NISS
Parameters
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A newsletter from the National Institute of Statistical Sciences

NISS Actively Working on TCRN Project

NISS and Duke University are halfway through the third year of a grant for the NSF-Census Research Network, called the Triangle Census Research Network (TCRN). The NISS-Duke University node is one of eight research nodes around the country that are part of the network.

Many federal statistical agencies are charged with disseminating data to the public for analysis. Obviously, the data should be of the highest possible quality. For example, detectable errors in the data should be corrected. At the same time, agencies must ensure that releases do not violate confidentiality. NISS and Duke have been working on new methodologies and tools that will allow the federal statistical agencies to circulate public use data with high quality and acceptable risks of disclosure. They are also working on developing theory and methodology for synthetic datasets that are based on flexible, nonparametric Bayesian models built for high-dimensional data with multi-level and longitudinal aspects. TCRN is developing approaches for including survey weights in redacted data that improve statistical estimation without leading to disclosures.

Senior fellow and former NISS director Alan Karr is co-PI of TCRN. Postdoctoral fellow Hang Kim, research analyst Satkartar "Saki" Kinney, and senior fellow Larry Cox also work on various aspects of this project. Multiple research papers have been published. A comprehensive list can be found on the NCRN website, www.ncrn.info as well as on the NISS bibliography.

"Agencies are facing big challenges, including limited budgets and declining response rates," said Karr. "The TRCN is creating new methods and tools that help the Census Bureau maintain its traditional data quality standards, and that help users derive maximum value from the data."

TCRN has published several technical reports including "Simultaneous Edit-Imputation for Continuous Microdata," "Why Data Availability is Such a Hard Problem," "Statistical Disclosure Limitation in the Presence of Edit Rules," "The Effect of Statistical Disclosure Limitation on Parameter Estimation for a Finite Population," "Multiple Imputation of Missing or Faulty Values Under Linear Constraints," and "The World's Simplest Survey Microsimulator," all of which can be found on NISS' website.

The group is holding a session at JSM this summer entitled "Bayesian Approaches to Record Linkage." Saki is chairing the panel and Hang is the organizer. Speakers will include Maria De Yoreo, Duke; Neung Soo Ha, NISS; Mauricio Sadinie Garcia-Ruiz, NISS/Duke; Daniel Manrique-Vallier, Indiana; and Terrance Savitsky, U.S. Bureau of Labor Statistics.

NISS Helps Convene Task Force for NASS

This will also appear in the June issue of Amstat News.

Every five years, the U.S. Census of Agriculture enumerates the characteristics of farms and farmers. Planning is underway for the 2017 census. One concern is fully counting two groups that are vulnerable to undercount: women and new/beginning farmers.

To ensure that the 2017 Census of Agriculture does not systematically miss women or new/beginning farmers, the

Panel discussing women and beginning/ small farm representation.

USDA's National Agricultural Statistical Service (NASS) called for an expert panel review. Public comment was invited. NISS was commissioned to convene the panel whose members had a broad range of expertise, including statistics, social science and agriculture. The panel was charged with considering changes to the census questionnaire that would lead to improved accuracy of counts of women and of

(Continued on page 2)

Solomon Remembers How NISS was Started

NISS and its sister organization, the Statistical and Applied Mathematical Sciences Institute (SAMSI) held a special reception for Dan Solomon in March. Solomon is dean of the College of Sciences from 2013 to present, and dean of the College of Physical and Mathematical Sciences (PAMS) since 2000 and is planning to retire this summer. He has been on the NISS Board of Trustees and/or been a Member of the Corporation since NISS was first created 25 years ago. He also helped to create SAMSI and has sat on its governing board since it was created in 2002.

Solomon still plans to remain active with NISS in the future.

At the reception, Solomon recalled how he first heard about the idea of what was to become NISS. "I remember Ingram Olkin and Jerry Sacks cornering me in a hallway, I think it was for the 50th anniversary JSM in Washington DC in August of 1989, to tell me there would be a request for proposals to establish an Institute and that North Carolina ought to develop one."

"The next month, Ingram called Dan Horvitz at RTI to arrange for Ingram and Al Bowker to visit the Triangle as representatives of a joint ASA-IMS committee established to: prepare such an RFP, to encourage the development of proposals, and then to select a preferred site," Solomon said.

