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Planning and Development for the United States Census 2000

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Following the 1990 Decennial Census, the U.S. Bureau of the Census faced considerable challenges in preparation and development of the 2000 census. Whereas the costs of the 1990 census had increased dramatically, the accuracy of that census as well as the perception of it by key stakeholders and the public had declined. Faced with the challenge to design a more accurate, less costly census that a diverse public could understand and support, the Census Bureau embarked on an extensive planning, research, testing and program development process for Census 2000. Key to that process was an examination and challenge of the fundamental processes required to conduct a population census. From that examination and subsequent testing program emerged some new and innovative approaches to census taking. This paper describes the United States Census 2000 planning, development and testing process along with the public and legal policy debate that arose and continues to shape it.

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PLANNING AND DEVELOPMENT FOR UNITED STATES CENSUS 2000

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Abstract

Following the 1990 Decennial Census, the U.S. Bureau of the Census faced considerable challenges in preparation and development of the 2000 census. Whereas the costs of the 1990 census had increased dramatically, the accuracy of that census as well as the perception of it by key stakeholders and the public had declined. Faced with the challenge to design a more accurate, less costly census that a diverse public could understand and support, the Census Bureau embarked on an extensive planning, research, testing and program development process for Census 2000. Key to that process was an examination and challenge of the fundamental processes required to conduct a population census. From that examination and subsequent testing program emerged some new and innovative approaches to census taking. This paper describes the United States Census 2000 planning, development and testing process along with the public and legal policy debate that arose and continues to shape it.

I. Mandate for New Direction

Population censuses have been conducted in the United States every ten years since 1790. Article I, Section 2 of the U.S. Constitution requires the taking of a population census every ten years for the purpose of reapportioning the U.S. House of Representatives among the States. Besides the Constitutional basis for the census, the census numbers are used for redrawing Congressional and State legislative districts, dispersement of more than \$200 billion in Federal programs annually, and to inform countless other private and public sector policy decisions on a daily basis. The census not only tells us who and where we are as a country and as a people, it permeates every aspect of our daily lives.

Following the 1990 census, the U.S. Census Bureau faced an enormous challenge in planning the 2000 census. Sound public policy is more than just doing things right--it also means doing the right things. The 1990 decennial census illustrates this point perfectly. From an implementation standpoint, it was by far the best planned and executed census in our nation's history. Most operations were completed on time and within budget, and major advances were made in census data collection and processing. Although these things were done well, there were clear messages that the 1990 census did not do the right things. The level of public cooperation, measured by the rate of questionnaire mail-back, was significantly lower than expected. Under coverage, particularly for people in minority groups, persisted despite myriad efforts to eliminate it. The Census Bureau was heavily criticized for both these outcomes; and for methods used to count the homeless population, for not having a more effective outreach and promotion program, for needing to hire 500,000 people to take the census, for spending more than \$2.6 billion, for taking too long to publish the results.

Other troubling issues proceeded from the 1990 census experience as well. Legal challenges to census processes and results were not new or without precedent, but the number of such challenges proceeding and following the 1990 census were daunting. So were the negative perceptions about the census process and results from key stakeholders and the public at large. It was clear that fundamentally new approaches to taking the census were not only needed but required.

II. Census 2000 Advisory Groups

The experience from the 1990 census clearly dictated the need for a fundamental review of design options early in the decade for the 2000 census. Certainly, one of the basic requirements for the design review was the need to educate and actively include stakeholders in design decisions not only early but at every major stage of the planning process. Toward this end, and at the prompting of the U.S. Congress, the Census Bureau established in November 1990 the Task Force for Planning Census 2000. The Task Force was comprised of three separate committees:

- The Policy Committee was comprised of senior staff from the President's Office of Management and Budget as well as senior officials from Federal Agencies who were major census data users. The Policy Committee was responsible for the review of design alternatives from the standpoint of concerns about their direct or indirect effects on society at large, as manifested through agencies of the Federal Government. The primary work of the Policy Committee revolved about the census instrument content development process--that is, examining what data were to be collected in the decennial census and how.
- The Technical Committee was comprised of technical staff from the Census Bureau and from other Federal statistical agencies. Its mandate was to identify key research questions, to formulate testing objectives, and to evaluate research findings. Toward this end, the Technical Committee conducting an exhaustive review of the census taking process from a methodological standpoint, developed 13 census design alternatives, and informed the choice, design and interpretations of the research efforts that were used to evaluate these design alternatives. Ultimately, the work of this committee directly led to the test and development of new methods, discussed later in this paper, designed to improve the census mail response rate and to reduce the differential undercount.
- The Public Advisory Committee was comprised of major census stakeholders from a variety of groups including private citizens; Federal Agencies; state, local and tribal governments; national nongovernmental organizations; community-based organizations; academia; private sector businesses; and census Congressional oversight committee staffers. The purpose of the Public Advisory Committee was to identify and communicate to the Secretary of Commerce, the Presidential Cabinet level official responsible for the census, the concerns of non-Federal and non-governmental

stakeholders about the design of Census 2000. The Public Advisory Committee was rechartered in 1995 and continues to advise the Secretary of Commerce on the design, development and implementation of Census 2000.

