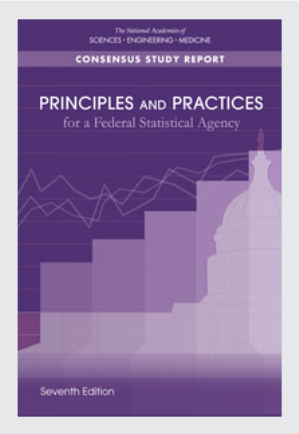

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for a Federal Statistical Agency

SEVENTH EDITION

Brian A. Harris-Kojetin and Constance F. Citro, *Editors*

Committee on National Statistics

Division of Behavioral and Social Sciences and Education

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DEDICATION

This seventh edition of *Principles and Practices for a Federal Statistical Agency* is dedicated to Lauren D. Harris-Kojetin, beloved wife of Brian A. Harris-Kojetin, and Joseph F. Citro, beloved husband of Constance F. Citro. Lauren and Joe both passed away in 2020 while this edition of *P&P* was being prepared. They provided the love, support, and light that enriched our lives beyond measure and enabled us to fulfill our careers.

PREFACE

The Committee on National Statistics (CNSTAT) is a standing unit of the National Academies of Sciences, Engineering, and Medicine, established in 1972 to provide an independent, objective resource for evaluating and improving the work of the decentralized federal statistical system. Under the terms of the 1863 congressional charter to the National Academy of Sciences to provide advice to the government on scientific and technical matters, CNSTAT has assessed a wide range of statistical methods and data sources for information that the public and policy makers need. It has evaluated numerous federal censuses, surveys, and other statistical programs and addressed a range of statistical policy issues, such as the independence required for statistical agencies to be credible with policy makers, data users, and the public, regardless of persuasion or party.

The origins of *Principles and Practices for a Federal Statistical Agency* (commonly known as *P&P* or the "purple book") date back to the late 1980s and early 1990s. During legislative debates over the (unsuccessful) establishment of a Bureau of Environmental Statistics and the (successful) establishment of a Bureau of Transportation Statistics, congressional staff asked CNSTAT for advice on what constitutes an effective federal statistical agency. CNSTAT prepared a document of high-level guidance, launching the first edition of *P&P* in 1992. It defined and discussed reasons for the establishment of a statistical agency, identified three fundamental principles for an effective statistical agency (relevance to policy, credibility with data users, and trust of data providers), and identified 11 practices to enable a statistical agency to put these principles into action and adhere to them.

The 1992 document served a useful purpose for the federal statistical community. However, it has also needed to be updated to respond to changes in the political, economic, social, and technological environment for statistical agency work. CNSTAT released the second edition of *P&P* in 2001, and it has released subsequent editions every 4 years to be available to new appointees and others at the beginning of a presidential term of office. CNSTAT adopted this schedule recognizing that officials in the various agencies that house federal statistical agencies are not always cognizant about how to be trusted as credible sources of objective, relevant, accurate, and timely statistics. *P&P* is designed to assist them, as well as the statistical agencies' leadership and staff, to be fully aware of the standards and ideals that are fundamental to the agencies' work. Stakeholders, Congress, the Government Accountability Office, and the Office of Management and Budget have also found *P&P* useful for such purposes as reviewing agency programs and setting standards.

CNSTAT has made some changes to the principles and practices over time. The first three editions included three principles. In light of threats to independence, the fourth edition elevated statistical agency independence from a practice to a fourth principle. The number of practices rose from 11 to 13 across the first six editions: conclusions and recommendations in CNSTAT study reports led to adding or rewording some practices.

This seventh edition contains five principles: CNSTAT added a new principle on Continual Improvement and Innovation, which has been a strong theme in a number of practices, to recognize its importance for the effective functioning of statistical agencies in the 21st century. We also streamlined the list of practices, reducing their number to 10 (from 13) by combining a few that were closely related. In Part I, we discuss the value of national statistics, uses of statistics for the public good, and the role of federal statistical agencies. In Part II we explicate and comment on each principle, and in Part III we do the same for each practice. Three appendixes (available online) follow: two provide updated information on legislation and regulations that govern federal statistics and the organization of the federal statistical system; a new appendix provides information on international frameworks relevant for U.S. statistical agencies.

We thank the many people who contributed their time and expertise to the preparation of this report, including all the current members of CNSTAT. We are most appreciative of their cooperation and assistance.

We are particularly grateful to the CNSTAT staff, including director Brian Harris-Kojetin, senior scholar Constance F. Citro, and program associate Rebecca Krone. We are also indebted to many others who offered valuable comments and suggestions, too numerous to mention.

This Consensus Study Report was reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise. The purpose of this independent review is to provide candid and critical comments that will assist the National Academies of Sciences, Engineering, and Medicine in making each published report as sound as possible and to ensure that it meets the institutional standards for quality, objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process.

We thank the following individuals for their review of this report: **Mary Jo Hoeksema**, Government and Public Affairs, Population Association of America/Association of Population Centers; **Thomas A. Louis**, Department of Biostatistics (retired), Bloomberg School of Public Health, Johns Hopkins University; **Colm A. O'Muircheartaigh,** Harris School of Public Policy Studies, The University of Chicago; **Steven Pierson,** Science Policy, American Statistical Association; **Nancy A. Potok,** Chief Statistician (retired), Office of Management and Budget; **Katherine K. Wallman,** Chief Statistician (retired), Office of Management and Budget.

Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations of this report nor did they see the final draft before its release. The review of this report was overseen by Alicia Carriquiry, Department of Statistics, Iowa State University. She was responsible for making certain that an independent examination of this report was carried out in accordance with the standards of the National Academies and that all review comments were carefully considered. Responsibility for the final content rests entirely with the authoring committee and the National Academies.

Finally, we thank the following federal agencies, which support the Committee on National Statistics directly and through a grant from the National Science Foundation, a cooperative agreement from the National Agricultural Statistics Service, and several individual contracts:

- National Science Foundation: Methodology, Measurement, and Statistics Program; National Center for Science and Engineering Statistics
- Social Security Administration: Office of Research, Evaluation, and Statistics
- U.S. Department of Agriculture: Economic Research Service, National Agricultural Statistics Service
- U.S. Department of Commerce: Bureau of Economic Analysis, U.S. Census Bureau
- U.S. Department of Education: National Center for Education Statistics
- U.S. Department of Energy: Energy Information Administration
- U.S. Department of Health and Human Services: Agency for Healthcare Research and Quality, National Center for Health Statistics, National Institute on Aging, Office of the Assistant Secretary for Planning and Evaluation
- U.S. Department of Housing and Urban Development: Office of Policy Development and Research
- U.S. Department of Justice: Bureau of Justice Statistics
- U.S. Department of Labor: Bureau of Labor Statistics
- U.S. Department of Transportation: Bureau of Transportation Statistics
- U.S. Department of the Treasury: Statistics of Income Division, Internal Revenue Service.

Without their support and their commitment to improving the national statistical system, the committee work that is the basis of this report would not have been possible.

Robert M. Groves, *Chair*
Committee on National Statistics

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SUMMARY

FROM its first edition in 1992 to this seventh edition, *Principles and Practices for a Federal Statistical Agency* is intended to support the invaluable role of widely available, trustworthy, relevant, accurate, and timely government statistics. Such statistics are essential not only for policy makers and program administrators at all governmental levels, but also for individuals, households, businesses, and other organizations to make informed decisions and for scientists to add to knowledge. Even more broadly, the effective operation of a democratic system of government depends on the unhindered flow of impartial, scientifically based statistical information to its citizens on a wide range of issues, including employment, growth in the economy, the cost of living, crime victimization, family structure, physical and mental health, educational attainment, energy use, and the environment.

In the United States, more than a dozen federal statistical agencies,[1] including the Bureau of Labor Statistics and the U.S. Census Bureau, are the entities whose principal function is to collect, compile, analyze, and disseminate information for such statistical uses as monitoring key economic and societal indicators, allocating legislative seats and government funds, evaluating programs, and conducting scientific research. Although statistical agencies provide objective and impartial information that

[1]The United States has a very decentralized statistical system. Depending on the threshold of funding used to define statistical activity, there are more than 60 (and possibly more than 100) additional agencies that conduct statistical activities.

informs policy makers, they should not advocate policies or take partisan positions that would undercut public trust and the credibility of the statistics they produce.

FIVE PRINCIPLES

Federal statistical agencies are coordinated by the U.S. Office of Management and Budget and are subject to government regulations and guidance, but their mission and contributions to the public good are best seen as resting on five well-established and fundamental principles, as follows.

Principle 1: Relevance to Policy Issues and Society

Federal statistical agencies must provide objective, accurate, and timely information that is relevant to important public policy issues. To provide relevant statistics needed by policy makers in Congress, the executive branch, and other users, statistical agencies must have a solid understanding of the public policy issues, federal programs, and information needs in their domains. To ensure that they are providing relevant information, statistical agencies need to reach out to a wide range of their data users, including staff in their own departments and other federal departments who use their data, members and staffs of Congress, state and local government agencies, academic researchers, businesses, and other organizations. However, statistical agencies should be careful not to become involved with policy development or implementation, as those activities could affect their ability (or the perception of their ability) to conduct impartial and objective statistical activities.

Principle 2: Credibility Among Data Users and Stakeholders

Federal statistical agencies must have credibility with those who use their data and information. The value of statistical agencies rests fundamentally on the accuracy and credibility of their data products. Because few data users have the resources to verify the accuracy of statistical information, users rely on an agency's reputation to disseminate high quality, objective, and useful statistics in an impartial manner. Agencies build and maintain respect and trust through clear public commitments to professional practice and transparency in all that they do, including informing users of the strengths and weaknesses of their data.

Principle 3: Trust Among the Public and Data Providers

Federal statistical agencies must have the trust of those whose information they obtain. Because virtually every person, household, business, state or local government, or organization is the subject of some federal statistics, public trust is essential for the continued effectiveness of federal statistical agencies. Individuals and entities providing data directly or indirectly to federal statistical agencies must trust that the agency is collecting information that serves a public purpose and that the agency will appropriately handle and protect their information. Federal statistical agencies not only have legal and ethical obligations that require them to fulfill these expectations, but they also have the obligation to effectively communicate the value of the data they collect and the methods they use for obtaining and protecting them. An effective statistical agency has policies and practices to instill the highest possible commitment to professional ethics among its staff and builds a culture of the confidentiality of its data and respect for those who provide data.

Principle 4: Independence from Political and Other Undue External Influence

Federal statistical agencies must be independent from political and other undue external influence in developing, producing, and disseminating statistics. Statistical agencies must be impartial and execute their missions without being subject to pressures to advance any political or personal agenda. They must avoid even the appearance that their collection, analysis, and reporting processes might be manipulated for political or other purposes or that individually identifiable data might be obtainable for nonstatistical purposes. Only in this way can statistical agencies serve as trustworthy sources of objective, relevant, accurate, and timely information. Protection from undue outside influences requires that statistical agencies have authority to make professional decisions concerning their programs, including authority over the selection and promotion of staff; the processing, secure storage, and maintenance of data; and the timing and content of data releases, accompanying press releases, and documentation.

Principle 5: Continual Improvement and Innovation

Federal statistical agencies must continually seek to improve and innovate their processes, methods, and statistical products to better measure an ever-changing world. Federal statistical agencies and programs cannot be static but must continually work to create reliable information on new policy questions, adopt improvements in all aspects of their operations, and respond to user demands for more timely and granular information. An effective statistical agency not only seeks out and evaluates potential new data sources that could provide useful information, but also tests and implements new methods to enhance the cost-effectiveness of its data collection, processing, and dissemination processes. It works closely with its data users to identify potential new statistical products that are needed.

TEN PRACTICES

In order to fulfill these five principles, 10 practices are essential for statistical agencies to adopt. These practices represent the ways and means of making the basic principles operational and facilitating an agency's adherence to them. Practices 1 to 4 pertain to an agency's operations, internally and within the federal government; practices 5 to 7 bridge internal operations and external relations with the professional statistical and research communities; and practices 8 to 10 focus externally on an agency's key constituents: data users and data providers. These are the 10 practices:

1. A Clearly Defined and Well-Accepted Mission
2. Necessary Authority and Procedures to Protect Independence
3. Commitment to Quality and Professional Standards of Practice
4. Professional Advancement of Staff
5. An Active Research Program
6. Strong Internal and External Evaluation Processes for an Agency's Statistical Programs
7. Coordination and Collaboration with Other Statistical Agencies
8. Respect for Data Providers and Protection of Their Data
9. Dissemination of Statistical Products That Meet Users' Needs
10. Openness About Sources and Limitations of the Data Provided

The principles and practices in this report remain guidelines, not prescriptions. Nevertheless, by adhering to the principles and following the practices, a federal statistical agency will be well positioned to provide the relevant, accurate, timely, credible, and trustworthy statistical information that policy makers and the public require.

The Committee on National Statistics (CNSTAT) of the National Academies of Sciences, Engineering, and Medicine first developed these principles and practices, beginning in 1992, as part of its mission to provide an independent review of federal statistical activities. Acts of Congress and statistical policy directives issued by the U.S. Office of Management and Budget have codified many of these principles and practices. Most recently, the Foundations of Evidence-Based Policymaking Act of 2018 expanded the role of heads of the principal statistical agencies in their departments and prescribed an enlarged role for federal surveys and administrative records to be used in support of sound policy making.

CNSTAT intends for its principles and practices to assist statistical agencies and units, as well as other agencies engaged in statistical activities, to carry out their responsibilities to provide accurate, timely, relevant, and objective information for public and policy use. It also intends this report to inform legislative and executive branch decision makers, data users, and others about the characteristics of statistical agencies that enable them to serve the public good.

PART I
Introduction

THE VALUE OF NATIONAL STATISTICS IN THE UNITED STATES

PEOPLE in the United States and other countries rely on data and statistics to live their lives, often without realizing it. They may check weather, traffic, or air quality reports and other readily available data to guide how they go about their day. They may use data to inform key family and personal decisions, such as where to live, based on information about housing, crime, schools, and jobs. In their own jobs, people may use data to guide policies and programs, make investment decisions, plan for the future, and develop knowledge.

People in a democracy also rely on accurate and trustworthy information to carry out their civic duties and maintain a government that protects and serves their interests. An informed citizenry must judge the merits of government actions through periodic votes for elected officials, and to become informed it depends on widely distributed information available both directly and through the media. Making every vote count requires that lawmakers have accurate population statistics for drawing up legislative districts. Identifying problems to address and opportunities to pursue requires that policy makers in both the governmental and private sectors have objective and timely information on the society and economy. Adding to knowledge about the society and the economy, in turn, requires detailed information for researchers to analyze in a wide range of fields.

The cornucopia of information that people use in all these ways and often take for granted comes from a wide range of sources—censuses, surveys, sensors, commercial transactions, and records of all kinds. The information is made available not only by governmental entities, but also

by businesses, the media, and other organizations in tables, graphs, maps, datasets, and other formats available today through the Internet and other modes of access.

To be useful, information on a nation's society and economy must be credible and trustworthy. The consumers of the information must believe that the information is objective and not affected by any political or ideological perspective concerning the phenomena being measured. They must trust that the technical expertise of the producers of the information is sufficient to produce statistics that will meet their needs, which include consistency so that one can judge whether things are getting better or worse over time and can compare different parts of the country.

Who produces such information to power the myriad needs and requirements of democracies and to inform societal and economic planning, decision making, and knowledge generation? Many actors provide useful information, but, across the world, central governments have the role of producing key national statistics in ways that maximize their credibility and utility to inform policy makers and the public.

The United Nations General Assembly in 2014 formally endorsed *Fundamental Principles of Official Statistics* (see Appendix C).[1] The first of these principles accords worldwide recognition to the indispensable role of official statistics:

> Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information (United Nations Statistical Commission, 2014, March 3, p. 1-2).

In that regard, national statistical information forms a data infrastructure that resembles the role of physical infrastructure for a nation, like interstate highways, national defense assets, interstate utility grids, and basic scientific research. All of these national investments serve the common good. Their benefits are sometimes relatively small for each

[1]These were originally adopted by the United Nations Statistical Commission in 1994; see Appendix C.

individual, but they are essential to the welfare of the whole country. In some sense, these infrastructures are among the threads of the fabric of society.

In their day-to-day lives, most people do not think about the benefits of highways and bridges—until they exhibit a problem, perhaps being closed for repairs, or worse, when they fail and collapse. So too, when statistical information is disrupted or compromised, its value is vividly illustrated by decisions that, in retrospect, appear misguided. As just one example, inadequate information that results in underestimating the depth of a looming recession or, conversely, an economic boom, can lead to less-than-optimal policies to rekindle or rein in growth (see Reamer, 2014).

How Statistical Information Powers Government and Policy Making

Following are a few examples of the many ways that statistical information provided by federal agencies serves the nation.

Informing political representation. The U.S. Constitution mandates a decennial census of the population every 10 years (the first census was taken in 1790) for determining the allocation of seats in the U.S. House of Representatives among the states. Reapportionment in turn triggers the redistricting process, by which states, using census data, redraw the boundaries of congressional districts to accommodate changes in the number of seats and in the geographic distribution of the population. States and many local governments also use census and other data to reapportion and redistrict their legislative bodies.

Informing economic decision making. Federal statistics drive important decisions. The federal government currently labels 36 statistics—such as gross domestic product (GDP), the employment situation, monthly wholesale trade, weekly natural gas storage, crop production, consumer credit, and others—as "principal federal economic indicators."[2] The Office of Management and Budget's (OMB's) *Statistical Policy Directive No. 3* requires these indicators to be published by the cognizant statistical agency on specified release dates under procedures designed to protect the integrity and credibility of the estimates and ensure that they are not subject to manipulation and do not give any user an unfair advantage,

[2]See Statistical Policy Directive No. 3 in Appendix A.

so that businesses and the public can be confident the statistics are objective (see Appendix A; and Practice 2 in Part III).

The indicators often lead the headlines upon their release, contribute significantly to public and private sector decision making, and help inform the public as to where the nation has been and where it is going. They and many other federal social and economic statistics have real consequences: the Consumer Price Index (CPI) determines annual cost-of-living adjustments to Social Security monthly benefits, which in May 2020 amounted to $89.9 billion provided to 69.7 million people.[3] Annual changes in the CPI also affect commercial and residential rents, public- and private-sector wages, and components of the federal income tax code. Annual changes in prices for geographic areas enter into local decisions, and monthly changes in prices are a major input into Federal Reserve Board decisions on short-term interest rates.

Informing business decisions. The U.S. and global economies are powered by data.[4] Whether starting or expanding a business, exploring prospects for different occupations, anticipating demand for products, projecting the labor force, evaluating effects of trade patterns, targeting investments, forecasting energy prices, planning for hurricanes, funding pension plans, devising better ways to serve customers with disabilities, or finding suppliers—business owners and community members rely every day on data produced by the federal government. Beginning in the 1960s, data provided by the U.S. government in computer form spurred the development of a new sector: firms that provide government-data related products to households, businesses, and organizations. This sector alone generates as much as $221 billion of revenue each year, which by itself is much more than the federal government pays to produce the statistics. There are countless other uses by businesses and governments (see, e.g., Hughes-Cromwick and Coronado, 2019; U.S. Department of Commerce, 2014).

Helping federal, state, and local governments take action. Federal statistics provide high-quality, comparable information across the country. The American Community Survey (ACS), for example, provides key information that states and local governments use for disaster preparedness, economic development and workforce planning, public

[3]See https://www.ssa.gov/policy/docs/quickfacts/stat_snapshot/index.html?number. [February 2021]

[4]See https://www.weforum.org/agenda/2016/01/a-global-economy-powered-by-data. [February 2021]

health surveillance, and regional transportation planning (see National Academies of Science, Engineering, and Medicine [NASEM] 2019a; National Research Council [NRC] 2013a, 2007b). Data from the decennial census and the ACS are used to distribute hundreds of billions of dollars to states and localities for Medicaid, housing programs, education, food assistance, veterans programs, transportation programs, safety, and many other programs.[5]

Monitoring the social and economic health of the nation, states, and localities. Regularly published social and economic indicators from statistical agencies are widely cited in the media and consulted by the public to identify trends and, when estimates are available for state and local areas, to compare across areas. Some examples include *America's Children: Key National Indicators of Well-Being* from the Interagency Forum on Child and Family Statistics; the *Condition of Education* from the National Center for Education Statistics; *Criminal Victimization* from the Bureau of Justice Statistics; *Statistics of Income* from the IRS; *Income and Poverty in the United States* from the U.S. Census Bureau; and *Science and Engineering Indicators* from the National Science Board and National Center for Science and Engineering Statistics.[6]

Providing empirical evidence for developing and evaluating federal, state, local, and private-sector programs. Data on the condition of housing and finance to inform housing policy come from the ongoing American Housing Survey (see NRC, 2008c). Statistics on the various types of energy used for heating, cooling, information technology, and other uses are provided by energy consumption surveys for commercial buildings and for residences (see NRC, 2012).

Providing input to important social science research that, in turn, informs the public and policy makers. Many policy-relevant insights have resulted from analysis of long-running federally funded surveys, including longitudinal surveys that follow individuals over time (see, e.g., NRC, 2005d). Some examples: the National Center for Education Statistics runs a number of longitudinal surveys following children through K–12 education and postsecondary education and beyond to look at the

[5]See https://gwipp.gwu.edu/counting-dollars-2020-role-decennial-census-geographic-distribution-federal-funds#Briefs. [February 2021]

[6]Websites for the cited series are, in the order cited: https://www.childstats.gov/americaschildren/; https://nces.ed.gov/programs/coe/; https://www.bjs.gov/index.cfm?ty=tp&tid=9; https://www.irs.gov/statistics; https://www.census.gov/library/publications/2019/demo/p60-266.html; and https://ncses.nsf.gov/pubs/nsb20201. [February 2021]

transitions from high school and college to the labor force; the Bureau of Labor Statistics' National Longitudinal surveys follow young adults through their working lives to look at career paths; and the Health and Retirement Study of the University of Michigan, supported by the National Institute on Aging and the Social Security Administration, follows older adults through retirement to look at health and well-being.[7]

The Costs and Benefits of Federal Statistics

The cost of federal statistical programs is a tiny fraction of overall U.S. federal spending. Even including the once-a-decade population census, the combined budgets for all the major statistical agencies and other statistical programs in federal agencies in fiscal 2020 totaled $11.9 billion.[8] This amount is about 0.2 percent of the total budget of about $4.8 trillion for the federal government, and it is equivalent to about $36 for every U.S. resident.[9]

The benefits from this investment in federal data collection and statistics permeate every corner of the United States. It is impossible to capture the full economic and societal value of having reliable data on economic, social, health, agricultural, industrial, and environmental characteristics of the country.[10] Some estimates have given the annual value of making federal data "open," that is, freely available to the public from statistical and program agencies, as hundreds of billions of dollars.[11] The United Nations (2018) report, *Recommendations for Promoting, Measuring, and Communicating the Value of Official Statistics*,[12] argued that official statistics have value far beyond their dollar worth. If the federal government

[7]See https://nces.ed.gov/surveys/; https://www.bls.gov/nls/; and http://hrsonline.isr.umich.edu/. [February 2021]

[8]See https://www.whitehouse.gov/wp-content/uploads/2020/12/statistical-programs-20192020.pdf. OMB includes all statistical programs with at least $3 million in estimated or direct funding in FY 2017, FY 2018, FY 2019, or FY 2020. [February 2021]

[9]Based on a total population of 330,000,000.

[10]https://www.commerce.gov/sites/default/files/migrated/reports/the-value-of-the-acs.pdf tells how the American Community Survey is used by federal, state, and local governments and by businesses, school districts, and academic researchers. A panel from the American Enterprise Institute (https://www.aei.org/wp-content/uploads/2017/02/170302-AEI-Vital-Role-of-Government-Statistics.pdf) discussed the immense value of government data for commerce, as well as the private companies that, essentially, repackage and sell government data. [February 2021]

[11]Making data collected by the federal government available to the public at no cost in a machine-readable format without restrictions on its use is referred to as "open data," and the value has been noted by the following: http://reports.opendataenterprise.org/2017OpenDataRT1-EconomicGrowth.pdf. [February 2021]

[12]See https://www.unece.org/fileadmin/DAM/stats/publications/2018/ECECESSTAT20182.pdf. [February 2021]

did not collect such data, the private sector might fill the breach—but likely at a greater cost to obtain data of comparable quality because response rates would be lower compared with federal surveys, with no guarantee of continuance or continuity, and possibly with a two-tier system whereby only those who could pay would have access to the data they need.

The fundamental characteristic of federal statistics as a public good (see Box I-1) and the demonstrated policy, planning, research, and informational value of today's portfolio of statistical programs justify adequate budgets for federal statistics. Such funding needs to provide for research and development for continuous improvement in relevance, accuracy, timeliness, and accessibility (see Practice 5). In turn, it is incumbent on federal statistical agencies to communicate the value of their programs to policy makers and others and to analyze the cost-effectiveness and value of their programs on a continuing basis so that they can ensure the best return possible on the tax dollars invested in them.

BOX I-1
FEDERAL STATISTICS AS A PUBLIC GOOD

Familiar public goods, which benefit everyone in a country but cannot readily be provided through the marketplace, include the judiciary and the national defense. Formally, a public good has two components (see Gravelle and Rees, 2004). First, a public good must be nonrivalrous—that is, when one individual consumes it, there is no actual or potential reduction in the amount available for another individual to consume. A public good must also be nonexcludable that is, it must be difficult for a business or other private entity to try to establish a market for such a good that is open only to those willing to pay the price. Federal statistics are essentially a public good—they satisfy the first component and practically speaking satisfy the second (see discussion in NRC, 1999, Ch. 2).

In regard to the second component, there are many examples of statistical information provided by businesses, academic institutions, and other nongovernmental organizations. The information may be based on a survey or another data source, and it may add

BOX I-1 (*Continued)*
FEDERAL STATISTICS AS A PUBLIC GOOD

value to an underlying federal data series. Yet the nongovernmental organization does not typically attempt to provide statistics on the scale of critically important federal surveys, censuses, and time series because federal statistics strive to represent the entire population of persons or organizations. Even "Big Data" often exclude the most vulnerable members of society who may not have cell phones or do not subscribe to or purchase a company's services.

Major federal household and business surveys and censuses that provide vitally important information for a broad range of data users are costly to carry out, while some kinds of statistical programs that are important for scientific research and program evaluation (e.g., longitudinal surveys) may have a specialized base of users—both reasons why nongovernmental organizations are not likely to view them as viable business propositions. Business reasons may also lead a nongovernmental data provider to modify or abandon a useful statistical series.

However, private-sector series often depend on federal statistics in various ways. For example, private-sector price indexes based on web-scraping (e.g., the MIT Billion Prices Index*) use federal CPI information for market-basket weights and benchmarking, and public opinion polls and marketing surveys use federal statistics on gender, age, ethnicity, and other characteristics to adjust the raw data to represent population groups. Thus, federal statistics not only are useful and often indispensable themselves, but also are a necessary ingredient to many other data products and services that fulfill information needs.

*See http://www.thebillionpricesproject.com. [February 2021]

FEDERAL STATISTICAL AGENCIES AND UNITS

THE U.S. government distributes responsibility for collecting the necessary data to generate statistics for public use among a set of agencies and organizational units in the executive branch. A *federal statistical agency* or *unit* is defined in law (most recently by the Foundations for Evidence-Based Policymaking Act of 2018, hereafter the Evidence Act, see Appendix A) as follows:

> An agency or organizational unit of the executive branch whose activities are predominantly the collection, compilation, processing, or analysis of information for statistical purposes.[13]

Statistical agencies and units must be recognized as such by the director of the OMB. At present, there are 13 principal statistical agencies located in cabinet departments and independent agencies, and there are also several smaller, more focused recognized statistical units (see Appendix B). In addition, many program, policy, and research agencies have sizeable statistical activities. The U.S. government developed its decentralized statistical system over time, so that today separate agencies have responsibility for labor statistics, justice statistics, education statistics, health statistics, and other subject-specific statistics. The Evidence Act required the appointment of a "Statistical Official" in every cabinet department and independent agency, with heads of the principal

[13] 44 USC 3561(11).

statistcal agencies to fill that role in their departments.[14] The federal statistical agencies and units are listed and described in Appendix B.

The Evidence Act, incorporating the Confidential Information Protection and Statistical Efficiency Act of 2002, also distinguished between statistical and nonstatistical purposes. Using information for a statistical purpose includes

> description, estimation, or analysis of the characteristics of groups, without identifying the individuals or organizations that comprise such groups; and includes the development, implementation, or maintenance of methods, technical or administrative procedures, or information resources that support the [statistical] purpose.[15]

In contrast, a nonstatistical purpose is defined as using data in identifiable form for such purposes as "administrative, regulatory, law enforcement, adjudicatory, or other purpose that affects the rights, privileges, and benefits of a particular, identifiable respondent."[16]

As an example, consider information that might be collected on a person's income by a federal agency. A statistical agency or unit would only collect and use that information to compute statistics such as median income, or the percentage of families below the poverty line, or the percentage eligible for supplemental nutrition assistance program (SNAP or food stamps) benefits. A program agency might collect and use that information to determine whether that individual or family was eligible to receive SNAP or other benefits, and then grant or deny those benefits based upon that information. This latter use would be a nonstatistical purpose, and statistical agencies are generally prohibited by law to use their data in this manner.

Federal statistical agencies and units have important statutory responsibilities to

1. produce and disseminate relevant and timely statistical information;
2. conduct credible and accurate statistical activities;
3. conduct objective statistical activities; and

[14]The Evidence Act applies to the 24 agencies with Chief Financial Officers.
[15]44 USC 3561(12).
[16]44 USC 3561(8)(a).

4. protect the trust of information providers by ensuring the confidentiality and exclusive statistical use of their responses.[17]

These responsibilities were codified from OMB *Statistical Policy Directive No. 1* as part of the Evidence Act. The passage of this law, based on the recommendations of the U.S. Commission on Evidence-Based Policymaking (2017), has directly affected the role of statistical agencies within their departments. It has given them and their heads (as Statistical Officials for their departments) new responsibilities and opportunities related to the statistical use of data for providing evidence for program evaluation, working in many departments and agencies with the new positions of Chief Data Officers and Chief Evaluation Officers.

Because the Evidence Act requires implementing regulations and guidance from OMB, only some of which have been issued as of the writing of this volume (see Appendix A), many details and relationships among the new officers with the statistical agency heads are yet to be determined. To achieve the long-term goals of greater use of government administrative and survey data for statistical purposes and for the public good, the broader statistical, research, and evaluation communities will need to come together in a productive dialogue regarding the appropriate principles and practices for these expanding statistical and evaluation activities and the programs and units within which they are occurring.

[17] 44 USC 3563(a)(1).

THE COMMITTEE ON NATIONAL STATISTICS AND THIS REPORT

THE Committee on National Statistics (CNSTAT) was established in 1972 at the National Academies of Sciences, Engineering, and Medicine to provide an independent review of federal statistical activities. The mission of CNSTAT is to provide advice to the federal government and the nation grounded in the current best scientific knowledge and practice that will lead to improved statistical methods and information upon which to base public policy. CNSTAT seeks to advance the quality of statistical information, contribute to the statistical policies and coordinating activities of the federal government, and help provide a forward-looking vision for the federal statistical system and national statistics more broadly in service of the public good. Over its 49-year history, CNSTAT has produced more than 275 reports on federal statistical programs, surveys, and statistical methods.

