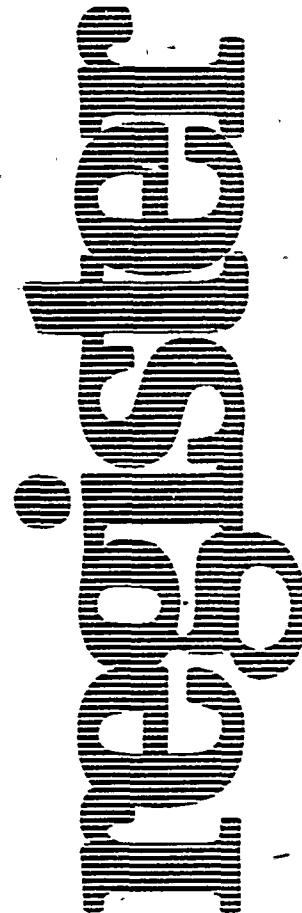


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Tuesday  
December 16, 1980



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## Part VI

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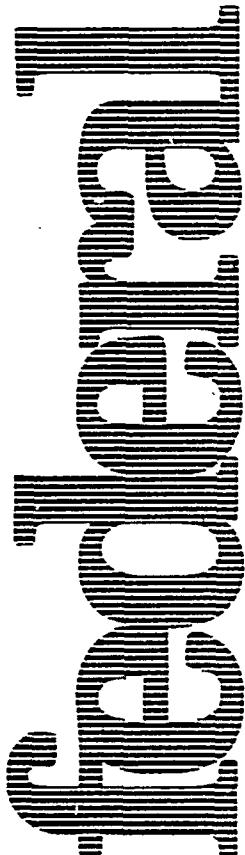
# Department of Commerce

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Bureau of the Census

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Position on Adjustment of the 1980  
Census Counts for Underenumeration



**DEPARTMENT OF COMMERCE****Bureau of the Census****Position on Adjustment of the 1980 Census Counts for Underenumeration**

Consistent with the May 13, 1980 directive of the Secretary of Commerce, the Bureau of the Census has now completed a thorough and open review of the census undercount adjustment issue and has arrived at a decision on adjustment of 1980 census results. The process leading to the decision included a review of preliminary results from the census; the eliciting of comments from Federal agencies and interested parties among the general public; the implementation of our 1980 evaluation efforts; and the initiation of further planning in this area designed to improve the measurement process.

This notice transmits the Census Bureau's decision on whether and how a statistical adjustment of census data should be implemented. This decision is presented independent of the pending judicial actions that may impose other procedures, timing, or applications.

Dated: December 11, 1980.

Vincent P. Barabba,  
*Director, Bureau of the Census.*

**Note.**—This paper describes how the Bureau of the Census will treat the undercount adjustment question in the absence of judicial or congressional decisions to the contrary.

**Executive Summary**

Undercounting the population in decennial censuses has long been a concern of elected officials, researchers and the public. Prior to the 1980 census, such undercoverage became a major statistical issue in large part because of the distribution of large sums of Federal funds to State and local governments on the basis of decennial census data. This controversy has generated proposals, legislative initiatives, and lawsuits which would result in a statistical adjustment of 1980 census counts to include estimates for those believed to have been omitted from the actual enumeration.

The Bureau of the Census has committed itself to deal with the undercount issue in a careful, systematic, and open way, so that decisions on the questions of whether, when, and how to adjust for census undercount would be clearly understood, if not embraced, by all affected individuals and groups. The process employed was fully consistent with the directive of Philip M. Klutznick, Secretary of Commerce.

Paramount in the undercount adjustment decision, in the Bureau's view, is the completeness of coverage of the 1980 census. Therefore, the process was designed to provide adequate time for preliminary assessments of the contribution of the large investments that have been made in coverage improvement programs. Data now available show that these coverage improvement programs met with considerable success.

Indeed, preliminary field count data show an impressively larger count than anticipated on the basis of unadjusted precensus estimates. The official estimate of the population for April 1, 1980 was 221.7 million (the unadjusted 1970 census count plus births and net known immigration and minus deaths over the decade). Based on preliminary data for areas containing almost all of the nation's population we believe that the 1980 census count will fall within the range of 225.7 to 226.0 million. The Bureau's preferred demographic analysis estimate of the "true" population (exclusive of illegal residents) is near 226 million. Taken together, these figures indicate a tiny, or nonexistent measured undercount. In fact, as explained in Section II, there is some undercount, but it cannot be measured adequately because we have no method, at present, to measure the number of illegal residents. As a result, our best estimate of the "true" population does not include illegal residents. The apparent zero undercount results from the underenumeration of legal residents being offset by enumeration of illegal residents.

The improvement in the 1980 census count and the inability to accurately measure the size and distribution of the illegal population are the determining factors in the undercount adjustment question as far as the 1980 census counts are concerned. At present, the Bureau has no sound statistical basis for estimating the true undercount or introducing adjustments.

Therefore, were it not for the existence of a court order requiring an adjustment of the 1980 census data (Detroit lawsuit) the Bureau would not introduce adjustments for the undercount. Should that court order be reversed, the Bureau plans to report and certify to the President final tabulated census counts, with no statistical adjustment, as the official population data for use in apportionment of representatives in the House of Representatives and for all other official purposes. If permitted, the Bureau plans to publish the entire series of decennial

census statistical reports without adjustment for undercount.

Well before the census data were available to dictate a decision on statistical grounds, the Bureau was engaged in a comprehensive, systematic assessment of the issue. The findings of the final stages of that process are an important adjunct of the current decision and in the determination of how the Bureau will deal with this issue in the future. In particular, in moving toward a decision, the Bureau carefully identified the most critical assumptions that provide the basis for decisions about adjustment. These assumptions and the reactions to them represent a wide range of contributions made by many individuals and organizations outside the Bureau as well as through a major conference and two staff workshops on this subject.

The process revealed a continuing need for research and development in the area of undercount adjustment. Thus, while the regular census tabulation and publication programs proceed in accord with established guidelines, the Bureau's evaluation and undercount analysis programs will be accelerated. As in the past, undercount research findings will be published promptly and consultation with users and interested researchers will be initiated in many forums. Unlike the patterns followed in the 1970's and 1960's, however, the Bureau will directly utilize undercount research findings in its post-census estimates programs as warranted. That is, if contrary to our current expectations, the research and evaluation results indicate that undercount adjustments to specific areas would clearly improve the Bureau's overall postcensal estimates of the population and its characteristics, such adjustments would be introduced in postcensal estimates programs. Because most revenue-sharing and block grant programs use postcensal estimates in fund distribution, this decision would mean that adjusted data would be used in the distribution of funds through allocation programs.

In considering any such adjustments, the key criteria will be to adjust only when there is clear statistical evidence of overall improvement in accuracy. In the past, the Bureau has led the statistical profession by pointing out the strengths and limitations of the data it produces. In continuance of this tradition, the Bureau will provide, along with any significant adjustments, a package of supporting analyses, error measures where possible, specification of assumptions, as well as follow its

practice of dialogues with users and other interested parties.

#### Section I.—Introduction.

This document presents the conclusions arising from a systematic analysis and evaluation process designed to provide an appropriate decision on whether, when, and how to adjust population and related socioeconomic data generated by the U.S. Bureau of the Census to correct for underenumeration in the decennial census. The guidance of Secretary Klutznick on this subject and the principal steps and administrative framework for making the decision, adopted in response to his directive, are presented in Appendix A.

The prime factor in the undercount adjustment decision, of course, is the completeness of the 1980 census count, or, less positively, the estimated size and statistical methods available for measuring the census undercount. Section II of this document presents the latest information on the size of the population count and revised estimates of the "true" population based on demographic analysis. A list of articles, monographs and reports that provide definitions of terms, the analytic foundation and important evaluations of the statistical and conceptual aspects of the undercount issue is provided in Appendix B.

Although a decision not to adjust the census counts automatically follows from the data presented in Section II, the findings of an extensive process to reach a decision are relevant and important on the grounds that undercount adjustment may still prove to be desirable in the Bureau's post-census estimates programs. Therefore, Section III of this paper summarizes the general public comment arising from the assumption testing process. Section IV of this paper further analyzes the user reaction and the available evidence bearing on individual key assumptions underlying the undercount adjustment decision.

The final section of the paper summarizes grounds for the decision not to adjust the 1980 census counts of population and related socioeconomic data for undercount, and explains briefly the Bureau's ongoing commitment to undercount research and to improvement of our postcensal estimates.

