



April 1988

WASHINGTON  
STATISTICAL  
SOCIETY

# NEWSLETTER

April 13	Wednesday	Near With Replacement Sampling Without Replacement Using Ranks
April 13	Wednesday	Effect of Recall Period on Reporting Work Injuries in a Household Survey
April 20	Wednesday	Trends in Statistical Practice: Some Thoughts About the Future (Distinguished Speaker Lecture)
April 25	Monday	Testing and Validating Survey Questions
May 3	Tuesday	Monte Carlo Methodology and the Finite Sample Properties of Statistics for Testing Nested and Non-Nested Hypotheses
May 18	Wednesday	Multivariate Shewhart and CUSUM Control Charts
May 24-25	Tues./Wed.	Symposium: Quality Assurance in the Government

## ANNOUNCEMENTS

### Nominations for the WSS Board of Directors - 1988

#### President Elect

CATHRYN DIPPO is a Senior Mathematical Statistician at the Bureau of Labor Statistics. She holds a Ph.D. in Mathematical Statistics from the George Washington University. She has served on the WSS Board as Methodology Program Chair and as Representative-at-Large, and is currently the Chair of the WSS Program Planning Committee for the ASA Sesquicentennial.

EDWARD WEGMAN is Dunn Professor and Director of the Center for Computational Statistics at George Mason University. He has a Ph.D. in Mathematical Statistics from the University of Iowa. He serves as Associate Editor for a number of journals, including the Journal of the American Statistical Association, and is a Fellow of the ASA, AAAS, IMS, and the Royal Statistical Society. He is the organizer of the 20th Symposium on the Interface: Computing Science and Statistics.

#### Representative-at-Large (two-year term)

STEPHANIE SHIPP is an economist in the Division of Consumer Expenditure Survey at the Bureau of Labor Statistics. She holds an M.A. in Economics from the George Washington University. During the last two years, she has been the WSS Membership Chair, has

conducted a survey for the WSS of the Building Representative network, and has authored the WSS chapter notes for the *Amstat News*. She is also a member of the WSS Program Planning Committee for the ASA Sesquicentennial.

VIRGINIA deWOLF is a Mathematical Statistician at the National Highway Traffic Safety Administration. She holds a Ph.D. from the University of Washington (Seattle). Her activities with the WSS include being the Chair of the Short Course Committee since 1985, and a member of the Arrangements Committee. She is currently Treasurer of the Caucus for Women in Statistics.

DAVID CANTOR is a Senior Research Associate at Westat, Inc. He holds a Ph.D. in Sociology from the University of Illinois at Urbana-Champaign. He currently is the Secretary-Treasurer of the Social Statistics Section of the ASA. His areas of interest include survey design, demography, and criminology.

MARY FOULKES is a Senior Staff Fellow at the National Institute for Neurological, Communicative Disorders, and Stroke. She holds a Ph.D. in Biostatistics from the University of North Carolina. She has been the Public Health and Biostatistics Program Chair since 1986, has participated as a WSS Science Fair Judge, and was active in the Houston Chapter of the ASA before moving to the Washington area.

(continued on page 4)

## WASHINGTON STATISTICAL SOCIETY PROGRAM CHAIRS

### Agriculture & Natural Resources

Ron Bosecker 447-3895  
W. Barnes Johnson 249-7388

### Economics

Francis X. Diebold 452-2461  
Robert Yuskavage 523-0876

### Physical Sciences & Engineering

Thomas Mazzuchi 994-7514  
Refik Soyer 994-6794

### Employment

Evelyn Kay 331-1153

### Public Health & Biostatistics

Jai Choi 436-7047  
Mary Foulkes 496-6818

### Social & Demographic Statistics

John Czajka 484-9220  
Harvey Schwartz 223-5555

### Statistical Computing

Khalid Aboura 994-7534  
David Grier 546-8231

### Short Courses

Virginia de Wolf 366-5361  
Donald Gantz 425-3931  
Brad Pafford 447-2129  
Glenn White 763-5248

### Methodology

Bill Winkler 763-3905  
David Marker 251-4398

### Newsletter Editor

Michael Cohen 454-6193

## PROGRAM ABSTRACTS

**TOPIC:** NEAR WITH REPLACEMENT SAMPLING WITHOUT REPLACEMENT USING RANKS

**SPEAKER:** Tommy Wright, Oak Ridge National Laboratory

**CHAIR:** William Winkler, Bureau of the Census

**DISCUSSANT:** Keith Rust, Westat

**DATE & TIME:** Wednesday, April 13, 1988; 12:30 to 2:00 p.m.

**LOCATION:** Room 2736, GAO Building, 441 G Street, N.W., Washington, D.C.  
(Please call 523-1760 if you plan to attend in order to assure building entrance.)

