



OCTOBER 1990

WASHINGTON  
STATISTICAL  
SOCIETY

# NEWSLETTER

October 4	Thursday	A Superlative Index Number Approach to Measuring Tax Burdens
October 9	Tuesday	Disclosure Avoidance Strategies for Hierarchical Datasets
October 12	Friday	An Introduction to Morphological Analysis of Images
October 15	Monday	Chaos, Fractals and the Stability of Modelling Equations
October 24	Wednesday	Efficient Techniques for Performing Uncertainty and Sensitivity Analyses with Computer Models
October 24	Wednesday	A Pox on P-values

## ANNOUNCEMENTS

### WSS and WSS Members Receive Awards

The Washington Statistical Society and three of its members were the recipients of special recognition by the American Statistical Association Council of Chapters at the Annual Joint Statistical meetings in Anaheim, California.

WSS won the Chapter Challenge contest award for chapters of more than 300 members. That contest encouraged each chapter to submit a summary of chapter activities in support of the ASA Sesquicentennial celebration. The WSS entry highlighted the 9 part series of special presentations which covered both emerging and historical statistical issues. Other activities mentioned were the special issue of the Washington Academy of Sciences Journal and the completion of a historical summary of WSS officers and activities. Prizes included an engraved plaque, a copy of the Proceedings of the

Sesquicentennial Invited Papers at the 1988 and 1989 meetings, and a copy of the History of Statistics videotape.

Susan Ellenberg was honored by the Council for her outstanding efforts to initiate ASA's judging of projects for statistical merit at the annual International Science and Engineering Fair and for ensuring that ASA continues the judging.

Mary Foulkes was recognized for her extraordinary efforts which resulted in an unprecedented response to the Council's annual Survey of Chapters. Because of her diligence, only one of the 76 chapters was not included in the current survey report.

Rich Allen received a plaque for his service during the past year as Chair of the Council and for serving as the Editor of LINK, the Council's Newsletter, and for work on the new redistricting of the chapters of ASA.

## WASHINGTON STATISTICAL SOCIETY PROGRAM CHAIRS

### Agriculture & Natural Resources

Cynthia Clark 763-8558  
John Herbert 532-4544

### Social & Demographic Statistics

Harvey Schwartz 443-6990  
Tom Dietz 323-2916

### Short Courses

Glenn White 763-7524  
Donald Gantz 764-6565  
Brad Pafford 447-3623  
Sid Schwartz 268-3490

### Economics

John Ruser 523-1347  
Neil Ericsson 452-3709

### Methodology

Sam Slowinski 452-2622  
Sue Ahmed 357-6781

### Public Health & Biostatistics

Ed Lakatos 496-5905  
Gordon Lan 881-9260

### Physical Sciences & Engineering

Nozer Singpurwalla 994-7515  
Julia Abrahams 696-4320

### Statistical Computing

Nancy Flournoy 885-3127  
 Sylvia Leaver 272-2350

### Quality Assurance

Stanley Freedman 586-2038  
John Galvin 272-5066

### Newsletter Editor

Stephen H. Cohen 523-7551

### Employment

Bill Arends 447-6812

## PROGRAM ABSTRACTS

**TOPIC:** A SUPERLATIVE INDEX NUMBER APPROACH TO MEASURING TAX BURDENS

**SPEAKER:** B. K. Atrostic, Office of Tax Analysis, U.S. Department of the Treasury

**DATE & TIME:** Thursday, October 4, 1990; 10:00 to 11:30 a.m. (Please note special time.)

**LOCATION:** Room 2437, GAO Building, 441 G Street, N.W., Washington, D.C.  
(Sign in at guard desk and state purpose and room number of visit.)

**SPONSORS:** WSS Economics Section and Office of Economic Research, Bureau of Labor Statistics

**ABSTRACT:** Tax burden measures are the fundamental tools of current tax policy analysis used to answer broad questions about how much welfare change is attributable to actual or proposed tax changes, and how that change is distributed across groups. This paper applies new tools, derived by Diewert and Bossons, to compute welfare measures of tax changes that are based on economic theory. The components of the measures can be calculated by modifying standard tax policy microdata models. The new measures are based on Fisher's ideal index, which is exact for homothetic quadratic utility functions and is superlative.

