

A KIDS COUNT/PRB Report on

# CENSUS 2000

## Counting Kids in Census 2000: Results and Challenges

By

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### **KIDS COUNT**

KIDS COUNT, a project of the Annie E. Casey Foundation, is a national and state-by-state effort to track the status of children in the United States. By providing policymakers and citizens with benchmarks of child well-being, KIDS COUNT seeks to enrich local, state, and national discussions concerning ways to secure better futures for all children. At the national level, the principal activity of the initiative is the publication of the annual *KIDS COUNT Data Book*, which uses the best available data to measure the educational, social, economic, and physical well-being of children. The Foundation also funds a nationwide network of state-level KIDS COUNT projects that provide a more detailed community-by-community picture of the condition of children.

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### **KIDS COUNT/PRB Reports on Census 2000**

This paper is part of a series of reports on the 2000 Census prepared for the nationwide network of KIDS COUNT projects. These reports have been guided by the recommendations of an expert advisory group of data users and child advocates brought together in a series of meetings by the Annie E. Casey Foundation and the Population Reference Bureau. Members of the advisory group have provided valuable assistance about how to interpret and use data from the 2000 Census.

A list of the advisory group members can be found at the back of this report.

For more information or for a pdf version of this report, visit the Annie E. Casey Foundation's KIDS COUNT website at [www.kidscount.org](http://www.kidscount.org) or PRB's website at [www.prb.org](http://www.prb.org).

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## Executive Summary

For many decades, according to the U.S. Census Bureau’s own measurements, the decennial census reflected an undercount of the nation’s population. Over time, better enumeration and outreach methods helped reduce, though not eliminate, the percentage of the population missed in the census. But certain segments of the population, including children, proved harder to count, resulting in a persistent “differential undercount.” For example, according to estimates from a post-census measurement survey, the 1990 census missed 3.2 percent of children under age 18, twice the net undercount rate for the population as a whole. The 2.1 million children missed in 1990 represented more than one-half (52 percent) of the net undercount, even though kids made up only a quarter of the population.

Research shows that some children are at higher risk of being missed or, in some cases, counted twice, in the census:

- Children in joint physical custody arrangements;
- Children in foster care;
- Children (ages 17 to 20) away at college;
- Children in institutional facilities (part of the ‘group quarters’ count); and
- Children living with someone other than their parents.

Census 2000 counted 72.3 million children under age 18, but the accuracy and quality of this count remains unclear. Evaluations generally suggest that the proportion of children missed in Census 2000 declined. But measures of census results offer conflicting conclusions about the accuracy of the count, and some methods used to add significant numbers of children to the count might have produced less reliable data.

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The Census Bureau assessed the accuracy of Census 2000 using two separate methods. One was a post-census survey, called the Accuracy and Coverage Evaluation (A.C.E.) survey, designed to measure undercounts or overcounts in the initial enumeration. The second was an independent benchmark of the population, based on a procedure known as Demographic Analysis, which uses birth, death, and other administrative records to construct population totals.

The Census Bureau issued three different estimates of census accuracy from the A.C.E. survey over a two-year period, acknowledging along the way that it lacked confidence in many of the findings. Based on the A.C.E. survey, the Census Bureau initially reported a net *undercount* of 1.5 percent for children, nearly a third higher than the total net undercount but half the reported rate from a similar survey for children missed in the 1990 census. The Bureau revised its estimates of census accuracy (although not specifically for children) in October 2001, but lingering doubts about the findings led it to reexamine A.C.E. procedures from the ground up. The final assessment, issued in March 2003, suggested that Census 2000 actually *overcounted* children, especially those ages 10 to 17. Although the final analysis of A.C.E. results showed a small overcount of children ages 0 to 9, Demographic Analysis indicated that Census 2000 might have *missed* more than 2.5 percent of children in this age group. Uncertainty about the accuracy of the count of children was one of several primary reasons the Census Bureau rejected a statistical adjustment of census numbers for any official purpose.

Early Census Bureau analyses showed that the number of miscounts in Census 2000—people missed, counted twice, or in the wrong place—rivalled the number in 1990.<sup>1</sup> The extent of duplications emerged as a significant concern. After further analysis of A.C.E. results, the Bureau reported that at least 5.8 million people were counted twice in 2000.<sup>2</sup> College students living away from home and children in joint custody situations are especially at risk of being

double-counted, suggesting the need for clearer instructions on who to include on the census questionnaire. Efforts to improve the coverage of children and other hard-to-enumerate groups using traditional census methods also may have fallen short: A National Academy of Sciences panel concluded that nearly 6 million people—a disproportionate number who were children—for whom some or all information was missing from the census form, were added to the census using a statistical process called *imputation*. Children living in large households were particularly vulnerable to being counted using this indirect method, which is less reliable than collecting information from forms mailed back close to Census Day.

What we know about the count of children in Census 2000 can help inform planning for a fundamentally different census in 2010: How accurate was it, and how do we know? How did it compare to previous enumerations? What methods and operations helped or hindered the effort to count children and their families accurately? We hope this overview of children and the census will provide the basis for further discussion about how to improve the count of this vulnerable segment of the population.

## **Background**

The Census Bureau unveiled its initial plan for Census 2000 in 1996 to great expectations. Faced with significant criticism over the cost and accuracy of the 1990 count, the Bureau had redesigned the census in fundamental ways. The plan incorporated both refined and new uses of statistical sampling techniques to contain costs and improve accuracy, particularly of historically undercounted population groups, such as children, racial minorities, and renters.<sup>3</sup>

The Census 2000 plan, however, quickly became a lightning rod for political debate over appropriate uses of sampling. Critics of these methods contended that the U.S. Constitution required a literal headcount of the population, and that sampling was subject to manipulation for partisan purposes. Supporters argued that traditional census methods could not reduce the disproportionate undercount of historically hard-to-count groups, and that the Constitution required the most accurate census possible to ensure equality of political representation. Opponents of the Census Bureau's plan, led by Republicans in the U.S. House of Representatives, went to court to stop the use of statistical sampling in the census. A divided U.S. Supreme Court ruled just one year before the start of the count that the Census Act prohibited the use of sampling to compile the state population totals used to reapportion the House of Representatives.<sup>4</sup>

The Census Bureau scrambled to draft a new Census 2000 plan that featured both a direct enumeration for apportionment purposes and a postcensus survey to measure and possibly correct miscounts in the raw numbers, for purposes other than apportionment. The Bureau also launched a first-ever paid advertising campaign, shared address lists with local governments in advance of the census, printed questionnaires in seven languages, sent census educational materials to schools, and partnered with thousands of organizations to promote participation.