Solomon remembered the regular meetings that were held at Research Triangle Institute (now known as RTI International) where the group created a plan and identified sources of support. The group was very excited about the venture and Dan was so excited his whole family started to get involved in the proposal. His wife, Carolyn, and his administrative assistant, Rachel Dupree, did most of the typing of the proposal.

" We often remember where we were and what we were doing when some momentous event occurs. I remember the day on which the joint committee was to meet to select the site from among the competing proposals. I think it was a Saturday. Jonas Ellenberg was on the committee and said that he would call me after the meeting. I was so nervous that I decided to go outside and work some of it off by digging in the backyard waiting for the call. I remember sitting on the back stoop when the phone rang and shouting aloud when Jonas reported that the right to develop NISS was awarded to North Carolina," Solomon shared.

Dan Solomon remembering how NISS was started 25 years ago.

Want to know more about the history of NISS? See the related article on page 6.

Task Force on Counting Women and Small Farmers (Cont.)

new/beginning farmers for the 2017 Census of Agriculture.

The Expert Panel met on April 2-3 at the USDA in Washington, DC. Deputy Secretary of Agriculture Krysta Harden discussed the importance of accurately representing these two groups. Specific charges to the expert panel were: 1) Do the items currently being reported in the Census of Agriculture adequately capture the participation of women and new/beginning farmers? 2) With the data currently being collected, what additional information could/should be reported? 3) Do these items fully meet the needs of stakeholders? and 4) If not, what information should be reported?

Reasons that women and new/beginning farmers are particularly vulnerable to undercount are multiple and differ for the two groups. In the case of new/beginning farmers (those who have farmed for less than 10 years), they are often too new to appear in the list frame or sometimes fail to recognize themselves as "farmers" when the operation is small or is a sideline effort. Also small new farms, like other small businesses, often go in and out of business too rapidly to be counted in an every-five year census.

The vast majority of farms in the United States are family farms, ranging in size from tiny to multi-million dollar operations. The family farm culture often persists in identifying the family patriarch as the principal operator, whether he is working or retired, whether he still lives on the farm or has moved away. Space on the form is limited, so even when a woman fills out the census form she may not self-identify as one of the farm operators. Farming, like any business, requires running the business as well as taking care of crops and managing livestock. Actually the definition of "farmer" is based on having responsibility for major farm operation decisions. Even though not all important decisions are made in the fields or in the barns and pens, a farm woman who is in charge of the business activities may be overlooked in designating the "farm operators."

NASS provided extensive background information on the Census of Agriculture and on the Agricultural Resource Management Survey (an annual USDA survey with more comprehensive data for a sample of farming operations) as well as agriculture census and survey questionnaires from Canada and Europe. Experts on the panel included: Norman Bradburn (NORC-Chicago), Fred Conrad (U Michigan/JPSM), John Eltinge (BLS), Danny Klinefelter (Texas A&M and Texas A&M AgriLife Extension), Jim MacDonald (USDA/ERS), Doris Mold (American Agri-Women), Eileen O'Brien (EIA), Brian Schilling (Rutgers, New Jersey Ag Experiment Station), Alicia Robb (Kaufman Foundation), Nora Cate Schaeffer (U Wisconsin), Rick Valliant (U Maryland/JPSM), Diane Willimack (US Census Bureau), and Anthony Yeboah (North -Carolina A&T). Nell Sedransk (NISS and NCSU) chaired the panel.

The expert panel's report will be published in Fall of 2015. NASS expects to incorporate those recommendations that are feasible into the planning and implementation of the 2017 Census of Agriculture.

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Affiliates Meeting Covers Review Processes, Availability and Quality of Data and More

The following was written by Neung Soo Ha, NISS Postdoctoral Fellow. Photos by NISS Postdoctoral Fellow Hang Kim.

The National Institute of Statistical Sciences (NISS) and the Statistical and Applied Mathematical Sciences Institute (SAMSI) held its annual Affiliates meeting on March 15 at Hyatt Regency Hotel in downtown Miami, Florida. About 30 affiliates and board members attended the meeting. The acting director, Nell Sedransk, provided a brief history of NISS. She explained that the purpose of being an affiliate is about active involvement with the research program development, such as planning conferences and workshops. She finished by talking about the new website for NISS which asked for a participation from every affiliate member.

