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Assessing Net Coverage Error for Young Children in the 2010 U.S. Decennial Census

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Abstract

The U.S. Census Bureau's Demographic Analysis shows the population age 0 to 4 experienced a net undercount rate of 4.6 percent in the 2010 Decennial Census. This is more than twice as high as any other age group. Despite the fact that the relatively high net undercount of young children was uncovered more than fifty years ago, this problem has received little systematic attention from demographers. To help fill that gap in the literature, this study examines the accuracy of the count of children in the 2010 Decennial Census. The initial focus on all children shifts to a focus on young children (age 0 to 4) where net undercount rates are the highest. Discussion highlights some of the potential explanations for the findings.

1. Introduction

The U.S. Census Bureau's Demographic Analysis shows a net undercount rate of 4.6 percent in the 2010 Census for the population age 0 to 4, which is more than twice as high as any other age group (O'Hare, 2012a). In the 2000 Census, the net undercount rate of the population age 0 to 4 based on Demographic Analysis (3.8 percent) was also more than twice as high as any other age group (O'Hare, 2012a).

The high net undercount of these young children has been documented historically in the U.S. Census and a high net undercount of children has been experienced in societies as varied as China, South Africa, Laos and the former Soviet Union (O'Hare, 2009 and 1999; West and Robinson, 1999; Goodkind 2011; Anderson and Silver, 1985; Anderson 2004).

The high net undercount of young children in the U.S. Census has received little attention in the professional literature and the field has offered few ideas about why young children experience such high net undercount rates. In the past, when census coverage data for children have been made available, they were often a small part of a larger volume related to assessing the quality of the Census count (U.S. Census Bureau, 1974; Fay et al., 1988; Robinson, et al, 1993; Robinson and Adlakha, 2002). In many analyses, data for young children are not shown separately from all children.

This article addresses this gap in the literature by providing data on coverage of children in the 2010 Census. After providing background on the Demographic Analysis (DA) estimation methodology and identifying a couple of innovations in the 2010 DA

program, DA estimates for children are compared to the 2010 Census counts to detect net undercounts and overcounts. Results are examined by single-year of age, sex, race and Hispanic Origin for the child population. That leads to a focus on the population age 0 to 4 where the net undercount rate is the highest. Finally, some ideas about potential explanations are discussed. A companion paper in this series is focused on trends since 1950 in the net undercount of young children.

2. Demographic Analysis History and Methodology

Assessing the net undercounts in the U.S. Census is typically based on one of two methods; 1) Demographic Analysis (DA), and/or 2) Dual System Estimates (DSE). This study focuses on the results of DA for reasons that will be explained later in this section. Since there are already several detailed descriptions of the DA methodology available, I will only review the method briefly here (See Robinson, 2010; Himes and Clogg, 1992; U.S. Census Bureau, 2010a).

The DA method has been used to assess the accuracy of Census figures for more than a half century, and its origins are often traced back to an article by Price (1947). The unexpectedly high number of young men who turned up at the first compulsory selective service registration on October 6, 1940 alerted scholars to the possibility of under-enumeration in the 1940 Census. The selective service data also provided an independent population estimate for assessing the size of such under-enumeration in the Census.

The relatively high net undercount among young children was uncovered early in the history of DA. In one of the first systematic efforts to use DA to examine Census

results, Coale (1955) found children age 0 to 4 had a relatively high net undercount rate in the censuses of 1940 and 1950. Coale provides a number of estimates for various groups. For the 0 to 4 age group, estimates range from a net undercount of 3.8 percent for White females to 19 percent for non-White males in 1940 and 3.8 percent for White females to 11 percent for non-White males in 1950. Siegel and Zelnik (1966) also found a significant net undercount of children age 0 to 4 in the 1950 and 1960 Censuses. Coale and Zelnick (1963) found high net undercount rates for young children in the Censuses as far back as 1880. Coale and Rives (1973) found very high undercount rates for young Black children in every Census from 1880 to 1970. Genealogical research shows a similar pattern of underreporting young children as far back as the 1850s (Adams and Kasakoff, 1991).

The DA methodology used in the 2010 Census is described in some detail by U.S. Census Bureau (2010a). The DA method employed for the 2010 Census used one technique to estimate the population under age 75 and another method to estimate the population age 75 and older (West 2012). Since this study focuses on children, only the method used for people age 0 to 74 is discussed here (people under age 1 are classified as age 0).

The 2010 DA estimates for the population age 0 to 74 are based on the compilation of historical estimates of the components of population change: Births (B), Deaths (D), and Net International Migration (NIM). The data and methodology for each of these components is described in a separate background document prepared for the development and release of the Census Bureau's 2010 DA estimates (Robinson 2010; Devine et al. 2010; Bhaskar et al. 2010).

As described by the U.S. Census Bureau (2010a), the DA population estimates for age 0 to 74 are derived from the basic demographic accounting equation (1) applied to each birth cohort:

(1) $P_{0-74} = B - D + NIM$

P_{0-74}= population for each single year of age from 0 to 74

B = number of births for each age cohort

D= number of deaths for each age cohort since birth

NIM = Net International Migration for each age cohort

For example, the estimate for the population age 17 on the April 1, 2010 Census date, is based on births from April 1992 through March 1993, reduced by the deaths to that cohort in each year between 1992 and 2010, and incremented by Net International Migration (NIM) of the cohort each year over the 17-year period.

Births are by far the largest component of the population estimates in the DA estimates for children. Births account for 97 percent of DA population estimate for age 0 to 17 in 2010, and for 99.6 percent of the DA population estimate for the population age 0 to 4 (U.S. Census Bureau 2010b). The DA estimate of the population age 0 to 4 released in May 2012 is comprised of 21,076,000 births, 148,000 deaths, and net international migration of 244,000.

The birth and death data used in the Census Bureau's DA estimates come from the U.S. National Center on Health Statistics (NCHS) and these records are widely viewed as being accurate and complete (Devine et al. 2010). The Census Bureau

assumes death data have been complete since 1959 and birth data have been complete since 1985 (Devine et al. 2010). Consequently, missing vital events data are not a problem for the DA estimates of the child population. In addition to regularly published totals, the Census Bureau receives microdata files from NCHS containing detailed monthly data on each birth and death that are used for DA estimates by race.

The Census Bureau changed the way it calculated net international migration for the 2010 set of DA estimates (Bhaskar et al. 2010). The current method relies heavily on data from the Census Bureau's American Community Survey (ACS) where the location of the Residence One Year Ago (ROYA) is ascertained for everyone in the survey. The total number of yearly immigrants is derived from this question in each year of the ACS, and then that total number is distributed to demographic cells (sex, age and race) based on an accumulation of the same data over the last five years of the ACS. Five years of ACS data are used to provide more stable and reliable estimates for small demographic groups. In addition to estimates for the total population, NIM provides estimates for younger Blacks (Black alone and Black alone or in combination) and for younger Hispanics.

Statistics on emigration of the foreign-born population from the U.S. are based on a residual method comparing data from the 2000 Census to later ACS estimates. Emigration of U.S. citizens (net native migration) is derived by examining census data from several other countries (Bhaskar et al, 2010). With few exceptions (Pitkin and Park 2005), it is widely felt that emigration has little impact on population estimates for young children. In the DA estimates released in May 2012, the Census Bureau estimated a net international migration of 244,000 for the population age 0 to 4 (O'Hare

2013b), while the net undercount for this age group was 972,000. Therefore, even if the estimated net international migration figure was underestimated by 100 percent (an unlikely situation), there would still be an estimated undercount of more than 700,000.

There are four major limitations to DA. First, DA estimates are only available nationwide and not for any subnational geographic units. The fact that many people move after birth is a barrier to employing this method at the subnational level. While attempts have been made to produce subnational DA estimates, they have not been widely used (Mayol-Garcia and Robinson 2011; Robinson, Ahmed, and Fernandez 1993; Adlakha et al. 2003).

Second, DA estimates are only available for a few race/ethnic groups. Historically the estimates have only been available for Black and Non-Black groups. This restriction is due to the lack of race specificity and consistency for data collected on the birth and death certificates historically. The only group that has been identified consistently over time is Blacks (African-Americans).