Still, revising the plan so late in the decade forced the Census Bureau to field several counting operations that it had not fully tested.

Final evaluations of Census 2000 showed unexpected results. The Census Bureau estimated from the A.C.E. survey that, for the first time, it had *overcounted* the U.S. population, by 0.5 percent. The reported net overcount resulted from significant double counting, or duplications, which more than offset the estimated number of people missed. The census was still more likely to miss members of some demographic groups than others. For example, analyses showed an overcount of 1.13 percent for non-Hispanic whites, but an undercount of 1.84 percent for blacks. However, evaluations failed to detect a net undercount of other historically hard-to-count racial and ethnic minorities, including Hispanics, Asians, and American Indians, leading some observers to question the reliability of the evaluation methods. In the end, the Census Bureau decided against using the results of its statistical survey to adjust the direct enumeration.

### **Why Does an Accurate Count of Children Matter?**

An accurate count of children in the census is important for reasons that are both fundamentally political and practical. The U.S. Constitution requires a census of population every 10 years to apportion seats in the House of Representatives and to ensure equality of representation in congressional districts. The principle of equal representation extends to legislative bodies at the state and local levels as well. An accurate count of children and their families helps ensure that the interests of this nonvoting, and therefore politically vulnerable, segment of the population are represented in our democratic system of governance.

Census data are also used to distribute upwards of \$200 billion annually in federal program funds to states, local governments, and school districts. Programs that rely in whole or in part, directly and indirectly, on census data to allocate funds include Medicaid, Social Services Block Grants, Foster Care, Adoption Assistance, WIC nutrition program, Child Care and Development Block Grants, and Title I grants to local education agencies.<sup>5</sup> Billions of dollars more in state funds go to counties, cities, and neighborhoods based on census numbers. Community-based organizations rely on information from the census to demonstrate eligibility for grants from public and private sources.

Beyond the allocation of money, census data provide an objective basis for assessing social and economic need and for guiding policy solutions. Local governments, for example, can use data on children to project the need for child care, schools and related educational services, health care, and recreational programs.

Census data are also an important tool for monitoring well-being and tracking the progress of children and their families over time. Census population figures are used to calibrate many government and private surveys, and serve as the benchmark for annual population estimates. An inaccurate count of children in the census can adversely affect an array of key socioeconomic indicators throughout the decade, result in inadequate resources for children in need, and lead to misinformed policy decisions affecting children and their families.

### **Measuring Census Accuracy**

No one disputes that the census misses people, or that certain population groups—primarily racial and ethnic minorities, children, and low-income Americans—are missed at higher rates than the population as a whole. Census 2000 highlighted, to a greater extent than

ever before, another significant enumeration problem: Millions of people are counted twice, and some groups, including non-Hispanic whites and older Americans, are more likely to be overcounted. But why are children missed or miscounted, and how do we know how many are missed?

### *Why Children Are Missed or Miscounted in the Census*

The census can miss or miscount children for several reasons.<sup>6</sup> Sometimes the census fails to count an entire household because the address is not on the mailing list, because more than one household resides (sometimes illegally) at the same address, or because the housing unit is irregular (such as a converted garage). In other cases, adults in an enumerated household fail to report some or all children who reside there. This can happen if there are more residents in a household than space to report information (large household cases), or if the adult filling out the form assumes a child will be counted at another home. Adults also might overlook children living with them temporarily, such as foster children or the children of a relative. In the past, the Census Bureau has estimated the number of people missed due to failure to count the entire housing unit versus the number missed in households that were otherwise enumerated; it did not conduct a similar evaluation for Census 2000.

Minority children and children living in poor, single-parent, less-educated, or linguistically isolated households also are more likely to be missed because these factors are historically associated with higher rates of undercount. Children who are transient, such as those in migrant farmworker families, or homeless are more difficult to count as well.

Some children are at higher risk of being double-counted. College students living away from home should be enumerated at school, but parents sometimes include them on their own

census form, as well. Children whose parents have joint physical custody might also be counted twice if both parents include them on their respective census forms.

### *Methods for Measuring Accuracy*

The Census Bureau measured the accuracy of Census 2000 using two primary methods: Demographic Analysis and the Accuracy and Coverage Evaluation (A.C.E.) survey.

***Demographic Analysis:*** Demographic Analysis (DA) is an independent estimate of the population that the Census Bureau has produced for each census year since 1940. It was developed following the 1950 Census and first used as a coverage evaluation method in 1970.<sup>7</sup> The DA estimate is constructed largely using administrative records. The estimate for the population under age 65 is built using information on births, deaths, immigration, and emigration. For the population age 65 or older, the Bureau relies primarily on aggregate Medicare data, adjusted for under-enrollment. Demographic Analysis estimates are reported by age, by gender, and for two broad racial categories (black and nonblack).

Demographic Analysis has provided since 1940 a consistent benchmark against which census results can be measured. The Census Bureau compares the DA population and the enumerated population to estimate the net national undercount or overcount in the census. The Bureau uses DA to assess the reliability of the count overall and to identify patterns and differentials in coverage for population subgroups, such as children and adult black males.<sup>8</sup>

Although previously accepted as a relatively accurate benchmark of the total U.S. population, Demographic Analysis is an increasingly problematic evaluation tool for several reasons. Most notably for Census 2000, Census Bureau estimates of undocumented immigration and temporary residents appear to be weak. In 1970, immigrants accounted for less than 5 percent of the U.S. population, compared with 11 percent of the population in 2000. From 1970

to 2000, the estimated number of immigrants tripled, from 10 million to 30 million, and a much higher proportion of recent immigrants are undocumented or are in the United States legally on temporary visas, making their presence more difficult to track and project.<sup>9</sup> The growing difficulty in quantifying immigration clearly affected the reliability of the DA estimates for 2000. However, it is generally believed that younger children are least likely to be immigrants, making DA estimates for this age group more robust than for the population overall.

