

Race of Children in Population Estimates

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Overview

- The U.S. Census Bureau and the National Center for Health Statistics (NCHS) make extensive use of each other's data
- Census and NCHS race and ethnicity data are not always consistent because the Census is self-reported while NCHS categories may be assigned by an observer
- Further complications arise from the fact that birth certificates report the parents' race and ethnicity, but the race and ethnicity of the child must be inferred

Overview (cont.)

- This paper builds on past research comparing Census and NCHS race and ethnicity data
- Further examination of these results indicate that the key to obtaining agreement between Census and NCHS birth data is proper assignment of race and ethnicity to children whose parents differ in these characteristics
- The Census Bureau developed and maintains a “Kid-Link File” to distribute race and ethnicity to births when these characteristics differ for the parents
- Research suggests that we could improve the method for building this file to increase Census-NCHS agreement

Kid-Link Method



Step 1:

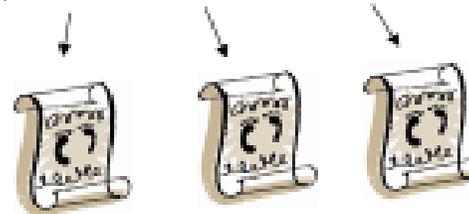
Link census race and Hispanic origin responses for mother, father, and child living in the same household

Step 2:

Calculate proportions of child's race and Hispanic origin based on reporting in the census



