



Statfax



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Northeastern Illinois Chapter of the American Statistical Association

Spring 2000

PROGRAM

Technology Assessment and Medical Cost-Containment

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Advances in medical technology are the primary cause of increases in health care costs, but while many technologies are clearly worthwhile, there is strong evidence that other technologies have little benefit at the margin. Moreover, the most common approaches to cost-containment have not been able to address the problem of technology assessment. These findings suggest that formal medical technology assessment is important to controlling health care costs, but technology assessment is plagued by important methodological problems concerning the measurement of the benefits and costs of medical interventions, and how to deal with uncertainty in those measures. Despite these challenges, a variety of new approaches to these problems that rely on the economic foundations of medical technology assessment suggest potential strategies to address these methodological challenges.

Biosketch

Dr. David Meltzer is Assistant Professor in the Department of Medicine, Department of Economics, and Graduate School of Public Policy Studies at the University of Chicago. He received his M.D. and Ph.D. in Economics from the University of Chicago, and completed his residency in Internal Medicine at Brigham and Women's Hospital in Boston, MA. His research has focused on the theoretical foundations of medical cost-effectiveness analysis. For this work he has received the Lee Lusted Prize and Award for Outstanding Paper by a Junior Investigator from the Society for Medical Decision Making, the Paper of the Year Award from the National Institute of Health Care Management, the Robert Wood Johnson Generalist Physician Scholars Fellowship, and the John M. Olin Faculty Fellowship. In other work, he has examined

the effects of medical specialization on the cost and quality of medical care through an experiment that randomizes hospitalized patient to care by traditional general internists versus doctors who specialize in inpatient care, the effects of the Medicare Prospective Payment System on the distribution of expenditures among high and low cost patients, and the effects of Food and Drug Administration policies on the approval times of important drugs. He also recently served on an Institute of Medicine Panel on the Allocation of Organs for Transplantation.

Conditional Second-Order Generalized Estimating Equations for Nonlinear Mixed-Effects Models

Edward F. Vonesh, Ph.D.,
Hao Wang, Dibyen Majumdar

Generalized linear and nonlinear mixed-effects models are used extensively in biomedical and healthcare research including applications in pharmacokinetics, clinical trials, and epidemiology. Since the underlying model may be nonlinear in the random effects, there will generally be no closed form expression for the marginal likelihood nor indeed for the marginal moments. Consequently estimation is often carried out using either numerical integration techniques or by approximating the marginal likelihood and/or marginal moments using first-order expansion methods. An advantage of first-order expansion methods is that they do not necessarily require one to specify the conditional distribution in order to estimate the regression parameters of interest. However, to the best of our knowledge, these methods either assume the conditional variance is independent of the random effects or they ignore such dependence in the estimation. In this paper, we propose using conditional second-order generalized estimating equations (CGEE2) to estimate both the fixed and random effects. This method, which is a natural extension of previous first-order methods, utilizes information about any fixed and/or random effects that appear in the conditional variance to improve the set of estimating equations. This, in turn, should yield more efficient estimates of both the fixed and random

effects. Examples illustrating this approach as well as some limited simulations comparing CGEE2 estimates to exact maximum likelihood estimates are provided.

Biosketch

Dr. Ed Vonesh is a technical director with the Applied Statistics Center at Baxter Healthcare Corporation. He received his Ph.D. in biostatistics from the University of Michigan in 1983 and has served as an internal statistical and mathematical consultant to Baxter, and particularly to the Baxter Renal Division, for 21 years. Author and co-author of numerous papers in such areas as methods for the analysis of repeated measurements, dialysis outcomes research, and kinetic modeling, he recently co-authored a book entitled *Linear and Nonlinear Models for the Analysis of Repeated Measurements* published by Marcel Dekker, Inc. He currently holds appointments as professor of Clinical Preventive Medicine from Northwestern University and as adjunct professor with Northern Illinois University's Division of Statistics. He is a member of the American Statistical Association, the Biometric Society (ENAR), and an elected member of the International Statistical Institute and serves on the editorial board for the journal, *Peritoneal Dialysis*

PRESIDENT'S REPORT

The spring program will expand our perspectives and introduce us to cutting edge ideas. We will hear from two nationally respected experts in economics and statistics. Dr. David Meltzer from the University of Chicago will present approaches to evaluate the cost and benefits of medical technology. Dr. Ed Vonesh, a past-president of NIC/ASA, gives us a preview of his results on mixed-effects models, hot off the computer from his Baxter-sabbatical work this fall. Check the article on the spring program in this newsletter for more enticing details.