Other limitations on using Demographic Analysis to assess census accuracy include a lack of reliable estimates below the national level<sup>10</sup> and the availability of DA estimates for only two racial categories (black and nonblack).<sup>11</sup> Efforts to compare DA estimates to the census for racial subgroups are also less viable because Census 2000 allowed individuals to choose more than one race for the first time. Comparisons of accuracy for children by race are increasingly less reliable because about 4 percent of children, and 8 percent of children ages 0 to 4, identified with two or more races in the census (compared with 2.1 percent of the total population), and that proportion is expected to grow in the future.<sup>12</sup>

***Coverage Measurement Surveys:*** Since 1950, the Census Bureau also has fielded coverage measurement surveys in each census to evaluate the accuracy of the direct enumeration for areas below the national level and for specific population subgroups. In 1990, the Census Bureau director and a committee of agency experts concluded that results of the Post Enumeration Survey (or PES, as the survey was then called) were sufficiently reliable to serve as the basis for a statistical adjustment of the census, but the Secretary of Commerce overruled their recommendation.<sup>13</sup> The Census 2000 Accuracy and Coverage Evaluation (A.C.E.) survey was the most sophisticated and extensive of these surveys to date.

The A.C.E. survey was conducted in the spring and summer of 2000, by telephone and household visits, after a completed form was received from households in the sample. Armed with new address lists developed independently of the census, well-trained census takers visited 300,000 representative households nationwide to gather fresh information on the composition of those households on Census Day. Data gathered in the A.C.E. sample were matched with the earlier results from those households to determine how many people were missed or counted twice, and if they were counted in the right place. The results of the matching process were then projected onto demographically and geographically similar areas (e.g., by race and ethnicity, age, gender, renter or owner status, and size of community), block by block, across the country. The Census Bureau hoped that the second set of “adjusted” numbers would more accurately reflect the composition and distribution of the population. That was not to be the case, however.

### **Undercounts and Overcounts: What Do They Mean?**

When the Census Bureau publishes figures on census accuracy, it usually presents the results in terms of *net undercounts* or *net overcounts*. Net undercounts and net overcounts reflect the difference between the number of people missed in the census (*omissions*) and the number of people counted twice (*duplications*) or by mistake (*other erroneous enumerations*). If omissions exceed duplications, the result is a net undercount. If there are more duplications (and other erroneous counts) than omissions, the result is a net overcount.

For example, based on the 1990 census Post Enumeration Survey, the Census Bureau estimated that it missed 8.4 million people and double-counted another 4.4 million, for a net national undercount of 4 million people.<sup>14</sup> In its final analysis of 2000 Census accuracy, the

Bureau estimated a minimum of 5.8 million duplications, offset by an estimated 4.5 million omissions, for a net national overcount of 1.3 million people.

Net undercounts and overcounts do not tell us everything we need to know about census accuracy. That is because the characteristics of people who are more likely to be missed in the census are different from those who are more likely to be counted twice. Historically, racial minorities and people of Hispanic origin,<sup>15</sup> renters,<sup>16</sup> children under age 18, and residents of urban and rural areas tended to be missed in the census at higher rates than non-Hispanic whites, homeowners, older people, and suburban residents. Undercounts are more concentrated in poor and minority communities, while overcounts are more likely to be concentrated in higher-income predominantly white communities. When assessing census accuracy, therefore, overcounts do not necessarily offset undercounts in specific communities, because a person who is likely to be counted twice (overcount) cannot always “replace” a person who is likely to be missed (undercount). It is important to examine coverage for different population subgroups, in addition to net figures, to get a full picture of accuracy. For example, for people age 50 or older, the Census 2000 A.C.E. survey revealed an overcount of 2.5 percent for women and 0.8 percent for men, which could offset an undercount of children when net accuracy figures are reported.

Net figures also obscure the full extent of counting mistakes. While omissions and duplications might offset each other in calculating net undercounts and overcounts, many experts believe that the total number of these errors is a better measure of census quality. In addition to omissions and duplications, *gross census error* includes people or housing units counted in the wrong place and people included erroneously (e.g., people born after, or who died before, Census Day, and fictitious persons). The Census Bureau estimates that there were 12.5 million

errors in 2000, compared with 12.8 million errors in the 1990 census. By this standard, the 1990 and 2000 censuses were of comparable quality.

### **The Differential Undercount**

Another important indicator of census accuracy is the *differential undercount*. This measure represents the gap in the accuracy of census counts between population subgroups, such as children and older Americans, and blacks and non-Hispanic whites. Demographic Analysis has documented a differential undercount between blacks and nonblacks since 1940. Coverage measurement surveys, which capture more detail, have revealed uneven outcomes for other populations of color (compared with non-Hispanic whites), renters (compared with homeowners), and children (compared with people over age 50). According to the 1990 Post Enumeration Survey, the undercount of children under age 18 was 3.2 percent, double the overall net undercount of 1.6 percent. The undercount of minority children was even higher; for example, the 1990 Census missed 7 percent of black children and nearly 5 percent of Hispanic children.

In the next section, we will review findings on the accuracy of the count of children in Census 2000.

### **How Well Did Census 2000 Count Children?**

The Census Bureau released its final evaluation of Census 2000 accuracy in March 2003. The *Accuracy and Coverage Evaluation (A.C.E.) Revision II* represented more than a year of additional research since initial estimates of census coverage were published in March and October 2001. Inconsistencies and anomalies in those earlier estimates led the Bureau to

recommend against a statistical adjustment of the census numbers used to draw congressional district boundaries and to calculate federal formula grants. Of particular concern was the apparent failure of the Accuracy and Coverage Evaluation survey to measure the full extent of overcounting (or duplication) in the census, a problem caused at least in part by joint physical custody of children of divorced parents and by misunderstood rules about where to count college students.

Conflicting results from various evaluations of census accuracy make it difficult to reach firm conclusions about how well Census 2000 counted children. Most evidence suggests an improvement in the coverage of children over 1990, but children were still more likely to be missed, or less likely to be overcounted, than most other age groups in 2000.