The 2010 DA estimates include data for Hispanics for the first time, but only for the population under age 20. Hispanics under age 20 were included in the DA estimates in 2010 because Hispanics have been consistently identified in birth and death certificates since 1990.

The third limitation of the DA estimates is that they only supply net undercount/overcount figures. A zero net undercount could be the result of no one being missed (omissions) or double counted (erroneous enumerations) or it could be the result of an equal number of omissions and erroneous enumerations.

The fourth limitation of the DA methodology is the lack of any measures of uncertainty for the estimates, however, it should be noted that the Census Bureau released DA estimates based on five different sets of assumptions in December 2010 to reflect some of the uncertainty regarding the DA estimates.

Despite these limitations, DA has been used for many decades, the underlying data and methodology are strong, and it has provided useful information for those trying to understand the strengths and weaknesses of the U.S. Census. According to Robinson (2000, page 1) “The national DA estimates have become the accepted benchmark for tracking historical trends in net Census undercounts and for assessing coverage differences by age, sex, and race (Black, all other).”

DA is particularly useful for assessing the accuracy of the Census count of young children for two reasons. First, one of the major uncertainties in using DA to assess the accuracy of total population counts is the assumptions about net international migration that must be made. For most age groups, net international migration is subject to more error because of the greater uncertainty of some specific elements such as undocumented immigrants and emigration (Jensen 2012). According to Bhaskar et al. (2009, page 1), “The largest uncertainty in the Demographic Analysis (DA) estimates comes from the international migration component.”

However, assumptions about net international immigration have minimal impact on the DA estimation for those ages 0 to 4. The DA estimates released in May 2012 assume a Net International Migration of only 244,000 out of a population of 21,172,000

for age 0 to 4. Therefore, errors in this component of population change would not have a big impact on the final DA population estimate for the 0 to 4 age group.

The second reason DA is the preferred method for assessing the net undercount of young children is that the quality of vital events data has improved over time and thus, the quality of DA estimates for younger people are likely to be better than those for older people. Improvement in the birth certificate data over time is a major reason the Census Bureau is now producing DA estimates for Hispanics under age 20. In the five DA scenarios provided in the 2010 DA estimates released in December 2010, the birth and death assumptions are identical for people under age 18 in all five series, which reflects the high level of reliability and credibility given to the vital events data.

The other major source of data on undercounts and overcounts is the Census Bureau's Dual Systems Estimates (DSE) methodology. The DSE uses a Post-Enumeration Survey (PES) to develop an estimate of the true population which is then compared to the Census counts. The DSE approach for 2010 is called Census Coverage Measurement, but DSE has been given other names in previous censuses. The 2010 Census is the first one where DSE has produced data for the population age 0 to 4.

In the context of comparing the results of DSE and DA in the 2000 Census, and noting the generally consistent results, the U.S. Census Bureau (2003, page v) concludes,

"The primary exception to the consistency of results occurs for children aged 0-9. While the A.C.E. Revision II estimates a small net overcount for children 0-9 (the estimate was not statistically significantly different from zero), Demographic Analysis estimated a net undercount of 2.56 percent. The Demographic Analysis estimate for

this age group is more accurate than those for other age groups because the estimate for young children depends primarily on recent birth registration data which are believed to be highly accurate."

Table 1 shows the results of DA and DSE for the 1990, 2000 and 2010 Censuses in terms of comparable estimates of census coverage for children. The data indicate significant inconsistencies between the results of the two methodologies.

In 2010, the DSE estimated a 0.7 percent undercount for age 0 to 4 compared to 4.6 percent for DA. In population terms, the DA estimates a net undercount of 970,000 people age 0 to 4, while the DSE estimated a net undercount of only 152,000 people in this age group. O'Hare, et al (2012c) document the inconsistency between DSE and DA estimates for young children and suggest that uncorrected correlation bias may result in an underestimation of the undercount for young children in the DSE methodology. However, correlation bias would not explain why the DSE estimate for children (age 0 to 17) in 1990 was substantially higher that the corresponding estimate from DA, so correlation bias does not provide a comprehensive explanation for the differences between DA and DSE for children.

Table 1. Net Percent Undercount Estimates from DA and DSE for age 0-9 and 10-17 in 2000 and 2010

	2000 Age 0-9	2010 Age 0-9	2010 Age 0-4
DA	-2.6	-3.4	-4.6
DSE	0.5	-0.2	-0.7
Source: O'Hare et al 2012			
Note in this table and those that follow, an undercount is denoted with a minus sign. This may be a point of confusion because some other studies have shown an undercount as a positive number.			

In the analysis shown here, I rely exclusively on DA estimates. I believe the strengths of the DA methodology make it a particularly good technique for estimating the number of children. In the decade prior to the 2010 Census, staff at the Census Bureau investigated a number of issues related to the production of DA estimates (Robinson 2010). The increased input, review, and examination enhance the likelihood that the 2010 DA estimates are accurate and credible. In addition, the inconsistency between DSE and DA estimates for young children raises questions about the accuracy of DSE estimates for young children.

2.1 Using DA to Estimate the Black Population

The Census Bureau faces a set of challenges in producing DA estimates for the Black population. In discussing the use of vital statistics for DA estimates by race, the Census Bureau (Devine et al., 2010, p.4) concludes, "While some of these issues may be relatively minor in terms of the impact on the final DA estimate of coverage, developing the estimates for DA race categories comes with a more complex, and substantial set of challenges."

As stated earlier, historically Black is the only race assessed using DA because Black is the only racial category where data have been collected consistently enough in the birth and death certificates to produce reliable DA estimates over time. It should be noted that the changes which now allow people to mark multiple races has made the Black/NonBlack distinction more problematic.

The Census Bureau faces multiple problems trying to make the Census racial categories consistent with the race data collected on birth and death certificates. For example, the “Some Other Race” category is a response category for the race question in the 2010 Census but not in birth or death certificates. Because the birth certificate data does not have a “some other race” category, the Census Bureau constructed a set of modified race categories from the 2010 Census responses in which respondents in the some other race category are distributed to Black and Non-Black categories. Thus for making comparisons between DA estimates and the 2010 Census counts for Blacks and Non-Blacks, one must use the 2010 Census modified race tabulations available on the Census Bureau’s website.

For some groups, the modified race tabulations are substantially different from the unmodified tabulations. In the 2010 Census, the number of people age 0 to 17 in the Black alone category from the unmodified race tabulations was 10,841,000, but in the modified race tabulations the number in the Black alone category age 0 to 17 was 11,317,000, which amounts to a difference of 4.3 percent. The Black alone or in combination population age 0 to 17 was 11,845,000 in the 2010 Census count and on the modified file; it was 13,030,000, which amounts to a difference of 10 percent. For the population age 0 to 4, the unmodified 2010 Census count for Black alone was 2,903,000 but the figure based on modified race concept was 3,055,000 which amounts to a 5 percent difference. For age 0 to 4, the unmodified count of Black alone or in combination was 3,538,000 but it was 3,905,000 on the modified file, which amounts to a 10 percent difference.

A second issue is the fact that Census respondents in 2000 and 2010 could mark more than one race. Prior to the 2000 Census, respondents were only allowed to mark one race, which meant the race data from the Census and from vital events records were consistent in this regard. In 1997, the U.S. Office of Management and Budget (1997) updated Statistical Policy Directive 15 requiring federal data collection efforts to allow respondents to mark more than one race.

This issue is further complicated by the fact it was not until 2003 that the federal government issued new standard birth certificate and death certificate forms allowing respondents to mark more than one race. Moreover, birth and death certificate data are collected by states who only changed to the new form slowly over time. Every year after 2003, a new group of states adopted the new birth certificate and death certificate forms. Therefore, each year from 2003 to 2010 the Census Bureau received a file on births from NCHS with two types of data; one type with multiple race data and the other type one which bridged back to single races available before 2000 Census.

