

Making Sense of Racial Population Change as Reported in the 2000 Census

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Introduction

Ethnic and minority populations have grown in many Arkansas communities during the past decade. The recent boom in the Hispanic population and the migration of minorities to urban areas have accounted for much of this growth. However, the magnitude of changes in the racial composition of local areas is difficult to determine from census figures because of changes in the way racial data were collected on the 2000 census.

Revisions to the 2000 census question on race have resulted in many new race categories. The new race categories do not match the previous census race categories and, therefore, make it difficult to calculate racial/ethnic population change for the period 1990 to 2000. Many persons counted in the new race categories in 2000 cannot easily be identified with 1990 race categories. Since it is not known which single-race category these individuals selected in 1990, exact population change by race from 1990 to 2000 cannot be determined. Fortunately, several methods exist for estimating 1990 to 2000 racial/ethnic population change. Thus far, the Census Bureau has used only one of these methods – the All Inclusive method. While this method is one of the easiest to use and understand, it may not be the most informative.

Because the press and many public offices get population information directly from Census Bureau

reports, we herein review the Census Bureau's All Inclusive method for reporting 1990 to 2000 population change by race and ethnic origin. We describe the revisions made to the 2000 census question on race and why the additional categories hinder calculating 1990 to 2000 population change by race and ethnic origin. Then we define the All Inclusive method with its related terminology and explore some of its strengths and weaknesses. Finally, we illustrate the importance of understanding the limitations of this method.

Revisions to Race on the 2000 Census

Two revisions to the 1990 census race question resulted in many new categories of race for 2000. These revisions are shown in Table 1. The race choices listed under the race question on the 2000 census questionnaire were nearly identical to those listed on the 1990 census questionnaire with two exceptions. The "Asian or Pacific Islander" category from the 1990 census was split into two categories – "Asian" and "Native Hawaiian and Other Pacific Islander" – for the 2000 census. This revision created only one additional race category which can be easily converted to 1990 classifications. So where did the other new categories come from?

The second and most significant revision is that respondents were asked to select **one or more races**

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Differences between 1990 & 2000 Census

1990 Census

Asian or Pacific Islander

Select Single Race Category

2000 Census

Asian
Pacific Islander

Select One or More Races

from the race choices in 2000, whereas they were asked to select **only one race in 1990** (see Table 1). This resulted in the creation of 57 new multi-race categories in 2000. These new multi-race categories correspond to all possible combinations of race choices that a census respondent could have selected in 2000. If a respondent selected more than one race, their response was recorded in one of these new multi-race categories. For instance, if a respondent selected White and Asian from the race choices on the 2000 census questionnaire, their response was recorded in a new category called “White-Asian.” Table 2 is a list of the race categories used in the 1990 and 2000 censuses.

As a result of these two revisions to the race question on the 2000 census, 63 race categories were used in 2000, whereas only five categories of race were used in 1990. Furthermore, an unknown number of respondents who chose only one race in 1990 may have selected more than one race in 2000. This means that the 2000 race categories cannot be matched exactly to the 1990 (and earlier) race categories when calculating 1990 to 2000 population change by race. Fortunately, the new “Asian” and “Native Hawaiian and Other Pacific Islander”

categories can easily be recombined to match the “Asian or Pacific Islander” category used in 1990.¹ Matters are not quite so simple when combining the new multi-race categories into single-race categories.

Allocating 2000 Multi-Race Population to Single-Race Categories

The Census Bureau uses the All Inclusive method for calculating and reporting 1990 to 2000 racial/ethnic population change. Alternative methods are available, but they are complicated and require special estimation techniques as well as considerable time and effort. They are not presented here because their complexity requires more explanation than can be provided in this brief fact sheet. For an in-depth treatment of alternative methods, the reader can refer to the Office of Management and Budget’s (OMB) *The Bridge Report: Tabulation Options for Trend Analysis*, in *Provisional Guidance on the Implementation of the 1997 Standards for Federal Data on Race and Ethnicity*, December 15, 2000.

¹The Census Bureau splits the 1990 category (Asian or Pacific Islander) to match the two 2000 categories (Asian and Pacific Islander).

Table 1. Revisions to the 1990 Census Question on Race

1990 Census	2000 Census
Choose only one of the following races:	Choose one or more of the following races:
– White	– White
– Black or African American	– Black or African American
– American Indian and Alaska Native	– American Indian and Alaska Native
– Asian or Pacific Islander	– Asian
– Other	– Native Hawaiian and Other Pacific Islander
	– Some Other Race

*The revised elements are in bold text. **Note:** This is not how the questions appeared on the census questionnaires. It is a simplified example meant to illustrate the revisions to census race categories.

