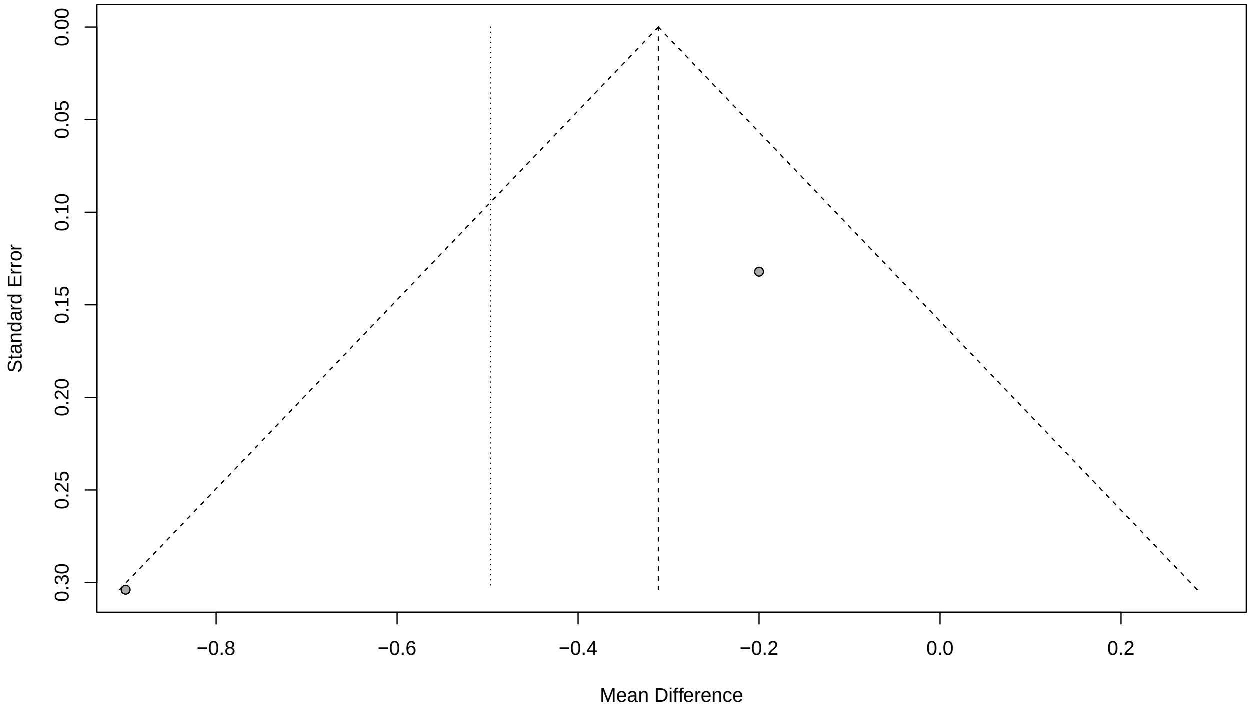


10.6.3 Trim and Fill

```
#trimfill(los_metacont)
#forest(trimfill(los_metacont),
#       sortvar = TE)
```

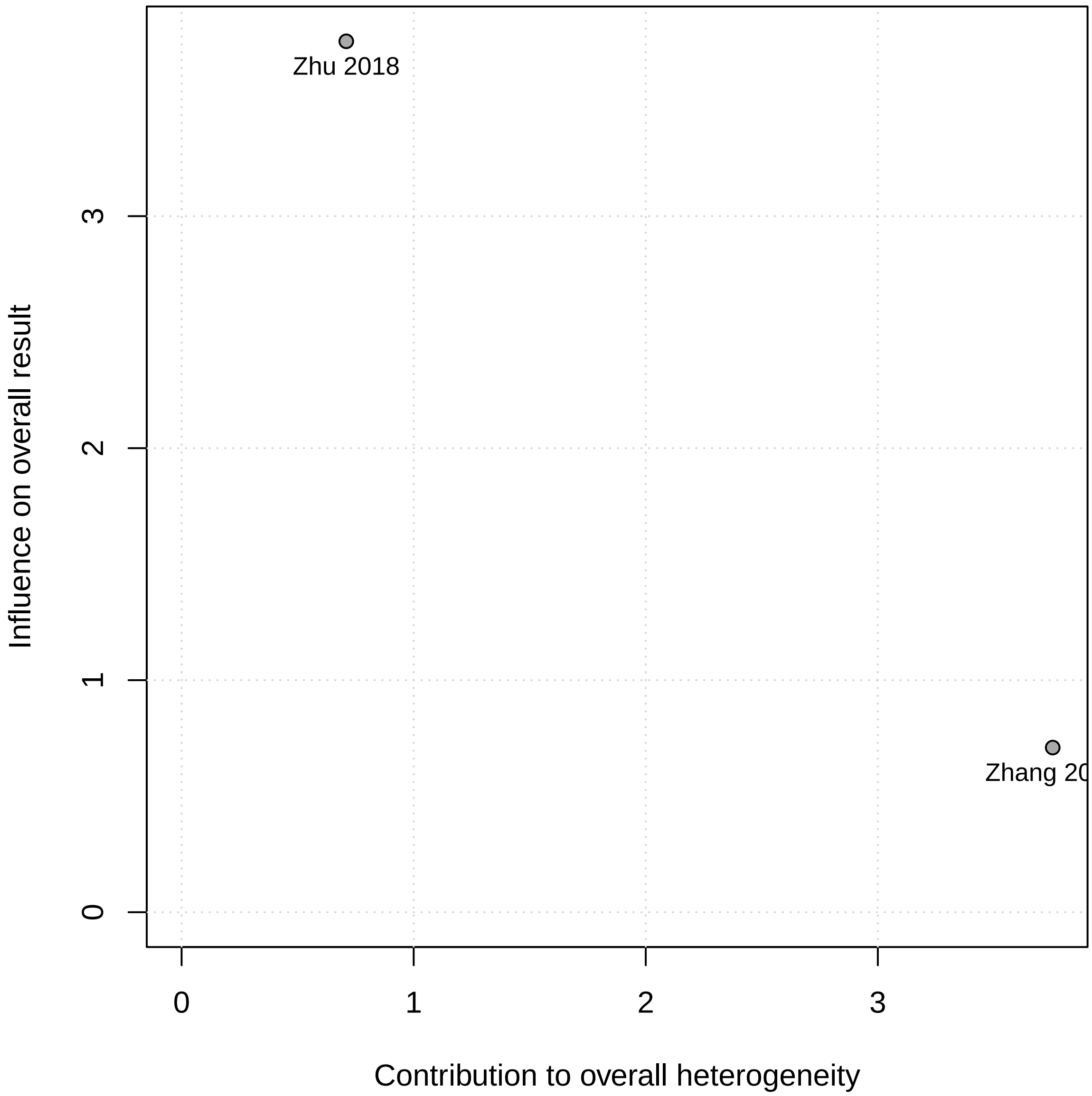
10.6.4 Funnel plot

```
funnel((los_metacont))
```



10.6.5 Baujat

```
baujat(los_metacont, pos = 1)
```



10.6.6 Leave one out

```r
metainf(los_metacont)
```

```
## Influential analysis (common effect model)
##
##                            MD             95%-CI p-value   tau^2    tau    I^2
## Omitting Sur 2022     -0.3113 [-0.5488; -0.0738]  0.0102  0.1901  0.4360  77.6%
## Omitting Zhu 2018     -0.9000 [-1.4956; -0.3044]  0.0031
## Omitting Zhang 2021   -0.3113 [-0.5488; -0.0738]  0.0102  0.1901  0.4360  77.6%
## Omitting Huang 2023   -0.3113 [-0.5488; -0.0738]  0.0102  0.1901  0.4360  77.6%
## Omitting Ding 2023    -0.3113 [-0.5488; -0.0738]  0.0102  0.1901  0.4360  77.6%
## Omitting Qian 2022    -0.3113 [-0.5488; -0.0738]  0.0102  0.1901  0.4360  77.6%
## Omitting Zhang 2022   -0.2000 [-0.4589;  0.0589]  0.1301
##
## Pooled estimate       -0.3113 [-0.5488; -0.0738]  0.0102  0.1901  0.4360  77.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.7 Complications - All

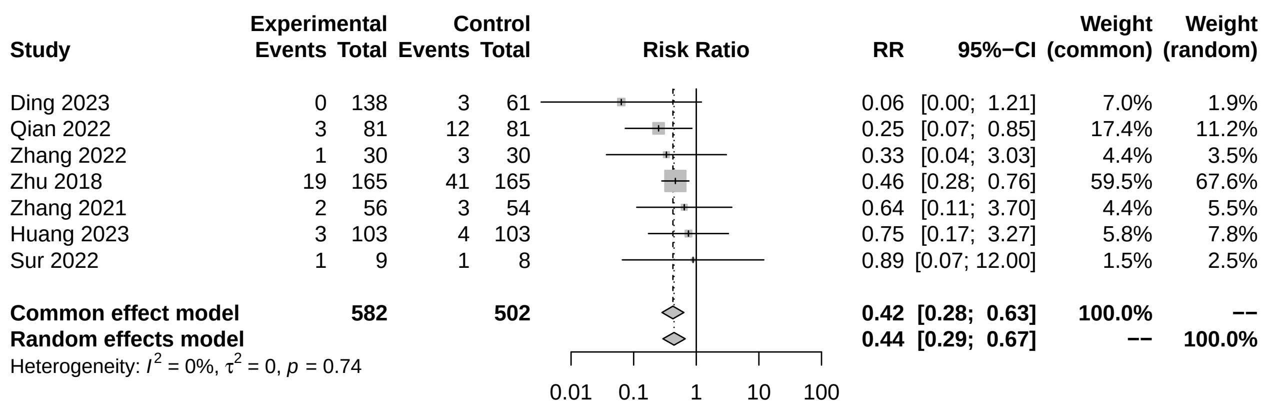
10.7.1 Meta-analysis

```
comp_metabin <- metabin(data = flexiurs_only,
                          event.c = complications_postop_overall_n_control,
                        n.c = sample_size_control,
                        event.e = complications_postop_overall_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
comp_metabin
```

```
## Number of studies: k = 7
## Number of observations: o = 1084
## Number of events: e = 96
##
##                          RR           95%-CI     z  p-value
## Common effect model  0.4237 [0.2831; 0.6339] -4.18 < 0.0001
## Random effects model 0.4420 [0.2931; 0.6664] -3.90 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.2180]; tau = 0 [0.0000; 1.4893]
##  I^2 = 0.0% [0.0%; 70.8%]; H = 1.00 [1.00; 1.85]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.54    6  0.7386
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.7.2 Forest plot

```r
forest(comp_metabin,
       sortvar = TE)
```

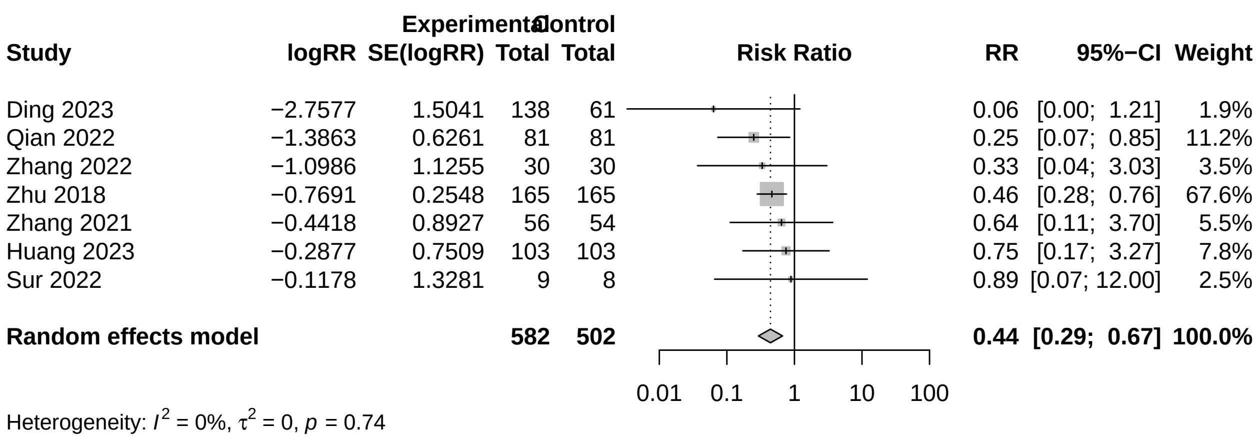


10.7.3 Trim and Fill

```r
trimfill(comp_metabin)
```

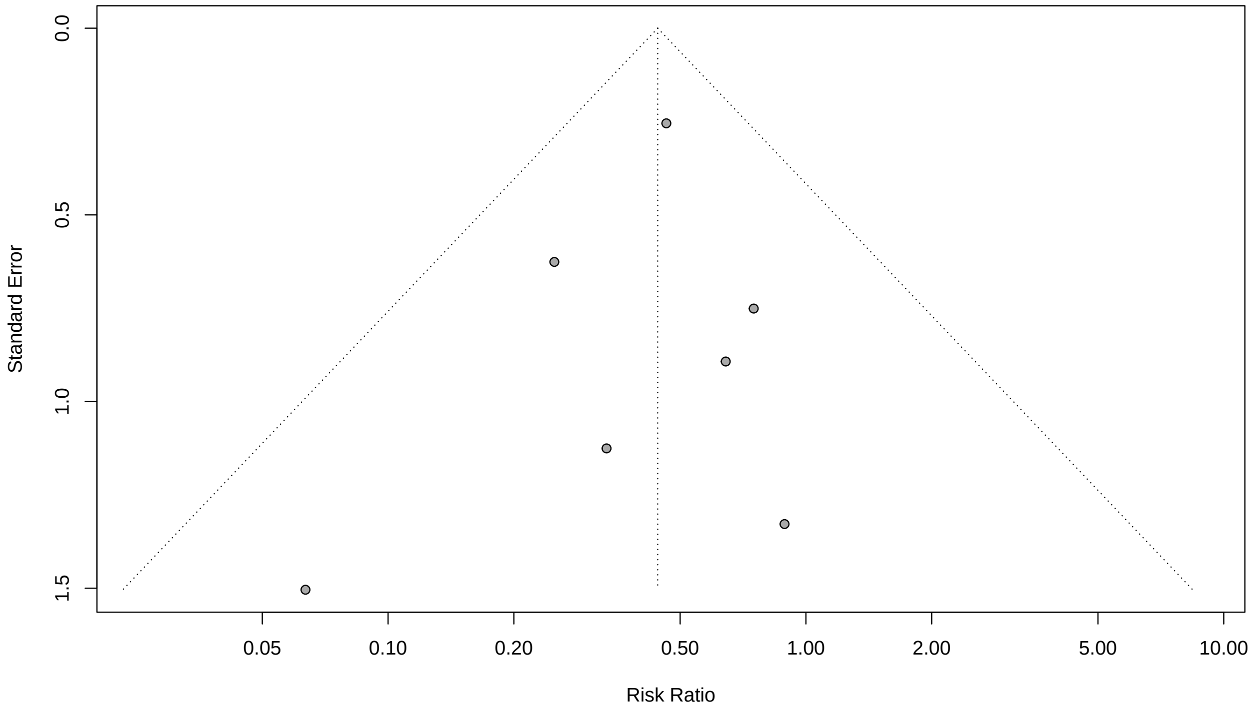
```
## Number of studies: k = 7 (with 0 added studies)
## Number of observations: o = 1084
## Number of events: e = 96
##
##                          RR           95%-CI     z  p-value
## Random effects model 0.4420 [0.2931; 0.6664] -3.90 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.2180]; tau = 0 [0.0000; 1.4893]
##  I^2 = 0.0% [0.0%; 70.8%]; H = 1.00 [1.00; 1.85]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.54    6  0.7386
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(comp_metabin),
       sortvar = TE)
```



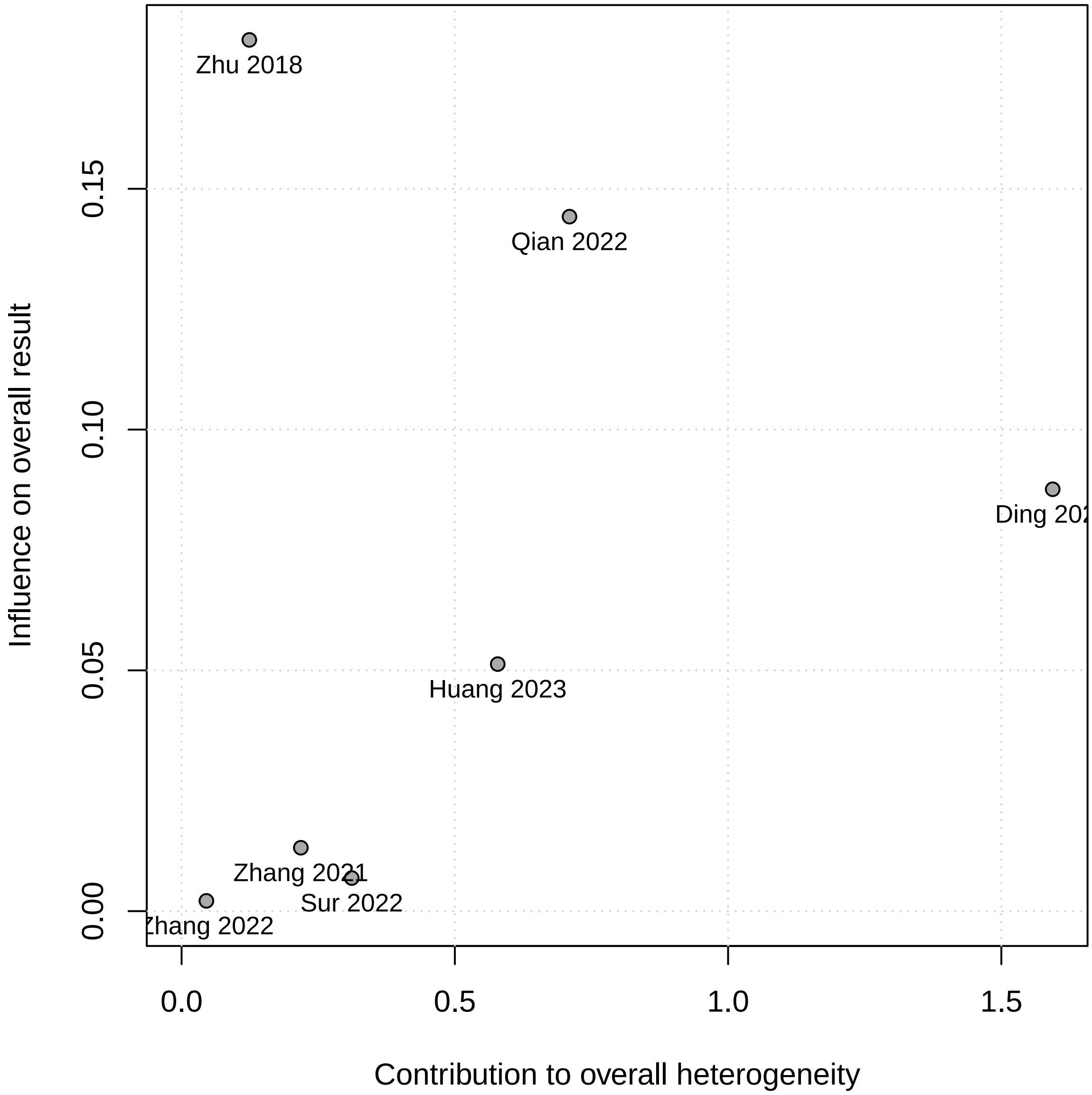
10.7.4 Funnel plot

```
funnel(trimfill(comp_metabin))
```



10.7.5 Baujat

```
baujat(comp_metabin, pos = 1)
```



10.7.6 Leave one out

```r
metainf(comp_metabin)
```

```
## Influential analysis (common effect model)
##
##                         RR           95%-CI  p-value   tau^2    tau   I^2
## Omitting Sur 2022     0.4164 [0.2768; 0.6265] < 0.0001  0.0000  0.0000  0.0%
## Omitting Zhu 2018     0.3654 [0.1847; 0.7228]   0.0038  0.0000  0.0000  0.0%
## Omitting Zhang 2021   0.4135 [0.2731; 0.6260] < 0.0001  0.0000  0.0000  0.0%
## Omitting Huang 2023   0.4036 [0.2650; 0.6145] < 0.0001  0.0000  0.0000  0.0%
## Omitting Ding 2023    0.4508 [0.2987; 0.6805]   0.0001  0.0000  0.0000  0.0%
## Omitting Qian 2022    0.4603 [0.3001; 0.7058]   0.0004  0.0000  0.0000  0.0%
## Omitting Zhang 2022   0.4278 [0.2839; 0.6445] < 0.0001  0.0000  0.0015  0.0%
##
## Pooled estimate       0.4237 [0.2831; 0.6339] < 0.0001  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.8 Fever

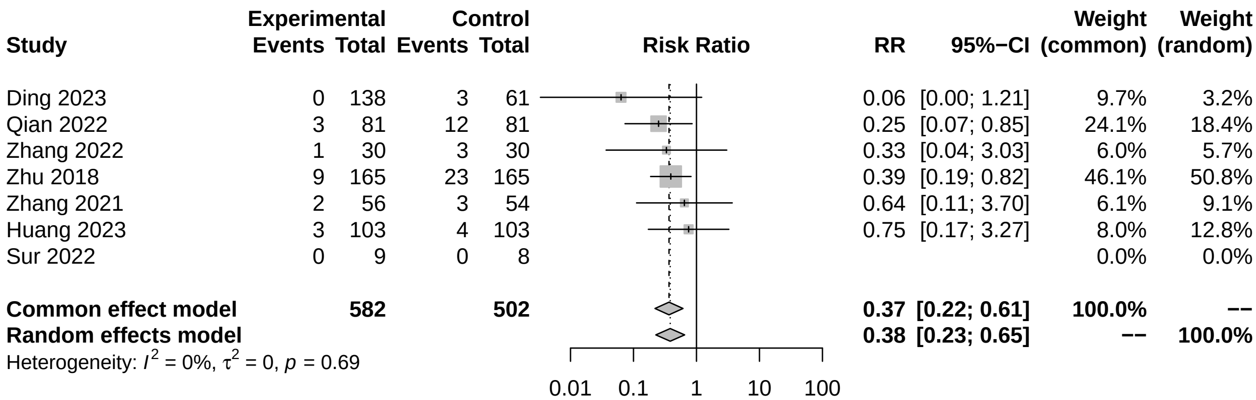
10.8.1 Meta-analysis

```
fever_metabin <- metabin(data = flexiurs_only,
                          event.c = fever_n_control,
                       n.c = sample_size_control,
                       event.e = fever_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
fever_metabin
```

```
## Number of studies: k = 6
## Number of observations: o = 1084
## Number of events: e = 66
##
##                           RR           95%-CI     z p-value
## Common effect model  0.3662 [0.2194; 0.6113] -3.84  0.0001
## Random effects model 0.3830 [0.2261; 0.6487] -3.57  0.0004
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 3.1138]; tau = 0 [0.0000; 1.7646]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.05    5  0.6924
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.8.2 Forest plot

```r
forest(fever_metabin,
       sortvar = TE)
```



10.8.3 Trim and Fill

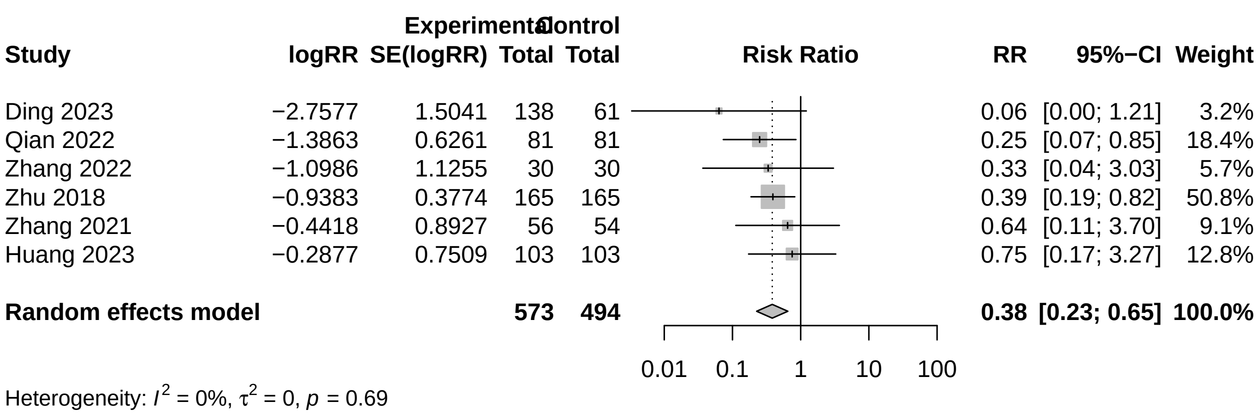
```r
trimfill(fever_metabin)
```

```
## Warning in trimfill.meta(fever_metabin): 1 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 6 (with 0 added studies)
## Number of observations: o = 1067
## Number of events: e = 66
##
##                          RR           95%-CI     z p-value
## Random effects model 0.3830 [0.2261; 0.6487] -3.57  0.0004
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 3.1138]; tau = 0 [0.0000; 1.7646]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.05    5  0.6924
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(fever_metabin),
       sortvar = TE)
```

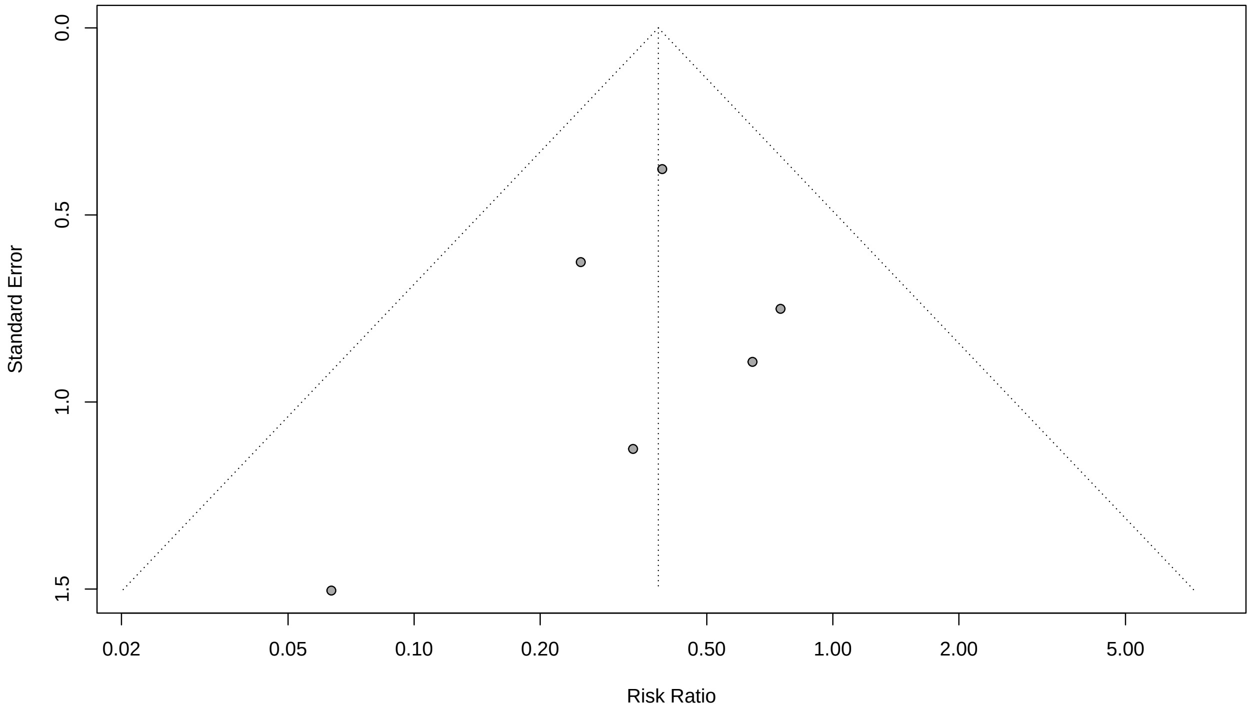
```
## Warning in trimfill.meta(fever_metabin): 1 observation(s) dropped due to
## missing values
```



10.8.4 Funnel plot

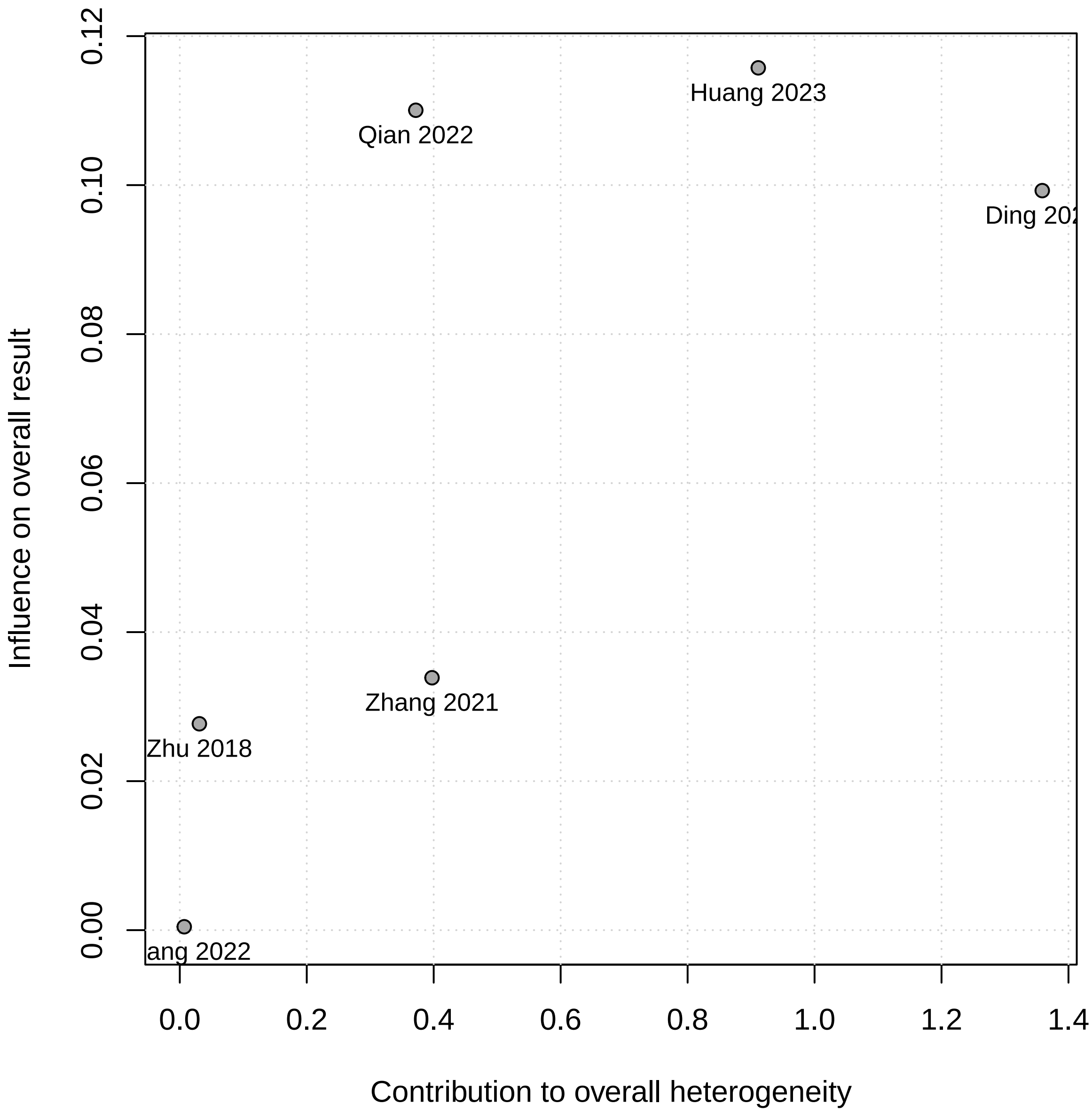
```
funnel(trimfill(fever_metabin))
```

```
## Warning in trimfill.meta(fever_metabin): 1 observation(s) dropped due to
## missing values
```



10.8.5 Baujat

```
baujat(fever_metabin, pos = 1)
```



10.8.6 Leave one out

```r
metainf(fever_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR            95%-CI  p-value   tau^2    tau   I^2
## Omitting Sur 2022     0.3662 [0.2194; 0.6113]   0.0001  0.0000  0.0000  0.0%
## Omitting Zhu 2018     0.3447 [0.1693; 0.7021]   0.0033  0.0000  0.0000  0.0%
## Omitting Zhang 2021   0.3482 [0.2033; 0.5962]   0.0001  0.0000  0.0000  0.0%
## Omitting Huang 2023   0.3328 [0.1916; 0.5778] < 0.0001  0.0000  0.0000  0.0%
## Omitting Ding 2023    0.3987 [0.2349; 0.6767]   0.0007  0.0000  0.0000  0.0%
## Omitting Qian 2022    0.4030 [0.2289; 0.7096]   0.0016  0.0000  0.0000  0.0%
## Omitting Zhang 2022   0.3683 [0.2175; 0.6238]   0.0002  0.0000  0.0007  0.0%
##
## Pooled estimate       0.3662 [0.2194; 0.6113]   0.0001  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.9 Infections

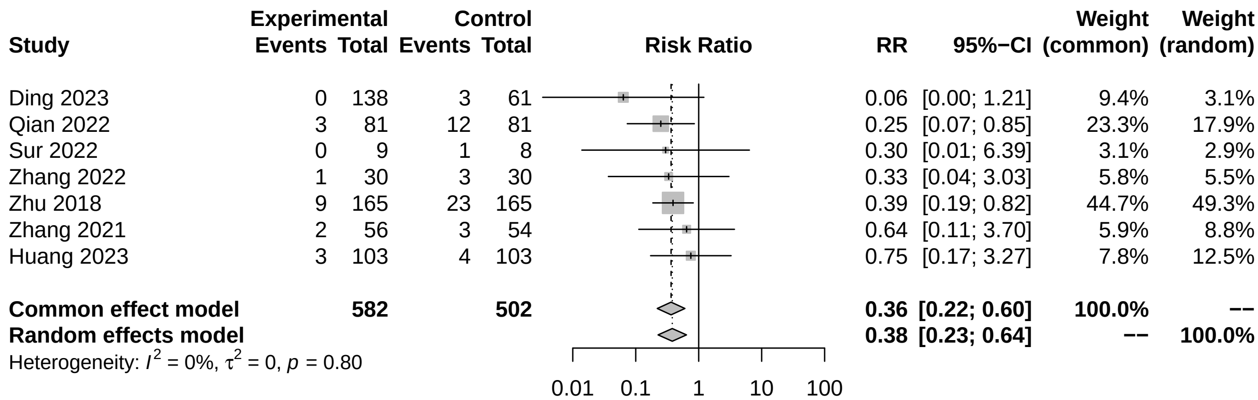
10.9.1 Meta-analysis

```
infection_metabin <- metabin(data = flexiurs_only,
                         event.c = infection_n_control,
                       n.c = sample_size_control,
                       event.e = infection_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
infection_metabin
```

```
## Number of studies: k = 7
## Number of observations: o = 1084
## Number of events: e = 67
##
##                            RR           95%-CI     z  p-value
## Common effect model  0.3642 [0.2197; 0.6037] -3.92 < 0.0001
## Random effects model 0.3802 [0.2262; 0.6392] -3.65   0.0003
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 1.6283]; tau = 0 [0.0000; 1.2760]
##  I^2 = 0.0% [0.0%; 70.8%]; H = 1.00 [1.00; 1.85]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.07    6  0.7995
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.9.2 Forest plot

```r
forest(infection_metabin,
       sortvar = TE)
```

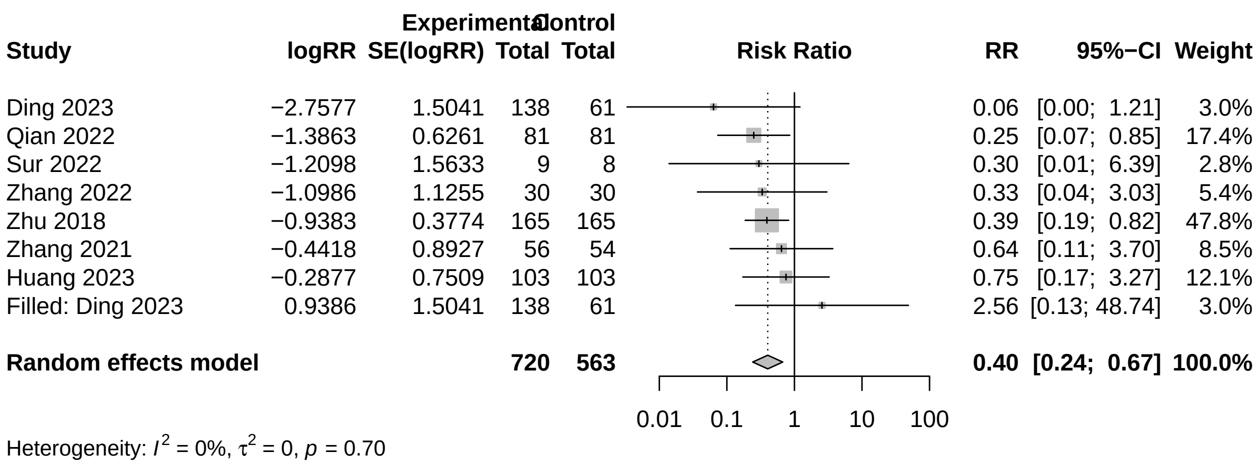


10.9.3 Trim and Fill

```r
trimfill(infection_metabin)
```

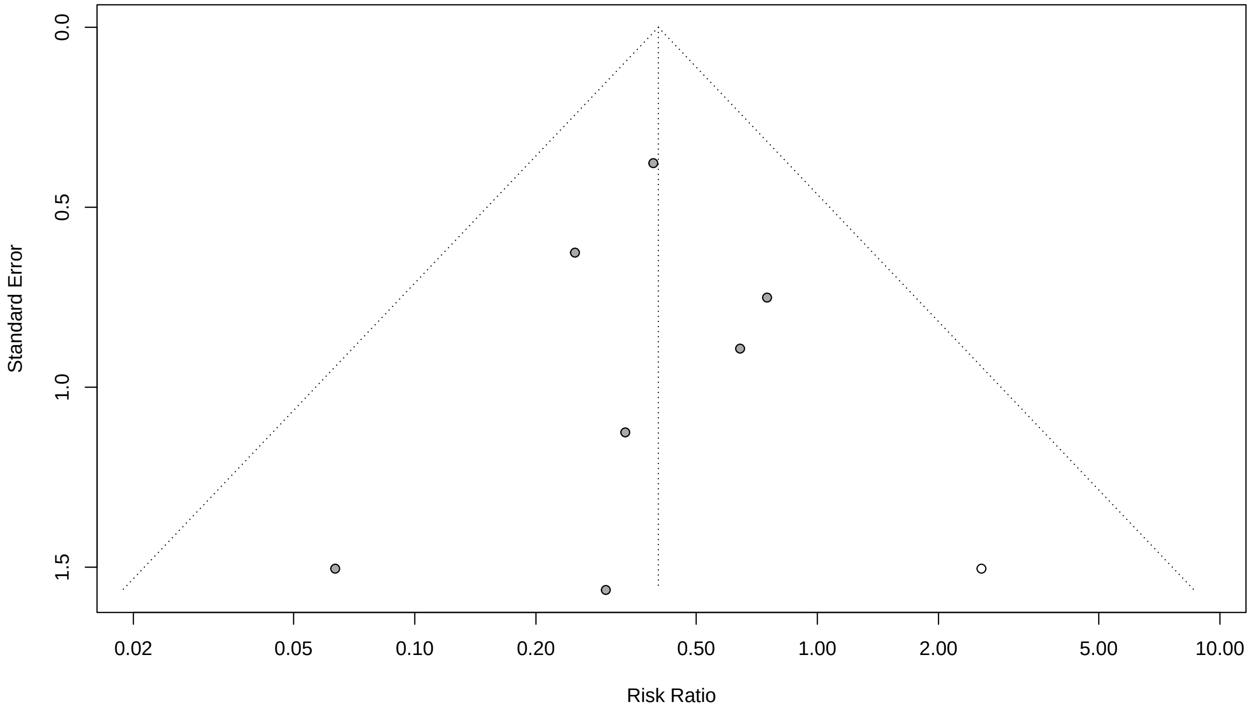
```
## Number of studies: k = 8 (with 1 added studies)
## Number of observations: o = 1283
## Number of events: e = 70
##
##                          RR           95%-CI     z p-value
## Random effects model 0.4027 [0.2414; 0.6716] -3.49  0.0005
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 2.6099]; tau = 0 [0.0000; 1.6155]
##  I^2 = 0.0% [0.0%; 67.6%]; H = 1.00 [1.00; 1.76]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  4.63    7  0.7049
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(infection_metabin),
       sortvar = TE)
```



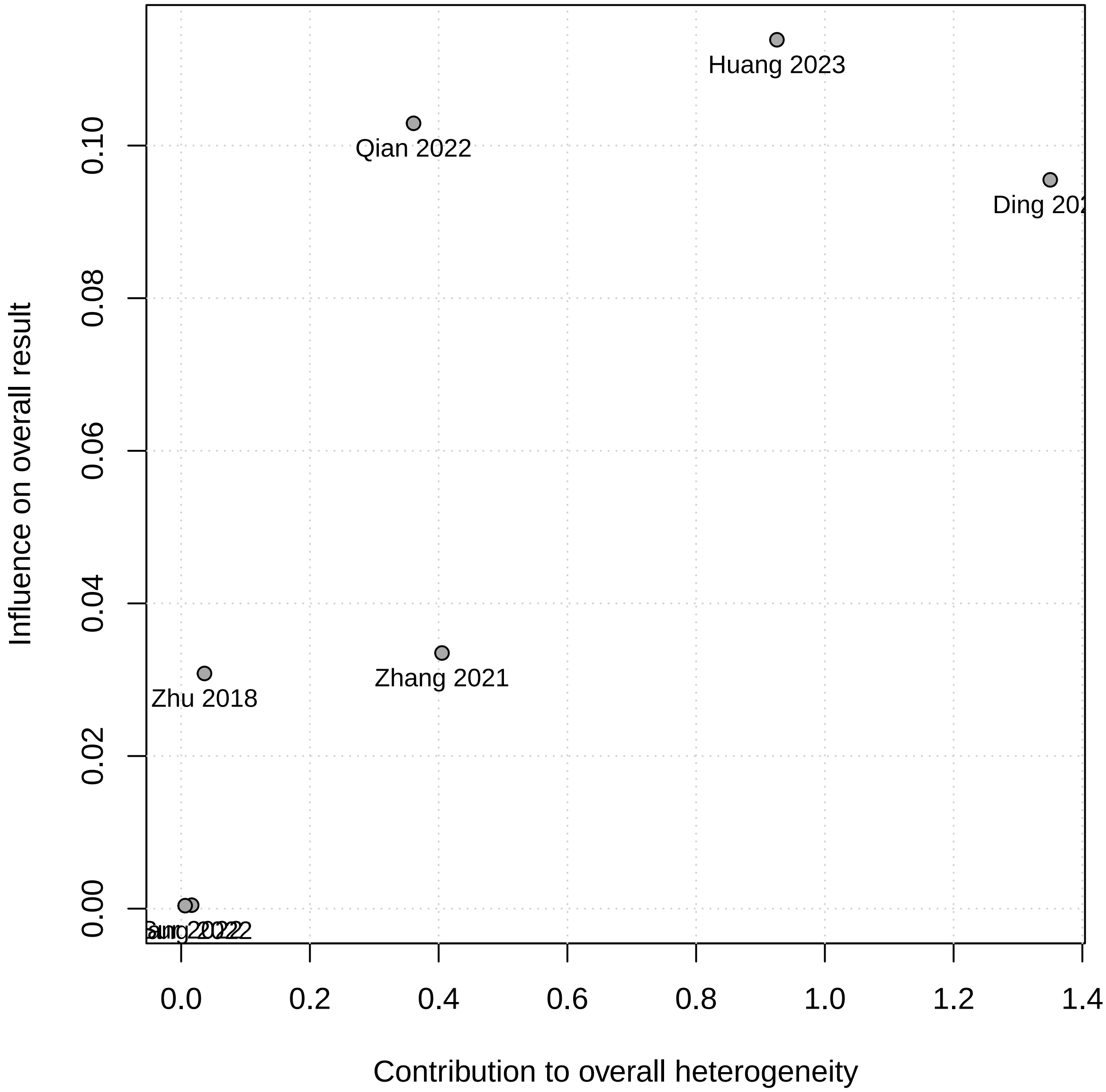
10.9.4 Funnel plot

```
funnel(trimfill(infection_metabin))
```



10.9.5 Baujat

```
baujat(infection_metabin, pos = 1)
```



10.9.6 Leave one out

```r
metainf(infection_metabin)
```

```
## Influential analysis (common effect model)
##
##                           RR           95%-CI  p-value   tau^2    tau   I^2
## Omitting Sur 2022     0.3662 [0.2194; 0.6113]   0.0001  0.0000  0.0000  0.0%
## Omitting Zhu 2018     0.3423 [0.1712; 0.6843]   0.0024  0.0000  0.0000  0.0%
## Omitting Zhang 2021   0.3466 [0.2040; 0.5888] < 0.0001  0.0000  0.0000  0.0%
## Omitting Huang 2023   0.3317 [0.1927; 0.5709] < 0.0001  0.0000  0.0000  0.0%
## Omitting Ding 2023    0.3954 [0.2348; 0.6658]   0.0005  0.0000  0.0000  0.0%
## Omitting Qian 2022    0.3989 [0.2287; 0.6957]   0.0012  0.0000  0.0000  0.0%
## Omitting Zhang 2022   0.3661 [0.2178; 0.6153]   0.0001  0.0000  0.0000  0.0%
##
## Pooled estimate       0.3642 [0.2197; 0.6037] < 0.0001  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.10 Sepsis

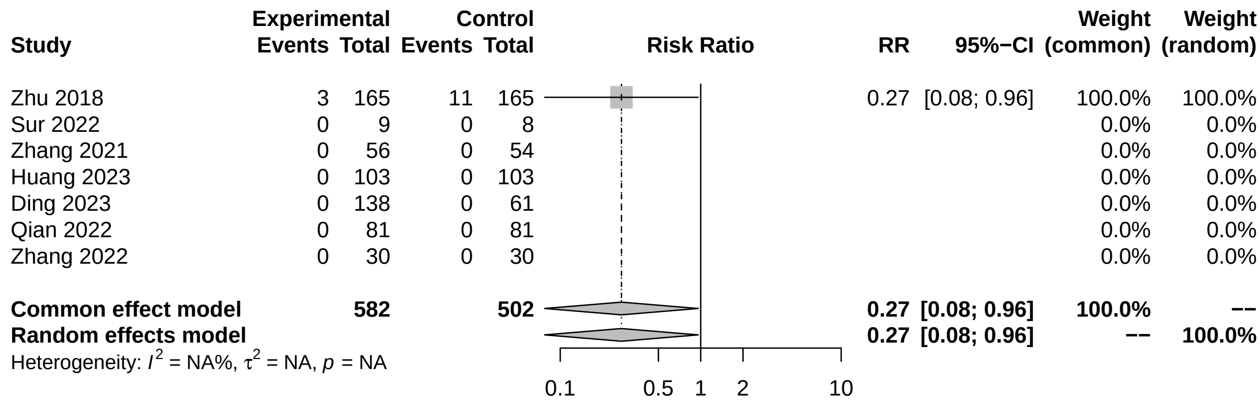
10.10.1 Meta-analysis