The decision not to adjust the 1980 census counts was reached on the basis of technical and operational considerations in the context of comprehensive assessments of current and future user and stakeholder needs; it is, therefore, independent of the

various pending judicial actions that may impose other decisions. This is particularly true for the Detroit lawsuit,<sup>1</sup> where a decision now under appeal would require adjustment of the 1980 census counts to be used to apportion the U.S. House of Representatives and to redistrict within States. Thus, this paper presents the decision that the Bureau will implement if permitted to do so by the absence of conflicting judicial decisions or congressional acts.

#### Section II.—The 1980 census count and estimated "true" population.

As part of its ongoing responsibilities, the Census Bureau developed an official estimate of the resident population of the United States for April 1, 1980, prior

<sup>1</sup> *Young v. Klutznick*, Civil Action 60-71330, U.S. District Court, Eastern District of Michigan.

to the 1980 census. The Bureau's population estimates are developed using the "component method". This method starts with the previous census count, adds births and known net immigration, and subtracts deaths during the intervening period to obtain the official estimate for the relevant point in time. For the 1980 census date, this process led to an estimate that the enumerated population would total 221.7 million persons. That estimate provided a planning figure for the census. This method has worked well in past censuses to predict the final census count. As shown in the following tabulation, the final census count and the component method estimates were virtually identical for the 1960 census and within two-tenths of one percent for 1970.

#### Derivation of Resident Population Estimates

[In thousands]

	1950 to 1960	1960 to 1970	1970 to 1980
Starting census count	151,326	179,323	203,235
Plus: Births over the decade	+40,963	+39,073	+33,239
Plus: Known immigration over the decade and net movement of Armed Forces to overseas posts	+2,645	+3,427	+4,474
Minus: Deaths over the decade	-15,608	-18,508	-19,275
Equals planning estimates for next census	179,326	203,614	221,673
Census count	179,323	203,235	221,673
Difference	-3	-379	

NOTE.—The figures do not include any allowance for undocumented residents or net illegal immigration.

The component method does not make allowance for underenumeration in the previous census, so there is an undercount in the estimate for 1980. In the case of 1980, the postcensal estimate of 221.7 million is about 2 percent below the Bureau's preferred estimate of the "true" resident population as discussed in the section on estimates of the "true" population.

#### Preliminary 1980 Census Counts

Unlike the experience of 1960 and 1970, it is now clear that the 1980 census count will exceed the April 1980 population estimate by a very large margin. That expectation is based on preliminary field count figures for areas in which about 99.9 percent of the U.S. population resides. The preliminary tally of the population in those areas is 1.6 percent higher than the official estimates of the population residing in those geographic areas and the minimum final count for the Nation as a whole has reached 225.2 million. Because additional persons not in the preliminary field count tallies (such as late enumerations from the "Were You Counted" and local review programs,

and additions from unclassified units) will also be included, the final count now is expected to be between 225.7 and 226.0 million persons.

This information, while preliminary, reliably shows that the 1980 census count will reflect significant gains in coverage over the 1970 experience and relative to the official precensal estimate. Indeed, the likely final count is more than 4.0 million above the official estimate and a final count of 226 million would represent the enumeration of 4.3 million more persons than the official estimate.

The apparent improvement in coverage doubtless resulted in part from the pervasive support of citizens, business, labor, the media and local, State and Federal officials. The improvement in coverage, however, is somewhat smaller than it appears from the summary estimates, since some unknown, and probably unknowable, number of illegal residents was counted in the census. To the extent that illegal residents were counted and to the extent that they are not reflected in the official precensal population estimates,

they make census coverage impossible to calculate with an appropriate degree of reliability.

#### *Estimating the "True" Population*

The Census Bureau has maintained a strong and continuing undercount research commitment which has two prime objectives:

First, to improve its performance in subsequent censuses (and surveys), such as it clearly has done in 1980, by developing the fullest possible understanding of the sources and scale of underenumeration; and

Second, to inform users of the strengths and weaknesses of the data from each census so that this information might be taken into account in analytic and programmatic applications.

The goals of census-taking improvement and evaluation of the quality of data for various uses were well-served by the publication of analytic reports after the 1950, 1960, and 1970 censuses. These reports detailed the methodology, limitations, range of estimates, and, finally, discussed the "preferred" estimate of the level of undercount. In this process, the Bureau developed a "preferred" estimate of the Nation's "true" population using demographic analysis. (The "true" population minus the census count provides the estimate undercount). In 1970, the "true" population was estimated to be 208.5 million.

In the cases of undercount estimates for 1950 and 1960, the initial estimates of net national undercount were revised with the availability of comprehensive new data after the next census. The same procedure was to be followed in the present situation; that is, revised 1970 census undercount estimates were to be developed as soon as the relevant data were available from the 1980 census. However, because of the urgencies of the undercount adjustment issue, the Bureau accelerated all aspects of its review and revision of the 1970 census undercount estimates that could be done without the final census data for 1980 to ensure that all relevant data were used to address the undercount adjustment issue.

This review indicated that the estimated net undercount for 1970 was overstated by approximately 800,000 persons (Appendix C). This new information, together with other recent statistics and analysis, led to net reduction of almost 200,000 in the estimate of population growth for the period of 1970-1980. These changes left the "preferred" estimate of the Nation's "true" legal resident population as of

April 1, 1980 at around 226 million (based on demographic analysis).

This estimate of the "true" population, which relies on the demographic method, ignores the accepted fact of a significant increase in the number of illegal, "undocumented" residents in the United States between 1970 and 1980; the unknown and currently unmeasurable level of this undocumented population resident in the United States; and the high probability that the illegal population is meaningfully represented in the large increase in the population count over the official unadjusted population estimate.

The relative undercount probably was considerably smaller in 1980 than in earlier censuses but its extent and distribution cannot be reliably defined or estimated because we are not able to measure how many illegals were present and counted. In the absence of reliable information on illegals, and in light of the data now in hand, it is clear that the "true" population and, hence, the undercount for 1980 cannot be reliably estimated in the near term, if at all. Because of the much smaller measured undercount, it is our firm judgment on statistical grounds that adjustments for undercount are not in the public interest.

#### *Section III.—General public comment on undercount adjustment.*

The Census Bureau has come to its decision about adjustment for census undercount in an open and participatory manner as possible. To that end, stakeholders in the public and private sectors have been invited to participate fully in the process of identifying, analyzing and discussing the issues. Each step of the process has been fully documented and reports have been published by the Bureau to encourage and solicit the fullest possible participation by interested parties.

This procedure is part of a tested process for dealing with relatively unstructured problems. As part of the process, two staff workshops were organized according to the guidelines of a decision-making system, in which participants were divided into groups according to contrasting views and positions. Each group surfaced assumptions and challenged the assumptions of other groups. Through this exercise, a wide range of views and issues emerged, and these were coupled to facts that strengthened or weakened specific assumptions as well as identified the individuals or segments of the public that supported these assumptions and have perceived stakes in the outcome of the decision process.

Following the second staff workshop on undercount adjustment held

September 2-5, 1980, a document outlining the basis for the adjustment decision was produced. In *Proceedings of the Second Census Undercount Workshop* critical assumptions, supporting evidence and rebuttals that would need to be considered in addressing the question, "Should the Census Bureau adjust the 1980 Census results for purposes other than apportionment?", were spelled out in detail. In deciding whether or not to adjust census results, the Bureau assumed, based on Constitutional and statutory grounds, that only the unadjusted actual counts could be used for reapportioning the U.S. House of Representatives.<sup>2</sup>

The assumptions and rebuttals reflected our knowledge of the census operations, past undercounts, the many uses of census data and the concerns of users, and the state of the knowledge at the Bureau and among other statisticians of methods of measuring census undercounts and their reliability.

The document was widely circulated to stimulate reaction and comment: it was sent to all members of census advisory committees and to all Members of Congress; it was published on 2 consecutive days in the *Federal Register*; its contents were described to the press; the head of each Federal agency that uses census data received copies; and copies were distributed to all persons who requested them. This final pre-decision solicitation of views and reactions provided a wide range of comments.

Although any undercount adjustment would have many consequences throughout the decade, many comments centered on the implications of the decision for the distribution of Federal and State revenues to subordinate units of government on the basis of census and post-census data. Implications for research program planning and other applications also were discussed in many comments. This section summarizes the general comments of stakeholders<sup>3</sup> on the assumptions the Bureau staff considered most critical in making the decisions on whether, when and how to adjust for the undercount.

#### *Comments From Federal Agencies*

As might be expected in light of their operational, administrative and public information uses of census data, comments from Federal agencies focused on the need for timeliness and internal consistency in census data. All

<sup>2</sup>See Section D, *Proceedings of the Second Census Undercount Workshop*.

<sup>3</sup>The individuals and institutions commenting are listed in Appendix D.

the agencies fully support efforts to improve accuracy, but they also indicated that adjustment procedures should not delay incorporation of new census data in their programs.