Table 2. Categories Used for Tabulating Race Responses From the 1990 and 2000 Censuses.

This table is for comparison, so the category names may not be as they appeared on the census.

<p>1990 Census</p>	<p>Single-Race Categories: White Black or African American American Indian and Alaska Native Asian or Pacific Islander Other</p>
<p>2000 Census</p>	<p>Single-Race Categories: White Black or African American American Indian and Alaska Native Asian Native Hawaiian and Other Pacific Islander Some Other Race</p> <p>Multi-Race Categories:</p> <p>2 Races White&Black or African American White&American Indian and Alaska Native White&Asian White&Native Hawaiian and Other Pacific Islander White&Some Other Race Black or African American&American Indian and Alaska Native Black or African American&Asian Black or African American&Native Hawaiian and Other Pacific Islander Black or African American&Some Other Race American Indian and Alaska Native&Asian American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander American Indian and Alaska Native&Some Other Race Asian&Native Hawaiian and Other Pacific Islander Asian&Some Other Race Native Hawaiian and Other Pacific Islander&Some Other Race</p> <p>3 Races White&Black or African American&American Indian and Alaska Native White&Black or African American&Asian White&Black or African American&Native Hawaiian and Other Pacific Islander White&Black or African American&Some Other Race White&American Indian and Alaska Native&Asian White&American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander White&American Indian and Alaska Native&Some Other Race White&Asian&Native Hawaiian and Other Pacific Islander White&Asian&Some Other Race White&Native Hawaiian and Other Pacific Islander&Some Other Race Black or African American&American Indian and Alaska Native&Asian Black or African American&American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander Black or African American&American Indian and Alaska Native&Some Other Race Black or African American&Asian&Native Hawaiian and Other Pacific Islander Black or African American&Asian&Some Other Race Black or African American&Native Hawaiian and Other Pacific Islander&Some Other Race American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander American Indian and Alaska Native&Asian&Some Other Race American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander&Some Other Race Asian&Native Hawaiian and Other Pacific Islander&Some Other Race</p> <p>4 Races White&Black or African American&American Indian and Alaska Native&Asian White&Black or African American&American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander White&Black or African American&American Indian and Alaska Native&Some Other Race White&Black or African American&Asian&Native Hawaiian and Other Pacific Islander White&Black or African American&Asian&Some Other Race White&Black or African American&Native Hawaiian and Other Pacific Islander&Some Other Race White&American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander White&American Indian and Alaska Native&Asian&Some Other Race White&American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander&Some Other Race White&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race Black or African American&American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander Black or African American&American Indian and Alaska Native&Asian&Some Other Race Black or African American&American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander&Some Other Race Black or African American&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race</p> <p>5 Races White&Black or African American&American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander White&Black or African American&American Indian and Alaska Native&Asian&Some Other Race White&Black or African American&American Indian and Alaska Native&Native Hawaiian and Other Pacific Islander&Some Other Race White&Black or African American&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race White&American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race Black or African American&American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race</p> <p>6 Races White&Black or African American&American Indian and Alaska Native&Asian&Native Hawaiian and Other Pacific Islander&Some Other Race</p>

The All Inclusive method allocates numbers from the new multi-race categories into single-race categories that equate to the 1990 race categories. By making the 1990 and 2000 race categories comparable, population change by race can be computed. The All Inclusive method uses three approaches to allocate 2000 census data on race to the 1990 categories:

- “Race Alone”
- “Race in Combination”
- “Race Alone **or** in Combination”

These are also the three ways in which the Census Bureau reports racial/ethnic population change for 1990 to 2000.

“Race Alone” is the single-race categories from the 2000 census. This category represents those respondents who selected only one race on the 2000 census. These categories can easily be matched to the race categories used in 1990 since the categories are essentially the same. However, “Race Alone” does not include multi-race respondents from the 2000 census so it under-counts the 2000 population.

“Race in Combination” is computed by allocating the multi-race responses from the 2000 census into two or more single-race categories that match the 1990 race categories. “Race in Combination” assigns a multi-race respondent to each of their race selections as reported on the 2000 census. For example, if a respondent selected more than one race on the 2000 census, such as “White” and “Black” and “Asian,” their response is counted once in the “White in Combination” category, once in the “Black in Combination” category and once in the “Asian in Combination” category. Because each multi-race respondent is counted more than once, “Race in Combination” over-counts the multi-race population.

