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Decennial Census

Overview of Historical Census Issues



Preface

The purpose of this report is to furnish context, background, and a historical perspective for Members of Congress, their staffs, and others interested in the debate on policy and operational questions related to the 2000 Census. It is organized by general decennial census concepts and discusses critical issues that emerged during decennial censuses as far back as the first one in 1790.

This report describes, in general terms, the Census Bureau's plans for the 2000 Decennial Census, but it does not evaluate the potential for success of the 2000 Census, nor does it contain recommendations. Many other GAO reports and testimonies (listed in Selected GAO Products and available upon request) analyze the 1990 Census and provide our perspective on the current progress and potential risks of the 2000 Census. In addition, Census Bureau, congressional, and other reports on technical issues and planning for the 2000 Census are available.

In developing this report, we researched available literature on the census (including publications on demography in early America, the framing of the Constitution, and social history) and interviewed Bureau officials knowledgeable about census history. We also reviewed publications on census issues prepared by the National Academy of Sciences' National Research Council and drew on available documentation describing plans for the 2000 Decennial Census. (See Bibliography for a listing of non-GAO publications.) It should be noted that, as with any effort to put current events into historical context, alternative interpretations are possible. Often debated are the intent and motivation of the framers of the Constitution who created the census. In this report, we have quoted the Constitution and various laws relating to the decennial census and have attempted to place their language in an historical context. We are not, however, providing our own independent review or interpretation of the constitutional and statutory issues discussed in this report, which, unless otherwise noted, are based primarily on the analysis contained in the various publications and documents we relied upon in preparing this report.

Short answers to some frequently asked questions about the decennial census are in appendix I. Appendix II contains information on changes in the apportionment of the membership of the House of Representatives between the 1920 and 1990 Decennial Censuses by region of country and on changes in the nation's population and its undercount by race and ethnicity between the 1950 and 1990 censuses, as well as a snapshot of the

growth and cost of census-taking since the first decennial census in 1790. Major contributors to this report are identified in appendix III.

A handwritten signature in black ink that reads "L. Nye Stevens". The signature is written in a cursive style with a large, prominent "L" and "S".

L. Nye Stevens
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Abbreviations

HUD	Department of Housing and Urban Development
ICM	integrated coverage measurement
INS	Immigration and Naturalization Service
LUCA	local update of census addresses
MAF	master address file
NRFU	nonresponse follow-up
OMB	Office of Management and Budget
RFD	rural free delivery
PES	post-enumeration survey
TIGER	Topographically Integrated Geographic Encoding and Referencing System

Why Take the Census?

The Constitution Requires a Census

The United States of America, in 1790, was the first modern nation to undertake a comprehensive and periodic count of its population as a regular responsibility of government. But the American decennial census—mandated in the Constitution—was also a component of a new, unprecedented concept of representative government.

The Tradition of Recordkeeping

A decennial census was an extension of colonial habits of recordkeeping born in the traditions of Europe. Old World religious institutions had long kept the vital records of their parishioners, and as early as 1611, the London Company required the residents of Jamestown to keep a record of local christenings, marriages, and deaths.¹ A few years later, the Virginia Assembly passed its own law requiring not only the recordation of these events, but also an annual quantitative report of them. Some colonies sporadically tracked a range of data about their populations, including occupation, gender, and age, during the pre-Revolutionary period. Some of these compilations served a particular purpose, such as determining the number of military-eligible men; others reflected an English tradition of tracking population movements that developed during the great social upheavals of the Elizabethan era. Although the Articles of Confederation mandated a triennial census for taxation purposes, the revolutionary war prevented its implementation; no general census of the colonies as a whole was ever carried out.

The Constitutional Imperative

The Constitution of the United States established a new, philosophically innovative, and technically complex form of government, which in turn established a need for periodic censuses. A principal innovation of the new government was that it would be representative of the population by means of elections. One of the principal complexities the framers faced was how to make the new government representative and, particularly, how to reflect the interests of the American people both as residents of a state and as individuals. The Senate, therefore, was designed to represent the interests of the states, and the House of Representatives was designed to represent the interests of individuals.

In section 2 of Article 1 of the Constitution, which concerns the composition of the House of Representatives, the framers wrote: “Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union, according to their

¹James H. Cassedy, *Demography in Early America; Beginnings of the Statistical Mind, 1600-1800* (Cambridge, MA: Harvard University Press, 1969).

respective Numbers....” If the Members of the House were to be apportioned among the states “according to their respective Numbers,” then the populations of the states had to be determined. The framers, aware that the states had already demonstrated different ideas about how to count their populations for apportioning delegates to the Continental Congress, stipulated the number of representatives for each state until a census could be taken. Furthermore, they established a requirement for the national government to undertake the census and described, in general terms, how it would be accomplished: “The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such manner as they shall by Law direct.”

Apportionment and Its Impact

The first census was duly taken in 1790 in a manner directed by Congress. The census was to have taken 9 months, but actually took 18 months. President George Washington believed that the count of 3.9 million people was too low. Congress, however, accepted the data and proceeded to apportion the number of representatives in accordance with the census data. Immediately, the debate about how exactly to implement the apportionment began, and this controversy has continued in one form or another for over 200 years.

The Constitution did not specify in precise detail how to apportion the Representatives; it only specified that there would be a minimum ratio of 1 representative to every 30,000 of the population. It also did not fix the number of seats there should be in the House, and it was silent on how the states were to elect their representatives. So, questions arose: How many people should one Representative represent? When the population of a state divided by 30,000, or whatever divisor was ultimately selected, had a remainder, should that remainder be dropped or rounded? Should the size of the House be fixed first and then apportioned, or should an apportionment fix the size of the House? The questions about apportionment method were more than academic; depending on the answers, states could gain or lose seats in the House of Representatives.

The debates over the years about methods of apportionment focused on mathematics, but the crux of the matter was political power. Not only did various apportionment methods affect individual states’ power, but they also influenced the outcome of national political debates and, over time, the balance of power between large and small states, northern and southern states, and the urban East and the agricultural/extractive West.

The context of the debate was always the rapidly growing population revealed by each successive census. From the beginning, the U.S. population grew at a phenomenal rate: over 30 percent between decennial censuses until the Civil War and 15-25 percent through 1930.² This growth and the simultaneous shifts in geographical concentration of the population resulted in dramatic reapportionments among states. To illustrate, in the 1920s, 91 representatives were apportioned to the Middle Atlantic states of New York, New Jersey and Pennsylvania, but by 1990, that number had declined to 65. In the 1920s, 19 representatives were apportioned for the Pacific states of Washington, Oregon, and California, but by 1990, that number had increased to 66. (Changes in the results of the apportionment of the House of Representatives between 1920 and 1990 are shown in table II.1.)

In 1911, when Congress fixed the number of representatives at 435—1 per state with the rest apportioned—the census results had even greater significance. Before this decision, a state’s loss of population, and therefore of representation, was mitigated by continuing increases in the total number of representatives. Before the change, states whose population declined relative to other states did not often lose representatives, although their representatives were relatively less powerful as members of a now larger House. But after 1911, a gain of representation for any one state came only with a loss of representation for another state.

Congress failed to reapportion following the 1920 Census. The failure was in part the result of a difference of opinion over the method of dividing political power. Throughout the 1920s, Congress debated which of two mathematical models for reapportionment—whose outcomes for distribution of House seats differed—would be used. In 1929, one mathematical method was selected for the reapportionment, but it was not applied until after the 1930 Census. Furthermore, the debate about apportionment methods was not over. In 1941, a different model was chosen called “the method of equal proportions.”³ It is still in use today.

²Statistical Abstract of the United States—The National Data Book, Bureau of Census, Department of Commerce, October 1996.

³The method of equal proportions is based on complex mathematical calculations whereby each state is initially assigned one seat while the other seats are assigned to the states based on the “priority numbers” given to the states on the basis of their relative population numbers. “Congressional and State Reapportionment and Redistricting: A Legal Analysis,” CRS Report for Congress, American Law Division, Congressional Research Service, The Library of Congress, 96-732A, September 4, 1996.

The failure to reapportion in 1920 was also a reflection of regional power dynamics. The results of the 1920 Census revealed a major and continuing shift in population from rural to urban areas, which meant that many representatives elected from rural districts resisted reapportionment. Also, the growing number of immigrants entering this country had some impact on population shifts. Delay followed delay as rural interests tried to come up with mechanisms that would reduce the impact of the population shift. Congressmen from rural areas that would lose seats to more urbanized areas simply blocked passage of reapportionment legislation for 9 years.