To employ the DA methodology, the mixed race data from the birth (and death) certificates had to be put into Black and Non-Black categories based on both single-race and multiple-race reported by mother and fathers. NCHS provided the Census Bureau with both the multiple races that are reported and the multiple race response "bridged" to the pre-1997 OMB single race categories. Details about the bridging method are provided by NCHS on their website (http://www.cdc.gov/nchs/nvss/bridged_race.htm).

In addition, for the DA release of May 2012, DA estimates were provided for "Black alone" as well as "Black alone or in combination" so birth certificate data had to be put into these two different racial categories.

A third issue is that birth certificate forms only record the race of the mother and father. Thus, the race of the child must be inferred from the race of the parent(s). This is further complicated by a significant level of missing data. While data on the race of mother is relatively complete, many birth certificates are missing the race of the father. In 2009, 19 percent of birth certificate forms did not contain the race of the father (Martin, et al. 2011).

When both parents report the same race, that is the race assigned to the child. When the two parents report different races on the birth certificate, newborns are assigned to a race category based on the reported race of their mother and father and on parent-child race relationships seen in the 2000 Census data (Ortman, 2012). This is also an issue for Hispanic newborns and a similar approach is used.

Mixed race parentage is a bigger statistical issue for young children than older people because increased rates of inter-marriage over time mean more children today are likely to have parents with different races and Hispanic status. One study found that about 15 percent of marriages in 2010 involved spouses of different race or ethnicity compared to 7 percent in 1980 (Wang 2012).

It is not difficult to imagine that parents of mixed racial background might report the race of a child differently on a Census questionnaire than estimated by the Census Bureau from the race of mother and father on the birth certificate form.

Given the issues described above, one should view DA estimates for Blacks (alone or alone or in combination) cautiously. Small differences could be due to methodological issues rather than real differences.

Assignment of race on death certificates is also a potential problem, but deaths contribute very little to the DA estimates for children (Aries et al. 2008).

2.3 Data Sources

For the analysis presented in this paper, I used the estimates from the revised DA estimates issued by the U.S. Census Bureau in May 2012 for all groups except Hispanics. In May 2012 the Census Bureau issued revised Demographic Analysis estimates for the total population, the Black alone population, the Black alone or in combination population, the Not Black alone population and the Not Black alone or in combination population (U.S. Census Bureau 2012).

Because no Hispanic DA estimates were provided in the May 2012 release, data for Hispanics used in this analysis are taken from the Middle Series of Census Bureau's DA estimates issue in December 2010.

The DA program for 2010 produced estimates by age, sex, and Black and Non-Black groups. However, the 2010 DA analysis included three new facets. For the first time, the Census Bureau provided DA estimates for the Hispanic population under age 20. Secondly, in order to reflect some of the uncertainty in the DA estimates, the Census Bureau produced five sets of estimates based on different assumptions about vital events and net international migration for the DA estimates released in December

2010 (U.S. Census Bureau 2010b). It should be noted, however, that the revised DA estimates issued in May 2012 were only for the middle series and did not include Hispanics. Third, for the first time the Census Bureau published DA estimates of the Black alone and the Black alone or in combination populations for those under age 30.

In this study, I use the term “children” to refer to the population age 0 to 17 and the term “young children” to refer to the population age 0 to 4.

In the remainder of this study, the differences between the Census counts and DA estimates are shown as the Census count minus the DA estimate. This calculation is often labeled “net census coverage error” in other research. A negative number implies a net undercount and a positive number implies a net overcount which is consistent with the presentation of 2010 DA analysis by Velkoff (2011). This may be a point of confusion because in some past studies a similar measure called net undercount rate has been used which subtracts the Census counts from the DA (or DSE) estimates. In that construction, a negative figure implies an overcount. I chose to use the net Census coverage error because I feel having an undercount reflected by a negative number is more intuitive.

In converting the differences between Census counts and DA estimates to percentages, the difference is divided by the DA estimate. Estimates are shown rounded to the nearest thousand for readability.

3. 2010 Demographic Analysis Results by Age

In the 2010 Census there was a net overcount of 0.1 percent of the total population based on DA, which translates into 400,000 people. However, this small

overall figure masks important differences among some age groups. Table 2 shows the net undercount/overcount rates for the total population as well as for children (age 0 to 17) and adults (age 18 and over). The 0.1 percent net overcount for the entire population masks a 0.7 percent overcount for adults and a 1.7 percent undercount for children.

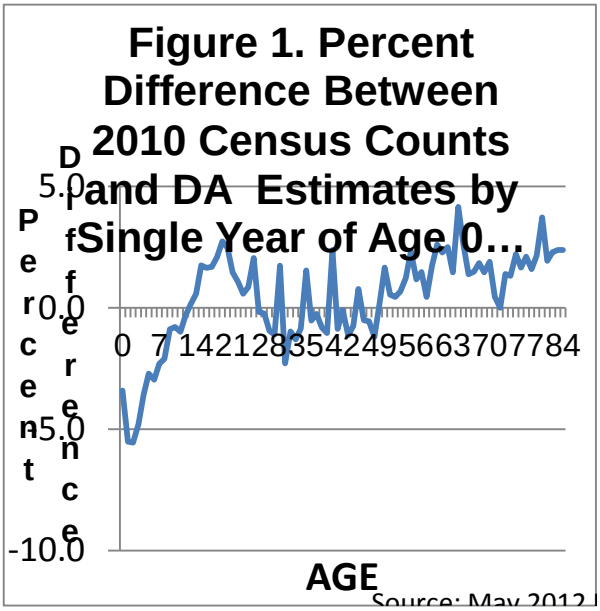
Table 2. Difference Between 2010 Census Counts and DA estimates for total population, age 0 to 17, and population 18 and over

	Revised 2010 Demographic Analysis Middle Series (in 1000s)	2010 Census (in 1000s)	Difference (Census - DA Estimate) (in 1000s)	Percent Difference ((Census - DA Estimate)/DA Estimate)*100
All Ages	308,346	308,746	400	0.13
Age 0 to 17	75,447	74,180	-1,267	-1.68
Age 18 and over	232,899	234,566	1,667	0.72
Source: U.S. Census Bureau, DA Release May 2012, Table 3,Available online at http://www.census.gov/popest/research/da-estimates/Table_3.pdf				

In population numbers, these reflect a net undercount of about 1.3 million children and a net overcount of about 1.7 million adults. This underscores the extent to which the small difference between the Census and the DA estimates for the total population conceals important differences by age. This theme is repeated when examining data for children.

Figure1 (based on data shown in Appendix Table A1) shows the net undercount and overcount figures from the 2010 Census by single year of age for ages 0 to 84. The age-specific estimates from DA closely match the Census counts with the

exception of three age groups. There is a large net undercount for people under age 10, particularly age 0 to 4, a large net overcount for young adults (roughly age 18 to 24) and a large net overcount for the population age 60 to 80. Figure 1 also shows the effect of "age heaping" where people prefer reporting their age in Tables ending with "0" or "5."

