The Use of Vital Statistics in the 2010 Demographic Analysis Estimates

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Abstract

This paper was prepared along with three companion documents to facilitate discussion during a Demographic Analysis technical review workshop. The paper focuses on the use of vital statistics in Demographic Analysis and: 1) describes the use of vital statistics data in Demographic Analysis, 2) identifies key issues related to the use of birth records in Demographic Analysis, 3) outlines issues related to how race is reported in the decennial census, and 4) provides an overview of ongoing research.

Introduction

The paper focuses on the use of vital statistics in Demographic Analysis and: 1) describes the use of vital statistics data in Demographic Analysis, 2) identifies key issues related to the use of birth records in Demographic Analysis, 3) outlines issues related to how race is reported in the decennial census, and 4) provides an overview of ongoing research.

As part of the evaluation process for the 2010 decennial census, the U.S. Census Bureau will estimate the resident population of the United States as of April 1, 2010 using a Demographic Analysis approach. This approach is considered independent of the census and is largely the result of accumulating data on vital statistics. In so doing, we recognize that key issues may influence the quality of these estimates.

Demographic Analysis (DA) estimates are produced through a basic demographic equation using administrative records of vital population events or program participation and estimates of international migration. The estimates are developed using separate methodologies for two different age segments of the population. For the population under age 65, the estimates are produced by following birth cohorts as they age and experience loss through deaths and emigration or change through immigration. For the population 65 and over, a stock estimate is derived from aggregated Medicare enrollment records.

The basic demographic equations for DA in 2010 are:

(1) Population <65 (born since 1945) = Births - Deaths + Immigration - Emigration
(2) Population 65+ = Medicare count + Estimate of the number not enrolled

Because of the limited race detail available from historical vital statistics data, the DA estimates have traditionally been developed by single year of age and sex for only two race categories, Black, and non-Black.[1]

[1] DA estimates are developed for the Black population, and all other races combined (referred to here as non-Black). Black is used throughout this report to refer to the Black or African American race category.

To show the size of each component of the DA estimate, the values that were used to produce an estimate of the April 1, 2000 total population are provided below. With almost 235 million births occurring between 1935 and 2000, this component contributed substantially more than the other components used to develop the estimate of 247 million people under age 65 in 2000. Because the vital statistics data were used to estimate only the population under age 65, deaths only reduce the estimate by about 15 million.

DA Components in 2000

Component	Estimate (In thousands)
Total Population	281,760
Population Under Age 65 in 2000	247,172
+ Births starting with 1935	234,860
- Deaths to persons born since 1935	14,767
+ Immigration of persons born since 1935	32,564
- Emigration of persons born since 1935	5,485
Population Ages 65 and Over in 2000	34,587
Medicare-based population	33,245
Estimated number not enrolled	1,342

Source: Robinson et al., 2002

Key Issues Related to the Use of Vital Statistics

The birth and death totals as they were tabulated for DA in 2000 will be used as the starting point for the estimate of the under 65 population for DA in 2010, with the exception of the projected births and deaths that were used for 1999 and the first quarter of 2000. Final birth and death data from 1999 and the first quarter of 2000 will replace the projections. Each birth cohort will be aged forward to April 1, 2010, and post-2000 deaths will be subtracted. Recorded births occurring during the period from 2000 through 2008 will be the primary component of the DA estimates for the population 2 to 10 years of age in 2010; ages 0 to 1 will be based on provisional and projected birth data. The National Center for Health Statistics (NCHS) provides the Census Bureau with individual level data on births and deaths without name and address information.[2] The level of detail available differs by year. For the majority of years in the decade, data on births and deaths are available in full detail. However, in more recent years, data are available in

[2] Birth and death data are released in three stages by the NCHS: provisional, preliminary, and final. Data in each successive stage are more complete than in the previous stage. Provisional data are based on counts of events and may have incomplete medical and demographic information.

either provisional (no race detail) or preliminary detail. If no data on births and deaths are available from NCHS they are projected using data from previous years.

The following assumptions are made regarding the use of vital statistics for DA:

- Birth registration has been 100 percent complete since 1985.[3]
- Infant deaths were underregistered at one-half the rate of the underregistration of births up to and including 1959.
- The registration of deaths for ages 1 and over has been 100 percent complete for the entire DA time series starting in 1935.

The use of vital statistics in the DA estimates is straightforward. Provisional national-level births for 2007 and 2008 available on the National Center for Health Statistics (NCHS) website indicate that there were 4.2 million births in 2008 and 4.3 million births in 2007. With small additions from international migration, and after accounting for deaths and parsing out the records by date of birth to align them with April 1, 2010, these figures will make up the largest portion of the DA estimate for the populations 2 and 3 years old on Census day. These figures, combined with the births recorded since 2000 and projections for 2009 and the first quarter of 2010, will represent the largest component of additions to the U.S. population since Census 2000 and will form the basis for the DA assessment of the census count of the population under the age of 10 as part of DA.[4]

With the 2000 DA estimates serving as the starting point, the accuracy of the 2010 DA estimates depends on a substantial amount of historical data. An overview of the historical vital statistics data and the use of adjustment factors to account for underregistration are discussed in a separate document prepared for this workshop (Robinson, 2009). Historical birth data are being retabulated in order to verify the accuracy of the total births used in 2000. This effort will also allow us to incorporate revisions to the 2000 DA base if needed. Because of the lower relative impact of deaths on the estimates of the population under age 65 in comparison to births, and the

[3] The last test of birth registration completeness conducted by the NCHS found of the births occurring between 1964 and 1968 over 99 percent were registered. For DA in 2000 an interpolation was used to increase the 99.2 percent coverage from the 1964-1968 test to 100 percent by 1985, the first year birth statistics were reported electronically by all states (Robinson, 2009).

[4] Births, after deaths were subtracted, accounted for over 96 percent of the estimated DA population under age 10 in 2000.

similarity between the issues related to use of the birth and death data, this paper focuses mainly on the birth component.