The new measures are contrasted with standard tax burden estimates of the Tax Reform Act of 1986. Standard measures show the Act to be revenue-neutral and generally welfare-increasing, while the new measures show the act to be generally revenue- and welfare-neutral. Alternative ways of aggregating individual household welfare measures within and across income classes are empirically, as well as theoretically, important. The welfare-neutral assessment of the Act is based on plutocratic weighting, corresponding to the weighting in the standard measures. Alternative estimates of the new measures using democratic weighting show the Act to increase aggregate welfare, with either a greater increase or smaller decrease in welfare for all positive income classes than under plutocratic weighting.

---

**TOPIC:** DISCLOSURE AVOIDANCE STRATEGIES FOR HIERARCHICAL DATASETS

**SPEAKER:** Bob Burton, National Center for Education Statistics

**CHAIR:** Virginia deWolf, Committee on National Statistics

**DISCUSSANT:** Brian Greenberg, Census Bureau

**DATE & TIME:** Tuesday, October 9, 1990; 12:30 to 2:00 p.m.

**LOCATION:** Room 2736, GAO Building, 441 G Street, N.W., Washington, D.C.  
(Sign in at guard desk and state purpose and room number of visit.)

**SPONSOR:** Methodology Section

**ABSTRACT:** Public Law 100-297, the Education Amendments of 1988, has imposed new requirements on the National Center for Education Statistics for the maintenance of confidentiality of individually identifiable data acquired by the Center in its surveys. These requirements come at a time when there is an increased demand for access to microdata files from Center surveys, making it imperative that public use files be developed to the greatest extent possible, while simultaneously reducing the possibility of disclosure to an acceptable level.

The Center has considered a variety of strategies to resolve this problem, some of which have a statistical basis, while others are more procedural. The presentation will focus on the statistically-based strategies, and will address techniques used to reduce the risk of disclosure, as well as those used to measure the extent to which this objective has been attained. Some of the specific topics that will be discussed are data masking, unlinking of related files, aggregating data at lower levels in a hierarchy, and the use of Euclidean distance measures to assess the risk of disclosure.

---

---

## PROGRAM ABSTRACTS (continued)

- TOPIC:** AN INTRODUCTION TO MORPHOLOGICAL ANALYSIS OF IMAGES
- SPEAKER:** John Goutsias, The Johns Hopkins University
- CHAIR:** Julia Abrahams, Office of Naval Research
- DATE & TIME:** Friday, October 12, 1990; 11:30 a.m. to 12:30 p.m. (Note special time.)
- LOCATION:** George Washington University, 707 22nd Street, N.W., Room 301 (between G & H) (near Foggy Bottom Metro stop)
- SPONSOR:** Physical Sciences and Engineering Section
- ABSTRACT:** Mathematical morphology is a set theoretic tool for nonlinear image analysis. This tool is broadly used in image analysis applications where a high-quality quantitative image description is required. A given image is probed by different patterns of predefined shapes, called structuring elements, in order to extract important image features from noisy data. The purpose of this talk is to introduce the audience to the fundamentals of mathematical morphology and to demonstrate its applicability in solving a broad variety of image analysis problems. After a brief introduction to the fundamental morphological operations of erosion, dilation, opening and closing, more complicated morphological operations are presented and their applicability in solving stochastic image analysis problems is discussed. Both binary and gray-scale images are considered. Important applications from the general areas of medical image processing, automated industrial inspection, and computer vision are presented. These applications demonstrate the potential of mathematical morphology in solving complex problems with high degree of accuracy.
- 
- TOPIC:** CHAOS, FRACTALS AND THE STABILITY OF MODELLING EQUATIONS
- SPEAKER:** David Grier, Department of Statistics, George Washington University
- CHAIR:** David Pierce, Board of Governors of the Federal Reserve System
- DISCUSSANT:** Tim Sauer, Department of Mathematical Science, George Mason University
- DATE & TIME:** Monday, October 15, 1990; 12:30 to 2:00 p.m.
- LOCATION:** Martin Building, Federal Reserve Board, Rooms M-3219 and M-3319, 20th & C Streets, N.W. (Entrance on the North side of C Street between 20th and 21st.)  
Please call Nancy Thomas at 452-2950 by 2:00 p.m., Oct. 12 to ensure building admission. On arrival, sign in at the guard's desk and state purpose and room number of visit.
- SPONSOR:** Methodology Section
- ABSTRACT:** The solutions to algorithms for solving estimating equations are sensitive to the initial starting values. Robust and nonlinear models are often particularly sensitive to bad choices in starting values. While ill conditioning of the problem exacerbates starting value sensitivity, it can be present in well-conditioned problems. The problem cannot be characterized as that starting values in certain ranges cause the algorithm to produce incorrect results. The problem is that certain subsets of the space of all starting values are instable. Small deviations within that set cause the algorithm to produce different answers. The breakdown of the algorithm is not smooth but rough. Plots to explore the space of starting values often reveal a fractal structure to the instable regions. This talk will explore starting value sensitivity using fractal plots and will discuss the contributions that fractal geometry can make to understanding the nature of these sensitivities.
-