Race and Hispanic Origin proportions from the Census

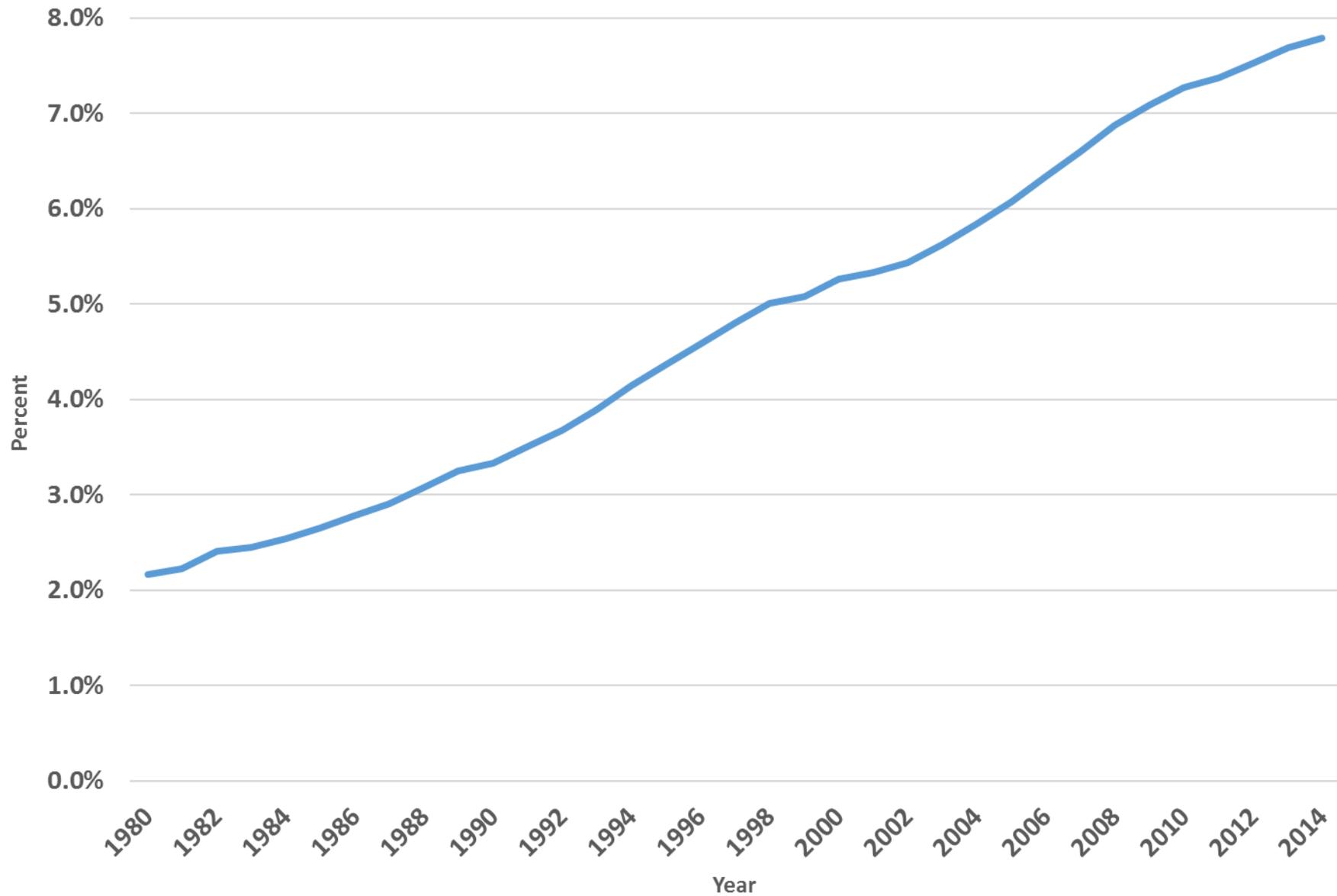


Aggregated birth records

Step 3:

Apply census proportions to aggregated birth records to produce estimates by race and Hispanic origin

Figure 1: Percent of Births to Parents of Differing Races by Year



Past Research

- We used the method of demographic analysis (DA), combining births from April 2009 through March 2010 with deaths to this cohort to produce estimates of the population aged zero at the time of the 2010 Census
- These DA estimates were compared to the age zero population from the 2010 Census by race and ethnicity to ascertain the consistency of Census and NCHS data with respect to these categories
- We concluded that the race and ethnicity categories present in NCHS data show generally good agreement with those found in the 2010 Census, though the agreement was weaker for smaller groups
- We found a strong inverse relationship between the strength of the agreement and the proportion of births to parents of different races

Table 1. Census Age 0 Population vs. DA Estimates

| Race/Ethnicity | Census Population | Share of Population | DA Estimate | Share of Estimate | Percent Difference |
|----------------|-------------------|---------------------|-------------|-------------------|--------------------|
| White NH | 1,338,000 | 0.489 | 1,392,000 | 0.492 | 0.73 |
| Black NH | 329,800 | 0.12 | 356,300 | 0.126 | 4.6 |
| AIAN NH | 21,640 | 0.008 | 19,491 | 0.007 | 12.79 |
| Asian NH | 122,500 | 0.045 | 135,430 | 0.048 | 7.04 |
| NHPI NH | 6,353 | 0.002 | 5,623 | 0.002 | 14.3 |
| TOMR NH | 131,800 | 0.048 | 114,400 | 0.04 | 15.94 |
| Hispanic | 788,300 | 0.288 | 805,000 | 0.285 | 1.13 |

Note: NH = non-Hispanic; AIAN = American Indian and Alaska Native; NHPI = Native Hawaiian and Pacific Islander;
 TOMR = Two or More Races
 Source: U.S. Census Bureau

Index of Dissimilarity = 1.226

Mean Absolute Percent Error = 8.477

Table 2. Births Where One Parent or Both Parents are of the Specified Race/Ethnicity

| Race | One Parent Only | Both Parents | Ratio (One/Both) |
|----------|-----------------|--------------|------------------|
| White NH | 328,200 | 1,738,000 | 0.189 |
| Black NH | 101,300 | 369,800 | 0.274 |
| AIAN NH | 17,790 | 9,387 | 1.895 |
| Asian NH | 56,090 | 179,000 | 0.313 |
| NHPI NH | 26,380 | 6,855 | 3.848 |
| TOMR NH | 62,900 | 8,536 | 7.373 |
| Hispanic | 234,700 | 567,500 | 0.414 |

