



MARCH 1990

WASHINGTON
STATISTICAL
SOCIETY

NEWSLETTER

March 12	Monday	Non-Local Power Approximations, Identification, and the Nonmonotonic Power of the Likelihood Ratio Test
April 5	Thursday	Indoor Radon Survey in 25 States
April 11	Wednesday	A Model for U.S. Inflation

ANNOUNCEMENTS

International Conference on Measurement Errors in Surveys Seeks Contributed Papers

The field of research in measurement errors in surveys spans a number of disciplines including sociology, psychology, statistics, communication science, business, and economics. To document the current state of the field, to report the findings of new research, and to promote interdisciplinary and cross-cultural interchanges, an *International Conference on Measurement Errors in Surveys* will be held November 11-14, 1990, in Tucson, Arizona, at the Sheraton El Conquistador Hotel. The Conference is jointly sponsored by the American Statistical Association (Section on Survey Research Methods), the American Association for Public Opinion Research, the American Marketing Association and the International Association for Survey Statisticians.

The Conference will bring professionals together from different disciplines and from around the world to share approaches to modeling, assessing, and reducing measurement errors in surveys. Approximately 60 invited papers and 125 contributed papers will be

presented during the three-day conference. An edited monograph of the best papers will be published as part of the project and sent to each registrant. Information on registration will be published in the newsletters of the four sponsoring organizations.

Abstracts for contributed papers are sought on the following topics:

- The questionnaire as a source of measurement error (e.g., effects of question wording and question order, the role of pilot tests, experiments in questionnaire development);
- The respondent as a source of measurement error (e.g., memory effects, proxy vs. self response, effects on the respondent's mood);
- Measurement errors due to data collectors and data collection (e.g., effects of interviewer training and education, reinterviews, evaluation of interviewer performance);
- The respondent-interviewer interaction (e.g., sensitive questions, structured vs. nonstructured interviewing); and
- Modeling measurement errors and their effects on estimation and data analysis. (continued on page 3)

WASHINGTON STATISTICAL SOCIETY PROGRAM CHAIRS

Agriculture & Natural Resources
Cynthia Clark 763-8558
Paul Gargiullo 586-1137

Social & Demographic Statistics
Harvey Schwartz 443-6990
John Czajka 484-9220

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
Myron Katzoff 436-7047
Andrew White 436-7904

Public Health & Biostatistics
Ed Lakatos 496-5905
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Sylvia Leaver 272-2350

Quality Assurance
Stanley R. Freedman 586-2038
John Galvin 272-5066

Newsletter Editor
Michael Cohen 454-6193

Employment
Bill Arends 447-6812

PROGRAM ABSTRACTS

TOPIC: NON-LOCAL POWER APPROXIMATIONS, IDENTIFICATION, AND THE NONMONOTONIC POWER OF THE LIKELIHOOD RATIO TEST

SPEAKER: Doug McManus, Federal Reserve Board

CHAIR: Neil R. Ericsson, Federal Reserve Board

DISCUSSANT: Steve Miller, BLS

DATE & TIME: Monday, March 12, 1990; 3:30 to 5:00 p.m. (Note special time.)

LOCATION: Room B-4001, Federal Reserve Board, 20th and C Streets, N.W. (entrance on the South side of C Street between 20th and 21st).
Please call Margaret Gray at 452-3726 by 2:00 p.m. March 9. On arrival, sign in at the guard desk and state purpose and room number of visit.

SPONSORS: Federal Reserve Board and Economics Section, WSS

ABSTRACT: This paper demonstrates the possibility of nonmonotonicity of the finite sample power function of the Likelihood Ratio (LR) test using simple analytically tractable examples. The power in these examples increases and then decreases as the distance between the null and the alternative increases. These examples motivate a theorem which states that nonmonotonicity holds for a general class of models: Nonmonotonicity occurs when the model is locally identified but nearly non-identified globally. This result is based on an approach to asymptotic power in which the Kullback-Liebler information number plays a role analogous to the noncentrality parameter in hypothesis testing. Applications in which this problem arises will be discussed.

TOPIC: INDOOR RADON SURVEY IN 25 STATES

SPEAKER: Maureen Anderson Clifford, U.S. Environmental Protection Agency

DATE & TIME: Thursday, April 5, 1990; 1:30 to 3:30 p.m. (Note special time.)