### **The First Assessment of Accuracy: March 2001**

Early assessments of Census 2000 accuracy produced uncertain results. The A.C.E. survey, which placed the U.S. population at 284.7 million, showed a net national *undercount* of 1.18 percent, an improvement over the 1.61 percent undercount measured by the 1990 Post Enumeration Survey. The A.C.E. also found that differential undercounts of children, racial and ethnic minorities, and renters were smaller than in 1990 but not eliminated. The Census Bureau reported a net undercount of children under age 18 of 1.54 percent, considerably lower than the 3.18 percent undercount measured in 1990 (see Table 1).

Table 1

**Percent Net Undercount of Children for Selected Coverage Measurement Programs, 1990 and 2000**

	<b>Children under age 18</b>
<b>1990 Post Enumeration Survey (PES)</b>	3.2
<b>1990 Demographic Analysis</b>	1.8
<b>2000 Original A.C.E.</b>	1.5
<b>2000 A.C.E. Revision II</b>	-0.8*
<b>2000 Demographic Analysis (Base estimate)</b>	-0.2
<b>2000 Demographic Analysis (Alternate estimate)</b>	0.6
<b>2000 Demographic Analysis (Revised estimate)</b>	0.7

\*Estimated by the Population Reference Bureau based on Census Bureau estimates of net undercount for children under age 10 and ages 10 to 17. A minus sign indicates a negative net undercount, or net overcount. The Census Bureau did not publish separate estimates of coverage by age cohort as part of A.C.E. Revision I in October 2001.

Source: All figures are from the U.S. Census Bureau.

But the Bureau faced a major inconsistency in its initial evaluation of Census 2000. The Demographic Analysis (DA) estimate of 279.5 million people was 0.7 percent *lower* than the census count of 281.4 million, suggesting a net national *overcount* of 1.8 million people.

The contradictory results of the DA and A.C.E. measurements surprised Census Bureau experts. Taking into account natural population increase (births minus deaths) and estimates of legal and illegal immigration, the Bureau still could not explain about 5.3 million of the population change between 1990 and 2000. Children accounted for 1.3 million of the unexplained change.<sup>17</sup> The Census Bureau suspected both problems with the A.C.E. methodology and underestimation of undocumented immigration between 1990 and 2000 in the DA estimate. To address the latter problem, the Bureau constructed an alternate DA estimate in early 2001 that assumed twice the level of undocumented immigration than the original “base” estimate. The alternate DA figure moved this independent population benchmark closer to both the census count and A.C.E. estimate, with an implied *net undercount* of 0.3 percent or 0.9 million people. The new immigration assumptions reduced the level of unexplained change for children to about 700,000.

Like the A.C.E. survey, Demographic Analysis showed a reduction in the net undercount of children from 1990. The base DA estimate for 2000 indicated a net overcount of 0.5 percent for boys and a net undercount of 0.1 percent for girls, while the revised 2000 DA estimate indicated net undercounts of 0.4 percent for boys and 0.9 percent for girls. The 1990 Demographic Analysis estimates showed higher net undercounts: 1.7 percent for boys and 1.9 percent for girls.<sup>18</sup>

Nevertheless, the inconsistency between the Demographic Analysis and A.C.E. estimates (and the failure to fully understand its causes) was a major factor in the Secretary of Commerce's March 2001 decision not to use the A.C.E. survey to statistically adjust the census figures used for congressional redistricting.<sup>19</sup>

#### **A.C.E. Revision I: October 2001**

Following the March 2001 release of unadjusted, block-level population counts for use by the states in redistricting, the Census Bureau continued to evaluate the census and A.C.E. results. Its analysis of the coverage measurement program revealed an unexpected problem: The A.C.E. survey had failed to detect at least 3 million counting errors, many of them duplications.<sup>20</sup>

The new A.C.E. analysis, released publicly in October 2001, indicated that Census 2000 had incorrectly included at least 6.1 million people, instead of the 3.1 million reported earlier. But while the estimated number of duplicates went up, the estimated number of omissions remained unchanged in the new analysis. The significantly larger number of duplicates nearly canceled out the number of people missed, bringing the revised net national undercount down essentially to zero (0.06 percent). The revised A.C.E. figures showed a small (though statistically insignificant) overcount of non-Hispanic whites and lower, though still disproportionately high,

undercounts of Hispanics and blacks.<sup>21</sup> The Census Bureau did not report new undercount estimates by age group. The Bureau also revised the Demographic Analysis estimate to reflect new assumptions about immigration, birth registration, and Medicare enrollment, in some cases using data from Census 2000 and other current surveys as a check (for example, data on the foreign-born population from the census long form). The revised DA estimate suggested a small net national undercount of 0.12 percent, much more in line with the A.C.E. estimate than the March 2001 comparisons.

The apparent problem with the A.C.E. measurement of duplications, along with the suspicion that there might be no net undercount in Census 2000, led the Census Bureau to announce in October 2001 that it would not use the A.C.E. results to adjust the annual population estimates used to distribute federal program funds. The Bureau pledged to continue its examination of presumed flaws in the A.C.E. that had led to a miscalculation of census accuracy.

### **A.C.E. Revision II: March 2003**

The final analysis of census, A.C.E., and Demographic Analysis results both confirmed the Census Bureau's earlier decisions not to adjust the census numbers based on the A.C.E. survey, and raised additional questions about the accuracy of the count, particularly for children.

The March 2003 A.C.E. estimates showed a small net national *overcount* of about one-half of 1 percent (-0.49 percent), or 1.3 million people,<sup>22</sup> as well as the persistence of a differential undercount for some race and ethnic groups<sup>23</sup> and for renters.<sup>24</sup>

The revised A.C.E. estimates for children were among the most puzzling findings of the Census Bureau's final review. The new assessment showed an overcount (-0.8 percent, or about 602,000 people) of children under age 18, a finding generally consistent with Demographic

Analysis. Both the A.C.E. and DA estimates indicated net overcounts for black and nonblack male and female children under age 18. However, A.C.E. Revision II showed virtually no undercount of children under age 10, while Demographic Analysis suggested that the census missed 2.6 percent of this group.<sup>25</sup> According to DA, nearly 3.3 percent of black males and 3.6 percent of black females in this youngest age cohort were not counted; the A.C.E. estimates for these groups suggest that roughly 0.7 percent of these groups were missed. For both nonblack male and female children under age 10, the undercount was more than 2 percent according to DA, while the A.C.E. showed an overcount of nearly 0.7 percent for both groups.