```
sepsis_metabin <- metabin(data = flexiurs_only,
                         event.c = sepsis_n_control,
                       n.c = sample_size_control,
                       event.e = sepsis_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sepsis_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
## Number of events: e = 14
##
##                          RR           95%-CI     z p-value
## Common effect model  0.2727 [0.0775; 0.9598] -2.02  0.0430
## Random effects model 0.2727 [0.0775; 0.9598] -2.02  0.0430
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.10.2 Forest plot

```r
forest(sepsis_metabin,
       sortvar = TE)
```

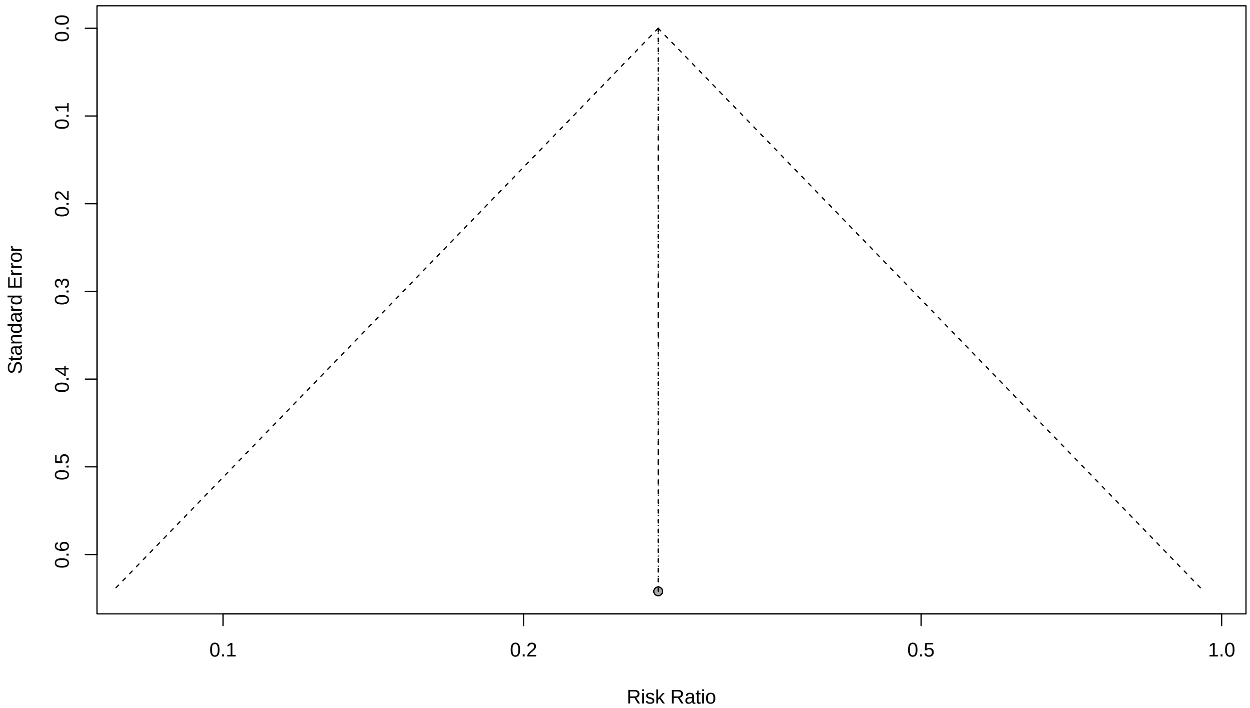


10.10.3 Trim and Fill

```
#trimfill(sepsis_metabin)
#forest(trimfill(sepsis_metabin),
#       sortvar = TE)
```

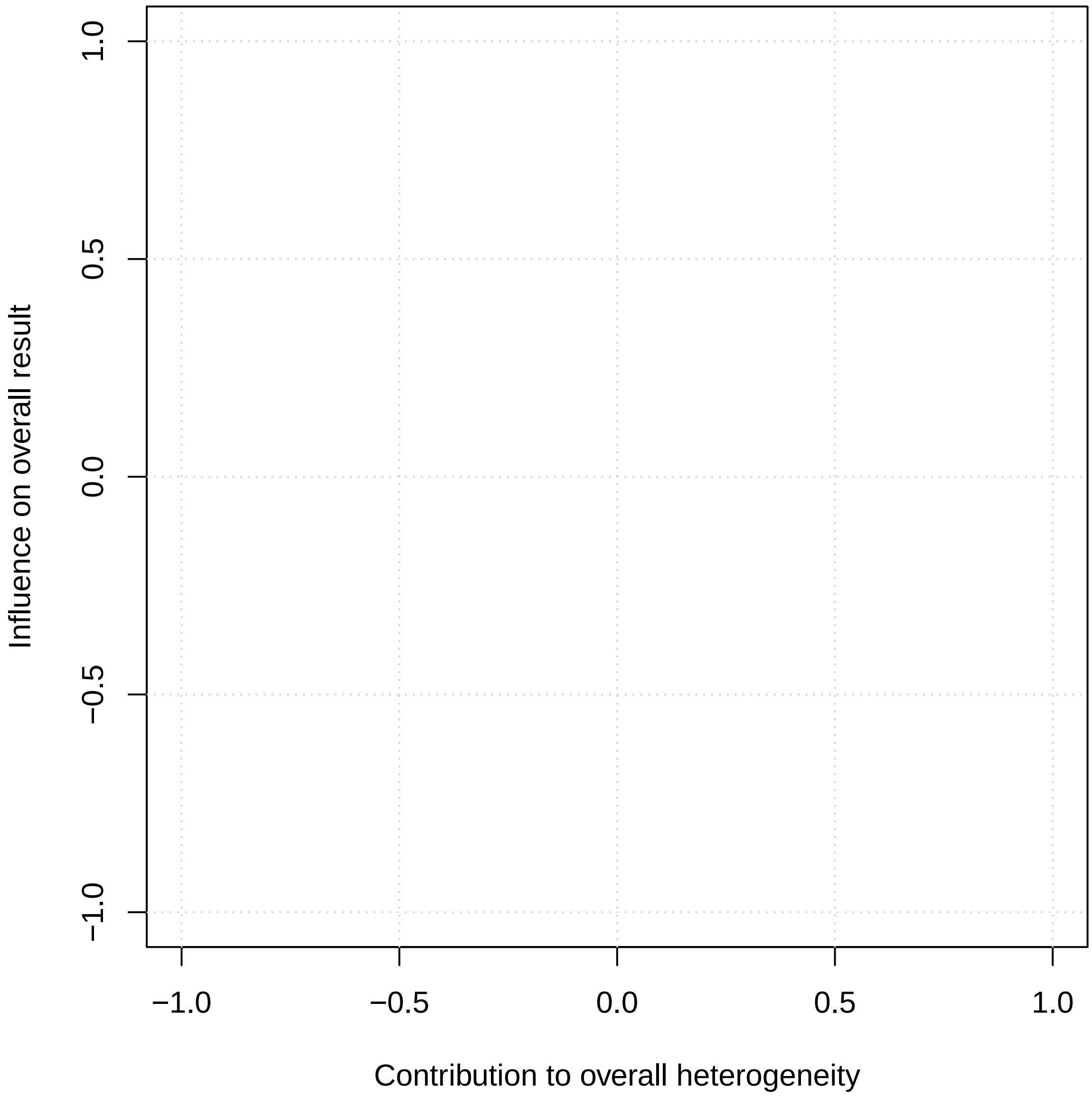
10.10.4 Funnel plot

```r
funnel((sepsis_metabin))
```



10.10.5 Baujat

```
baujat(sepsis_metabin, pos = 1)
```



10.10.6 Leave one out

```
metainf(sepsis_metabin)
```

```
## Influential analysis (common effect model)
##
##                             RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022     0.2727 [0.0775; 0.9598]  0.0430
## Omitting Zhu 2018
## Omitting Zhang 2021   0.2727 [0.0775; 0.9598]  0.0430
## Omitting Huang 2023   0.2727 [0.0775; 0.9598]  0.0430
## Omitting Ding 2023    0.2727 [0.0775; 0.9598]  0.0430
## Omitting Qian 2022    0.2727 [0.0775; 0.9598]  0.0430
## Omitting Zhang 2022   0.2727 [0.0775; 0.9598]  0.0430
##
## Pooled estimate       0.2727 [0.0775; 0.9598]  0.0430
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.11 Abscess

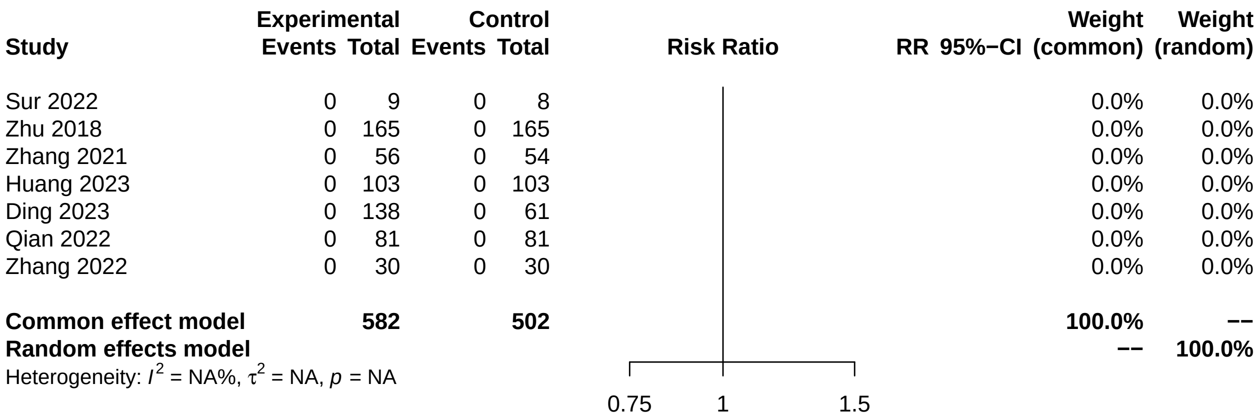
10.11.1 Meta-analysis

```
abscess_metabin <- metabin(data = flexiurs_only,
                              event.c = abscess_n_control,
                          n.c = sample_size_control,
                          event.e = abscess_n_suction,
                          n.e = sample_size_suction,
                          studlab = author_year)
abscess_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 1084
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.11.2 Forest plot

```r
forest(abscess_metabin,
       sortvar = TE)
```



10.11.3 Trim and Fill

```
#trimfill(abscess_metabin)
#forest(trimfill(abscess_metabin),
#       sortvar = TE)
```

10.11.4 Funnel plot

```
#funnel((abscess_metabin))
```

10.11.5 Baujat

```
#baujat(abscess_metabin, pos = 1)
```

10.11.6 Leave one out

```
#metainf(abscess_metabin)
```

10.12 Haematoma

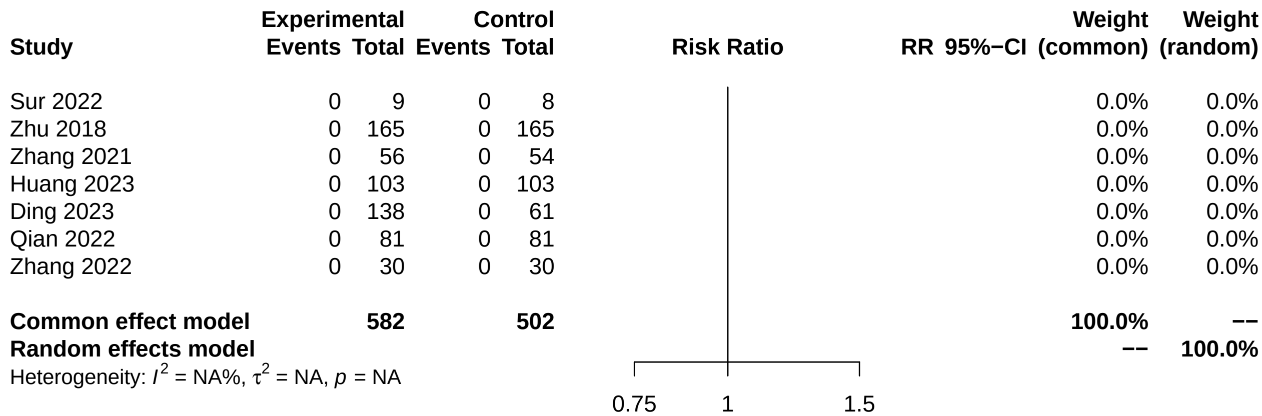
10.12.1 Meta-analysis

```
haematoma_metabin <- metabin(data = flexiurs_only,
                         event.c = hematoma_n_control,
                       n.c = sample_size_control,
                       event.e = hematoma_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
haematoma_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 1084
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.12.2 Forest plot

```r
forest(haematoma_metabin,
       sortvar = TE)
```



10.12.3 Trim and Fill

```
#trimfill(haematoma_metabin)
#forest(trimfill(haematoma_metabin),
#       sortvar = TE)
```

10.12.4 Funnel plot

```
#funnel((haematoma_metabin))
```

10.12.5 Baujat

```
#baujat(haematoma_metabin, pos = 1)
```

10.12.6 Leave one out

```
#metainf(haematoma_metabin)
```

10.13 Pain

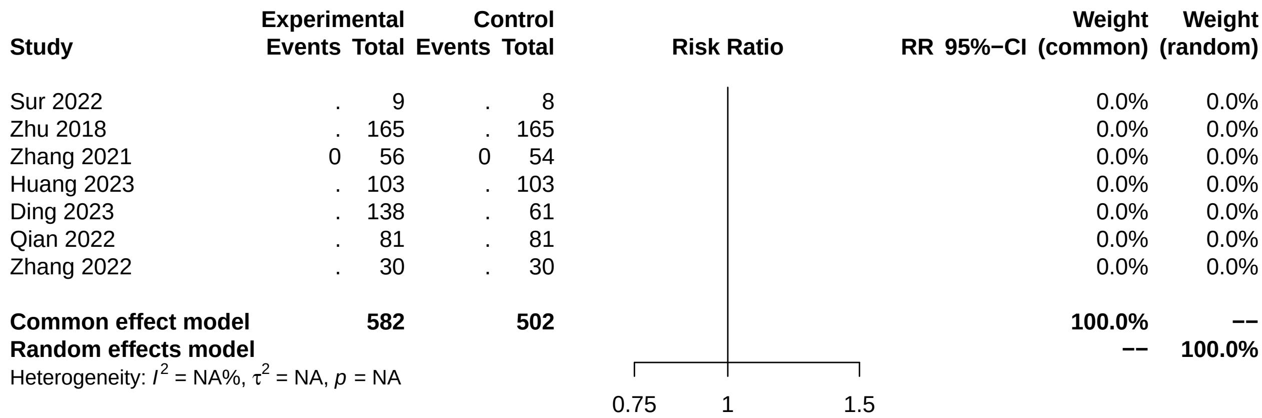
10.13.1 Meta-analysis

```
pain_metabin <- metabin(data = flexiurs_only,
                          event.c = pain_n_control,
                        n.c = sample_size_control,
                        event.e = pain_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
pain_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 1084
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA         --      --
## Random effects model NA         --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.13.2 Forest plot

```r
forest(pain_metabin,
       sortvar = TE)
```



10.13.3 Trim and Fill

```
#trimfill(pain_metabin)
#forest(trimfill(pain_metabin),
 #      sortvar = TE)
```

10.13.4 Funnel plot

```
#funnel(trimfill(pain_metabin))
```

10.13.5 Baujat

```
#baujat(pain_metabin, pos = 1)
```

10.13.6 Leave one out

```
#metainf(pain_metabin, pos = 1)
```

10.14 Stricture

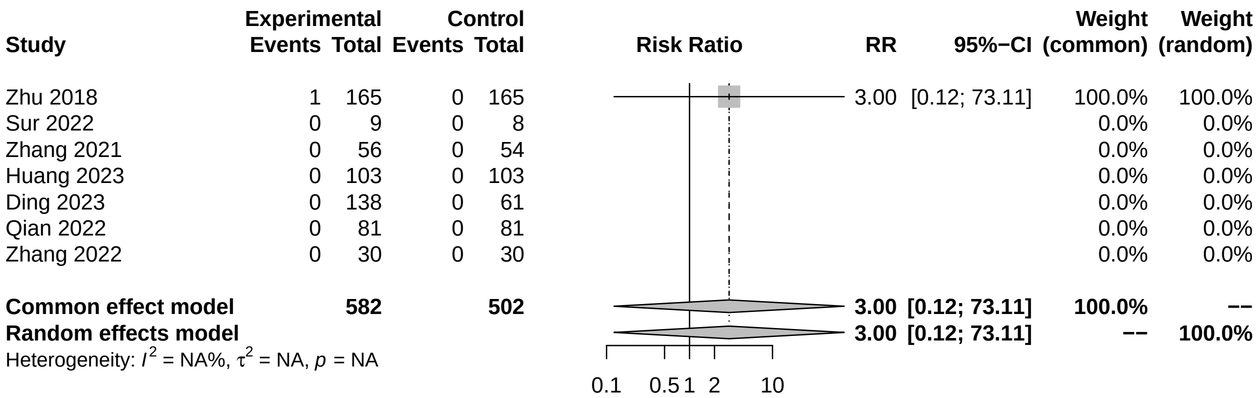
10.14.1 Meta-analysis

```
stricture_metabin <- metabin(data = flexiurs_only,
                              event.c = stricture_n_control,
                            n.c = sample_size_control,
                            event.e = stricture_n_suction,
                            n.e = sample_size_suction,
                            studlab = author_year)
stricture_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
## Number of events: e = 1
##
##                           RR            95%-CI    z p-value
## Common effect model  3.0000 [0.1231; 73.1112] 0.67  0.5001
## Random effects model 3.0000 [0.1231; 73.1096] 0.67  0.5001
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.14.2 Forest plot

```r
forest(stricture_metabin,
       sortvar = TE)
```

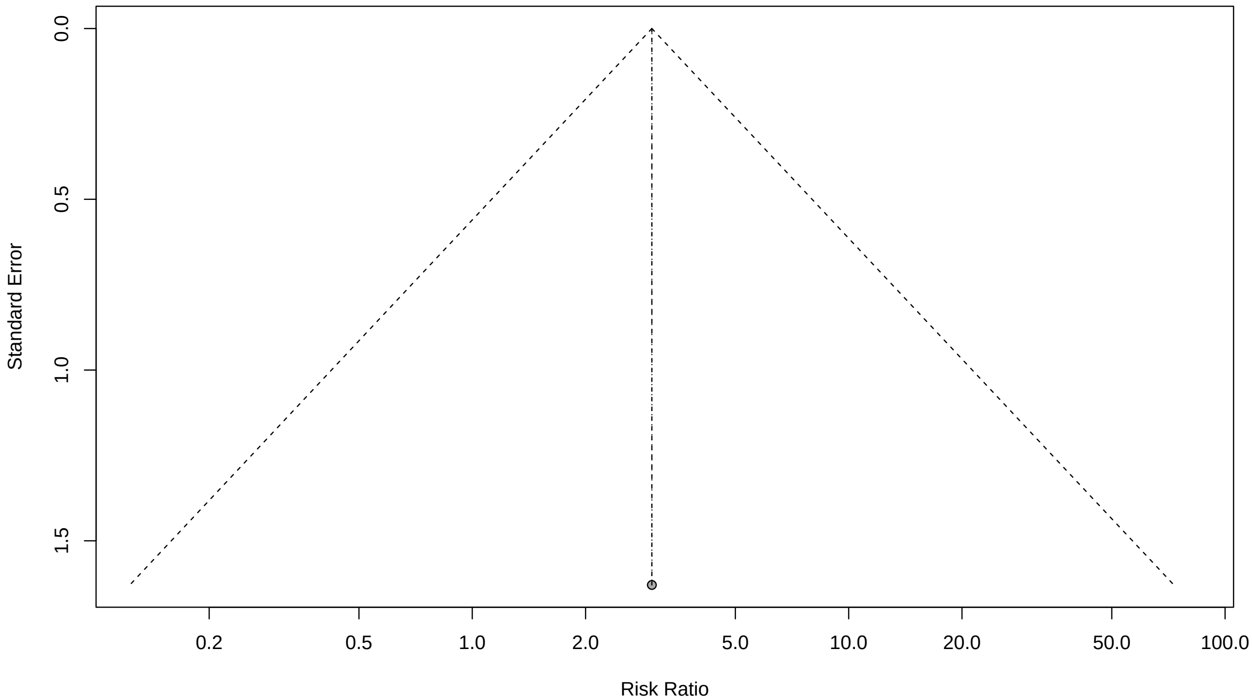


10.14.3 Trim and Fill

```
#trimfill(stricture_metabin)
#forest(trimfill(stricture_metabin),
#       sortvar = TE)
```

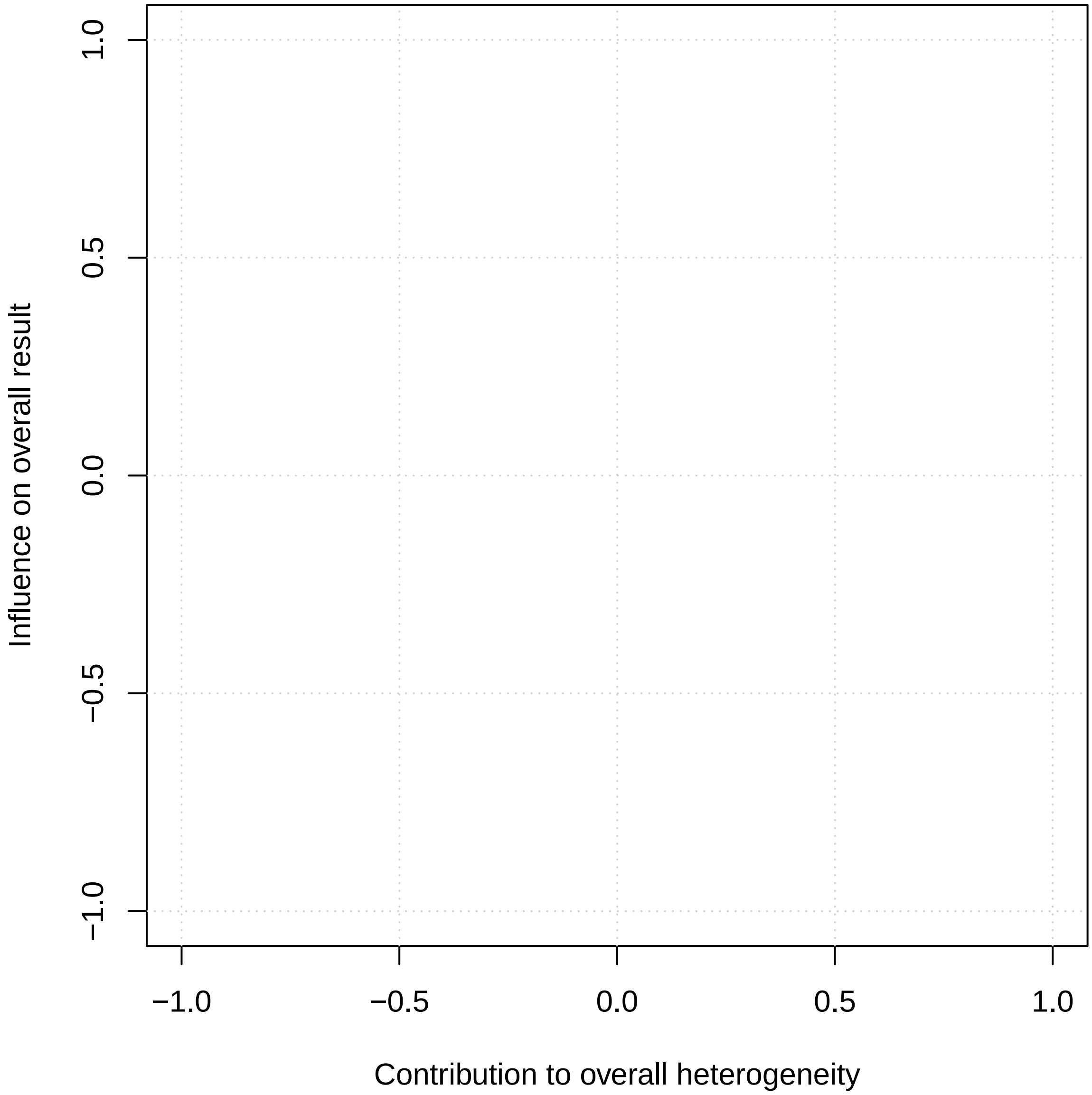
10.14.4 Funnel plot

```r
funnel((stricture_metabin))
```



10.14.5 Baujat

```
baujat(stricture_metabin, pos = 1)
```



10.14.6 Leave one out

```r
metainf(stricture_metabin)
```

```
## Influential analysis (common effect model)
##
##                             RR            95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022     3.0000 [0.1231; 73.1112]  0.5001
## Omitting Zhu 2018
## Omitting Zhang 2021   3.0000 [0.1231; 73.1112]  0.5001
## Omitting Huang 2023   3.0000 [0.1231; 73.1112]  0.5001
## Omitting Ding 2023    3.0000 [0.1231; 73.1112]  0.5001
## Omitting Qian 2022    3.0000 [0.1231; 73.1112]  0.5001
## Omitting Zhang 2022   3.0000 [0.1231; 73.1112]  0.5001
##
## Pooled estimate       3.0000 [0.1231; 73.1112]  0.5001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.15 Embolisation required

10.15.1 Meta-analysis

```
ir_embolisation_metabin <- metabin(data = flexiurs_only,
                         event.c = embolism_ir_intervention_n_control,
                       n.c = sample_size_control,
                       event.e = embolism_ir_intervention_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
ir_embolisation_metabin
```

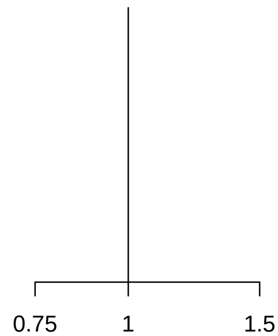
```
## Number of studies: k = 0
## Number of observations: o = 1084
## Number of events: e = 0
##
##                        RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.15.2 Forest plot

```r
forest(ir_embolisation_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	Risk Ratio	RR	95%−CI	Weight (common)	Weight (random)
Sur 2022	0	9	0	8				0.0%	0.0%
Zhu 2018	0	165	0	165				0.0%	0.0%
Zhang 2021	0	56	0	54				0.0%	0.0%
Huang 2023	0	103	0	103				0.0%	0.0%
Ding 2023	0	138	0	61				0.0%	0.0%
Qian 2022	0	81	0	81				0.0%	0.0%
Zhang 2022	0	30	0	30				0.0%	0.0%
Common effect model		**582**		**502**				**100.0%**	**−−**
Random effects model								**−−**	**100.0%**

Heterogeneity: I^2 = NA%, τ^2 = NA, p = NA



10.15.3 Trim and Fill

```
#trimfill(ir_embolisation_metabin)
#forest(trimfill(ir_embolisation_metabin),
#       sortvar = TE)
```

10.15.4 Funnel plot

```
#funnel((ir_embolisation_metabin))
```

10.15.5 Baujat

```
#baujat(ir_embolisation_metabin, pos = 1)
```

10.15.6 Leave one out

```
#metainf(ir_embolisation_metabin)
```

10.16 Transfusion

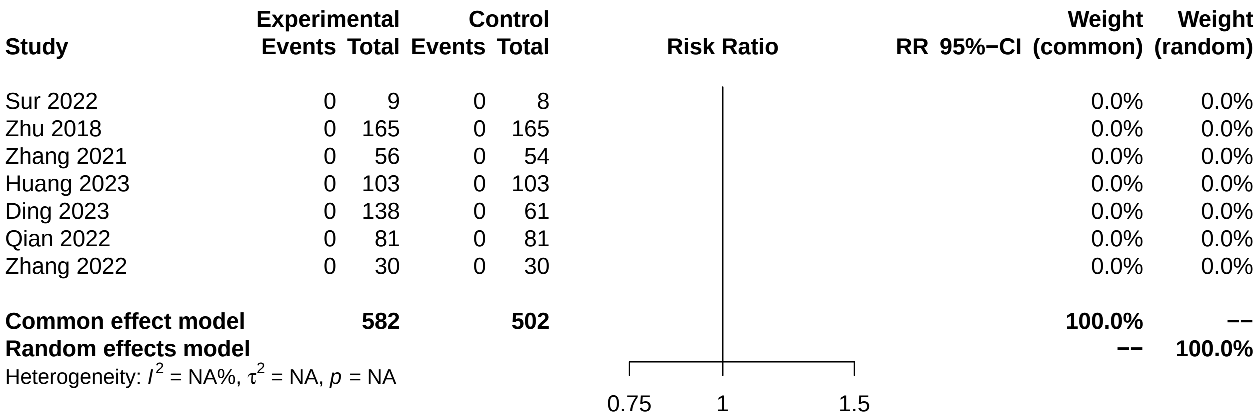
10.16.1 Meta-analysis

```
transfusion_metabin <- metabin(data = flexiurs_only,
                                 event.c = transfusion_n_control,
                               n.c = sample_size_control,
                               event.e = transfusion_n_suction,
                               n.e = sample_size_suction,
                               studlab = author_year)
transfusion_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 1084
## Number of events: e = 0
##
##                        RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.16.2 Forest plot

```r
forest(transfusion_metabin,
       sortvar = TE)
```



10.16.3 Trim and Fill

```
#trimfill(transfusion_metabin)
#forest(trimfill(transfusion_metabin),
#       sortvar = TE)
```

10.16.4 Funnel plot

```
#funnel(trimfill(transfusion_metabin))
```

10.16.5 Baujat

```
#baujat(transfusion_metabin, pos = 1)
```

10.16.6 Leave one out

```
#metainf(transfusion_metabin)
```

10.17 Clavien I

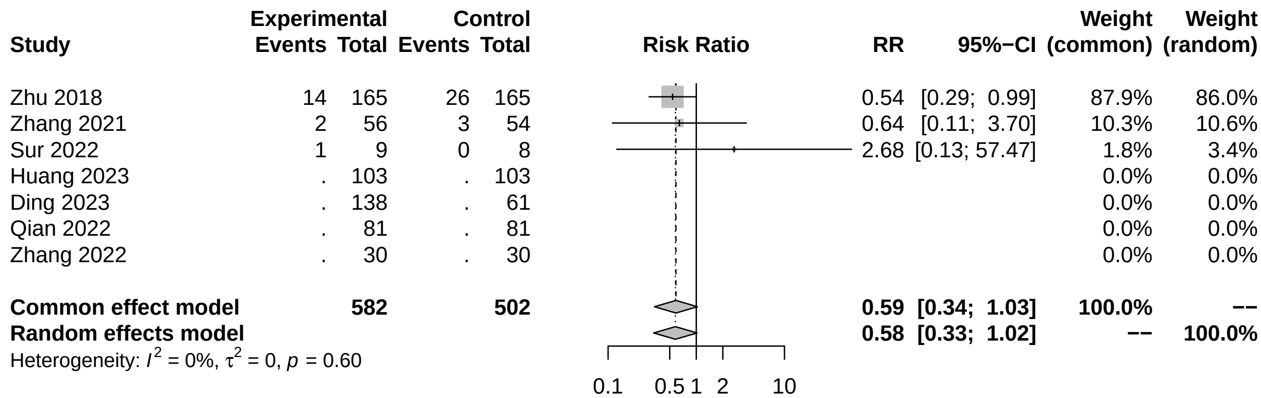
10.17.1 Meta-analysis

```
clav_i_metabin <- metabin(data = flexiurs_only,
                          event.c = clavien_i_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_i_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_i_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 1084
## Number of events: e = 46
##
##                          RR           95%-CI     z p-value
## Common effect model  0.5877 [0.3352; 1.0304] -1.86  0.0635
## Random effects model 0.5798 [0.3284; 1.0236] -1.88  0.0602
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 28.9209]; tau = 0 [0.0000; 5.3778]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.03    2  0.5974
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.17.2 Forest plot

```r
forest(clav_i_metabin,
       sortvar = TE)
```



10.17.3 Trim and Fill

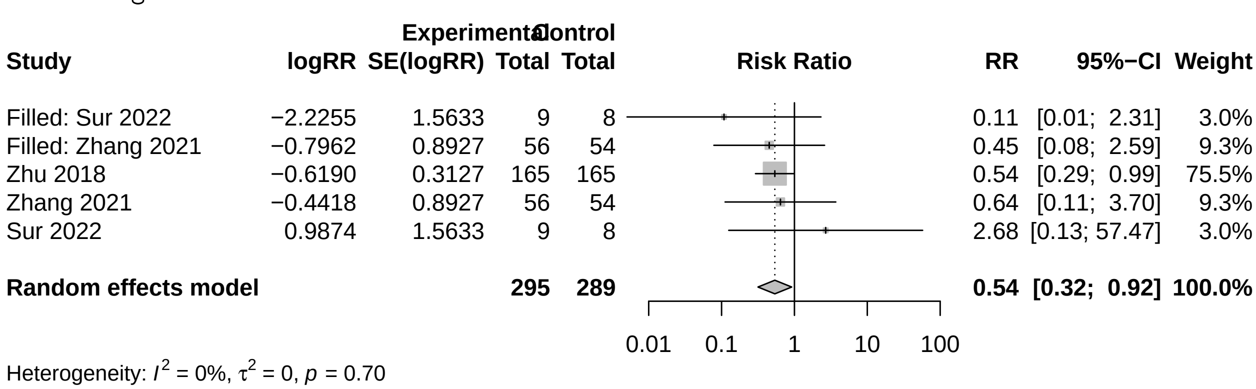
```r
trimfill(clav_i_metabin)
```

```
## Warning in trimfill.meta(clav_i_metabin): 4 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 5 (with 2 added studies)
## Number of observations: o = 584
## Number of events: e = 52
##
##                          RR           95%-CI     z p-value
## Random effects model 0.5385 [0.3162; 0.9169] -2.28  0.0227
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 8.3636]; tau = 0 [0.0000; 2.8920]
##  I^2 = 0.0% [0.0%; 79.2%]; H = 1.00 [1.00; 2.19]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.19    4  0.7007
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(clav_i_metabin),
       sortvar = TE)
```

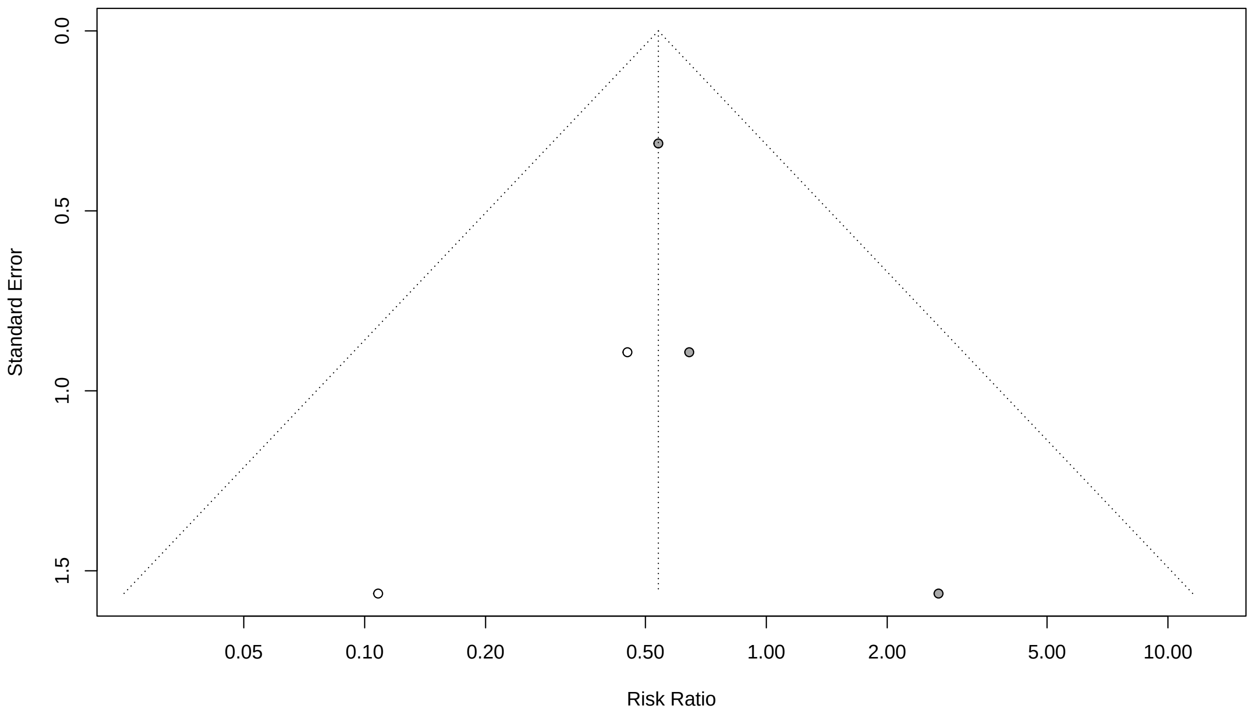
```
## Warning in trimfill.meta(clav_i_metabin): 4 observation(s) dropped due to
## missing values
```



10.17.4 Funnel plot

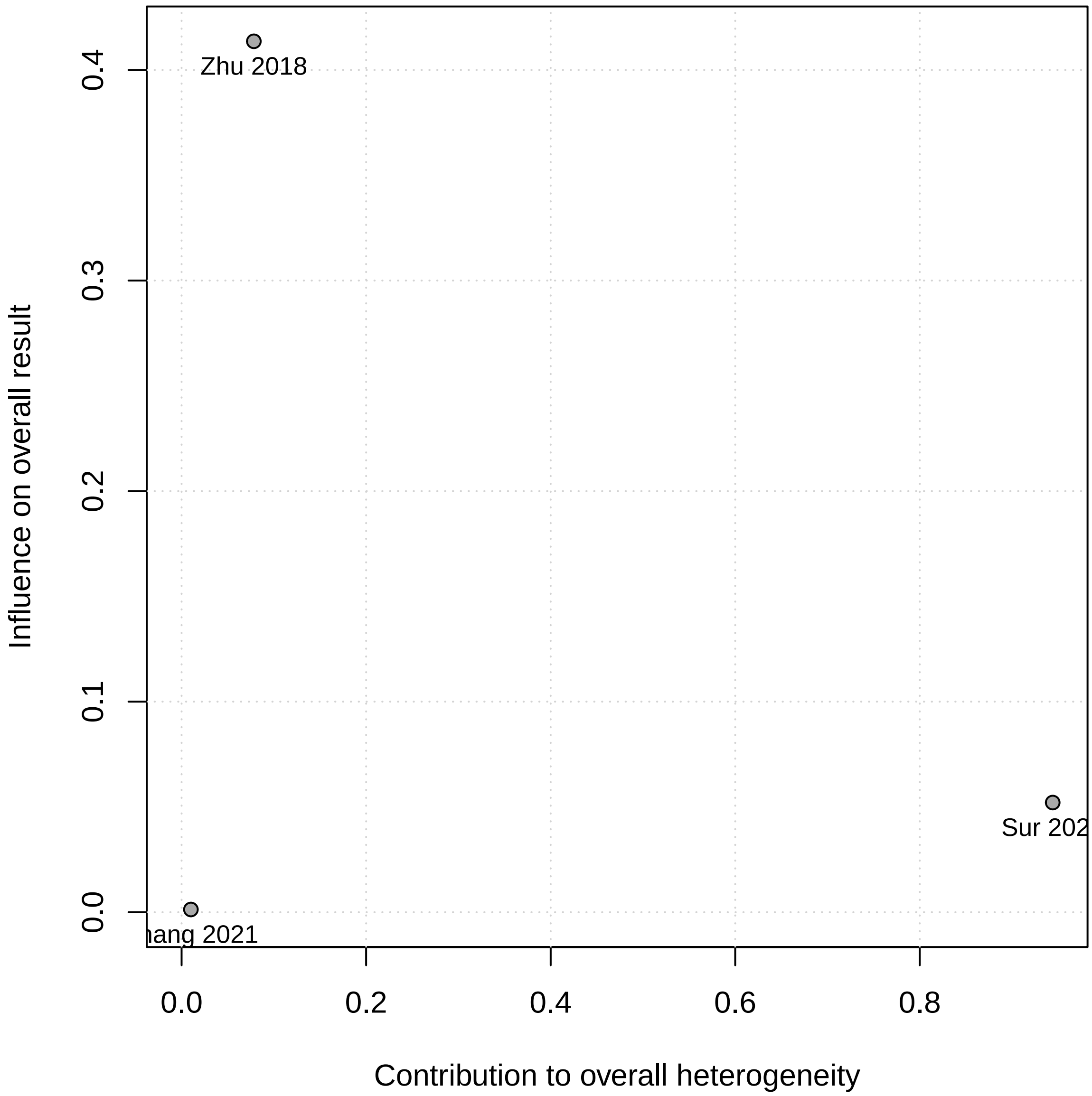
```
funnel(trimfill(clav_i_metabin))
```

```
## Warning in trimfill.meta(clav_i_metabin): 4 observation(s) dropped due to
## missing values
```



10.17.5 Baujat

```
baujat(clav_i_metabin, pos = 1)
```



10.17.6 Leave one out

```r
metainf(clav_i_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Sur 2022     0.5494 [0.3082; 0.9796]  0.0424  0.0000 0.0000  0.0%
## Omitting Zhu 2018     0.9452 [0.2221; 4.0222]  0.9392  0.0000 0.0000  0.0%
## Omitting Zhang 2021   0.5813 [0.3213; 1.0517]  0.0729  0.0195 0.1398  1.5%
## Omitting Huang 2023   0.5877 [0.3352; 1.0304]  0.0635  0.0000 0.0000  0.0%
## Omitting Ding 2023    0.5877 [0.3352; 1.0304]  0.0635  0.0000 0.0000  0.0%
## Omitting Qian 2022    0.5877 [0.3352; 1.0304]  0.0635  0.0000 0.0000  0.0%
## Omitting Zhang 2022   0.5877 [0.3352; 1.0304]  0.0635  0.0000 0.0000  0.0%
##
## Pooled estimate       0.5877 [0.3352; 1.0304]  0.0635  0.0000 0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.18 Clavien II

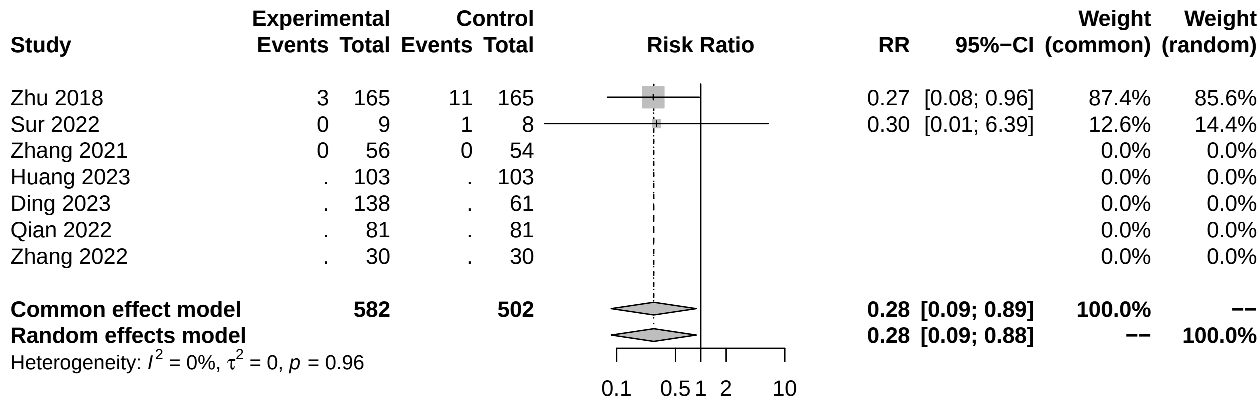
10.18.1 Meta-analysis

```
clav_ii_metabin <- metabin(data = flexiurs_only,
                          event.c = clavien_ii_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_ii_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_ii_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 1084
## Number of events: e = 15
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2762 [0.0861; 0.8853] -2.16  0.0304
## Random effects model 0.2763 [0.0863; 0.8847] -2.17  0.0303
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.00    1  0.9578
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

