We are fortunate to have Constance Citro as this month's Science Policy columnist. Having directed reports on topics ranging from the 2000 Census and Survey of Income and Program Participation to microsimulation models for social welfare programs and the NSF science and engineering personnel data system, Citro is one of the foremost experts on the federal statistical agencies and so carries much authority in making the following recommendations.

~Steve Pierson, ASA Director of Science Policy, *pierson@amstat.org*

The Federal Statistical System: R&D to Bolster a National Treasure

Constance F. Citro, Director, Committee on National Statistics, The National Academies

The U.S. statistical system is a national treasure—essential to maintaining a democratic form of government, facilitating a market-based economy, and nourishing a thriving scientific research enterprise. That treasure, while giving tremendous value, also shows signs of wear and tear. Many parts of the system need refurbishing and bolstering, based not only on a proper appreciation of the resources the system needs, but also on sustained research and development (R&D) to guide improvements and innovations.

What Is the Federal Statistical System?

Before critiquing the system, it is necessary to understand its basic contours. The United States has a highly decentralized system in comparison with other countries. According to Janet Norwood in *Organizing to Count: Change in the Federal Statistical System*, the system grew by adding separate agencies whenever Congress and the executive branch felt the need for systematic information about a particular aspect of the economy, society, or environment to serve specific government programs and constituencies.

At present, the federal statistical system comprises the 14 principal statistical agencies that sit on the Interagency Council on Statistical Policy, chaired by the chief statistician in the Office of Management and Budget (OMB) (see Principal Federal Statistical Agencies). These agencies are overseen by seven congressional appropriations subcommittees, as well as authorizing committees. The system also includes more than 80 research, policy, and program agencies with budgets for statistical activities of $500,000 or more (see Table 1, *www.whitehouse.gov/omb/budget/fy2008/summarytables.html*). Many of the principal agencies direct federal-state cooperative statistics programs. From this system come monthly, quarterly, annual, and less frequent indicators of population, employment, crime, education, health, poverty, prices, gross domestic product, and many other topics (see *www.fedstats.gov*). In addition, the system provides detailed tabulations, often for subnational geographic areas and population groups, and individual-level microdata, either in public-use microdata files suitably processed to protect confidentiality or in a restricted access mode for research use.

The statistical system is a bargain in budgetary terms. In fiscal 2008, funding for the entire system totaled about $5 billion (exclusive of the 2010 Census), of which about 40% represented budgets of the 14 principal agencies. The $5 billion equaled only about $16 for every man, woman, and child and

only about 0.02% of the total budget authority of about $2.5 trillion for the entire federal government. And the dedicated civil servants at the statistical agencies get the job done—key indicators come out on schedule, data collection proceeds for a wide array of censuses and surveys, much important methodological research is carried out, and significant innovations are made.

What Is the Problem?

Yet, all is not well. The budget authority for the 14 principal agencies (excluding the 2000 and 2010 censuses) has remained almost flat in real terms over the last 10 years. Most agencies have had to carry out their responsibilities over the past decade with the same or fewer staff, even as their responsibilities have grown along with the size and complexity of the population and economy (see Appendix A in *Principles and Practices for a Federal Statistical Agency, 4th ed.*).

Adding to staffing problems is a growing wave of senior-level retirements coupled with hurdles to recruitment, such as the inability to hire noncitizens. Consequently, despite best efforts, important data series have been compromised in their relevance and usefulness. Andrew Reamer's column in the March issue of *Amstat News* provides examples—and others could be added—of series that have been reduced in sample size, scope, or periodicity or for which the underlying design has not been reviewed or updated in 10 or 20 years, or even longer. Coordination of data series across agencies on such topics as income and health insurance coverage is not as thoroughgoing as it could be; methodological research on common problems, such as increasing rates of unit and item nonresponse in key surveys, is not as far advanced as it could be, and innovation in concepts, measures, and methods has often lagged behind social, economic, and technological change.

Part of the Solution—More Money

The problems for the statistical system are well known by the agencies, which, with the Statistical and Science Policy Office in OMB, are striving hard—and doing a remarkable job in many instances—to make bricks without straw. While money may not be everything, it is undoubtedly true that the statistical system needs significantly more funding than it currently receives if it is to meet the information needs of government, business, academia, and the public at large.

Realistically, the chances of sizeable increases in statistical agency funding in the current economic climate are not high compared with other national needs. Yet, the positive statements made by the new administration about the importance of scientific evidence and the role of government give rise to hope that statistical agency appropriations will grow in recognition of the fundamental importance of objective, high-quality information for public policy analysis, research, and decisionmaking.