## PROGRAM ABSTRACTS (continued)

- TOPIC:** EFFICIENT TECHNIQUES FOR PERFORMING UNCERTAINTY AND SENSITIVITY ANALYSES WITH COMPUTER MODELS
- SPEAKER:** Ronald L. Iman, Safety and Reliability Analysis Division, Sandia National Laboratories, Albuquerque, New Mexico and ASA Treasurer
- CHAIR:** Rich Allen, USDA-NASS
- DATE & TIME:** Wednesday, October 24, 1990; 12:30 to 2:00 p.m.
- LOCATION:** Room 5152 South Agriculture Building, between 12th and 14th Sts. and Independence Ave., S.W., Smithsonian Metro exit. Enter 1st or 4th wing along Independence Avenue. If there are any problems gaining admittance to the building, have the guard desk call 447-4333.
- SPONSOR:** Statistical Computing Committee
- ABSTRACT:** Computer models are being utilized by an ever expanding audience, with applications in such fields as economics, medicine, engineering, system reliability analysis, and risk assessment, to name but a few. These models are frequently characterized by mathematical complexity, time-consuming calculations, a large number (perhaps several hundred) of uncertain inputs, and the production of many different (perhaps time dependent) outputs. Moreover, dependencies frequently exist among many of the inputs.
- The objective of exercising such models usually centers on the performance of uncertainty and sensitivity analyses to determine the principal contributors to the uncertainty in the output as well as the magnitude of the output. These analyses are frequently performed by using Monte Carlo techniques. Characterization of the uncertainty in the outputs requires the use of efficient techniques for uncertainty and sensitivity analysis.
- This presentation demonstrates the advantages of Latin hypercube sampling over simple random sampling. These advantages result from an improved probabilistic coverage of the input space. In addition, a procedure for inducing a desired rank correlation structure in the model input will be presented. This procedure is based on pairing the specific values of the input variables in the input matrix to achieve desired pairwise rank correlations, that is, pairing to either remove spurious correlations or to induce desired correlations. All techniques are easy to implement and will be demonstrated by practical applications.

- 
- TOPIC:** A POX ON P-VALUES
- SPEAKER:** J. A. Nelder, Imperial College, London, U.K.
- CHAIR:** Edward Lakatos, Biostatistics Research Branch, NHLBI
- DATE & TIME:** Wednesday, October 24, 1990; 2:00 p.m.
- LOCATION:** Room B119, Federal Bldg., 7550 Wisconsin Ave. (one block north of Bethesda Metro station)
- SPONSORS:** Biostatistics and Public Health, and Biostatistics Research Branch, NHLBI
- ABSTRACT:** The traditional and well-tested procedures of science, developed over several centuries, have depended on experiments to measure something, with apparently interesting results being repeated in other institutions. If Brown's (say) original result is confirmed it becomes known as the Brown effect, and if it isn't it becomes known as Brown's person error (Jeffreys). Recently there has appeared an alternative procedure, especially in psychology and the social sciences, whereby results are judged in terms of a p-value based on (a usually uninteresting) null hypothesis. If, as often, experiments are not repeated, the literature can become a junkyard of false positives. At best it will represent a biased collection, as studies that did not produce a significant result are not published. I shall argue that this alternative procedure is non-scientific in nature, and that statisticians, who bear a considerable responsibility for its introduction, should consider urgently how its hold can be weakened and eventually supplanted by a return to scientific ways of working.
-

## ANNOUNCEMENTS (continued)

### WSS Members Selected as ASA Fellows

Three members of the Washington Statistical Society were honored at the Joint Statistical Meetings in Anaheim, California by their selection as Fellows of the American Statistical Association. The three are Daniel Kasprzyk, Chief, Survey of Income and Program Participation, Research and Coordination Staff, U.S. Bureau of the Census; Joel C. Kleinman, Director, Division of Analysis, National Center for Health Statistics, Centers for Disease Control; and David R. Morganstein, Vice President, Head of the Statistical Group, Westat, Inc.

Dan has served WSS as a Representative-at-Large and as the Board of Directors President for 1986-87. David recently completed his term as the Regional Representative to the ASA Board and formerly served WSS as a Representative-at-Large, Methodology Section Chair, and Statistical Computing Chair.

