Evaluating Clinical and Public Health Interventions

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A practical guide to study design and statistics

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To Igael Gurin-Malous, with love

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Preface

My experience as a public health director has taught me that solving complex health problems requires identifying useful interventions. This book is my intervention to make it easier (and more fun) to conduct intervention studies.[1]

Many different types of interventions can improve health and health care, including drugs and medical devices, laws and changes in medical and organizational practices. To enable you to evaluate a wide range of interventions, this book explains the advantages and disadvantages of many different approaches: randomized and nonrandomized studies; prospective and retrospective studies; planned clinical trials and observational studies (e.g., studies using administrative databases, disease registries); evaluations of investigator-initiated interventions as well as evaluations of interventions created by others (e.g., a law or a system change).

By covering both study design and statistical analysis in one book I hope to save you from having to go back and forth between a textbook on study design and one on statistics. Also, for many intervention studies, especially nonrandomized designs, understanding the statistical approach to analyzing the data is key to judging the robustness of the design. Within the statistics section I have organized the material the way that researchers think: what is the best test to perform to answer a particular question? For readers who wish to learn more about particular tests (e.g., McNemar test, mixed-effects model) I have provided references in the footnotes.

To illustrate the points in this book, I have included many examples from the medical and public health literature. Examining published articles builds on your knowledge of how to read the literature, and illustrates practical strategies to use in planning your study and analyzing the results. Also, you may find it helpful to model your study after one of the examples in the book. Given the number and range of examples I am certain you will find one that is similar to your work.

[1] Katz, M. H. "Interventions to increase interventions are needed." *J. Publ. Health Mgt. Pract.* **14** (2008): 224–7.

To minimize overlap between this book and my other two books: *Study Design and Statistical Analysis: A practical guide for clinicians* (Cambridge University Press, 2006) and *Multivariable Analysis: A practical guide for clinicians* (2nd edition: Cambridge University Press, 2006), I liberally cite them. Please don't see this as an expression of ego, but rather as a desire to minimize overlap. Some may prefer all the material in one text. Although that would have some advantages, it would make the books longer, more expensive, and more daunting to people new to the field. If you like this book and are interested in learning more about non-intervention studies (e.g., descriptive studies, risk-factor studies) or learning more about statistics I hope you will read these other two books.

I have benefited from reading several existing textbooks. *Experimental and Quasi-experimental Designs for Generalized Causal Inference* by W. R. Shadish, T. D. Cook and D. T. Campbell (Houghton Mifflin Company, 2002) provides a deeper theoretical review of many of the study designs included in this book. Investigators planning to conduct a clinical trial should read *Fundamentals of Clinical Trials,* by L. Friedman *et al*. (3rd edition: Springer, 1999).

I appreciate the support of my editors Richard Marley and Katie James and the staff at Cambridge University Press.

If you have any questions or suggestions for future editions, please e-mail me at mhkatz59@yahoo.com. Readers of my other two books have e-mailed me from all around the world. Writing textbooks is an arduous and lonely business. Knowing that others benefit from the books sustains me.