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.)

ABSTRACT: Radon is an important public health and environmental concern. This talk will describe the cumulative results of 25 statewide radon surveys conducted from 1986 to 1989 as a joint effort between the Environmental Protection Agency and each state. Two-day screening Radon concentration measurements using charcoal canisters were made on the lowest livable level in approximately 35,000 randomly selected homes. Various aspects of the survey design are discussed. The Radon distributions are presented with mapping used to present some of the results.

PROGRAM ABSTRACTS (continued)

- TOPIC:** A MODEL FOR U. S. INFLATION
- SPEAKER:** David H. Richardson, Great Falls Analytics
- CHAIR:** Harvey Schwartz, NCHSR & HCTA
- DATE & TIME:** Wednesday, April 11, 1990; 12:30 to 2:00 p.m.
- LOCATION:** Room 2437, BLS, 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:** The need to identify and specify the appropriate model on the basis of the data is standard in econometric analysis. This model development results in extreme complications both in estimation and hypothesis testing. In addition, applied work suffers from the paucity of formal work in the methodology of econometric model building. Much of the published work is from the point of view of information theory and measures, e.g., Akaike's AIC or Mallow's C_p . Gale and Pregibon have developed Student, an expert modeler based on traditional artificial intelligence (AI) principles, which focuses on the properties of the residuals as indications of model (in)adequacy.
- The issue of the causes of inflation in the United States has been much debated by political economists; some of the leading hypothesized causes are interest rates, the rate of increase of the money supply, the government deficit, and economic growth. Since time series of these variables are highly correlated, the identification and specification of an inflation model is quite challenging.
- The author has recently developed Samuel, an AI model specification program, to routinely perform this task. Samuel is an expert program, emulating the decision-making process of an experienced analyst in search of the underlying economic structure, i.e., just which independent variables and which lags of those variables belong in the model. The search is based on rules for model building developed by the author. Samuel will be described and example analyses will be presented.

ANNOUNCEMENTS (continued)

International Conference on Measurement Errors in Surveys (continued)

Review papers and descriptive papers on methods for dealing with measurement errors may be appropriate if they illustrate widely applicable methods. However, the papers most sought are those containing empirical data.

Send two copies of a 1-2 page abstract to arrive by May 1, 1990, to: Lee Decker, American Statistical Association, 1429 Duke Street, Alexandria, VA 22314. A \$100 non-refundable

"submission fee" must accompany the abstract (no purchase orders, please). If the abstract is accepted, the \$100 will be applied to the \$365 conference registration fee. Contributors will be notified of acceptance by June 1. If the abstract is not accepted, the submission fee will be returned.

For more program information, contact Paul P. Biemer, Chair of the Organizing Committee, Experimental Statistics Department, Box 30003, Dept. 3130, New Mexico State University, Las Cruces, NM 88003-0003. For information on registration, contact Lee Decker at the ASA.

ANNOUNCEMENTS (continued)

Quality Assurance in the Government Symposium Announced

The Washington Statistical Society Short Course Committee is again sponsoring the Quality Assurance in the Government Symposium to be held on Thursday, May 31, 1990 at the Jefferson Auditorium, U.S. Department of Agriculture, South Building, Washington, D.C. (Smithsonian stop on the blue/orange metro line). This year's conference will be a one-day format. The agenda should be finalized by the release of this newsletter and is expected to focus in the A.M. session on the need for quality assurance in the government, and in the P.M. session on actual case studies. Further details and registration materials will be provided in the April WSS newsletter. For further information contact Brad Pafford (202/447-3623), or Ron Fecso (202/475-3486).

WSS Quantitative Literacy Group

Are you concerned with the future of statistics? Would you like to see more young people take an interest in statistical science and learn the value of accurate statistics? Now you can take a part in the promotion of these ideas.