The National Academy of Sciences established two panels to advise the Secretary of Commerce on options for Census 2000 and beyond. The first of these panels, the Methods Panel, was established by the Census Bureau to provide an independent review of the technical and operational feasibility of the design alternatives and tests as they were developed by the Technical Committee and conducted by the Census Bureau. The Methods Panel's recommendations on testing and design alternatives were integral to informing the final design of Census 2000.

The second Panel on Census Requirements for the Year 2000 and Beyond was established at the direction of the U.S. House of Representatives to examine independently the role of the decennial census within the Federal statistical system. A key recommendation from the Requirements Panel, one that is at the core of the current policy debate surrounding Census 2000, was its advocacy of the use of statistical estimation as a means of addressing the differential undercount, given that sole reliance on traditional physical enumeration methods to address this issue were no longer defensible.

Finally, in addition to the above advisory groups formed specifically to provide advise and assistance in planning Census 2000, the Census Bureau also continued to solicit and rely heavily on advice from the following two advisory groups that had been formed during earlier censuses:

- The Professional Advisory Committees were comprised of representatives from the American Statistical Association, the American Population Association, and the American Economic Association.
- The Race and Ethnic Advisory Committees were comprised of representatives from the African American, American Indian and Alaska Natives, Hispanic, and Asian and Pacific Islander communities. These committees provide advise and recommendations throughout the decade on census design issues as they relate to members of their respective communities.

III. Early Decade Research and Testing

About the same time the Task Force was formed, the Census Bureau created the Year 2000 Research and Development Staff. While the staff provided day-to-day coordination and support of the Task Force, it also planned, developed, and implemented the research and early decade testing program needed to inform decisions about design alternatives. These early decade research and testing efforts were conducted between 1992 and 1995 and comprised the following features:

- Early research and testing focused on ways to increase the willingness and ability of respondents to respond by mail to the census by using: (1) questionnaire and mailing formats that were easier for them to understand and complete and (2) multiple notifications for alerting and reminding respondents to complete the forms.
- Various testing and research studies focused on technologies designed to speed data collection and on ways to give people greater flexibility in how they could respond to the census. Other research assessed current and emerging data capture technologies (for example, electronic imaging, optical mark and optical character recognition) that offered the potential for processing cost reductions.
- Research on automated address list maintenance focused on supporting the development of a continuously updated Master Address File linked to the TIGER (Topological Integrated Geographic Encoding and Referencing) geographic database.
- Considerable testing and research were conducted to study administrative records including: examining respondent attitudes about using records held by other agencies, investigating various state and local administrative records systems, and developing effective methods to use with importing, standardizing and matching files.
- At mid-decade, the 1995 Census Test provide an additional opportunity to test many procedures and features recommended by the Task Force and endorsed by the National Academy of Science Panels. This test evaluated 15 activities, among them a multiple mail strategy including respondent-friendly forms, a new methodology to count the homeless, techniques of sampling for nonresponse, use of sampling and estimation to substantial reduce the total but especially the differential undercount among minority populations, intelligent use of automation: such as computer assisted telephone data collection, electronic image data capture, and automated matching software to reduce multiple enumerations.
- The 1996 National Content Survey was the principle vehicle for testing and evaluating subject content for Census 2000. It also provided information on questionnaire design and mailing strategy and techniques to improve coverage.
- The 1996 Race and Ethnic Targeted Test was the principle vehicle for testing and evaluating several major alternatives for asking the race and ethnicity questions. It studied how the proposed alternatives affected the distribution and the quality of responses compared with the 1990 census questions.
- The 1996 Community Census tested features of the use of sampling and estimation to reduce the undercount on American Indian Reservations and in an inter-city urban community. Some of these features included techniques for measuring coverage in

housing units, use of administrative records for coverage improvement, and experimental questions designed to within household coverage.

IV. Design Decisions and Final Testing

The 1995 Census Test had demonstrated the operational feasibility of many of the ideas and new design alternatives that had been considered throughout the planning process for Census 2000. Based on these results and in consideration of the advice and recommendations for the Task Force, the National Academy of Science Panels, and other advisory groups, the Census Bureau established a basic set of guiding objectives for Census 2000. These objectives were as follows:

- Make unprecedented efforts to count every household and person--from simpler, user-friendly forms to better design of census operations.
- Maintain an open process that diverse groups and interests can understand and support.
- Eliminate the differential undercount of racial and ethnic groups.
- Produce a “one-number” census that is right the first time.

