April 11, 2001

The Honorable Richard B. Cheney
President
United States Senate
Washington, DC 20510

The Honorable J. Dennis Hastert
Speaker
United States House of Representatives
Washington, DC 20515

Dear Mr. President and Mr. Speaker:

Pursuant to P.L. 105-119, the Presidential Members of the U.S. Census Monitoring Board hereby transmit this semi-annual report to Congress.

Since our October 1, 2000 report, the Presidential Members have been working to monitor, analyze and review the Census Bureaus' final results for Census 2000.   In an effort to better understand the issues at hand, the Board commissioned nine research projects to analyze and evaluate the results of the 1990 undercount. The undercount and its effects had been identified by communities of interest i.e. community-based organizations, civil rights groups, state legislators and federal units who rely on accurate census data, as an issue that could have significant implications if the 1990 scenario was repeated. The findings of those research projects were published and public meetings were held in San Antonio, Texas; Phoenix, Arizona; Albuquerque, New Mexico; Chicago, Illinois, and in an event held at the National Press Club televised by C-SPAN. Their summaries are included in this report.

On December 28, 2000, the Census Bureau released the first results from Census 2000 which showed that the resident population of the U.S. on April 1, 2000 was 281,421,906. Following this announcement, Dr. Eugene Ericksen of Temple University and Dr. Jeffrey Passel of the Urban Institute began to analyze the data, evaluate methodology, pose questions and arrive at some basic conclusions. Their initial analysis of the number of errors and uncertain cases found that the numbers in 2000 were comparable to that of 1990, and that the Demographic Analysis, long used as the benchmark population estimate showed significant discrepancies among Demographic Analysis, the Accuracy and Coverage Evaluation (A.C.E), and the raw data. Their findings are also included in this report.

Finally, the recommendation by the Bureau's Executive Steering Committee on Accuracy and Coverage Evaluation Policy (ESCAP) and the Acting Director "that unadjusted census data be released as the Census Bureau's official redistricting data" was finalized by Secretary of Commerce Don Evans' decision on March 6, 2001. There is still an outstanding question as to who will make any subsequent decision regarding the accuracy and/or possible release of corrected data if and when the Bureau concludes its on-going analysis of A.C.E.

Therefore, based on the information learned from these activities, the following recommendations are provided:

1. That the Bureau continue its analysis of the 2000 census results to better understand the discrepancies that exist among the three units of measure and ultimately provide information regarding the value and accuracy of the data.

2. That the low Demographic Analysis total not be used as a basis for deciding against adjustment because current research offers (a) sound empirical evidence for the addition of a minimum of 2 million persons from these components; (b) reasonable evidence for an additional 1 million people; and (c) arguments that the number of people added should be even higher.

3. That the Bureau release all of the A.C.E. data as soon as possible for the purposes of further research.

Sincerely,

Gilbert F. Casellas
Co-Chair, Presidential Members

Lt. Governor Cruz M. Bustamante
Presidential Member

Everett M. Ehrlich
Presidential Member

Lorraine A. Green
Presidential Member

cc: Members of the 106th Congress
        The Honorable Donald Evans, Secretary of Commerce
        William G. Barron, Acting Director of the Bureau of the Census

U.S. CENSUS MONITORING BOARD, PRESIDENTIAL MEMBERS
REPORT TO CONGRESS
APRIL 2001

I.   Introduction

On December 28, 2000, the Census Bureau released the first results from Census 2000 which included national and statewide population totals. Statutory requirements specify that the Bureau use these totals to reapportion congressional seats. According to these raw numbers, the U.S. population as of April 1, 2000, was 281.4 million, up from 248.7 million in 1990, a gain of about 32 million people. The results confirmed major demographic shifts throughout the country, most notably the dramatic growth of the Hispanic and Asian American populations.

The national population figure was significantly higher than the Bureau's most recent population estimates, leading most census observers to conclude that the traditional head count taken last year was overall a very successful operation. We generally concur that the career professionals at the Bureau did a superb job preparing for and conducting Census 2000. It is clear that they did not sacrifice the accuracy of a traditional head count in favor of statistical adjustment methodology (a charge leveled throughout 1999 and 2000 by critics of the Bureau's operational plan). Indeed, there is widespread consensus among nonpartisan census experts that the Bureau strived to achieve the most accurate census possible by both traditional means of enumeration and modern scientific methods.

We applaud the Bureau for the success of Census 2000 and believe that Congress should be pleased with the results of this $7 billion endeavor. There is no dispute that the Bureau completed the nation's largest peacetime mobilization under budget and on time. Nearly one million persons were hired, 520 temporary local census offices were established, an unprecedented paid advertising program was implemented, and more than 140,000 local and national partnerships were formed.

As part of the operation, the Bureau's statistical experts, the most respected in the world, completed a massive post-enumeration survey of 314,000 households (called the Accuracy and Coverage Evaluation or A.C.E.) in order to assess the accuracy of the raw count and to quantify the inevitable errors that took place. Indeed, it is the A.C.E. program that allows us to measure the undercount and to reach the conclusion that the traditional enumeration was a success relative to 1990, generally considered a disaster. Still, as the preliminary results of A.C.E. have become clearer, there is little doubt that the so-called "actual enumeration" in 2000 included millions of errors and did not provide a complete picture of the American population.

It is disturbing that a disproportionate number of the undercounted were minorities. African Americans were missed three times as often as Whites; Hispanics were missed over four times as often; Native Hawaiians and Other Pacific Islanders were missed over six times as often; and American Indians were missed seven times as often. Young adult males were missed at nearly twice the rate of young adult females. The differential is also evident by income level. Renters were missed over six times as often as people who own their homes. [1]

The Presidential Members commissioned expert scientists to review and oversee the compilation and analysis of the data collected by the Census Bureau. Their findings have been discussed and presented to the public. In an effort to further understand questions that confront the Bureau regarding the 2000 Census results, their analysis has increased the dialogue on such topics as to why there is such discrepancy between the Bureau's three estimates of the population; has the number of immigrants increased over the last decade; and, does the differential undercount remain?

This report addresses errors in the raw data as well as problems in the demographic analysis. Additionally, nine reports were commissioned in order to better comprehend the real effects of a census undercount. Summaries of those findings are included in Section IV.

II.   Census 2000 Errors

As with any decennial census, it is impossible to conduct such a vast operation without errors. In the 2000 Census, there were a large number of errors and uncertain cases. We are especially concerned about the 6.4 million people missed and the 3.1 million people who were counted twice. As a result, there was a net undercount of 3.3 million people. The following is our analysis of the number of people missed by state. All numbers are net and therefore include both overcounts and undercounts.

Dr. Eugene P. Ericksen, a consultant to the Monitoring Board, a decennial census expert and professor of statistics at Temple University, estimated the undercount rates for all 50 states and the District of Columbia.

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[1] Undercount differential rates were calculated by dividing the undercount rate for Whites (.67) by the rates for Native Americans, Hispanics, Blacks, Native Hawaiians and Other Pacific Islanders. The undercount rate for males 18 – 29 years old (3.77) was divided by females 18 – 29 years old (2.23). The methodology used in calculating the undercount estimates can be found in Appendix A.

A Comparison of Net Undercount Rates by State and Percent Minority For 1990 and 2000				
State	Percent Minority [*]	Net Undercount 1990	Net Undercount Revised 2000**	Number of People Missed Revised 2000
Alabama	29.7%	1.8%	1.16%	52,192
Alaska	32.4%	2.0%	2.36%	15,153
Arizona	32.4%	2.4%	1.40%	72,849
Arkansas	21.4%	1.8%	1.24%	33,566
California	49.7%	2.7%	1.48%	508,831
Colorado	25.5%	2.1%	1.23%	53,564
Connecticut	22.5%	0.6%	0.94%	32,316
Delaware	27.5%	1.8%	1.46%	11,610
District of Columbia	67.8%	3.4%	2.02%	11,794
Florida	34.1%	2.0%	1.21%	195,755
Georgia	37.4%	2.2%	1.44%	119,607
Hawaii	77.1%	1.9%	2.10%	25,988
Idaho	12.0%	2.2%	1.60%	21,040
Illinois	32.2%	1.0%	0.84%	105,206
Indiana	14.2%	0.5%	0.74%	45,331
Iowa	7.4%	0.4%	0.47%	13,819
Kansas	16.9%	0.7%	0.64%	17,317
Kentucky	10.7%	1.6%	1.19%	48,676
Louisiana	37.5%	2.2%	1.30%	58,862
Maine	1.9%	0.7%	1.29%	16,661
Maryland	37.9%	2.1%	1.37%	73,570
Massachusetts	18.1%	0.5%	0.73%	46,689
Michigan	18.7%	0.7%	0.69%	69,052
Minnesota	11.1%	0.4%	0.28%	13,813
Mississippi	39.3%	2.1%	1.20%	34,551
Missouri	16.2%	0.6%	0.45%	25,292
Montana	10.5%	2.4%	1.53%	14,018
Nebraska	12.7%	0.7%	0.55%	9,464
Nevada	34.8%	2.3%	1.65%	33,524
New Hampshire	4.9%	0.8%	1.10%	13,745
New Jersey	34.0%	0.6%	1.13%	96,169
New Mexico	55.3%	3.1%	1.90%	35,231
New York	38.0%	1.5%	1.05%	201,367
North Carolina	29.8%	1.9%	1.32%	107,672
North Dakota	8.3%	0.7%	0.46%	2,968
Ohio	16.0%	0.7%	0.55%	62,788
Oklahoma	23.8%	1.8%	1.36%	47,576

Oregon	16.5%	1.9%	1.24%	42,958
Pennsylvania	15.9%	0.3%	0.79%	97,793
Rhode Island	17.5%	0.1%	0.82%	8,667
South Carolina	33.9%	2.0%	1.16%	47,086
South Dakota	12.0%	1.0%	0.54%	4,098
Tennessee	20.8%	1.8%	1.19%	68,518
Texas	47.6%	2.8%	1.72%	364,928
Utah	14.7%	1.7%	1.32%	29,872
Vermont	3.8%	1.1%	1.46%	9,021
Virginia	29.8%	2.0%	1.29%	92,506
Washington	21.1%	1.8%	1.38%	82,477
West Virginia	4.3%	1.4%	1.16%	21,223
Wisconsin	12.7%	0.6%	0.68%	36,723
Wyoming	10.2%	2.2%	1.52%	7,621

*Minority is here defined as all persons other than those identified as non-Hispanic white or more than one race.