10.18.2 Forest plot

```r
forest(clav_ii_metabin,
       sortvar = TE)
```

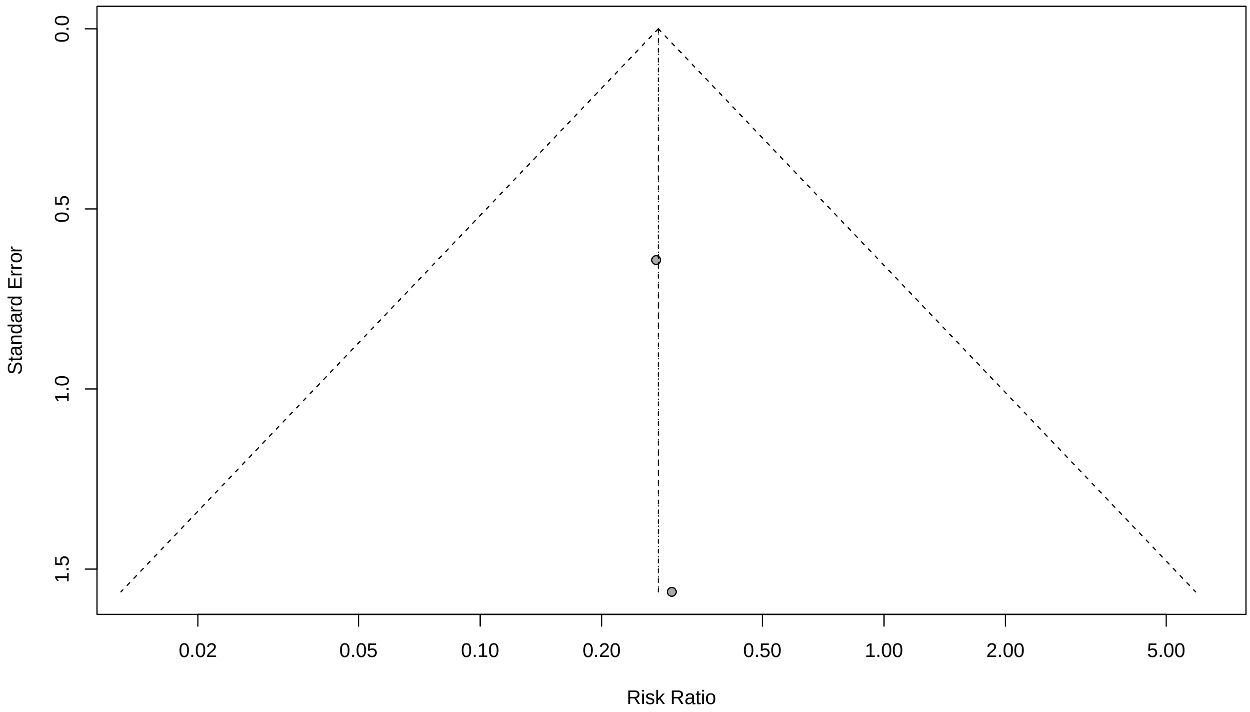


10.18.3 Trim and Fill

```
#trimfill(clav_ii_metabin)
#forest(trimfill(clav_ii_metabin),
#       sortvar = TE)
```

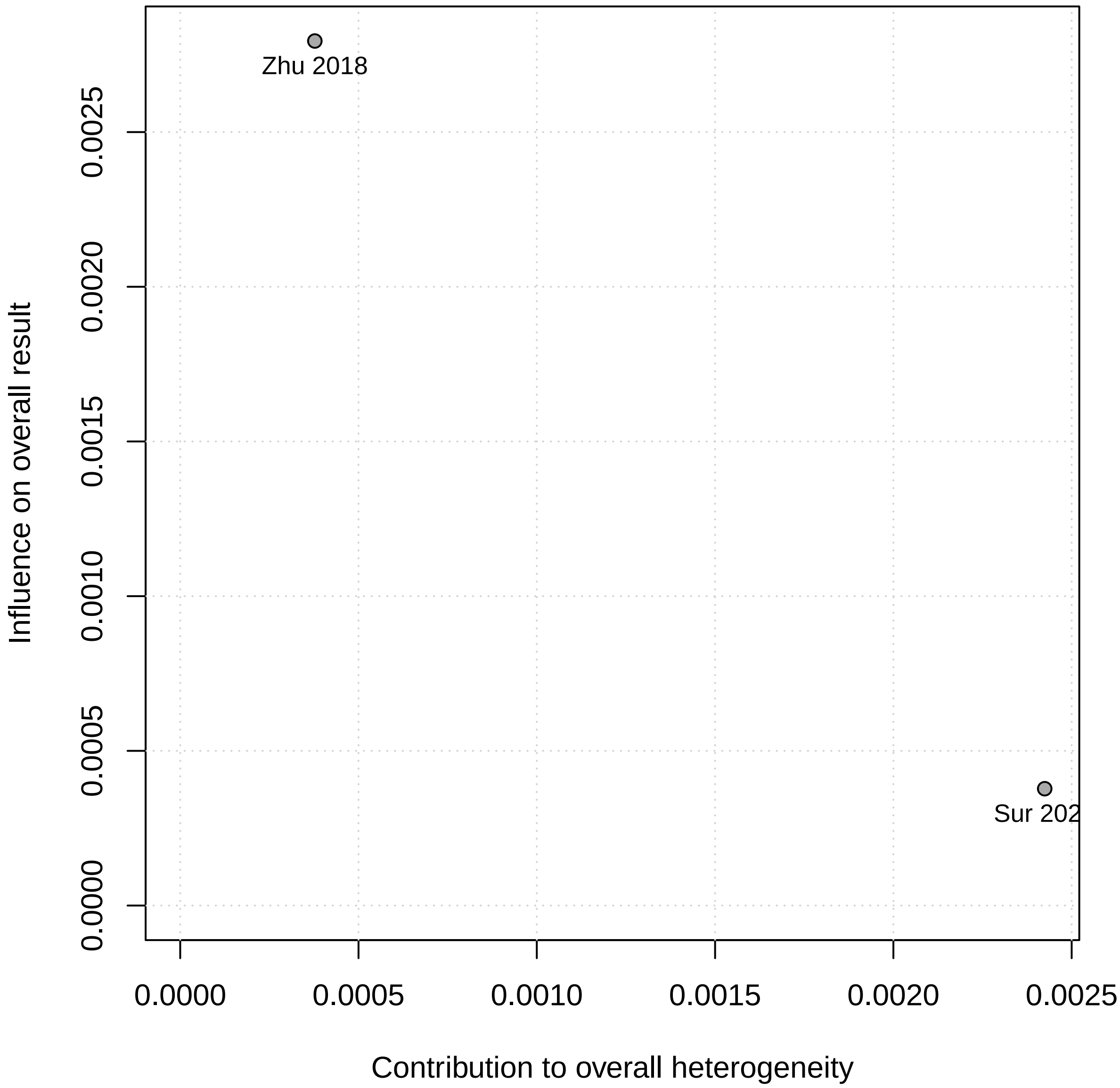
10.18.4 Funnel plot

```r
funnel((clav_ii_metabin))
```



10.18.5 Baujat

```
baujat(clav_ii_metabin, pos = 1)
```



10.18.6 Leave one out

```
metainf(clav_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2     tau   I^2
## Omitting Sur 2022     0.2727 [0.0775; 0.9598]  0.0430
## Omitting Zhu 2018     0.3000 [0.0139; 6.4710]  0.4423
## Omitting Zhang 2021   0.2762 [0.0861; 0.8853]  0.0304  0.0000  0.0000  0.0%
## Omitting Huang 2023   0.2762 [0.0861; 0.8853]  0.0304  0.0000  0.0000  0.0%
## Omitting Ding 2023    0.2762 [0.0861; 0.8853]  0.0304  0.0000  0.0000  0.0%
## Omitting Qian 2022    0.2762 [0.0861; 0.8853]  0.0304  0.0000  0.0000  0.0%
## Omitting Zhang 2022   0.2762 [0.0861; 0.8853]  0.0304  0.0000  0.0000  0.0%
##
## Pooled estimate       0.2762 [0.0861; 0.8853]  0.0304  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.19 Clavien III

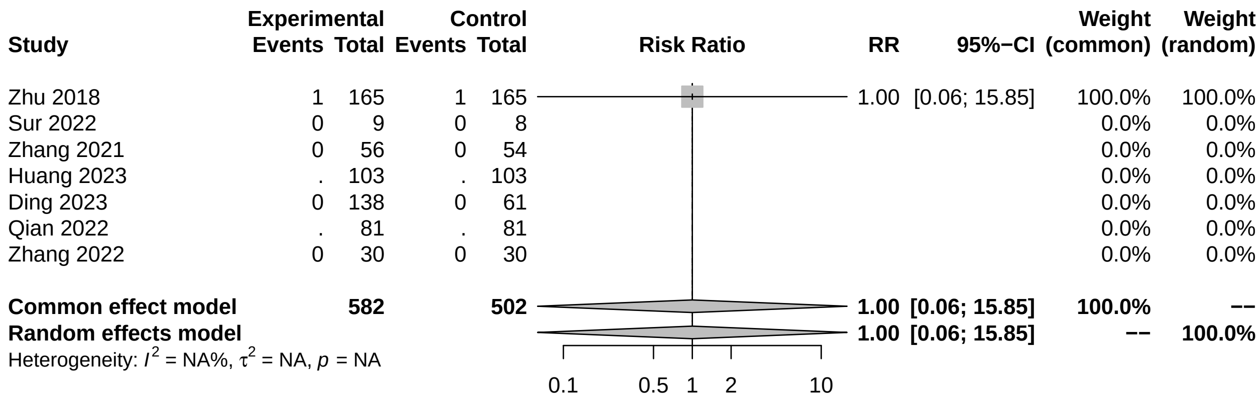
10.19.1 Meta-analysis

```
clav_iii_metabin <- metabin(data = flexiurs_only,
                         event.c = clavien_iii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_iii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
## Number of events: e = 2
##
##                          RR           95%-CI    z p-value
## Common effect model  1.0000 [0.0631; 15.8536] 0.00  1.0000
## Random effects model 1.0000 [0.0631; 15.8536] 0.00  1.0000
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.19.2 Forest plot

```r
forest(clav_iii_metabin,
       sortvar = TE)
```



10.19.3 Trim and Fill

```
#trimfill(clav_iii_metabin)
#forest(trimfill(clav_iii_metabin),
#       sortvar = TE)
```

10.19.4 Funnel plot

```
#funnel(trimfill(clav_iii_metabin))
```

10.19.5 Baujat

```
#baujat(clav_iii_metabin, pos = 1)
```

10.19.6 Leave one out

```
#metainf(clav_iii_metabin)
```

10.20 Clavien IV

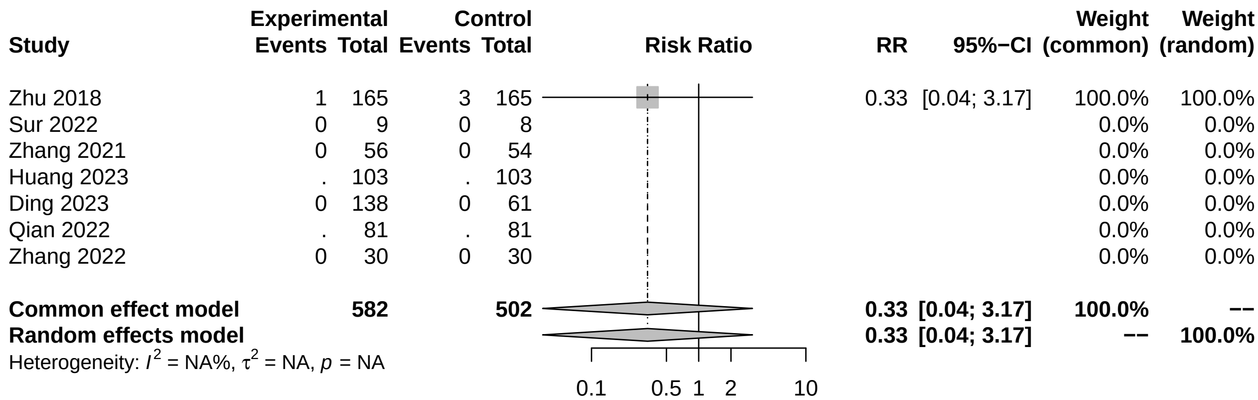
10.20.1 Meta-analysis

```
clav_iv_metabin <- metabin(data = flexiurs_only,
                         event.c = clavien_iv_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_iv_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iv_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
## Number of events: e = 4
##
##                         RR           95%-CI     z p-value
## Common effect model  0.3333 [0.0350; 3.1716] -0.96  0.3392
## Random effects model 0.3333 [0.0350; 3.1716] -0.96  0.3392
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.20.2 Forest plot

```
forest(clav_iv_metabin,
       sortvar = TE)
```

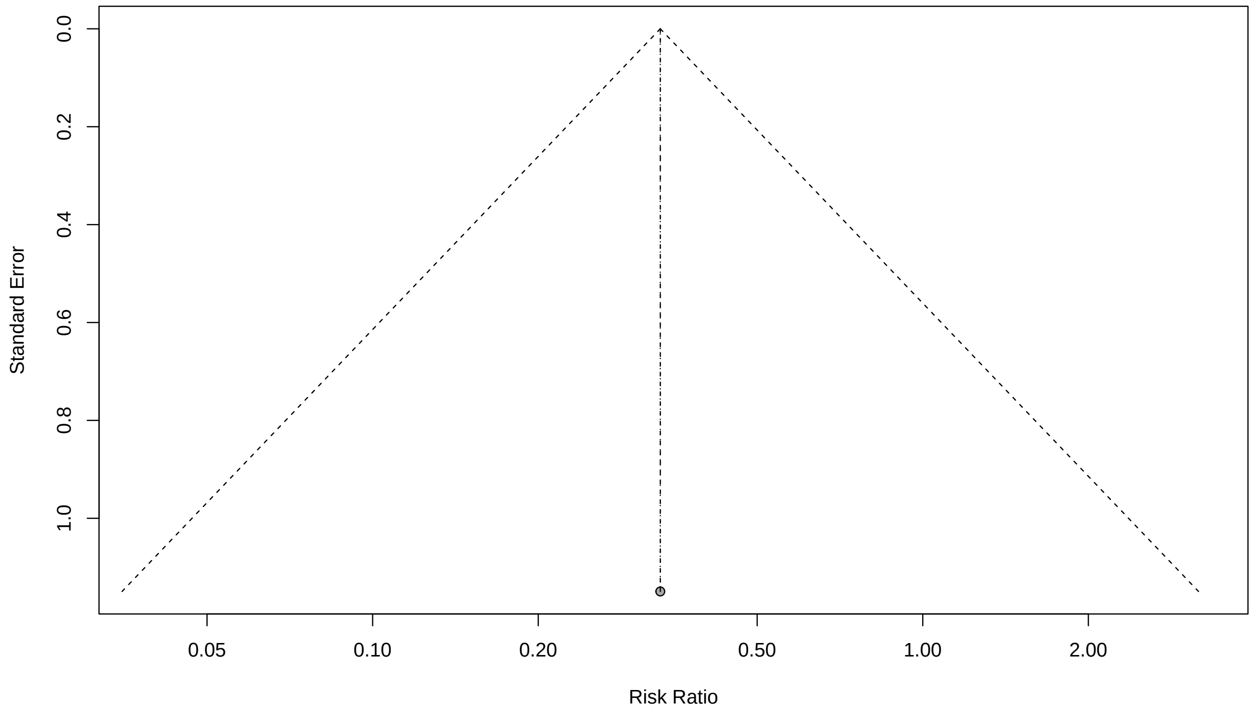


10.20.3 Trim and Fill

```
#trimfill(clav_iv_metabin)
#forest(trimfill(clav_iv_metabin),
#       sortvar = TE)
```

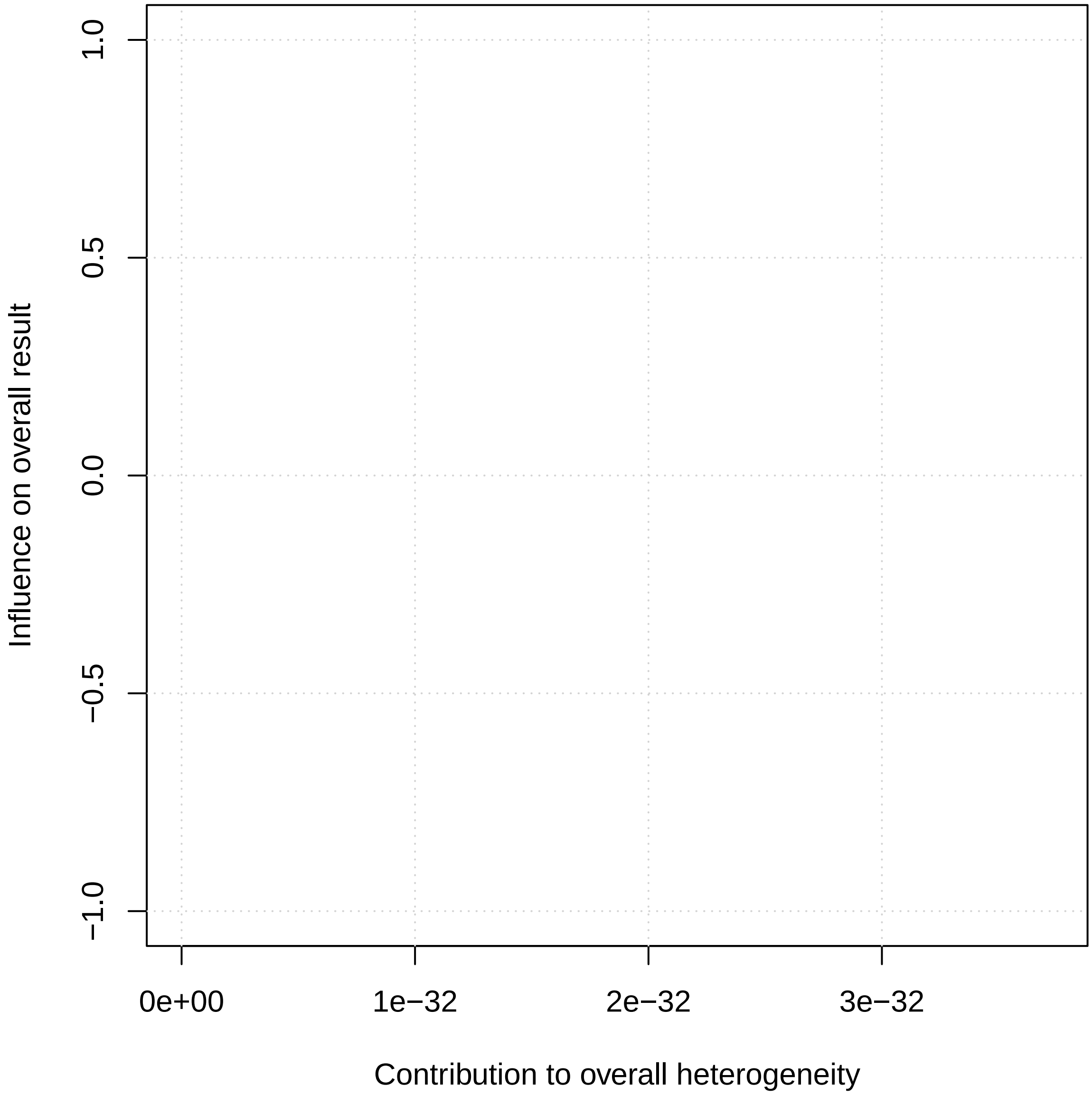
10.20.4 Funnel plot

```
funnel((clav_iv_metabin))
```



10.20.5 Baujat

```
baujat(clav_iv_metabin, pos = 1)
```



10.20.6 Leave one out

```r
metainf(clav_iv_metabin)
```

```
## Influential analysis (common effect model)
##
##                             RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022      0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhu 2018
## Omitting Zhang 2021    0.3333 [0.0350; 3.1716]  0.3392
## Omitting Huang 2023    0.3333 [0.0350; 3.1716]  0.3392
## Omitting Ding 2023     0.3333 [0.0350; 3.1716]  0.3392
## Omitting Qian 2022     0.3333 [0.0350; 3.1716]  0.3392
## Omitting Zhang 2022    0.3333 [0.0350; 3.1716]  0.3392
##
## Pooled estimate        0.3333 [0.0350; 3.1716]  0.3392
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.21 Clavien V

10.21.1 Meta-analysis

```
clav_v_metabin <- metabin(data = flexiurs_only,
                          event.c = clavien_v_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_v_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 1084
## Number of events: e = 0
##
##                        RR 95%-CI  z p-value
## Common effect model  NA         --       --
## Random effects model NA         --       --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.21.2 Forest plot

```
#forest(clav_v_metabin,
#       sortvar = TE)
```

10.21.3 Trim and Fill

```
#trimfill(clav_v_metabin)
#forest(trimfill(clav_v_metabin),
#       sortvar = TE)
```

10.21.4 Funnel plot

```
#funnel(trimfill(clav_v_metabin))
```

10.21.5 Baujat

```
#baujat(clav_v_metabin, pos = 1)
```

10.21.6 Leave one out

```r
#metainf(clav_v_metabin)
```

10.22 Clavien I-II

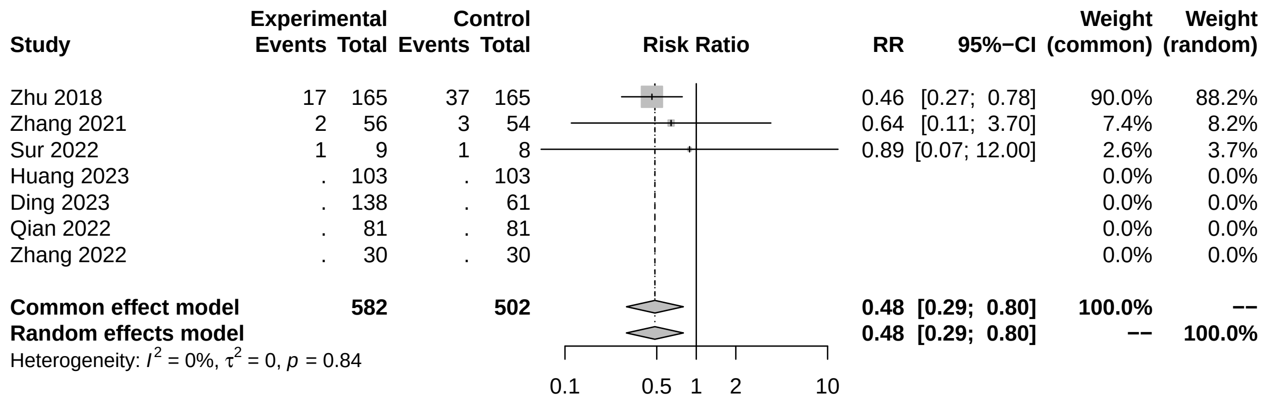
10.22.1 Meta-analysis

```r
clav_i_ii_metabin <- metabin(data = flexiurs_only,
                         event.c = clav_i_ii_n_control,
                       n.c = sample_size_control,
                       event.e = clav_i_ii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_i_ii_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 1084
## Number of events: e = 61
##
##                          RR           95%-CI     z p-value
## Common effect model  0.4841 [0.2941; 0.7969] -2.85  0.0043
## Random effects model 0.4838 [0.2936; 0.7975] -2.85  0.0044
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 3.4477]; tau = 0 [0.0000; 1.8568]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.35    2  0.8406
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

10.22.2 Forest plot

```r
forest(clav_i_ii_metabin,
       sortvar = TE)
```



10.22.3 Trim and Fill

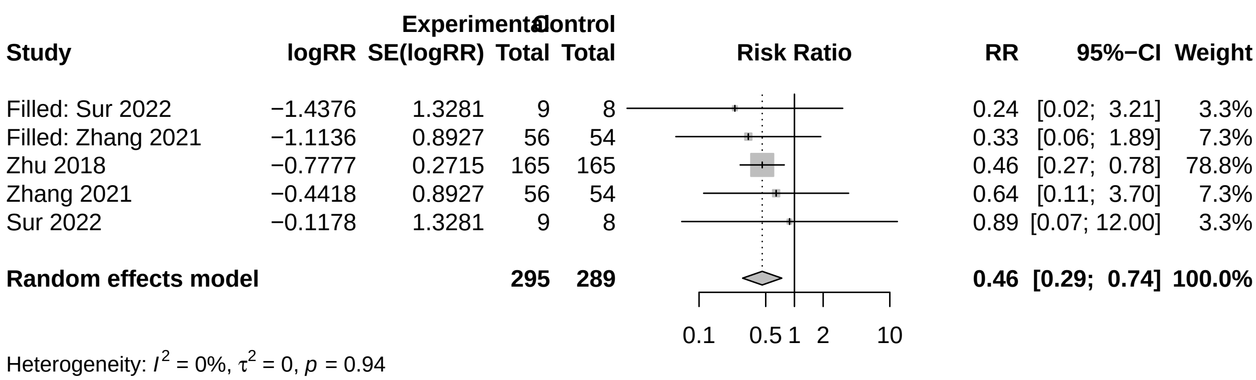
```
trimfill(clav_i_ii_metabin)
```

```
## Warning in trimfill.meta(clav_i_ii_metabin): 4 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 5 (with 2 added studies)
## Number of observations: o = 584
## Number of events: e = 68
##
##                             RR           95%-CI     z p-value
## Random effects model 0.4595 [0.2864; 0.7370] -3.23  0.0013
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.7846]; tau = 0 [0.0000; 0.8858]
##  I^2 = 0.0% [0.0%; 79.2%]; H = 1.00 [1.00; 2.19]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.78    4  0.9415
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```
forest(trimfill(clav_i_ii_metabin),
       sortvar = TE)
```

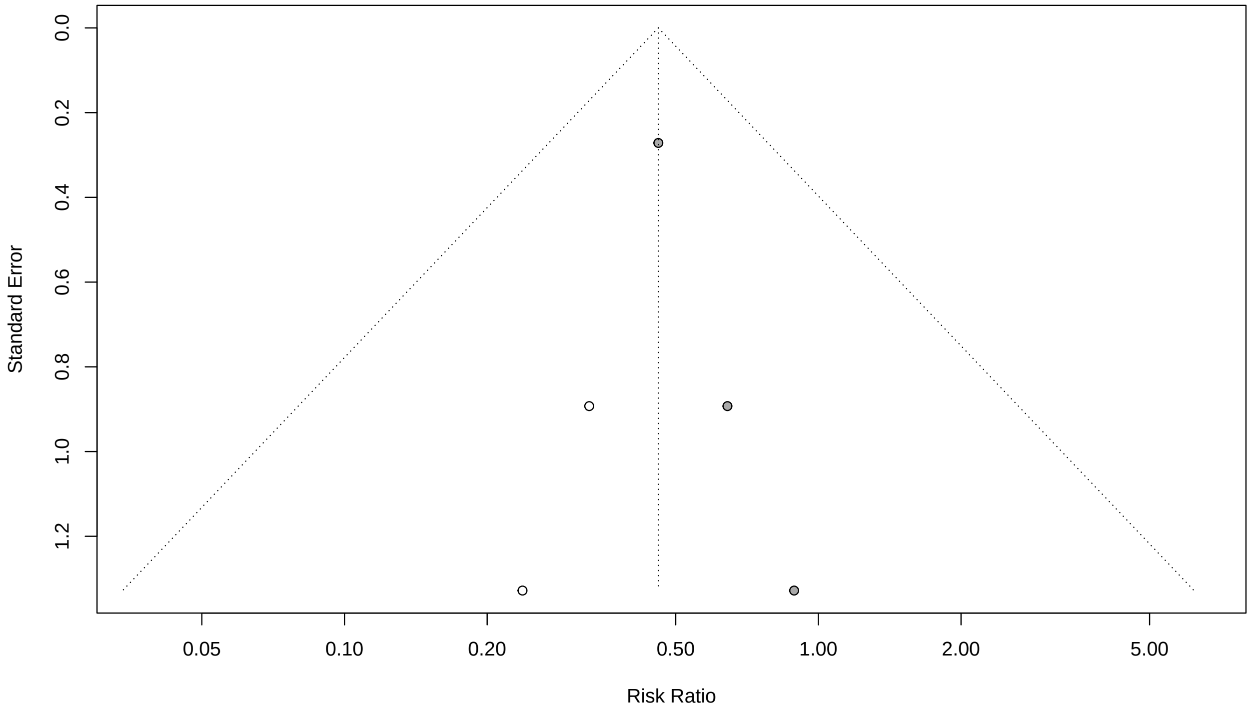
```
## Warning in trimfill.meta(clav_i_ii_metabin): 4 observation(s) dropped due to
## missing values
```



10.22.4 Funnel plot

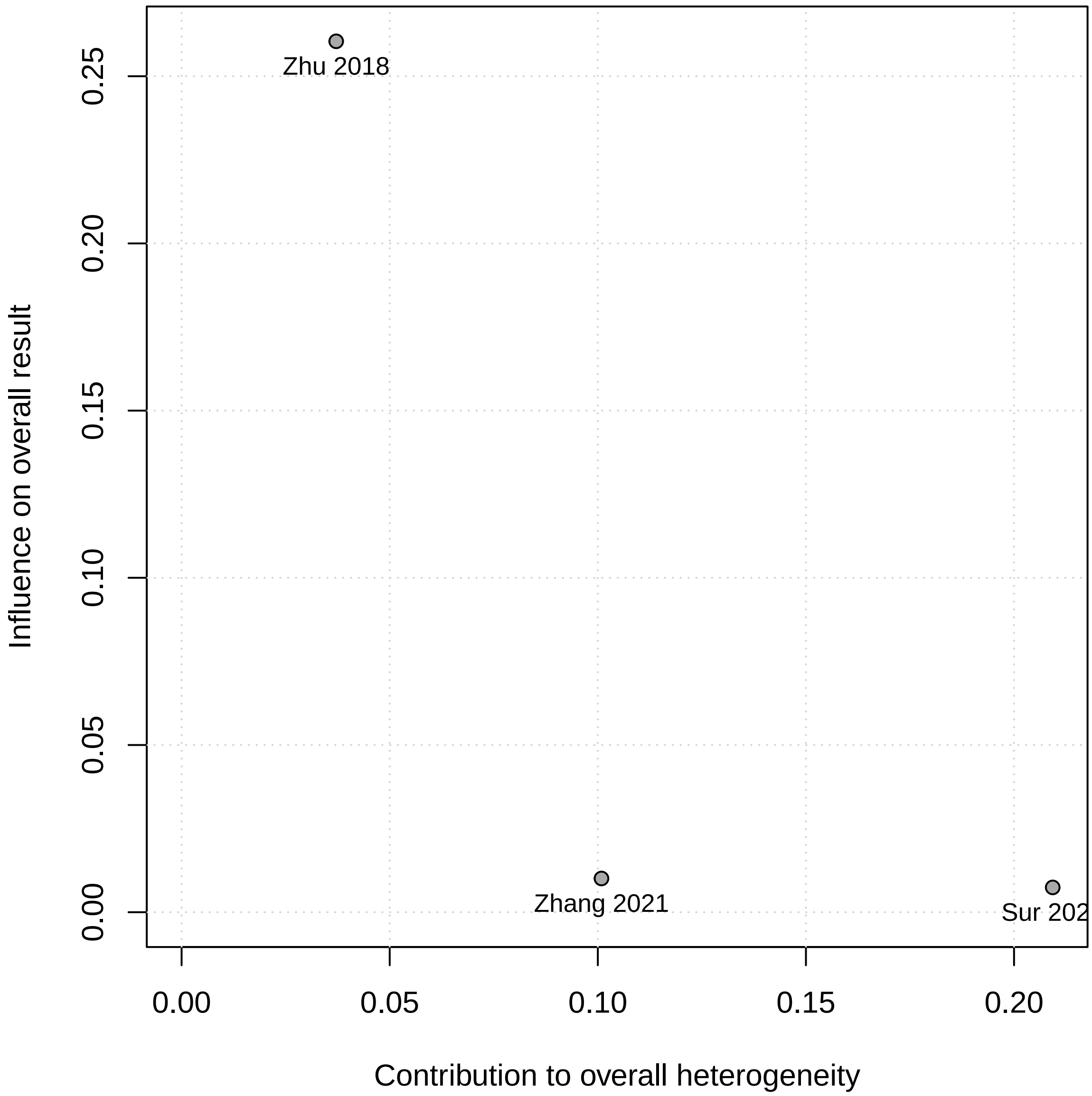
```r
funnel(trimfill(clav_i_ii_metabin))
```

```
## Warning in trimfill.meta(clav_i_ii_metabin): 4 observation(s) dropped due to
## missing values
```



10.22.5 Baujat

```
baujat(clav_i_ii_metabin, pos = 1)
```



10.22.6 Leave one out

```r
metainf(clav_i_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Sur 2022     0.4734 [0.2847; 0.7874]  0.0040  0.0000  0.0000  0.0%
## Omitting Zhu 2018     0.7062 [0.1657; 3.0100]  0.6382  0.0000  0.0000  0.0%
## Omitting Zhang 2021   0.4714 [0.2802; 0.7932]  0.0046  0.0000  0.0000  0.0%
## Omitting Huang 2023   0.4841 [0.2941; 0.7969]  0.0043  0.0000  0.0000  0.0%
## Omitting Ding 2023    0.4841 [0.2941; 0.7969]  0.0043  0.0000  0.0000  0.0%
## Omitting Qian 2022    0.4841 [0.2941; 0.7969]  0.0043  0.0000  0.0000  0.0%
## Omitting Zhang 2022   0.4841 [0.2941; 0.7969]  0.0043  0.0000  0.0000  0.0%
##
## Pooled estimate       0.4841 [0.2941; 0.7969]  0.0043  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

10.23 Clavien III-V

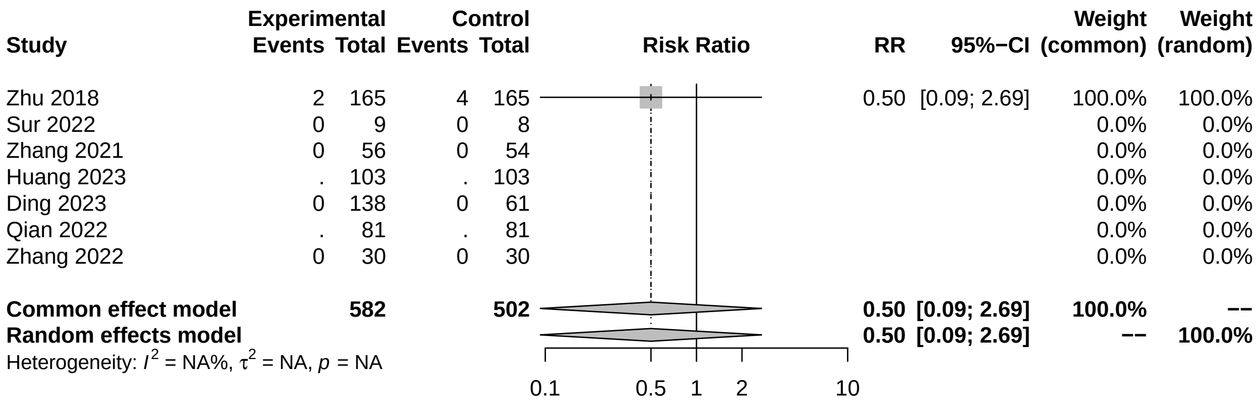
10.23.1 Meta-analysis

```
clav_iii_v_metabin <- metabin(data = flexiurs_only,
                         event.c = clav_iii_v_n_control,
                       n.c = sample_size_control,
                       event.e = clav_iii_v_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_v_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 1084
## Number of events: e = 6
##
##                          RR           95%-CI     z p-value
## Common effect model  0.5000 [0.0929; 2.6925] -0.81  0.4197
## Random effects model 0.5000 [0.0929; 2.6925] -0.81  0.4197
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

10.23.2 Forest plot

```
forest(clav_iii_v_metabin,
       sortvar = TE)
```

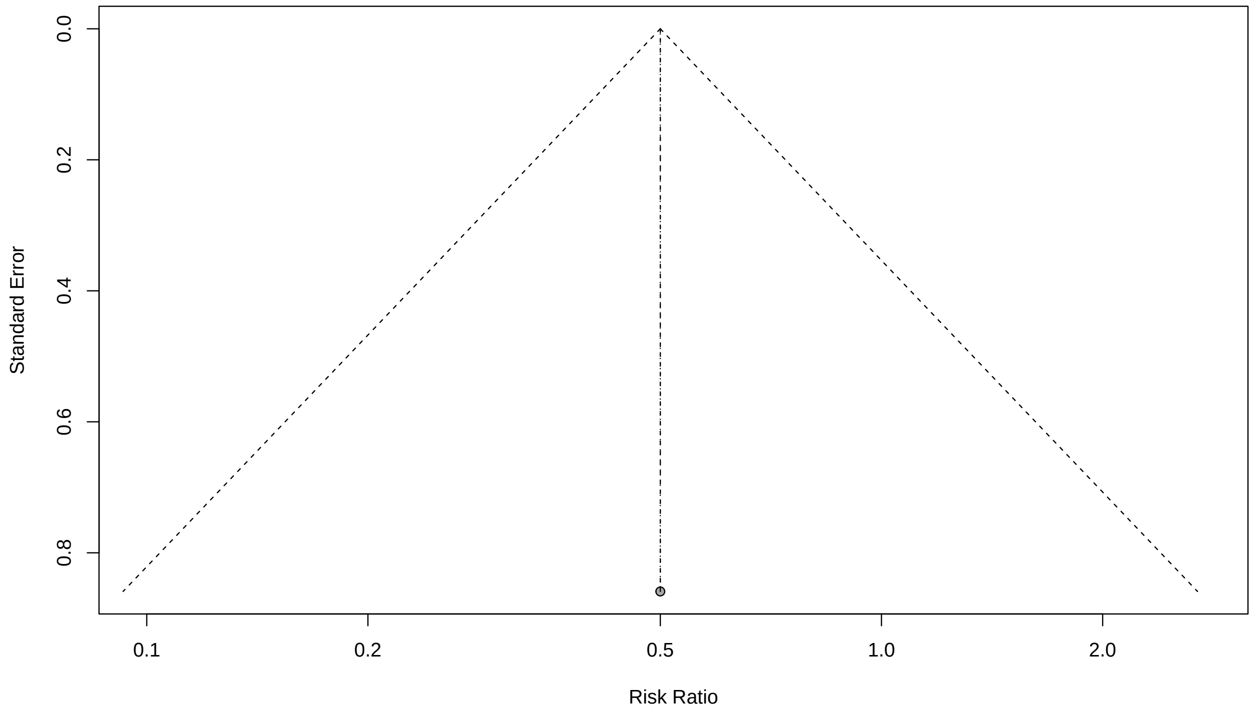


10.23.3 Trim and Fill

```
#trimfill(clav_iii_v_metabin)
#forest(trimfill(clav_iii_v_metabin),
#       sortvar = TE)
```

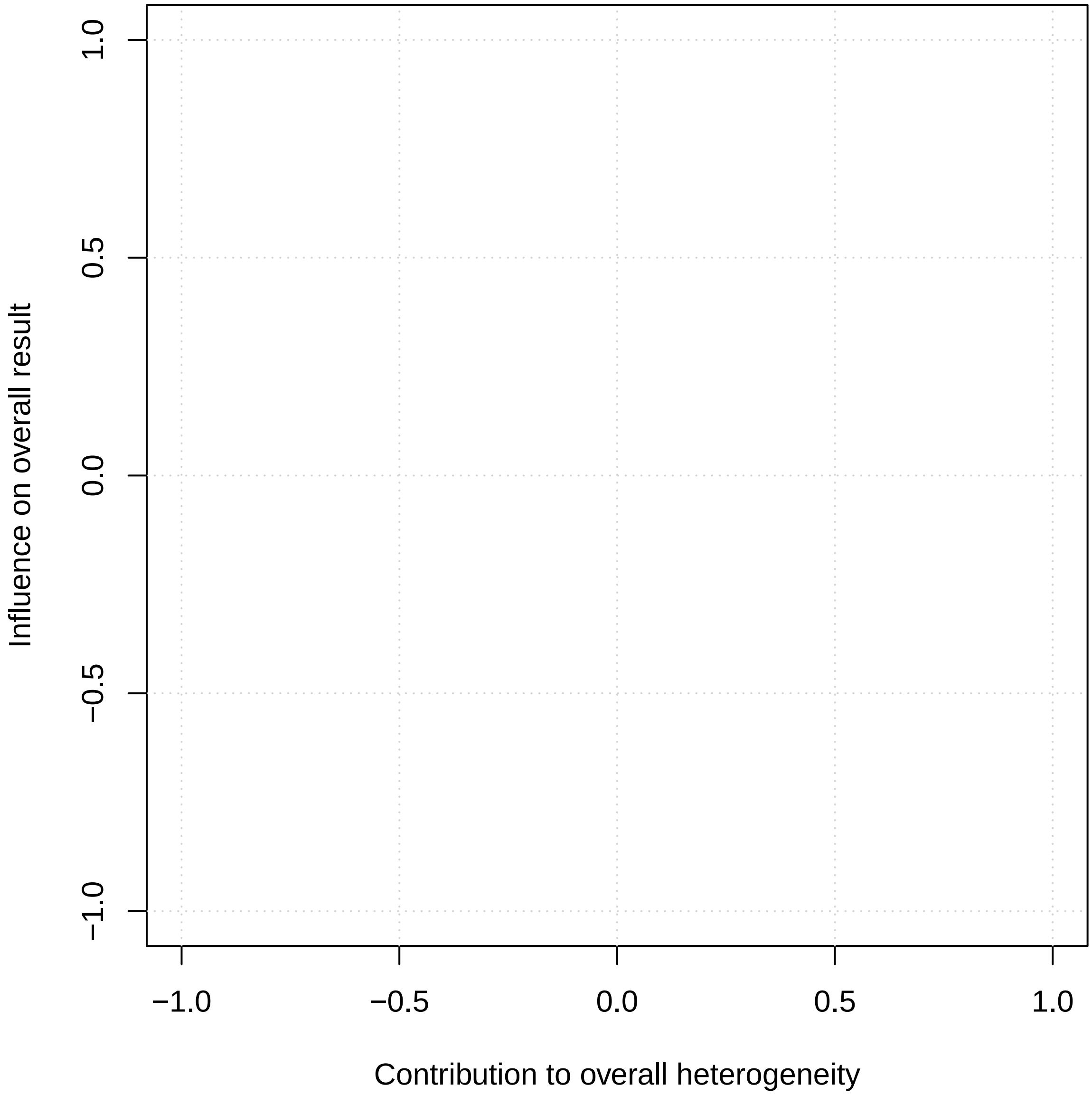
10.23.4 Funnel plot

```
funnel((clav_iii_v_metabin))
```



10.23.5 Baujat

```
baujat(clav_iii_v_metabin, pos = 1)
```



10.23.6 Leave one out

```r
metainf(clav_iii_v_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value tau^2 tau I^2
## Omitting Sur 2022     0.5000 [0.0929; 2.6925]  0.4197
## Omitting Zhu 2018
## Omitting Zhang 2021   0.5000 [0.0929; 2.6925]  0.4197
## Omitting Huang 2023   0.5000 [0.0929; 2.6925]  0.4197
## Omitting Ding 2023    0.5000 [0.0929; 2.6925]  0.4197
## Omitting Qian 2022    0.5000 [0.0929; 2.6925]  0.4197
## Omitting Zhang 2022   0.5000 [0.0929; 2.6925]  0.4197
##
## Pooled estimate       0.5000 [0.0929; 2.6925]  0.4197
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

11 Flexi URS only Summary Forest plots

```
overall <- cbind(
  "Outcome" = c(
    "Immediate SFR",
    "Final SFR",
    "Auxiliary Treatment",
    "Overall Complications",
    "Fever",
    "Infection",
    "Sepsis",
    "Abscess",
    "Haematoma",
    "Pain",
    "Stricture",
    "Embolisation",
    "Transfusion",
    "CD I",
    "CD II",
    "CD III",
    "CD IV",
    "CD I-II",
    "CD III-V",
    "Operative time",
    "VAS",
    "Length of Stay"
  ),
  "type" = c(
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "cont",
    "cont",
    "cont"
  ),
  "n_studies" = c(
    immediate_sfr_metabin$k,
```

```
  sfr_metabin$k,
aux_rx_metabin$k,
comp_metabin$k,
fever_metabin$k,
infection_metabin$k,
sepsis_metabin$k,
abscess_metabin$k,
haematoma_metabin$k,
pain_metabin$k,
stricture_metabin$k,
ir_embolisation_metabin$k,
transfusion_metabin$k,
clav_i_metabin$k,
clav_ii_metabin$k,
clav_iii_metabin$k,
clav_iv_metabin$k,
clav_i_ii_metabin$k,
clav_iii_v_metabin$k,
or_time_metacont$k,
vas_metacont$k,
los_metacont$k),
"es" = c(
  immediate_sfr_metabin$TE.random %>% exp(),
  sfr_metabin$TE.random %>% exp(),
aux_rx_metabin$TE.random %>% exp(),
comp_metabin$TE.random %>% exp(),
fever_metabin$TE.random %>% exp(),
infection_metabin$TE.random %>% exp(),
sepsis_metabin$TE.random %>% exp(),
abscess_metabin$TE.random %>% exp(),
haematoma_metabin$TE.random %>% exp(),
pain_metabin$TE.random %>% exp(),
stricture_metabin$TE.random %>% exp(),
ir_embolisation_metabin$TE.random %>% exp(),
transfusion_metabin$TE.random %>% exp(),
clav_i_metabin$TE.random %>% exp(),
clav_ii_metabin$TE.random %>% exp(),
clav_iii_metabin$TE.random %>% exp(),
clav_iv_metabin$TE.random %>% exp(),
clav_i_ii_metabin$TE.random %>% exp(),
clav_iii_v_metabin$TE.random %>% exp(),
or_time_metacont$TE.random,
vas_metacont$TE.random,
los_metacont$TE.random),
"lower_ci" = c(
  immediate_sfr_metabin$lower.random %>% exp(),
  sfr_metabin$lower.random %>% exp(),
aux_rx_metabin$lower.random %>% exp(),
comp_metabin$lower.random %>% exp(),
fever_metabin$lower.random %>% exp(),
infection_metabin$lower.random %>% exp(),
sepsis_metabin$lower.random %>% exp(),
abscess_metabin$lower.random %>% exp(),
```

```
haematoma_metabin$lower.random %>% exp(),
pain_metabin$lower.random %>% exp(),
stricture_metabin$lower.random %>% exp(),
ir_embolisation_metabin$lower.random %>% exp(),
transfusion_metabin$lower.random %>% exp(),
clav_i_metabin$lower.random %>% exp(),
clav_ii_metabin$lower.random %>% exp(),
clav_iii_metabin$lower.random %>% exp(),
clav_iv_metabin$lower.random %>% exp(),
clav_i_ii_metabin$lower.random %>% exp(),
clav_iii_v_metabin$lower.random %>% exp(),
or_time_metacont$lower.random,
vas_metacont$lower.random,
los_metacont$lower.random),
"upper_ci" = c(immediate_sfr_metabin$upper.random %>% exp(),
               sfr_metabin$upper.random %>% exp(),
aux_rx_metabin$upper.random %>% exp(),
comp_metabin$upper.random %>% exp(),
fever_metabin$upper.random %>% exp(),
infection_metabin$upper.random %>% exp(),
sepsis_metabin$upper.random %>% exp(),
abscess_metabin$upper.random %>% exp(),
haematoma_metabin$upper.random %>% exp(),
pain_metabin$upper.random %>% exp(),
stricture_metabin$upper.random %>% exp(),
ir_embolisation_metabin$upper.random %>% exp(),
transfusion_metabin$upper.random %>% exp(),
clav_i_metabin$upper.random %>% exp(),
clav_ii_metabin$upper.random %>% exp(),
clav_iii_metabin$upper.random %>% exp(),
clav_iv_metabin$upper.random %>% exp(),
clav_i_ii_metabin$upper.random %>% exp(),
clav_iii_v_metabin$upper.random %>% exp(),
or_time_metacont$upper.random,
vas_metacont$upper.random,
los_metacont$upper.random),
"p" = c(
  immediate_sfr_metabin$pval.random,
  sfr_metabin$pval.random,
aux_rx_metabin$pval.random,
comp_metabin$pval.random,
fever_metabin$pval.random,
infection_metabin$pval.random,
sepsis_metabin$pval.random,
abscess_metabin$pval.random,
haematoma_metabin$pval.random,
pain_metabin$pval.random,
stricture_metabin$pval.random,
ir_embolisation_metabin$pval.random,
transfusion_metabin$pval.random,
clav_i_metabin$pval.random,
clav_ii_metabin$pval.random,
clav_iii_metabin$pval.random,
```

