Dental
and Medical Problems

# Statistical analysis guidelines

1. Authors must avoid presenting their results based only on hypothesis testing and *p*-value reporting. Effect size measures are also required, e.g., differences between two means (if a sample mean was used as an estimator of the location parameter), odds ratios (*OR*), correlation coefficients, relative risk (*RR*), coefficient of determination in regression analysis ($R^2$), etc. For most of the presented effect sizes, their confidence intervals (*CI*) are required with regard to the standard significance coefficient, e.g., $\alpha = 0.05$, so *CI* 95% is appropriate in most cases ($0.01 \leq \alpha \leq 0.1$).

2. Results should be reported by means of basic descriptive statistics, e.g., min, max, median (*Me*), mean (*M*), 1st and 3rd quartile (Q1 and Q3), standard deviation (*SD*), median absolute deviation (*MAD*), number of observations (*n*), etc.

3. Numerical results should be reported in an open form, i.e., in tables.

4. Parametric methods are preferred over non-parametric rank tests. If the data doesn't meet the criteria for the preferred parametric method, e.g., observations are not symmetrically distributed or have a heavy-tailed distribution, the data should be transformed first (for example using the Box–Cox method) and information about the type of transformation must be included in the Statistical analysis section.

5. In the case of data subjected to the analysis of variance (ANOVA), predefined (a priori) comparisons (contrasts) are preferred over unplanned (a posteriori) comparisons. Whenever the *k* conditions (the factor levels) can be arranged from the smallest to the largest level, orthogonal polynomial contrasts should be used and tested at one denominator degree of freedom (df) instead of multiple comparisons after the omnibus test of ANOVA proved to be significant. Full tables of ANOVA must be included either in the main text or in supplementary materials, but supplementary files are preferred.

6. Authors should avoid presenting the comparisons of different groups by plotting bar graphs with *M* and *SD* or standard error of the mean (*SEM*) as whiskers. Such information must be presented in tables. However, when the sample size is sufficient, box-and-whiskers plots can be used to describe and compare the data graphically. Otherwise points can be individually presented on the plot with the average level (*M*, *Me*, etc.).

7. All *p*-values must be presented with an accuracy to first three decimal places, e.g., $p = 0.47695418$ should be expressed as $p = 0.477$. In the case of very low values like $p = 0.0000755$, the *p*-value should be expressed as $p < 0.000$. Authors should avoid performing too many, unnecessary statistical comparisons with hypothesis testing. Instead, effect sizes should be presented with *CI*. Non-significant results must also be reported to avoid bias in publications and future meta-analyses.

8. If statistics with df are used (*t* test, ANOVA, $\chi^2$ test, etc.), not only *p*-values should be reported, but also df number.

9. Whenever a *p*-value is given (in text, figures or tables), it should be accompanied by the test name (e.g., Mann–Whitney test or General Linear Model – GLM) and the test value (*U*, *t*, *F*, etc.).