Sujit Ghosh, SAMSI's deputy director, gave a description about SAMSI and some of its programs, including workshops, working groups, and education and outreach programs for undergraduates and graduates. He showed how affiliates can be involved for developing future programs.

People listening to one of the panel discussions at the affiliates meeting.

The morning session ended with presentations from three post doc researchers from NISS and SAMSI. First presenter was Daniel Taylor-Rodriguez who is a first year post doc from SAMSI. His presentation was about analyzing the jaguar population in Central and South America. Second presenter was Neung Soo Ha, who is a second year post doc from NISS. He presented an analysis of participation rates for health insurance in Florida in 2010. The last presenter was Hang Kim, who is a third year post doc from NISS, and he talked about data confidentiality.

In session 2, there was a panel about effective reviewers. The panel members were: Michelle Dunn, National Institute of Health program director, Sujit Ghosh, a former National Science Foundation program director, and Xihong Lin, professor at Harvard University, School of Public Health.

The goal of the session was to foster a clear understanding of review processes and grant proposals from reviewer and reviewee's point of view. Dr. Dunn described about how the program directors are usually the ones who decide on the funding decisions for the project, yet those people might not be the experts in the field for the proposed program. Thus, when the principal investigators write the proposals, they should always keep in mind about whom would read and make decisions on the project.

The next two panel members talked about the review processes for proposals and journals. Dr. Ghosh said that the reviewing the proposals should focus on overall ideas rather than being technical and should make judgements on contents. Dr. Lin talked about reviewing for journals. It's important for the journal reviewer to see what is novel about the article and to provide constructive criticism on methodologies.

Session 3 was about availability and quality of the data. The panel members were: David Madigan, professor, Columbia University; Patrick Ryan, research associate, Janssen Research and Development; Rima Izem, researcher , Food and Drug Administration (FDA); and John Eltinge, director of research at the Bureau of Labor Statistics (BLS). They all talked about the concept and the availability of "Big" data from different fields, and how the data can be used for analysis and how results can propagate to the population.

The last session was about leadership skills. The panel members were: Sally Morton, professor, University of Pittsburg; Ruth Pfeiffer, director, National Cancer Institute. They talked about what makes an effective leader and agreed that a leader should be a person with a vision and clear objectives. Dr. Morton emphasized that a leader should also have an understanding about both the financial and human resources, and it's important for institutions to have a program for leadership skills for junior researchers. Dr. Pfeiffer described that a person with authority does not equate to a person with leadership, and that a lower ranked person can also have a leadership skills. She also mentioned that a person can acquire leadership skills through proper training.

L-R: Xihong Lin (Harvard), Sujit Ghosh (SAMSI), Michelle Dunn (NIH) and John Eltinge (BLS).

SAMSI postdoc Daniel Taylor Rodriguez talks about analyzing the jaguar population.

NISS News Bytes

NISS postdoc **Hang Kim** is happy to share that he has accepted a tenure-track Assistant Professorship at the Department of Mathematical Sciences, University of Cincinnati, starting this August.

He also gave an invited talk as the keynote speaker at the Survey Methodology Symposium hosted by Statistics Korea, October 16, 2014. The title was "Statistical Disclosure Control (SDC) for Microdata."

Former researcher at NISS **Chunhua "Charlie" Liu** recently published a book entitled "Producing High-Quality Figures Using SAS/Graph® and ODS Graphics Procedures" published by Chapman and Hall/CRC. The book gives statisticians and SAS programmers practical guidance on presenting research data in high-quality figures that meet the publication requirements of academic institutions and various industries, such as pharmaceutical companies, agricultural businesses, and financial organizations. Charlie was at NISS in 2002-2003 working on the data swapping project for the National Center for Education Statistics as part of the Data Quality project.

Shanti Gomatam, who was at NISS as a postdoc from 2001-2003 has just moved to the Federal Drug Administration's Center for Drugs after having spent over 10 years in the Center for Devices. Congratulations on the new move!