Experts agree that the Demographic Analysis estimate for children under age 10 is generally reliable, because recent birth records are of high quality and because immigration, while increasingly difficult to quantify, affects young children the least. The Census Bureau believes that an undiscovered problem with the revised A.C.E. estimates might explain the inconsistency between the two measurements.<sup>26</sup>

### **Accuracy Benchmarks Below the National Level**

While the Census Bureau only produces population estimates from Demographic Analysis at the national level, evaluators conducted checks on the accuracy of Census 2000 below the national level using alternative demographic techniques. While the methods are very different from the primary evaluations at the national level, these checks shed additional light on the coverage of children in the census.<sup>27</sup>

Birth records, with an allowance for migration, were used to construct benchmarks of the population under age 10. This independent evaluation indicated a net national undercount of 1.7 percent for children in this age group. Different methods for producing the migration component

might explain the higher undercount rate (2.6 percent) suggested by the national DA estimate, but both measurements clearly document both an undercount of the youngest children in 2000 and an improvement in coverage over 1990.

Below the national level, comparisons between demographic estimates constructed from birth records and the enumerated population showed that Census 2000 improved coverage of children under age 10 in all four regions of the country over 1990. The net undercount rate for this age group declined in all regions, although the pattern of regional differences was unchanged from 1990. The West had the highest net undercount rate (4.3 percent), while the Midwest region was the only one with a net overcount (-1.0 percent undercount). Net undercount rates for the South and Northeast were 2.1 percent and 0.7 percent, respectively.

For children ages 7 to 14, Census Bureau evaluators used school enrollment data to gauge whether coverage in 2000 had improved or declined over 1990.<sup>28</sup> Their analysis showed that net coverage of this age group improved for the nation and all regions. An analysis of county-level data also showed greater improvements in accuracy for counties with higher concentrations of minority populations.

### **Counting Children Accurately: Successes and Challenges**

Not surprisingly, as the nation grows, diversifies, and displays increasingly complex household relationships, the census becomes more difficult to design and administer. Census 2000 presented several methodological and operational challenges that affected the count of children and, by extension, information on the characteristics of their households. It appears that some design changes and counting efforts were successful in reaching a larger proportion of children, while others produced results that were uncertain at best.

## 1. Imputation

While official measures showed a lower undercount of children in 2000 than in 1990, evidence suggests that the measured net undercount of children might have been higher in Census 2000 without the use of a statistical procedure known as *imputation*. Imputation is used when there is evidence of residents in a household for whom census takers are unable to collect information directly. The Census Bureau might impute one or more individuals in an enumerated household, or it might fully impute all residents and their characteristics in a household for which no information is available. In other cases, the Bureau might impute one or more missing characteristics. If possible, imputed data is based on other information provided for that household on a census form; otherwise, imputations are based on data gathered from neighboring homes, including household size if necessary.<sup>29</sup>

Overall, there were 5.8 million “whole person imputations” in 2000, representing 2.1 percent of the household population, three times more than in 1990. A review by an expert panel of the National Research Council found that a disproportionate number of these imputations were for minorities, renters, and children. The panel concluded that the net national undercount and differential undercount of children and other historically hard-to-count groups would have been higher without imputations.<sup>30</sup>

In Census 2000, 3.1 percent of children under age 18 were imputed into the count, the highest proportion of imputations of any age group. Sixty percent of these imputations occurred in households that were enumerated through a regular counting procedure, but for which data could not be collected for all household members. This might occur, for example, if there are more people in a household than space on the census form and census workers are unable to

follow up with the household by telephone. In fact, the largest share of imputations of people in otherwise-enumerated households (as opposed to imputations for households in which no one was counted directly) was for children; 60 percent of imputed children were in enumerated households. (See next section for a further discussion of this situation.)

The census cannot always collect information on age even for people reported on a census form. The Census Bureau had to impute age for 4.8 percent of the total household population; age imputation rates for non-Hispanic blacks and Hispanics were higher—7.6 percent and 7.5 percent, respectively.<sup>31</sup>

## **2. Children in Large Households**

Children living in large households were at greater risk of being overlooked in the census. The 2000 Census questionnaire had space to report up to six people living in a household; the 1990 Census questionnaire included space for up to seven people to report their information. The first question on the census form asked the number of household residents as of Census Day.<sup>32</sup> Larger households were instructed to list additional residents at the end of the form, so that census takers could follow up by telephone to gather the additional data in an operation called Coverage Edit Followup.<sup>33</sup> There were no follow-up visits to households that could not be reached by telephone; data for those additional residents were imputed.

The Census Bureau used a “continuation form” to record data for household residents beyond the six reported on the regular questionnaire. About 2,100 continuation forms could not be linked to the original household form during processing, leaving the Census Bureau to impute the missing information for roughly 4,100 people listed on the rosters of the original forms. When filling in the missing data, the Census Bureau assumed an even age distribution of

children, overlooking research that shows respondents tend to list nonadult household members in descending age order. Therefore, the imputation of age for some large households overestimated the number of older children and underestimated the number of younger children.

Processing problems aside, the large household counting operation appears to have improved the coverage of children in Census 2000. Almost 675,000 people under age 20 were added in this follow-up activity. Equally important, people added to the census from large household continuation forms were much more likely to be under age 15 than people in the overall population. For example, nearly 30 percent of those added were under age 5, while only 6.8 percent of the population is under age 5. Evaluations of large households also showed that people in these homes for whom data were reported on the original census form (e.g., one of the first six people in the household) were more likely than the overall population to be in the 5 to 19 age group. This suggests that children tend to be listed on census forms in order of age, since a disproportionate number of children counted on the continuation forms (people ages 7 through 12 in the household) were under age 5. It also means that the youngest children in large households were most at risk of being missed if the household could not be reached by telephone or if the continuation form was “lost.”

Coverage Edit Follow-up for large households was successful in some respects, but an accurate count of children in these households was still problematic. The Census Bureau was able to gather information on additional people in large households in less than two-thirds (57 percent) of the roughly 1.4 million households in this category, primarily because the household could not be reached by telephone and there was no follow-up visit to the home. Imputation was used for the remaining cases, a likely explanation for the high proportion of child imputations in households that responded to the census.