### Fellowship Announcement

American Statistical Association/National Science Foundation/Census Bureau Research announces Fellowships and Associateships at the Census Bureau (subject to funding). Unique opportunity to make major advances in methodological or subject matter research related to Census Bureau operations or data. General areas for research are statistical methodology and computing, social and demographic studies, and economic measurement and analysis. Requirements: for Fellows, recognized research record in relevant field, (e.g., Statistics, Demography, Sociology, Economics, Geography); for Associates, at least two years of graduate study (or equivalent) in relevant field plus computer experience. Salaries are commensurate with qualifications and experience; also, fringe benefits and a travel allowance are provided. Length of term and start date are flexible—usually six months to a year beginning September 1. Can start as early as June 1, 1991; can split term into two or more parts. Apply by

January 4, 1991 for Fellows and February 15, 1991 for Associates. For information on specific research topics and on how to apply, contact Dr. William Bell, Room 3000-4, Statistical Research Division, Bureau of the Census, Washington, D.C. 20233 (301-763-3957).

### Tentative Schedule of SIGSTAT Meetings

SIGSTAT is the Special Interest Group in Statistics in the Capital PC User Group. The tentative schedule of events through next April is as follows:

- |          |                                                                                                                        |
|----------|------------------------------------------------------------------------------------------------------------------------|
| 10/10/90 | Statistical Navigator - an expert system to help select an appropriate statistical analysis.                           |
|          | Understanding Statistics in Education and Psychology - a computer-based tutorial for learning statistics.              |
| 11/07/90 | SAS/IML - powerful matrix programming language: graphics, window creation, dynamic code generation, etc.               |
| 12/05/90 | Limdep ET - an econometric toolkit with extensive regression capabilities.                                             |
| 1/09/91  | StatXact - unique package providing exact p-values and confidence intervals for contingency tables and k-sample tests. |
| 2/13/91  | Derive - symbolic math package.                                                                                        |
| 3/13/91  | Forecast Master - time series forecasting.                                                                             |
| 4/10/91  | Shazam - a very complete econometric estimation package.                                                               |
| 5/15/91  | ???? wildcard - suggestions to Charlie Hallahan.                                                                       |

All meetings are scheduled for Wednesdays from 12:30 to 1:30 p.m. in Room B-14, 1301 New York Avenue, N.W. The building is located midway between the Metro Center and McPherson Square Metro stops. If this is your first SIGSTAT meeting, call Charlie Hallahan, 786-1507, and leave your name in order to gain entry into the building.

## ANNOUNCEMENTS (continued)

### **Mid-Atlantic Regional Probability and Statistics Day**

The George Washington University Department of Statistics/Computer and Information Systems is hosting the next meeting of the on-going series of regional Probability and Statistics Days on Saturday, October 20, 1990. These informal meetings offer a chance for professionals in academia, government, and industry in the Mid-Atlantic region to meet with each other, communicate recent findings, and discuss common interests. The George Washington University campus is located in downtown Washington, D.C.

The day will begin about 9:00 a.m. with registration and refreshments. We plan to have a morning and an afternoon session of contributed talks (about 20 minutes each) and discussions. Professor John Aitchison of the University of Virginia and Professor James Fill of the Johns Hopkins University have agreed to present invited talks. Professor Aitchison will present "The Triangle in Statistics," a discussion of the central role of the triangle and its higher-dimensional generalizations in many statistical applications, and of some of our misunderstandings of it. Professor Fill will present a survey of the growing field of mixing times for Markov chains.

We welcome informal talks on any aspect of probability and statistics, including summaries of your recent publications, discussions on preliminary and ongoing work, formulations of open problems, and discussions of new pedagogical techniques. Participation by graduate students is also encouraged.

We encourage you to bring reprints or announcements that would be of interest to other participants of the meeting. To help defray expenses we will ask at registration for contributions of \$15.00. This fee includes lunch and coffee breaks.

If you plan to attend, please mail your name, organization, address, and phone number and return it no later than October 12, 1990 to Blaza Toman, Department of Statistics/Computer and Information Systems, George Washington University, Washington, D.C. 20052 (phone 202/994-

6356 or toman@gwuvm.bitnet). A mailing will follow for those who respond which will include directions and a program of talks. We look forward to seeing you in October.

