Early-Bird Deadline Extended until February 15

International Biometric Society

Eastern North American Region

2002 Spring Meeting with IMS and Sections of ASA

March 17–20, 2002

Hyatt Regency Crystal City

Arlington, VA

Table of Contents

Introduction and Overview

The ENAR 2002 Spring Meeting will be held March 17–20 at the Hyatt Regency Crystal City, Arlington, VA, near Reagan National Airport. Overlooking the Potomac River, the meeting hotel is close to both historic Old Town Alexandria and the Pentagon. In addition to free shuttles between the airport and the hotel, the hotel provides a free shuttle to and from the nearby Crystal City METRO stop which connects visitors to the U.S. Capitol, the Smithsonian, the White House, Georgetown, and other sights of interest in the Washington, D.C., area.

Joanna Shih and the 2002 Program Committee have put together an outstanding scientific program of 36 invited sessions and two IMS special lectures that spans theory through applications areas where there are major new developments. This is a time when we face challenges in keeping our knowledge and skills up-to-date due to rapidly changing directions in several areas of application. The ENAR meeting provides an opportunity for you to hear about the most recent statistical methods and practice in areas such as genetics, environmetrics, and evolving new areas of application, such as bioinformatics. The invited sessions provide presentations and discussion by statisticians who are actively contributing in these important areas. The sessions also encompass innovative and timely developments in other disciplinary areas of application, including medicine, agriculture, and environmental sciences.

We are very pleased that Sir Richard Peto, Professor of Medical Statistics and Epidemiology and Co-Director of the Clinical Trials Service Unit at Oxford University, has agreed to present the 2002 Presidential Address on Tuesday morning, March 19. Sir Richard Peto first became widely known for his statistical research in developing the log-rank test for comparison of survival curves. He has been a leader in developing and applying statistical methods for conducting systematic overviews (meta-analyses) of randomized clinical trials, as well as for designing and conducting large-scale trials to address important clinical questions. His applied research has had a major impact on public health. With Sir Richard Doll and others, he is internationally recognized for contributions in assessing the effects of tobacco smoking on mortality and for his role in influencing public policy on smoking. In collaboration with Professor Rory Collins and others, he showed that tens of thousands of deaths could be prevented annually by having patients use low-dose aspirin as an anti-platelet treatment following a heart attack. The worldwide overviews conducted by Sir Richard Peto produced the earliest reliable evidence that adjuvant systemic therapy could reduce mortality in women with early stage breast cancer. For these and other outstanding accomplishments, he has received many awards and honors, including his election as a Fellow of the Royal Statistical Society in 1989 and being knighted in 1999.

This year, we will have five short courses, four full-day and one half-day, offered on Sunday, March 17. The short courses, which are described more fully on pages 10–11, include methods for analyzing functional data, design and analysis of cluster randomized studies, Bayesian survival analysis, statistical methods for genetic epidemiology, and analysis of microarray data. Starting from first principles, they provide background instruction on fundamental concepts and methods with illustrative examples that will complement and enhance the understanding of many of the invited talks. The short courses are intended for a broad audience who want a systematic introduction to statistical methods and applications in the topical area. Five tutorial sessions are also scheduled on Monday and Tuesday. Each tutorial consists of approximately two hours of instruction on applying specialized techniques or software relevant for practicing biometricians. The tutorials offered this year include use of SAS routines tailored for analyzing microarray data, analyses of balanced and unbalanced cluster randomized designs using Stata and SUDAAN, inferential issues in measuring quality-adjusted lifetime (QAL) with censored observations, hierarchical regression models for evaluating performance of healthcare providers, and imputation for missing outcomes or covariates in multivariate regression analyses. Detailed descriptions of the these tutorials are given on pages 12–13.

The Workshop for Junior Biostatisticians will be given again this year on Saturday, March 16, preceding the Spring Meeting. We are indebted to Naisyin Wang and her committee for assuring the continuation of this highly successful endeavor. Individuals who have received their Ph.D. within the past five years are eligible to register for the Workshop. Attendees will receive suggestions for career development in areas such as publication, writing grants, statistical collaboration, and survival skills.

On Sunday, March 17, there will be a workshop on “Fostering Diversity in Biostatistics”. This workshop, organized by Amita Matatunga, Louise Ryan, and other members who are committed to enhancing the diversity of professionals in our fields provides

a forum for discussing important concerns related to mentoring, recruiting, and retaining minority students in biostatistical programs. For details, please refer to page 17.

On Monday, March 18, we will again hold the popular luncheon roundtable discussions, which provide an opportunity to engage in discussion with colleagues around a variety of current issues of interest in our field. Topics for the thirteen roundtable luncheons range from issues of general interest, such as how to be successful in publishing statistical articles and mentoring statisticians who work in environments apart from other statisticians, to statistical issues specific to particular settings or areas of application, such as choosing appropriate case-control study designs in genetic epidemiology and statistical considerations associated with evaluation of drugs or devices for regulatory approval. Each roundtable has a designated organizer who will facilitate the discussion. Details on the organizers and topics of the roundtable luncheons are on pages 13–15.

On a lighter note, our annual social event will be held on Tuesday, March 19, beginning at 8:00 p.m. Kathy Hirst of George Washington University and the Local Arrangements Committee have planned a special evening for us. At 8:00 p.m. we will begin with a dessert reception after which the Capitol Steps, a group locally noted and enjoyed for their political satire, will perform for us. This singing troupe of current and former Congressional staffers is the only group that comes with the Surgeon General's warning. For a prelude to this evening of hilarity and entertainment, visit the Capitol Steps website at *www.capsteps.com.* If this is your first ENAR meeting or you are a student member this year, we especially encourage you to take advantage of this opportunity to meet new colleagues during a fun, informal evening. Many of us have found the social program a wonderful forum for striking up casual conversations with statisticians from other settings that have on occasion led to unexpected future collaborations and lifetime friendships. We are pleased also to offer a greatly reduced fee to students for the social event (see page 7 for details). Due to limited seating, we strongly recommend that you sign up for this event at the same time you register for the Spring Meeting.

As in prior years, we are recognizing 20 outstanding students with Student Travel Awards to present their excellent papers at our meeting. These students were selected by the Student Awards Committee, chaired by Louise Ryan. The award winners are featured in the scientific program as bolded entries. I hope that you will make the most of this opportunity to hear their presentations. Additionally, I would like to remind you that posters will also be presented during the mixer on Sunday night, providing a chance to review the work of ENAR members in a more relaxed, informal setting.

We look forward to seeing you in Crystal City this coming March!

Website:

www.enar.org

General Information

Meeting Dates
Sunday, March 17, 2002, to Wednesday, March 20, 2002 (noon)

Location
Hyatt Regency Crystal City
Arlington, VA

Registration
Registration will be held from 3:00 to 5:00 p.m. on Saturday, March 16, and from 7:30 a.m. to 6:30 p.m. on Sunday, March 17, for those enrolling in the short courses. The registration fee includes refreshment breaks and the opening mixer. The registration fee, less a $100 administrative fee, is refundable if written notice of cancellation is received by February 18, 2002.

Registration Fees

Received	**before Feb. 15**	**after Feb. 15**
ENAR/WNAR/IBS Member	$170	$195
ASA Member (not a member of ENAR/WNAR/IBS)	$190	$215
IMS Member (not a member of ENAR/WNAR/IBS) ($190 – $20 IMS contribution = $170)	$170	$195
Student	$90	$100
Nonmember* (in any participating society)	$260	$285

*Nonmember fee includes $70 for 2002 ENAR membership.

Opening Mixer and Poster Session
The Opening Mixer and Poster Session (included in the registration fee) will take place from 8:00 to 11:00 p.m. on Sunday, March 18.

Roundtable Luncheons
This year, the roundtable luncheons will be held on Monday, March 18, from 12:15–1:30 p.m. Space for each roundtable is limited and preregistration is required. The fee is $25 per person and includes lunch. For topic information, please see pages 13–15.

Short Courses
The Washington, D.C., meeting will begin with an exciting set of short courses on Sunday, March 17.

Received by February 15

	Full Day	Half Day
Member	$180	$100
Nonmember	$205	$125

Received after February 15

	Full Day	Half Day
Member	$205	$125
Nonmember	$230	$150

Be sure to register in advance, using either the Registration Form on page 41 or the electronic registration form on the ENAR Web site (*www.enar.org/meetings.htm*).

Placement Service
There will be a job placement service at the Spring Meeting. The registration deadline for the placement service is February 20, 2002. Applicant and Employer Forms appear on pages 45–48 in this booklet. **Forms, along with all resumes, must be received by February 20** to insure inclusion in the review binders. ENAR cannot accept confidential listings. The Placement Center will be open during the following times:

- Sunday, March 17: 4:30–6:30 p.m.
- Monday, March 18: 9:00 a.m.–5:00 p.m.
- Tuesday, March 19: 9:00 a.m.–5:00 p.m.

The Placement Center will not be open on Wednesday, March 20.

Abstract Publication in *Biometric Bulletin*
If you want your abstract published in the *Biometric Bulletin,* please provide a 50-word description along with the author's name and address and abstract title. These "short version" abstracts must be received in the ENAR office by April 5, 2002. You may e-mail the 50-word abstract to *enar@enar.org.*

Student Breakfast
All students are invited to attend the student breakfast on Monday, March 18, from 7:30 to 8:30 a.m.

Tuesday Evening Event

Tuesday, March 19, 2002: The Capitol Steps

We have arranged an evening of eating, meeting, and greeting followed by a performance by the Capitol Steps (*http://www.capsteps.com)* a troupe of Congressional staffers turned comedians who satirize the very people and places that once employed them. You may have seen them on public television or heard them on public radio.

The Capitol Steps were born in December 1981 when three staffers for former Illinois Senator Charles Percy were planning entertainment for a holiday party. Digging into the headlines of the day, they created song parodies and skits that conveyed a special brand of satirical humor that played as well in Peoria as it did on Pennsylvania Avenue.

Most cast members have worked on Capitol Hill—some for Democrats, some for Republicans, and others for politicians who firmly straddle the fence. No matter who holds office, there's never a shortage of material. According to the Steps, "Typically the Republicans goof up and the Democrats party. Then the Democrats goof up and the Republicans party. That's what we call the two-party system."

No matter what the audience, the Steps have found that people love to laugh at the foibles of public figures like Bill Clinton ("My Way"), George W. Bush ("Aristocrat From the Cradle With a Silver Spoon"), and Bob and Liddy Dole, whose polls may finally rise with the help of "Viagra" (sung to "Maria"). In fact, the Capitol Steps have performed for the last four Presidents. The only complaints the Steps seem to get are from politicians and personalities who are not included in the program!

A reception with dessert and a cash bar will be held from 8:00–8:30 p.m. in the hotel, and the Capitol Steps will perform from 8:30–9:30 p.m. Cost is $60 per person ($30 per student).

Airline Information

ENAR has selected United Airlines as the official airline for the 2002 Spring Meeting. If you or your travel agent call United's Specialized Meeting Reservations Center, (800) 521–4041, to book your reservations, you will receive a 5% discount off the lowest applicable discount fare, including first class, or a 10% discount off full-fare, unrestricted coach fares purchased seven days in advance. Discounts also apply on Shuttle by United and United Express. Make sure you refer to Meeting ID Number 557XD. Reservation agents are on duty seven days a week from 7:00 a.m. to 12:00 midnight EST.

Local Transportation

Taxicabs

Taxi service will bring you directly to the hotel from Reagan National Airport for approximately $15.

Shuttle Service

Complimentary shuttle service is available to and from the hotel and Reagan National Airport, Metrorail, nearby office buildings, shopping, and restaurants.

Hotel Parking

Valet parking is available at the Hyatt Regency Crystal City. The rate is $7 for the first hour, $9 for two hours, $12 for 2–8 hours, $15 for 8–12 hours, and $18 for more than 12 hours. The price for overnight guests is $18 per day.

Hotel Accommodations

Hyatt Regency Crystal City
2799 Jefferson Davis Highway
Arlington, VA 22202
Phone: 703–418–1234 or 1–800–233-1234

Hotel Rates
Single/Double: $155
Each additional person: $25

Currently an additional 9.75% will be added for state and local taxes. You will receive confirmation directly from the hotel.

Be sure to say you are with the ENAR meeting. We encourage you to reserve your room early. The cutoff date for making reservations is February 22, 2002. Guest room reservations must be received by the above date or availability cannot be guaranteed.

The Hotel Reservation Form is on page 43. Please mail or fax the form directly to the Hyatt Regency Crystal City whose address appears on the form.

Crystal City

Welcome to Crystal City in Arlington, Virginia—part of the Washington, D.C., metropolitan area. Whether you are a first-time or repeat visitor, the metro area offers a multitude of sightseeing opportunities. Public transportation makes getting to activities easy. The Metrorail system extends from the District of Columbia into Maryland and Virginia, including stops at Crystal City and National Airport. Metrorail and other information is available at the Washington, D.C., visitor information center Web site: *http://www.dcvisit.com*. Other helpful Web sites are given below, representing just a few of the historical, theatrical, educational, and entertainment attractions.

The **Smithsonian Museum** (*http://www.si.edu*) includes the National Air and Space Museum (offering IMAX theater and planetarium shows), the National Museum of Natural History (with another IMAX theater), the National Museum of American History, and the Hirshhorn Museum and Sculpture Garden. Hours are 10:00 a.m. to 5:30 p.m. every day. General admission is free.

The **National Mall** (*http://www.nps.gov)* is a favorite destination. Americans honored by the monuments and memorials include Lincoln, Jefferson, Washington, Franklin Delano Roosevelt, Vietnam Veterans, and Korean War Veterans. Buildings include the Smithsonian, National Gallery of Art, White House, U.S. Capitol Building, Supreme Court, and Library of Congress. If we're lucky, the cherry trees will put on a show—they have bloomed as early as March 15.

For more information, contact

Kathryn Hirst
Biostatistics Center
George Washington University

E-mail: *khirst@biostat.bsc.gwu.edu*

The **National Zoological Park** (*http://www.natzoo.si.edu)* is also part of the Smithsonian. The two giant pandas, Mei Ziang and Tian Tian, are among the attractions. The grounds are open daily from 6:00 a.m. to 6:00 p.m. (buildings from 10:00 a.m. to 4:30 p.m.). General admission is free.

The **National Gallery of Art** (*http://www.nga.gov)* offers special exhibits as well as permanent collections. Hours are 10:00 a.m. to 5:00 p.m., Monday through Saturday, and 11:00 a.m. to 6:00 p.m., Sunday. General admission is free.

The **John F. Kennedy Center for the Performing Arts** (*http://kennedy-center.org)* is located on the banks of the Potomac River. Home to the National Symphony Orchestra, the Kennedy Center also offers theater, musical, dance, ballet, jazz, and opera performances as well.

The **MCI Center** (*http://www.mcicenter.com*) offers sports, concerts, and special events. Catch the action of the NBA's Washington Wizards or the NHL's Washington Capitals if they're in town.

Alexandria, Virginia (*http://ci.alexandria.va.us)* is located a few Metrorail stops south of Crystal City. It features historic Alexandria; the Torpedo Factory Art Center, home to working studios and galleries; and many shops and restaurants.

Workshop for Junior Researchers

A workshop for junior researchers will be held in the afternoon and evening of **Saturday, March 16, 2002.** The purpose of the workshop is to provide junior researchers with the requisite knowledge of necessary skills and opportunities essential for a successful research career and to provide a forum for junior and senior researchers to interact and exchange information.

Topics to Be Covered:

The workshop will offer junior participants in-depth coverage of four key topics through four sessions:

- publishing in scholarly journals,
- NIH funding information and grant writing strategies,
- approaches for collaborating with practitioners, and
- survival skills for a successful career.

Sufficient time will be available for junior participants to ask candid questions and seek advice in each session.

The **first session** of the workshop covers publishing. A panel consisting of several senior researchers will discuss the journal editorial process, including review criteria and practices, and address questions such as how to put together a nice paper and how to be successful in publishing.

The **second session** is on grant writing. Several senior participants who have served in NIH study sections, together with Dr. Ram Tiwari, will form a panel. Dr. Tiwari will give an overview of the NIH review and funding processes and related information. The senior participants will then focus on scientific aspects of writing successful methodological and collaborative grant applications.

The **third session** focuses on collaboration. Senior participants will form a panel to discuss how biostatisticians can collaborate successfully with practitioners.

Survival skills for a successful career are the focus of the **fourth session**. Topics include identifying priorities; time management; balancing methodological and collaborative research; balancing research, teaching, service, other responsibilities; and understanding of the tenure/promotion process. The two speakers who still have fresh memories of their own promotion processes will discuss their experiences and perspectives. Floor discussion and questions/answers involving senior and junior participants will follow.

All participants will then go to dinner, where discussions will continue in small, informal groups.

Workshop Participants

Nine prominent researchers at diverse stages of their careers and with different backgrounds and interests will attend this workshop. They are

- **Marie Davidian,** Professor, Department of Statistics, North Carolina State University, current *Biometrics* co-Editor;
- **David Harrington,** Professor, Department of Biostatistics, Harvard University;
- **Xihong Lin,** Associate Professor, Department of Biostatistics, University of Michigan;
- **Roderick Little,** Professor and Chair, Department of Biostatistics, University of Michigan;
- **Thomas A. Louis,** Senior Statistical Scientist, Rand Corporation, current JASA Applications and Case Study Editor;
- **Kathryn Roeder,** Professor, Department of Statistics, Carnegie Mellon University;
- **Thomas TenHave,** Professor, Department of Biostatistics and Epidemiology, University of Pennsylvania;
- **Anastasios Tsiatis,** Professor, Department of Statistics, North Carolina State University; and
- **Scott Zeger,** Professor and Chair, Department of Biostatistics, Johns Hopkins University, current *Biostatistics* co-Editor.

Participants in the workshop also include one NIH staff member, Ram Tiwari, who is an expert in the NCI Statistical Research and Applications Branch, as well as forty junior researchers.

Short Courses

SC1: A Survey of Analysis Methods for Functional Data

(full day)

Mary Lindstrom, University of Wisconsin

Functional data arise when the ideal observation for each experimental unit is a curve or function. Since we usually cannot observe the entire function, a functional data set typically consists of sets of noisy observations from each of a number of curves. Functional data is a relatively new term and data of this type have also been referred to as "repeated measures" or "longitudinal data." Functional data however usually have the special feature that each individual's data describe a relatively complex curve. Typical goals in analyzing functional data include estimating the typical curve for the population from which the sample of individuals was drawn, describing the between- and within-curve variability structure, estimating individual curves, and testing for differences between groups of curves.