Though the coverage of birth records is generally accepted as complete, there may still be issues that need to be addressed to derive the total number of births. There may have been state-specific issues that have affected the total number of reported births. For example, a micro-level file provided by NCHS for Vermont in 2005 was based on incomplete data and underreported resident births by about 3 percent of resident births (U.S. Department of Health and Human Services, 2008). In addition, during the past decade, natural disasters, such as Hurricane Katrina, may have disrupted reporting of births and deaths for large reporting areas (Hamilton et al., 2009).

The postcensal estimates and DA in 2000 only included births to mothers who resided in the United States. Births to non-resident mothers are excluded. While these births would be considered native-born, the children may not reside in the United States. There may also be births that occur to mothers who report their residence as in the United States who leave before the census date that may or may not be accounted for in the estimates of emigration.

The timing of the availability of final vital statistics data raises questions about whether provisional data from the NCHS or projected values should be used. This decision will impact our estimates of the population under 5 years of age. At the time this paper was written, the National Center of Health Statistics had published final data on births through 2006, preliminary birth data for 2007, and provisional data for 2008.

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 the DA race categories comes with a more complex, substantial set of challenges.

Differences in how race is collected in the vital statistics system and the decennial census and how this has changed over time, along with differences in how people report their race across time and in different situations affects the comparability of the DA estimates with the census. For births, race can be ascribed to each birth based on the recorded mother's race, the father's

race, or a combination of both. For death certificates, race is obtained from the race reported by proxy, such as a funeral director or family member. Race in the census is either self-reported or reported by the person filling out the form for the members of the household. The majority of birth certificates used for Demographic Analysis only included the option to record a single race for each parent. Census 2000 and Census 2010 include the option to report multiple races.

As mentioned earlier, DA estimates are produced for two race categories: Black and non-Black. Historically, vital statistics forms have collected race through an open-ended fill-in-the-blank approach and responses have been coded into specific race categories. The reporting of race in the vital statistics for Blacks is considered reliable. According to research by Arias et al. (2008), the reporting of race on death certificates for the White and Black populations "…continues to be excellent." However, the quality for other groups, such as American Indian or Alaska Native is "poor" and for the Asian and Pacific Islander population is "reasonably good".

The states supply data for births and deaths to NCHS on a continual basis, to be tabulated at the national level. Therefore, the collection of data on race is done at the state-level through the cooperative use of the standard birth and death certificates. Data on race collected prior to 2002 were based on the reporting of a single race. However, in 2003, the standard was revised by NCHS to comply with the Office of Management and Budget (OMB) revisions to Statistical Policy Directive Number 15, Race and Ethnic Standards for Federal Statistics and Administrative Reporting. The OMB revisions included separating the formerly combined Asian and Pacific Islander category to form five racial categories: 1) White; 2) Black or African American; 3) American Indian and Alaska Native; 4) Asian; and 5) Native Hawaiian and Other Pacific Islander. The revised standard also included the option to indicate one or more races. The Census 2000 questionnaire provided the option to report a race either alone or in combination with one or more races. Census 2000 also included a "Some Other Race" category.[5] The 2010 Census will also provide both of these options. The 2010 Census questionnaire and the most recent revision to the certificate of live birth are provided in Appendix 1 of this document.

[5] In order to keep this paper brief, detailed descriptions of the Census 2000 race categories and responses to Census 2000 have not been included. For detailed information see the Census 2000 Brief: Overview of Race and Hispanic Origin. http://www.census.gov/population/www/cen2000/briefs/.

Issues for DA related to the revised standard were described in the ESCAP II report on Demographic Analysis prepared after Census 2000:

> The effect of the new "mark one or more" instruction for the Census 2000 question on race complicates the traditional comparison of DA estimates by race with census race tabulations. In fact, the Census 2000 tabulations do not include a category "Black" that is comparable to 1990 or earlier census tabulations. Tabulations for the Black population for 2000 contain tabulations of the number of people who reported Black only and tabulations of the number who reported Black whether or not they reported other races as well (Robinson, 2001).

It is important to stress however; that the issues associated with assigning race should have little impact on the DA estimates of the total population or the population by age and sex for all races.

Issues for DA Related to Multiple Race Reporting in the Census

DA Estimates of Coverage Differentials

The DA estimates by the Black and non-Black race categories have been used to measure reductions in the differential undercount by race over time. The undercount for Blacks as estimated by DA has historically been higher than that for the total population. In the 1990 Census of Population and Housing, the estimated undercount from DA was 5.5 percent for Blacks and 1.6 percent for the total population. For Census 2000, the estimated DA undercount was 2.8 percent for Blacks and 0.1 percent for the total population (Robinson, 2001). While the DA estimates of coverage have documented this decrease, the meaning of the Black, non-Black coverage differential has changed over time as the non-Black population has become more diverse. Additionally, the option to mark one or more races in the census represents a new source of uncertainty in the DA estimates of implied coverage.

Births recorded through birth certificates serve as the primary source for determining the size of each native-born birth cohort. The information recorded on the birth certificate on the race(s) of the mother and father is used to assign race to each birth. Decisions about the assignment of race to the vital events and how the decennial census counts are tabulated for comparison with the DA estimates can have an impact on the results obtained from DA.

For the DA estimates to provide accurate estimates by race, comparisons must be made between the same groups. While respondents to the Census in 2010 will have the opportunity to identify

themselves or their children as more than one race, they or their parents may not have had the same opportunity when recording race on the birth certificate. In tabulating the birth records for use in DA we must work within this limitation.

> Because DA uses historical data on births, deaths, and immigration, the categories of the estimates are limited by the available data. Further, comparisons with census figures must be for groupings that are the same or nearly the same. If the comparison groups are defined differently, then one component of the difference, and possibly a major component, is definitional change. Complicating such comparisons even more is the new method of collecting race data in Census 2000 which allows respondents to select more than one race, an option that was not available when the historical series of birth and death data were collected (Passel, 2001).