This report is the seventh edition of *Principles and Practices for a Federal Statistical Agency (P&P)*, first published in 1992 by CNSTAT. The publication draws on CNSTAT's many studies of specific statistical and research agencies, programs, and topics. Previous editions have proven helpful to Congress, OMB, federal statistical agencies, and others about what constitutes an effective and credible statistics entity.[18] Beginning with the second edition in 2001, CNSTAT has updated the document every 4 years to provide a current edition to newly appointed cabinet

[18]See, e.g., U.S. Office of Management and Budget (2007, 2014); U.S. General Accounting Office (1995); U.S. Government Accountability Office (2007, 2012); see also Citro (2014b).

secretaries and other personnel at the beginning of each presidential administration or second term.[19]

CNSTAT believes that *P&P* should continue to play an important role going forward in the new environment of enhanced roles for statistical agency heads and statistics to inform policy making. It provides an important independent perspective that spans departments and administrations. Since the first edition of *P&P,* other statistical organizations, such as the United Nations Statistical Commission, Eurostat, and a number of national statistical offices of foreign governments have issued fundamental principles or codes of practice that reinforce and echo many of the same themes (see Appendix C).

Previous editions of *P&P* focused on federal statistical agencies but noted that many of the principles and practices also apply to statistical activities in federal policy, evaluation, research, and program agencies, in state and local government agencies, in nongovernmental organizations, and in other countries. The past few years have also witnessed greater attention to using administrative and private-sector data sources, not only for national statistics (see NASEM 2017b, 2017c, 2017d), but also more broadly for program evaluation and evidence-based policy making (Commission on Evidence-Based Policymaking, 2017). This has been a growing theme in recent editions of *P&P* and continues in this edition. There are also parallels to related efforts to identify principles and practices for federal evaluation[20] and the broader federal data strategy.[21]

The committee distinguishes between "principles," which are fundamental and intrinsic to the concept of a federal statistical agency, and "practices," which are ways and means of making the basic principles operational and facilitating an agency's adherence to them. The current edition of *P&P* expands the list of principles from four to five, adding a principle for continual improvement and innovation—an underlying theme in previous editions, which, on considered reflection, merits elevation to a principle in and of itself. The practices have been streamlined down to 10 (from 13) by combining some practices that are

[19]The Committee on National Statistics had the following statement of work for this seventh edition: The National Academies of Sciences, Engineering, and Medicine will convene an ad hoc committee to develop a seventh edition of *Principles and Practices for a Federal Statistical Agency*. The report will take into account changes in laws, regulations, and other aspects of the environment for federal statistical agencies that have taken place since the release of the sixth edition.

[20]See OMB M-20-12 in Appendix A.

[21]See Strategy.data.gov and Federal Data Strategy in Appendix A.

tied together. The principles and practices in this report remain guidelines, not prescriptions. CNSTAT intends them to assist statistical agencies and units, as well as other agencies engaged in statistical activities, and to inform legislative and executive branch decision makers, data users, and others about the characteristics of statistical agencies that enable them to serve the common good.

Following this Introduction, Part II of the seventh edition presents five basic principles that statistical agencies must embody to carry out their mission fully:

Principle 1: Relevance to Policy Issues and Society
Principle 2: Credibility among Data Users and Stakeholders
Principle 3: Trust among the Public and Data Providers
Principle 4: Independence from Political and Other Undue External Influence
Principle 5: Continual Improvement and Innovation.

Part III discusses 10 important practices that provide the means for statistical agencies to implement the five principles. The first four practices pertain to an agency's operations, internally and within the federal government, while practices 5 through 7 bridge internal operations and external relations with the professional statistical and research communities, and practices 8 through 10 focus externally on an agency's key constituents: data users and data providers. The 10 practices are

1. A Clearly Defined and Well-Accepted Mission
2. Necessary Authority and Procedures to Protect Independence
3. Commitment to Quality and Professional Standards of Practice
4. Professional Advancement of Staff
5. An Active Research Program
6. Strong Internal and External Evaluation Processes for an Agency's Statistical Programs
7. Coordination and Collaboration with Other Statistical Agencies
8. Respect for Data Providers and Protection of Their Data
9. Dissemination of Statistical Products That Meet Users' Needs
10. Openness about Sources and Limitations of the Data Provided

Parts II and III include commentary on each principle and practice. The online version of the report contains hyperlinks to related discussions and to references. The three appendices update material included in previous editions and add new information to help orient readers; their contents are listed in this document, and they are available in full in the on-line edition. Appendix A summarizes the history and current status of key legislation and regulations that affect federal statistical agencies, OMB statistical policy directives, relevant memoranda for the Evidence Act, and other relevant guidance. Appendix B reviews the organization of the U.S. federal statistical system, providing information about each recognized statistical agency and statistical unit and the coordinating function in OMB. Appendix C provides information on some key international frameworks for national statistics promulgated by the United Nations, the Organisation for Economic Co-operation and Development, the European Statistical System, and the United Kingdom. These appendices are intended to serve as a useful reference for statistical agency staff and stakeholders seeking to understand how the federal statistical system operates and the guiding principles and quality frameworks for other national statistical offices.

PART II
Principles

PRINCIPLE 1

Relevance to Policy Issues and Society

Federal statistical agencies must provide objective, accurate, and timely information that is relevant to important public policy issues.

FEDERAL statistical agencies exist to provide accurate and timely information relevant for policy and public use. Federal statistics can describe economic conditions, delineate societal problems, and inform policy making and the evaluation of programs. To provide the relevant statistical information needed by policy makers in Congress and the executive branch, as well as by other users, statistical agencies must have a solid understanding of the public policy issues, federal programs, and information needs in their domain and a clear mission (see Practice 1). A major advantage of the decentralized federal statistical system in the United States is that separate federal statistical agencies are located in appropriate departments and are closer to the policy makers and programs in those areas. However, this can also present a challenge when different agencies produce different statistical estimates of the same or similar phenomena. It is essential that statistical agencies coordinate and collaborate with each other (see Practice 7) to ensure that coherent and consistent statistical information is provided on major policy issues.

To ensure that they are providing relevant information, statistical agencies need to reach out to a wide range of their data users, including staff in their own departments and other federal departments who use their data, members of Congress and congressional staff, state and local government agencies, academic researchers, businesses and other organizations, organized constituent groups, and the media. Agencies may need to expend considerable energy to open avenues of communication more broadly with current and potential users (see Practice 9).

Statistical agencies have used a variety of approaches to engage with users. Advisory committees are one tool to obtain the views of users outside a statistical agency (see National Research Cound [NRC], 1993a, 2007b).[1] Many agencies obtain advice from committees that are chartered under the Federal Advisory Committee Act (see Box II-1 for some examples).[2] Some agencies obtain advice from committees and working groups that are organized by an independent association, such as the American Statistical Association's Committee on Energy Statistics for the Energy Information Administration. Holding workshops and conferences for data users or engaging with them at professional conferences are also valuable activities for facilitating interchange among users and agency staff (see NRC, 2013a). Online mechanisms, such as blogs and web surveys, may assist a statistical agency in obtaining input from users (see Practice 9). Similarly, agencies can use web analytics to better understand their user base and to assess the accessibility and usability of their website and data products. Offering positions to data users as fellows or temporary employees can also help a statistical agency gain a richer perspective on user interests and concerns.

Statistical agencies should periodically review their data collection programs and products to make sure they remain relevant (see Practice 6). Relevance should be assessed, not only for particular programs or closely related sets of programs but also for an agency's complete portfolio, to assist each agency in making the best choices among program priorities given available resources.

To increase data quality and relevance, an agency's own staff should actively analyze its data (Martin, 1981; Norwood, 1975; Triplett, 1991). Such analyses may examine correlates of key social or economic phenomena or study the statistical error properties of the data. Carrying out such work can lead to improvements in the quality of the statistics, to the identification of new needs for information and data products, to a reordering of priorities, and to a deeper understanding of data users' needs (see Practice 5).

The substantive analyses that statistical agencies produce as a regular part of their dissemination and research activities will likely be helpful

[1]Some statistical agencies had advisory committees that were later disbanded by their departments. This has occurred for the Bureau of Transportation Statistics and the National Center for Education Statistics.

[2]PL-92-463.

BOX II-1

Some Examples of Federal Statistical Agency Advisory Committees

- The Advisory Committee on Agriculture Statistics for the National Agricultural Statistics Service
- The Board of Scientific Counselors for the National Center for Health Statistics
- The Data Users Advisory Committee and the Technical Advisory Committee for the Bureau of Labor Statistics
- The Census Scientific Advisory Committee and the National Advisory Committee for the U.S. Census Bureau
- The Federal Economic Statistics Advisory Committee (FESAC), which provides substantive and technical advice cutting across the major economic statistics programs of three agencies—the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the Census Bureau*

*See https://apps.bea.gov/fesac/. [February 2021]

to policy analysis units in their departments, as well as other data users. These analyses typically describe relevant conditions and trends over time and across geographic areas and population groups (e.g., high school completion rates by race, poverty rates for each year, or state variation in employment rates). A statistical agency may properly extend such analyses at the request of a policy analysis unit or other data user, for example by examining trends for particular population groups. Further, statistical agencies have an obligation to provide useful data to Chief Evaluation Officers to conduct their work.

However, statistical agencies should be careful not to become involved with policy development or implementation, because these activities could affect their ability (or the perception of their ability) to conduct impartial and objective statistical activities. A statistical agency should neither make policy recommendations nor conduct substantive analyses of policies, although it may advise on the availability and strengths

and limitations of relevant information without being involved in the analysis. The distinction between analysis consistent with the mission of a statistical agency and policy analysis is not always clear, and a statistical agency must consider carefully the extent of policy-related activities that are appropriate for it to undertake to maintain its primary mission of providing impartial and objective statistical information for public use (see Practices 1 and 2).

Practices That Are Particularly Relevant for Principle 1

Practice 1: A Clearly Defined and Well-Accepted Mission

Practice 2: Necessary Authority and Procedures to Protect Independence

Practice 5: An Active Research Program

Practice 6: Strong Internal and External Evaluation Processes for an Agency's Statistical Programs

Practice 7: Coordination and Collaboration with Other Statistical Agencies

Practice 9: Dissemination of Statistical Products That Meet Users' Needs

PRINCIPLE 2

Credibility Among Data Users and Stakeholders

Federal statistical agencies must have credibility with those who use their data and information.

THE value of a statistical agency rests fundamentally on the accuracy and credibility of its data products. Because few data users have the resources to verify the accuracy of statistical information, they rely on an agency's reputation to disseminate high quality, objective, and useful statistics in an impartial manner. Only if its products are viewed as credible can an agency be regarded as working in the national interest, not beholden to a particular set of users (Ryten, 1990; see Practice 2).

Credibility therefore stems from the respect and trust of users and stakeholders in the statistical agency. Agencies build this respect and trust, not only by producing accurate and objective data and meeting all of their deadlines for the release of their statistics, but also by adhering to the other principles for federal statistical agencies and by following some key practices. When different agencies produce similar or related estimates, it is essential that statistical agencies coordinate and collaborate with each other (see Practice 7) to ensure that users understand the differences and can determine which data are most useful for their needs.

Agencies build and maintain respect and trust through clear public commitments to professional practice and transparency in all that they do. For example, statistical agencies should actively engage with users in determining priorities for data collection and analysis, make their data available widely on an equal basis to all users, formally and informally (see Practice 9), and fully inform users of the strengths and weaknesses of the data (see Practice 10). Such activities demonstrate an agency's respect toward, and openness with, its users and stakeholders.

A statistical agency's website is a key vehicle for conveying not only its statistical data, but also key information about its data. Providing clear and easy access for users to locate, work with, and understand the strengths and limitations of the agency's data is a vital part of an agency's mission (see Practice 1) and requires ongoing efforts to continue to meet users and stakeholders' evolving needs. An agency's website can enhance its credibility by providing information about its policies for data access (e.g., explaining which tables and microdata files are publicly available and which data require approval to access in secure sites to protect confidentiality) (see Practice 8); scientific integrity policies; standards for data quality and for documenting sources of error in data collections and estimation models (see Practice 3); procedures and schedules for the release of new and continuing data series; procedures for timely notice of errors and corrections to previously released data; procedures and schedules for archiving historical data; and documentation of ongoing research efforts to provide accurate statistics that meet users'needs (see Practice 5).

Statistical agencies also engage in internal activities that are key to their ability to function effectively, thereby garnering the respect and trust of their users and stakeholders. To keep up with an ever-changing society and technology, statistical agencies need to recruit, develop, and retain high-quality professional staff who are dedicated to providing high-quality products and upholding high ethical standards (see Practice 4). Statistical agencies also need to regularly review and evaluate their programs and share the results of these evaluations with their users and stakeholders (see Practice 6).

Practices That Are Particularly Relevant for Principle 2

Practice 1: A Clearly Defined and Well-Accepted Mission

Practice 2: Necessary Authority and Procedures to Protect Independence

Practice 3: Commitment to Quality and Professional Standards of Practice

Practice 4: Professional Advancement of Staff

Practice 5: An Active Research Program

Practice 6: Strong Internal and External Evaluation Processes for an Agency's Statistical Programs

Practice 7: Coordination and Collaboration with Other Statistical Agencies

Practice 8: Respect for Data Providers and Protection of Their Data

Practice 9: Dissemination of Statistical Products That Meet Users' Needs

Practice 10: Openness About Sources and Limitations of the Data Provided

PRINCIPLE 3

Trust Among the Public and Data Providers

Federal statistical agencies must have the trust of those whose information they obtain.

NEARLY every day of the year, individuals, household members, businesses, state and local governments, and other organizations provide information about themselves when requested by federal statistical agencies. Without the cooperation of these data providers, federal statistical agencies could produce very little useful statistical information.

Some information provided is required by law or regulation for government tax and transfer programs, such as reports of employers' wages to state employment security agencies or payments to program beneficiaries. A small number of federal statistical surveys are so important that participation is mandatory. But most of the data come from the voluntary cooperation of respondents. In all cases, the willing cooperation of data providers reduces costs and likely promotes accuracy (see National Academies of Sciences, Engineering, and Medicine [NASEM, 2016b; National Research Council [NRC], 1995b, 2004a).

Because virtually every person, household, business, state or local government, and organization is the subject of some federal statistics, public trust is essential for the continued effectiveness of federal statistical agencies. Individuals and entities providing data directly or indirectly to federal statistical agencies must trust that the agencies will appropriately handle and protect their information. Implicitly and explicitly, they expect the following:

- the agency's computer systems will not be hacked and their information taken;

- their information will not be accessed and used by others for nonstatistical purposes;
- the statistical agency has a legitimate need for each piece of information it is requesting;
- the statistical agency will use their information for creating useful statistics;
- the statistical agency will not release or publish their information in identifiable form;
- the statistical agency will control who is allowed to see and access their information; and
- the statistical agency will evaluate and update its systems for using and protecting data providers' information to take account of new information needs and new threats to privacy.

Federal statistical agencies not only have legal and ethical obligations that require them to fulfill these expectations, they also have the obligation to effectively communicate how they fulfill them. Consistent ethical conduct on the part of a statistical agency is critical for obtaining the trust of the general public and of data providers, whether those providers are individuals, organizational entities, or custodians of administrative records. Statistical agencies should coordinate and collaborate with each other to ensure that their communications and internal practices are clear and consistent to strengthen the trust of data providers who may interact with more than one agency (see Practice 7).

Data providers must trust that the information the agency seeks is important for the government to collect and is being collected in a competent manner, for the good of the larger society, and only for the purposes that the agency has described. To engender trust, a statistical agency should also respect the privacy of data providers in other ways and ensure that each individual's consent to respond to a survey is given knowingly and with full information. Agencies should describe the intended and likely future uses of the data being collected, the data's relevance for important public purposes, and the extent of confidentiality protection that will be provided. Agencies should minimize the intrusiveness of questions and the effort needed to respond to them, and they should seek administrative or other nonsurvey sources to fulfill needs consistent with each agency's requirements for information (see Practices 5 and 8).

Trust among data providers also requires that an agency treat respondents with courtesy in appreciation for their time (see NASEM, 2016b).

The mission of federal statistical agencies is to produce statistical information that aggregates the data provided by individuals, businesses, or other entities. These agencies pledge to use the information they collect only for statistical purposes, not to provide individual records for any administrative, regulatory, or judicial use, and to make every effort to protect the confidentiality of individual information in the data they make available for public use. This pledge is supported by many statistical agencies' individual statutes as well as the Confidential Information Protection and Statistical Efficiency Act (CIPSEA) of 2018 (see Appendix A).

Data providers must be able to trust that a statistical agency will scrupulously honor its pledge of confidentiality and will fulfill the expectations noted above. Earning this trust, however, goes beyond what the agency is simply required to do by law, and recognizes that there are many potential threats, some outside the control of the statistical agency, that the agency must anticipate and guard against. In the world of "big data," agencies must guard against the use of external data to re-identify information provided by individuals. Agencies must consistently innovate in privacy-protecting technologies to protect—to the extent possible—against re-identification of individual records in statistical data products (see NASEM, 2017b, 2017d; and Practice 8).

When data are obtained from the administrative records of other federal, state, or local government agencies or other third-party providers, the same requirements of trust building apply to justify their cooperation.[3] Provider organizations need to trust that their records are important and legitimate for a statistical agency to obtain, that their own restrictions on data access will be honored, and that the statistical agency will make every effort to minimize their burden in responding.

An effective statistical agency has policies and practices to instill the highest possible commitment to professional ethics among its staff and builds a culture of confidentiality of its data. When issues arise or

[3]See OMB Memorandum M-14-06 in Appendix A, which asserts the legitimacy and benefits of use of administrative data from other federal agencies for statistical agency purposes. It also provides guidance for best practices and procedures to engender mutual respect and trust and facilitate such data sharing.

guidance is unclear, it must be able to rely on its staff to keep this culture and resist unethical actions as contrary to the ethical principles of their profession and the ethical requirements for their agency to merit public trust (see Practices 3 and 4).

Practices That Are Particularly Relevant for Principle 3

- **Practice 2:** Necessary Authority and Procedures to Protect Independence
- **Practice 3:** Commitment to Quality and Professional Standards of Practice
- **Practice 4:** Professional Advancement of Staff
- **Practice 5:** An Active Research Program
- **Practice 7:** Coordination and Collaboration with Other Statistical Agencies
- **Practice 8:** Respect for Data Providers and Protection of Their Data

PRINCIPLE 4

Independence from Political and Other Undue External Influence

Federal statistical agencies must be independent from political and other undue external influence in developing, producing, and disseminating statistics.

A statistical agency must be impartial and execute its mission without being subject to pressures to advance any political or personal agenda. It must avoid even the appearance that its collection, analysis, or reporting processes might be manipulated for political or other purposes. Only in this way can a statistical agency serve as a trustworthy source of objective, relevant, accurate, and timely information (Habermann and Louis, 2020).[4]

Statistical agencies and the statistical data they produce can play a key role in *informing* policy makers, but they are not and should not be responsible for *developing* or *implementing* policy (see Practice 1). For this reason, statistical agencies should be distinct from units of a larger department that carry out administrative, regulatory, law enforcement, or policy-making activities. It is also essential that a statistical agency be independent of other undue external influence in developing, producing, and disseminating statistics. "Undue external influences" are those from outside the agency that seek to undermine its impartiality, nonpartisanship, or professional judgment. Independence from any undue outside influence fosters trust among data providers and credibility with data users.

To fulfill this principle, a statistical agency must have the necessary authority and support to protect its independence (see Practice 2);

[4]See United Nations Fundamental Principles of Official Statistics and the Common Quality Framework of the European Statistical System in Appendix C, and OMB Statistical Policy Directive No. 1 in Appendix A.

however, a broad view of this authority is needed. Statistical agencies exist in a complex ecosystem and are governed by their legislative authority, which may give ultimate responsibility for the activities of the agency to the secretary of the department, as well as by the Office of Management and Budget (OMB) and congressional committees. Within this broad framework, a statistical agency has to maintain its credibility as an impartial purveyor of information (Habermann and Louis, 2020).

There are some structural ways that statistical agencies are authorized that can help promote their independence from political or other undue external influences. For the head of an agency, independence and protection from undue political influence can be strengthened by the method of the person's appointment. A method widely regarded as bolstering the professional independence of an agency head is appointment by the President with confirmation by the Senate for a fixed term and with a statutory requirement that the appointee be selected with appropriate professional qualifications, as is the case for the commissioner of the Bureau of Labor Statistics (BLS) and the director of the U.S. Census Bureau.[5] It may also be desirable that the term not coincide with the presidential term to better ensure that professional criteria, rather than political ones, guide the appointment process. Appointment by the President with Senate confirmation for a term that is at the pleasure of the President, as is the case for the head of the Energy Information Administration (EIA), provides less assurance of independence (however, it is worth noting that EIA does have other strong legislative protection for the authority of its administrator). Appointment of a qualified career civil servant as the head of an agency is another method considered helpful for maintaining the independence of a statistical agency.[6]

Having its agency head report directly to the secretary of the department can also be helpful for a statistical agency to maintain a position of independence from political or other undue external

[5]The heads of the Bureau of Justice Statistics (BJS), the Bureau of Transportation Statistics (BTS), and the National Center for Education Statistics (NCES) had been appointed by the President and confirmed by the Senate in the past; these positions were changed, two to become Presidential appointments without Senate confirmation (BJS and NCES) and one to become a career civil servant (BTS).

[6]Agencies headed by career civil servants, many of whom hold their positions for long periods of time, include the Bureau of Economic Analysis; the Bureau of Transportation Statistics; the Economic Research Service in the U.S. Department of Agriculture; the National Agricultural Statistics Service; the National Center for Health Statistics; the National Center for Science and Engineering Statistics; the Office of Research, Evaluation, and Statistics in the Social Security Administration; and the Statistics of Income Division in the Internal Revenue Service.

influence. Such access allows the head to inform new secretaries about the role of their statistical agency and to directly present the case for new or changed statistical initiatives. Such direct access currently is provided by legislation for BLS and EIA. Other statistical agencies have one or more layers of departmental management between the statistical agency head and the secretary (see Figure B-1 in Appendix B). Over time there has been an increase in the "layering of statistical agencies," that is, positioning them lower in their department's administrative structure, a trend that the National Research Council (2009a, p. 226) has identified as "a subtle, but increasingly common" threat to independence because it increases the number of political appointees and career staff who could seek to exercise control over the agency without transparency to external stakeholders or users.

Another means to protect against political and other undue external interference is for the statistical agency to have its own funding appropriation from Congress separate from that for other departmental agencies or programs. This provides greater visibility and accountability to Congress, both by the agency and by its department. Other funding arrangements, such as the statistical agency being completely dependent on allocations from the budget of its parent department or agency, risk giving the department too much unchecked leverage over the statistical agency without transparency to external stakeholders and users, and potentially compromising its ability to fulfill its mission.

A key aspect of a federal statistical agency's mission is its ability to release its statistical products without review or approval by policy officials outside the statistical agency (see Practice 2). Some agencies have this authority spelled out in statute, while others have departmental policies that support it. OMB provides governmentwide protocols and assurances on the release of key federal statistics and publishes in advance a release calendar for the entire year for Principal Federal Economic Indicators.[7] A strong internal and external evaluation program (see Practice 6) can also help ensure that all agency statistical programs are adhering to standard procedures and are not manipulated.

In the long run, the effectiveness of an agency depends on its reputation for impartiality: thus, an agency must be continually alert to possible infringements on its credibility and be prepared to strenuously

[7]See OMB's Statistical Policy Directives No. 3 and 4 in Appendix A.

resist such infringements. OMB has stated that it is also the responsibility of the statistical agency's department to "enable, support, and facilitate federal statistical agencies and recognized statistical units" as they implement their responsibilities to produce objective data.[8] A federal statistical agency that has the respect and trust of its stakeholders and users, who can help publicly defend the agency, is better equipped to ward off or resist attempts by others to exert political or other undue external influence on the agency (see Principle 3). Within an agency, the professional staff's adherence to the mission of the agency and its quality standards and ethical principles (see Practices 3 and 4) is also key to the agency's preservation of its independence from political or other undue external interference.

Practices That Are Particularly Relevant for Principle 4

- **Practice 1:** A Clearly Defined and Well-Accepted Mission
- **Practice 2:** Necessary Authority and Procedures to Protect Independence
- **Practice 3:** Commitment to Quality and Professional Standards of Practice
- **Practice 4:** Professional Advancement of Staff
- **Practice 6:** Strong Internal and External Evaluation Processes for an Agency's Statistical Programs

[8]See OMB's Statistical Policy Directive No. 1 in Appendix A.

PRINCIPLE 5

Continual Improvement and Innovation

Federal statistical agencies must continually seek to improve and innovate their processes, methods, and statistical products to better measure an ever changing world.

FEDERAL statistical agencies cannot be static. They must continually improve and innovate to be able to create reliable information on new policy questions, to provide objective information in a cost-effective way, and to meet user demands for more timely and granular information for statistical purposes.

Policy needs shift and evolve, and the society and economy that federal statistical agencies seek to measure are also evolving and changing at a rapid pace. To provide relevant information, statistical agencies must attend to changes in policy issues in their domain, identify emerging needs, and work with their data users and stakeholders to identify gaps in the agency portfolio or potential new statistical products that are needed (see Practice 9). One option to address needs for new information is for the agency to create experimental series; doing so allows the agency and its users time to evaluate a new data product without impacting existing data series (see Practice 5).

Recent years have witnessed an explosion of new data sources, some providing more geographic detail and more timely (some in near real-time) information than federal statistical programs. Users have come to expect more, better, and faster data. At the same time, individuals and businesses have been less and less willing to complete federal surveys and provide information to the government (a phenomenon that also affects private sector surveys). Declining response rates have increased agency data collection costs, while federal statistical agency budgets have generally declined in real terms for more than a decade. Thus, agencies

need to improve and innovate even to maintain their current programs (see NASEM, 2017b; 2017d).

Agencies should engage in regular, periodic reviews of their major data collection programs that consider how to produce relevant, accurate, and timely data in the most cost-effective manner possible, while seeking to maintain comparability in key statistics over time and across geographies (see Practice 6). In ongoing programs for which it would be disruptive to implement improvements on a continuous basis, a common practice is to bundle changes to implement several at the same time. For example, classifications such as the North American Industry Classification System (NAICS) are updated every 5 years and agencies may implement other changes at the same time as this. Agencies should ensure that the intervals between major research and development activities do not become so long that data collection programs deteriorate in quality, relevance, and efficiency (see Practice 6). When changes are made to ongoing data series, agencies should provide information to help users bridge across the old and new series.

An effective statistical agency keeps up to date on developments in theory and practice that may be relevant to its program. Examples of such developments include new techniques for imputing missing data (see, e.g., NRC, 2004a, 2010e) or for combining data from more than one source and estimating error in the resulting statistics (see NASEM, 2017b); new technologies for data collection, processing, and dissemination; new methodologies addressing data confidentiality and disclosure avoidance; new techniques, such as machine learning or artificial intelligence, to analyze and process data; and new kinds of and uses for data about collection processes (paradata) (see, e.g., NRC, 2013a).

Statistical agencies need a robust research program that includes statistical methods, quality assessments, and evaluations of potential new data sources. An effective statistical agency seeks out and carefully evaluates the quality and utility of potential new data sources and methods to harness information that could be useful for statistical purposes. Nontraditional data sources, such as sensor or transactions data, and fuller use of administrative records can potentially contribute to statistical programs by: (1) augmenting information obtained from traditional sources such as surveys; (2) replacing information elements previously obtained from traditional sources; (3) providing earlier estimates that

are later benchmarked with traditional sources; and (4) analyzing information streams to identify needed changes (see Practice 5). Agencies also need the appropriate IT infrastructure to handle alternative data sources. History has repeatedly shown that research conducted within federal statistical agencies on subject areas, methods, and operations can lead to large productivity gains in statistical activities for a relatively low cost (see, e.g., Citro, 2016; NRC, 2010c).

An effective statistical agency has a culture of continual improvement and innovation. All employees, and not just research staff, should be encouraged to seek to innovate and improve their functions within the organization. Staff in production and support areas should seek to improve processes, methods, and cost-effectiveness (see Practice 3). A statistical agency also needs to hire staff with cutting-edge skills and maintain and enhance the skills of its current staff through ongoing training and development opportunities so that it can continually improve and innovate (see Practice 4). To take the greatest advantage of staff with new and improved skills and to better support their operations, statistical agencies should maintain and regularly upgrade their information technology infrastructure.

The decentralized nature of the U.S. federal statistical system can make it difficult for federal statistical agencies to easily learn from each other, but interagency and international collaborations can provide important and useful means for improving statistical programs. Some issues, such as accessing and using new data sources, are common to many statistical agencies and can benefit from collaborative research across organizations (see Practice 7).

Practices That Are Particularly Relevant for Principle 5

Practice 3: Commitment to Quality and Professional Standards of Practice

Practice 4: Professional Advancement of Staff

Practice 5: An Active Research Program

Practice 6: Strong Internal and External Evaluation Processes for an Agency's Statistical Programs

Practice 7: Coordination and Collaboration with Other Statistical Agencies

Practice 9: Dissemination of Statistical Products That Meet Users' Needs

PART III
Practices

Practice 1

A Clearly Defined and Well-Accepted Mission

A statistical agency's mission should serve as a foundation for not only what work it does but how it does its work. Some agency missions are clearly spelled out in legislation; other agencies have only general authority granted them by legislation. Sometimes specific requirements are set by legislation or regulation (see agency descriptions in Appendix B).

A statistical agency's mission includes its responsibility to:

- produce and disseminate relevant and timely statistical information;
- conduct credible and accurate statistical activities;
- conduct objective statistical activities; and
- protect the trust of information providers by ensuring the confidentiality and exclusive statistical use of their responses.[1]

These responsibilities should be so ingrained into agency staff during their training and through the procedures and practices they follow that they become part of the culture of the agency.

To be effective, a statistical agency also should

- ensure the quality of all aspects of its statistical programs, including measurement methods, data collection and processing, and appropriate methods of data analysis;
- evaluate, implement, and document new methods and processes that better serve users' needs (see Practice 5); and

[1]See 44 USC 3563(a)(1); originally issued as *Statistical Policy Directive No. 1* (see Appendix A).

- curate its data to ensure their availability for future use, as well as documenting the methods used and the quality of the estimates (see Practice 9).

A statistical agency's mission must focus on information that is to be used for statistical purposes, because nonstatistical activities threaten public trust in the agency. A statistical agency should defend its mission and resist external attempts to extend its work beyond statistical purposes (see Practice 2). If a statistical agency is charged with collecting information for nonstatistical purposes (e.g., collecting data, not only for statistical purposes, but also for possible use in administrative actions affecting an individual), the agency should carefully segregate the statistical activities from the nonstatistical ones (e.g., perhaps locating the latter within a clearly demarcated office). If the senior leadership of the agency conclude that it is not possible to develop a satisfactory arrangement responsive to the agency's statistical mission, they should request that the activity be assigned elsewhere. Departments with federal statistical agencies have the responsibility to support and facilitate statistical agencies carrying out their mission and should not impose nonstatistical activities on them.[2]

A statistical agency should publicly communicate its mission and disseminate its statistical information and associated documentation on its website and other appropriate venues. The website should also provide information about enabling legislation, the scope of the agency's statistical programs, confidentiality provisions, and data quality guidelines. Consequently, agencies should carefully design their websites to maximize their utility to their users, stakeholders, and the public.

A statistical agency should periodically review its mission. As part of strategic planning to carry out its mission within its budget, it should review priorities among different programs (see, e.g., National Academies of Sciences, Engineering, and Medicine [NASEM], 2020a; National Research Council [NRC], 1976, 2000b, 2009a), the infrastructure (e.g., computing capabilities, staff with appropriate expertise) needed to support them, and the relative urgency of needed improvements, say, in timeliness versus accuracy. Statistical agencies should regularly evaluate their programs to determine whether they are fulfilling the agency's mission

[2]See 44 USC Section 3563(b).

(see Practice 6), and an agency may need to eliminate or cut back an existing program in favor of a new initiative to better meet its mission (see Practices 5 and 9).