### **Science Fair Winners 1990**

The Washington Statistical Society presented awards to 51 Washington-area students at regional science fairs this spring. Awards were made to students whose projects demonstrated excellence in investigation of statistical methods or in application of statistical methods to a particular scientific problem. First award winners received a book (Statistics: A Guide to the Unknown, by Tanur et al., or Fifty Challenging Problems in Probability, by Mosteller); others received certifications of honorable mention. As you can see from the project titles, awards were given in virtually all categories of projects, from Behavioral Science to Zoology.

Awardees, their schools and project titles are as follows:

#### Arlington-Alexandria-Falls Church

##### *First Awards:*

Claire Homan, 8th grade, Williamsburg Intermediate School, "Color Association of Children"

Marcus Shaker, 12th grade, Bishop O'Connell High School, "Testing the Mail"

William Shear, 9th grade, Yorktown High School, "Can Pillbugs be Conditioned?"

Mark Waters, 10th grade, Washington-Lee High School, "Potomac River Water Quality Variations"

##### *Honorable Mention:*

Jennifer Gordon, 8th grade, Francis C. Hammond Intermediate School, "Melting Point: What Causes it to Change?"

Daniel Kopp, 9th grade, Yorktown High School, "The Respiration Rate of Germinating Alaska Sea Bush Seeds at Different Temperatures"

Ernest Latham, 10th grade, Yorktown High School, "Do Adolescents Mirror Adult Personality Types?"

Tami Mazer and Kim Tennes, 12th grade, Washington-Lee High School, "Analysis of GPA's with Relation to Music and Sports"

Christopher Symanoskie, 12th grade, Bishop O'Connell High School, "Binocular Suppression"



## ANNOUNCEMENTS (continued)

### Science Fair Winners 1990 (continued)

#### District of Columbia: Secondary

##### *First Award:*

Christina Bird, 8th grade, Maret School, "Effect of Grouping on Short-Term Memory"

##### *Honorable Mention:*

Takia Craven, 10th grade, Ballou Senior High School, "Effect of Cyocel on Sunflower Seeds"

Oliver Gacad, 12th grade, Gonzaga High School, "Linkage Groups in Soybeans"

Joseph James, 7th grade, Hardy Middle School, "Does Storage Temperature Affect Battery Life?"

Alonzo Patterson, 12th grade, Woodson High School, "An In-Vitro Study of Effects of Ultra-rapid and Slow Thawing on Mammalian Spleen Cells"

Greg Peterson, 7th grade, Capitol Hill Day School, "How do Weight and Surfaces Affect Friction?"

#### District of Columbia: Elementary

##### *First Award:*

Loren Lebert, Murch Elementary, "Dangerous Traffic"

##### *Honorable Mention:*

Jackson Norton, Stuart-Hobson Elementary, "Which Tennis Ball is the Most Durable?"

Omari Ware, Murch Elementary, "Nintendo Fever"

Regina Van Horne, Stuart-Hobson Elementary, "Does Music Affect Reaction Time?"

Bobby Taborn, Ketcham Elementary, "Plate Waste"

#### Fairfax County, 9-12

##### *First Awards:*

Jeff Aitken, 10th grade, Robinson High School, "A Computer Simulation of a Traffic Intersection"

Jack Levenson, 12th grade, Thomas Jefferson High School, "Dietary Aluminum Shows no Effect on Higher Learning in Rats"

Eva Loh, 11th grade, Woodson High School, "Food Substances' Effect on Survival and Reproduction of *Drosophila Melonogaster*"

##### *Honorable Mention:*

Robert Eckman, 9th grade, Hayfield Secondary School, "Can Electronics be Protected from an Electromagnetic Pulse?"

David Finberg, 12th grade, Woodson High School, "Economic Indicators: How Good are They?"

Alex Tsow, 10th grade, McLean High School, "Modeling Mendelian Genetics"

Chad Wright, 9th grade, West Springfield High School, "Effect of Sound Frequency on Earthworms"

#### Fairfax County, 7-8

##### *First Awards:*

Geoffrey Giekes, 7th grade, Lanier Intermediate School, "Which Bridge Structure Provides the Strongest Support?"

Joseph Reopel, 7th grade, Key Intermediate School, "Probability: Understanding Marble Fallout"

Tevya Zukor, 7th grade, Irving Intermediate School, "Increased Regenerative Abilities of Starfish"

##### *Honorable Mention:*

Michelle Bolter, 8th grade, Frost Intermediate School, "How do Real Number Axioms Relate to Set Theory?"

