Fall 2005 Section of the American Statistical Association

TEACHING of STATISTICS in the HEALTH SCIENCES

WALTER AMBROSIUS

From the Section Chair

When I was asked in 1999 to serve as the 2002 Program Chair for TSHS, it seemed so far in the future. That led to running for Chair-Elect, serving as Chair-Elect and then Chair, and will end with a term as Past-Chair. I've been involved with the Section in some capacity for six years and the time has flown. I would like to thank the Section membership for the opportunity to serve. I've learned much about teaching and statistics in general during my association with the Section. Thank you.

There are many people who contribute their time to our Section. Program Chair Patrick Arbogast put together a great slate of presentations for the JSM this past summer. Program Chair-Elect Janet Tooze organized the roundtable luncheons and will be responsible for the program in Seattle. Reena Deutsch makes sure we don't spend too much and reminds us of what we've previously decided in her role as Secretary-Treasurer. She's served for two years and will be stepping down at the end of the year. Lynn Ackerson as our Representative to the ASA Council of Sections and Monica Clark as our ASA Staff Liaison keep us connected to the larger ASA. Renee Stolove serves as our Publications Officer. Bringing the Newsletter to you is Ed Gracely who serves as the Editor of the TSHS Newsletter. Thanks to all of them for their contributions to the running of the Section. Finally, I would like to thank Robert Oster, Past-Chair, and Cyndy Long, Chair-Elect, who have given me excellent advice over the last year.

Planning for the 2006 JSM is already underway and Janet Tooze has been working to fill our program. She has an article elsewhere in this Newsletter soliciting contributed sessions. If you are contemplating giving a presentation at the 2006 JSM, please consider submitting a presentation to TSHS.

I look forward to seeing many of you in Seattle next summer!

A Vision for More TSHS Sessions at JSM

Cynthia R. Long, Chair-Elect

I am very excited to be serving the TSHS section as Chair-elect. In reflecting on what I'd like to accomplish during my term, I continue to come back to one thing: to get more of you, our members, to contribute papers and posters on TSHS topics at the JSM. My motivation is really a selfish one—I am always looking for ways to improve my teaching to health care professionals, both in the classroom and in consulting interactions. I typically attend as many sessions as possible sponsored by the Stat Ed section, but would like to see many of the fabulous topics they cover from the perspective of teaching in the health sciences, rather than in the general undergraduate setting.

Our Section is on the small side, especially compared to the Stat Ed, Biometrics and Statistical Consulting sections. Therefore, we only get one

invited session per JSM. However, we can have unlimited numbers of contributed sessions. I organized an invited session for TSHS at JSM a few years back on including modern methods in teaching biostatistics in the health sciences. It was well attended, so I hoped it would spawn papers from you describing your views and experiences. But, that hasn't really happened yet. I'd also like to see all of you present your ideas and examples for teaching both statistical concepts and advanced topics to health care professionals.

We have some great people serving as program chairs and I know they would welcome ideas for contributed sessions based on your experiences. Patrick Arbogast is just finishing his term, but he made a lot of contacts and still has many ideas to share with you for future sessions. Janet Tooze is the program chair for the 2006 JSM, so she is definitely interested in hearing from you. And, in case you are contemplating submissions further down the road, contact Patrick Tarwater, who is the 2007 program chair. You may even get him to share his secrets to winning the award for the TSHS Best Contributed Paper a few years back.

Please, let me know how we on the TSHS executive committee can entice you to contribute a paper on your experiences teaching in the health sciences at future JSM meetings!

BOOK REVIEW

Statistical Methods in Medical Research.
Peter Armitage, Geoffrey Berry, J.N.S. Matthews
Blackwell Publishing 2002 (Fourth ed.)

Reviewed by Daniel W. Byrne, Department of Biostatistics, Vanderbilt University Medical Center (Pictured)

"Statistical Methods in Medical Research" is unquestionably among the finest introductory biostatistics textbooks available. The purpose of this review is to discuss the type of course and level of student for which this book would be an appropriate match. It would only be proper to start with the strengths of this book.

