Project name	Github Project
R Software Version	R version 4.2.2 (2022-10-31)
Version	V1
Change description	Initial redaction

	First Name	*Last Name*	Date
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Contents

1 Definitions

- **The standard deviation:** The standard deviation quantifies the variation within a set of measurements. Must not be confused with the standard error. The standard deviation is the most used.

$$s = \sqrt{\frac{\sum_{i=1}^{n}(x - \bar{x})^2}{n-1}}$$

- **The standard error:** The standard error quantifies the variation (standard deviation) of an estimated parameter (or statistic) from a sampling distribution. This is the distribution of the means. Can be estimated with a single set of measurments.

$$Standard\ Error = SE = \frac{s}{\sqrt{n}}$$

- **The coefficient of variation:** The coefficient of variation, also known as relative standard deviation, is a standardized measure of dispersion of a probability distribution. The coefficient of variation in absolute value :

$$CV = \frac{\sigma}{\overline{x}}$$

- **The coefficient of variation in percentage :**

$$CV_{\%} = \frac{\sigma}{\overline{x}} * 100$$

2 Data presentation

2.1 ToothGrowth

Descriptive statistics for the ToothGrowth data set included in R.

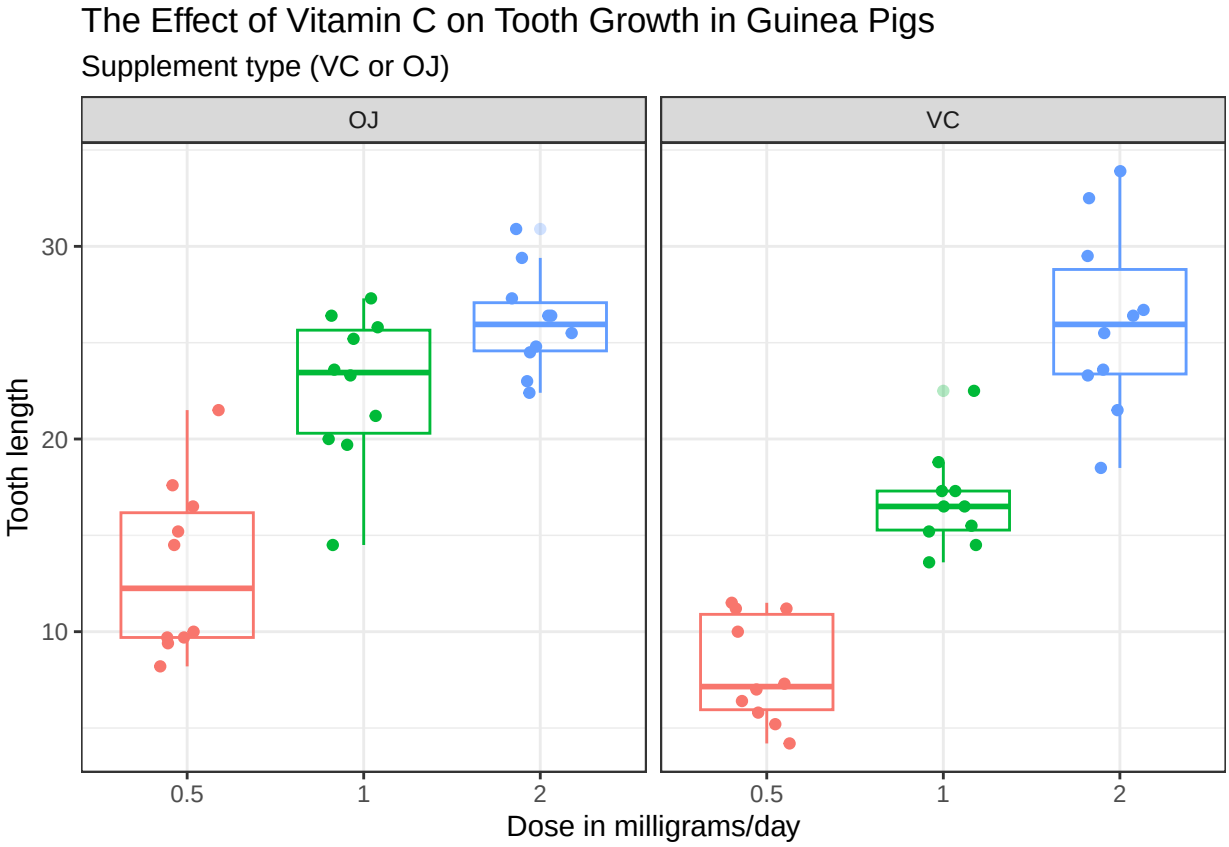

Table 1: Data Overview for the ToothGrowth data set

dose	supp	n	mean	sd	median	min	max
0.5	OJ	10	13.23	4.46	12.25	8.2	21.5
0.5	VC	10	7.98	2.75	7.15	4.2	11.5
1.0	OJ	10	22.70	3.91	23.45	14.5	27.3
1.0	VC	10	16.77	2.52	16.50	13.6	22.5
2.0	OJ	10	26.06	2.66	25.95	22.4	30.9
2.0	VC	10	26.14	4.80	25.95	18.5	33.9

2.2 Paired data comparison

By comparing two measurement methods and calculating the measurement bias, we use a difference plot to visually represent the disparity between the two groups.

```
## Creating a data set with two groups and comparing the difference between two groups
data <- tibble::tibble(group1 = seq(1:100) + rnorm(n = 100,mean = 10, sd = 2),
                       group2 = group1 + rnorm(n = 100,mean = 1, sd = 2))
```