**The Monitoring Board released undercount numbers March 28, 2001 by state that were updated on April 2, 2001 after Dr. Ericksen was able to discuss his findings with the Census Bureau.

Source: Census 2000 Redistricting Data (Public Law 94-171) Summary File/neraphl/user/share/Census2000/Phil Winterfeldt's Runs/ March 20, 2001/eppers9w6

The above chart gives the minority population for each state to show states with higher percentages of minorities have a higher net undercount. California remained the largest undercounted state with 508,831 people not counted. Other states with high undercounts included Texas (364,928), New York (201,367), Florida (195,755), Georgia (119,607), North Carolina (107,672), Illinois (105,206), Pennsylvania (97,793), and New Jersey (96,169).

As defined by the Census Bureau, census error consists of three components -- the numbers of omissions, erroneous enumerations, and non-data defined persons. Omissions are people who were missed in the census. Erroneous enumerations are people who were counted twice, counted in the wrong place, or should not have been counted at all (such as fictitious people, children born after April 1, 2000, and people who died before April 1). Non-data defined people, sometimes referred to as "whole-person imputations," are computer-generated estimates of the number or characteristics (such as age, sex or race) of people in a household.

In the 2000 Census results, there were areas of specific concern – not merely the existence of, but the large number of non-data defined people as well as re-instated possible duplications. These uncertain cases contain a high probability of error because there is so little information provided. There were 5.7 million non-data defined persons in the 2000 census, nearly three times the 2.2 million cases in 1990. Re-instated possible duplications refer to the 2.3 million persons for whom the Bureau could not definitively determine whether or not they were counted twice, and therefore were included in the 2000 count.

The Bureau discovered in October 2000 (after completion of the census field operations but before the apportionment numbers were released) that 6 million persons may have been counted twice. In an effort to try and correct this problem, the Bureau created a process where each housing unit identified as a potential duplicate was re-checked. From this process, 3.6 million people were deleted from the count. However, over 2.3 million people were conservatively re-instated into the census. The Census Bureau calls these uncertain cases "late census adds" and suggests that over half of these may be erroneous (1.2 million)[2].

In 1990, the sum of omissions and erroneous enumerations was 12.8 million while in 2000 the sum is between 9.5 and 11.9 million.

The following chart provided by the Census Bureau on March 15, 2001, to the Census Advisory Committees summarizes the reported errors in Census 2000 compared to the 1990 results[3]:

Estimated Error Counts from 1990 and 2000
(in millions)

	1990	2000
Estimated Total Population	252.7	284.7
Census Count	248.7	281.4
Measured Net Undercount	4.0	3.3

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[2] Memorandum for Preston J. Waite from Susan M. Miskura. "Results of Reinstatement Rules for the Housing Unit Duplication Operations." November 21, 2000
[3] On March 9, 2001, the Presidential Members released information on the number of census errors and uncertain cases in the 2000 Census. Census error is a more general term than "gross coverage error" as reported in the above chart. In that March 9 release, which can be found in Appendix B, the Presidential Members stated that 8.4 million people were missed and 4.4 million people were counted twice in the 1990 Census and that the comparable number (gross coverage error) in 2000 was still unknown. The Bureau released the answer contained in the above chart on March 15, 2001, which shows that 6.4 million people were missed and 3.1 million people were counted twice.

Measured Gross Erroneous Enumerations	4.4	3.1
Implied Gross Omissions	8.4	6.4
Gross Coverage Error	12.8	9.5
Assumed Errors in Reinstated "Potential Duplicates"	--------	1.2
Total Assumed Gross Erroneous Enumerations	--------	4.3
Implied Gross Omissions	--------	7.6
Implied "Gross Coverage Error"	--------	11.9

Dr. Ericksen has analyzed the 2000 data released thus far by the Bureau and has concluded the following: "The results from the 2000 Census show that the differential undercount was reduced, not eliminated, but does not tell how. The reduction in the differential undercount could very well have been achieved by increasing numbers of erroneous enumerations and non-data defined people. Moreover, there are additional questions such as how did the so-called re-instated possible duplications contribute to reducing the differential undercount? It is likely that these re-instated possible duplications contributed to increased error in the raw census count. For example, why is the racial differential undercount less in the rural South than in the rest of the country? Does the fact that many Blacks in the rural South were counted twice offset the missing of others who were harder to count?"

One of the most significant causes of uncertain cases in the 2000 Census is imputations. Census enumerators were required to follow up in person at least six times to try to reach people who did not respond by mail. If the enumerator could determine the housing unit was occupied but could not contact a person inside the household, the enumerator was instructed to ask a neighbor or building manager for enough information to fill out the census form for the respondent who was not at home. Sometimes, this alternative source of information for the household also was not available. In this instance, the Census Bureau "imputed" information from the neighborhood for which the Bureau did have information. For example, if you were not at home when the enumerator tried to contact you, the Bureau borrowed the number of persons and/or characteristics (such as age, sex and race) from your neighborhood and applied them to your household. In 2000, there were 5.7 million imputations, nearly three times that of 1990.

The following is a listing of imputations by state:[4]

State	Imputations
Alabama	97,851
Alaska	15,082
Arizona	160,478
Arkansas	37,572
California	905,724
Colorado	87,456
Connecticut	51,444
Delaware	22,139
Florida	333,677
Georgia	189,528
Hawaii	35,074
Idaho	23,329
Illinois	301,857
Indiana	130,857
Iowa	27,599
Kansas	32,395
Kentucky	46,609
Louisiana	83,201
Maine	15,864
Maryland	131,920
Massachusetts	96,510
Michigan	131,241
Minnesota	60,161
Mississippi	47,074
Missouri	66,062
Montana	14,378
Nebraska	16,687
Nevada	64,864
New Hampshire	24,512
New Jersey	166,802
New Mexico	53,074
New York	596,224
North Carolina	130,921
North Dakota	6,363
Ohio	125,326
Oklahoma	43,329
Oregon	57,983
Pennsylvania	188,703
Rhode Island	23,975
South Carolina	85,534
South Dakota	10,325

[4] The Census Bureau provided imputation data to a limited-access computer server on February 26, 2001, "CurrentStateSummary_US.dat." Both sides of the Monitoring Board, the Census Subcommittee and the National Academy of Sciences signed a Memorandum of Understanding (M.O.U.) with the Census Bureau to gain access to Accuracy and Coverage Evaluation data. The M.O.U. states that the information provided could not be shared with the public until after the ESCAP made their recommendation on March 1, 2001.

Tennessee	89,978
Texas	541,298
Utah	39,109
Vermont	13,292
Virginia	107,832
Washington	110,131
West Virginia	15,409
Wisconsin	84,389
Wyoming	13,009

More specifically, there are three types of imputations: non-population count imputations, population count only (or whole person imputations), and individual whole person substitutions.

Non-population count imputations are essentially not "real" people but virtual people for whom characteristics are invented by the computer. In 1990, there were 54,000 and in 2000, there were 1,172,100. These virtual people are included in the apportionment count that the Census Bureau made public on December 28, 2000.[5]

Population count only imputations occur where the Bureau knows the household exists but only has information on the number of persons living in the house but no information on the age, sex or race of the persons within the house. The Bureau then borrows, or imputes, the age, sex and race characteristics from the neighborhood. In 1990, there were 1,547,000 population count only imputations and in 2000, there were 2,269,000.[6]

Individual whole person substitutions occur when information is imputed for a person or persons for whom the Bureau already has information on other persons within the same household. For example, the census form allowed respondents to list up to 12 persons living in a housing unit but only had room to fill in the characteristics of six people. When there was no phone number or the Bureau could not otherwise re-contact this household, information for the remaining people after the original six was borrowed, or imputed from a neighbor. In 1990, there were 301,000 of these and in 2000, there were 2,333,000. [7]

III.   Demographic Analysis

There are three components the Census Bureau uses to determine the nation's population: the traditional headcount, the post-enumeration survey (A.C.E.), and Demographic Analysis (DA). DA looks at administrative records to produce an estimate of the population (births minus deaths plus immigration minus emigration plus the

[5] Thompson, John, Associate Director for the Decennial Census. *Presentation to the Joint Meeting of the Census Advisory Committees on the ESCAP Final Report.* March 15, 2001. Arlington, VA. p. 16.
[6] *Ibid.*
[7] *Ibid.*

Medicare population over age 65). By using all three estimates, the Census Bureau is best able to come up with the most accurate accounting of the nation's population.

The Bureau's DA for 2000 includes an estimate of the total U.S. population by age and sex for the black and "non-black" populations.[8]   Therefore, DA can serve as a benchmark from which to evaluate the national census number and also show whether or not a differential undercount persists. The preliminary DA total is 279.6 million. The 2000 Census count of the resident population — 281,421,906 — when compared with the DA estimate implies an <u>overcount</u> of about 1.8 million. This is a new problem for the Census Bureau especially because the initial A.C.E. shows an estimated <u>undercount</u> of about 3.3 million. Thus, the A.C.E. and preliminary DA estimates of the total population differ by about 5.2 million.

Reconciling this difference, or at least understanding its source, is a crucial factor in determining what is the most accurate representation of the nation's population.

There is reason to be cautious in relying on the national DA number. According to a Monitoring Board analysis conducted by Dr. Jeffrey S. Passel of the Urban Institute, the low DA total should not be used as a basis for deciding against adjustment because the current DA systematically underestimates immigration -- particularly Hispanic, undocumented immigration and temporary residents.[9] However, DA and the A.C.E. are quite consistent in undercount estimates for the non-Hispanic Black population and the non-Hispanic, non-Black population (White, Asian, Native Hawaiian and other Pacific Islanders and American Indian/Alaska Native). This consistency shows the 2000 Census contains a differential undercount by race. However, A.C.E. and DA differ on estimates for the Hispanic population because the DA figures are too low.