To show the effects of this inconsistency between the DA estimates and the Census in 2000, results using two census tabulations by race were provided. The first approach compared the DA estimates for Blacks with Census 2000 tabulations for "Black alone," and the second used tabulations for people who reported Black whether or not they reported any other race, or "Black alone or in combination." For each approach, the same DA estimate based on the race of the father was used and no attempt was made to assign race in a way that would be more consistent with the census tabulation. The estimates of undercoverage for the Black population ranged from 4.6 percent for the first comparison to 0.9 percent for the second. The final DA estimate of undercoverage for the Black population of 2.8 percent is the result of averaging the two census tabulations (Robinson, 2001).

Multiracial Births and DA

Following guidance provided in the Office of Management and Budget's 1997 revisions to Statistical Policy Directive No. 15, NCHS provided new standards in 2003 that included the option of selecting more than one race on birth and death certificates, but not all states have adopted this standard. Revisions to the standard birth and death certificates serve as models that states may use for registering births and deaths. By 2006, 23 states had implemented a revised birth certificate to allow for the reporting of more than one race. Table 1 shows the states that collect more than one race on their birth certificates and when they implemented the new standards. The 23 states that reported multiple races for births for 2006 accounted for 55 percent of U.S. births in 2006 and reported 1.6 percent of mothers as multiracial (U.S. Department of Health and Human Services, 2008). NCHS provides both the multiple races that are reported

and the multiple race responses "bridged" to the pre-1997 OMB single race categories.[6] Even if the multiple race option was not available, having the race of the mother and father on the birth certificate makes it possible to identify some births to parents of different races. However, if either parent is multiracial, they may not have had the opportunity to indicate so when their child was born, but will have the opportunity in the 2010 Census. An example would be a birth where the mother was Black (Black alone) and the father was Black and Asian (Black in combination). The birth may be recorded as being to two Black parents (Black alone) but reported as Black and Asian in the census (Black in combination).

Assignment of Births to the DA Black, non-Black Race Categories

Decisions about what rule to use to assign race to each child need to take into account the intended use of the result. In 1989, NCHS moved from using an algorithm based on the race of the mother and father to using primarily the race of the mother to tabulate birth data. The most important factor in this change was the addition of health questions that pertained to the mother and the many other items already on the birth certificate that related directly to the mother. The use of the mother's race was considered to be more consistent with the reporting of these other items (U.S. Department of Health and Human Services, 1997).

For DA in 2000, race was assigned to births based on the race of the father because it was found to produce the closest agreement with census responses from among three approaches (Adlahka et al., 2002). However, this research dealt with censuses prior to 2000, when multiple race responses were not an option. The issue prior to 2000 was how to best "predict" how parents of different races would report the race of their children or how an individual would report their multiracial heritage when given the option to indicate only one race.

Two points help explain why it is not possible to completely account for the differences between the single race collected through the birth certificate and the multiple race reporting in the Census:

1) Black in combination births can only be identified when one parent is recorded as Black and the other parent as a race other than Black on the birth certificate.

[6] Additional information on how multiple race responses are bridged to one race by NCHS is available at the following website: http://www.cdc.gov/nchs/nvss/bridged_race.htm.

2) When the "in combination" part of a Black in combination response in the census is from one or both parents being multiracial it is not possible to determine if they were Black alone or Black in combination from the single race reported on the pre-2003 birth certificates, with the exception of the situation described above.

There are several established options for assigning race to the child to obtain an estimate of the Black population. Each of the following approaches use the race of the mother, father, or both reported on the child's birth certificate to assign a race to the child:

- Minority Rule – uses the race of the minority parent
- Mother Rule – uses the race of the mother
- Father Rule – uses the race of the father

The Minority Rule, as used by NCHS prior to adopting the use of the race of the mother, determines the race of the child based on the race of the parents as follows:

1) When of the same race, the race of the child is the same as the race of the parents.
2) When of different races and one parent is White, the child is assigned the race of the minority parent.
3) When the parents are of different races and neither parent is White, the child is assigned the father's race, unless either parent is Hawaiian; then the child is assigned Hawaiian.
4) If the race was missing from one parent, the child is assigned the race of the other parent.[7]

Items 1 and 4 also apply to both the Mother and Father rules. A version of the Minority Rule is discussed later where the birth is considered Black if either parent on the birth certificate is Black.

The challenge for DA in 2010 is different from decades when reporting multiple races was not an option on the census questionnaire or the birth certificate. In those decades, as is still the case, it was possible to identify some multiracial births from the race of both parents recorded on the birth certificate. In the census, some multiracial children could also be identified from the reported race of their parents, but for the population not residing in the same household as their biological parents only one race was available. This meant that past strategies for assigning race to births for DA needed to reflect how parents of different races would report the race of their

[7] Eighteen percent of the 2006 birth records are missing the race of the father. All records include a race for the mother. If missing, NCHS imputes the race of mother based on the race of the father. If the race of the father is missing the race on the preceding record with a known race of mother is used.

children or how an individual would report their multiracial heritage when given the option to indicate only one race.

Because of the option of selecting multiple races in the 2010 census, for DA in 2010 we no longer need to try to match how parents of different races or individuals with multiracial heritage reported race when given the option of only identifying one race. However, we do need to consider how the race of the parents is recorded on the birth certificate and how this relates to the reporting of multiple races in the census.

Potential Impact of Multiracial Births on the DA Estimates

The obvious question at this point is how much uncertainty this issue introduces into the DA estimates by race. There are a number of data sources and approaches that can be used to start to assess the importance of this issue for DA in 2010. The multiracial births that have the potential to impact the estimates by the DA race categories of Black and non-Black are births where the parent's race includes Black and a race other than Black (Black in combination), even if this is from one parent who is Black in combination. An analysis of data from a 2002 supplement to the Current Population Survey indicates that only 0.8 percent of married couples include one partner who is Black and one who is a race other than Black (U.S. Census Bureau, 2004). While 0.8 percent is a small proportion of all married couples, this number would increase if all births where either parent would identify themselves as Black in combination were also considered. Based on data from the Census Bureau's 2008 population estimates, the Black alone population was 39.1 million and the Black in combination population was 2.1 million.