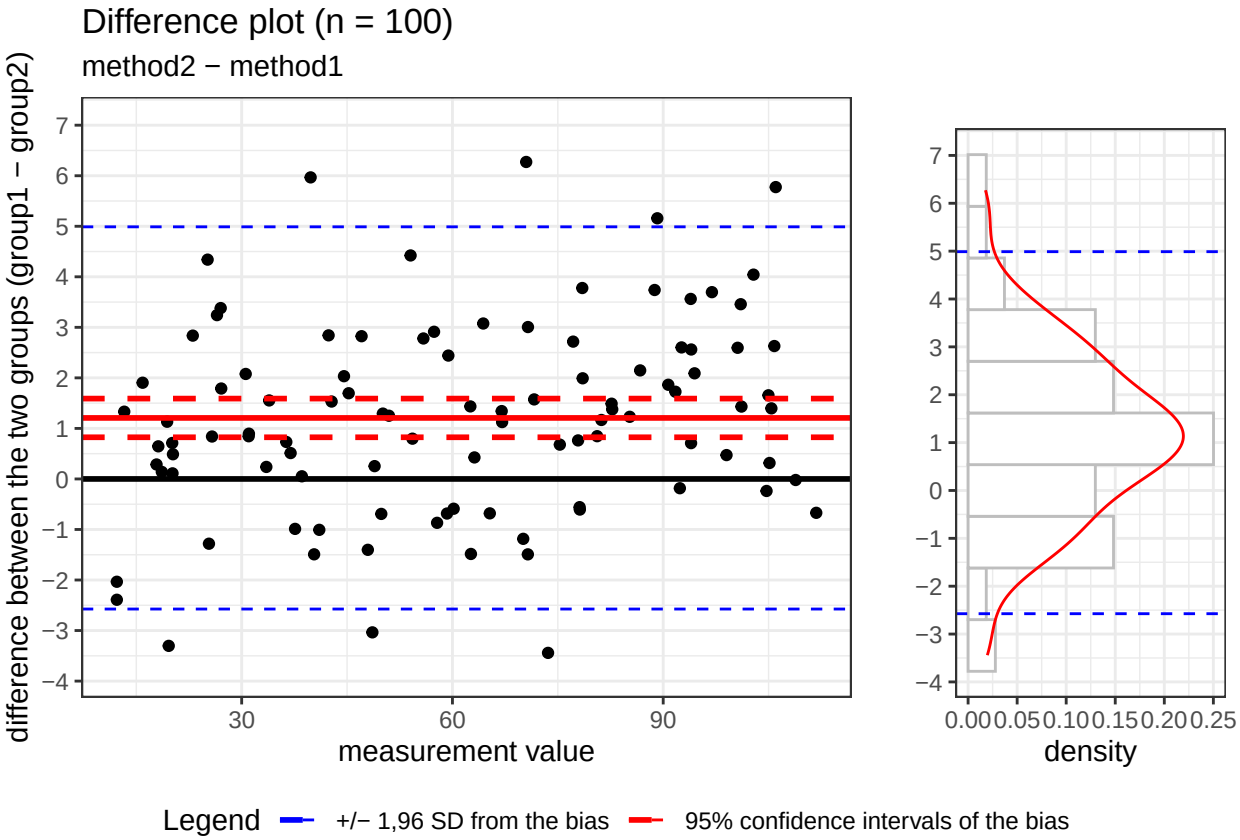

Table 2: Data overview

bias	min.CI	max.CI	SD	mean - 1.96 SD	mean + 1.96 SD
1.207	0.8243	1.59	1.929	-2.574	4.989

The table above is utilized to showcase the essential values derived from the plots.

3 Session Info

```
sessionInfo()
```

```
## R version 4.2.2 (2022-10-31)
## Platform: aarch64-apple-darwin20 (64-bit)
## Running under: macOS Ventura 13.4
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] splines   stats     graphics  grDevices utils     datasets  methods
## [8] base
##
## other attached packages:
##  [1] reactable_0.4.4     flexdashboard_0.6.1 paletteer_1.5.0
##  [4] ggrepel_0.9.2       knitr_1.40          plotly_4.10.1
##  [7] modelr_0.1.10       lubridate_1.9.0     timechange_0.1.1
## [10] forcats_0.5.2       stringr_1.4.1       dplyr_1.0.10
## [13] purrr_0.3.5         readr_2.1.3         tidyr_1.2.1
## [16] tibble_3.1.8        ggplot2_3.4.0       tidyverse_1.3.2
##
## loaded via a namespace (and not attached):
##  [1] httr_1.4.4          sass_0.4.2          jsonlite_1.8.3
##  [4] viridisLite_0.4.1   carData_3.0-5       bslib_0.4.1
##  [7] assertthat_0.2.1    highr_0.9           googlesheets4_1.0.1
## [10] cellranger_1.1.0    yaml_2.3.6          pillar_1.8.1