The initial meeting of the Quantitative Literacy Interest Group met on November 16, 1989 at the USDA South Building. The discussion at the initial meeting revealed a variety of interest from the members attending. The Program has the potential to develop applications in several areas depending on the inclinations of the members involved. Some of the ideas suggested included:

1. Visits to math clubs of various schools.
2. Work with the National Academy of Sciences Mathematical Sciences Education Board on curriculum development.
3. Participate in county math fairs.
4. Exit polls by students in the upcoming elections.
5. Introduce Census data to students to solve local problems.
6. Introduce students to the statistical literature through Stats and Chance magazines.

We encourage all interested persons to attend the next meeting, scheduled for 1:00 p.m. on Thursday, March 29th at the USDA South Building (adjacent to the Smithsonian Metro

station). Please contact Ron Fecso (202/475-3486) or Dwight Brock (301/496-9795) for more information.

USDA Graduate School Offers New Courses on Survey Methods and Total Quality Management

Taught by experts known throughout the survey community, a course on Advanced Topics in Survey Methods will be offered this spring quarter by the USDA Graduate School Evening and Weekend Programs. In addition, a new course, Total Quality Management, also will be offered.

Robert D. Tortora, an expert in the field of statistical research, will be the seminar coordinator of Survey Methods. Tortora, chief of the statistical research division, Bureau of the Census, and Robert M. Groves, from the University of Michigan and the Bureau of the Census, will start off the first night of class.

Some of the topics to be presented and discussed during the ten-week seminar are: questionnaire development, interviewer training, computer-assisted telephone interviewing, cognitive aspects of survey research, longitudinal survey data, and missing data.

The seminar will meet in Capital Gallery, 600 Maryland Avenue, S.W., from 6:00 to 8:00 p.m. on Tuesdays, April 17 - June 19. Tuition, which includes course materials, is \$269.

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Since World War II, Japanese industries have successfully employed the American concepts of total quality management (TQM) and statistical process control in the revitalization of their economy.

Tom O'Rourke, who serves as the TQM facilitator for the joint data system support center of the Defense Communications Agency, will be the instructor of the USDA Graduate School course on Total Quality Management. Students will learn the basic concepts, methods, and processes of TQM.

The evening course will meet in the General Services Administration Building, 7th and D Streets, S.W., April 17-June 19, on Tuesdays from 6:00 to 9:00 p.m. Tuition for the course is \$139.

For more information about these courses and registration information, please call Evening Programs at 202/447-5885.

ANNOUNCEMENTS (continued)

WANTED: Editor

I would like to inform members of the Washington Statistical Society that I will be stepping down as editor of the newsletter at the end of this term; the June issue will be my last.

First, I would like to offer some thanks. During the three years that I have been editor I have received compliments for the continued improved appearance of the newsletter. These compliments all should have been directed towards Jackie Nemes, the real newsletter editor. All of the improvements were her ideas. Every month for the past four years, Jackie has painstakingly put together the newsletter, always with a critical eye with respect to ways in which it could be improved. In addition, Jackie always accepted last minute changes with good humor. Simply put, I could not have done this job without her. We all owe her a great thanks for a superb job. I do not know whether Jackie intends to continue on, but we should do everything we can to keep her.

I would also like to thank Dan Kasprzyk for giving me the opportunity to be editor, and for passing along a variety of important materials for inclusion, and I would like to thank Nancy Kirkendall for getting me involved with the WSS in the first place. I thoroughly enjoyed getting to know the people that make the WSS the success that it is. It was a joy to help promote the superb sessions that people like Rich Allen, Ginny de Wolf, Glenn White, and Kathy Dippo put together.

I would like to apologize for any errors that appeared in the newsletter and to those of you who received the newsletter later than you wished. I also wish that I had been more successful in encouraging people to author lead articles. Here is an area in which the next editor can point to for improvement.

If anyone is interested in getting involved with the WSS, the position of editor is a central one which involves about 4 hours of work a month, 2 more if you attend the business meeting. The WSS is composed of delightful individuals who for no apparent reason work without compensation to put together first rate talks, short courses, and social functions which help develop a sense of community among Washington area statisticians.

If anyone is interested in becoming editor, please call Kathy Dippo at 523-1874, or me, Michael Cohen, at 454-7613.

Thanks again.

Michael Cohen
WSS Newsletter Editor

Survey Design, Methodology and Analysis Conference

The Institute of Statisticians and the International Association of Survey Statisticians are jointly staging an international conference on survey design, methodology and analysis, from July 4 - 7, 1990, at the University of Essex, Colchester, England. Colchester is within easy travelling distance of London.