Because many Federal agencies are dependent on small area data for distributions of funds and planning programs dependent on small area data, if a decision to adjust were made, they urged adjustments for all levels of geographic detail. Several agencies noted that adjustments of 1980 data to increase accuracy would not necessarily ensure equity in the application of data in Federal programs. Some funding programs, for example, are based on change over time. Adjustments to attain greater accuracy in 1980 census data may in fact distort measures of change from data from 1970 or intercensal estimates. Thus, several agencies commented that without undercount adjustments of 1960 and 1970 census data, and intercensal estimates, validity of the application of adjusted 1980 census data would be vulnerable to judicial challenge.

In the interest of timeliness and consistency, Federal agencies generally support the issuance of one official set of unadjusted census data released without delay.

#### *Comments From Minority Group Representatives*

Responses from minority group representatives universally supported undercount adjustment for purposes of reapportionment and all applications in public programs, especially those involving fund distributions. Minority group representatives expressed the conviction that the census has significantly undercounted their populations and that adjustment for separate geographic areas is necessary for equitable political representation and program participation. Several of the groups, for whom no separate coverage estimates have been developed, urged that such estimates be developed and applied.

#### *Comments From Technical Advisory Committee Members and Academics*

Comments received from academic researchers reflected a general concern for accuracy and the timely release of census data. This user group relies on census data for analytical work and requires data that are internally consistent for characteristics as well as the population totals. Several comments reflected an awareness that the preliminary census results imply a relatively small undercount in the 1980 census and expressed concern that an adjustment procedure may introduce

more error than is present in the actual (unadjusted) count. Several of the letters expressed opinions about delays in timing and possible misgivings about the technical accuracy of available adjustment methodologies. In a related area, depositions by experts in the statistical and demographic disciplines have expressed concern about the accuracy of undercount measurement.

#### *Comments From Cities and Other Governmental Units*

Comments from persons representing cities and regions varied considerably. Those cities that felt they would gain through an adjustment, based upon the assumption that the experiences from 1970 would hold true again in 1980, were strongly in favor of undercount adjustment. In the main, those favoring adjustment were "Snowbelt" cities, which have lost population recently. By contrast, "Sunbelt" cities, which have gained population, generally felt that an adjustment of census counts was not necessary, and that the coverage improvement procedures used in 1980 had worked to get a good count. Some expressed the concern that if an adjustment was done, the northern cities would gain more political power than they deserved.

Representatives from planning commissions strongly expressed their concern that consistency be maintained in the data, that is, internal consistency for 1980 census results at all geographic levels and for socioeconomic and housing characteristics as well as consistency over time, so that trend data would be preserved. One opinion expressed was that not only there not be an adjustment for undercount, but that there should be an adjustment to remove those undocumented aliens who were counted.

#### *Public Comment*

Comments were received from a few individual citizens. These uniformly were against adjustment; they generally felt that the count should reflect only the number of persons who made the effort to be counted. Some persons perceived that an adjustment in 1980 could lay the groundwork for the manipulation of future censuses for political reasons. One writer proposed that political subdivisions that felt they had not been properly counted share in the cost of a recount.

#### *Section IV.—Assessment of the validity of the assumptions.*

In this section, the key assumptions to undercount adjustment decisions are examined with reference to this basic question: *Should the Census Bureau adjust the 1980 Census counts for*

*purposes other than apportionment?* A "Yes" answer to this question requires that facilitating, statistical and user-oriented assumptions be accepted as plausible. However, rejection of any major assumption because the rebuttals are stronger means that the answer to this question should be "No."

The assumptions are organized into three categories: the first one dealing with assumptions necessary to carry out the adjustment, the second with assumptions necessary to satisfy user needs, and the third with technical statistical assumptions. Critical individual assumptions are discussed individually on the pages shown in the margin below and the full detail of specific supporting material and rebuttals identified at the second staff workshop on undercount adjustment is reproduced in Appendix E. These are the same assumptions that appeared in the report on the September 1980 Workshop.

#### *Critical Facilitating Assumptions*

1. The Census Bureau is recognized as having the ability to objectively make and defend the appropriate decision on whether or not to adjust census data. If the adjustments are to be made, the Census Bureau should formulate the procedures. This will promote a high standard of statistical rigor and encourage the appropriate use of census results. (page 6 in Appendix E)

1a. A Census Bureau adjustment procedure would be recognized as legally acceptable, meeting professional standards and providing users with more accurate data and would be perceived as equitable. (App. E-4)

2. The Census Bureau will continually examine, evaluate, and share its understanding of undercoverage throughout the decade. (App. E-2)

#### *Critical User-Oriented Assumptions*

3. Recognizing the present limits of technical feasibility, affected parties will accept and find useful initial adjustments for larger geographic areas only, despite program requirements for data for smaller areas. (App. E-10)

4. In order for adjustment to improve program effectiveness, program agencies will require adjustment for key demographic characteristics, such as age and income, as well as for total population counts; adjustment for a limited number of key characteristics will satisfy the most important program needs. (App. E-13)

#### *Critical Statistical Assumptions*

5. The Census Bureau has the ability to develop a statistical and analytical methodology which will permit

adjustment of *critical variables* (e.g., selected subnational geographical units and selected characteristics) in a timely fashion. (App. E-3)

6. A simple synthetic adjustment procedure would not satisfy the Census Bureau's standards for accuracy. (App. E-8)

7. Given the estimated magnitude of the undocumented alien population and the fact that our policy was to count all residents, it is important to include the development of an estimate of their "true" number as part of the 1980 Census evaluation and statistical adjustment program of the Census Bureau. (App. E-14)

#### *Critical Facilitating Assumptions*

*Assumption 1. The Census Bureau is recognized as having the ability to objectively make and defend the appropriate decision on whether or not to adjust census data. If the adjustments are to be made, the Census Bureau should formulate the procedures. This will promote a high standard of statistical rigor and encourage the appropriate use of census results.*

The Bureau has systematically studied the undercount problem and took the lead in analyzing the problem and its consequences. The Bureau has the appropriate technical skills, resources, and specialized knowledge to develop and implement a procedure for adjusting census data, and, of equal significance, has the organizational responsibility via statute, administrative order and judicial interpretations. Most affected parties have strongly expressed their opinions that, if an adjustment is justified by statistical evidence, the Bureau should make the actual adjustment rather than anyone else. No one has questioned the Bureau's competence in this area, nor its objectivity or integrity. Official statistics issued by the Bureau are accepted by the public as impartial, and free of vested interests. However, more than one stakeholder felt that it was appropriate for the Courts to make the decision about whether or not to adjust, and that it was the duty of the Census Bureau to act upon that decision by providing appropriate methodology. It was also suggested that the only manner in which the Bureau could ensure appropriate use of data is to produce one set of adjusted estimates that are internally consistent. This assumption is warranted and facilitates a decision to adjust if it is justified on other grounds.

*Assumption 1a. A Census Bureau adjustment procedure would be recognized as legally acceptable, meeting professional standards and providing users with more accurate*

*data, and would be perceived as equitable.*

This assumption is related to Assumption 1 and is warranted on essentially the same grounds. However, its acceptance is based on the care the Bureau has shown in the past in making similar decisions. In supporting this assumption, supporters recognize that the Bureau may decide not to adjust on the basis that the prime methods available to adjust have serious shortcomings; namely, estimates of undercount from demographic analysis are subject to unknown errors, especially in the net immigration component. Undercount estimates from the Post Enumeration Program surely will be subject to high sampling variances and nonsampling statistical and operational features that contribute to bias, some of which cannot be adequately measured by available techniques. Beyond measuring the undercount itself, studies of synthetic estimates used for subnational or sub-State distribution of adjustment have shown that any areas with undercount rates much above or below the national average would be adjusted in such a way that the error in the undercount adjustment would be high.

If an adjustment were to be made, however, responses to the Bureau (and the current experience of the Bureau in the courts) reveal that this would be acceptable to some groups and very unacceptable to others. The Census Bureau has stated that its concern is with accuracy and has taken the position that greater accuracy of the data would, by definition, provide greater equity. However, one respondent rejected this equation, saying that the Bureau was overly concerned with accuracy, that this concern would delay production of adjusted data, and that the delay in itself would be inequitable to the groups that were undercounted.

*Assumption 2. The Census Bureau will continually examine, evaluate, and share its understanding of undercoverage throughout the decade.*

This assumption is warranted but does not necessarily facilitate a decision to adjust. Clearly, the Bureau has the responsibility to continue to improve the state of the art by striving to achieve greater statistical accuracy in coverage estimates and in all other aspects of the quality of data. A continuing reevaluation of coverage would provide the flexibility to respond to methodological advances, new data, and changes in policies, programs, and enabling legislation. Furthermore, an ongoing program would permit expansion of the number and kinds of areas covered and would contribute to

accuracy as more data and refined methods are employed.