Looking at the number of interracial couples or the size of the Black in combination population can only give a rough idea of the potential number of Black in combination births. A second, more direct, approach is to examine historical birth data. In 1960, 1 percent of all births were to parents of different races. By 1980, this figure had risen to 1.9 percent, and by 2000 it was 5.3 percent (Adlahka et al., 2002). Figure 1 shows the ratio of births to a Black and non-Black parent (Black in combination) and births to two Black parents (Black alone) tabulated from 1980 to 2006 birth records. In the earlier years of the time series, the number of Black in combination births is small relative to the number of Black alone births, so the decision of how to classify the "in combination" births will not have a large impact on our estimate of the Black population born

in these years. As Figure 1 shows, however, this ratio increases steadily over time. The recent availability of multiple race responses from some states makes it possible to examine how many births include at least one Black in combination parent in those states. Of the births that occurred in the 23 states that collected multiple race responses for all of calendar year 2006, only 1.6 percent of mothers were reported as multiracial (U.S. Department of Health and Human Services, 2008).

Census data can also be used to view historical patterns in multiracial births. An examination of the Census 2000 Black in combination population by age shows a similar increase as was seen in multiracial births (Figure 2). Because of the increase in multiracial births in the 1990s, this population is concentrated in younger ages with a median age of 13. Of the Census 2000 Black alone or in combination population 0-9 years old, 8.2 percent were Black in combination.

The implications of an increasing number of multiracial births and the use of alternative rules for assigning race for DA was examined after Census 2000 (Adlakha et al., 2002). Their analysis demonstrated that by changing from the use of the "Minority Rule" to the "Mother Rule," the estimate of coverage for the Black population 0 to 4 years old went from a 7.8 percent undercount to an estimated 1.9 percent overcount. This range of estimated coverage is due in part to using the same Census 2000 tabulation of the Black population to develop each estimate of coverage. Using a rule to assign race at birth more consistent with the method used to tabulate the census counts would reduce the range of the estimates of coverage. As was already discussed, two approaches for tabulating the Census 2000 count of the Black population were used for DA in 2000. The two approaches resulted in overall estimates of undercoverage of 4.6 percent and 0.9 percent. The final DA estimate of coverage for the Black population of 2.8 percent was developed using an average of the Black alone and the Black alone or in combination population from Census 2000.

The range of estimates of coverage from DA in 2000 was developed by altering how the Census results were tabulated. By using micro-level births for 2010 with the race of the mother and father, we can also alter how race is assigned to each birth. This will allow us to examine the range between the strategies for assigning race that will result in the minimum and maximum number of estimated Black births. Table 2 and Figure 3 allow for such examination by showing

the number of Black births between 1980 and 2006 when using the Mother Rule, the Father Rule, a rule that requires "Both" parents to be Black for the birth to be recorded as Black, and a rule that assigns the birth as Black if "Either" parent is Black. Alternative strategies for assigning race should produce results that fall within the range created by the "Both" rule and the "Either" Rule. Compared with the Father Rule in 2006, using the "Both" Rule results in 12.4 percent *fewer* Black births and the "Either" Rule results in 4.1 percent *more* Black births. While Table 2 and Figure 3 show a widening gap between these two approaches (from 28,686 in 1980 to 120,129 in 2006), this gap should not be thought of as uncertainty in the DA estimates. For each version of the DA estimate a Census tabulation of either the Black alone or Black in combination population would minimize the universe definition differences. The size of the gap in the early 1980s and its widening over time also shows that there will be less to gain by using different strategies to revise the assignment of race to the birth cohorts prior to 1980. It should be noted that the information on the birth certificate is fixed and therefore cannot change as concepts of race change over time. However, we know that the concept of race can be fluid, so if patterns in how individuals self identify changes over time, the multiracial population may become larger from not just multiracial births, but also from more people reporting their multiracial heritage.

An examination of how parents of different races in Census 2000 reported the race of their children found that they did not always identify them as multiracial (Jones and Smith, 2003). For example, Jones and Smith found that only 44 percent of children with Black and White multiracial parentage were reported as Black and White. Thus, since concepts of race and patterns of racial identification change over time, if more parents report their children's multiracial heritage there could potentially be a substantial increase in the number of children reported to be Black in combination.

Estimates of Coverage for Other Race Categories

Inconsistencies between how race is collected in the decennial census and how race was collected in the vital statistics has been the primary limitation for producing DA estimates of coverage for race categories other than Black and non-Black. The issues outlined in this paper related to multiple race responses in the decennial census further limit the usefulness of DA estimates of coverage for additional race groups. For example, while the Black in combination

responses from Census 2000 represented only 4.8 percent of the Black alone or in combination population, for the American Indian and Alaska Native race category, the in combination responses made up 39.9 percent of the American Indian and Alaska Native alone or in combination population (U.S. Census Bureau, 2001).

Some Other Race

In Census 2000, 15.4 million people indicated Some Other Race alone and 3.2 million people indicated Some Other Race in combination with another race. Of the Black in combination population, 417 thousand indicated Black and Some Other Race. The majority, 90 percent, of those who indicated Some Other Race alone or in combination also indicated they were Hispanic. While only a relatively small number indicated Black and Some Other Race, how this population is tabulated for DA in 2010 also needs to be considered (U.S. Census Bureau, 2001).

In the postcensal estimates and DA in 2000, respondents who indicated Some other race alone were assigned to one of the OMB race categories. When the Some Other Race response was in combination with one of the OMB mandated race categories the Some Other Race response was ignored. Because of this, the postcensal and DA estimates show fewer people reporting two or more races than other tabulations from Census 2000.[8]

Ongoing Research

Because of the increase in multiracial births and possible changes in how people self identify in the census, more effort is being directed towards researching how to best align the decennial census counts with the DA estimates for the Black population. This work is building on previous research on how parents of different races report the race of their children in the census and how the reporting of multiracial heritage in the census has changed over time.

Race of children under 1 year of age from Census 2000 for households where one parent was Black alone and the other parent was not Black were tabulated and provided in Table 3. In this table, the category Black refers to respondents who selected only the Black category and

[8] Detailed information on how the Some Other Race responses were handled for DA in 2000 is available at http://www.census.gov/popest/archives/files/MRSF-01-US1.html.