Mark your calendars for the June 22, 2000 summer workshop on multiple imputation by Harvard Professor John Barnard. Also, the Fall meeting on October 26, 2000 will include talks by another past-NIC/ASA president, Dr. Ajit Tamhane, and Dr. David Cella, a prominent leader in outcomes research methods. Our thanks to the program committee for assembling a valuable and interesting topical menu for the year. A particular note of appreciation goes to our program chair, Donna Kowalski, for finalizing speakers far in advance so that our calendars will not crowd out these great opportunities.

Publish or perish. While that dictum is associated with academia, it holds some truth for this chapter. This

Statfax newsletter is the lifeline that lets our members know about chapter events. As a volunteer organization, the newsletter reflects the generous donation of time and effort of many members. *Statfax* comes to you, compliments of the editorial work of Anita Ross and Molly Walsh, the coordination of duplication/distribution efforts of Jim Lancaster and Micki Hultquist, the electronic distribution efforts of Art Roth, and the mailing list update from Linda Odom who chairs the membership committee. In addition we thank Abbott Laboratories which currently donates the printing and G.D. Searle & Co which donated printing for the past 5+ years. As you may recognize, this is almost an entirely new team producing *Statfax*. They take over efforts that Borko Jovanovic, Tom Peppard, and Donna Kowalski previously did and to whom we express our appreciation.

Other people taking on new chapter responsibilities this year include Domenic Reda who is NIC/ASA Secretary, Josephine Ribauda who is NIC/ASA Treasurer, Carole Bernett who returns, joining Paul Coe to co-chair the Community Activities Committee, and Peter Yu who is assisting Kathy Feaheny with arrangements. Thanks to all for their dedicated efforts which benefits all our chapter members.

~ Dorothy Dunlop

SPRING MEETING

The Spring meeting (March 30th) will be at the Double Tree Northshore, 9599 Skokie Blvd, Skokie (847) 679-7000. We will have lunch in Windows - buffet from 12:00-1:00 pm.

~ Kathy Feaheny

BOOK GIVEAWAY

At our previous Chapter Meeting (October 7, 1999), we distributed two copies of the newly published statistics book, *Orthogonal Arrays-Theory and Applications*, by A.S. Hedayat, N.J.A. Sloane and J. Stufken (Springer Verlag, 1999), to two randomly selected participants. As it is our tradition now, one book was given to a student member and one to a non-student member. The randomly selected student was Mr. Min Yang from UIC and the regular member was Dr. Eli Shamiyeh from Trilogly. Mr. John Kimmel from Springer Verlag donated one copy of the book to our chapter. My sincere thanks to Springer Verlag and to John Kimmel for this contribution.

For the next meeting we will give away two copies of another newly published book, written by two distinguished members of our Chapter. The book is: *Statistics and Data Analysis (From Elementary to Intermediate)* by Ajit C. Tamhane and Dorothy D. Dunlop (Prentice-Hall, 2000.) This is a superb book by any standard. If you are not lucky enough to get it for free, I recommend that you order it from the publisher directly. I would like to acknowledge that the publisher Prentice-Hall (via Ms. Joanne Wendelken), donated the two copies we will give away to the chapter. My sincere thanks to Springer Verlag and to Joanne Wendelken for contributing these books to our Chapter.