This course covers a number of methods for analyzing functional data. These range from simple to complex and include two-stage regression models, linear and nonlinear mixed effects models, self-modeling (a semi-parametric method), principle curve analysis, and functional linear models. Available software is discussed and examples provided using S+ and/or R.

Participants should be very comfortable with linear regression and matrix manipulations. In addition, we discuss methods based on nonlinear regression, random effects models, regression splines, and principal components. These techniques are briefly described but, because of limited time, prior experience with one or more of these topics will increase the usefulness of the course.

SC2: Design and Analysis of Cluster Randomization Trials

(full day)

Allan Donner, Ph.D., The University of Western Ontario; and Neil Klar, Cancer Care Ontario

The purpose of this course is to present a systematic and unified treatment of comparative trials that randomize intact social units, or clusters of individuals, to different intervention groups. Such trials have become particularly widespread in the evaluation of nontherapeutic interventions, including lifestyle modification, educational programs, and innovations in the provision of health care. Their increasing popularity over the last two decades has led to an extensive body of methodology and a growing, but somewhat scattered, literature that cuts across several disciplines in the statistical, social, and medical sciences. We integrate this material into a full-day course that emphasizes applications to health research. The overall prerequisite for the course is knowledge of the fundamentals of biostatistics and familiarity with the basic principles of design and analysis of clinical trials. The sequence of topics presented are based on the recently published text entitled *Design and Analysis of Cluster Randomization Trials in Health Research* by Allan Donner and Neil Klar (Arnold Publishing Company, London, 2000).

Date

Sunday,
March 17, 2002

Fee

Full Day
Members
$180 ($205 after 2/15)
Nonmembers
$205 ($230 after 2/15)

Half Day
Members
$100 ($125 after 2/15)
Nonmembers
$125 ($150 after 2/15)

Registration

Saturday, March 16,
3:00–5:00 p.m.
Sunday, March 17,
7:00–8:30 a.m.

Course

Sunday, March 17,
8:30 a.m.–5:00 p.m. (full day)
(lunch on your own)

Sunday, March 17,
1:00–5:00 p.m. (half day)

SC3: Bayesian Survival Analysis

(FULL DAY)

Joseph G. Ibrahim, Harvard University; and Ming-Hui Chen, University of Connecticut

Survival analysis arises in many fields of study, including medicine, biology, engineering, public health, epidemiology, and economics. Recent advances in computing; software development, such as BUGS; and practical methods for prior elicitation have made Bayesian survival analysis of complex models feasible for both practitioners and researchers. This short course provides a comprehensive treatment of Bayesian survival analysis. Several topics are addressed, including parametric and semiparametric models, proportional and nonproportional hazards models, frailty models, cure-rate models, model selection and comparison, joint models for longitudinal and survival data, models with time-varying covariates, missing covariate data, design and monitoring of clinical trials, accelerated failure time models, models for multivariate survival data, and special types of hierarchical survival models. We also consider various censoring schemes, including right- and interval-censored data. Several additional topics related to the Bayesian paradigm are discussed, including noninformative and informative prior specifications, computing posterior quantities of interest, Bayesian hypothesis testing, variable selection, model-checking techniques using Bayesian diagnostic methods, and Markov chain Monte Carlo (MCMC) algorithms for sampling from the posterior and predictive distributions.

The course is applied in flavor and also examines more fundamental topics, such as basic MCMC sampling and basic concepts of the Bayesian paradigm. Datasets and case studies are examined in detail, and the software package BUGS is demonstrated for a wide variety of models and applications. The course is based on the recently published book titled *Bayesian Survival Analysis*, by Ibrahim, Chen, and Sinha (Springer-Verlag, 2001). The prerequisite for this course is one course in statistical inference at the level of Casella and Berger, and some introductory knowledge of Bayesian inference.

SC4: Statistical Analysis for Genetic Epidemiology

(FULL DAY)

Robert C. Elston and Audrey H. Schnell, Case Western Reserve University

After an initial overview of genetic terminology and concepts, the course covers the underlying theory and application of S.A.G.E. (Statistical Analysis for Genetic Epidemiology) Release 4.0 (using downloadable data for examples), utilizing some of the latest methods for studying familial correlations, linkage analysis, and association analysis. This short course focuses on the use of the program package S.A.G.E. to analyze family data. Because S.A.G.E. is designed to perform meaningful analyses with minimal user direction, emphasis is placed on interpreting the computer program output, rather than writing a parameter file for program input, for each of these applications. Participants are expected to have a basic knowledge of biostatistics or statistics, but no prior knowledge of genetics. The manual for S.A.G.E. 4.0 can be viewed at *http://darwin.cwru.edu/docs/*

SC5: Statistical Analysis of Microarray Data

(HALF DAY)

Lisa McShane, Michael D. Radmacher, and Richard Simon, National Cancer Institute

This course provides an overview of statistical issues that arise in the design and analysis of microarray studies. The course begins with an elementary explanation of microarray technology followed by a discussion of the various sources of variability inherent in microarray experiments, methods of evaluating data quality, and data normalization techniques. Focus then shifts to outlining the main types of scientific questions that investigators aim to answer from microarray experiments, accompanied by an in-depth discussion of proper design and analysis strategies for addressing each of the specific types of questions. Statistical analysis methods discussed include clustering methods, class-prediction methods, permutation tests, multiple-comparisons procedures, ANOVA/mixed-model approaches, and Bayesian methods. Analysis methods covered range from basic to more computationally complex procedures, and efforts are made to identify software available for carrying out these procedures. Visualization methods and graphical display techniques will also be demonstrated. Numerous real examples are presented throughout the course to reinforce concepts and illustrate the methods. Master's level training in biostatistics or the equivalent is assumed.

Tutorials

Dates

Monday, March 18, & Tuesday, March 19,

Tutorial sessions, a popular addition to the program, stress the practical aspects of applying newer statistical methods or the use of specialized computer software. Titles and abstracts for this year's tutorials are listed below.

Fee: $50 (member/nonmember)

T1: Handling Missing Data in Longitudinal Studies: An Imputation Approach

Myunghee Cho Paik, Columbia University

Monday, March 18, 8:30–10:15 a.m.

In this tutorial, we review different approaches in handling missing data and then compare the pros and cons of each. We present specific examples of handling missing outcomes or covariates in multivariate regression settings using an imputation approach. The methods presented through the examples are (1) formal in that we can draw correct inferences if the model assumptions are right, and (2) easy-to-implement. We also provide SAS codes used in the examples.

T2: Microarray Data Analysis

Russell Wolfinger, SAS Institute, Inc.

Monday, March 18, 1:45–3:30 p.m.

The recent flood of microarray data has presented biostatisticians with wonderful opportunities to utilize their training in working with scientists to draw optimal conclusions. It has also spurred a lot of new statistical research with varying degrees of complexity and usefulness. In this tutorial, we present a systematic approach to microarray data analysis with a view toward standardized interpretation. The framework centers around tried-and-true mixed linear models, and we discuss methods for effectively applying them. Examples derive from both oligonucleotide and cDNA arrays.

T3: Statistical Inference for Quality-adjusted Lifetime

Hongwei Zhao, University of Rochester

Monday, March 18, 3:45–5:30 p.m.

In this tutorial, we discuss the motivation for using the measure, quality-adjusted lifetime (QAL), that incorporates both quality and quantity of life. We outline the difficulties encountered in making inference about QAL with censored data. We present methods for estimating the survival distribution of QAL, the mean of QAL, and methods for testing the difference of QAL from two random samples, when independent right-censoring is present. Finally, we discuss regression problems with QAL. Due to the presence of censoring, all the inference procedures are intended for QAL accumulated over a specific time period, which is smaller than the largest observation time. Examples are used to illustrate the methods.

T4: Evaluating the Performance of Health Care Providers

Constantine Gatsonis, Brown University

Tuesday, March 19, 8:30–10:15 a.m.

The need to measure, compare, and monitor the performance of providers of medical care, such as physicians, clinics, hospitals, and health plans, has been the focus of considerable attention and the topic of intense debates in recent years. The overall importance of the question is quite clear. However, the particular formulation of the problem and the final answers may depend on the perspective of the stakeholders involved: patients, health care providers, payers, and health policy makers. The challenge for the statistical analyst is to develop flexible and nuanced methodologic approaches that permit the explicit incorporation of particular perspectives and are powerful enough to address the statistical complexity of the data. Some aspects of this complexity are common to observational data, notably the effects of selection and differential ascertainment. Others include the correlations due to clustering in the data and the low precision resulting from the relatively small sample sizes within each cluster. In addition, the data may involve multivariate and longitudinal observations on each cluster, and the analysis may need to address issues of multiple comparisons. The latter is a significant concern when ranks are reported and when performance indices are used to screen providers and identify "outliers."

In this tutorial, we examine the conceptual framework and the main methodologic approaches to the evaluation of the performance of health care providers. The use of hierarchical regression models is featured as the primary methodologic tool. The analysis of unidimensional, cross-sectional measures of performance provides the main setting for the discussion. However, we also examine recent methodologic developments in the field, which address the analysis of multidimensional and longitudinal measures of provider performance.

T5: Analysis of Cluster Randomized Trials: Two Case Studies

Roslyn A. Stone, University of Pittsburgh

Tuesday, March 19, 3:45–5:30 p.m.

Two recently completed cluster-randomized trials of guideline implementation strategies to change physician behavior are similar in design yet exhibit quite different clustering structure. A total of 85 defined physician groups in 25 hospitals nationwide participated in a "Nationwide study;" 116 practice groups in 7 Pittsburgh hospitals participated in the "Pittsburgh study." The intervention was randomized at the level of the physician practice group in both studies. This tutorial focuses on the practical aspects of analyzing these studies, with emphasis on the comparative analysis of a relatively well-balanced and an imbalanced study. We focus on regression methods for discrete survival and binary outcomes using Stata and SUDAAN. Attendees should be familiar with generalized linear models.

Roundtable Luncheons

Date

Monday, March 18, 12:15–1:30 p.m.

Fee

$25

Space is limited.
Preregistration is required.

R1: Publishing in Statistical Journals

Discussion Leader: Marie Davidian, North Carolina State University and co-Editor, *Biometrics*

Success in publishing in statistical journals is an important evaluation criterion for both junior- and senior-level researchers. Moreover, publication in statistical journals represents the primary mode of dissemination of new results to our profession. Yet many researchers still feel uncertain about publishing in general and the review and editorial processes in particular. What practices lead to success in publishing? What qualities do editors, associate editors, and reviewers look for in a journal article? How should an author choose an appropriate outlet for his or her work? An issue that affects all authors is the fact that times to review for our journals lag well behind those in other disciplines. What are the reasons for this and what can be done to improve the situation? What do editors and associate editors expect from referees? What should authors expect from the editorial process? This roundtable serves as a forum to discuss these and other relevant issues.

R2: Statistics in the Courtroom

Discussion Leader: Joseph Gastwirth, George Washington University and Dr. Charles R. Mann, Charles R. Mann Associates, Inc.

The analysis and interpretation of statistical data has an important role in a wide variety of litigation. Observational studies are routinely discussed in product liability cases concerned with whether use of a product causes a disease. Surveys are used in trademark and misleading advertising cases, and clinical studies are used to demonstrate the equivalence of drugs or the superiority of a product compared to its competitors. The role of the statistician and problems arising from the adversarial nature of the courtroom, as well as the different standards of proof in law and science, start the discussion.

R3: Connecting the Isolated Statistician

Discussion Leader: Thomas A. Louis, Rand

Isolated statisticians in government, industry, and academia (especially those early in their careers) have a difficult time obtaining advice on scientific, organizational, and political issues because they don't benefit from having an experienced statistician as supervisor and mentor. This roundtable focuses on identifying the principal issues and activities associated with improving this situation, including the possibility of setting up a program through which experienced statisticians would act as external mentors.

R4: Health Informatics: Opportunities and Challenges for Biostatistics

Discussion Leader: Vicki Hertzberg, Emory University

Health informatics, a rapidly emerging discipline, refers to the application of computer science and information science to

health sciences research and health care delivery. A number of subspecialty areas have emerged in the last two decades, including clinical, medical, dental, nursing, veterinary, and public health informatics. Many of the issues confronting health informaticians are familiar to biostatisticians, especially those involved in the creation, acquisition, management, merger, analysis, interpretation, and storage of very large datasets. In this roundtable discussion, we examine these issues. In particular we discuss the opportunities for research, application, and education that present themselves at the confluence of health informatics and biostatistics. We also discuss the challenges that may result from collaborations between health informaticians and biostatisticians.

R5: Academic Careers in Biostatistics

Discussion Leader: Lisa Weissfeld, University of Pittsburgh

This roundtable focuses on the potential career paths for biostatisticians in academia. Biostatisticians work in many different environments in academia from schools of public health to schools of medicine and, less typically, arts and sciences faculty. The demands placed on a faculty member and the availability of jobs in each of these environments can be quite different. The initial years in an academic career can present a challenge as faculty members juggle their workloads to meet the demands of their job while developing an independent research program. The discussion centers around the following issues: description of the types of work that biostatisticians do, availability and types of jobs, the "job hunting" process, and the juggling and prioritizing of the multiple demands of each of these jobs.

R6: Future directions in Biostatistics

Discussion Leader: Nancy L. Geller, National Heart, Lung and Blood Institute

Although predicting the future is risky, the convener predicts that the future of biostatistics will be influenced by improved computing and the explosion of knowledge of genetics and, more generally, new areas of biomedicine (such as better imaging). The generation of huge data sets will lead to more exploratory analyses and perhaps more specialization among statisticians. Several questions arise: How will we deal with communicating new methods to each other and to our biomedical colleagues? How will we train biostatisticians to undertake this broad range of problems? Can we train enough biostatisticians to meet these challenges (without glutting the market)? How will these developments impact clinical trials?

R7: Careers in Statistical Consulting

Discussion Leader: Yuko Palesch, TCIG*STATS℠—Medical University of South Carolina

Statistical consulting is the *raison d'etre* of many applied statisticians. In the health care and medical fields, clinical investigators in academia often require statistical expertise in the design and analysis of their studies. Many pharmaceutical and biotechnology companies seek statistical support from consulting groups and contract research organizations (CROs) for reasons ranging from lack of resources within the company to a desire to validate analysis results via an independent group of statistical experts. This roundtable discussion will explore the issues facing both the provider and the recipient of such statistical consultations. Topics of discussion include areas of statistical expertise in demand; academic versus private consulting groups; evaluation criteria; and some practical issues in establishing and conducting statistical consulting services (e.g., advertisement, standard operating procedures, and authorship of publications).

R8: Missing Data and Regulatory Evaluation of Clinical Trials

Discussion Leader: Susan Ellenberg, Food and Drug Administration

In an ideal study, there would be no missing data. When the amount of missing data is very small, the approach to analysis—dropping out subjects with missing data, imputing the missing data using crude or sophisticated approaches, assuming a worst-case scenario—won't usually have much impact on the inference to be made. But it is unfortunately the case that the amount of missing data often is large enough to present real problems in interpreting the results of clinical trials. In this roundtable session, we discuss various approaches to performing analyses in the presence of missing data, the meaning of intent-to-treat analysis when some outcome data are missing, ways of designing studies to minimize missing data and/or the impact of missing data on study results, and the regulatory guidance that has been put forward regarding the handling of missing data.

R9: Image Analysis in the Pharmaceutical Industry

Discussion Leader: Darryl Downing, GlaxoSmithKline

This roundtable will provide a forum for discussing current imaging issues in the pharmaceutical industry—both pre-clinical and clinical imaging. We probe how the statistician can help the scientist/clinician in utilizing images to make informed decisions. Discussions center around regulatory and statistical consider-

ations of images (design, statistical parametric mapping, and incorporation of pharmacokinetic endpoints such as AUC), novel approaches to analysis of images, software support, and related information technology issues.

R10: Statistical Issues in Medical Devices

Discussion Leader: Gregory Campbell, Food and Drug Administration

This roundtable focuses on unique statistical challenges that evaluation of medical devices pose in terms of the design, as well as the subsequent analysis of the clinical data. Not only are there almost all of the statistical issues of traditional clinical trials, but the wide variety of medical devices create a large number of special challenges. There are also often opportunities to incorporate prior information. In addition, diagnostic medical devices (including imaging, as well as in vitro products) provide their own set of statistical challenges.

R11: Genomic Control: A Fix for Spurious Correlations in Case-Control Studies in Genetic Epidemiology?

Discussion Leader: Kathryn Roeder, Carnegie Mellon University

To discover genes associated with disease, geneticists often design either a case-control study or the equivalent of a matched case-control study (known as a family-based design and analyzed using McNemar's test). In both designs, the objective is to determine if particular genotypes are observed more often than expected in case subjects. While more powerful and convenient, the case-control study design is subject to producing spurious correlations, primarily because human populations are made up of numerous subpopulations, each with different genetic backgrounds.

Recent literature, however, suggests that it is possible to correct for confounding in case-control studies without collecting data on the genetic background of study participants. These claims are based on a unique feature of genetic studies. Unlike the typical epidemiological setting, it is possible to repeat the association study under the null hypothesis by simply measuring genotypes at numerous sites across the genome. This follows because the same probabilistic mechanism generates an individual's entire genome. For example, cousins are equally likely to share DNA from a common ancestor at any point on their chromosomes.

A new experimental design, called Genomic Control, has been proposed that recommends using this repetition to control for confounding (Devlin and Roeder, *Biometrics* 55:997–1004, 1999). An alternative latent class approach that also utilizes the Genomic Control concept has been proposed by Pritchard et al. (*Amer. J. Hum. Genet.* 67:170–181, 2000) and extended by Satten et al. (*Amer. J. Hum. Genet.* 68, 466–477 2001).

Issues to be discussed include: Is this a valid way to control for confounding in a case-control study? As genomic control focuses on spurious correlations induced by hidden subpopulations, does it also account for biases induced by environmental confounding? Can the repetition across the genome best be exploited by conditioning on unobserved latent variables coding for ethnicity or by measuring the over-dispersion induced in measures of association due to confounding? To perform Genomic Control, how many control loci should be selected, and how should they be selected?; Where do we go from here—should we abandon the protection of family-based studies in favor of Genomic Control? Is the greater power and convenience of the case-control study design worth the risk?