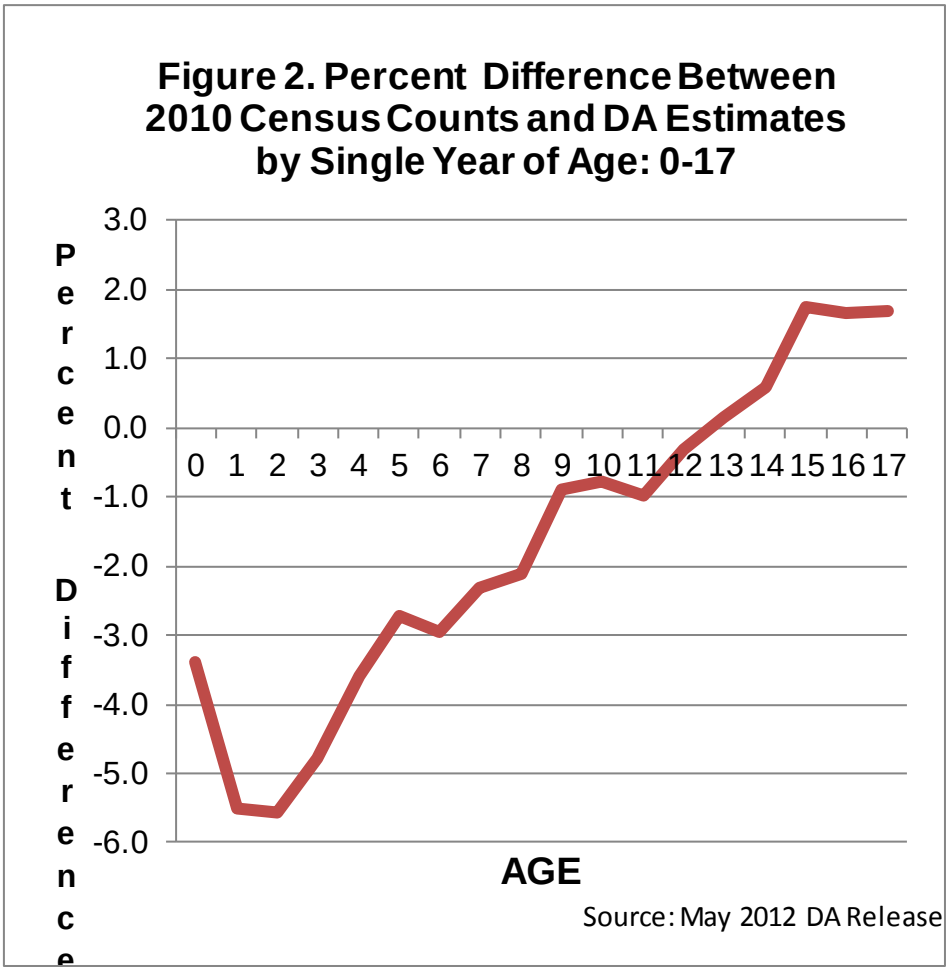


The overcount of 18 to 24-year-olds is widely believed to be due to the fact that many people in this age group are counted in the home of their parents as well as where they reside most of the time… for example in a college dormitory. The net overcount of 60 to 80-year-olds may be due to the large portion of this population who have second homes (particularly as they transition into retirement) and are counted in

both places. On the other hand, there is no similar commonly accepted explanation for the net undercount of young children.

A National Research Council (NRC) report (2004, page 254) made the same observation about the inconsistency of DA and DSE estimates for young children and the NRC authors note, “No explanation for this discrepancy has been advanced.”

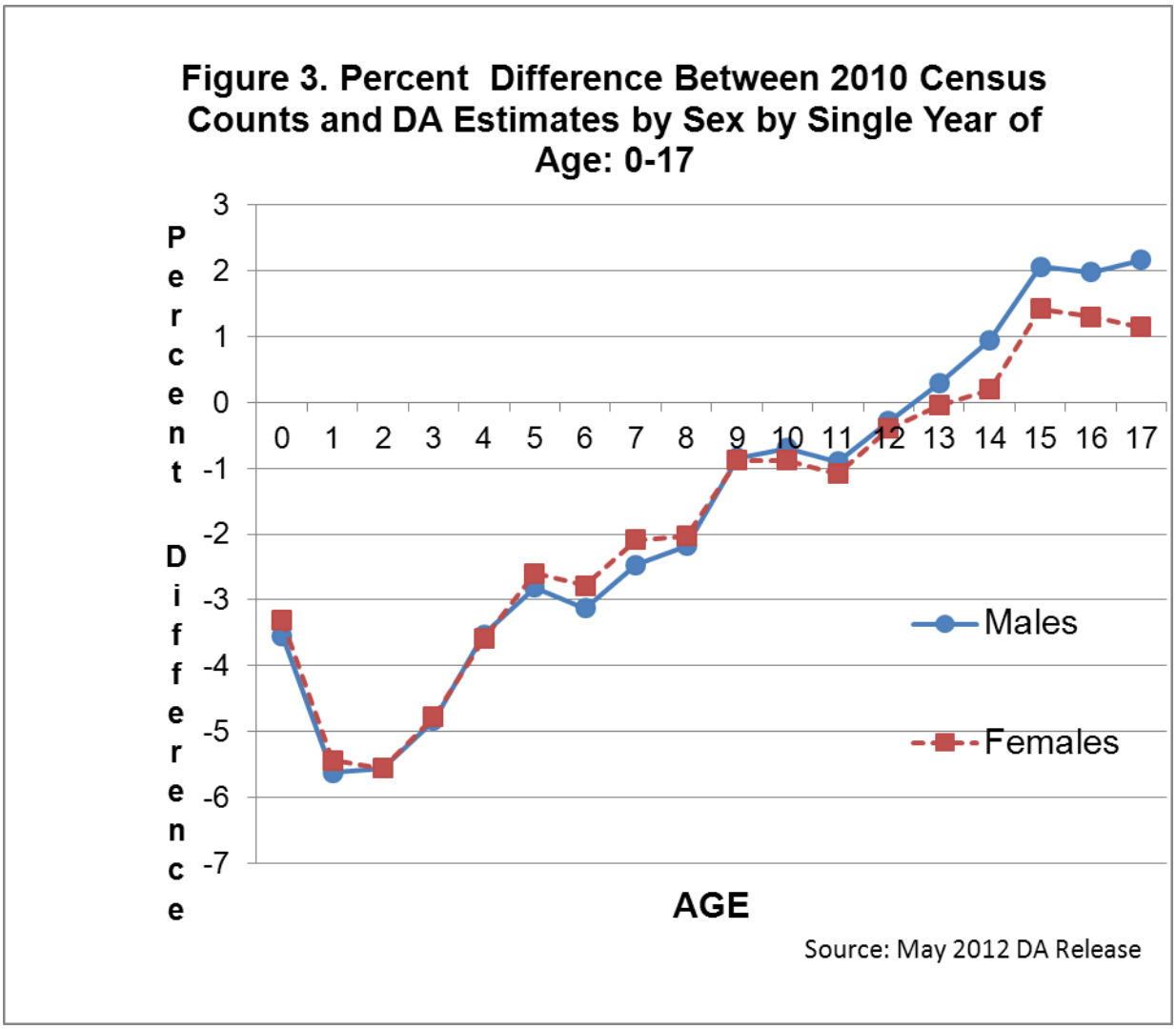
Figure 2 (based on data shown in Appendix Table A2) shows the net undercount rates for children by single year of age and underscores the extent to which undercount rates for children vary by age.



There are three key points that can be derived from Figure 2. First, the highest net undercount rates are found among the youngest children, particularly age 0 to 4. More than three-quarters of the 1.3 million person net undercount for the population age 0 to 17 can be accounted for by those age 0 to 4, where the net undercount is about one million people.

Second, there is a net overcount rate for people age 14 to 17. The net overcount of people age 14 to 17 is an interesting finding, but examination of this issue goes beyond the scope of the current analysis, which focuses on young children. It should be noted, however, all of the net overcount of children age 14 to 17 is explained by a high net overcount of Hispanics and Blacks in this age range**.** There was an overcount of 184,000 Hispanics and 84,000 Blacks Alone or in Combination. I suspect the overcount of Hispanics in this age range may reflect faulty immigration estimates, but I find it difficult to believe that the explanation for the net overcount of Blacks in this age range is due to immigration estimates.

Third, there is a very clear age gradient along the age range from age 1 to 17. The net undercount rate declines steadily from age 1 to age 13 and there is a net overcount in the 14 to 17-year-old age group. The strong correlation between age and net undercount rates shown in Figure 3 raises questions about why net undercount rates decrease systematically as children age.



The correlation coefficient between age and net undercount rate for the population age 0 to 17 is -0.96. This is a very strong correlation by social science standards and yet there is not a commonly accepted explanation for the association. At this point, I think it is fair to say there are not even competing theories to explain the association between age and net undercount rates for children.

Interestingly, the net undercount rate of those age 0 (-3.4 percent) is much lower than the rate for those in the age 1 (-5.5 percent) or age 2 (-5.6 percent). There was an instruction added to the 2010 Census questionnaire reminding respondents to include

newborns, which may explain this anomaly. It is also the case that many children are recoded into the age zero category. Often times, respondents put their infants age in months rather than years. So someone who is six months old (age 0) respondents may put a “6” in for age. If the date of birth for this person is within the past year, their age is usually recoded to zero. Perhaps too many children are recoded into the age zero category.