```
clav_iv_metabin$pval.random,
clav_i_ii_metabin$pval.random,
clav_iii_v_metabin$pval.random,
or_time_metacont$pval.random,
vas_metacont$pval.random,
los_metacont$pval.random)) %>% as_tibble() %>% drop_na(es)

overall$es <- as.numeric(overall$es)
overall$es <- round(overall$es, digits = 2)

overall$lower_ci <- as.numeric(overall$lower_ci)
overall$lower_ci <- round(overall$lower_ci, digits = 2)

overall$upper_ci <- as.numeric(overall$upper_ci)
overall$upper_ci <- round(overall$upper_ci, digits = 2)

overall$p <- as.numeric(overall$p)
overall$p <- round(overall$p, digits = 2)
overall$p <- ifelse(overall$p<0.001, "<0.001", overall$p)
```

11.1 Summary Table of number of studies for each outcome included in meta-analysis

```
overall %>% subset(select = c(Outcome, n_studies)) %>% gt() %>% tab_header(title = "Summary table of Nu
```

Summary table of Number of Studies for Each Outcome Meta-Analyis

Outcome	Studies, n
Immediate SFR	9
Final SFR	7
Auxiliary Treatment	1
Overall Complications	7
Fever	6
Infection	7
Sepsis	1
Stricture	1
CD I	3
CD II	2
CD III	1
CD IV	1
CD I-II	3
CD III-V	1
Operative time	6
VAS	1
Length of Stay	2

11.2 Summary Forest plot of Continuous outcomes

11.2.1 Continuous Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

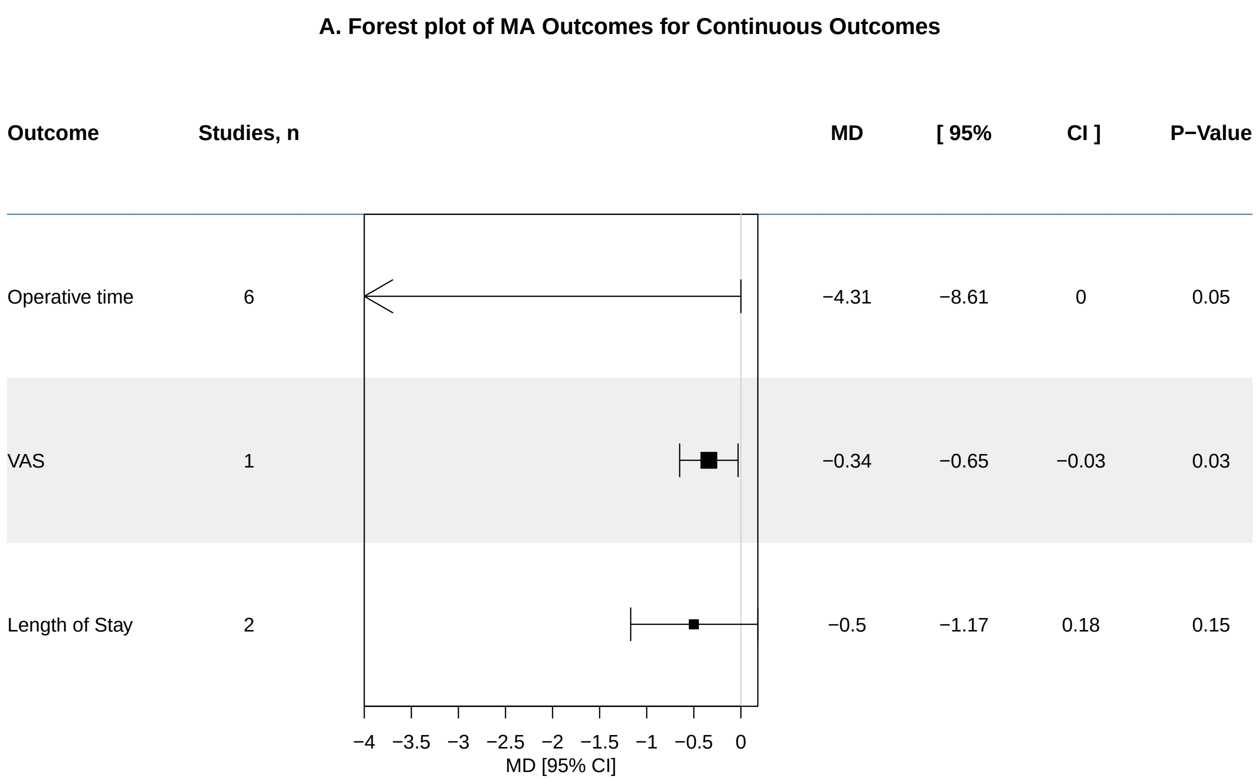
```
overall_continuous <-
  overall %>% subset(type ==  "cont") %>% subset(select = c(Outcome,
                                                             n_studies,
                                                             es,
                                                             lower_ci,
                                                             upper_ci,
                                                             p)) %>% as_tibble()
overall_continuous %>% gt() %>% tab_header(title = "Summary Table for Continuous Outcomes") %>% cols_me
```

Summary Table for Continuous Outcomes

Outcome	Studies, n	MD (95% CI)	p
Operative time	6	-4.31 (-8.61-0.00)	0.05
VAS	1	-0.34 (-0.65–0.03)	0.03
Length of Stay	2	-0.50 (-1.17-0.18)	0.15

11.2.2 Continuous Forest plot

```
continuous_plot <- overall_continuous %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 0,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Continuous Outcomes",
  clip = c(-4, 2),
  xlab = "MD [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "MD",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
continuous_plot
```



11.3 Summary Forest plot of Binary outcomes

11.3.1 Binary Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

```
overall_binary <-
  overall %>% subset(type ==  "binary") %>% subset(select = c(Outcome,
                                                          n_studies,
                                                          es,
                                                          lower_ci,
                                                          upper_ci,
                                                          p)) %>% as_tibble()
overall_binary %>% gt() %>% tab_header(title = "Summary Table for Binary Outcomes") %>% cols_merge(colu
```

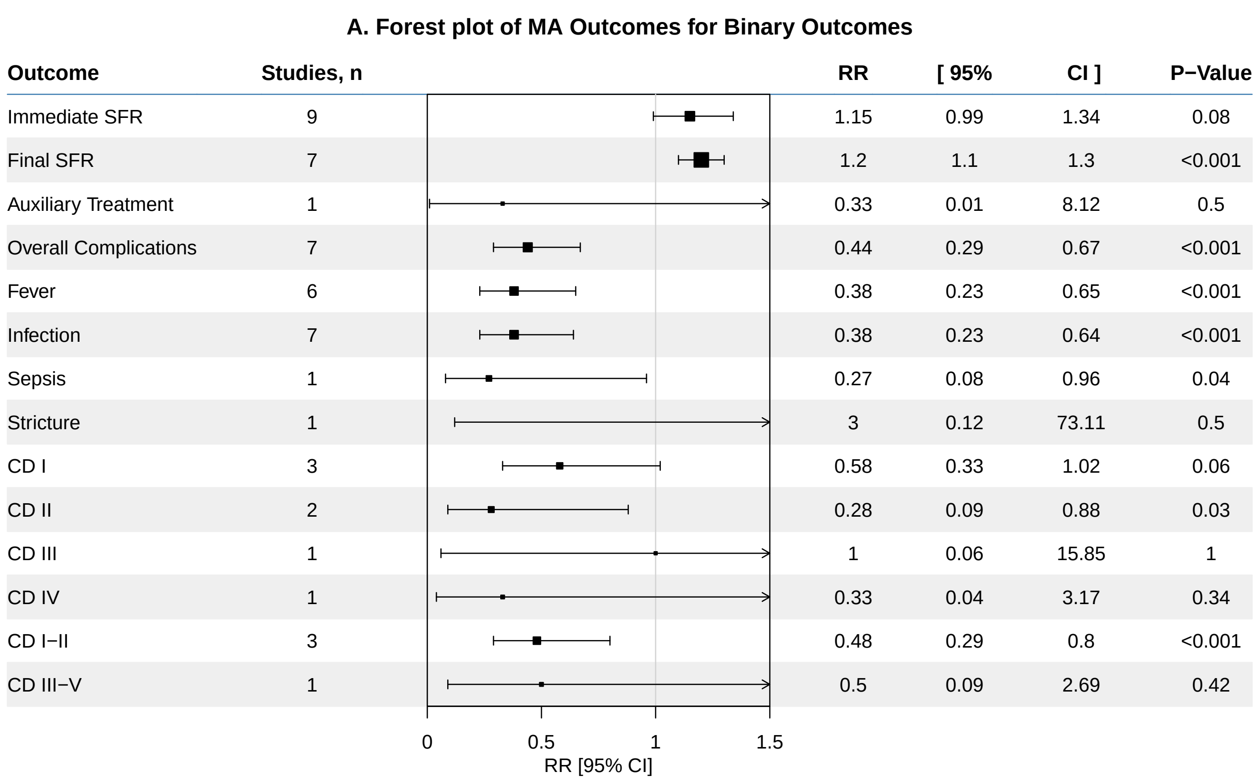
Summary Table for Binary Outcomes

Outcome	Studies, n	RR (95% CI)	p
Immediate SFR	9	1.15 (0.99-1.34)	0.08
Final SFR	7	1.20 (1.10-1.30)	<0.001
Auxiliary Treatment	1	0.33 (0.01-8.12)	0.5
Overall Complications	7	0.44 (0.29-0.67)	<0.001
Fever	6	0.38 (0.23-0.65)	<0.001
Infection	7	0.38 (0.23-0.64)	<0.001
Sepsis	1	0.27 (0.08-0.96)	0.04
Stricture	1	3.00 (0.12-73.11)	0.5
CD I	3	0.58 (0.33-1.02)	0.06
CD II	2	0.28 (0.09-0.88)	0.03
CD III	1	1.00 (0.06-15.85)	1
CD IV	1	0.33 (0.04-3.17)	0.34
CD I-II	3	0.48 (0.29-0.80)	<0.001
CD III-V	1	0.50 (0.09-2.69)	0.42

11.3.2 Binary Forest plot - Meta-Analysis

Reference = No Suction

```
binary_plot <- overall_binary %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 1,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Binary Outcomes",
  clip = c(-1.5, 1.5),
  xlab = "RR [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "RR",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
binary_plot
```



12 Mini-PCNL vs Flexi URS with Suction Meta-Analysis Outcomes

```
minipcnl_only <- suction_data %>% subset(control_group == "mini-PCNL ")
```

12.1 Immediate SFR

12.1.1 Meta-analysis

```
immediate_sfr_metabin <- metabin(data = suction_data,
                          event.c = sfr_immediate_n_control,
                        n.c = sample_size_control,
                        event.e = sfr_immediate_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
immediate_sfr_metabin
```

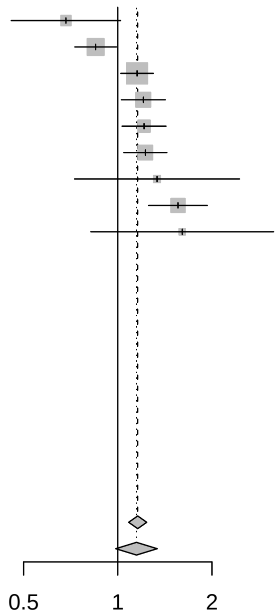
```
## Number of studies: k = 9
## Number of observations: o = 2311
## Number of events: e = 979
##
##                          RR           95%-CI    z  p-value
## Common effect model  1.1581 [1.0834; 1.2380] 4.31 < 0.0001
## Random effects model 1.1478 [0.9854; 1.3370] 1.77   0.0765
##
## Quantifying heterogeneity:
##  tau^2 = 0.0365 [0.0088; 0.2318]; tau = 0.1910 [0.0939; 0.4814]
##  I^2 = 74.6% [50.9%; 86.9%]; H = 1.99 [1.43; 2.76]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  31.55    8  0.0001
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

12.1.2 Forest plot

```
forest(immediate_sfr_metabin,
       sortvar = TE)
```

Study	Experimental Events	Experimental Total	Control Events	Control Total	RR	95%−CI	Weight (common)	Weight (random)
Lai 2020	14	28	41	56	0.68	[0.46; 1.02]	6.1%	7.7%
Tang 2023	63	86	75	87	0.85	[0.73; 0.99]	16.6%	14.2%
Zhu 2018	136	165	118	165	1.15	[1.02; 1.30]	26.3%	15.1%
Qian 2022	70	81	58	81	1.21	[1.03; 1.42]	12.9%	14.0%
AlSmadi 2019	40	43	46	60	1.21	[1.03; 1.43]	8.6%	14.0%
Wu 2022	67	76	59	82	1.23	[1.05; 1.44]	12.6%	14.1%
Zhang 2021	18	56	13	54	1.34	[0.73; 2.45]	2.9%	4.6%
Huang 2023	81	103	52	103	1.56	[1.25; 1.93]	11.6%	12.5%
Zhang 2021	18	56	10	50	1.61	[0.82; 3.15]	2.4%	3.9%
Sur 2022	.	9	.	8			0.0%	0.0%
Chen 2019	.	44	.	45			0.0%	0.0%
Du 2019	.	62	.	60			0.0%	0.0%
Lechevallier 2003	.	11	.	14			0.0%	0.0%
Ding 2023	.	138	.	61			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhai 2023	.	60	.	60			0.0%	0.0%
Zhang 2022	.	30	.	30			0.0%	0.0%
Deng 2022	.	57	.	70			0.0%	0.0%
Common effect model		**1165**		**1146**	**1.16**	**[1.08; 1.24]**	**100.0%**	**--**
Random effects model					**1.15**	**[0.99; 1.34]**	**--**	**100.0%**

Heterogeneity: $I^2 = 75\%$, $\tau^2 = 0.0365$, $p < 0.01$



12.1.3 Trim and Fill

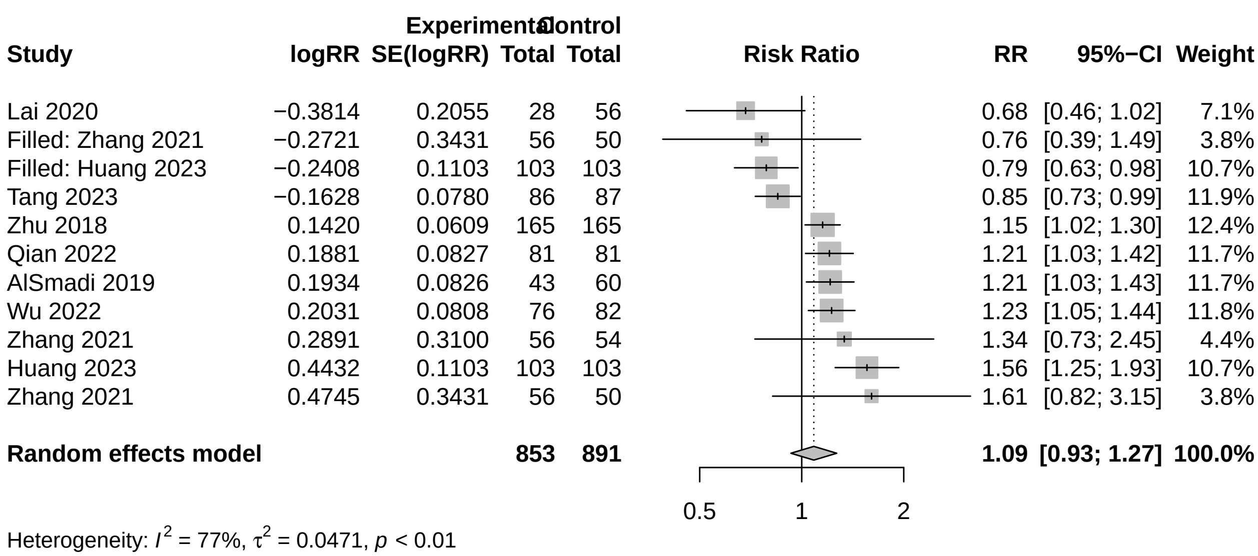
```r
trimfill(immediate_sfr_metabin)
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```

```
## Number of studies: k = 11 (with 2 added studies)
## Number of observations: o = 1744
## Number of events: e = 1140
##
##                          RR           95%-CI    z p-value
## Random effects model 1.0855 [0.9289; 1.2685] 1.03  0.3019
##
## Quantifying heterogeneity:
##  tau^2 = 0.0471 [0.0138; 0.2196]; tau = 0.2170 [0.1173; 0.4686]
##  I^2 = 76.9% [58.8%; 87.1%]; H = 2.08 [1.56; 2.78]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  43.33   10 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(immediate_sfr_metabin),
       sortvar = TE)
```

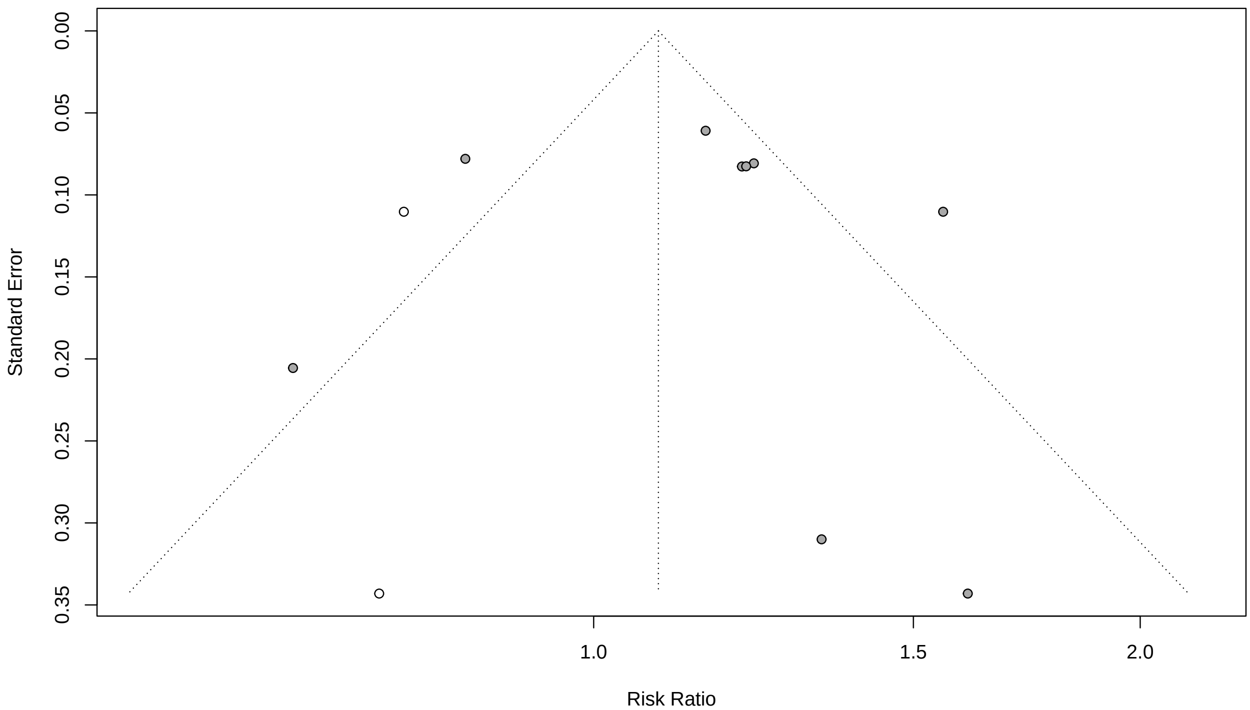
```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



12.1.4 Funnel plot

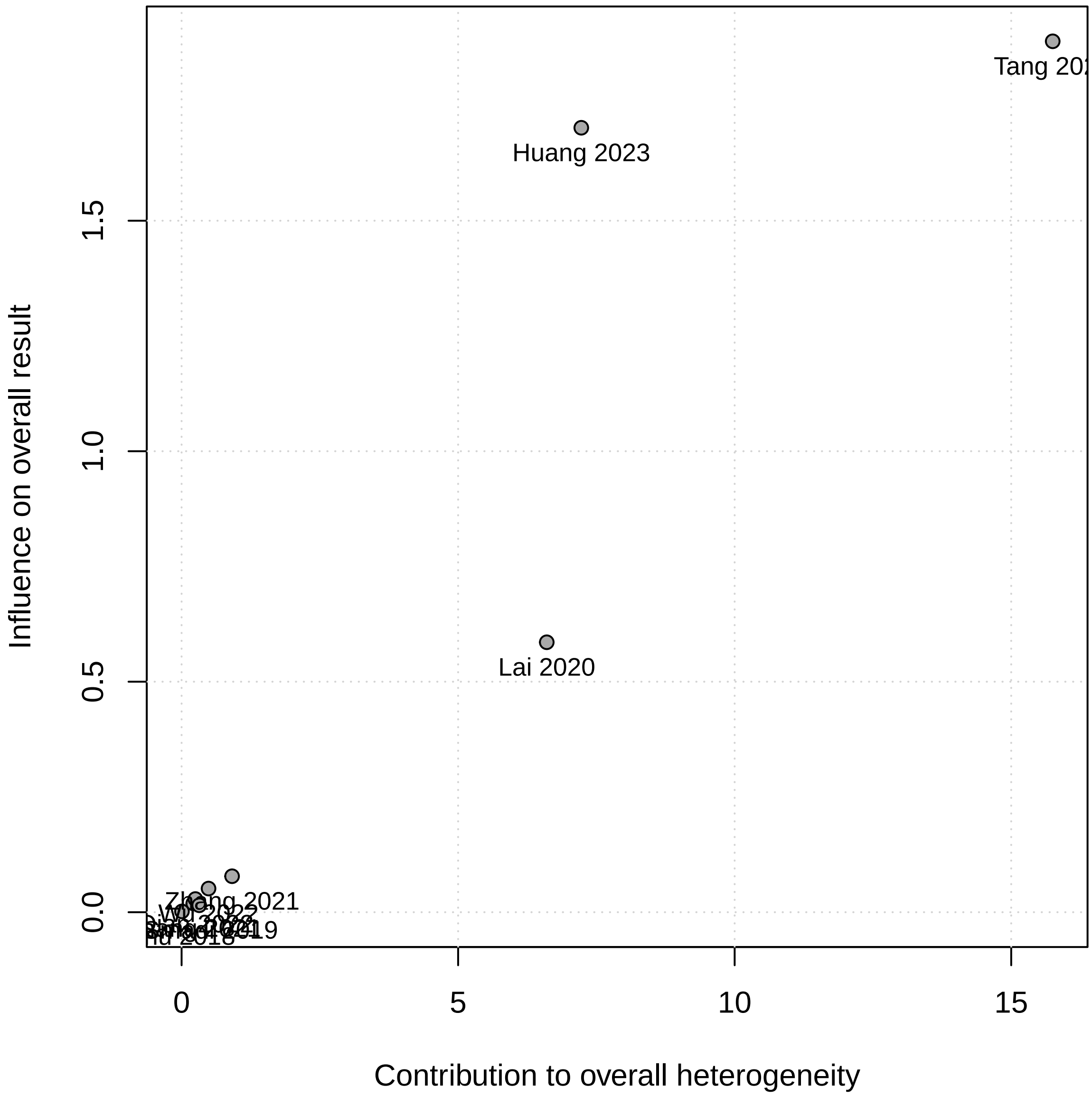
```
funnel(trimfill(immediate_sfr_metabin))
```

```
## Warning in trimfill.meta(immediate_sfr_metabin): 9 observation(s) dropped due
## to missing values
```



12.1.5 Baujat

```
baujat(immediate_sfr_metabin, pos = 1)
```



12.1.6 Leave one out

```
metainf(immediate_sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                                  RR           95%-CI  p-value   tau^2     tau
## Omitting Sur 2022            1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Tang 2023           1.2195 [1.1329; 1.3128] < 0.0001  0.0076  0.0873
## Omitting Chen 2019           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Du 2019             1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Lai 2020            1.1889 [1.1116; 1.2716] < 0.0001  0.0258  0.1607
## Omitting Zhu 2018            1.1601 [1.0710; 1.2565]   0.0003  0.0482  0.2196
## Omitting Zhang 2021          1.1473 [1.0741; 1.2254] < 0.0001  0.0376  0.1938
## Omitting Zhang 2021          1.1527 [1.0791; 1.2313] < 0.0001  0.0396  0.1990
## Omitting Lechevallier 2003   1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Huang 2023          1.1057 [1.0315; 1.1853]   0.0046  0.0246  0.1568
## Omitting Wu 2022             1.1484 [1.0676; 1.2353]   0.0002  0.0464  0.2153
## Omitting Ding 2023           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Zhai 2023           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Qian 2022           1.1508 [1.0700; 1.2377]   0.0002  0.0468  0.2164
## Omitting Zhang 2022          1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting Deng 2022           1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
## Omitting AlSmadi 2019        1.1529 [1.0734; 1.2383] < 0.0001  0.0467  0.2160
##
## Pooled estimate              1.1581 [1.0834; 1.2380] < 0.0001  0.0365  0.1910
##                                 I^2
## Omitting Sur 2022             74.6%
## Omitting Tang 2023            51.5%
## Omitting Chen 2019            74.6%
## Omitting Du 2019              74.6%
## Omitting Lai 2020             72.2%
## Omitting Zhu 2018             77.8%
## Omitting Zhang 2021           77.1%
## Omitting Zhang 2021           77.6%
## Omitting Lechevallier 2003    74.6%
## Omitting Huang 2023           69.4%
## Omitting Wu 2022              77.2%
## Omitting Ding 2023            74.6%
## Omitting Zhai 2023            74.6%
## Omitting Zhai 2023            74.6%
## Omitting Qian 2022            77.4%
## Omitting Zhang 2022           74.6%
## Omitting Deng 2022            74.6%
## Omitting AlSmadi 2019         77.4%
##
## Pooled estimate               74.6%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.2 Final SFR

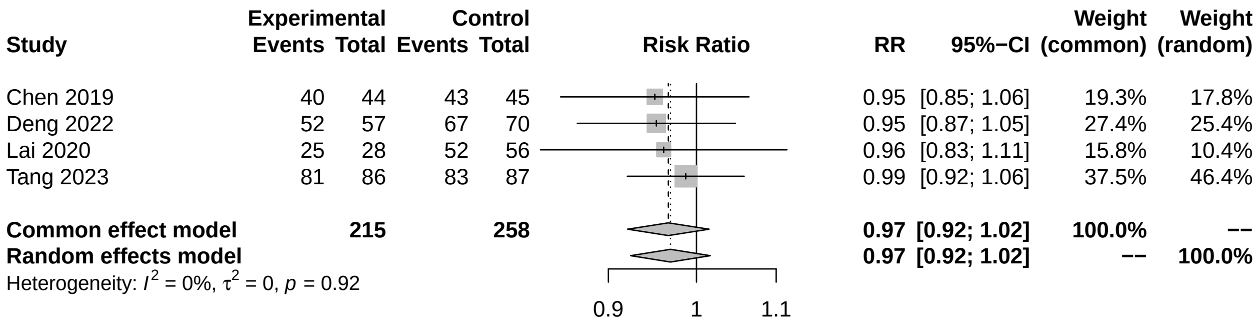
12.2.1 Meta-analysis

```
sfr_metabin <- metabin(data = minipcnl_only,
                         event.c = sfr_final_n_control,
                       n.c = sample_size_control,
                       event.e = sfr_final_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sfr_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 473
## Number of events: e = 443
##
##                          RR           95%-CI     z p-value
## Common effect model  0.9669 [0.9210; 1.0151] -1.36  0.1754
## Random effects model 0.9694 [0.9243; 1.0166] -1.28  0.2003
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.0023]; tau = 0 [0.0000; 0.0482]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.50    3  0.9182
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

12.2.2 Forest plot

```
forest(sfr_metabin,
       sortvar = TE)
```

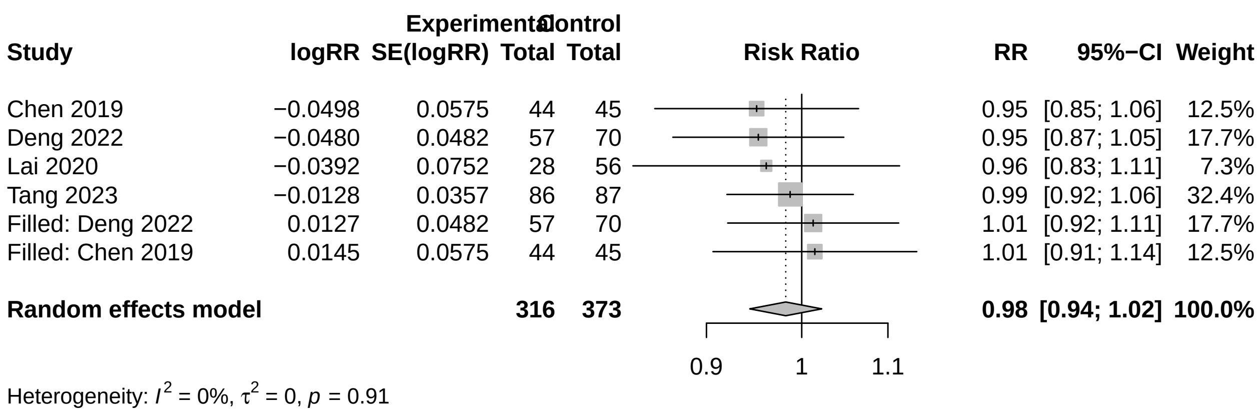


12.2.3 Trim and Fill

```r
trimfill(sfr_metabin)
```

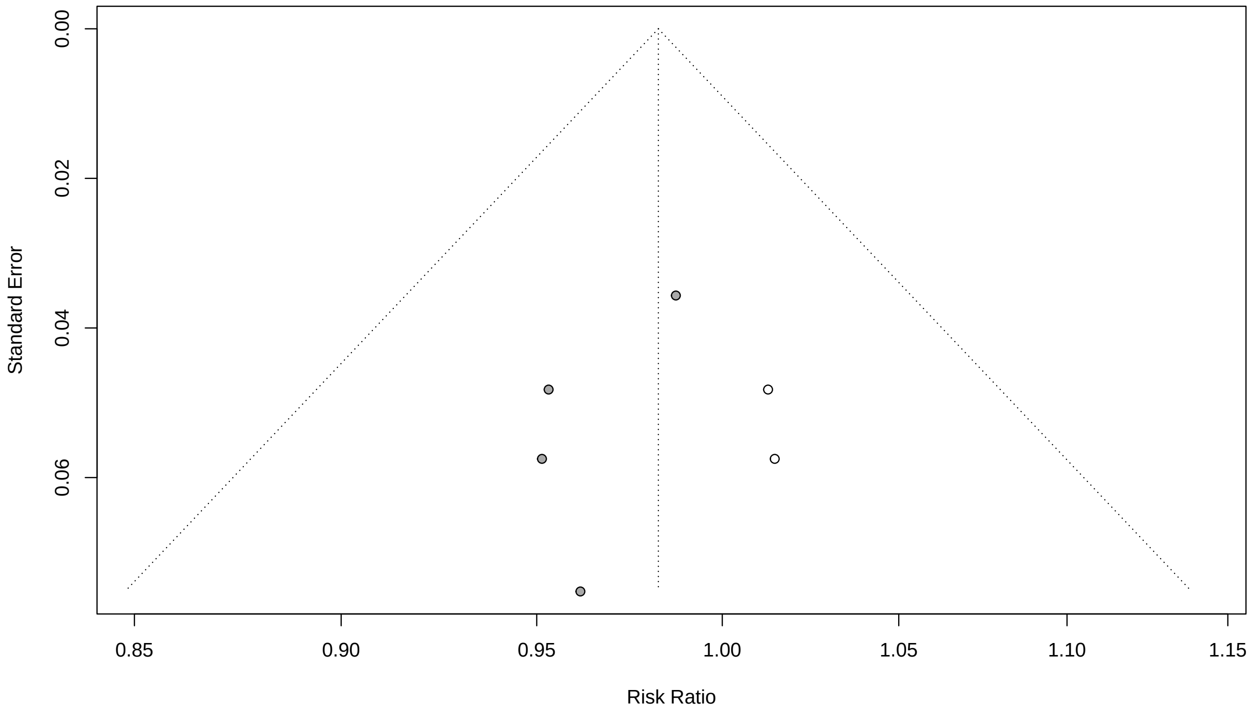
```
## Number of studies: k = 6 (with 2 added studies)
## Number of observations: o = 689
## Number of events: e = 645
##
##                          RR           95%-CI     z p-value
## Random effects model 0.9825 [0.9442; 1.0224] -0.87  0.3839
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 0.0023]; tau = 0 [0.0000; 0.0476]
##  I^2 = 0.0% [0.0%; 74.6%]; H = 1.00 [1.00; 1.99]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  1.52    5  0.9110
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(sfr_metabin),
       sortvar = TE)
```



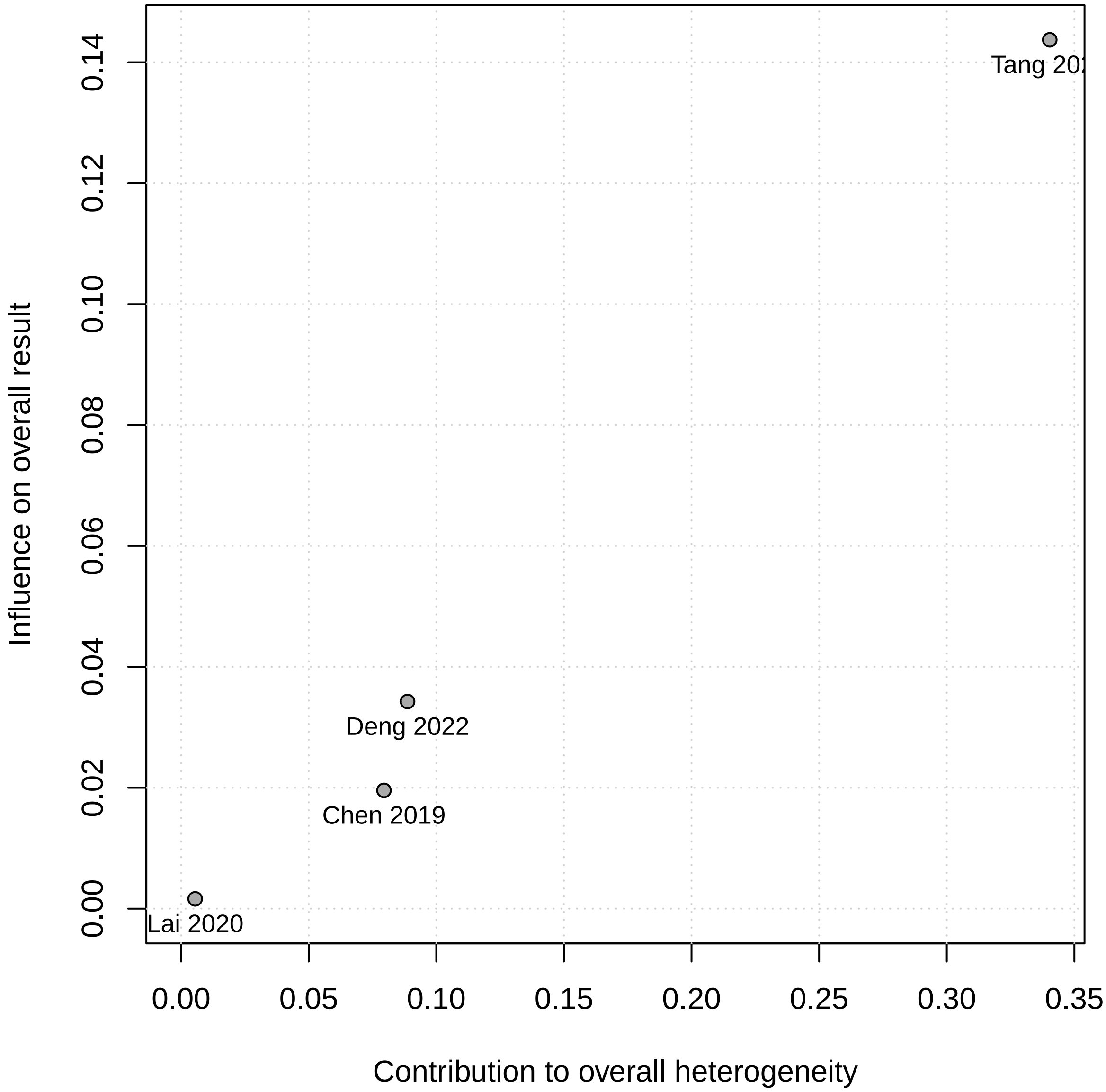
12.2.4 Funnel plot

```r
funnel(trimfill(sfr_metabin))
```



12.2.5 Baujat

```
baujat(sfr_metabin, pos = 1)
```



12.2.6 Leave one out

```
metainf(sfr_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Tang 2023   0.9547 [0.8940; 1.0196]  0.1669  0.0000  0.0000  0.0%
## Omitting Chen 2019   0.9707 [0.9197; 1.0244]  0.2790  0.0000  0.0000  0.0%
## Omitting Lai 2020    0.9679 [0.9200; 1.0183]  0.2081  0.0000  0.0000  0.0%
## Omitting Deng 2022   0.9721 [0.9185; 1.0289]  0.3286  0.0000  0.0000  0.0%
##
## Pooled estimate      0.9669 [0.9210; 1.0151]  0.1754  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.3 OR time

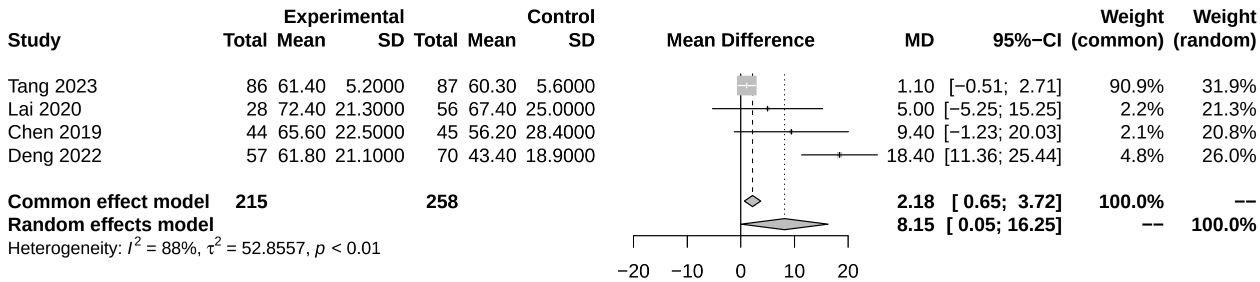
12.3.1 Meta-analysis

```
or_time_metacont <- metacont(data = minipcnl_only,
                              mean.c = or_time_min_mean_control,
                              sd.c = or_time_min_sd_control,
                              mean.e = or_time_min_mean_suction,
                              sd.e = or_time_min_sd_suction,
                              n.e = sample_size_suction,
                              n.c = sample_size_control,
                        studlab = author_year)
or_time_metacont
```

```
## Number of studies: k = 4
## Number of observations: o = 473
##
##                          MD            95%-CI    z p-value
## Common effect model  2.1825 [0.6472;  3.7178] 2.79  0.0053
## Random effects model 8.1512 [0.0481; 16.2544] 1.97  0.0487
##
## Quantifying heterogeneity:
##  tau^2 = 52.8557 [9.6858; >528.5572]; tau = 7.2702 [3.1122; >22.9904]
##  I^2 = 87.6% [70.5%; 94.8%]; H = 2.84 [1.84; 4.38]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  24.16    3 < 0.0001
##
## 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
```

12.3.2 Forest plot

```
forest(or_time_metacont,
       sortvar = TE)
```

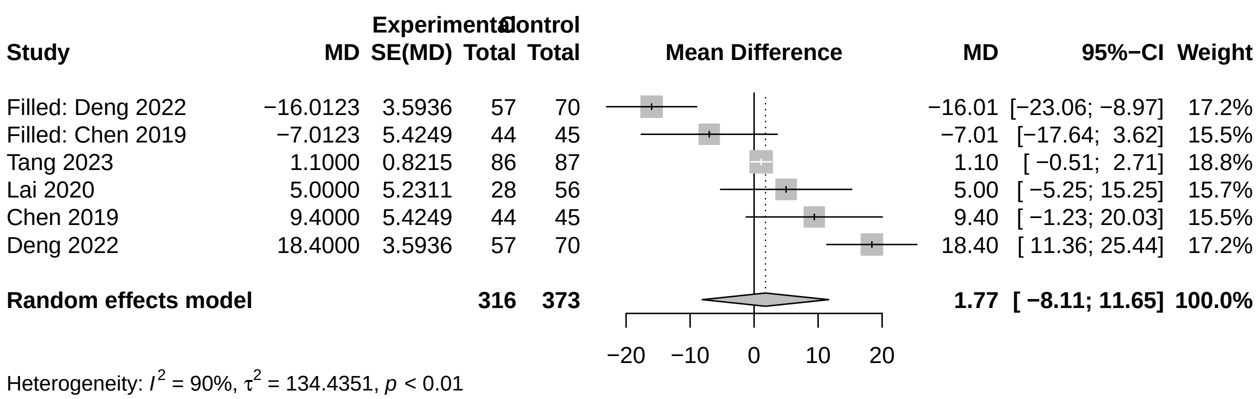


12.3.3 Trim and Fill

```r
trimfill(or_time_metacont)
```

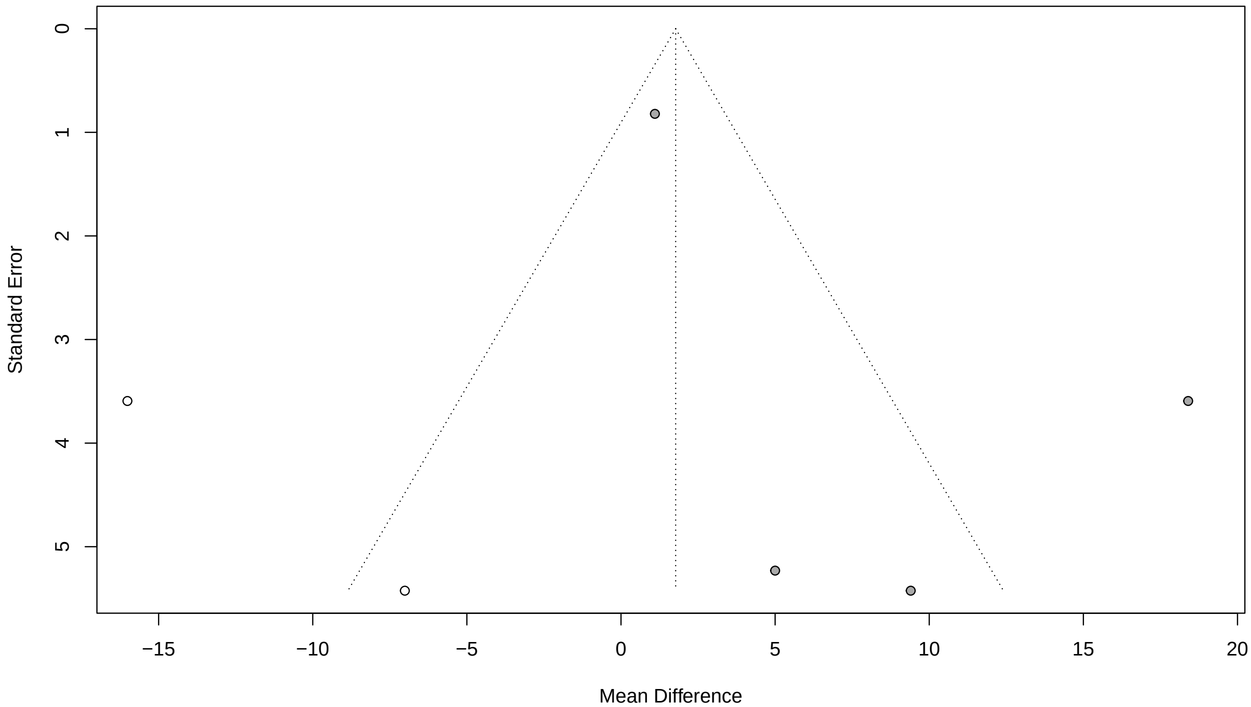
```
## Number of studies: k = 6 (with 2 added studies)
## Number of observations: o = 689
##
##                           MD             95%-CI    z p-value
## Random effects model 1.7739 [-8.1053; 11.6530] 0.35  0.7249
##
## Quantifying heterogeneity:
##  tau^2 = 134.4351 [42.0770; 872.9574]; tau = 11.5946 [6.4867; 29.5459]
##  I^2 = 90.2% [81.4%; 94.8%]; H = 3.19 [2.32; 4.40]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  50.97    5 < 0.0001
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(or_time_metacont),
       sortvar = TE)
```



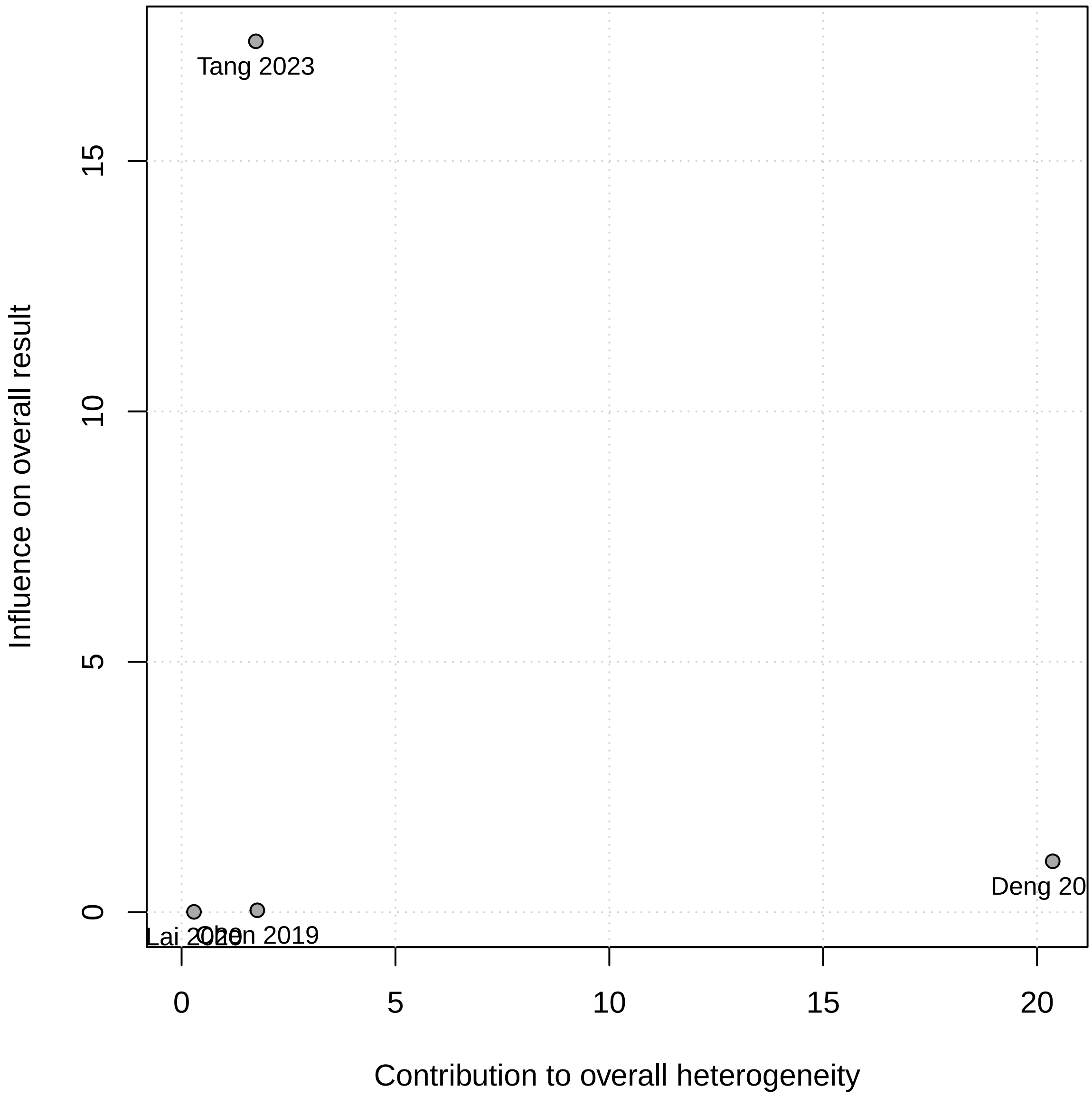
12.3.4 Funnel plot