Alyson Davis, 8th grade, Longfellow Intermediate School, "Humidifiers May be Hazardous to Your Health"

Nicole Fauquet, 7th grade, Twain Intermediate School, "Effect of Electromagnetic Radiation on Regeneration of Common Brown Planaria"

Melissa Firestone, 8th grade, Jackson Intermediate School, "What's the Probability of Winning a Carnival Toss Game?"

Amanda Heiler, 7th grade, Cooper Intermediate School, "Insulating a Homemade Sauna"

Jodi Jacoby, 7th grade, Robinson Intermediate School, "Under Which Light Conditions Does Algae Grow Best?"

Craig Metz, 8th grade, Langston Hughes Intermediate School, "Data Compression"

Molly Murdock, 8th grade, Irving Intermediate School, "Study of the Effects of Various Liquids on Certain Solids"

Heather Simmons, 8th grade, Longfellow Intermediate School, "How do White Mice Respond to Both Positive and Negative Stimuli?"

#### Montgomery County

##### *First Awards:*

Nancy Lieberman, 7th grade, Herbert Hoover Intermediate School, "Triangle of Probability"

David Paper, 9th grade, Thomas Wooten High School, "Time is Money: The Queueing Theory"

Stephanie Reed, 7th grade, Redland Middle School, "Probability and Chance"

##### *Honorable Mention:*

Karen Codell, 10th grade, Magruder High School, "The Effects of Sugar on Athletic Performance"

Rebecca Ford, 7th grade, St. Andrew the Apostle, "What are the Chances?"

Heather Landers, 9th grade, Magruder High School, "Weather Forecasting: Professionals vs. Amateurs"

Tavis Werts, 8th grade, White Oak Intermediate School, "If Elvis Reigns, Will Bush do the Same?"

## ANNOUNCEMENTS (continued)

### Science Fair Winners 1990 (continued)

#### Prince Georges' County

##### *First Awards:*

James C. Hilke, 8th grade, Kenmoor Middle School,  
"Computing Superstitious Behavior"

Paul M. Rice, 9th grade, Eleanor Roosevelt High School,  
"Effects of Diazinon on Musca Domestica"

Katie Thorn, 9th grade, Thomas Stone High School,  
"Degree of Error in Equations"

##### *Honorable Mention:*

Nathan Dwyer, 6th grade, Kenmoor Elementary School,  
"Correlations Between Tree Measurements"

Devin C. J. Lowe, 11th grade, Duval High School, "We are Being Mislead by Drinking Water"

Thanks to all those who volunteered as judges. They are: Lee Abramson, Aroona Borpujari, Eugene Burns, Bill Cleveland, Bob Clickner, Paul Cook, Ann Crosby, Frank Dorsey, Brenda Edwards, Susan Ellenberg, Teri Gardenier, Tom Harahush, Gene Heyman, Howard Hogan, David Kao, Rebecca Klemm, Jim Knaub, Mary Paxton, Dan Ramey, John Rogers, Sid Schwartz, Heather Smith, Don Stablein, Mike Stoto, Brian Taylor, Sholom Wacholder and Wylie Wilson (2 fairs).

## EMPLOYMENT COLUMN

The Washington Statistical Society Newsletter provides a service of notification of employment opportunities and descriptions of those seeking employment here in Washington. Readers are encouraged to take advantage of this feature of the newsletter. Deadline for inserting notices is 5 (five) weeks before the publication date. Those interested should write to: Bill Arends, USDA-NASS, Room 4133 South Building, Washington, D.C. 20250-2000, Phone 447-6812.

### JOB OPENINGS

**STATISTICIAN GS-12 with the Water Resources Division of the U.S. Geological Survey (\$35,825-46,571 per year).** The position (Ph.D.) includes original research, joint multidisciplinary research, and advising scientists on design and analysis methods. Expertise in categorical variables and experimental design preferred. Opportunities abound to work on national water-quality issues. AVEEO employer. Send SF-171, CV, list of college courses to **Priscilla Mawyer, MS-215, USGS, Reston, VA 22092.**

### STATISTICIAN

Prominent trade association in real estate finance seeks a Statistician to design and implement its industry surveys and compile the results. Candidates must possess working knowledge of frame construction and refinement, sampling design and selection, estimation, non-response adjustments and variance estimation. Proficiency in at least one programming language (FORTRAN, PL/1, DBASE IV, etc.) is highly desirable.