R12: Training the Next Generation of Biostatisticians

Discussion Leader: Dennis O. Dixon, National Institute of Allergy and Infectious Diseases

The current demand for biostatisticians far exceeds the supply and the gap is rapidly widening. The undersupply results from a combination of burgeoning needs and a relatively flat rate of graduating PhD and Masters-level biostatisticians. While academic departments must assume responsibility and take some leadership, they need both additional financial resources and other types of assistance. The federal government, especially NIH, also has a leadership role, but the profession generally needs to take some degree of ownership of the challenge. This roundtable provides an opportunity to propose and discuss strategies for addressing these needs.

R13: Roles, Responsibilities and Operating Procedures of Clinical Trial Data Monitoring Committees

Discussion Leader: John L. Bryant, University of Pittsburgh

Discussion centers on the roles, responsibilities and operating procedures of clinical trial Data Monitoring Committees (DMCs) and the trial biostatistician in various settings, including pharmaceutical-sponsored clinical trials, cooperative group trials, and other government-sponsored trials. Various models of the relationship between the DMC and the trial Steering Committee will be explored, and the appropriate degree of DMC autonomy will be addressed. The recent FDA Draft Guidance on DMCs will be reviewed (*http://www.fda.gov/cber/gdlns/clindatmon.htm*), and comparisons will be drawn with other policies, including the National Cancer Institute (NCI) DMC Policy (*http://ctep.info.nih.gov*/Policies/DMCGuidelines.htm).

Program Summary

Monday, March 18
8:30-10:15 a.m.

T1. Handling Missing Data in Longitudinal Studies: An Imputation Approach
1. Bayesian Methods for Analyzing Gene Expression Data
2. Applications of Spectral Methods for Spatial Data
3. Cancer Screening in the New Millennium
4. Some Recent Developments and Applications of Random Partition Distributions
5. Contributed Papers: Repeated Measures and Multiple Endpoints in Clinical Trials
6. Contributed Papers: Nonignorable Missing Data in Longitudinal Studies
7. Contributed Papers: Linear and Generalized Linear Mixed Models
8. Contributed Papers: Regression Trees and Neural Networks

Monday, March 18
10:15-10:30 a.m.
Break

Monday, March 18
10:30 a.m.-12:15 p.m.

9. IMS Special Invited Lecture
10. The Use of Haplotypes in Genetic Epidemiology
11. Analysis of Outcomes Challenged by Induced Dependent Censoring
12. Health Effects of Air Pollution: Statistical Methods and Future Directions
13. Contributed Papers: Epidemiological Methodology
14. Contributed Papers: Methodological Issues in Clinical Trials I
15. Contributed Papers: Methodology for Diagnostic Tests and Reproducibility
16. Contributed Papers: Nonparametric and Semiparametric Methods

Monday, March 18
12:15-1:30 p.m.
Roundtables Luncheon

Monday, March 18
1:45-3:30 p.m.

T2. Microarray Data Analysis
17. Decision Analysis in the Pharmaceutical Industry
18. Statistical Methods for Reproductive Health
19. Recent Advances in Estimating Diagnostic Error without a Gold Standard
20. Clustering and Mixture Modeling Applications
21. Contributed Papers: Analysis of Recurrent Event Data
22. Contributed Papers: Design Issues in Clinical Trials
23. Contributed Papers: Approaches for Jointly Modeling Longitudinal Data and Survival
24. Contributed Papers: Modeling Data with Measurement Error
25. Contributed Papers: Statistics in Medical Sciences and Methodology

Monday, March 18
3:30-3:45 p.m.
Break

Monday, March 18
3:45 -5:30 p.m.

T3. Statistical Inference for Quality-Adjusted Lifetime
26. Nonparametric and Semiparametric Modeling Strategies for Biological/Medical Data
27. Outcome Adaptive Methods in Early Phase Clinical Trials
28. Statistical Methods for Small Area Estimation
29. Semiparametric Models in Survival Analysis
30. Contributed Papers: Testing in Survival Analysis
31. Contributed Papers: Topics in Linkage Analysis
32. Contributed Papers: Analysis of Correlated Data with Discrete Outcomes
33. Contributed Papers: Analysis of Imaging and Spatial Data

Tuesday, March 19
8:30-10:15 a.m.

T4. Evaluating the Performance of Health Care Providers
34. Modeling with Penalized Regression Splines
35. Survival Analysis Methods in Genetic Studies
36. Statistical Issues in Studies of Mother-to-Child-Transmission of HIV
37. Statistics in Brain Mapping
38. Contributed Papers: Approaches for Handling Missing Data in Clinical Studies
39. Contributed Papers: Analysis of Data from Epidemiological Studies
40. Contributed Papers: Estimating Equations
41. Contributed Papers: Nonparametric Methods
42. Contributed Papers: Statistical Methods with Biopharmaceutical Applications

Tuesday, March 19
10:15-10:30 a.m.
Break

Tuesday, March 19
10:30 a.m.-12:15 p.m.
Presidential Invited Address

Tuesday, March 19
1:45-3:30 p.m.

43. Recent Advances in Modelling Longitudinal Data
44. Surrogate Endpoints in Clinical Trials
45. Spatial Optimal Design
46. Statistical Methods for Animal Experiments
47. New Software
48. Contributed Papers: Methodology for Correlated Survival Data
49. Contributed Papers: Models for Gene Expression Data
50. Contributed Papers: Statistical Methods in Health Services and Policy Research
51. Contributed Papers: Categorical Data Analysis

Tuesday, March 19
3:30-3:45 p.m.
Break

Tuesday, March 19
3:45 -5:30 p.m.

T5. Analysis of Cluster Randomized Trials: Two Case Studies
52. Statistical Issues in the Design and Analysis of Extensions to Clinical Trials
53. Gene-Environment Interaction: Statistical Issues in the Epidemiological Study of How Genetic Makeup and Environmental Exposures Jointly Influence Disease Risk
54. Semiparametric Mixed Effects Regression Models
55. Recent Advances in Dimension Reduction for Regression
56. Contributed Papers: Methodology for Drug Discovery and Bioassay
57. Contributed Papers: Analysis of Gene Expression Data
58. Contributed Papers: Methodology for the Analysis of Spatial Data
59. Contributed Papers: Applications in Longitudinal Data Analysis

Wednesday, March 20
8:30-10:15 a.m.

60. Panel Discussion: Some Statisticians' Perspective on FDA Advisory Committee Meetings
61. Statistical Applications with Microarray Data
62. Health Economics Meets Statistics: Analysis of Medical Costs
63. Applications of Function Estimation
64. Contributed Papers: Modeling Approaches for the Analysis of Survival Data
65. Contributed Papers: Methodological Issues in Clinical Trials II
66. Contributed Papers: Topics in Statistical Genetics
67. Contributed Papers: Applications of Bayesian Methods

Wednesday, March 20
Break

68. Joint Modeling of Longitudinal and Survival Data
69. Biologically Motivated Developments in Categorical Data Analysis
70. Current Hot Topics in Vaccine Field Studies
71. Monte Carlo In Action
72. Contributed Papers: Design and Normalization of Gene Expression Experiments
73. Contributed Papers: Generalized Linear Models
74. Contributed Papers: Statistical Methods for Environmental and Ecological Applications
75. Contributed Papers: General Statistical Methods

Diversity Workshop

On **Sunday, March 17,** ENAR will be sponsoring a special workshop entitled "Fostering Diversity in Biostatistics." Faculty and students from several Washington, D.C., area historically black colleges and universities will be invited to attend. The workshop will run from 11 a.m.–4:30 p.m. Mentoring, recruiting, and retaining minority students are important themes of the workshop. Registration is required. For information please contact Amita Manatunga at 404–727–1309 or via e-mail: *amantu@sph.emory.edu.*

Scientific Program

Times may change slightly prior to the meetings. Please, check the on-site program for final times. Asterisks (*) indicate paper presenters. Student Travel Award Winner presentations appear in **boldface**.

Monday, March 18

8:30–10:15 a.m.

1. Bayesian Methods for Analyzing Gene Expression Data

Sponsor: *ENAR and ASA Biometrics Section*
Organizer: *Elizabeth Garrett, Johns Hopkins University*
Chair: *Elizabeth Garrett, Johns Hopkins University*

8:30 Bayesian Models for Gene Expression with DNA Microarray Data
Joseph Ibrahim*, Ming-Hui Chen, and Robert J. Gray, Dana-Farber Cancer Institute

8:55 A Statistical Framework for Expression—Based Molecular Classification
Giovanni Parmigiani* and Elizabeth Garrett, Johns Hopkins University

9:20 Gene Expression Analysis Using Bayesian Decomposition
Thomas D. Moloshok and Ghislain H. Bidaut, Fox Chase Cancer Center; Robert R. Klevecz, Beckman Research Institute of the City of Hope; Jeffrey D. Grant, Frank J. Manion and Michael F. Ochs*, Fox Chase Cancer Center

9:45 Bayesian Modelling & Analysis of Gene Expression Data in Clinical Applications
Mike West*, Duke University

10:10 Floor Discussion

2. Applications of Spectral Methods for Spatial Data

Sponsor: *ASA Statistics and Environment Section and ENAR*
Organizer: *Oliver Schabenberger, Virginia Tech*
Chair: *Oliver Schabenberger, Virginia Tech*

8:30 Testing for Isotropy and Separability of Spatio-Temporal Data Using Periodograms
Nelson Lu and Dale L. Zimmerman*, University of Iowa

9:00 Spectral Methods for Nonstationary Spatial Processes
Montserrat Fuentes*, North Carolina State University

9:30 Data Tapers for Spectral Analysis of Spatial Point Patterns
Sundardas S. Dorai-Raj*, Auburn University

10:00 Discussant: Mark S. Handcock, University of Washington

3. Cancer Screening in the New Millennium

Sponsor: *ENAR and ASA Health Policy Statistics Section*
Organizer: *Yu Shen, M.D. Anderson Cancer Center*
Chair: *Yu Shen, M.D. Anderson Cancer Center*

8:30 Simplified Periodic Screening Evaluation
Stuart G. Baker*, National Cancer Institute; Diane Erwin, Information Management Services; Barnett S. Kramer, National Institutes of Health; and Philip Prorok, National Cancer Institute

8:55 Overdiagnosis in PSA Screening: Lessons from US Prostate Cancer Incidence Trends
Ruth D. Etzioni*, Fred Hutchinson Cancer Research Center; David F. Penson, Fred Hutchinson Cancer Research Center and VA Medical Center; Julie M. Legler, National CancerInstitute; Dante di Tommaso, Fred Hutchinson Cancer Research Center; Rob Boer, RAND Corporation; Peter H. Gann, Northwestern University; and Eric J. Feuer, National Cancer Institute

9:20 Group Randomization, Clinical Trials and Endpoints of Small Probability
Ping Hu*, National Cancer Institute and Marvin Zelen, Harvard School of Public Health and Dana-Farber Cancer Institute

9:45 Early Detection of Ovarian Cancer
Patricia L Stephenson*, Harvard School of Public Health and Dana-Farber Cancer Institute

10:10 Floor Discussion

4. Some Recent Developments and Applications of Random Partition Distributions

Sponsor: *IMS*
Organizer: *Hemant Ishwaran, Cleveland Clinic Foundation*
Chair: *Hemant Ishwaran, Cleveland Clinic Foundation*

8:30 Poisson-Dirichlet Approximations for Random Permutations: A Tale of Three Couplings
Simon Tavare* and Richard Arratia, University of Southern California; and Andrew D. Barbour, University of Zuerich

9:05 Continuous Time Processes, Bayesian Models, and Partition Structures
Fred M. Hoppe*, McMaster University

9:40 Random Partition Structures and Bayesian Models
Lancelot F. James*, Johns Hopkins University

5. Contributed Papers:

Repeated Measures and Multiple Endpoints in Clinical Trials

Sponsor: *ENAR*

Chair: *Paige Williams, Harvard School of Public Health*

8:30 Summarizing a Multivariate Treatment Effect from Longitudinal Data
Howard M. Mackey*, Scott Zeger, and Kung-Yee Liang, Johns Hopkins University

8:45 **Latent-Class Models for Longitudinal Data with Bivariate Ordinal Outcomes**
D. Todem* and K. Kim, University of Wisconsin-Madison; and E. Lesaffre, K.U. Leuven

9:00 Modeling Longitudinal Transition of Distributions for Ordinal Categorical Data
Junhong Zhu* and Xiaoping Xiong, St. Jude Children's Research Hospital

9:15 Measuring Compliance and Its Effect on Analysis in Longitudinal Clinical Trials
Avital Cnaan*, Huaqing Zhao, Patricia Timlin, Margaret Tartaglione, and Jeffrey H. Silber, University of Pennsylvania

9:30 Likelihood Inference for Exchangeable Binary Data with Applications
Catalina Stefanescu* and Bruce W. Turnbull, Cornell University

9:45 Implications of Loss Functions on Bayesian Evaluation of Multiple Treatment Effects
Maria K. Mor* and Stewart J. Anderson, University of Pittsburgh

10:00 Floor Discussion

6. Contributed Papers:

Nonignorable Missing Data in Longitudinal Studies

Sponsor: *ENAR*

Chair: *Andrea Troxel, Columbia University*

8:30 Pattern-Mixture Models With Proper Time Dependence
Geert Molenberghs*, Limburgs Universitair Centrum, Belgium; and Michael G. Kenward, London School of Hygiene and Tropical Medicine

8:45 Estimation in Longitudinal Studies of Continuous Measures That Are Subject to Purposeful Censoring
George DeMuth and Paul W. Stewart*, University of North Carolina at Chapel Hill

9:00 Generalized Additive Selection Models for the Analysis of Non-Ignorable Missing Data
Daniel O. Scharfstein* and Rafael A. Irizarry, Johns Hopkins University

9:15 Quantifying the Asymptotic Bias in the Linear Mixed-Effects Model under Information Dropout, Drop-In and Other Missing Data Patterns
Chandan K. Saha* and Michael P. Jones, University of Iowa

9:30 Pattern-Mixture Models Adjusting for Non-Ignorable Dropout with Administrative Censoring in Longitudinal Studies
Jingjin Li* and Mark Schluchter, Case Western Reserve University

9:45 A Pseudo Likelihood Method for Multivariate Missing Data
Gong Tang*, University of Pittsburgh, Roderick J.A. Little and Trivellore E. Raghunathan, University of Michigan

10:00 Maximum Likelihood Methods for Nonignorable Missing Responses and Covariates in Random Effects Models
Amy L. Stubbendick* and Joseph G. Ibrahim, Harvard School of Public Health

7. Contributed Papers:

Linear and Generalized Linear Mixed Models

Sponsor: *ENAR*

Chair: *Brian Caffo, Johns Hopkins University*

8:30 Bayesian Semiparametric Mixed Models for Longitudinal Data
Yisheng Li* and Xihong Lin, University of Michigan

8:45 Linear Mixed Model Robust Regression
Megan J. Waterman*, Jeffrey B. Birch, and Oliver Schabenberger, Virginia Tech

9:00 Explaining Variation in Linear Mixed Effects Models
Ronghui Xu*, Harvard School of Public Health

9:15 Exploration of Clinical Laboratory Data Using Nonparametric Mixed Effects Model
Xiwu Lin, Kwan R. Lee*, and Daniel C. Park, GlaxoSmithKline

9:30 Comparison of Approximate F Tests for Fixed Effects in Incomplete Block Designs
Lynette L. Keyes-Elstein*, Rho, Inc. and Babu V. Shah, Research Triangle Institute

9:45 Accounting for Heterogeneity of Residual Variance in Generalized Linear Mixed Models
Robert J. Tempelman* and Kadir Kizilkaya, Michigan State University

10:00 Floor Discussion

8. Contributed Papers:

Regression Trees and Neural Networks

Sponsor: *ENAR*

Chair: *Heping Zhang, Yale University*

8:30 Generalized Degrees of Freedom for Modeling Binary Outcomes with Application to Neural Networks
Douglas P. Landsittel*, University of Pittsburgh; Harshinder Singh, West Virginia University; and Vincent C. Arena, University of Pittsburgh

8:45 Faster Computation of Classification Trees
Terry M. Therneau*, Mayo Clinic

9:00 Application of Neuron-Network Model to the In-Vitro In-Vivo Prediction
Lang Li* Indiana University; and Xiang Sun, University of Michigan

9:15 A Regression Tree Method for Multivariate Survival Data
Feng Gao*, Emory University; Shande Chen, University of North Texas Health Center at Fort Worth; and Amita K. Manatunga, Emory University

9:30 Prediction Error Criteria for Tree-Based Regression: The Multinomial and Poisson Case
Karla V. Ballman*, Joseph Sexton, and Terry M. Therneau, Mayo Clinic

9:45 Cartscans
Martha C. Nason*, Scott S. Emerson, and Michael LeBlanc, University of Washington

10:00 Floor Discussion

Monday, March 18

10:15–10:30 a.m.

Break

Monday, March 18

10:30 a.m.–12:15 p.m.