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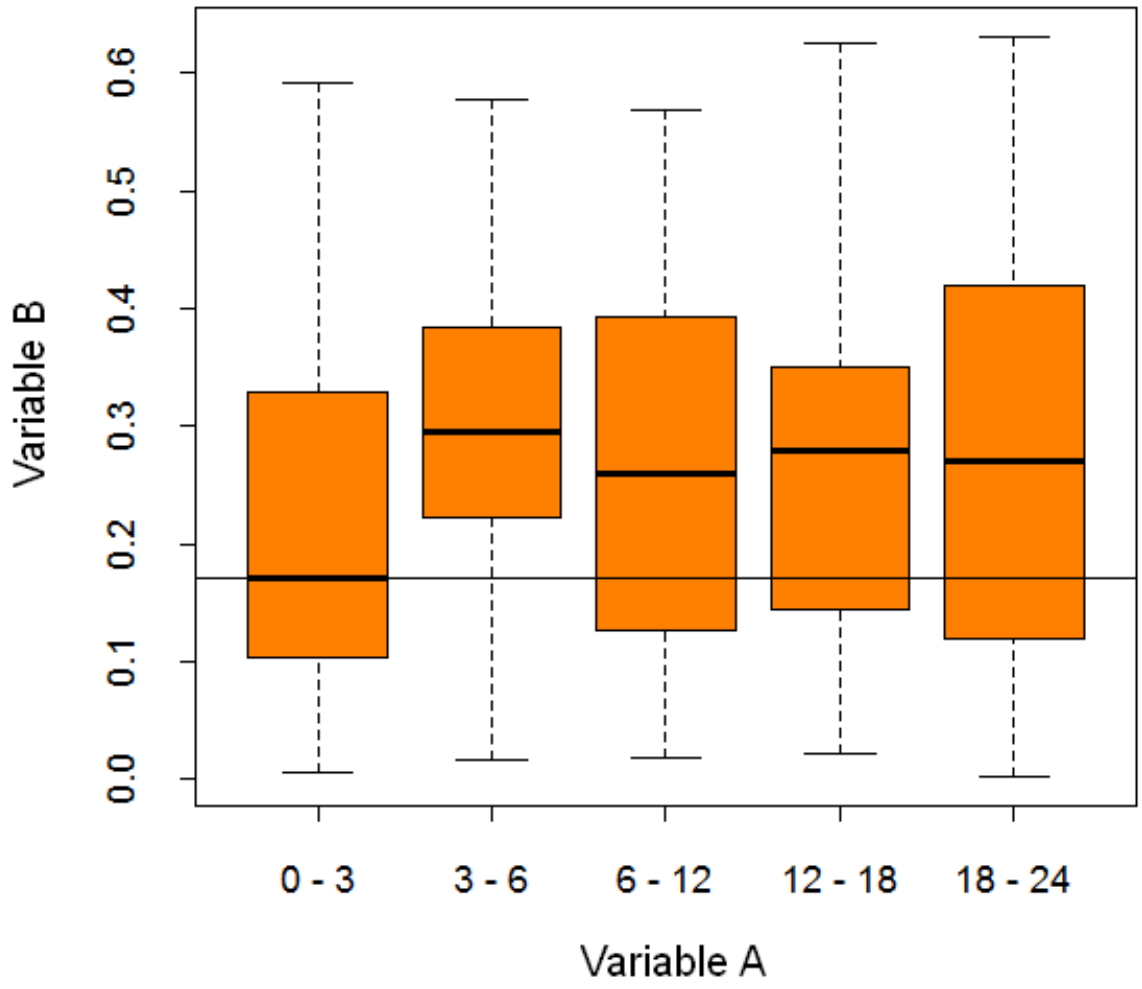
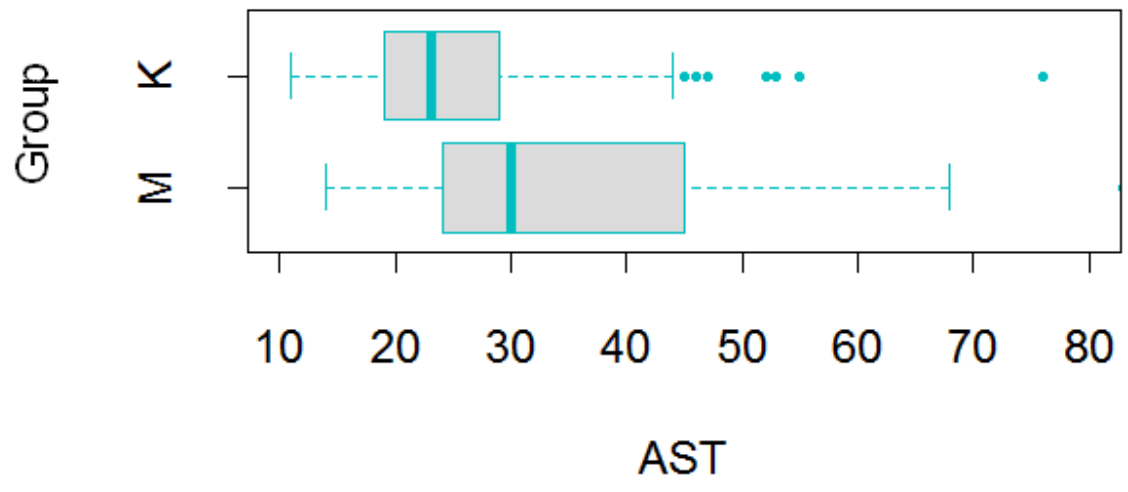