Candidates are expected to have a Master's or Bachelor's degree in Mathematical Statistics and up to two years of experience, have strong analytical and/or written communication skills. We invite qualified applicants to submit their resume and salary history to: **Mortgage Bankers Association of America, 1125 15th Street, N.W., Washington, D.C. 20005, (202) 861-6510.**



## JOB OPENINGS (continued)

### STATISTICIANS

Westat is an employee-owned corporation headquartered in the suburbs of Washington D.C. (Rockville, Maryland). We provide statistical consulting and survey research to the agencies of the U.S. Government and to a broad range of business and institutional clients. With a strong technical and managerial staff and a long record of quality research, our company has become one of the leading survey research and statistical consulting organizations in the United States.

Our company was founded nearly 30 years ago by three statisticians. The current staff of more than 550 includes statisticians, survey researchers, psychologists, medical researchers, sociologists, economists, market research and behavioral analysts, computer systems analysts, programmers, and support staff. The professional staff is supported by survey field supervisors, coders and interviewers. The atmosphere is open, progressive, and highly conducive to professional growth.

Our statistical efforts continue to expand in areas such as the environment, energy, health, education, human resources, and teaching courses in statistical methods. Several positions are currently available which require a graduate degree in statistics:

**Biostatistician.** Work in Clinical Trials, their design, analysis and management. Also work in Survival Analysis Models and Longitudinal Studies. Substantial (but not exclusive) focus on HIV related issues. Ph.D. in Biostatistics and relevant experience required.

**Environmental Statistics.** Experience with environmental or energy problems essential. Skills in sample design, analysis, survey operations, and project direction helpful.

**Survey Sampling.** Experience required in sample design and selection, frames development, weighting, and variance estimation. Must have Masters degree or Ph.D. in statistics program.

**Industrial Consulting.** Teach statistical process control and consult with clients in industry. Must have consulting and teaching experience, willingness to travel.

To insure proper consideration, interested applicants should indicate one of the above areas and send resume with current salary to: **Personnel Director, Westat, Inc., Dept. DRM, 1650 Research Boulevard, Rockville, MD 20850.** An Equal Opportunity Employer M/F/V/H.

### WESTAT

An Employee-Owned Research Corporation

### STATISTICAL PROGRAMMER

The JOHNS HOPKINS ONCOLOGY CENTER, a comprehensive research, treatment, and teaching center seeks a statistical programmer to work with multi-disciplinary faculty team in analyzing cancer inpatient length of stay and costs.

M.S. in statistics, and programming ability using SPSSX, SAS, and mainframe computers required. Experience in econometric, longitudinal and survival analyses desired.

We offer comprehensive benefits program including life and health insurance, dental plan and tuition for employees, spouse and dependent children. Please send resume and salary history to: **Paulette Hynson, Employment Manager, The Johns Hopkins University School of Medicine, P.O. Box 2454, Baltimore, MD 21205.** EOE M/F/H

## **JOB OPENINGS (continued)**

### **Openings for Survey Methodologists**

The National Laboratory for Collaborative Research in Cognition and Survey Measurement at the National Center for Health Statistics, Hyattsville, Maryland has openings for survey researchers in the interdisciplinary field of cognition and survey measurement. All positions require experience in survey research including questionnaire design research, and degree(s) in social or cognitive psychology, statistics, or other social science disciplines.

**SURVEY STATISTICIAN** - This is a permanent position to be filled at the GS 13/14 level. The incumbent will design and direct methodological research on new laboratory techniques to investigate sources of response error; direct laboratory research projects concerning the development and testing of survey questionnaires and other data collection instruments; plan and conduct laboratory experiments to test hypotheses concerning the cognitive aspects of response errors; serve as project officer for contracts involving response error research; and prepare and present papers at professional meetings. Salary range \$42,600-65,400 depending on qualifications and experience.

**VISITING FELLOWS** - These are fixed length appointments to be filled at the GS-12 to GS-15 level. Fellows will participate in collaborative projects with other National Laboratory researchers and conduct independent research. Projects will involve the application of statistical and cognitive methods in researching the cognitive burdens that questionnaires impose on survey respondents and interviewers. Ph.D. or equivalent work experience is required. Salary range \$35,800-76,900 depending on qualifications and experience.

Starting dates are negotiable. For visiting fellows, length of appointment is also negotiable. Send C.V. or SF-171 to: Deborah Bercini, Office of Research and Methodology, National Center for Health Statistics, 6525 Belcrest Road, Room 915, Hyattsville, MD 20782. (301) 436-7111.