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9. IMS Special Invited Lecture

Sponsor: *IMS*

Chair: *Nidhan Choudhuri, Case Western Reserve University*

10:30 Introduction
Nidhan Choudhuri, Case Western Reserve University

10:35 Bayesian Curve-Fitting and Neuron Firing Patterns
Rob Kass*, Carnegie Mellon University

11:25 L'evy Random Fields and Statistical Inverse Problems
Robert L. Wolpert*, Duke University

12:00 Discussants: Tilmann Greiting and Julian Besag, University of Washington

10. The Use of Haplotypes in Genetic Epidemiology

Sponsor: *ENAR and IMS*

Organizer: *Kathryn Roeder, Carnegie Mellon University*

Chair: *Kathryn Roeder, Carnegie Mellon University*

10:30 Haplotype-Based Methods for Samples of Unrelated Individuals: Case-Control and Case-only Studies
Daniele Fallin*, Johns Hopkins Bloomberg School of Public Health

11:05 Strategies for Localizing Disease-Predisposing Variants in Human Gene Mapping Studies
Michael L. Boehnke*, University of Michigan

11:40 Discovering the Origins of Complex Disease by Haplo type Analysis
Bernie Devlin*, University of Pittsburgh; and Howard Seltman, Carnegie Mellon University

11. Analysis of Outcomes Challenged by Induced Dependent Censoring

Sponsor: *ENAR*

Organizer: *Yijian Huang, Fred Hutchinson Cancer Research Center*

Chair: *Yijian Huang, Fred Hutchinson Cancer Research Center*

10:30 Introduction
Yijian Huang*, Fred Hutchinson Cancer Research Center

10:35 Analysis of Time-Between-Events Data Challenged by Induced Informative Censoring and Intercepted Sampling
Mei-Cheng Wang*, Johns Hopkins University

11:05 Censoring and Cost-Effectiveness Analysis
D.Y. Lin* and A. Willan, University of North Carolina

11:35 Efficient Estimation of the Mean of a Time-Lagged Variable Subject to Right Censoring
Anastasios A. Tsiatis*, North Carolina State University

12:05 Floor Discussion

12. Health Effects of Air Pollution: Statistical Methods and Future Directions

Sponsor: *ENAR and ASA Statistics and Environment Section*

Organizer: *Francesca Dominici, Johns Hopkins University*

Chair: *Francesca Dominici, Johns Hopkins University*

10:30 Introduction
Francesca Dominici*, Johns Hopkins University

10:35 Mapping the Mortality-Particular Air Pollution Relative Rate of Mortality: A Hierarchical Spatial Time Series Model
Francesca Dominici, Aidan McDermont, Jonathan M. Samet, and Scott L. Zeger*, Johns Hopkins University

11:05 Understanding PM Exposure and Its Impact on Estimation of Air Pollution Health Effects
Lianne Sheppard*, University of Washington

11:35 A Statistical Critique of the 2001 PM Criteria Document
Peter Guttorp and Lianne Sheppard, University of Washington; and Richard L. Smith*, University of North Carolina at Chapel Hill

12:05 Floor Discussion

13. Contributed Papers:

Epidemiologic Methodology

Sponsor: *ENAR*

Chair: *Wanzhu Tu, Indiana University*

10:30 Design and Analysis of Case-Control Follow-up Studies
Marshall M. Joffe*, University of Pennsylvania

10:45 Using a Serial Marker to Predict a Repeated Measure Outcome in a Cohort Study
James Rochon*, George Washington University

11:00 A Comparison of Multiple Regression to Two Latent Variable Techniques for Estimation and Prediction
Melanie M. Wall*, University of Minnesota; and Ruifeng Li, Harvard School of Public Health

11:15 Methods for Bridging Multiple Race Data
Jennifer Madans*, Jennifer D. Parker, Nathaniel Schenker, Deborah Ingram, James Weed, Brady Hamilton, and Elizabeth Arias, National Center for Health Statistics

11:30 Semiparametric Maximum Likelihood Methods for Continuous Outcome Models With Outcome-Dependent Validation Samples
Mark A. Weaver* and Haibo Zhou, University of North Carolina-Chapel Hill

11:45 **Diagnostic Test Validation Using a Modified Case-Cohort Design**
L.C. Miller*, C.T. Yiannoutsos, and M.D. Hughes, Harvard School of Public Health

12:00 Estimating Cluster Means in Finite Population Two-Stage Clustered Designs
Edward J. Stanek III*, University of Massachusetts; and Julio Singer, Universidade de Sao Paulo, Brazil

14. Contributed Papers:

Methodological Issues in Clinical Trials I

Sponsor: *ENAR*

Chair: *Ming Tan, St. Jude Children's Research Hospital*

10:30 A Multivariate Rank Test for Comparing Several Responses
Peng Huang*, Medical University of South Carolina; and W.J. Hall, University of Rochester

10:45 A Copula-Based Semiparametric Model for Meta-Analytic Assessment of Surrogate Endpoints
Zhiwei Zhang* and Lisa A. Weissfeld, University of Pittsburgh

11:00 Improving the Information Content of Clinical Trial Endpoints
Vance W. Berger*, National Cancer Institute; and Bonnie La Fleur, Vanderbilt University

11:15 Assessing Treatment Efficacy in Non-Inferiority Trials
Sue-Jane Wang* and H.M. James Hung, FDA

11:30 A Graphical Display of Treatment Comparisons Using O'Brien Rank Sum Adjustment for Multiple Endpoints
Birol Emir* and Michael Gaffney, Pfizer Pharmaceutical Group

11:45 **A Measure of the Proportion of Treatment Effect Explained by a Surrogate Endpoint**
Yu Wang*, University of Michigan

12:00 The Schizophrenia Clinical Trial Consortium for Modeling Placebo Response: An Application of Hierarchical Modeling to Individual Patient Data Meta-Analysis
Jeffrey A. Welge*, University of Cincinnati College of Medicine

15. Contributed Papers:

Methodology for Diagnostic Tests and Reproducibility

Sponsor: *ENAR*

Chair: *Margaret S. Pepe, University of Washington*

10:30 Monte Carlo Power Study of the Dorman-Berbaum-Metz Method for Receiver Operating Characteristic (ROC) Discrete Rating Data
Stephen L. Hillis*, Kevin S. Berbaum, and Donald D. Dorfman, University of Iowa

10:45 Conditional Time Dependent Receiver Operating Characteristic Curves
Jiping Wang* and Howard E. Rockette, University of Pittsburgh

11:00 A Method for Partial AUC Regression
Lori E. Dodd*, National Cancer Institute; and Margaret S. Pepe, University of Washington

11:15 The Analysis of Matched-Pair Data Under an Equivalence Study Design
Valerie L. Durkalski*, Yuko Y. Palesch, Stuart Lipsitz, and Phil Rust, Medical University of South Carolina

11:30 Quantifying Predictive Accuracy of Continuous Prognostic Factors
Chaya S. Moskowitz* and Margaret S. Pepe, University of Washington

11:45 On Selecting the Instrument Closest to a Gold Standard
Pankaj K. Choudhary* and H. N. Nagaraja, Ohio State University

12:00 Evaluation of Reproducibility When the Data are Curves
Runze Li* and Mosuk Chow, Penn State University

16. Contributed Papers:

Nonparametric and Semiparametric Methods

Sponsor: *ENAR*

Chair: *Matt Wand, Harvard School of Public Health*

10:30 Wavelet-Based Nonparametric Modeling of Hierarchical Functions in Colon Carcinogenesis
Jeffrey S. Morris*, MD Anderson Cancer Center; Marina Vannucci, Texas A&M University; Philip J. Brown, University of Kent at Canterbury; and Raymond J. Carroll, Texas A&M University

10:45 HIV Infectivity Among Monogamous Thai Women with Uncertain Exposure Periods
Charles M. Heilig*, Centers for Disease Control and Prevention; Stephen C. Shiboski, University of California-San Francisco; Vinai Suriyanon, Chiang Mai University; Kenrad E. Nelson, Johns Hopkins University; and Ann Duerr, Centers for Disease Control and Prevention

11:00 **Semi-Parametric Analysis of Changes in Censored Measurements With Application to the Analysis of Changes in HIV RNA**
Meredith A. Goldwasser* and Michael D. Hughes, Harvard School of Public Health

11:15 Application of Functional Data Analysis: Associations Between Particulate Matter and Daily Mortality After Windstorms, Still-Air Inversions and Closely Timed Combinations in the Paso Del Norte Airshed
Joan G. Staniswalis, Julia O. Bader*, Norris J. Parks, University of Texas at El Paso; and Yolanda Munoz Maldonado, Texas A&M University

11:30 Penalized Spline Model-Based Estimation of Finite Population Total from Probability-Proportional-to-Size Samples
Hui Zheng* and Roderick J.A. Little, University of Michigan

11:45 Local Multiple Imputation
Marc Aerts*, Limburgs Universitair Centrum, Belgium; Gerda Claeskens, Texas A&M University; and Niel Hens and Geert Molenberghs, Limburgs Universitair Centrum, Belgium

12:00 A Resampling-Based Variance Estimator for Cumulative Incidence With Competing Events
Thomas M. Braun*, University of Michigan

Monday, March 18

12:15–1:30 p.m.

Roundtable Luncheons

Monday, March 18

1:45–3:30 p.m.

17. Decision Analysis in the Pharmaceutical Industry

Sponsor: *ASA Biopharmaceutical Section*

Organizer: *Jerry Nedelman, Novartis*

Chair: *Jerry Nedelman, Novartis*

1:45 Decision Analysis in the Pharmaceutical Industry: an Academician's Perspective
Donald A. Berry*, University of Texas M.D. Anderson Cancer Center

2:15 Decision Management in Pharmaceuticals – Perspectives of a Training and Coaching Consultant
Gerald A. Bush*, Decision Strategies, Inc.

2:45 Using Decision Analysis to Enhance the Influence of the Pharmaceutical Industry Statistician
Tom Spradlin*, Eli Lilly and Company

3:15 Discussant: Robert Clemen, Duke University

18. Statistical Methods for Reproductive Health

Sponsor: *ENAR*

Organizer: *Haibo Zhou, University of North Carolina at Chapel Hill*

Chair: *Haibo Zhou, University of North Carolina at Chapel Hill*

1:45 Bayesian Modeling of the Day-Specific Probabilities of Conception
David B. Dunson*, National Institute of Environmental Health Sciences

2:20 A Statistical Model for the Evaluation of Barrier Contraceptive Efficacy
Rosalie C. Dominik*, Family Health International; Haibo Zhou and Jianwen Cai, University of North Carolina at Chapel Hill

2:55 A Bayesian Approach to Handling Missing Daily Data in a Study of Time to Conception and Early Fetal Loss
Louise Ryan*, Harvard School of Public Health; and Jonathan French, Pfizer, Inc.

19. Recent Advances in Estimating Diagnostic Error without a Gold Standard

Sponsor: *ENAR and ASA Epidemiology Section*

Organizer: *Paul S. Albert, National Cancer Institute*

Chair: *Paul S. Albert, National Cancer Institute*

1:45 Random Effects Models for Conditional Dependence in Diagnostic Error without a Gold Standard
Yinsheng Qu*, Fred Hutchinson Cancer Research Center

2:15 Latent Class Models for Assessing Diagnostic Accuracy
Mark P. Becker*, University of Minnesota

2:45 Assessing Dependent Diagnostic Tests with Longitudinal Data Using Latent Markov Models
Richard J. Cook*, University of Waterloo

3:15 Discussant, Margaret S. Pepe, University of Washington

20. Clustering and Mixture Modeling Applications

Sponsor: *IMS*

Organizer: *David W. Scott, Rice University*

Chair: *David W. Scott, Rice University*

1:45 Nonparametric Poisson Mixture Models for Genomic EST Data
Bruce Lindsay*, Changxuan Mao, and Jiping Wang, Penn State University

2:15 Class Cover Catch Digraphs for Gene Expression Analysis
Carey Priebe*, The Johns Hopkins University

2:45 Mixture Analysis for Flow Cytometry
Guenther Walther*, Stanford University

3:15 Discussant: David Scott, Rice University

21. Contributed Papers:

Analysis of Recurrent Event Data

Sponsor: *ENAR and IMS*

Chair: *Richard J. Cook, University of Waterloo*

1:45 Flexible Modeling of Recursive Multiple Event Survival Dataset Analogous to Anderson and Gill
Zekarias Berhane* and Lisa Weissfeld, University of Pittsburgh

2:00 **Weighted Estimating Equations for Recurrent Event Data With Missing Event Types**
Douglas E. Schaubel* and Jianwen Cai, University of North Carolina at Chapel Hill

2:15 A General Class of Models for Recurrent Events
Edsel A. Pena*, University of South Carolina

2:30 Analysis of Recurrent Event Data With Covariate Measurement Error
Chengcheng Hu*, Harvard School of Public Health; and D.Y. Lin, University of North Carolina at Chapel Hill

2:45 Efficiency Comparison Between Mean and Log-rank Tests with Recurrent Event Times
Wenbin Lu*, Columbia University; Steven Wang, The R.W. Johnson Pharmaceutical Research Institute; and Ziliang Ying, Columbia University

3:00 Parametric and Nonparametric Estimation of the Distribution for Women Menstrual Cycle Length
Ying Guo*, Amita Manatunga, Shande Chen, Emory University; and Michele Marcus, University of North Texas Health Center at Fort Worth

3:15 Regression Analysis of Recurrent Event Data: Inference Based on Reduced Risksets
Y.Q. Chen*, University of California at Berkeley; M.C. Wang, Johns Hopkins University; and Y. Huang, Fred Hutchinson Cancer Research Center

22. Contributed Papers:

Design Issues in Clinical Trials

Sponsor: *ENAR*

Chair: *Michael Proschan, National Heart Lung and Blood Institute*

1:45 Optimal Design of Follow-up Times
Lurdes Y.T. Inoue*, MD Anderson Cancer Center; and Giovanni Parmigiani, Johns Hopkins University

2:00 Choosing a Sample Size for Estimating a Confidence Interval to Insure Good Study Properties
Michael R. Jiroutek*, Keith E. Muller, Lawrence L. Kupper, and Paul W. Stewart, University of North Carolina at Chapel Hill

2:15 Innovative Phase II Designs for Antiangiogenesis Agents
R.A. Parker*, J.R. Merchan, and V.P. Sukhatme, Beth Isreal Deaconess Medical Center

2:30 The Value of Phase II Clinical Trials—Application to Stroke Therapy
Yuko Y. Palesch* and Barbara C. Tilley, Medical University of South Carolina

2:45 Non-Stop Drug Development: Statistical Methods for More Time Efficient Trials
Karen L. Kesler* and Ronald W. Helms, Rho, Inc.

3:00 Comparison of a Study Design With an Internal Pilot to a Triangular Test for Assessing Clinical Equivalence
Murray R. Selwyn *and Michael Schwabacher, Statistics Unlimited, Inc.

3:15 Double Consent Randomized Designs with Use of the Logistic Regression Model
Chii-Dean Lin* and Kung-Jong Lui, San Diego State University

23. Contributed Papers:

Approaches for Jointly Modeling Longitudinal Data and Survival

Sponsor: *ENAR*

Chair: *Daowen Zhang, North Carolina State University*

1:45 Incorporating Death in the Analysis of Longitudinal Health Status Data
Laura L. Johnson*, University of Washington

2:00 Analyses for Handling Non-Random Missing Data and Censorship by Death in Longitudinal Quality of Life Studies for Advanced-Stage Disease
Donna K. Pauler*, Sheryl Giarritta, and Carol Moinpour, Fred Hutchinson Cancer Research Center

2:15 **A Bayesian Semiparametric Joint Hierarchical Model for Longitudinal and Survival Data**
Elizabeth R. Brown* and Joseph G. Ibrahim, Harvard School of Public Health

2:30 A Joint Modeling Approach for Longitudinal Data With Outcome-Related Time Points
Donglin Zeng*, University of North Carolina and Daohai Yu, Duke University

2:45 Joint Modeling of Survival and Longitudinal Data via a Common Frailty
Sarah J. Ratcliffe*, Wensheng Guo, and Thomas T. Ten Have, University of Pennsylvania

3:00 Joint Modeling and Estimation of Recurrent Event Process and Failure Time
Chiung-Yu Huang* and Mei-Cheng Wang, Johns Hopkins University

3:15 Bayesian Methods for Analysis of Panel Count Data With Dependent Termination
Debajyoti Sinha*, Medical University of South Carolina, Tepabrata Maiti, Iowa State University

24. Contributed Papers:

Modeling Data with Measurement Error

Sponsor: *ENAR*

Chair: *Mari Palta, University of Wisconsin-Madison*

1:45 **Transition Measurement Error Models for Longitudinal Data**
Wenqin Pan* and Xihong Lin, University of Michigan

2:00 Bayesian Measurement Error Models for in Utero Exposure to Polychlorinated Biphenyls
Sally W. Thurston* and Susan Korrick, Harvard School of Public Health

2:15 An Estimator for the Proportional Hazards Model With Multiple Longitudinal Covariates Measured with Error
Xiao Song*, Marie Davidian, and Anastasios A. Tsiatis, North Carolina State University

2:30 **Covariate Measurement Error in Spatial Linear Mixed Models**
Haicheng Tang* and Xihong Lin, University of Michigan

2:45 Measurement Error Models for a Skewed Regressor
Liang Li*, Mari Palta, and Jun Shao, University of Wisconsin-Madison

3:00 The Impact of Categorization of Exposure Measured With Error
Grant Izmirlian* and Victor Kipnis, National Cancer Institute

3:15 Nonparametric Estimation of a Distribution with Measurement Error and Replication
John P. Buonaccorsi*, University of Massachusetts

25. Contributed Papers:

Statistics in Medical Sciences and Methodology

Sponsor: *IMS*

Chair: *Jun Zhu, University of Wisconsin*

1:45 The Use of Frailty Hazard Models for Unrecognized Heterogeneity That Interacts with Treatment: Considerations of Efficiency and Power
Yi Li and Rebecca Betensky*, Harvard School of Public Health; David Louis, Massachusetts General Hospital; and Gregory Cairncross, London Regional Cancer Centre

2:00 A Multivalent Pairing Model of Linkage Analysis in Autotetraploids
Samuel S Wu*, Rongling Wu, and Chang-Xing Ma, University of Florida; Zhao-Bang Zeng, North Carolina State University; Mark Yang, University of Florida; and George Casella, University of Florida

2:15 Combining Asymptotically Normal Tests
Song Yang*, Li Hsu, and Lueping Zhao, Texas Tech University

2:30 Small Sample Confidence Regions for Exponential Families
John E Kolassa*, Rutgers University; and Bo Yang, Schering-Plough

2:45 Adding More Observations to Saturated D-optimal Resolution III Two-level Factorial Designs
Samad Hedayat* and Haiyuan Zhu, University of Illinois at Chicago

3:00 Constrained Linear Group Symmetry Models
Heng Li*, University of Rochester

3:15 Floor Discussion

Monday, March 18

3:30–3:45 p.m.

Break

Monday, March 18

3:45–5:30 p.m.