During the congressional debates on Public Law 71-13, which was enacted in 1929, language requiring that districts be composed of contiguous, compact territory and contain the same number of individuals was deleted. Therefore, the reapportionment law that finally passed in 1929 was silent on the subject of rules for how the states were to establish districts to elect their representatives. As a result, some states simply stopped redistricting, despite major changes in the internal distribution of their populations over time from rural to urban to suburban. A process of malapportionment—meaning establishment of districts containing unequal population sizes—continued unchecked for decades.

The difference in population size among congressional districts increased, setting the stage for the debate that started in the 1960s and continues today: What are the standards for population size in and shape of congressional districts? The federal courts, which had declined for 40 years to rule on malapportionment cases, revisited the issue in the early 1960s, and ultimately the Supreme Court accepted the argument that “one-man, one-vote” meant that districts had to be of equal size.⁴ More recently, issues concerning the ethnic composition of those districts and their physical shape have arisen. Interpretations of the Voting Rights Act of 1965, as amended, led to the creation by 1990 of over 50 congressional districts configured in order to achieve a majority of minority population. For a time, there was no limit to the peculiarity of the shape of a district created in the process of meeting the goals of the act. Now, the courts are reconsidering limits to the eccentricity of the shape of a district.

Census data have been essential to the late twentieth century debates on the division of representational power, just as they were to the first apportionment debate in 1791. Block-by-block census data were essential to the 1960s goal of creating districts of equal population size. The efforts in the 1990s to achieve majority minority districts relied on census data on

⁴*Baker v. Carr*, 369 U.S.C. 186 (1962).

the ethnicity of the people in specific blocks. The debate over how best to meet the constitutional objective of representative government continues today, with the census still at the core of the debate.

Direct Taxation Rarely Used

The census, according to Article I, section 2, of the Constitution, was also to be used to apportion any direct taxes levied by the federal government. The founding fathers purposefully linked the two. Their thinking was that any incentive for a state to boost population in order to gain additional representation would be offset by the disincentive of raising its tax burden. Direct taxation, however, was enacted only twice—once in 1798 to try to diversify the federal government’s reliance on tariffs and customs duties and once to finance the War of 1812. Both taxes were based on the value of land, houses, and slaves, and both were difficult to assess and collect. While this authority has never been repealed, direct taxation based on a decennial census never became practical.

Census Data Have Other Important Uses

While apportionment is the most widely known use of census data, the data are also used for congressional redistricting, managing federal agencies, and allocating federal funds, and are disseminated to state and local governments, academia, and the private sector as well. Data from a decennial census⁵ provide official, uniform information gathered over the decades on this country’s people and their social, demographic, and economic characteristics. They provide the baselines for countless other surveys and are used to develop sampling frames for a number of other federal data collections, such as the Current Population Survey, which is used to measure participation in the labor market and unemployment rates.

Congressional Redistricting

The Constitution does not require that states use the census data to redraw the boundaries of congressional districts following a change in the apportionment of representatives, but most states have always used the census data for this purpose. The general perception of the impartiality of the Bureau and the great cost and administrative effort required to take a census have been strong arguments in favor of using the Bureau’s data. In addition, the ready availability of census data is important because redistricting generally has been required shortly after the census data are made available. In recent years, immediate and detailed population data

⁵Decennial census data are gathered from short and long form questionnaires. Questions on the short form are asked of the entire population, and questions on the long form are asked of only a portion of the population for projection of national information.

have become especially critical because some states have court-ordered deadlines to complete redistricting.

Managing Federal Agencies

The decennial census is a cost-effective method of providing baseline and trend data for use by federal agencies and various other census stakeholders, compared to the alternative of multiple data collections by other federal agencies for their own purposes. Decennial census data and data from other Bureau surveys assist federal agencies in managing their unique mission responsibilities. Federal agencies can use Bureau data to assist in evaluating established programs, identifying the particular geographic area of the county where success or problems are occurring, planning corrective actions, and later determining if their corrective actions were effective. For example, Bureau data can assist federal agencies in managing programs under the Government Performance and Results Act. Under this Act, agencies must measure their performance against the goals they have set and report to Congress and the public on how well they are doing.

Federal agencies often turn to census data in managing their programs because it is mandated by legislation or regulation. The use of census data is a legal requirement in some federal programs. For example, the Department of Housing and Urban Development (HUD) is required to use Census data as the basis for allocating funds for the Community Development Block Grant Program (42 U.S.C. 5302). Without these data, HUD would be unable to meet legislatively mandated requirements because there is no other source of data for the geographic level needed.

Allocating Federal Aid

The distribution of federal revenues in order to meet national socioeconomic objectives started in the late nineteenth century with an appropriation to each state to establish agricultural experiment stations at land grant colleges. In the early decades of this century, Congress gradually expanded its provision of federal assistance. During the mid-1930s, as New Deal programs, including Social Security, expanded to account for roughly one-third of the federal budget, the need for greater detail and higher quality census data increased. To this day, census data remain an important element in the allocation of federal aid to state and local governments, and with billions of dollars at stake, the data are scrutinized intensely for accuracy.

For fiscal year 1998, funding estimates indicate states should receive about \$170 billion in aid through 20 federal programs that used census data, in whole or in part, to allocate that aid. The largest of these programs is Medicaid, which plans to distribute about \$104.4 billion in fiscal year 1998, followed by the Federal Aid Highway Program at \$20 billion, and \$7.5 billion under Title I grants to local education agencies.⁶ Census information is important to the distribution of these federal funds, though generally it is not the sole factor in allocation formulas.

Helping Local Governments

The decennial census produces data that states use not only to determine boundaries for congressional districts, but also to establish boundaries for smaller jurisdictional divisions. The census is also a rich source of data to help county and city governments plan for and provide services. The data help them answer questions such as the following:

- Will the population of preschoolers in the various school districts warrant building additional elementary schools?
- Are local transit systems reaching the people likely to use public transport, and
- Where and when should the next senior citizen facility be built?

Without federal census data, state and local governments would have to undertake their own censuses, a costly alternative given the federal government's experience and economies of scale.

Helping Businesses

Businesses use the aggregated census data⁷ available to them to plan for and provide their services and goods. Census data about population trends help businesses succeed—and provide jobs in the process—by alerting them to opportunities to provide new services and products and to tailor existing ones to demographic changes. Census data also help businesses efficiently target their advertising dollars. A free sample, for example, of a magazine focused on the interests of Hispanic readers can be distributed based on information at the census block level. Companies also use population data to locate new stores where they expect likely consumers to be, as well as to locate production facilities where they can expect to find a suitable labor force.

⁶1997 Catalog of Federal Domestic Assistance, Executive Office of the President, Office of Management and Budget, Washington D.C., 1997.

⁷Some Bureau data are free, while special data requests are filled for a fee.

Taking the Census

Deciding How to Count

“The actual Enumeration shall be made,” according to the Constitution, under Article 1, section 2, “... in such Manner as they [Congress] shall by law direct.” In effect, this has enabled Congress to adjust decennial census procedures allowing for changes in American society unforeseen in 1787. Congress responded by delegating the census-taking to executive branch agencies while maintaining overall responsibility and periodically enacting legislation affecting census-taking methodology. While changes to census-taking methodologies have occurred, one constant—the focus on identifying households and enumerating people within them—has stayed the same.

Changing Conditions in American Society

Since the 1790 Census, American society has constantly changed, thereby necessitating changes in the methodology of enumeration in the decennial census. Among the most significant societal changes have been:

1. Increased population mobility: Although westward-bound frontier pioneers were difficult to count in the late-eighteenth and nineteenth centuries, the number of mobile Americans today is much greater, increasing problems for census-taking. Short-term renters, “snowbird” retirees, students splitting their residence between home and college, and young urbanites rotating temporary residences are a few of the modern phenomena that have created a population mobility unimagined in 1787. During the period 1990 to 1994, 17 percent of the American population on average changed residences each year.⁸

2. Varied domestic arrangements: Households have always been the major focus of census enumeration. In eighteenth century America, nearly all citizens identified themselves with a household whose members were almost always related by blood, marriage, or through regular employment, and therefore included servants, slaves, apprentices, and resident farmworkers. Most people lived in a family-occupied dwelling that was headed by a male readily able to provide a count and characterize the members of his household. Today, divorce, cohabitation without marriage, and group housing, among other domestic arrangements rarely heard of in 1787, make the determination of whom to count and where to count them increasingly complex. From 1970 to 1990 alone, the number of American households grew 47 percent, while average household size shrank from 3.1 to 2.6 people and nonfamily households grew by 128 percent.⁹

⁸Statistical Abstract of the United States—The National Data Book, Bureau of Census, Department of Commerce, October 1996.

⁹Statistical Abstract of the United States—The National Data Book, October 1996.

