DECEMBER 1990

WASHINGTON STATISTICAL SOCIETY

NEWSLETTER

December 4	Tuesday	De Finetti-Type Representations for Life Distributions
December 6	Thursday	Employment and Hours Variation Over the Business Cycle
December 11	Tuesday	An Application of Regression Superpopulation Models in the Current Employment Statistics Survey
December 11	Tuesday	Hierarchical Models for Small Area Estimation of Probabilities of Victimization and Nonresponse
December 12	Wednesday	Determination of Normal Ranges to Screen for α1-antitrypsin Deficiency—A Statistical Model of An Upregulatable Gene
December 13	Thursday	Survey Methods for the Evaluation of National Cause-of-Death Data
December 17	Monday	*WSS Holiday Party*

ANNOUNCEMENTS

Science Fairs 1991

Volunteers are now being solicited to represent the Washington Statistical Society as judges in local area science fairs next spring. For the past several years, WSS has provided special awards at these fairs to students whose projects demonstrate excellence in statistical theory or application. Those who have participated in this activity have very much enjoyed the opportunity to interact with these students and to observe the widely diverse projects which are presented. The WSS sponsors awards at fairs in Northern Virginia, suburban Maryland, and the District of Columbia. The fairs are held on a Saturday morning in mid- to late March and early April. The only time required is that one Saturday morning, plus one weekday lunchtime meeting to discuss judging strategy and to distribute the awards to be given out at each fair.

If you would like to be a WSS science fair judge, or if you would like additional information about this activity, please contact Susan Ellenberg at (301) 496-0694 or send a note with your name, address, and daytime telephone number to Susan Ellenberg, Division of AIDS, NIAID, 6003 Executive Boulevard, Rockville, Maryland 20892.

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: **DE FINETTI-TYPE REPRESENTATIONS FOR LIFE DISTRIBUTIONS**

SPEAKER: Richard E. Barlow, University of California, Berkeley

CHAIR: Telba Z. Irony, George Washington University

DATE & TIME: Tuesday, December 4, 1990; 11:30 a.m. to 12:30 p.m. (Please note special time.)

LOCATION: Room 301, Staughton Hall, 707 22nd Street, George Washington University. Near Foggy Bottom-GW Metro (blue/orange). Pay parking available at Marvin Center (800 21st St.: H St. entrance), and at 22nd and Eye Street garage.

SPONSORS: George Washington University and WSS Physical Sciences and Engineering Section

ABSTRACT: Beginning with a finite population of units and the judgment of exchangeability for units with respect to lifetime, we argue that measures of diversity lead to the appropriate probabilistic models for wearout conditional on average life. This in turn implies that Schur-concavity of the joint probability function (or more generally, the joint survival distribution) provides the correct probabilistic definition of wearout conditional on average life. Following this argument and using the Principle of Indifference as applied to l9-isotropic distributions by Mendel (1989), we argue that the appropriate probability models for life distributions conditional on average life are in a family of distributions which we call the generalized gamma distributions. If, on the other hand, we are interested in appropriate probabilistic models for wearout conditional on average lifetime maintenance cost, it follows from our development that generalized Weibull distributions conditional on average lifetime maintenance cost are appropriate. Wearout in this case corresponds to Schur-concavity of the joint lifetime probability function on an appropriate sphere determined by the average lifetime maintenance cost function. (With Max Mendel.)

TOPIC: **EMPLOYMENT AND HOURS VARIATION OVER THE BUSINESS CYCLE**

SPEAKER: Stephen G. Bronars, University of California at Santa Barbara and ASA/NSF/BLS Research Fellow

DATE & TIME: Thursday, December 6, 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: This paper uses the monthly employment, hours, and wage micro data reported in the BLS 790 series to analyze cyclical variation in employment and hours from 1972 to 1989. Several alternative measures of employment variability are analyzed. The evidence indicates that the employment change distribution is skewed — large employment reductions are more common than large employment increases, but this skewness is much more pronounced in goods-producing industries. The empirical analysis also shows that there exists substantial heterogeneity in employment changes across establishments, even in industries with little variation in aggregate employment. In general, negative cyclical shocks decrease the mean employment change in an industry and increase the dispersion in employment changes across establishments in an industry. The magnitude of these cyclical effects varies substantially across detailed industry groups.

PROGRAM ABSTRACTS (continued)

TOPIC: **AN APPLICATION OF REGRESSION SUPERPOPULATION MODELS IN THE CURRENT EMPLOYMENT STATISTICS SURVEY**

SPEAKER: Stephen Woodruff, Bureau of Labor Statistics

CHAIR: Alan Tupek, Bureau of Labor Statistics

DATE & TIME: Tuesday, December 11, 1990; 12:30 to 2:00 p.m

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.)