The conference will be a combination of invited papers, contributed papers, and poster sessions, covering a variety of aspects of the survey process from planning through to analysis and reporting. There will also be demonstrations of computer software and hardware. Topics to be featured at the conference include:

- Automation of the survey process
- Panels and cohorts
- Opinion poll methodology
- Sampling of minority groups
- Non-sampling errors
- Data fusion
- Post-stratification
- Log-linear analysis of survey data
- Multi-level analysis of survey data
- Teaching of survey research methods
- Computer software for surveys

Anyone interested in presenting a contributed paper or a poster should send a synopsis of about 500 words to the Technical Convenors as soon as possible. Application forms to attend the conference may be obtained from the Administrative Convenor. The address for both the Technical Convenors and Administrative Convenor is IoS/IASS 1990 Summer Conference, Institute of Statisticians, 50 Fitzroy Street, London W1P 5HS, ENGLAND.

ANNOUNCEMENTS (continued)

COPAFS to Host Seminar on Quality of Federal Data

In 1975, the Office of Management and Budget [OMB] organized the Federal Committee on Statistical Methodology. Comprised of individuals selected by OMB for their expertise and interest in statistical methods, the committee has during the past fifteen years determined areas that merit investigation and discussion, and overseen the work of subcommittees organized to study particular issues. Since 1978, fifteen Statistical Policy Working Papers have been published under the auspices of the Committee.

On May 23-24, 1990, the Council of Professional Associations on Federal Statistics will host a "Seminar on the Quality of Federal Data." Developed to capitalize on work undertaken during the past dozen years by the Federal Committee on Statistical Methodology and its subcommittees, the seminar will focus on a variety of topics that have been explored in the Statistical Policy Working Paper series. The subjects to be covered will include:

- Survey Quality Profiles
- Statistical Uses of Administrative Records
- Federal Longitudinal Surveys
- Disclosure-Avoidance Techniques
- Approaches to Developing Questionnaires
- Survey Coverage Evaluation
- Data Editing
- Telephone Data Collection
- Computer Assisted Statistical Surveys
- Cognitive Labs
- Quality in Business Surveys
- The Employer Reporting Unit Match Study

Each of these topics will be considered in a two-hour session that will feature formal papers and discussion, followed by informal dialogue among all speakers and attendees.

Seminar participants will include federal statisticians, economists, and managers, as well as others in the broader statistical community who share an interest in the quality of federal data. Users and producers of federal statistics who participate in the seminar will have the opportunity to share experiences and ideas, discuss technical issues, and consider future policy initiatives.

The cost for the two-day seminar will be \$90 per person. Registration will be limited to 200

participants. For further information, contact Katherine Wallman in the COPAFS' office [703/836-0404].

Reports Available in the Statistical Policy Working Paper Series:

- Report on Statistics for Allocation of Funds
- Report on Statistical Disclosure and Disclosure-Avoidance Techniques
- An Error Profile: Employment as Measured by the Current Population Survey
- Glossary of Nonsampling Error Terms: An Illustration of a Semantic Problem in Statistics
- Report on Exact and Statistical Matching Techniques
- Report on Statistical Uses of Administrative Records
- An Interagency Review of Time-Series Revision Policies
- Statistical Interagency Agreements
- Contracting for Surveys
- Approaches to Developing Questionnaires
- A Review of Industry Coding Systems
- The Role of Telephone Data Collection in Federal Statistics
- Federal Longitudinal Surveys
- Workshop on Statistical Uses of Microcomputers in Federal Agencies
- Quality in Establishment Surveys

Copies of these working papers may be ordered from NTIS Document Sales, 5285 Port Royal Road, Springfield, VA 22161 [703/487-4650].

Census Bureau's 1990 Annual Research Conference Announced

The Census Bureau's 1990 Annual Research Conference (ARC 1990) will be held March 18-21, 1990, at the Holiday Inn Crowne Plaza in Arlington, Virginia, only 1/2 mile from National Airport and three blocks from Metro. ARC 1990 will comprise a mix of topics such as reconciling foreign trade estimates between countries, disclosure avoidance, imputation methodology, behavioral research on the census undercount and more. For further information contact Ms. Maxine Anderson-Brown, ARC Conference Coordinator, Office of the Director, Bureau of the Census, Washington, D.C. 20233, 301/763-1150.

