

# TEACHING OF STATISTICS IN THE HEALTH SCIENCES

BOB OSTER

## From the Section Chair

I am really looking forward to the Joint Statistical Meetings (JSM) in Toronto this August, and hope that you are as well. I encourage all section members, and also all non-members who might be reading this newsletter, to participate in the JSM. We again have an exciting program this year in our section. I would especially like to thank Brent Shelton, our Program Chair, for putting this year's program together, and Patrick Arbogast, our Program Chair-Elect, for organizing the roundtable luncheons.

Please try to attend the TSHS sessions, the roundtable luncheons, and the one-day short course. Our JSM activities will almost certainly stimulate additional discussion on the topics that are presented in these activities, and also on issues relevant to our section. I also believe that our activities will continue to move our section forward. Following is a brief summary of our JSM activities. Additional details can be found in Brent's article, which appears elsewhere in this issue, and on the ASA website at <http://www.amstat.org/meetings/jsm/2004/onlineprogram>.

We are sponsoring three roundtable luncheons this year. These will occur on Monday, August 9, Tuesday, August 10, and Wednesday, August 11, with each luncheon beginning at 12:30. We are also sponsoring a contributed paper session on Tuesday at 8:30, an invited paper session on Tuesday at 2:00, and a topic contributed panel on Wednesday at 10:30. In addition, we are sponsoring a one-day short course entitled "Writing Effectively: Communicating with Non-Statisticians". The instructors of this course are Tom Lang and Ralph O'Brien, both of whom are TSHS members, and also winners of "Excellence-in-CE" awards (for JSM courses taught in previous years). This course is offered on Tuesday, August 10, beginning at 8:15.



**TSHS MEMBERS  
MEETING AND  
MIXER  
WEDNESDAY  
5:30 - 7:00 P.M.  
August 11, 2004  
Wellington Room  
Intercontinental Hotel**

Please plan to attend the TSHS members business meeting and mixer. This event will be held on Wednesday, August 11 from 5:30 – 7:00 pm in the Wellington Room of the Intercontinental Hotel. This event is informal, and a good variety of food and drink will be available. We also intend to have a drawing for door prizes, which are donated by some of the JSM exhibitors. Last year, I won a brand new text (published in 2003) on survival analysis!

Program plans for the 2005 JSM are already underway. Please contact Patrick Arbogast ([patrick.arbogast@vanderbilt.edu](mailto:patrick.arbogast@vanderbilt.edu)) with your ideas and offers of assistance. He will be most appreciative. Also, please let Patrick know if you would like to plan or chair a session.

Recently, there have been e-mails circulated to section members regarding a discussion on distance learning. Due to large number of e-mails generated in this discussion, and also due to suggestions from a few of our members, I am pleased to announce that we have established a listserv for TSHS. Actually, there are two listservs: one that any section member

can post to, and one that only members of the TSHS Executive Committee can post to. All of you should have received an e-mail stating that you are now subscribed to the former listserv (and to the latter if you are a member of the TSHS Executive Committee). If you did not receive this e-mail, please make sure that ASA has a valid e-mail address for you. I would like to thank to Patrick Arbogast and Jackie Dietz for setting up these listservs. Please refer to Stephen Looney's column elsewhere in this issue for more details on these listservs.

Our book review editor, Dan Byrne, continues to solicit book reviews from TSHS members. If you are interested in writing a book review, or have suggestions for books that you would like to see reviewed, please contact Dan directly (at [daniel.byrne@vanderbilt.edu](mailto:daniel.byrne@vanderbilt.edu)).

All section members are again welcome and encouraged to submit articles to our newsletter. The deadline for receipt of articles for the fall issue is November 1, 2004. All items are to be sent directly to Stephen Looney ([sloon1@lsuhsc.edu](mailto:sloon1@lsuhsc.edu)).

