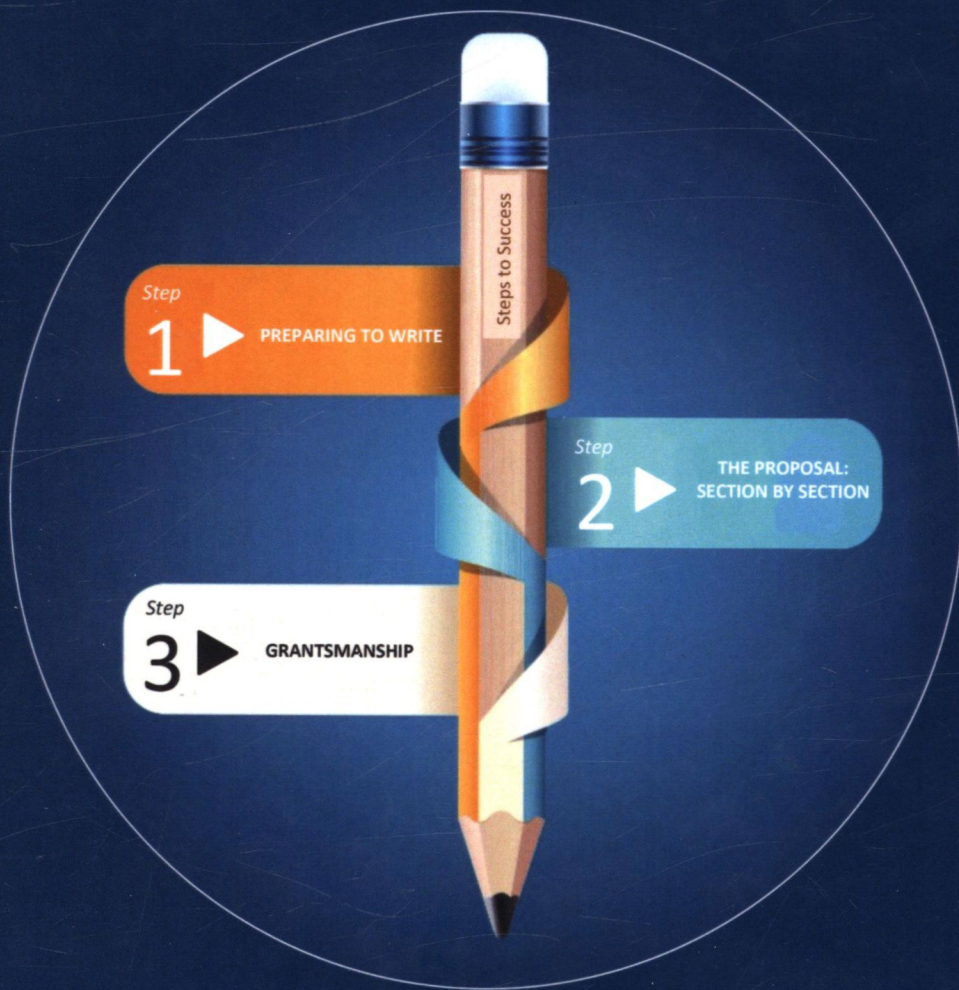


WRITING DISSERTATION AND GRANT PROPOSALS

Epidemiology, Preventive Medicine and Biostatistics

Lisa Chasan-Taber



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Competition for research funds in epidemiology, preventative medicine, and biostatistics has never been more intense and, at the same time, the grant application and review process at such agencies as the National Institutes of Health (NIH) is undergoing significant transformation. **Writing Dissertation and Grant Proposals: Epidemiology, Preventive Medicine and Biostatistics** targets effective grant proposal writing in this highly competitive and evolving environment. Covering all aspects of the proposal writing process, the text:

- Provides summary checklists and step-by-step guidelines for grant structure and style alongside broader strategies for developing a research funding portfolio
- Explains how to avoid common errors and pitfalls, supplying critical dos and don'ts that aid in writing solid grant proposals
- Demonstrates proven tactics and illustrates key concepts with extensive examples from successfully funded proposals

Written by an established NIH reviewer with inside knowledge and an impressive track record of funding, **Writing Dissertation and Grant Proposals: Epidemiology, Preventive Medicine and Biostatistics** is a virtual cookbook of the appropriate ingredients needed to construct a winning grant proposal. Therefore, the text is not only relevant for early-stage investigators including graduate students, medical students/residents, and postdoctoral fellows, but also valuable for experienced faculty, clinicians, epidemiologists, and health professionals who cannot seem to break the barrier to obtain NIH-funded research.



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WRITING DISSERTATION AND GRANT PROPOSALS

Epidemiology, Preventive Medicine and Biostatistics

Preface

For more than 15 years, I have taught a graduate course on grant proposal writing for students in the School of Public Health and Health Sciences at the University of Massachusetts at Amherst. With their encouragement and suggestions, this textbook has come to be a reality. Competition for research funds has never been more intense and, at the same time, the grant application and review process at such agencies as the National Institutes of Health (NIH) are undergoing significant transformation. *Writing Dissertation and Grant Proposals: Epidemiology, Preventive Medicine, and Biostatistics* is unique in representing an up-to-date textbook targeting effective grant proposal writing in this growing and important field.

The text covers all aspects of the proposal-writing process from *soup to nuts*. Step-by-step tips address grant structure and style alongside broader strategies for developing a research funding portfolio. Throughout, concepts are illustrated with annotated examples from successfully funded proposals in the field. Strategies to avoid common errors and pitfalls (e.g., *do's and don'ts*) and summary checklists of guidelines are provided. Essentially, the text can be viewed as a virtual *cookbook* of the appropriate ingredients needed to construct a successful grant proposal.

Therefore, this text is not only highly relevant for early-stage investigators including graduate students, medical students/residents, and postdoctoral fellows, but also valuable for more experienced faculty, clinicians, epidemiologists, and other health professionals who cannot seem to break the barrier to NIH-funded research. This book can serve as the primary text for courses in grant and proposal writing and as an accompanying text to courses in research methods, epidemiology, preventive medicine, statistics, and population health, as well as a personal resource.

Chapter 1, *Ten Top Tips for Successful Proposal Writing*, reviews what I believe are the ten most important factors in developing a grant proposal. The text is then divided into three parts. Part One, Preparing to Write the Proposal, begins with Chapter 2, *Starting a Dissertation Proposal*, which provides tips on selecting a dissertation topic, strategies for selecting and interacting with a dissertation committee, and a plan of action with suggested timelines. Chapter 3, *How to Develop and Write Hypotheses*, outlines strategies for developing your ideas into effective hypotheses. The often daunting task of conducting the literature search is made manageable through the step-by-step approach provided in Chapter 4, *Conducting the Literature Search*. Guidelines for writing with clarity and precision are provided in Chapter 5, *Scientific Writing*.

Part Two, The Proposal: Section by Section, follows the structure of a research proposal beginning with crafting your *Specific Aims* (Chapter 6) to leverage a research gap that your proposal will address and then continuing through *Background and Significance Section* (Chapter 7), *Summarizing Preliminary Studies* (Chapter 8), *Study Design and Methods* (Chapter 9), *Data Analysis Plan* (Chapter 10), and *Power and Sample Size* (Chapter 11).

Potential study limitations and a fourfold approach to strategically present and minimize these limitations are reviewed in Chapter 12, *Review of Bias and Confounding*, and Chapter 13, *How to Present Limitations and Alternatives*. Issues specific to pilot and feasibility studies, often excellent topics for early grant proposals, are described in Chapter 14, *Reproducibility and Validity Studies*. Techniques for crafting your abstract, potentially the most critical component of a grant proposal, are discussed in Chapter 15, *Abstracts and Titles*. Chapter 16, *Presenting Your Proposal Orally*, covers preparing the visual and oral content of a proposal presentation.