Correcting the immigration underestimation could substantially narrow the gap between DA and A.C.E. by at least two to three million.[10] In addition, there is evidence to support higher estimates of undocumented immigration which would bring the DA estimates even closer to the A.C.E. estimates.

The shortfall in DA compared to both the Census count and the A.C.E. can be traced almost entirely to two components of immigration — undocumented immigration and legal, temporary residents. Current research offers: (a) sound empirical evidence for the addition of a minimum of two million persons from these components; (b) reasonable evidence for an additional one million; and (c) arguments that the

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[8] These race groups correspond to the 1990 "modified age race sex" (MARS) definition. The black population includes black Hispanics. Further, based on results from the Census Bureau's pre-census testing programs, this version of the black population probably corresponds fairly closely to a grouping from Census 2000 defined by persons choosing the "black" race response either alone or in combination.
[9] Dr. Passel's memo to the Board containing this analysis can be found in Appendix C.
[10] According to some researchers, underestimation of undocumented immigration might account for the *entire* gap between the A.C.E. Sum *et al. An Analysis of the Preliminary 2000 Census Estimates of the Resident Population of the U.S. and Their Implications for Demographic, Immigration, and Labor Market Analysis and Policymaking.* Center for Labor Market Studies, Northeastern University, Boston, MA. February 2001.

number of people added should be even higher. In addition, there are two other components — out-migration of legal immigrants and net movement of legalized immigrants — for which sound logical arguments can be put forth for adding an additional 200,000–400,000 persons to the DA estimates. The latter component is not even addressed in the Bureau's DA estimates.

Dr. Passel's analysis of data from the March 2000 Current Population Survey (CPS) in conjunction with estimates of legal immigration yields an estimate of 6.8 million undocumented immigrants. In comparison, the DA estimates include an implied figure of 6.0 million undocumented immigrants nationally. The difference between DA and Dr. Passel's analysis is consistent with the degree of underestimation shown by the Census Bureau's estimates of the foreign-born population in comparison with the CPS figures. It can be expected that the CPS also under-estimates the undocumented population. Thus, there are at least one million more undocumented immigrants in the population than are included in DA.

Other analyses, such as the Sum *et al* (2001) analysis of the employment gap between the establishment and population surveys, point to numbers that are larger still.

Another shortfall of the DA is the assumption that the number of legal temporary foreign-born residents (i.e., legal non-immigrants) has not changed since 1990. This group includes foreign students and scholars, guest workers (such as the so-called "hi-tech" guest workers), intra-company transferees, exchange visitors, and their dependents. All of these are defined as part of the U.S. population for census purposes and should be included in the census, A.C.E., and DA. There are no "official" estimates of the legal non-immigrant population, but INS does keep track of the annual number of arrivals by visa category. Between 1990 and 1998, the annual number of arrivals in the visa categories that include the legal non-immigrants who should be counted in the census increased by more than 80 percent, or by more than 800,000. There are two non-immigrant categories where estimates of the population do exist. The number of foreign students and guest scholars increased by more than 150,000 between 1990 and 2000 according to survey data from the Institute for International Education. The number of H-1B guest workers living in the United States increased over this period by more than 200,000.[11] The legal non-immigrant population could increase the DA estimates by at least 750,000 according to estimates developed from admissions data, the previously mentioned estimates, and some INS data on duration of stay.

DA estimates out-migration of legal foreign-born residents by applying a set of rates derived from the 1980–90 period to their estimates of legal foreign-born residents. Given the strong economy of the 1990s, particularly the late 1990s, it is reasonable to think that the rate of out-migration would have decreased during the decade. Further, the "legal" foreign-born population that the Bureau uses in its computation of out-migration for groups other than Mexicans and Central Americans includes some undocumented immigrants. All of this argues that emigration might be overstated by as

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[11] Lowell, B. Lindsay. *H-1B Temporary Workers: Estimating the Population*. Institute for the Study of International Migration at Georgetown University. April 2000.

much as 10-15 percent. If out-migration were actually 10 percent lower than the DA estimate, it would <u>add</u> 200,000 persons to the population estimate.

During the late 1980s and early 1990s a significant number of formerly undocumented immigrants (2.7 million) were granted legal status under the Immigration Reform and Control Act of 1986 (IRCA). About two million of these were from Mexico. Of the total, about one million were special agricultural workers (SAWs) who did not have to actually live in the United States to acquire legal status. The number of documented or legal immigrants living in the United States at any given time has been subject to a great deal of uncertainty. For the 1990 DA estimates, only half to two-thirds of the SAWs were assumed to be in the U.S. Again, given the relative economies of Mexico and the United States during the 1990s, it is reasonable to assume that many of the SAWs who did not live in the U.S. in 1990 would have moved here since then. Further, many of these legal immigrants, even if they live in Mexico most of the time, may have endeavored to be counted in the 2000 Census, in part to prove their continuing right to legal U.S. residence. Based on such arguments, it is reasonable to assume that there was an increase between 1990 and 2000 in the number of legal immigrants living in the United States. In the 2000 DA estimates, this component is assumed to be zero, in effect, because there is no explicit allowance for it.

While DA contains inadequate estimates of the immigrant population, the DA continues to show a persistent differential undercount in the 2000 Census. The DA method used by the Bureau compares only the Black and non-Black populations.

For the non-Hispanic Black population, the A.C.E. and DA estimates are in very close agreement. Both show at least a two percent undercount of the Black population. In fact, A.C.E. may actually underestimate the number of Blacks missed, according to DA.

For the non-Black population, the A.C.E. and DA estimates are also in very close agreement showing less than one percent of the population was missed.

Further analysis conducted by Dr. Passel found that the A.C.E. and DA estimates for the Hispanic population diverge greatly. The differences support the notion that DA has underestimated immigration and that most, if not all, of the overall discrepancy between DA and A.C.E. is due to this component.

Since a very high proportion of Hispanic immigration is undocumented, this shortfall in the DA estimate points to a significant underestimation of undocumented migration. The addition of more than two million Hispanic undocumented immigrants to the DA estimates would bring the A.C.E. and DA estimates into closer agreement — for the Hispanic population, but more importantly for the non-Black and total populations.

Thus, taken together, correcting the underestimation of immigration components in DA could add a minimum of two million to the DA estimate and add up to three and a half to four million. At this level, the DA estimate would show an overall undercount of more than two million and would reduce the difference between the DA and the A.C.E estimates. Further, since most of the additional immigration would be Hispanic, the DA

and A.C.E. estimates for Blacks, Hispanics, and non-Black, non-Hispanics would all show quite consistent levels and patterns of undercount.

IV. Effects of a Census Undercount

In order to provide a context for people to understand how census undercounts affect different segments of our society, the Presidential Members commissioned nine research reports, which examined the following seven areas:

A.   **Political Representation**

B.   **Children**

C.   **Schools**

D.   **Transportation**

E.   **Native Americans**

F.   **Health**

G.   **City Planning**

These reports draw upon 1990 census data and present problems that are likely to result from an unadjusted 2000 census. Until the statistically corrected 2000 census data are released for public review, the 1990 adjusted census data will remain the most recent data available to analyze the effects of an undercount. Complete copies of all nine reports can be accessed via www.cmbp.gov.

A.   **Political Representation**

In an effort to understand certain effects of relying on the 1990 uncorrected data for redistricting, the Presidential Members sponsored a study by Dr. Allan J. Lichtman of American University entitled, "Report On The Implications For Minority Voter

Opportunities If Corrected Census Data Had Been Used For The Post-1990 Redistricting: States With The Largest Numerical Undercount."

Focusing on the 10 states with the largest numeric undercounts, this report considered whether the use of corrected data would have had the potential to expand opportunities for minority voters to participate fully in the political process. These states were …

In 1991, the census results were released to the states for political redistricting. However, those results did not include an adjustment to correct for the known undercount. The adjusted data, partitioned to the block level, were not released until after states completed the post-1990 redistricting process.

According to the study, if the 1990 census had released corrected data, minority voter opportunities would have been expanded in nine of the 10 states studied. In those nine states, at least 44 state legislative districts and one Congressional district would have significantly increased minority voter representation.

The study found that in plans for both State Senate and State House positions, the use of corrected data would have increased the number of baseline majority-minority districts against which the next redistricting plan would be measured. The use of corrected data would have enhanced minority voter strength in districts that have significant minority representation, but fall below the majority-minority threshold. And for all 10 states, the use of corrected rather than uncorrected data for the post-1990 redistricting would have had the potential to affect minority voter opportunities in state legislative seats.

In addition, if corrected data had been used for the apportionment of Congressional districts among states, this would have opened up an opportunity to draw an additional majority-minority Congressional district in California.

Despite this impact on minority voter opportunities and contrary to most reports indicating a partisan tone around the adjustment issue, using corrected data for the previous redistricting process does not appear to have significant partisan effects. The potential to enhance the voting strength of minorities would be derived from adding minorities to districts that already were predominantly Democratic. Thus, Democrats would not have gained a partisan advantage from this process, even though minority voters are more likely than White voters to support Democratic candidates for public office.

B.1. Children - Poverty

Because the characteristics of persons most likely to be missed in the census – children and minorities – correlate highly with the characteristics of persons in poverty, an unadjusted 2000 Census will likely miss a high number of children in poverty.

Children comprised half of the net undercount in the 1990 Census and represent 38 percent of people in poverty. Poverty rates for children help target federal, state and local initiatives aimed at improving the quality of life for the most vulnerable members of our society. The Presidential Members commissioned a study to determine: How many children in poverty were missed in the 1990 Census and what are the implications for the results of the 2000 Census?

The resulting study, conducted by Professors Donald J. Hernandez and Nancy A. Denton of the State University of New York at Albany, found that children in poverty are among the hardest hit by unadjusted census data. The researchers found that at least 532,769 and as many as 2,099,620 poor children were missed in the 1990 count. The study is the first to quantify the number of undercounted children in poverty nationwide. The report is entitled, "Census Affects Children in Poverty."