The major strength is that it is comprehensive and well referenced. That it is in the 4th edition and first published in 1971 testifies to its value. The 817 pages are divided into 20 chapters, beginning with easy to understand chapters on describing data (1) and probability (2).

The remaining chapters cover topics found in most introductory biostatistics courses but also provide sage advice from three highly experienced professors of biostatistics. Many introductory biostatistics textbooks are written in a timid style in which the authors fail to include specific advice about applying statistical methods. Armitage and his coauthors provide specific and direct advice that is invaluable to students and practicing biostatisticians. Examples of this include avoiding one-sided tests (page 89) and presenting results with confidence intervals (page 91). The entire chapter on clinical trials (chapter 18) is truly a gem. In addition, the authors include 731 references to help readers find the original papers of the topics covered or the most appropriate books to find additional detail.

Another strength, of particular interest to those who teach statistics in the health sciences, is the care and effort that went into communicating statistical concepts. This is evident in the excellent figures, for example the figure on page 99 describing confidence intervals. Descriptive, smooth explanations introduce each new concept and formula. This book contains remarkably few errors. In fact, when I offered my students points toward their final grade for errors they detected, only one student reported an error, which was a minor typographical error. The errors detected in this review were also minor: "0.5xx", page 49; "$x_{2"}$, page 106; "There", page 603.

Given these strengths, I decided to use this book as the primary textbook in a graduate-level introduction to biostatistics course in the Master of Science in Clinical Investigation program at Vanderbilt. The students are mostly physician-scientists at the fellow level, with little previous formal training in biostatistics. Unfortunately, the Armitage book was overwhelming for these students. Although the level of mathematical detail and formulas presented are appropriate for students preparing for a career in biostatistics, these physician-scientists were frustrated and exhausted by this book. This is not a criticism of this book or the authors. Most statistics instructors would agree that it is impossible to write a book that is appropriate for these two diverse audiences.

This book does have several weaknesses. Some sections and advice are outdated, for example, such as the section on data entry (page 15) and the details of manual calculations (page 19). In general, there is much attention given to calculating methods by hand and with a calculator and almost no information on statistical software. In an age where nearly all statistical analyses are performed with statistical software, readers of this book would benefit from more advice about software. The free statistical software R is not even mentioned in this book. Obviously, a statistical textbook cannot also include the details found in statistical software manuals. Nevertheless, a description and screen shots of the sample size software and online calculators currently available would be valuable additions to the sample size section. Also, numerous sections are unnecessarily complex and confusing. The fine level of detail provides for a useful reference book for the professional statistician but limits the value as an introductory textbook. Instructors considering this text for a course should also know that the book does not contain homework problems, and the data sets used in examples are not included on a CD or web site.

In summary, "Statistical Methods in Medical Research" is a comprehensive reference book that every biostatistician should own. This book is an appropriate textbook for an introductory course in a biostatistics Masters or Ph.D. program. For an introductory biostatistics course in which the students are not preparing for a career in biostatistics, such as an MPH or MSCI program, this book is a bit overwhelming. In the preface the authors state "Although the book developed from material used in courses for postgraduate students in the medical sciences, we have always regarded it primarily as a resource for research workers rather than as a course book." In my opinion, "Essential Medical Statistics" by Kirkwood and Sterne is currently the best textbook for introductory biostatistics courses in which the students are not preparing for a career in biostatistics.

Number of Pages: 817 + xi, 198 illustrations
ISBN: 0-632-05257-0.
Price: $90.00, hardcover.

Contributed Paper Sessions at JSM 2006 in Seattle

Janet Tooze

It's not too early to start thinking about submitting a contributed paper for JSM 2006, in Seattle from August 6-10. Papers that are submitted to the Teaching Statistics in the Health Sciences Section will be eligible to win awards for Best Contributed Paper and Best Contributed Poster.

Abstract submission will open online on **December 1, 2005**, and end on **February 1, 2006**

(http://www.amstat.org/meetings/jsm/2006/index.cfm).