**SPONSOR:** Methodology Section

**ABSTRACT:** Let  $U_1, U_2, \dots, U_N$  be the  $N$  units of a finite population and let  $(y_i, x_i)$  be a vector of nonnegative components associated with the  $i^{th}$  unit, where the  $x$ 's are known and the  $y$ 's are unknown. A sample of fixed size  $n$  ( $< N$ ) is to be selected to estimate the unknown population total  $Y = \sum_{i=1}^N y_i$ . Let  $\pi_i$  be the probability of sample inclusion for the  $i^{th}$  unit. Many (e.g., Hansen and Hurwitz, 1943, and Brewer and Hanif, 1983) have realized improvements in efficiency by taking  $\pi_i = np_i$  where  $p_i = x_i / \sum_{j=1}^N x_j$  is a normed measure of size for the  $i^{th}$  unit.

Such plans, called probability proportional to size ( $\pi ps$ ) sampling plans, can be difficult to execute when sampling is without replacement ( $wor$ ), particularly when  $n > 2$ . When a suitable variable  $x$ , which is directly proportional to the variable of interest  $y$ , is not available, one may know how to rank units reasonably well relative to the unknown  $y$  values before sample selection. When such ranking is possible, we introduce a simple and efficient  $\pi ps wor$  sampling plan for general  $n$  using the ranks as the known  $x$  measures of size. The proposed sampling plan is similar to, has the simplicity of, and has no greater sampling variance than with replacement sampling, but is without replacement.

The method is compared numerically with several other methods for various populations.

---

**TOPIC:** EFFECT OF RECALL PERIOD ON REPORTING WORK INJURIES IN A HOUSEHOLD SURVEY

**SPEAKERS:** James Massey, Chief, Survey Design Staff, Office of Research and Methodology, NCHS

**CHAIR:** Joe Fred Gonzalez, Jr., Office of Research and Methodology, NCHS

**DATE & TIME:** Wednesday, April 13, 1988; 1:30 to 2:30 p.m. (Note special time.)

**LOCATION:** National Center for Health Statistics, 3700 East-West Highway, Hyattsville, MD, Rm. 1-39

**SPONSOR:** Office of Research and Methodology, NCHS and WSS

**ABSTRACT:** When collecting information on work injuries in a sample survey, a recall period of six to twelve months or possibly longer is desirable to produce an adequate number of reported injuries for statistical analysis. The longer the recall period, however, the more likely work injuries are to be underreported by the household respondents. This paper examines a number of recall periods with respect to both sampling error and underreporting bias to determine the optimum recall period for work injuries in the National Health Interview Survey. As part of this analysis the reporting of work injuries by self respondents and persons reporting for other household members (proxy respondents) is examined. The effect of the severity of work injuries with respect to recall bias is also studied.

---

---

## PROGRAM ABSTRACTS (continued)

**TOPIC:** TESTING AND VALIDATING SURVEY QUESTIONS  
**SPEAKER:** William Belson, The Survey Research Centre, London  
**CHAIR:** David Mingay, Office of Research and Methodology, NCHS  
**DISCUSSANT:** Elizabeth Martin, Census Bureau  
**DATE & TIME:** Monday, April 25, 1988; 10:30 a.m. to 12:00 noon (Note special time.)  
**LOCATION:** National Center for Health Statistics, 3700 East-West Highway, Hyattsville, MD, Rm. 1-39  
 (Please call Lisa Himmelfarb, NCHS, 436-7022, by Thursday, April 21, if you plan to attend.)  
**SPONSOR:** Office of Research and Methodology, NCHS and WSS  
**ABSTRACT:** Topics covered will include laboratory and field testing of respondents' comprehension of survey questions, and validation studies of checklist and open-ended questions.