3. People of varied linguistic backgrounds: The heads of households to whom the census questions were posed in the late eighteenth century came overwhelmingly from Western European cultural traditions and spoke a limited number of Western European languages. Today, the U.S. population includes people from a great variety of countries, and language barriers pose significant challenges in taking the census. To deal with this diversity, in 1990 the Bureau had questionnaire guides available in over 32 languages and had enumerators able to speak about 50 languages.

4. Increased concerns about privacy: As a result of changing attitudes toward government in general, concerns that census information will be passed to other government agencies, and fears of further loss of privacy in the computer age, the rate at which the population voluntarily responds to requests for census information has declined. For example, mail response (considered to be the most reliable and cost-efficient means of obtaining census information) declined from 78 percent in 1970 to 65 percent in 1990. (Chapter 3 of this report discusses the Bureau's efforts to mitigate these privacy concerns.)

Decennial Decisionmaking

For the first census, Congress delegated the 17 U.S. marshals and their 650 assistants to undertake the census, and gave them 9 months to do so and report the results by district to the President. For each of the succeeding five censuses, Congress passed a new piece of legislation. These censuses were similar to the first, except that the questions to be asked grew in number with each decade. During this 50-year period, Congress directed that some refinements to census-taking be made: the tallies were passed to the Secretary of State starting in 1800, and enumerators used printed schedules for the first time in 1830. Congress also continued to authorize a small clerical staff in Washington whose function was simply to check for clerical errors in the work and compile the tabulations.

In 1850, Congress created a new management structure for administering the decennial census, which was becoming an increasingly complex undertaking as more sophisticated questions were being asked of a growing population spread over a wide geographical area. Congress created a Census Office and authorized a superintendent of the census at a salary of \$2,500. Congress also determined that the 1850 law would govern future censuses should Congress fail to pass authorizing legislation. This was done to avoid the potential for a disruption in the census-taking schedule and possible congressional deadlocks over particular issues.

In the last decades of the nineteenth century, Congress began to delegate more responsibility to the Census Office, which moved beyond clerical functions and gained authority to control the field administration of the census and appoint or approve the appointment of supervisors and enumerators. Until this time, the appointment of those staff had been a matter of political patronage. Furthermore, despite the fact that census activities took almost 7 years to complete in the late nineteenth century, the census offices that Congress authorized every 10 years closed when the work of each successive census was done. In 1902, Congress established the Bureau of the Census, under the Department of the Interior, as a permanent agency that, for the first time, would not disband between censuses. The Bureau was transferred to the newly created Department of Commerce and Labor in 1903.

By 1913, the Census Bureau was under the authority of the Department of Commerce and had gained its role as the preeminent census, survey, and statistical agency of the United States, which it remains to this day. The Bureau not only conducts the decennial census as it did in its early history, but also about 200 other censuses and surveys.

Title 13 Governs the Basic Rules of Census-Taking Today

While legislation passed in 1850 made a new authorization for each decennial census unnecessary, Congress continued to pass legislation every decade for implementation of upcoming censuses. In 1954, title 13 of the U.S. Code was enacted to establish the basic rules for the taking of future decennial censuses, including the following:

- The census, as required for apportionment, must be completed and reported to the president within 9 months after the census date of April 1;
- the Secretary of Commerce must submit to the committees having legislative jurisdiction over the census, not later than 3 years before the next census, the subjects proposed to be included in the coming census and the types of information to be compiled; and
- the Secretary must submit to the committees having legislative jurisdiction, not later than 2 years before the next census, the planned questions to be included.

Although Congress delegated responsibility in title 13 to the Secretary of Commerce to undertake a decennial census “in such form and content as he may determine,” Congress has maintained authority and responsibility under the Constitution for directing the decennial census. Congress exercises a continuing role in overseeing the conduct of the census

through a number of congressional committees, including for authorization, the Senate Governmental Affairs Committee and the Subcommittee on the Census of the House Government Reform and Oversight Committee,¹⁰ and for appropriations, the Commerce, Justice, State, and the Judiciary and Related Agencies subcommittees in the House and Senate.

While these committees and subcommittees provide general oversight, Congress enacts legislation from time to time that contains specific additional direction to the Secretary. For example, in 1994, in order to facilitate development of accurate address lists, Congress enacted the Census Address List Improvement Act of 1994 that allowed the Bureau and the U.S. Postal Service to exchange address list information under certain conditions.

Additional Influences on Census-Taking

The Bureau and its predecessor entities have always been responsive to congressional direction, but they have also been influenced by the many users of its statistics. In the nineteenth century, state governments, scholars, business associations, and reformers were among those who influenced the questions contained in the schedules, and the censuses provided them data that helped them in their various endeavors. Professional statisticians have been and continue to be influential in the Secretary's determination of the form and content of the questions, as well as in decisions concerning the presentation of data.

In the late twentieth century, the influence of various interest groups has had an effect on the census. Advocates for the homeless spurred the Bureau's efforts in the last several censuses to count people who live in shelters and on the streets. In the 1970s, the Bureau created several advisory committees of experts involved with minority issues. Recently, racial and ethnic groups urged the Office of Management and Budget (OMB) to reconsider the federal standards on race and ethnicity classifications; their efforts resulted in the 1997 changes to those standards, which will allow individuals to choose more than one racial category when completing their census questionnaires. The plans for the tabulating and reporting of these new racial categories by the Bureau continue to be a much debated issue.

¹⁰The House Government Reform and Oversight Committee established a Subcommittee on the Census, effective February 1998, whose primary function is oversight of the 2000 Decennial Census.

Deciding Who to Count

The Constitution identified who should be counted in the decennial census in Article 1, section 2, with the following language: The count “shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, three fifths of all other Persons [slaves].”

Although the framers were specific about how to count (or not count) Native Americans and slaves, they were not specific about whom to count. Only one important criterion for eligibility was established: “persons” rather than “citizens” were to be counted, meaning citizenship was not to determine who should be counted. There was little reason to be more specific since the population in the 1780s was relatively homogenous, stationary, monolingual, and organized in stable household units.

In the years since the framing of the Constitution, however, many of those conditions have changed, posing new philosophic and pragmatic issues. Among the changed conditions are the following:

1. Illegal aliens: No one in 1787 was an illegal resident because the first laws controlling immigration were not passed until 1875.¹¹ The Immigration and Naturalization Service (INS) estimated there were approximately 5 million illegal aliens residing in the United States as of October 1996, with approximately 275,000 to 300,000 illegal aliens arriving yearly.

2. Temporary and seasonal workers: Nearly everyone who made the journey to America to work in the eighteenth century stayed for years. Many were bound to do so by bonds of indenture or slavery, while the broken ties with the distant homeland and the high cost of returning encouraged others to stay. In 1990, the INS reported about 140,000 foreign citizens working temporarily in the United States in a variety of occupations.

3. Homeless people: Paupers without family to assist them and depending therefore on the public benefice were few in number in the 1780s, and they were generally lodged at public expense in a household where they would be counted. In contrast, the Bureau counted over 230,000 homeless persons during the 1990 Census. The number of homeless with no fixed

¹¹Jeffrey S. Passel and Karen A. Woodrow, “The Judicial Basis for Enumeration of Undocumented Aliens in the 1980 Census and Implications for 1990,” U.S. Bureau of the Census, 1984.

address, however, is a matter of conjecture, with other estimates ranging from 800,000 upward.¹²

4. Foreign visitors and U.S. citizens living abroad: While short-term travel was not unheard of in the late eighteenth century, the number of Americans living abroad and the number of foreign citizens visiting in the United States were insignificant. In contrast, throughout 1990, approximately 16 million foreign citizens visited the United States for business and/or pleasure. Furthermore, on Census Day in 1990, about 1 million federal civilian and military employees were living and working abroad. (The Bureau's residency rules generally do not include in the population count either Americans living abroad who are not federal or military employees, or foreign visitors to this country.)

The lack of specificity in the Constitution about who should be counted has raised questions over time about the eligibility of certain categories of people. When Congress passed the 14th amendment in 1868, which modified Article 1, section 2, to eliminate the language concerning slaves and indentured servants, Congress debated whether to change the definition of those to be counted from "persons" to "citizens" or "voters," but decided to keep the original language. The effect of legislation and court decisions over the past centuries is that the language of Article 1, section 2, is read at its most inclusive. All persons who are resident in the United States on Census Day, whether here legally or illegally, are to be counted.