26. Nonparametric and Semiparametric Modeling Strategies for Biological/Medical Data

Sponsor: *ENAR and ASA Biometrics Section*

Organizers: *Naisyin Wang, Texas A&M University, and Colin Wu, Johns Hopkins University*

Chair: *Colin Wu, Johns Hopkins University*

3:45 Varying-Coefficient Models for the Analysis of Repeated Measurements
Jianhua Huang*, University of Pennsylvania; Colin O. Wu, Johns Hopkins University; and Lan Zhou, University of Pennsylvania

4:10 Analysis of DNA Damage and Repair in Colonic Crypts
Jeffrey S Morris, M.D. Anderson Cancer Research Center; Marina Vannucci and Raymond J Carroll*, Texas A&M University

4:35 Semiparametric Random Effects Models for Functional and Longitudinal Data
Jeng-Min Chiou, National Health Institute, Taiwan; Hans-Georg Mueller and Jane-Ling Wang*, University of California, Davis

5:00 Multivariate Adaptive Splines for the Analysis of Longitudinal Data
Heping Zhang*, Yale University
5:25 Floor Discussion

27. Outcome Adaptive Methods in Early Phase Clinical Trials

Sponsor: *ENAR and ASA Biometrics Section*
Organizer: *Peter F. Thall, M.D. Anderson Cancer Center*
Chair: *Lurdes Y.L.T. Inoue, M.D. Anderson Cancer Center*

3:45 A Curve-Free Method for Phase I Clinical Trials
Jeffrey Eisele*, Novartis Pharma AG, Switzerland; and Mauro Gasparini, Politecnico di Torino, Italy
4:10 Monitoring the Rates of Composite Events with Censored Data in Phase II Clinical Trials
Ying Kuen Cheung*, Columbia University; and Peter F. Thall, M.D. Anderson Cancer Center
4:35 Isotonic Designs for Phase I Trials
Denis Leung*, Singapore Management University; and You Gan Wang, National University of Singapore
5:00 Adaptive Decision-Making in a Lymphocyte Infusion Trial
Peter F. Thall*, Lurdes Y.L.T. Inoue, and Thomas G. Martin, M.D. Anderson Cancer Center
5:25 Floor Discussion

28. Statistical Methods for Small Area Estimation

Sponsor: *ASA Survey Research Methods Section*
Organizer: *Barry Graubard, National Cancer Institute*
Chair: *Barry Graubard, National Cancer Institute*

3:45 Robustness Properties of Estimating Function Gausian Likelihood Based Hierarchical Bayes Modeling for Small Area Estimation with Survey Data
Ralph E. Folsom*, Babubhai V. Shah, Akhil K. Vaish, and Avinash C. Singh, RTI International
4:15 Hierarchical Bayes Estimation of Prevalence of Drug and Alcohol Abuse
Shijie Chen, Research Triangle Institute; Jane L. Meza*, University of Nebraska Medical Center; and Partha Lahiri, University of Nebraska at Lincoln
4:45 Complete Bayesian Small Area Estimates from the American Community Survey Using a Housing Unit Model
Donald Malec* and Nanak Chand, U.S. Census Bureau
5:15 Discussant: Thomas A. Louis, Rand Corp.

29. Semiparametric Models in Survival Analysis

Sponsor: *IMS*
Organizer: *Zhiliang Ying, Columbia University*
Chair: *Zhiliang Ying, Columbia University*

3:45 A Generalized Self-Consistency Approach to Semiparametric Survival Models
Alex Tsodikov*, University of Utah
4:20 Comparing Non-Nested Cox Models
Jason Fine*, University of Wisconsin
4:55 Semiparametric Analysis of Transformation Models
Kani Chen*, Hong Kong University of Science and Technology; Zhezhen Jin, Columbia University; Zhiliang Ying, Columbia University

30. Contributed Papers: Testing in Survival Analysis

Sponsor: *ENAR*
Chair: *Glen Heller, Memorial Sloan-Kettering Cancer Center*

3:45 A Comparison of Test Statistics for Cox's Proportional Hazards Assumption
Rana Z. Ezzeddine* and Lisa Weissfeld, University of Pittsburgh
4:00 A Test for Independent Censoring Using Clustered Survival Data
Xuelin Huang* and Robert A. Wolfe, University of Michigan
4:15 **Testing Quasi-Independence of Failure and Truncation via Conditional Kendall's Tau**
Emily C. Martin* and Rebecca A. Betensky, Harvard School of Public Health
4:30 A Nonparametric Test for Comparing Crossing Survival Curves
Margaret Short*, University of Minnesota
4:45 Nonparametric Analysis of Covariance for Survival Data
Glenn Heller and E.S. Venkatraman*, Memorial Sloan-Kettering Cancer Center
5:00 **Combining Stratified and Unstratified Log-Rank Tests in Matched Pair Data**
Changyong Feng* and David Oakes, University of Rochester
5:15 Floor Discussion

31. Contributed Papers: Topics in Linkage Analysis

Sponsor: *ENAR*
Chair: *Zhaohai Li, George Washington University*

3:45 A Statistically Valid Alternative to the TDT
Xin Liu* and Knut M. Wittkowski, Rockefeller University
4:00 Tests of Genetic Association with Sibship Data in the Presence of Linkage
Xiaoyun Zhong* and Hongzhe Li, University of California-Davis
4:15 Interval Mapping of Quantitative Trait Loci by Linkage Disequilibrium Analysis
Ruzong Fan*, Texas A&M University and Momiao Xiong, University of Texas-Houston

4:30 Diagnostic Tools in Linkage Analysis for Quantitative Traits
Mariza de Andrade, Mayo Clinic, Brooke Fridley*, Iowa State University, and Stephen Turner, Mayo Clinic

4:45 Crossover Interference in Calculating Probabilities of Genetic Data from Pedigrees
Sharon Browning*, North Carolina State University

5:00 Extension of Variance Components Approach to Incorporate Temporal Trends and Longitudinal Pedigree Data Analysis
Mariza de Andrade*, Mayo Clinic and Christopher I. Amos, M.D. Anderson Cancer Center

5:15 A Multipoint Likelihood Method to Infer Quantitative Trait Loci Using Data from Unrelated Individuals
Tao Wang* and Zhao-Bang Zeng, North Carolina State University

32. Contributed Papers:

Analysis of Correlated Data with Discrete Outcomes

Sponsor: *ENAR*

Chair: *Eva Petkova, Columbia University*

3:45 A Parametric Model for Analyzing Longitudinal Binary Responses
Wei Lang*, Wake Forest University; Lisa A. Weissfeld, University of Pittsburgh; and Ralph D'Agostino, Jr., Wake Forest University

4:00 An Interactive Diagnostic Support Approach Utilizing Multivariate Ordinal Data
Knut M. Wittkowski*, The Rockefeller University

4:15 Design of Panel Studies for Disease Progression With Multiple Stages
Wei-Ting Hwang*, University of Pennsylvania; and Ron Brookmeyer, Johns Hopkins University

4:30 **Exact Analysis of Dose-Response for Multiple Correlated Binary Outcomes**
Karen E. Han*, Paul J. Catalano, Pralay Senchaudhuri, and Cyrus Mehta, Harvard School of Public Health

4:45 The Analysis of Data with Multiple Levels of Association
Justine Shults*, Melicia Whitt, and Shiriki Kumanyika, University of Pennsylvania

5:00 Characterizing the Progression of Viral Mutations Over Time in Response to Drug Pressure
Andrea S. Foulkes*, Victor DeGruttola, and Wing Wong, Harvard School of Public Health

5:15 Floor Discussion

33. Contributed Papers:

Analysis of Imaging and Spatial Data

Sponsor: *ENAR and IMS*

Chair: *Nick Lange, Harvard University*

3:45 A Bayesian Approach to MRI Image Reconstruction
Vera L. Bulaevskaya* and Gary W. Oehlert, University of Minnesota

4:00 Modeling Addiction with fMRI and Neural Networks: Functional Connectivity, Effective Connectivity and Connectionist Models for Neural Processes
Raymond G. Hoffmann* and Elliot A. Stein, Medical College of Wisconsin; Thomas Ross and Thomas J. Hoffmann, University of Wisconsin-Madison; and Paul G. Hoffmann, Marquette University

4:15 False Discovery Rate for Functional Neuroimaging
Thomas E. Nichols*, University of Michigan

4:30 Using Model-Classified LANDSAT Thematic Imagery for Stratification
Ronald E. McRoberts*, North Central Research Station USDA Forest Services

4:45 **Model-Based Prediction of Spatial Intensity**
C.G. Wager*, B.A. Coull, and N. Lange, Harvard School of Public Health

5:00 Spatial Prediction Using Wavelet
Hsin-Cheng Huang*, Academia Sinica

5:15 Mixed-Model Functional ANOVA for Studying Human Tactile Perception
Dan J. Spitzner*, Virginia Tech; J.S. Marron and G.K. Essick, University of North Carolina at Chapel Hill

Tuesday, March 19

8:30–10:15 a.m.

34. Modeling with Penalized Regression Splines

Sponsor: *ENAR*

Organizers: *Timothy G. Gregoire, Yale University, and Mary Lindstrom, University of Wisconsin-Madison*

Chair: *Timothy G. Gregoire, Yale University*

8:30 The Mixed Model Revolution in Smoothing
Matt P. Wand*, Harvard School of Public Health

9:05 Penalized Estimation of Free-Knot Splines
Mary J. Lindstrom*, University of Wisconsin-Madison

9:40 Generalized Linear Additive Smooth Structures
Brian D. Marx*, Louisiana State University and Paul H.C. Eilers, Leiden University Medical Center, The Netherlands

35. Survival Analysis Methods in Genetic Studies

Sponsor: *ENAR*

Organizer: *Hongzhe Li, University of California, Davis*

Chair: *Yi Li, Harvard School of Public Health*

8:30 Tests for Genetic Association Using Family Data
Mei-Chiung Shih*, Harvard School of Public Health; Alice S. Whittemore and Jerry Halpern, Stanford University

8:55 Multipoint Mapping for Complex Diseases in the Presence of Etiologic Heterogeneity
David V. Glidden*, UC San Francisco; and Kung Yee Liang, Johns Hopkins University

9:20 A Competing Risk Problem for Kin-Cohort Estimation
Nilanjan Chatterjee*, Sholom Wacholder, and Patricia Hartge, National Cancer Institute

9:45 A Method for Incorporating Ages at Onset in Affected Sibpair Linkage Studies
Li Hsu*, Fred Hutchinson Cancer Research Center; Hongzhe Li, University of California at Davis; and Jeanine J. Houwing-Duistermaat, Erasmus University

10:10 Floor Discussion

36. Statistical Issues in Studies of Mother-to-Child-Transmission of HIV

Sponsor: *ENAR*
Organizer: *James P. Hughes, University of Washington*
Chair: *James P. Hughes, University of Washington*

8:30 Weaning as a Competing Risk in Mother-to-Child HIV Transmission
Michael G. Hudgens*, Fred Hutchinson Cancer Research Center

8:55 Estimation of a Failure Time Distribution Based on Imperfect Diagnostic Tests, with Application to HIV Vertical Transmission Studies
Raji Balasubramanian* and Stephen W. Lagakos, Harvard School of Public Health

9:20 Modeling Breastmilk Infectivity of HIV-1 Infected Mothers
Barbra A. Richardson* and James P. Hughes, University of Washington

9:45 Estimating Treatment Effects in Studies of Perinatal Transmission of HIV with Fetal Loss
Heejung Bang and Donna Spiegelman*, Harvard School of Public Health

10:10 Floor Discussion

37. Statistics in Brain Mapping

Sponsor: *IMS*
Organizer: *Keith Worsley, McGill University*
Chair: *Song Yang, Texas Tech University*

8:30 Statistical Morphometry in Neuroanatomy
Moo K Chung*, McGill University; W.M. Keck, University of Wisconsin-Madison; Keith J. Worsley, Tomas Paus, Steve Robbins, McGill University; Jonathan Taylor, Stanford University; and Jay N. Giedd, Judith L. Rapoport, and Alan C. Evans, National Institute of Mental Health

9:05 Bayesian Analysis of fMRI Time Series
Chris Genovese*, Carnegie Mellon University

9:40 Estimating the Variability of BOLD-FMRI Response Delays
Ziad S. Saad*, National Institute of Mental Health; Edgar A. DeYoe, Medical College of Wisconsin; Robert W. Cox, National Institute of Mental Health; and Kristina M. Ropella, Marquette University

38. Contributed Papers:

Approaches for Handling Missing Data in Clinical Studies

Sponsor: *ENAR*
Chair: *Myunghee C. Paik, Columbia University*

8:30 Comparing Early Response Between Treatments Across Studies When There are Missing Early Response Data in One Study
Fredrick S. Whaley*, Pharmacia Corporation

8:45 Incomplete Data in 2-By-2 Crossover Studies
David R. Bristol*, Purdue Pharma LP.

9:00 Estimation in Mixed, Censored, and Truncated Data
Calvin L. Williams* and Kashema Washington, Clemsion University

9:15 A Test for Non-Ignorable Non-Response
Sreelatha Meleth*, University of Alabama Medical School and James Leeper, University of Alabama-Tuscaloosa

9:30 An Imputation Method for Intermittently Missing Values
Hsiao-Lan Wei* and Howard E. Rockette, University of Pittsburgh

9:45 Estimating Causal Effects in the Presence of Treatment Non-Compliance and Missing Outcomes: The Case of Logistic Regression
Douglass Levy*, James O'Malley, and Sharon-Lisa T. Normand, Harvard Medical School

10:00 Floor Discussion

39. Contributed Papers:

Analysis of Data from Epidemiologic Studies

Sponsor: *ENAR*
Chair: *Raymond Hoffmann, Medical College of Wisconsin*

8:30 A Method for Estimating Risks of Transmission of an Infection Between Spouses Based on Seroprevalence Data
Laurence S. Magder* and Alan D. Fix , University of Maryland School of Medicine; Nabiel M. Mikhail, Assiut University, Egypt; Mohomed Abdel-Hamid, Minya University Faculty of Medicine, Egypt; Ahmed Medhat, Assiut University, Egypt; Fatma Abdel-Azia, Center for Field and Applied Research, Egypt; and G. Thomas Strickland, University of Maryland School of Medicine

8:45 A Latent Variable Model Approach for Scoring Neuropsychological Tests for Dementia
Sujuan Gao* and Jianzhao Shen, Indiana University School of Medicine

9:00 Effects of Measurement Error on the Estimated Segmented Regression Between Folate and Homocysteine
John Staudenmayer*, University of Massachusetts and Donna Spiegelman, Harvard School of Public Health

9:15 Quantifying the Change of Melanoma by Breslow Thickness
Jing Qin* and Marianne Berwick, Memorial Sloan-Kettering Cancer Center

9:30 Modeling Dietary Measurement Error: Results of the Open Biomarker Study
Victor Kipnis* and Douglas Midthune, National Cancer Institute; Laurence S. Freedman, Bar Ilan University, Israel; and Raymond J. Carroll, Texas A&M University

9:45 Statistical Analysis of Multiply Matched Cohort Studies with Two Heterogeneous Comparison Groups-Application to Pregnancy Rates Among HIV+ Women
Yan Li* and Daniel Zelterman, Yale University

10:00 Missing Data Indicators in Epidemiological Studies
James B. Kampert*, Cooper Institute

40. Contributed Papers:

Estimating Equations

Sponsor: *ENAR*

Chair: *Terry Cox, National Eye Institute*

8:30 Quadratic Score Tests of Ordered Group Effect for Correlated Data
Annie Qu*, Oregan State University

8:45 Empirical Exponential Family Likelihood for Linear
Suddhasatta Acharyya*, Yale University

9:00 Adjusted Profile Estimating Functions
Molin Wang* and John J. Hanfelt, Emory University

9:15 Working-Independence or Covariance Weight Should Be Used in Nonparametric Kernal Regression for Longitudinal Data
Hulin Wu* and Hua Liang, Frontier Science and Technology Research Foundation

9:30 A GEE Approach on Estimating the Correlation of Left-Censored Variables
Jingli Song*, Huiman X. Barnhart, and Robert H. Lyles, Emory University

9:45 Extended GEE Methods with Multi-Layer Structured Correlation
Edward C. Chao*, Insightful Corporation

10:00 Quantile Regression under General Random Censorship
Lu Tian and L.J. Wei, Harvard School of Public Health

41. Contributed Papers:

Nonparametric Methods

Sponsor: *ENAR*

Chair: *Warren Bilker, University of Pennsylvania*

8:30 Hoeffding's Test of Bivariate Independence With Goodness-of-Fit Applications
Gregory E. Wilding* and Govind S. Mudholkar, University of Rochester; and Carol E. Marchetti, Rochester Institute of Technology

8:45 Clustering with Nonparametric Density Estimation
Woncheol Jang*, Carnegie Mellon University

9:00 Nonparametric Variable Selection via Likelihood Basis Pursuit with Applications in Medical Studies
Hao Zhang*, Grace Wahba, Ronald Klein, and Barbara Klein, University of Wisconsin-Madison

9:15 Designing Monte-Carlo Implementations of Permutation or Bootstrap Hypothesis Tests
Michael P. Fay*, National Cancer Institute; and Dean A. Follmann, National Heart, Lung, and Blood Institute

9:30 **A Similarity Analysis of Curves**
Yolanda Munoz Maldonado*, Joan Staniswalis, Louis Irwin, and Donna Byers, University of Texas at El Paso

9:45 A Nonparametric Bootstrap Test for Interaction Effect in a 2^2 Factorial Design
Jonghyeon Kim*, The EMMES Corporation

10:00 Floor Discussion

42. Contributed Papers:

Statistical Methods with Biopharmaceutical Applications

Sponsor: *ENAR*

Chair: *Sue-Jane Wang, FDA*

8:30 Adverse Event Monitoring in Safety Trials
Vladimir Dragalin* and Valerii Fedorov, GlaxoSmithKline

8:45 Issues of Simultaneous Tests for Non-Inferiority and Superiority
Tie-Hua Ng*, FDA

9:00 Shelf Life Determination-A Hypothesis Testing Approach
Yi Tsong*, Wen Jen Chen, and Chi-Wan Chen, FDA

9:15 Estimates of Standard Deviations for a Log-Trans formed Variable Using Arithmetic Means and Standard Deviations
Hui Quan* and Ji Zhang, Merck Research Laboratories

9:30 Gamma Failure-Time Mixture Models: Yet Another Way to Establish Efficacy
Kallappa M. Koti*, FDA

9:45 A Comparison of the BLUP (Best Linear Unbiased Predictor) Method with Existing Methods of QT Interval Correction: A Simulation Study
Daniel C. Park*, Kwan R. Lee; and Xiwu Lin, GlaxoSimthKline

10:00 Evaluating Evidence From Sequentially Conducted Studies
Qian Li*, FDA

Tuesday, March 19

10:15–10:30 a.m.

Break

Tuesday, March 19

10:30 a.m.-12:15 p.m.

Presidential Invited Address

Sponsor: *ENAR*

Organizer/Chair: *Carol Redmond, University of Pittsburgh*

10:30 Introduction: Student Travel Awards, Chair

10:45 Getting Large Scale Randomized Evidence
Sir Richard Peto, Oxford University

Tuesday, March 19

1:45–3:30 p.m.