“Race Alone or in Combination” is simply the sum of “Race Alone” and “Race in Combination” for each race group. Since it incorporates “Race Alone” and “Race in Combination,” it overestimates the population of individual race categories.

To illustrate the All Inclusive method, consider the following example to match 2000 census data for Blacks to the 1990 Black race category. “Black Alone” refers to those who selected only Black when answering the race question on the 2000 census. “Black in Combination” refers to those who selected Black in addition to any other race(s). Their response is also counted in each of the other categories of race that they selected in addition to Black. “Black Alone or in

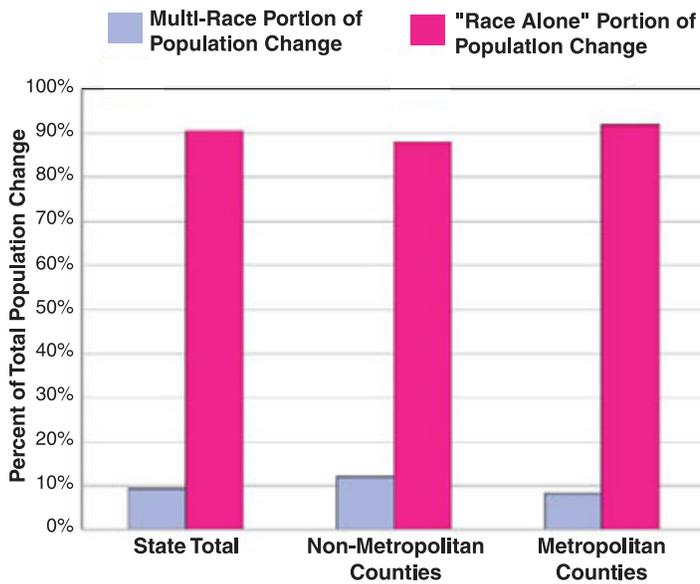
Combination” refers to the total of those who selected only Black plus those who selected Black and any other race. Therefore, the total black population in 2000 is over-counted if some of the black multi-race respondents would choose a race other than black if asked to select a single-race category. The three approaches produce a minimum number (“Race Alone”) and maximum possible number (“Race Alone or in Combination”) of individuals for each of the single-race categories.

The All Inclusive Method: Buyer Beware

The All Inclusive method has strengths and weaknesses. One strength of this method is that it does not assume how individuals would have responded to the 2000 census question on race had they been asked to select only one of the race choices. Another strength is its ease of computation and understandability. While it has theoretical and operative benefits, the All Inclusive method also has two major methodological weaknesses that can result in miscalculation of racial/ethnic population change from 1990 to 2000. First, “Race Alone” omits an important component of racial/ethnic population change, the multi-race population in 2000. The result is an understatement of actual population change by race when comparing the 2000 “Race Alone” categories to the matching 1990 race categories.

Second, “Race Alone or in Combination” overestimates the population of each race category and the minority populations in particular. The non-Hispanic, multi-race population is proportionally small in Arkansas, only 1.1 percent of the total population. This is equally true of metropolitan/non-metropolitan areas in Arkansas. Only 1.3 percent of the metropolitan population was non-Hispanic and multi-race in 2000 as compared to 1.0 percent in non-metropolitan areas. However, the multi-race population represents a significant portion of the total population increase from 1990 to 2000. Figure 1 illustrates this point. It compares the “Race Alone” portion of total 1990 to 2000 population change (all races) to the actual multi-race portion. The chart in Figure 1 shows that multi-race is 10 percent of the total population increase in Arkansas. Even though the proportion of the multi-race population is very small, the number of multi-race individuals can significantly contribute to the numbers for racial/ethnic population change in many areas. Figure 1 shows that this is especially true in non-metropolitan areas where there is typically slow population growth or population loss.

Figure 1. Non-Hispanic Multi-Race and “Race Alone” Portions of Total Population Change, 1990 to 2000



“Race Alone or in Combination,” unlike “Race Alone,” includes the multi-race population and seriously over-counts it. The greatest problems with reporting “Race Alone or in Combination” are two-fold. First, every person who selected more than one race in 2000 is counted more than once using this approach. This inflates the total non-Hispanic population (all races) for 2000 by 1.2 percent (about 32,000 people) in Arkansas.