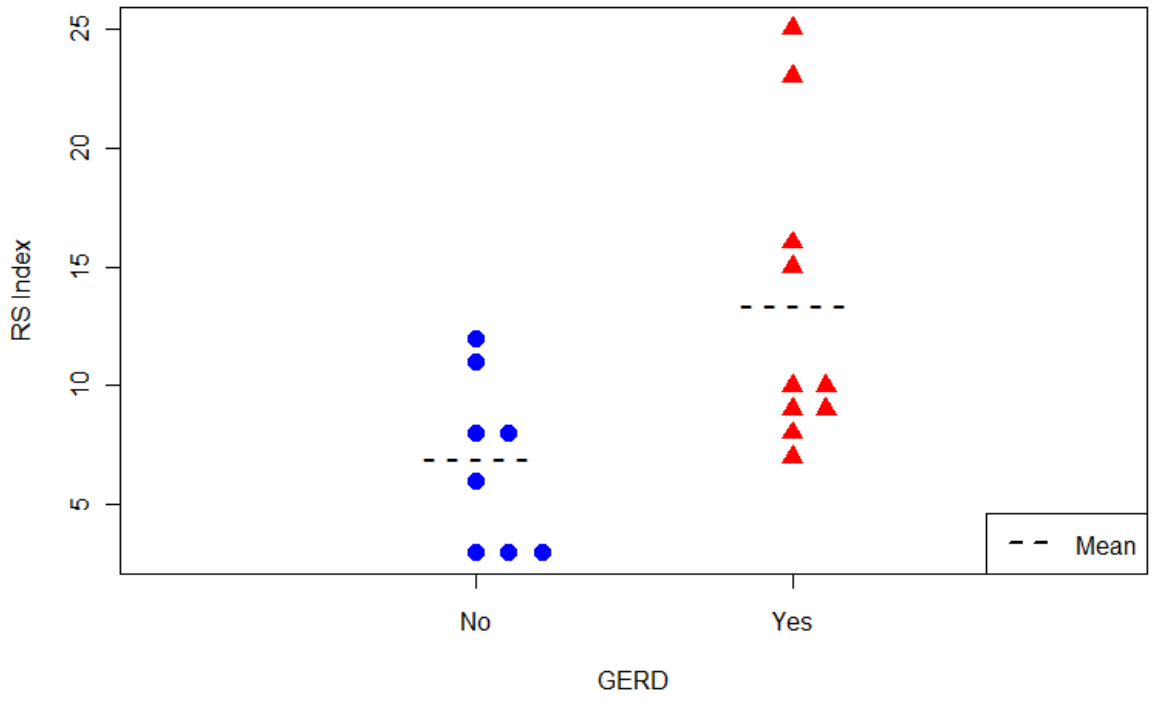
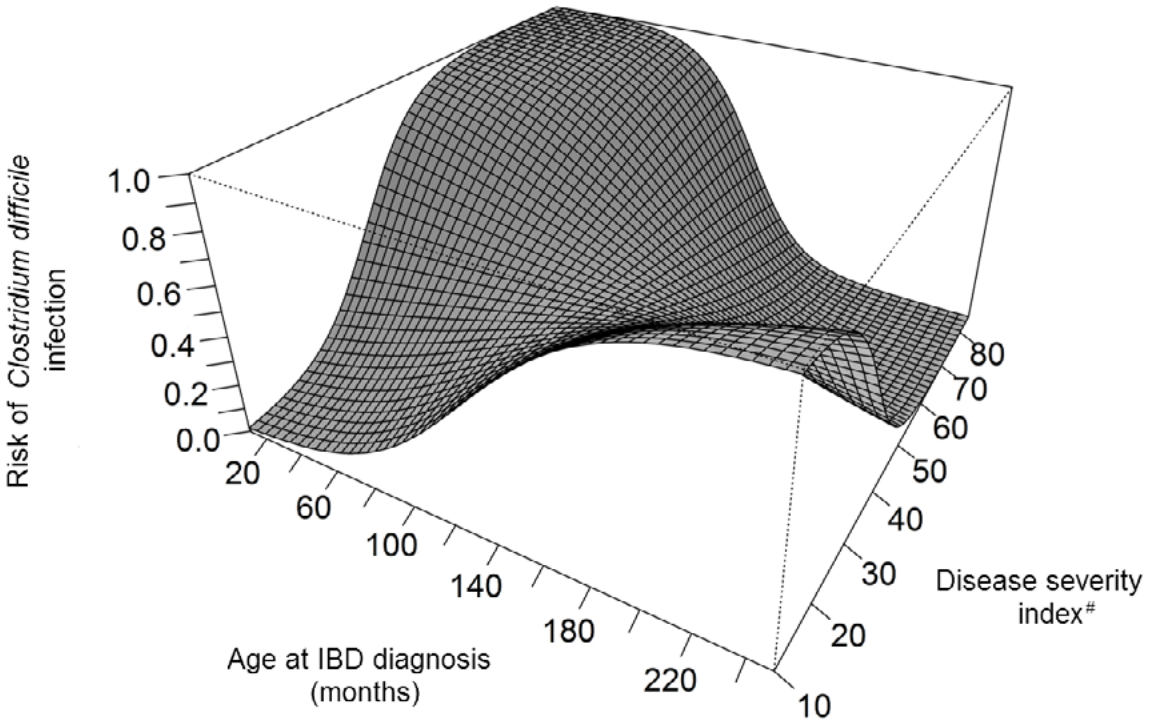