Note: NH = Non-Hispanic; White, Black, AIAN, Asian, NHPI are race-alone

Source: National Center for Health Statistics

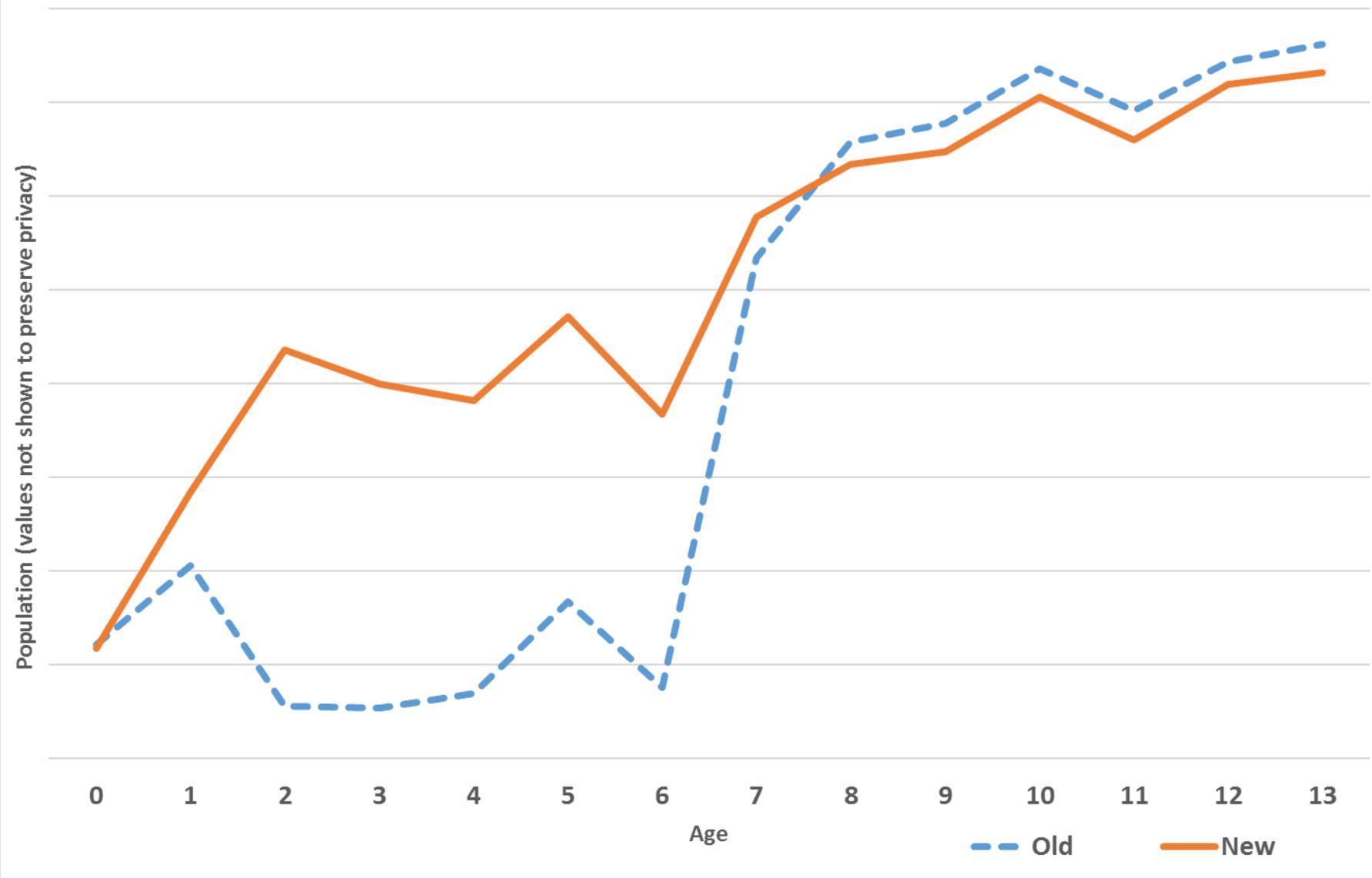
Building a Better Kid-Link File

- Our current Kid-Link File contains national-level proportions based on families with children 17 years old or younger
- Current Population Survey (CPS) data include more information about family relationships than the Census, and indicate that younger children are more likely to be biologically related to the householder and partner
- We created and tested a succession of Kid-Link Files, varying the ages of the children included, and learned that we get the best results using only children of age 0

Building a Better Kid-Link File (cont.)

- To account for regional variation in race reporting, we calculated the Kid-Link proportions by metropolitan area, grouping non-metropolitan areas into balance-of-state
- We replicated our previous research using this new Kid-Link File and compared the results
- We also tested the new Kid-Link methodology in a simulated set of population estimates at the county level to gauge the impact of these modifications

Figure 2: Example County: Population in the Old versus New Kid-Link Method, Ages 0 to 13



Results

- Use of the new Kid-Link File substantially improved overall agreement between Census and NCHS: the MAPE for the national comparison was reduced from 8.5 to 4.9
- We also saw improved agreement for the majority of counties, especially for those with problematic age distributions for their youngest populations
- For about a quarter of the counties, use of the new file caused the Census-NCHS MAPE to increase by 0.5 or more; these were generally the smallest counties, and the MAPE increases resulted from small-number problems

Conclusions

- Proper assignment of race and ethnicity to children of parents whose characteristics differ is the key to obtaining consistency between NCHS and Census data
- We can improve our method by allowing for regional variation and excluding data from families whose members are unlikely to be biologically related
- Proper assignment can be very difficult when working with small populations

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