

Create a Change from Baseline Table with gt Package in R

Hengwei Liu, Hengrui USA, Princeton, New Jersey

ABSTRACT

For the safety analysis in a clinical trial, such as the analysis for lab, vital signs and ECG parameters, we often need to create change from baseline tables.

We will use the gt package in R to create a change from baseline table.

INTRODUCTION

We will use two made-up datasets ADSL and ADVS. In the datasets there are two treatments, trt_a and trt_b. Both treatments are displayed in the table as column headers that span two columns. The two columns are the assessment result and change from baseline for a visit.

We will use the gt package in R to produce the change from baseline table. See the reference [1] and [2] for more details about the gt package.

The datasets, R program and output in this paper are available in reference [3].

THE DETAILS

We will need four packages in the R program:

- use the haven package to read the SAS® datasets
- use the describeBy function from the package psych to count the descriptive statistics
- use the pivot_wider function from the package tidyr to transpose a dataset
- use the gt package to create the table in HTML format.

This is the R program chg.R.

```
library(haven)
library(tidyr)
library(psych)
library(gt)

the_date <- as.character(Sys.Date())

# read in the data
adsl <- read_sas("adsl.sas7bdat")
advb <- read_sas("advb.sas7bdat")

# get the bign for the column header
```

```

bign <- table(group=adsl$TRT01P)

# create a function to calculate the descriptive statistics
get_stat <- function(invar, decimal, prefix){

  # get the descriptive statistics
  ht <- describeBy(advs[[invar]], group=list(advs$TRT01P, advs$PARAM,
advs$AVISIT), mat=TRUE)

  # handle the decimals
  ht$n <- format(ht$n, nsaml1=0)
  ht$mean <- format(round(ht$mean,decimal+1), nsmall=decimal+1)
  ht$sd <- ifelse(is.na(ht$sd), NA, format(round(ht$sd,decimal+2),
nsmall=decimal+2))
  ht$median <- format(round(ht$median,decimal+1), nsmall=decimal+1)
  ht$min <- format(round(ht$min,decimal), nsmall=decimal)
  ht$max <- format(round(ht$max,decimal), nsmall=decimal)

  # create a variable minmax
  ht$minmax <- paste(ht$min, ',', ht$max)

  ht_n <- ht %>%
    pivot_wider(id_cols=c(group2, group3), names_from = group1, values_from =
n,
                names_prefix = prefix)

  ht_mean <- ht %>%
    pivot_wider(id_cols=c(group2, group3), names_from = group1, values_from =
mean,
                names_prefix = prefix)

  ht_sd <- ht %>%
    pivot_wider(id_cols=c(group2, group3), names_from = group1, values_from =
sd,
                names_prefix = prefix)

  ht_median <- ht %>%
    pivot_wider(id_cols=c(group2, group3), names_from = group1, values_from =
median,
                names_prefix = prefix)

```

```

    ht_minmax <- ht %>%
      pivot_wider(id_cols=c(group2, group3), names_from = group1, values_from =
minmax,
                  names_prefix = prefix)

    ht_n$stat <- "n"
    ht_n$ord <- 1

    ht_mean$stat <- "Mean"
    ht_mean$ord <- 2

    ht_sd$stat <- "Std"
    ht_sd$ord <- 3

    ht_median$stat <- "Median"
    ht_median$ord <- 4

    ht_minmax$stat <- "Min, Max"
    ht_minmax$ord <- 5

    ht_final <- rbind(ht_n, ht_mean, ht_sd, ht_median, ht_minmax)
    ht_final <- data.frame(ht_final[order(ht_final$group2, ht_final$group3),])
    return(ht_final)
}

out1 <- get_stat(invar="AVAL", decimal=1, prefix="val_")
out2 <- get_stat(invar="CHG", decimal=1, prefix="chg_")

# need to merge out1 and out2

final <- merge(out1, out2, by=c("group2", "group3", "ord", "stat"))

final$chg_trt_a <- ifelse(final$group3=="Baseline", NA, final$chg_trt_a)
final$chg_trt_b <- ifelse(final$group3=="Baseline", NA, final$chg_trt_b)

final$fdot <- !duplicated(final[c("group2", "group3")])
final$group3 <- ifelse(final$fdot==TRUE, final$group3, '')