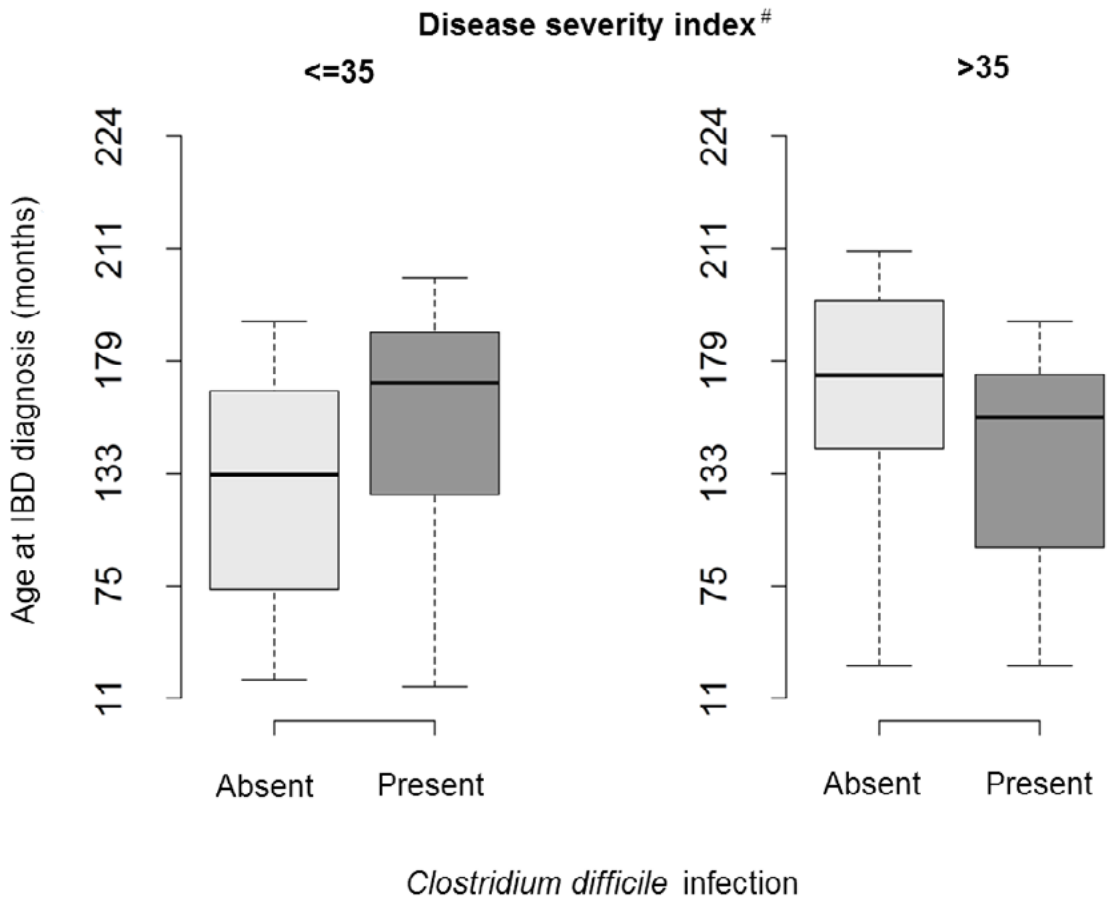




RS Index
5
10
15
20
25
No
Yes
GERD
Mean


Risk of Clostridium difficile infection
1.0
0.8
0.6
0.4
0.2
0.0
20
60
100
140
180
220
Age at IBD diagnosis (months)
10
20
30
40
50
60
70
80
Disease severity index#

# Statistical analysis guidelines





# Statistical analysis guidelines



**Table 1**
Characteristics of MS cases analyzed in this study.

| Genetic study | | | |
|---|---|---|---|
| | MS patients (336) | Male (110) | Female (226) |
| Disease course | | | |
| RR | 250 | 76 | 174 |
| SP | 86 | 34 | 52 |
| Age at diagnosis | | | |
| Min | 23 | 23 | 23 |
| Q1 | 10 | 13 | 10 |
| Median | 29 | 27.5 | 29 |
| Q3 | 35 | 35 | 35 |
| Max | 50 | 48 | 50 |
| EDSS | | | |
| Min | 1.0 | 1.0 | 1.0 |
| Q1 | 1.5 | 2.0 | 1.5 |
| Median | 3.0 | 3.5 | 3.0 |
| Q3 | 5.0 | 6.0 | 4.5 |
| Max | 8.0 | 8.0 | 8.0 |
| MSSS | | | |
| Min | 0.38 | 0.38 | 0.45 |
| Q1 | 2.65 | 2.82 | 2.60 |
| Median | 4.21 | 4.33 | 4.19 |
| Q3 | 6.46 | 6.55 | 6.46 |
| Max | 9.70 | 9.18 | 9.70 |
| mRNA expression analysis | | | |
| | MS patients (39) | Male (13) | Female (26) |
| Disease course | | | |
| RR | 39 | 13 | 26 |
| SP | 0 | 0 | 0 |

RR — Relapsing–Remitting MS course.
SP — Secondary Progressive MS course.
EDSS — Expanded Disability Status Scale.
MSSS — Multiple Sclerosis Severity Score.
Min, Max — minimal and maximal value.
Q1 — first quartile.
Q3 — third quartile.

**Table 1** Clinical characteristics of the included patients

| Variable | Min | Q1 | Median | Q3 | Max |
|---|---|---|---|---|---|
| Age | 43 | 65.75 | 68.5 | 74 | 79 |
| BMI | 18.5 | 20.75 | 22.5 | 23 | 25 |
| CRP before | 0.30 | 1.00 | 1.16 | 2.15 | 12.90 |
| CRP after | 0.31 | 1.00 | 1.33 | 1.98 | 14.92 |
| CRP before-after | −11.90 | −0.18 | 0.01 | 0.48 | 13.69 |
| MMSE | 12 | 14 | 19 | 22 | 23 |
| MoCA 7.2 | 3 | 10.75 | 14 | 16.25 | 23 |
| DSM V classification | | | | | |
| Mild | | Moderate | | Serious | |
| *n* | % | *n* | % | *n* | % |
| 5 | 25 | 7 | 35 | 8 | 40 |
| Gender | *n* | % | Age* | BMI* | MMSE* |
| Men | 7 | 35 | 69 | 22 | 18 |
| Women | 13 | 65 | 68 | 23 | 19 |