Practice 2

Necessary Authority and Procedures to Protect Independence

TO maintain its credibility and reputation for providing objective, relevant, and accurate information, a federal statistical agency must have authority to maintain its independence from political and other undue external influences. Within an agency's ecosystem—namely, among its own department, the Office of Management and Budget (OMB), and Congress—there are often important safeguards for its independence. In some cases, these are enshrined in law, such as the requirement that data collected for exclusively statistical purposes may not be used for law enforcement.[3] Others exist as longstanding governmentwide regulations promulgated by OMB that, for example, specify strict procedures for the release of statistical information that moves financial markets.[4] Others may exist as departmental policies or agency policies, widely accepted norms, or longstanding practices.

Some statistical agencies have more safeguards for their independence built into their originating statutes than others do,[5] and some agencies rely on a history for having certain authorities without formal acknowledgement by their department. The proper functioning of the statistical agency and the entire federal statistical system requires that there be strong and uniform recognition that it has the authority to do the following:

[3]See Confidential Information Protection and Statistical Efficiency Act of 2018, Appendix A.

[4]See OMB *Statistical Policy Directive No. 3*, Appendix A.

[5]For example, the statute creating the Energy Information Administration specifically gives the Administrator the right to release statistical information without review by the Department of Energy.

- Make decisions over the scope, content, and frequency of data compiled, analyzed, and disseminated within the agency's authorizing statutes based on sound scientific and professional considerations.
- Select and promote professional, technical, and operational staff based on their professional skills and knowledge (see Practice 4).
- Release statistical information, including accompanying press releases and documentation, without prior clearance regarding the statistical content of the release.[6]
- Be able to make pledges to respondents and other data providers that their data will be kept confidential and used only for statistical purposes (see Practice 8).
- Be able to meet with members of Congress, congressional staff, and the public to discuss the agency's statistics, resources, and staffing levels.

In order to provide objective statistical information, a statistical agency must have highly qualified staff (see Practice 3), who can make decisions on the scope, content, and frequency of data compiled, analyzed, and disseminated without political or other undue external influence. Their decisions should be based solely on scientific and professional considerations. These decisions should be well informed by consulting with users and stakeholders, including policy officials in their department, on their need for information (see Practices 5 and 9), and they must also meet statutory requirements for content and OMB clearance of information collections.

The selection of qualified professional staff, including senior executive career staff, should be determined by the statistical agency. While departments may need to approve some appointments, they should allow great discretion to the statistical agency in selecting staff with appropriate expertise. Agency staff who report directly to the agency head should have formal education and deep experience in the substantive, methodological, operational, and management issues facing the agency, as appropriate for their positions. For the head of a statistical agency, professional qualifications are of the utmost importance, whether the profession is that of statistician or is in a relevant subject-matter field (NRC,

[6]See *Statistical Policy Directives* Nos. 3 and 4 in Appendix A.

1997b). Relevant professional associations can provide valuable input about suitable candidates.

Statistical agencies must protect the confidentiality of the data they acquire throughout the lifecycle of those data and their use.[7] Thus, statistical agencies must be able to exercise appropriate control over their data and the information technology (IT) systems on which they reside to securely maintain the integrity and confidentiality of individual records, ensure the data can only be used for statistical purposes, and reliably support timely and accurate production of key statistics. A statistical agency must demonstrate the integrity, confidentiality, and impartiality of the data collected and sustained under its authority to maintain the trust of its data providers and data users (see Practices 8 and 9). Such trust is fostered when a statistical agency has control over its IT resources and there is no opportunity or perception that policy, program, or regulatory agencies could gain access to records of individual respondents. When departments seek to centralize IT functions, they must support statistical agencies' ability to control access to and use of their confidential data to ensure that the data are kept confidential and used only for statistical purposes.[8]

Although statistical agencies must be able to make pledges of confidentiality, it is not required that they do so for all of their collections. Statistical agencies may collect aggregated data from state and local governments that are already publicly available, and it would not serve the public good for the agency to then keep them confidential.[9] Because it is expected that statistical agencies will collect data solely for statistical purposes with pledges of confidentiality, they must be very clear when any data they are collecting will have nonstatistical uses.[10]

Authority to release statistical information (including press releases) without prior clearance for the statistical content by department policy officials is essential so that there is no opportunity for or perception of political manipulation of any of the reports.[11] Statistical agencies are

[7]See CIPSEA guidance, Appendix A.

[8]See 44USC 3563(b).

[9]The Census Bureau collects data from state and local governments in the Census of Governments without a pledge of confidentiality, but Census only uses the information for statistical purposes. The National Center for Education Statistics collects some data on public schools that it makes publicly available, and does not promise to keep the data confidential.

[10]See CIPSEA guidance, Appendix A.

[11]The Energy Information Administration had its independence authorized in this regard in Section 205 of the Department of Energy Organization Act of 1977; 42 USC 7135(d)): "The Administrator [of EIA] shall not be required to obtain the approval of any other officer or employee of the

required to adhere to predetermined schedules for the public release of key economic indicators and to take steps to ensure that no person outside the agency has prior access except under carefully specified conditions.[12] Agencies are also required to develop and publish schedules for the release of other important social and economic indicators and to announce and explain any changes in schedules as far in advance as possible.[13]

Statistical agencies are encouraged to use press releases to expand the dissemination of data to the public. However, such press releases must "be produced and issued by the statistical agency and must provide a policy-neutral description of the data."[14] Any policy pronouncements must be issued separately by executive branch policy officials and not by the statistical agency, and "policy officials of the issuing department may review the draft statistical press release [solely] to ensure that it does not include policy pronouncements."[15]

Statistical agencies should also have dissemination policies that foster regular, frequent release of major findings from the agency's programs to the public through the traditional media, the Internet, and other means. They should also provide access to the underlying data, using appropriate safeguards to protect confidentiality (see Practice 9) to permit their results to be replicated. In these ways, an agency can guard against the perception of political and other undue external influence that might bias its operations.

Finally, the head of the statistical agency or unit should be able to meet with congressional staff and members to explain the agency's statistics and programs. Although department representatives may also attend these meetings, the department should fully support the statistical agency in this regard. Similarly, it is essential that statistical agency leadership and staff be able to interact directly with their users and stakeholders. While the department may benefit from hearing the needs and concerns of these groups and individuals, the statistical agency should have the autonomy to arrange these meetings.

Department in connection with the collection or analysis of any information; nor shall the Administrator be required, prior to publication, to obtain the approval of any other officer or employee of the United States with respect to the substance of any statistical or forecasting technical reports which he has prepared in accordance with law."

[12]See *Statistical Policy Directive No. 3* in Appendix A.

[13]See *Statistical Policy Directive No. 4* in Appendix A.

[14]See *Statistical Policy Directive No. 4* in Appendix A.

[15]See *Statistical Policy Directive No. 4* in Appendix A.

Statistical agencies should be vigilant to threats to their independence, but they should also seek to educate officials in their ecosystem proactively about the appropriate roles and responsibilities of a statistical agency. Senior leaders of an agency should cite relevant laws, regulations, and these widely accepted principles and practices for federal statistical agencies as precedent and as necessary for the mission of the agency. Undermining the authorities described in this practice undermines the mission of the agency itself, so if serious threats are made to a statistical agency's independence and references to the relevant laws, regulations, principles, and practices are not heeded, senior leaders should turn to the secretary of the department, the chief statistician at OMB, Congressional oversight committees, stakeholders, professional associations, and users to come to the agency's defense. Such outreach should not be undertaken lightly but should not be avoided if the fundamental mission of the agency is at stake.

Practice 3

Commitment to Quality and Professional Standards of Practice

A federal statistical agency's commitment to quality and professional standards is the foundation of its credibility. Such commitment should be deeply embedded in the agency's culture and reflected through:

- adhering to and implementing OMB standards and guidelines;
- publishing and implementing agency quality standards;
- maintaining quality assurance programs to improve data quality and the processes of compiling, editing, documenting, analyzing, and disseminating data;
- evaluating the quality of the agency's data (see Practice 6);
- communicating clearly what is known about the validity and accuracy of the agency's data and the resulting measures of quality (both uncertainty and bias) (see Practice 10);
- documenting concepts, definitions, and data collection methods and possible sources of error in data releases to the public (see Practice 10); and
- developing and maintaining relationships with appropriate professional organizations in statistics and relevant subject-matter areas (see Practice 5).

An effective statistical agency devotes resources to developing and implementing standards for data quality and professional practice. Although a long-standing culture of data quality contributes to professional practice, an agency should document standards through an explicit

process. Having explicit standards, which are regularly reviewed and updated, facilitates the training of new in-house staff and contractors' staffs. The reviews should include a careful consideration of quality frameworks used by other national statistical organizations as well as international organizations (see Appendix C).

To ensure the quality of its data collection programs and data releases, an effective statistical agency combines formal quality assurance programs with mechanisms and processes for obtaining both inside and outside reviews (see Practice 6). Formal quality assurance programs include such procedures as well-developed methods for detecting outliers and other errors in raw data, as well as methods for identifying errors from editing and other data processing steps. Reviews help ensure data quality by addressing various aspects of an agency's operations, including the soundness of the data collection and estimation methods and the completeness of the documentation of the methods used and the error properties of the data. For individual reports, formal processes are needed that incorporate review by agency technical experts and, as appropriate, by technical experts in other agencies and outside the government.[16]

An effective statistical agency keeps up to date on developments that may be relevant to its program—for example, methods for combining data from more than one source and for estimating error in the resulting statistics (see NASEM, 2017b, 2017c, 2017d, 2018a, 2018d, 2019d, 2020a); and new technologies for data collection, processing, and dissemination (see, e.g., NASEM, 2018c, 2019b; NRC, 2013a).

Statistical agencies should be alert to social and economic changes that may call for innovations in the concepts or methods they use (see, e.g., NASEM, 2017a, 2018b, 2019c, 2020a). The need for change often conflicts with the need for comparability with past data series. Agencies have the responsibility to manage this conflict by initiating more relevant series or revising existing series to improve quality, while providing information to compare old and new series.

The best resource for ensuring high-quality data is a strong professional staff, which includes experts in the subject-matter fields covered by the agency's program, experts in statistical methods and techniques, and experts in data collection, computing and information science, and other operations (see Practice 4). A major function of an agency's leadership is

[16]See Appendix A for a description of OMB guidelines for peer review of scientific information.

to strike a balance among these staff and to promote collaboration, with each group of experts contributing to the work of the others. An effective statistical agency encourages professional staff to participate in relevant professional associations to refresh their skills and knowledge and to develop networks of experts from other statistical agencies, academia, and the private sector (see Practice 4).

An effective statistical agency also has policies and practices to instill the highest possible commitment to professional ethics among its staff. Because knowledge of codes of ethics from professional associations can reinforce this commitment in the agency culture, an effective agency ensures that its staff members are aware of and have access to such statements of professional practice as those of the American Association for Public Opinion Research (2015), the American Statistical Association (2018), and the International Statistical Institute (2010), as well as to the agency's own policies and practices regarding such matters as the protection of confidentiality, respect for privacy, and standards for data quality. An effective agency endeavors in other ways as well to ensure that its staff are fully cognizant of the ethics that must guide their actions in order for the agency to maintain its credibility as a source of objective, reliable information for use by all (Hartman et al., 2014).

Practice 4

Professional Advancement of Staff

THE long-term credibility of a statistical agency depends on the agency's staff and the culture they build and maintain for quality and professionalism. Thus, a statistical agency should recruit and support highly qualified and dedicated staff for all aspects of its operations, including subject-matter experts in fields relevant to its mission (e.g., demographers, economists), statistical methodologists who specialize in data collection and analysis, and other skilled staff such as budget analysts, procurement specialists, human resource specialists, computer scientists, and data scientists. Statistical agency staff should be recruited and promoted based solely on their professional qualifications and performance, and these personnel decisions should be made solely by agency career staff without external interference (see Practice 2).

To manage its staff effectively, an agency should provide them with opportunities for work on challenging projects in addition to more routine, production-oriented assignments. An agency's personnel policies, supported with sufficient resources, should enable staff to extend their technical capabilities through appropriate professional and developmental activities (see below). These activities enhance the knowledge and skills of the staff members and pay dividends to the agency, helping keep it on top of new developments.

The personnel policies of an effective federal statistical agency should encourage the development and retention of a strong professional staff who are committed to the highest standards of quality work for their

agency and in collaboration with other agencies. Key elements of such policies include the following:

- Providing staff with continuing technical education and training, appropriate to the needs of their positions. Technical education may come from in-house training programs and opportunities for external education and training at universities or through professional societies. Supervisory and leadership training from the U.S. Office of Personnel Management or other institutions should also be encouraged for managers and emerging leaders.
- Structuring position responsibilities to ensure that staff have the opportunity to participate, in ways appropriate to their experience and expertise, in research and development activities to improve the quality of data and cost-effectiveness of agency operations.
- Encouraging and recognizing professional activities, such as publishing in refereed journals and presentations at conferences. Such presentations should include technical work in progress, with appropriate disclaimers.
- Supporting participation in relevant statistical and other scientific associations, including leadership positions, to promote interactions with researchers and methodologists in other organizations that can advance the state of the art. Such participation is also a mechanism for disseminating information about an agency's programs and helps ensure a culture of scientific integrity in federal agencies.[17]
- Fostering interaction with other professionals inside and outside the agency through a variety of mechanisms, including opportunities to participate in technical advisory committee meetings, interacting with contract researchers and research consultants on substantive matters, interacting with visiting fellows and staff detailed from other agencies, offering developmental assignments with other relevant statistical, policy, or research organizations, and offering rotational assignments within the agency.
- Supporting participation in cross-agency collaboration efforts, such as the Federal Committee on Statistical Methodology and its subcommittees. Such participation not only benefits the professional staff of an agency, but also contributes to improving the work of the statistical system as a whole (see Practice 7).

[17]See Office of Science and Technology Policy Memorandum on Scientific Integrity in Appendix A.

- Rewarding accomplishment by appropriate recognition and by affording opportunities for further professional development. The prestige and credibility of a statistical agency is enhanced by the professional visibility of its staff, which may include establishing high-level nonmanagement positions for highly qualified technical experts.
- Seeking opportunities to reinforce the commitment of its staff to ethical standards of practice.

Implementing these policies requires sufficient funding, time off, and institutional respect for professional education and development.

An effective statistical agency carefully considers the costs and benefits—both monetary and nonmonetary—of using contractor organizations, not only to collect data but also to supplement in-house staff in other areas, such as carrying out methodological research. Outsourcing can have benefits, such as providing experts in areas in which the agency is unlikely to be able to attract highly qualified in-house staff (e.g., some information technology functions), enabling an agency to handle an increase in its workload that is expected to be temporary or that requires specialized skills, and allowing an agency to learn from best industry practices. However, over time excessive outsourcing can also have unintended costs, including a transformation of agency staff to become primarily contract managers and grow less qualified as technical experts and leaders in their fields.

An effective statistical agency maintains and develops a sufficiently large number of in-house staff, including mathematical statisticians, survey researchers, subject-matter specialists, and information technology experts, who are qualified to analyze the agency's data and to plan, design, carry out, and evaluate its core operations, so that the agency maintains the integrity of its data and its credibility in planning and fulfilling its mission. Agencies also need staff with specialized skills to create visualizations, metadata, and application programming intefaces (APIs) for data dissemination (see Practice 9). At the same time, statistical agencies should maintain and develop staff with the expertise necessary for effective technical and administrative oversight of contractors. Given the increasing use of alternative data sources, agencies should not only encourage training in programming and software engineering to build up their staff's skills in data science, but also encourage their

subject-matter experts to become fully knowledgeable about the content and quality of various relevant sources.

Having sufficient in-house staff with the required types of expertise is as critical as having adequate budget resources for enabling a statistical agency to carry out its mission. Statistical agencies are constrained by federal personnel policies that can affect whom they are permitted to hire (U.S. citizens) and by federal pay scales. However, some statistical agencies have been needlessly constrained in the number of agency staff they can employ regardless of their budgetary resources, resulting in too few staff to adequately handle the work needed to maintain existing programs and oversee contractors. As part of their fundamental responsibilities to support statistical agencies, departments housing statistical agencies should work with and support them in being able to hire a sufficient number of staff with the right expertise to carry out their missions.

Practice 5

An Active Research Program

STATISTICAL agencies need active research programs that are closely tied to their mission of producing relevant and high-quality statistics. Research is not an "optional" or "extra" activity that can be deferred whenever resources are tight. It produces the innovation that refreshes relevance. The underfunding of statistical agencies' research has threatened the data infrastructure that provides vital information needed by governments, businesses, organizations, and individuals.[18]

To maintain relevance for public and policy purposes, federal statistical agencies must identify emerging needs and look for ways to develop new information sources. To improve the quality and timeliness of their data products, they must keep abreast of methodological and technological advances and be prepared to implement new procedures in a timely manner (see Practice 3). They must also continually seek ways to make their operations more efficient (see Practice 6).

An effective statistical agency's research program includes research on the substantive issues for which the agency's data are compiled as well as methodological research to improve statistical methods and operational procedures. A key and growing research concern for statistical agencies in recent years focuses on the use of administrative records and alternative data sources to enhance or potentially replace some of the information currently obtained through surveys. Current research questions being examined because of this concern include how closely statistics from

[18]E.g., see https://www.linkedin.com/pulse/federal-statistical-agencies-struggle-maintain-vital-role-citro/?trackingId=hWmaUxpC4ao5VxtMmWioyg%3D%3D. [February 2021]

these sources correspond to existing measured concepts, what additional information they may offer, and methodological issues for evaluating quality and integrating data sources.

Substantive Research and Analysis

A statistical agency should include staff with responsibility for conducting objective substantive analyses of the data that the agency compiles, such as analyses that assess trends over time or compare population groups. Substantive analyses provided by an agency should be kept relevant to policy by addressing topics of public interest and concern; however, such analyses should not espouse policy positions or be designed to reflect any particular policy agenda (see Martin, 1981; Norwood, 1975; Triplett, 1991). The existence and output of an analytical staff can contribute not only to the knowledge base in the applicable subject areas, but also to the credibility, relevance, accuracy, timeliness, and cost-effectiveness of the agency's data collection programs. Benefits that a strong subject-matter staff bring to a statistical agency include the following:

- Agency analysts understand the need for the data from a statistical program and how the data will be used, and they can communicate more effectively with data users (see Practice 9).
- Agency analysts have access to the complete microdata and so are better able than outside analysts to understand and describe the limitations of the data for analytic purposes and to identify errors or shortcomings in the data that can lead to subsequent improvements (see Practice 10).
- Substantive research maintains the relevance of an agency's data program, suggesting changes in priorities, concepts, and needs for new data or discontinuance of outmoded or little-used series.

An agency's subject-matter analysts should be encouraged and have ample opportunity to build networks with analysts in other agencies, academia, the private sector, other countries, and relevant international organizations and to present their work at relevant conferences and in working papers and refereed journal articles (see Practice 4).

Research on Methodology and Operations

Statistical agencies should be innovative in the methods they use for data collection, processing, estimation, analysis, and dissemination, with the goals of improving data accuracy, timeliness, and operational efficiency and of reducing respondent burden. Careful evaluation of new methods is required to assess their benefits and costs in comparison with current methods and to determine effective implementation strategies, including the development of methods for bridging time series before and after a change in procedures.

Research on methodology and operations must be ongoing and geared to both current and future needs. Some current research topics include

- developing methods for producing rapid statistics to respond to high-priority situations or emergencies, such as the COVID-19 pandemic;[19]
- evaluating administrative records for use to replace or enhance existing surveys;
- assessing uncertainty when combining data from a variety of data sources;
- developing models for improved forecasting in subnational areas (e.g., Young, 2019);
- improving the accuracy of survey estimates in the presence of nonresponse;
- using adaptive designs for maintaining and improving the quality and the cost-effectiveness of surveys;
- understanding and minimizing mode effects on data quality; and
- developing and evaluating new methods of confidentiality protection.

Surveys will likely remain an important component of federal statistical agencies' portfolios because (1) some information is best (or only) obtained by asking questions; and (2) surveys can collect information on many characteristics at the same time, thereby permitting rich multivariate analysis. But declining survey response rates are making it increasingly difficult to maintain high data quality while controlling data collection costs (see NRC, 2013c; NASEM, 2017d). Many of the large

[19]See, for e.g., https://www.census.gov/newsroom/press-kits/2020/pulse-surveys.html [February 2021]; https://www.cdc.gov/nchs/covid19/index.htm. [February 2021]

federal surveys are designed to produce annual nationwide estimates and do not produce the rapid and granular estimates needed by some data users. It is thus essential to consider how administrative records and alternative data sources can bolster the completeness, quality, and utility of statistical estimates while containing costs and reducing respondent burden (see NASEM, 2016b, 2017b).

Expanding the Statistical Use of Administrative Records

Administrative records include records of federal, state, and local government agencies that are used to administer a government program. Examples include U.S. Social Security Administration records of payroll taxes collected from workers and benefits paid out to beneficiaries; state agency records provided by applicants for assistance programs and payments to applicants deemed eligible; and property tax records of local governments and federal agencies. Administrative records have been used for statistical purposes for many years to generate up-to-date population estimates by age, gender, race, and ethnicity. In turn, these estimates are used to adjust population survey weights for coverage errors and for many other purposes (see, e.g., NRC, 2004a, 2007b).

Some of the many examples of statistical agencies' use of administrative data include the Census Bureau using tax records for the economic censuses for small and nonemployer businesses,[20] the National Center for Health Statistics' National Vital Statistics System drawing upon birth and death records from the states,[21] and the National Center for Education Statistics' National Postsecondary Student Aid Study drawing upon federal and institutional administrative data to analyze student financial aid.[22] Research is being conducted to assess whether tax records can replace income items in the American Community Survey (see NASEM, 2019a). Administrative records are also frequently used with survey data to produce model-based estimates with improved accuracy for small geographic areas or population groups (see, e.g., NRC, 2000c, 2000d)

There are many other potential statistical uses for administrative records from program agencies, and expanding the use of these records could improve the cost-effectiveness and quality of some statistical

[20]Nonemployer businesses include just the sole proprietor with no other employees.

[21]See https://www.cdc.gov/nchs/nvss/index.htm. [February 2021]

[22]See https://nces.ed.gov/surveys/npsas/index.asp. [February 2021]

programs. Potential uses include substituting administrative records for specific survey questions and adding richness to a combined dataset by appending administrative records variables to matched survey records (e.g., Commission on Evidence-Based Policymaking, 2017; NASEM, 2018d, 2019b; NRC, 1997a, 2009e; NRC and Institute of Medicine, 2012). Administrative records from multiple federal agencies are also being used in the decennial census to verify vacant units and, when good information exists, to fill in data if an initial nonresponse follow up visit is not successful in locating a respondent.[23]

Evaluating and Using Alternative Data Sources

This data-rich age has a multitude of data sources beyond administrative records, including data gleaned or "scraped" from Internet websites (e.g., price quotes or social media postings), data extracted from sensors (e.g., from traffic cameras), and data obtained from the private sector (e.g., credit card transactions or scanner data on retail purchases). Often, these sources generate large volumes of data that require computationally intensive techniques for extracting useful information for statistics (see NASEM, 2017b, 2017d; NRC, 2008a). However, to make use of most nontraditional data sources, it is necessary for statistical agencies to first evaluate the accuracy and error properties of the data.

In an era when data users expect timeliness and when budgets are constrained, researchers in statistical agencies should explore how nontraditional data sources can contribute to their programs (see NASEM, 2017b, 2017d). Procedures could include (1) augmenting information obtained from traditional sources; (2) replacing information elements previously obtained from traditional sources; (3) providing preliminary estimates that are later benchmarked with traditional sources; and (4) analyzing information streams to identify needed changes (e.g., in types of jobs, education majors) in statistical classifications and survey questions.

A major challenge for statistical agencies has been the difficulty of identifying, locating, and accessing administrative records that could be useful for their programs. As the Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act) is implemented, it is hoped

[23]See https://www2.census.gov/programs-surveys/decennial/2020/program-management/planning-docs/administrative-data-use-2020-census.pdf. [February 2021]

that the data inventories and practices of the program agencies will make these resources more transparent and make processes for obtaining these datasets for statistical purposes more streamlined (also see Practice 8).

In considering their strategies, statistical agencies should adopt broad quality frameworks that capture user needs, including aspects such as relevance, accuracy, timeliness, comparability (over time and with other data sources), transparency, accessibility, privacy, protection from outside manipulation, and interpretability. They should examine the tradeoffs between different quality aspects, such as trading precision for timeliness and granularity (see NASEM, 2017b, and Appendix C). An agency's own research staff can assist in examining these tradeoffs, and the Federal Committee on Statistical Methodology (2019, 2020) also has been pursuing work in this area to assist agencies.

Value of an Active Research Program

Supporting federal agencies' in-house research staffs is critical given the challenges and opportunities posed by the increasing availability of alternative data sources. Many current practices in statistical agencies were developed through research they conducted or obtained from other agencies. Federal statistical agencies, frequently in partnership with academic researchers, pioneered the use of statistical probability sampling, the national economic accounts, input-output models, and other analytic methods. The U.S. Census Bureau pioneered the use of computers for processing the census. Several statistical agencies use academic principles of cognitive psychology—a research strand dating back to the early 1980s (see NRC, 1984)—to improve the design of questionnaires, the clarity of data presentation, and the ease of use of electronic data collection and dissemination tools. History has repeatedly shown that research conducted within federal statistical agencies on subject areas, methods, and operations can lead to large productivity gains in statistical activities at relatively low cost (see, e.g., Citro, 2016; NRC, 2010c).

An effective statistical agency also actively partners with the academic community for methodological research. It seeks out academic and industry expertise for improving data collection, processing, and dissemination operations. For example, a statistical agency can learn techniques and best practices for improving software development processes from computer scientists (see NRC, 2003c, 2004d). An effective agency also

learns from and contributes to methodological research of statistical agencies in other countries and relevant international organizations (see Practice 7). Thus, it is important for agency staff to seek to publish their work in the leading peer-reviewed journals, which enables broader dissemination as well as adding credibility to the changes the agency makes.

Preparing for the future requires that agencies periodically assess the scope of existing data series, alter data series as required, and innovate to improve their programs. Because of the decentralized nature of the federal statistical system, innovation often requires and benefits from cross-agency collaboration (see Practice 7) and a willingness to implement different kinds of data collection efforts to answer different needs, while being mindful of the need for historical trend data and comparability across different levels of geography.

Practice 6

Strong Internal and External Evaluation Processes for an Agency's Statistical Programs

STATISTICAL agencies should have processes in place to support regular evaluations of their major statistical programs and their overall portfolio of programs. Reviews of major data collection programs and their components should consider how to produce relevant, accurate, and timely data in the most cost-effective manner possible. Reviews of an agency's portfolio should consider ways to reduce duplication, fill gaps, and adjust priorities so that the overall portfolio is as relevant as possible to the information needs of policy makers and the public (e.g., see NASEM, 2018c, 2020a and NRC, 2009a). Such evaluations should include internal reviews by staff and external reviews by independent groups.

Agencies should seek outside reviews not only of specific statistical programs but also of program priorities and quality practices across their entire portfolio. They should also consider ways to improve program cost-effectiveness by combining data from multiple sources, particularly because fewer people and organizations are responding to surveys than in the past. It is increasingly urgent to determine whether there are alternative data sources to surveys that also offer better quality (e.g., see NASEM, 2017b, 2017c, 2017d, 2018a, and Practice 5).

Statistical agencies that fully follow practices related to an active research program (Practice 5), openness (Practice 10), dissemination of statistical data products (Practice 9), and commitment to quality and professional standards (Practice 3) will likely be in a good position to make continuous assessments of and improvements in the relevance, quality, and efficiency of their data collection systems. Yet even the

best-functioning agencies will benefit from an explicit program of internal and independent external evaluations to obtain fresh perspectives.

Evaluating Quality, Relevance, Efficiency

Evaluation of data quality for any kind of data collection program begins with regular monitoring of quality indicators that are readily available to users. Agencies should use broad quality frameworks (see Practice 3 and Appendix C) and assess the costs and benefits of using alternative data sources (see Practice 5 and NASEM, 2017b, 2017d). These evaluations should be undertaken periodically and the results made public (see Practice 10 and NRC, 2007b).

When it is disruptive to implement improvements on a continuing basis, a common practice is to bundle changes to implement several at the same time. For example, classifications such as the North American Industry Classification System (NAICS) are updated every 5 years, and agencies may implement other changes at the same time as this. Agencies should ensure that the intervals between innovations do not become so long that data collection programs deteriorate in quality, relevance, and efficiency. Regular, well designed program evaluations, with adequate budget support, are key to ensuring that data collection programs do not deteriorate. Having a set schedule for research and development efforts will enable data collection managers to ensure that the quality and usefulness of their data are maintained and help prevent locking in less optimal procedures.

As part of ongoing evaluation, the relevance of an agency's data collection programs and products needs to be continually assessed. The question of relevance is whether the agency is "doing the right thing," in contrast to whether the agency is "doing things right." Relevance should be assessed not only for particular programs or closely related sets of programs, but also for an agency's complete portfolio in order to make the best choices among program priorities given the available resources (see Practice 1).

Engaging and consulting with stakeholders—through such means as regular meetings, workshops, conferences, and other activities—is important to ensuring relevance (see Practice 9). Including other federal statistical colleagues in this communication, both as users and as collaborators, can be valuable (see Practice 7).

Statistical agencies commonly find it difficult to discontinue a particular data series, even when it has largely outlived its usefulness relative to other series, because of objections by users who have become accustomed to it. In the face of limited resources, however, discontinuing a series is preferable to across-the-board cuts in all programs, which would reduce the accuracy and usefulness of both the more relevant and less relevant data series. Regular internal and external reviews and a documented priority-setting process or framework can help an agency not only in reassessing its priorities but also in developing the justification and support for changes to its portfolio.

Finally, statistical agencies should review their statistical programs for efficiency and cost-effectiveness.[24] Federal statistics as a public good represent a legitimate draw on public resources, and statistical agencies in turn are properly called on to analyze the costs of their programs on a continuing basis to ensure the best return possible on tax dollars. For this purpose, statistical agencies should develop complete, informative models for evaluating the costs of current procedures and of possible alternatives and follow best practice in the design of statistical production processes.[25]

Types of Reviews

Regular statistical program reviews should include a mixture of internal and external evaluation. Agency staff should set goals and timetables for internal evaluations that involve informed staff outside the program under review. Independent external evaluations should also be conducted on a regular basis. The frequency of these external evaluations should depend on the importance of the data, how quickly the phenomena being measured change, and how quickly respondent behavior and data collection technology may adversely affect a program change.

External reviews can take many forms. They may include recommendations from advisory committees that meet at regular intervals (typically, every 6 months). However, advisory committees should never be the sole

[24]"Efficiency" is generally defined as an ability to avoid waste (of materials, energy, money, time) in producing a specified output. "Cost-effectiveness" connotes a broader, comparative look at inputs and outputs to assess the most advantageous combination. ("Cost-benefit" analysis attempts to add monetary values to outputs.) In the context of federal statistical programs, cost-effectiveness analysis would assess the costs of conducting a program for different combinations of desired characteristics, such as improved accuracy or timeliness and reduced burden on respondents.

[25]See Generic Statistical Business Process Model of the United Nations Economic Commission for Europe in Appendix C

source of outside review, because the members of such committees rarely have the opportunity to become deeply familiar with agency programs. External reviews can also take the form of a special committee or panel established by a relevant professional association, such as the American Statistical Association, or by some other recognized group, such as the National Institute of Statistical Sciences (also see NRC, 2009a).