Deciding What to Ask in the Census

The decennial census never simply counted heads. Since the earliest days of the republic, Congress directed the Bureau or its predecessors to gather additional information as it enumerated the population. In the nineteenth century, the trend to greater numbers of questions, which peaked with an encyclopedic number¹³ in 1890 on a large variety of issues, was inspired by the curiosity of a self-conscious young nation and by the need to form public policy. In the twentieth century, the census questions have been increasingly shaped by the need to fulfill the data requirements of programs legislated by Congress and to properly allocate the federal funds authorized by those programs.

¹²"Homelessness: Toward Another Decade of Homelessness? An Issue Paper," GAO/RCED, September 15, 1995.

¹³The 1890 Census contained inquiries on subjects that later became separate censuses; these inquiries included the subjects of agriculture, crime, insurance, mines and mining, manufacturing, transportation, etc. This census contained a total of 13,161 questions; the majority of households probably answered little more than the 45 questions on population.

From Simple to Complex Questionnaire Content

Even before the first census was taken in 1790, Congress considered asking a range of additional questions, including one which would determine individuals' military eligibility. After debate, however, Congress authorized enumerators to pose six questions: the name of the head of each family, the number of free white males over 16 and under 16, the number of free white females, the number of other free persons, and the number of slaves. The 1800 and 1810 Censuses made further distinctions among the ages of the free white respondents, and the 1820 Census added distinctions for age and sex of the slave and free black populations and also broke new ground in collecting basic information about people's occupations. The 1830 Census added a count of the numbers of deaf, dumb, and blind household members, and the 1840 Census added questions on literacy, schooling, and revolutionary war pensioners. This first period of census-taking reflected the concerns of a new nation absorbed in its political experiment and identity.

In 1850, the question of what to ask in the census became highly political as the nation debated how to handle the coming crisis between the northern and southern states. The focal point of the debate was what level of detailed information to gather about slaves, but the debate became a debate on the census itself and what was the proper reach of the federal government. At the same time, new questions were asked that gathered information about schools, crime, churches, and pauperism. A growing national awareness about the changing ethnic composition of the American population was reflected in the census questions. A question about unnaturalized foreigners had been posed in the 1820 Census. For the 1850 Census, a question was asked on the householder's place of birth by the identification of the state, territory, or country where born and the birthplace of parents.

Immigration, and particularly immigration from southern and eastern Europe, became a critical issue in American politics in the last decades of the nineteenth century and the first decades of the twentieth century, and the answers to census questions became a part of the debate. For the 1910 Census, respondents were asked to identify their mother tongue in a further effort to determine individuals' ethnic backgrounds. In 1921, such information, gathered over the decades, was used when Congress enacted legislation that ended America's historic policy of open immigration. The law limited immigration to 500,000 people per year and was to limit the percentage of immigrants from any country to their proportional representation in the 1910 Census. That law's 1924 successor, the National

Origins Act, further cut immigration levels and returned to the 1890 Census as the basis for immigration quotas.

Until the 1930 Census, the details of the questions on the form were specified minutely by Congress. In the 1929 law authorizing the 1930 Census, Congress specified areas to be investigated but, for the first time, left the exact questions to the Bureau.

Unemployment was one of the areas that Congress directed the Bureau to investigate in the 1930 Census. As the economic crisis of the 1930s wore on, the need for more information with regard to the population's socioeconomic condition increased as legislators and government officials at the federal and state levels evaluated existing programs and planned new efforts to deal with the Depression. The 1940 Census of Population and Housing included questions on income, internal migration, and Social Security status, as well as more refined questions on unemployment. In addition, Congress authorized a new set of questions about the types of plumbing, heating, and appliances in people's dwellings.

It became apparent prior to the 1940 Census that the amount of information the Bureau was required to collect had come to exceed the Bureau's ability to gather and tabulate it in an accurate and timely manner. As a result, the Bureau developed a new methodology for the 1940 Census and included supplementary questions that were asked of only a portion of the population. The Bureau's statisticians used the data to extrapolate to the general population.

For the 1950 Census, the Bureau moved toward limiting the decennial census' primary focus to population, demographic, and housing questions. Many questions, such as those concerning unemployment, moved to separate surveys and censuses, often done at more frequent intervals. Today, the Bureau administers about 200 surveys related to various economic and demographic issues.

In 1960, the Bureau began to move toward the mail-out/mail-back census questionnaires that we know today in order to eliminate enumerator bias. The nature of the population and housing questions remained relatively constant from 1960 to 1990, with many supplementary questions being asked of only a portion of the households. In 1960, for example, the Bureau asked 7 population and 14 housing questions on a short form questionnaire and posed an additional 28 population and 30 housing questions on the long form questionnaire sent to 25 percent of the

households. For the 2000 Census, an effort has been made to reduce the number of questions and hence the burden on respondents. The short form questionnaire is currently designed to have 5 population and housing questions and the long form questionnaire, which the Bureau plans to send to 17 percent of the population, is currently designed with 45 additional questions.

Race and Ethnicity Questions Today

The census has collected data on race and ethnicity in a variety of forms for 200 years. Since the 1960s, data on race and ethnicity have been used extensively in civil rights monitoring and enforcement, covering such areas as employment, voting rights, housing and mortgage lending, health care services, and educational opportunities. Over the last several years, however, the form of those questions has been a topic of considerable debate within American society.

In the mid-1970s, OMB collaborated with other federal agencies to standardize racial and ethnic data collected and published by the federal government. The result was OMB's 1977 Statistical Policy Directive No. 15, which provided for classifications based on four races—American Indian or Alaskan Native, Asian or Pacific Islander, Black, and White; and one ethnicity—Hispanic Origin or Not of Hispanic Origin. These classifications applied to all federal government data collection efforts and were often used by state agencies. The Bureau used these standard classifications too, although in the 1980 and 1990 censuses the questionnaire also provided an "other response" category selection and a place where a respondent could write in another category. In addition, the Bureau's long form or sample form gathers more information on ancestry.

During the 1990s, these standards came under increasing criticism from people who believed that the minimal categories set forth in Directive 15 did not reflect the increasing diversity of the American population resulting from growth in both immigration and interracial marriages and who, therefore, urged changes in the standards. Other people, however, feared that changing the categories would decrease the number of officially designated members of some racial and ethnic groups, which might decrease the distribution of federal dollars devoted to the programs designed to benefit those groups.

An interagency group was convened in March 1994 to consider proposed changes to the names of the groups, as well as several suggested additions to the categories for race and ethnicity. Another suggested change the

group considered was the addition of a “multiracial” category. On October 30, 1997, OMB issued revisions to the standards of Directive 15. The revised standards, which are to be used by the Bureau for the 2000 Census, have a minimum of five categories: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White. Two categories remain for ethnicity: Hispanic or Latino and Not Hispanic or Latino. OMB also directed that forms, including the 2000 Census questionnaire, must tell respondents to “select one or more” categories to identify themselves. By choosing multiple categories, respondents can indicate a multiracial identity. (For information on the percentage of population by race and ethnicity, see table II.2.)

Counting Methods

The United States has always based its censuses on an enumeration of persons residing in households as reported by one of its members. This self-enumeration method reflects an American commitment to a minimally intrusive government and respect for individual privacy. In contrast to this method, China requires its people to report to local government offices to register their existence, and Norway and Denmark consolidate the records of various government agencies to determine a population count. In December 1997, the government of Turkey conducted its latest quinquennial census whereby the entire population is counted manually in one day over a 14-hour period. Citizens were required to stay home and be counted under threat of punishment if found in public without special permission. Starting in 2000, the Turkish government plans to change to more modern statistical procedures.

For censuses prior to 1960, enumerators went door-to-door posing census questions and recording the information. While there was no standardized recording process before 1830, thereafter enumerators used a variety of standardized census forms to record the respondents’ answers. With advances in technology, the compilation of information for each new census became more sophisticated.

After some testing in the 1960 Census, the Bureau began in earnest during the 1970 Census to move away from the door-to-door census. Instead, it began mailing census questionnaires to households to be filled out and returned. Should households fail to mail back the census questionnaires, enumerators follow up with telephone calls and door-to-door visits. As a last resort, enumerators solicited census data from knowledgeable people, such as an addressee’s building superintendent, letter carrier, or

neighbors. These last resort data ranged in detail from just the number of people in the household to all the information requested on the census questionnaire. It should be noted that nonresponse follow-up activities have become more and more challenging as the public becomes less responsive to census questionnaires. It should also be noted that even though this census-taking methodology has existed for just the last three censuses, it is generally referred to as a traditional census.

In addition to the nonresponse follow-up, three other particularly challenging activities in conducting the last three censuses were (1) identifying or obtaining correct addresses for households, (2) enumerating people in nontraditional housing, and (3) encouraging public participation.

Associating Addresses With Households

Finding all households and being able to geographically pinpoint their locations are important parts of the decennial census. It is the persons residing in those households who make up the population counts of the United States, and it is the locations of households that provide the population counts for smaller geographic areas, such as states, congressional districts, counties, cities, and towns.