If a revision were made, however, reevaluation would likely result in increased sets of revised numbers, and this would lead to confusion among data users as to which data sets should be used for various purposes. Most stakeholders need data with which they can plan and allocate resources for program uses relatively rapidly. They prefer that only one official set of data that is internally consistent be produced—and that needs for timeliness as well as consistency, over time and internally, be given due weight in the decision.

#### *Critical User-Oriented Assumptions*

*Assumption 3. Recognizing the present limits of technical feasibility, affected parties will accept and find useful initial adjustments for larger geographic areas only, despite program requirements for data for smaller areas.*

This assumption is warranted in the eyes of some stakeholders and unwarranted for others. For purposes of program administration, all users expressed their need for internally consistent data. That is, if adjustments are made, adjusted data are necessary for key socioeconomic characteristics as well as for all geographic levels. Some program managers, recognizing comprehensive adjustment is not currently possible, would prefer to have the unadjusted census results released for their uses. Unadjusted data clearly have the advantage of being timelier and internally consistent. Some programs require use of trend data, and for these purposes, census data should be consistent over time. The indications of a smaller relative undercount in 1980 than in 1970 and 1960 already poses a problem for such programs.

For those concerned about program participation, the demand for undercount adjustment of decennial census data stems in large part from the conviction that differential population undercoverage, especially of Black and Spanish-origin populations, produces serious inequity in the administration of Federal and State programs, especially those which distribute funds according to statistical formulas. Because data for small areas are frequently required, many participants argue that limited area adjustments are not adequate because stakeholders' program interests would be in constant conflict and that litigation and efforts to obtain administrative relief would be costly and erode confidence in the Nation's data resources. In this context, all Federal agencies and most participants indicated that adjustment should be

applied to all geographic levels which have program applicability.

Most program administrators' comments noted that unadjusted census data have been adequate in the past partly because they provide internally consistent figures for use in program administration and formula grants but mainly because there is no objective evidence that adjustment would necessarily improve equity in their programs.

*Assumption 4. In order for adjustment to improve program effectiveness, program agencies will require adjustment for key demographic characteristics, such as age and income, as well as for total population counts; adjustment for a limited number of key characteristics will satisfy the most important program needs.*

Government agencies are dependent on accurate, internally consistent distributions of the population for certain demographic characteristics in order to carry out major program directives. Thus, this assumption imposes a major constraint on a decision to adjust in that the time it may take to implement an adjustment would not satisfy agency needs for timely and internally consistent data.

Stakeholders have expressed their need for census data that are consistent for all characteristics and at all geographic levels. Adjustment for some characteristics but not others would not fill all the data requirements and would result in an inconsistent set of data. The result could be that users would apply some factor to the data for the remaining unadjusted characteristics in order to obtain "consistency," but such efforts could instead bring the data further from the truth. Thus, program agencies have indicated that if adjustment is warranted, program and research needs will dictate simultaneous adjustment of more than a limited number of key characteristics. On balance, this assumption is implausible.

#### Critical Statistical Assumptions

*Assumption 5. The Census Bureau has the ability to develop a statistical and analytical methodology which will permit adjustment of critical variables (e.g., selected subnational geographical units and selected characteristics) in a timely fashion.*

In light of the large census count, this assumption is not warranted. Furthermore, there is a concern within the professional statistical community that the work being developed on estimation of census coverage and on adjustment techniques is at the "frontier" and is not yet ready for implementation. On this general topic,

Professor Ansley J. Coale, a prominent researcher on undercounts since the 1950's, said "I personally doubt that it would have been possible to provide good estimates [of undercount] of individual geographic areas in 1970; it appears clearly impossible in 1980."

Professor T. James Trussell has stated "Since it cannot be convincingly argued that adjustment will produce results nearer the true distribution of the population of the United States, adjusted census counts should not be used for purposes of apportionment, redistricting, or distribution of Federal funds." In the summer of 1980, the Census Bureau assembled a panel of distinguished researchers to discuss the undercount adjustment issue. The consensus view of this panel was that the measurement of undercount by either the demographic method or by the Post Enumeration Program was not statistically defensible to use as the basis for adjusting census counts. Nevertheless, in the past, when the Census Bureau has been confronted with a significant information need, it has been able, over time, to develop a statistically acceptable procedure for generating the required information. As discussed in the conclusion, time for further research and methods development is needed to evaluate fully how undercount research findings can be properly introduced into the intercensal estimates program.

*Assumption 6. A simple synthetic adjustment procedure would not satisfy the Census Bureau's standards for accuracy.*

This assumption is related to Assumption 5 and is warranted for essentially the same reasons that Assumption 5 is rejected. In this context, Professor Nathan Keyfitz has said, "If the [measured] national undercount is 1 percent or less, it is my opinion that no means of measuring or distributing that undercount at the subnational level exists that is statistically defensible, given the data likely to be available for this decennial census." The Bureau's analyses of 1970 Census undercount show that geographic variation is substantial. The simple synthetic method is not sensitive to this variation, and can, in fact, introduce serious distortions not present in the unadjusted data. If the 1980 undercount for specific age/race/sex groups were shown to be proportionate among subnational geographic units, the simple synthetic method could be acceptable, but an even distribution of undercount is highly unlikely.

*Assumption 7. Given the estimated magnitude of the undocumented alien*

*population and the fact that our policy was to count all residents, it is important to include the development of an estimate of their "true" number as part of the 1980 Census evaluation and statistical adjustment program of the Census Bureau.*

This assumption is warranted. The stated policy of the Census Bureau, based on historical interpretation of the Constitution, is to enumerate all residents of the U.S. regardless of legal status. Ultimately, a valid estimate of the undercount using demographic methods cannot be made without including an estimate of undocumented residents in the estimate of the "true" population. Since some undocumented residents were likely to have been counted in the 1980 Census, they must also be accounted for in the national population estimates for consistency in making an adjustment. This assumption was supported by most respondents; however, several stakeholders felt that an estimate of the illegal resident population should be developed in order to take them out of the population counted for apportionment purposes. The Bureau does not now have any adequate methodology to estimate the number of undocumented residents nationally or for geographic subdivisions and it may not be possible to derive an estimate of undocumented immigrants to be included in the estimated "true" population. This assumption precludes a decision to adjust the census counts in the current situation.

#### Section V.—Conclusions.

In summary, the Bureau now has considerable reliable information on the population count in the 1980 Census. These data indicate that the final census count will fall between 225.7 and 226 million persons, some 4.0 to 4.3 million more persons than suggested by the Bureau's precensus estimate. If, as now seems likely, the population count reaches 226 million, this figure will equal the revised estimate of the "true" population determined through demographic analysis—implying a measured undercount of zero. In fact, as explained in Section II, there is some undercount, but it cannot be measured adequately because we have no method, at present, to measure the number of illegal residents. As a result, our best estimate of the "true population does not include illegal residents. The apparent zero undercount results from the underenumeration of legal residents being offset by enumeration of illegal residents.

With improved coverage and the problem of illegal residents who cannot now be accommodated in the

demographic analysis technique the method of demographic analysis and its supporting data base are not sufficient to measure the undercount, and there is no assurance that any alternative methods would adequately measure the undercount. Indeed, non-Bureau experts in demography and statistics, and members of Census Bureau Technical Advisory Committees have generally concluded that, in light of the improved coverage indicated by the count, no reasonable and generally supportable rationale for adjustment of the census counts now exists.

In the absence of a current reliable method of measuring the undercount in 1980, it would be irresponsible to implement any undercount adjustment at the national, State or sub-State levels. Thus, unless otherwise directed by the courts or statute, the Bureau will not introduce any any undercount adjustment into the 1980 census counts. In compliance with existing statutory deadlines, the Bureau will report and certify to the President final tabulated census counts, with no undercount adjustment, as the official population counts for use in apportionment of representatives in the House of Representatives and for all other official purposes. The Bureau will publish the entire series of census statistical reports without adjustment for undercount.

Even with this decision dictated by the improved count, the concern about the undercount issue will remain. So, while census tabulation and publication programs are proceeding in accord with established guidelines, the census evaluation and undercount analyses programs will move ahead vigorously. Research on the undocumented residents problem will be given high priority and Bureau proposals to support research initiatives in the areas of emigration and immigration will be submitted for consideration for funding. As in the past, research findings will be published promptly and appropriate consultation with users and interested researchers will be initiated in many forums.