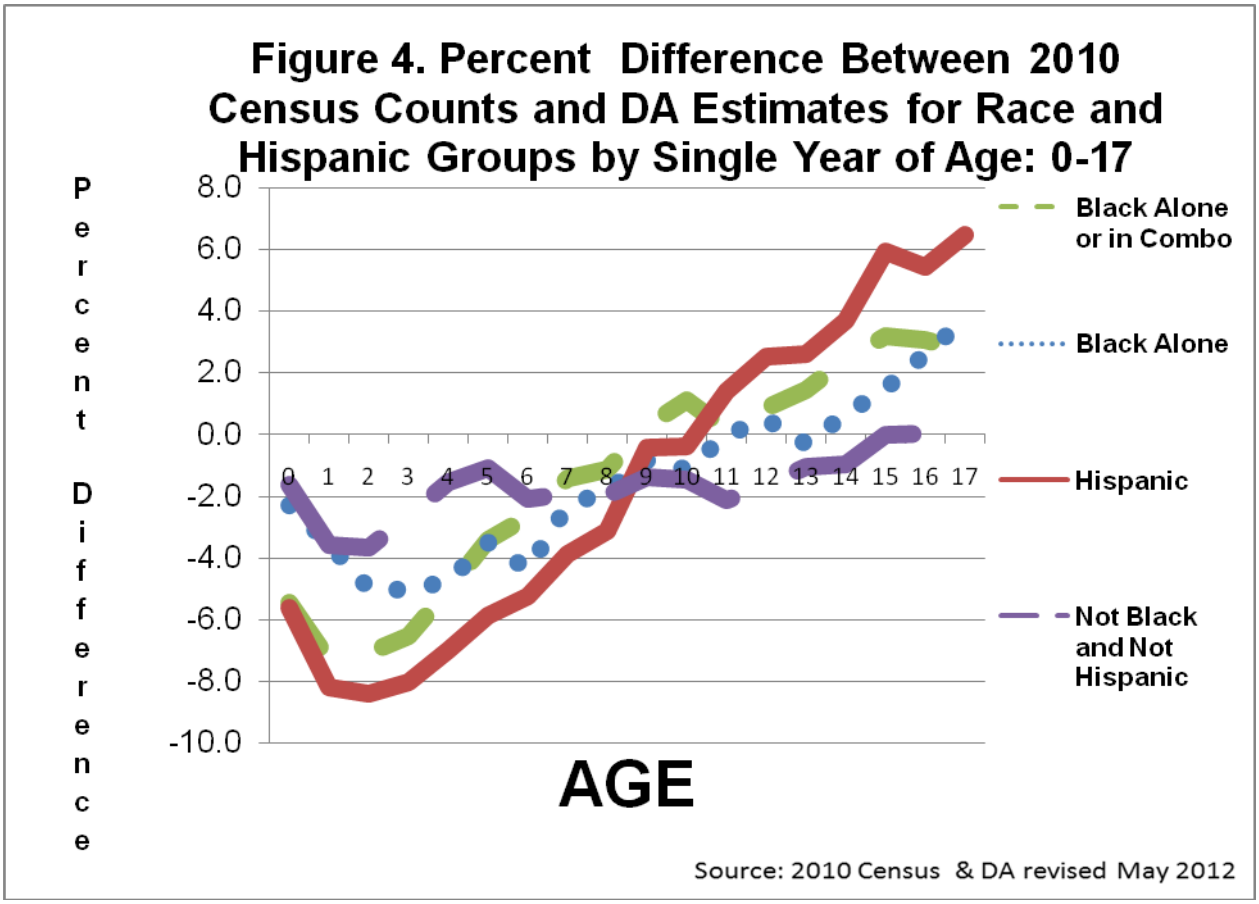
4. Single Year of Age by Sex, Race, and Hispanic Origin

Several major demographic groups show the same age gradient seen for the total child population. Data in Figure 3 (based on data shown in Appendix Table A3) which shows undercount estimates by single year of age for males and females, indicates there are virtually no differences in net undercount rates between males and females at the youngest ages. When children enter the middle teens, however, the net overcount rate of males becomes noticeably higher than that of females. In addition, both groups show the same age gradient seen in Figure 2.

I suspect the high overcount of males in the 14 to 17 year age group may be related to undetected net immigration from abroad, where males typically outnumber females, but this deserves further research.

Figure 4 shows net undercount rates for Black Alone, Black Alone or in Combination, Hispanic, and a group labeled “Not Black Alone or In Combination and Not Hispanic” children by single year of age based on the 2010 DA estimates series.

The derivation of the Not Black Alone or in Combination and Not Hispanic group is explained later. The data for Figure 4 are taken from Table A4 in Appendix A.)



The age gradient for the total population is seen consistently among all the race/Hispanic Origin groups examined here. While the exact levels of undercounting and age breaks differ slightly, the same pattern is seen for Black Alone, Black Alone or in Combination, Hispanic, and Not Black and Not Hispanic children. As one moves up in age, the net undercount decreases, and turns into a net overcount in the early teen years, this is followed by increasing overcounts in later years of adolescence.

The age gradient seen for the total population is steeper for racial minorities. While racial minorities account for a disproportionately large share of the net undercount

of children age 0 to 4, they experienced high net overcounts in the 10 to 17 age group. In fact, Blacks and Hispanics account for all of the net overcount for the population age 14 to 17. The net overcounts of minorities age 10 to 17 raises a number of questions particularly relative to the high net undercount of Blacks and Hispanics in the 0 to 4 age group but this issues goes beyond the bounds of this paper, which is focused on young children.

There were about 172,000 persons ages 14 to 17 living in Group Quarters in 2010 according to analysis of the 2010 ACS PUMS file. It seems plausible that many of these people might be double counted the same way college students are often double counted. They are counted at the institution where they are staying and they are included on the Census forms returned by households where the parents live.

The high net undercount rate of young Black and Hispanic children relative to others is consistent with much of the past research on Census undercount differentials which shows racial minorities often have higher net undercount rates those of others.

The net undercount rates for “Black Alone” and “Black alone or in Combination” are similar for ages 10 to 17, but differ substantially for the population below age 10 and particularly for ages 0 to 4. The net undercount rate for the population of Black alone age 0 to 4 is 4.4 percent but it is 6.3 percent for Blacks alone or in Combination in this age group. Of course, the only difference between these two series is the “Black in Combination” population. The number of Blacks in combination estimated from the birth certificate data used in the DA estimates is much higher than the number reported in the

census for younger children. For the population age 0 to 4, the net undercount rate for Blacks in combination is about 15 percent.

The difference between Black alone and Black alone or in combination demonstrates the difficulty of accurately estimating detailed race categories from birth certificate information about race of parents that match the way race is reported for children in the most recent Census. Recall that new birth certificates were introduced in 2003, which allowed parents to mark more than one race for the first time. The switch to the more than one race option for parents on the birth certificates starting in 2003 corresponds to the increase in the number of newborns classified as “Black in combination” which is reflected in the population 0 to 4 in 2010.

The Not Black Alone or in Combination and Not Hispanic group shown Figure 4 is a derived group and not one that is used by the Census Bureau. The Not Black Alone or in Combination and Not Hispanic figures are derived by subtracting the number in the Black Alone or in Combination category and the number in the Hispanic category from the total number for each age group. Since there is no data for the Non-Hispanic White population to compare with the minority populations to gauge the racial/Hispanic differentials, the Not Black and Not Hispanic category is used as a proxy population for the Non-Hispanic White population. Data from the 2010 Census shows that Non-Hispanic Whites are 90 percent of the Not Black and Not Hispanic population age 0 to 17 and 92 percent of the Not Black Alone or in Combination and or Not Hispanic population age 0 to 4. While the Black Alone or in Combination categories and the Hispanic Tables includes a small number of people who are included in both categories,

the Not Black Alone or in Combination and Not Hispanic population provides a much better comparison group than the alternatives of total, Non-Black, or Non-Hispanic.