```

```

df <- final[c("group2", "group3", "stat", "val_trt_a",
"chg_trt_a","val_trt_b", "chg_trt_b")]

df %>%
  gt(groupname_col="group2")

# use gt to do the reporting
tab_html <- df %>%
  gt(groupname_col="group2") %>%
  fmt_missing(
    columns=everything(),
    missing_text = "") %>%

  tab_header(
    title = "Table 14.3.4. Change from Baseline in Vital Signs Parameters",
    subtitle = "Safety Population"
  ) %>%

  tab_source_note(
    source_note = paste('Program Source: chg.R', Executed: (Draft)',
the_date)
  ) %>%

  cols_label(

    group3 = html("Visit"),
    stat = html("Statistics"),
    val_trt_a = html("Result"),
    chg_trt_a = html("Change from Baseline"),
    val_trt_b = html("Result"),
    chg_trt_b = html("Change from Baseline")

  ) %>%

  tab_options(
    table.border.top.color = "white",

```

```

    heading.border.bottom.color = "black",
    table.border.bottom.color = "white",
    table_body.border.bottom.color = "black",
    table_body.hlines.color = "white",
    row_group.border.bottom.color = "white",
    row_group.border.top.color = "white",
    column_labels.border.top.color = "black",
    column_labels.border.bottom.color = "black",
  ) %>%
  tab_spanner(
    label = html(paste("Treatment A <br> (N=", bign[1], ")")),
    columns = c(val_trt_a, chg_trt_a)
  ) %>%
  tab_spanner(
    label = html(paste("Treatment B <br> (N=", bign[2], ")")),
    columns = c(val_trt_b, chg_trt_b)
  ) %>%

  cols_align(
    align = "left",
    columns = c(group3)
  )

# output the HTML table

tab_html %>%
  gtsave("chg.html", path = "C:\\chg_from_baseline" )

```

The table created with this R program is shown in display 1.

Table 14.3.4. Change from Baseline in Vital Signs Parameters

Safety Population					
Visit	Statistics	Treatment A (N= 4)		Treatment B (N= 4)	
		Result	Change from Baseline	Result	Change from Baseline
Diastolic Blood Pressure (mmHg)					
Baseline	n	4		4	
	Mean	77.00		77.50	
	Std	8.165		15.089	
	Median	74.00		72.00	
	Min, Max	71.0 , 89.0		67.0 , 99.0	
Cycle 1 Day 28	n	3	3	1	1
	Mean	70.67	-8.33	62.00	-5.00
	Std	5.132	5.508		
	Median	72.00	-8.00	62.00	-5.00
	Min, Max	65.0 , 75.0	-14.0 , -3.0	62.0 , 62.0	-5.0 , -5.0
Cycle 2 Day 28	n	3	3	1	1
	Mean	72.67	-6.33	64.00	-3.00
	Std	5.132	5.508		
	Median	74.00	-6.00	64.00	-3.00
	Min, Max	67.0 , 77.0	-12.0 , -1.0	64.0 , 64.0	-3.0 , -3.0

Display 1. Change from Baseline Table in HTML Format, Created with gt Package in R**CONCLUSION**

The package gt is a great tool to create tables.

REFERENCES

[1] Some detailed discussion about gt package, available at:

https://aosmith16.github.io/spring-r-topics/slides/week04_gt_tables.html#1

[2] Presentation by Rich Iannone, available at:

<https://www.youtube.com/watch?v=h1KAjSfSbmK&t=872s>

[3] the datasets, R program and output in this paper are available at:

<https://github.com/hengweiliu2020/change-from-baseline-table-with-gt-package>

CONTACT INFORMATION

Hengwei Liu
Hengrui USA
400 Alexander Park
Princeton, NJ 08540
Hengwei_liu@yahoo.com

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