If you have any suggestions on how our section can better meet your needs and expectations, please contact me or any other section officer. In addition, please bring your ideas to our business meeting and mixer. I look forward to seeing you at the JSM in Toronto! ■

## 2004 JSM IN TORONTO

### From the 2004 Program Chair: Brent J. Shelton

**O**ur Section is sponsoring one invited session, 1 contributed paper session, 1 Topic Contributed Panel Discussion, 2 contributed posters, 3 roundtable luncheons, some CE courses (either sponsored or co-sponsored) and, of course, the annual TSHS members meeting and mixer. Below see all of these activities listed along with the day, time and hotel location. You can see the details of the sessions at the online program on the ASA website.

Here are the TSHS sponsored activities (with locations provided):

**FRY** = Fairmont Royal York, **ICH** = InterContinental Hotel, **TCC** = Metro Toronto Convention Center

134	Mon, 8/9/04, 12:30 PM - 1:50 PM	ICH-Caledon
Roundtable Luncheon: Teaching Intermediate-level Biostatistics to Clinicians Using General Statistical Software Packages		
CE_24 C	Tue, 8/10/04, 8:15 AM - 4:15 PM	FRY-Tudor 7
1 Day Course: Writing Effectively: Communicating with Nonstatisticians		
191	Tue, 8/10/04, 8:30 AM - 10:20 AM	ICH-Ballroom A
Contributed Papers: Issues and Methods of Program and Course Development in Teaching Statistics for the Health Sciences		
246	Tue, 8/10/04, 12:30 PM - 1:50 PM	ICH-Caledon
Roundtable Luncheon: Assessment of Medical Students and Post-graduate Physicians in Biostatistics Courses		
254	Tue, 8/10/04, 2:00 PM - 3:50 PM	TCC-701 A
Invited Papers: Ways to Increase the Number of US Resident Students Who Obtain PhD's in Statistics and Biostatistics		
	Wed, 8/11/04, 7:00 AM - 8:30 AM	ICH-Halton
Section on Teaching of Statistics in the Health Sciences Executive Committee Meeting		
336	Wed, 8/11/04, 10:30 AM - 12:20 PM	TCC-717 A
Topic Contributed Panel: Consulting with CAM Investigators: Challenges, Opportunities, or Both?		
357	Wed, 8/11/04, 12:30 PM - 1:50 PM	ICH-Caledon
Roundtable Luncheon: The Role of Statisticians in Teaching Evidence-based Practice to Future Clinicians		
	Wed, 8/11/04, 5:30 PM - 7:00 PM	ICH-Wellington
Section on Teaching Statistics in the Health Sciences Business Meeting and Mixer		

## 2005 JSM IN MINNEAPOLIS

### From the 2005 Program Chair: Patrick Arbogast

**H**ello from Music City! First off, I would like to say that I am greatly looking forward to our program at this year's JSM in Toronto. Our programs at JSM over the years have been stimulating and engaging, and I certainly have my work cut out for me at JSM 2005, which will be held in Minneapolis on August 7-11. One order of business is to plan our invited session, and our submission deadline is July 22.

Some time ago, I sent an e-mail message shamelessly soliciting ideas for the invited session for JSM 2005. Thank you to everyone who contributed suggestions. I received a number of great ideas. However, one topic in particular that generated a tremendous amount of e-mail discussion was "distance learning". As was shared through the e-mail threads, there was support, caution, as well as concern, expressed over it in many different respects. Given the interest in this topic, I would like to make this the central theme of the invited session. I would like to thank those who have already agreed to participate. However, I am still in the process of formulating the session and would greatly appreciate additional input, in particular, suggestions for speakers.

I have also received many wonderful suggestions for other topics. However, since we are limited to one invited session, I am hoping to organize some of these into topic contributed papers, panel discussions, poster sessions, or roundtable luncheons. So, some of you may be hearing from me again.