Non-Black refers to respondents who selected a single race other than Black. In households where both parents were a single race, but of different races, some gave their children the race of the mother and some the race of the father, but the majority listed the children as multiracial. Aligning cohorts from the birth records with census counts and data from surveys such as the National Health Interview Survey and the American Community Survey should further our understanding of how the self-identification of race changes over time.

The use of micro-level vital statistics data in 2010 will allow for greater flexibility in assigning race to births since 2000 while also making it possible to retabulate historical data on births. However, as was previously stated, for the majority of birth records it will not be possible to differentiate between a Black alone birth and a Black in combination birth unless one parent was recorded as Black and the other as a race other than Black.

For years prior to 1980, our birth and death data consist of annual tabulations provided by NCHS. For these years, we have separate tabulations by race of father, race of mother, and race of child, where race of child is derived from the parents' races using the Minority Rule. Race of the father was used for DA in 2000. Because we only have tabulated data there are limits to what we can do for births occurring in these years but because multiracial births were relatively rare prior to 1980, this should not have a large impact on the DA estimates.

Summary

While there are a number of different approaches that could be used, none will completely resolve the inconsistencies between the decennial census tabulations and the DA estimates. One possible approach would be to include an additional, Multiple-Race category where all births to parents of different races would be considered non-Black for DA. With this approach, Black alone births would be the only births that would be classified as Black. DA estimates of the Black population developed using this approach should align best with the Census Black alone population. This approach, because of the multiple race option in the Census, would likely result in a smaller Black alone population than the DA estimate due to the inability to identify and exclude multiracial births using the single race of the parents on the birth certificate. Another approach would be to consider a birth Black if either parent is Black, in which case the appropriate comparison would be to the Black alone or in combination population**.** This

approach may result in a DA estimate that is lower than the census tabulation because of the inability to identify Black in combination births where the non-Black race is from a parent's multiracial heritage.

Regardless of the approach used, it is not possible to completely eliminate the inconsistencies between how race is assigned to births for the DA estimates and the tabulation by race from the decennial census. Therefore, ongoing research needs to be geared towards identifying the strategy that will minimize the inconsistencies and then quantifying the uncertainty around the DA estimates due to these inconsistencies.

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Table 1. Multiple Race on the Birth Certificate by State: 2003 to 2006

State	2003	2004	2005	2006
California				x
Delaware				x
Florida		x	x	x
Hawaii*	x	x	x	x
Idaho		x	x	x
Kansas			x	x
Kentucky		x	x	x
Michigan (selected facilities)*	x	x	x	x
Minnesota*	x	x	x	x
Nebraska			x	x
New Hampshire		x	x	x
New York (excluding New York City)		x	x	x
North Dakota				x
Ohio				x
Pennsylvania	x	x	x	x
South Carolina		x	x	x
South Dakota				x
Tennessee		x	x	x
Texas			x	x
Utah*	x	x	x	x
Vermont			x	x
Washington	x	x	x	x
Wyoming				x
Total	6	13	17	23

* Used the 1989 birth certificate and reported multiple-race.

Note: Prior to 2003 and the remaining states in 2006 are based on the 1989 revision and follow the 1977 OMB standard.

U.S. Department of Health and Human Services. 2008. *Detailed Technical Notes, 2006* . <http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm>

Table 2. Black Births Tabulated Using Alternative Approaches for Assigning Race of Births With One or Two Black Parents : 1980 to 2006

Year	Birth assigned Black if:				Percent difference from either approach:		
	Either mother or father is black	Father is black	Mother is black	Both father and mother are black	Father is black	Mother is black	Both father and mother are black
Total	18,004,880	17,578,544	16,604,964	16,178,628	-2.37	-7.78	-10.14
1980	588,660	582,426	566,208	559,974	-1.06	-3.81	-4.87
1981	586,916	580,195	563,267	556,546	-1.15	-4.03	-5.17
1982	591,602	584,400	566,703	559,501	-1.22	-4.21	-5.43
1983	585,155	577,776	560,853	553,474	-1.26	-4.15	-5.41
1984	591,404	583,515	565,789	557,900	-1.33	-4.33	-5.67
1985	607,860	598,921	580,390	571,451	-1.47	-4.52	-5.99
1986	620,882	611,252	591,560	581,930	-1.55	-4.72	-6.27
1987	641,721	630,992	610,017	599,288	-1.67	-4.94	-6.61
1988	671,938	660,454	637,224	625,740	-1.71	-5.17	-6.88
1989	710,892	698,538	673,213	660,859	-1.74	-5.30	-7.04
1990	726,053	713,024	684,435	671,406	-1.79	-5.73	-7.53
1991	726,703	713,117	682,723	669,137	-1.87	-6.05	-7.92
1992	720,876	706,604	673,735	659,463	-1.98	-6.54	-8.52
1993	709,351	694,762	658,968	644,379	-2.06	-7.10	-9.16
1994	690,621	675,483	636,489	621,351	-2.19	-7.84	-10.03
1995	660,009	643,705	603,250	586,946	-2.47	-8.60	-11.07
1996	655,384	638,445	594,870	577,931	-2.58	-9.23	-11.82
1997	664,454	646,533	600,029	582,108	-2.70	-9.70	-12.39
1998	679,029	659,225	610,014	590,210	-2.92	-10.16	-13.08
1999	677,392	657,087	606,089	585,784	-3.00	-10.53	-13.52
2000	696,915	674,282	622,743	600,110	-3.25	-10.64	-13.89
2001	681,256	658,688	606,324	583,756	-3.31	-11.00	-14.31
2002	669,928	646,807	593,819	570,698	-3.45	-11.36	-14.81
2003	678,830	654,076	599,963	575,209	-3.65	-11.62	-15.26
2004	696,466	670,847	616,256	590,637	-3.68	-11.52	-15.20
2005	717,528	690,124	633,318	605,914	-3.82	-11.74	-15.56
2006	757,055	727,266	666,715	636,926	-3.93	-11.93	-15.87

Note: For births reported using the revised birth certificate, race was bridged to the pre-2003 certificate race categories.

Source: U.S. Census Bureau, tabulation of NCHS birth records.