I encourage everyone to submit an abstract for a session, panel, paper, or poster. Past topics have included creative teaching methods, teaching medical students, teaching in consulting, teaching short courses, distance learning, journal clubs, and computer-based education. These topics are certainly not all-inclusive and a paper on *any* teaching in the health sciences is welcomed.

I have summarized the opportunities for presenting in a JSM session below.

Contributed Papers:

Topic Contributed Paper: These sessions consist of a collection of contributed talks and discussions (if desired) that share a common topic. The sessions are 110 minutes in length, and there must be 5 presentations (including discussants) of 20 minutes each with 10 minutes at the end for floor discussion. Up to 2 discussants may be included.

Topic Contributed Panel: These sessions are also 110 minutes in length, with a minimum of 3 and a maximum of 5 panelists providing commentary on a particular topic. Only one abstract is required for this session.

Regular Contributed Session: These sessions are a maximum of 110 minutes in length, and generally

include 6 or 7 speakers speaking for 15 minutes each.

Posters:
Posters are also an excellent opportunity to present your work and interact with your colleagues one-on-one.

Topic Contributed Posters: A topic contributed poster cluster will contain approximately 3 to 6 posters on a given topic, with roughly the same level of cohesion as in a topic contributed session.

Regular Contributed Posters: Poster sessions provide an opportunity for the author to discuss his or her work in depth with persons interested in the topic, and to be given direct feedback. The poster sessions are 110 minutes in length.

Please feel free to contact me with any questions or comments about JSM 2006: jtooze@wfubmc.edu or (336)716-3833. See you in Seattle!

JSM 2005 RECAP

Patrick G. Arbogast
2005 Program Chair

Our JSM 2005 program was quite the success. The invited session, "Distance Learning in the Health Sciences" drew 35+ attendees and stimulating discussion. Our Contributed Paper Session, "Issues and Methods of Program and Course Development in Teaching Statistics for the Health Sciences" had 25+ attendees. Felicity Boyd Enders's talk, "Teaching the Teacher: an Active Learning Exercise to Train Biostatistics Teaching Assistants" won the Best Contributed Paper award and received $100 and a plaque. Congratulations Dr. Enders!
Our three roundtable luncheons, "Assessment of Medical Students and Postgraduate Physicians in Biostatistics Courses" lead by Reena Deutsch, "Integrating Statistical Software in Health Sciences Graduate Courses" lead by Jodi Lapidus, and "Distance Education in Biostatistics" lead by Scott Evans, were well attended. Our CE course, "Sample-Size Analysis for Study Planning" given by Ralph G. O'Brien and John Castelloe was another success. Thank you to all of the presenters and to the session chairs!

International Conference on Teaching Statistics

Reena Deutsch, Ph.D.
University of California, San Diego

Every four years, the International Association for Statistical Education (IASE), which seeks to promote, support, and improve statistical education at all levels everywhere around the world, sponsors the International Conference on Teaching Statistics (ICOTS). The next meeting, ICOTS-7, is scheduled to take place in Salvador, Bahia, Brazil, July 2-7, 2006. The TSHS section will be well represented at the meeting, as there is an invited session on Statistics in Medicine organized by TSHS section member Reena Deutsch and which includes an invited paper presented by another TSHS section member Cyndy Long.

Previous participants in ICOTS have lauded the enthusiasm and knowledge of the attendees and encourage anyone interested or involved in teaching statistics at any level to consider attending this conference. Many attendees take advantage of the foreign locales for the meetings and sign up for a pre-conference or post-conference tour during the registration process. Information about the conference can be found at:
http://www.maths.otago.ac.nz/icots7
and information about IASE is at:
http://www.stat.auckland.ac.nz/~iase/.
Contributed papers may still be accepted. If interested in submitting a paper, please contact Joachim Engel:
(Engel_Joachim@ph-ludwigsburg.de) or
Allan MacLean:
(alan.mclean@buseco.monash.edu.au).