Practice 7

Coordination and Collaboration with Other Statistical Agencies

STATISTICAL agencies should not be islands unto themselves. They need to engage and collaborate not only with their stakeholders but also with other statistical agencies and units in the federal government, in state governments, and internationally. The U.S. federal statistical system consists of many agencies in different departments, each with its own mission and subject-matter focus (see Appendix B). Yet these agencies have a common interest in serving the public need for credible, relevant, accurate, and timely information gathered as efficiently and fairly as possible. Moreover, needed information may often span the mission areas of more than one statistical agency: for example, both the Bureau of Labor Statistics (BLS) and the National Center for Education Statistics have programs that relate to education and employment outcomes. Consequently, statistical agencies should not and do not conduct their activities in isolation.

An effective statistical agency actively seeks opportunities to conduct research and carry out other activities in collaboration with other statistical agencies to enhance the value of its own information and that of the system as a whole. Such collaboration is essential not only for smaller statistical agencies with limited staff and resources but, equally, for larger agencies so that they do not overlook useful innovations outside their own agency. When possible and appropriate, federal statistical agencies should collaborate not only with each other but also with policy, research, and program agencies in their departments, with state and local statistical agencies, and with foreign and international statistical agencies.

Such collaborations can serve many purposes, including standardization of concepts, measures, and classifications (see, e.g., NRC, 2004b, 2004c, and Appendix A); augmentation of available information for cross-national and subnational comparisons (see, e.g., NRC, 2000c, 2000d); identification of useful new data sources and data products; and improvements in many aspects of statistical programs.

In their new role as statistical officials for their departments, heads of the principal statistical agencies should help improve intradepartmental coordination of statistical activities. In addition, statistical agency heads should help improve statistical practices across government by providing advice and mentoring, as appropriate, to the Statistical Officials who are now part of the Interagency Council on Statistical Policy (ICSP). This type of collaboration can help foster the understanding and integration of principles and practices for statistical activities as they are more widely adopted across the federal government to implement the federal data strategy and the Evidence Act.

Coordinating Role of the Office of Management and Budget

The responsibility for coordinating statistical work in the federal government is specifically assigned to the chief statistician, who leads the Statistical and Science Policy (SSP) Office in the Office of Information and Regulatory Affairs in OMB (see Appendix A). The chief statistician chairs the ICSP, which consists of the heads of the principal statistical agencies and statistical officials, to coordinate federal statistical programs and activities across the federal government (see Appendix B).

The chief statistician and a small SSP staff often create interagency committees as a vehicle for agencies to collaborate and work together on issues of common concern, such as concepts of interest to more than one agency (e.g., classifications of sexual orientation, gender identity, and race/ethnicity), the development and periodic revision of standard classification systems (e.g., of industries, products, occupations, and metropolitan areas), and best practices for domains such as survey methods, statistical use of administrative records, and confidentiality protection. SSP may then take the recommendations of these committees and issue more formal guidance or directives for all agencies to follow.

Forms of Interagency Collaboration

Interagency collaboration and coordination takes many forms, some multilateral, some bilateral. Some collaborations are formally chartered by OMB or the ICSP, to perform a specific task, while others result from common interests and may continue for years as a means of sharing information. Some interagency collaborations have been active for decades. Since 1975, the Federal Committee on Statistical Methodology, chaired by SSP, has convened technical experts across the federal government to advise OMB and the ICSP on methodological and statistical issues that affect the quality of federal data. This committee also provides a forum for statisticians in different federal agencies to discuss issues affecting federal statistical programs and promotes collaborative research.

Other ongoing collaborations, such as the Federal Interagency Forum on Aging-Related Statistics and the Federal Interagency Forum on Child and Family Statistics, provide statistical information to the public in a broad area of interest. These forums produce regular products that draw data from a wide range of agencies to provide a broad description of their population of interest in publications and materials that are easily understood and used by a broad audience.

A common bilateral arrangement is an agreement of a program agency to provide administrative data to a statistical agency to use as a sampling frame, a source of classification information, a summary compilation to check (and possibly revise) preliminary sample results, and a source with which to improve imputations for survey nonresponse, reduce variability in estimates for small geographic areas, or substitute for survey questions. The Census Bureau, for example, uses Schedule C tax information from the Internal Revenue Service in place of surveys for millions of nonemployer businesses. Such practices improve statistical estimates, reduce costs, and eliminate duplicate requests for information from the same respondents.

In other arrangements, federal statistical agencies engage in cooperative data collection with state statistical agencies to let one collection system satisfy the needs of both. A number of such joint systems have been developed, notably by the Bureau of Labor Statistics, the National Agricultural Statistics Service, the National Center for Education Statistics, and the National Center for Health Statistics.

Another example of a joint arrangement is one in which one statistical agency contracts with another to conduct a survey, compile special tabulations, or develop models. Such arrangements make use of the special skills of the supplying agency and facilitate the use of common concepts and methods. The Census Bureau conducts many surveys for other agencies; both the National Center for Health Statistics and the National Agricultural Statistics Service receive funding from other agencies in their departments to support their survey work; and the National Center for Science and Engineering Statistics receives funding from agencies in other departments to support several of its surveys.

It is noteworthy that many current practices in statistical agencies were developed through research they conducted or obtained from other agencies. Federal statistical agencies, frequently in partnership with academic researchers, pioneered the use of statistical probability sampling, the national economic accounts, input-output models, and other analytic methods.

International Collaborations

In order to be relevant and useful, many federal statistics must be internationally comparable. The chief statistician at OMB is responsible for coordinating U.S. participation in international statistical activities. Many other agencies' staffs participate in a wide variety of activities in collaboration with other national statistical offices, such as working groups sponsored by the United Nations Statistical Commission or the Organisation for Economic Co-operation and Development. These activities include participating in the development of international standard classifications and systems; supporting educational activities that promote improved statistics in developing countries; and learning from and contributing to the work of established statistical agencies in other countries in such areas as survey methodology, record linkage, confidentiality protection techniques, and data quality standards.

There are a growing number of international frameworks and tools that describe the common activities of statistical organizations and facilitate the documentation and sharing of data and metadata. The Generic Statistical Business Process Model (GSBPM) describes and defines the set of business processes needed to produce official statistics. It provides a standard framework and harmonized terminology to help statisti-

cal organizations modernize their statistical production processes, as well as to share methods and components (see Appendix C). There is also ongoing international work on using administrative and big data sources for federal statistics and on the quality frameworks for these data sources (see Appendix C).

Challenges and Rewards for Collaboration

Collaborative activities, such as sharing and integrating data compiled by different statistical and program agencies, standardizing concepts and measures, reducing unneeded duplication, and working together on methodological challenges, invariably require effort to overcome differences in agency missions and operations. There are also potentially greater threats to confidentiality because the linking of data provides more information that can lead to indirect identification. Yet with constrained budgets and increasing demands for more relevant, accurate, and timely statistical information, collected at reduced costs and burden, the importance of proactive collaboration and coordination among statistical agencies cannot be overstated. To achieve the most effective integration of their work for the public good, agencies must be willing to take a long view, to strive to accommodate each other, and to act as partners in the development of statistical information for public use. The rewards of effective collaboration can be not only data that are more efficiently obtained, of higher quality, and more relevant to policy concerns, but also a stronger, more effective statistical system.

Statistical agencies that collect similar information should consider integrating their microdata records for specified statistical uses as another way to improve data quality, develop new kinds of information, and increase cost-effectiveness. One cost-effective approach is for a large survey to provide the sampling frame and additional content for a smaller, more specialized survey. The National Health Interview Survey of NCHS serves this function for the Medical Expenditure Panel Survey of the Agency for Healthcare Research and Quality. Similarly, the American Community Survey serves this function for the National Survey of College Graduates, which the Census Bureau conducts for the National Center for Science and Engineering Statistics (see NRC, 2008b).

Another key collaboration is with states. Many federal statistical agencies have relationships with states for data collection, but they would also

like greater access to state administrative records. Obtaining such access often depends on having good relationships with states (see Goerge, 2018; NASEM, 2017d).

Unfortunately, there are sometimes legal or administrative barriers that prevent statistical agencies from collaborating on common activities. Both the BLS and the Census Bureau maintain business establishment lists, but each of the lists derives from different sources (state employment security records for BLS and a variety of sources, including federal income tax records, for the Census Bureau). Research has demonstrated that synchronizing the lists would improve the accuracy of the information and the coverage of business establishments in the United States (NRC, 2006b, 2007c). However, business establishment lists cannot currently be synchronized between BLS and the Census Bureau because the latter is prohibited by law (Title 26 of the U.S. Code) from sharing with BLS (or BEA) any tax information on businesses or individuals that it may acquire from the Internal Revenue Service, even for statistical purposes. These barriers should be removed, as they negatively impact data quality and efficiency (see NASEM, 2017d; NRC, 2007c). It is hoped that implementation of the Evidence Act and identification of these barriers will lead to the needed legal and administrative changes to permit these joint statistical activities.

Practice 8

Respect for Data Providers and Protection of Their Data

FEDERAL statistical agencies are able to produce useful statistical information because they can collect and acquire data from many providers, including survey respondents, organizations that provide data files, government agencies that provide administrative records, third-party data aggregators, and others. A statistical agency's ability to fulfill its mission thus depends upon the relationships that the agency is able to build and maintain with data providers. Effective statistical agencies demonstrate respect for their data providers and protect the providers' data to ensure that agencies can fulfill their missions.

To maintain a relationship of respect and trust with survey participants and other data providers, a statistical agency should respect their privacy, minimize the reporting burden imposed on them, and respect their autonomy when they are asked to participate in a voluntary program to collect data. The statistical agency must also comply with all legal requirements to ensure that the data are used only for statistical purposes. To do this, a statistical agency must communicate its privacy and confidentiality protection procedures and policies,[26] as well as the societal benefits from collecting the data.

[26]Informational privacy is "an individual's freedom from excessive intrusion in the quest for information, and an individual's ability to choose the extent or circumstances under which his or her beliefs, behaviors, opinions, and attitudes will be shared with or withheld from others," while confidentiality refers broadly to an obligation not to transmit information to an unauthorized party (NRC, 1993b, p. 22).

Respecting Privacy in Surveys

To promote trust and encourage accurate responses from survey respondents, it is important that statistical agencies respect their privacy by reducing, to the extent possible, the intrusiveness of questions they ask and the time and effort required to respond. Agencies must also give respondents adequate information with which to decide if a survey is worthy of response—that is, so respondents can give their informed consent (see below). Thus, when individuals or organizations are asked to participate in a survey, they should be told whether it is mandatory or voluntary, how the data will be used, and what confidentiality protections apply to the data. They should also be informed of the likely duration of a survey response task, whether they will be asked to consult records, and whether the survey involves repeated responses over time (see U.S. Office of Management and Budget, 2016a).

To reduce the burden of replying to surveys (see NASEM, 2016b; NRC, 2013a, Ch. 4), statistical agencies should write clear questions that fit respondents' common understanding, minimize the intrusiveness of questions, and explain why intrusive-seeming questions serve important purposes. Statistical agencies should also allow alternative modes of response when appropriate (e.g., Internet, smartphone) and use administrative records or other data sources, if sufficiently complete and accurate, to provide some or all of the needed information. In surveys of businesses or other organizations, agencies should seek to obtain information directly from the organization's records and so minimize the need for duplicate responses to multiple requests.

Protecting and Respecting the Autonomy of Human Research Participants

Collecting data from individuals for research purposes using federal funds falls under a series of regulations, principles, and best practices that the federal government has developed over a period of more than 50 years (see NRC, 2003b, 2014c). The pertinent regulations, which have been adopted by 11 departments and 6 agencies, are known as the "Common Rule" (45 CFR 46). The Common Rule regulations (the most recent revision took effect in January 2019) require that researchers adequately protect the privacy of human participants and maintain the confidentiality of data collected from them, minimize the risks to participants from

the data collection and analysis, select participants equitably with regard to the benefits and risks of the research, and seek the informed consent of individuals to participate (or not) in the research. Under the regulations, most federally funded research involving human participants must be reviewed by an independent institutional review board (IRB) to determine whether the design meets ethical requirements for protection.[27]

Not all federal statistical agencies' data collections are subject to IRB review. Nonetheless, agencies should strive to incorporate the spirit of the Common Rule in the design and operation of all activities that involve data collection from individual respondents. Statistical agencies should seek ways to inform potential respondents that will help them decide whether to participate, such as sending respondents an advance letter. Such information should include the planned uses of the data and their benefits to the public.

Even for mandatory data collections, such as the decennial Census of Population and Housing and the quinquennial Economic Census, a statistical agency should respect its respondents by giving them as much information as possible about the reasons for the collection and making it as easy as possible for them to respond (see U.S. Office of Management and Budget, 2016a). The principles and practices of respect apply not only to individuals asked to participate in a survey, but also to representatives of organizations (e.g., businesses, state and local governments) asked to participate in a survey and to custodians of existing data, such as administrative records, who are asked to share their data for statistical purposes.

Respecting the Providers of Administrative and Other Data

Moving to a new paradigm of using multiple data sources for federal statistics, an agency must develop procedures that respect the constraints of data-providing organizations. In working with federal agencies that hold useful administrative records, statistical agencies should plan to cooperate, communicate, and coordinate with them on a continuing basis, as urged in Hendriks (2012). A continuing relationship of mutual respect and trust enables a statistical agency to better understand the strengths and

[27]For information about the Common Rule and certification of IRBs by the Office for Human Research Protections in the U.S. Department of Health and Human Services, see http://www.hhs.gov/ohrp [February 2021] and Appendix A.

limitations of a custodial agency's data. Mutual respect can help identify improvements in the data that are useful to both agencies.

An important consideration in using administrative records is whether informed consent of the individuals or organizations that provided their information to the custodial agency is required. In many cases the statistical use of administrative records may qualify under the "routine use" exception of the Privacy Act to provide evidence for the effective operation of the program. In some instances it may be necessary to obtain new consent of the original data providers.

Protecting the Confidentiality of Data Providers' Information

When individuals and organizations provide information to statistical agencies, they advance the public good. They must be able to rely on the statistical agency's promise to protect their information, to use it only for statistical purposes, and to protect it from other uses.

A credible pledge of confidentiality for individual and organizational responses is considered essential to encourage high response rates and accuracy of responses from survey participants.[28] Moreover, if individual participants have been assured of confidentiality, disclosure of identifiable information would violate the principle of respect for persons even if the information is not sensitive and would not result in any social, economic, legal, or other harm. For sensitive administrative data obtained from another government agency, there must be a credible pledge of confidentiality in a properly formulated memorandum of understanding or other authorizing document.

The Confidential Information Protection and Statistical Efficiency Act (CIPSEA) was originally enacted in 2002 and recodified as part of the Evidence Act (see Appendix B). This law protects the confidentiality of all federal data collected for statistical purposes under a confidentiality pledge, including but not limited to data collected by statistical agencies.[29] CIPSEA thus provides a common basis for the protection

[28]See Hillygus et al. (2006) and NRC (1979, 2004a, 2013c).

[29]Section 508 of the USA PATRIOT Act of 2001 (P.L. 107-56) amended the National Center for Education Statistics (NCES) Act of 1994 to allow the U.S. attorney general (or an assistant attorney general) to apply to a court to obtain any "reports, records, and information (including individually identifiable information) in the possession" of NCES that are considered relevant to an authorized investigation or prosecution of domestic or international terrorism. Section 508 also removed penalties for NCES employees who furnish individual records under this section. This exclusion for NCES has not been invoked.

of all statistical data across agencies, which enables some data sharing and provides statistical agencies the ability to designate external researchers as their agents so they could access data for statistical purposes. The law contains penalties for employees and agents who knowingly disclose identifiable statistical information (up to 5 years in prison, up to $250,000 in fines, or both).

Both the perception and the reality of agencies' confidentiality protection may be affected by departmental initiatives to consolidate data processing and storage to bolster computer and network security in the federal government, improve the cost-effectiveness of information technology development and maintenance, and protect against cyberattacks. An effective statistical agency will work with its department on approaches to computer security. As part of their responsibilities to support federal statistical agencies, departments should ensure that statistical agencies are able to control their data and information systems to ensure that the data are only used for statistical purposes and are kept confidential (see Practice 2).

Practice 9

Dissemination of Statistical Products That Meet Users' Needs

AN effective statistical agency produces and disseminates statistical products that meet the needs of its users. Users' needs for information evolve as new tools for using data become available. Once statistical information is made public, it will be used in numerous ways, including ways not originally envisaged, and by numerous types of users, ranging from government officials, to academic scholars, to activists, to students. A statistical agency should continually strive to obtain input from data users on its programs, products, and dissemination tools and methods. Understanding data users' needs and how they use data products is critical for making an agency's data services as relevant, accurate, timely, and accessible as possible.

Keeping abreast of the interests of current and potential new users requires continual attention to changes in the relevant policy issues and social and economic conditions in a statistical agency's domain, as well as changes in technologies for data access. Statistical agencies should work with professional associations, institutes, universities, and scholars to determine the current and emerging needs of research communities. They should also work with relevant professional associations and other organizations to determine the needs of business and industry as well as state and local governments. Statistical agencies can proactively explore the needs of users through advisory committees.

Individual persons, households, businesses, institutions, organizations, and government entities have provided the underlying source data for an agency's statistics. Furthermore, the public has paid for the

data collection, compilation, and processing. In return, the information created with such data should be accessible in ways that make it as useful as possible to the largest number of users—for decision making, program evaluation, scientific research, and public understanding (see also the Federal Data Strategy in Appendix A).

A statistical agency should strive for the widest possible dissemination of the statistical products it produces, consistent with its obligations to protect confidentiality. The products should be clearly identified, easy to find and use, and well documented. Dissemination should be timely, and information should be made readily available on an equal basis to all users. Agencies should have data curation policies and procedures in place so that data are preserved, fully documented, and accessible for statistical use in future years.[30]

Statistical agencies disseminate two broad classes of products: products that are publicly available, such as statistical releases, analytical reports, infographics, and public use microdata, and restricted access products, such as datasets containing confidential information, which are available in Federal Statistical Research Data Centers (FSRDCs) or through other restricted arrangements.[31]

Public Statistical Data Products

Dissemination of aggregate statistics may take the form of regularly updated time series, cross-tabulations of aggregated characteristics of respondents, analytical reports, interactive maps and charts, infographics, profiles, fact sheets, and press releases providing key findings. Such products should be readily accessible through an agency's website, supplemented by more detailed tabulations and data tools.

While printed statistical reports remain an important product, statistical agencies have introduced new data tools that make it easier for users to discover, query, retrieve, and use statistics on their own. These include redesigned websites, new platforms, interactive tools and applications, customized tables, new mapping capabilities, and APIs.

[30]Data curation involves the management of data from collection and initial storage to archiving (or deletion should the data be deemed of no further use—e.g., a data file that represents an initial stage of processing). The purpose of data curation is to ensure that information can be reliably retrieved and understood by future users.

[31]See https://www.census.gov/fsrdc. [February 2021]

For publicly available data products, a statistical agency's dissemination program should include the following elements:

- An established publications policy that describes, for each statistical program, the types of reports and other data releases to be made available, the formats to be used, the audience to be served, and the frequency of release.[32]
- A variety of avenues for disseminating information about data availability and upcoming releases.
- Multiple data products (suitably processed to protect confidentiality), so that information can be accessed by users with varying skills and needs. Useful data products include not only understandable maps, graphs, indicators, tables, and interactive data tools and applications on statistical agency websites, but also public-use microdata samples when practicable.
- Statistical press releases when data products are made available, produced, and issued by the statistical agency to provide a policy-neutral description of key findings and links to the data. Such releases must not include any policy commentary.[33]
- Explanatory material for all statistical product releases that assist users in understanding the product and convey the strengths and limitations of the data (see Practice 10).
- Archiving policies that guide decisions on which underlying data assets are to be retained, where they are to be archived (with the National Archives and Records Administration, or an established archive maintained by an academic or other nonprofit institution, or both), and how they are to be made accessible for future secondary analysis while protecting confidentiality.

Individual-level microdata files make it possible for users to conduct in-depth research and analyses that are not possible with aggregate data. Such files contain data for samples of individual respondents that have been processed to protect confidentiality by deleting, aggregating, or modifying any information that might permit individual identification.[34] Statistical agencies should keep abreast of new developments in confidentiality protection so that they can continue to provide as much useful

[32]See *Statistical Policy Directive* Nos. 3 and 4 in Appendix A.

[33]See S*tatistical Policy Directive No. 4*, Section 6a, in Appendix A.

[34]See Federal Committee on Statistical Methodology (2005), *Statistical Policy Working Paper #22.*

aggregate and microdata as possible at a time of increasing threats to privacy and confidentiality.

Restricted-Access Statistical Products

Some statistical agency data are deemed too difficult to protect in public releases and are made available to bonafide researchers only through some form of restricted access. To provide researchers with the ability to run their own analyses on restricted microdata, some statistical agencies provide access to an analysis engine on their websites that performs the selected statistical operations on the confidential data. Safeguards are built in so that the researcher cannot see the individual records and cannot obtain any output, such as too-detailed tabulations, which could identify individual respondents.[35]

A second method, pioneered by the National Center for Education Statistics (NCES), is to grant licenses to individual researchers to analyze restricted microdata at their own sites for statistical purposes. Such licenses require that the researchers agree to follow strict procedures for protecting confidentiality and accept liability for penalties if confidentiality is breached.[36]

A third method is to allow approved researchers to analyze restricted microdata at a secure site for statistical purposes, such as one of the FSRDCs currently located at 30 universities and research organizations around the country. The FSRDC network began as a Census Bureau initiative and now offers access to data from other participating agencies.[37] There are also other efforts to provide virtual data enclaves and platforms to analyze data while protecting confidentiality.[38]

The Evidence Act is expected to facilitate greater use of data for statistical purposes and for evidence and program evaluation. This act requires OMB to issue guidance on tiers of access for data depending on their sensitivity and legal protections. OMB is also required to implement a single-application portal for researcher access to data from different agencies, and this is currently being piloted.[39]

[35]See e.g., https://nces.ed.gov/datalab/index.aspx. [February 2021]

[36]For NCES's licensing procedures and terms, see https://nces.ed.gov/statprog/instruct.asp. [February 2021]

[37]See https://www.census.gov/fsrdc. [February 2021]

[38]See e.g., https://coleridgeinitiative.org/adrf/ and https://www.norc.org/Research/Capabilities/Pages/data-enclave.aspx. [February 2021]

[39]See https://www.icpsr.umich.edu/web/pages/appfed/index.html. [February 2021]

Practice 10

Openness About Sources and Limitations of the Data Provided

A statistical agency must be transparent about how it acquires data and produces statistics and be open about the strengths and limitations of its data. No matter how high-quality the statistical data are, they will contain some uncertainty and error. This does not mean the data are wrong but that they need to be used with an understanding of their limitations. Statistical agencies need to communicate clearly to a wide range of potential users what the uncertainty in the data means for using the statistical information appropriately.

To be most effective, openness should be tailored to different user groups. For press releases disseminated to the public, the agency must make every effort to note both the meaning of the statistics and their limitations for various uses. For more technically trained users, detailed descriptions of methods and measures of quality should be made available (see Federal Committee on Statistical Methodology, 2001).

Openness requires that statistical releases from an agency include a full description of the purpose of the program; the methods and assumptions used for data collection, processing, and estimation; information about the quality and relevance of the data; analysis methods used; and the results of research on the methods and data (see NASEM, 2019c). Such transparency is essential for credibility with data users and stakeholders and for public trust. Thus, openness about statistical limitations requires much more than providing estimates of sampling error. In addition to a discussion of nonsampling errors (e.g., coverage errors, nonresponse errors, measurement errors, and processing errors), it is valuable to have

a description of the concepts measured and how they relate to the major uses of the data. Descriptions of the shortcomings of the data should be provided in sufficient detail to permit a user to take them into account in analysis and interpretation. Descriptions of how the data relate to similar data collected by other agencies should also be provided, particularly when the estimates from two or more surveys or other data sources exhibit large differences that may have policy implications.

There is often a tension between timeliness and accuracy. When concerns for timeliness prompt the release of preliminary estimates (as is done for some economic indicators and has been done in response to COVID-19), consideration should be given to the frequency of revisions and the mode of presentation from the point of view of the users as well as the issuers of the data. Agencies that release preliminary estimates must educate the public about differences among preliminary, revised, and final estimates.

An important aspect of openness concerns the treatment of errors that are discovered subsequent to data release. Openness means that an agency has an obligation to issue corrections publicly and in a timely manner. The agency should use not only the same dissemination avenues to announce corrections that it used to release the original statistics, but also additional vehicles, as appropriate, to alert the widest possible audience of current and future users of the corrections in the information. Agencies should be proactive in seeking ways to alert potential users of the data about the nature of a problem and the corrective actions that it is taking or that users should take.

Federal statistical agencies should implement quality frameworks for their programs and use these to describe the strengths and limitations of the statistical information produced by the data (see Practices 3 and 6). Some statistical agencies have developed "quality profiles" for major surveys, which document what is and is not known about errors in estimates to help users.

As agencies use administrative data and other alternative sources, they need to provide information not only on what is known about those sources but also on how the data were linked or blended with other data sources and the potential errors introduced through linkage. This is a challenging and evolving area (see NASEM, 2017b, 2017d), and efforts are currently underway to develop best practices and quality frameworks

for these topics (see e.g., Czajka and Strange, 2018; Federal Committee on Statistical Methodology, 2019, 2020).

Statistical agencies should treat the effort to provide information on the quality, limitations, and appropriate use of their data as an essential part of their mission. Such information and metadata should be readily accessible to all known and potential users (see NRC, 1993a, 1997b, 2007b). By being open about the sources and limitations of their data and by providing as much data as possible in ways that are as easy as possible for users to access and apply, federal statistical agencies fulfill their vital mission to inform the public, contribute to evidence-based policy making, and support the development of societal knowledge for the public good.

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APPENDIX A
Legislation and Regulations That Govern Federal Statistics

This appendix summarizes the major legislation, regulations, and guidance that govern the operations of the federal statistical system as a whole, including: (1) laws on the U.S. Office of Management and Budget (OMB) authority over federal statistics; (2) OMB statistical policy directives; (3) laws and OMB guidance on surveys, statistics, and evidence building; (4) laws and guidance on confidentiality and privacy protection; (5) OMB guidance on information quality, and the federal data strategy; and (6) Interagency on Statistical Policy documents. In addition to these laws, regulations, and guidance documents, each agency is governed by additional legislation and guidance particular to its department and itself.

Most of the legislation, regulations, and guidance summarized here are issued by OMB, which plays a critical role in oversight of the federal government's widely dispersed statistical operations. OMB's oversight role dates to 1939, when the functions of a Central Statistical Board, created in 1933, were transferred to the then-named Bureau of the Budget (see Anderson, 2015; Duncan and Shelton, 1978; Norwood, 1995). Recent legislation and guidance address such systemwide issues as confidentiality protection and privacy of respondents, data quality (including peer review prior to dissemination), efficiency of operations, and scientific integrity and transparency.

LEGAL AUTHORITY OF OMB OVER FEDERAL STATISTICS

The Paperwork Reduction Act (PRA) of 1980 (P.L. 96-511 and codified at 44 USC 3501 and following; reauthorized and amended in 1986 by P.L. 99-500 and in 1995 by P.L. 104-13) is the legal foundation for the modern statistical coordination and management mission of OMB. It affirms OMB's review power over federal statistical agencies and myriad other agencies throughout the federal government that collect information from individuals and organizations. This review power covers both the burden imposed by information collection and methods and practices for data collection and dissemination. The Foundations for Evidence-Based Policymaking Act of 2018 broadened this authority to include using data and statistics for evidence, and it further strengthened the role of the chief statistician.

Background: 1933–1980

The PRA's origins trace back to Executive Order 6226, signed by Franklin D. Roosevelt in July 1933, which established a Central Statistical Board to "appraise and advise upon all schedules of all Government agencies engaged in the primary collection of statistics required in carrying out the purposes of the National Industrial Recovery Act, to review plans for tabulation and classification of such statistics, and to promote the coordination and improvement of the statistical services involved." Members of the board were appointed by the relevant cabinet secretaries. The board was established in law for a 5-year period in 1935. Its functions were transferred to the Bureau of the Budget (itself established in 1921) in 1939, when the Budget Bureau was transferred to the Executive Office of the President.

The 1942 Federal Reports Act represented another milestone by codifying the authority for the Budget Bureau to coordinate and oversee the of federal statistical agencies. Most famously, it provided that no federal agency could collect data from 10 or more respondents without approval of the budget director. The 1950 Budget and Accounting Procedures Act (31 USC 1104(d)) further strengthened the statistical coordinating and improvement role of OMB, giving OMB authorization to promulgate regulations and orders governing statistical programs throughout the federal government.

The statistical policy function continued in the budget office in the Executive Office of the President when the Budget Bureau became OMB in 1970. However, in 1977 the statistical policy staff was split into two groups: one group remained in OMB to handle the paperwork clearance and review function for statistical agencies; the other group was moved to the U.S. Department of Commerce to address statistical policy and standards issues (Executive Order 12013, October 7, 1977).[1]

Paperwork Reduction Act, 1980–Present

The overarching goal of the 1980 Paperwork Reduction Act (PRA) was to reduce the burden of filling out federal forms by businesses and individuals. It created a new Office of Information and Regulatory Affairs (OIRA) within OMB, which was charged with reducing the combined burden imposed by regulatory agencies and administrative and statistical program agencies. The PRA required OIRA to engage in long-range planning to improve federal statistical programs; review statistical budgets; coordinate government statistical functions; establish standards, classifications, and other guidelines for statistical data collection and dissemination; and evaluate statistical program performance. In furtherance of that work, Executive Order 12318 (August 21, 1981) revoked the 1977 order and moved the statistical policy office from the Department of Commerce and moved it under OIRA; the 1986 reauthorization of the PRA required the appointment of a chief statistician at OMB to carry out the statistical policy functions (100 Stat. 1783-337).[2] In the 1995 reauthorization and extensive revision of the PRA, the director of OMB was given broad authority over the activities of the federal statistical system, but was directed to appoint a chief statistician who is a trained and experienced professional statistician to carry out the following functions:

1. coordinate the activities of the federal statistical system to ensure (a) the efficiency and effectiveness of the system; and (b) the integrity, objectivity, impartiality, utility, and confidentiality of information collected for statistical purposes;

[1]Seven months later, a pair of *Federal Register* notices (43 *Federal Register* 19260 and 19308) formally transferred the content of and responsibility for various regulatory circulars on federal statistical activities to the Commerce Department—at which time they were designated "statistical policy directives" for the first time.

[2]Consequent to congressional hearings, the Reagan administration first appointed a chief statistician in 1983.

2. ensure that budget proposals of agencies are consistent with systemwide priorities for maintaining and improving the quality of federal statistics, and prepare an annual report on statistical program funding;
3. develop and oversee the implementation of governmentwide policies, principles, standards, and guidelines concerning:
    a. statistical collection procedures and methods;
    b. statistical data classification;
    c. statistical information presentation and dissemination;
    d. timely release of statistical data; and
    e. such statistical data sources as may be required for the administration of federal programs;
4. evaluate statistical program performance and agency compliance with governmentwide policies, principles, standards and guidelines;
5. promote the sharing of information collected for statistical purposes consistent with privacy rights and confidentiality pledges; and
6. coordinate the participation of the United States in international statistical activities, including the development of comparable statistics. (44 USC 3504(e))

The law also codified the Interagency Council on Statistical Policy, which is headed by the chief statistician and consists of the heads of the major statistical programs and representatives of other statistical agencies under rotating membership. In addition, it authorizes training opportunities in statistical policy functions for employees of the federal government who serve on rotational assignments at OMB. The law also requires an annual report to Congress on the statistical programs of the U.S. government.

The Foundations for Evidence-Based Policymaking Act of 2018

The Foundations for Evidence-Based Policymaking Act of 2018 (P.L 115-345) includes three separate sections covering, respectively, Evidence Building Activities; Open Government Data; and Confidential Information Protection and Statistical Efficiency. It includes about half of the recommendations from the Commission on Evidence-Based Policymaking (2017) as well as some key provisions for federal statistics.