43. Recent Advances in Modelling Longitudinal Data

Sponsor: *ENAR and ASA Biometrics Section*

Organizer: *Michael Daniels, Iowa State University*

Chair: *Michael Daniels, Iowa State University*

1:45 Generalized Linear Models for Covariance of Longitudinal Data
Mohsen Pourahmadi*, Northern Illinois University and The University of Chicago; and Michael Daniels, Iowa State University

2:15 Analysis of Multivariate Longitudinal Outcomes with Nonignorable Dropouts and Missing Covariates
Jason Roy, Brown University; and Xihong Lin*, University of Michigan

2:45 Marginalized Transition Models and Likelihood Inference for Longitudinal Categorical Data
Patrick J. Heagerty*, University of Washington

3:15 Discussant: Joe Hogan, Brown University

44. Surrogate Endpoints in Clinical Trials

Sponsor: *ENAR*

Organizers: *Paul S. Albert, National Cancer Institute and Dean Follmann, National Heart, Lung, and Blood Institute*

Chair: Dean Follmann, National Heart, Lung, and Blood Institute

1:45 On Meta-Analytic Assessment of Surrogate Outcomes
Mitchell H Gail* and Ruth Pfeiffer, National Cancer Institute; Hans C. van Houwelingen, Leiden Universtiy Medical Center; and Raymond J. Carroll, Texas A&M University

2:15 Assessing Surrogates as Trial Endpoints Using Mixed Models
Edward L. Korn*, Paul S. Albert, and Lisa M. Mcshane, National Cancer Institute

2:45 The Evaluation of Multiple Surrogate Endpoints
Jane Xu*, Novartis Pharmaceuticals; and Scott L. Zeger, Johns Hopkins University

3:15 Discussant: *Laurence Freedman, Bar Ilan University, Israel*

45. Spatial Optimal Design

Sponsor: *ASA Epidemiology Section, ASA Statistics and Environment Section, and ENAR*

Organizer: *Chii-Dean Lin, San Diego State University*

Chair: *Montserrat Fuentes, North Carolina State University*

1:45 Dynamic Design of Ecological Monitoring Networks
Christopher K. Wikle*, University of Missouri-Columbia; and Andy Royle, U.S. Fish and Wildlife Service

2:10 Evaluating and Designing Environmental Monitoring Networks
Douglas W. Nychka* and Eric Gilleland, National Center for Atmospheric Research

2:35 Optimal Shrinkage of a Monitoring Network
Peter Mueller*, M.D. Anderson Cancer Center; Dave M. Higdon, Los Alamos National Laboratories; and Maria de Iorio, Oxford University

3:00 Building Tractable, Non-Stationary Space-Time Models for Environmental Monitoring and Network Design
Dave M. Higdon*, Los Alamos National Lab and Duke University; Maria de Iorio, Oxford University; and Peter Muller, M.D. Anderson Cancer Center

3:25 Floor Discussion

46. Statistical Methods for Animal Experiments

Sponsor: *ENAR*

Organizer: *David B. Dunson, National Institute of Environmental Health Sciences*

Chair: *Brian Neelon, University of North Carolina at Chapel Hill*

1:45 Bayesian Semi-Parametric Analysis of Developmental Toxicology Data
Francesca Dominici* and Giovanni Parmigiani, Johns Hopkins University

2:15 Bayesian Modeling of Multivariate Current Status Data with Applications to Animal Carcinogenicity Experiments
Gregg E. Dinse* and David B. Dunson, National Institute of Environmental Health Sciences

2:45 A General Methodology for Testing Order Restrictions with Applications to Toxicology
Shyamal D. Peddada*, National Institute of Environmental Health Sciences

3:15 Discussant: Paige Williams, Harvard School of Public Health

47. New Software

Sponsor: *IMS*
Organizer: *Heping Zhang, Yale University*
Chair: *Hongtu Zhu, Yale University*

1:45 Computation and Visualization of Simultaneous Confidence Bands
Catherine Loader*, Bell Lab, Lucent

2:20 Interactive Projection Pursuit and Applications
Jiayang Sun*, Case Western Reserve University

2:55 Logic Regression
Charles Kooperberg*, Fred Hutchinson Cancer Research Center; and Ingo Ruczinski, Johns Hopkins University

48. Contributed Papers:

Methodology for Correlated Survival Data

Sponsor: *ENAR*
Chair: *Joel Dubin, Yale University*

1:45 Inference for Copulas from Bivariate Censored Data
David Oakes* and Changyoung Feng, University of Rochester

2:00 **Marginal Analysis of Clustered Failure Time Data**
Shou-En Lu*, University of Medicine and Dentistry of New Jersey; and Mei-Cheng Wang, Johns Hopkins University

2:15 Analysis of Clustered Root Survival Data
Michael G. Akritas, Penn State University; and Yunling Du*, Columbia University

2:30 Nonparametric Quantile Inferences with Multivariate Failure Time Data
Guosheng Yin* and Jianwen Cai, University of North Carolina at Chapel Hill

2:45 Parameter Estimation in Bivariate Copula Models
Antai Wang* and David Oakes, University of Rochester

3:00 **Analysis of Clustered and Interval Censored Data From a Community-Based Study in Asthma**
Scarlett L. Bellamy*, University of Pennsylvania; Yi Li and Louise M. Ryan, Harvard School of Public Health; Marina Jacobson and Rosalind Wright, Channing Laboratory

3:15 Floor Discussion

49. Contributed Papers:

Models for Gene Expression Data

Sponsor: *ENAR*
Chair: *Russell Wolfinger, SAS Institute, Inc.*

1:45 A Mixture Model Approach to Detecting Differentially Expressed Genes with Microarray Data
Wei Pan*, Jizhen Lin, and Chap Le, University of Minnesota

2:00 Statistical Modeling of Gene Expression Data
Yuan Ji* and KyungMann Kim, University of Wisconsin-Madison

2:15 A Systematic Statistical Linear Modeling Approach to Oligonucleotide Array Experiments
Tzu-Ming Chu*, North Carolina State University and SAS Institute; Bruce S. Weir, North Carolina State University; and Russel D. Wolfinger, North Carolina State University and SAS Institute

2:30 **Identification of Differentially Expressed Genes Using Bayesian Analysis of Variance Models**
Mahlet G. Tadesse* and Joseph G. Ibrahim, Harvard School of Public Health

2:45 Multinomial Data, Model Selection and Microarray Data
Naijun Sha and Marina Vannucci*, Texas A&M University; and Philip J. Brown, University of Kent at Canterbury

3:00 Classification of Multiple Cancer Types by Multicategory Support Vector Machines Using Gene Expression Data
Yoonkyung Lee*, University of Wisconsin-Madison

3:15 Floor Discussion

50. Contributed Papers

Statistical Methods in Health Services and Policy Research

Sponsor: *ENAR*
Chair: *Dalene K. Stangl, Duke University*

1:45 Lead Time Estimation in Periodic Cancer Screening
Dongfeng Wu*, Mississippi State University; Gary L. Rosner and Lyle D. Broemeling, MD Anderson Cancer Center

2:00 A Bayesian Approach to Modeling the Proportion of HIV/AIDS Patients Prescribed Appropriate Care
Laura H. Gunn*, Dalene K. Stangl, and Kathryn Whetten-Goldstein, Duke University

2:15 Calibration Regression of Censored Lifetime Medical Cost
Yijian Huang*, Fred Hutchinson Cancer Research Center

2:30 Longitudinal Assessment of Cost in Health Care Interventions
Joseph C. Gardiner*, Zhehui Luo, Elena Polverejan, Pfizer, Inc, Cathy Bradley, Margaret Holmes-Rovner, and David Rovner, Michigan State University

2:45 Comparing Medical Costs Based on Inverse Gaussian Distributions
Lili Tian*, University of Florida

3:00 On Estimating Medical Cost and Incremental Cost-Effectiveness Ratios with Censored Data
Hongwei Zhao*, University of Rochester; and Lili Tian, University of Florida

3:15 Floor Discussion

51. Contributed Papers:

Categorical Data Analysis

Sponsor: *ENAR*

Chair: *Elizabeth Garrett, Johns Hopkins University*

1:45 On the Use of Stochastic Ordering for Cluster Based Tests of Treatment Related Trend
E. Olusegun*, The University of Memphis and Aniko Szabo, Huntsman Cancer Institute

2:00 Asymptotic Power for Linear Rank Tests for Ordered Multinomial Data
Nusrat Rabbee*, and Brent A. Coull, Harvard School of Public Health, Cyrus R. Mehta and Pralay Senchaudhuri, Cytel Software Corp.

2:15 An Algorithm for Generating Two-way Contingency Tables With Fixed Marginal Totals and Arbitrary Mean Proportions Using Sequentially Assigned Counts
Craig B. Borkowf*, National Cancer Institute

2:30 Comparison of Different Filters in Detection of Weak Signals for Large Size Contingency Tables
Valeri Fedorov, Xiwu Lin*, and Rita N. Patwardhan, GlaxoSmithKline

2:45 Testing for Marginal Independence Between Two Categorical Variables With Multiple Responses
Christopher R. Bilder*, Oklahoma State University and Thomas M. Loughin, Kansas State University

3:00 Latent Class Analysis of SESTAT Survey Data
Michael D. Larsen*, University of Chicago

3:15 Exact Inference for Correlated 2X2 Table With Structural Zeros
Man L. Tang*, Harvard Medical School and Nian S. Tang, Yunnan University

Tuesday, March 19

3:30–3:45 p.m.

Break

Tuesday, March 19

3:45–5:30 p.m.

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52. Statistical Issues in the Design and Analysis of Extensions to Clinical Trials

Sponsor: *ASA Biopharmaceutical Section, ENAR, and ASA Biometrics Section*

Organizers: *Matilde Sanchez and Meehyung Cho, Merck Laboratories*

Chair: *Matilde Sanchez, Merck Research Laboratories*

3:45 An Overview of the Design and Analysis of Extension Studies
Bruce S. Binkowitz*, Merck Research Laboratories.

4:15 Proper and Improper Extension Studies
Weichung J Shih*, University of Medicine & Dentistry of New Jersey

4:45 Missing-Data Issues in Clinical Trials
Nathaniel Schenker*, National Center for Health Statistic

5:15 Discussant: Mohammad F. Huque, Food and Drug Administration

53. Gene-Environment Interaction: Statistical Issues in the Epidemiological Study of How Genetic Makeup and Environmental Exposures Jointly Influence Disease Risk

Sponsor: *ENAR and ASA Biometrics Section*

Organizer: *David M. Umbach, National Institute of Environmental Health Sciences*

Chair: *David M. Umbach, National Institute of Environmental Health Sciences*

3:45 Assessment of Heterogeneity Using Regression Models for Allele Sharing
Shelley B. Bull*, University of Toronto; and Celia M.T. Greenwood, McGill University

4:10 Hierarchical Modeling of Genetic Linkage Disequilibrium and Environmental Factors
John S. Witte*, Case Western Reserve University

4:35 Characterizing GxE Interaction in Family-Based Case-Control Studies
Kimberly D. Siegmund*, University of Southern California

5:00 Joint Effects of Genetic and Environmental Factors: Epidemiologic Questions and Design Options
Sholom Wacholder*, National Cancer Institute

5:25 Floor Discussion

54. Semiparametric Mixed Effects Regression Models

Sponsor: *ENAR and IMS*

Organizer: *Paul Rathouz, University of Chicago*

Chair: *Paul Rathouz, University of Chicago*

3:45 Linear and Generalized Linear Mixed Models with Flexible Random Effects Distribution for Longitudinal Data
Daowen Zhang* and Marie Davidian, North Carolina State University; and Junliang Chen, PPD INC

4:10 Longitudinal Analysis of Repeated Binary Data Using Autoregressive and Random Effect Modeling
Murray Aitkin*, Education Statistics Services Institute; and Marco Alfo', Ufficio di Statistica, Italy

4:35 ANOVA for Related Random Effects Distributions
Peter Mueller, M.D. Anderson Cancer Center; Maria De Iorio, Oxford University; and Gary L. Rosner*, M.D. Anderson Cancer Center

5:00 On Semiparametric Mixture Approach to Repeated Ordinal Data
Ramani S. Pilla*, University of Illinois at Chicago

5:25 Floor Discussion

55. Recent Advances in Dimension Reduction for Regression

Sponsor: *IMS*

Organizer: *Dennis Cook, University of Minnesota*

Chair: *Efstathia Bura, George Washington University*

3:45 Recent Advances in Dimension Reduction for Regression
Dennis Cook*, University of Minnesota

4:20 Dimension Reduction for conditional mean in regression
Bing Li*, Penn State University and Dennis Cook, University of Minnesota

4:55 Extending Dimension Reduction to Regressions with Categorical Predictors
Francesca Chiaromonte*, Penn State University; Dennis Cook, University of Minnesota; and David Louis, Massachusetts General Hospital

56. Contributed Papers:

Methodology for Drug Discovery and Bioassay

Sponsor: *ENAR*

Chair: *Yi Tsong, FDA*

3:45 A Factorial Design to Optimize Cell-Based Drug Discovery Analysis
Bingming Yi* and Jacqueline M. Hughes-Oliver, North Carolina State University; and S. Stanley Young and Lei Zhu, GlaxoSmithKline

4:00 Optimal Design for Compartmental Models with Cost Constraints
Valeri V. Fedorov, Robert C. Gagnon*, and Sergei Leonov, GlaxoSmithKline

4:15 A Functional Linear Model for Comparing Two Pharmacokinetics Profiles
Jason Liao*, Merck Research Labs

4:30 Estimation of Parameters in Carcinogenesis
Wai-Yuan Tan and Junhong Zhu*, The University of Memphis and C.W. Chen, USEPA

4:45 **Using Percentile Regression for Quantitative Risk Assessment in Developmental Toxicology**
Zi-Fan Yu* and Paul J. Catalano, Harvard School of Public Health

5:00 Performance of Bioequivalence Tests Based on the Parallel Line Bioassay Analysis with an Underlying EMAX Model
Donald J. Schuirmann*, FDA

5:15 Floor Discussion

57. Contributed Papers:

Analysis of Gene Expression Data

Sponsor: *ENAR and IMS*

Chair: *Lisa McShane, National Cancer Institute*

3:45 Introduction to biological, technological and analytical issues in microarray experiments
Danh V. Nguyen*, Texas A&M University; Bulak Arpat, University of California, Davis; and Raymond J. Carroll, Texas A&M University

4:00 Variable Selection and Pattern Recognition with Microarray Data
Aniko Szabo*, Kenneth Boucher, Alexander D. Tsodikov, Andrei Y. Yakovlev, University of Utah; and Leonid B. Klebanov, Idaho State University

4:15 Selection of Informative Genes in Microarray Classification
Aiyi Liu* and Ying Zhang, Georgetown University Medical Center

4:30 Quantifying Uncertainty in Clustering Microarray Data: Taking All Sources Into Account
Mario Medvedovic* and Siva Sivaganesan, University of Cincinnati

4:45 Using Gene Expression Microarrays to Identify Cancer-Associated Regions of Chromosomal Gain or Loss
Stephen J. Iturria*, Mayo Clinic

5:00 Robust Microarray Image Analysis Through Pixel Clustering
Jorg Rahnenfuhrer* and Daniel Bozinov, Nebraska Informatics Center for the Life Sciences

5:15 Floor Discussion

58. Contributed Papers:

Methodology for the Analysis of Spatial Data

Sponsor: *ENAR*

Chair: *Melanie Wall, University of Minnesota*

3:45 Spatio-Temporal Frailty Models for Biostatistical Analysis
Brad Carlin* and Sudipto Banerjee, University of Minnesota

4:00 Modeling Spatial Survival Data Using Semi-Parametric Frailty Models
Yi Li*, Harvard School of Public Health

4:15 Hierarchical Model for Spatial Clustering
Ronald E. Gangnon* and Murray K. Clayton, University of Wisconsin-Madison

4:30 Incorporating Parameter Uncertainty into Prediction Intervals for Spatial Data Modeled via a Parametric Variogram
Fujun Wang* and Melanie M. Wall, University of Minnesota

4:45 Bayesian Inference for Directional Gradients With Applications in Spatial Statistics
Sudipto Banerjee*, University of Minnesota; and Alan E. Gelfand, University of Connecticut

5:00 Hierarchical Spatial-temporal Models for Alcohol Availability and Violent Crime
Li Zhu*, Texas A&M University

5:15 Disease Mapping for Failure Time Data
Bhaswati Ganguli* and Matt Wand, Harvard School of Public Health

59. Contributed Papers:

Applications in Longitudinal Data Analysis

Sponsor: *ENAR*

Chair: *James Rochon, George Washington University*

3:45 An Application of Generalized Linear Mixed Models for Bioterrorism Surveillance
Ken Kleinman*, Ross Lazarus, and Richard Platt, Harvard Medical School

4:00 A Pulsatile Driver-Response Model for Two Hormones
Nichole E. Carlson* and Mortan B. Brown, University of Michigan

4:15 Characterizing Profiles of a Repeated Cognitive Measure in Alzheimer's Disease Patients
Hyonggin An* and Roderick, J.A. Little, University of Michigan

4:30 Detecting Change in Visual Field Data
Hong Gu*, David Hamilton, Paul H. Artes, and Balwantray C. Chauhan, Dalhousie University

4:45 Short and Long Range Serial Correlation in a Panel Study with Binary Response Data: Detection and Impact on Regression
Jonathan S. Schildcrout*, Patrick J. Heagerty, Thomas S. Lumley, and Elizabeth A. Sheppard, University of Washington

5:00 Detecting Changes in National Cancer Trends
Elizabeth H. Slate*, Medical University of South Carolina; and Kathleen A. Cronin, National Cancer Institute

5:15 Bayesian Analysis of a Population HIV Dynamic Model: A Case Study
Cong Han* and Kathryn Chaloner, University of Minnesota; and Alan Perelson, Los Alamos National Laboratory

Wednesday, March 20

8:30–10:15 a.m.