---

**TOPIC:** MONTE CARLO METHODOLOGY AND THE FINITE SAMPLE PROPERTIES OF STATISTICS FOR TESTING NESTED AND NON-NESTED HYPOTHESES  
**SPEAKER:** Neil Ericsson, Federal Reserve Board  
**CHAIR:** Francis Diebold, Federal Reserve Board  
**DISCUSSANT:** David Findley, Bureau of the Census  
**DATE & TIME:** Tuesday, May 3, 1988; 12:30 to 2:00 p.m.  
**LOCATION:** Federal Reserve Board, Martin Building, Rooms 3219 and 3319, 20th & C, N.W.  
 (Please call 452-2461 at least one day in advance to ensure building admission.)  
**SPONSOR:** Economics Section  
**ABSTRACT:** Using recently developed Monte Carlo methodology, this paper investigates the effect of dynamics and simultaneity on the finite sample properties of maximum likelihood and instrumental variables statistics for testing both nested and non-nested hypotheses. Numerical-analytical approximations (response surfaces) to the unknown finite sample size and power functions of those statistics are obtained for dynamic one- and two-equation models. The results illustrate the value of asymptotic theory in interpreting finite sample properties and certain limitations for doing so. Two practical finite sample results arise: the F form of the Wald statistic is strongly favored over its chi-squared form; and the effects of "large- $\sigma$ " and a small effective sample size are particularly pronounced for Sargan's (1958) instrumental variables statistic and Ericsson's (1983) Cox-type instrumental variables statistic. Re-examining Pesaran and Deaton's (1978) empirical example illustrates the additional information gained from the instrumental variables statistics.

---

**TOPIC:** MULTIVARIATE SHEWHART AND CUSUM CONTROL CHARTS  
**SPEAKER:** Dr. Frank Alt, University of Maryland College of Business and Management  
**CHAIR:** David Marker  
**DATE & TIME:** Wednesday, May 18, 1988; 12:30 to 2:00 p.m.  
**LOCATION:** Room 2736, GAO Building, 441 G Street, N.W., Washington, D.C.  
 (Please call 523-1760 if you plan to attend in order to assure building entrance.)  
**SPONSOR:** Methodology Section  
**ABSTRACT:** For those situations in which it is necessary to simultaneously monitor two or more correlated characteristics, multivariate quality control methods will be necessary. Although such procedures are employed in industry, they can easily be implemented in the government or service sectors. This talk will focus on multivariate control charts, of which there are basically two types: Shewhart and CUSUM. Shewhart will be presented for both phase 1 (parameter estimates are obtained from rational subgroups) and phase 2 (standard or target values are specified). There is no unique cumulative sum method. Attention will focus on those methods developed by Woodall, Crosier, Healy, and Smith. These alternative methods will be evaluated by considering their average run lengths.

---

## ANNOUNCEMENTS (continued)

### Nominations for the WSS Board of Directors - 1988 *(continued from page 1)*

#### Methodology Program Chair-Elect

MYRON KATZOFF is presently at the National Center for Health Statistics. He has a Ph.D. from the George Washington University and worked at the Census Bureau for 10 years. His interests are survey sampling, econometrics, time series, general linear models, sequential analysis, and contingency tables.

PHILIP KOTT is presently at the Department of Agriculture. He has a Ph.D. from Brown University and has worked at the Bureau of Labor Statistics and Energy Information Administration. His interests are survey sampling, economics, linear models, and regression.

#### Treasurer (two-year term)

BENNIE CLEMMER is a Senior Statistician with the Social Security Administration. He holds a Ph.D. in Statistics from Virginia Polytechnic Institute and State University (VPISU). He has served as treasurer of WSS since 1980.

*(Please see the enclosed ballot.)*

### Annual American University Spring Lecture in Statistics

The Department of Mathematics and Statistics of the American University invites all to attend the annual Spring Lecture in Statistics. This year's lecture will be held on Friday, April 15, from 3:00 to 4:30 p.m. in the Ward Circle Building, Room 2, The American University, Massachusetts and Nebraska Avenues, N.W. The featured speaker will be Geoffrey Watson of Princeton University. The talk is entitled "The Statistics of Rotations."

In several fields of science one wishes to estimate rotations. The simplest problem is rather like regression. We suppose  $n$  known unit vectors  $u_j$  are taken by a rotation  $A$  to unit vectors  $v_j$ . The  $v_j$  are measured with error resulting in vectors  $y_j$ , which are Fisher distributed about  $v_j = A u_j$ . Thus, one is trying to fit  $A [u_1, \dots, u_n]$  to  $[y_1, \dots, y_n]$ . Several geophysical applications will be discussed.

For further information call 301/885-3132.

### GAUSS Meeting

GAUSS/Washington, the Washington area GAUSS Users' Group, will meet at the Economic Research Service (ERS), 1301 New York Avenue, in Room B-14, from 12:30 to 1:30, Wednesday, April 13. GAUSS is a matrix-oriented language useful for statistics and numerical analysis that runs on the

PC. Dr. Ronald Schoenberg, NIH, will speak on constrained parameters in linear models. This will be a practical, informal "how-to-do-it-in-GAUSS" presentation, intended to teach theory and GAUSS. Dr. Schoenberg sits at a PC, writes GAUSS programs and executes them while he talks. A big screen projection monitor shows the programs and results. Please call 496-1250 in advance of the meeting to insure entrance into the ERS building. (Note: The next meeting will be held on May 18, same time and place.)