In 1970, the Bureau changed its primary census-taking methodology from door-to-door enumeration to mail-out/mail-back. With this change, the association of mailing addresses with households' locations became more important. The Bureau's strategy of pinpointing the physical locations of households, or geocoding, continues to be important for 2000 for such procedures as nonresponse follow-up.

For prior censuses, the Bureau constructed a new address list from scratch. For urban areas, the Bureau started with address lists purchased from commercial vendors; for suburban and rural areas, Bureau employees made a physical reconnaissance. Many aspects of American life make accurate identification of housing units difficult, including rapid suburban and rural housing construction, urban demolition and conversion, and the mobility of some housing units, such as mobile homes and recreational vehicles. Locating the housing units of such diverse types in a country with an anticipated 118 million households in 2000 will be a labor-intensive and expensive task.

For the purpose of the census, every housing unit address is geocoded to a census block whose size varies but which generally contains 30 to 85

people. Through 1980, the Bureau relied on maps that had hand-plotted census block boundaries and had new streets and features drawn in by temporary employees or enumerators. The resulting maps could be rough and hard to read. By the 1990 Census, a new computer-generated mapping system—called the Topographically Integrated Geographic Encoding and Referencing System (TIGER) was in place. TIGER is designed to locate every housing unit on 1 of the 7 million TIGER maps representing each census block. The TIGER maps can be easy to update and can be printed off the database by many users other than the Bureau.

In the past, the Bureau has not used U.S. Postal Service address lists to develop its own list for several reasons. There was concern about protecting individuals' privacy, and the Postal Service was prohibited under title 39 of the U.S. Code from sharing its lists. In addition, the Postal Service lists may not conform to the Bureau's specialized needs. For example, the Postal Service's addresses are for mail delivery points and may not differentiate between more than one household at an address, whereas the Bureau needs this household differentiation at all addresses. Furthermore, Postal Service post office boxes or RFD addresses (which may not indicate the actual location of a residence) cannot be used by the Bureau because questionnaires must be delivered to actual household addresses in the event follow-up becomes necessary.

Nonetheless, Congress and the Bureau have recognized that cooperation with the Postal Service can alleviate some of the cost and labor burden in preparing for a census. In 1994, Congress passed the Census Address List Improvement Act, which allows the Postal Service to share information with the Bureau. The Postal Service now notifies the Census Bureau of new and newly-obsolete addresses. The Census Bureau also provides the local governments with a list of addresses in particular locales so that they can point out discrepancies with their own information. To protect privacy, however, the act specifies that only officials designated as census liaisons can handle the Bureau's copy of their jurisdiction's address list, which does not contain names of residents at the addresses, and that the liaisons are prohibited from disclosing address list information or using it for local purposes, such as identification of illegal housing.

For the 2000 Census, the Bureau is planning to rely on a Master Address File (MAF), which is to be developed, in part, from the Bureau's 1990 Census address list and the most recent Postal Service address list (referred to as the delivery sequence files). Under a reengineering plan approved in September 1997, the Bureau also plans to conduct a

100-percent canvass of all census blocks in early 1999 and will request the Postal Service to validate the city-style addresses prior to the delivery of 2000 Census questionnaires. For the 2000 Census, the Bureau is not going to rely on the Postal Service to deliver questionnaires to non-city style addresses as it did in 1990. Instead, the Bureau is planning for enumerators to deliver the questionnaires and ask that they be mailed back. Furthermore, the Bureau has no plans to purchase addresses from commercial vendors as it did in the prior three censuses. Vendors' lists were found to be less accurate in low-income areas, which are not a high priority for companies selling goods and services.

Locating Nontraditional Housing

Because the Bureau's basic data collection method revolves around households, counting people who do not live in traditional households can be especially difficult. Such people live in group quarters, such as shelters for battered women and the homeless, nursing homes, college dormitories, migrant worker camps, and military installations, as well as in remote areas. It takes special efforts to count these individuals.

In the 1990 Census, the Bureau tried a Street and Shelter Night program to count the homeless wherever they could be found on a particular night. In 2000, the Bureau will focus its efforts to count the homeless on the places where many of them come for services, such as shelters and soup kitchens, as well as targeted outdoor locations. The emphasis will shift from finding the homeless on street corners to identifying them through the organizations that assist them. Other nontraditional procedures include cooperation between the Bureau and the Department of Defense and the U.S. Coast Guard to count individuals on military installations. Another special operation will count highly transient individuals living at recreational vehicle parks, commercial or public campgrounds, and marinas. Remote areas of Alaska will be enumerated in mid-February, a time when the difficult travel to these areas by dogsled and snowmobile is somewhat easier, rather than on April 1.

Another way that the Bureau plans to count individuals in nontraditional households is by making census questionnaires available at public places, such as post offices and community centers. In this way, people who did not receive a mailed questionnaire will have a greater chance to be counted. This new approach does introduce a higher risk, which the Bureau continues to assess, of multiple responses for a given household or person. "Unduplication" formerly required a massive clerical operation, but now the Bureau expects that advances in computer storage, retrieval,

and matching, along with image capture and recognition, will give the Bureau a much greater ability to eliminate duplicative responses.

Several lawsuits alleging undercounts of the homeless were filed against the Bureau following the 1990 Census. Despite the efforts planned for the 2000 Census, the count of the homeless and other people living in nontraditional households is likely to be less accurate than for those living in housing units that can be plotted on a TIGER map. Issues of possible undercounts of people living in nontraditional households will likely surface again in the 2000 Census.

Encouraging Public Participation

In 1970, 78 percent of the households who received a mailed questionnaire fill it out and returned it; in 1990, that percentage dropped to 65 percent. Based on the response rate for other surveys in the meantime, the mail return rate for the 2000 Census could be even lower. This decline in the mail response rate poses not only an enumeration challenge to the Bureau, but also a major financial problem. The cost of eliciting responses from the 34 million households that failed to return their questionnaires in 1990 was \$730 million. Nonresponse follow-up was one of the most costly operations of the 1990 Census. Encouraging voluntary public participation, therefore, is a major objective of the Bureau.

Lack of awareness of the census was not a major problem in the 1990 census. Apathy, concerns over loss of privacy, and fears that census information might be shared with other government agencies, however, were major impediments to achieving high rates of returned questionnaires. To encourage the public to mail back the questionnaires, the Bureau spent approximately \$75 million on promotion and outreach in 1990, and received pro bono promotional services valued at \$65 million from the Advertising Council—a nonprofit organization that administers public service advertising campaigns. The Bureau reached the public through the media and through coordinated efforts with local and state governments, national and community organizations, and business and religious entities. However, because the Bureau had little control over when or where the Advertising Council disseminated the Bureau's message, it has decided to use a paid advertising campaign in 2000 to complement its continuing efforts with its organizational partners. The Bureau estimates the cost of all outreach and promotion activities will be about \$230 million for the 2000 Census.

In order to improve the mail response rate in 2000, the Bureau is planning to use a new, multiple mail contact strategy. The Bureau plans to increase the number of its mail contacts with households by sending out a letter notifying households of the coming questionnaire, an initial questionnaire, a thank you or reminder card, and possibly a replacement questionnaire. Both the initial and any possible replacement questionnaires will be barcoded to minimize counting duplicate submissions. In areas lacking city-style addresses, either the Bureau or the Postal Service will implement segments of this strategy. The multiple mail contact strategy was used in the 1995 Test Census and showed a potential for increasing the mail response rate. Multiple mail contact will also be tested during the 1998 dress rehearsal.

Language barriers can be an obstacle to gathering a full count of the population. During the 1970 Census, despite the fact that 9.2 million U.S. residents spoke Spanish in their homes, the census questionnaire was not printed in Spanish. Since then, the Bureau has tried to remove that obstacle by printing the questionnaires in both English and Spanish, hiring enumerators with foreign language skills, and providing toll-free telephone assistance in languages other than English. In 1990, census questionnaire guides were available in 32 languages. For 2000, the Bureau is researching the use of questionnaires in additional languages.

Certain racial and ethnic minorities have long been undercounted in the census. Language barriers, fears of deportation, and a greater tendency to live in nontraditional households are factors that have led to this undercount. In the 1970s and 1980s, the Bureau established advisory committees on the Hispanic, African-American, Native American, and Asian and Pacific Islander populations to help the Bureau find ways to improve its count of these groups. Those advisory committees will continue to function for the 2000 Census, but the obstacles to increasing minority participation in the census have not been eliminated.