Jian (Frank) Zou, who was a NISS postdoc 2009-2011, has a new job at Worcester Polytechnic Institute(WPI) as assistant professor of statistics and as a faculty member in the new Data Science program. "I continue to maintain active research by publishing good quality papers in statistical and interdisciplinary journals, as well as IEEE conference proceedings. I have started to mentor several Ph.D. and Master's students as their dissertation and thesis adviser. I actively serve the department, campus and community by participating in different committees at various levels, such as the data science hiring committee, data science steering committee, chair of the departmental statistics seminar," Frank said.

Zhulin He, who was a postdoc at NISS last year, is currently a Research Assistant Professor at the Center for Survey Statistics and Methodology in the Department of Statistics, Iowa State University. Her research interest lies in complex survey data analysis, causal inference and survival analysis. She is now collaborating with fellow faculty members and staff on statistical design and methodology development related to the National Resources Inventory. In particular, they apply statistical methods on editing of national commodity crop productivity index, and imputing revised universal soil loss equation. She expressed her great gratitude to her mentors and colleagues at NISS, saying that she benefited a lot from her postdoctoral experience which prepared her well for her future statistical research.

Anna Oganyan wrote to tell us she has been with the National Center for Health Statistics (NCHS), one of NISS and SAMSI's affiliates, for the past year and a half. She is enjoying her position at NCHS. Anna was a postdoc at NISS 2004-2007.

NISS Board members **Roger Hoerl** of Union College and **Tim Hesterberg** of Google, along with a group of ASA members chaired by Nicholas Horton, recently updated the ASA Curriculum Guidelines for Undergraduate Programs in Statistical Science. The updated guidelines were adopted in November 2014 by the ASA Board of Directors. Former ASA President Nathaniel Schenker appointed the group to update the curriculum guidelines as they had not been updated since 2000. In particular, he was anxious to ensure that bachelor's graduates had the skills necessary to drive impact in an era of Big Data.

Tim Hesterberg also recently wrote a paper entitled, " What Teachers Should Know about the Bootstrap: Resampling in the Undergraduate Statistics Curriculum" and wrote a blog entry about this paper. You can read it here.

Fritz Scheuren, NISS Board member, gave a talk recently at Harvard on fabrication in surveys, traditionally also called "curbstoning." The session had multiple sponsors, including the local chapters of AAPOR and ASA in Boston. The slides used by all the speakers are found at http://neaapor.org/event-materials/. He also spoke to the UN on March 2 to discuss his work as the Chief Editor of the Statistical Journal of the International Association for Official Statistics (IAOS). Fritz also ran a New Techniques and Technologies for Statistics (NTTS) 2015 session in Brussels in April that he organized on modernizing population censuses -- using administrative records, rather than direct enumeration. Three papers made the recent history of this movement, starting with the history of how the idea started in Denmark and how widely it has grown since. The other two papers are from Ireland and New Zealand.

NISS Board member **Rebecca Doerge** reported that the Purdue Statistics department has added six new faculty members this year! They include: Stanley Ho Chan, Assistant Professor of Electrical and Computing Engineering and Statistics; Shengchun Kong, Assistant Professor of Applied Statistics; Raghu Pasupathy, Associate Professor of Statistics; Vinayak Rao, Assistant Professor of Computational Statistics; Arman Sabbaghi, Assistant Professor of Applied Statistics; and Qifan Song, Assistant Professor of Computational Statistics.

We say goodbye to long-term Board member and former head of the Bureau of Labor Statistics (BLS), **Janet Norwood**, who passed away in March. Janet was 91. She was the first female to lead the BLS. She served on the NISS Board of Trustees from 1992-2000.

Former Postdoc Profile - Matthias Schonlau

Where were you born/where did you grow up?

I grew up in Höxter, Germany, a small town near the northern part of West Germany. The easiest way to find it is to look at a map of Autobahns, and pick the spot that is farthest away from any of them.

Where did you go to school (high school, undergrad and graduate school)?

My high school was in Höxter, Germany. My undergrad was in Ulm, in southern Germany. This was very far away for the local Bavarians and Swabians in Ulm. They called me the guy from south-Sweden.

I then moved to Queen's University in Kingston, Ontario for 8 months. On arrival I realized to my delight I was admitted into a master's program, and later enrolled in a Ph.D. program at the University of Waterloo, Ontario. So I never went back to the University of Ulm to finish my degree. Now, German bureaucracy is very good at keeping accurate records and in those records I am counted as a University drop-out.

What inspired you to go into statistics?