~ Sam Hedayat

TREASURER'S REPORT

BALANCE 1/1/99	\$ 6,372.53
INCOME	
1999 Spring Meeting/Memberships	\$ 2,742.00
1999 Summer Workshop/Memberships	\$ 6,680.00
1999 Fall Meeting/Memberships*	\$ 2,274.00
Donations	\$ 8.00
Advance Payments for 2000 Membership	\$ 45.00
Bank Interest	\$ 179.78
Total Income*	\$ 11,928.78
EXPENSES	
1999 Spring Meeting	\$ 2,291.93
1999 Summer Workshop	\$ 8,012.11
1999 Fall Meeting	\$ 2,598.22
Mailing (Spring Newsletter)	\$ 33.33
Mailing (Bulk Mailing Permit)	\$ 100.00
Mailings (Summer Newsletter & Workshop)	\$ 144.10
Mailings (Fall Newsletter)	\$ 32.34
U.S. Savings Bonds (1999 Spring Meeting)	\$ 200.00
Book Giveaway (1999 Fall Meeting)	\$ 64.95
Total Expenses	\$ 13,476.98
BALANCE 1/1/2000	\$ 4,824.33

1999 Membership: 214 (198 regular, 16 students)
2000 Membership (prepaid during 1999): 9

*Except an additional \$41.00 for meeting/membership fees which is yet to be received. Figures reported above must be adjusted by this amount to obtain actual income and actual overall bank balance.

~ Donna Kowalski

COMMUNITY ACTIVITIES REPORT

This year Paul Coe and I have decided to co-chair the committee. We are trying to resurrect what was done in the past and also get involved in some new ventures. First of all, the Annual Regional Science Fair will be held on Saturday morning, March 4th, 2000 at Niles North High School in Skokie. I will be judging and would love to have some other members join me as we look for the projects that deal with the Best use of Statistics. The top winners are awarded Savings Bonds. Everyone who volunteers usually quite amazed at the caliber of statistics used by some of the students. We usually love to hear them explain their hypotheses and testing used. Please try to join me on that day. We are usually done by noon.

Also, another call for Volunteers. Glen Jablanski, AP Stats teacher at Oak Park-River Forest High school has asked for members to volunteer an hour or two to come to his classes and speaking about the uses of Statistics in their careers. This not only applies to Glen's school but any school interested in supplementing their AP classes with guest lecturers. We would also like to plan with the AP Stats group some meetings with the teachers on topics that they would be interested in. After the test is over in Spring, the students would really appreciate a talk on the uses of Statistics or even a field trip is possible.

I gave a talk at a local district meeting for teachers to publicize our Adopt-A-School efforts, and will be meeting with Ken Priban of Lincoln Hall Middle School this weekend. We would love to see new faces in this area as well helping with class demos on the uses of statistics in their careers. So as you can see, Paul and I are anxiously waiting for other to help share in some of these events. Be sure to contact either of us.

~ Carole Bernett and Paul Coe

VOLUNTEERS NEEDED for CHICAGO ENAR MEETING

The annual scientific meeting of the Eastern North American Region (ENAR) of the International Biometric Society will be held at the Palmer House Hilton here in Chicago, March 19-22. They are looking for volunteers to help assure the meeting runs smoothly. Volunteers will need to attend a meeting Saturday March 18 to go over duties and to help stuff registration packets. All volunteers will be given FREE registration for the meeting. If interested, please email Julia Bienias, the ENAR Local Arrangements Committee Chair, at jbienias@rush.edu.

CHAPTER WEBPAGE

Please join us on the net at our Chapter web page at <http://homepage.interaccess.com/~mlcarn/nic.htm>. The page can also be accessed by following links found on the main ASA webpage (www.amstat.org.) Select *ASA Directories*, then *Chapters*, and then click on *Northeastern Illinois*. Phil Pichotta recently updated the Chapter webpage which includes information about Chapter events, as well as links to current and past program information and newsletters. We also have contact information for Chapter officers and a membership directory. Many thanks to Phil Pichotta and Mike Carniello for maintaining and updating our Chapter web page!

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Statfax welcomes letters and material for articles from its readers. Address correspondence to: The Editor, Statfax, c/o Anita Ross, Ross Consulting, 4554 Main St., Skokie, IL, 60076.