Part Three, Grantsmanship, provides strategies for putting together a winning NIH proposal and is kicked off by Chapter 17, *Choosing the Right Funding Source*, which outlines how to develop a grant funding plan. Chapter 18, *Submission of the Grant Proposal*, continues by providing strategic tips for each component of the grant application. Chapter 19, *Review Process*, describes the review criteria for research, career, and fellowship awards; ways to maximize your chances for a successful review; and potential reasons for rejection. Finally, Chapter 20, *Resubmission of the Grant Proposal*, goes on to describe the pathway to resubmitting your grant proposal along with strategic tips for how to be highly responsive to reviewer concerns—the key criteria in a successful resubmission.

Throughout the chapters, examples from successfully funded proposals in the field appear in shaded boxes. These excerpts have been edited to remove reference to specific investigators and study sites; details of the study design have often been modified. Therefore, superscripts in the text demonstrate where references should be placed, but actual references are not included. In this manner, the examples focus on the structure and techniques used in scientific writing and can be broadly applied to a variety of grant topics.

While the focus of the text is on principles to guide the pursuit of funding primarily from NIH, these principles also apply to other federal and state agencies as well as foundations. NIH, however, remains the largest funder of biomedical research in the world, and NIH funds research in just about every area that is remotely related to human health and disease. It is also important to note that this book is not designed to teach you research methodology or statistics; readers without exposure to these areas would profit by referring to an introductory text. Instead, the focus of the text is on how to convert your research ideas into a successful grant proposal. Keep in mind that in science, if one is to make an impact, it is not sufficient to reach the truth; you must persuade your colleagues of it.

Finally, I would like to acknowledge the help I received in bringing this book to completion. The concepts in this book owe much to the work and ideas of my mentors, colleagues, and former students and were greatly informed by the grant review panels on which I have served. This book is also in debt to earlier courses that I took at Harvard and is a tribute to my mentor Dr. Meir Stampfer. In addition, crucial input on specific chapters has been provided by Drs. Michael D. Schmidt, Amy E. Haskins, Sarah Goff, Larissa R. Brunner Huber, Scott Chasan-Taber, Renée Turzanski Fortner, and Tiffany A. Moore Simas. JCT contributed her formidable formatting skills. The support of my indomitable daughters, Adina and Jessie, has been unwavering. Lastly, this book is dedicated to my husband Scott, the composer of the best proposal I have ever heard.

Author

Dr. Lisa Chasan-Taber is a professor of epidemiology and the former associate dean for research in the School of Public Health and Health Sciences at the University of Massachusetts Amherst. She is a reproductive epidemiologist and a nationally and internationally recognized expert on physical activity during pregnancy. Early in her career, Dr. Chasan-Taber received the American Diabetes Association Career Development Award, and she has consistently been funded by the National Institutes of Health (NIH) as a principal investigator for the last 15 years. Dr. Chasan-Taber was a standing member of the NIH Infectious Disease, Reproductive Health, Asthma, and Pulmonary Epidemiology (IRAP) Study Section and has served on multiple national review panels, as a mentor on NIH Research Career Development Awards, and as the principal investigator of Mentoring Grants designed to provide early-career faculty with successful grant-writing strategies. For more than 15 years, she has taught a class on proposal and grant writing for epidemiology graduate students, which serves as the basis for this book. She has been recognized for her research through the Chancellor's Medal, the highest recognition bestowed to faculty by the university, and for her teaching excellence and innovative approaches to instruction through the College Outstanding Teacher Award. Chasan-Taber received her postdoctoral and doctoral training in epidemiology at the Harvard School of Public Health, a master's in public health from the University of Massachusetts, and a bachelor of arts from the University of Pennsylvania.

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