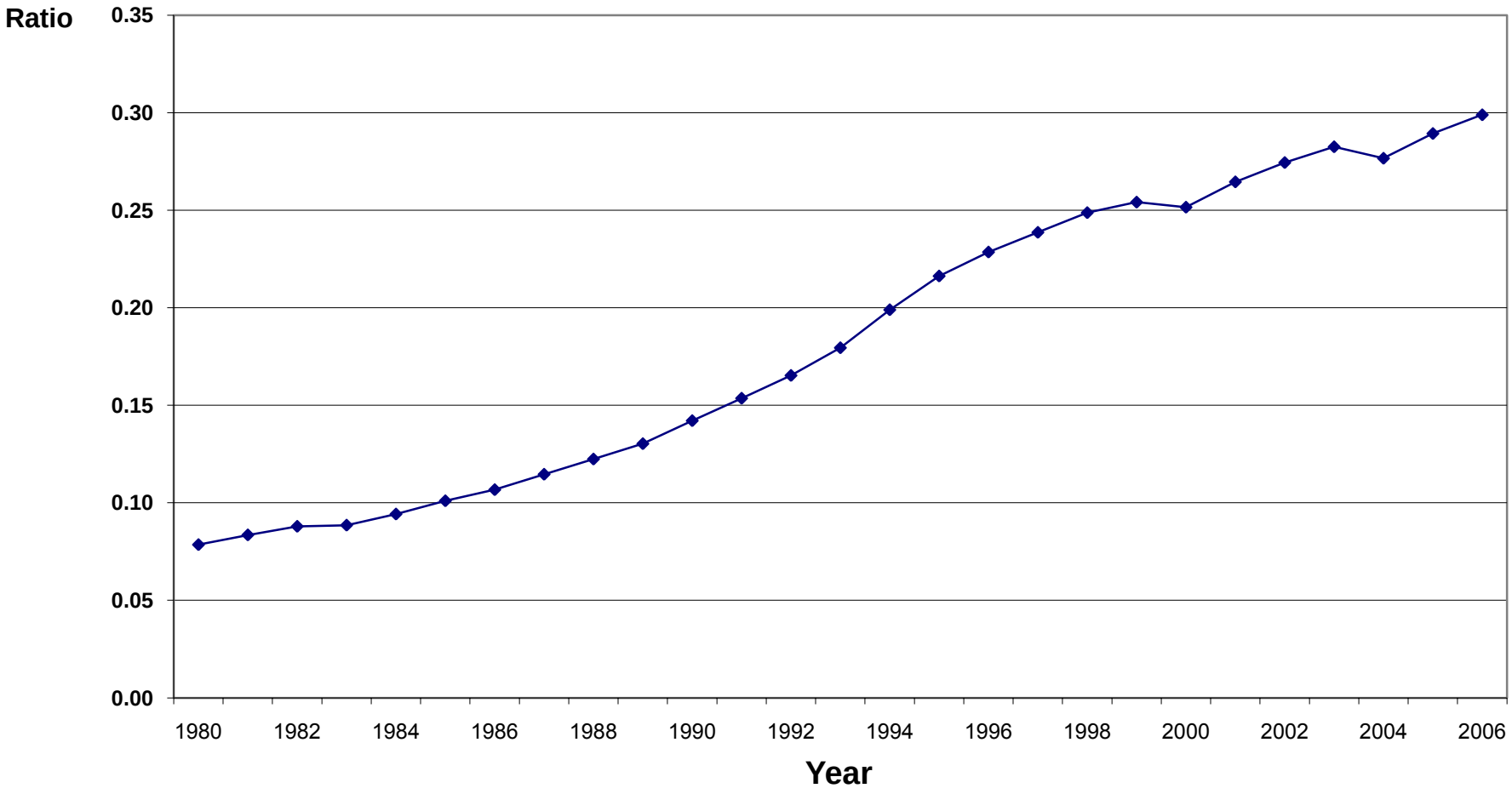
Table 3. Reported and Potential Black In Combination Children Under Age 1 by Reported Race of Parents and Child: 2000[1]

Race of father and race of mother	Reported race of child			
	Total	Black alone	Non-black	Black in combination
NUMBER				
Total	33,478	9,186	3,646	20,646
Black father (non-Black mother)	26,897	7,744	2,316	16,837
Black mother (non-Black father)	6,581	1,442	1,330	3,809
PERCENT				
Total	100.0	27.4	10.9	61.7
Black father (non-Black mother)	100.0	28.8	8.6	62.6
Black mother (non-Black father)	100.0	21.9	20.2	57.9

[1] Includes biological children of the householder in two-parent households regardless of marital status of the parents.