Please send change of address to Linda C. Odom, CORE / Evanston Northwestern Healthcare, 1000 Central Street, Suite 101, Evanston, IL 60201

The Chapter's purpose, as stated in its Constitution, is "to foster statistics and its applications and promote the interests of the statistical profession...". Accordingly, diverse views are presented. They do not necessarily reflect the opinions of the officers or the policies of the chapter.

Northeastern Illinois Chapter, ASA
c/o Linda C. Odom, Membership Chair
CORE / Evanston Northwestern Healthcare
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Evanston, IL 60201

Spring Meeting Notice

Northeastern Illinois Chapter
American Statistical Association

DATE: Thursday, MARCH 30, 2000, at 12:00 p.m.

LOCATION: Double Tree Northshore, 9599 North Skokie Blvd., Skokie, IL 60076, TEL. 847-679-7000

RESERVATIONS: Advance reservations are required and must be received by 4 p.m., Thursday, MARCH 23. Cancellations can not be accepted after the above date, and "no shows" will be billed. Registration is transferable except for the \$5 in membership dues (\$1 for students) that are included in the non-member fees.

FEES:	Luncheon & Sessions		Sessions Only		NE Chapter	
	Regular	Member	Non-Member	Member	Non-Member	Membership Only
Full-time Student		\$ 6.00	\$ 7.00	no charge	\$ 1.00	\$5.00

Since membership is held on a calendar year basis, if you have not expressly joined the Chapter this year, you should pay the non-member rate. Doing so will make you a member for 2000.

PAYMENT: Make checks payable to: Northeastern Illinois Chapter, ASA

REGISTRATION: Please mail (no call-ins, please) the registration form (below) to:

Josephine Ribaud
1000 Central Street
Suite 101
Evanston, IL 60201
(847) 570-1736

PROGRAM:	Time	Activity
	11:30am – 12:00pm	Registration and Sign-In
	12:00pm – 1:00pm	Luncheon
	1:00pm – 1:10pm	Business Meeting
	1:10pm – 2:40pm	David Meltzer: Technology Assessment and Medical Cost-Containment
	2:40pm – 3:00pm	Break
	3:00pm – 4:30pm	Ed Vonesh: Conditional Second-Order Generalized Estimating Equations for Nonlinear Mixed-Effects Models

NORTHEASTERN ILLINOIS CHAPTER MEETING REGISTRATION/MEMBERSHIP DUES

Name _____

Name for meeting badge (if different) _____

Department _____

Company _____

Street _____

City/State/Zip _____

Phone (____) _____

E-mail address _____

I will be attending: Luncheon and sessions Sessions only

I will not be attending the meeting and am enclosing my **Membership Dues Only.**

2000 NIC/ASA member prior to this registration?

(See FEES for details) Yes No

The above address & phone number are for: Work Home

Full-time student? Yes No

Send my newsletters/meeting notices via: Email U.S. mail

Tax Identification Number 52-1665956

DIRECTIONS TO THE MEETING

The Double Tree Northshore Hotel is located on the southeast corner of the intersection of Golf Road (Route 58) and Skokie Boulevard, opposite the Old Orchard Shopping Center.

FROM DOWNTOWN CHICAGO: 90/94 West to O'Hare/Rockford—at the Junction of 90/94, Take 94 North to Milwaukee—Exit at Old Orchard Road—East on Old Orchard Road to Skokie Blvd.—South on Skokie Blvd. approximately ½ mile to Hotel. The entrance to the Hotel parking lot is on the left, just south of Golf Road.

FROM THE WEST: 90 East to 294—294 North to Dempster St.—East on Dempster to Skokie Blvd. (approx 6 miles)—North on Skokie Blvd. (about 1 mile.) Entrance to the Hotel parking lot is on the right, just south of Golf Road.

FROM THE NORTH: 94 South to Old Orchard Rd.—East on Old Orchard Road to Skokie Blvd.—South on Skokie Blvd. approximately ½ mile. The entrance to the Hotel parking lot is on the left just south of Golf Road.

FROM THE SOUTH: 294 North to Dempster St.—East on Dempster to Skokie Blvd. (approx 6 miles)—North on Skokie Blvd. (about 1 mile.) Entrance to the Hotel parking lot is on the right, just south of Golf Road.