Again, if anyone has suggestions for speakers for the invited session, or if there are any suggestions for topics in other program formats, please feel free to contact me at [patrick.arbogast@vanderbilt.edu](mailto:patrick.arbogast@vanderbilt.edu)

I am looking forward to working with everyone on JSM 2005 and to seeing everyone in Toronto at one of our sessions or at our mixer. Thanks much! ■

## BOOK REVIEW

### *Medical Statistics from A to Z: A Guide for Clinicians and Medical Students*

**Brian S. Everitt**

**Cambridge University Press  
2003**

**Reviewer:**

**Robert A. Oster, Ph.D.  
University of Alabama at Birmingham**

**T**he goal of this new text is to provide clinicians, medical students, and research workers in the health sciences with non-technical definitions of terms from medical statistics and related areas. This text may be particularly helpful to such people as they read medical journals and other literature relevant to their work. No mathematical nomenclature or formulae are used in any of the definitions.

More than 1500 terms are clearly explained in this text. Many of the definitions are supplemented with a reference for further reading. These references are citations to peer-reviewed journal articles, book chapters, or entire books. Providing these references as supplemental information allows the definitions to remain clear, non-technical, and non-mathematical. In addition, these references provide a link between the definitions and more sophisticated mathematical and statistical material.

Some of the definitions are accompanied by annotated comments that warn the reader of common pitfalls associated with a particular statistical method or interpretation. For example, the definition of the term "P-value" is accompanied by the following comment: "Researchers should avoid despair on finding a P-value of 0.051 and equally restrain from joy on finding a value of 0.049. P-values without accompanying confidence intervals are like Wise without Morecambe or Frasier without Nyles." As a second example, the definition of the term "clinical versus statistical significance" is accompanied by the following comment: "Beware the researcher who tries to convince you that a difference of 4 mm Hg in blood pressure between

two groups with  $P < 0.05$  is of any clinical relevance. With large samples, even tiny differences will be statistically significant."

Most of the definitions of graphical techniques are accompanied by publication quality figures that illustrate the specific technique. This text contains 84 such figures.

One nice feature of this text is that several forms of cross-referencing are used for the definitions. The author uses Courier New font to denote terms that appear with their own definitions elsewhere in the text. In addition, the author uses italics to denote terms that are synonymous or terms that are more conveniently discussed under another entry. All entries in the text appear in alphabetical order using the letter-by-letter convention (instead of the word-by-word convention). This feature helps to make the text user-friendly.

Another nice feature of this text is the inclusion of definitions of modern terms that have been added to the statistical vocabulary. For example, the terms "microarrays", "data mining", "bootstrap method" and "artificial neural network" are all defined. Substantive definitions are also provided for techniques that have received a lot of attention in recent years, such as Bayesian statistics ("Bayesian confidence interval", "Bayesian methods", "Bayesian persuasion probabilities", "Bayes theorem", "prior distributions", and "posterior distributions"), generalized additive models, generalized estimating equations, generalized linear models, and exact tests. In addition, definitions are provided for several terms specific to clinical trials (such as "clinical trial", "interim analyses", and "sequential analysis"), epidemiology (such as "Berkson's fallacy" and "healthy worker effect"), and medical research (such as "evidence-based medicine", "markers of disease progression", "Karnofsky rating scale", and "stroke index"). Note that Phase I, Phase II, Phase III, and Phase IV studies are discussed under "clinical trial".

The author draws much (but certainly not all) of his material from Armitage and Colton (1989) and from Last (2001). I believe that Last (2001) would make an excellent companion to this text.

I recommend "Medical Statistics from A to Z: A Guide for Clinicians and Medical Students". I believe that it will be useful for the target audience (clinicians, medical students, and research workers in the health sciences). This text may also be of interest to TSHS members who consult with clinicians and investigators in the health sciences, and who teach medical students and

health science students.

#### REFERENCES

1. Armitage, P., and Colton, T. (1989), *Encyclopedia of Biostatistics*, New York: Wiley.
2. Last, J.M. (2001), *Dictionary of Epidemiology* (4<sup>th</sup> ed.), New York: Oxford University Press. ■

#### BOOK REVIEW

#### *Statistics with Confidence*

**Douglas G. Altman, David Machin,  
Trevor N. Bryant, Martin J. Gardner**

**BMJ Books  
2000 (second edition)**

**Reviewer:  
Daniel W. Byrne, M.S.  
Vanderbilt University**

**E**ven if this book were completely dreadful it would be worth buying simply for the accompanying software - Confidence Interval Analysis (CIA). But the fact is that this is a superb book, full of useful information. For the past three years, I have used this book as a supplementary (but required) textbook in a graduate biostatistics course for physician-scientists. Many of the students have commented to me that long after the course is finished, they continue to refer to this book and use the CIA software.