```r
funnel(trimfill(or_time_metacont))
```



12.3.5 Baujat

```
baujat(or_time_metacont, pos = 1)
```



12.3.6 Leave one out

```
metainf(or_time_metacont)
```

```
## Influential analysis (common effect model)
##
##                            MD             95%-CI  p-value    tau^2     tau
## Omitting Tang 2023   13.0235 [ 7.9282; 18.1189] < 0.0001  31.8643  5.6448
## Omitting Chen 2019    2.0288 [ 0.4773;  3.5804]   0.0104  76.4762  8.7451
## Omitting Lai 2020     2.1179 [ 0.5651;  3.6707]   0.0075  74.4036  8.6258
## Omitting Deng 2022    1.3735 [-0.1996;  2.9466]   0.0870   7.8020  2.7932
##
## Pooled estimate       2.1825 [ 0.6472;  3.7178]   0.0053  52.8557  7.2702
##                         I^2
## Omitting Tang 2023    60.3%
## Omitting Chen 2019    91.1%
## Omitting Lai 2020     91.6%
## Omitting Deng 2022    28.1%
##
## Pooled estimate       87.6%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.4 Auxiliary Treatments

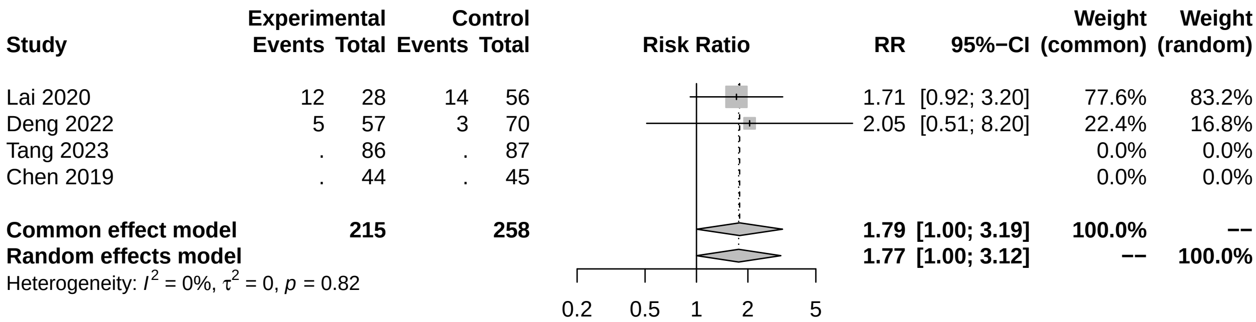
12.4.1 Meta-analysis

```
aux_rx_metabin <- metabin(data = minipcnl_only,
                         event.c = auxillary_tx_n_control,
                       n.c = sample_size_control,
                       event.e = auxillary_tx_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
aux_rx_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 34
##
##                            RR           95%-CI    z p-value
## Common effect model  1.7887 [1.0028; 3.1907] 1.97  0.0489
## Random effects model 1.7661 [1.0000; 3.1189] 1.96  0.0500
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.05    1  0.8194
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.4.2 Forest plot

```r
forest(aux_rx_metabin,
       sortvar = TE)
```

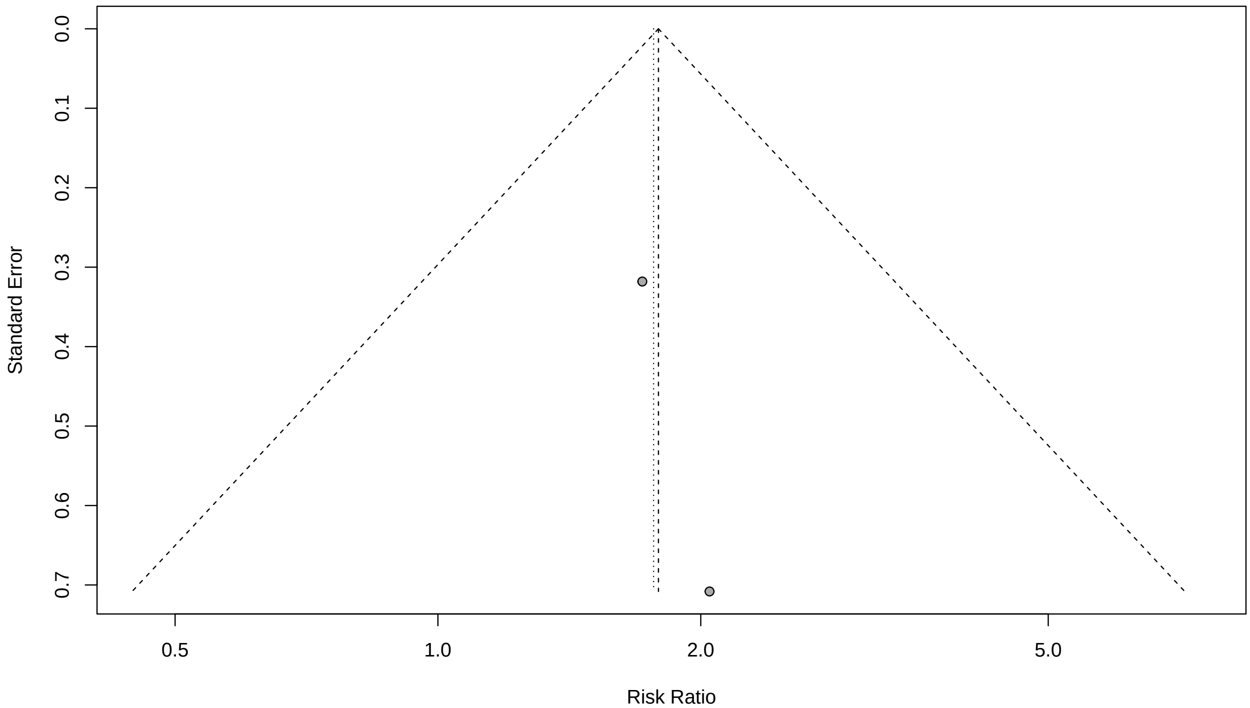


12.4.3 Trim and Fill

```
#trimfill(aux_rx_metabin)
#forest(trimfill(aux_rx_metabin),
#       sortvar = TE)
```

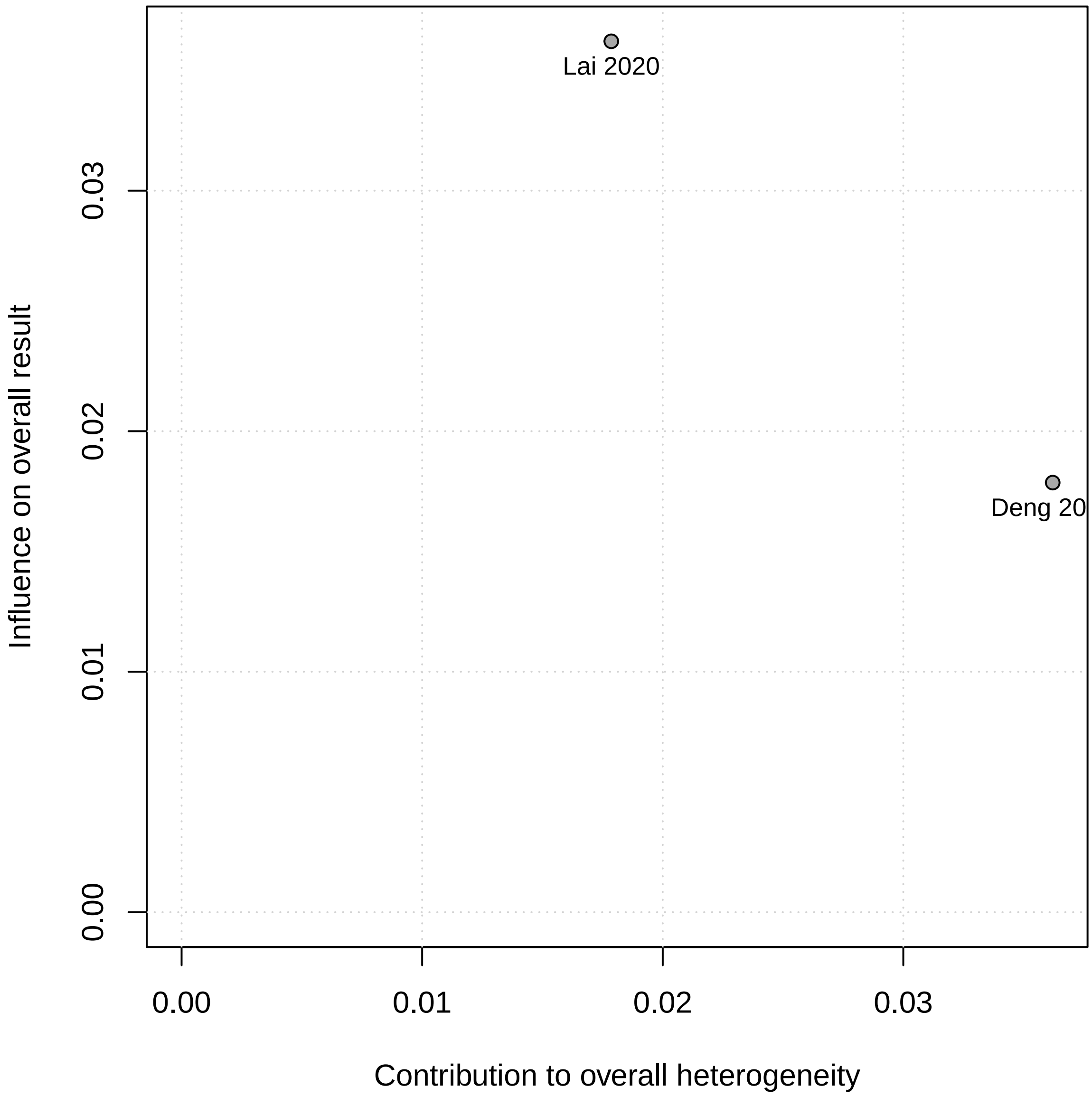
12.4.4 Funnel plot

```
funnel((aux_rx_metabin))
```



12.4.5 Baujat

```
baujat(aux_rx_metabin, pos = 1)
```



12.4.6 Leave one out

```r
metainf(aux_rx_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Tang 2023   1.7887 [1.0028; 3.1907]  0.0489  0.0000 0.0000  0.0%
## Omitting Chen 2019   1.7887 [1.0028; 3.1907]  0.0489  0.0000 0.0000  0.0%
## Omitting Lai 2020    2.0468 [0.5108; 8.2010]  0.3118
## Omitting Deng 2022   1.7143 [0.9190; 3.1978]  0.0902
##
## Pooled estimate      1.7887 [1.0028; 3.1907]  0.0489  0.0000 0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.5 VAS

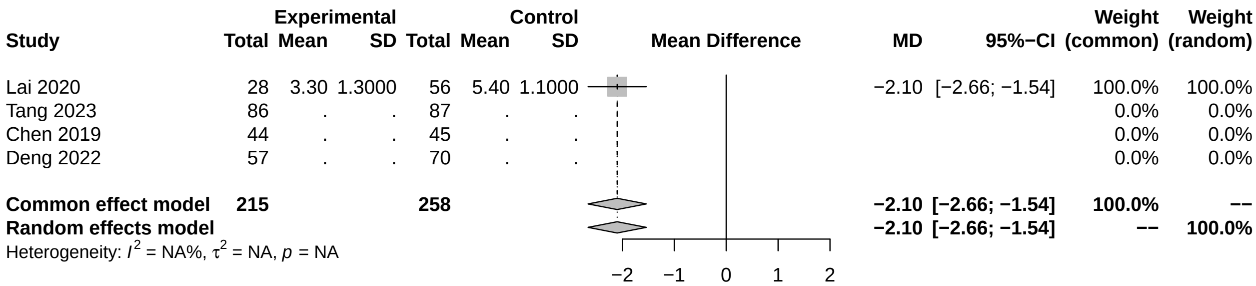
12.5.1 Meta-analysis

```
vas_metacont <- metacont(data = minipcnl_only,
                             mean.c = vas_score_mean_control,
                             sd.c = vas_score_sd_control,
                             mean.e = vas_score_mean_suction,
                             sd.e = vas_score_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
vas_metacont
```

```
## Number of studies: k = 1
## Number of observations: o = 473
##
##                            MD             95%-CI     z  p-value
## Common effect model  -2.1000 [-2.6611; -1.5389] -7.34 < 0.0001
## Random effects model -2.1000 [-2.6611; -1.5389] -7.34 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.5.2 Forest plot

```r
forest(vas_metacont,
       sortvar = TE)
```

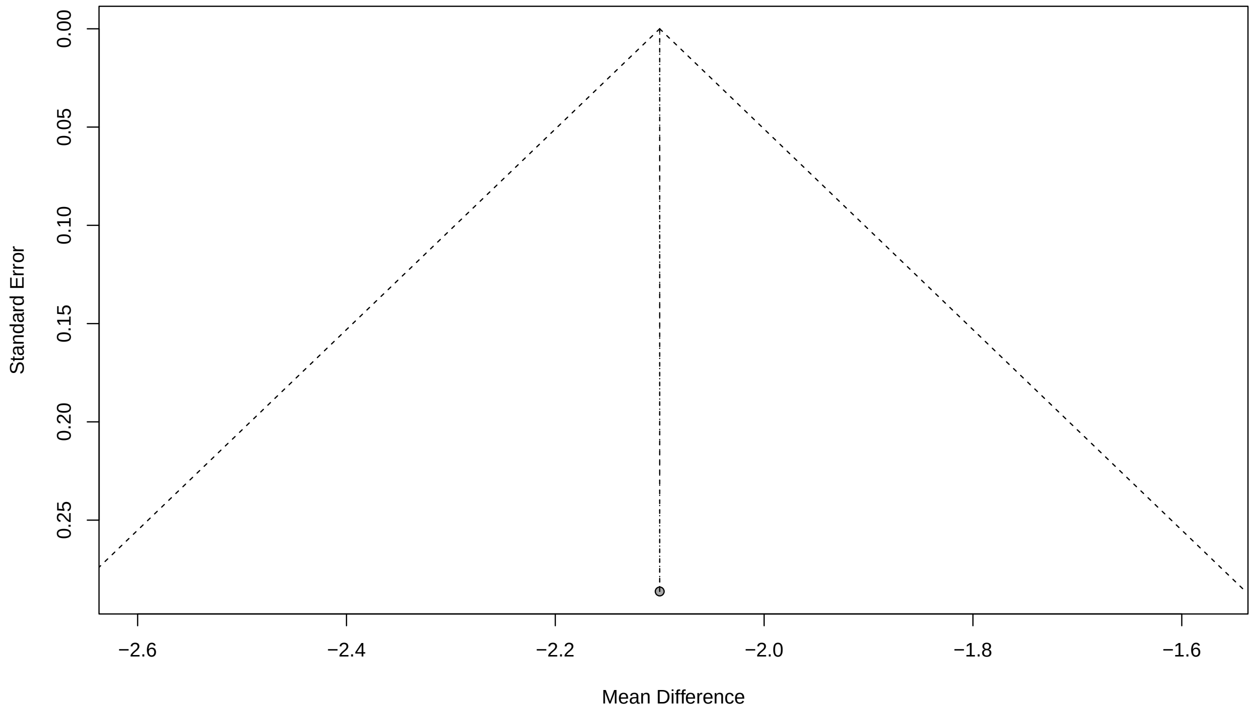


12.5.3 Trim and Fill

```
#trimfill(vas_metacont)
#forest(trimfill(vas_metacont))
```

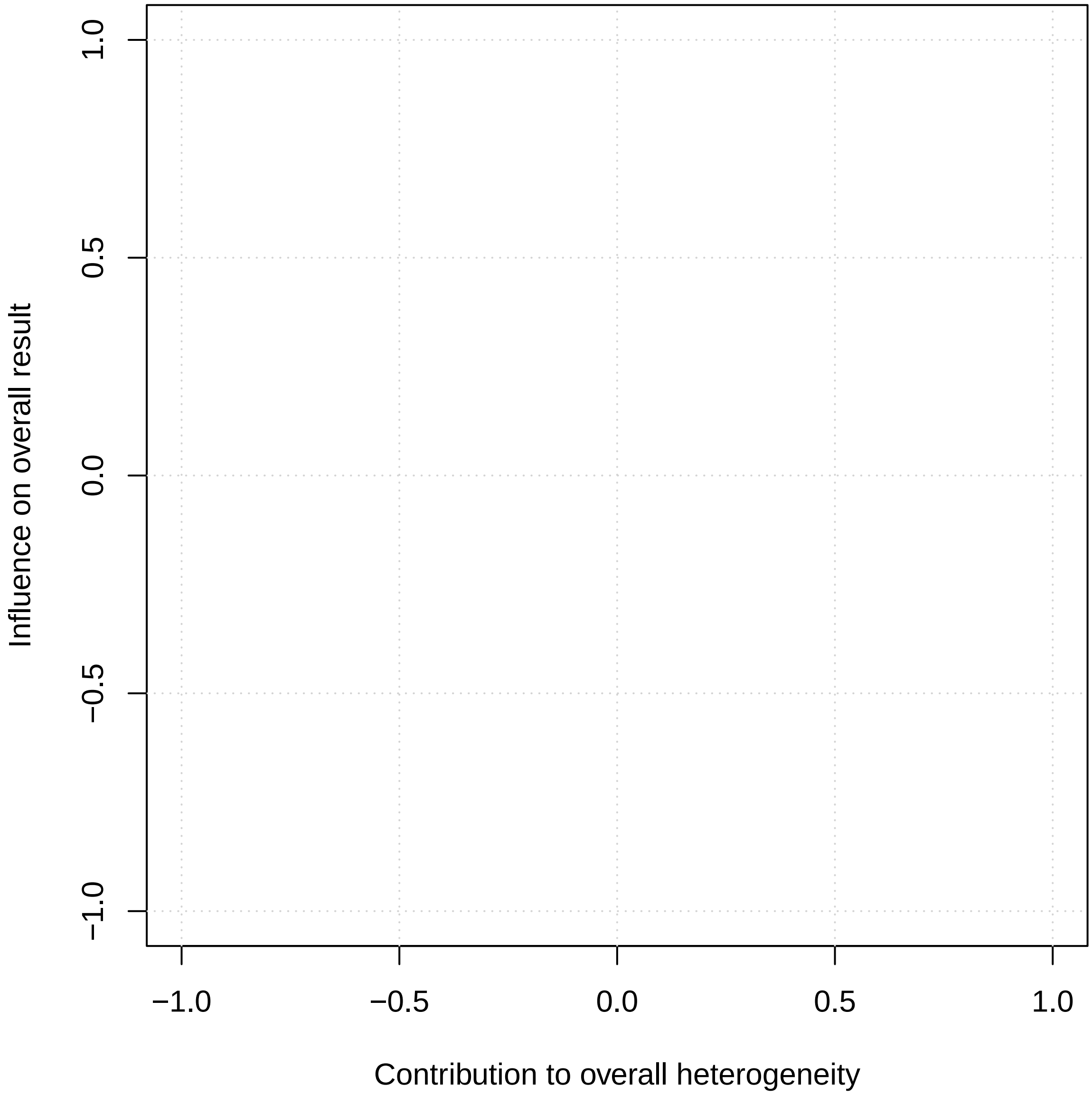
12.5.4 Funnel plot

```
funnel((vas_metacont))
```



12.5.5 Baujat

```
baujat(vas_metacont, pos = 1)
```



12.5.6 Leave one out

```r
metainf(vas_metacont)
```

```
## Influential analysis (common effect model)
##
##                            MD             95%-CI  p-value tau^2 tau I^2
## Omitting Tang 2023   -2.1000 [-2.6611; -1.5389] < 0.0001
## Omitting Chen 2019   -2.1000 [-2.6611; -1.5389] < 0.0001
## Omitting Lai 2020
## Omitting Deng 2022   -2.1000 [-2.6611; -1.5389] < 0.0001
##
## Pooled estimate      -2.1000 [-2.6611; -1.5389] < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.6 LoS

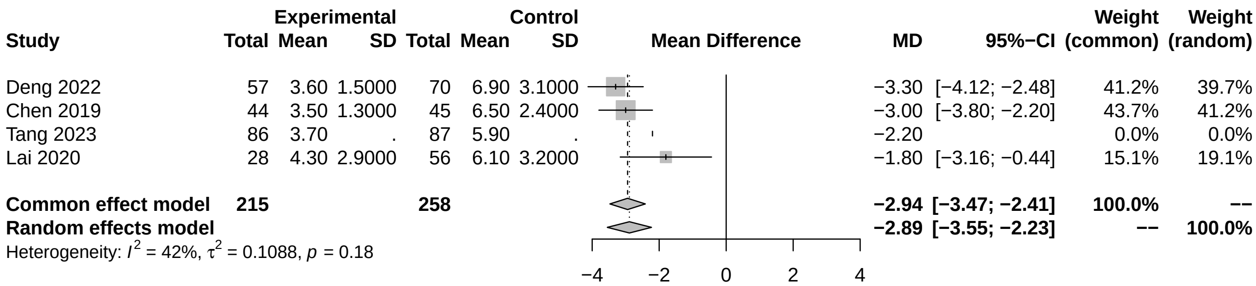
12.6.1 Meta-analysis

```
los_metacont <- metacont(data = minipcnl_only,
                             mean.c = los_days_mean_control,
                             sd.c = los_days_sd_control,
                             mean.e = los_days_mean_suction,
                             sd.e = los_days_sd_suction,
                             n.e = sample_size_suction,
                             n.c = sample_size_control,
                       studlab = author_year)
los_metacont
```

```
## Number of studies: k = 3
## Number of observations: o = 473
##
##                              MD             95%-CI      z  p-value
## Common effect model  -2.9428 [-3.4716; -2.4139] -10.91 < 0.0001
## Random effects model -2.8894 [-3.5491; -2.2296]  -8.58 < 0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 0.1088 [0.0000; 24.5107]; tau = 0.3299 [0.0000; 4.9508]
##  I^2 = 41.9% [0.0%; 82.4%]; H = 1.31 [1.00; 2.38]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  3.44    2  0.1787
##
## 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
```

12.6.2 Forest plot

```r
forest(los_metacont,
       sortvar = TE)
```



12.6.3 Trim and Fill

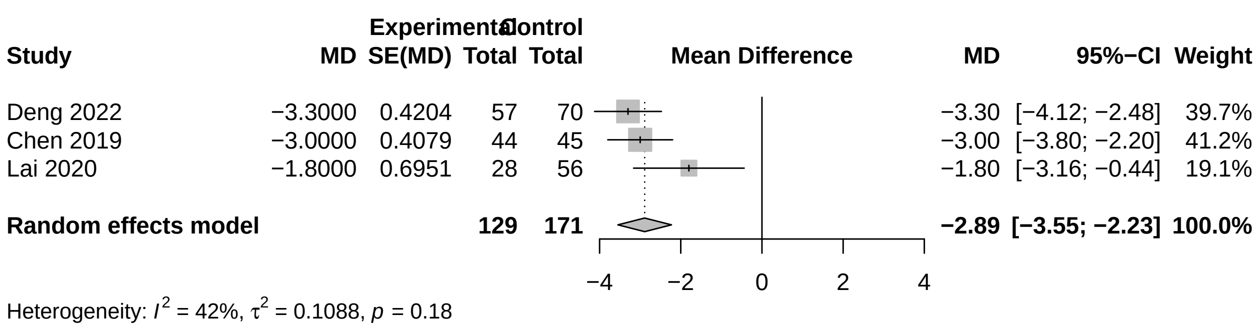
```r
trimfill(los_metacont)
```

```
## Warning in trimfill.meta(los_metacont): 1 observation(s) dropped due to missing
## values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 300
## 
##                           MD              95%-CI     z  p-value
## Random effects model -2.8894 [-3.5491; -2.2296] -8.58 < 0.0001
## 
## Quantifying heterogeneity:
##  tau^2 = 0.1088 [0.0000; 24.5107]; tau = 0.3299 [0.0000; 4.9508]
##  I^2 = 41.9% [0.0%; 82.4%]; H = 1.31 [1.00; 2.38]
## 
## Test of heterogeneity:
##     Q d.f. p-value
##  3.44    2  0.1787
## 
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(los_metacont),
       sortvar = TE)
```

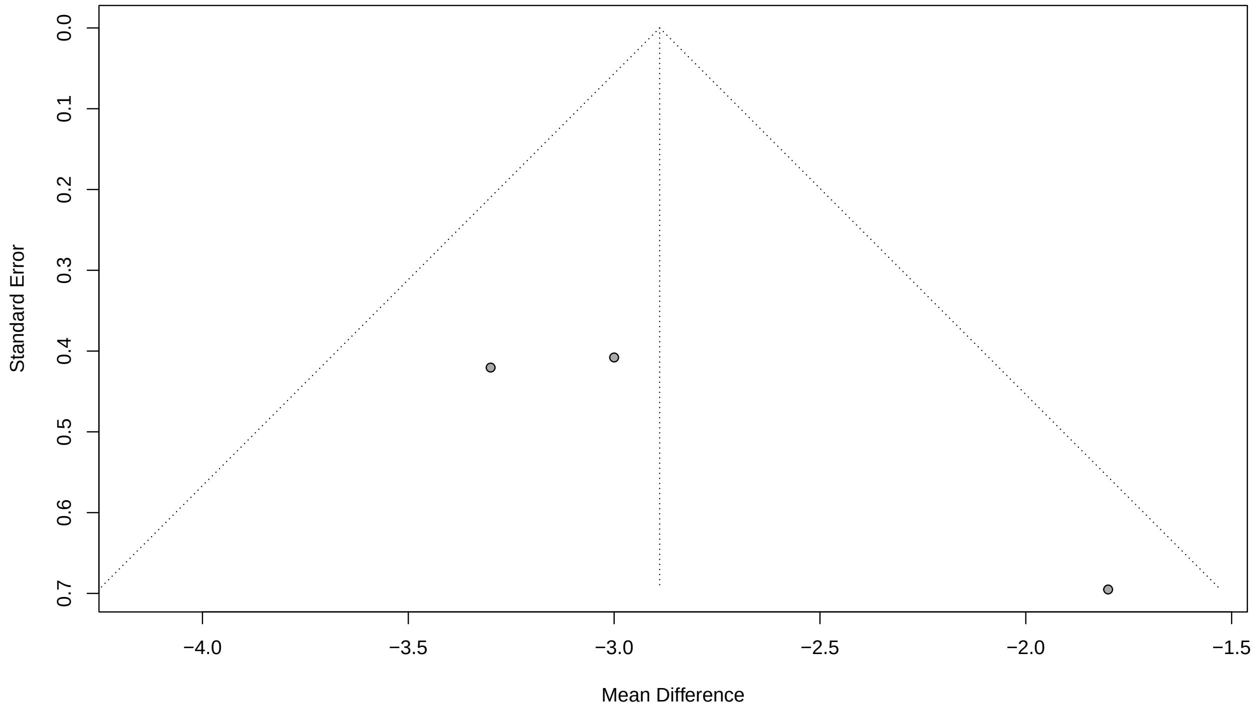
```
## Warning in trimfill.meta(los_metacont): 1 observation(s) dropped due to missing
## values
```



12.6.4 Funnel plot

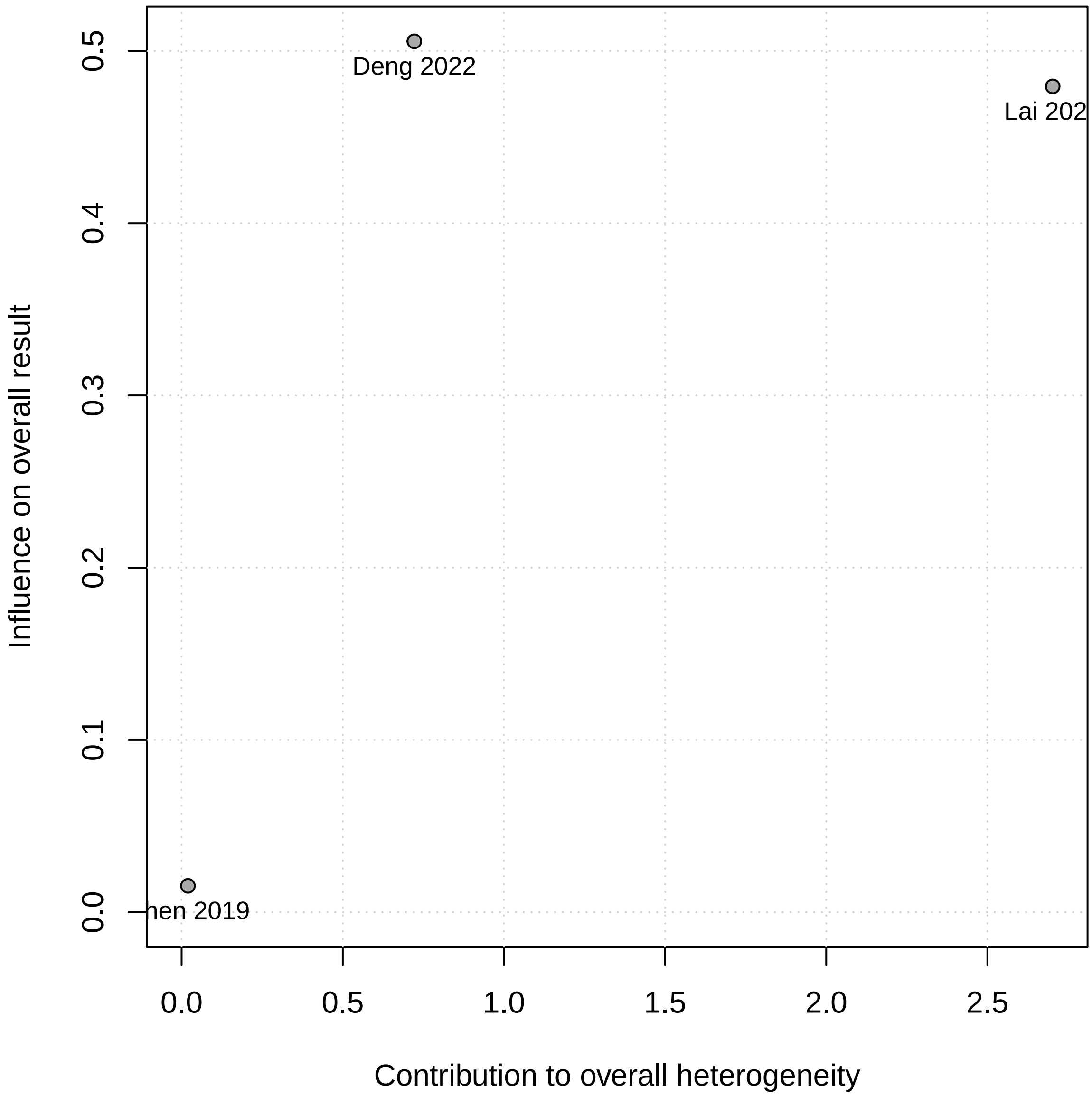
```
funnel(trimfill(los_metacont))
```

```
## Warning in trimfill.meta(los_metacont): 1 observation(s) dropped due to missing
## values
```



12.6.5 Baujat

```
baujat(los_metacont, pos = 1)
```



12.6.6 Leave one out

```r
metainf(los_metacont)
```

```
## Influential analysis (common effect model)
##
##                            MD            95%-CI  p-value   tau^2    tau    I^2
## Omitting Tang 2023   -2.9428 [-3.4716; -2.4139] < 0.0001  0.1088  0.3299  41.9%
## Omitting Chen 2019   -2.8983 [-3.6034; -2.1932] < 0.0001  0.7950  0.8916  70.7%
## Omitting Lai 2020    -3.1455 [-3.7193; -2.5717] < 0.0001  0.0000  0.0000   0.0%
## Omitting Deng 2022   -2.6926 [-3.3822; -2.0030] < 0.0001  0.3952  0.6286  54.9%
##
## Pooled estimate      -2.9428 [-3.4716; -2.4139] < 0.0001  0.1088  0.3299  41.9%
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.7 Complications - All

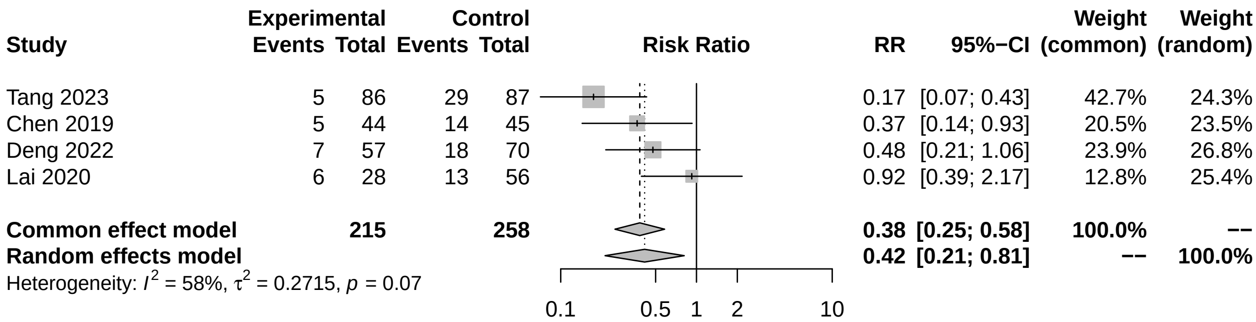
12.7.1 Meta-analysis

```
comp_metabin <- metabin(data = minipcnl_only,
                         event.c = complications_postop_overall_n_control,
                       n.c = sample_size_control,
                       event.e = complications_postop_overall_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
comp_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 473
## Number of events: e = 97
##
##                          RR           95%-CI     z  p-value
## Common effect model  0.3823 [0.2508; 0.5825] -4.47 < 0.0001
## Random effects model 0.4151 [0.2121; 0.8121] -2.57   0.0102
##
## Quantifying heterogeneity:
##  tau^2 = 0.2715 [0.0000; 6.4062]; tau = 0.5211 [0.0000; 2.5310]
##  I^2 = 57.8% [0.0%; 86.0%]; H = 1.54 [1.00; 2.67]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  7.10    3  0.0687
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

12.7.2 Forest plot

```r
forest(comp_metabin,
       sortvar = TE)
```

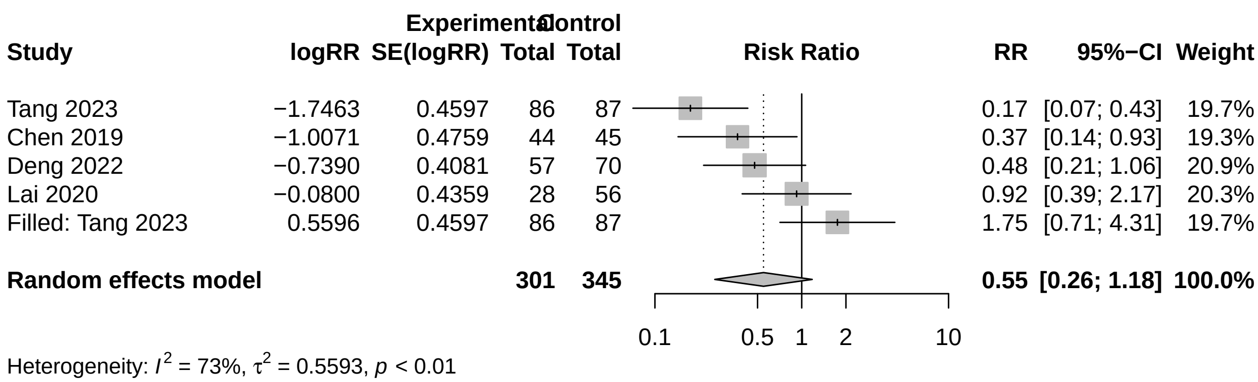


12.7.3 Trim and Fill

```r
trimfill(comp_metabin)
```

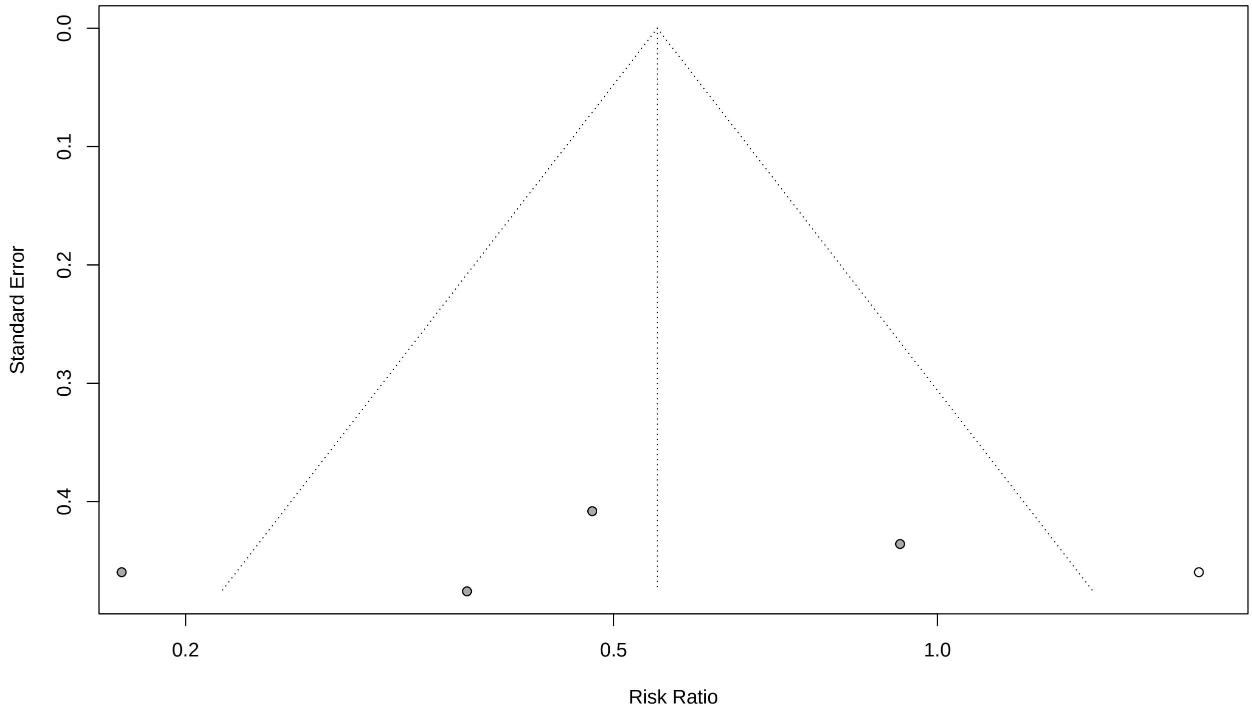
```
## Number of studies: k = 5 (with 1 added studies)
## Number of observations: o = 646
## Number of events: e = 131
##
##                          RR           95%-CI     z p-value
## Random effects model 0.5489 [0.2557; 1.1786] -1.54  0.1239
##
## Quantifying heterogeneity:
##  tau^2 = 0.5593 [0.0697; 6.2184]; tau = 0.7479 [0.2639; 2.4937]
##  I^2 = 73.1% [32.6%; 89.2%]; H = 1.93 [1.22; 3.05]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  14.85    4  0.0050
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(comp_metabin),
       sortvar = TE)
```



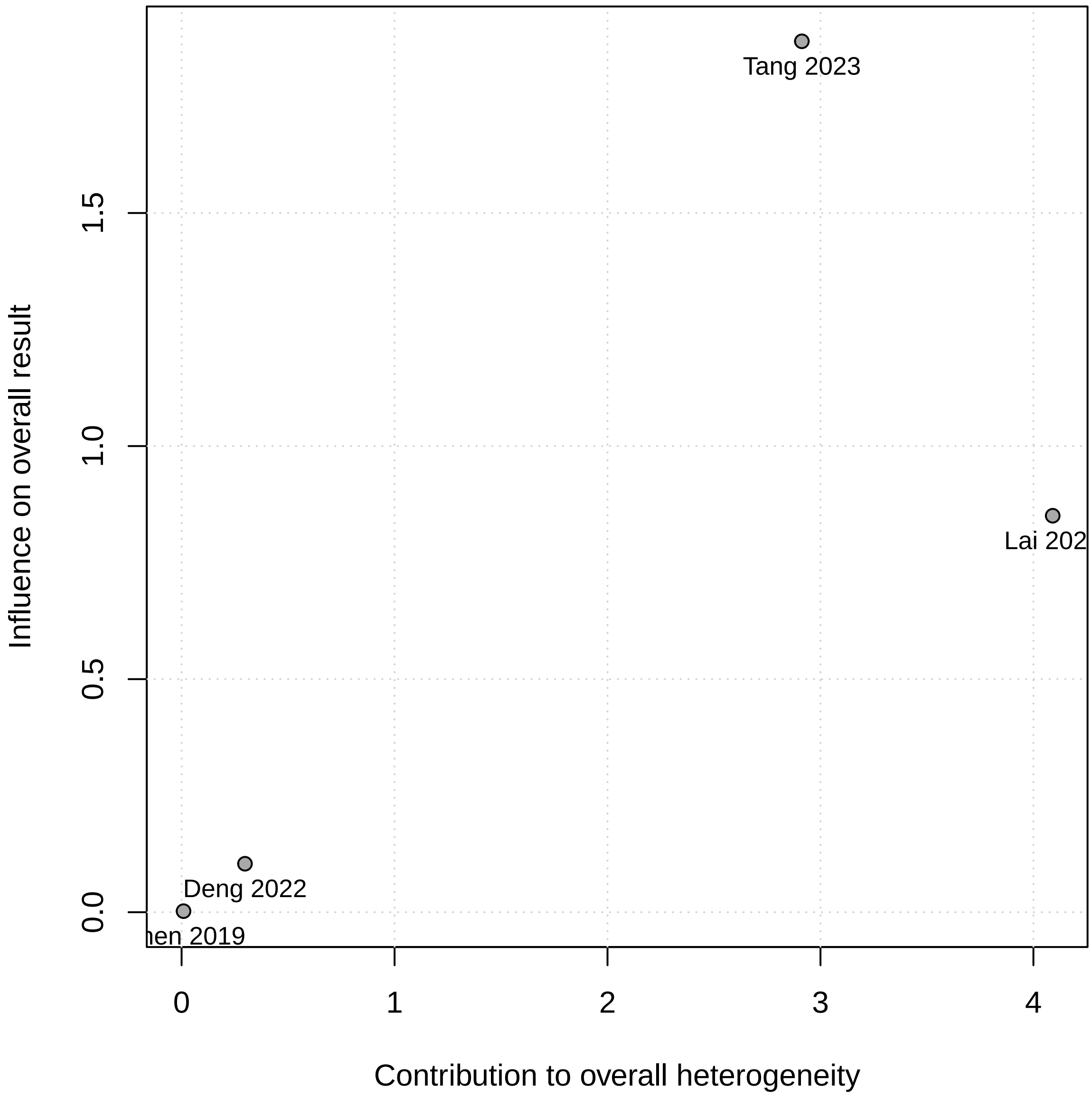
12.7.4 Funnel plot

```
funnel(trimfill(comp_metabin))
```



12.7.5 Baujat

```
baujat(comp_metabin, pos = 1)
```



12.7.6 Leave one out

```
metainf(comp_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI  p-value   tau^2     tau    I^2
## Omitting Tang 2023   0.5372 [0.3298; 0.8752]   0.0126  0.0203  0.1423  11.9%
## Omitting Chen 2019   0.3866 [0.2411; 0.6199] < 0.0001  0.4894  0.6996  71.3%
## Omitting Lai 2020    0.3026 [0.1841; 0.4972] < 0.0001  0.0812  0.2849  28.1%
## Omitting Deng 2022   0.3522 [0.2143; 0.5789] < 0.0001  0.5062  0.7115  71.3%
##
## Pooled estimate      0.3823 [0.2508; 0.5825] < 0.0001  0.2715  0.5211  57.8%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.8 Fever

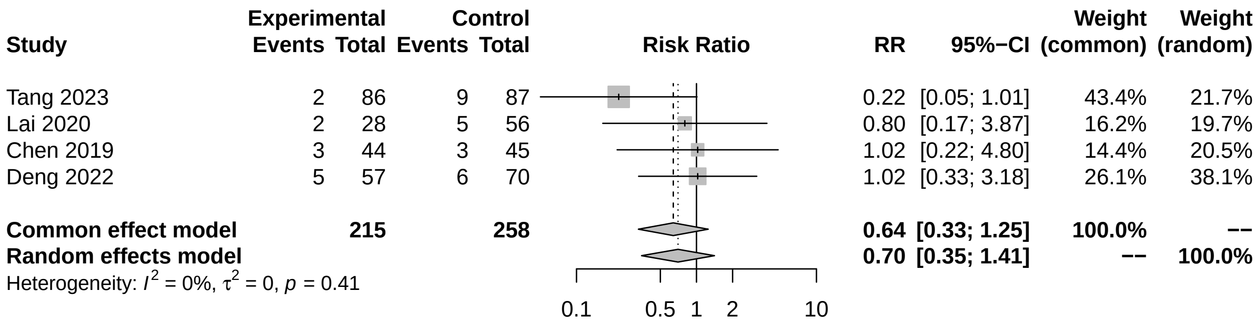
12.8.1 Meta-analysis