### **3. Counting Children in the Right Location**

The growth in nontraditional households makes it increasingly difficult to count people in the right location. The Census Bureau uses a concept of “usual residence” to establish where people should be counted. Applying usual residence rules to children of divorced parents with joint physical custody is especially difficult. Children who go back and forth between parental homes might either be included on both census forms, resulting in duplicate counts, or missed altogether, because one parent thinks the other included the child on their form.

College students also are more prone to double counting. Those living away from home should be counted at their college dorm, with assistance from the school’s administrators, or at their off-campus residence on a regular census form. But many parents include college-age children on their own census form, resulting in duplication.<sup>34</sup> The proportionately and numerically higher postsecondary enrollment among whites most likely contributes to their higher overcount, when compared with college-age minorities.<sup>35</sup>

### **4. Coverage Improvement Programs**

The Census Bureau carried out several programs in 2000 designed to improve accuracy by reaching people who might be overlooked in the primary counting operations (mailed questionnaires and door-to-door visits). Evaluations suggest that at least some of these programs improved the count of children in the census.

“Be Counted” forms were distributed at targeted public locations (e.g., community centers and post offices) nationwide for several weeks starting on Census Day, to give people who did not receive a form at their address or who believed they were left off of their household’s form, as well as those without a usual residence, an opportunity to be counted.

More than 560,000 people were added to the census through these forms, more than twice the number added through a similar campaign in 1990. An analysis of Be Counted returns showed that a higher percentage of children under age 5 and ages 5 to 9 were added through this operation than were counted in the census overall, indicating that the program was successful in improving the coverage of young children. Nearly 38,000 children under age 5 and 42,500 children ages 5 to 9 were added to the census based on Be Counted returns.

Another coverage improvement program, called Update/Enumerate, targeted “special need” areas that included colonias<sup>36</sup> and some American Indian reservations. Census enumerators delivered questionnaires and gathered information from the residents at the same time. The Census Bureau added a higher percentage of children under age 18 through Update/Enumerate (31.9 percent) than were enumerated nationally; far more children (551,742 people) than any other age group were counted in this operation.

The Urban Update/Leave program was designed to deliver questionnaires to urban households that were unlikely to get a form by mail. These cases included apartment buildings where mail is dropped off in the lobby, instead of placed in individual mailboxes for each unit, and communities where a high percentage of households receive mail at a post office box.<sup>37</sup> Census workers dropped off questionnaires at each housing unit and asked residents to mail them back. (Households that did not return a form by mail received a follow-up visit later in the census.) A slightly higher percentage of children under age 18 (27.3 percent) were counted through Urban Update/Leave than in the census overall (25.7 percent). However, the roughly 140,000 children counted this way also were less likely to be enumerated by mail, suggesting that it might be more efficient to enumerate some of these households in person when the forms are delivered. Only eight of 12 census regions participated in this program.

## **5. Reporting Age Accurately**

The Census Bureau took steps to reduce misreporting of age in Census 2000 by asking respondents to give both their age and birth date, allowing precise comparison of reported age with calculated age.<sup>38</sup> Evaluations showed that 90 percent of respondents reported an age consistent with their birth date. Nearly two percent of the population underreported age by one year, while six percent overreported age by one year.<sup>39</sup> The incorrect reporting is most likely related to when the household filled out the census form. The census collects age data as of April 1 of the census year (Census Day), but some people with birthdays close to the reference date might have given incorrect ages depending on whether they filled out the form before or after April 1. Also, people who were counted during field follow-up visits by census takers were more likely to overreport age, since these interviews were conducted farther away from the reference date.

Misreporting of age can affect the age distribution of the child population, as well as the number of children at the high and low ends of frequently reported age cohorts. For example, children born on or before Census Day can be left out entirely if the household already mailed back its questionnaire, while those born after Census Day might be included erroneously if the household completed its form later in time and failed to heed the reference date of April 1. Similar mistakes can affect the number of children in each single-year age group, as well as the total count of children under age 18, reported in the census.

## **Beyond Census 2000: The Future of Census Data on Children and Families**

The next census will be different from previous enumerations in at least one significant way: It will not include the traditional long form, which has gathered important social and economic information from one in six households (roughly 20 million households in Census 2000) since 1940. The long form will be replaced by the American Community Survey (ACS), an ongoing monthly sample of 250,000 households (3 million households annually) that will collect long-form type data from communities across the country. The Census Bureau has been testing the new survey since 1996 and will launch it nationwide in late 2004. The first annual estimates from the ACS will be available in the summer of 2006.

The primary advantage of the ACS over the long form will be the availability of more current data on key socioeconomic indicators, including educational attainment, language spoken at home, income and poverty, and grandparents as primary caregivers, for areas as small as neighborhoods. Potential drawbacks of shifting critical information gathering to an annual survey include the uncertainties of adequate annual funding and lower reliability of the estimates due to sample size (when compared to the once-a-decade long form). Without a long form in 2010, however, the ACS would become the only source of nationally comparable information critical for tracking the social and economic well-being of children and families at the neighborhood, city, and county levels.

The Census Bureau has already taken one undoubtedly contentious issue off the table for 2010. Agency experts have concluded that coverage measurement surveys are not sufficiently reliable to assess accuracy for small geographic areas (such as census blocks, tracts, towns, and small cities), and that the methodology is too complex to permit a timely decision on whether

survey results can be used to adjust the census numbers used for congressional redistricting. The Bureau will instead expand or develop initiatives that target historically undercounted groups, such as making census forms available in public places, developing special procedures to deliver forms in rural and inner city areas, and identifying households that might include harder-to-count people.<sup>40</sup> The National Research Council has urged the Census Bureau to review procedures for counting large households, to reduce reliance on imputation as a method for adding children to the count in the future.

The evidence, while not entirely consistent or clear, indicates that coverage of children was better in Census 2000 than in 1990, but that children remain at high risk of being miscounted or missed altogether at a disproportionate rate. A significant number of children were added to the count through imputation, in part because the Census Bureau was unable to contact more than a third of households with more than six residents, and children were disproportionately likely to be listed as persons seven to 12 on household rosters. Evaluations of coverage improvement programs suggest that children are less likely than older people to be self-enumerated (that is, to be included on a form completed without assistance from a census taker), which is widely considered to be the most accurate form of enumeration.