Unlike the patterns followed in the 1970's and 1960's, however, the Bureau will consider the direct use of research findings on the level of the undercount in its postcensal estimates programs. That is, if findings indicate that specific undercount adjustments would improve the Bureau's postcensal estimates of the population and its characteristics, such adjustment would be introduced in postcensal estimates programs.

In some respects, our approach would be similar to the Australian government's method of dealing with undercoverage. In Australia, as in the

United States, population counts are used in allocation of electoral seats and funds to States. After the 1976 Census of Population in Australia, the Post-Enumeration Survey (PES) revealed substantial variation in amount of undercount between States. The census results, themselves, were published without any adjustment. However, based upon the results of the PES, it was decided that the population figures should be adjusted for undercount, that these adjusted figures should be used for allocation, and that the adjusted figures would be the official population figures updated annually in the population estimates series to be used for all purposes.

In Australia, adjustments based on age and sex were made to the State and the Local Government authorities levels. Overall, the 1976 figures were adjusted up by 2.7 percent. The Australians felt confident about the adjustments to the State level but not about those below the State level. However, on an area basis, no adjustment greater than 4 percent was made and no adjustments were negative. To provide smooth trend data, the figures for 1961 were left unadjusted, but those for 1966 and 1971 were adjusted up by 0.5 and 1.35 percent, respectively. (Thus, the historical series was smoothed but some underenumeration was left for 1966 and 1971.)

#### *An Illustration of How Intercensal Adjustment Could Work*

The Census Bureau develops national population estimates between censuses using the component method. In this method, the count from the last census is increased by births and net immigration in the period since the last census and reduced by deaths since the last census, as in the simplified hypothetical example for a three-year period shown below:

Census count (Year T)	200.0
Plus: births from T to T+3	+6.0
Plus: net immigration from T to T+3	+.7
Minus: deaths from T to T+3	-3.7
Equals: current estimate (T+3)	203.0

The procedure, of course, is much more complex in terms of its detail (including as it does separate age, sex and race categories) and is modified or supplemented in a variety of ways (including use of administrative data and other estimation methods) for compiling population-estimates below the national level (such as for 39,000 geopolitical areas for general revenue sharing).

In the past, the Bureau has not introduced any adjustment for

undercount in its postcensal estimates. In the future, adjustment for undercount may be undertaken if statistical standards and user needs are met by such an adjustment. To illustrate how any such adjustment might operate, a hypothetical example is provided in the tabulation below:

	Group 1			Total
	1	2	3	
Census count (T)	150.0	25.0	25.0	200.0
Plus: undercount adjustment (T)	1.0	.5	.5	2.0
Plus: births (T to T+3)	4.4	.8	.8	6.0
Plus: net immigration (T to T+3)	.5	.1	.1	.7
Minus: deaths	-3.0	-.3	-.4	-3.7
Equals: Population estimate (T+3)	152.9	20.1	26.0	205.0

<sup>1</sup>The groups, for example, could be age, sex, and race categories.

Based on past Bureau policy, the base for postcensal estimates was the unadjusted census count. As noted above, that restraint will no longer apply and adjustment for undercount may be included in the base if statistical standards and user needs are met by such an adjustment. It cannot be said at this time whether undercount adjustment will or will not be made since it is contingent on the evidence of measurable undercounts and reasonable confidence that adjustments would improve the accuracy and utility of statistics. More discussion of this will be contained in forthcoming reports dealing with the evaluation of the current postcensal population estimates program, methods for improving these estimates during the 1980's, and the 1980 census results and procedures.

#### *Concluding Comment*

The notion of altering census figures to correct for deficiencies is probably as old as the Republic; it is said that Thomas Jefferson, in corresponding with his European friends about the 1790 Census, made red pencil additions to census figures he judged to be incomplete. The basis for doing that now, however, has surely changed in two centuries; to alter the figures, we must "get it right." Ideally, each challenge to the accuracy of a census should be accompanied by a proposed remedy; perfection is but a goal, but improvement is an obligation shared by all. *Introduction to Reasoning*, a book by Stephen Toulmin, Richard Rieke, and Allan Jarik, helped us address the need for a collective and transactive evaluation of the grounds for undercount adjustment; two paragraphs from the book clearly point to the direction the

Bureau has tried to take to identify its objectives.

Reasoning, then, comes into play as a means of providing support for our ideas when they are open to challenge and criticism. This is not to say that procedures of reasoning always take place later in time than the formation of the ideas that call them forth. Since reasoning (or the providing of good reasons) plays so important and widespread a part in our culture, we often begin to test our ideas in a critical manner and think over the available reasons for or against them as soon as we first have the ideas. In a form of thinking that might be called *intrapersonal communication*, we imagine ourselves sharing an idea with other people and rehearse the questions they might ask and the challenges they might make to our supporting reasons.

In the course of this rehearsal, we may be able to refine and improve on the reasons in support of the idea, and so we finally arrive at a point where we can "go public," confident in our ability to justify it. Or alternatively, we may find ourselves recognizing so many arguments against the idea that we decide to forget it altogether or never to make it public. In either case, the "transactive" character of reasoning is preserved, at any rate to the extent that we criticize it with an eye to its "visibility" within a collective debate—in terms of either how certain specific people would respond to it or in terms of some more overall picture of the kinds of people who might attack the idea. (Will our argument have to be presented to a jury, to a group of professional scientists, to a political meeting, or to whom?) So once again, the standards for judging even this "intrapersonal" reasoning must respect the claims of the forum in which it will eventually have to make its way.

The census undercount adjustment issue has brought the Census Bureau into a swirl of conflicting currents of legal, political, and technical ideas in search of the most appropriate statistical instruments to apportion political strength and economic resources. The search does not end with this report, nor with the considerable success of the 1980 census, nor with the Bureau itself. Statisticians engage in what is possible; legislators and legal scholars must help decide what is right and what is best. Debates about the census will continue, as they should, and they will help the Bureau achieve future improvements. Meanwhile, tens of thousands of people will use the census results for good purpose, because they have no equal.

#### Appendix A

May 13, 1980.

Memorandum for: Vincent Barabba, Director, Bureau of the Census

Through: Courtenay M. Slater, C.M.S., Chief Economist for the Department of Commerce

Subject: 1980 Census: Statistical Adjustment for Undercoverage

Apparent undercoverage in previous decennial censuses has led to widespread interest in the possibility of statistical adjustments to the 1980 census date. Extraordinary efforts have been undertaken by the Census Bureau to achieve the most complete coverage possible in 1980. The extent of any undercount will not be known for some months. You are now engaged in an active and systematic process of examining the validity of various methods of measuring and analyzing a possible undercount in the 1980 Census, as well as the desirability of making adjustments once the existence and extent of an undercount is determined. This process should continue with the following guidelines.

1. Planning for and execution of a program to evaluate census data should continue to be given high priority by the Bureau and should proceed as expeditiously as is consistent with good professional standards.

2. There should be full and frequent consultation with the Chief Economist and the General Counsel throughout this process.

3. Federal agencies and interested parties among the general public should be kept informed regarding the Bureau's examination of this issue and should be given adequate opportunity to comment on the approach being taken by the Bureau.

The culmination of this process should be a decision by the Director of the Census Bureau on whether and how any statistical adjustment should be made to 1980 census data. This decision should take full cognizance of the importance of:

(1) the need for confidence that any adjustment will produce more accurate information regarding the distribution of the population and the relevant characteristics of that population;

(2) the defensibility of any adjustment methodology that may be used;

(3) a continued public perception of the accuracy, reliability, and objectivity of census data; and

(4) the very great public need for accurate and timely data about the U.S. population and its characteristics.

Even if there were some basis for an adjustment of the population count to be used for apportionment of the House of Representatives, I do not believe that any adjustment can be made prior to the statutory deadline for the delivery of this information to the President. I do expect, however, that by the end of this calendar year, or shortly thereafter, you will be prepared to announce a decision on adjusting the census data for other uses.

I should appreciate receiving from you a detailed description of the process to be followed in arriving at the above decision, and shall expect you to take direct personal charge of this process.

Philip M. Klutznick,  
*Secretary of Commerce.*

#### Appendix B.—References and Background Material

##### *Discussion Toward the 1980 Undercount Adjustment Decision*

1. Bounpane, Peter, and Meyer Zitter. "Technical Issues in Adjusting for the Census

Undercount," presented at the 1980 Annual Meeting of the American Statistical Association, Houston, Texas: August 11-14, 1980.

2. Letter to the Honorable William Lehman, Chairman, Subcommittee on Census and Population, House Committee on Post Office and Civil Service, from the Comptroller General of the United States, November 9, 1978, CGD-79-7.

3. National Academy of Sciences, National Research Council, Assembly of Behavioral and Social Sciences, Committee on National Statistics, Panel on Decennial Census Plans. *Counting the People in 1980: An Appraisal of Census Plans*. Washington, DC: 1978.