Since children in poverty rely on federal programs that use census data, such as Medicaid, Head Start, Foster Care, Adoption Assistance and Social Service Block Grants, the study suggests that decisions about required levels of funding for children could be adversely affected if corrected census data are not used.

The study estimated the number of children in poverty missed in the 1990 census by state and in the 50 largest cities. A limitation of the study is that it does not provide an estimate for the number of poor children missed in each city. However, the upper and lower bound estimates provide a range, within which the true number lies. Dr. Hernandez has suggested that in highly populated geographic areas, the true number is more likely to be closer to the upper-bound estimate than the lower-bound estimate.

The following is one of four similar data tables presented in the study:

Undercount of Poor Children in 50 Largest U.S. Cities

City	# of Poor Children Counted in 1990	Of Counted Children, % That Were Poor in 1990	Lower-Bound Estimate of Missed Poor Children		Upper-bound Estimate of Missed Poor Children	
			Total #	As % of Counted Poor Children	Total #	As % of Counted Poor Children
New York, NY	496,999	29.5	26,712	5.4	79,676	16.0
Los Angeles, CA	233,600	27.1	16,678	7.1	54,086	23.2
Chicago, IL	240,968	33.3	13,829	5.7	34,718	14.4
Houston, TX	128,602	29.5	8,906	6.9	28,846	22.4
Philadelphia, PA	112,622	29.7	7,641	6.8	18,485	16.4
San Diego, CA	49,703	19.4	3,140	6.3	11,256	22.6
Detroit, MI	138,242	45.7	8,105	5.9	17,328	12.5
Dallas, TX	67,611	26.9	4,616	6.8	16,011	23.7
Phoenix, AZ	53,169	19.9	2,611	4.9	9,730	18.3
San Antonio, TX	87,289	32.1	5,375	6.2	16,302	18.7
San Jose, CA	26,567	12.7	1,299	4.9	7,841	29.5
Baltimore, MD	57,203	31.8	3,800	6.6	11,318	19.8
San Francisco, CA	21,228	18.2	1,740	8.2	6,521	30.7
Indianapolis, IN	34,800	18.6	1,642	4.7	6,020	17.3
Jacksonville, FL	30,364	18.3	1,769	5.8	8,315	27.4
Columbus, OH	35,696	23.8	1,843	5.2	5,843	16.4
Milwaukee, WI	63,985	37.1	3,943	6.2	8,373	13.1
Memphis, TN	56,198	34.3	3,682	6.6	9,973	17.7

Washington, DC	28,610	24.5	2,086	7.3	8,369	29.3
Boston, MA	30,372	27.7	1,745	5.7	5,238	17.2
El Paso, TX	55,985	34.2	3,676	6.6	10,495	18.7
Seattle, WA	13,279	15.7	1,152	8.7	4,266	32.1
Cleveland, OH	57,692	42.3	3,207	5.6	6,666	11.6
New Orleans, LA	62,808	45.9	4,238	6.7	8,629	13.7
Nashville-Davidson, TN	22,301	20.0	1,445	6.5	6,073	27.2
Austin, TX	22,617	21.0	1,624	7.2	6,310	27.9
Denver, CO	27,499	26.9	2,179	7.9	6,006	21.8
Fort Worth, TX	29,051	24.4	1,947	6.7	7,148	24.6
Oklahoma City, OK	26,024	22.6	1,659	6.4	6,290	24.2
Long Beach, CA	29,167	26.7	2,316	7.9	7,188	24.6
Portland, OR	17,777	18.5	970	5.5	2,830	15.9
Kansas City, MO	24,064	22.4	1,463	6.1	4,288	17.8
Tucson, AZ	25,505	25.8	1,483	5.8	4,243	16.6
Atlanta, GA	39,836	41.9	2,806	7.0	6,276	15.8
Charlotte, NC	15,164	15.8	856	5.6	4,724	31.2
St. Louis, MO	38,796	38.8	2,505	6.5	5,276	13.6
Virginia Beach, VA	8,460	7.7	478	5.7	5,607	66.3*
Albuquerque, NM	18,254	19.0	820	4.5	3,278	18.0
Oakland, CA	27,580	29.8	2,896	10.5	8,817	32.0
Sacramento, CA	27,043	27.8	1,714	6.3	4,903	18.1
Miami, FL	35,367	42.9	2,831	8.0	6,560	18.5
Tulsa, OK	19,249	21.5	1,249	6.5	4,805	25.0
Minneapolis, MN	22,599	29.8	1,500	6.6	2,865	12.7
Pittsburgh, PA	23,545	32.0	1,169	5.0	2,066	8.8
Cincinnati, OH	33,638	36.9	2,287	6.8	4,879	14.5
Honolulu, HI	7,944	11.4	367	4.6	2,851	35.9
Fresno, CA	40,586	36.1	2,839	7.0	6,160	15.2
Omaha, NE	15,806	18.5	731	4.6	2,074	13.1
Toledo, OH	23,663	27.2	1,150	4.9	2,817	11.9
Buffalo, NY	30,400	38.2	1,567	5.2	2,902	9.5
United States	**11,428,916**	**18.0**	**532,769**	**4.7**	**2,099,620**	**18.4**

* It should be noted that in geographic areas with very low child poverty rates, such as Virginia Beach, it is especially unlikely that the actual number of missed children in poverty approaches the total number of missed children.

B.2.   Children - Infants Undercounted

In a study that compared birth, death and school enrollment records to the results of the 1990 census, Professor Beth Osborne Daponte of Carnegie Mellon University found that more than 20 percent of infants (persons under one year of age) were missed in the 1990 census. The astounding results of this study suggest that funding for federal programs such as Medicaid and Foster Care, and public policy decisions such as school construction and childcare, could be adversely affected if corrected census data are not released in 2001. The report is entitled, "An Analysis of the 1990 Infant and Children Undercount: Implications for Census 2000."

For the nation as a whole, the study found that approximately 4.1 million births occurred between April 1, 1989 and March 31, 1990. However, the 1990 census enumerated only 3.25 million infants. This implies that 20 percent of infants were missed. If one were to believe that the census accurately includes infants, then the number of deaths to infants per 1,000 births in the United States in 1990 would have had to be approximately 201, an absurd infant mortality rate for this country. Indeed, the National Center for Health Statistics reported a 1990 infant mortality rate (infant deaths per 1,000 births) of 9.2 for the United States.

The study also examined the school-aged population. Data are available from the National Center for Education Statistics on the number of children enrolled in school. For public school children, the data are available by grade, while for children enrolled in private schools, data are only available by school level, i.e., primary or secondary. However, one can compare the number of children implied by the data in various grades with the number of children of corresponding ages. In doing so, discrepancies exist, albeit not as serious as the infant population.

Based on this approach, the study concludes that the census missed approximately 11 percent of 6-year old children and between 4.5 percent and 7.1 percent of children 7-9 years of age.

In general, this study concludes that the 1990 Census seriously under-enumerated children. The pattern observed indicates that the younger the child, the greater the degree of under-enumeration. Compared with any other age group, the under-enumeration of infants by far accounted for the worst errors in the 1990 raw census count.

When infants are left out of the census, local childcare providers are ill-prepared to handle the number of children who need care, programs targeting children whose funding formulas rely on census data are compromised, and policy and lawmakers are given an incomplete picture of the number of children in the U.S. Infants missed in the decennial census enter school well before the next census. This severe under-enumeration undoubtedly contributes to school overcrowding and subsequent problems. Infants from the 1990 census are currently in 4th and 5th grade.

States Ranked (from Poorest to Best) on the Proportion of Infants Not Enumerated in the 1990 Census

State	Proportion of Infants Not Included in the 1990 Census	State Ranking (from poorest enumeration of infants to best)
Washington D.C.	38.9%	1
California	26.3%	2
Florida	26.1%	3
New York	25.5%	4
New Jersey	23.4%	5
Arizona	23.3%	6
South Carolina	22.7%	7
Alabama	21.9%	8
Texas	21.9%	9
North Carolina	21.2%	10
Hawaii	21.1%	11
New Mexico	21.0%	12
Rhode Island	20.8%	13
Illinois	20.7%	14

Delaware	20.5%	15
West Virginia	20.4%	16
Louisiana	20.3%	17
Tennessee	20.3%	18
Mississippi	20.2%	19
Arkansas	20.0%	20
Georgia	19.9%	21
Massachusetts	19.4%	22
Connecticut	18.8%	23
Maryland	18.3%	24
Colorado	18.1%	25
Virginia	17.6%	26
Oklahoma	17.2%	27
Kentucky	17.1%	28
Pennsylvania	17.1%	29
Nevada	16.3%	30
New Hampshire	16.1%	31
Missouri	16.1%	32
Maine	15.9%	33
Alaska	15.7%	34
Washington State	15.1%	35
Indiana	14.8%	36
Oregon	14.7%	37
Ohio	14.3%	38
Wyoming	14.0%	39
Kansas	13.9%	40
Vermont	13.5%	41
Utah	12.8%	42
Michigan	12.8%	43
South Dakota	12.6%	44
Montana	11.6%	45
Iowa	11.6%	46
Wisconsin	11.4%	47
Minnesota	10.9%	48
Nebraska	10.5%	49
Idaho	10.5%	50
North Dakota	9.1%	51

C.   Schools

Public school systems rely heavily on the findings of the decennial census to forecast needs and to allocate resources. Even relatively small undercounts can result in major planning problems for school systems as shown by a study recently commissioned by the Presidential Members.

The Portland, Oregon Public Schools System provides an example of how even geographic areas with low undercounts can be negatively affected by uncorrected

census data. Portland was one of the best-counted urban areas in 1990 and is nationally recognized for its school and urban planning. The system currently enrolls about 52,000 students, who represent almost 90 percent of local school-age children. But a study sponsored by the Presidential Members and conducted by Dr. Barry Edmonston, Director of the Population Research Center at Portland State University found that the Portland Public School's enrollment forecasts through 2010 were off by as many as 1,250 students as a result of the 1990 undercount. The report is entitled, "Effects of Census Undercount on School Planning."

