Department of Biostatistics
Colleges of Medicine and Public Health

Departmental Guidelines for the Technical Report

A **technical report** is a written report that will follow standard scientific format. There is no page limit and the goal is to adequately describe certain aspects of the project listed below. Following are the general departmental recommendations on formatting and contents of the report.

Order of Material: Title Page, Acknowledgments, Abstract, the Text of the Technical Report, Bibliography or Literature Cited, Appendix.

Page numbering: Centered below bottom margin

Font: Times New Roman 12 point is recommended. Any formulas should be inserted using some standard equation editor. (If using Microsoft Word, Equation 3.0 is part of the standard object package)

Spacing: Double-spaced throughout, with the exception of the bibliography, and quotations of more than four lines or two or more sentences.

Title page:

1. Name of the University
2. Name of the College
3. Name of the Department
4. Title of the technical report
5. Student's name starting with the first name
6. MPH ILE committee members (starting with the chair)

(See example)

Acknowledgments: This page is to thank those who have helped in the process of obtaining the graduate degree and provided guidance for the Integrative Learning Experience. Permissions to quote copyrighted material are listed here, as well as acknowledgments for grants and special funding that supported the work if applicable. (See example)

Abstract: Short summary of the work presented in the technical report, not to exceed one page. (See example)

Text of the Technical Report: Text of the technical report will consist of five major sections. These are *Introduction, Background, Methods, Results and Discussion*. Any logical system of subdivision within each section is permissible, but the scheme must be consistent throughout the report. There are certain aspects of the project that have to be described within each component of the report. Even though this is not the full listing and it's highly dependent on the topic here are some general suggestions.

Introduction

- General introduction and description of the topic
- What motivated the work
- Hypothesis and questions of interest

Background

Theory

- Theoretical foundation of the research topic

Literature review

- Literature contributions to the topic
- What's not covered in the literature
- What's unique about the proposed research questions (i.e. justification of the selected topic)

Methods

- Detailed description of the methods that will be used to answer the questions of interest
- Study design
- Sampling and data collection
- Analytical methods
- Proposed summary and presentation of the results

Results

- Description of the results starting with summary statements and moving into more complex methodology
- Appropriate tables and graphs should be included where applicable

Discussion

- Discussion of the meaning of the results in terms of your study and literature
- Conclusions and answers to the questions of interest

Since it is required to tie each student's work into wider public health practice, you will describe the application of your work as it relates to other major public health disciplines either in the introduction or discussion part of your report, whichever seems more appropriate for the given project.

Appendix: An appendix is not required. However it is desirable to include all of the results in tabulated or graphical form here, as well as computer code used in the study along with other results and data if possible. You must maintain the same consecutive page numbering as used in the body of the text.

References: References usually consist of information in parenthesis or square brackets within the text. Two common methods of referencing are (1) to use author's name and date of publication, as in (Smith, 1990), or (2) to assign numbers to the bibliographical

entries and insert the corresponding number for the authors as they are cited in the text, as in Smith (95). The purpose of references is to guide the reader to the corresponding entry in the List of References or Bibliography, where complete information is available.

Bibliography/List of References: A report must include a list of materials used in the preparation of the manuscript. This may consist only of references cited in the text (List of References) or it may include works consulted as well (Bibliography). When not otherwise instructed by the department, follow the attached sample page for instruction. Double spacing is recommended between the references. References of more than one line should be single spaced. It is desirable to have references sorted in alphabetical order based on the first author's last name. (See example)

Printing of the copies: After the report has been completed and approved by advisory committee, student will make a minimum of four copies (one for the department and one for each faculty member on the committee) and turn those in to the committee chair.

UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES

COLLEGE OF PUBLIC HEALTH

DEPARTMENT OF BIOSTATISTICS

AN EFFECTIVE CONFIDENCE INTERVAL FOR THE MEAN WITH SAMPLES OF SIZE ONE AND TWO

MELANIE E. WALL

INTEGRATIVE LEARNING EXPERIENCE ADVISORY COMMITTEE

MAURA E. STOKES (CHAIR)

CHARLES S. DAVIS

GARY G. KOCH

ACKNOWLEDGMENTS

It is with deep gratitude and appreciation that I acknowledge the professional guidance and friendship of Dr. Maura Stokes. Here constant encouragement and support helped me to achieve my goal. My gratitude goes to the other members of the computing laboratory, Dr. John Doe and programmers, David Smith and Mike Reed. Their technical help and good humor made these years a great learning experience.

I am grateful to the graduate faculty of the Department of Biostatistics of the University of Arkansas for Medical Sciences, especially Dr. Charles Davis for his moral support since the beginning of my studies. Gratitude is also expressed to the members of my reading and examination committee, Dr. Gary Koch and Dr. Mary Miller.

I would also like to thank the staff of the Graduate College for their constant help and for the financial support received through the Provost Fellowship Program.

ABSTRACT

It is counterintuitive that, with a sample of only one value from a normal distribution, one can construct a finite confidence interval of any size for the mean. It goes just as much against standard teaching that from a sample of size two such a CI might be shorter than that based on the *t* statistic. We refine an earlier version of this first result, and use it to prove the second. For samples of three and larger, we show that the *t*-based interval cannot be improved using this approach.

BIBLIOGRAPHY

1. Allison, P. (2000). Multiple imputation for missing data: A cautionary tale. Sociological methods and research, 28(3), 301-309.

2. Beale, E., and Little, R. (1975). Missing values in multivariate analysis. J Roy Stat Soc, B37, 129-145.

3. Bock, R.D. (1989). Multilevel analysis if educational data. New York: Academic Press.

4. Box, G.E.P. (1949). A general distribution theory for a class of likelihood criteria. Biometrika, 36, 317-346.

5. Brown, C.H. (1990). Protecting against nonrandomly missing data in longitudinal studies. Biometrics 46, 143-155.

6. Bryk, A.S., and Raudenbush, S.W. (1992). Hierarchical linear models: Application and data analysis methods. Newbury Park, CA: Sage Publications.

7. Crowder, M.J., and Hand, D.J. (1990). Analysis of repeated measures. New York: Chapman & Hall.

8. Deming, J. (1957). Application of the Gompretz curve to the observed pattern of growthin length of 48 boys and girls during adolescent cycle of growth. Human Biology, 29, 83-122.

9. Dempster, A.P., Laird, N.M., and Rubin, D.B. (1977). Maximum likelihood estimation from incomplete data via the EM algorithm. J Roy Stat Soc, B39, 1-38.

10. Diggle, P.J., Liang, K.Y. and Zeger, S.L. (1994). Analysis of longitudinal data. Oxford: Claredon Press.

11. Dobson, A.J. (1990). An introduction to generalized linear models. New York: Chapman & Hall.

12. Donnelly, C.A., Laird, N.M. and Ware, J.H. (1995). Prediction and creation of smooth curves for temporally correlated longitudinal data. JASA 90, No. 431, 984-989.