4. Passel, Jeffrey S. and Jacob S. Siegel. "Measuring the Coverage of the Hispanic Population of the United States in the 1970 Census by Demographic Analysis," revised version of a paper presented at the 1979 Annual Meeting of the Southwestern Social Science Association, Fort Worth, Texas: March 28-31, 1979.

5. Siegel, Jacob S., Jeffrey S. Passel and J. Gregory Robinson. "Preliminary Review of Existing Studies of the Number of Illegal Residents in the United States," Working paper for the research staff of the Select Commission on Immigration and Refugee Policy, January 1980.

6. U.S. Bureau of Census. *Conference on Census Undercount, Proceedings of the 1980 Conference*. Washington, DC: July 1980. See especially:

"The Census Bureau Experience and Plans," Jacob S. Siegel and Charles D. Jones  
"Adjusting for Decennial Census Undercount: An Environmental Impact Statement," Peter K. Francese  
"The Impact of Census Undercoverage on Federal Programs," Courtenay M. Slater  
"The Impact of the Undercount on State and Local Government Transfers," Herrington J. Bryce

"Should the Census Count Be Adjusted for Allocation Purposes: Equity Considerations," Ian P. Fellegi

7. U.S. Bureau of the Census. "Coverage of Population in the 1970 Census and Some Implications for Public Programs," *Current Population Reports*, Series P-23, No. 56, Washington, DC: U.S. Government Printing Office, 1975.

8. U.S. Bureau of the Census. 1970 Census of Population and Housing, *Evaluation and Research Program*, "Estimates of Coverage of Population by Sex, Race, and Age: Demographic Analysis" Issued February 1974, Reprinted June 1978.

9. U.S. Bureau of the Census. *Proceedings of the Census Undercount Workshop*, September 5-8, 1979, Washington, DC: October 2, 1979.

##### *Framework for the Decisionmaking Process*

10. Mason, Richard O. and Ian I. Mitroff, *A Primer for SAST: Strategic Assumption Testing and Surfacing for Strategic Management*.

11. Toulmin, Stephen, Richard Rieke and Allan Janik. *An Introduction to Reasoning*. New York: Macmillan Publishing Co., Inc., 1978.

**Appendix C.—Revised Demographic Analysis Estimate of Corrected Population as of April 1, 1980**

This Appendix provides an explanation of revisions in the demographic analysis estimate of the corrected population of the United States for April 1, 1980.

In a press release issued in April 1973, the Census Bureau announced its "preferred" estimate of the undercount in the 1970 Census at 5.3 million, or 2.5 percent of the 1970 population. This estimate was based on the method of demographic analysis, using principally the data then available on births, deaths, immigration and emigration, and Medicare enrollments. Combining the estimated undercount in 1970 (5.3 million) and the unadjusted postcensal estimate of the population for April 1, 1980 (221.7 million), provides the estimate of the corrected population on April 1, 1980, 227.0 million.

An improved estimate of the corrected population on April 1, 1980 has now been developed. Additional, empirically-based research, particularly relating to emigration, indicates that the corrected population for April 1, 1980 should be lower than 227.0 million. The new evidence indicates far higher estimates of emigration for the 1970-80 and 1960-70 decades than were employed in deriving the previous estimates of the corrected population for 1970 and for 1980. The other components have also been examined but reestimation of these components has a smaller effect on the estimates of corrected population. The table below sets forth modifications in the components underlying the estimates of corrected population:

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(Figures in thousands)

1. Published 4/1/80 population estimate (1970 Census + 1970-80 components)	221,672
2. Plus: "Preferred" estimate of 1970 undercount	<u>+5,328</u>
3. Equals: Corrected 4/1/80 population	227,000
4. Adjustments based on newly incorporated data:	
a. Revision in estimate of emigration, 1960-70 (cohorts 5-64 on 4/1/70) Current figure: 181 (Foreign-born = 45 Native = 136) Revised figure for foreign-born = 981 Adjustment in foreign-born figure = 981 - 45 = 936	-936 ----- -813
b. Adjustment in corrected Medicare figure, 4/1/70	<u>+123</u>
c. Revision in estimate of emigration, 1970-80 (all ages) Current figure: 360 (Foreign-born = 90 Native = 270) Revised figure for foreign-born = 730 Adjustment in foreign-born figure = 730 - 90 = 640	-640 ----- -172
d. Revision in estimate of migration from Puerto Rico, 1970-80	<u>+244</u>
e. Correction for underregistration of births, 1970-80	<u>+224</u>
5. Revised corrected population, 4/1/80	226,015

Reestimates of emigration between 1960 and 1970, completed after the undercount estimates for 1970 were issued and, therefore, not integrated into the corrected estimates, indicate that emigration during this period was much greater than previously allowed. This recalculation of emigration, which was based on an analysis of the data on the foreign-born population in the 1970 and 1960 Censuses, indicates that emigration was about 936,000 greater than allowed in previous estimates.<sup>a</sup> In addition, a revised estimate of corrected Medicare enrollments for 1970, based on Medicare enrollments for 1975, raises the population 65 and over in that year by 123,000. The net effect of these adjustments is to lower the estimated undercount in 1970 from 5.3 million to 4.5 million.

A revised estimate of emigration for 1970-80 has also just been developed on the basis of a recently completed analysis of tabulations of the foreign-born population from the November 1979 and November 1969 Current Population Surveys. This analysis, which was supported by an analysis of the annual Alien Address registrations for 1970 to 1976 and an analyses of data on Social Security beneficiaries abroad, indicates an understatement in the previous estimate of emigration during the decade of 640,000. On the other hand, new data on migration between Puerto Rico and the United States between 1970 and 1980 raises the estimate of net movement from Puerto Rico to the United States employed previously by about 244,000. A reexamination of the birth statistics for 1970-80 indicated the need to make a small allowance for underregistration, amounting to 224,000.

The net effect of the revised estimates of immigration and emigration for the 1970-80 period and of a correction for underregistration of births for 1970-80 is to further reduce the corrected population for April 1, 1980 by 172,000. Taking the adjustments for the entire 1980-80 period into account results in a reduction of the corrected population for April 1, 1980 of 1.0 million, or from 227.0 million to 226.0 million.

The estimate of net immigration employed in developing the estimate of corrected population for 1980 does not include an allowance for the net immigration of illegals to that date. Deaths of illegals would be included in the death component, however. We do not have a satisfactory basis for estimating the number of illegal residents or the volume of net illegal immigration. We have been unable, therefore, to take account of them in our estimates of corrected population.

#### Appendix D.—Persons Commenting on Undercount Adjustment Assumptions

Comments on the key assumptions presented in the *Proceedings of the Second Census Undercount Workshop* were received from the individuals and institutions listed below:

<sup>a</sup> Robert Warren and Jennifer Marks Peck, "Foreign-Born Emigration from the United States, 1960 to 1970," *Demography*, Vol. 17, No. 1 (February 1980), pp. 71-81.

#### Members of Census Technical Advisory Committees

- Samuel Preston, Chairman, Graduate Group in Demography, University of Pennsylvania
- Reynolds Farley, Population Studies Center, University of Michigan
- Charles Nam, Director, Center for the Study of Population, Florida State University
- Catherine Shaw Bell, Department of Economics, Wellesley College
- William Kruskal, Department of Statistics, University of Chicago
- Leon Pritzker, Anheuser-Busch Companies
- National Social Science and Law Foundation

#### Representatives of Cities and Areas

- Mayor, Montgomery, Alabama
- Senator Walter D. Huddleston, Kentucky
- Speaker Thomas O'Neill, Massachusetts, Boston Redevelopment Authority
- Congressman Bob Eckhardt, Texas
- Atlanta Regional Commission—Executive Director
- Atlanta Regional Commission—City of East Point
- Chattanooga Hamilton County Regional Planning Commission
- Cambridge, Massachusetts
- New York State
- Detroit Planning Department
- Detroit Executive Office
- City of Greensboro, Community Development Planning Division
- American Planning Association

#### Minority Interests

- Mexican American Legal Defense and Educational Fund (MALDEF)
- Puerto Rican Legal Defense and Education Fund
- Native American Rights Fund
- Louisiana Equal Opportunity Association
- Japanese American Citizens League
- Manoranjan Dutta, Professor of Economics, Rutgers University Member of Census Advisory Committee for Asian and Pacific Islanders

#### Other Government

- Department of Labor, Bureau of Labor Statistics
- Department of Health and Human Services, National Center for Health Statistics
- Department of Housing and Urban Development

#### Appendix E.—The Basic Question and Critical Assumptions

As noted in the introduction and discussed fully in section D, we have argued that Federal statutes do not permit us to adjust census results for purposes of apportionment, and are convinced that it is not operationally feasible to do so in accordance with timing requirements as set forth in Federal law.