There are categories of people who have incentives to avoid participating in the census. Individuals who are in the U.S. without the proper documentation or who otherwise have reason to fear various law enforcement or regulatory government agencies are unlikely to be convinced to be counted.

Sampling and Statistical Estimation in the 2000 Census

The Bureau plans to use two new sampling procedures in the 2000 Census. One is designed to reduce the time required for and expense of following up on the projected 40 million housing units that may not respond in 2000 to the questionnaires. The other, referred to as Integrated Coverage Measurement (ICM), is designed to adjust the population counts obtained from census questionnaires and nonresponse follow-up procedures to eliminate the endemic differential undercount.

Nonresponse Follow-Up Sampling

As in the previous three censuses, the Bureau plans to encourage households to mail back the questionnaires that have been mailed to them or left at their homes. Four weeks after Census Day, the Bureau plans to implement a procedure known as nonresponse follow-up (NRFU) to collect information from households that have not returned their forms. The 2000 procedure departs from previous censuses in that it incorporates sampling to select the housing units that the Bureau will contact for NRFU. A sample of housing units is to be selected in each census tract, sorted by geography and form type (long versus short form) to make sure that the sample is distributed evenly across nonresponding housing units in each tract. Each sample is to be selected immediately after the cutoff date for mail returns, and households are to be selected in sufficient numbers to ensure that the number of housing units in the sample, when added to the households that have voluntarily returned their forms, will total at least 90 percent of households in the tract. Data for households not in the sample is to be imputed by a systematic procedure that relies on data collected from geographically contiguous households.

To illustrate, in a tract where 70 percent of the households responded to the census questionnaire, the Bureau would draw a two-thirds sample (to reach 90 percent) of the remaining households. They would then use results of this follow-up enumeration to impute characteristics of the households not selected for the sample.

There are to be several exceptions to this procedure. First, all housing units in blocks that have been selected for the Integrated Coverage Measurement survey are to be contacted (100-percent nonresponse follow-up). Second, nonresponse follow-up is not to be conducted in rural households that are listed by enumerators. Data from these households are to be collected by enumerators listing the housing units. Third, late data submitted voluntarily by a household are not to be thrown away and are to be used in preference to data either collected by an enumerator or

imputed by NRFU, if the questionnaire is received before the completion of NRFU data collection activities.

Using ICM to Adjust Population Counts

The purpose of ICM is to adjust for errors that occur in census-taking. (Errors in past censuses are discussed further on under Accuracy of Past Censuses.) In general, ICM is a statistical procedure that would be used in an effort to improve the accuracy of the original data collected by the census by reconciling that data with data obtained from an independent sample of 750,000 households. The reconciliation process, referred to as Dual System Estimation, applies probability theory to the ICM and the census figures to generate a third, better estimate of the true population. ICM would be conducted after basic data collection, including nonresponse follow-up, had ended and would estimate the extent to which people were correctly counted, missed, or included by error in the census.

Since ICM would be the last step in the census process and its results would be an integral part of the final census numbers, the Bureau plans to release only one set of official census numbers. In order to accomplish this “one-number census,” the Bureau is planning for both nonresponse follow-up and ICM to be completed quickly so that it can announce results by December 31, in time to meet the deadline for reporting census data for apportionment purposes. The use of laptop computers during the post-enumeration interviews is planned to speed the process of reconciling differences between the census and ICM data. The cost of ICM, including the laptop computers, is projected to be \$325 million.

Constitutional and Legal Issues on Sampling

Article I, section 2, of the Constitution refers to an “actual Enumeration” of the population for the census. It also vests Congress with the authority to conduct censuses “in such a Manner as they shall by Law Direct.” Congress, in turn, has delegated this authority to the Department of Commerce through title 13 of the U.S. Code.¹⁴ The question now being debated is whether the latitude allowed the Secretary of Commerce includes the use of the statistical methods proposed for 2000, provided the Secretary determines that using them would improve the census accuracy, or whether the requirement for an “actual Enumeration” limits that discretion. The issue also has a similar statutory incarnation: Title 13 of the U.S. Code states that the Secretary of Commerce is to undertake a decennial census in such form and context as he may determine, including the use of sampling procedures, yet it excludes authority to use sampling

¹⁴13 U.S.C. 141(a).

in the determination of population for purposes of apportionment of representatives in Congress.¹⁵

The question of whether sampling is statutorily and constitutionally permissible in determining the decennial census count can only be definitively resolved by the Supreme Court. The Supreme Court has not yet considered the specific issue of whether the use of sampling violates the Constitution and, in the course of considering past challenges to the conduct of the census, has specifically stated that its rulings were not to be construed as either prohibiting or allowing the methods.

Sampling through the use of the long form questionnaire to obtain demographic information has become an unremarkable part of late twentieth century census-taking in America. However, the possible use of sampling and statistical estimation to adjust the 1990 census population count raised fundamental constitutional and statutory issues that continue to be debated today. The resolution of these issues is now essential to the completion of planning for the 2000 Census.

Accuracy of Past Censuses

Ever since George Washington questioned the results of the first census in 1791, the accuracy of any given census has been in question. The questions have always been legitimate: The census has never counted 100 percent of those it should, in part because American sensibilities would probably not tolerate more foolproof census-taking methods, such as requiring residents to register with a central governmental authority. In addition, some percentage of the populace has always chosen to evade census-takers out of fear. Others have gone, and will continue to go, uncounted because there is an incongruence between the Bureau's primary means of locating individuals and particular individuals' circumstances. For example, in the nineteenth century, isolated homesteaders were difficult for enumerators to locate and count. Today, young urban males are especially likely to be missed in an enumeration process based on associating people at fixed household addresses.

Until the 1940s, there were no means to answer the question of how inaccurate a particular census had been, or at least no means less prone to inaccuracy than the census itself. The Bureau began to evaluate census coverage in the 1940s, at first based on comparisons of birth and death certificates and other administrative data—a procedure known as demographic analysis. The Bureau also began to use statistical methods

¹⁵13 U.S.C. 195.

based on sampling, a method that involves using a representative part of a population to convey information about a whole population. Since 1940, the Bureau has quantified the amount by which any census undercounts the population. (See table II.3 for net undercount estimates.¹⁶)

Measures of the total undercount have been possible since 1940 with demographic analysis, but detailed measures of the differences among undercounts of particular ethnic, racial, or other groups have only become available since 1980. The statistics reveal that some subgroups of the population are counted less completely than others. The availability of the data, and the fact that not only representation but also allocation of federal resources is at stake, have made the composition of the undercount a sensitive and widespread concern.

In the 1940 census, the Bureau instituted its first effort to gain accurate information through sampling. The Bureau, responding to pressure to add a multitude of questions on unemployment, housing, and income, among others, developed a set of supplementary questions that were asked of only 5 percent of the population. The Bureau statisticians, using newly-developed statistical methods, used those answers to extrapolate to the general population.¹⁷ This statistical method continues in use today, although the percentage of households receiving what is now known as the long form questionnaire is to be 17 percent.

The Bureau has evaluated the magnitude and characteristics of census errors and undercounts for decades, but it has never used the findings of these evaluations to actually correct coverage errors. In 1990, a survey called the Post Enumeration Survey (PES) was used to determine the error in the 1990 census. After the census was taken, PES enumerators interviewed a sample of 5,000 census block clusters containing 150,000 households, and matched by name the people counted in the PES with those counted in the census. The extent to which housing units and people were correctly enumerated, missed, or counted in error was used to estimate error for the entire census. Rates of error were then determined for 1,392 various types of people or post strata in the population and applied to every person counted in the census. The post strata were based

¹⁶The “net undercount” reported does not reveal the even larger errors in the census. The net undercount is the difference between those missed and those counted twice. In 1990, for example, the net undercount was 4 million. The number, however, of persons missed was 10 million, and the number of persons counted twice was 6 million, making the gross error 16 million.

¹⁷Statistical analysis was critical to the 1950 Census in a different way when statistical analysis by the Bureau revealed that enumerators were introducing errors into the census results. This realization was one of the factors that led the Census Bureau to introduce a 1960 test of the method of self-enumeration via mailed questionnaires that has become the standard today.

on such characteristics as age, sex, race, ethnicity, location, and status as renter versus owner of housing. Thus, for example, if Asian and Pacific Islander females between the ages of 18 and 29 were found to be undercounted by 1 percent, an adjusted census would have counted each person in that post stratum as 1.01 persons.

Matching had been tried in the post-enumeration effort of 1980, but the computer technology was not sufficiently sophisticated to base an adjustment on the effort. The quality of the data improved in 1990, but the Secretary of Commerce determined that the evidence to support an adjustment was inconclusive and decided not to adjust the 1990 census results. The decision whether to adjust the census with the results of PES was complicated by the fact that the 1990 census figures had already been released when the PES figures became available in the spring of 1991. The Secretary of Commerce expressed concern that having two sets of numbers could create confusion and might allow political considerations to play a part in choosing between sets of numbers when the outcome of the choices, such as differences in apportionment of seats in Congress, can be known in advance of a decision.