### **Committee on National Statistics**

#### **NATIONAL RESEARCH COUNCIL--NATIONAL ACADEMY OF SCIENCES**

The Committee on National Statistics is seeking Study Directors and Research Associates to assist the Committee and its panels of experts in advising federal government agencies on how to improve statistical methods and information for public policy decisions. Studies are expected on quality control of student financial aid programs, a methodological review of studies to evaluate bilingual education programs, and the census in the twenty-first century. Research Associates may work on one or more of these studies as well as studies on the Survey of Income and Program Participation, foreign trade statistics, confidentiality and data access, disability statistics, small-area estimates of population and income, and plans for a national health care survey. Candidates require a Ph.D. or equivalent in a discipline relevant to the study and at least one more year of relevant experience, preferably with experience or training in statistics, economics, policy analysis, survey methodology, or quantitative methods. Study Directors require 4 or more years experience. All positions require demonstrated organizational and research abilities, effective oral and written communication skills, and the ability to interact effectively with senior scientists in a team effort. Part-time availability and faculty on leave also will be considered. Salary commensurate with experience; exceptional benefits package. Send resume with names of 3 references and salary requirement. An equal opportunity employer. **CONTACT: Director, Committee on National Statistics, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.**

## JOB OPENINGS (continued)

### **STATISTICIAN (GS-9, 11, or 12 with promotion potential to 13)**

The U.S. Environmental Protection Agency is recruiting for a position in the Office of Water Regulations and Standards. The responsibilities of the position emphasize the application of statistics to multi-disciplinary projects directed at protecting and enhancing the waters of the United States. The substance of these projects include development of industrial water pollution control regulations, development of water quality criteria and monitoring ambient water quality. Responsibilities also include supporting EPA in matters arising in law suits. This position offers the opportunity to apply statistics to important and visible problems. Applicants with computer skills and experience and/or training in engineering, science, economics and litigation support are preferred. Send SF-171 or resume to **Dr. Henry D. Kahn, Environmental Protection Agency, Office of Water Regulations and Standards, (WH-586), 401 M Street, S.W., Washington, D.C. 20460.**

### **Biostatistician**

The Division of Biostatistics and Epidemiology, Department of Community and Family Medicine, Georgetown University School of Medicine is seeking an applied biostatistician at the Assistant Professor level (non tenure track). The individual selected will participate in the Division's consultation and teaching programs. The Division offers a Master's in Biostatistics and Epidemiology and is responsible for the School of Medicine's required course in biostatistics and epidemiology. Divisional areas of research include occupational, cancer, cardiovascular, and clinical epidemiology.

Doctorate in biostatistics, knowledge of SAS and ability to interact with investigators from various specialties are required. Prior participation in collaborative clinical/laboratory research highly desirable. Please send letter of intent, c.v., and names of three references to **Leonard Chiazze, Jr., Sc.D., Professor and Director, Division of Biostatistics and Epidemiology, Room 409 Kober-Cogan Hall, Georgetown University School of Medicine, Washington, D.C. 20007.** Georgetown University is an affirmative action/equal opportunity employer.

### **Biostatistician**

The Division of Biostatistics and Epidemiology, Department of Community and Family Medicine, Georgetown University School of Medicine is seeking a Masters level biostatistician at the Research Associate level. Primary responsibility will be to provide biostatistical support for the Division's consulting service.

Masters in biostatistics/statistics, a minimum of two years experience, knowledge of microcomputers and SAS are required. Prior consultation experience with clinical/laboratory studies high desirable. Please send letter of intent, c.v., and names of three references to **Leonard Chiazze, Jr., Sc.D., Professor and Director, Division of Biostatistics and Epidemiology, Room 409 Kober-Cogan Hall, Georgetown University School of Medicine, Washington, D.C. 20007.** Georgetown University is an affirmative action/equal opportunity employer.

## JOB OPENINGS (continued)

### Statistician

The Orkand Corporation supports multiple Federal statistical agencies in the collection, analysis, and publication of many data series in the health, energy, and employment topic areas with anticipated expansion into environmental areas. There is currently an opening for a qualified candidate with the following qualifications.

- M.S. or Ph.D. in Statistics or related field
- Sample design and estimation
- Variance estimation
- Statistical quality control
- Imputation for missing data

We offer a professional environment with competitive compensation and a flexible benefits package. For consideration for a part-time or full-time position, please send your resume and salary requirement to: The Orkand Corporation, Dept. CLV, 8484 Georgia Avenue, Silver Spring, MD 20910. EOE.



P.O. Box 70843  
Washington, D.C. 20024-0843

NON-PROFIT ORG.  
U. S. POSTAGE  
PAID  
FALLS CHURCH, VA.  
PERMIT NO. 186