Under Evidence Building Activities, the Act requires that agencies develop evidence-building plans, appoint qualified evaluation officers, and appoint qualified statistical officials. It also establishes an Advisory Committee on Data for Evidence Building, which shall be chaired by the chief statistician at OMB, to recommend ways to facilitate data sharing, enable data linkages, and develop privacy-enhancing methods.

The Open Government Data Act, which is Title II of the Foundations for Evidence-Based Policymaking Act, requires agencies to make Open Data the government default for nonsensitive publicly available government data. It requires agencies to create a comprehensive data inventory and appoint qualified chief data officers. It also establishes a chief data officer council and requires the General Services Administration to host and maintain a comprehensive Federal Data Catalogue of all data assets.

The Confidential Information Protection and Statistical Efficiency Act (CIPSEA) of 2018 reauthorized the 2002 law of the same name, and codified the responsibilities of statistical agencies in units originally issued as *Statistical Policy Directive No. 1* (see below). It also provides statistical agencies with broader statutory authority for accessing and using data assets of nonstatistical agencies, expands secure access to CIPSEA data assets for approved statistical purposes, including evidence and evaluation uses, and establishes a single access portal for qualified researchers to apply for the use of restricted or sensitive data (see additional information on CIPSEA below).

OMB is charged with implementing guidance for multiple sections of this law (see below).

OMB STATISTICAL POLICY DIRECTIVES

OMB issues guidance to federal agencies via "circulars," which are expected to have a continuing effect of 2 years or more, and "bulletins," which are more limited in their effect.[3] OMB statistical standards and guidance were originally issued in this form; however, after the statistical policy function was temporarily moved to the U.S. Department of Commerce in 1977, the circulars were reissued as "statistical policy directives" (43 Federal Register 19260) so as not to cause confusion with other OMB circulars. When the statistical policy function was moved back to OMB in 1981, the statistical policy directives were transferred

[3]See https://www.whitehouse.gov/omb/information-for-agencies/circulars. [February 2021]

back to OMB. Through the years, OMB terminology has varied, with some policy documents called "directives" and others called "standards" or "classifications," but the current OMB website has recently gone back to referring to these standards as statistical policy directives, as noted below. The process of issuing or revising a directive or standard involves expert review, agency consultation, and public comment.

Statistical Policy Directive No. 1—Fundamental Responsibilities of Federal Statistical Agencies and Recognized Statistical Units

OMB issued this statistical policy directive on December 2, 2014 (U.S. Office of Management and Budget, 2014b), and labeled it no. 1 because of its foundational importance.[4] The directive cites relevant documents issued by OMB (e.g., other statistical policy directives) and by the Office of Science and Technology Policy, together with *Principles and Practices for a Federal Statistical Agency* (NRC, 2013b), the *European Statistics Code of Practice* (European Statistical System Committee, 2011), and the *Fundamental Principles of Official Statistics* (United Nations Statistical Commission, 2014), as contributing "to an integrative framework guiding the production of Federal statistics, encompassing design, collection, processing, editing, compilation, storage, analysis, release, and dissemination" (U.S. Office of Management and Budget, 2014b, p. 71611).

The directive goes on to articulate four statistical agency responsibilities: (1) produce and disseminate relevant and timely information; (2) conduct credible and accurate statistical activities; (3) conduct objective statistical activities; and (4) protect the trust of information providers by ensuring the confidentiality and exclusive statistical use of their responses. These responsibilities were codified in the Foundations for Evidence Based Policymaking Act of 2018.[5] Importantly, the law retained the requirement that requires heads of departments to "enable, support, and facilitate statistical agencies or units in carrying out the responsibilities."[6]

[4]The original *Statistical Policy Directive No. 1* was Standards for Statistical Surveys. When this was revised, updated, and issued in 2006, it was referred to as Standards and Guidelines for Statistical Surveys, and was later renamed as *Statistical Policy Directive No. 2*, as noted below.

[5]44 USC 3563.

[6]44 USC 3563(b).

Statistical Policy Directive No. 2—Standards and Guidelines for Statistical Surveys

OMB issued a revised and updated *Standards and Guidelines for Statistical Surveys in 2006* (U.S. Office of Management and Budget, 2006) but now refers to this document as *Statistical Policy Directive No. 2*.[7] It includes 20 standards with one or more associated guidelines for every aspect of survey methodology from planning through data release:

1. survey planning
2. survey design
3. survey response rates
4. pretesting survey systems
5. developing sampling frames
6. required notification to potential survey respondents
7. data collection methodology
8. data editing
9. nonresponse analysis and response rate calculation
10. coding
11. data protection
12. evaluation
13. developing estimates and projections
14. analysis and report planning
15. inference and comparisons
16. review of information products
17. releasing information
18. data protection and disclosure avoidance for dissemination
19. survey documentation, and
20. documentation and release of public-use microdata.

On October 12, 2016, OMB issued a notice in the *Federal Register* of a final decision to add an *Addendum: Standards and Guidelines for Cognitive Interviews to Directive No. 2* (U.S. Office of Management and Budget, 2016b). This addendum recognizes the important role that qualitative cognitive interviewing techniques play in the design of effective survey questions (see NRC, 1984, 2006c, Ch. 8).

[7]This document was a combined update and revision of the original *Statistical Policy Directive No. 1, Standards for Statistical Surveys*, and *Statistical Policy Directive No. 2, Publication of Statistics.*

Statistical Policy Directive No. 3—Compilation, Release, and Evaluation of Principal Federal Economic Indicators

OMB first issued Directive No. 3 in the 1970s and strengthened it in 1985.[8] Its purpose is clearly stated (U.S. Office of Management and Budget, 1985, p. 38932):

> [This directive] designates statistical series that provide timely measures of economic activity as Principal Economic Indicators and requires prompt release of these indicators by statistical agencies in a politically neutral manner. The intent of the directive is to preserve the time value of such information, strike a balance between timeliness and accuracy, prevent early access to information that may affect financial and commodity markets, and preserve the distinction between the policy neutral release of data by statistical agencies and their interpretation by policy officials.

Each September, OMB issues the *Schedule of Release Dates for Principal Federal Economic Indicators* for the calendar year.[9] At present, the following agencies issue one or more of the 36 principal economic indicators:

- Bureau of Economic Analysis (5 indicators, including gross domestic product [GDP], personal income and outlays, corporate profits);
- Bureau of Labor Statistics (7 indicators, including the employment situation, Consumer Price Index [CPI]);
- Census Bureau (13 indicators, including new residential construction, monthly retail trade);
- Energy Information Administration (natural gas storage);
- Federal Reserve Board (2 indicators, industrial production, consumer credit);
- Foreign Agricultural Service (world agricultural production);
- National Agricultural Statistics Service (6 indicators, including agricultural prices, grain production); and

[8]Norwood (2016) recounts the history of threats to the integrity of economic indicators that necessitated the directive's issuance and updating.

[9]See https://www.whitehouse.gov/wp-content/uploads/2020/09/pfei_schedule_release_dates_2021.pdf. [February 2021]

- World Agricultural Outlook Board (world agricultural supply and demand).

OMB issued a *Federal Register* notice on April 11, 2019, seeking comment on one aspect of this directive. The directive has required that:

> Except for members of the staff of the agency issuing the principal federal economic indicator who have been designated by the agency head to provide technical explanations of the data, employees of the Executive Branch shall not comment publicly on the data until *at least one hour after* the official release time. (emphasis added)[10]

OMB sought public comment on just this provision of the directive and asked:

> whether advances in information dissemination technology since Directive No. 3's issuance in 1985 could provide for meeting the goals of Directive No. 3 to ensure equitable, policy neutral and timely release and dissemination of [Principal Federal Economic Indicators] PFEIs under a shorter time delay, including no time at all.[11]

OMB has not reported any results from this request for comment or made any changes to Directive No. 3 as of the writing of this report.

Statistical Policy Directive No. 4—Release and Dissemination of Statistical Products Produced by Federal Statistical Agencies

OMB issued Directive No. 4, which essentially covers all statistical releases other than those specified in Directive No. 3, in 2008 (U.S. Office of Management and Budget, 2008). It includes not only statistical information released in printed reports or on the Internet, but also statistical press releases, which describe or announce a statistical data product. Statistical press releases are the sole responsibility of the relevant statistical agency. Each fall statistical agencies must issue a schedule of when they expect each regular or recurring product to be released and give timely notification of any change to the published schedule.

[10] *Federal Register* vol. 84 no. 70, p. 14684.
[11] *Federal Register* vol. 84 no. 70, p. 14684.

On October 17, 2016, OMB issued a notice in the *Federal Register* requesting comments on a proposed addendum to Directive No. 4, which would constitute *Section 10: Performance Review* (U.S. Office of Management and Budget, 2016c). Comments were due December 1, 2016. As proposed, the addendum, which incorporates language from Directive No. 3, would require each statistical agency and recognized statistical unit to submit an annual performance review of the production and dissemination of its key statistical products to OMB. Key products would be defined by the agency in consultation with OMB. Reviews would address for each product (U.S. Office of Management and Budget, 2016c, 71541–71542):

> (a) The accuracy and reliability of the series, e.g., the magnitude and direction of all revisions, the performance of the series relative to established benchmarks, and the proportion and effect of nonresponses or responses received after the publication of preliminary estimates; (b) the accuracy, completeness, and accessibility of documentation describing the methods used in compiling and revising the product; (c) the agency's performance in meeting its established release schedule and the prompt release objective of this Directive; (d) the agency's ability to avoid disclosure prior to the scheduled release time; (e) any additional issues (such as periodicity, electronic access, etc.) that the Administrator for Information and Regulatory Affairs specifies in writing to the agency at least 6 months in advance of the scheduled submission date.

OMB would include a summary of the year's evaluations in its annual report to Congress. As of February 2021, this addendum has yet to be enacted. If enacted, it would represent the first formal process by OMB for performance review specifically of statistical products, with the exception that Directive No. 3 requires that the key economic indicators (see above) be evaluated every 3 years.

Statistical Policy Directive No. 7—Metropolitan Statistical Areas

Since the 1950s, OMB's Metropolitan Area Classification Program has provided standards for delineating areas that are "metropolitan" in nature for use throughout the federal government. In general, such

an area has a population nucleus plus one or more adjacent communities that have a high degree of interaction with the nucleus. These areas were called "standard metropolitan areas" in the 1950 census publications. For censuses from 1960 through 2000, OMB revised as appropriate the definitional criteria for metropolitan areas before each census and, on the basis of those criteria, issued an updated list of recognized areas after each census.[12]

The definitional criteria issued before the 2000 census marked a major revision to the coverage of the program. *Standards for Defining Metropolitan and Micropolitan Statistical Areas* defined not only metropolitan statistical areas but also, for the first time, micropolitan areas.[13] Metropolitan areas are those with a central urbanized core of 50,000 or more people in one or more counties; micropolitan areas are those with a central urbanized core of 10,000 or more people in one or more counties. The list of metropolitan and micropolitan areas using the 2000 criteria was initially issued in 2003 and was updated annually through 2008 by OMB on the basis of the Census Bureau's population estimates. Two years later, OMB issued *2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas*, which largely continued the criteria adopted for the 2000 standards.[14] Areas based on these standards, using data from the 2010 census and the American Community Survey (ACS), were announced in 2013, and any proposed revisions are subject to public comment.

Beginning with the 2010 Census, the revision and updating process was changed to reflect the availability of needed commuting and employment information from the continuous ACS. Under the changed process, OMB will issue as often as annually a list of newly recognized areas by using Census Bureau population estimates; in addition, on the basis of ACS and census data, OMB issued revisions in 2018 and 2020, using population estimates and ACS data on commuting and employment.[15] OMB requested comments on potential changes to the standards for

[12]Issues of rural area classification were discussed at a Committee on National Statistics workshop sponsored by the Economic Research Service, U.S. Department of Agriculture, in April 2015 (NASEM, 2016a).

[13]See 65 *Federal Register* 82228 (December 27, 2000). Available: https://www.federalregister.gov/d/00-32997. [February 2021]

[14]See 75 *Federal Register* 37245. Available: https://www.federalregister.gov/d/2010-15605. [February 2021]

[15]See https://www.whitehouse.gov/wp-content/uploads/2018/09/Bulletin-18-04.pdf [February 2022] https://www.whitehouse.gov/wp-content/uploads/2020/03/Bulletin-20-01.pdf. [February 2021]

delineating the 2020 Census in early 2021 (see 86 *Federal Register* 5263-5266). Input to the OMB decisions is provided by an interagency Metropolitan Area Standards Review Committee.

Statistical Policy Directive No. 8—North American Industry Classification System

The North American Industry Classification System (NAICS) was developed by the United States, Canada, and Mexico to provide a common, contemporary classification system for economic production activity following the enactment of the North American Free Trade Agreement (NAFTA). NAICS, which is a substantial revision of its predecessor, the Standard Industrial Classification (SIC), was first issued in 1997. (The SIC was originally issued in various sections in 1938–1940 and revised on an irregular basis between 1940 and its last iteration in 1987, and it is now being discontinued.) Interagency and country working groups (under the aegis of OMB in the United States) have the opportunity to update NAICS every 5 years for years ending in 2 and 7 so that it keeps up reasonably well with changes in the structure of industrial activity in the three countries. NAICS was most recently updated for use beginning in 2017.[16] In 2020, OMB issued a *Federal Register* notice requesting comments on potential changes to the structure and content of NAICS for the 2022 update.[17]

Statistical Policy Directive No. 10—Standard Occupational Classification

The Standard Occupational Classification (SOC) is used by federal statistical agencies to classify workers into occupational categories for collecting, tabulating, and disseminating data.[18] The first SOC was published in 1977 in an effort to standardize the collection of occupational data by multiple agencies. It was revised in 1980 but not universally

[16]See "North American Industry Classification System—Revision for 2017," 81 *Federal Register* 52584 (August 8, 2016). Available: https://www.federalregister.gov/d/2016-18774 [February 2021]. See also "North American Industry Classification System (NAICS)—Updates for 2017," 80 *Federal Register* 46480 (August 4, 2015). Available: https://www.federalregister.gov/d/2015-19022. [February 2021]

[17]As a formality, comments are also being sought on the elimination of the Standard Industrial Classification of Enterprises, which has not been updated or widely adopted over the past 45 years. See *Federal Register* 85 FR 38: 11120-11124. Available: https://www.census.gov/eos/www/naics/federal_register_notices/notices/fr26fb20.pdf. [February 2021]

[18]Available: http://www.bls.gov/soc. [February 2021]

adopted until an interagency process under the aegis of OMB further revised it in 1998 for use in the 2000 decennial census and surveys conducted in the following decade. Work to revise the 2000 SOC was completed in time for its use in 2010 for the ACS, which provides occupational data in place of the decennial census "long form" sample, and other surveys. The latest version of the SOC was issued for 2018, and it will be updated every 10 years thereafter.[19]

Statistical Policy Directive No. 14—Definition of Poverty for Statistical Purposes

OMB first issued standards for the statistical definition of poverty in 1969. It adopted the existing poverty thresholds (first specified by Mollie Orshansky of the Social Security Administration in 1963 and used by the Office of Economic Opportunity) for different categories of families defined by size, number of children, gender of the family head, and farm-nonfarm residences. (One change from Orshansky's specification was that the farm thresholds were raised from 70% to 85% of the nonfarm thresholds.) For most family types, the thresholds represented the costs of a minimally adequate diet multiplied by three to allow for all other expenses.

The 1969 directive specified that the thresholds would be updated each year for the change in the Consumer Price Index (instead of the cost of the Economy Food Plan as in prior years) and compared with families' total regular money income as measured in the Current Population Survey. The directive was promulgated as *Statistical Policy Directive No. 14* in 1978, when the statistical policy function was briefly housed in the Department of Commerce (U.S. Department of Commerce, 1978); minor modifications were made to the thresholds beginning in 1982 (the nonfarm thresholds were used for all families, the thresholds for male- and female-headed families were averaged, and the largest family-size category was raised from 7 to 9 people).[20] No further changes have been made to the official thresholds or definition of countable resources, although major socioeconomic changes in the United States and in income support policies have made the official poverty concept increasingly unable to inform assessments of policy effectiveness for different population

[19]See https://www.govinfo.gov/content/pkg/FR-2017-11-28/pdf/2017-25622.pdf. [February 2021]

[20]Information on the poverty measure and current statistics are available at: https://www.census.gov/topics/income-poverty/poverty.html. [February 2021]

groups (e.g., refunds from the Earned Income Tax Credit are not counted in the resource measure).

With input from the observations of an Interagency Technical Working Group on Developing a Supplemental Poverty Measure (2010), the U.S. Census Bureau released a new supplemental poverty measure (SPM in fall of 2011 (referencing poverty in calendar 2010), using thresholds developed by the U.S. Bureau of Labor Statistics.[21] The thresholds and definition of countable resources as money and near-money disposable income for the SPM were derived in large part from the recommendations from the report of a Committee on National Statistics panel, *Measuring Poverty: A New Approach* (NRC, 1995b). The SPM, which is designed to be a useful tool for policy evaluation, is issued annually, as is the official measure.

In the past 2 years, OMB has sought public comments twice on issues related to poverty measurement. In 2019, OMB sought comments on the differences among various consumer price indexes produced by the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA) and how those differences might influence the estimation of the Official Poverty Measure. OMB reportedly received thousands of comments in response and as of the writing of this report has not reported on those comments or issued any changes.[22]

In 2020 OMB requested answers to questions posed by the Interagency Technical Working Group on Evaluating Alternative Measures of Poverty, which was established by OMB in 2019. The working group issued an interim report,[23] which posed 14 specific questions in categories covering definitions, resource measures, and thresholds.[24] The comments were intended to inform the working group's recommendations to OMB. As of the writing of this report, no further information has been publicly released.

[21]Information on the supplemental poverty measure is available at https://www.census.gov/topics/income-poverty/supplemental-poverty-measure.html. [February 2021]

[22]See *Federal Register* vol. 84 No. 88, pages 19961-19963, May 7, 2019.

[23]See www.regulations.gov in docket number OMB-2019-0007.

[24]See *Federal Register* vol. 85 No. 31, pages 8610-8613, February 14, 2020.

Statistical Policy Directive No. 15—Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity

The first standards on this topic, issued in 1977, *Race and Ethnic Standards for Federal Statistics and Administrative Reporting*, specified a minimum set of racial and ethnic categories for reporting of race and ethnicity on federal surveys and in administrative records systems. It recommended either two separate questions, one on ethnicity (Hispanic or non-Hispanic) and one on race (white, black, Asian or Pacific Islander, American Indian or Alaska Native), or a combined question that included Hispanic as a category. Historically, the U.S. decennial census has included additional categories under the two-question format.

Following an intensive research, testing, and consultation process, OMB issued a revised set of standards in 1997.[25] The updated standards retain a two-question format, include separate categories for Asians and for Native Hawaiian and other Pacific Islanders, emphasize self-identification, and allow respondents to select more than one racial category.

The 2010 census included several experimental panels to test different strategies that incorporated alternative wording and format for the questions on race and ethnicity, including a combined race and ethnicity question. Analysis of the results led to an important finding that the combined question improved reporting.[26] Additional research was conducted in subsequent years, including a National Content Test in 2015 for 2020 census planning.[27]

On September 30, 2016, OMB issued a request for comments on a "possible limited revision" of *Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity.*[28] Comments were requested within 30 days on the possibility of allowing the use of a combined race and ethnicity question, adding a "Middle Eastern or North African (MENA)" category, and some other changes in terminology. On March 1, 2017, OMB asked for comments within 60 days on the interim proposals of the Federal Interagency Working Group for Research on

[25]See https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf. [February 2021]

[26]See http://www.census.gov/2010census/pdf/2010_Census_Race_HO_AQE.pdf. [February 2021]

[27]See https://www.census.gov/programs-surveys/decennial-census/2020-census/research-testing/testing-activities/2015-census-tests/national-content-test.html. [February 2021]

[28]See 81 *Federal Register* 67398. Available: https://www.federalregister.gov/d/2016-23672. [February 2021]

Race and Ethnicity, which took account of the comments received on the September 30 notice.[29] However, OMB took no further action on the proposal, and the race and ethnicity questions on the 2020 Census continued to follow the 1997 standards.

OMB GUIDANCE FOR SURVEYS, FEDERAL STATISTICS, AND EVIDENCE BUILDING

PRA Implementation Guidance for Surveys and Other Agency Information Collection Activities

In January 2006, the OMB Statistical and Science Policy Office released *Guidance on Agency Survey and Statistical Information Collections—Questions and Answers When Designing Surveys for Information Collections*.[30] The guidance is a set of 81 questions and answers that attempts to demystify the OMB clearance process (required by the PRA) for surveys and other statistical information collections. Its purpose is to explain OMB's review process, assist agencies in strengthening their supporting statements for information collection requests, and provide advice for improving information collection designs.

The *Guidance* covers such topics as its purpose; submission of information collection requests (ICRs, often called clearance packages) to OMB; scope of the information collection (e.g., calculation of burden hours on respondents); choice of methods; sampling; modes of data collection; questionnaire design and development; statistical standards; informing respondents about their participation and the confidentiality of their data; response rates and incentives; analysis and reporting; and studies using stated preference methods (which ask respondents about the use or nonuse value of a good in order to obtain willingness-to-pay estimates relevant to benefit or cost estimation). The *Guidance* includes a glossary of terms and ICR supporting statement instructions.

OMB also issued several memoranda to clarify particular interpretations and applications of the PRA to agency activities.[31] Topics covered

[29]See 82 *Federal Register* 12242. Available: https://www.federalregister.gov/d/2017-03973. [February 2021]

[30]This was updated in October 2016 (U.S. Office of Management and Budget, 2016a) to incorporate reference to the standards and guidelines for cognitive interviewing (U.S. Office of Management and Budget, 2016b).

[31]All the memoranda can currently be found at https://obamawhitehouse.archives.gov/omb/inforeg_infocoll. [February 2021]

include an overview of PRA requirements, PRA implications of social media and web-based interactive technologies, the use of generic clearances, options for streamlining the PRA process for scientific research, a fast-track process for qualitative customer service delivery feedback, and answers to PRA questions related to challenges and prizes.

North American Product Classification System

The North American Product Classification System (NAPCS) is intended to be a comprehensive, market- or demand-based, hierarchical classification system for products or outputs (goods and services) that: (a) is not industry-of-origin based but can be linked to the NAICS industry structure; (b) is consistent across the three North American countries; and (c) promotes improvements in the identification and classification of service products across international classification systems, such as the Central Product Classification System of the United Nations NAPCS responds to the problem that a business establishment can only have one NAICS code, even though it may produce more than one product. It is also the case that the same product can be produced by more than one industry.

NAPCS has been under development since 1998, beginning with exploratory efforts to develop classifications for the services sector. At present, a version of NAPCS for 2017 is in beta testing by U.S. statistical agencies; the plan is to update NAPCS every 5 years on the same cycle as NAICS. For more information, see Economic Classification Policy Committee of the United States (2003), in which the three countries agreed that the objectives and principles articulated in sections A through C of that paper define the purposes of NAPCS and the operational guidelines for creating it.[32]

2014 Guidance for Providing and Using Administrative Data for Statistical Purposes (M-14-06)

Recognizing the informational value and potential efficiencies to be achieved by using already collected federal administrative data for federal statistics, the OMB director issued M-14-06 on February 14, 2014 (U.S. Office of Management and Budget, 2014a). The intent of this memorandum is to provide agencies with "guidance for addressing the legal, policy, and operational issues that exist with respect to using

[32]See https://www.census.gov/naics/napcs/. [February 2021]

administrative data for statistical purposes." First, it "calls for departmental and agency leadership to: (i) foster greater collaboration between program and statistical offices; (ii) develop strong data stewardship policies and practices around the statistical use of administrative data; (iii) require the documentation of quality control measures and key attributes of important administrative datasets; and (iv) require the designation of responsibilities and practices through the use of agreements amongst these offices." Second, it "encourages Federal departments and agencies to promote the use of administrative data for statistical purposes…[while] continu[ing] to fully protect the privacy and confidentiality afforded to the individuals, businesses, and institutions providing the data." Third, it "provides some 'best practice' tools, including detailed guidance on the interaction of the Privacy Act requirements and the use of administrative data for statistical purposes, as well as a model interagency agreement for…sharing data for statistical purposes." Fourth, it "requires each department/agency to report to OMB, within 120 days…on its progress in implementing this Memorandum."

2015 Guidance on Improving Statistical Activities Through Interagency Collaboration (M-15-15)

Issued by the administrator of the OMB Office of Information and Regulatory Affairs (OIRA) on July 8, 2015 (U.S. Office of Management and Budget, 2015), this memorandum "strongly encourages the Federal statistical agencies and units, and their parent Departments, to build interagency collaboration that will help the Federal statistical community more effectively meet the information needs of the 21st century." The memorandum cites examples of successful interagency collaboration (including within and across departments). It also describes available tools for collaboration, such as use of the 1933 Economy Act, which authorized departments and agencies to buy goods and services from each other, and the new Category Management model for federal contracting. This model could, for example, facilitate obtaining a single license for governmentwide use of statistical software in accordance with the 2014 Federal Information Technology Acquisition Reform Act (see below).

Phase 1 Implementation of the Foundations for Evidence-Based Policymaking Act of 2018: Learning Agendas, Personnel, and Planning Guidance (M-19-23)

OMB issued memorandum M-19-23 in July 2019 to provide initial guidance to implement Phase 1 requirements from the Foundations for Evidence-Based Policymaking Act of 2018 ("Evidence Act"). For Phase 1, agencies were required to develop learning agendas, designate and develop roles and responsibilities for new personnel, and undertake planning activities.

Agencies were required to start the process of developing and implementing a multiyear learning agenda that coincides with the four-year timeframe defined for agency strategic plans and to submit them with their budget requests to OMB.

The Evidence Act created three new roles related to data and evidence. Heads of agencies were required to appoint a Chief Data Officer (CDO), an Evaluation Officer, and a Statistical Official, and to establish an agency Data Governance Body, to be chaired by the Chief Data Officer, with participation from relevant senior-level staff in agency business units, data functions, and financial management. The designated key officials are required to participate with their peers on their respective interagency councils: CDO Council, Evaluation Officer Council, and the Interagency Council on Statistical Policy (ICSP). The ICSP has existed since the late 1980s, but it was expanded by the Evidence Act to include 12 new statistical officials (heads of the current principal statistical agencies serve as statistical officials for their departments and remain on the ICSP). The CDO Council and the Evaluation Officer Councils were newly created by the law.

For planning activities, agencies were required to begin the process of developing their first Annual Evaluation Plan, including the key questions for each planned "significant" evaluation study, as well as the key information collections or acquisitions the agencies plan to begin. Agencies were also required to begin to plan how they will assess the coverage, quality, methods, effectiveness, and independence of their statistics, evaluation, research, and analysis efforts.

The Evidence Act requires each agency to develop and maintain an Open Data Plan, which, in general, shall describe the agency's efforts to make government data open to the public. OMB also plans to issue Phase

2 Guidance to provide agencies further guidance necessary to implement the Evidence Act's Open Data Plan requirement, which will substantively update technical aspects of operationalizing these mechanisms. Until the Phase 2 Guidance goes into effect, agencies are required to meet their existing open data obligations.

Phase 4 Implementation of the Foundations for Evidence-Based Policymaking Act of 2018: Program Evaluation Standards and Practices (M-20-14)

OMB issued Memorandum M-20-14 in March of 2020 to provide program evaluation standards to guide agencies in developing and implementing evaluation activities, evaluation policies, and the hiring and retaining of qualified staff. It also provides examples of leading practices for agencies to draw upon as they build evaluation capacity, develop policies and procedures, and carry out evaluations to support evidence-based policy making.

OMB states that evaluators need to practice and embody the following five standards in their work in order for federal evaluations to have the credibility needed for full acceptance and use:

Relevance and Utility: Federal evaluations must address questions of importance and serve the information needs of stakeholders in order to be useful. Evaluations should present findings that are actionable and available in time for use. Information should be presented in ways that are understandable and that can inform agency activities and actions.

Rigor: Federal evaluations must produce findings that federal agencies and their stakeholders can confidently rely upon, while providing clear explanations of limitations. The quality of an evaluation depends on the underlying design and methods, implementation, and how findings are interpreted and reported. Credible evaluations must be managed by qualified evaluators, and an evaluation must have the most appropriate design and methods to answer key questions.

Independence and Objectivity: Federal evaluations must be viewed as objective in order for stakeholders, experts, and the public to accept their findings. This depends on the independence and objectivity of the evaluators. The implementation of evaluation activities, including how evaluators are selected and operate, should be appropriately insulated from political and other undue influences that may affect their

objectivity, impartiality, and professional judgement. Evaluators should strive for objectivity in the planning and conduct of evaluations and in the interpretation and dissemination of findings, avoiding conflicts of interest, bias, and other partiality.

Transparency: Federal evaluation must be transparent in the planning, implementation, and reporting phases to enable accountability and help ensure that aspects of an evaluation are not tailored to generate specific findings. Decisions about the evaluation's purpose and objectives (including internal versus public use), the range of stakeholders who will have access to details of the work and findings, the design and methods, and the timeline and strategy for releasing findings should be clearly documented before conducting the evaluation. Once evaluations are complete, comprehensive reporting of the findings should be released in a timely manner and provide sufficient detail so that others can review, interpret, or replicate/reproduce the work.

Ethics: Federal evaluations must be conducted to the highest ethical standards to protect the public and maintain public trust in the government's efforts. Evaluations should be planned and implemented to safeguard the dignity, rights, safety, and privacy of participants and other stakeholders and affected entities. Evaluators should abide by current professional standards pertaining to treatment of participants. Evaluations should be equitable, fair, and just, and should take into account cultural and contextual factors that could influence the findings or their use.

OMB also identified leading evaluation practices to support the evaluation standards. The practices aim to provide greater specificity and detail on what may be useful when planning and implementing evaluation activities to fulfill the goals of the standards. The 10 practices are

1. Build and Maintain Evaluation Capacity
2. Use Expert Consultation Effectively
3. Establish, Implement, and Widely Disseminate an Agency Evaluation Policy
4. Pre-Specify Evaluation Design and Methods
5. Engage Key Stakeholders Meaningfully
6. Plan Dissemination Strategically
7. Take Steps to Ensure Ethical Treatment of Participants
8. Foster and Steward Data Management for Evaluation

9. Make Evaluation Data Available for Secondary Use
10. Establish and Uphold Policies and Procedures to Protect Independence and Objectivity.

OMB expects that the guidance will be implemented by (1) evaluation officers, who are expected to play a leading role in overseeing the agency's evaluation activities and learning agenda, as well as collaborating with, shaping, and making contributions to other evidence-building functions within the agency; and (2) agency evaluators and staff in related functions who support the development and use of evaluation, using technical expertise and knowledge of evaluation methodology and these standards for evaluation and related analytic activities within federal agencies.

LAWS AND OMB GUIDANCE ON CONFIDENTIALITY AND PRIVACY PROTECTION

Protecting the confidentiality of individual information collected under a confidentiality pledge—whether from individuals, households, businesses, or other organizations—is a bedrock principle of federal statistics. Federal statistical agencies also strive to respect the privacy of individual respondents through such means as limiting the collection of information to that which is necessary for an agency's mission. Respect for privacy has a history in federal legislation and regulation that extends back many decades; so, too, does protection of confidentiality, except that not all federal agencies were covered.[33] With the original passage of CIPSEA in 2002 (see below), a firm legislative foundation was established for confidentiality protection of statistical data governmentwide.