The census undercount had significant effects on school enrollment analysis for the Portland Public Schools. How might these findings compare to other school districts? One caution is that the census undercount is lower in Portland than in other major metropolitan areas. The undercount is lower in Portland for two reasons: (1) there are fewer sub-populations such as immigrants and minorities who have been historically undercounted, and (2) the city's housing includes a higher proportion of owner-occupied units that are usually better counted in the census. If anything, the findings observed for Portland underestimate the effects of a census undercount on school planning for other cities. These effects would be doubled or tripled for larger-sized cities.

Relying heavily on reported data from the 1990 census, Dr. Edmonston examined births, migration, and enrollment rates in public and other types of schools. Taking the 1990 Census under-coverage into account led to four central findings:

1) Birth rates are <u>lower</u> than originally calculated using unadjusted census data. Analysis based on the new birth rates suggests that there will be fewer births due to population growth. This implies that future enrollments will be <u>lower</u> than originally calculated.

2) Migration rates are <u>lower</u> using unadjusted census data. Analysis based on the new migration rates suggests that there will be fewer net in-migrants than originally calculated. This implies that that there may be somewhat lower levels of net out-migration of preschool and school-age children and that enrollments may be <u>greater</u> than originally estimated.

3) Public school enrollment rates are <u>lower</u> than originally calculated, based on unadjusted census data. This implies that future changes in the school-age population will have a diminished effect on school enrollment changes. This means that although Portland's public school enrollments will decrease in the future, enrollments will be <u>greater</u> than originally anticipated.

4) The combined influence of birth, migration and public school enrollment rates lower school enrollment forecasts when unadjusted data are used. Because forecasts are created 10 to 15 years in advance, public school enrollments in 2010 are likely to be about 200 to 300 fewer students than originally expected when taking census undercoverage into account.

School districts forecast are negatively affected by a census undercount. The ability to plan or allocate resources effectively is damaged by inaccurate census data. These problems can only be exacerbated in school districts that have high concentrations of traditionally undercounted populations.

D.   Transportation

Census undercounts distort transportation policy, planning, funding allocation and governmental programs, according to Dr. Paul Ong, a UCLA Professor and urban planning specialist. Ong found that the 1990 census missed more than 500,000 commuters who travel to work in 22 metropolitan areas across the country. Mass transit users tended to be undercounted at a higher rate than other users (such as auto users). The undercount of mass transit users translates into inadequate funding of and planning for mass transit, which disproportionately serves low-income populations. Overall, an undercount will cause widespread transportation underfunding and poor city planning, which could negatively affect productivity by keeping workers in transit instead of on the job. The report is entitled, "Undercounting Commuters."

The report estimates the undercount of the number of commuters and how the undercount varies by demographic, economic and geographic characteristics. The commute to work is key to the economy's productivity because it links Americans to the work site, transforming people from being a consumer at their place of residence to producers on the job. The commute to work has profound economic consequences. How workers get to their jobs plays a critical role in defining the extent of traffic congestion that wastes time and the level of air pollution that affects health. Persons without adequate access to private transportation can be isolated from employment opportunities. Having accurate statistics on the number of commuters and the way they travel to work is key to sound public policy, effective transportation plans, fair allocation of public resources, the design of governmental programs and assessing air quality.

Transportation policy is impacted by the decennial census for five key reasons. First, the census is the single largest data set. Second, census data are consistent across all parts of the country, while the transportation-oriented surveys are often unique to specific locations. Third, the quality of census data is much higher because the Census Bureau has one of the best data gathering operations in the world and because federal law enhances individual cooperation in the decennial census. Fourth, census data are used extensively in the transportation field by federal, regional and local authorities for transportation analysis and planning. Fifth, census statistics are used as a benchmark for other surveys.

The demographic and economic factors that are related to the population undercount are correlated with travel behavior and the means by which workers get to their place of employment. The type of travel at greatest risk of suffering from a high differential undercount is tied to public transit, the mode heavily relied upon by minorities and low-income populations. A consequence of a differential undercount by type of travel is a mismatch between people's needs and the transportation service provided.

The report estimates the number of undercounted commuters by mode of transportation and determines how the undercount rates vary by metropolitan areas, race and ethnicity, and economic status. The report uses the five percent 1990 PUMS (Public Use Micro Sample), which is the only data set sufficiently large enough to generate detailed disaggregated rates. Data from this source are over a decade old, but the required data from the 2000 Census will not be available for another two or three years. Despite this limitation, an analysis of the 1990 PUMS can nevertheless provide some important insights into the differential undercount by mode of transportation and lay a foundation for working with the 2000 PUMS when it becomes available.

The following chart shows that minorities and the poor use car pools and mass transit systems more than Whites relative to their population size.

Socioeconomic Characteristics by Mode for All 21 MSAs

	Solo Drivers	Car Pool	Mass Transit Modes	Other
All Commuters	100%	100%	100%	100%
Race/Ethnicity				
NH Whites	73.0%	54.6%	43.1%	66.2%
African Americans	12.0%	17.0%	32.3%	12.8%
Latinos	9.7%	19.5%	16.7%	13.8%
APIs	4.9%	8.3%	7.4%	6.6%
Other	0.4%	0.6%	0.5%	0.6%
Family Poverty Rate				
Below 200%	11.7%	20.9%	24.9%	27.5%
200%-299%	13.4%	17.2%	17.1%	16.2%
300%-399%	16.2%	16.4%	15.6%	14.1%
400%-499%	15.0%	13.1%	12.2%	10.8%
500% plus	43.8%	32.4%	30.1%	31.5%
PUMA[12] Percent Minority*				
0%-10%	25.4%	17.3%	6.2%	14.5%
11%-25%	29.3%	25.1%	19.5%	27.7%
26%-50%	23.5%	24.0%	28.1%	28.3%
51%-75%	12.3%	17.2%	17.7%	17.0%
76% plus	9.6%	16.4%	28.5%	12.6%

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[12] Public Use Micro Sample Areas (PUMA)

The following chart shows that minorities and non-solo drivers are the highest undercounted groups.

Estimated Undercount Rates, All 21 MSAs

	Solo Drivers	Car Pool	Mass Transit Modes	Other
All Commuters	1.28%	2.20%	3.20%	2.27%
Race/Ethnicity				
NH Whites	0.29%	0.41%	0.33%	0.66%
African Americans	4.57%	4.84%	5.75%	6.02%
Latinos	4.51%	5.12%	5.65%	5.58%
APIs	1.49%	1.74%	3.39%	4.14%
Other	1.10%	1.42%	1.27%	1.55%
Family Poverty Rate				
Below 200%	3.26%	4.27%	5.19%	3.86%
200%-299%	2.15%	3.06%	4.27%	2.83%
300%-399%	1.52%	2.20%	3.38%	2.11%
400%-499%	1.12%	1.51%	2.67%	1.47%
500% plus	0.44%	0.65%	1.06%	0.64%
PUMA Percent Minority				
0%-10%	-.09%	0.18%	-.08%	0.26%
11%-25%	0.77%	1.29%	1.25%	1.40%
26%-50%	1.65%	2.32%	2.59%	2.30%
51%-75%	2.53%	3.24%	4.00%	3.49%
76% plus	3.92%	4.45%	5.35%	4.74%

*Public Use Micro Sample Areas

E. Native Americans

Historically, one of the most undercounted populations in the decennial census is Native Americans. In fact, American Indians living on reservations were the highest undercounted group in 1990 and the 2000 results show that they continue to be the most undercounted group.

Despite chronic undercounts, census data plays a vital role in providing a variety of social services for Native Americans. For example, Indian Health Services and programs funded by the Bureau of Indian Affairs are closely tied to the census numbers because of their federal funding formula requirements. Furthermore, programs such as domestic violence centers or after school programs that provide social services for urban Indians are also based upon census numbers.

Given the government-to-government status of Native American tribes with the U.S. Government, the Presidential Members commissioned a study by American Indian/Alaska Native Census 2000 Advisory Committee Chair Dr. Ted Jojola of the University of New Mexico. Dr. Jojola's study "Profiling the Native American Community in Albuquerque: Assessing the Impacts of Census Undercounts and Adjustments," uses Metropolitan Albuquerque and the surrounding 11 reservations as a case study.

According to the unadjusted 1990 U.S. Census counts, the population residing within Albuquerque's Metropolitan Statistical Area (MSA) represented approximately 39 percent (487,120) of New Mexico's population. Urban Indians comprised approximately 2.7 percent (13,156) of Albuquerque's MSA and American Indians living on reservations comprised 3.8 percent (18,747).

Dr. Jojola studied the impact of the undercount on the urban and reservation-based Native American populations in the metro Albuquerque area. He found that:

- The 1990 census missed nearly 3,000 American Indians in the Albuquerque metro area—2,550 on the surrounding 11 Indian reservations and 379 urban Indians (Table 1) translating into a 13.6 percent and 4 percent undercount rate respectively (Table 2).

- The adjustment of population counts for American Indians has a significant impact on the provision of services for both urban and reservation populations.

- Three types of service providers interviewed for the study (the City, the reservation, and community-based organizations) believe that the 1990 adjusted numbers reflect Indian population more accurately.

- Additionally, City and community-based service providers believe the 1990 census actually missed more than four percent of urban Indians but that the adjusted number improves the count.

- The transitory nature of the urban Indian community—drawing on residency between their reservations and their urban neighborhood—is one of the main factors for the chronic undercount of urban Indians.

Based on the findings listed above, Dr. Jojola concludes that because of systematic biases in census data collection, the use of adjusted counts for purposes of program development will greatly benefit both urban and reservation-based Indians in Census 2000.