The 2010 Census shows that there were 285,000 children age 0 to 4 who were both Black Alone or in Combination and Hispanic, which translates into 1.4 percent of the total population age 0 to 4 in 2010. There were 838,000 children age 0 to 17 who were both Black Alone or in Combination and Hispanics, which translates into 1.1 percent of the total population age 0 to 17.

For the 2020 DA program it would be a good idea to create estimates for Non-Hispanic White population. The historical distinction between Black and non-Black is not very relevant any more. Production of a Non-Hispanic White estimate would really help people understand racial differentials in Census coverage.

5. The Population Age 0 to 4

Since children age 0 to 4 have the highest net undercount rates of any age group in the 2010 Census, the remainder of this paper will focus on that age group.

Table 3 shows the 2010 Census net undercount rates and numbers for population age 0 to 4 by various demographic characteristics. The net undercount rate for all people age 0 to 4 was 4.6 percent, but the rate for Black Alone or in Combination children in this age range was 6.3 percent and the rate for Hispanic children in this age range was 7.5 percent. For the Not Black or Not Hispanic category, the net undercount

rate for age 0 to 4 was 2.6 percent. The net undercount rate for males and females was nearly identical at 4.6 percent and 4.5 percent, respectively.

Table 3. Difference Between 2010 Census Counts and Middle Series DA Estimates for People Age 0 to 4, by Sex, Race and Hispanic Origin

	2010 Census Count (in 1000s)	2010 DA Estimate (in 1000s)	Difference Between Census Count and DA Estimate	Percent Difference
TOTAL	20,201	21,171	-970	-4.6
FEMALE	9,882	10,353	-471	-4.5
MALE	10,320	10,821	-501	-4.6
BLACK ALONE	3055	3195	-140	-4.4
BLACK ALONE OR IN COMBINATION	3658	3905	-247	-6.3
NOT BLACK ALONE	17146	17976	-830	-4.6
NOT BLACK ALONE OR IN COMBINATION	16544	17268	-724	-4.2
HISPANIC*	5,114	5,528	-414	-7.5
NOT HISPANIC	15,087	15,643	-556	-3.6
NOT BLACK ALONE AND NOT HISPANIC	12,032	12,448	-416	-3.3
NOT BLACK ALONE OR IN COMBINATION AND NOT HISPANIC	11,429	11,738	-309	-2.6
Source: Based on Revised DA estimates released May 2012, except for data on Hispanics which is from Middle Series of December 2010 DA release.				

There was a net undercount of slightly less than one million people age 0 to 4 in the 2010 Census including a net undercount of 247,000 Blacks Alone or in Combination and a net undercount of 414,000 Hispanics. The combination of young Black Alone or in Combination and young Hispanic children account for about two-thirds of the net undercount in this age group even though they only account for about 40 percent of the population in this age range. Moreover, the net undercount of Black Alone or in Combination and Hispanic children age 0 to 4 (about 661,000), accounts for more than half of the total net undercount of all people under age 18 (1.3 million shown in Table 2) even though this group comprises only 11 percent of that population age 0 to 17.

6. Discussion

The comparative perspective used in this study focuses primarily on differences by age, and I would argue that this is an important new comparative perspective to keep in mind as we move toward the 2020 Census. Over time, the gap between the undercount rates of adults and young children has become larger than the gap between Black and Non-Black populations. The gap between young children and adults (5.3 percentage points in 2010) is now much larger than the gap between Blacks and Non-Blacks of all ages (0.5 percentage points in 2010) (Velkoff, 2011). Future investigations of Census undercount differentials should focus as much on age differences as difference among race/ethnic groups.

It is also clear that there is an interaction between age and race/Hispanic Origin status. Black Alone or in Combination and Hispanic children account for a disproportionate share of the net undercount for the population age 0 to 4.

While the high net undercount rate for young children is clear, the reasons for such a high rate are not. In fact, the conventional wisdom in survey research suggests the presence of children in a household increases response rates. Groves and Couper (1998, page 138) offer this succinct summary of the relationship between children in the household and cooperation in survey research, “Without exception, every study that has examined response or cooperation finds positive effects of the presence of children in the household.” It should be noted that there is no distinction made in this review about the ages of the children in the household. Also a household response is not the same as getting data for everyone in the household. A household could response to the Census, for example, but fail to include a young child on the Census questionnaire. The heterogeneity of net census undercount rates for children of different ages suggests that age of child should be examined more closely in terms of the impact it has on the propensity of children to be included in survey responses.

Gaining a better understanding of why young children have such a high net undercounts as soon as possible will be important in terms of reducing such an undercount in the 2020 Census. Planning for the 2020 Census is well underway, and any changes to census procedures to improve the count of young children will have to be made within the overall census plans.

Most ideas about why young children have such a high net undercount fall into one of two categories. The first category relates to the way the Census Bureau collects and processes data. The second category relates to the kinds of living arrangements and households where young children live. A few ideas in both of these categories are explored below.

West and Robinson (1999) suggest limitations of the census questionnaire may make it more difficult for the respondent to include all children. In the context of filling out the questionnaire, it is important to note that respondents typically fill in entries from the oldest to the youngest person on the household roster. Wetrogan & Crease (2001, page iii) conclude "…children are generally listed after adults on questionnaires filled out by respondents." Anything that disrupts the completion of the questionnaire is likely to have a disproportionate impact on children.

On the mailout-mailback census questionnaire that was used in the 2010 census there is only room for complete demographic information for six people in the household. There is limited room for the names and a few characteristics of for the 7th through the 12th person. If more than 12 people lived in the household, the Census Bureau had to follow up with a continuation form to get complete information for these people. Any difficulties collecting data for children in the largest households (13 or more people) are not likely to be major problem because so few children live in such households. Only about 138,000 children lived in a household of 13 or more people in 2010, including 47,000 children under age 5. About ten percent of young children live in households of six or more people compared to only about three percent of adults. So the extent to which the continuation form is a problem, it will impact young children more than adults.

However, between 2000 and 2010, a number of improvements were made in the Census questionnaire (O'Hare 2009) but the net undercount of young children increased between 2000 and 2010. This suggests that the questionnaire form is not likely to be a major driver of the undercount of young children.

There is also speculation that adults with time pressures may be less likely to complete and return the census form (Hillygus, et al 2006). This hypothesis would help explain why the net undercount of young children is so much higher than that of older children.

Another idea about why young children have high net undercount rates is related to how the Census Bureau processes data. Many children have their age imputed allocated, or substituted in the Census data. If there are flaws in this process, it may not allocate the right number of people to the 0 to 4 age range. However, preliminary examination of imputation rates does not indicate this is likely to explain a very significant portion of the net undercount of nearly one million young children.

Analysis presented in this paper suggests that efforts to minimize net undercounts in future Censuses should focus on families, households, and neighborhoods with high concentrations of Black or Hispanic children age 0 to 4. Planning for the 2020 Census might be enhanced if there was an analysis of the distribution of young children (particularly Black and Hispanic young children) across the block groups and tracts in the Census Bureau Planning database. Are Black and Hispanic children age 0 to 4 disproportionately living in census tracts with high hard-to-count scores? If the Census Bureau can identify locations with concentrations of young Blacks and Hispanics ahead of the 2020 Census operations, it can put additional resources in those neighborhoods.

Many ideas about why young children have a high net undercount are derived from anecdotal evidence. Ethnographic research related to the 2010 Census (U.S.

Census Bureau, 2013, page viii) concluded that, “The 0-4 age cohort had the greatest proportion of inconsistency among all age cohorts.” Some Census Bureau employees have reported hearing that young children were left off Census questionnaires because respondents did not think of them as “people” or that the respondent thought the Census Bureau would not be interested in information on such young people. In addition, some people have heard that families intentionally do not report young children on the Census form, perhaps, because they distrust the government. Given the uncertain nature of such possible reasons for the undercount of young children, it might be wise to undertake some targeted qualitative research to gain a better understanding of this issue.

Although it is widely believed that net international migration is not a large factor in the population estimates for children under age 5, it would be good to solidify this estimate.