## [13] backports_1.4.1     glue_1.6.2          digest_0.6.30
## [16] ggsignif_0.6.4      rvest_1.0.3         colorspace_2.0-3
## [19] cowplot_1.1.1       htmltools_0.5.3     pkgconfig_2.0.3
## [22] broom_1.0.1         haven_2.5.1         scales_1.2.1
## [25] tzdb_0.3.0          googledrive_2.0.0   car_3.1-1
## [28] generics_0.1.3      farver_2.1.1        ggpubr_0.4.0
## [31] ellipsis_0.3.2      cachem_1.0.6        withr_2.5.0
## [34] lazyeval_0.2.2      cli_3.4.1           magrittr_2.0.3
## [37] crayon_1.5.2        readxl_1.4.1        evaluate_0.18
## [40] fs_1.5.2            fansi_1.0.3         rstatix_0.7.1
## [43] xml2_1.3.3          tools_4.2.2         data.table_1.14.4
## [46] hms_1.1.2           gargle_1.2.1        lifecycle_1.0.3
## [49] munsell_0.5.0       reprex_2.0.2        compiler_4.2.2
## [52] jquerylib_0.1.4     rlang_1.0.6         grid_4.2.2
## [55] rstudioapi_0.14     htmlwidgets_1.5.4   labeling_0.4.2
## [58] rmarkdown_2.18      gtable_0.3.1        abind_1.4-5
## [61] DBI_1.1.3           rematch2_2.1.2      R6_2.5.1
## [64] gridExtra_2.3       fastmap_1.1.0       utf8_1.2.2
## [67] stringi_1.7.8       Rcpp_1.0.9          vctrs_0.5.0
## [70] dbplyr_2.2.1        tidyselect_1.2.0    xfun_0.34
```