Principal Federal Statistical Agencies

Bureau of Economic Analysis (U.S. Department of Commerce)

Bureau of Justice Statistics (U.S. Department of Justice)

Bureau of Labor Statistics (U.S. Department of Labor)

Bureau of Transportation Statistics (U.S. Department of Transportation)

U.S. Census Bureau (U.S. Department of Commerce)

Economic Research Service (U.S. Department of Agriculture)

Energy Information Administration (U.S. Department of Energy)

National Agricultural Statistics Service (U.S. Department of Agriculture)

National Center for Education Statistics (U.S. Department of Education)

National Center for Health Statistics (U.S. Department of Health and Human Services)

Office of Environmental Information (U.S. Environmental Protection Agency)

Office of Research, Evaluation, and Statistics (U.S. Social Security Administration)

Science Resources Statistics Division (National Science Foundation)

Statistics of Income Division (U.S. Treasury Department)

Another Part of the Solution—Goal-Oriented Research and Development

More funding is not the whole answer. How agencies use their current funding, let alone funding increases, also needs to be smarter, as do the efforts of constituencies to garner support for statistical agencies with Congress. In particular, for the statistical system as a whole, too little funding and staff are devoted to sustained R&D within and across agencies, which is essential for keeping data series as up to date as possible in terms of relevance, quality, timeliness, usability, and value for the dollars invested.

Of course, many agencies engage in significant R&D efforts, but from the perspective of the Committee on National Statistics, too many data programs are on autopilot and, consequently, lag behind in their efficiency and effectiveness. In addition, too many R&D efforts are scattershot and not focused on identifying the most important threats to data quality, relevance, and timeliness and the best methods to surmount them. Steps that would increase the benefit-cost ratio from statistical agency R&D include the following:

- Allocating a meaningful fraction of the budget for major continuing data series to R&D

ASA Science Policy Actions

The ASA signs letters in support of funding for 2010 Census, NSF, and physical science research funding

The ASA initiates letter of professional organizations in support of newly reintroduced "Maloney Bill" (H.R. 1254) to make the U.S. Census Bureau independent and give the director a fixed, five-year term

The ASA joins other professional organizations in support of the nomination of Robert Groves for director of the U.S. Census Bureau

The ASA joins dozens of groups to sign letter to top officials in the Obama administration urging that they end the practice of "ideological exclusion"

Sign-up for JSM congressional visits is now open at *www.amstat.org/meetings/jsm/2009/index.cfm?fuseaction=capitolhill.*

- Including the resources in the R&D budget for a data series to achieve the following:
  - Regularly monitor key indicators of potential problems, such as item nonresponse rates, time between data collection and release, and per-interview cost
  - Monitor key indicators not only in the aggregate, but also for geographic areas, data collection offices, and population subgroups to identify potential trouble spots
  - Evaluate the extent of problems and their effects on data use
  - Conduct research on ways to address problems at the source (such as improved question design or use of administrative records in place of questions) and ways to address problems in estimation (such as improved imputation methods or preliminary data releases to improve timeliness)
  - Conduct feasibility research on how best to scale up test results to full-scale implementation
  - Develop methods for phasing in improvements to facilitate data use (such as running old and new data series concurrently)
- Including in the R&D budget for individual series a share of resources to support agency-wide R&D efforts on common problems
- Regularly revisiting short-term and longer-term priorities for R&D to focus attention on the most important problems, using prior research findings and input from research staff, program staff, and data users
- Setting implementation goals so R&D efforts either bear fruit in a timely manner or resources are allocated elsewhere
- Rotating research and program staff so each gets a feel for the work of the other
- Working closely with leading investigators outside the agency—not reinventing the wheel
- Making R&D a mission-critical function with strong support from agency leadership

Having goal-oriented R&D programs for the major data series at an agency could mean funding is not sufficient for all its current programs. In that case, canceling a program may well be preferable to continuing all programs when none has sufficient R&D resources to identify, let alone ameliorate, major problems that may adversely affect relevance, data quality, timeliness, or usability. Goal-oriented R&D along the lines outlined above also has the benefits of helping to energize agency staff and attract new staff.

The Statistical and Science Policy Office could help bolster sustained R&D efforts for major data series by expecting agencies to include R&D in budgets and supporting R&D funding within OMB; asking the OMB-chaired Federal Committee on Statistical Methodology to establish action-oriented working groups on high priority, system-wide problems to review the literature, document best practices, and identify priorities for additional research; and urging the Interagency Council on Statistical Policy to set system-wide priorities for needed R&D.

Finally, recognizing that the statistical system cannot sustain goal-oriented R&D without the support of a Congress that recognizes its value and that Congress is unlikely to support R&D without strong constituency input, data users and supporters of programs that rely on statistical information should do the following:

- Become knowledgeable of the strengths and weaknesses of relevant data series
- Become educated about the importance of R&D for improving data series and keeping them up to date
- Educate members of Congress and their staffs about the need to include sufficient R&D funding in every statistical budget as a fundamental element, not a frill

The new administration, by working with Congress and constituents who care about objective, high-quality statistics to bolster the federal statistical system and statistical R&D, will take a major step in strengthening the foundation for evidence-based policy. ■