1990 Census Counts For Eleven Tribes Surrounding Albuquerque

	Official Count	**Adjusted Count**	**Difference**	**Percent**
Sandia	358	403	45	12.6%

Santa Ana	481	544	63	13.1%
Cochiti	666	751	85	12.8%
Zia	637	728	91	14.3%
Canoncito	1,177	1,350	173	14.7%
Jemez	1,738	1,981	243	14.0%
San Felipe	1,859	2,122	263	14.1%
Acoma	2,551	2,893	342	13.4%
Isleta	2,699	3,058	359	13.3%
Santo Domingo	2,947	3,358	411	13.9%
Laguna	3,634	4,109	475	13.1%
Totals	**18,747**	**21,297**	**2,550**	**13.6%**

Comparison of Urban and Reservation-Based Indian Counts

	Official Count	**Adjusted Count**	**Difference**	**Percent**
Urban	13,156	13,535	379	4.0%
Reservation-based	18,747	21,297	2,550	13.6%

F. 1. Health - Uninsured Costs

Though the decennial census long-form questionnaire (sent randomly to one of every six households) asks only two of 53 questions that are directly connected to health care, census data play a vital role in illustrating the physical health of Americans. Many health-related studies are based on a sample of residents that is then weighted using census counts to make generalities about the population. The National Center for Health Statistics (NCHS) and the Agency for Health Care Research and Quality (AHRQ), both of which are part of the U.S. Department of Health and Human Services, use decennial census data to estimate the health of Americans.

Congressionally-commissioned studies regarding medical care, health insurance, employment and access to care also rely on decennial census data. [13] Health care researchers and policy analysts routinely use data collected from samples of U.S.

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[13] For example, in 1998 the General Accounting Office (GAO) was commissioned by the Senate Committee on Labor and Human Resources to estimate the ability of the near elderly (ages 55 to 64) to obtain health insurance. The report is entitled, "Private Insurance: Declining Employer Coverage May Affect Access for 55 to 64 Year Olds." This study relied on data from the AHRQ, the Census Bureau and the NCHS to generate policy analyses for Congress.   In another GAO study commissioned by Congress in 1996, "Private Health Insurance: Millions Relying on Individual Market Face Cost and Coverage Tradeoff," data from the Census Bureau and the National Center for Health Statistics were used. More notable examples of this activity include providing data for the Catastrophic Health Insurance Act during the 1980s and the Comprehensive Health Care Reform Plan in the mid 1990s.

residents that are generalized to the U.S. population using decennial census information.

In order to determine the effects of the census undercount on health care planning-related research, the Presidential Members commissioned a study entitled, "Examining the Effects of Census Adjustments on Estimates of Working–Age Uninsured Minorities in the United States." The research was conducted by Llewellyn J. Cornelius, Ph.D. of the University of Maryland School of Social Work and Martha A. Hargraves, Ph.D. of the University of Texas Medical Branch at Galveston.

The study identifies negative effects that result from using unadjusted census data on which health policy planners and health care providers rely. The study found that:

- Due to the 1990 census undercount, health policy planners were unprepared for an additional 400,000 uninsured adults.

- Close to half (192,000) of the uninsured Americans missed in the 1990 census were either African American or Hispanic.

- Given that the per capita health care expenses for all sources (out of pocket, private insurance, public insurance and government payments) came to $2,400 in 1996, the difference of 400,000 uninsured Americans translated into $960,000,000 in health expenses in that year alone.

- The nearly $1 billion cost of missing 400,000 uninsured adults by the census was borne by persons with private insurance, remained as uncompensated care, or in the case of for-profit health care institutions, were reflected as a profit loss.

Given the disproportionate undercount of African Americans and Hispanics in the census, adjusting for the undercount would have a disproportionately negative effect on policies and programs affecting these groups. [See Figure below]

The ripple effect of deficient policies would both impact an already strained health care safety net and would result in unplanned and unforeseen financial burdens on the current system of care and the American public at large.

Therefore, the issue of the undercount in health policy and planning does not only affect those left uncounted in the census. All Americans are affected through higher insurance rates, misallocated public funds and a lower overall ability of the health care system to meet the needs of the country.

Growth (in thousands) in the Number of Uninsured Working Age Adults (18-64) Between 1987 and 1990, Adjusting for Census Undercount by Race/Ethnicity.

Notes: Whites refers to Non-Hispanic Whites and Blacks refers to Non-Hispanic Blacks. Numbers from 1987 are based on data from the 1987 National Medical Expenditure Survey (Source: Agency for Health Care Research and Quality). Adjusted and unadjusted 1990 numbers are based on data from the U.S. Census Bureau and the 1994 Commonwealth Fund Minority Health Survey.

	1987	**1990**
Whites Unadjusted	17,669	16,746
Whites Adjusted	17,669	16,663
Blacks Unadjusted	4,491	4,585
Blacks Adjusted	4,491	4,697
Hispanics Unadjusted	4,011	4,914
Hispanics Adjusted	4,011	5,007

F.2.   Health-Preventable Hospitalizations

The use of unadjusted census data distorts measures of access to health care by inflating the rates of mortality, morbidity, injuries and accidents. This situation, which existed during the 1990s, has particularly negative effects on racial and ethnic minority populations. Since these populations tend to reside in racially separated communities, a major result of the census undercount is that minority communities are less attractive for private investment.[14] Health care provider-to-population ratios are inflated when unadjusted census numbers are used. Thus, the 1990 undercount resulted in some doctor and hospital shortages, according to a study conducted by Dr. Darrell Gaskin, an economic researcher at the Institute for Health Care Research and Policy at Georgetown University Medical Center. The report is entitled, "Census Effects on Access to Healthcare."

Unadjusted census data exaggerates problems regarding access to care and minimizes the statistical appearance of physician and hospital shortages in two ways. First, unadjusted data inflates medical "incidence rates," which are indicators of unmet health care needs. Second, unadjusted data also inflates health provider per capita measures, which are indicators of healthcare provider availability.

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[14] Typically, advocates for using adjusted census data argue that the systematic undercounting of minority populations results in a loss of needed public funds for services that are allocated on a per capita basis. While this is true, there is another part of the problem created by using unadjusted census figures for minority communities. The impact is not limited to the healthcare field. The systematic undercounting of minority populations also makes their communities less attractive for private investment and development. Overall, the risks such as injury and crime rates associated with living in minority communities are exaggerated, making them less attractive relative to other communities for private enterprise and investors.

The study focuses on preventable hospitalizations - a measure of access to primary health care. Preventable hospitalizations are those that might not have occurred had the patient received appropriate and timely outpatient care. Examples of preventable hospitalizations are those admissions for a primary diagnosis of: cellulitus, dehydration, kidney and urinary tract infections, pneumonia, angina, chronic obstructive pulmonary disease, or congestive heart failure.

County rates of preventable hospitalizations were calculated using both the adjusted and unadjusted census data by race and ethnicity. A comparison of the rates reveals that those calculated using unadjusted data are higher than those calculated with adjusted data. In comparison to Whites, the overestimation is six times greater for African Americans and eight times greater for Hispanics. In addition, the overestimation is greater for rural counties compared to urban counties, especially for African American and Hispanic rural residents. Rates of preventable hospitalizations in counties with high poverty rates and with high percentages of adults with less than a high school education were also inflated by the unadjusted census data. This overestimation exaggerates the challenges facing minority, rural, poor and poorly educated communities. Hence, this discourages individuals, employers, health care providers and health plans from investing in these communities.

Percentage Difference between Unadjusted to Adjusted Rates of Preventable Hospitalizations for African Americans, Hispanics, Whites: Comparison by Location, Poverty Rate and Educational Attainment

		African Americans	Hispanics	Whites
Location	Rural	4.87	6.11	0.81
	Urban	3.87	5.42	0.54
Poverty Level	High	7.42	7.19	0.79
	Low	3.84	4.68	0.42
Educational Attainment	Low	5.10	6.26	0.73
	High	3.44	5.52	0.66

In addition to preventable hospitalizations, health care provider availability measures are also inflated by the systematic undercounting of minority populations in the census. Physicians per capita and hospital beds per capita are common ratios used to measure the supply of health care providers in a county. Using the unadjusted data to calculate these ratios suggest that counties have more physicians and hospital beds per capita than are actually present. Such information is misleading in determining the need for additional physicians and hospital beds. The reporting of the availability of health services in particular, rural counties and counties in Texas, California, Georgia,

Colorado, Mississippi and New Mexico are most likely to be distorted. Also, counties with high percentages of minorities and large low-income populations are more likely to be misrepresented. The average impact was a 1.4 percent change for physicians per capita and a 1.1 percent change for hospital beds per capita.

G. City Planning

In a case study that examined the funding effects of an undercount on city services, University of Southern California Professor Christopher Williamson found that in the last decade the City of Long Beach lost at least $10 million in federal funds due to the 1990 census undercount. Additional funding from state and local governments was also lost because corrected census data was not used. The 18,350 local residents missed in the count, resulted in an annual loss of about $1 million in federal funding ($56 per undercounted person). More than 1,000 library books, three additional public health nurses, and a new public bus are among the benefits of using adjusted census data for Long Beach. The report is entitled, "How Would Adjusted 1990 Census Data Have Made a Difference? A Case Study of Long Beach, CA." These effects are not unique to Long Beach and could occur in other cities.

