A Guide to Report Writing

When statisticians are asked to analyse some data or carry out some research, they usually present their findings in the format of a statistical report. The structure of these reports does vary a little; however, the structure that is presented below would be generally acceptable.

Abstract

The Abstract begins the report. It should include a brief summary relating to the research, the research question, a statement of methods used and a brief summary of the results. For the purposes of this unit, the abstract need only be one or two sentences.

Introduction

The Introduction should give background relating to the question of interest. The research question should be clearly stated, with an explanation of why it is of interest. A brief explanation of the circumstances leading to your research or experiment could follow. The Introduction often includes the answer to the question. Data sources and/or methods of selecting subjects could be mentioned. References to other relevant studies could be cited, although, for purposes of STAT6170, this will not be a requirement.

Methods

The Methods section should explain *how* the research was carried out in order to answer the research question.

The Methods section should include details of:

- design of the experiment and why the design was chosen

- selection of subjects

- variables that were measured

- methods of collecting the data and managing the data

- methods of analysing the data including the name of any statistical package that was used.

The reader should be satisfied that the correct methods were undertaken in order to answer the research question.

Results 1 — Preliminary Data Exploration

This section introduces the data to the reader. It will include graphs displaying the frequency distributions of the variables (e.g., histograms, bar charts, boxplots). If appropriate, comparative graphs and graphs displaying bivariate relationships would be included. The graphs should be relevant and informative and each should be followed by a brief comment summarising the main features of the graph. Brief numerical summaries should also be given in a table, with accompanying comments.

Results 2 — Analyses

The Results should include outcomes of analyses pertaining to the research question. If a statistical model is known, then the results should be incorporated into this. If a test statistic has been utilised then its value and the corresponding p-value should be quoted. The extent to which the assumptions of the model or test have been satisfied should be stated and verified where possible. If there are any discrepancies in the data (for example, outliers) then details of how these were dealt with should be included.

Results should be kept to a minimum in the text. Details can be included in the Appendix.

Conclusions and Further Discussion

The Conclusion should include answers to the research question mentioned in the Introduction and any explanation or defence of these answers. It may include explanations of any results or unexpected findings going beyond the scope of the research question. A discussion of the limitations of the methods, or any other weaknesses could be included. Suggestions for further study should follow. The importance of the field of research is often discussed in this section.

References

Every reference in the text must be included in this section as well as any books or articles you have read that have assisted you in carrying out the research. Make sure your references are accurate, important and relevant.

References to **journal articles** should include, in the given order:
> Author's second name
> Author's initials
> Title of paper, including subtitle if there is one
> Journal
> Year of publication
> Volume
> First and last page numbers

References to **books** should include:
> Author's surname
> Author's initials
> (Year of publication)
> Title of book (in italics)
> Publishing Company and cityof publication

Appendix

The Appendix should include any information, graphs, tables that are relevant to the research, but that are too detailed or too cumbersome to include in the body of the report. If the data set was small, then this could also be included. Any information in the appendix should have been cited in the main text. Each entry in the Appendix should have an appropriate title and be numbered. (Not every report needs an Appendix.)

Summary of structure

Introduction: State research question, i.e., why you are conducting the study. Target Population, etc.

Methods: Description of variables and subjects. The design of experiment is mentioned, as is the statistical test being used. Comment on the assumptions underlying the statistical test. The statistical package used to analyse the data may also be mentioned.

Results: Data and analysis – quote test statistic, associated p-value and interpret briefly the results. Mention any concerns.

Conclusion: Give an answer to the research question mentioned in the introduction.

Appendix: Any further information, graphs and tables relevant to the research.