To achieve the above objectives, the Census Bureau developed a set of strategies to ensure successful operational implementation of the fundamental design changes. These operational strategies included the following basic principles:

Build partnerships at every stage of the census process. The early decade planning process had demonstrated the advantages of an inclusive process for developing ideas about approaches to census taking. Further, it was clear that the Census Bureau could not accomplish its goals alone. So for Census 2000 we are reaching out in an unprecedented manner and forming partnerships to help us accomplish our objectives. The idea is to think in terms of the “best in class” provider. Which means that the Census Bureau is developing partnerships with other Federal agencies, with state, local, and tribal governments for a variety of census tasks from address list development to outreach and promotion. We also are forming partnerships with national nongovernmental organizations and local community groups for census promotion and assistance in enumeration activities. Finally, in concert with the “best in class” approach, we have formed partnerships with the private sector for such tasks as advertising and promotion, data processing, and telephone customer service.

Keep it simple. The simpler and easier Census 2000 is, the greater the response and the more accurate and less expensive it will be. Simplicity is the goal for every part of the process. No where is this strategy more evident than in the methods we will employ to allow the public to respond to the census. From the use of easy to complete questionnaires, to multiple mail contacts to encourage census participation, to multiple ways of responding, Census 2000 is dedicated to being customer friendly.

Use technology intelligently. Dramatic advances in computing will allow Census 2000 to be simpler and more accurate. Thus, digital capture of forms using electronic image systems, the use of matching software to spot multiple enumerations, and “point and click” systems for providing census data tabulations to users via Internet are all examples of cutting edge technology being used to support Census 2000 operations and processes.

Use statistical methods. Sampling and estimation have been an integral part of our country’s census process since 1940. For example, at one time the census asked every household for all the census information; now most census questions are asked of a sample of households. Our original plan was to expand the use of statistical methods by using these techniques to produce more accurate results at lower costs. In the 1990 census respondents who did not return their questionnaire by mail cost the Census Bureau considerable more than those who did. So, we had planned to select a sample for follow-up of those household who did not respond by mail or electronic means to the census. (As explained in the section on legal and policy issues, this approach is no longer legally permissible.) Further, our experience from the last six decennial censuses has demonstrated that having responses from 100 percent of the households will not ensure inclusion of 100 percent of the population. People are left out for many reasons, and our objective is to account for everyone. To check the quality of the our work and to reach the goal of accounting for 100 percent of the population, we plan to use the results of a very large coverage measurement survey to correct for net coverage errors in the census counts. (Again, as explained in the section on legal and policy issues, this plan has been modified to fit within the framework prescribed by the Courts concerning the use of sampling and estimation to produce certain classes of data from the decennial census.)

As a final pre-Census 2000 demonstration of the above basic strategies and methods, the Census Bureau conducted the Census 2000 Dress Rehearsal in 1998. The Census 2000 Dress Rehearsal, as its precursor in past censuses, was designed as a platform for live testing of the full array of systems, methods, and procedures planned for a census in a census-like environment. Thus, for the dress rehearsal, we selected sites based on their likeness to some of the typical situations we could expect to find challenging in the census itself. Three areas were selected, including an ethnic diverse urban setting (Sacramento, CA.), a mixed small city-suburban-rural area (eleven counties in South Carolina, including the city of Columbia), and a rural county containing an American Indian Reservation (Menominee County, WI). Within these areas we planned to demonstrate the Census 2000 plans under development for Census 2000. However, the dress rehearsal became embroiled in the political and legal debate surrounding the issue of the use of sampling and estimation to produce the census count. (See legal and policy discussion below.) To address these policy and legal issues, the Administration and the Congress reached a compromise whereby one of the sites (South Carolina counties) would be enumerated using components of a census that did not use sampling and estimation to produce the count, whereas the other two sites (Sacramento and Menominee County) would proceed with implementation of the census plan that used sampling and estimation to produce the census count. At the end of this process, a rigorous examination of the results of the two distinct census taking approaches would be used to inform a decision for Census 2000 methodology. As we discuss in the

next section, however, an independent evaluation of the dress rehearsal results to inform a decision for Census 2000 would be supplanted by a legal decision on the role of sampling and estimation in the census.