Privacy Act of 1974

The Privacy Act of 1974 (P.L. 93-579, as amended; codified at 5 USC 552a) is a landmark piece of legislation that grew out of concerns about the implications of computers, credit bureaus, proposals for national databanks, and the like on personal privacy. The act states in part (5 USC 552a(b)):

> No agency shall disclose any record which is contained

[33]For example, Title 13 of the U.S. Code, providing for confidentiality protection for economic and population data collected by the U.S. Census Bureau, dates back to 1929; in contrast, the Bureau of Labor Statistics had no legal authority for its policies and practices of confidentiality protection until the passage of CIPSEA in 2002 (see NRC, 2003b, p. 119–121).

> in a system of records by any means of communication to any person, or to another agency, except pursuant to a written request by, or with the prior written consent of, the individual to whom the record pertains, unless disclosure of the record [is subject to one or more of 12 listed conditions.]

The defined conditions for disclosure of personal records without prior consent include use for statistical purposes by the Census Bureau, for statistical research or reporting when the records are to be transferred in a form that is not individually identifiable, for routine uses within a U.S. government agency, for preservation by the National Archives and Records Administration "as a record which has sufficient historical or other value to warrant its continued preservation by the United States Government," for law enforcement purposes, for congressional investigations, and for other administrative purposes.

The Privacy Act mandates that every federal agency have in place an administrative and physical security system to prevent the unauthorized release of personal records; it also mandates that every agency publish in the *Federal Register* one or more system of records notices (SORNs) for newly created and revised systems of records that contain personally identifiable information as directed by OMB.[34] SORNs are to describe not only the records and their uses by the agency, but also procedures for storing, retrieving, accessing, retaining, and disposing of records in the system.[35]

Federal Policy for the Protection of Human Subjects, 45 Code of Federal Regulations (CFR) 46, Subpart A ("Common Rule"), as Revised in 2017

The 1991 Common Rule regulations, promulgated by the U.S. Department of Health and Human Services (DHHS)[36] and signed onto by nine

[34]See OMB Circular A-130, *Managing Information as a Strategic Resource, Appendix II,* revised 2016. Available: https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A130/a130revised.pdf. [February 2021]

[35]For an example of SORNs for a statistical agency, see https://www.census.gov/about/policies/privacy/sorn.html. [February 2021]

[36]See https://www.hhs.gov/ohrp/regulations-and-policy/regulations/common-rule/ [February 2021]. In addition to Subpart A of 45 CFR 46, DHHS and some other departments and agencies have signed onto Subparts B, C, and D, which pertain to pregnant women, human fetuses, and neonates; prisoners; and children, respectively.

other cabinet departments and seven independent agencies (in their own regulations), represent the culmination of a series of DHHS regulations dating back to the 1960s (see Practice 7 and NRC, 2003b, Ch. 3). The regulations are designed to protect individuals whom researchers wish to recruit for research studies funded by the federal government, which include surveys and other kinds of statistical data collection.[37]

These regulations require that researchers obtain informed consent from prospective participants, minimize risks to participants, balance risks and benefits appropriately, select participants equitably, monitor data collection to ensure participant safety (where appropriate), and protect participant privacy and maintain data confidentiality (where appropriate). Institutional review boards (IRBs) at universities and other organizations and agencies, registered with DHHS, review research protocols to determine whether they qualify for exemption from or are subject to IRB review and, if the latter, whether the protocol satisfactorily adheres to the regulations. Some federal statistical agencies are required to submit data collection protocols to an IRB for approval; other agencies maintain exemption from IRB review but follow the principles and spirit of the regulations.

An Advance Notice of Proposed Rulemaking, issued in 2011, proposed changes to the Common Rule, including revisions to the provisions for confidentiality protection.[38] A Notice of Proposed Rulemaking, which indicated responses to the extensive comments on that advance notice, was issued in 2015; it too included a comment period.[39] A final rule was published January 19, 2017,[40] which took effect on January 19, 2018 (for cooperative research involving more than one institution, the effective date was January 20, 2020). Some of the changes from the 1991 version of the Common Rule are these:

- The U.S. Department of Labor became a signatory to the Common Rule; consequently, only one department that houses a federal statistical agency (U.S. Department of the Treasury) is not a signatory.

[37]Of those departments with statistical units, all signed onto the Common Rule with the exception of the Departments of Labor and the Treasury.

[38]See 76 *Federal Register* 44512 (July 26, 2011). Available: https://www.federalregister.gov/d/2011-18792 [February 2021]. See also NRC (2014).

[39]See 80 *Federal Register* 53933 (September 8, 2015). Available: https://www.federalregister.gov/d/2015-21756. [February 2021]

[40]See 82 *Federal Register* 7149 (January 19, 2017). Available: https://www.federalregister.gov/d/2017-01058. [February 2021]

- Provisions to exempt research with human participants from IRB review were modified and enlarged and, where appropriate, IRB review is to be focused on the adequacy of confidentiality protection.
- To assist IRBs in determining the adequacy of confidentiality protection, the Secretary of DHHS, after consultation with OMB and other federal signatories, is to issue guidance on what provisions are adequate to protect the privacy of subjects and to maintain the confidentiality of data.
- Provisions are added for "broad" consent for storage, maintenance, and secondary research use of identifiable private information or biospecimens.

1997 Order Providing for the Confidentiality of Statistical Information

OMB issued this order in 1997 to bolster the confidentiality protections afforded by statistical agencies or units (as listed in the order), some of which lacked legal authority to back up their confidentiality protection.[41] CIPSEA (see next section) placed confidentiality protection for statistical information on a strong legal footing across the entire federal government.

Confidential Information Protection and Statistical Efficiency Act

The Confidential Information Protection and Statistical Efficiency Act (CIPSEA) was first enacted as Title V of the E-Government Act of 2002 (P.L. 107-347) and was recodified as part of the Evidence-Based Policymaking Act of 2018 (see above). CIPSEA provides a strong statutory basis for the statistical system with regard to confidentiality protection and data sharing. CIPSEA has four parts: two original parts cover confidentiality (Part B) and data sharing (Part C; efficiency), respectively, while the other two parts include definitions and *Statistical Policy Directive No. 1* (Part A), and Access to Data for Evidence (Part D; see Evidence Act above).

Part B, Confidential Information Protection. Part B of CIPSEA strengthens and extends statutory confidentiality protection for all statistical data collections of the U.S. government. Prior to CIPSEA, such

[41]See 62 *Federal Register* 35044 (June 27, 1997). Available: https://www.federalregister.gov/d/97-16934. [February 2021]

protection was governed by a patchwork of laws applicable to specific agencies, judicial opinions, and agencies' practices. For all data furnished by individuals or organizations to an agency under a pledge of confidentiality for exclusively statistical purposes, Subtitle A provides that the data will be used only for statistical purposes and will not be disclosed in identifiable form to anyone not authorized by the title. It makes the knowing and willful disclosure of confidential statistical data a class E felony, with fines up to $250,000 and imprisonment for up to 5 years.

Subtitle A pertains not only to surveys, but also to collections by a federal agency for statistical purposes from nonpublic administrative records (e.g., confidential state government agency records). Data covered under Subtitle A are not subject to release under a Freedom of Information Act request.

Part C, Statistical Efficiency. Part C of CIPSEA permits the BEA, the BLS, and the Census Bureau to share individually identifiable business data for statistical purposes. The subtitle has three main purposes: (1) to reduce respondent burden on businesses; (2) to improve the comparability and accuracy of federal economic statistics by permitting these three agencies to reconcile differences among sampling frames, business classifications, and business reporting; and (3) to increase understanding of the U.S. economy and improve the accuracy of key national indicators, such as the National Income and Product Accounts.

However, this part does not authorize any new sharing among BEA, BLS, and the Census Bureau of any individually identifiable tax return data that originate from the Internal Revenue Service (IRS). This limitation currently blocks some kinds of business data sharing, such as those for sole proprietorships, which are important for improving the efficiency and quality of business data collection by statistical agencies. For tax return information, data sharing is limited to a small number of items for specified uses by a small number of specific agencies (under Title 26, Section 6103 of the U.S. Code, and associated Treasury Department regulations, as modified in the 1976 Tax Reform Act). The governing statute would have to be modified to extend sharing of tax return items to agencies not specified in the 1976 legislation. Although proposals for legislation to expand access to IRS information for limited statistical purposes have been discussed and developed through interagency discussions, they have not received necessary congressional approval.

CIPSEA Implementation Guidance. OMB originally released implementation guidance for CIPSEA in 2007 (U.S. Office of Management and Budget, 2007). The guidance covered such topics as the steps that agencies must take to protect confidential information; wording of confidentiality pledges in materials that are provided to respondents; steps that agencies must take to distinguish any data or information they collect for nonstatistical purposes and to provide proper notice to the public of such data; and ways in which agents (e.g., contractors, researchers) may be designated to use individually identifiable information for analysis and other statistical purposes and be held legally responsible for protecting the confidentiality of that information. Under the Evidence Act, OMB is charged with promulgating guidance for implementation of a process to designate statistical agencies and units.[42] A total of 16 agencies and units are currently so recognized (see Appendix B).

Privacy Impact Assessments Required Under the E-Government Act of 2002, Section 208

Section 208 of the E-Government Act of 2002 (P.L. 107-347) requires federal agencies to conduct a privacy impact assessment whenever an agency develops or obtains information technology that handles individually identifiable information or whenever the agency initiates a new collection of individually identifiable information.[43] The assessment is to be made publicly available and cover topics such as what information is being collected and why, with whom the information will be shared, what provisions will be made for informed consent regarding data sharing, and how the information will be secured. Typically, privacy impact assessments cover not only privacy issues, but also confidentiality, integrity, and availability issues.[44] OMB was required to issue guidance for development of the assessments, which was done in a September 26, 2003, memorandum (M-03-22) from the OMB director to the heads of executive agencies and departments.[45]

[42]44 USC 3562(a).

[43]Section 208 also mandates that OMB lead interagency efforts to improve federal information technology and use of the Internet for government services.

[44]See, e.g., the available privacy impact assessments prepared by the Census Bureau at https://www.census.gov/about/policies/privacy/pia.html. [February 2021]

[45]See https://www.whitehouse.gov/wp-content/uploads/2017/11/203-M-03-22-OMB-Guidance-for-Implementing-the-Privacy-Provisions-of-the-E-Government-Act-of-2002-1.pdf. [February 2021]

Section 208, together with Title III, FISMA (see below), and Title V, CIPSEA (see above), of the 2002 E-Government Act are the latest in a series of laws beginning with the Privacy Act of 1974 (see above) that govern access to individual records maintained by the federal government (see also "Federal Cybersecurity Enhancement Act of 2015," below).

Federal Information Security Management Act of 2002

The Federal Information Security Management Act (FISMA) was enacted in 2002 as Title III of the E-Government Act of 2002 (P.L. 107-347) to bolster computer and network security in the federal government and affiliated parties (such as government contractors) by mandating yearly audits.

FISMA imposes a mandatory set of processes that must be followed for all information systems used or operated by a federal agency or by a contractor or other organization on behalf of a federal agency. These processes must follow a combination of Federal Information Processing Standards documents, the special publications issued by the National Institute of Standards and Technology (SP-800 series), and other legislation pertinent to federal information systems, such as the Privacy Act of 1974 and the Health Insurance Portability and Accountability Act of 1996.

The first step is to determine what constitutes the "information system" in question. There is no direct mapping of computers to an information system; rather, an information system can be a collection of individual computers put to a common purpose and managed by the same system owner. The next step is to determine the types of information in the system and categorize each according to the magnitude of harm that would result if the system suffered a compromise of confidentiality, integrity, or availability. Succeeding steps are to develop complete system documentation, conduct a risk assessment, put appropriate controls in place to minimize risk, and arrange for an assessment and certification of the adequacy of the controls.

FISMA affects federal statistical agencies directly in that each agency must follow the FISMA procedures for its own information systems. In addition, some departments are taking the position that all information systems in a department constitute a single information system for the purposes of FISMA: those departments are taking steps to require that

statistical agencies' information systems and personnel be incorporated into a centralized departmentwide system.

Federal Information Technology Acquisition Reform Act of 2014

The Federal Information Technology Acquisition Reform Act (FITARA) was enacted on December 19, 2014, to respond to such federal information technology (IT) challenges as duplicate IT spending among and within agencies; difficulty in understanding the cost and performance of IT investments; and inability to benchmark IT spending between federal and private-sector counterparts. FITARA has four major objectives: (1) strengthening the authority over and accountability for IT costs, performance, and security of agency chief information officers (CIOs); (2) aligning IT resources with agency missions and requirements; (3) enabling more effective planning for and execution of IT resources; and (4) providing transparency about IT resources across agencies and programs. It requires agencies (defined as cabinet departments and independent agencies) to pursue a strategy of consolidation of agency data centers, charges agency CIOs with the responsibility for implementing FITARA, and charges the U.S. Government Accountability Office with producing quarterly scorecards to assess how well agencies are meeting the FITARA objectives.

The director of OMB issued implementation guidance for FITARA, M-15-14, *Management and Oversight of Federal Information Technology*, on June 20, 2015.[46] This memorandum explicitly stated that agencies must implement the FITARA guidance to ensure that information acquired under a pledge of confidentiality solely for statistical purposes is used exclusively for those purposes. It also provided a "Common Baseline for IT Management," which lays out FITARA responsibilities of CIOs and other agency officials, such as the chief financial officer and program officials. On May 4, 2016, the federal CIO and the administrator of OIRA, both in OMB, jointly issued *Supplemental Guidance on the Implementation of M-15-14 "Management and Oversight of Federal Information Technology"—Applying FITARA Common Baseline to Statistical Agencies and Units* (U.S. Office of Management and Budget, 2016d). This supplemental guidance posed questions for CIOs and other

[46]See https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2015/m-15-14.pdf. [February 2021.

officials, including statistical agency heads, to address when implementing FITARA for statistical agency programs. The questions refer to the fundamental responsibilities of federal statistical agencies outlined in *Statistical Policy Directive No. 1* (see above), which include confidentiality protection and meeting deadlines for key statistics.

Federal Cybersecurity Enhancement Act of 2015

The Federal Cybersecurity Enhancement Act of 2015 is Title II, Subpart B, of the Cybersecurity Act of 2015, which was attached as a rider to the Consolidated Appropriations Act of 2016, and so became law (P.L. 114-113) when the appropriations bill was signed on December 18, 2015. The impetus for Title II, Subpart B, was the efforts of the U.S. Department of Homeland Security (DHS), dating back to 2003, to deploy systems for detection and prevention of intrusions ("hacking") into federal government information networks (see Latham & Watkins, 2016, p. 3). As of the end of 2015, this technology, known as EINSTEIN, covered only 45 percent of federal network access points. The act requires DHS to "make [EINSTEIN] available" to all federal agencies within one year, and thereafter requires all agencies to "apply and continue to utilize the capabilities" across their networks.

The technology, currently in version E3A, has been welcomed by federal statistical agencies, but agencies initially were concerned about a DHS interpretation of the act that would allow DHS staff to monitor traffic on agency networks and follow up on actual or likely intrusions. Such surveillance by DHS staff could lead to violations of agencies' pledges to protect the confidentiality of information provided by individual respondents for statistical purposes, which state that only statistical agency employees or sworn agents can see such information. Ultimately, DHS retained its surveillance authority, and statistical agencies modified their confidentiality pledges. As described in a *Federal Register* notice from the U.S. Census Bureau (other statistical agencies have issued similar notices):[47]

[47]Agency Information Collection Activities; Request for Comments; Revision of the Confidentiality Pledge Under Title 13 United States Code, Section 9, 81 *Federal Register* 94321 (December 23, 2016). Available: https://www.federalregister.gov/d/2016-30959. [February 2021]

> DHS and Federal statistical agencies, in cooperation with their parent departments, have developed a Memorandum of Agreement for the installation of Einstein 3A cybersecurity protection technology to monitor their Internet traffic and have incorporated an associated Addendum on Highly Sensitive Agency Information that provides additional protection and enhanced security handling of confidential statistical data. However, many current Title 13, U.S.C. and similar statistical confidentiality pledges promise that respondents' data will be seen only by statistical agency personnel or their sworn agents. Since it is possible that DHS personnel could see some portion of those confidential data in the course of examining the suspicious Internet packets identified by Einstein 3A sensors, statistical agencies need to revise their confidentiality pledges to reflect this process change.

The BLS led an interagency research program to test revised wording with samples of respondents, and agencies revised their pledges accordingly. As an example, the Census Bureau's revised pledge, provided in 81 *Federal Register* 94321 (December 23, 2016), states:

> The U.S. Census Bureau is required by law to protect your information. The Census Bureau is not permitted to publicly release your responses in a way that could identify you. Per the Federal Cybersecurity Enhancement Act of 2015, your data are protected from cybersecurity risks through screening of the systems that transmit your data.

LAWS AND GUIDANCE RELATED TO INFORMATION QUALITY AND THE FEDERAL DATA STRATEGY

Since 2000, there has been heightened interest in the Congress and the executive branch regarding the quality of scientific evidence, including federal statistics. Legislation and guidance from OMB and the Office of Science and Technology Policy (OSTP) have addressed concerns about information quality, performance evaluation, scientific integrity, and transparency.

The Information Quality Act of 2000

The Information Quality Act of 2000 (P.L. 106-554) directed OMB to issue government-wide guidelines that "provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies." It also required federal agencies to develop their own implementing procedures, including "administrative mechanisms allowing affected persons to seek and obtain correction of information maintained and disseminated by the agency." After a public comment period, OMB issued governmentwide guidelines on February 22, 2002.[48]

2004 OMB Final Information Quality Bulletin for Peer Review

Consistent with the Information Quality Act of 2000 (see above), OMB developed guidance for federal agencies with regard to seeking peer review of the policy-relevant scientific information an agency disseminates. After two rounds of public comment, OMB issued the *Final Information Quality Bulletin for Peer Review* on December 16, 2004: it requires federal agencies to conduct a peer review of "influential scientific information" before the information is released to the public.[49] "Influential scientific information" is defined as "scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions" (U.S. Office of Management and Budget, 2005, p. 2667). *The Final Information Quality Bulletin for Peer Review* allows agencies discretion to select the type of peer review process most appropriate for a given scientific information product. Research reports and nonroutine collections by statistical agencies that can be considered "influential scientific information" are covered under the guidelines, but "routine statistical information released by federal statistical agencies (e.g., periodic demographic and economic statistics) and the analysis of these data to compute standard indicators and trends (e.g., unemployment and poverty rates)" are excluded (U.S. Office of Management and Budget, 2005, p. 2674).

[48]See 67 *Federal Register* 8452 (February 22, 2002). Available: https://www.federalregister.gov/d/R2-59. [February 2021]

[49]See https://www.whitehouse.gov/wp-content/uploads/2017/11/2005-M-05-03-Issuance-of-OMBs-Final-Information-Quality-Bulletin-for-Peer-Review-December-16-2004.pdf. [February 2021]

Government Performance and Results Modernization Act of 2010

The Government Performance and Results Modernization Act of 2010, which supersedes the Performance Assessment Rating Tool and the Government Performance and Results Act of 1993, was signed into law on January 4, 2011.[50] It requires performance assessments of government programs for purposes of evaluating agency performance and improvement. In carrying out the provisions of the act, the director of OMB coordinates with agencies to develop the federal government performance plan. The act requires all federal agencies,with few exceptions, to establish performance indicators to be used in measuring or assessing progress toward their identified performance goals and an objective, quantifiable, and measurable means by which to compare actual program results with these established performance goals. Additionally, each agency must describe how it will ensure the accuracy and reliability of the data used, including validation of measures, data sources, required level of accuracy, data limitations, and management of those limitations.

The broad scope of agencies affected by this act, and the use of the act in making budgetary decisions based on measured achievement toward program goals, have fostered added focus among many agencies on how to collect high-quality data and produce sound government statistics with which to conduct rigorous program evaluation. The addendum to *Statistical Policy Directive No. 4* (see above), issued in 2016, prescribes a program of annual performance reviews for federal statistical products.

2010 Office of Science and Technology Policy Memorandum on Scientific Integrity

In a memorandum on scientific integrity issued March 9, 2009, President Obama stated:[51]

> The public must be able to trust the science and scientific process informing public policy decisions. Political officials should not suppress or alter scientific or technological findings and conclusions. If scientific and technological information is developed and used by the Federal Govern-

[50]See http://www.gpo.gov/fdsys/pkg/PLAW-111publ352/pdf/PLAW-111publ352.pdf. [February 2021]

[51]See https://obamawhitehouse.archives.gov/the-press-office/memorandum-heads-executive-departments-and-agencies-3-9-09. [February 2021]

> ment, it should ordinarily be made available to the public. To the extent permitted by law, there should be transparency in the preparation, identification, and use of scientific and technological information in policymaking. The selection of scientists and technology professionals for positions in the executive branch should be based on their scientific and technological knowledge, credentials, experience, and integrity.

President Obama directed the Office of Science and Technology Policy (OSTP) to develop a strategy to ensure scientific integrity in government decision making. In response, the OSTP director issued a memorandum on December 17, 2010, that called for executive departments and agencies to develop policies to "ensure a culture of scientific integrity," "strengthen the actual and perceived credibility of Government research," "facilitate the free flow of scientific and technological information, consistent with privacy and classification standards," and "establish principles for conveying scientific and technological information to the public."[52] The memorandum included guidance on the selection of candidates for scientific positions, independent peer review, whistleblower protections, promoting access to scientific and technological information in online open formats, and agency communications. It also provided guidance on public communications, use of federal advisory committees, professional development of government scientists and engineers, and implementation.

Each statistical agency is covered by its department's scientific integrity policies. In addition, the principal statistical agencies developed a *Statement of Commitment to Scientific Integrity* that documents in a single place their response to the OSTP memorandum. The statement articulates how the *Principles and Practices for a Federal Statistical Agency, Fourth Edition* (NRC, 2009c), various OMB statistical policy directives and standards, and each agency's information quality guidelines together form "the foundation for achieving and maintaining scientific integrity within and among the principal statistical agencies."[53]

[52]See https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/scientific-integrity-memo-12172010.pdf. [February 2021]

[53]See http://www.census.gov/content/dam/Census/about/about-the-bureau/policies_and_notices/scientificintegrity/Scientific_Integrity_Statement_of_the_Principal_Statistical_Agencies.pdf. [February 2021]

2013 Office of Science and Technology Policy Memorandum on Increasing Access to the Results of Scientific Research

On February 22, 2013, the OSTP director issued a memorandum for heads of executive departments and agencies on "Increasing Access to the Results of Federally Funded Scientific Research."[54] Citing the importance of scientific research for driving improvements in "areas such as health, energy, the environment, agriculture, and national security," the memorandum outlined the administration's commitment to:

> ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out [in the memorandum], the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

The memorandum directed federal agencies with more than $100 million in annual research and development expenditures to develop a plan "to support increased public access to the results of research funded by the Federal Government. This includes any results published in peer reviewed scholarly publications that are based on research that directly arises from Federal funds…" The memorandum further directed agencies to develop plans for ensuring archiving of and access to data underlying federally funded research and the associated documentation or metadata. It listed various topics to be covered in each agency's plan, including that the plan be posted on the agency's website and provide for protection of the confidentiality of individual respondents' information.

Improving Implementation of the Information Quality Act (M-19-15)

OMB issued Memorandum M-19-15 in April of 2019 to reinforce, clarify, and interpret agency responsibilities under the Information Quality Act. The guidance provides updates for specific areas in the original guidance related to identifying influential information, peer review of influential scientific information, public access to government informa-

[54]See https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf. [February 2021]

tion (open data), and reuse of existing agency program data. Guidance in the last area draws from OMB Memorandum M-14-06 and includes the following updates:

- Implementation Update 2.3: Agencies should consider the potential for using existing data sources from both inside and outside the agency for statistical and research purposes, while protecting privacy and confidentiality.
- Implementation Update 2.4: When designing or improving data collection systems, departments should actively solicit comment from their statistical, research, and evaluation agencies about potential downstream uses. Agencies should describe such uses in the Information Collection Request submitted to OMB for review under the PRA.
- Implementation Update 2.5: If agencies are considering secondary analysis of data that includes personally identifiable information, the agencies should coordinate with their Senior Agency Official for Privacy to meet all privacy requirements and manage privacy risks.
- Implementation Update 2.6: Agencies should develop procedures for clearly documenting and communicating the quality of administrative data that have the potential to be used for statistical purposes

There are also several updates regarding the reproducibility of influential information and requests for correction.

Federal Data Strategy—A Framework for Consistency (M-19-18)

The Federal Data Strategy describes a 10-year vision for how the federal government will accelerate the use of data to deliver on mission, serve the public, and steward resources while protecting security, privacy, and confidentiality. OMB states that federal data is both a strategic asset and a valuable national resource that enables the government to carry out its mission and programs effectively. It provides the public with knowledge of the government, society, economy, and environment and serves as a means to ensure the accountability of government, to manage the government's operations, and to maintain and enhance the performance of the nation's economy, public health, and welfare. The strategy states that

appropriate access to federal data significantly enhances its value and the return on the nation's investment in its creation.

The Federal Data Strategy comprises three components to guide federal data management and use:

- Mission Statement: The mission statement articulates the intent and core purpose of the Strategy.
- Principles: The principles serve as motivational guidelines in the areas of *ethical governance*, *conscious design*, and *learning culture*.
- Practices: The practices guide agencies in leveraging the value of data.

Federal Data Strategy Mission. The Mission Statement reads as follows:

> The mission of the Federal Data Strategy is to fully leverage the value of federal data for mission, service, and the public good by guiding the Federal Government in practicing ethical governance, conscious design, and learning culture.

Federal Data Strategy Principles. There are 10 principles in the Federal Data Strategy, which are intended to guide the development of a comprehensive data strategy:

Ethical Governance

1. *Uphold ethics:* Monitor and assess the implications of federal data practices for the public. Design checks and balances to protect and serve the public good.
2. *Exercise responsibility:* Practice effective data stewardship and governance. Employ sound data security practices, protect individual privacy, maintain promised confidentiality, and ensure appropriate access and use.
3. *Promote transparency:* Articulate the purposes and uses of federal data to engender public trust. Comprehensively document processes and products to inform data providers and users.

Conscious Design

4. *Ensure relevance*: Protect the quality and integrity of the data. Validate that data are appropriate, accurate, objective, accessible, useful, understandable, and timely.

5. *Harness existing data*: Identify data needs to inform priority research and policy questions; reuse data if possible and acquire additional data if needed.
6. *Anticipate future uses*: Create data thoughtfully, considering fitness for use by others; plan for reuse and build in interoperability from the start.
7. *Demonstrate responsiveness*: Improve data collection, analysis, and dissemination with ongoing input from users and stakeholders. The feedback process is cyclical; establish a baseline, gain support, collaborate, and refine continuously.

Learning Culture

8. *Invest in learning*: Promote a culture of continuous and collaborative learning with and about data through ongoing investment in data infrastructure and human resources.
9. *Develop data leaders*: Cultivate data leadership at all levels of the federal workforce by investing in training and development about the value of data for mission, service, and the public good.
10. *Practice accountability*: Assign responsibility, audit data practices, document and learn from results, and make needed changes.

Federal Data Strategy Practices. There are 40 practices in the Federal Data Strategy, which are intended to be sufficiently general so as to apply to all federal agencies. These practices represent aspirational goals that are intended to improve the government's approach to data stewardship and the leveraging of data to create value. They are organized in three categories that reflect the importance of tailoring the management of data to the uses of the data:

- Building a Culture that Values Data and Promotes Public Use (Practices 1–10),
- Governing, Managing, and Protecting Data (Practices 11–26), and
- Promoting Efficient and Appropriate Data Use (Practices 27–40).

Practices 1–10 derive value by articulating data uses for agency decision-making and accountability and supporting commercialization, innovation, and public use:

1. Identify data needs to answer key agency questions.
2. Assess and balance the needs of stakeholders.

3. Champion data use.
4. Use data to guide decision-making.
5. Prepare to share.
6. Convey insights from data.
7. Use data to increase accountability.
8. Monitor and address public perceptions.
9. Connect data functions across agencies.
10. Provide resources explicitly to leverage data assets.

Practices 11–26 derive value from data by bringing leaders with diverse perspectives and expertise together to plan for using the data appropriately and responsibly:

11. Prioritize data governance.
12. Govern data to protect confidentiality and privacy.
13. Protect data integrity.
14. Convey data authenticity.
15. Assess maturity.
16. Inventory data assets.
17. Recognize the value of data assets.
18. Manage with a long view.
19. Maintain data documentation.
20. Leverage data standards.
21. Align agreements with data management requirements.
22. Identify opportunities to overcome resource obstacles.
23. Allow amendment.
24. Enhance data preservation.
25. Coordinate federal data assets.
26. Share data between state, local, and tribal governments and federal agencies.

Practices 27–40 derive value from data by providing access to data resources, promoting appropriate use of data resources, and providing guidance on approaches for data augmentation:

27. Increase capacity for data management and analysis.
28. Align quality with intended use.
29. Design data for use and re-use.

30. Communicate planned and potential uses of data.
31. Explicitly communicate allowable use.
32. Harness safe data linkage.
33. Promote wide access.
34. Diversify data access methods.
35. Review data releases for disclosure risk.
36. Leverage partnerships.
37. Leverage buying power.
38. Leverage collaborative computing platforms.
39. Support federal stakeholders.
40. Support nonfederal stakeholders.

Federal Data Strategy Action Plan. FY 2020 is the first year of the Federal Data Strategy Action Plan. The plan includes actions for individual agencies, communities of practice, and shared solutions.

Agency Actions. Six Agency Actions are identified as foundational steps to support agencies in establishing plans, processes, and priorities for better managing data assets while considering how the agency's data assets could be leveraged to advance the agency's mission:

Action 1: Identify data needs to answer priority agency questions.

Action 2: Constitute a diverse data governance body.

Action 3: Assess data and related infrastructure maturity.

Action 4: Identify opportunities to increase staff data skills.

Action 5: Identify priority data assets for agency open data plans.

Action 6: Publish and update data inventories.

Community of Practice Actions. Community of Practice Actions are taken by a specific agency or group of agencies related to a common topic, usually through an established interagency council or other existing coordinating mechanism. Community of Practice Actions seek to integrate and coordinate ongoing efforts related to existing laws, regulations, and executive orders that are particularly relevant to the strategy:

Action 7: Launch a federal Chief Data Officer council.

Action 8: Improve data and model resources for AI research and development.

Action 9: Improve financial management data standards.

Action 10: Integrate geospatial data practices into the federal data enterprise.

Shared Solution Actions. Shared Solution Actions are described as governmentwide data services and represent discrete pilot projects or efforts led by a single agency or existing council for the benefit of all agencies. The 10 Shared Solution Actions identified in the 2020 Action Plan are designed to provide governmentwide direction, tools, and/or services for implementing the strategy that other agencies will be able to leverage in the future:

Action 11: Develop a repository of federal enterprise data resources.

Action 12: Create OMB federal data policy committee.

Action 13: Develop a curated data skills catalog.

Action 14: Develop a data ethics framework.

Action 15: Develop a data protection toolkit.

Action 16: Pilot a one-stop standard research application.[55]

Action 17: Pilot an automated tool for information collection reviews that supports data inventory creation and updates.

Action 18: Pilot enhanced data management tool for federal agencies.

Action 19: Develop data quality measuring and reporting guidance.

Action 20: Develop a data standards repository.

It is anticipated that fully implementing the Federal Data Strategy will require a sustained, iterative, and systematic effort over a 10-year period. The Action Plans produced each year will be designed to identify priority actions for a given year and incrementally build on progress from year to year.

INTERAGENCY COUNCIL ON STATISTICAL POLICY DOCUMENTS

The Interagency Council on Statistical Policy (ICSP) is chaired by the chief statistician at OMB and consists of the heads of the principal statistical agencies and the statistical officials designated under the Evidence Act (see Box A-1). The ICSP creates task forces or working groups to tackle issues of interest to the federal statistical system, and these groups may

[55]See ResearchDataGov: https://www.icpsr.umich.edu/web/pages/appfed/index.html. [February 2021]

report to the ICSP alone or may issue public reports. The ICSP issued a public statement of principles for modernizing federal statistics, which is summarized next.