```r
fever_metabin <- metabin(data = minipcnl_only,
                         event.c = fever_n_control,
                       n.c = sample_size_control,
                       event.e = fever_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
fever_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 473
## Number of events: e = 35
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6409 [0.3280; 1.2522] -1.30  0.1930
## Random effects model 0.7017 [0.3485; 1.4129] -0.99  0.3212
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 6.7656]; tau = 0 [0.0000; 2.6011]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.88    3  0.4099
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

12.8.2 Forest plot

```r
forest(fever_metabin,
       sortvar = TE)
```

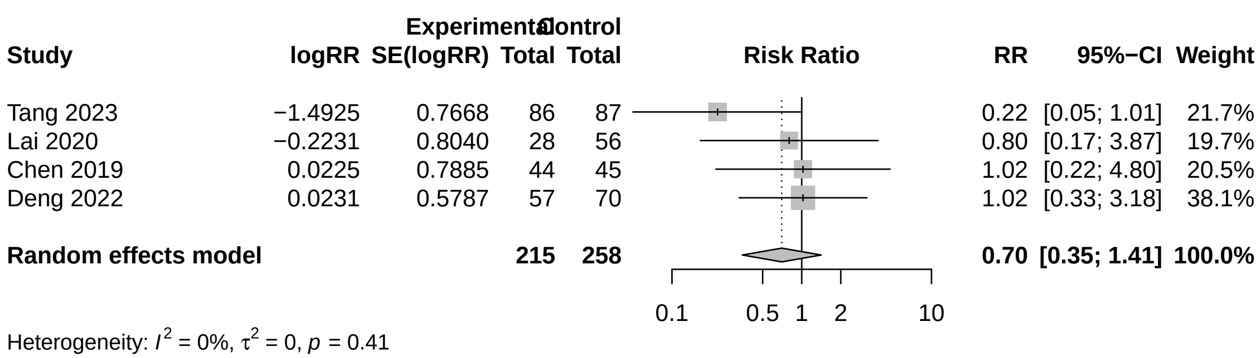


12.8.3 Trim and Fill

```r
trimfill(fever_metabin)
```

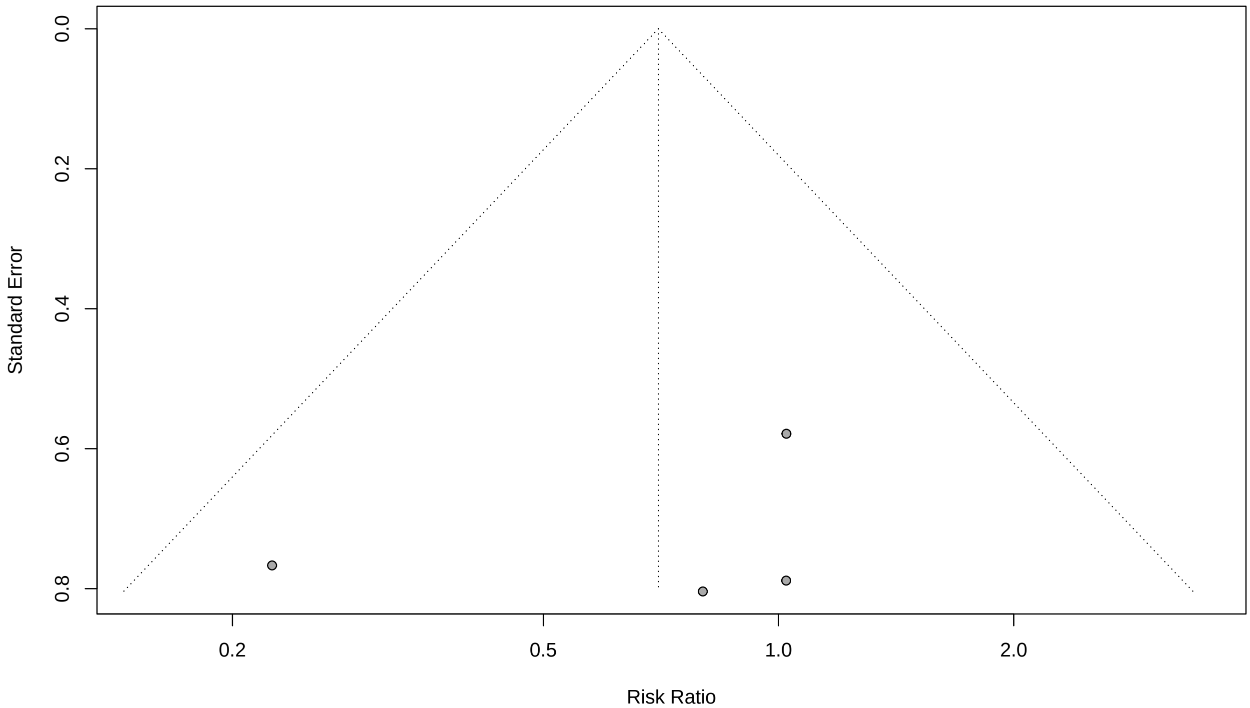
```
## Number of studies: k = 4 (with 0 added studies)
## Number of observations: o = 473
## Number of events: e = 35
##
##                          RR           95%-CI     z p-value
## Random effects model 0.7017 [0.3485; 1.4129] -0.99  0.3212
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 6.7656]; tau = 0 [0.0000; 2.6011]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.88    3  0.4099
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(fever_metabin),
       sortvar = TE)
```



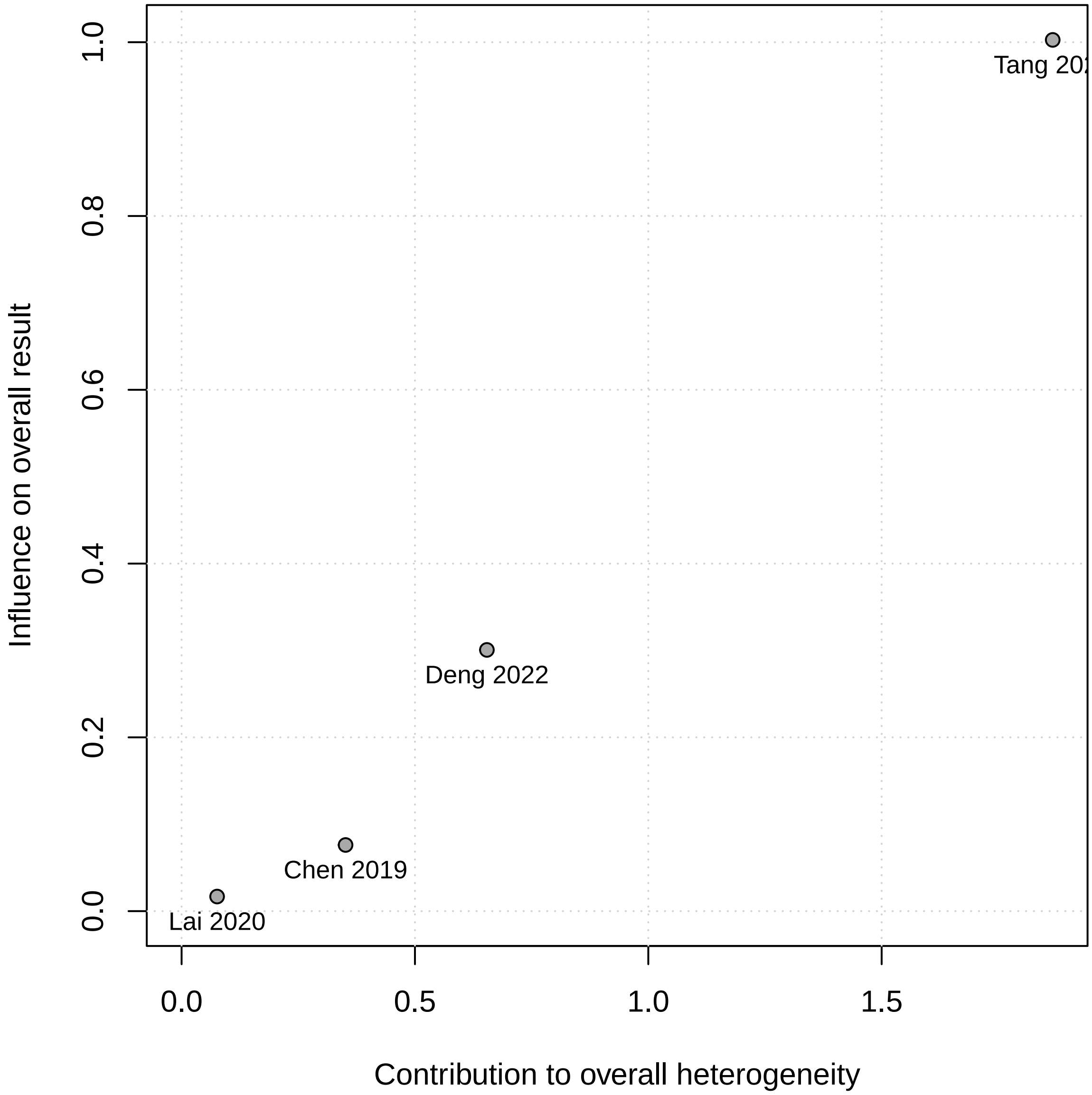
12.8.4 Funnel plot

```
funnel(trimfill(fever_metabin))
```



12.8.5 Baujat

```r
baujat(fever_metabin, pos = 1)
```



12.8.6 Leave one out

```r
metainf(fever_metabin)
```

```
## Influential analysis (common effect model)
##
##                         RR           95%-CI p-value  tau^2    tau    I^2
## Omitting Tang 2023   0.9595 [0.4355; 2.1139]  0.9183  0.0000  0.0000   0.0%
## Omitting Chen 2019   0.5768 [0.2728; 1.2194]  0.1497  0.1571  0.3963  23.0%
## Omitting Lai 2020    0.6102 [0.2908; 1.2805]  0.1915  0.1959  0.4426  29.8%
## Omitting Deng 2022   0.5058 [0.2170; 1.1790]  0.1144  0.0752  0.2743   9.0%
##
## Pooled estimate      0.6409 [0.3280; 1.2522]  0.1930  0.0000  0.0000   0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.9 Infections

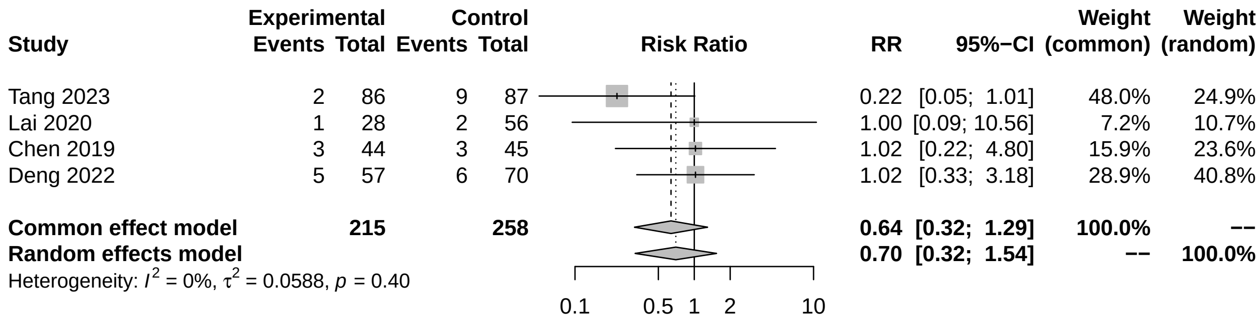
12.9.1 Meta-analysis

```r
infection_metabin <- metabin(data = minipcnl_only,
                         event.c = infection_n_control,
                       n.c = sample_size_control,
                       event.e = infection_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
infection_metabin
```

```
## Number of studies: k = 4
## Number of observations: o = 473
## Number of events: e = 31
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6381 [0.3152; 1.2918] -1.25  0.2119
## Random effects model 0.7003 [0.3191; 1.5367] -0.89  0.3743
##
## Quantifying heterogeneity:
##  tau^2 = 0.0588 [0.0000; 7.2737]; tau = 0.2426 [0.0000; 2.6970]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.94    3  0.4004
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
```

12.9.2 Forest plot

```r
forest(infection_metabin,
       sortvar = TE)
```

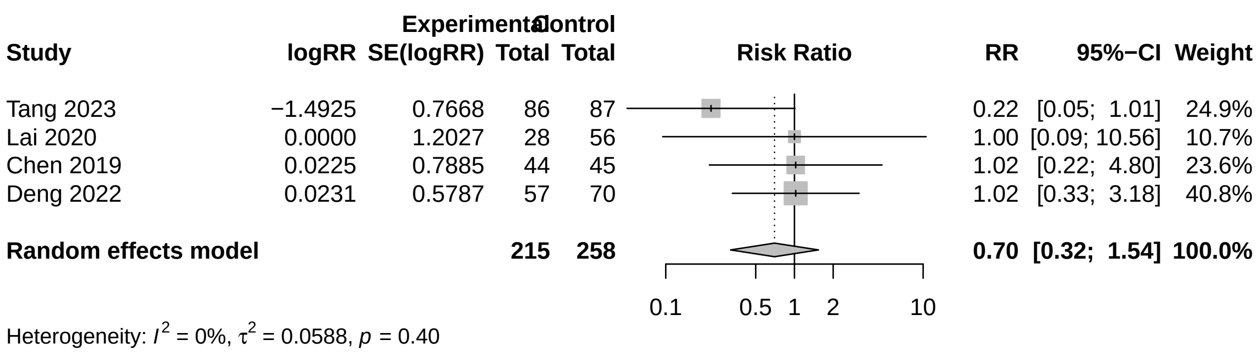


12.9.3 Trim and Fill

```r
trimfill(infection_metabin)
```

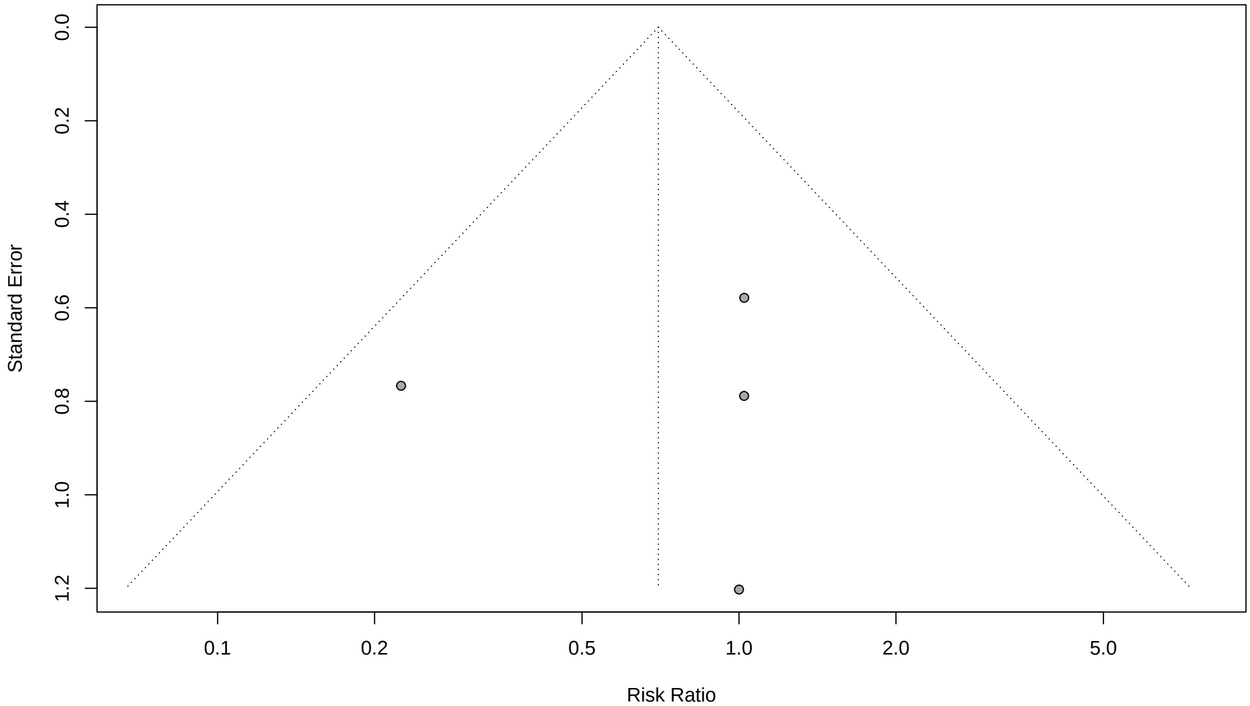
```
## Number of studies: k = 4 (with 0 added studies)
## Number of observations: o = 473
## Number of events: e = 31
##
##                          RR           95%-CI     z p-value
## Random effects model 0.7003 [0.3191; 1.5367] -0.89  0.3743
##
## Quantifying heterogeneity:
##  tau^2 = 0.0588 [0.0000; 7.2737]; tau = 0.2426 [0.0000; 2.6970]
##  I^2 = 0.0% [0.0%; 84.7%]; H = 1.00 [1.00; 2.56]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  2.94    3  0.4004
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(infection_metabin),
       sortvar = TE)
```



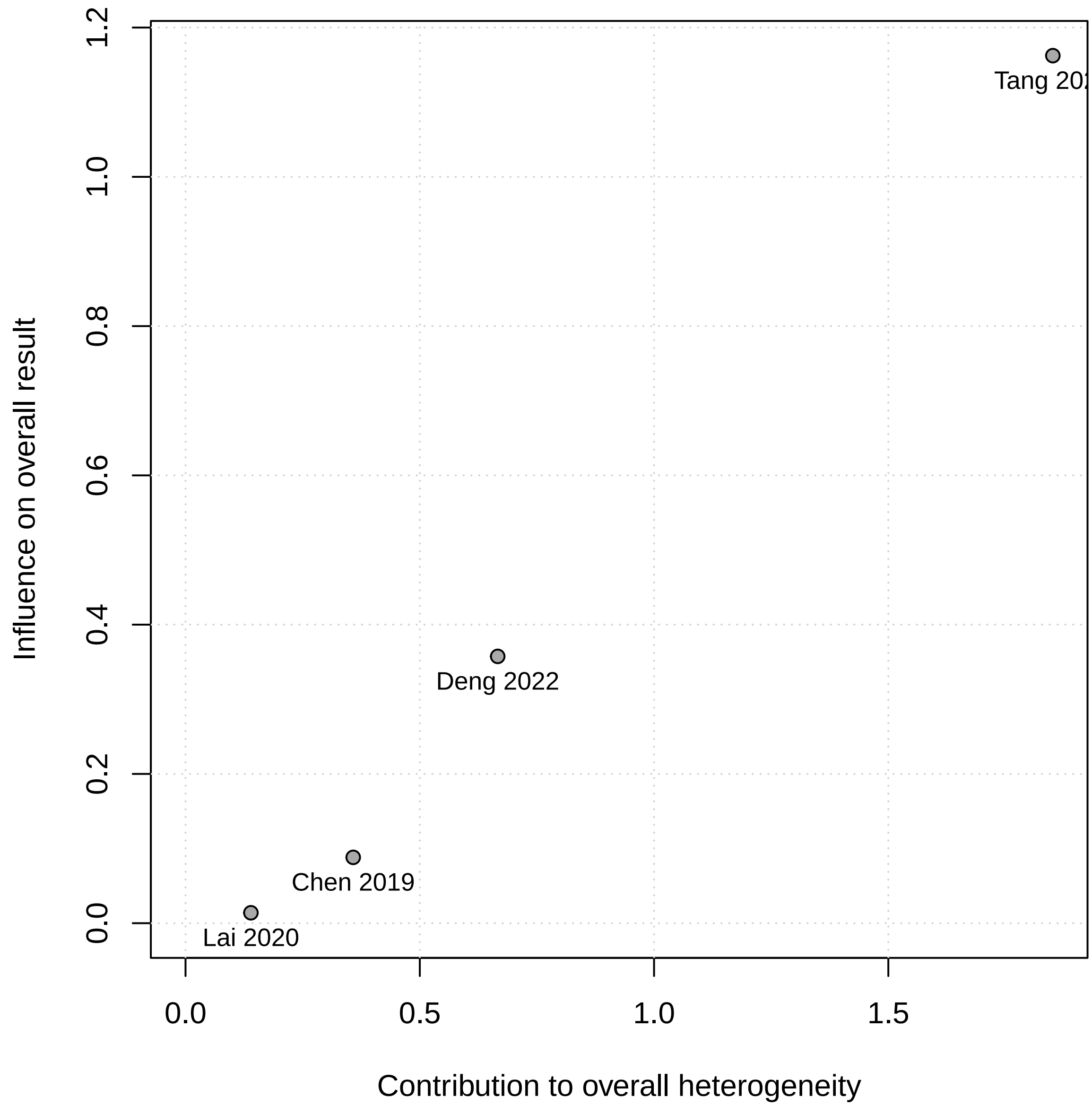
12.9.4 Funnel plot

```
funnel(trimfill(infection_metabin))
```



12.9.5 Baujat

```
baujat(infection_metabin, pos = 1)
```



12.9.6 Leave one out

```r
metainf(infection_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau    I^2
## Omitting Tang 2023   1.0200 [0.4348; 2.3926]  0.9637  0.0000 0.0000   0.0%
## Omitting Chen 2019   0.5653 [0.2541; 1.2576]  0.1621  0.2938 0.5421  24.7%
## Omitting Lai 2020    0.6102 [0.2908; 1.2805]  0.1915  0.1959 0.4426  29.8%
## Omitting Deng 2022   0.4815 [0.1913; 1.2121]  0.1208  0.2048 0.4526  10.1%
##
## Pooled estimate      0.6381 [0.3152; 1.2918]  0.2119  0.0588 0.2426   0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.10 Sepsis

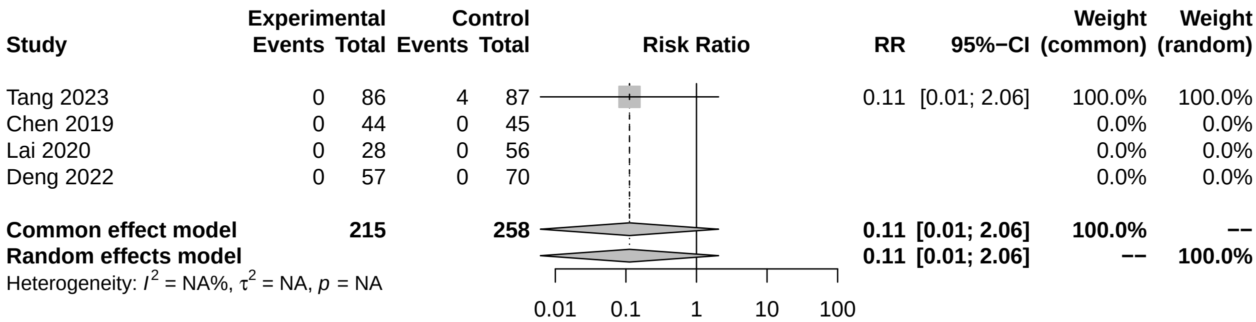
12.10.1 Meta-analysis

```
sepsis_metabin <- metabin(data = minipcnl_only,
                         event.c = sepsis_n_control,
                       n.c = sample_size_control,
                       event.e = sepsis_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
sepsis_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 473
## Number of events: e = 4
##
##                            RR           95%-CI     z p-value
## Common effect model  0.1124 [0.0061; 2.0562] -1.47  0.1405
## Random effects model 0.1124 [0.0061; 2.0562] -1.47  0.1405
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.10.2 Forest plot

```r
forest(sepsis_metabin,
       sortvar = TE)
```

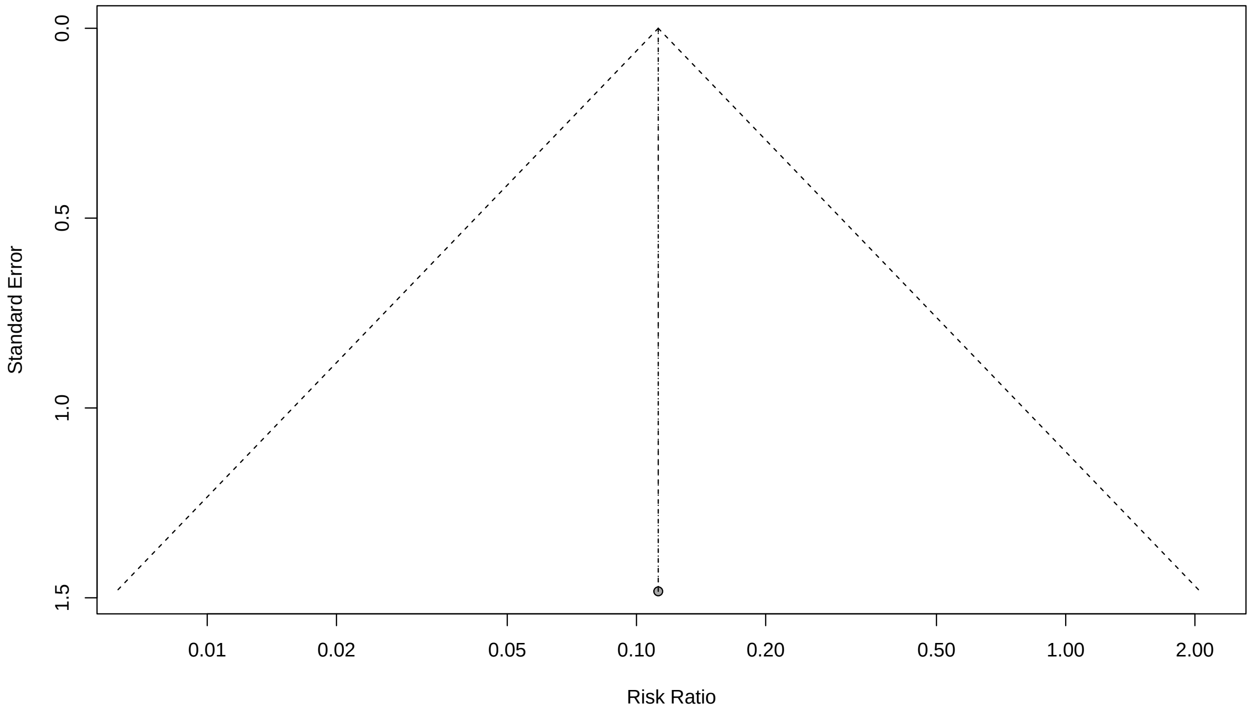


12.10.3 Trim and Fill

```
#trimfill(sepsis_metabin)
#forest(trimfill(sepsis_metabin),
#       sortvar = TE)
```

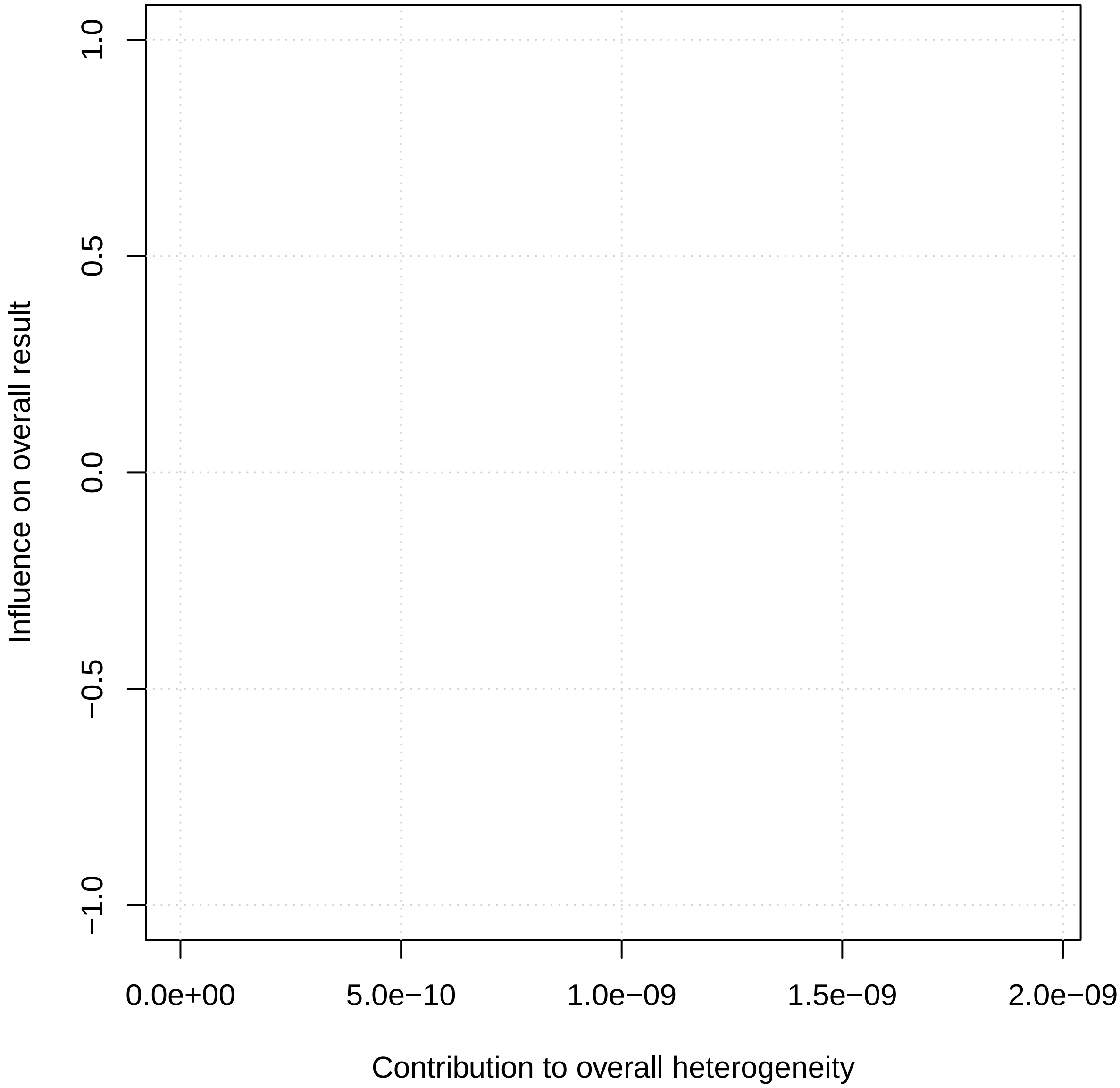
12.10.4 Funnel plot

```
funnel((sepsis_metabin))
```



12.10.5 Baujat

```r
baujat(sepsis_metabin, pos = 1)
```



12.10.6 Leave one out

```
metainf(sepsis_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value tau^2 tau I^2
## Omitting Tang 2023
## Omitting Chen 2019   0.1124 [0.0061; 2.0562]  0.1405
## Omitting Lai 2020    0.1124 [0.0061; 2.0562]  0.1405
## Omitting Deng 2022   0.1124 [0.0061; 2.0562]  0.1405
##
## Pooled estimate      0.1124 [0.0061; 2.0562]  0.1405
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.11 Abscess

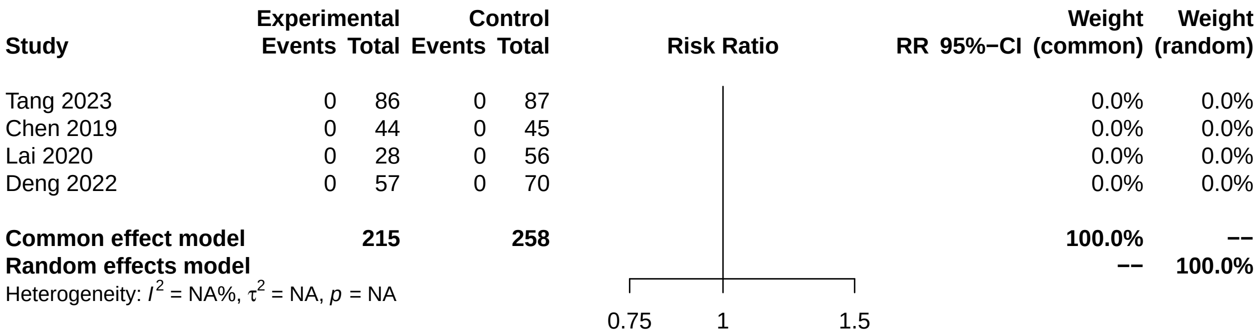
12.11.1 Meta-analysis

```
abscess_metabin <- metabin(data = minipcnl_only,
                          event.c = abscess_n_control,
                        n.c = sample_size_control,
                        event.e = abscess_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
abscess_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 473
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.11.2 Forest plot

```
forest(abscess_metabin,
       sortvar = TE)
```



12.11.3 Trim and Fill

```r
#trimfill(abscess_metabin)
#forest(trimfill(abscess_metabin),
#       sortvar = TE)
```

12.11.4 Funnel plot

```
#funnel((abscess_metabin))
```

12.11.5 Baujat

```r
#baujat(abscess_metabin, pos = 1)
```

12.11.6 Leave one out

```
#metainf(abscess_metabin)
```

12.12 Haematoma

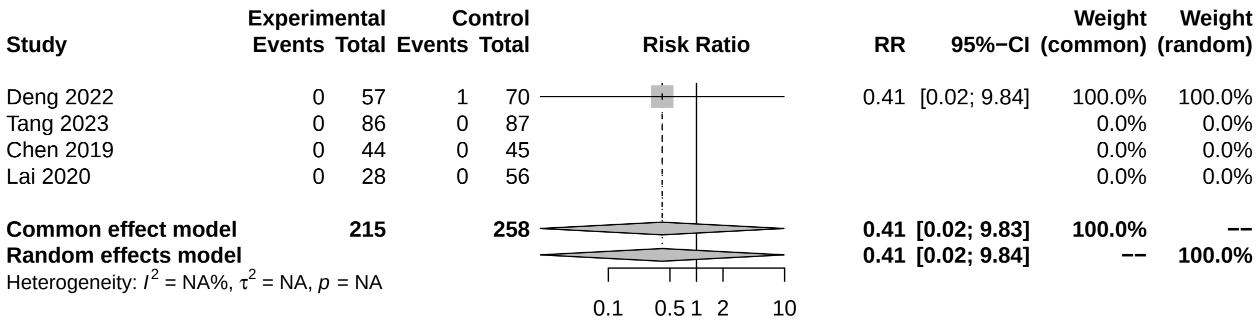
12.12.1 Meta-analysis

```
haematoma_metabin <- metabin(data = minipcnl_only,
                         event.c = hematoma_n_control,
                       n.c = sample_size_control,
                       event.e = hematoma_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
haematoma_metabin
```

```
## Number of studies: k = 1
## Number of observations: o = 473
## Number of events: e = 1
##
##                          RR           95%-CI     z p-value
## Common effect model  0.4080 [0.0169; 9.8294] -0.55  0.5808
## Random effects model 0.4087 [0.0170; 9.8436] -0.55  0.5815
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.12.2 Forest plot

```r
forest(haematoma_metabin,
       sortvar = TE)
```

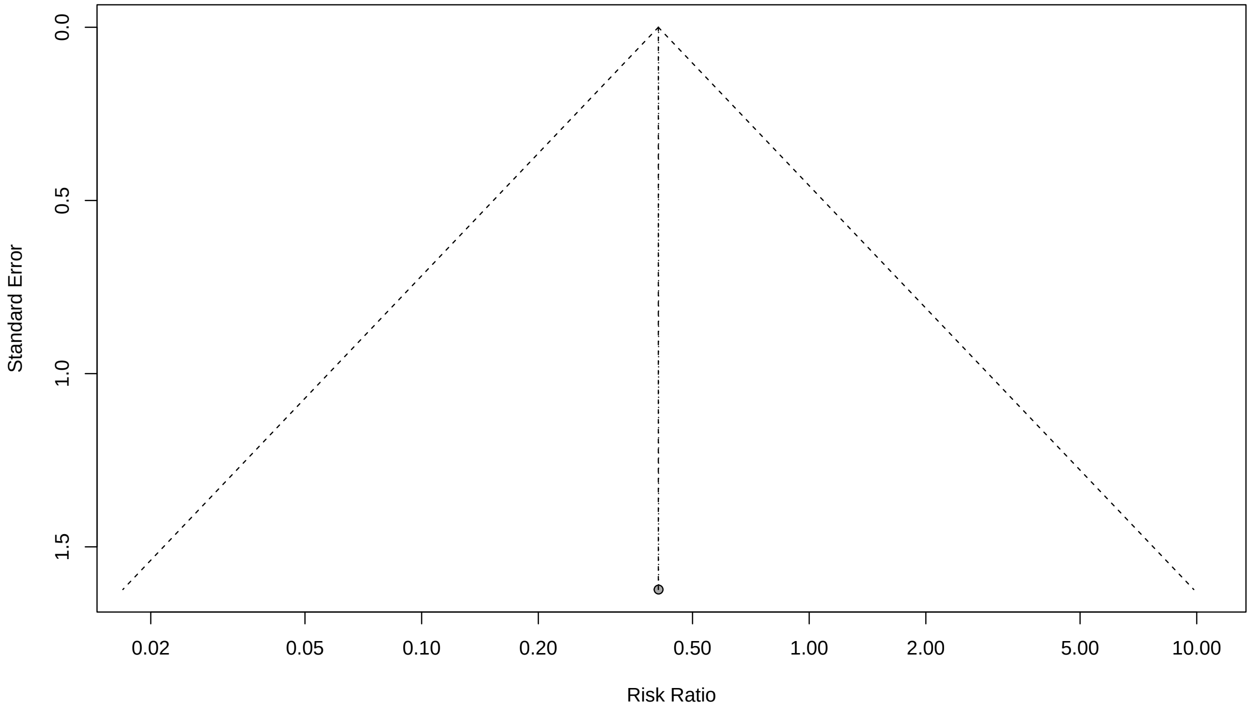


12.12.3 Trim and Fill

```
#trimfill(haematoma_metabin)
#forest(trimfill(haematoma_metabin),
#       sortvar = TE)
```

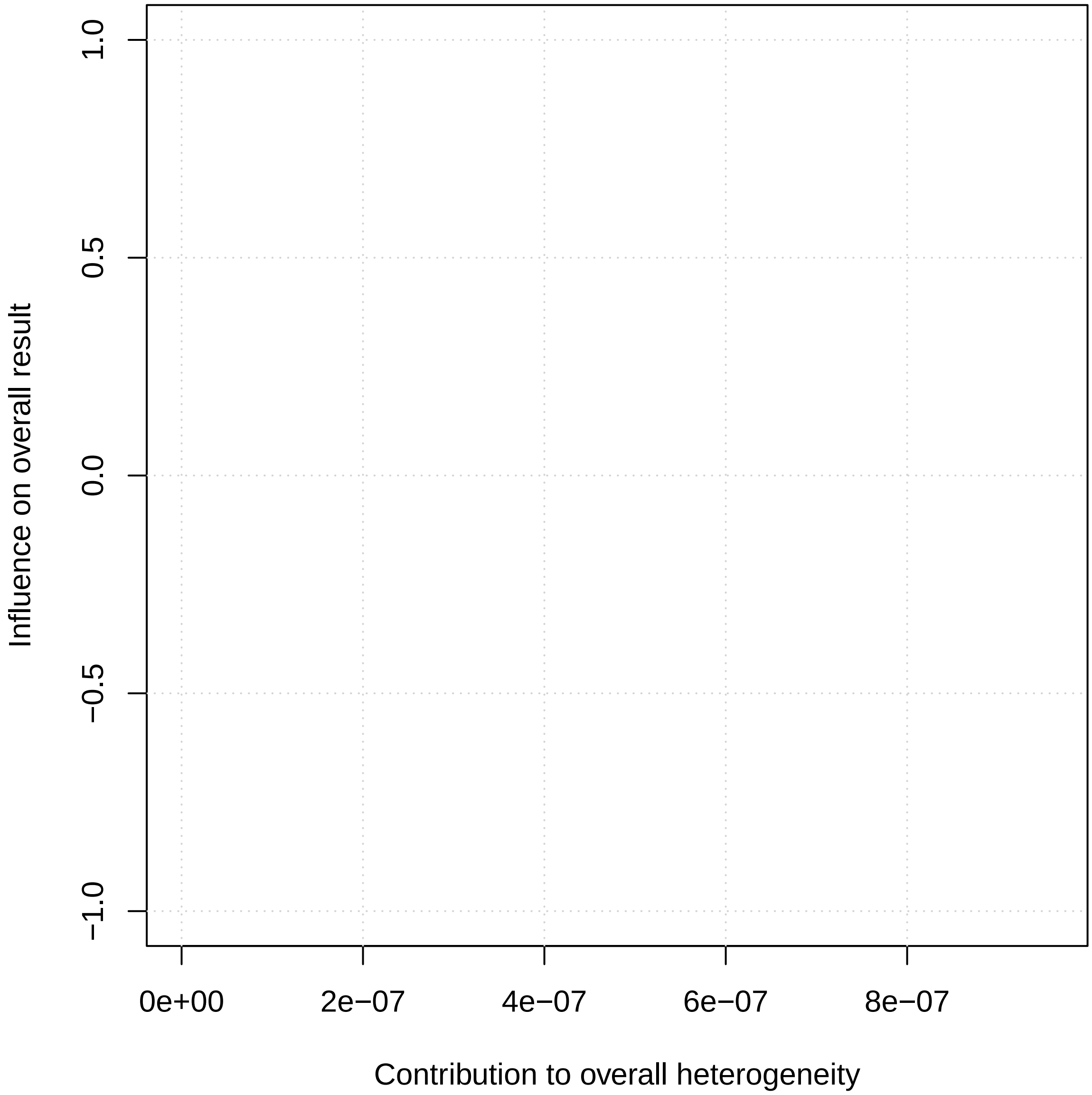
12.12.4 Funnel plot

```
funnel((haematoma_metabin))
```



12.12.5 Baujat

```
baujat(haematoma_metabin, pos = 1)
```



12.12.6 Leave one out

```
metainf(haematoma_metabin)
```

```
## Influential analysis (common effect model)
##
##                           RR           95%-CI p-value tau^2 tau I^2
## Omitting Tang 2023   0.4080 [0.0169; 9.8294]  0.5808
## Omitting Chen 2019   0.4080 [0.0169; 9.8294]  0.5808
## Omitting Lai 2020    0.4080 [0.0169; 9.8294]  0.5808
## Omitting Deng 2022
##
## Pooled estimate      0.4080 [0.0169; 9.8294]  0.5808
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.13 Pain

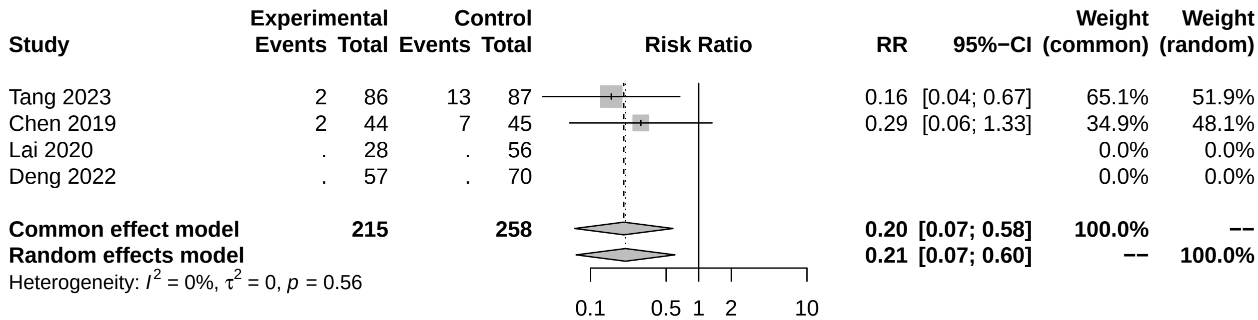
12.13.1 Meta-analysis

```
pain_metabin <- metabin(data = minipcnl_only,
                          event.c = pain_n_control,
                        n.c = sample_size_control,
                        event.e = pain_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
pain_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 24
##
##                           RR           95%-CI     z p-value
## Common effect model  0.2033 [0.0715; 0.5781] -2.99  0.0028
## Random effects model 0.2107 [0.0737; 0.6027] -2.90  0.0037
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.34    1  0.5572
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.13.2 Forest plot

```r
forest(pain_metabin,
       sortvar = TE)
```