60. Panel Discussion: Some Statisticians' Perspective on FDA Advisory Committee Meetings

Sponsor*: ASA Biopharmaceutical Section and ENAR*

Organizer: *Janet Wittes, Statistics Collaborative*

Moderator: *Janet Wittes, Statistics Collaborative*

FDA Participants: *Tony Lachenbruch and Erica Brittain*

Advisory Committee Participants: *Judith Goldberg, New York University; and Ralph D'Agostino, Boston University*

Sponsor Participants: *Thomas Capizzi, Merck; and Corsee Sanders, Genentech*

61. Statistical Applications with Microarray Data

Sponsor: *ENAR and IMS*

Organizer: *Wei Pan, University of Minnesota*

Chair: *Wei Pan, University of Minnesota*

8:30 A Statistical Framework For Functional Genomics
Lue Ping Zhao*, Fred Hutchinson Cancer Research Center

8:55 Experimental Design Considerations for Microarrays
Kathleen Kerr*, University of Washington

9:20 Mining for Low-abundance Transcripts in Microarray Data
Yi Lin, Samuel T. Nadler, Alan D. Attie, Hong Lan, and Brian S. Yandell*, University of Wisconsin-Madison

9:45 Making Sense of Clusters from Microarray Data
Hongyu Zhao*, Yale University

10:10 Floor Discussion

62. Health Economics Meets Statistics: Analysis of Medical Costs

Sponsor*: ENAR and ASA Health Policy Statistics Section*

Organizers: *Ruth Etzioni, Fred Hutchinson Cancer Research Center; and Eric J. (Rocky) Feuer, National Cancer Institute*

Chair: *Eric J. (Rocky) Feuer, National Cancer Institute*

8:30 Cost-Effectiveness Analysis When the Willingness-to-Accept Is Greater Than Willingness-to-Pay
Andrew R. Willan*, Bernie J. O'Brien, and Rina A. Leyva, McMaster University

8:55 Estimating Lifetime Medical Costs Using a Joint Frailty Model of Survival Time and Cost as a Mark Variable
Kristin Berry* and Yijian Huang, Fred Hutchinson Cancer Research Center

9:20 Statistical Methods for Analyses of Health Care Costs
Xiao-Hua A. Zhou*, Indiana University

9:45 Functional Form and Risk Adjusting Hospital Costs: Bayesian Analysis of a Box-Cox Random Coefficients Model
Christopher S. Hollenbeak*, Penn State College of Medicine

10:10 Floor Discussion

63. Applications of Function Estimation

Sponsor: *IMS*

Organizer: *Catherine Loader, Bell Lab, Lucent*

Chair: *Catherine Loader, Bell Lab, Lucent*

8:30 Covariate Centering and Scaling in Varying-Coefficient Regression
Colin Wu*, Johns Hopkins University; Kai F. Yu, National Institute of Child Health and Human Development; and Vivian W. Yuan, Allied Technologies Group, Inc.

9:05 Self-Modeling with Flexible, Random Time Transformations
Lyndia C. Brumback* and Mary J. Lindstrom, University of Wisconsin-Madison

9:40 Variable Selection for Cox's Proportional Hazards Model and Frailty Model
Jianqing Fan*, University of North Carolina; and Run-Ze Li, Pennsylvania State University

64. Contributed Papers:

Modeling Approaches for the Analysis of Survival Data

Sponsor: *ENAR*

Chair: *Daijin Ko, Medical College of Virginia*

8:30 A Flexible Parametric Modeling in Survival Analysis
Jong-Hyeon Jeong*, University of Pittsburgh

8:45 Estimation of Covariate Effects in Aalen's Additive Risk Model Using Smoothing Splines
Michael Bent McHenry*, Stewart J. Anderson, Chung-Chou H. Chang, and Lisa Weissfeld, University of Pittsburgh

9:00 A Semiparametric Accelerated Failure Time Cure Model
Chin-Shang Li*, St. Jude Children's Research Hospital; and Jeremy M.G. Taylor, University of Michigan

9:15 Semiparametric Analysis of Censored Point Processes Using Accelerated Rates Models
Debashis Ghosh*, University of Michigan

9:30 Semiparametric Transformation Models for Case-Cohort Studies
Lan Kong* and Jianwen Cai, University of North Carolina at Chapel Hill

9:45 Evaluating Factors Associated with STD Infection in a Microbicide Effectiveness Trial With Interval Censored Event Times and a Proportion of Participants Not at Risk for Disease
Douglas J. Taylor*, University of North Carolina at Chapel Hill; Mark A. Weaver and Ronald E. Roddy, Family Health International

10:00 Semiparametric Estimation for Proportional Odds Model Based on Censored and Truncated Times
Rajeshwari Sundaram*, University of North Carolina-Charlotte

65. Contributed Papers:

Methodological Issues in Clinical Trials II

Sponsor: *ENAR*

Chair: *Mario Stylianou, National Heart, Lung, and Blood Institute*

8:30 Sequential Conditional Probability Ratio Tests for Test Statistics on Information Time
Xiaoping Xiong*, Ming Tan, and James Boyett, St. Jude Children's Research Hospital

8:45 Sequential Tests and Estimates After Overrunning Based on P-value Combination
W.J. Hall*, University of Rochester; and Keyue Ding, Queen's University

9:00 Estimating the Treatment Effect in a Trial After Modifying the Sample Size
John P. Lawrence* and H.M. J. Hung, FDA

9:15 **Estimation of Survival Distributions of Treatment Policies in Two-Stage Randomization Designs in Clinical Trials**
Jared K. Lunceford*, Merck & Co.; Marie Davidian and Anastasios A. Tsiatis, North Carolina State University

9:30 Effect of Within-Household Reinfestation on Design Sensitivity
Cong Chen*, Lawrence A. Gould, Robert W. Tipping, Cynthia Guzzo, and Christine Furtek, Merck Research Labs

9:45 Using Counterfactuals to Account for Treatment Failures in Clinical Trials
Michele L. Shaffer*, The Pennsylvania State University; and Vernon M. Chinchilli, Penn State College of Medicine

10:00 Bias in the Assessment of Recurrence Rate
Yen-Hong Kuo*, Jersey Shore Medical Center

67. Contributed Papers:

Topics in Statistical Genetics

Sponsor: *ENAR*

Chair: *David V. Glidden, UC San Francisco*

8:30 Model Selection Approach for the Identification of Quantitative Trait Loci in Experimental Crosses
Karl W. Broman*, Johns Hopkins University and Terence P. Speed, University of California-Berkeley

8:45 Candidate-Gene Association Studies With Pedigree Data: Controlling for Environmental Covariates
Susan L. Slager* and Daniel J. Schaid, Mayo Clinic

9:00 A Random Effect Approach for the Quantitative Traits and Haplotypes Association Test Considering Treatment Effects
Zhaoling Meng* North Carolina State University, Dmitri V. Zaykin and Margaret G. Ehm, GlaxoSmithKline; and Bruce S. Weir, North Carolina State University and GlaxoSimthKline

9:15 Affected Sib Pair Tests in Inbred Populations
Wenlei Liu*, North Carolina State University

9:30 Functional Mapping of Complex Traits Based on Biological Laws
Rongling Wu*, Chang-Xing Ma, Samuel S. Wu, and George Casella, University of Florida

9:45 The Power of Population Based Case-Control Genetic Association Studies Using Estimated Haplotype Frequencies
Kathryn L. Lunetta* and Mark Reimers, Genomics Collaborative, Inc.

10:00 A Comparison of Two Methods for Detecting Interactions Among Genetic Polymorphisms in Matched Case-Control Studies
Christopher S. Coffey*, University of Alabama, Patricia R. Hebert, Yale University, Marylyn D. Ritchie, Vanderbilt University, Harlan M. Krumholz and Thomas M. Morgan, Yale University, J. Michael Gaziano and Paul M. Ridker, Harvard Medical School, and Nancy J. Brown, Douglas E. Vaughan, and Jason H. Moore, Vanderbilt University

67. Contributed Papers:

Applications of Bayesian Methods

Sponsor: *ENAR*
Chair: *Dennis Dixon, NIAID*

8:30 Calibrating the Two Antimicrobial Susceptibility Tests without a Gold Standard
Bruce A. Craig*, Purdue University

8:45 An Exact Partial Bayesian Test for the Equality of Two Independent Binomial Proportions
Fan Xu* and Vicki S. Hertzberg, Emory University

9:00 Sequential Importance Sampling of Universal Portfolios
Samuel P. Wong*, Hong Kong University of Science & Technology

9:15 On Sequential and Fixed Designs for Estimation with Comparisons and Applications
Mekki Terbeche, University d'Oran, Oran; and Broderick O. Oluyede*, Georgia Southern University

9:30 Estimating Heterogeneous Transmission with Multiple Primary Cases Using MCMC Methods
Haitao Chu*, Marie-Pierre Preziosi, and M. Elizabeth Halloran, Emory University

9:45 Bayesian Group Testing and Neuropsychological Assessment
Curtis M. Tatsuoka*, George Washington University

10:00 ESUP Accept/Reject Sampling
Brian S. Caffo*, Johns Hopkins University; James G. Booth, University of Florida; and Anthony C. Davison, Swiss Federal Institute of Technology

Wednesday, March 20

10:15–10:30 a.m.

Break

Wednesday, March 20

10:30 a.m.–12:15 p.m.

68. Joint Modeling of Longitudinal and Survival Data

Sponsor: *ENAR*
Organizer: *Joseph Ibrahim, Harvard School of Public Health*
Chair: *Debajyoti Sinha, Medical University of South Carolina*

10:30 Survival Analysis via Multiple Imputation (186)
Jeremy M. Taylor*, University of Michigan; Cheryl L. Faucett, University of California, Los Angeles; and Nathaniel Schenker, National Center for Health Statistics

10:55 Jointly Modeling the Relationship between Survival and Pulmonary Function in Cystic Fibrosis Patients
Mark D. Schluchter*, Case Western Reserve University

11:20 Bayesian Methods for Joint Modeling of Longitudinal and Survival Data with Applications to Cancer Vaccine Studies
Ming-Hui Chen*, University of Connecticut; Joseph G. Ibrahim, Harvard School of Public Health and Dana-Farber Cancer Institute; and Debajyoti Sinha, Medical University of South Carolina

11:45 A Likelihood-Based Method for Informatively Censored Longitudinal Data with Possibly Nonignorable Intermittent Missingness
Amy H. Herring*, University of North Carolina; and Joseph G. Ibrahim, Harvard School of Public Health and Dana-Farber Cancer Institute

12:10 Floor Discussion

69. Biologically Motivated Developments in Categorical Data Analysis

Sponsor*: ENAR and ASA Biometrics Section*
Organizer*: Craig B. Borkowf, National Cancer Institute*
Chair: *Craig B. Borkowf, National Cancer Institute*

10:30 Estimating the Number of Human Rights Violations Using Extensive Observer Reports
Stephen E. Fienberg and Jana L. Asher*, Carnegie Mellon University; and Patrick Ball, American Association for the Advancement of Science

10:55 Hierarchical Extensions of Multivariate Logistic Models in Environmental Epidemiology
Brent A. Coull*, Harvard School of Public Health

11:20 Comparing Neonatal Radiograph Evaluation Methods: ROC Curves and Agreement Measures Based on

Bidistribution Association Marginal (BAM) Models for Bivariate Ordinal Rating Data
Thor Aspelund and Joseph B. Lang*, University of Iowa

11:45 Modeling Transition Rates of a Progressive Disease in the Presence of Misclassification
Kenneth J. Koehler*, Iowa State University

12:10 Floor Discussion

70. Current Hot Topics in Vaccine Field Studies

Sponsor: *ENAR and ASA Biometrics Section*
Organizer: *M. Elizabeth Halloran, Emory*
Chair: *Gregory T. Golm, Merck Laboratories*

10:30 Assessing Vaccine Efficacy with Correlates of Immune Protection
Wasima N. Rida*, FDA

11:00 Constrained Randomization of Group-Randomized Trials
Lawrence H. Moulton*, Johns Hopkins School of Public Health

11:30 Estimating Vaccine Efficacy from Secondary Attack Rates
M. Elizabeth Halloran*, Marie-Pierre Preziosi, and Haitao Chu, Emory University

12:00 Floor Discussion

71. Monte Carlo In Action

Sponsor: *IMS and ENAR*
Organizer: *Jun Liu, Harvard University*
Chair: *Scott Schmidler, Duke University*

10:30 Advance Sequential Monte Carlo and Their Applications in Nonlinear/Non-Gaussian Dynamic Systems
Rong Chen*, The University of Illinois at Chicago

11:05 Bayesian Inference of Phylogeny Using Markov Chain Monte Carlo
John Huelsenbeck*, University of Rochester

11:40 The Haplotyping Problem - a Bayesian method
Matthew Stephens*, University of Washington; and Nicholas Smith and Peter Donnelly, University of Oxford

72. Contributed Papers:

Design and Normalization of Gene Expression Experiments

Sponsor: *ENAR*
Chair: *Kenneth Hess, M.D. Anderson Cancer Center*

10:30 On Statistical Issues in the Design of Microarray Studies
Christina Kendziorski*, University of Wisconsin-Madison

10:45 Some Issues in Microarray Experimental Design
Kevin K. Dobbin* and Richard Simon, National Cancer Institute

11:00 Nonlinear Normalization and Multivariate Analysis of Microarray Data
Dung-Tsa Chen*, Yui-Hsi Wang, Renee' Desmond, University of Alabama at Birmingham; Wenyaw Chan, University of Texas-Houston; Max D. Cooper and Seng-Jaw Soong, University of Alabama at Birmingham

11:15 Exploration, Normalization, and Summaries of High Density Oligonucleotide Array Probe Level Data
Rafael A. Irizarray*, Johns Hopkins University; Terrance Speed University of California-Berkeley; and Bridget Hobbs, Walter and Eliza Hall Institute

11:30 Standardizing Microarray Data with Mixed Effects Models
Mary E. Putt*, Heping Hu, and Lan Zhou, University of Pennsylvania; K. Laszle, Michael Nebozhyn, Michael Showe, and Louise Showe, Wistar Institute

11:45 Floor Discussion

73. Contributed Papers:

Generalized Linear Models

Sponsor: *ENAR*
Chair: *Roslyn Stone, University of Pittsburgh*

10:30 Approaches to fitting age-period-cohort models with unequal intervals
Theodore R. Holford*, Yale University

10:45 Predicting US Cancer Mortality Using State Space Generalized Linear Models
Ram C. Tiwari, National Cancer Institute; Kaushik Ghosh*, George Washington University; Rocky Feuer and Kathleen Cronin, National Cancer Institute; and Ahmedin Jemal, American Cancer Society

11:00 Directly and Indirectly Adjusted SMRS
Gene A. Pennello*, FDA

11:15 Score Tests for Heterogeneity and Overdispersion in Zero-Inflated Regression Models
Daniel B. Hall*, University of Georgia; and Kenneth S. Berenhaut, Wake Forest University

11:30 Two Goodness-of-Fit Tests for Logistic Regression Models
Erik Pulkstenis*, Human Genome Sciences; and Timothy Robinson, University of Wyoming

11:45 An Index of Sensitivity to Nonignorability in Generalized Linear Models
Guoguang Ma* and Daniel F. Heitjan, Columbia University

12:00 Floor Discussion

74. Contributed Papers:

Statistical Methods for Environmental and Ecological Applications

Sponsor: *ENAR*

Chair: *Ron McRoberts, USDA Forest Service*

10:30 Summer Heat-Waves and Cardiovascular Mortality in 88 U.S. Cities
Aidan McDermott*, Francesca Dominici, and Scott L. Zeger, Johns Hopkins University

10:45 Homeostatic Control of Normal Organ Size in Mathematical Models of Carcinogenesis
Russell W. Helms* and Christopher J. Portier, University of North Carolina-Chapel Hill

11:00 Bayesian Uncertainty Assessment for Deterministic Simulation Models for Environmental Assessment
Samantha C. Bates*, Virginia Tech.; Alison Cullen and Adrian E. Raftery, University of Washington

11:15 Summer Ozone and Mortality in 20 U.S. Cities
Yi Huang*, Francesca Dominici, Aidan McDermott, and Scott L. Zeger, Johns Hopkins University

11:30 Assessing Interaction Effects in Measurement Error Models with an Application to the Effect of Methylmercury through Fish Consumption on Child Development
Li-Shan Huang* and Christopher Cox, University of Rochester

11:45 A Nonstationary Spatial Model for Estimation and Prediction of Environmental Processes Using a Bayesian Framework
Jarrett J. Barber* and Montserrat Fuentes, North Carolina State University

12:00 Modeling Non-Euclidean Isotropic Spatial Dependence
Frank C. Curriero*, Johns Hopkins University

75. Contributed Papers:

General Statistical Methods

Sponsor: *ENAR*

Chair: *Paul S. Albert, National Cancer Institute*

10:30 An Alternative Estimate of Location for Circular Data
Bennett S. Otieno* and Christine M. Anderson-Cook, Virgina Tech

10:45 Tuning Variable Selection Procedures
Xiaohui Luo*, Dennis D. Boos, and Leonard A. Stefanski, North Carolina State University

11:00 **Jacknife Method Under Successive Sampling with Varying Probabilities without Replacement**
Jianmin Wang*, UNC-CH

11:15 Biologically Motivated Probabilistic Model Using Independent and Limited Data Sources
Hrishikesh Chakraborty*, Quintiles, Inc.; Pranab K. Sen and Myron S. Cohen, University of North Carolina

11:30 Second Order Bias of a Multivariate Gaussian Maximum Likelihood Estimate with a Chain-Rule for Higher Moments
Michele Zanolin*, Eran Naftali, and Nicholas C. Makris, Massachusetts Institute of Technology

11:45 Universal Optimality of Balanced Uniform Crossover Designs
Samad Hedayat and Min Yang*, University of Illinois at Chicago

12:00 The Principia of Seeding Stand Indeed
G. Arthur Mihram*

Open Forum: Training the Next Generation of Biostatisticians

Wednesday, March 20

The current demand for biostatisticians far exceeds the supply and the gap is widening. This undersupply results from a combination of burgeoning needs and a relatively flat rate of graduating PhD and Masters-level biostatisticians. While academic departments must assume responsibility and leadership in increasing the supply, they need additional financial resources, visibility enhancement for the field and other types of assistance. The federal government, especially the NIH, also has a leadership role, and the profession more generally needs to increase ownership of the issues and challenges. In September an *ad hoc* meeting of interested biostatisticians (including several past presidents of ENAR) took place at the NIH to begin developing strategies to address these needs. This forum will serve as an opportunity to report on those discussions and progress, and to enlarge the discussion.