In this context, there has also be speculation that the high undercount of young children may be related to a phenomenon of women coming to the U.S. to have a birth, then leaving the country undetected with their newborn very soon afterword. This would add a birth to the DA estimates, but such a child would not be included in the Census or in the net outmigration statistics. It would be useful to gain an understanding of how prevalent this is. I suspect this activity would explain very little of the nearly 1 million young children missed in the Census, but it would be useful to have some empirical evidence on the issue.

As we move toward the 2020 Census it would be good for all Census operations to be made aware that young children had a higher net undercount than any other age group and make sure that problem is taken into account when planning research or data collection. This was not widely done in preparation for the 2010 Census. For example, the Census Barriers and Motivation Study used to help shape the communication campaign for the 2010 Census did not make any attempt to understand how having young children in the household shaped respondents views of the Census and the likelihood of responding to the Census questionnaire (U.S. Census Bureau, 2009). The Gallup Poll data gathered by the Census Bureau leading up to Census day on April 1, 2010, to gauge the public's views on the Census-taking process did not gather data on the presence of young children in the household (Walejko, Miller and Bates, 2011). The Census in Schools project was timely and well executed, but it was aimed at a population (age 5 to 17) that actually had a net overcount in the 2000 Census. A pre-school component, like the one in the 2000 Census, would have been more likely to reach households with young children. The Planning Data Base used for the 2010 Census did not include data on young Black and Hispanic children even though the net undercount rates of these groups are among the highest seen in the Census (Robinson, Johnson and Bruce 2007).

A special outreach effort for households with young children was mounted prior to the 2010 Census, but not until March 9, 2010, just as census questionnaires were being mailed out. An effort that started sooner might have been more successful. In all fairness, the late start on this effort is due in part to the fact that there was not confirmed Census Bureau director from December 2008 to July 2009.

7. Conclusions

The net undercount of people age 0 to 4 in the 2010 Census is higher than any other age group, but this is not a new problem. A passage from the 1940 U.S. Census (U.S. Census Bureau, 1944 page 32), reads, “Underenumeration of children under 5 year old, particularly of infants under one year old, has been uniformly observed in the United States Census and in the Censuses of England and Wales and of various countries of continental Europe.” This observation from almost 70 years ago is still largely true today. The net undercount rate for the population age 0 to 4 in the 2010 Census is almost identical to the net undercount rate experienced by this age group in the 1950 Census, although this masks a decline in the net undercount rate of young children between 1950 and 1980, followed by an increase from 1980 to 2010.

The high net undercount rate for young children is driven primarily by the high net undercount of young minority children (Blacks Alone or in Combination and Hispanic). The net undercount rates for young Black Alone or in Combination and Hispanic children are more than twice as high as those for Not Black Alone or in Combination and Not Hispanic children age 0 to 4, which is used here as a proxy for the Non-Hispanic White population.

Given the changing demographics of the nation, racial and Hispanic minorities are destined to be an increasing share of the total population. Increasing our collective ability to count such groups accurately will become a bigger factor in the overall accuracy of the Census counts. Moreover, as minority groups grow in number and

political power, demands for developing accurate assessments of overcount and undercounts will grow.

Appendix A – Background Tables

Table A1. Difference Between 2010 Census Counts and DA Estimates by Single Year of Age: 0 to 84

Age on April 1, 2010	Revised 2010 Demographic Analysis Middle Series Released May 2010 (in 1000s)	2010 Census Count (In 1000s)	2010 Census - DA	((2010 Census - DA)/DA)*100
	Total	Total	Total	Total
Total	**308,346**	**308,746**	400	0.1
0	4,083	3,944	-139	-3.4
1	4,210	3,978	-232	-5.5
2	4,338	4,097	-241	-5.6
3	4,326	4,119	-207	-4.8
4	4,214	4,063	-151	-3.6
5	4,170	4,057	-113	-2.7
6	4,190	4,066	-124	-3
7	4,126	4,031	-95	-2.3
8	4,133	4,046	-87	-2.1
9	4,185	4,148	-37	-0.9
10	4,206	4,173	-33	-0.8
11	4,155	4,114	-41	-1
12	4,119	4,106	-13	-0.3
13	4,112	4,118	6	0.1
14	4,142	4,166	24	0.6
15	4,170	4,243	73	1.8
16	4,246	4,316	70	1.6
17	4,322	4,395	73	1.7
18	4,409	4,501	92	2.1
19	4,463	4,585	122	2.7
20	4,410	4,519	109	2.5
21	4,291	4,354	63	1.5
22	4,220	4,265	45	1.1
23	4,175	4,199	24	0.6
24	4,213	4,249	36	0.9
25	4,176	4,262	86	2.1
26	4,159	4,152	-7	-0.2

27	4,259	4,249	-10	-0.2
28	4,255	4,215	-40	-0.9
29	4,270	4,223	-47	-1.1
30	4,213	4,286	73	1.7
31	4,063	3,970	-93	-2.3
32	4,026	3,987	-39	-1
33	3,931	3,880	-51	-1.3
34	3,872	3,839	-33	-0.9
35	3,896	3,956	60	1.5
36	3,822	3,802	-20	-0.5
37	3,944	3,934	-10	-0.3
38	4,156	4,122	-34	-0.8
39	4,411	4,365	-46	-1
40	4,281	4,383	102	2.4
41	4,151	4,115	-36	-0.9
42	4,080	4,076	-4	-0.1
43	4,152	4,105	-47	-1.1
44	4,243	4,211	-32	-0.8
45	4,474	4,509	35	0.8
46	4,543	4,520	-23	-0.5
47	4,560	4,535	-25	-0.5
48	4,594	4,539	-55	-1.2
49	4,598	4,606	8	0.2
50	4,584	4,660	76	1.7
51	4,441	4,465	24	0.5
52	4,481	4,501	20	0.4
53	4,351	4,380	29	0.7
54	4,240	4,292	52	1.2
55	4,158	4,255	97	2.3
56	3,991	4,038	47	1.2
57	3,879	3,936	57	1.5
58	3,778	3,795	17	0.4
59	3,579	3,641	62	1.7
60	3,529	3,621	92	2.6
61	3,415	3,493	78	2.3
62	3,476	3,563	87	2.5
63	3,434	3,484	50	1.5
64	2,551	2,657	106	4.2

65	2,613	2,681	68	2.6
66	2,603	2,639	36	1.4
67	2,610	2,649	39	1.5
68	2,282	2,324	42	1.8
69	2,111	2,142	31	1.5
70	2,005	2,043	38	1.9
71	1,940	1,949	9	0.5
72	1,864	1,864	0	0
73	1,713	1,737	24	1.4
74	1,662	1,684	22	1.3
75	1,585	1,620	35	2.2
76	1,447	1,471	24	1.7
77	1,425	1,455	30	2.1
78	1,378	1,400	22	1.6
79	1,342	1,371	29	2.2
80	1,262	1,309	47	3.7
81	1,190	1,213	23	1.9
82	1,135	1,161	26	2.3
83	1,050	1,075	25	2.4
84	963	986	23	2.4
85+	5,519	5,493	-26	-0.5
Source: U.S. Census Bureau, Population Division, 2010 Demographic Analysis, Released May 2012				

Table A2. Difference Between 2010 Census Counts and DA Estimates by Single Year of Age: 0 to 17

Age on April 1, 2010	Revised 2010 Demographic Analysis Middle Series	2010 Census	2010 Census - DA	((2010 Census - DA)/DA)*100
	(in 1000s)	(in 1000s)	(in 1000s)	(in 1000s)
Total	**308,346**	**308,746**	400	0.1
0	4,083	3,944	-139	-3.4
1	4,210	3,978	-232	-5.5
2	4,338	4,097	-241	-5.6
3	4,326	4,119	-207	-4.8
4	4,214	4,063	-151	-3.6
5	4,170	4,057	-113	-2.7
6	4,190	4,066	-124	-3
7	4,126	4,031	-95	-2.3
8	4,133	4,046	-87	-2.1
9	4,185	4,148	-37	-0.9
10	4,206	4,173	-33	-0.8
11	4,155	4,114	-41	-1
12	4,119	4,106	-13	-0.3
13	4,112	4,118	6	0.1
14	4,142	4,166	24	0.6
15	4,170	4,243	73	1.8
16	4,246	4,316	70	1.6
17	4,322	4,395	73	1.7