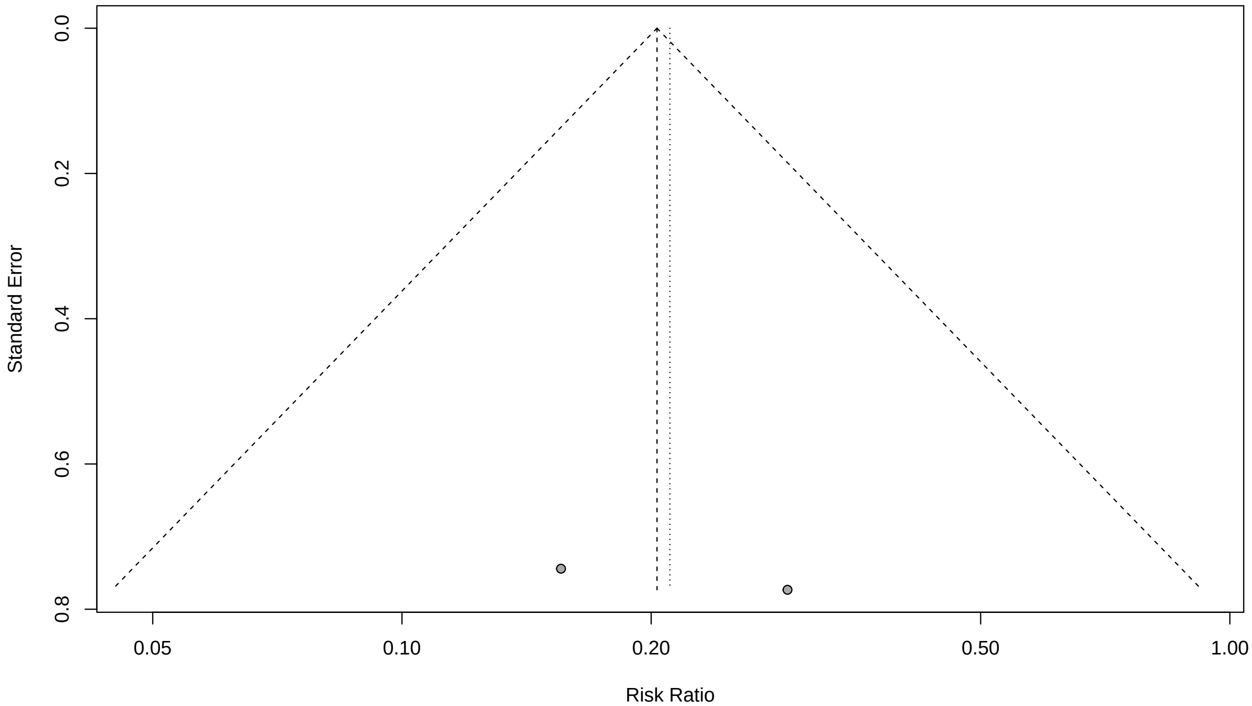


12.13.3 Trim and Fill

```
#trimfill(pain_metabin)
#forest(trimfill(pain_metabin),
#       sortvar = TE)
```

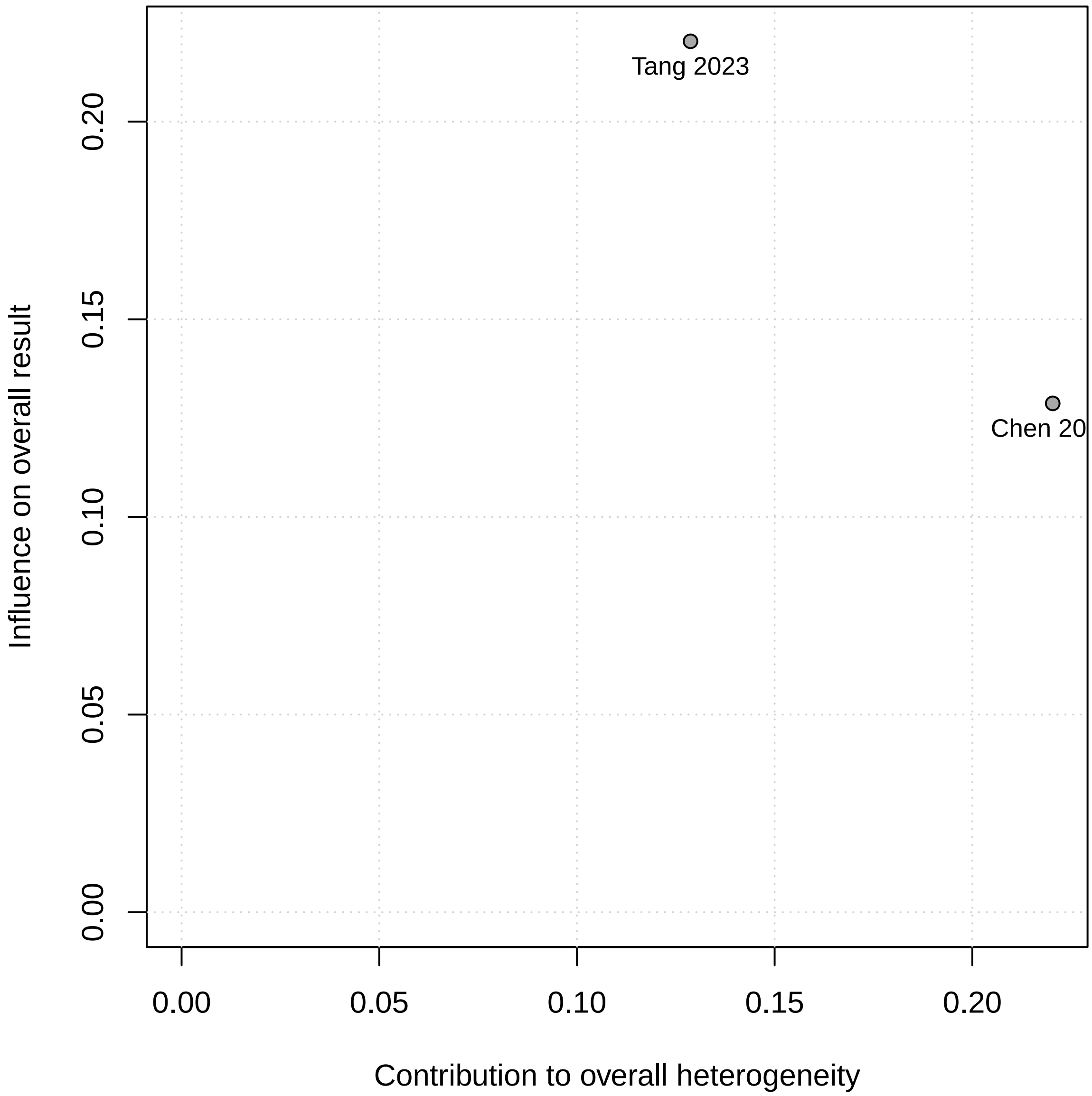
12.13.4 Funnel plot

```
funnel((pain_metabin))
```



12.13.5 Baujat

```
baujat(pain_metabin, pos = 1)
```



12.13.6 Leave one out

```
metainf(pain_metabin, pos = 1)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2     tau   I^2
## Omitting Tang 2023   0.2922 [0.0642; 1.3301]  0.1116
## Omitting Chen 2019   0.1556 [0.0362; 0.6692]  0.0124
## Omitting Lai 2020    0.2033 [0.0715; 0.5781]  0.0028  0.0000  0.0000  0.0%
## Omitting Deng 2022   0.2033 [0.0715; 0.5781]  0.0028  0.0000  0.0000  0.0%
##
## Pooled estimate      0.2033 [0.0715; 0.5781]  0.0028  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.14 Stricture

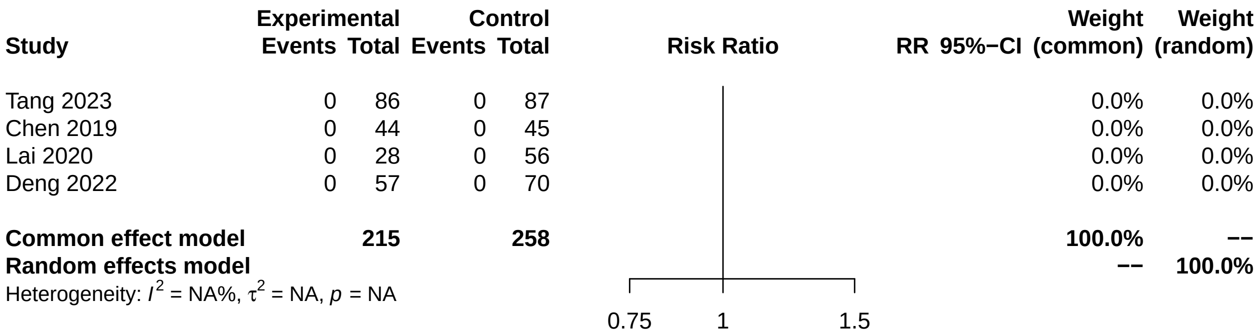
12.14.1 Meta-analysis

```
stricture_metabin <- metabin(data = minipcnl_only,
                             event.c = stricture_n_control,
                           n.c = sample_size_control,
                           event.e = stricture_n_suction,
                           n.e = sample_size_suction,
                           studlab = author_year)
stricture_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 473
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.14.2 Forest plot

```r
forest(stricture_metabin,
       sortvar = TE)
```



12.14.3 Trim and Fill

```
#trimfill(stricture_metabin)
#forest(trimfill(stricture_metabin),
#       sortvar = TE)
```

12.14.4 Funnel plot

```
#funnel((stricture_metabin))
```

12.14.5 Baujat

```
#baujat(stricture_metabin, pos = 1)
```

12.14.6 Leave one out

```
#metainf(stricture_metabin)
```

12.15 Embolisation required

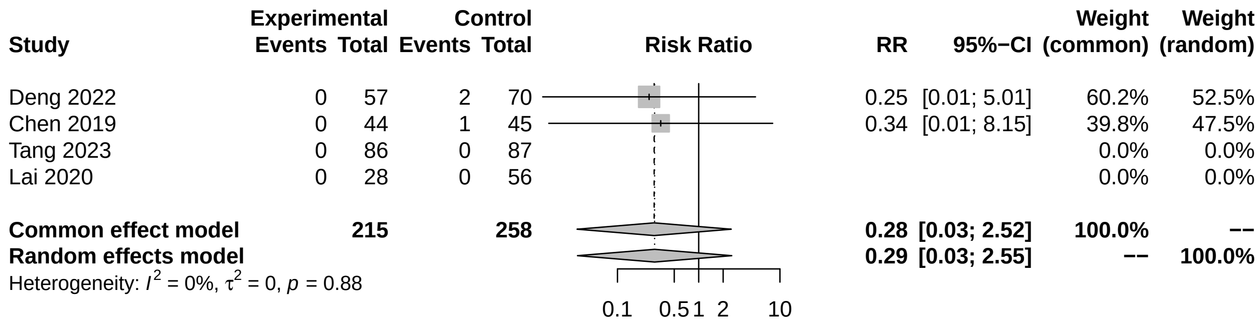
12.15.1 Meta-analysis

```
ir_embolisation_metabin <- metabin(data = minipcnl_only,
                          event.c = embolism_ir_intervention_n_control,
                        n.c = sample_size_control,
                        event.e = embolism_ir_intervention_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
ir_embolisation_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 3
##
##                          RR           95%-CI     z p-value
## Common effect model  0.2830 [0.0318; 2.5161] -1.13  0.2575
## Random effects model 0.2867 [0.0322; 2.5524] -1.12  0.2627
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.02    1  0.8828
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.15.2 Forest plot

```r
forest(ir_embolisation_metabin,
       sortvar = TE)
```

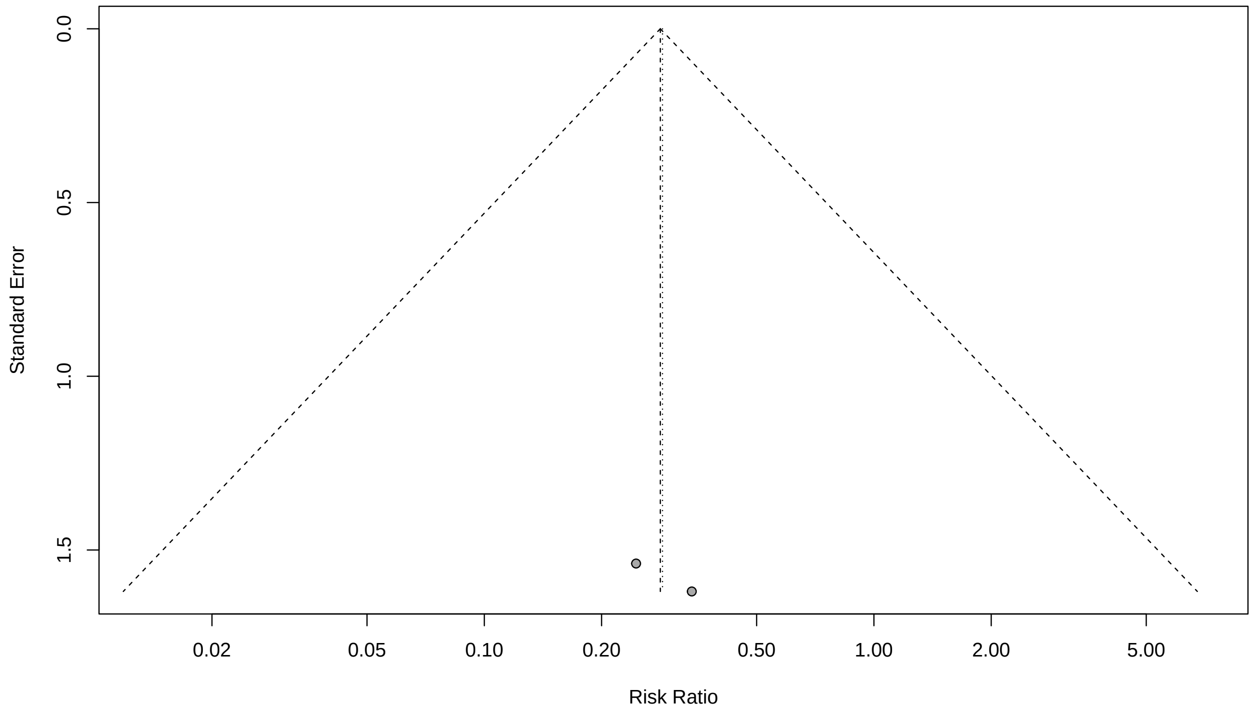


12.15.3 Trim and Fill

```
#trimfill(ir_embolisation_metabin)
#forest(trimfill(ir_embolisation_metabin),
#       sortvar = TE)
```

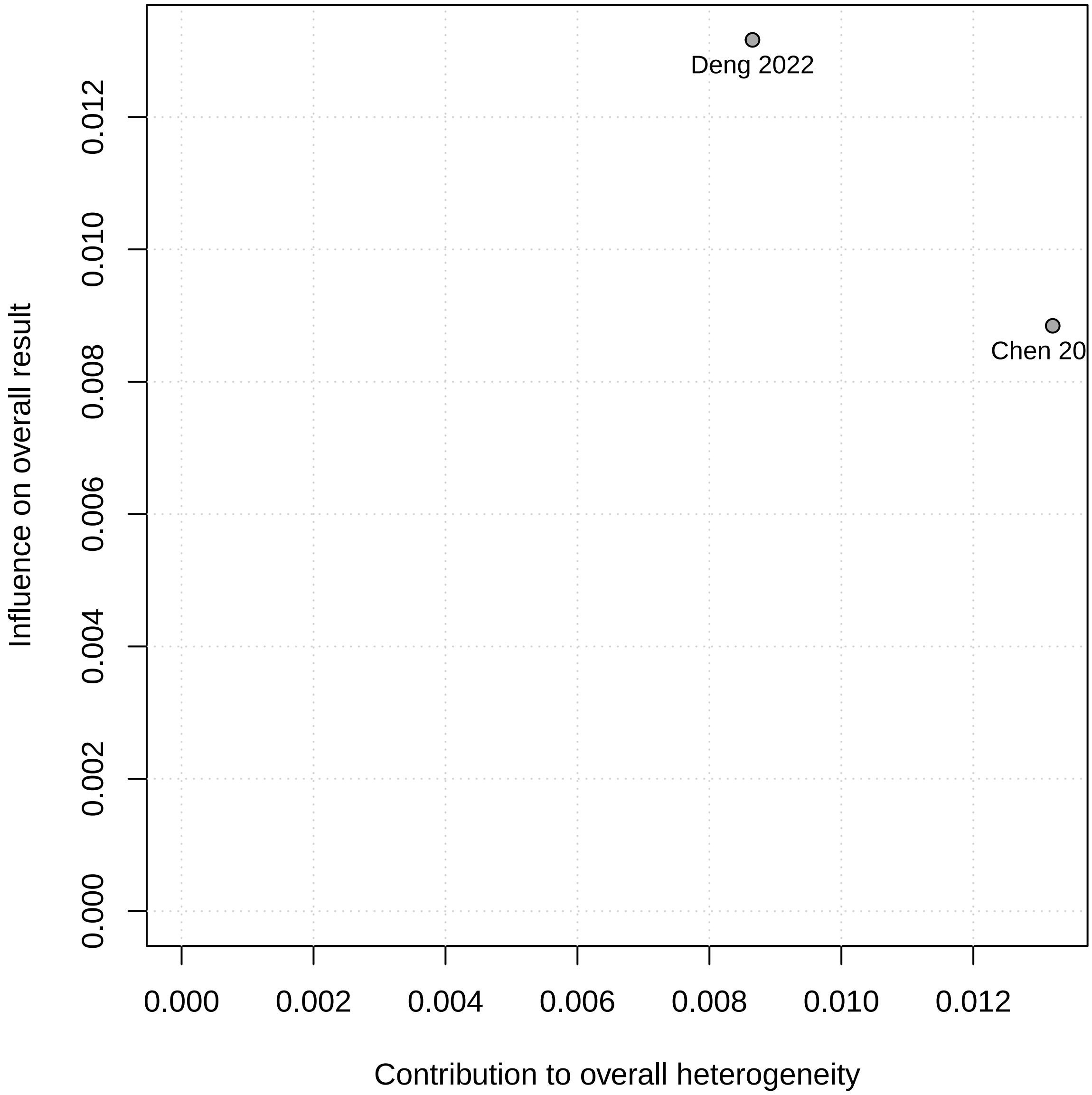
12.15.4 Funnel plot

```
funnel((ir_embolisation_metabin))
```



12.15.5 Baujat

```
baujat(ir_embolisation_metabin, pos = 1)
```



12.15.6 Leave one out

```r
metainf(ir_embolisation_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Tang 2023   0.2830 [0.0318; 2.5161]  0.2575  0.0000 0.0000  0.0%
## Omitting Chen 2019   0.2448 [0.0120; 4.9992]  0.3605
## Omitting Lai 2020    0.2830 [0.0318; 2.5161]  0.2575  0.0000 0.0000  0.0%
## Omitting Deng 2022   0.3407 [0.0143; 8.1456]  0.5062
##
## Pooled estimate      0.2830 [0.0318; 2.5161]  0.2575  0.0000 0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.16 Transfusion

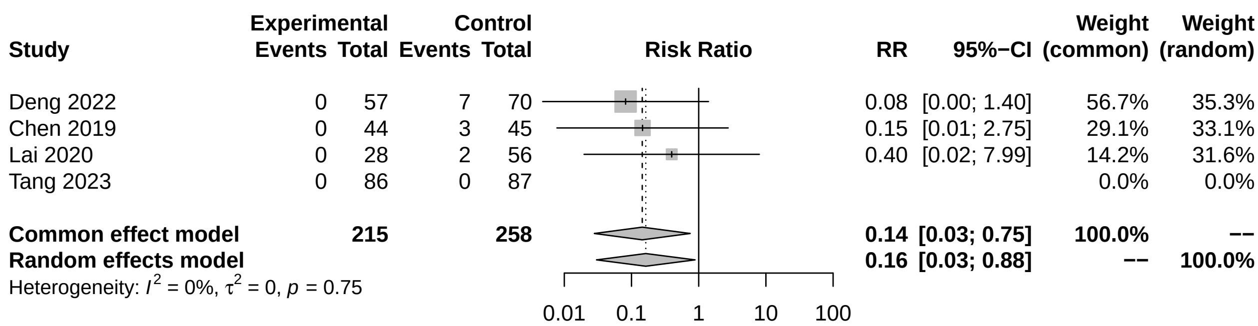
12.16.1 Meta-analysis

```
transfusion_metabin <- metabin(data = minipcnl_only,
                         event.c = transfusion_n_control,
                       n.c = sample_size_control,
                       event.e = transfusion_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
transfusion_metabin
```

```
## Number of studies: k = 3
## Number of observations: o = 473
## Number of events: e = 12
##
##                          RR           95%-CI     z p-value
## Common effect model  0.1445 [0.0280; 0.7467] -2.31  0.0210
## Random effects model 0.1632 [0.0302; 0.8826] -2.10  0.0353
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 22.9527]; tau = 0 [0.0000; 4.7909]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.57    2  0.7525
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.16.2 Forest plot

```r
forest(transfusion_metabin,
       sortvar = TE)
```



12.16.3 Trim and Fill

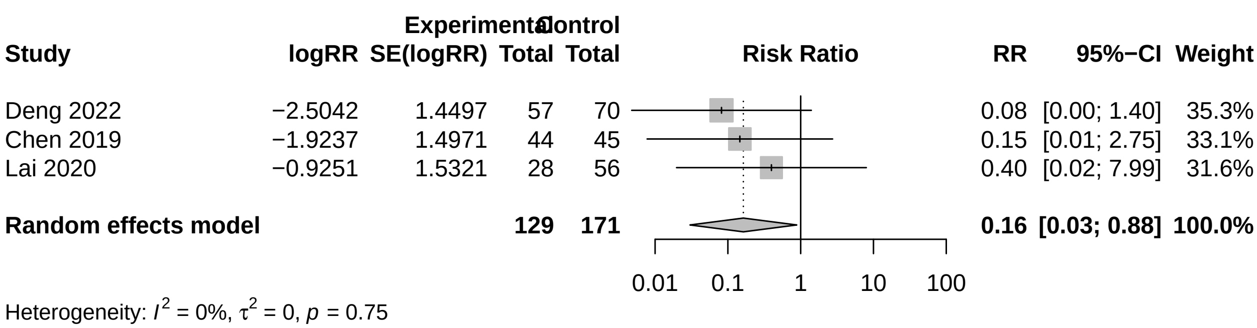
```r
trimfill(transfusion_metabin)
```

```
## Warning in trimfill.meta(transfusion_metabin): 1 observation(s) dropped due to
## missing values
```

```
## Number of studies: k = 3 (with 0 added studies)
## Number of observations: o = 300
## Number of events: e = 12
##
##                          RR           95%-CI     z p-value
## Random effects model 0.1632 [0.0302; 0.8826] -2.10  0.0353
##
## Quantifying heterogeneity:
##  tau^2 = 0 [0.0000; 22.9527]; tau = 0 [0.0000; 4.7909]
##  I^2 = 0.0% [0.0%; 89.6%]; H = 1.00 [1.00; 3.10]
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.57    2  0.7525
##
## 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
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
forest(trimfill(transfusion_metabin),
       sortvar = TE)
```

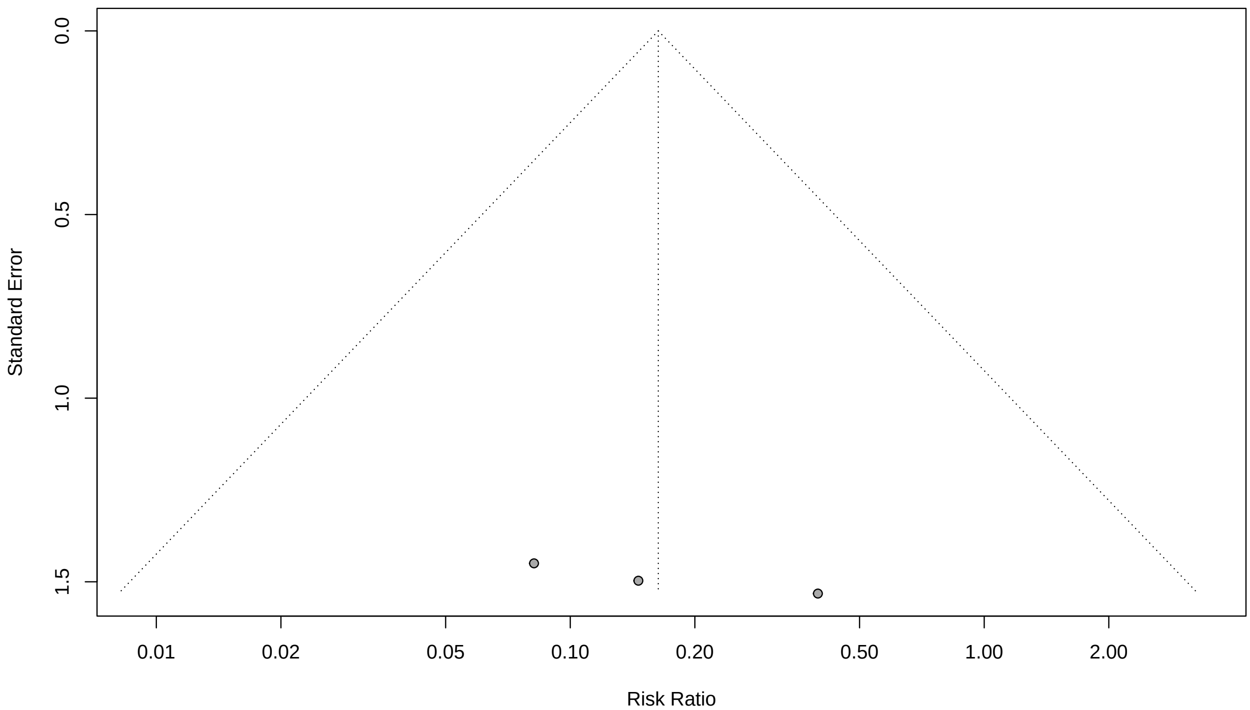
```
## Warning in trimfill.meta(transfusion_metabin): 1 observation(s) dropped due to
## missing values
```



12.16.4 Funnel plot

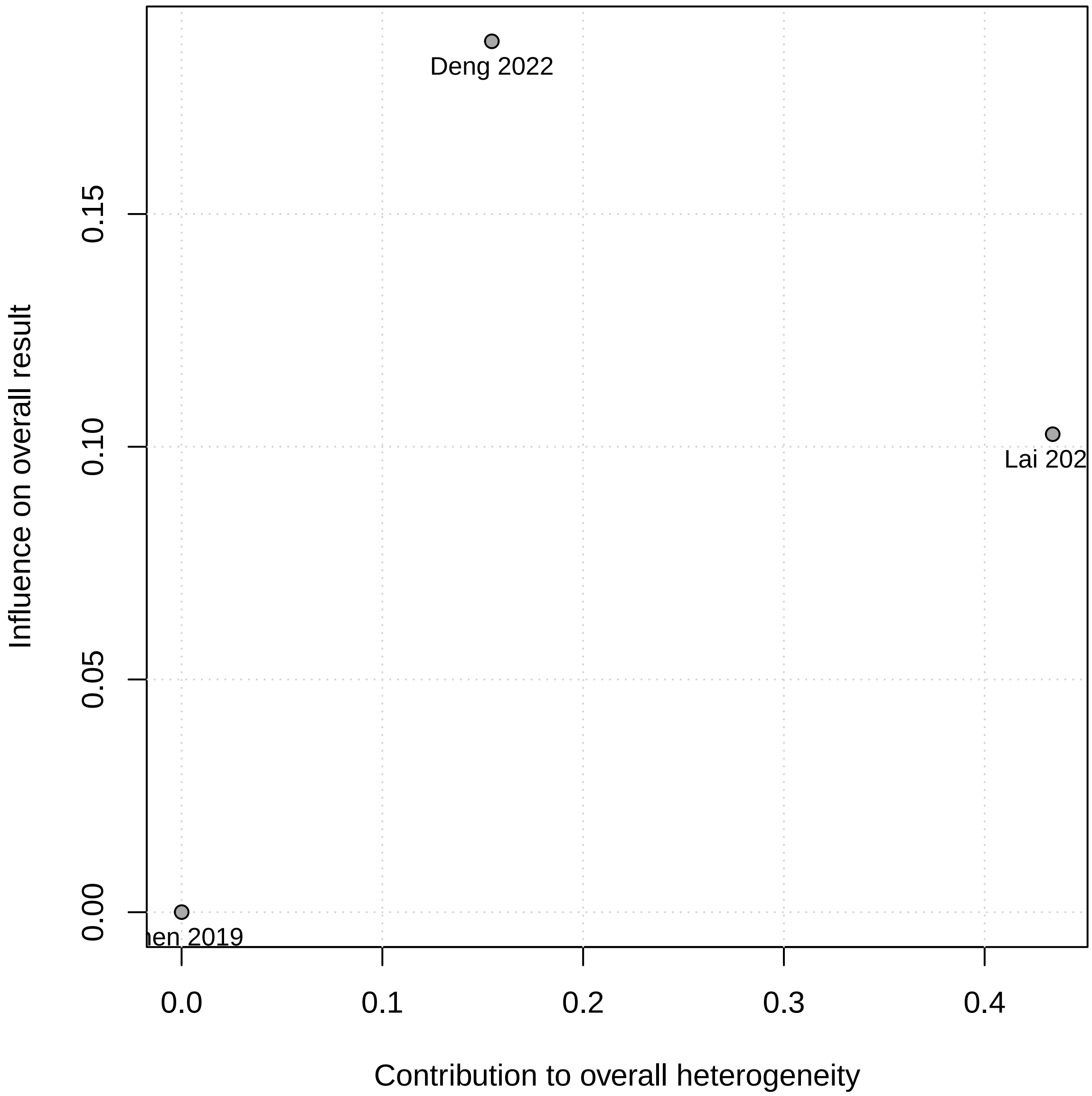
```
funnel(trimfill(transfusion_metabin))
```

```
## Warning in trimfill.meta(transfusion_metabin): 1 observation(s) dropped due to
## missing values
```



12.16.5 Baujat

```
baujat(transfusion_metabin, pos = 1)
```



12.16.6 Leave one out

```r
metainf(transfusion_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Tang 2023   0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000  0.0%
## Omitting Chen 2019   0.1439 [0.0199; 1.0412]  0.0549  0.0000  0.0000  0.0%
## Omitting Lai 2020    0.1035 [0.0134; 0.7992]  0.0296  0.0000  0.0000  0.0%
## Omitting Deng 2022   0.2270 [0.0294; 1.7540]  0.1552  0.0000  0.0000  0.0%
##
## Pooled estimate      0.1445 [0.0280; 0.7467]  0.0210  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.17 Clavien I

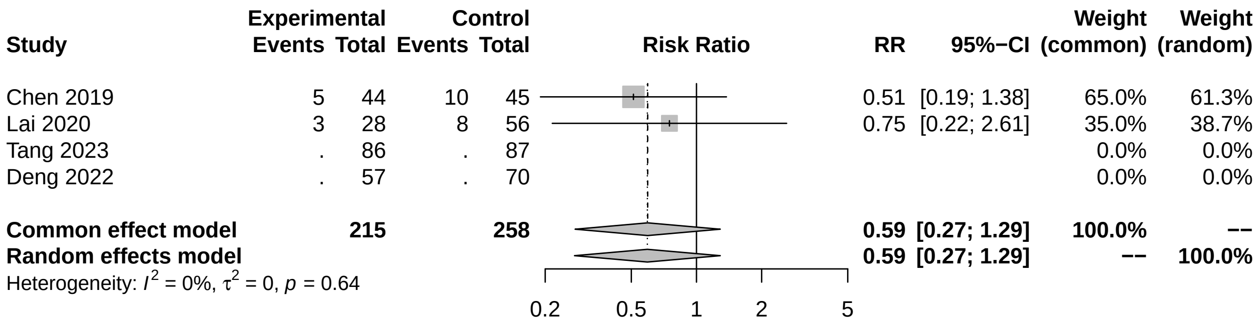
12.17.1 Meta-analysis

```
clav_i_metabin <- metabin(data = minipcnl_only,
                         event.c = clavien_i_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_i_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_i_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 26
##
##                            RR           95%-CI     z p-value
## Common effect model  0.5950 [0.2749; 1.2876] -1.32  0.1874
## Random effects model 0.5930 [0.2731; 1.2874] -1.32  0.1864
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.22    1  0.6373
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.17.2 Forest plot

```
forest(clav_i_metabin,
       sortvar = TE)
```

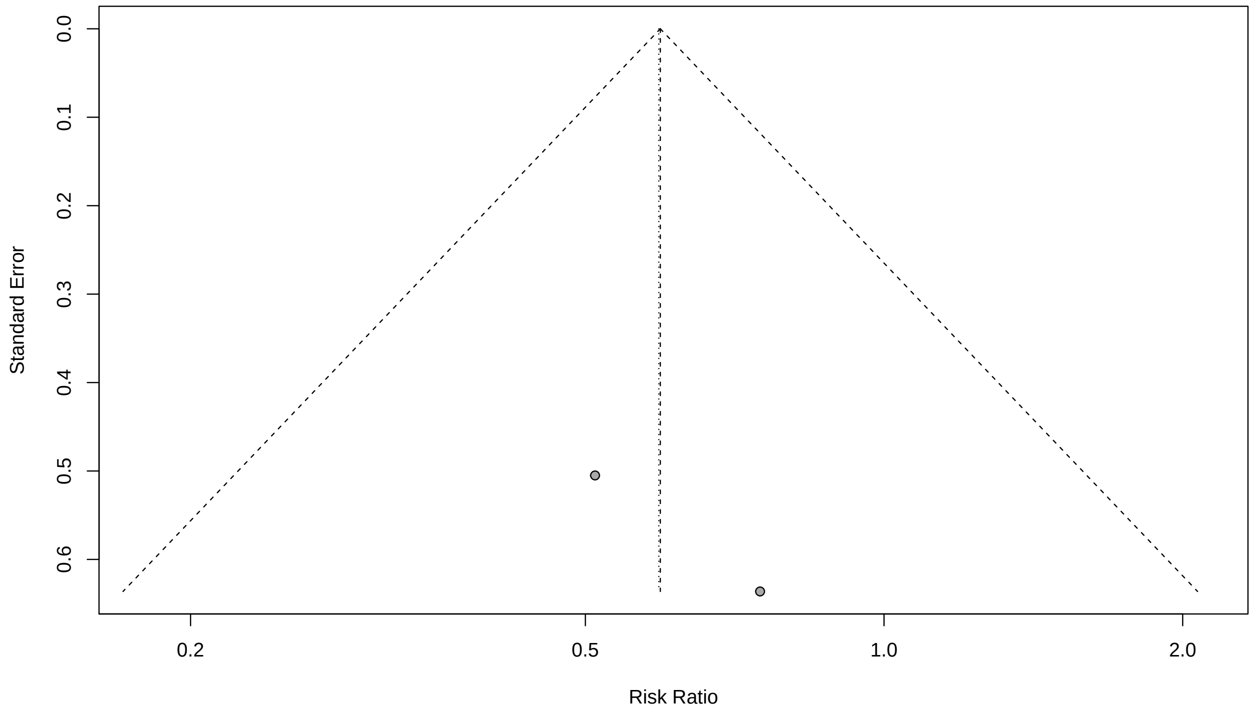


12.17.3 Trim and Fill

```
#trimfill(clav_i_metabin)
#forest(trimfill(clav_i_metabin),
#       sortvar = TE)
```

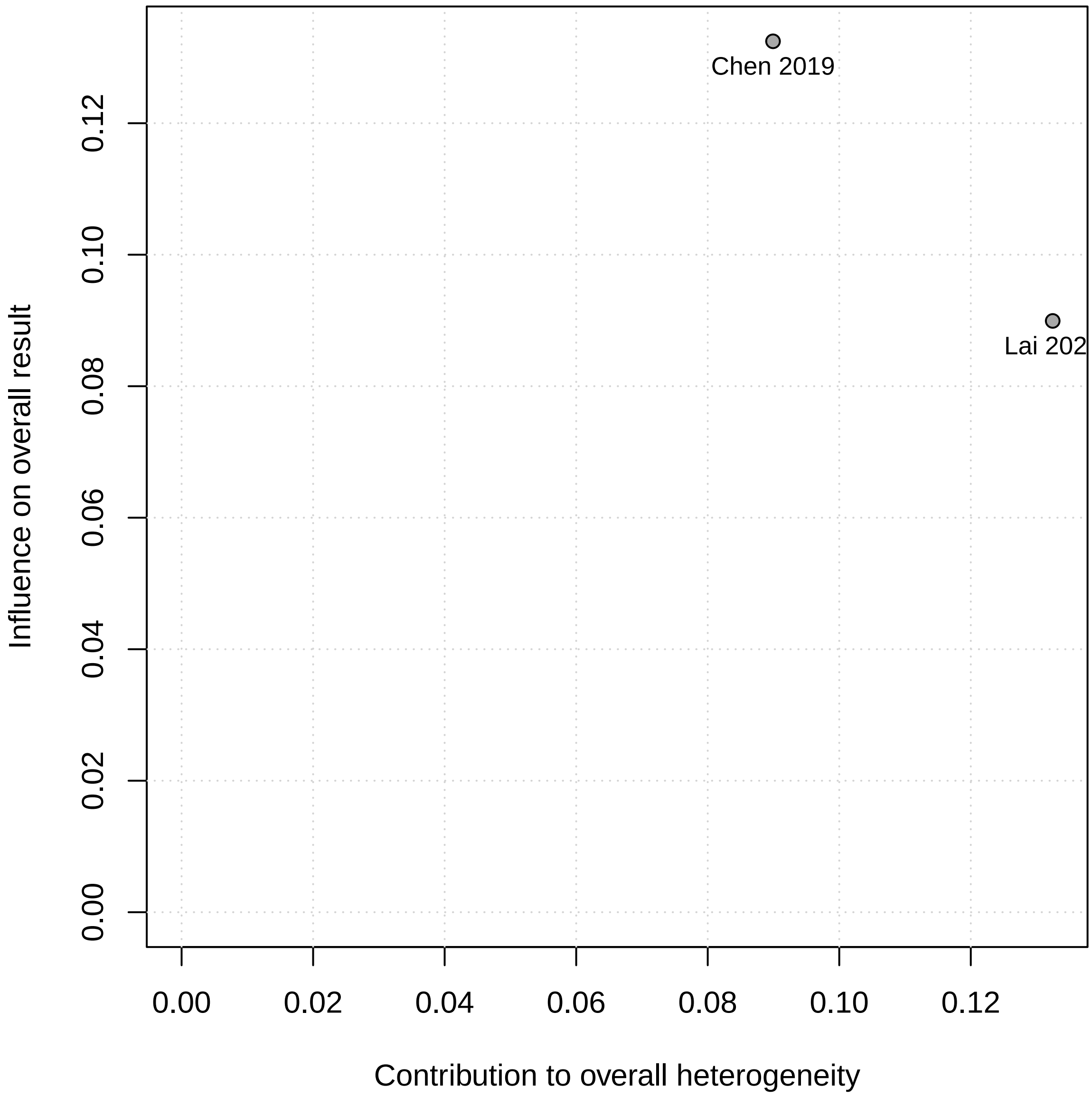
12.17.4 Funnel plot

```
funnel((clav_i_metabin))
```



12.17.5 Baujat

```
baujat(clav_i_metabin, pos = 1)
```



12.17.6 Leave one out

```
metainf(clav_i_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2    tau   I^2
## Omitting Tang 2023   0.5950 [0.2749; 1.2876]  0.1874  0.0000  0.0000  0.0%
## Omitting Chen 2019   0.7500 [0.2155; 2.6098]  0.6511
## Omitting Lai 2020    0.5114 [0.1900; 1.3760]  0.1842
## Omitting Deng 2022   0.5950 [0.2749; 1.2876]  0.1874  0.0000  0.0000  0.0%
##
## Pooled estimate      0.5950 [0.2749; 1.2876]  0.1874  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.18 Clavien II

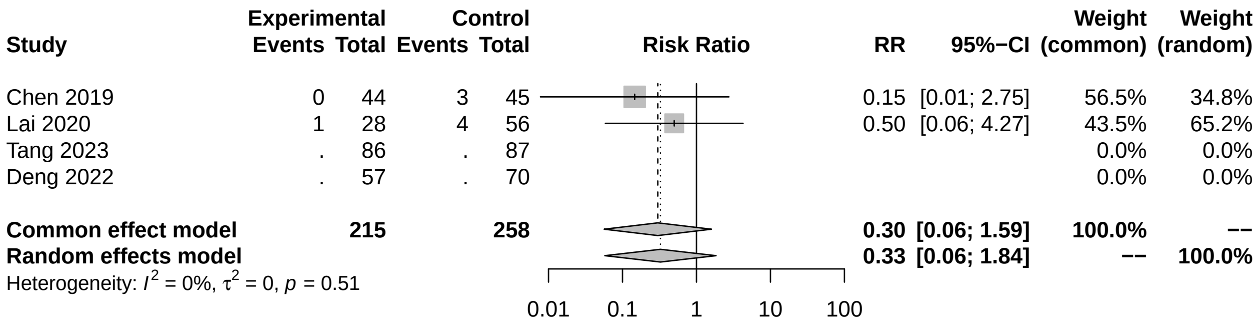
12.18.1 Meta-analysis

```
clav_ii_metabin <- metabin(data = minipcnl_only,
                         event.c = clavien_ii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_ii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_ii_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 8
##
##                           RR           95%-CI     z p-value
## Common effect model  0.3001 [0.0565; 1.5932] -1.41  0.1576
## Random effects model 0.3258 [0.0577; 1.8397] -1.27  0.2042
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.44    1  0.5069
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.18.2 Forest plot

```r
forest(clav_ii_metabin,
       sortvar = TE)
```

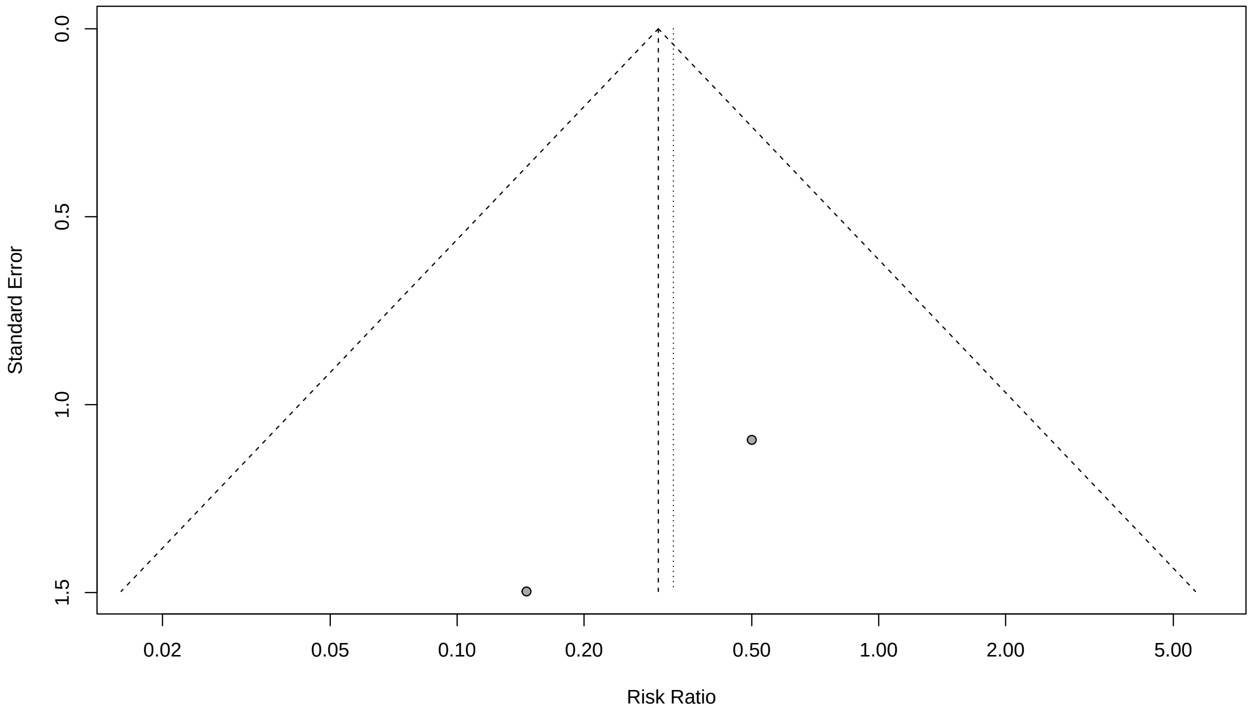


12.18.3 Trim and Fill

```
#trimfill(clav_ii_metabin)
#forest(trimfill(clav_ii_metabin),
#       sortvar = TE)
```

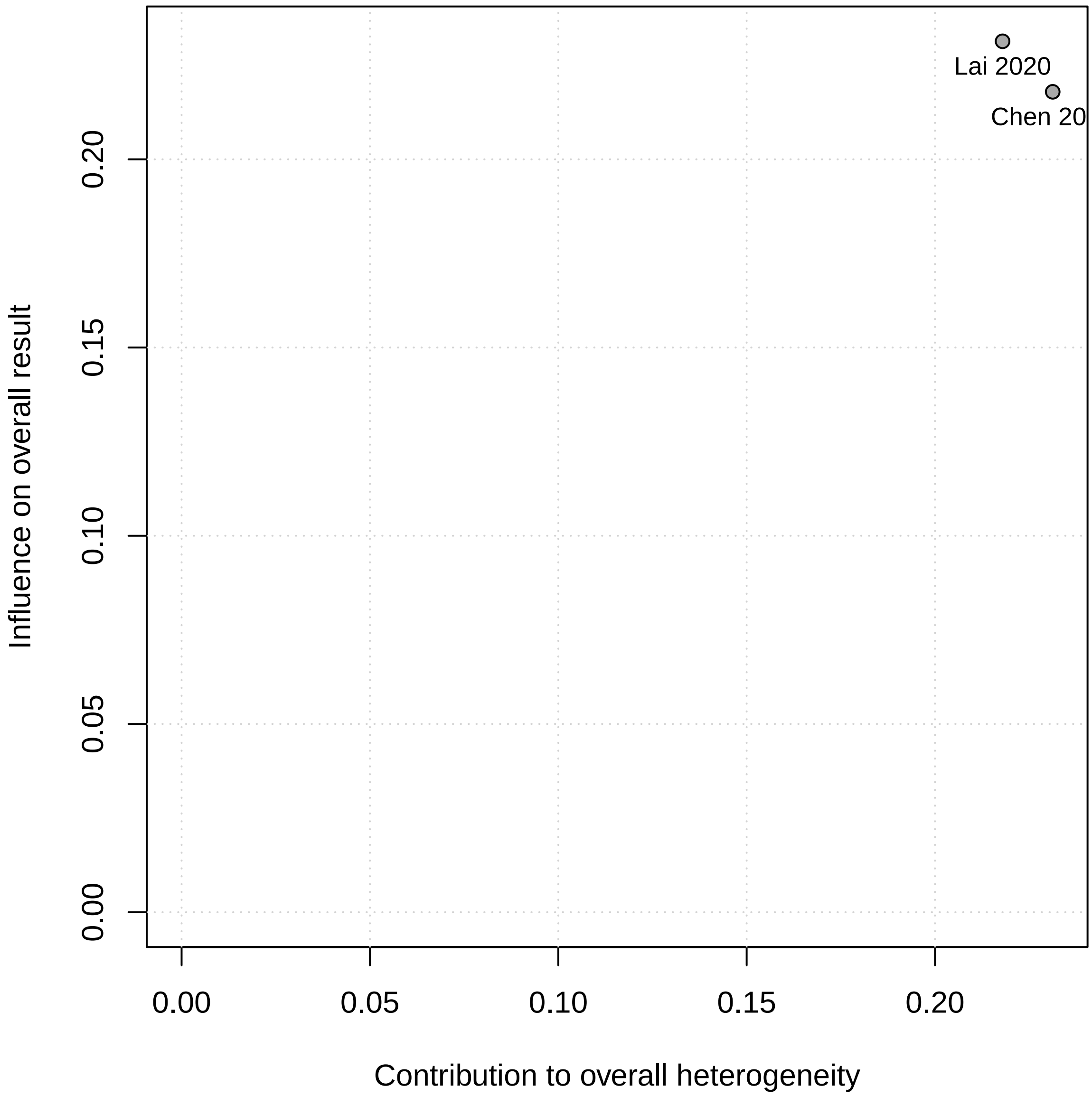
12.18.4 Funnel plot