Biostatisticians are constantly struggling to convince physicians, and other non-statisticians, to rely more on confidence intervals and less on P-values. Yet, it is surprising how many biostatisticians are unaware of this book and software, which facilitate this goal.

The book is logically organized into 18 short, highly readable chapters. In Part I, the first 13 chapters provide a non-technical explanation of confidence intervals, a rationale for their use over P-values, and descriptions of the commonly used methods.

Part II includes two chapters that are particularly valuable to non-statisticians. Chapter 14, "Statistical guidelines for contributors to medical journals" is filled with important and

helpful advice that can make the difference on whether or not a paper is accepted for publication in a prestigious medical journal. For those who teach workshops on how to present statistical analysis in a medical paper, chapter 14 can serve as a supplemental resource. Chapter 15 provides statistical checklists that can be consulted when planning a clinical trial and when describing a trial for publication.

Part III provides notation, software, and tables. Although the book includes a short chapter describing the CIA software, it is unnecessary. The software is intuitive enough to use without instruction. The current Windows version of the software is a significant improvement over the DOS version that accompanied the first edition of this book in 1989. To use the software, one pulls down the "Methods" menu and selects from one of 8 categories of confidence intervals. Each category corresponds to a chapter in the book, for example, "Diagnostic Studies – Chapter 10". The user then selects the specific method within this category, for example, "Sensitivity and Specificity". After filling in the table of required fields, the software computes the confidence intervals not only for sensitivity and specificity but also for positive and negative predictive values.

Since this software is not a complete statistical package, and confidence intervals are generally included in the output of most statistical packages, one may ask why this software is needed. First, as a teaching tool, it is invaluable. One can easily demonstrate interactively to a class the concepts of confidence intervals by altering the sample size or variability. Second, this software provides confidence intervals for many applications that are sometimes not included in statistical packages (such as for kappa and the median). Third, this book is a handy reference to have on one's bookshelf with nearly all confidence interval formulae organized in one place. Fourth, investigators often need a confidence interval for their results and do not wish to rerun the analysis. Finally, this software is useful for calculating confidence intervals based on another investigator's results for which the raw data are unavailable, for example, when reviewing a paper or critiquing a paper for a journal club.

The CIA software does not compute bootstrap confidence intervals. The book, however, does provide a clear description of how these are calculated and refers the reader to the appropriate software, such as Stata, SPlus, or R. The software and book do not address floating confidence intervals. With the current

controversies surrounding this method, however, this may be a plus (Greenland, et al., 1999).

When ordering this book, it is important to specify the ISBN and authors, since there are two books with the same title. Periodically this book can be difficult to find, in which case it can be purchased directly from the BMJ web site: [www.bmjbookshop.com](http://www.bmjbookshop.com).

In summary, Statistics with Confidence and the CIA software are resources that every biostatistician could benefit from. Those teaching statistics in the health sciences should consider it as a supplementary textbook.

#### REFERENCES

1. Greenland S, Michels KB, Robins JM, Poole C, Willett WC. Presenting statistical un-certainty in trends and dose-response relations. *American Journal of Epidemiology* 1999; 149(12): 1077–1086. ■

#### ANNOUNCEMENT

### ***TSHS 2004 Membership Drive Bring a Buddy!***

**Renee Stolove  
Publications Officer**

In an effort to attract ASA members from other sections to TSHS, a multi-faceted strategy is under way. An announcement of our section's activities appeared in the April issue of *Amstat News* and an update will appear in the July issue. Please look for it and let me now what you think ([Renee.Stolove@nymc.edu](mailto:Renee.Stolove@nymc.edu)). Our annual business meeting is an excellent opportunity for others to get to know us as well. Amidst our scintillating conversation (not to mention the *hors d'oeuvres*, beer, and wine), we are sure to attract new members. A limited number of "guests only" door prizes will be awarded. In keeping with the spirit of the conference, the door prizes will consist of Canadian delicacies. Many of us will have colleagues at JSM who teach or consult. Be sure to bring a buddy with you to any or all of our activities! ■

## ANNOUNCEMENT

**New Designation for Professional Statisticians in Canada: P.Stat.**

**S**tatisticians are now being offered an opportunity for extra professional recognition with the development of good integrative skills. It is expected that such a designation will raise the profile of statisticians working in fields such as medicine and engineering.