Protecting Privacy and Controlling Costs Are Persistent Census Concerns

Protecting Privacy

Title 13 of the U.S. Code prohibits the Bureau and its employees from releasing or allowing anyone other than Department of Commerce employees to examine individual census records. Penalties of up to \$5,000 and 5 years in prison for violating the provisions of the title apply. Despite the Bureau's strict policies, stringent penalties, and its modern record of conscientious defense of the confidentiality of its records against a number of agencies and groups that have sought to obtain certain records, some portion of the population fails to respond to the census, or responds reluctantly, out of fear that their personal information will find its way into the public domain.

The Evolution From Public Posting to Strict Privacy

From 1790 through 1840, the censuses were entirely public.¹⁸ In fact, during this period, the census results by household were posted "in two of the most important places" in the enumeration districts by Congress' express direction. The purpose of the posting was to allow omissions and errors to be caught by districts' residents.

After the 1840 Census, census results were no longer publicly posted, but there was no law formally safeguarding the confidentiality of the information. Bureau policy, however, as enunciated by the Secretary of the Interior in 1850, was that the returns were to be "exclusively for the use of the government, and not to be used in any way to the gratification of curiosity, the exposure of any man's business or pursuits, or for the private emolument of the marshals or assistants." However, because the originals of the census were given to local officials, the security of the returns could not always be ensured.

The 1880 Census Act included major changes with regard to privacy. Enumerators were required to swear an oath not to disclose any information to anyone except their supervisors, and census returns were no longer given to local officials but were filed instead with the Department of the Interior. Business information was protected, but information related to individuals was not. That information was available at the discretion of the Director of the Census for a fee.

In the early 1900s, the Bureau focused on a different threat to confidentiality, which was the potential that businesses might, by analyzing aggregate pieces of information provided at the local level, deduce the identity of their competitors and information about them. The

¹⁸Frederick G. Bohme and David M. Pemberton, "Privacy and Confidentiality in the U.S. Census—A History," Bureau of Census, Department of Commerce, 1991.

1910 Census Act prohibited the Bureau from publishing data from which a business might be identified.

The discretion given the Director of the Census to release information related to individuals allowed Civil War veterans to obtain information that helped them prove their age and status for pension purposes at a time when census records might have been the best or only source of official information. World War I era men received information from the Bureau to prove that they were too young to be eligible for the draft. Exercising the same discretion, the Director agreed in 1917 to supply federal officials with the names and ages of individuals potentially eligible for the draft, and in 1921, the Director approved the provision of information to private institutions promoting literacy that wanted to use Bureau records to identify illiterate people in the nation.

Later in the 1920s, the Bureau, following the guidance of the Justice Department, began to narrow the circumstances under which information could be released. In 1930, it denied access to a federal agency called the Women's Bureau, which wanted the names, addresses, and occupations of some women. In 1942, the Bureau turned down the War Department's request for the names and addresses of people of Japanese descent living in the West—although the Bureau did identify geographic concentrations of Japanese.

The new practice of thoroughly restricting access by private or public entities to census records was codified in title 13 of the U.S. Code in 1954. The Supreme Court, citing title 13, ruled in 1982 that the Bureau could not even release its address list without names to the City of New York so that city officials could compare their lists with the Bureau's. Subsequently, in 1994, Congress passed the Census Address List Improvement Act, which allows the Bureau to share address list information with local governments as part of its decennial address list development procedures.

Title 13 assures complete confidentiality for all records in the Bureau's custody. Once the records are passed to the custody of the National Archives, the Archives can then release them for public use when the records are 72 years old. For records not yet in the Archives, individuals can, for a fee, get a copy of their own record or their minor child's record, but for anyone else they must have a signed authorization. For a deceased person, a death certificate or similar evidence must be submitted, as well as proof that the applicant is either a direct blood-line descendant or an heir of the person requesting the information.

Privacy Issues Today

Title 13 provides for strict confidentiality and substantial penalties for deliberate release of individuals' information. The Privacy Act of 1974 does not apply to census records. The Bureau has long been concerned about inadvertent release of information about individuals via published data that could be analyzed in a way to reveal a particular respondent's data. The Bureau has procedures to prevent the possible identification of a particular household's data, especially when it is cross-tabulated with other information.

In order to prevent such an accidental release of economic information, in earlier days, the Bureau would visually inspect the data before release and, when necessary, would collapse it into broad categories or delete information from certain cells in tables. Today, the Bureau uses computer programs to ensure that information cannot be analyzed to reveal individuals' information. Additional techniques, such as random rounding or exchanging household statistics among census blocks, are being studied to avoid potential problems.

Nonetheless, in an age when many people feel anxious about the reach of marketers, poll-takers, and others who come armed with computer-based data about individuals, the concern over privacy and confidentiality will be hard to vanquish, and its effect on census-taking will not easily be mitigated. Some part of the declining response rate is a function of people's anxiety about what will become of the data they provide to the Bureau.

Rising Census Costs

The cost of the census has steadily increased over the course of 200 years. The rate of increase has been dramatic in the twentieth century: the 1960 Census cost \$523 million,¹⁹ and the 1990 Census cost \$2.6 billion—an increase of 400 percent after adjusting for inflation. The rate of increase will continue to escalate with the 2000 Census, which is projected to cost \$4 billion. Three major factors are involved in the soaring costs over the last 40 years: an increase in the number of housing units to be enumerated, an increasing use of expensive technology, and an increase in the number of staff needed to take a decennial census.

¹⁹The actual cost of the 1960 Census was \$120 million, but using 1990 constant dollars the cost is \$523 million. In addition, the 1960 Census was not conducted using primarily mail-out/mail-back questionnaires as was the 1990 Census.

Increasing Number of Housing Units

Rapid population growth has been one of the hallmarks of the American national experience. The country's population has grown over 10 percent on average per decade since the 1960 Census, and that fact has contributed to the ever increasing price tag of the decennial census. In recent decades, however, an additional factor has been important: the rapid rise in the number of housing units.

While the number of people in the country has been increasing, there have been fewer people living in the average household. The rate of increase in the number of households, therefore, has been rising at an even quicker pace than the population. In 1960, the Bureau counted people at nearly 60 million housing units; in 1990, it counted people at 102.3 million housing units, a 75-percent increase in the number of units to be either contacted by mail or visited, or both. For 2000, the Bureau estimates there should be 118.6 million housing units that need to be contacted.

Increasing Use of Technology

The Bureau has been a leader in the use of automation technology and electronic data processing methods for nearly a century. The Bureau needed to be inventive because, as the population grew and the census questions and the possible answers to them became more numerous, the decennial census required increasing numbers of clerks to tally and cross-tabulate the responses. To conduct the 1860 Census, the Bureau had 184 office staff and 4,417 field enumerators and produced 3,189 pages of census reports. In 1890, the census effort required just over 3,143 office workers, 46,804 field enumerators, and the pages published numbered 26,408. The census was also taking ever longer to complete as the amount of data collected increased.

All the tallying of the 1880 Census was still done by hand, and the Bureau recognized then that the solution to what was becoming a data crisis was mechanization. Herman Hollerith, a former Bureau employee, developed an electrical enumerating machine with its punch cards for the 1890 Census.²⁰ With 105 of Hollerith's machines, the 1890 census was completed in 3 years, as opposed to the 7 years it took to complete the 1880 Census.

In 1946, the Bureau contracted with a private firm, the Eckert-Mauchly Computer Corporation, to design a machine for its statistical purposes that would use electrical impulses rather than mechanical holes to tabulate census responses. The machine, known as UNIVAC, had a processing unit

²⁰Hollerith went on to establish the Hollerith Tabulating Company to manufacture machines and sell punch cards and later merged his company with others making time clocks, scales, and grinders. In 1924, the merged companies were renamed International Business Machines.

containing 18,000 vacuum tubes and was delivered in 1951. Although it was too late for processing much of the 1950 Census data, it proved the concept and was a precursor to much greater use of computer processing in subsequent censuses. Since 1950, the Census Bureau has taken advantage of improvements and additional capabilities in electronic data processing developed during the previous decade.

While the punch card automation systems of the late nineteenth and early twentieth centuries saved enormous clerical labor costs, they were also a practical necessity: the time needed for completing a census tabulation was approaching 7 years. The benefits of technology in the second half of the twentieth century have produced some savings in labor costs, but the major benefits have been in faster census data processing and improved data analysis and accuracy. For example, the TIGER maps developed for the 1990 Census integrated maps, addresses, and other geographical information, thus solving most problems of inconsistency.