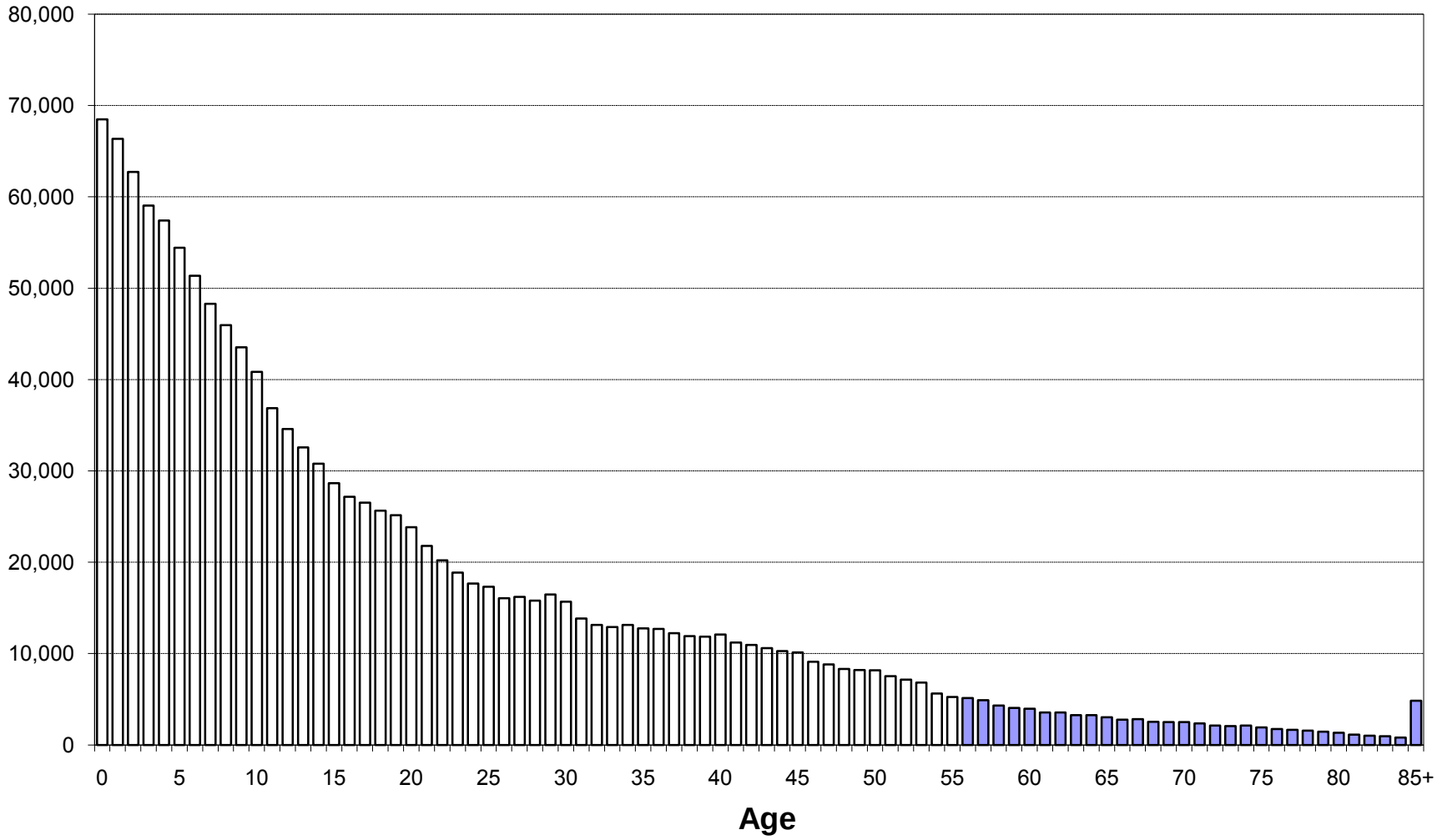
Source: U.S. Census Bureau, Census 2000.

Figure 1. Ratio of Black In Combination Births to Black Alone Births Based On the Race of the Parents Reported on the Birth Certificate: 1980 to 2006



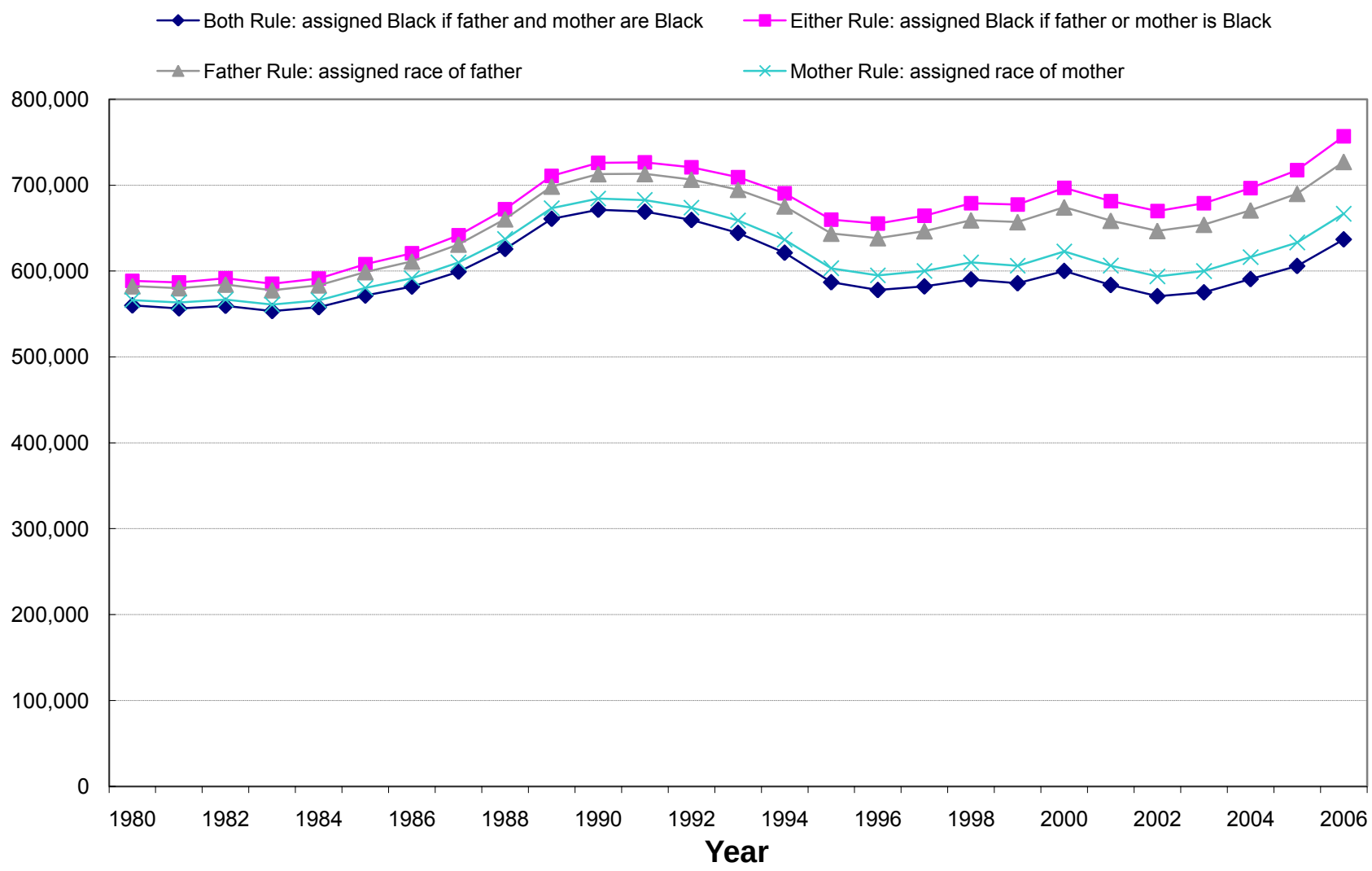
Source: U.S. Census Bureau, tabulation of NCHS birth records.