Likewise, it disproportionately escalates the perceived population growth rate for minority race groups, especially the smaller ones. Figure 2 illustrates how this approach inflates the rate of population change for each race group in Arkansas. The groups that are most affected in Arkansas are the American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander and the Some Other Race groups.

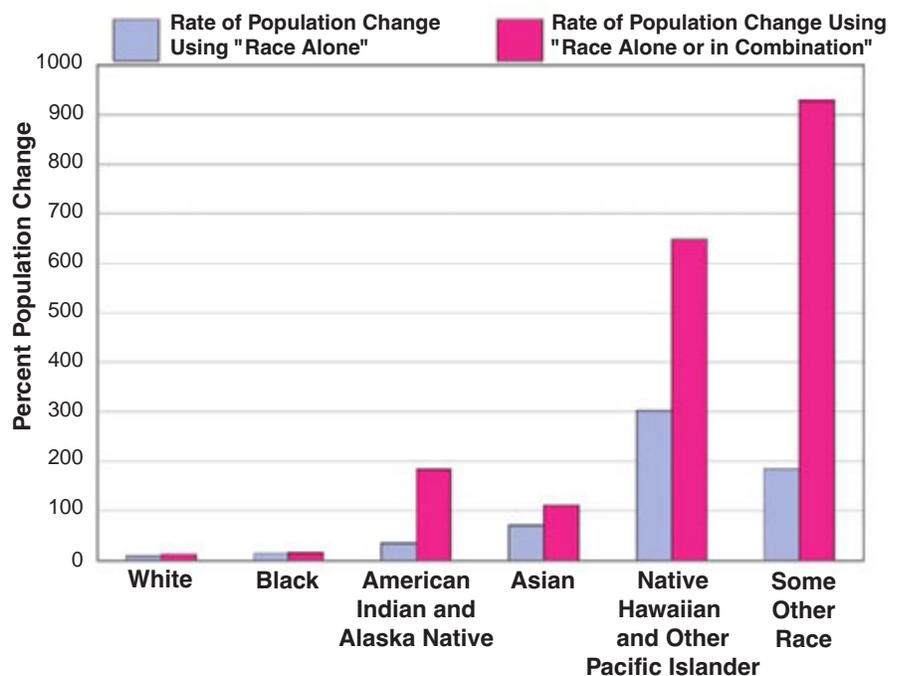
Summary

The 2000 population census allowed an individual to specify more than one race in response to the race question. Since previous population censuses did not permit multiple-race

responses and many new categories of race were added for 2000, it is difficult to compute the growth of minority populations between 1990 and 2000. To remedy this situation, various estimation procedures have been proposed to assign multi-race responses into categories that match the 1990 race categories. Of these methods, the Census Bureau uses the All Inclusive method. While easy to use and understand, this method is not the most accurate.

The approaches used with the All Inclusive method either under-count or over-count the population in each single-race category depending on whether “Race Alone” or “Race Alone or in Combination” is reported. “Race Alone” is used for computing the minimum population change of each single-race category, but the reported numbers exclude the multi-race population. “Race Alone or in Combination” is used to compute the maximum possible population change of each single-race category, but it can greatly overestimate the actual rates of minority population change. Therefore, researchers and policymakers need to use caution when considering minority population growth reported by the Census Bureau using the All Inclusive method.

Figure 2. Rate of Population Change by Race Using “Race Alone or in Combination” Versus “Race Alone,” 1990 to 2000



Arkansas Population by Race, 2000¹

Subject	Number	Percent
Total Population	2,673,400	100.0%
RACE		
One race	2,637,656	98.7%
White	2,138,598	80.0%
Black or African American	418,950	15.7%
American Indian and Alaska Native	17,808	0.7%
Asian	20,220	0.8%
Native Hawaiian and Other Pacific Islander	1,668	0.1%
Some other race	40,412	1.5%
Two or more races	35,744	1.3%
Race alone or in combination with one or more other races		
White	2,170,534	81.2%
Black or African American	427,152	16.0%
American Indian and Alaska Native	37,002	1.4%
Asian	25,401	1.0%
Native Hawaiian and Other Pacific Islander	3,129	0.1%
Some Other Race	48,267	1.8%
Total – Race alone or in combination	2,711,485	101.4%

¹These figures include both the Hispanic and non-Hispanic population.

Source: 2000 Census, Bureau of the Census, U.S. Department of Commerce.

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