Poster Session

1. Mapping Soil Properties in Precision Agriculture Using a Multi-Scale Spatial Model
Jun Zhu, University of Wisconsin-Madison
John M. Norman, University of Wisconsin-Madison

2. Computing Aspects of Power for Multiple Regression
Xue Xin, Tulane University
William P. Dunlap, Tulane University

3. Normalization Methods for cDNA Microarray Data Analysis
Yi-Ju Chen, National Center for Toxicological Research, FDA
Ralph Kodell, National Center for Toxicological Research, FDA
James J. Chen, National Center for Toxicological Research, FDA

4. Quantitative Trait Locus Analysis in Polyploids
Dachuang Cao, Purdue University
Bruce A. Craig, Purdue University
R. W. Doerge, Purdue University

5. Likelihood Ratio Tests of the Number of Components in a Normal Mixture with Unequal Variances
Yungtai Lo, Montefiore Medical Center

6. New Analytic and Computational Forms of Quadratic Form Ratios
Hae-Young Kim, University of North Carolina at Chapel Hill
Keith E. Muller, University of North Carolina at Chapel Hill

7. Global Hypothesis Testing in Care Management Trials
David Jarjoura, Northeastern Ohio Universities College of Medicine
Keding Hua, Northeastern Ohio Universities College of Medicine
Sue Hazelett, SUMMA Health Systems

8. Multivariate Multilevel Models and Missing Data: An Application to Recovery After Stroke
Kate Tilling, King's College London

9. Nonparametric Discriminant Analysis for the Class Prediction Using Gene Expression Data
Kyunga Kim, Purdue University

10. The Correspondence Between Interracial Births and Multiple Race Reporting
Jennifer D. Parker, National Center for Health Statistics
Madans Jennifer, National Center for Health Statistics

11. Computing Power for a Test of Group Differences for a Longitudinal Design with a Poisson Outcome
Lynette Keyes-Elstein, Rho, Inc.
Juliet Allen, Rho, Inc.

12. Concordance Between Survival Estimates Using Kaplan-Meier Method and Cox's Model in Each Prediction Index Group
Qin Liu, Cancer Center of UMass Medical School
Chung-cheng Hsieh, Cancer Center of UMass Medical School

13. Multiple Imputation in Environmental Research
Monique T. Spruill, Tulane University School of Public Health and Tropical Medicine
Federico Montealegre, Ponce School of Medicine

14. Nonparametric Modeling of Auxiliary Covariate Data in the Generalized Linear Mixed Models
Jianwei Chen, University of North Carolina at Chapel Hill
Haibo Zhou, University of North Carolina at Chapel Hill
Jianwen Cai, University of North Carolina at Chapel Hill

15. Use of Trajectories as Predictor Variables
Sujata M. Patil, University of Michigan Transportation Research Institute
Trivellore E. Raghunathan, University of Michigan Transportation Research Institute
Jean T. Shope, University of Michigan Transportation Research Institute

16. Analytic Models of Clustered Multivariate Data from the Patients in Intensive Care Units
H. Refik Burgut, Cukurova University School of Medicine
Yasar Sertdemir, Cukurova University School of Medicine

17. A Markov Mixture Model for the Recurrence of REM Sleep
Gavin G. Gregory and Rafael Cabeza University of Texas at El Paso

18. Testing the Equality of Spearman's Correlation Coefficients
Leann Myers and Maria J. Sirois, Tulane University

19. A New Index for Diet and Blood Pressure Awareness: A Comparative Analysis of the KDBP Score
Maria J. Runaldue*, Lori Carter-Edwards, and Lynette Keyes-Elstein, Rho, Inc.

Special Thanks

2002 ENAR Program Committee

Joanna Shih (Chair), National Cancer Institute
Paul Albert (Vice Chair), National Cancer Institute
Christopher Amos, University of Texas M.D. Anderson Cancer Center
Francesca Dominici, Johns Hopkins University
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Louise Ryan, Harvard University

Diversity Chair

Amita Manatunga, Emory University

Junior Researcher Workshop

Naisyin Wang, Texas A&M University

Notes

Registration Form

The International Biometric Society/Eastern North American Region (ENAR)
With Participating Societies, IMS and Sections of ASA

2002 Spring Meeting ■ March 17–20, 2002 ■ Hyatt Regency Crystal City ■ Arlington, VA

(Please print or type)

First name _____ Middle initial _____ Last name _____

Degree _____

Name for badge if different _____ Spouse/Guest name for badge _____

Organization _____

Mailing address _____

City _____ State _____ ZIP code _____

Daytime phone(_____) _____ Fax(_____) _____ E-mail _____

Membership in Participating Societies *(Check **all** that apply.)*
❑ ENAR ❑ WNAR ❑ ASA ❑ IMS ❑ IBS

Meeting Fees *(to be paid by **all** applicants)*
Registration fees, less a $100 administrative fee, will be refunded if written notice is received by February 17, 2002. Requests for refunds will not be honored after February 17.

Meeting Registration

❑ ENAR/WNAR/IBS Member
$170 ($195 after 2/10) $ _____

❑ ASA Member (not a member of ENAR/WNAR/IBS)
$190 ($215 after 2/10) $ _____

❑ IMS Member (not a member of ENAR/WNAR/IBS)
$190 – $20 IMS contribution = $170
($195 after 2/10) $ _____

❑ Nonmember (in any participating society)
$260 ($285 after 2/10) $ _____

❑ Student*
$ 90 ($100 after 2/10) $ _____

Short Courses
The short courses will be held on Sunday, March 17.
(Indicate course number.)

❑ Member (participating society)
SC _____
Half Day: $100 ($125 after 2/10)
Full Day: $180 ($205 after 2/10) $ _____

❑ Nonmember* SC _____
Half Day: $125 ($150 after 2/10)
Full Day: $205 ($230 after 2/10) $ _____

Tutorials
The tutorials will be held on Monday, March 18, and Tuesday, March 19.

❑ T1 Handling Missing Data in Longitudinal Studies: Imputation Approach	$50	$ _____
❑ T2 Microarray Data Analysis	$50	$ _____
❑ T3 Statistical Inference for Quality-adjusted Lifetime	$50	$ _____
❑ T4 Evaluating the Performance of Health Care Providers	$50	$ _____
❑ T5 Analysis of Cluster Randomized Trials: Two Case Studies	$50	$ _____

Roundtables
The roundtables will be held on Monday, March 18. Space is limited. Preregistration is required. Indicate the number of your 1st, 2nd, and 3rd choices:
1st # _____ 2nd # _____
3rd # _____ $25 $ _____

Diversity Workshop
Preregistration required. Space is limited.
❑ Yes ❑ No Free

Social Events

❑ Capitol Steps,
Tuesday, March 19
Regular $60
Student $30 $ _____

Membership

❑ YES, I want to renew my ENAR membership or become an ENAR member.

❑ Regular	$70	$ _____
❑ Associate	$20	$ _____
❑ Student*	$20	$ _____

TOTAL PAYMENT ENCLOSED $ _____

Form of Payment
❑ Check ❑ Money order ❑ MasterCard ❑ VISA
The check or money order should be in U.S. currency, payable to ENAR.

Credit Card Information
Signature _____
Card no. _____ Exp. date _____

Special Needs
Please list any special needs you have:

_____

Return Registration Form with payment to

ENAR Conference Manager
ENAR Lockbox #4643
C/O First Union Bank
P.O. Box 85080
Richmond, VA 23285–4643

Fax: 703–435–4390

* Student: With letter from major professor verifying status.

If you are paying by credit card and fax your registration form, PLEASE DO NOT ALSO MAIL THE FORM—This may result in double payment.

Questions? Call 703-437-4377 or E-mail: *enar@enar.org*

Hotel Registration Form

The International Biometric Society/Eastern North American Region (ENAR)

Hyatt Regency Crystal City ■ Arlington, VA

Reservation requests will be honored as space allows. You will receive confirmation directly from the hotel.

The cutoff date is **February 22, 2002.**

(Please print or type)

Name _____

Mailing address _____

City _____ State _____ Zip code _____

Daytime phone(_____) _____ Fax(_____) _____

Please reserve _____ rooms for _____ people.

Arrival date _____ Arrival time _____

Departure date _____

Check-in time is 3:00 p.m.; checkout time is noon.

Room Preferences

Single/Double $155

Additional person $25 each

❑ Smoking ❑ Nonsmoking ❑ Special Needs _____

Person(s) sharing with 1. _____

2. _____

❑ 1 person/1 bed ❑ 2 people/1 bed ❑ 2 people/2 beds ❑ 3 people/2 beds ❑ 4 people/2 beds

Reservation Terms (please read)

The hotel will require a first-night's deposit, which is refundable up to 24 hours in advance of your arrival date. Checks and credit cards are acceptable to establish prepayment.

I am guaranteeing my reservation with the following:

❑ Check or money order

❑ MasterCard ❑ VISA ❑ AMEX ❑ Diner's ❑ Carte Blanche ❑ Discover

Card no. _____ Expiration date _____

I authorize the hotel to charge my account for one night's deposit and applicable taxes.

Signature _____

Mail or fax Hotel Reservation Form to

Hyatt Regency Crystal City • 2799 Jefferson Davis Highway • Arlington, VA 22202

1–800–233–1234 or 703–418–1234 • (Fax) 703–418–1289

Or call the hotel to make your reservation. Be sure to say you are with ENAR.

Register by February 20, 2002. Mail completed forms plus $10 check to
ENAR Job Placement Service
11250 Roger Bacon Drive, Suite 8
Reston, VA 20190–5202

2002 ENAR Spring Meeting APPLICANT FORM

(see over for instructions)

ENTER CLASSIFICATION CODE:

(Use code A through D from reverse side. Separate form required for each code.)

For office use only:

(PLEASE TYPE OR PRINT IN BLACK INK.)

Name _____
Last First Middle

Address _____

City _____

State/Province _____ Zip/mail code _____

Telephone (include area code) (_____) _____

E-mail address _____

❑ WILL ATTEND THE PLACEMENT SERVICE

❑ WILL NOT ATTEND THE PLACEMENT SERVICE (Contact directly)

U.S. CITIZEN

❑ Yes ❑ No (Specify status) _____

❑ CHECK HERE IF RESUME IS ENCLOSED

PREFERENCES

Geographic Location

Type of Organization

❑ Academic
❑ Government
❑ Industry
❑ Other (Specify) _____

Salary (optional)

$ _____

Date available

EDUCATION

Name of College or University	From	To	Major	Degree

Languages

Honors and/or Awards

Areas of concentration in course work

EXPERIENCE
(Last or current position)

Position Title

Name of Organization

From to

Primary Duties and Responsibilities

Salary $

EXPERIENCE
(Most significant previous position)

Position Title

Name of Organization

From to

Primary Duties and Responsibilities

Salary $

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

SKILLS, KNOWLEDGE, ABILITIES NOT FULLY REFLECTED ABOVE (major interest areas):

COMPUTER SKILLS (languages, packages, machines, operating systems, etc.):

MAJOR INTEREST AREAS IN STATISTICS:

INSTRUCTIONS FOR APPLICANT FORM
JOB PLACEMENT SERVICE
ENAR 2002 SPRING MEETING

There will be a job placement service at the Spring Meeting. The registration deadline for the placement service is February, 20, 2002. Forms must be received by the deadline to insure placement in the review binders. ENAR cannot accept confidential listings. The Placement Center will be open during the following times:

Sunday, March 17, 4:30–6:30 p.m.

Monday, March 18, 9:00 a.m.–5:00 p.m.

Tuesday, March 19, 9:00 a.m.–5:00 p.m.

The Placement Center will not be open on Wednesday, March 20.

Please check:

❑ Will attend placement service

❑ Will not attend placement service

Please check:

❑ Full-time student

❑ Not a full-time student

Fees: $10 per applicant. Please make checks payable to ENAR.

Please follow the instructions for completing the Applicant Form.

1. Enter the ONE classification code (below) that best describes your qualifications in the upper right-hand corner of the form in the "Classification Code" box. **A separate Applicant Form is required for each code.** No more than **THREE** classification codes (forms) will be accepted.

2. ONE copy of EACH form with a different classification code on it must be submitted.

3. **You must submit ONE copy of your resume if you wish it to be included in the resume book**, BUT NOT IN LIEU OF the fully completed form. The resumes (**5-page limit**) will be filed separately and will be available for review by employers. Bring extra resumes with you for on-site interviewing.

4. Indicate in the box provided whether or not you will attend the meeting.

5. If you are planning to interview on site, you must register for the conference. (See registration form on page 17.)

6. Send check and completed form(s) to
   ENAR Job Placement Service
   11250 Roger Bacon Drive, Suite 8
   Reston, VA 20190–5202

CLASSIFICATION CODES

Applications and job orders will be classified and filed in review binders according to various specialties or areas in statistics, as indicated in the list below. **Be sure to submit a separate form for each classification code.** No more than **THREE** classification codes (forms) will be accepted.

Classification	Code	Classification	Code
Biometrics/Government	A	Academia	C
Biopharmaceutical/Industry	B	Mathematical Statistics	D

Include all essential information regarding qualifications on the form. **Please type or print in black ink**. Instructions on how to use the service on site will be provided at the meeting.

NOTE: No browsers are permitted in the Placement Service. Entrance will be restricted to registered applicants and employers. **There will be no refunds.**

Register by February 20, 2002. Mail completed form(s) plus $300 per employer to
ENAR Job Placement Service
11250 Roger Bacon Drive, Suite 8
Reston, VA 20190–5202

2002 ENAR Spring Meeting
EMPLOYER FORM

(see over for instructions)

ENTER CLASSIFICATION CODE:

(Use code A through D from reverse side. Separate form required for each code.)

For office use only:
NUMBER:

(PLEASE TYPE OR PRINT IN BLACK INK.)

Employer's Name _____

Representative's name(s) (up to two*) _____

*The $300 fee includes access for a maximum of two representatives.

Title _____

Address _____

City _____

State/Province _____ Zip/Mail code _____

Telephone (include area code) (_____) _____

E-mail address _____

❑ WILL INTERVIEW ON-SITE

❑ WILL NOT INTERVIEW ON SITE
(Contact employer directly)

❑ ADDITIONAL INFORMATION WILL BE AVAILABLE ON SITE FROM
_____

POSITION AVAILABLE	Title of position	Starting date	Number of vacancies
SALARY	Starting salary or appointment range: $		Fringe benefits
CITIZENSHIP REQUIREMENTS	❑ YES *Country* _____		❑ NO
POSITION DESCRIPTION	List primary duties, responsibilities, supervision, etc.		
EDUCATIONAL REQUIREMENTS	Check appropriate box and indicate field of study on line below. ❑BACHELOR'S ❑MASTER'S ❑DOCTORAL CANDIDATE ❑DOCTORATE		
EXPERIENCE REQUIREMENTS			
SPECIALIZED SKILLS, KNOWLEDGE, ABILITIES			

INSTRUCTIONS FOR EMPLOYER FORM
JOB PLACEMENT SERVICE
ENAR 2002 SPRING MEETING

There will be a job placement service at the Spring Meeting. The registration deadline for the placement service is February 20, 2002. Forms must be received by the deadline to insure placement in the review binders. ENAR cannot accept confidential listings. The Placement Center will be open during the following times:

Sunday, March 17, 4:30–6:30 p.m.

Monday, March 18, 9:00 a.m.–5:00 p.m.

Tuesday, March 19, 9:00 a.m.–5:00 p.m.

The Placement Center will not be open on Wednesday, March 20.

The placement service fee is $300 for each employer. Please make checks payable to ENAR. A check or money order is required; purchase orders are not accepted. An employer may list more than one position in the same city at no extra charge. Employers interviewing on-site must be either registered attendees of the conference or registered exhibitors.
The $300 fee is separate from the registration fee for the Spring Meeting.

Please follow the instructions for completing the Employer Form.

1. In the upper-right-hand corner of the form in the "Classification Code" box, enter the ONE classification code (below) that best describes your position. **A separate Employer Form is required for each code.**

2. ONE copy of EACH form with a different classification code on it must be submitted.

3. Send completed form(s) and $300 per employer to
ENAR Job Placement Service
11250 Roger Bacon Drive, Suite 8
Reston, VA 20190–5202

CLASSIFICATION CODES

Applications and job position announcements will be classified and filed in review binders according to various specialties or areas in statistics, as indicated in the list below. Be sure to submit a separate form for each classification code.

Classification	Code	Classification	Code
Biometrics/Government	A	Academia	C
Biopharmaceutical/Industry	B	Mathematical Statistics	D

Include all essential information regarding the position and qualifications required on the form. Please type or print in black ink. Instructions on how to use the service on site will be provided at the meeting.

The International Biometric Society

An International Society Devoted to the Mathematical and Statistical Aspects of Biology

Eastern North American Region (ENAR)

11250 Roger Bacon Drive, Suite 8 • Reston, VA 20190–5202

Tel: 703–437–4377 • Fax: 703–435–4390 • E-mail: enar@enar.org

(Please print)

Name _____ Degree _____

Title _____

Address _____

_____

City _____ State _____ Zip code _____

Telephone _____ Fax _____ E-mail _____

Membership Type

❑ **Regular Member** (Includes subscription to *BIOMETRICS,* the *Biometric Bulletin,* and voting rights in ENAR)
$70.00 $ _____

❑ **Student Member** (This form must be certified by your major professor that you are a full-time student.)
$20.00 $ _____

I certify that _____ is a full-time student.

Signature _____ Title _____

❑ **Associate Member** (Includes subscription to *BIOMETRICS,* but does not include voting rights in ENAR)
$20.00 $ _____

Associate Members only: Name of Regular Member _____

Please indicate two (2) areas of interest below (in order of preference):

❑ Agriculture (01)
❑ Animal and Veterinary Science (02)
❑ Clinical Trials (03)
❑ Epidemiology (04)
❑ Genetics and Heredity (05)
❑ Molecular Biology and Biotechnology (06)
❑ Toxicology (07)

Natural Resources:
❑ Ecology (08)
❑ Entomology (09)
❑ Fisheries (10)
❑ Forestry (11)
❑ Wildlife (12)

Payment Method

❑ Enclosed is my check, payable to ENAR (remittance accepted only in U.S. currency) for the year _____ .

❑ Please charge my membership dues to ❑ VISA ❑ MasterCard

Signature _____

Card No. _____ Expiration date _____

Mail to

The International Biometric Society (ENAR)
ENAR Lockbox #4643
C/O First Union Bank
P.O. Box 85080
Richmond, VA 23285–4643

The International Biometric Society/
Eastern North American Region
11250 Roger Bacon Drive, Suite 8
Reston, VA 20190–5202

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2002
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