SPONSOR: Methodology Section

ABSTRACT: In this paper we develop and analyze a potential improvement (called the Link90) to the estimator (the Link Relative) of employment levels which is now used in the Current Employment Statistics Survey at the Bureau of Labor Statistics. The most important difference between the Link Relative and the Link90 is that the Link90 is less wasteful of the available data. Otherwise, the Link90 is a direct generalization of the Link Relative. The derivation of the Link90 includes a few odd twists; it uses superpopulation models to estimate covariance matrices, pseudo-auxiliary variables (variables which, except for a few missing values, would be auxiliary variables), and a minimal amount of imputation to predict missing auxiliary values. The estimation methodology from which the Link90 resulted can also be used to solve estimation problems where composite estimators are usually considered.

The preliminary test results show that the Link90 has about 80% of the variance of the Link Relative estimator but, in spite of this modest reduction in variance, the Link90 reduces the expected number of "large" revisions by factors of three or more.

TOPIC: **HIERARCHICAL MODELS FOR SMALL AREA ESTIMATION OF PROBABILITIES OF VICTIMIZATION AND NONRESPONSE**

SPEAKER: Elizabeth A. Stasny, Assistant Professor, Department of Statistics,
Ohio State University

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

DATE & TIME: Tuesday, December 11, 1990; 2:00 to 3:30 p.m. (Please note special time.)

LOCATION: National Center for Health Statistics, Presidential Building, Room 948, 6525 Belcrest Road, Hyattsville, Maryland 20782.

SPONSORS: Office of Research and Methodology, NCHS and the Washington Statistical Society

ABSTRACT: This work considers the problem of obtaining small-area estimates of the probabilities of being victimized. A random-parameter or hierarchical-model approach is used to estimate both the probabilities of victimization and the probabilities of nonresponse. The models allow nonresponse to be either informative, in that the probability of nonresponse may depend on the victimization status, or random. Empirical-Bayes methods are used to fit the models to data from the National Crime Survey.

PROGRAM ABSTRACTS (continued)

TOPIC: **DETERMINATION OF NORMAL RANGES TO SCREEN FOR α1-ANTITRYPSIN DEFICIENCY—A STATISTICAL MODEL OF AN UPREGULATABLE GENE**

SPEAKER: Janet Wittes, Statistics Collaborative, Washington, D.C.

DISCUSSANT: Dean Follmann, Biostatistics Research Branch, NHLBI

DATE & TIME: Wednesday, December 12, 1990; 12:00 p.m. (Please note special time.)

LOCATION: Conference Room J, Executive Plaza North, 6130 Executive Boulevard, Rockville, Maryland (shuttle at 11:08, 11:43, and 11:48 a.m. from White Flint Metro station)

ABSTRACT: Screening for the heredity disorder α1-antitrypsin (α1AT) deficiency is carried out by measuring serum levels of α1AT, an antiprotease that serves to protect the lung from destruction by neutrophil elastase. Using observed serum levels for 443 individuals with known phenotypes MM, SS, ZZ, MZ, MS, and SZ, we developed a statistical model to describe the distribution of α1AT serum levels for each phenotype. The model assumes that the two alleles act independently in their contribution to the α1AT concentration. It also incorporates parameters that allow description of upregulation of the M and S genes in response to acute phase stimuli. Assuming underlying Gaussian densities, we show the resulting distributions of serum levels are described by convolutions of mixtures of Gaussian random variables; the mixing parameters represent the degree of upregulation characteristic of each gene. Maximum likelihood and method of moments were used to estimate the parameters. The technique is currently being used to screen populations to identify deficient phenotypes. Similar modelling may be useful for other hereditary conditions with upregulatable genes.

TOPIC: **SURVEY METHODS FOR THE EVALUATION OF NATIONAL CAUSE-OF-DEATH DATA**

SPEAKER: Lester R. Curtin, Chief, Statistical Methods, Office of Research and Methodology, NCHS

CHAIR: James Weed, Deputy Director, Division of Vital Statistics, NCHS

DISCUSSANT: Harry Rosenberg, Chief, Mortality Statistics Branch, Division of Vital Statistics, NCHS

DATE & TIME: Thursday, December 13, 1990; 10:00 to 11:30 a.m. (Please note special time.)