The Master's program at Queen's was a far better match with my interests than the theoretical German math courses. At that time, we used computers in Ulm only for learning programming, not for analyzing data. As a matter of fact, I never saw a data set during my three years of undergraduate studies in Germany.

Who were some of your mentors?

Alan Karr was an early mentor at NISS. Sally Morton was very influential while I was at the RAND Corporation.

How did you hear about NISS?

My advisor Will Welch had worked with Jerry Sacks before. I had heard about NISS all throughout graduate studies.

What did you do when you were at NISS?

I was working on computer intrusion detection and was located at AT&T Labs. Alan and sometimes Jerry would fly out once every month or so to see how things were going. It was great fun learning from everybody around me and probably the ideal position for me.

Matthias Schonlau at JSM 2006 (Photo by Dr. Alan Karr)

What advice would you give someone going into statistics?

Work on problems that you find interesting, and don't worry if it's not a traditional statistics problem. If your problem has a subject matter component, learn about it. Some of the best fun is to discuss problems with non-statisticians from their point of view.

What are you doing now?

After NISS I spent 12 years at the RAND Corporation and developed an interest in survey methodology. This was interrupted by a one year leave of absence which I spent at a survey department at a German institute, DIW, in Berlin, Germany. Now I am a Professor of Statistics in Waterloo, Ontario.

What area(s) of research are you working on these days?

Open-ended questions are usually ignored in surveys or used for the occasional anecdote. A special case is the final comment question "Do you have any other comments?" at the end of many surveys. Nobody really knows what respondents are trying to tell researchers in such questions. I want to give social scientists the tools to analyze those questions. So I am exploring this area using variations on text mining.

Where are you living now?

Waterloo, Ontario

What do you like to do in your spare time?

With two young kids the concept of spare time is evolving. I bike leisurely on the country roads surrounding Waterloo as part of a bike club. I go to French and Spanish meet-up groups in town to chat over coffee - or in my case - tea. I try to catch a good play whenever I can. We are very fortunate to live close to the Stratford festival, possibly the most celebrated repertory theatre festival in Canada.

Are you married/have any children or pets?

I am married to Karla and have a girl and a boy, Elske (4) and Sören (1.5).

And, of course, we have to end with "other comments?

I will be spending a one year sabbatical in Auckland, New Zealand starting in September 2015.

NISS Celebrates its 25th Anniversary

NISS is celebrating its 25th anniversary this year. It is hard to believe so much time has transpired since a group of statisticians, including Ingram Olkin, Jerome Sacks, Nancy Flournoy and Murray Aborn talked about the need to pursue new opportunities for cross-disciplinary collaboration back in the late 1980s. A prospectus was distributed and a selection committee including Albert Bowker, Janet Norwood and Ingram Olkin was formed. The committee looked at several locations and eventually chose to locate the cross-disciplinary institute in Research Triangle Park, North Carolina.

In addition to being a place that had a plethora of statisticians (second only to Washington DC on the East Coast), the proximity of three major research universities and an offer from the Triangle Universities Center for Advanced Studies Incorporated (TUCASI) of a 99-year lease on a 5-acre building site for one dollar a year, along with a six-year startup grant was a good deal.

Daniel Horvitz of Research Triangle Institute (RTI, now known as RTI International) became the interim director of NISS while a search was conducted to find a director. The founding ceremony took place on December 3, 1990.

By 1991, Jerome (Jerry) Sacks was selected as the first director of NISS. He hired Martha Williamson to be his administrative assistant and soon after hired Alan Karr to be the first associate director. The offices were originally located at 200 Park Drive, in space occupied by RTI.

The first large-scale project was Statistical Strategies for Monitoring and Assessing Environmental Changes and Effects, which was funded by the U.S. Environmental Protection Agency (US EPA). Shortly after the EPA project began, NISS landed the Measurement, Modeling and Prediction for Infrastructural Systems project funded by the Mathematical/Physical Sciences and Engineering Directories of the National Science Foundation (NSF).