The following table summarizes the findings of the research:

Summary Table	Program	Change	Significance
City of Long Beach			
Citywide	Federal Programmatic Funding, 22 programs	$924,560 per year, about $10 million during period 1990 data are in use	About 1/2 the FY01 budget for improving access under the Americans with Disabilities Act.
Library	AB345 state Library funds	$28,000 additional funds, FY00	Purchase of 1,240 books
Fire Department	Community Services	Additional outreach and education events	Improves public's safety awareness and prevention activities
Health and Human Services	AB1288 Core Public Health funding and HUD Homeless Funding	Increase of $220,068 per year	3 full-time public health nurses and 1.5 full-time homeless case managers
	Lead-Based Paint Removal and Healthy Homes	Increase of $52,000 Per year	Abate lead-based paint in 13 additional housing units
Parks, Recreation, and Marine	Prop 12 bond funding based on population	Increase of $193,000	Maintenance and improvements of city bikepaths
Planning and Building	Annual city population estimates	Higher estimates and projections	Better information for Strategic Planning program
	Environmental	Better estimates of	Better information for utility

	Review CEQA/NEPA	energy consumption & waste generation	and solid waste capital improvements and policies
	Quality of Life Indicators, PPHU and Density	More accurate crowding and affordability information	Better Quality of Life information for decision and policy-makers
Police Department	COPS program funding	Increase of $42,000 in FY95	Additional 1/2 police officer
Community Development	CDBG program	$720,000 increase	Double the FY01 budget for neighborhood traffic mitigation
Long Beach Transit			
Funding	FTA Section 5307 grants	Increase of $185,000 in FY 98	One additional city bus Or
	Prop A 1/2 cent sales tax transit funding	Increase of $1 Million over 10 years	Annual city cost of free downtown circulator service
Service Planning	Planning service and routes	Increase in population likely to use transit	Better indications of areas with increasing transit need, better long-range planning
Long Beach Unified School District			
Enrollment Projections	Enrollment by grade by school projections	Higher census count of under age 5 population	Better projections of entering Kindergarten class

V.   Conclusion

In conclusion, the Presidential Members have diligently been pursuing their statutory responsibilities of "observing and monitoring all aspects of the preparation and implementation of the 2000 decennial census…" and reporting on the findings. Any and all information derived from these efforts has been made available on the website (www.cmbp.gov) as a means of better informing the public, engaging interested parties in genuine dialog, and promoting thoroughly transparent operations.

Appendix A

Methodology for Undercount Estimates (released March 28, 2001)

The undercount estimates were created by Presidential Member consultant, Dr. Eugene P. Ericksen. First, Dr. Ericksen obtained the adjustment factors from a file that the Bureau provided by the 448 post-strata (e.g., Black renters in small Metropolitan Statistical Areas in the South or White owners in large Metropolitan Statistical Areas in the North).[15] Dr. Ericksen divided, for each post-stratum, the dual systems estimate by the census count to calculate the adjustment factor, or ratio.

Second, Dr. Ericksen required the population distribution for each state across the post-strata. This information was not available, therefore he estimated the distributions from the e-sample data. Dr. Ericksen adjusted the racial totals by the state level counts (P.L. 94-171 data) for those 41 states where there was available data.

Third, Dr. Ericksen created a weighted average of the adjustment factors, where the population shares in the post-strata were the weights.

For the cities, Dr. Ericksen followed the same procedure for those post-strata defined for large MSAs. He used 1990 Census data to get the distributions between renters and owners.

Methodology for Undercount Estimates (revised April 2, 2001)

When the March 28 estimates were released, the Census Bureau was then able to provide Dr. Ericksen a better way to calculate the state undercounts by directing him to the post-strata by state file on the limited-access server where information was made available to the Census Subcommittee, the National Academy of Sciences, and the Census Monitoring Board. This file replaced step two in the estimates released March 28 and revised estimates were created. The 1990 undercount numbers were also updated and were taken directly from the Census Bureau's website (www.census.gov).

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[15] The file is called FINALDSEUS.

Appendix B

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FOR IMMEDIATE RELEASE:
March 9, 2001

DESPITE DECLARATIONS OF INCREASED ACCURACY CENSUS 2000 FILLED WITH ERRORS

Errors Match or Exceed 1990 Levels And May Contribute to Reduced Differential Undercount

Washington, D.C. (March 9, 2001) – After a preliminary analysis of the Census Bureau's quality control check of the 2000 census, the Accuracy and Coverage Evaluation (A.C.E.), the Presidential Members of the U.S. Census Monitoring Board found that the 2000 count contained 44 million errors and uncertain cases - 9 million more than the 1990 count.

The Census Bureau announced last week that a net of 3.3 million people were missed in the 2000 Census. "How can we accept 36 million errors and 8 million questionable cases as the most accurate census ever but refuse to correct 3 million errors that scientific methods identify with confidence?" asked Everett Ehrlich, Census Monitoring Board Member and former Undersecretary of Commerce.

As defined by the Census Bureau, census error consists of three components -- the numbers of omissions, erroneous inclusions and non-data defined persons. Omissions are people who are missed in the census and erroneous inclusions are people who were counted twice, counted in the wrong place, or shouldn't have been counted at all, such as fictitious people, children born after April 1st and people who died before April 1st. Non-data defined people, sometimes referred to as "whole-person imputations," are computer-generated estimates of the number or characteristics (such as age, sex or race) of people in a household. There were 5.7 million of these in the 2000 Census and 2.2 million in 1990. Uncertain cases include counts where there is a high probability of error, or where there is so little information that we can not tell if it is erroneous.

Re-instated possible duplications refer to the 2.3 million persons for whom the Census Bureau could not definitively determine whether or not they were counted twice.

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Errors and Uncertain Cases in the Census, 1990 and 2000

	Omissions (error)	Erroneous Inclusions (error)	Non-Data Defined Persons (uncertain)	Re-instated Possible Duplications (uncertain)	Net Undercount	Total Error and Uncertain Cases
1990 Census	19.9 million	13.0 million	2.2 million	----------	4.0 million	35.1 million
2000 Census	23.7 million	12.5 million	5.7 million	2.3 million	3.2 million	44.2 million

The Census Bureau would not be able to say that Census 2000 is the "most accurate census in history" without reviewing the results of the A.C.E. Moreover, the A.C.E. tells us how many people were missed and how to adjust the census accordingly. In an operation as large as the decennial census, there are bound to be problems. The 2000 Census unfortunately includes a massive number of errors. The following chart depicts the errors and uncertain cases in the 2000 count.

"Should we accept the Census Bureau's relative definition of accuracy when we know that the 2000 count contained as many errors as 1990," asked Gilbert F. Casellas, Presidential Co-Chair of the Monitoring Board. "If you're one of the millions of Americans not included in the final count, the answer is no."

It is possible that the same person could be included in more than one error or uncertain case category. However, despite possible offsetting of errors, the vast numbers clearly indicate a massive census error rate. **Furthermore, the effects of errors in the census are differential by race as evidenced in the chart below.**

Errors and Uncertain Cases in the 2000 Census, by Race

	Omissions	Erroneous Inclusions	Non-Data Defined Persons	Re-instated Possible Duplications	Net Undercount
Whites, non-Hispanic	6.9%	4.0%	1.5%	0.8%	0.6%
Blacks, non-Hispanic	13.0%	6.6%	3.3%	0.9%	2.2%
Hispanics	12.6%	5.1%	3.8%	0.9%	2.8%

Dr. Eugene P. Ericksen, a decennial census expert and professor of statistics at Temple University added, "The results from the 2000 Census show us that the differential undercount was reduced, not eliminated, but doesn't tell us how. It is very possible, for example, that the level of omission in the 2000 Census was the same as or greater than the corresponding 1990 level. The reduction in the differential undercount could very well have been achieved by increasing numbers of erroneous inclusions and non-data defined people. Moreover, there are additional questions such as how did the so-called re-instated possible duplications contribute to reducing the differential undercount? It is likely that these re-instated possible duplications contributed to increased error in the raw census count. For example, why is the racial differential undercount less in the rural South than in the rest of the country? Does the fact that many Blacks in the rural South were counted twice offset the missing of others who were harder to count?"

"Now that we have information about census error, we still need to know how many people were missed, how many people were counted twice, or how many people were included by mistake. Until we have the answers to these and other key questions, we cannot determine the accuracy of Census 2000," added Casellas. In 1990, 8.4 million people were missed and 4.4 million were counted twice, or incorrectly included for a net undercount of 4 million.

The bipartisan Census Monitoring Board was established in 1997 to monitor Census 2000 operations. Its findings are reported to Congress every six months. For further information, visit www.cmbp.gov.

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Appendix C

MEMORANDUM

To:	U.S. Census Monitoring Board, Presidential Members
From:	Jeffrey S. Passel
Subject:	Comparison of Demographic Analysis, A.C.E., and Census 2000 Results by Race
Date:	February 27, 2001

The Census Bureau has furnished a preliminary demographic analysis (DA) estimate of the total U.S. population by age and sex for the black and "nonblack" populations.[16] The preliminary DA total is 279.9 million. The 2000 Census count of the resident population — 281,421,906 — when compared with the DA estimate implies an *overcount* of about 1.5 million or 0.5 percent. The initial A.C.E. estimates show an estimated *undercount* of about 1 percent (mid-range estimate) or 2.7 million. Thus, the A.C.E. and DA estimates of the total population differ by about 4.2 million. Reconciling this difference, or at least understanding its source, is a crucial factor in the adjustment decision.

On the basis of my analyses, two of which are briefly reported here, I conclude: ***The low DA total should NOT be used as a basis for deciding AGAINST adjustment because the current DA estimate underestimates immigration, particularly Hispanic and undocumented immigration. Furthermore, demographic techniques and the A.C.E. are quite consistent in estimates of undercount for the non-Hispanic Black population and the non-Hispanic, non-Black population. They disagree on estimates for the Hispanic population because the demographic figures are too low.***

My initial analysis shows that the current version of DA systematically underestimates the immigration component, especially undocumented immigration and temporary residents but also other areas, by a significant amount. Correcting the underestimation could substantially narrow the gap between DA and A.C.E by at least 2–3 million, thus bringing the DA estimate within the low-high range of the A.C.E.[17] In addition, there is some evidence to support even higher estimates of undocumented immigration that would bring the DA estimates closer to the mid-range A.C.E. estimates. Later in this memorandum I briefly address these immigration components of the DA estimates.

A full analysis of the three data sources — Census, A.C.E., and DA — would require, at a minimum, age-sex-race/Hispanic data from all three. These data, particularly the census data, are not yet available. The A.C.E. estimates that Gene Ericksen has supplied provide both adjusted (A.C.E.) population totals and unadjusted ("Census") population totals. These figures represent the non-group-quarters population (NGQ). As such, we cannot compare them to the

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[16] These race groups correspond to the 1990 "modified age race sex" (MARS) definition. The black population includes black Hispanics. Further, based on results from the Census Bureau's pre-census testing programs, this version of the black population probably corresponds fairly closely to a grouping from Census 2000 defined by persons choosing the "black" race response either alone or in combination.