Source: U.S. Census Bureau, Population Division, 2010 Demographic Analysis Released May 2012

Table A3. Difference Between 2010 Census Counts and DA Estimates for Males and Females by Single Year of Age : 0 to 17

	Male		Females	
	Number	Percent	Number	Percent
Age	Census - DA (in 1000s)	((Census-DA)/DA)*100	Census - DA (in 1000s)	((census-DA)/DA)*100
	-1275	-0.8	1675	1.1
0	-74	-3.5	-66	-3.3
1	-121	-5.6	-112	-5.4
2	-123	-5.6	-118	-5.6
3	-107	-4.8	-101	-4.8
4	-76	-3.5	-74	-3.6
5	-60	-2.8	-53	-2.6
6	-67	-3.1	-57	-2.8
7	-52	-2.5	-42	-2.1
8	-46	-2.2	-41	-2.0
9	-18	-0.8	-18	-0.9
10	-15	-0.7	-18	-0.9
11	-19	-0.9	-22	-1.1
12	-6	-0.3	-8	-0.4
13	6	0.3	-1	0.0
14	20	0.9	4	0.2
15	44	2.1	29	1.4
16	43	2.0	27	1.3
17	48	2.2	24	1.1

Source: U.S. Census Bureau, Population Division, 2010 Demographic Analysis, Released May 2012

Table A4. Difference Between 2010 Census and DA Estimates by Sex for age 0- 17

MALE						FEMALE			
Age on April 1, 2010	**Revised 2010 Demographic Analysis Middle Series (in 1000s)**	**2010 Census (in 1000s)**	Difference (Census - DA Estimate) (in 1000s)	Percent Difference ((Census - DA Estimate)/DA Estimate)*100		**Revised 2010 Demographic Analysis Middle Series (in 1000s)**	**2010 Census (in 1000s)**	Difference (Census - DA Estimate) (in 1000s)	Percent Difference ((Census - DA Estimate)/DA Estimate)*100
0	2,088	2,014	-74	-3.54		1,996	1,930	-66	-3.31
1	2,152	2,031	-121	-5.62		2,059	1,947	-112	-5.44
2	2,215	2,092	-123	-5.55		2,123	2,005	-118	-5.56
3	2,212	2,105	-107	-4.84		2,115	2,014	-101	-4.78
4	2,154	2,078	-76	-3.53		2,060	1,986	-74	-3.59
5	2,132	2,072	-60	-2.81		2,038	1,985	-53	-2.6
6	2,142	2,075	-67	-3.13		2,048	1,991	-57	-2.78
7	2,109	2,057	-52	-2.47		2,016	1,974	-42	-2.08
8	2,111	2,065	-46	-2.18		2,022	1,981	-41	-2.03
9	2,138	2,120	-18	-0.84		2,047	2,029	-18	-0.88
10	2,151	2,136	-15	-0.7		2,055	2,037	-18	-0.88
11	2,122	2,103	-19	-0.9		2,033	2,011	-22	-1.08
12	2,106	2,100	-6	-0.28		2,014	2,006	-8	-0.4
13	2,099	2,105	6	0.29		2,014	2,013	-1	-0.05
14	2,116	2,136	20	0.95		2,026	2,030	4	0.2
15	2,133	2,177	44	2.06		2,037	2,066	29	1.42
16	2,173	2,216	43	1.98		2,073	2,100	27	1.3
17	2,215	2,263	48	2.17		2,108	2,132	24	1.14

Source: U.S. Census Bureau, DA Release May 2012, Table 3,Available online at http://www.census.gov/popest/research/da-estimates/Table_3.pdf

Table A4. Difference Between 2010 Census and DA Estimates by Sex for age 0- 17

MALE						FEMALE			
Age on April 1, 2010	**Revised 2010 Demographic Analysis Middle Series (in 1000s)**	**2010 Census (in 1000s)**	Difference (Census - DA Estimate) (in 1000s)	Percent Difference ((Census - DA Estimate)/DA Estimate)*100		**Revised 2010 Demographic Analysis Middle Series (in 1000s)**	**2010 Census (in 1000s)**	Difference (Census - DA Estimate) (in 1000s)	Percent Difference ((Census - DA Estimate)/DA Estimate)*100
0	2,088	2,014	-74	-3.54		1,996	1,930	-66	-3.31
1	2,152	2,031	-121	-5.62		2,059	1,947	-112	-5.44
2	2,215	2,092	-123	-5.55		2,123	2,005	-118	-5.56
3	2,212	2,105	-107	-4.84		2,115	2,014	-101	-4.78
4	2,154	2,078	-76	-3.53		2,060	1,986	-74	-3.59
5	2,132	2,072	-60	-2.81		2,038	1,985	-53	-2.6
6	2,142	2,075	-67	-3.13		2,048	1,991	-57	-2.78
7	2,109	2,057	-52	-2.47		2,016	1,974	-42	-2.08
8	2,111	2,065	-46	-2.18		2,022	1,981	-41	-2.03
9	2,138	2,120	-18	-0.84		2,047	2,029	-18	-0.88
10	2,151	2,136	-15	-0.7		2,055	2,037	-18	-0.88
11	2,122	2,103	-19	-0.9		2,033	2,011	-22	-1.08
12	2,106	2,100	-6	-0.28		2,014	2,006	-8	-0.4
13	2,099	2,105	6	0.29		2,014	2,013	-1	-0.05
14	2,116	2,136	20	0.95		2,026	2,030	4	0.2
15	2,133	2,177	44	2.06		2,037	2,066	29	1.42
16	2,173	2,216	43	1.98		2,073	2,100	27	1.3
17	2,215	2,263	48	2.17		2,108	2,132	24	1.14

Source: U.S. Census Bureau, DA Release May 2012, Table 3,Available online at http://www.census.gov/popest/research/da-estimates/Table_3.pdf

Table A5. Total Population by Age and Race: April 1, 2010

	Census - DA (in 1000s)					((Census- DA)/DA)*100			
Age	Black alone	Black alone or in combination	Hispanic	Not Black Alone or in Combination and Not Hispanic		Black alone	Black alone or in combination	Hispanic	Not Black Alone or in Combination and Not Hispanic
0	-22	-42	-61	-36		-3.5	-5.5	-5.6	-1.6
1	-32	-58	-90	-84		-5.0	-7.4	-8.2	-3.6
2	-33	-57	-95	-89		-5.0	-7.1	-8.4	-3.7
3	-31	-52	-91	-64		-4.7	-6.6	-8.0	-2.7
4	-22	-38	-76	-37		-3.5	-5.0	-7.0	-1.5
5	-14	-25	-61	-27		-2.3	-3.4	-5.8	-1.1
6	-11	-19	-54	-51		-1.8	-2.7	-5.3	-2.1
7	-5	-10	-39	-46		-0.8	-1.4	-3.9	-1.9
8	-7	-8	-31	-48		-1.1	-1.1	-3.1	-2.0
9	0	2	-4	-35		0.0	0.3	-0.5	-1.4
10	3	8	-4	-37		0.5	1.1	-0.4	-1.5
11	-2	1	13	-55		-0.3	0.1	1.5	-2.2
12	4	6	22	-41		0.6	0.9	2.5	-1.6
13	9	10	23	-27		1.5	1.4	2.6	-1.1
14	16	17	31	-24		2.6	2.4	3.7	-0.9
15	24	23	50	0		3.7	3.2	5.9	0.0
16	25	23	47	0		3.7	3.1	5.5	0.0
17	26	21	55	-3		3.7	2.7	6.4	-0.1

Source: All figures except for Hispanics are from the May 2012 DA Release. Data on Hispanics is only available from the December 2010 DA Release.

The “Not Black Alone or in Combination and Not Hispanic” category is not a category used by the Census Bureau.

The racial categories used here are the Modified Race Categories where people who marked “some other race” were assigned to one of the five major race categories.

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