Giving a presentation

At some stage you will have to present or defend your work. Here are a few tips about the do's and don'ts or presentations.

- Don't panic or get too stressed out. If you know the subject material well, then you should not have too many problems presenting. If nerves are an issue, try some deep breathing before you start.
- When we are nervous, we tend to speak faster. Try to deliberately slow your speech down, and speak at a slightly lower or deeper pitch than you usually do.
- Most people create their slides and then make notes for each one. A better technique is to write down the whole talk, and then choose suitable slides for each section.
- Do not make slides too busy. Less is better. No more than 6 words per line. Try using emotive pictures, instead of words on a slide, and then talk to the picture.
- NEVER use font smaller than 24 pitch. There is nothing more unprofessional than someone saying "I know you can't read this but…". If they can't read it, why are you presenting it?
- Do not use transition effects or sounds.
- Keep the colour scheme consistent across all slides and simple. Remember, the lighting might not be brilliant in the hall or room you are presenting in, so make sure that you have a good contrast, eg white font on a dark blue background.
- Budget for 1 slide per minute of talk, eg 15 slides for a 15-minute presentation. You can get away with up to 20 slides if they are presented quickly.
- Practice your presentation several times and check the timing. Better to finish 5 minutes early than 5 minutes late.

Common statistical mistakes

1. Having a vague research question

The research question drives the aims of your study. The aims of your study tell you what hypotheses to test. The hypotheses tell you what statistical test to use. Hence, if your research question is vague, don't be surprised if you struggle with the statistical analysis.

2. Being too precise

If your subjects' weights are measured to the nearest Kilogram, there is little point in presenting mean weight to 3 decimal places.

3. Categorising continuous variables

If you have measured something as a continuous variable, categorising it is throwing information away. Make sure you have good justification for categorising a continuous variable.

4. Confusing SD and SEM

The standard deviation (SD) is a measure of variability of your observations. It is (roughly) the average distance of each observation from the mean. The standard error of the mean (SEM) is the SD of a set of means rather than the original observations. It is always smaller than the SD.

5. Using the mean when the distribution is skewed

Because of the way the mean is calculated, if the distribution is skewed, the extreme observations drag the mean towards them, and it no longer represents a typical value. Instead, use the median, which is where the bulk of the observations lie. Further, since the SD relies on the mean for its calculation, it too is problematical in skewed distributions. Instead, consider providing the interquartile range (IQR).

6. Presenting only p-values

p-values are calculated using the sample size in the numerator of the test statistic. This means that with a very large sample size, the test statistic will be large, and even small differences will be statistically significant. On the contrary, with a very small sample size, the test statistic will be small, and even large differences will not be statistically significant. We undertake power calculations to try and avoid this. However, the best approach is to provide the p-value, a 95% Confidence Interval for the difference of interest, the effect size (ES), and its 95% Confidence Interval. The ES is a measure of clinical significance, rather than statistical significance. Importantly, it does not rely on sample size. There are many different types of ES measures for the different statistical tests. There is a good article on effect sizes in Wikipedia, and many good online ES calculators.

7. Overlapping 95% confidence intervals

If two confidence intervals overlap, then it is certain that the two means are statistically significantly different. However, if the two confidence intervals do not overlap, there could still be a statistically significance difference between means.

8. Going straight into advanced statistical analysis

Always undertake simple descriptive statistics and graphs before going into any statistical testing. The graphs have the added bonus in that they can check the statistical assumptions required by all parametric tests.

9. Confusing correlation with causation

Correlation is a measure of linear association between two continuous variables. It does not necessarily imply causation. For the latter, we need much more information than just the correlation coefficient.

10. Confusing correlation with regression

We use correlation when we are only interested in whether two variables have a linear association. If we are trying to predict one from the other, we use regression.

11. The use of asterisks to represent statistical significance

Wherever possible, avoid the use of asterisks to represent statistical significance. Instead, give the exact p-value.

12. Subgroup analysis

Do not undertake subgroup analysis unless it was stated you would do so in the study protocol. Otherwise, it is just a fishing expedition.