### How Do You Improve Your Response Rates?

The U.S. Department of Agriculture conducts detailed personal interview surveys of food expenditures and consumption. The response rates for these surveys are not as high as we had hoped. We would like to exchange information on measuring and improving response rates with other organizations that conduct household surveys of a similar nature. If there is enough interest, a small staff level conference on these issues may be organized. Please contact Diane Willimack (202/475-3481) to express your interest in an information exchange or conference.

### 14th Annual IASSIST Conference

The International Association of Social Science Information Services and Technology (IASSIST) is holding its 14th Annual Conference in Washington, D.C. Thursday, May 26 through Sunday, May 29, 1988. The program features contributed papers, workshops and roundtable discussions concerned with archiving, accessing and using machine readable social science data. The conference is being held at the Dupont Plaza Hotel, 1500 New Hampshire Avenue, N.W., which is conveniently located near Dupont Circle and the Dupont Circle metro stop. Rooms are guaranteed to be available at the Dupont Plaza Hotel through April 25, 1988 for a flat rate of \$65 per night. The conference rate will be offered on an as available basis after April 25.

Conference and workshop registration for members is \$140 if registered by April 25. Late fee is \$20. Nonmembers should add an additional \$20. Separate registration fees are available for conference and workshops.

For further information and an advanced program, contact Pat Doyle, Mathematica Policy Research, Inc., 600 Maryland Avenue, S.W., Suite 550, Washington, D.C. 20024.



## OTHER ANNOUNCEMENTS (continued)

### Continuing Education Seminar Set (Rescheduled) for April 29

The Washington OR/MS Council (WORMSC) and the Center for Education Statistics, U.S. Department of Education, are co-sponsoring a seminar on *Missing Data and Imputation*. Featured speakers are Donald Rubin, chairman of the Statistics Department at Harvard, and Roderick Little of UCLA. The seminar will be held at the Center for Education Statistics Auditorium, 555 New Jersey Avenue, N.E., on Friday, April 29. (The location is one block from the Union Station Metro stop.) Pre-registration is due by April 15 and costs \$115 per person for WORMSC members, \$130 for non-members. Handout materials for the course are included. Textbooks explaining the material in more detail are also available, at discount prices. Registration at the door will be \$15 more per person, if available, and will not include textbooks.

For further information contact Doug Samuelson at 703/478-9808 (office) or 703/476-2058 (home).

### WAS Annual Awards Program

The Washington Academy of Sciences will hold its annual awards program in the Mary Graydon Center of American University at Massachusetts and Nebraska Avenues, N.W., on Thursday, April 21. The speaker will be James Spates, President Elect, Washington Academy of Sciences.

There will be a wine and cheese reception at 6:45 p.m. followed by dinner at 7:30. The program will begin at 8:30 p.m. Call 301/320-3621 for information and make dinner reservations at least three days in advance.

### NBS-GWU Conference on "Uncertainty in Engineering Design"

The National Bureau of Standards and the George Washington University are hosting a conference on May 10 and 11, 1988, which will focus on problems of engineering design for quality and reliability. The aim is to provide an opportunity for engineers and statisticians to explore approaches to handling uncertainty in design and manufacturing. The Conference is to facilitate the interaction of these disciplines in the context of both product and process design. The program will include invited talks and open discussion led by selected participants. Participants will have an opportunity to tour the NBS Advanced Manufacturing Research Facility.

The five sessions of the conference are being chaired by:

Dr. Gary McDonald, General Motors Research  
Dr. J. Stuart Hunter, Princeton, New Jersey  
Dr. Dennis Swyt, National Bureau of Standards  
Professor Stephen Pollock, University of Michigan  
Dr. Ragu Kacker, AT&T Bell Laboratories

The conference agenda and information on registration may be obtained from: Ms. Shirley Bremer, National Bureau of Standards, Bldg. 101, Room A337, Gaithersburg, MD 20834, 301/975-2845.

### Short Course on Optimizing Computer Simulations

In response to demands from simulation designers and users, a two-day course is scheduled for April 11-12, and May 9-10, on *Optimizing Computer Simulations*. The topics include principles of experimental design to plan simulation runs, multivariate analysis for screening variables, response surface methods, and graphical interpretation. For those not actively using computer simulations, the course is also a good refresher for experimental design, analysis, and interpretation of results. Registration involves a fee; group discounts are allowed. For information and registration materials, please call: Pro-File Computer Institute (24 hours, 7 days), 703/281-8725. The course will be held at the Holiday Inn in McLean, Virginia, near Tysons Corner. It carries 1.2 Continuing Education credits.