ANNOUNCEMENTS (continued)

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 May is as follows:

- | | |
|---------|---|
| 3/14/90 | Introductory demo of Systat - powerful, general stat package |
| 4/18/90 | Advanced features in Systat |
| 5/9/90 | Demo of BASS - BASS programs "look like" SAS programs. A comparison with the much more comprehensive SAS system will be made. |

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.

Shiskin Award for Economic Statistics

Nominations are still invited for the eleventh annual Julius Shiskin Award in recognition of outstanding achievement in the field of economic statistics.

The Award is designed to honor an unusually original and important contribution in the development of economic statistics or in the use of economic statistics in interpreting the economy. The contribution could be in statistical research, in the development of statistical tools, in the application of computer techniques, in the use of economic statistical programs, or in developing public understanding of measurement issues, to all of which Mr. Shiskin contributed. Either individuals or groups can be nominated.

The Award will be presented with an honorarium of \$500 at the Washington Statistical Society Annual Dinner in June 1990. A nomination form may be obtained by writing to the Julius Shiskin Award Committee, c/o American Statistical Association, 1429 Duke Street, Alexandria, VA 22314-3402. Completed nomination forms must be received by April 1, 1990.

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 (Service Fellow-equivalent to GS 11/12/13)

The Agency for Health Care Policy and Research (AHCPR) is seeking a statistician to join the statistical staff of the National Medical Expenditure Study. The position is available for a Ph.D. in statistics/biostatistics or a M.S. with experience in sample design, survey research, sampling, weights development, data analysis for complex surveys, imputation procedures and matching techniques. Familiarity with statistical software packages (SAS, SPSS) is required. Send SF-171 application forms and resume to: Dr. Steven B. Cohen, Senior Research Manager, Agency for Health Care Policy and Research, Room 18A-55, 5600 Fishers Lane, Rockville, MD 20857, or call him at (301) 443-4836 for additional information.

JOB OPENINGS (continued)

Program Officer Epidemiology/Biostatistics

The INSTITUTE OF MEDICINE, NATIONAL RESEARCH COUNCIL, is seeking a staff officer for studies on follow-up of HIV-infected Korean Hemorrhagic fever-infected servicemen. Responsibilities include preparing draft data base and data collection plans, participating in quality control efforts and data collection, performing analyses of data bases, identifying and obtaining relevant data and citations from other studies, preparing draft reports, and assisting in proposal preparation. Requires an MA/MS or equivalent training in epidemiology and biostatistics, at least 5 years epidemiological research experience, data collection, analyses, and data base management in both a mainframe and PC environment (including PC software such as SAS), and demonstrated communication skills. Familiarity with military personnel, health, and clinical records desired. We offer a salary commensurate with experience and an exceptional benefits package. Please send resume in confidence to: IOM/HA 372 (BP), 2101 Constitution Avenue, N.W., Washington, D.C. 20418. EOE.

NATIONAL RESEARCH COUNCIL

Mathematical/Health Statisticians GS-11/12/13

The Statistics Branch of the Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration (FDA) has immediate openings for full-time mathematical (GS-1529) or health (GS-1530) statisticians to provide statistical support for the regulatory and research activities of CDRH. These positions are at the GS-11/12/13 levels depending on qualifications and experience. They are also open to qualified Commissioned Officers in the U.S. Public Health Service. Responsibilities include: evaluating manufacturer's analyses of clinical trials submitted to establish safety and effectiveness of new medical devices; providing risk assessments of medical device or radiation health hazards; and collaborating with scientists and engineers on research projects. Interested applicants should contact: **Harry F. Bushar, Ph.D., Chief, Statistics Branch, CDRH, FDA, 12200 Wilkins Avenue, Rockville, MD 20852** or call (301) 443-7224 for additional information. The FDA is an 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 (MS, MSPH, MPH) **Biostatistician** at the research associate level. Primary responsibility will be to provide biostatistical support for the Division's consulting service in the School of Medicine. Masters in biostatistics/statistics, a minimum of two years of experience, and knowledge of micro-computers and SAS are required. Prior participation in collaborative clinical research and ability to interact with clinical investigators highly desirable. The position is to be filled at the earliest possible date. Please send letter of intent, C.V. and names of three references to: **Leonard Chiazze, Jr., ScD, Professor and Director, Division of Biostatistics and Epidemiology, Room 402 Kober-Cogan Hall, Georgetown University School of Medicine, Washington, D.C. 20007.** Georgetown University is an affirmative action/equal opportunity employer.