2002 Federal Statistical Agency Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Disseminated Information

A few months after OMB issued implementation guidance in February 2002 for the 2000 Information Quality Act (see above), 13 principal statistical agencies issued a notice outlining a common approach to the development and provision of guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of disseminated information.[56] The notice directed people to the websites of each agency for more information and to learn how to comment on draft guidelines.

[56]See 67 *Federal Register* 38467 (June 4, 2002). Available: https://www.federalregister.gov/d/02-13892. [February 2021]

BOX A-1
MEMBERS OF THE INTERAGENCY COUNCIL ON STATISTICAL POLICY, BY DEPARTMENT

Heads of the Principal 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)
- Census Bureau (U.S. Department of Commerce)
- Economic Research Service (U.S. Department of Agriculture)
- Energy Information Administration (U.S. Department of Energy)

BOX A-1 *Continued*

- 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)
- National Center for Science and Engineering Statistics (U.S. National Science Foundation)
- Office of Research, Evaluation, and Statistics (U.S. Social Security Administration)
- Statistics of Income Division (U.S. Department of the Treasury)

MEMBERS OF THE INTERAGENCY COUNCIL ON STATISTICAL POLICY, BY DEPARTMENT

Statistical Officials from the Other CFO Act Agencies

- Department of Defense
- Department of Homeland Security
- Department of Housing and Urban Development
- Department of State
- Department of the Interior
- Department of Veterans Affairs
- Environmental Protection Agency
- General Services Administration
- National Aeronautics and Space Administration
- Nuclear Regulatory Commission
- Office of Personnel Management
- Small Business Administration
- U.S. Agency for International Development

Each agency then finalized its own guidelines.[57] The information quality framework developed by the agencies was followed in the 2006 revision of OMB's standards and guidelines for statistical surveys (see *Statistical Policy Directive No. 2* above).

Principles for Modernizing Production of Federal Statistics by Interagency Council on Statistical Policy[58] [Summary]

Increasingly, the federal statistical system is facing challenges maintaining statistical surveys, primarily due to falling response rates and rising costs. At the same time, advances in technology and methodology are creating opportunities for statistical agencies to modernize their practices.

A shift from reliance on surveys for primary data collection to reliance on surveys as a complement to already existing data, either in-house or otherwise available to an agency, is essential to the modernization of the federal statistical system.

The use for statistical purposes of nonstatistical or integrated data—also known as blended, hybrid, or combined data—requires investment in data acquisition and development of standards. First, statistical agencies and components must be able to access alternative data sources. A second major challenge is measuring and transparently communicating the quality of statistical information derived from nonstatistical or integrated statistical and nonstatistical information. The following principles for the ICSP work on integrated data are intended to guide the FCSM and to establish priorities for research and ongoing work by statistical agencies to advance the use of nontraditional information and data to produce statistical information. The work by the ICSP and the FCSM fits more broadly under OMB's development of a Federal Data Strategy as part of the President's Management Agenda.

Principles for Using NonStatistical Data for Statistical Purposes:

1. Agencies should employ the highest quality reasonably obtainable sources of information, including nonstatistical data sets and derivative information in developing statistical datasets in support of mission activities.

[57]See, e.g., https://www.census.gov/about/policies/quality/guidelines.html. [February 2021]
[58]See https://nces.ed.gov/FCSM/pdf/Principles.pdf.

2. While fully complying with confidentiality and privacy requirements, agencies should continue to make statistical information created in support of mission activities as granular and timely as practicable and widely accessible.
3. Agencies should report transparently on the quality of information they disseminate.
4. Characterization of quality should be both quantitative and qualitative, consistent with available information.
5. Judgments used in developing data sets, such as assumptions, defaults, and uncertainties, should be stated explicitly.
6. Agencies should work to adopt a common language and framework for reporting on the quality of data sets and derivative information they disseminate.

Quality is composed of multiple dimensions, each of which should be addressed in transparent public reporting:

a. Objectivity
b. Accuracy
c. Precision
d. Confidentiality
e. Accessibility
f. Relevance
g. Comparability and Coherence
h. Integrity.

APPENDIX B
Organization of the Federal Statistical System

OVERVIEW

This appendix begins with a brief overview of the U.S. statistical system as a whole, including history, structure, and budget. It then briefly summarizes the statistical functions of the U.S. Office of Management and Budget (OMB), the principal statistical agencies and other recognized statistical units, and a brief description of statistical programs in the departments represented on the Interagency Council on Statistical Policy (ICSP).[59]

Brief History and Structure of the U.S. Federal Statistical System

The U.S. government collected and published statistics long before any distinct federal statistical agency was formed (see also Anderson, 2015; Citro, 2016; Duncan and Shelton, 1978; Norwood, 1995). The U.S. Constitution mandates a decennial census of population; the first such censuses (beginning in 1790) were conducted by U.S. marshals as one of their many duties. The Constitution also mandates reporting of federal government receipts and expenditures, which led to early collection by the U.S. Department of the Treasury of foreign trade statistics because of the reliance of the federal government on tariffs for revenues in the 19th century. A census of manufactures was first taken in conjunction with the 1810 population census, and the 1820 population census laid the

[59]The Foundations for Evidence-Based Policymaking Act of 2018 expanded the ICSP from the heads of the principal statistical agencies to also include statistical officials at Departments subject to the Chief Financial Officers Act.

groundwork for additional economic statistics by asking for the number of household members principally employed in agriculture, manufacturing, or commerce.

In the 1860s, Congress enacted laws providing for the compilation of statistics on agriculture, education, and income. It established the Bureau of Labor (forerunner of the Bureau of Labor Statistics) as a separate agency with a mandate to respond to widespread public demand for information on the conditions of industrial workers in 1884. It established the Census Bureau as a permanent agency in 1902.

Many federal statistical agencies that can trace their roots back to the 19th or early 20th century, such as the Bureau of Economic Analysis (BEA) and the National Center for Health Statistics, which were organized in their current form following World War II. Other agencies organized since then include the Bureau of Justice Statistics, the Bureau of Transportation Statistics, the Energy Information Administration, and the National Center for Science and Engineering Statistics.

The United States has a highly decentralized statistical system, in contrast with other developed countries (see Norwood, 1995). Essentially, the system grew by adding separate agencies whenever the need for objective empirical information on a particular aspect of the economy, society, or environment came to the fore. Periodic recommendations from presidential commissions and other initiatives to consolidate one or more of the principal statistical agencies have never been adopted.

Today, OMB, through its Statistical and Science Policy Office (which has roots going back to the 1930s), coordinates the work of federal statistical agencies. The chief statistician, who heads the office, chairs the ICSP, which was created by OMB in the late 1980s and authorized in statute in 1995. The current ICSP membership includes the heads of the 13 principal statistical agencies and statistical officials from the other CFO Act agencies. Figure B-1 depicts reporting relationships for the 13 principal statistical agencies, from the relevant congressional appropriations subcommittee to the cabinet secretary and any other intermediate levels of authority.

Budget for Statistical Activities

For fiscal 2020, OMB estimated that the President's budget provided $11.9 billion in direct funding for the entire federal statistical system,

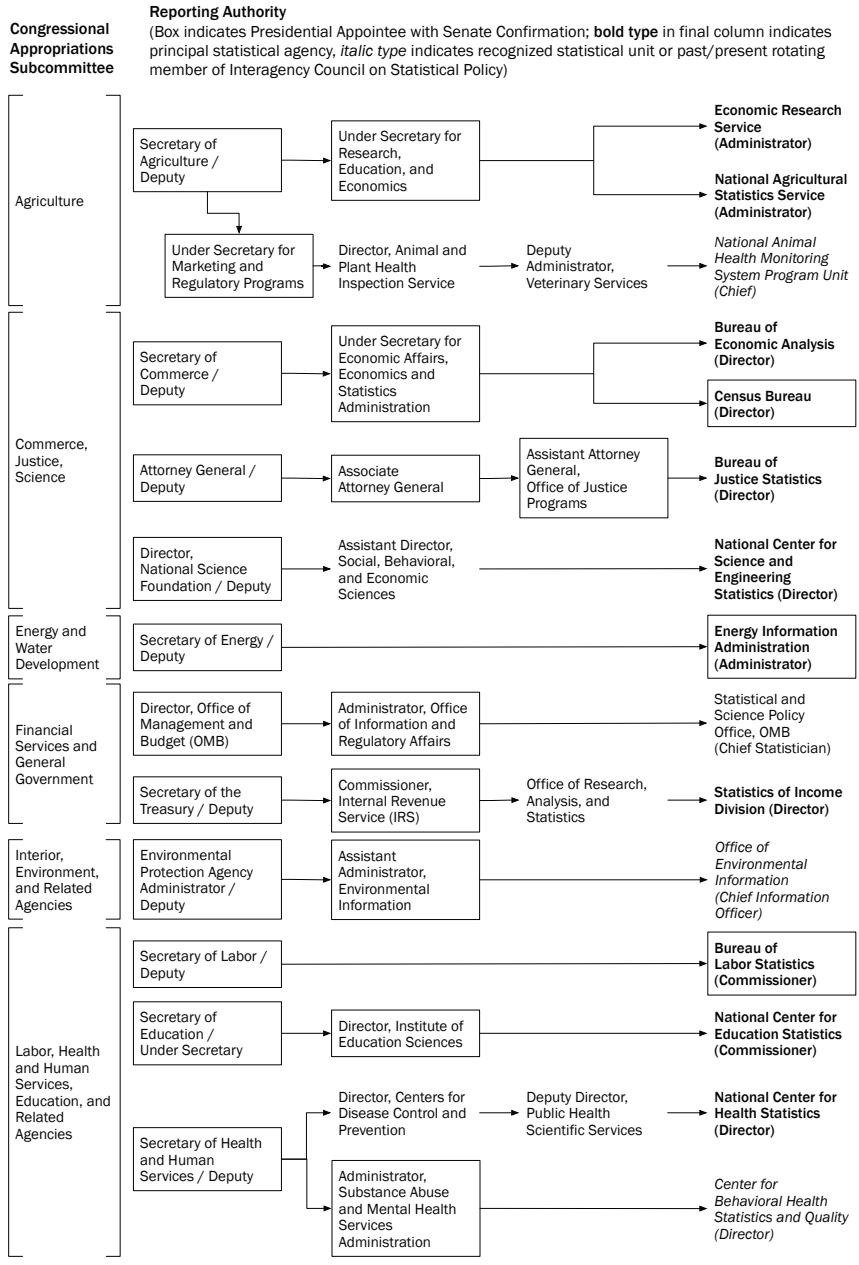

FIGURE B-1 Principal statistical agencies by congressional appropriations committee and parent department/agency.

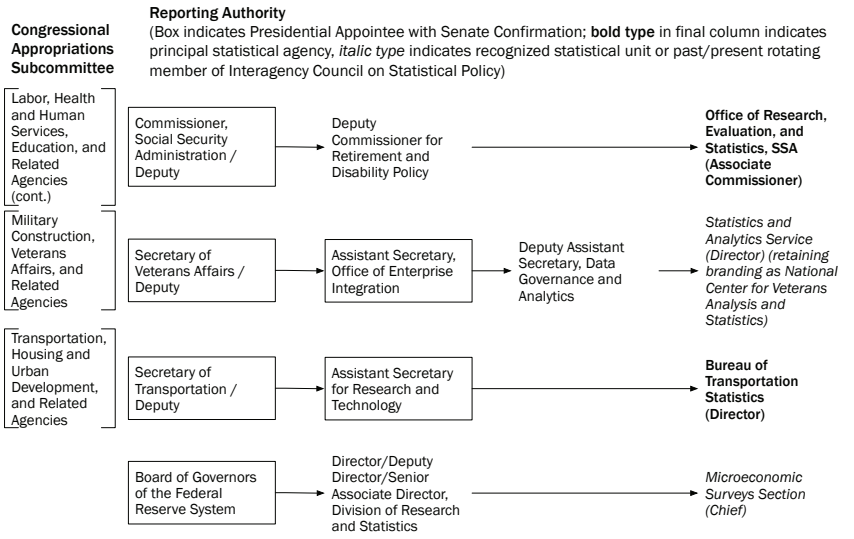

FIGURE B-1 *Continued*

including $6.5 billion for the decennial census and $2.4 billion for the nondecennial funding for the 13 principal federal statistical agencies (see U.S. Office of Management and Budget, 2020). "Direct funding" covers congressional appropriations to an agency. Some agencies (e.g., the Census Bureau) carry out statistical activities for other agencies on a cost-reimbursable basis. The funding for these activities is allocated to the sponsoring agency and not to the data collection agency.

U.S. OFFICE OF MANAGEMENT AND BUDGET

At the center of the federal statistical system is the Statistical and Science Policy (SSP) Office, which is part of the Office of Information and Regulatory Affairs (OIRA), in OMB. SSP is headed by the chief statistician, which is a senior executive civil service position.

As noted in Appendix A, OMB establishes statistical policies and standards, identifies priorities for improving programs, evaluates statistical programs for compliance with OMB guidance, reviews statistical agency budgets, approves information collections for many of the principal statistical agencies, and coordinates U.S. participation in international

statistical activities.[60] It currently has a staff of seven professionals (Chief Statistician plus six), often augmented by professional staff from other agencies who are working on particular initiatives. Appendix A provides background information on the authority of OMB over federal statistics, statistical policy directives, and other legislation and OMB guidance that affect the U.S. statistical system.

PRINCIPAL STATISTICAL AGENCIES

This section covers the 13 principal statistical agencies identified by OMB (see U.S. Office of Management and Budget, 2020, p.6) that are all members of the ICSP. The information presented here includes origins, authorizing legislation or other authority, and status of agency head (presidential appointee, career senior executive service official). The agencies are discussed in alphabetical order.

Bureau of Economic Analysis

The BEA (see https://bea.gov/) is part of the Department of Commerce (as is the Census Bureau). The BEA director is a career senior executive service appointee. BEA's history traces back to 1820, when the Secretary of the Treasury was directed by Congress to compile and publish statistics on U.S.-foreign commerce. Three 20th-century predecessors of BEA were all located in the Department of Commerce: the Bureau of Statistics (1903–1912); the Bureau of Foreign and Domestic Commerce (1912–1945); and the Office of Business Economics (1945–1972).

BEA produces statistics on the performance of the nation's economy. Although it collects some source data, it primarily compiles data from the Census Bureau, the Bureau of Labor Statistics (BLS), and other agencies as input to estimating the National Income and Product Accounts (NIPAs), which include estimates of the nation's gross domestic product (GDP) and related measures. GDP, which was recognized by the Department of Commerce as its greatest achievement of the 20th century in a December 2009 ceremony, has major influence on U.S. financial markets.

Since the NIPAs were first developed in the aftermath of the Great Depression, BEA has extended its estimates to cover a wide range of economic activities for the nation, regions, and industries and also for

[60]See https://www.whitehouse.gov/omb/information-regulatory-affairs/statistical-programs-standards/. [February 2021]

the nation's position in the world economy. BEA also produces "satellite accounts" in such areas as health care, outdoor recreation, travel and tourism, and arts and culture production. Satellite accounts provide a framework for testing alternative economic assumptions without disruption to BEA's core economic accounts.

Bureau of Justice Statistics

The Bureau of Justice Statistics (BJS; see http://www.bjs.gov/), in the U.S. Department of Justice (DOJ), was formally established by the Justice Systems Improvement Act of 1979 (P.L. 96-157). It inherited statistical functions that had previously been vested in an office of the Law Enforcement Assistance Administration (which had been established in 1968).

BJS is housed in the DOJ's Office of Justice Programs (OJP), which also contains the National Institute of Justice (a research agency) and other agencies that are primarily focused on providing grant and technical assistance to state and local governments and law enforcement agencies. BJS's director is a presidential appointee (not requiring Senate confirmation—a change as of August 2012) and reports to the assistant attorney general for OJP.

The centerpiece of BJS's data collections is the National Crime Victimization Survey (originally the National Crime Survey), which has served as one of the nation's principal measures of crime (particularly crime not reported to police) since its full-scale implementation in 1972. Data collection for most BJS surveys is conducted by the Census Bureau or private contractors.

BJS publishes annual statistics on criminal victimization, populations under correctional supervision, law enforcement management and administration, case processing in the state and federal courts, and sexual violence in prisons under the 2003 Prison Rape Elimination Act. Its periodic data series covers the administration of law enforcement agencies and correctional facilities, prosecutorial practices and policies, state court case processing, felony convictions, criminal justice expenditure and employment, civil case processing in state courts, and special studies on other criminal justice topics.

Bureau of Labor Statistics

The BLS (https://www.bls.gov/) is an agency of the U.S. Department of Labor, which is responsible for the production of some of the nation's

most sensitive and important economic data, including unemployment statistics and consumer and producer price indexes, which are closely watched by the public, Congress, other federal agencies, state and local governments, businesses, and labor organizations. The BLS commissioner is a presidential appointee, subject to Senate confirmation, and serves for a fixed term of 4 years.

The history of the BLS dates back to 1884, when the Bureau of Labor was established in the Interior Department to collect information about employment and labor. It was made an independent (subcabinet) agency by the Department of Labor Act in 1888; it was made part of the Department of Commerce and Labor (as the Bureau of Labor) in 1903, and it was transferred to the newly created Department of Labor in 1913.

BLS programs use a variety of data collection methods and sources. Certain wage, benefit, employment, and price data are collected by BLS staff in offices throughout the country, who contact employers, households, and businesses directly. BLS also has contractual arrangements with various state agencies to collect much of the data it publishes on employment and workplace safety and health. Its contractual arrangements with the Census Bureau support the collection of data for several programs, including the Current Population Survey (the source of monthly unemployment statistics) and the Consumer Expenditure Survey (the source of the market baskets for the Consumer Price Index [CPI]). Some BLS data, such as those for the various national longitudinal surveys, are collected by private contractors.

BLS's surveys, indexes, and statistics fall into four main categories:

1. Consumer expenditures and prices, including the CPI, the producer price index, and U.S. import and export prices indexes;
2. The labor force, including monthly data on employment from households and business establishments, monthly and periodic data on unemployment, time use, job openings and labor turnover, occupational employment and projections of trends, and longitudinal data on the work experience of cohorts of the population;
3. Compensation and working conditions, including the employment cost index, workplace injuries and fatalities, employee benefits, and occupational requirements; and
4. Productivity.

Bureau of Transportation Statistics

The Bureau of Transportation Statistics (BTS; https://www.bts.gov/) is under the Office of the Assistant Secretary of Transportation for Research and Technology (OST-R) in the U.S. Department of Transportation. OST-R also includes the Intelligent Transportation Systems Joint Program Office; the Office of Research, Development, and Technology; the Transportation Safety Institute; and the Volpe National Transportation Systems Center.

BTS's director is a career senior executive service appointee who reports to the assistant secretary. Prior to 2004, the director was a presidential appointee with a fixed term of 4 years who reported directly to the secretary of the department.

BTS was established by the 1991 Intermodal Surface Transportation Efficiency Act and began operations in late 1992. It was moved to the newly created Research and Innovative Technology Administration (RITA) by the Norman Y. Mineta Research and Special Programs Improvement Act of 2004. BTS moved with the rest of RITA to OST-R in 2014. The 2015 Fixing America's Surface Transportation (FAST) Act (P.L. 114-94) authorized the reorganization of BTS and strengthened its ability to produce statistical products free of political influence.

In regard to independence, Section 6017 of the FAST Act specified that the BTS director did not need the approval of the department for data collection or analysis or for the substance of any statistical data product or press release. The act charged the BTS director with a "significant role" in allocation of the BTS budget, hiring, and grant and contract awards, with the exception that the secretary was to direct external support functions, such as coordination of activities involving BTS and other departmental administrations. Finally, the act charged the departmental chief information officer to consult with the BTS director to ensure that information technology decisions protected the confidentiality of BTS statistical information in accordance with the Confidential Information Protection and Statistical Efficiency Act (CIPSEA).

Prior to the establishment of BTS, statistical programs of the Department of Transportation focused exclusively on specific modes of transportation (highways, airlines, railroads, etc.). The exception was the first 10 years of the department's existence (1967–1977), when the Office of the Secretary funded intermodal surveys on commodity flows

and long-distance personal transportation. BTS is charged to produce an annual report on transportation statistics, develop intermodal data on commodity and passenger flows, administer the National Transportation Library, and carry out other functions to ensure that the department, the states, and other federal agencies have available comprehensive information on the nation's transportation systems. BTS also operates the Office of Airline Information, which was transferred to it from the now-defunct Civil Aeronautics Board in 1995. The 2015 FAST Act added a new Port Performance Freight Statistics Program to BTS's portfolio. BTS contracts with the Census Bureau for major surveys.

Census Bureau

The Census Bureau (see http://www.census.gov/) is part of the Department of Commerce (as is BEA). It conducts population and economic censuses and a wide array of surveys.

The first censuses were conducted by U.S. marshals under the authority of the Secretary of State. Beginning in 1850, a separate census office was established each decade to supervise the census. In 1902 a permanent Census Bureau was established; it was made part of the new Department of Commerce and Labor in 1903, and it moved to the newly created Department of Commerce in 1913. Title 13 of the U.S. Code includes the major legal provisions related to the Census Bureau, including strict provisions for protecting the confidentiality of population and business information.

The director of the Census Bureau is appointed by the President with Senate confirmation for a fixed 5 year term that can be renewed once (to begin in years ending in 2 and 7).[61]

The major periodic activity of the Census Bureau is the decennial population census, which in 2020 consisted of basic questions on age, sex, race, Hispanic origin, relationship to household head, and housing tenure (own, rent). As part of the decennial census program, the Census Bureau also conducts the continuous American Community Survey, which includes questions previously part of a long-form sample in the decennial census. Population and housing estimates are updated annually using administrative records in cooperation with state and local governments.

[61]The fixed term was signed into law in August 2012; previously, the director served at the pleasure of the President.

The Census Bureau also has a large portfolio of censuses and surveys about businesses, nonprofit organizations, and federal, state, and local governments. The economic census of businesses and the census of governments takes place every 5 years (in years ending in 2 or 7). The Census Bureau also has a portfolio of demographic surveys, including surveys it conducts jointly with or for other statistical agencies. The Census Bureau produces annual estimates of poverty, median income, and health insurance coverage using the Current Population Survey, which BLS uses to produce the unemployment rate. The Census Bureau also does the data collection for the American Housing Survey (for the Department of Housing and Urban Development), the Consumer Expenditure Survey (for BLS), the National Crime Victimization Survey (for BJS), and the National Health Interview Survey (for NCHS).

Economic Research Service

The Economic Research Service (ERS; http://www.ers.usda.gov/), along with the National Agricultural Statistics Service and two other agencies in the U.S. Department of Agriculture (USDA), reports to the Under Secretary for Research, Education, and Economics. The administrator of ERS is a career senior executive service appointee.

The origins of ERS trace back to 1905, when USDA established the Office of Farm Management, which was renamed the Office of Farm-Management and Farm Economics in 1919. The office's research areas included farm organization, cost of production, farm labor, farm finance, land economics, agricultural history, and rural life studies. Several reorganizations took place, and in 1961 USDA created ERS, assigning it responsibility for conducting economic research and policy analysis to inform program and policy decisions throughout USDA. The agency's mission is to anticipate food, agricultural, agri-environmental, and rural development issues that are on the horizon and conduct peer-reviewed economic research so that research findings are available when issues require decisions by policy makers. As a statistical agency, ERS does not make recommendations: it designs its research to show the consequences of alternative policy or programmatic choices.

ERS is also the primary source of statistical indicators on food and agriculture, such as those that gauge the health of the farm sector (including farm income estimates and projections), assess the current

and expected performance of the agricultural sector (including trade and productivity), measure food insecurity in the United States and abroad, and measure dimensions of food availability and access. ERS jointly funds two primary data collection efforts: (1) the Agricultural Resources Management Survey on farm household and business income and crop practices, also funded by the National Agricultural Statistics Service; and (2) the National Household Food Acquisition and Purchase Survey, which focuses on American households' food purchase and acquisitions behavior, also funded by USDA's Food and Nutrition Service.

Energy Information Administration

The Energy Information Administration (EIA; http://www.eia.gov/) is an agency of the U.S. Department of Energy (DOE); its administrator is a presidential appointee with Senate confirmation.

EIA was created by Congress in 1977 as part of the newly established Department of Energy. Its mission is to provide policy-independent energy data, forecasts, and analyses in order to promote sound policy making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment. To assure EIA's independence, the Department of Energy Organization Act specifies that EIA's products are not subject to clearance by executive branch officials: in particular, the administrator does not need to obtain the approval of any other DOE official for data collection and analysis, and he or she does not need to "obtain the approval of any other officer or employee of the United States" before publishing energy data and analysis reports (42 USC 7135(d)).

Many EIA data products, such as weekly, monthly, and annual data on petroleum and natural gas supply, deal with specific industries; others contain data on all fuel types. EIA's mandatory energy supply surveys are conducted by private contractors, who survey energy producers, users, and transporters, and certain other businesses. Data on energy consumption are collected for households, commercial buildings, manufacturing, and transportation. Analyses prepared by EIA staff cover energy economics, technology, production, prices, distribution, storage, consumption, and environmental effects.

EIA forecasts cover all energy types and include supply, consumption, prices, and other factors. Short-term forecasts cover 1–2 years;

20-year projections are also developed and often serve as the baseline for independent analyses of policy proposals that are prepared by EIA at the request of Congress or the administration. More than three-quarters of EIA's resources are used for energy data collection and dissemination; the rest is used to support forward-looking forecasts, projections, and analyses.

National Agricultural Statistics Service

The National Agricultural Statistics Service (NASS; https://www.nass.usda.gov/) is under the Under Secretary for Research, Education, and Economics in USDA (as is ERS). The administrator of NASS is a career senior executive service appointee.

The foundation of NASS began with the establishment of USDA in 1862. Agricultural supply information was one of the purposes of the new department. The first official report on the condition of crops was issued in July 1863. NASS's mission of providing timely, accurate, and useful statistics continues today through its agriculture estimates and census of agriculture programs. In its agricultural estimates program, NASS provides the USDA forecasts and estimates for numerous commodities. The census of agriculture is conducted every 5 years and provides comprehensive information about the nation's agriculture down to the county level, which provides a foundation for farm policy among its many uses.

Slightly more than one-third of the agency's staff is located at its Washington, DC, headquarters; the rest of the staff is located at the National Operations Center near St. Louis, Missouri, and in 12 regional offices, each of which is responsible for the statistical work in several states. All field and telephone interviewing staff are obtained through contracting with the National Association of State Departments of Agriculture (NASDA). NASS researchers also collaborate with researchers, largely from land-grant universities and the National Institute of Statistical Sciences, to improve statistical methodologies and practices of both the agricultural estimates and the census of agriculture programs.

NASS provides data services for many agencies inside and outside USDA. It collaborates with state departments of agriculture and land-grant universities to meet state, local, and national needs for agricultural statistics. Through cooperative agreements going back as far as 1917 and memoranda of understanding, NASS provides data collection

and statistical services to other federal agencies, and it provides statistics to the public through trust fund agreements with private producer organizations when federal funding is inadequate.

NASS works with its regional field offices to carry out hundreds of surveys every year and prepares reports covering virtually every aspect of U.S. agriculture. Examples include production and supplies of food and fiber, prices paid and received by farmers, farm labor and wages, farm finances, chemical use, and changes in the demographic characteristics of U.S. producers.

National Center for Education Statistics

The National Center for Education Statistics (NCES; http://nces.ed.gov/) is part of the Institute of Education Sciences (IES) in the U.S. Department of Education; IES also includes three research and evaluation centers. The NCES commissioner is a presidential appointee for a fixed term of 6 years.[62]

NCES's origins date back to 1867 when Congress established a Department of Education and gave it a primary mission of "collecting such statistics and facts as shall show the condition and progress of education in the several States and Territories, and of diffusing such information respecting the organization and management of schools and school systems and methods of teaching" (P.L. 39-73, 14 Stat. 434). The legislation also charged the department's commissioner to issue an annual report. However, only 2 years later the department was abolished, and an Office of Education was established in the U.S. Department of the Interior, where it remained through 1939. The Office of Education was part of the newly created Federal Security Agency from 1939 to 1953, when it was made part of the newly created U.S. Department of Health, Education, and Welfare. A separate Department of Education was reestablished in 1980.

A major function of the Office of Education throughout its history was the collection and publication of education statistics. NCES was established in 1965 as a staff office reporting to the Commissioner of Education. NCES received statutory authority in 1974; in 1980 it was made part of the Office of Educational Research and Improvement, which in 2002 became the IES. Supporting the independence of NCES, the Education Sciences Reform Act of 2002, which created IES, stipulated

[62]Senate confirmation is no longer required, a change that was made in August 2012.

that "each Commissioner [head of one of IES's constituent centers], except the Commissioner for Education Statistics, shall carry out such Commissioner's duties…under the supervision and subject to the approval of the Director" of IES (20 USC 9517(d)).

NCES has an extensive survey program, including longitudinal surveys that follow the educational experience of cohorts of the U.S. population from early childhood through adulthood, periodic surveys of adult literacy, and international studies of educational achievement. It also collects the "Common Core of Data" from administrative records of state and local K–12 educational agencies, and it collects data for the Integrated Postsecondary Education Data System. It regularly assesses the educational knowledge and achievement of primary and secondary school students in the National Assessment of Educational Progress. It also administers the Statewide Longitudinal Data Systems program, which provides grants to the states to develop longitudinal databases of student records for analyzing student performance and for identifying methods to improve achievement.

National Center for Health Statistics

The National Center for Health Statistics (NCHS; https://www.cdc.gov/nchs/index.htm) is part of the Centers for Disease Control and Prevention (CDC) in the U.S. Department of Health and Human Services (DHHS). The NCHS director is a career senior executive service appointee.

NCHS's roots lie in two formerly separate historical strands for the provision of national health statistics. The first strand includes vital statistics on births, deaths, and other life events; its origins trace back to 1902, when Congress gave the newly created permanent Census Bureau the authority to establish registration areas to produce nationally comparable vital statistics by working with state agencies. This function was transferred in 1946 to the Federal Security Administration, which was folded into the new U.S. Department of Health, Education, and Welfare in 1953, which subsequently was split into two federal departments. The second strand concerns general statistics on the nation's health and was authorized in the 1956 National Health Survey Act.

NCHS was created in 1960 as the merger of the National Office of Vital Statistics and the National Health Survey Division; it was relocated every few years in DHHS until its last relocation in 1987, when it was

made part of CDC. In 2005 it became one of three centers reporting to the newly created Coordinating Center for Health Information and Service in CDC. In 2013, further administrative reorganization placed NCHS within the new CDC Office of Public Health Scientific Services (78 *Federal Register* 70049, November 22, 2013).

NCHS has four major data collection programs:

1. The National Health Interview Survey, in continuous operation since 1956, which collects a wide range of information on self-reported health status and conditions and use of health care services by the population;
2. The National Health and Nutrition Examination Survey, which ascertains self-reported information on health and dietary intake and also, by use of mobile examining units, obtains extensive information from physical examinations and laboratory tests;
3. Healthcare surveys of various providers, including hospitals, outpatient facilities, and long-term care providers; and
4. Vital statistics, which are collected and maintained by the states.

National Center for Science and Engineering Statistics

The National Center for Science and Engineering Statistics (NCSES; https://www.nsf.gov/statistics/) is part of the Social, Behavioral, and Economic Sciences Directorate of the National Science Foundation (NSF). Its director is a career senior executive service appointee.