Experienced statisticians practicing in Canada are invited to apply now for a new designation, Professional Statistician (P.Stat.) which is being sponsored by the Statistical Society of Canada (SSC).

Accredited statisticians are expected to ensure good statistical practices for an application throughout:

- planning of projects and studies
- data collection and management
- analyses of data
- synthesis of results
- interpretation of data and results, and
- oral and written communication about projects and studies.

Statistical Accreditation establishes:

- national standards for good statistical practice, and
- a code for ethical conduct.

Statistical Accreditation involves development and maintenance of expertise:

- requirement for ongoing practice-specific professional development;
- website and internet access to resources, advice, and new statistical knowledge;
- mentorship by a professional advisor for recent honours, masters, and PhD statistics graduates.

P.Stat. applicants should have a minimum six years experience after at least a recognized undergraduate degree

<http://www.stat.sfu.ca/~cschwarz/pstat>.

The deadline for 2004 applications was June 30th. ■

Judy-Anne Chapman, Ph.D., P.Stat.  
Chair, Initial SSC Accreditation Committee  
[jachapma@aol.com](mailto:jachapma@aol.com)

## ANNOUNCEMENT

**Section Electronic Mailing List Now Available**

**A**s mentioned by Bob Oster in his column earlier in this newsletter, there is now an electronic mailing list available for the Section (sometimes these are referred to as "distribution lists" or "listservs"). What this means is that e-mails of general interest can now be distributed easily and quickly to all Section members. The address is [asa\\_tshs\\_members-l@amstat-online.org](mailto:asa_tshs_members-l@amstat-online.org) and we owe a special debt of gratitude to Patrick Arbogast and Jackie Deitz for their efforts in putting this distribution list together.

***The e-mail notifying Section members that the most recent issue of the Section newsletter is now available will be sent using this distribution list.*** If you have a valid e-mail address on file with the ASA, you were automatically made a member of this list, and you will continue to receive notification via e-mail that the most recent issue of the newsletter is available at the TSHS website.

***If you chose not to provide your e-mail address to ASA, or if you unsubscribe to the Section distribution list, you will no longer receive e-mail notification about the Section newsletter.*** However, you will still be able to access each issue of the newsletter at the TSHS website

[http://www.bio.ri.ccf.org/ASA\\_TSHS/html/index.html](http://www.bio.ri.ccf.org/ASA_TSHS/html/index.html).

***Hardcopies of the newsletter will no longer be mailed.***

If you did not receive an e-mail notifying you that you are now a member of the TSHS distribution list, or if you have questions about the list itself, send an e-mail to [owner-asa\\_tshs\\_members-l@amstat-online.org](mailto:owner-asa_tshs_members-l@amstat-online.org). If you have a question about how the Section newsletter is distributed, please contact me at [sloon1@suhsoc.edu](mailto:sloon1@suhsoc.edu). Thank you. ■

Stephen Looney  
TSHS Newsletter Editor

**2004 Section Officers for TSHS**

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## Congratulations!

A BIG pat on the back for these deserving statisticians . . .

TSHS Chair 2005: Walter Ambrosius, Wake Forest University

TSHS Chair 2006: Cyndy Long, Palmer Center for Chiropractic Research

TSHS Program Chair 2005: Patrick Arbogast, University of Washington

TSHS Publications Officer 2004-2005: Renee Stolove, NYMC School of Public Health

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TSHS Book Review Editor 2004-2005: Daniel Byrne, Vanderbilt University

American Statistical Association

TSHS Newsletter

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