LOCATION: NCHS, Auditorium, Presidential Bldg., 11th Flr., 6525 Belcrest Rd., Hyattsville, MD 20782

SPONSORS: Office of Research and Methodology, NCHS and the Washington Statistical Society

ABSTRACT: As part of its ongoing effort to maintain and improve the quality of mortality statistics, the National Center for Health Statistics designed and conducted, under contract with the Research Triangle Institute, a small study to examine survey methods for collecting information that could be used to evaluate the quality of cause-of-death statistics. A sample of 682 certificates, mostly with Diabetes mellitus or Chronic Obstructive Pulmonary disease as the underlying cause of death, was selected from the Current Mortality Sample. A mail survey was used to collect information from hospitals, nursing homes, certifiers, and other physicians identified on the death certificate. The response rate among all eligible providers was about 70 percent; at least one provider responded for over 90 percent of the sample cases. At least two physicians reviewed each set of information to determine a revised cause of death certification. In cases where the panel physicians disagreed, an adjudication process was used to determine a revised certificate. For the information collected, a revised certificate was constructed for nearly 88 percent of the original sample. This paper presents an analysis of the effectiveness of the survey and study methods by examining detailed response rates, the extent of useful information collected, an assessment of within-panel variation, and measures of agreement between the original and the revised certificate by cause of death.

ANNOUNCEMENTS (continued)

The American Statistical Association announces the ASA/NSF/NIST Senior Research Fellowship Program 1991-92

The ASA/NSF/NIST Senior Research Fellowship Program, cosponsored by the National Science Foundation and the National Institute of Standards and Technology, seeks senior researchers, advanced graduate students, or recent Ph.D.'s for 1991-92 Fellowships and Associateships at the National Institute of Standards and Technology (NIST). In particular the program seeks Fellows with a strong interest in collaborative cross-disciplinary research in process modeling and optimization. Areas of research that fit NIST's research mission and facilities include:

- Statistical approaches in materials processing and bioprocessing research
- On-line quality control in automated flexible manufacturing
- Analysis of lifetime data from multifactor experiments
- Sources of variability in physical measurement procedure; calibration for manufacturing process control
- Variance components
- Design of experiments
- Errors in variable regression
- Graphical data analysis
- Statistical Image Processing

Stipends of the Senior Research Fellows will be commensurate with qualifications and experience. Fringe benefits will be provided. Appointments will be for four to nine months. Applications are due January 15, 1991 for Fellows and February 15, 1991 for Associates. For application information, contact Ms. Carolee Bush, ASA/NSF/NIST Research Program, American Statistical Association, 1429 Duke Street, Alexandria, Virginia 22314-3402; (703) 684-1221. For information on research topics and other aspects of the program contact Ms. Ruth Varner, Coordinator, ASA/NSF/NIST Research Program, Statistical Engineering Division, National Institute of Standards and Technology, Admin. Building, Room A337, Gaithersburg, Maryland 20899; (301) 975-2839.

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:

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.

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

STATISTICIANS

Advanced Computer Systems, Inc. (ACS), a fast growing small business, has a need for Statisticians at all levels (entry, mid and senior) of experience and education (BS, MS, PhD). Opportunities exist on recent multi-year contract award. Individuals selected will participate in assessment and evaluation of various energy information systems, survey statistics, data analysis and modeling.

Positions are available for both survey and mathematical statisticians. Familiarity with SAS, SPSS, and other statistical computer tools is desirable. ACS is a professional services firm oriented toward client and employee satisfaction and success. Competitive salaries, excellent benefits incl. 401K and Profit Sharing Plan.

Interested candidates please forward resume to: Personnel Coord. (ES-1).

Advanced Computer Systems, Inc.
10530 Rosehaven St., Suite 520
Fairfax, VA 22030

EOE

The Agriculture Division is currently recruiting for a **Senior Mathematical Statistician** to serve as Assistant Chief for Research and Methodology, GM15/1529 ($59,216 - $76,982). The incumbent manages the staff and work of two branches, each consisting of approximately 14 employees. The incumbent is responsible for development and oversight of all statistical methodology, research, and evaluation for programs of the Agriculture Division. The incumbent additionally oversees the compilation of the mail lists for the census of agriculture and agriculture surveys, the coverage evaluation of the census of agriculture, and the conduct of other research and evaluation studies for programs of the Division. The statistical research and evaluation projects encompass all areas of survey and census methodology. The incumbent is expected to have had graduate training in statistics and to have proven competency as a manager. Knowledge of agricultural statistics is desirable and U.S. citizenship is required. Interested applicants should contact **Dr. Charles P. Pautler, Jr., Chief of the Agriculture Division**, by telephone at 301/763-8555 or by mail to the **Agriculture Division, Bureau of the Census, Washington, D.C. 20233**.

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