Issues concerning adjustment go well beyond these purposes, however, and the resolution of those issues will have consequences throughout the decade. Principal among them is the distribution of Federal and State revenues to subordinate units of government on the basis of decennial census data, and on population and income

estimates compiled regularly between censuses from other sources and linked in various ways to census results.

Through the workshop process many issues and assumptions were thoroughly discussed and debated (see Appendix B). This section examines only those considered most critical in making the decisions on whether, when, and how to adjust, without extensive discussion of specific end uses of census information. The format for discussing the critical assumptions provides key premises, supporting information, and possible rebuttals to the assumption. This approach is intended to encourage the reader to react to specific as well as general points; to defend, reject, or modify assumptions; or to present counterarguments. Although predispositions are not entirely avoidable, we have attempted to develop an approach that provides a reasonably neutral framework for comment.

The assumptions are examined with reference to this basic question: *Should the Census Bureau adjust the 1980 census results for purposes other than apportionment?*

A "Yes" answer to this question requires that certain critical assumptions be accepted as plausible.

If, however, the assumptions are rejected because the rebuttals are considered stronger, then the answer to this question should be "No."

These assumptions are organized around three broad premises and supporting statements shown on the following page and discussed later in terms of specific assumptions and rebuttals beginning on the pages noted in the margin. Background materials are listed in Appendix C.

#### Critical Assumption

The Census Bureau will continually examine, evaluate, and share its understanding of undercoverage throughout the decade.

#### Basis of Assumption

The Bureau has the responsibility to continue to improve the state of the art by striving to achieve greater statistical accuracy in coverage estimates.

#### Supporting Information

1. The Bureau has historically advanced the level of knowledge regarding undercoverage estimates.
2. An ongoing program permits expansion of the number and kinds of areas covered and would contribute to accuracy as more data and refined methods are employed.
3. The continuing reevaluation of coverage provides the flexibility to respond to methodological advances, new data, and changes in policies, programs, and enabling legislation.
4. This policy is in line with the traditional approach of revising and improving current data series.
5. Work is continuing on the development of undercoverage estimates for Hispanics, since this group may be affected by specific programs.
6. The present schedule of research and evaluation work calls for different pieces of information to become available at different points in time.

***Rebuttal***

1. Once a revision is made, reevaluation will result in increased demands for revised numbers, and this will lead to confusion among data users as to which data sets should be used for various purposes.

2. The Bureau often neglects to anticipate the broad consequences of an issue. Thus an announcement of new findings which the Bureau regards merely as technical improvements may have widespread impact that the Bureau fails to recognize in advance.

3. Lack of congressional or administration support could result in budgetary constraints limiting the Bureau's work in this area.

4. Changes in type of funding or a reduction in funding for the census count in 1990 may occur if, for example, Congress argues that based upon 1980 results, adjustments are cheaper and more accurate.

5. The census count is recognized to be the best measure of the U.S. population. Doing anything to that count might not necessarily improve it.

***Critical Assumption***

The Census Bureau has the ability to develop a statistical and analytical methodology which will permit adjustment of critical variables (e.g., selected subnational geographic units and selected characteristics) in a timely fashion.

***Basis of Assumption***

In the past, when the Census Bureau has been confronted with a significant information need, it has been able, over time, to develop a statistically acceptable procedure for generating the required information.

***Supporting Information***

1. The need for credible employment statistics during the Depression era was the impetus for the development of sample survey methodology leading to the Current Population Survey.

2. General Revenue Sharing generated the need for current estimates of the population for 39,000 general-purpose governments.

3. The Bureau has experimented with and tested the following methodologies which have shown some promise:

- a. Matching studies
- b. Demographic analysis
- c. Regression analysis or refined synthetic estimation

4. The Bureau is supporting research related to adjustment methodologies.

5. The Bureau has been able to rearrange priorities to expedite carrying out the Post Enumeration Program.

6. The Bureau will have available throughout the next 3 years the results of the Post Enumeration Program, which should provide the following:

- a. Estimates of undercount for total population at the State level.

b. Estimates of undercount by region for age, sex, race, and Hispanic origin.

c. Information about undercount related to income, education, labor force, urban vs. rural, and metropolitan vs. nonmetropolitan areas that could be used in regression analysis or in refined synthetic estimation.

***Rebuttal***

1. Although the need to generate "adjusted" totals for geographic subdivisions has existed for the past couple of decades, the Bureau has not yet developed a procedure it is willing to implement today.

2. Results of the 1980 census test program, especially for Oakland and Richmond, indicate there are a number of difficulties in the match studies that still need to be resolved.

3. There is a stated concern within the professional statistical community that the techniques being developed are at the "frontier" and are not yet ready for implementation.

***Critical Assumption***

A Census Bureau adjustment procedure would be recognized as equitable, legally acceptable, meeting professional standards, and providing users with more accurate data.

***Basis of Assumption***

In the past, the need to provide adjustment procedures to take care of nonresponse and undercoverage biases has resulted in the development of statistically acceptable and useful procedures.

***Supporting Information***

1. Survey undercoverage in the Current Population Survey is adjusted for by using the ratio of survey estimates to independently derived population control totals. (The control totals are based on previous census data, which do not include adjustments for undercoverage in the census.)

2. To improve coverage in the 1978 Census of Agriculture, a direct enumeration of an area sample was used to supplement mailing lists. Since the sample data provided reliable estimates for State totals only, data for lower levels were not adjusted. Both adjusted State totals and unadjusted data below the State level were published. The size of the adjustment from the area sample was also published with the adjusted State data.

3. There currently is being developed an adjustment procedure (based on direct estimates of the undercount) for the national and State levels, using data which will be available from demographic analysis and the Post Enumeration Program.

4. A study of the effect of population adjustment on General Revenue Sharing allocations in two States showed that most areas tended to move in the direction of their "proper" allotment (although this means a decrease in allotment for most areas), "proper" being determined by both population and income adjustments.

5. The National Academy of Sciences' panel on decennial census plans concluded that "inequities resulting from the geographic differentials in the decennial census undercount could be reduced by adjustment of the data for underenumeration."

6. The courts, in the past, have upheld Bureau procedures because they could be shown to be neither arbitrary nor capricious.

***Rebuttal***

1. Currently there is no adequate methodology for measuring the quality (limitations) of adjusted figures at geographic levels below the State.

2. Studies of synthetic estimates have shown that any areas with undercount rates much above or below the national average would be adjusted in such a way that error rates for those areas would be high.

3. Estimates from demographic analysis are subject to unknown errors, especially in the net immigration component.

4. Examination of the effects of an adjustment procedure on allocation of funds will result in the realization that there are more "losers" than "winners."

***Critical Assumption***

The Census Bureau is recognized as having the ability to objectively make and defend the appropriate decision on whether or not to adjust. If adjustments are to be made, the Census Bureau should formulate the procedures. This will promote a high standard of statistical rigor and encourage the appropriate use of census results.

***Basis of Assumption***

The Bureau has long been recognized as an agency of unquestioned integrity. It has a history of systematically studying the undercount problem and took the lead in bringing the issue into the open. The Bureau has the appropriate technical skills, resources, and specialized knowledge to develop and implement a procedure for adjusting census data.

***Supporting Information***

1. Bureau leadership in this area will enhance the credibility of the results, in view of the Bureau's accumulation of information on the undercount not shared by other organizations.

2. Official statistics issued by the Bureau are accepted by the public as impartial and free of vested interests.

3. Legislators, program administrators, and courts of law give sanction to census data as official Government statistics.

4. Affected parties have strongly expressed their opinions that the Bureau should make the adjustment. No one has questioned the Bureau's competence in this area, nor its objectivity or integrity.

5. Through conferences and workshops, the Bureau encouraged discussion and debate on the adjustment issue so that all relevant information could be considered in arriving at a sound decision.

6. A large-scale Post Enumeration Program is in place and funded; it will provide the necessary information for adjustments for States and other subnational areas.

***Rebuttal***

1. Census statistics are in the public domain; users are free to accept, modify, or reject them (and sometimes do).

2. The judiciary has not always prescribed the use of decennial census figures when superior data are available from a source other than the Census Bureau.

3. Census data are used for a multitude of purposes; adjusted data are not appropriate for all of them. The responsibility for proper use of data, including appropriate adjustments, rests with the user.

4. There are other reputable institutions that can produce adjusted census data which would be acceptable for many purposes.

5. Equity is essentially a political issue, and the decision whether or not to adjust census data should be made by Congress, not by the Census Bureau.

#### Critical Assumption

A simple synthetic adjustment procedure would not satisfy the Census Bureau's standards for accuracy.