Distance Education and Teaching Statistics in the Health Sciences

Scott Evans, Harvard University

In the summer of 2004, I was asked to add a distance education option to my "Introduction to Biostatistics" course. My lectures were to be videotaped; a production sequence would synchronize the video with my slides, and then made available via a course website for distance students. As I knew very little about distance education, I sent an email to the listserve for the Section on Teaching Statistics in the Health Sciences (TSHS). I stated that I had been asked to provide this option to my course and I would appreciate words of wisdom from educators with experience with teaching statistics using distance methods. Little did I realize the stir that this would cause and the discussion that this would generate. Over the next few days, a stampede of email was circulated (my apologies to those that received more email than they wished to see), discussing the pros and cons, and individual experiences with teaching (bio)statistics from a distance. One resulting take home message from this discussion was that teaching statistics in the health sciences using distance methods is a complex and controversial topic that requires more critical thought and discussion, as well as careful scientific evaluation.

The volume of email generated by the discussion resulted in two TSHS Section-sponsored events at the Joint Statistical Meetings (JSM) 2005. The first event was a luncheon roundtable entitled, "Distance Education in Biostatistics". Biostatistics is a particularly attractive course to offer via distance education because it is not universally offered at all institutions. Six attendees at the roundtable (one from each of Drexel, Johns Hopkins, Duke, Minnesota, the Mayo Clinic, and Harvard), discussed the advantages, disadvantages, trends, and challenges of offering biostatistics courses from a distance. It was noted that "distance education" is a very broad term that encompasses many methods of delivery (e.g., synchronous vs. asynchronous, videotape vs. document-based, semester schedule vs. self-paced, etc.). Each university/course may have its own approach to delivery. It was also apparent that universities are trending towards offering more distance courses due to the flexibility it provides many students (and perhaps the cost efficiency of such courses). Most biostatistics courses that have been offered from a distance were introductory in nature and were generally targeted towards students that were non-biostatisticians. Attendees noted the importance of providing distance students with an avenue of communication and a venue for asking questions, noting that biostatistics is not easy for many students. Thus focusing on important concepts rather than mathematical details may be a more effective approach. The discussants also noted that teaching biostatistics courses from a distance required more preparation than traditional courses and that technological support from the hosting university is important. Educators need to consider themselves as a student of the distance education process and examine methods to improve teaching skills and increase student learning. Discussants also noted that it would be valuable to conduct scientific evaluation of the effectiveness of student learning of biostatistics from a distance.

The TSHS Section also sponsored an invited session, "Distance Learning in the Health Sciences". The first presentation was "Basic Biostatistics Online: A Distance Education Success Story" by John McGready of Johns Hopkins University. John described the challenges of transitioning presentation materials into a format in which real-time, face-to-face communication is not the norm. He also described techniques to maximize opportunities for instructor-student contact including use of an electronic bulletin board system which allowed live "talk" between students and instructors. He further noted that teaching distance courses may actually improve teaching skills due to the additional preparation needed and the awareness of the challenges that students face during the course.

The second presentation was "Distance Learning from the Trenches: Lessons Learned" by Carol Bigelow and Penny Pekow of the University of Massachusetts. They noted that distance students have limited opportunities to study collaboratively and identified alternative strategies based on four key aims: (1) meeting the students where they are, (2) accommodating the diversity of student preparedness (which can be more variable in distance settings), (3) enlisting the students as coinstructors, and (4) extensive and timely responsiveness. They further suggested that distance educators provide extensive website resources, provide exercises with solutions and fully annotated computer illustrations in multiple

formats, and use free-from but structured threaded discussions (e.g., white board). They noted the advantages of online teaching assistants and that students appreciated an emphasis on applications.

The final presentation of the invited session was "Distance Learning in Statistical Training of Health Care Professionals Conducting Research" by Bob Riffenburgh of the Navel Medical Center in San Diego. Dr. Riffenburgh noted that medical students frequently conduct research projects as part of their training; however their knowledge of statistics is often limited. Residency training is generally characterized by asynchronous tailored program phases. Distance learning may provide a mechanism for an asynchronous, multi-level, training program for health care researchers that can offer the flexibility of tailoring to the individual student baseline knowledge and discipline-specific interests.