Demographic trends also suggest that gathering accurate information on children and their households in the future will remain a challenge. The number and proportion of single-parent families with children, families who are more likely to be poor than households with both parents present, continue to grow. Census 2000 collected data for the first time on grandparents who are primary caregivers for their grandchildren. While we do not know whether children in this type of household are more likely to be missed, nearly one in five grandparent caregivers lived in poverty, a factor historically associated with higher rates of undercount.

The Census Bureau reported in August 2004 that the poverty rate for children, at 17.6 percent, remains higher than for all other age groups, and the number of children in poverty increased between 2002 and 2003, from 12.1 million to 12.9 million.<sup>41</sup> According to a recent Population Reference Bureau report, the number of children living in “severely distressed neighborhoods” grew by 18 percent in the 1990s. Significant proportions of black and Hispanic children live in these neighborhoods, characterized by high rates of poverty, single-parent families, high school dropouts, and unemployment among men.<sup>42</sup> All of these factors are associated with higher rates of undercount in the census.

The Census Bureau does plan to field a postcensus survey to analyze coverage in the 2010 census, including the extent of any undercounts and overcounts for selected demographic subgroups. The survey, however, could be vulnerable to future budget cuts, since evaluation programs are a lower priority than activities directly associated with counting the population.

## Notes

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<sup>1</sup> “Estimated Error Counts from 1990 and 2000,” issued by the U.S. Census Bureau at a meeting of the Decennial Census Advisory Committee meeting, March 15, 2001. The Bureau reported “gross coverage error” of 12.8 million in 1990. Initial estimates from the 2000 Accuracy and Coverage Evaluation survey showed gross coverage error of 9.5 million. Further analysis of the A.C.E. estimates led the Bureau to conclude that the survey had failed to measure at least 3 million duplications.

<sup>2</sup> U.S. Census Bureau, “Technical Summary of A.C.E. Revision II,” March 12, 2003.

<sup>3</sup> Research has shown that people with lower incomes are at greater risk of being missed in the census. Renters are considered more likely to have lower incomes than homeowners. Because renter/homeowner status is the only socioeconomic variable asked of all respondents, it is used as a proxy for lower (renter) or higher (owner) income.

<sup>4</sup> *Department of Commerce v. U.S. House of Representatives*, 525 U.S. 316 (1999). Article I, section 2, of the U.S. Constitution, requires a census of population every 10 years to apportion seats in the U.S. House of Representatives. The Justices in *Department of Commerce* did not rule on the constitutionality of sampling to enumerate the population, nor did they state clearly whether sampling could be used to produce the detailed population counts used for congressional redistricting. The latter issue remains a significant point of contention.

<sup>5</sup> Many federal grant programs distribute funds based on intercensal population estimates, which are derived from the decennial census numbers.

<sup>6</sup> See also, Kirsten K. West and J. Gregory Robinson, “What Do We Know About The Undercount of Children?” U.S. Census Bureau, Population Division, *Working Paper* No. 39 (August 1999) for an additional discussion of this topic.

<sup>7</sup> The Census Bureau conducted Demographic Analysis case studies for specific age groups, such as children and young men of draft age, in the 1940s.

<sup>8</sup> The explanation of Demographic Analysis in this report is highly simplified. For a more thorough and detailed account of this method, see chapter 4, Demographic Analysis, authored by Jeffrey Passel, of the “U.S. Census Monitoring Board Presidential Members, Final Report to Congress,” September 1, 2001.

<sup>9</sup> J. Passel, “U.S. Census Monitoring Board Presidential Members, Final Report to Congress,” September 1, 2001 (chapter 4).

<sup>10</sup> Coverage measurement surveys and other research have shown that the accuracy of the census varies from place to place, an important factor in assessing the overall fairness of the results.

<sup>11</sup> States historically used only white and black to register births and deaths, and the standards for recording race and ethnicity varied from state to state. Reporting of births by Hispanic origin did not begin until the late 1970s. Dramatic changes in the nation’s racial and ethnic composition in the latter half of the 20th century, however, have rendered the two-category estimate less useful as a point of comparison. According to the 2000 Census, less than 70 percent of the population is non-Hispanic white, while blacks make up only 40 percent of the remainder of the population. The “nonblack” population is now 20 percent minority.

<sup>12</sup> Citro, Constance F., Daniel L. Cork, and Janet L. Norwood, eds., “The 2000 Census: Counting Under Adversity,” report of the Panel to Review the 2000 Census, National Research Council (Washington, DC: National Academies Press, 2004): 312-13. The Census Bureau originally reported that 2.4 percent of the total population checked two or more races; discovery of a processing error led to a reduction in that percentage. However, the percentages cited for children are the original published estimates.

<sup>13</sup> The Census Bureau is an agency of the U.S. Department of Commerce. Secretary Robert Mosbacher’s decision not to adjust the 1990 Census was challenged in court by dozens of cities and states, led by New York City. In 1996, the U.S. Supreme Court upheld his decision, finding in a 9-0 opinion that the Secretary did not abuse his administrative authority in reaching his conclusion (*Wisconsin v. City of New York*, 517 U.S. 1 (1996)).

<sup>14</sup> Letter to U.S. Representative Carolyn B. Maloney from Acting Census Bureau Director William G. Barron, Jr., April 9, 2001.

<sup>15</sup> Under federal standards for the collection of data on race and ethnicity, developed by the Office of Management and Budget, “Hispanic” is considered an ethnicity, not a race.

<sup>16</sup> The tenure question on the census short form asks if the householder owns or rents his or her home.

<sup>17</sup> U.S. Census Bureau, “Demographic Analysis of Population Change,” by John F. Long. Prepared for Joint Meeting of the Census Advisory Committees on Race and Ethnicity and the Decennial Census Advisory Committees, March 15, 2001.

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<sup>18</sup> The final Demographic Analysis estimates of undercount for boys and girls are cited in the Executive Steering Committee for Accuracy and Coverage Evaluation Policy (ESCAP) II report on Demographic Analysis.

