**Report Guidelines**

**Project Description:**

Describe the research goals of the client and purpose of the analysis.

* What brought the client in?
* Do they have data?
* What question(s) are they hoping to answer with a statistical analysis?
* How did they get the data?
* How did they choose what variables to measure? How were they measured?
* What population is represented in the data?
* What is the timeline?
* What do they hope to do with the results?
* Is this an experiment/observational study/or survey?
* Are there any software requests/requirements?

Research and statistical questions may be combined. You should clearly enumerate the questions that are to be addressed in the analysis.

**Research Questions and Statistical Questions:**

You may keep these sections separate, or combine them (e.g. Client Questions) as seems most natural for you on a given project. However, all questions must be numbered. You will then answer each of these questions succinctly at the end of the report in the “recommendations” section.

**Variables of Interest**

Short description of each variable considered in the analysis including how it was measured, and the range of values possible. (If you do not know, this may be a relevant comment in the potential limitations discussion section as you probably had to make some assumptions before any formal analysis).

Also include a description of any transformations you used in your final analysis. E.g. did you change something to percent, or log values? Try to include an example calculation so as to make sure your description is clear.

**Study Diagram**

Optional. Good for experiments, or studies with complex sampling designs. Use if you think would be helpful.

**EDA:**

* Numerical summaries of the data.

E.g. How many observations are there?

How many subjects?

Mean, sd on all quantitative variables.

Proportions/counts on discrete variables.

Other summaries may be useful, too.

* Graphical Summaries of Data
  + Figures to explore univariate and bivariate trends (histograms, boxplots, scatterplots, etc). Some of these may be left to the appendix if the results were not surprising or not relevant to the main research question. However, if the trends may inform your analysis, or speak to the research question then they should be included in the **main body[[1]](#footnote-1)** of the report.

**Figures:**

* Every report must contain AT LEAST one figure (probably more) in the **main body** of the report (i.e. not the appendix).
* Every figure must have a caption, and appropriately labeled axes, and a reference number (e.g. “Figure 1”).
* Every figure included in the main body of the report must be referenced and described in the text of the main body of the report.

**Tables:**

Every table must have a title and caption, and a reference (e.g. “Table 1”).

**Statistical Analysis**

Provide a description of the method and results of your “final” analysis. In other words, if you started with a linear model, and then decided you needed to transform your response, and re-fit the model, you should only include a description of the model based on the final transformed data. You should also explain why the transformation was used (presumably to make sure that the assumptions were valid, or to ease interpretation, etc). Another example would be: if you used step-wise regression, do NOT include all potential models explored. Simply describe the criteria for how you selected variables, and then describe the final model.

A description (in context) of the assumptions your model makes, and how you checked them (in most cases residual plots may be left to the appendix).

Do not include raw code or output in the main portion of the report! These items should be left to the appendix.

Carefully interpret any relevant statistical summaries. E.g. interpret model coefficients that are of interest to the client (in context). Interpret relevant p-values.

Avoid jargon, and avoid generic descriptions of assumptions and interpretations. E.g.

Example of poor description:

* for an increase in x of 1 we expect an increase in y of Beta .
* The model assumes linearity. OR we assume dependent variable is linearly related to the independent variable

Example of interpretation in context:

* For an increase in grade point average of 0.1 we see an average increase in starting salary of $800.
* The model assumes that starting salary changes linearly with grade point average.

**Recommendations:**

Repeat each question outlined in the Project Description. Provide a succinct (1 to 3 sentence) answer based on your analysis. Yes, this section may seem redundant (repeating questions and conclusions already stated), but redundancy is very important to drive home main points! Also, it makes the report easier to follow if the client does not need to flip back to remember what Q1 was, or dig through the results for the p-value and what that means.

**Resources:**

Provide citation of software. Provide links to explanations the client may find useful. This section may be small or quite large depending on the project/client needs.

**Considerations:**

* Limitations to the recommendations
* Concerns you may have about the study
* Technical comments

For example,

* clarification of the fact that correlation does not imply causation…
* scope of inference
* design limitations that limit your conclusions
* validity of assumptions, and how a violations may affect your results

Anything else you feel is important to impress upon your client.

**Grading considerations:**

How well did you understand the purpose of the study/goals of the client?

How well were you able to address the research question of the client?

Were statistical concepts clearly communicated?

Were abstract concepts and jargon avoided?

Was the communication appropriate to the background knowledge of the client in statistics?

Were the results and conclusions communicated in a clear and organized way?

Were the statistical methods implemented appropriate and interpreted correctly?

Polish/Professionalism

1. You are welcome to include appendices in your report for items such as code, program output, or additional figures. However, the appendix is NOT the “main body” of the report. [↑](#footnote-ref-1)