#### Basis of Assumption

The Bureau implements new statistical methods only when certain general standards of data quality can be satisfied.

#### Supporting Information

1. A most important criterion is that there should be some knowledge of the limitations of the data to reduce misuse of statistics that are not fully reliable.

2. The Bureau's analyses of 1970 census undercount show that geographic variation is substantial. The simple synthetic method is not sensitive to this variation, and can, in fact, introduce serious defects not present in the unadjusted data.

3. If the undercount for specific age/race/sex groups were the same among subunits below the national level, the method would be acceptable.

4. The simple synthetic method is dependent on readily available independent estimates of undercount for population subgroups, and therefore provides no direct means for adjusting for undercounts of Hispanics.

5. Bureau research, and comparable studies by Canada for its census, demonstrate that adjustments by this method would produce more errors than superior methods that can be refined as more information is available from evaluation projects.

#### Rebuttal

1. The simple synthetic method is uncomplicated, easily understood, and timely. Its use would produce acceptable results on the average.

2. In view of the important and immediate uses of census results, adoption of the simple synthetic method will produce adjusted data quickly, and such data will correct for some of the most serious defects of unadjusted data.

3. The Bureau has an obligation to reduce statistical inequity even though the method used may not satisfy its highest standards of data quality.

4. The National Urban League recommends that synthetic adjustments be used for States and local areas and that the national undercount rate for Blacks be used for subnational adjustment for the Hispanic undercount.

5. Application of the simple synthetic method requires only that the null hypothesis be satisfied—that there is no statistically significant difference in undercoverage rates among geographic areas.

6. Alternatives to the synthetic method depend partly on demographic analysis, for which a number of questionable assumptions must be made to derive national undercount estimates.

7. According to the National Commission on Employment and Unemployment Statistics, adjustments for undercount in

labor force statistics by use of the synthetic method would be smaller in magnitude than the adjustments the Census Bureau traditionally makes to account for underreporting of income and unemployment in its Current Population Survey.

#### Critical Assumption

Recognizing the present limits of technical feasibility, affected parties will accept and find useful initial adjustments for larger geographic areas only, despite program requirements for data for smaller areas.

#### Basis of Assumption

The demand for statistical adjustment of decennial census data stems in large part from the conviction that differential population undercoverage, especially of minorities such as the Black and Spanish-origin populations, produces serious inequity in the administration of Federal and State programs, especially those which distribute funds according to statistical formulas. Adjustment for States and large metropolitan areas, which should be feasible by 1982, will be an important step toward improved program administration.

#### Supporting Information

1. Population data, both counts and characteristics, are key elements in many formulas used to distribute billions of dollars in Federal funds annually.

2. Partial adjustments, such as for selected geographic areas and key characteristics, would satisfy some program requirements.

3. About one-third of the population lives in the 30 largest SMSA's, for which adjustment is expected to be feasible within 2 years.

#### Rebuttal

1. Limited adjustments are not adequate:

a. An adjustment would be of dubious utility unless it applied to all geographic levels for which stakeholders have a program interest.

b. Many Federal agencies indicate that adjustment should be applied to all levels for which they have program responsibility.

2. Census results without adjustment are adequate; unadjusted census data have been valuable in the past and will continue to be useful, partly because they provide internally consistent figures for use in program administration and formula grants.

3. The Census Bureau should be in the counting business. Its staff is the most competent and highly regarded in that field.

4. Going beyond an absolute count would be to go outside of the mission of the Census to try to solve the problems of society.

#### Critical Assumption

No currently available adjustment procedure will provide more accurate numbers than the actual counts for all units of government or down to the block level; therefore, adjustments to relevant geographic levels must be made over time as procedures are refined geographically.

#### Basis of Assumption

None of the currently known procedures have been tested for their capability to measure the undercount at all levels for all units of government.

#### Supporting Information

1. There is a stated concern within the professional statistical community that the techniques being developed are still in the experimental stage and are not yet ready for implementation.

2. Canadian experience with reverse record checks indicates that simple synthetic adjustment might not be appropriate for geographic subdivisions below the regional level.

3. Comparisons of demographic estimates for States with those computed by synthetic methods also raise doubts about the accuracy of synthetic adjustment for small areas.

4. Demographic estimates are available only for the Nation and are still developmental for the States.

5. Standards against which to measure and evaluate adjustment procedures are not yet available for the smallest geographic areas.

6. To make estimates for every unit of government involves an assumption that undercount rates from the sample area apply to areas not in the sample.

7. Even though more accurate numbers cannot be provided for all units, it is important to increase the accuracy of as many as possible; improving the level of accuracy of some numbers is better than leaving them alone. Demographic estimates of national undercount by age, sex, and race will be available in the spring of 1981. Estimates of the undercount, based on evaluation studies, for the States, the 30 largest SMSA's, and 10 cities, and for the Hispanic undercount at the national level, will be available in late 1981, and improvements in these estimates will be possible by 1983.

#### Rebuttal

1. Adjustments for smaller geographic areas could be made using various synthetic or regression techniques. Although the data might be of unknown accuracy, at least a complete set of "official" data would be available for program administration.

2. Multiple series of adjusted census data may be unacceptable to users of census data.

3. The Census Bureau may not be capable of handling the workload required to produce multiple sets of printed and taped census figures.

4. There would be "numerator-denominator" difficulties in Federal program implementation where unadjusted and adjusted figures had to be combined to produce rates and ratios for program analysis or fund allocation formulas.

5. Because of difficulties in producing small area detail counts and characteristics, publication of official data could be delayed with corresponding adverse effects on timely application of census results for policy planning and program implementation.

#### Critical Assumption

In order for adjustment to improve program effectiveness, program agencies will require adjustment for key demographic characteristics such as age and income; adjustment for a limited number of key characteristics will satisfy the most important program needs.

*Basis of Assumption*

Agencies are dependent on accurate distributions of the population by certain demographic characteristics in order to carry out major program goals.

*Supporting Information*

1. Adjustment for some areas and not others is acceptable for many programs.
2. Legislated programs are often targeted at specific segments of the population; for example, the Elementary and Secondary Education Act allocates funds on the basis of the number of children ages 5 through 17 in low-income families.
3. The distribution of General Revenue Sharing funds could be adjusted if and when adjustment factors are available for all geographic areas and for income.
4. Among the characteristics most commonly incorporated into funding formulas are race, age, per capita income, family income, and employment and unemployment.

*Rebuttal*

1. No timely adjustments are feasible:
  - a. Current methodology does not produce estimates of acceptable quality for the adjustment of characteristics.
  - b. The time it may take to implement an adjustment of this type will not satisfy agency needs for timely data.
2. A few adjustments are not enough:
  - a. Different adjustment techniques must be used for various characteristics. This will result in a combination of adjustment procedures ranging from very sophisticated to simple raking, and therefore, there may be inconsistencies in the data.
  - b. Program agencies have indicated the need for adjustment of many characteristics and will press for adjustment of more than a limited number of key characteristics.

*Critical Assumption*

Given the estimated magnitude of the undocumented-alien population and the fact that the Bureau's policy is to count all residents, it is important to include the development of an estimate of their "true" number as part of the 1980 census evaluation and statistical adjustment program.

*Basis for Assumption*

The stated policy of the Census Bureau is to enumerate all U.S. residents, regardless of legal status.

*Supporting Information*

1. Current interpretation of the Constitution indicates that the census should enumerate all residents.
2. Determining the legal status of respondents would be a complex legal undertaking and is not feasible or appropriate in a statistical activity such as the census.
3. Ultimately, a valid estimate of the undercount by demographic methods cannot be made without an estimate of undocumented residents in the estimate of the "true" population. Since some undocumented residents were likely to have been counted in the 1980 population census, they must also be accounted for in the national population estimates for consistency in making an adjustment.

4. Users of census data require complete information about all residents of the United States and its subnational areas.

5. Undocumented residents have an impact on economic and political life in the United States.

6. The speculative estimates of undocumented residents indicate this group may be a significant portion of the population. The number could be as high as several million.

7. Because of their reported concentration in certain areas of the country, the underenumeration of undocumented aliens could reduce political representation and funds allocated to certain States and cities.

*Rebuttal*

1. The Bureau does not now have a methodology to estimate the number of undocumented residents nationally or for geographic subdivisions, and the available evidence indicates an uneven geographic distribution of such persons.
2. It may not be possible to derive an estimate of undocumented immigrants to include in the estimated "true" population.
3. Including undocumented residents in the census or the undercount estimates may not be acceptable to Congress.
4. Even if no method is available to adjust for an undercount of undocumented aliens, that does not relieve the Bureau of the responsibility to adjust for other groups for which estimates are available.

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