<sup>19</sup> *Report of the Executive Steering Committee for Accuracy and Coverage Evaluation Policy*, “Recommendation Concerning the Methodology to be Used in Producing the Tabulations of Population Reported to States and Localities Pursuant to 13 U.S.C. 141(c),” U.S. Census Bureau, March 1, 2001.

<sup>20</sup> In addition to duplicates, erroneous enumerations include people who should not have been included in the census, fictitious cases, people counted in the wrong place (which might be duplicates), and other counting errors. The Census Bureau identified the additional 3 million counting errors through a computer matching process.

<sup>21</sup> In April 2002, the Census Bureau published more detailed calculations of accuracy for seven race and ethnic groupings, based on its October 2001 revisions to the A.C.E. estimates.

<sup>22</sup> The net national overcount would have been higher without a correction the Census Bureau made for a statistical assumption known as *correlation bias*. Correlation bias refers to the probability that some population subgroups that are more likely to be missed in the census (such as young adult black males) are also more likely to be missed in the coverage measurement survey, leading to an underestimation of the number of people missed in those groups. Because the ability to adjust for correlation bias is limited by the data available and the range of assumptions necessary, the Census Bureau incorporated an adjustment only for a presumed underestimation in the count of adult black males and nonblack males ages 30 and over into its revised A.C.E. estimates, bringing those figures more in line with Demographic Analysis estimates. There was no correlation bias adjustment for children.

<sup>23</sup> Non-Hispanic whites were overcounted by 1.13 percent, while non-Hispanic blacks were undercounted by 1.84 percent, for a differential undercount of nearly 3 percent, only slightly less than the comparable differential undercount in 1990. However, unlike the 1990 coverage measurement survey, the Census 2000 A.C.E. found no statistically significant undercount or overcount for any other race or ethnic group.

<sup>24</sup> Owners were overcounted by 1.25 percent, while renters were undercounted by 1.14 percent. (The Census Bureau’s report on A.C.E. Revision II refers to renters as “Non-Owners.”) The difference of 2.39 percent, while less than the comparable 1990 owner-renter differential of 4.47 percent, is significant. The Census 2000 A.C.E. only measured accuracy for the household-based population, while the 1990 Census Post Enumeration Survey also included the noninstitutional, nonmilitary group quarters population.

<sup>25</sup> The A.C.E. Revision II estimate for children under age 10 showed a net overcount of 0.46 percent, which is not statistically different from zero.

<sup>26</sup> “Decision on Intercensal Population Estimates,” U.S. Census Bureau, March 12, 2003. Also see footnote 13.

<sup>27</sup> For a more complete discussion of census evaluations below the national level, see U.S. Census Bureau, Census 2000 Evaluation Memorandum C7, “Assessment of Consistency of Census Data with Demographic Benchmarks at the Subnational Level,” by Arjun L. Adlakha et al. (Aug. 18, 2003).

<sup>28</sup> While school enrollment data are considered largely complete, especially for public schools, there are known differences between enrollment data and census coverage of the school age population. Therefore, the Census Bureau uses this data set to evaluate trends and changes in the coverage of school-age children over time, not to provide direct estimates of accuracy. The subnational demographic benchmark analysis did not include children in group quarters.

<sup>29</sup> Some “whole person imputations” occur with even less information about household size or occupancy status of the housing unit.

<sup>30</sup> Letter to Acting Census Bureau Director William Barron, from Dr. Janet L. Norwood, Chair, Panel to Review the 2000 Census, Committee on National Statistics, National Research Council, November 26, 2001. The panel’s analysis was completed following release of A.C.E. Revision I in October 2001, when the estimates showed a small net national undercount. The final A.C.E. estimates showed a net national overcount.

<sup>31</sup> Citro, Constance F., Daniel L. Cork, and Janet L. Norwood, eds., “The 2000 Census: Counting Under Adversity,” report of the Panel to Review the 2000 Census, National Research Council (Washington, DC: National Academies Press, 2004): p. 274 (Table 7.1). Total household population in 2000 was 273.6 million. Non-Hispanic black household population was 32.4 million; Hispanic household population was 33.4 million.

<sup>32</sup> In Alaska, a special form used in remote areas had space for only five household members to report their information. “Be Counted” forms also had space for only five people.

<sup>33</sup> The Census Bureau also conducted telephone follow-up with households that reported information for six people but that did not list the number of people in the household, to explore the possibility of more residents.

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<sup>34</sup> U.S. Department of Education surveys show that about one-sixth of college freshmen attend an out-of-state school. Comparable figures are not available for other college students. Even students attending college in their state of residence but living away from home are prone to being double-counted in the census.

<sup>35</sup> U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 2001 and 2002*.

<sup>36</sup> *Colonias* are unincorporated communities near the U.S.-Mexican border. The residents are virtually all Hispanic.

<sup>37</sup> The Census Bureau mails or delivers questionnaires to a specific address, in order to place residents at a specific location. This geographic precision is required to produce numbers that can be used for legislative redistricting. The Bureau will not send forms to a post office box or other mailing addresses (such as Rural Route 1) not associated with a geographic location.

<sup>38</sup> Previous censuses asked for year of birth instead of date of birth.

<sup>39</sup> The remaining 2.4 percent, or 5.9 million people, underreport or overreported their age by more than one year, indicating that they made a mistake in either their age or birth date, as opposed to misunderstanding the reference date.

<sup>40</sup> Letter to U.S. Representative Carolyn B. Maloney from Census Bureau Director C. Louis Kincannon, June 30, 2003. Barring an amendment to the Census Act, which is unlikely, the Supreme Court ruling in *Department of Commerce v. U.S. House of Representatives* 525 U.S. 316 (1999) prohibits statistical adjustment for purposes of congressional reapportionment.

<sup>41</sup> Carmen DeNavas-Walt, Bernadette D. Proctor, and Robert J. Mills, "Income, Poverty, and Health Insurance Coverage in the United States: 2003," *Current Population Reports* P60-226 (2004).

<sup>42</sup> William P. O'Hare and Mark Mather, *The Growing Number of Kids In Severely Distressed Neighborhoods: Evidence from the 2000 Census* (Baltimore: Annie E. Casey Foundation, October 2003).

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