### Seminar Series: Advanced Topics in Survey Methodology

The USDA Graduate School's popular seminar series on Advanced Topics in Survey Methodology, first presented in the Fall of 1984, will be repeated in the Spring of this year. The series is intended for anyone who sponsors, designs, manages or works on any aspect of statistical surveys. It will provide insights into all phases of survey methodology, with leading practitioners as presenters and discussion leaders. Among the many topics to be included in the 1988 series are: total survey design, questionnaire development, interviewer training, treatment of missing data, cognitive aspects of surveys and survey processing on microcomputers. The seminar series is scheduled for Thursday evenings from April 7 through June 9. The fee will be \$249. For a brochure and further information, call the USDA Graduate School office on 202/447-5885.

## OTHER ANNOUNCEMENTS (continued)

### WSS Annual Dinner

The WSS Annual Dinner has been set for Wednesday evening, June 1. It will be held at the China Taste in Bethesda. The menu (Chinese, of course) directions, and other details will appear in next month's newsletter. The price will be \$15 per person. Our speaker will be a science fiction writer who will entertain us with stories about the environment (and statistics?) in the future. Mark your calendar. It should be fun.

### Press Release on the 20th Interface Symposium

The Twentieth Symposium on the Interface of Computing Science and Statistics will be held at the Sheraton International Conference Center in Reston, Virginia on April 21-23, 1988. The Symposium is a long-standing interdisciplinary forum focusing on the interface between computing science and statistics. The focus of the 20th Symposium will be on computationally intensive methods in statistics. Professor Brad Efron of Stanford University will give the keynote address on this theme and sessions are organized with this theme in mind.

Sessions will include invited talks, contributed papers and exhibits. An opening night reception is planned as well as a banquet. An extensive exhibit area is also planned. Contributed presentations will be selected by the Program Committee and will last for 20 minutes. Authors who wish to contribute a paper should submit a written abstract no later than January 15, 1988. The abstract should be no longer than one page. Abstracts of invited and contributed papers will be available at the Symposium. Abstract and inquiries should be sent to: Professor Edward J. Wegman, Interface Symposium, P.O. Box 7460, Fairfax Station, VA 22039-7460, 703/323-2723.

Conference Proceedings will be published. Camera-ready copy of the contributed and invited papers will be due on June 1, 1988. The Proceedings will include both invited and contributed papers.

The Conference will be held at the Sheraton International Conference Center in Reston, VA (suburban Washington, D.C.) on the 21st through 23rd of April. April is an extremely attractive time in Washington coinciding with the blooming of the famous cherry blossoms. Free shuttle service is provided by the Sheraton to and from nearby Dulles Airport. A commercial airport bus service is

available from Washington National Airport. Hotel rates are quite reasonable for the peak of the tourist season (\$79 for a single on Wednesday and Thursday and \$45 for a single on Friday and Saturday). A block of rooms has been reserved and attendees are expected to make their own reservations. **Because this is a peak tourist season, early reservations are strongly encouraged.** Reservations can be made by calling 800/325-3535 or 703/620-9000. Make sure to identify yourself as being associated with the Interface Symposium. Registration and welcoming reception will take place on Wednesday, April 22.

The regular registration fee for members of the cooperating societies (ASA, IMS, SIAM, and ORSA) is \$105 and for non-members is \$130. A preregistration discount is being offered to those who register early. For registrations received before January 15, 1988, the registration fee will be \$95 for members of cooperating societies and \$120 for non-members. The registration fee will include a copy of the proceedings and the opening night reception. For further information, to be put on the INFA mailing list and/or to register, please contact Ed Wegman at the above address.

### National Bureau of Standards Speaker Series

The Statistical Engineering Division of the National Bureau of Standards is pleased to announce a series of three talks to be given at the Bureau of Standards in Gaithersburg, Maryland. All members of the Washington area statistical and scientific community are cordially invited to attend any or all of the talks. The first speaker, scheduled for March 31, will be Lucien Le Cam of the University of California at Berkeley who will speak on, "*Can the Misbehavior of Wald's Confidence Ellipsoids be Avoided?*" The talk will be held in Room B119 of the Polymers Building, National Bureau of Standards at 2:00 p.m. Also scheduled to speak are:

Murray Rosenblatt, University of California at San Diego	-- April 26
James Berger, Purdue	-- May 5

For further details concerning exact topic, time, and place please call Fran Weygand at 301/975-2838 or Marilyn Leach at 301/975-2839.