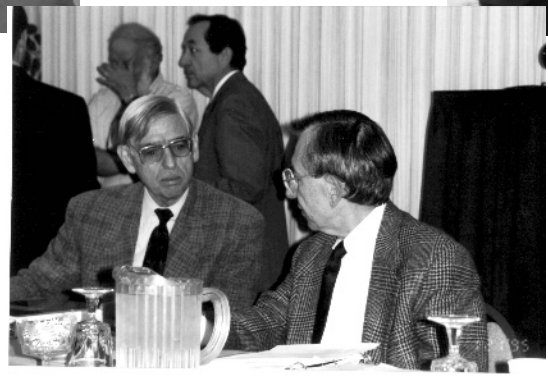
NISS also received a grant in 1993 from NSF that funded the postdoctoral program. The first group of postdocs included Feng Gao, Nancy McMillan, Laura Steinberg, Patricia Styer, Valerie Williams and Haibo Zhou. NISS is proud to have mentored about 70 postdoctoral fellows through the years; many of them are now in prominent positions within their organizations.

The first of many projects with the National Center for Education Statistics also began in 1993. NISS and NCES' partnership is very strong and has produced many important research results.

NISS faced a setback in building its own facility after the North Carolina General Assembly first cut the funding out of its budget in the early 1990s due to the recession. However, after diligent work from Sacks, Horvitz and Karr amongst others, the legislature approved $2.5 million. NISS hired O'Brien Atkins to design the building, broke ground in 1997 and moved into the building at the end of the year.

At a meeting in 1993.

At the groundbreaking for the NISS building in 1997. L-R: Dan Solomon, Alan Karr, Jerry Sacks, Claude McKinney



Jerry Sacks and Dick Cyert from a meeting in 1995.

In 2000, Alan Karr became the second director of NISS after Jerry Sacks retired. Several new projects commenced including one on digital government that explored topics such as confidentiality, data swapping and data quality. NISS worked on complex computer models, which resulted in a Focused Research Group (FRG) award from NSF and several projects funded by General Motors.

NISS' relationship with NCES grew even stronger with a review of NCES' statistical standards, and later convening task forces on high school graduation completion and dropout indicators, whose recommendations were endorsed by the National Association of Governors. The recommendations also were used in President Bush's No Child Left Behind and President Obama's Race to the Top programs. In 2005, NISS partnered with the American Institutes for Research (AIR) in operating the Education Statistics Services Institute (ESSI) and the NAEP Education Statistics Services Institute (NESSI). NISS hired a few research analysts in Washington DC dedicated to this ongoing relationship.

NISS added S. Stanley Young to be the assistant director of bioinformatics. Young helped bring in contracts with several pharmaceutical companies including Eli Lilly and GlaxoSmithKline.

In 2005, NISS hired Nell Sedransk to be an associate director. She was instrumental in helping NISS obtain new grants.

In 2008, NISS expanded its building to accommodate the growth of both NISS and SAMSI. In 2009, NISS had a record number of postdoctoral fellows working on research projects. The organization also initiated a couple of new research projects including an agreement with the National Agricultural Statistics Service (NASS) and another with the National Cancer Institute for the Clinical Proteomic Technology Assessment (CPTAC).

In 2010, NISS expanded by opening an office in Washington DC to have a presence where many of its research projects are being generated. Larry Cox became an assistant director to work on research projects such as the Triangle Census Research Network (TCRN), which is part of the NSF-Census Research Network, which was a project that began in 2012.

As NISS turns 25, it is also transitioning again as Alan Karr left the organization in the fall of 2014 and a search for a new director is underway. The organization, led by Nell Sedransk as acting director, is beginning a new project for NASS and has several grant applications out to begin even more new projects. The Washington DC office is continuing to thrive and grow and the affiliates program has more partners than ever in industry, academia and government.

What will our future bring? You get to help us be a part of that story. We will be the preeminent research organization for cross-disciplinary, cross-sector statistical research.

Jon Kettenring leading a session of a meeting about National Security in 2002.

2008 ribbon cutting of the building expansion. L-R: Jim Berger, SAMSI; Dan Solomon, NCSU; Alan Karr, NISS; Peter March, NSF; and Jim Landwehr., NISS Board chair.

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Government Agencies & National Laboratories

Bureau of Labor Statistics, Washington, DC
Energy Information Administration, Washington, DC
National Agricultural Statistics Service, Fairfax, VA
National Center for Education Statistics, Washington, DC
National Center for Health Statistics, Washington, DC
National Security Agency, Washington, DC
US Census Bureau, Washington, DC

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