JOB OPENINGS (continued)

Survey/Health Statisticians

The Division of Hazard Analysis, Directorate for Epidemiology, of the U.S. Consumer Product Safety Commission has vacancies in the following positions:

Position: STATISTICIAN (Health), GS-1530-13.

The incumbent of this position serves as a statistician responsible for designing, initiating, monitoring and reviewing surveys and special studies that are conducted for injury data analysis for the Agency's Hazard Programs. Plans data editing and processing for computer input, retrieval, and report generation. Uses available computer software, frequently making modifications to create special data files and generate charts, tables, and other graphic displays. Analyzes statistical and related data to identify hazard patterns. Writes reports for assigned projects using the information from this analysis. Serves as expert consultant or advisor in subject matter areas to other Agency units and other agencies.

Position: STATISTICIAN (Survey), GS-1530-9/11/12.

Incumbent develops, implements and administers systematic management, communications, and other procedures between the Divisions within the Directorate for Epidemiology to ensure appropriate statistical studies and reports to support the Agency decision making. In collaboration and consultation with statisticians, epidemiologists, medical officers, and researchers; plans, initiates, directs, and coordinates special studies of injuries attributable to the use of specific consumer products. Uses statistical theories, techniques, and methods to gather and interpret quantified information. Develops national hazard analyses and reports based on the specific environmental, mechanical, and behavioral factors associated with the victim and the product involved.

Interested applicants should call: **Robert E. Frye, Director, Division of Hazard Analysis, Directorate for Epidemiology** at (301) 492-6470, for additional information on the requirements of these positions and how to apply.

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 29 years ago by three statisticians. The current staff of more than 500 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:

Survey Sampling. Experience required in sample design and selection, frames development, weighting, and variance estimation. Must have Masters degree or PhD 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:

WESTAT

Personnel Director

1650 Research Boulevard, Dept. DM
Rockville, Maryland 20850

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JOB OPENINGS (continued)

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 to fill a full-time, non-tenure track position. This person will provide statistical expertise for the research activities of the Lombardi Cancer Research Center. Masters degree in Statistics or Biostatistics and experience with statistical computing (e.g., SAS, SYSTAT) are required. Relevant prior work experience highly desirable. Position to be filled at the earliest possible date. Please send letter of intent, c.v., and names of three references to: **Linda W. Pickle, Ph.D., Director, Biostatistics Unit, Lombardi Cancer Research Center, LCRC-Podium, Georgetown University School of Medicine, 3800 Reservoir Road, N.W., Washington, D.C. 20007.** No phone calls please. AA/EOE.

Faculty Vacancies in Mathematics and Statistics

The American University anticipates Assistant Professor positions available for 1990-1991. One is a tenure-track position in mathematics. A Ph.D. in mathematics and evidence of strong scholarship are required. The second is a tenure-track position in statistics with preferred areas being experimental design or statistical computing. A Ph.D. in statistics with evidence of strong scholarship and an interest in applied statistics are required.

Responsibilities: Undergraduate and graduate teaching, advising scholarship and University service.

Competitive salary will be commensurate with qualifications and experience. Positions are subject to final budgetary approval. Preference will be given to applications received by March 1, 1990.

Send C.V. and names of three references to: **Professor Basil P. Korin, Department of Mathematics and Statistics, The American University, 4400 Massachusetts Avenue, N.W., Washington, D.C. 20016.** An EOE/AA University; minorities and women candidates are encouraged to apply.

Statistician/Health Economist

The Veterans Administration, Washington, D.C., in early 1990, expects to be recruiting for an experienced statistician with an emphasis on individuals with some background in health economics. To inquire about this opportunity, contact Esther Greenfield at (202) 233-3279.



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