NCSES was formerly the Division of Science Resources Statistics, and before that it was the Division of Science Resources Studies. It became NCSES with passage of the America COMPETES Reauthorization Act of 2010 (Section 505; 42 USC 1862), with an expanded mandate to serve as a "central Federal clearinghouse for the collection, interpretation, analysis, and dissemination of objective data on science, engineering, technology, and research and development."

NCSES's history began in 1950, when the newly created NSF was charged to maintain a register of scientific and technical personnel so that the nation would be able to mobilize the scientific and technical workforce in the event of a major war. Although no longer required to maintain a complete register, NSF has continued (by the terms of its founding act, as amended) to have responsibility "to provide a central clearinghouse for the collection, interpretation, and analysis of data on

scientific and engineering resources and to provide a source of information for policy formulation by other agencies of the Federal Government" (42 USC 1862). NSF also has a congressional mandate from 1980 to provide information on women and minorities in science and engineering.

The NSF mandates provide the basis for statistical programs in NCSES. The center is called on to support the collection of statistical data on research and development trends, the science and engineering workforce, U.S. competitiveness, and the condition and progress of the nation's science, technology, engineering, and mathematics (STEM education; to support research using the data it collects and on methodologies in areas related to its work; and to support the education and training of researchers in the use of its own and other large-scale, nationally representative data sets. NCSES designs, supports, and directs a coordinated collection of periodic national surveys and performs a variety of other data collections and research, providing policy makers, researchers, and other decision makers with high-quality data and analysis on research and development, innovation, the education of scientists and engineers, and the science and engineering workforce. NCSES also serves as staff to the National Science Board in producing the biennial congressionally mandated *Science and Engineering Indicators Report*, which uses data from all NCSES surveys.

Office of Research, Evaluation, and Statistics, Social Security Administration

The Office of Research, Evaluation, and Statistics (ORES; https://www.ssa.gov/policy/index.html) is located in the Social Security Administration (SSA). ORES reports to the SSA Deputy Commissioner for Retirement and Disability Policy. ORES is headed by an associate commissioner, who is a career senior executive service appointee.

SSA began as the Social Security Board in 1935; it became part of the Federal Security Agency in 1939, part of the Department of Health, Education, and Welfare in 1953, and part of DHHS in 1980; it regained independent agency status in 1995. From the outset, SSA has had a research, statistics, and evaluation function.

ORES produces numerous recurring statistical publications about the Social Security and Supplemental Security Income (SSI) programs, such as the *Annual Statistical Supplement*. ORES also produces statistical

publications about earnings and employment and other topics related to Social Security, such as the *Income of the Population 55 or Older* and the *Income of the Aged Chartbook*.

ORES conducts and sponsors research and evaluation on the effects of the Social Security and SSI programs and proposed changes in those programs on individuals, the economy, and program solvency. It develops and operates microsimulation models to assess the distributional effects of proposed reforms to the Social Security and SSI programs. ORES also conducts comparative analyses of social insurance systems in other countries. The research generated by ORES often is published in its in-house journal, the *Social Security Bulletin*. In addition, ORES funds two external research networks through cooperative agreements, the Retirement Research Consortium (RRC), and the Disability Research Consortium (DRC).[63] The RRC and DRC promote research on a wide range of topics related to Social Security retirement and disability policy at universities and think tanks.

Finally, ORES performs a significant data infrastructure function in support of policy research. ORES is responsible for working with outside research partners to create restricted-use research datasets by linking survey and other external data to Social Security program data. ORES also supports epidemiologists by providing vital status data on subjects of health research.[64]

Statistics of Income Division, Internal Revenue Service

The Statistics of Income Division (SOI; see https://www.irs.gov/uac/tax-stats) is housed in the Office of Research, Analysis, and Statistics of the Internal Revenue Service (IRS) in the U.S. Department of the Treasury. The director is a career senior executive service appointee.

SOI's history traces back to the enactment of authority to levy individual income taxes in the 16th amendment to the U.S. Constitution, which was ratified in 1913. Section 21 of the Revenue Act of 1916 mandated the annual "publication of statistics reasonably available with respect to the operation of the income tax law" (39 Stat. 776); identical language is found in the current Internal Revenue Code (see 26 USC 6108).

[63]See https://www.ssa.gov/policy/rrc/ and https://www.ssa.gov/policy/drc/index.html. [February 2021]

[64]See https://www.ssa.gov/policy/about/epidemiology.html. [February 2021]

SOI provides income, financial, and tax information data products to the user community that are based largely on individual and corporate tax returns and on returns filed by most tax-exempt organizations. It also provides periodic data derived from other returns and schedules, such as estate and gift taxes, foreign income and taxes, and gains and losses from sales of capital assets.

On written request, SOI tax return data are available to staff in the Department of the Treasury and the Congressional Joint Committee on Taxation for policy analysis and revenue estimation. SOI data are also available to the Congressional Budget Office for modeling Social Security and Medicare programs, but not for any other purpose. Selected tax return data are also available, under strict confidentiality protection provisions, for use by the Census Bureau, the BEA, and the National Agricultural Statistics Service: the purposes of this access are for structuring censuses and national economic accounts and conducting related statistical activities authorized by law.

OTHER AGENCIES WITH STATISTICAL OFFICIALS

As noted in Appendix A, agencies without principal statistical agencies or units were required under the Evidence Act to designate qualified statistical officials, who would also serve on the ICSP. We briefly describe some of the statistical programs within each of these agencies below.

Department of Defense

The Department of Defense (DoD) is a source of federal current demographic, economic, health, and transportation statistics. The largest statistical program is the Office of People Analytics (OPA), which was created to utilize big-data analytics to better understand key components of service members' career paths, and how policy or environmental changes affect the performance and composition of the DoD workforce.[65]

Department of Homeland Security

The Department of Homeland Security (DHS) is a source of federal safety, crime and justice, current demographic, and current economic statistics. DHS has statistical programs in several agencies. Customs and Border Protection (CBP) collects entry data on aliens entering and denied admis-

[65]See https://opa.defense.gov/. [February 2021]

sion to the United States. The Federal Emergency Management Agency (FEMA) evaluates victims' satisfaction with emergency relief services, and provides statistics on fires. The Office of Immigration Statistics (OIS) collects and disseminates statistical information and analysis useful in evaluating the social, economic, environmental, and demographic impact of immigration laws, migration flows, and immigration enforcement.[66]

Department of Housing and Urban Development

The Department of Housing and Urban Development (HUD) is a source of current federal economic statistics. The largest statistical program is the Office of Policy Development and Research (PD&R), responsible for maintaining current information on housing needs, market conditions, and existing programs, as well as conducting research on priority housing and community development issues.[67] The Office of Housing and the Office of Public and Indian Housing also collect and analyze data in support of their programs.

Department of the Interior

The Department of the Interior is a source of federal statistics on energy and minerals; environment; and soil, forest, fish, wildlife, and public lands. The department's largest statistical program is the U.S. Geological Survey, which conducts applied research on the environment and provides data on streamflow, floods, drought, earthquakes, volcanic activity, landslides, the Landsat program, and geomagnetism.[68]

Department of State

The Department of State is a source of federal health statistics, and it has one statistical program—the Office of the U.S. Global AIDS Coordinator (OGAC)—which provides data related to the President's Emergency Plan for AIDS Relief.[69]

Department of Veterans Affairs

The Department of Veterans Affairs (VA) is a source of federal current demographic and health statistics. VA has large statistical programs in the Veterans Health Administration and the Veterans Benefits Administra-

[66]See https://www.dhs.gov/office-immigration-statistics, [February 2021]
[67]See https://www.huduser.gov/portal/about/pdrabout.html. [February2021]
[68]See https://www.usgs.gov/. [February 2021]
[69]See https://www.state.gov/pepfar/. [February 2021]

tion, but its primary statistical unit is the National Center for Veterans Analysis and Statistics,[70] which develops descriptive, diagnostic, and predictive analytics on a broad range of topics about veterans and VA programs; collaborates with other federal agencies to survey and analyze the veteran population; and sponsors the National Survey of Veterans.

Environmental Protection Agency

The Environmental Protection Agency (EPA) is a source of natural resources, energy, and environment statistics. EPA monitors the quality of the air and of drinking, surface, and ground-water; ecosystem status; and the use and release of toxic and hazardous substances.

General Services Administration

The General Services Administration (GSA) provides a host of data center services, research tools, and other services to federal agencies.

National Aeronautics and Space Administration

National Aeronautics and Space Administration (NASA) is a source of federal environmental statistics. NASA collects remotely sensed data on climate, weather, and natural hazards and supports the National Climate Assessment.

Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) is headed by a five-member commission[71] that formulates policies and regulations governing nuclear reactor and materials safety, issues orders to licensees, and adjudicates legal matters brought before it. The program offices ensure that the commercial use of nuclear materials in the United States is safely conducted and conduct inspection, enforcement, and emergency response programs for licensees.

Office of Personnel Management

The Office of Personnel Management (OPM) is the focal point for providing statistical information about the federal civilian workforce. OPM's FedScope is an online tool that allows customers to access

[70]See https: //www.va.gov/vetdata/. [February 2021]

[71]See https://www.nrc.gov/about-nrc/organization/commfuncdesc.html. [February 2021]

and analyze the most popular data elements from OPM's Enterprise Human Resources Integration (EHRI) Data Warehouse.

Small Business Administration

The Small Business Administration (SBA) is a source of federal economic statistics. SBA supports and produces statistics on small business characteristics and contributions.

U.S. Agency for International Development

The U.S. Agency for International Development (USAID) leads international development and humanitarian efforts to save lives, reduce poverty, strengthen democratic governance, and help people progress beyond assistance. USAID conducts rigorous evaluations to track the progress, results, and effectiveness of international development programs.[72]

OMB-RECOGNIZED STATISTICAL UNITS UNDER CIPSEA

Implementation guidance issued in 2007 for the 2002 Confidential Information Protection and Statistical Efficiency Act (CIPSEA) (see Appendix A) recognized 12 principal statistical agencies—the 13 agencies identified as principal statistical agencies that serve on the ICSP, with the exception of the Social Security Administration Office of Research, Evaluation, and Statistics.[73] The guidance provided a mechanism by which other agencies or units can be recognized as statistical agencies or units for the purposes of CIPSEA (U.S. Office of Management and Budget, 2007, p. 33368).[74] As noted in Appendix A, OMB is required to issue guidance on how agencies may be designated as statistical agencies or units.

Using criteria from the 2007 CIPSEA Implementation Guidance, OMB recognized four additional units as statistical units for purposes of CIPSEA: the Office for Research, Evaluation, and Statistics of SSA; the Center for Behavioral Health Statistics and Quality of the

[72]See https://www.usaid.gov/evaluation. [February 2021]

[73]CIPSEA adopted the designation of 12 agencies from the *Order Providing for the Confidentiality of Statistical Information*, issued by OMB in 1997 (see Appendix A).

[74]In addition to the requirements for designation as a statistical unit spelled out in the quoted paragraph, *Statistical Policy Directive No. 1* (U.S. Office of Management and Budget, 2014b) applies to recognized statistical units in addition to principal statistical agencies. This directive requires a statistical agency or unit's department to recognize the agency or unit's independence (see Appendix A).

Substance Abuse and Mental Health Services Administration in the U.S. Department of Health and Human Services; the Microeconomic Surveys Section of the Federal Reserve Board; and the National Animal Health Monitoring System Program Unit of the Animal and Plant Health Inspection Service in the U.S. Department of Agriculture. The last three units are described below.

Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration

The Center for Behavioral Health Statistics and Quality (CBHSQ)[75] is the lead federal agency for behavioral health statistics, and it is housed in the Substance Abuse and Mental Health Services Administration In DHHS. CBHSQ conducts the continuing National Survey on Drug Use and Health (NSDUH), which is the nation's primary data system for collecting information on the incidence and prevalence of substance abuse and adverse health consequences associated with drug abuse from the civilian, noninstitutionalized population of the United States for people ages 12 and older. NSDUH (formerly called the National Household Survey on Drug Abuse) was fielded periodically from 1972 to 1990 and then annually beginning in 1991. Other CBHSQ statistical programs include the Behavioral Health Services Information System and its associated surveys, which are the primary data sources for information on the nation's substance abuse treatment system and outcomes; the Drug Abuse Warning Network (DAWN), a public health surveillance system that monitors drug-related visits to hospital emergency departments, as well as drug-related deaths investigated by medical examiners and coroners; and other programs.

Microeconomic Surveys Section, Federal Reserve Board

The Microeconomic Surveys Section of the Division of Research and Statistics of the Federal Reserve Board conducts research in a variety of areas, including consumer finances, financial markets, general applied microeconomics, survey methodology, and other statistical methodology.[76] The section has responsibilities for a number of the surveys conducted by the Federal Reserve Board, including the triennial Survey of Consumer Finances, which ascertains detailed information on fami-

[75]See https://www.samhsa.gov/about-us/who-we-are/offices-centers/cbhsq. [February 2021]

[76]See https://www.federalreserve.gov/econresdata/rsmecs-staff.htm. [February 2021]

lies' balance sheets, pensions, income, and demographic characteristics from an area probability sample of households supplemented by a list of samples from federal income tax records of high-income families that hold disproportionately large amounts of assets.

National Animal Health Monitoring System Program Unit, Animal and Plant Health Inspection Service, USDA

The Animal Plant Health and Inspection Service of the U.S. Department of Agriculture established the National Animal Health Monitoring System Program Unit (NAHMS) in 1983 to collect, analyze, and disseminate data on animal health, management, and productivity across the United States.[77] The NAHMS staff conduct national studies on the health and health management of U.S. domestic livestock and poultry populations. Each animal group is studied at regular intervals, providing up-to-date and trend information needed to monitor animal health, support trade decisions, assess research and product development needs, answer questions for consumers, and set policy.

[77]See https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/monitoring-and-surveillance/nahms/about. [February 2021]

APPENDIX C

Some International Frameworks and Guidance Relevant for Federal Statistics

National statistical offices around the world face many of the same issues as federal statistical agencies. Although the United States participates in a wide variety international statistical work, including through the United Nations Statistical Commission and the Organisation for Economic and Co-operation and Development Statistics and Data Directorate, the decentralized nature of the U.S. federal statistical system has often meant that many staff and even entire agencies or programs in the system are unaware of relevant international work. This Appendix is intended to provide a general introduction to some key resources developed by international entities that could be useful for federal statistical agencies.

UNITED NATIONS FUNDAMENTAL PRINCIPLES OF OFFICIAL STATISTICS

The United Nations Statistics Division website notes that the need for a set of principles governing official statistics became apparent at the end of the 1980s when countries in Central Europe began to change from centrally planned economies to market-oriented democracies. It was essential to ensure that national statistical systems in such countries would be able to produce appropriate and reliable data that adhered to certain professional and scientific standards.

The Conference of European Statisticians developed and adopted the Fundamental Principles of Official Statistics in 1991, and these were subsequently adopted by the United Nations Statistical Commission in 1994

as the United Nations Fundamental Principles of Official Statistics. In 2014, the U.N. General Assembly endorsed the following Fundamental Principles of Official Statistics:[78]

> *Principle 1.* Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.
>
> *Principle 2.* To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.
>
> *Principle 3.* To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.
>
> *Principle 4.* The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.
>
> *Principle 5.* Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.
>
> *Principle 6.* Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

[78]See https://unstats.un.org/fpos/. [February 2021]

Principle 7. The laws, regulations and measures under which the statistical systems operate are to be made public.

Principle 8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

Principle 9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

Principle 10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

In 2015, the U.N. Statistical Commission issued implementation guidelines for the Fundamental Principles.[79] These guidelines list several actions or activities that a statistical agency is advised to take into account when aiming to improve the practical and effective implementation of a certain principle or when developing a certain principle further. Concrete as well as practice-orientated examples (good practices) complement these recommended actions. Part II of the implementation guidelines contains recommendations on how to ensure a high level of independence for national statistical systems. These guidelines differentiate between various forms of independence (such as institutional, professional, and scientific independence) and recommend good practices in order to ensure independence.

THE COMMON QUALITY FRAMEWORK OF THE EUROPEAN STATISTICAL SYSTEM

The common quality framework of the European Statistical System is composed of the European Statistics Code of Practice, the Quality Assurance Framework of the European Statistical System, and general quality management principles (such as continuous interaction with users, commitment of leadership, partnership, staff satisfaction, continuous improvement, integration and harmonization). The European Statistics Code of Practice is the cornerstone of the common quality framework

[79]See https://unstats.un.org/fpos/implementation/. [February 2021]

of the European Statistical System. It is a self-regulatory instrument and is based on 16 principles covering the institutional environment, statistical processes, and statistical outputs.[80] A set of indicators of best practices and standards for each of the principles provides guidance and reference for reviewing the implementation of the Code of Practice, increasing transparency within the European Statistical System.

> **Institutional Environment**
>
> Institutional and organizational factors have a significant influence on the effectiveness and credibility of a statistical authority developing, producing, and disseminating European statistics. The relevant principles are professional independence, coordination and cooperation, mandate for data collection, adequacy of resources, quality commitment, statistical confidentiality, impartiality, and objectivity.
>
> *Principle 1:* Professional Independence. Professional independence of statistical authorities from other policy, regulatory or administrative departments and bodies, as well as from private sector operators, ensures the credibility of European Statistics.
>
> *Principle 1b:* Coordination and Cooperation. National Statistical Institutes and Eurostat ensure the coordination of all activities for the development, production, and dissemination of European Statistics at the level of the national statistical system and the European Statistical System, respectively. Statistical authorities actively cooperate within the partnership of the European Statistical System, so as to ensure the development, production and dissemination of European statistics.
>
> *Principle 2:* Mandate for Data Collection and Access to Data. Statistical authorities have a clear legal mandate to collect and access information from multiple data sources

[80]European Statistics Code of Practice: https://ec.europa.eu/eurostat/web/products-catalogues/-/KS-02-18-142. [February 2021]

for European statistical purposes. Administrations, enterprises and households, and the public at large may be compelled by law to allow access to or deliver data for European statistical purposes at the request of statistical authorities.

Principle 3: Adequacy of Resources. The resources available to statistical authorities are sufficient to meet European Statistics requirements.

Principle 4: Commitment to Quality. Statistical authorities are committed to quality. They systematically and regularly identify strengths and weaknesses to continuously improve process and output quality.

Principle 5: Statistical Confidentiality and Data Protection. The privacy of data providers, the confidentiality of the information they provide, its use only for statistical purposes, and the security of data are absolutely guaranteed.

Principle 6: Impartiality and Objectivity. Statistical authorities develop, produce, and disseminate European Statistics respecting scientific independence and in an objective, professional, and transparent manner in which all users are treated equitably.

Statistical Processes

European and other international standards, guidelines, and good practices are fully observed in the statistical processes used by the statistical authorities to develop, produce, and disseminate European Statistics, while constantly striving for innovation. The credibility of the statistics is enhanced by a reputation for good management and efficiency. The relevant principles are sound methodology, appropriate statistical procedures, non-excessive burden on respondents, and cost effectiveness.

Principle 7: Sound Methodology. Sound Methodology underpins quality statistics. This requires adequate tools, procedures, and expertise.

Principle 8: Appropriate Statistical Procedures. Appropriate statistical procedures implemented throughout the statistical processes underpin quality statistics.

Principle 9: Non-excessive Burden on Respondents. The response burden is proportionate to the needs of the users and is not excessive for respondents. The statistical authorities monitor the response burden and set targets for its reduction over time.

Principle 10: Cost effectiveness. Resources are used effectively.

Statistical Output

Available statistics meet users' needs. Statistics comply with the European quality standards and serve the needs of European institutions, governments, research institutions, business concerns, and the public generally. Output quality is measured by the extent to which the statistics are relevant, accurate and reliable, timely, coherent, comparable across regions and countries, and readily accessible by users, i.e., the Principles of Statistical Output.

Principle 11: Relevance. European Statistics meet the needs of users.

Principle 12: Accuracy and Reliability. European Statistics accurately and reliably portray reality.

Principle 13: Timeliness and Punctuality. European Statistics are released in a timely and punctual manner.

Principle 14: Coherence and Comparability. European Statistics are consistent internally, over time and comparable between regions and countries; it is possible to combine and make joint use of related data from different data sources.

Principle 15: Accessibility and Clarity. European Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance. [pages 4-54]

QUALITY FRAMEWORK FOR OECD STATISTICAL ACTIVITIES

Quality Dimensions

The OECD Quality Framework has four elements:

1. A definition of quality and its dimensions;
2. A procedure for assuring the quality of proposed new statistical activities;
3. A procedure for evaluating the quality of existing statistical activities on a regular basis; and
4. A set of broad principles on which OECD statistical activities are to be conducted and quality guidelines covering all phases of the statistical production process.[81]

Quality

Quality is defined as "fitness for use" in terms of user needs. This definition is broader than has been customarily used in the past when quality was equated with accuracy. It is now generally recognized that there are other important dimensions. Even if data is accurate, they cannot be said to be of good quality if they are produced too late to be useful, or cannot be easily accessed, or appear to conflict with other data. Thus, quality is viewed as a multifaceted concept. The quality characteristics of most importance depend on user perspectives, needs and priorities, which vary across groups of users.

Relevance

The *relevance* of data products is a qualitative assessment of the value contributed by these data. Value is characterized by the degree to which the data serve to address the purposes for which they are sought by users. It depends upon both the coverage of the required topics and the use of appropriate concepts. Value is further characterized by the merit of users' purposes in terms of the OECD mandate, the agreements with member countries, and the opportunity costs of producing the data.

[81]See http://www.oecd.org/sdd/qualityframeworkforoecdstatisticalactivities.htm. [February 2021]

Accuracy

The *accuracy* of data products is the degree to which the data correctly estimate or describe the quantities or characteristics they are designed to measure. Accuracy refers to the closeness between the values provided and the (unknown) true values. Accuracy has many attributes, and in practical terms there is no single aggregate or overall measure of it. Of necessity these attributes are typically measured or described in terms of the error, or the potential significance of error, introduced through individual sources.

Credibility

The *credibility* of data products refers to the confidence that users place in those products based simply on their image of the data producer, i.e., the brand image. The confidence of users is built over time. One important aspect is trust in the objectivity of the data. This implies that the data are perceived to be produced professionally in accordance with appropriate statistical standards and that policies and practices are transparent. For example, data are not manipulated nor their release timed in response to political pressure.

Timeliness

The *timeliness* of data products reflects the length of time between their availability and the event or phenomenon they describe, but considered in the context of the time period that permits the information to be of value and still acted upon. The concept applies equally to short-term or structural data; the only difference is the timeframe.

Accessibility

The *accessibility* of data products reflects how readily the data can be located and accessed from within OECD data holdings. The range of different users leads to such considerations as multiple dissemination formats and selective presentation of metadata. Thus, accessibility

includes the suitability of the form in which the data are available, the media of dissemination, and the availability of metadata and user support services. It also includes the affordability of the data to users in relation to their value to them and whether the user has reasonable opportunity to know that the data are available and how to access them.

Interpretability

The *interpretability* of data products reflects the ease with which the user may understand and properly use and analyze the data. The adequacy of the definitions of concepts, target populations, variables, and terminology underlying the data, and the information describing the limitations of the data, if any, largely determines the degree of interpretability.

Coherence

The *coherence* of data products reflects the degree to which they are logically connected and mutually consistent. Coherence implies that the same term should not be used without explanation for different concepts or data items; that different terms should not be used without explanation for the same concept or data item; and that variations in methodology that might affect data values should not be made without explanation. Coherence in its loosest sense implies that the data are "at least reconcilable." For example, if two data series purporting to cover the same phenomena differ, the differences in time of recording, valuation, and coverage should be identified so that the series can be reconciled. Coherence has four important subdimensions: within a dataset, across datasets, over time, and across countries.

Cost-efficiency

The *cost-efficiency* with which a product is produced is a measure of the costs and provider burden relative to the output. Provider burden is a cost that happens to be borne by the provider, but is a cost nevertheless. Whilst

the OECD does not regard cost-efficiency as a dimension of quality, it is a factor that must be taken into account in any analysis of quality as it can affect quality in all dimensions. If a product can be produced more efficiently with the same quality, then resources released can be used to improve the quality of that product or other products.

Core Values for OECD Statistics

The main principles of OECD statistical activities are as follows:[82]

a. OECD statistics are compiled and made available on an impartial basis. OECD statistics are produced according to strictly professional considerations, including scientific principles and professional ethics with regard to methods and procedures used for the collection, processing, storage and dissemination of statistical data.
b. The OECD presents statistical information according to scientific standards on the sources, methods, and procedures adopted to produce its statistics.
c. Individual data collected by the OECD for statistical compilation are considered to be strictly confidential and used exclusively for statistical purposes. Specific measures are taken to ensure the full protection of confidential data from any potential disclosure.
d. Internal rules and measures under which the OECD statistical system operates are made public.
e. The OECD is committed to carrying out its statistical activities in co-ordination with national statistical agencies and with other international organisations.
f. The OECD is committed to developing bilateral and multilateral co-operation in statistics in order to contribute to the development of systems of official statistics in all countries.
g. Within the constraints of resource availability, OECD data products are of the best possible overall quality

[82]Taken from http://www.oecd.org/sdd/qualityframeworkforoecdstatisticalactivities.htm. [February 2021]

in terms of each of the seven quality dimensions outlined in the Organisation's Quality Framework. Effort involved in assuring quality is commensurate with the scale of the statistical activity, the purpose of the activity and its frequency (i.e. whether it is intended to be repeated regularly or occasionally, or is one-off). [pages 6-12]

U.K. CODE OF PRACTICE FOR STATISTICS[83]

The framework for the U.K. Code of Practice for Statistics is based on three pillars:

- Trustworthiness is about having confidence in the people and organizations that produce statistics and data.
- Quality is about using data and methods that produce assured statistics.
- Value is about producing statistics that support society's needs for information.

Each pillar contains a number of principles and detailed practices that apply when producing and releasing official statistics.

Trustworthiness: Confidence in the people and organisations that produce statistics and data

Trustworthiness is a product of the people, systems and processes within organizations that enable and support the production of statistics and data. Trustworthiness comes from the organization that produces statistics and data being well led, well managed and open, and the people who work there being impartial and skilled in what they do.

T1: Honesty and integrity: People in organizations that release statistics should be truthful, impartial and independent, and meet consistent standards of behavior that reflect the wider public good.

[83]Taken from https://www.statisticsauthority.gov.uk/code-of-practice/the-code/. [February 2021]

T2: Independent decision making and leadership: Organizations should assign a Chief Statistician/Head of Profession for Statistics who upholds and advocates the standards of the Code, strives to improve statistics and data for the public good, and challenges their inappropriate use.

T3: Orderly release: Organizations should commit to releasing their statistics in an open and transparent manner that promotes public confidence.

T4: Transparent processes and management: Organizations should have effective business processes and appropriate resources to support their statistical functions and be open about their plans, priorities and progress.

T5: Professional capability: People producing statistics should be appropriately skilled, trained and supported in their roles and professional development.

T6: Data governance: Organizations should look after people's information securely and manage data in ways that are consistent with relevant legislation and serve the public good.

Quality: Data and methods that produce assured statistics

Quality means that statistics fit their intended uses, are based on appropriate data and methods, and are not materially misleading. Quality requires skilled professional judgement about collecting, preparing, analyzing and publishing statistics and data in ways that meet the needs of people who want to use the statistics.

Q1: Suitable data sources: Statistics should be based on the most appropriate data to meet intended uses. The impact of any data limitations for use should be assessed, minimized, and explained.

Q2: Sound methods: Producers of statistics and data should use the best available methods and recognised standards, and be open about their decisions.

Q3: Assured quality: Producers of statistics and data should explain clearly how they assure themselves that statistics and data are accurate, reliable, coherent, and timely.

Value: Statistics that support society's needs for information

Value means that the statistics and data are useful, easy to access, remain relevant, and support understanding of important issues. Value includes improving existing statistics and creating new ones through discussion and collaboration with stakeholders, and being responsible and efficient in the collection, sharing and use of statistical information.

V1: Relevance to users: Users of statistics and data should be at the center of statistical production; their needs should be understood, their views sought and acted on, and their use of statistics supported.

V2: Accessibility: Statistics and data should be equally available to all, not given to some people before others. They should be published at a sufficient level of detail and remain publicly available.

V3: Clarity and insight: Statistics and data should be presented clearly, explained meaningfully, and provide authoritative insights that serve the public good.

V4: Innovation and improvement: Statistics producers should be creative and motivated to improve statistics and data, recognizing the potential to harness technological advances for the development of all parts of the production and dissemination process.

V5: Efficiency and proportionality: Statistics and data should be published in forms that enable their reuse. Producers should use existing data wherever possible and only ask for more where justified. [pages 17-23]

GENERIC STATISTICAL BUSINESS PROCESS MODEL

The Generic Statistical Business Process Model (GSBPM) of the United Nations Economic Commission for Europe was first developed in 2008 and most recently updated in 2019 (version 5.1). The model is designed to enable statistical agencies to describe production processes in a coherent

way, compare processes within and among organizations, and make better decisions on production systems and allocation of resources.[84] The GSBPM (shown in Figure C-1) describes and defines the set of business processes needed to produce official statistics. It provides a standard framework and harmonized terminology to help statistical organizations modernize their statistical production processes, as well as to share methods and components. The GSBPM can also be used for integrating data and metadata standards, as a template for process documentation, for harmonizing statistical computing infrastructures, and to provide a framework for process quality assessment and improvement.[85]

[84]See UNECE High-Level Group for the Modernisation of Official Statistics (2013).

[85]For more information, see: https://statswiki.unece.org/display/GSBPM/GSBPM+v5.1 [February 2021].

Overarching Process							
Specify Needs	**Design**	**Build**	**Collect**	**Process**	**Analyse**	**Disseminate**	**Evaluate**
1.1 Identify Needs	2.1 Design outputs	3.1 Resuse or build collection instruments	4.1 Create frame and select sample	5.1 Integrate data	6.1 Prepare draft outputs	7.1 Update output systems	8.1 Gather evaluations inputs
1.2 Consult and confirm needs	2.2 Design variable descriptions	3.2 Reuse or build processing and analysis components	4.2 Set up collection	5.2 Classify and code	6.2 Validate outputs	7.2 Produce dissemination products	8.2 Conduct evaluation
1.3 Establish output objectives	2.3 Design collection	3.3 Reuse or build dissemination components	4.3 Run collection	5.3 Review and validate	6.3 Interpret and explain outputs	7.3 Manage release of dissemination products	8.3 Agree an action plan
1.4 Identify concepts	2.4 Design frame and sample	3.4 Configure workflows	4.4 Finalize collection	5.4 Edit and inputs	6.4 Apply disclosure control	7.4 Promote dissemination products	
1.5 Check data availablity	2.5 Design processing and analysis	3.5 Test production systems		5.5 Derive new variables and units	6.5 Finalize outputs	7.5 Manage user support	
1.6 Prepare and submit business case	2.6 Design production systems and workflow	3.6 Test statistical business process		5.6 Calculate weights			
				5.7 Calculate aggregates			
				5.8 Finalize data files			

FIGURE C-1 Generic Statistical Business Process Model.
SOURCE: United Nations Economic Commission for Europe (UNECE), on behalf of the international statistical community. Version 5.1 January 2019 Available: https://statswiki.unece.org/display/GSBPM/Generic+Statistical+Business+Process+Model.

COMMITTEE ON NATIONAL STATISTICS

The Committee on National Statistics was established in 1972 at the National Academies of Sciences, Engineering, and Medicine to improve the statistical methods and information on which public policy decisions are based. The committee carries out studies, workshops, and other activities to foster better measures and fuller understanding of the economy, the environment, public health, crime, education, immigration, poverty, welfare, and other public policy issues. It also evaluates ongoing statistical programs and tracks the statistical policy and coordinating activities of the federal government, serving a unique role at the intersection of statistics and public policy. The committee's work is supported by a consortium of federal agencies through a National Science Foundation grant, a National Agricultural Statistics Service cooperative agreement, and several individual contracts.