The 2000 Census will rely on computer technology to a greater extent than ever before, but most improvements are not primarily aimed at cost reduction. For example:

- The census address list and the geographic file will be integrated to assist enumerators in finding housing units.
- By providing census data electronically directly on the Internet and through libraries, universities, and the Bureau's Data Centers, the Bureau intends to make more data available faster to the public than ever before.
- The improved data recognition software to be introduced in 2000 will facilitate the processing of enumeration data.
- The use of laptop computers pre-loaded with census data for the enumerators to use during the post-enumeration interviews for ICM is planned to speed the process of reconciling differences between the census and ICM data.

While there is a cost for implementing these technologies, the benefit is wider, faster distribution, and therefore use, of public census data; greater accuracy and fuller coverage of the census; internal Bureau efficiencies; and, to a lesser degree, reduction of labor costs.

Increase in Census Staffing

Taking a decennial census is a very labor intensive and costly endeavor. Over the decades, as the population has grown, so have the different types and numbers of workers needed to complete and report a census on time.

(Table II.3 provides information on the growth of the 21 completed decennial censuses by listing the population, enumerator staff, office and headquarters staff, and the actual cost of each census.)

Decennial census staffing can be generally divided into three different categories—field enumeration, local census and census field offices, and headquarters staff. The majority of the field staff are enumerators and supervisors whose primary job is verifying addresses prior to a census, doing nonresponse follow-up during the initial census-taking; and doing post-enumeration surveys. The majority of enumerators work from 6 to 10 weeks and are paid a few dollars over minimum wage. Enumerators do not receive regular federal employees benefits but have been eligible for unemployment compensation during past censuses. Partly because of the high turnover rate of enumerators during prior censuses, the Bureau plans to employ part-time workers who may have another job. The Bureau estimates it will need over 300,000 field staff working out of 520 local census offices and 402 census field offices for the 2000 Census.

Local census and census field office staff generally reflect a variety of occupations, such as clerks, lower to mid-level managers, data processors, and data scanning operators. Some of these local census office staff may be employed for up to 11 months. Temporary office staff are generally paid at rates similar to those of full-time federal employees. The Bureau has 4 processing offices and 12 regional offices whose primary mission every 10 years becomes taking the decennial census. The Bureau estimates it should need several thousand employees for its local census, census field, and processing offices in 2000.

Headquarters staff consists primarily of managers and analytical staff, such as the Director of the Bureau, high-level managers, lawyers, computer programmers, statisticians, demographers, advertising experts, and writers. The types and amounts of pay received by headquarters staff are as divergent as the many different occupations needed to take and report a census. Several thousand full-time employees from Bureau headquarters are expected to work on the 2000 Decennial Census.

Having sufficient staff may allow the Bureau to meet its stated goals of producing an accurate and timely one-number census in 2000. But, doing so also could be costly since it requires the Bureau to undertake many labor-intensive procedures and special activities to ensure that all residents of the United States are counted and included in the 2000 Census.

Most Frequently Asked Questions and Answers About the Decennial Census

Question	Answer
Why is a census count taken?	For constitutionally mandated reapportionment and other statutory requirements.
What is reapportionment?	Allocation of the 435 members in the House of Representatives among the states according to the population from the decennial census.
What is the latest count?	248.7 million people per the 1990 Census.
Who is counted?	All persons residing in the United States, regardless of their citizenship status.
How long does it take to count and report results?	Nine months, with extensive research, pretesting, and planning.
How much does it cost?	\$2.6 billion for the 1990 Census; about \$4 billion is the projected cost for the 2000 Census.
How many workers are needed?	Over 500,000 temporary workers and about 6,800 permanent employees were used during the 1990 Census.
How is the census taken?	Mostly self-enumeration, by mail, using standardized short and long form questionnaires and door-to-door follow-up for nonresponding households.
What questions are asked?	Population, economic, demographic, and housing issues.
Are statistical procedures used?	The long form or sample questionnaire is filled out by one-sixth of the population and used to project national results. The Census Bureau plans to use statistical sampling and estimation procedures in 2000.
At what levels are the results available for public uses?	Computerized data are available by state, county, city, municipalities, etc., in various enumerations.
What publications are available?	Standardized and special publications are available on paper, computer tapes, CD-ROM, and the Internet.

Note: The plans for the 2000 Census are not final. Depending upon decisions made by the Bureau and Congress, operational procedures may change, and costs must then be adjusted.

Changes and Undercounts in and Growth of the Decennial Census

Table II.1: Changes in the Apportionment of Membership of the House of Representatives Between the 1920 and 1990 Decennial Censuses, by Region of Country

Regions/divisions	Decennial census							
	1920	1930	1940	1950	1960	1970	1980	1990
Northeast	123	122	120	115	108	104	95	88
New England	32	29	28	28	25	25	24	23
Middle Atlantic	91	93	92	87	83	79	71	65
Midwest	143	137	131	129	125	121	113	105
East North Central	86	90	87	87	88	86	80	74
West North Central	57	47	44	42	37	35	33	31
South	136	133	135	134	133	134	142	149
South Atlantic	56	54	56	60	63	65	69	75
East South Central	39	34	35	32	29	27	28	27
West South Central	41	45	44	42	41	42	45	47
West	33	43	49	59	69	76	85	93
Mountain	14	14	16	16	17	19	24	24
Pacific	19	29	33	43	52	57	61	69
Total for United States	435	435	435	437	435	435	435	435

Source: United States Summary, "Population and Housing Unit Counts," Bureau of Census, Department of Commerce, Aug. 27, 1993.

Table II.2: Changes in the U. S. Population and Its Undercount by Race and Ethnicity Between the 1950 and 1990 Decennial Censuses

	1950	1960	1970	1980	1990
Population distribution (percentage)					
White (non-Black)	89.3	88.6	87.6	79.9	75.7
Black	9.9	10.5	11.1	11.5	11.8
American Indian, Alaska Native	NA	NA	NA	0.6	00.7
Asian Pacific Islander	NA	NA	NA	1.6	02.8
Hispanic	NA	NA	NA	6.4	09.0
Other	0.7	0.9	01.3	•	•
Net undercount estimates (percentage)					
White (non-Black)	3.8	2.7	2.2	0.8	1.3
Black	7.5	6.6	6.5	4.5	5.7
American Indian, Alaska Native	NA	NA	NA	NA	4.5
Asian Pacific Islander	NA	NA	NA	NA	2.3
Hispanic	NA	NA	NA	NA	5.0

Note: NA = Not available.

Sources: Statistical Abstract of the United States—The National Data Book, Bureau of Census, Department of Commerce, October 1996; Economic and Statistics Administration brochure, Bureau of Census, Department of Commerce, November 1996.

Appendix II
Changes and Undercounts in and Growth of
the Decennial Census

Table II.3: Growth of the Decennial Census From 1790 to 1990

Census year	Total U.S. population (millions)	Number of enumerator staff	Number of headquarters and/or office staff	Total cost of census (thousands of dollars)
1790	3.9	650	a	\$44
1800	5.3	900	a	66
1810	7.2	1,100	a	178
1820	9.6	1,188	a	208
1830	12.9	1,519	43	378
1840	17.1	2,167	28	833
1850	23.2	3,231	160	1,423
1860	31.4	4,417	184	1,969
1870	38.6	6,530	438	3,421
1880	50.2	31,382	1,495	5,790
1890	63.0	46,804	3,143	11,547
1900	76.2	52,871	3,447	11,854
1910	92.2	70,286	3,738	15,968
1920	106.0	87,234	6,301	25,117
1930	123.2	87,756	6,825	40,156
1940	132.2	123,069	9,987	67,527
1950	151.3	142,962	9,233	91,462
1960	179.3	159,321	2,960	127,934
1970	203.2	166,406	4,571	247,653
1980	226.5	458,523	4,081	1,136,000
1990	248.7	510,200	6,763	2,600,000

^aThere was no official headquarters staff for the first four censuses. In addition, the records for the 1790, 1800, and 1810 Censuses were accidentally destroyed; the numbers shown are estimates.

Sources: *The Story of the Census—1790-1915*, Bureau of the Census, Department of Commerce, 1915; *The Bureau of Census*, adapted by A. Ross Eckler, Bureau of the Census, 1972; Margo J. Anderson, *American Census: A Social History* (New Haven: 1988); *Modernizing the U.S. Census*, National Research Council, 1995; *Statistical Abstract of the United States—The National Data Book*, Bureau of the Census, Department of Commerce, October 1996.

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