[17] According to some researchers (Sum et al. 2001), underestimation of undocumented immigration might account for the *entire* gap.

DA estimates which represent the total population. However, I have used data from the April 2000 Current Population Survey (CPS) to derive some "quasi DA" estimates for comparison. The CPS data are for the civilian, noninstitutional (CNI) population. Although the NGQ and CNI populations are not exactly the same, they are quite similar in that the groups they exclude overlap to a high degree. With these data, one can approximate the estimates that *a* demographic analysis would yield for more detailed racial groups than *the* DA estimates show.[18] While these new data are not an exact representation of what DA will show, they serve very well to address issues of adequacy of DA estimates and consistency of A.C.E. and DA.

Black Population. For the non-Hispanic Black population, the A.C.E. and DA estimates are in very close agreement.

Source	Population (millions)	Percent Undercount	Sex Ratio Ages 18–29	Sex Ratio Ages 30–59
Census	33.470	—	83.1	80.3
A.C.E.	34.211	2.2%	83.5	81.6
Quasi-DA	34.424	2.8%	89.4	90.5

From this comparison (approximate though it is), I conclude several things. First, there is a high degree of similarity in the DA and A.C.E. estimates which both show an *undercount* of the Black population. Second, the A.C.E. actually may *underestimate* the Black undercount, particularly since the revisions I suggest for immigration would raise the DA population estimate slightly. Third, correlation bias in the A.C.E. still remains an issue. The A.C.E. does not find substantially different undercount rates for adult Black males and females, yet the DA sex ratios when compared with the census would imply that the undercount rates for males should exceed those for females by about 6 percent at ages 18–29 and 10 percent at 30–49. (These results are similar in nature to results from the 1990 PES and the 1980 PEP.) None of these results *per se* argues against using the A.C.E.; in fact, they argue that DA and A.C.E. show similar results.

Non-Black, Non-Hispanic Population. I opted to display results for the non-Black, non-Hispanic population because this group should be similarly defined and reported in the three data sources whereas the more detailed groups (white, API, American Indian) are more affected by differences in race reporting between the CPS and Census 2000. For the non-Black, non-Hispanic population, the A.C.E. and DA estimates are also in very close agreement.

Source	Population (millions)	Percent Undercount	Sex Ratio Ages 18–29	Sex Ratio Ages 30–59
Census	205.579	—	100.0	98.1
A.C.E.	207.086	0.7%	101.0	98.6
Quasi-DA	206.555	0.5%	100.4*	100.2*

*Based on entire non-Black population.

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[18] Demographic techniques are used by the Census Bureau to make estimate for four race groups (White, Black, Asian/Pacific Islander, American Indian/Alaska Native), for the Hispanic and non-Hispanic populations, and for the full four-by-two matrix of race/Hispanic groups. These estimates are not used for coverage measurement because of concerns about the precision and accuracy of the more detailed groups and because of issues surrounding consistency of race definitions across the census and various demographic data sources.

These data also show a very high degree of agreement between DA and A.C.E., both in terms of the size of the total population and the percent undercount. Thus, contrary to the gross comparisons of the total population where DA is well below the A.C.E. and even below the Census, *DA does show a net undercount for the largest share of the population — the non-Black, non-Hispanic population*. Second, here again, if the DA estimate were corrected for understatement of the immigration component, it might show that the A.C.E. estimate is slightly too low. The addition of more legal non-immigrants and undocumented immigrants would increase the DA estimate to a number somewhat larger than the A.C.E. number, but probably not much larger. Third, for this population, there is not much evidence of substantial correlation bias. The sex ratios seem to be in reasonable agreement, especially given the differences in population definitions. *These results for the non-Black, non-Hispanic population argue strongly that the A.C.E. measurements are sound and that the two systems (A.C.E. and DA) are in agreement as to the size and direction of the undercount and on the differential between the Black (not Hispanic) population and the non-Black (**also not Hispanic**) population.*

Hispanic Population. The A.C.E. and quasi-DA estimates for the Hispanic population diverge greatly. The differences support the notion that DA has underestimated immigration and that most, if not all, of the overall disagreement between DA and A.C.E. is due to this component.

Source	Population (millions)	Percent Undercount	Sex Ratio Ages 18–29	Sex Ratio Ages 30–59
Census	34.538	—	115.1	104.6
A.C.E.	35.552	2.9%	120.0	107.1
Quasi-DA	33.195	-4.0%	102.8*	101.8*

* Based on CPS, not a true "DA-type" sex ratio.

According to these data, the DA estimates for Hispanics are 2.4 million *lower* than the A.C.E. estimates and even 1.3 million below the census count. These data are quite consistent with the argument that the DA estimates have understated the amount of Hispanic immigration during the decade of the 1990s. Since a very high proportion of Hispanic immigration is undocumented and a large majority of undocumented immigration is Hispanic, this shortfall in the DA estimate points to a significant underestimation of undocumented migration. The sex ratio information also points in this direction. Again, a high proportion of undocumented Hispanic immigration consists of adult males. In fact, the sex ratio of adult undocumented immigrants can often exceed 140 or 150. The addition of 2+ million Hispanic undocumented immigrants to the DA estimates (with a reasonable age-sex distribution) would bring the A.C.E. and DA estimates into close agreement —for the Hispanic population, but more importantly for the non-Black and total populations. ***Thus, on the basis of these data, both the quasi-DA (with corrected undocumented immigration) and A.C.E. estimates point to roughly the same overall undercount in Census 2000 and to the continued existence of a higher than average undercount among Blacks and Hispanics.***

The Immigration Component in DA. The shortfall in DA compared to both the Census count and the A.C.E. can be traced almost entirely to two components of immigration — undocumented immigration and legal, temporary residents. My research and that of others offers: (a) sound empirical evidence for addition of a minimum of 2 million persons from these components; (b) reasonable evidence for perhaps an additional 1 million; and (3) arguments that

the number should be even higher. In addition, there are two other components — out-migration of legal immigrants and net movement of legalized immigrants — for which sound logical arguments can be put forth for adding an additional 200,000–400,000 persons to the DA estimates. The latter component is not even addressed in the DA estimates.

My analysis of data from the March 2000 CPS in conjunction with estimates of legal immigration yields an estimate of 6.8 million undocumented aliens counted in the CPS. In comparison, the DA estimates include an implied figure of "only" 6 million undocumented immigrants in the entire population. The difference between DA and my own work is also consistent with the degree of underestimation shown by the Census Bureau's estimates of the foreign-born population in comparison with the CPS figures. Further, because my own work only represents the undocumented population *included in the CPS,* it can be expected to underestimate the undocumented population. Thus, there are clearly at least 1 million more undocumented immigrants in the population than are included in DA. Other analyses, such as the Sum et al. (2001) analysis of the employment gap between the establishment and population surveys, point to numbers that are much, much larger still.

The DA estimates assume that the number of legal temporary foreign-born residents (i.e., legal non-immigrants) has not changed since 1990. This group includes foreign students and scholars, guest workers (such as the so-called "hi-tech" guest workers), intracompany transferees, exchange visitors, and their dependents. All of these are defined as part of the U.S. population for census purposes and should be included in the census, A.C.E., and DA. There are no "official" estimates of the legal non-immigrant population, but INS keeps track of the annual number of arrivals by visa category. Between 1990 and 1998, the annual number of arrivals in the visa categories that include the legal non-immigrants who should be counted in the census increased by more than 80%, or by more than 800,000. There are two nonimmigrant categories where estimates of the population numbers actually do exist. The number of foreign students and guest scholars increased by more than 150,000 between 1990 and 2000 according to survey data from the Institute for International Education. The number of H-1B guest workers living in the United States increased over this period by more than 200,000 according estimates by a researcher at Georgetown University (Lowell 2000). As a group, the legal non-immigrant population increased by at least 750,000 according to estimates I have developed from admissions data, the previously mentioned estimates, and some INS data on duration of stay.

DA estimates out-migration of legal foreign-born residents by applying a set of rates derived from the 1980–90 period to their estimates of legal foreign-born residents. Given the strong economy of the 1990s, particularly the late 1990s, it is reasonable to think that the rate of out-migration would have *decreased* during the decade. Further, the "legal" foreign-born population that the Bureau uses in its computation of out-migration for groups other than Mexicans and Central Americans includes some undocumented immigrants. All of this argues that emigration might be overstated by as much as 10-15 percent. If out-migration were actually 10 percent lower than the DA estimate, it would *add* 200,000 persons to the population estimate.

During the late 1980s and early 1990s a significant number of formerly undocumented immigrants (2.7 million) were granted legal status under the Immigration Reform and Control Act of 1986 (IRCA). About 2 million of these were from Mexico. Of the total, about 1 million were special agricultural workers (SAWs) who did not have to actually live in the United States to acquire legal status. The number of legalized aliens living in the United States at any given time has been subject to a great deal of uncertainty. For the 1990 DA estimates, only half to

two-thirds of the SAWs were assumed to be in the U.S. Again, given the relative economies of Mexico and the United States during the 1990s, it is reasonable to assume that many of the SAWs who did not live in the U.S. in 1990 would have moved here since then. Further, many of these legalized aliens, even if they live in Mexico most of the time, may have endeavored to be counted in the 2000 Census, in part to prove their continuing right to legal U.S. residence. Based on such arguments, it is reasonable to assume that there was an increase between 1990 and 2000 in the number of legalized immigrants living in the United States. In the 2000 DA estimates, this components is assumed to be zero, in effect, because there is no explicit allowance for it.

Thus, taken together, correcting the underestimation of immigration components in DA could add a minimum of 2 million to the DA estimate and, with quite reasonable assumptions, add 3.5–4 million. At this level then, the DA estimate would show an overall undercount of more than 2 million and would differ by an insignificant amount from the A.C.E. estimate. Further, since most of the additional immigration would be Hispanic, the DA and A.C.E. estimates for Blacks, Hispanics, and non-Black non-Hispanics would all show quite consistent levels and patterns of undercount.