Distance education has generated a great deal of discussion amongst educators of statistics. Opinions regarding distance education vary widely with some believing that it jeopardizes education quality. Others disagree and note the increased accessibility and flexibility that it provides to students. It has numerous advantages, disadvantages, and presents unique challenges. It is clear that distance education is a reality, and that we have learned some valuable lessons as evidenced by the JSM events. However, it is also clear that more thought, discussion, and evaluation of distance education are needed.

INTERNATIONAL STATISTICAL LITERACY PROJECT NEEDS YOUR HELP

In order to make the webpages of the International Statistical Literacy Project (ISLP) more helpful for users, the ISLP Advisory Committee is conducting a short survey of the users of the ISLP webpages. The survey is anonymous and is at http://course1.winona.edu/cblumberg/survey.htm. It should take about 3 minutes to complete. We would appreciate the filling out of the survey by anybody who has ever looked at the ISLP webpages. Thank you in advance to all who fill out the survey form.

If you have not yet explored the webpages of the ISLP, you can begin to do so by going to http://course1.winona.edu/cblumberg/islplist.htm.

Contact Carol Joyce Blumberg at cblumberg@winona.edu for further information.

JSM 2005 TSHS Roundtable Luncheon (Monday, August 8, 2005)

Reena Deutsch, Ph.D.

Assessment of Medical Students and Postgraduate Physicians in Biostatistics Courses
Sponsored by the Section on Teaching Statistics in the Health Sciences

Organizer: Janet Tooze, Wake Forest University School of Medicine

Presenter: Reena Deutsch, University of California, San Diego

There were five folks at the lunch table having lively and informative crosstalk about how, what, and when to assess medical students and physician-trainees in biostatistics courses. Each participant introduced him- or herself and described the setting in which classes are taught. We shared the assessment tools we currently use and what has been tried in the past. We did not all come to agreement on what skills, knowledge, or attitudes should be assessed, but we did hear about experiences that others have had. Handouts were distributed containing information about various sources related to assessment, such as the ARTIST website (Assessment Resource Tools for Improving Statistical Thinking http://data.gen.umn.edu/artist//), the Statistics Education Research Journal (http://www.cbs.nl/isi/SERJ.HTM), an exerpt from Amstat News describing past JSM sessions on assessment, and the abstract from Joan Garfield's paper on Assessing statistical reasoning (SERJ 2(1):22-28). Supplemental material was also made available.

Open discussion included thoughts about traditional quizzes and exams vs. using journal articles as cases and having the students develop their own statistical plan for a research project. Participants gave feedback that hearing how others assess in their classes was most informative and worthwhile.

FINAL REPORT OF THE 2005 TSHS NOMINATING COMMITTEE

Bob Oster

On behalf of the 2005 TSHS Nominating Committee, I want to say "thank you" to all section members that expressed an interest in being a candidate for an elected TSHS office in the 2006 ASA elections. There were several folks interested in running for each of the offices that we will be voting on. The Nominating Committee is pleased to announce that the candidates in the 2006 elections are as follows. For Chair-Elect (Chair-Elect in 2007, Chair in 2008, Past Chair in 2009), the candidates are Patrick Arbogast of Vanderbilt University, and Scott Evans of the Harvard School of Public Health. For Council of Sections Representative (2007-2009), the candidates are Janine Janosky of the University of Pittsburgh, and Joseph Lucke of the University of Texas Health Science Center. Congratulations to these members!

The nominating committee consisted of Walter Ambrosius, Cyndy Long, and myself (as committee chair). I want to thank Walter and Cyndy for their assistance with the work of this committee.

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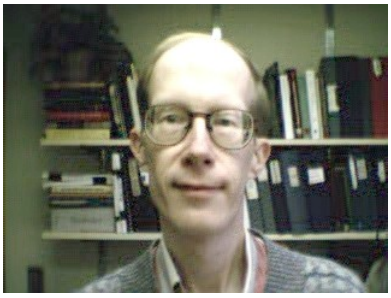
FROM THE EDITOR



Well, you thought the last issue was full, eh? This one has even more!

Hope you find plenty of items of interest.

As always, if you have something to contribute, send it along!

Ed