V. Policy and Legal Issues

The role of sampling and estimation in determining the count has been at the core of the major legal and policy debates about the most recent United States censuses. Following the 1970 and the 1980 census, in which the use of statistical coverage measurement programs on a large scale not only highlighted under coverage problems but pointed to possible methodological solutions to those problems, the possibility of using such techniques in this fashion has been sharply debated. More recently during the 1990 census, the Census Bureau incorporated the possibility of using coverage measurement techniques as a means for correcting deficiencies in the basic enumeration count. While the 1990 census plan did not incorporate an up front use of coverage measurement results to produce the count, it did stipulate the use of such measures after evaluating the basic enumeration results against a set of pre-defined standards. As it happened, the verdict following the 1990 census was mixed, while overall counts at large geographic levels would have been improved by the application of coverage measurement "adjustments," that was not always the case at lower geographic levels, such as census blocks. Faced with those mixed results, the Secretary of the Commerce decided to forego an adjustment of the basic enumeration results by using a statistical adjustment. As a result of that decision, several jurisdictions launched legal challenges to the census results, essentially demanding that the coverage measurement based adjusted numbers be recognized as the official census numbers. These legal challenges to the census results stretched far into the decade with the last case not being decided until 1996 by the U.S. Supreme Court, in favor of the position against the use of statistical adjustment taken by the Secretary of Commerce.

As part of the planning process for Census 2000, the Census Bureau and its key advisors sought an early legal opinion regarding the legal standing of the use of sampling and estimation to obtain the census count. As stated elsewhere in this paper, the use of sampling and estimation for Census 2000 was viewed as desirable not only as a means of addressing the problem of under coverage, especially among racial and ethnic minority people, but as a means for census cost containment as well. The latter was deemed to be especially important as well as necessary given some disturbing trends regarding public response to the census as well as perceived difficulties in hiring and retaining the very large temporary workforce needed to conduct the follow-up operations. The Census Bureau decided, based on legal advice, to rigorously incorporate statistical methods for producing the count for Census 2000. Thus, instead of including the results of such methods after the fact as planned for the 1990 census, the Census Bureau decided to incorporate these methods as an integral part of the basic census process and by so doing, produce a "one-number census."

These plans were challenged by the U.S. Congress during the planning for the Census 2000 Dress Rehearsal. As part of the budget negotiation process between the Administration and the

Congress for the fiscal year 1999, the Census Bureau was required to develop two separate plans for Census 2000, one that did not incorporate the use of sampling and estimation to derive the count, along with the Administration plan that did. Moreover, as mentioned elsewhere in this paper, the Census Bureau was required to demonstrate both plans during its dress rehearsal. Yet another part of the budget compromise between the Administration and the Congress endorsed the process for an expedited Federal Court decision on the legality (including Constitutionality) of the use of statistical methods to derive the census count.

Two separate court cases were introduced challenging the Administration's Census 2000 plans in 1998. Both cases, one introduced by a group of local governments and the other by the Speaker of the U.S. House of Representatives himself, were ruled in favor of the plaintiffs later that same year. Both cases were decided not based on the Constitutional issue, both on the census statute which was interpreted to preclude the use of sampling and estimation to produce the count used to apportionment the members of the U.S. House of Representatives among the 50 states. The Administration appealed the lower court rulings to the Supreme Court, which in turn upheld the lower court ruling in one of the cases in February 1999.

Faced with the Supreme Court ruling, the Census Bureau revised its plans for Census 2000. No longer allowed to use sampling and estimation to produce the apportionment count, it dropped altogether the plan to use sampling for following up nonresponding households. That still left open, however, the use of coverage measurement results for census data products other than the apportionment count. Thus, the current plan for Census 2000 is to produce two sets of numbers, one with and one without the use of sampling and estimation. To fulfill the legal requirements for the count used to apportionment the members of the U.S. House of Representatives among the states, the Census Bureau will use an enhanced set of traditional enumeration methods. The Census Bureau recently announced that it will use the results of a very large coverage measurement survey to adjust the counts for all other data products, including data used to draw Congressional and state legislative districts, formula based Federal funds transfer programs, etc. That strategy also is being strongly debated in the political arena and thus could change.

VI. Conclusion

The planning and development of the United States Census 2000 has been one of the most challenging and contentious of any in our nation's history. Throughout the planning process, the Census Bureau has been guided by advice and recommendations from a wide diversity of stakeholders and interest groups. That planning process has benefited greatly from such involvement--and the ultimate implementation of Census 2000 will benefit from the fact that the Census Bureau did reach out for consultation, early and frequently, from not only these groups but to the nation, its communities and their people. While the political and legal debate about the conduct of the census has at times seemed counter productive, it has focused the questions about the role of the census in the public policy arena. Ultimately, the success of Census 2000 will depend not only on how well it is planned and implemented, but also to a very large extent on

how well it is perceived by those who are asked to participate in it and by those who depend on its results.

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