Figure 2. Black in Combination Population by Age: April 1, 2000



Note: Values do not include Black in combination with Some Other Race.
Source: U.S. Census Bureau, Census 2000.

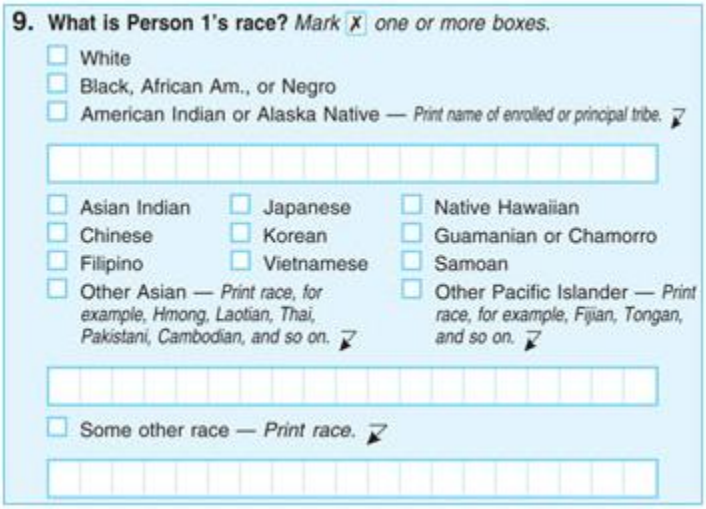
Figure 3. Number of Black Births by Assignment Rule: 1980 to 2006



Source: U.S. Census Bureau, tabulation of NCHS birth records.

Appendix 1. The 2010 Census and 2003 Revised Live Birth Certificate Race Items

2010 Census



9. What is Person 1's race? *Mark* ✗ *one or more boxes.*

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian — *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander — *Print race, for example, Fijian, Tongan, and so on.*

- ☐ Some other race — *Print race.*

2003 Revision to the Standard Birth Certificate

22. MOTHER'S RACE (Check one or more races to indicate what the mother considers herself to be)

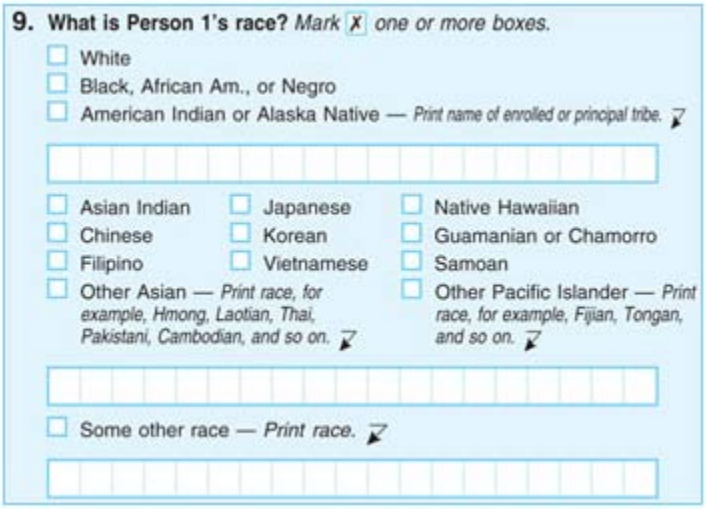
- □ White
- □ Black or African American
- □ American Indian or Alaska Native (Name of the enrolled or principal tribe)_____
- □ Asian Indian
- □ Chinese
- □ Filipino
- □ Japanese
- □ Korean
- □ Vietnamese
- □ Other Asian (Specify)_____
- □ Native Hawaiian
- □ Guamanian or Chamorro
- □ Samoan
- □ Other Pacific Islander (Specify)_____
- □ Other (Specify)_____

25. FATHER'S RACE (Check one or more races to indicate what the father considers himself to be)

- □ White
- □ Black or African American
- □ American Indian or Alaska Native (Name of the enrolled or principal tribe)_____
- □ Asian Indian
- □ Chinese
- □ Filipino
- □ Japanese
- □ Korean
- □ Vietnamese
- □ Other Asian (Specify)_____
- □ Native Hawaiian
- □ Guamanian or Chamorro
- □ Samoan
- □ Other Pacific Islander (Specify)_____
- □ Other (Specify)_____

Appendix 1. The 2010 Census and 2003 Revised Live Birth Certificate Race Items

2010 Census



9. What is Person 1's race? *Mark* X *one or more boxes.*

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian — *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander — *Print race, for example, Fijian, Tongan, and so on.*

- ☐ Some other race — *Print race.*

2003 Revision to the Standard Birth Certificate

22. MOTHER'S RACE (Check one or more races to indicate what the mother considers herself to be)

- □ White
- □ Black or African American
- □ American Indian or Alaska Native (Name of the enrolled or principal tribe)_____
- □ Asian Indian
- □ Chinese
- □ Filipino
- □ Japanese
- □ Korean
- □ Vietnamese
- □ Other Asian (Specify)_____
- □ Native Hawaiian
- □ Guamanian or Chamorro
- □ Samoan
- □ Other Pacific Islander (Specify)_____
- □ Other (Specify)_____

25. FATHER'S RACE (Check one or more races to indicate what the father considers himself to be)

- □ White
- □ Black or African American
- □ American Indian or Alaska Native (Name of the enrolled or principal tribe)_____
- □ Asian Indian
- □ Chinese
- □ Filipino
- □ Japanese
- □ Korean
- □ Vietnamese
- □ Other Asian (Specify)_____
- □ Native Hawaiian
- □ Guamanian or Chamorro
- □ Samoan
- □ Other Pacific Islander (Specify)_____
- □ Other (Specify)_____