```
funnel((clav_ii_metabin))
```



12.18.5 Baujat

```
baujat(clav_ii_metabin, pos = 1)
```



12.18.6 Leave one out

```r
metainf(clav_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR           95%-CI p-value   tau^2     tau   I^2
## Omitting Tang 2023   0.3001 [0.0565; 1.5932]  0.1576  0.0000  0.0000  0.0%
## Omitting Chen 2019   0.5000 [0.0586; 4.2661]  0.5263
## Omitting Lai 2020    0.1460 [0.0078; 2.7473]  0.1988
## Omitting Deng 2022   0.3001 [0.0565; 1.5932]  0.1576  0.0000  0.0000  0.0%
##
## Pooled estimate      0.3001 [0.0565; 1.5932]  0.1576  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.19 Clavien III

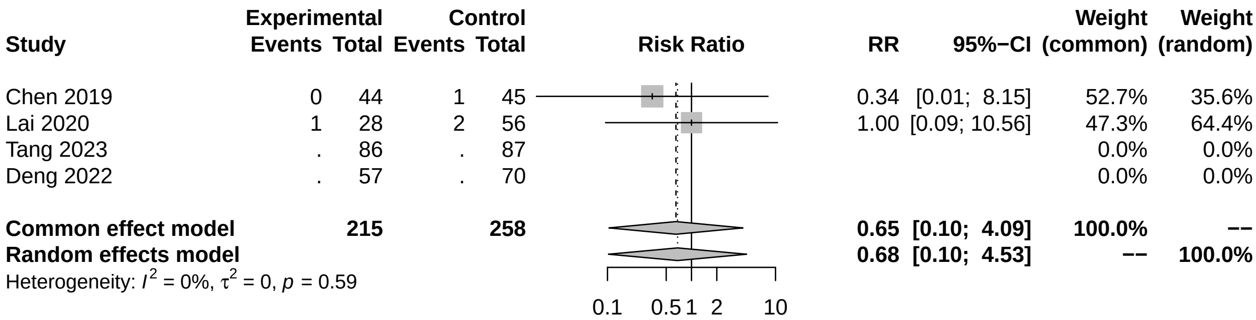
12.19.1 Meta-analysis

```
clav_iii_metabin <- metabin(data = minipcnl_only,
                         event.c = clavien_iii_n_control,
                       n.c = sample_size_control,
                       event.e = clavien_iii_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 4
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6528 [0.1042; 4.0882] -0.46  0.6487
## Random effects model 0.6820 [0.1028; 4.5254] -0.40  0.6919
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.28    1  0.5936
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.19.2 Forest plot

```r
forest(clav_iii_metabin,
       sortvar = TE)
```

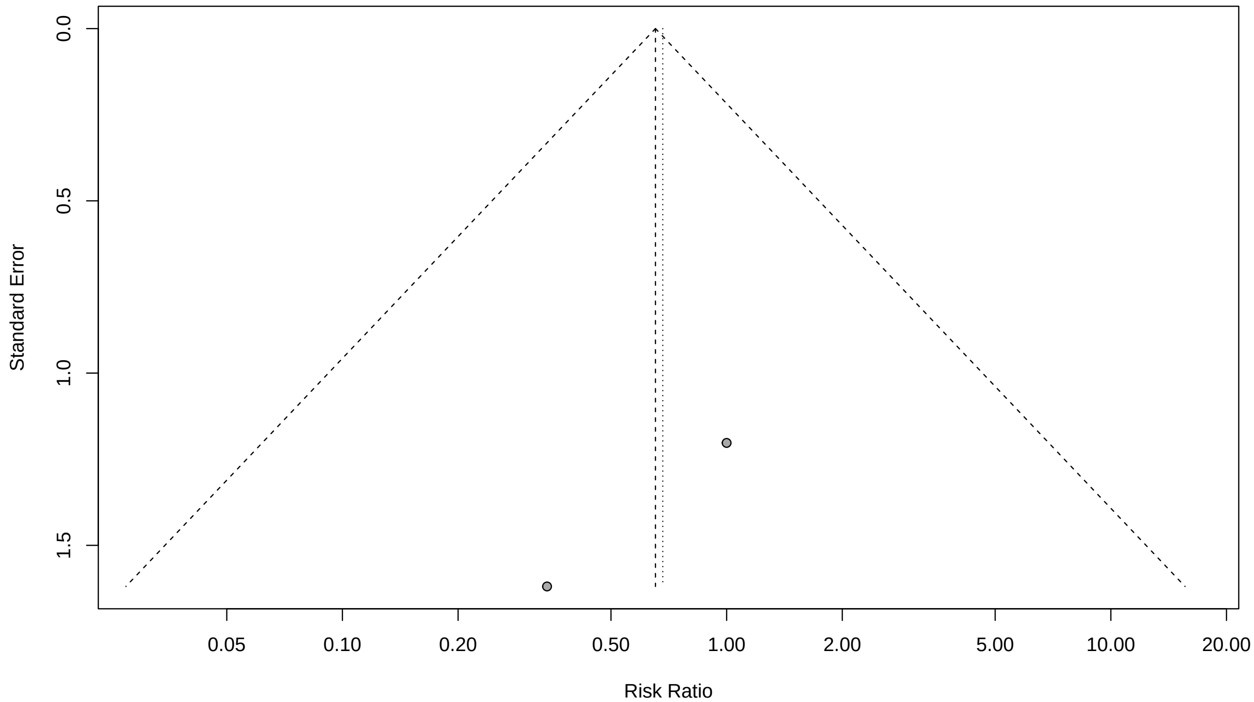


12.19.3 Trim and Fill

```
#trimfill(clav_iii_metabin)
#forest(trimfill(clav_iii_metabin),
#       sortvar = TE)
```

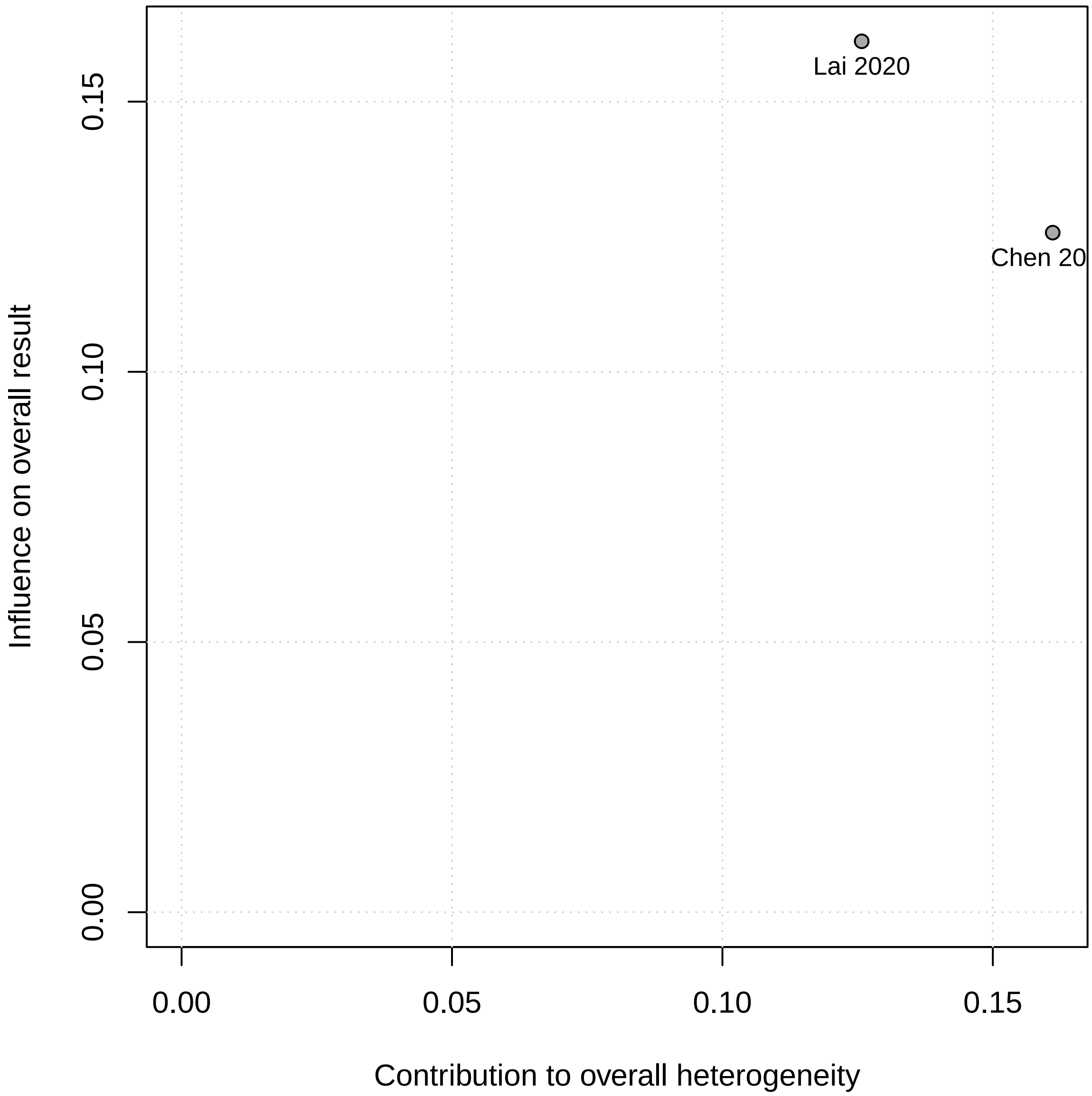
12.19.4 Funnel plot

```
funnel((clav_iii_metabin))
```



12.19.5 Baujat

```
baujat(clav_iii_metabin, pos = 1)
```



12.19.6 Leave one out

```
metainf(clav_iii_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR            95%-CI p-value   tau^2     tau   I^2
## Omitting Tang 2023   0.6528 [0.1042;  4.0882]  0.6487  0.0000  0.0000  0.0%
## Omitting Chen 2019   1.0000 [0.0947; 10.5613]  1.0000
## Omitting Lai 2020    0.3407 [0.0143;  8.1456]  0.5062
## Omitting Deng 2022   0.6528 [0.1042;  4.0882]  0.6487  0.0000  0.0000  0.0%
##
## Pooled estimate      0.6528 [0.1042;  4.0882]  0.6487  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.20 Clavien IV

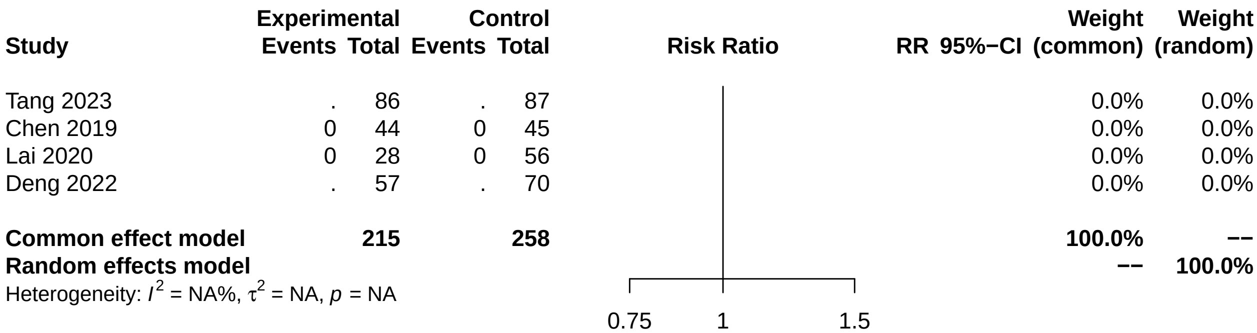
12.20.1 Meta-analysis

```
clav_iv_metabin <- metabin(data = minipcnl_only,
                             event.c = clavien_iv_n_control,
                           n.c = sample_size_control,
                           event.e = clavien_iv_n_suction,
                           n.e = sample_size_suction,
                           studlab = author_year)
clav_iv_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 473
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA         --      --
## Random effects model NA         --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.20.2 Forest plot

```r
forest(clav_iv_metabin,
       sortvar = TE)
```



12.20.3 Trim and Fill

```
#trimfill(clav_iv_metabin)
#forest(trimfill(clav_iv_metabin),
#       sortvar = TE)
```

12.20.4 Funnel plot

```
#funnel((clav_iv_metabin))
```

12.20.5 Baujat

```
#baujat(clav_iv_metabin, pos = 1)
```

12.20.6 Leave one out

```
#metainf(clav_iv_metabin)
```

12.21 Clavien V

12.21.1 Meta-analysis

```
clav_v_metabin <- metabin(data = minipcnl_only,
                          event.c = clavien_v_n_control,
                        n.c = sample_size_control,
                        event.e = clavien_v_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_v_metabin
```

```
## Number of studies: k = 0
## Number of observations: o = 473
## Number of events: e = 0
##
##                       RR 95%-CI  z p-value
## Common effect model  NA        --      --
## Random effects model NA        --      --
##
## Quantifying heterogeneity:
##  tau^2 = NA; tau = NA; I^2 = NA; H = NA
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.21.2 Forest plot

```
#forest(clav_v_metabin,
#       sortvar = TE)
```

12.21.3 Trim and Fill

```
#trimfill(clav_v_metabin)
#forest(trimfill(clav_v_metabin),
#       sortvar = TE)
```

12.21.4 Funnel plot

```
#funnel(trimfill(clav_v_metabin))
```

12.21.5 Baujat

```
#baujat(clav_v_metabin, pos = 1)
```

12.21.6 Leave one out

```
#metainf(clav_v_metabin)
```

12.22 Clavien I-II

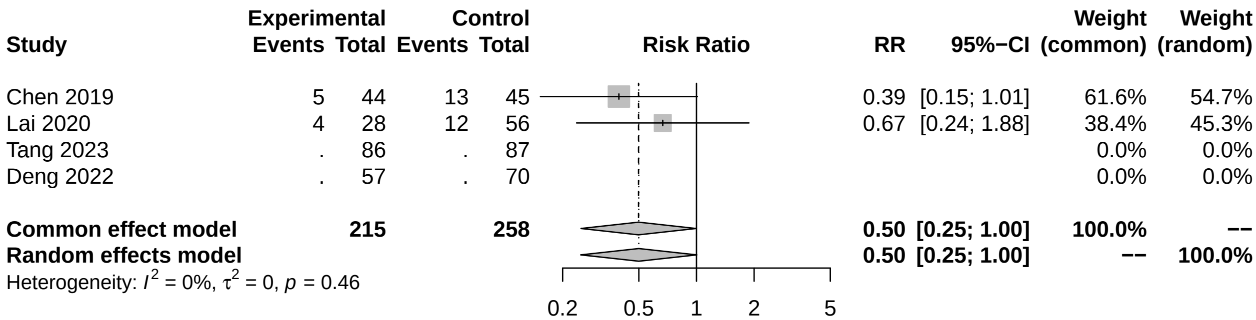
12.22.1 Meta-analysis

```
clav_i_ii_metabin <- metabin(data = minipcnl_only,
                          event.c = clav_i_ii_n_control,
                        n.c = sample_size_control,
                        event.e = clav_i_ii_n_suction,
                        n.e = sample_size_suction,
                        studlab = author_year)
clav_i_ii_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 34
##
##                          RR           95%-CI     z p-value
## Common effect model  0.4982 [0.2494; 0.9953] -1.97  0.0485
## Random effects model 0.4996 [0.2486; 1.0041] -1.95  0.0514
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.54    1  0.4608
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
```

12.22.2 Forest plot

```r
forest(clav_i_ii_metabin,
       sortvar = TE)
```

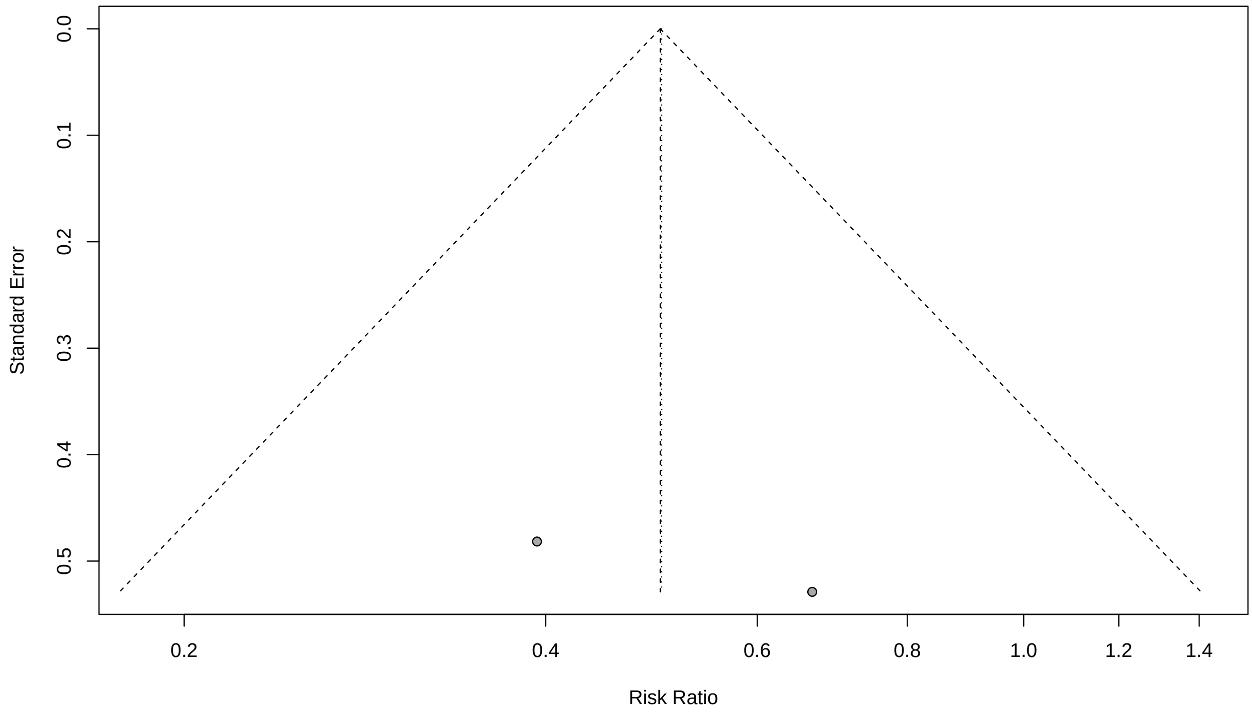


12.22.3 Trim and Fill

```
#trimfill(clav_i_ii_metabin)
#forest(trimfill(clav_i_ii_metabin),
#       sortvar = TE)
```

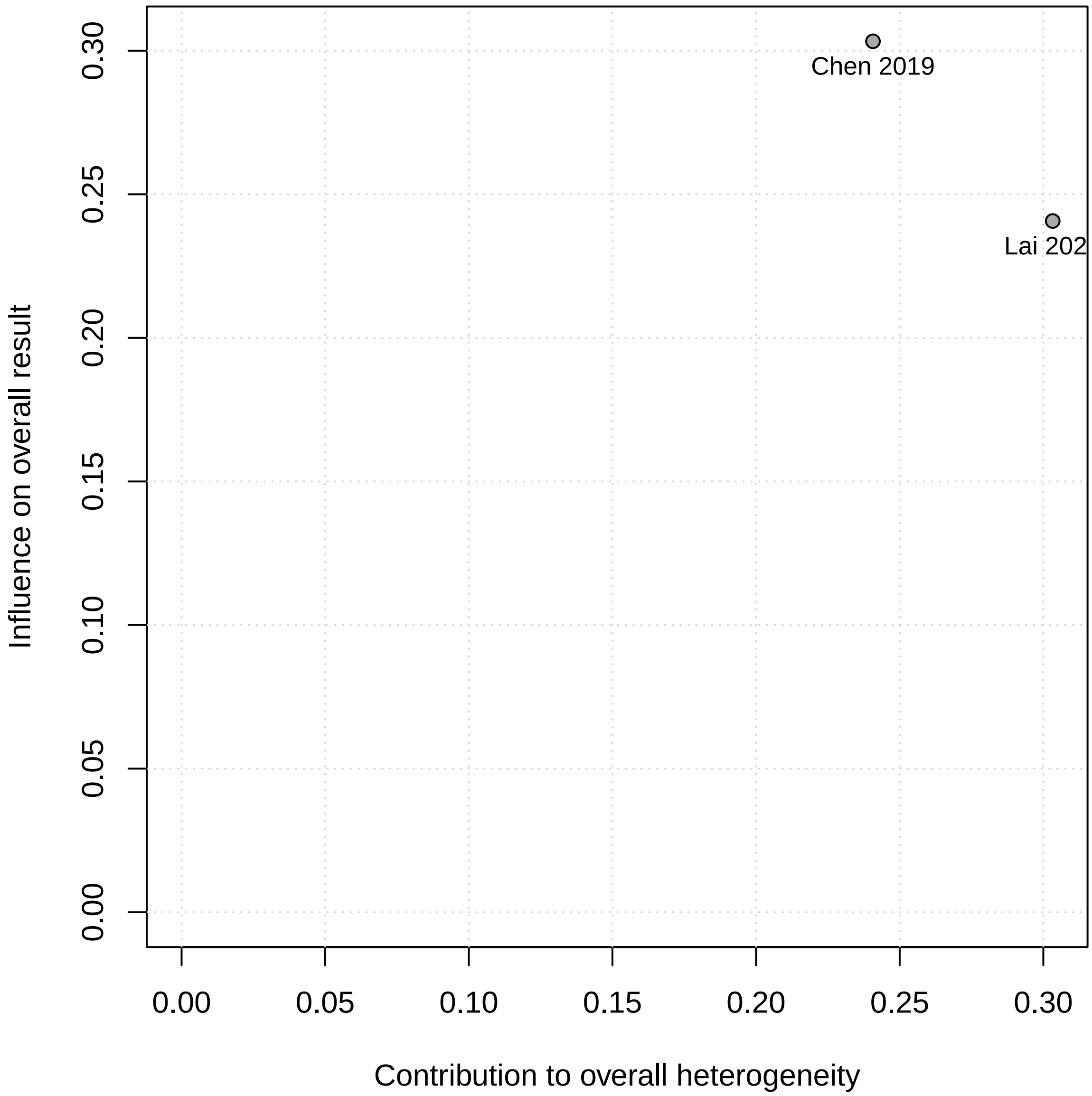
12.22.4 Funnel plot

```
funnel((clav_i_ii_metabin))
```



12.22.5 Baujat

```
baujat(clav_i_ii_metabin, pos = 1)
```



12.22.6 Leave one out

```r
metainf(clav_i_ii_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR            95%-CI p-value   tau^2     tau   I^2
## Omitting Tang 2023   0.4982 [0.2494; 0.9953]  0.0485  0.0000  0.0000  0.0%
## Omitting Chen 2019   0.6667 [0.2364; 1.8799]  0.4433
## Omitting Lai 2020    0.3934 [0.1530; 1.0110]  0.0527
## Omitting Deng 2022   0.4982 [0.2494; 0.9953]  0.0485  0.0000  0.0000  0.0%
##
## Pooled estimate      0.4982 [0.2494; 0.9953]  0.0485  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

12.23 Clavien III-V

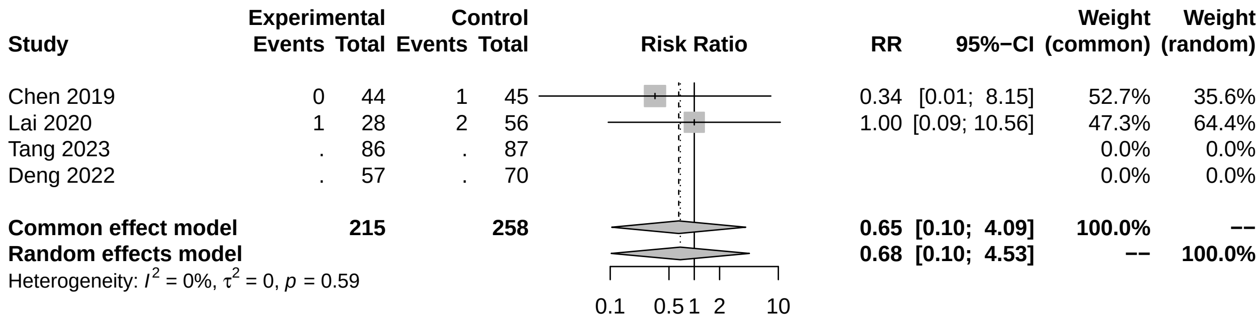
12.23.1 Meta-analysis

```
clav_iii_v_metabin <- metabin(data = minipcnl_only,
                         event.c = clav_iii_v_n_control,
                       n.c = sample_size_control,
                       event.e = clav_iii_v_n_suction,
                       n.e = sample_size_suction,
                       studlab = author_year)
clav_iii_v_metabin
```

```
## Number of studies: k = 2
## Number of observations: o = 473
## Number of events: e = 4
##
##                          RR           95%-CI     z p-value
## Common effect model  0.6528 [0.1042; 4.0882] -0.46  0.6487
## Random effects model 0.6820 [0.1028; 4.5254] -0.40  0.6919
##
## Quantifying heterogeneity:
##  tau^2 = 0; tau = 0; I^2 = 0.0%; H = 1.00
##
## Test of heterogeneity:
##     Q d.f. p-value
##  0.28    1  0.5936
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Continuity correction of 0.5 in studies with zero cell frequencies
```

12.23.2 Forest plot

```r
forest(clav_iii_v_metabin,
       sortvar = TE)
```

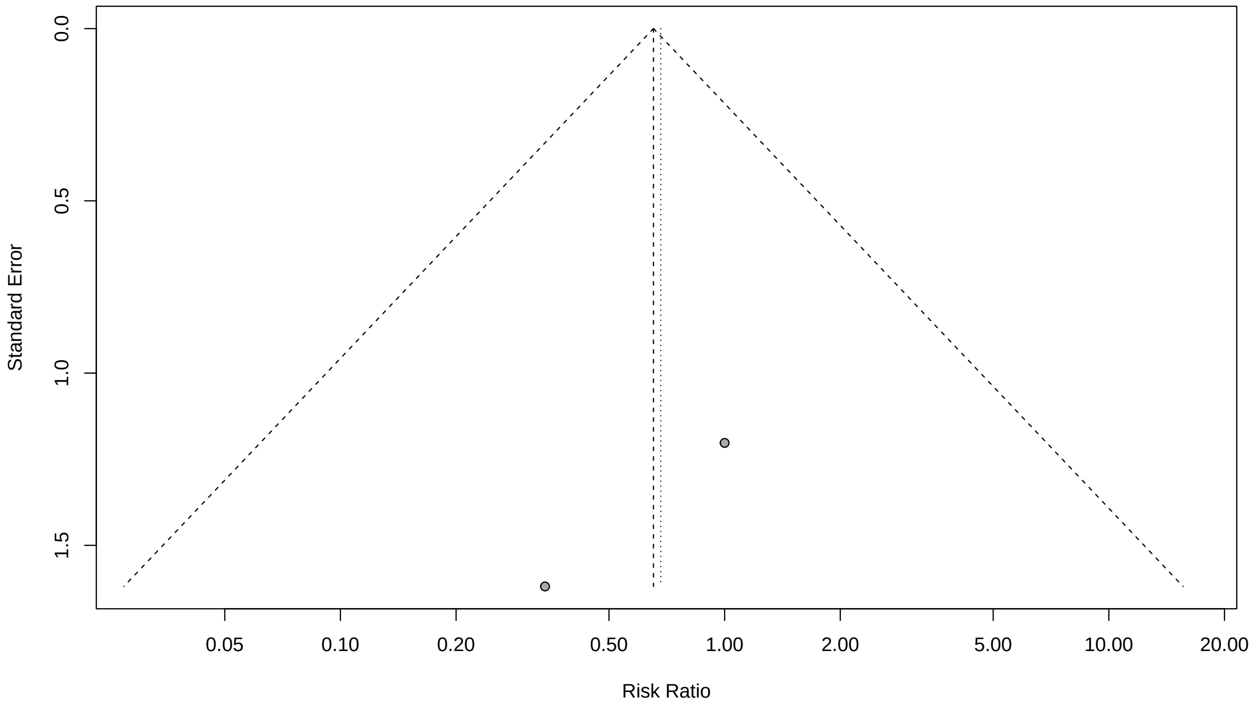


12.23.3 Trim and Fill

```
#trimfill(clav_iii_v_metabin)
#forest(trimfill(clav_iii_v_metabin),
#       sortvar = TE)
```

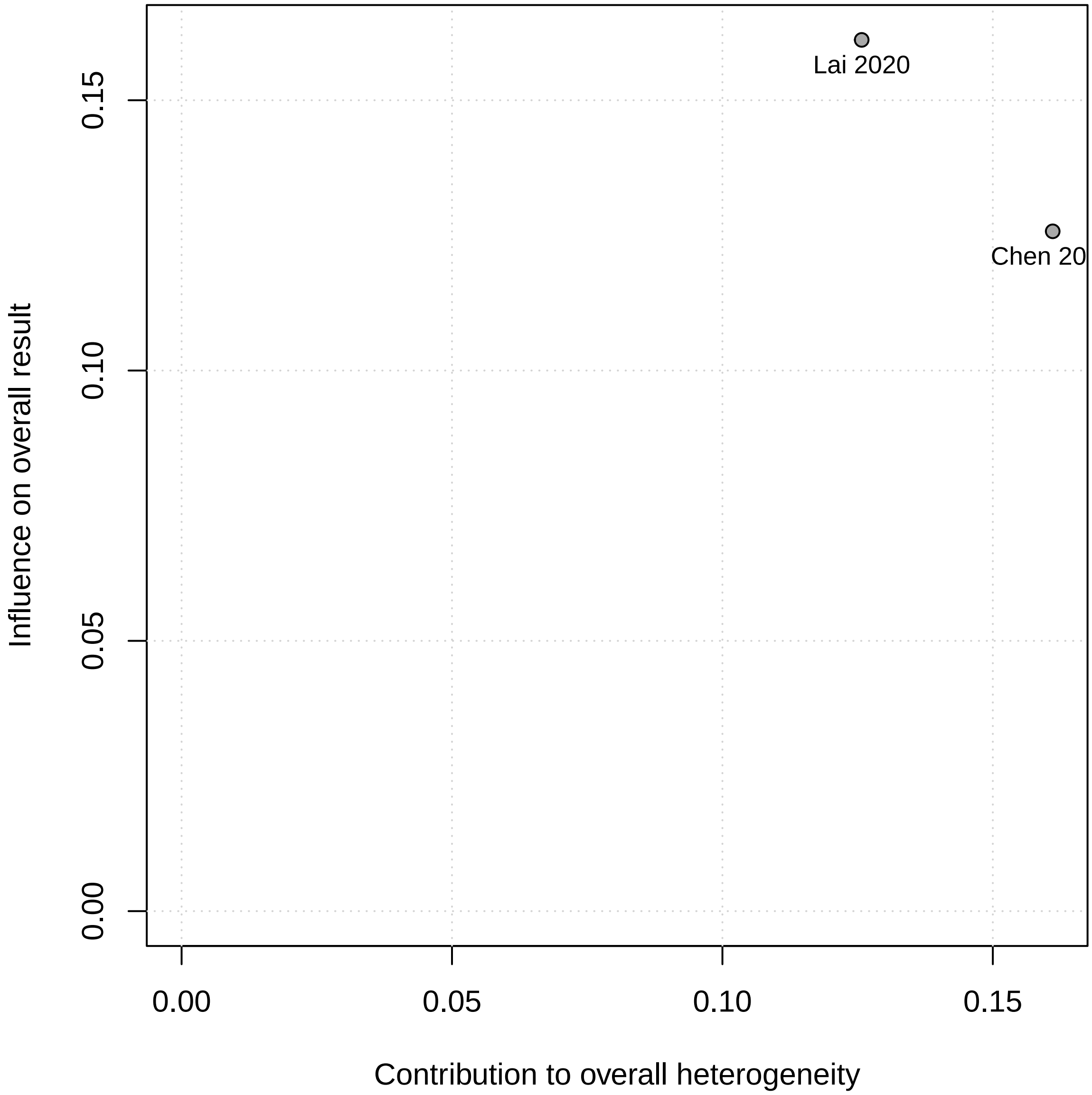
12.23.4 Funnel plot

```
funnel((clav_iii_v_metabin))
```



12.23.5 Baujat

```
baujat(clav_iii_v_metabin, pos = 1)
```



12.23.6 Leave one out

```r
metainf(clav_iii_v_metabin)
```

```
## Influential analysis (common effect model)
##
##                          RR            95%-CI p-value   tau^2    tau   I^2
## Omitting Tang 2023   0.6528 [0.1042;  4.0882]  0.6487  0.0000  0.0000  0.0%
## Omitting Chen 2019   1.0000 [0.0947; 10.5613]  1.0000
## Omitting Lai 2020    0.3407 [0.0143;  8.1456]  0.5062
## Omitting Deng 2022   0.6528 [0.1042;  4.0882]  0.6487  0.0000  0.0000  0.0%
##
## Pooled estimate      0.6528 [0.1042;  4.0882]  0.6487  0.0000  0.0000  0.0%
##
## Details on meta-analytical method:
## - Mantel-Haenszel method
## - Restricted maximum-likelihood estimator for tau^2
```

13 Mini-PCNL vs Flexi URS Summary Forest plots

```r
overall <- cbind(
  "Outcome" = c(
    "Immediate SFR",
    "Final SFR",
    "Auxiliary Treatment",
    "Overall Complications",
    "Fever",
    "Infection",
    "Sepsis",
    "Abscess",
    "Haematoma",
    "Pain",
    "Stricture",
    "Embolisation",
    "Transfusion",
    "CD I",
    "CD II",
    "CD III",
    "CD IV",
    "CD I-II",
    "CD III-V",
    "Operative time",
    "VAS",
    "Length of Stay"
  ),
  "type" = c(
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "binary",
    "cont",
    "cont",
    "cont"
  ),
  "n_studies" = c(
    immediate_sfr_metabin$k,
```

```
  sfr_metabin$k,
aux_rx_metabin$k,
comp_metabin$k,
fever_metabin$k,
infection_metabin$k,
sepsis_metabin$k,
abscess_metabin$k,
haematoma_metabin$k,
pain_metabin$k,
stricture_metabin$k,
ir_embolisation_metabin$k,
transfusion_metabin$k,
clav_i_metabin$k,
clav_ii_metabin$k,
clav_iii_metabin$k,
clav_iv_metabin$k,
clav_i_ii_metabin$k,
clav_iii_v_metabin$k,
or_time_metacont$k,
vas_metacont$k,
los_metacont$k),
"es" = c(
  immediate_sfr_metabin$TE.random %>% exp(),
  sfr_metabin$TE.random %>% exp(),
aux_rx_metabin$TE.random %>% exp(),
comp_metabin$TE.random %>% exp(),
fever_metabin$TE.random %>% exp(),
infection_metabin$TE.random %>% exp(),
sepsis_metabin$TE.random %>% exp(),
abscess_metabin$TE.random %>% exp(),
haematoma_metabin$TE.random %>% exp(),
pain_metabin$TE.random %>% exp(),
stricture_metabin$TE.random %>% exp(),
ir_embolisation_metabin$TE.random %>% exp(),
transfusion_metabin$TE.random %>% exp(),
clav_i_metabin$TE.random %>% exp(),
clav_ii_metabin$TE.random %>% exp(),
clav_iii_metabin$TE.random %>% exp(),
clav_iv_metabin$TE.random %>% exp(),
clav_i_ii_metabin$TE.random %>% exp(),
clav_iii_v_metabin$TE.random %>% exp(),
or_time_metacont$TE.random,
vas_metacont$TE.random,
los_metacont$TE.random),
"lower_ci" = c(
  immediate_sfr_metabin$lower.random %>% exp(),
  sfr_metabin$lower.random %>% exp(),
aux_rx_metabin$lower.random %>% exp(),
comp_metabin$lower.random %>% exp(),
fever_metabin$lower.random %>% exp(),
infection_metabin$lower.random %>% exp(),
sepsis_metabin$lower.random %>% exp(),
abscess_metabin$lower.random %>% exp(),
```

```
haematoma_metabin$lower.random %>% exp(),
pain_metabin$lower.random %>% exp(),
stricture_metabin$lower.random %>% exp(),
ir_embolisation_metabin$lower.random %>% exp(),
transfusion_metabin$lower.random %>% exp(),
clav_i_metabin$lower.random %>% exp(),
clav_ii_metabin$lower.random %>% exp(),
clav_iii_metabin$lower.random %>% exp(),
clav_iv_metabin$lower.random %>% exp(),
clav_i_ii_metabin$lower.random %>% exp(),
clav_iii_v_metabin$lower.random %>% exp(),
or_time_metacont$lower.random,
vas_metacont$lower.random,
los_metacont$lower.random),
"upper_ci" = c(immediate_sfr_metabin$upper.random %>% exp(),
               sfr_metabin$upper.random %>% exp(),
aux_rx_metabin$upper.random %>% exp(),
comp_metabin$upper.random %>% exp(),
fever_metabin$upper.random %>% exp(),
infection_metabin$upper.random %>% exp(),
sepsis_metabin$upper.random %>% exp(),
abscess_metabin$upper.random %>% exp(),
haematoma_metabin$upper.random %>% exp(),
pain_metabin$upper.random %>% exp(),
stricture_metabin$upper.random %>% exp(),
ir_embolisation_metabin$upper.random %>% exp(),
transfusion_metabin$upper.random %>% exp(),
clav_i_metabin$upper.random %>% exp(),
clav_ii_metabin$upper.random %>% exp(),
clav_iii_metabin$upper.random %>% exp(),
clav_iv_metabin$upper.random %>% exp(),
clav_i_ii_metabin$upper.random %>% exp(),
clav_iii_v_metabin$upper.random %>% exp(),
or_time_metacont$upper.random,
vas_metacont$upper.random,
los_metacont$upper.random),
"p" = c(
  immediate_sfr_metabin$pval.random,
  sfr_metabin$pval.random,
aux_rx_metabin$pval.random,
comp_metabin$pval.random,
fever_metabin$pval.random,
infection_metabin$pval.random,
sepsis_metabin$pval.random,
abscess_metabin$pval.random,
haematoma_metabin$pval.random,
pain_metabin$pval.random,
stricture_metabin$pval.random,
ir_embolisation_metabin$pval.random,
transfusion_metabin$pval.random,
clav_i_metabin$pval.random,
clav_ii_metabin$pval.random,
clav_iii_metabin$pval.random,
```

```
clav_iv_metabin$pval.random,
clav_i_ii_metabin$pval.random,
clav_iii_v_metabin$pval.random,
or_time_metacont$pval.random,
vas_metacont$pval.random,
los_metacont$pval.random)) %>% as_tibble() %>% drop_na(es)

overall$es <- as.numeric(overall$es)
overall$es <- round(overall$es, digits = 2)

overall$lower_ci <- as.numeric(overall$lower_ci)
overall$lower_ci <- round(overall$lower_ci, digits = 2)

overall$upper_ci <- as.numeric(overall$upper_ci)
overall$upper_ci <- round(overall$upper_ci, digits = 2)

overall$p <- as.numeric(overall$p)
overall$p <- round(overall$p, digits = 2)
overall$p <- ifelse(overall$p<0.001, "<0.001", overall$p)
```

13.1 Summary Table of number of studies for each outcome included in meta-analysis

```
overall %>% subset(select = c(Outcome, n_studies)) %>% gt() %>% tab_header(title = "Summary table of Nu
```

Summary table of Number of Studies for Each Outcome Meta-Analyis

Outcome	Studies, n
Immediate SFR	9
Final SFR	4
Auxiliary Treatment	2
Overall Complications	4
Fever	4
Infection	4
Sepsis	1
Haematoma	1
Pain	2
Embolisation	2
Transfusion	3
CD I	2
CD II	2
CD III	2
CD I-II	2
CD III-V	2
Operative time	4
VAS	1
Length of Stay	3

13.2 Summary Forest plot of Continuous outcomes

13.2.1 Continuous Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

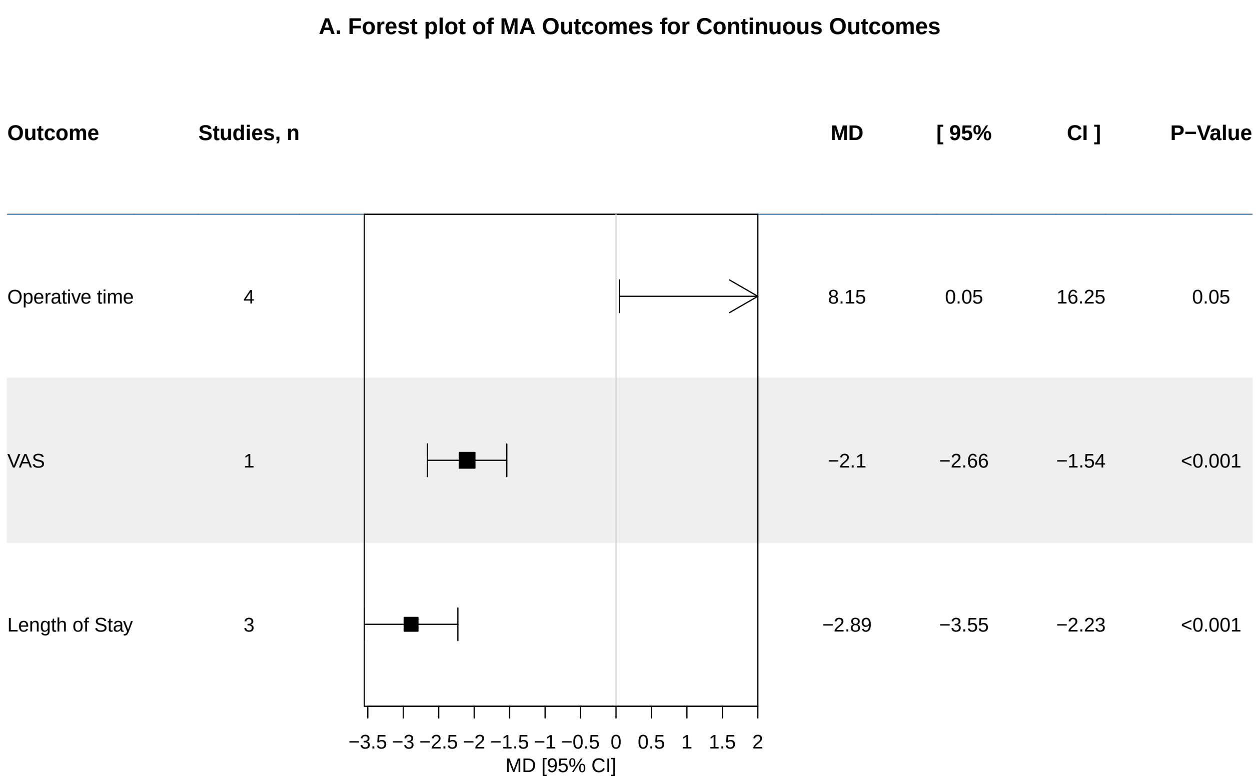
```
overall_continuous <-
  overall %>% subset(type ==  "cont") %>% subset(select = c(Outcome,
                                                           n_studies,
                                                           es,
                                                           lower_ci,
                                                           upper_ci,
                                                           p)) %>% as_tibble()
overall_continuous %>% gt() %>% tab_header(title = "Summary Table for Continuous Outcomes") %>% cols_me
```

Summary Table for Continuous Outcomes

Outcome	Studies, n	MD (95% CI)	p
Operative time	4	8.15 (0.05-16.25)	0.05
VAS	1	-2.10 (-2.66–1.54)	<0.001
Length of Stay	3	-2.89 (-3.55–2.23)	<0.001

13.2.2 Continuous Forest plot

```
continuous_plot <- overall_continuous %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 0,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Continuous Outcomes",
  clip = c(-4, 2),
  xlab = "MD [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "MD",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
continuous_plot
```



13.3 Summary Forest plot of Binary outcomes

13.3.1 Binary Outcomes Table

md = mean difference lb = lower bound of 95% confidence interval ub = upper bound of 95% confidence interval tf = trim and fill

```
overall_binary <-
  overall %>% subset(type ==  "binary") %>% subset(select = c(Outcome,
                                                          n_studies,
                                                          es,
                                                          lower_ci,
                                                          upper_ci,
                                                          p)) %>% as_tibble()
overall_binary %>% gt() %>% tab_header(title = "Summary Table for Binary Outcomes") %>% cols_merge(colu
```

Summary Table for Binary Outcomes

Outcome	Studies, n	RR (95% CI)	p
Immediate SFR	9	1.15 (0.99-1.34)	0.08
Final SFR	4	0.97 (0.92-1.02)	0.2
Auxiliary Treatment	2	1.77 (1.00-3.12)	0.05
Overall Complications	4	0.42 (0.21-0.81)	0.01
Fever	4	0.70 (0.35-1.41)	0.32
Infection	4	0.70 (0.32-1.54)	0.37
Sepsis	1	0.11 (0.01-2.06)	0.14
Haematoma	1	0.41 (0.02-9.84)	0.58
Pain	2	0.21 (0.07-0.60)	<0.001
Embolisation	2	0.29 (0.03-2.55)	0.26
Transfusion	3	0.16 (0.03-0.88)	0.04
CD I	2	0.59 (0.27-1.29)	0.19
CD II	2	0.33 (0.06-1.84)	0.2
CD III	2	0.68 (0.10-4.53)	0.69
CD I-II	2	0.50 (0.25-1.00)	0.05
CD III-V	2	0.68 (0.10-4.53)	0.69

13.3.2 Binary Forest plot - Meta-Analysis

Reference = No Suction

```
binary_plot <- overall_binary %>%
  forestplot(
    mean = es,
    lower = lower_ci,
    upper = upper_ci,
    labeltext = c(Outcome, n_studies, es, lower_ci, upper_ci, p),
  zero = 1,
  vertices = TRUE,
  title = "A. Forest plot of MA Outcomes for Binary Outcomes",
  clip = c(-1.5, 1.5),
  xlab = "RR [95% CI]",
  graph.pos = 3
) %>% fp_set_style(
    box = c("black"),
    line = "black",
    txt_gp = fpTxtGp(
      ticks = gpar(fontfamily = "", cex = 1),
      xlab  = gpar(fontfamily = "", cex = 1)
    )) %>% fp_add_lines("steelblue") %>%
  fp_add_header("Outcome",
                "Studies, n",
                  "RR",
                "[ 95%", " CI ]",
                "P-Value")  %>% fp_decorate_graph(box = TRUE) %>% fp_set_zebra_style("#EFEFEF")
binary_plot
```