Q1, Q3—1st and 3rd quartile; *median

# Statistical analysis guidelines



**Table 3** Spontaneous and VSV-induced cytokine production by PBLs of AD patients ($n = 20$) after PRP treatment. General impact and data grouped by MMSE score are present. Means of ratio of the cytokine levels (before/after PRP treatment) are presented for all levels of the MMSE score. Virus effect was considered as the ratio of VSV induced and spontaneous. ANOVA linear contrast was used to test relationship between MMSE and virus effect (*F*-test). PRP effect was tested with Student *t* test

| MMSE | | *n* | TNF-α | | IFN-γ | | IL-1β | | IL-10 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Range | Mean | | Spontaneous | VSV-induced | Spontaneous | VSV-induced | Spontaneous | VSV-induced | Spontaneous | VSV-induced |
| 23–22 | 22.2 | 6 | 0.320 | 0.161 | 0.817 | 0.989 | 0.729 | 0.691 | 0.131 | 0.213 |
| 21–19 | 19.6 | 5 | 1.181 | 2.548 | 0.766 | 1.123 | 0.794 | 0.935 | 1.091 | 0.868 |
| 18–14 | 15.2 | 5 | 0.491 | 0.420 | 1.036 | 0.712 | 0.352 | 0.145 | 0.059 | 0.027 |
| 13–12 | 12.5 | 4 | 2.551 | 1.039 | 0.674 | 0.867 | 0.973 | 0.498 | 1.303 | 0.987 |
| Total mean ratio after/before (regardless of MMSE) | | 20 | 0.747 | 0.593 | 0.821 | 0.916 | 0.658 | 0.472 | 0.288 | 0.246 |
| Mean change [%] after PRP treatment | | | − 25.3% | − 40.7 | − 17.9 | − 8.4 | − 34.2 | − 52.8 | − 71.2 | − 75.4 |
| CI95% for the mean change | Lower | | − 71.20% | − 81.6 | − 33.8 | − 25.5 | − 54.8 | − 76 | − 89.8 | − 91.4 |
| | Upper | | 102.60% | 102.60 | 3.30 | 10.10 | − 5.40 | − 14.50 | − 16.90 | − 22.80 |
| *F*-test for MMSE effect<br>$H_0$: VSV effect independent of MMSE<br>$H_1$: linear relationship | | | 0.179 | | 0.293 | | 2.794 | | 0.695 | |
| *p* value for *F*-test | | | 0.678 | | 0.596 | | 0.114 | | 0.417 | |
| $r^{*}_{\text{effect size}}$<br>(MMSE effect size) | | | 0.105 | | 0.134 | | 0.386 | | 0.204 | |
| Student *t* test for PRP effect<br>$H_0$: total mean ratio ≥ 1<br>$H_1$: total mean ratio < 1 | | | − 0.574 | − 0.819 | − 1.687 | − 0.862 | − 2.126 | − 2.322 | − 2.247 | − 2.423 |
| *p* value for the *t* test | | | 0.2862 | 0.2114 | 0.054 | 0.1996 | *0.0234*** | *0.0158*** | *0.0184*** | *0.0128*** |
| Power of the *t* test | | | 0.145 | 0.299 | 0.191 | 0.092 | 0.685 | 0.918 | 0.915 | 0.943 |

*$r_{\text{effect size}}$ means the correlation coefficient between ratio of VSV- induced and spontaneous and MMSE means both non-contrast between-group variation and the within-group variation are incorporated; ** statistically significant