Research Note for Subcounty Controls

2009 ACS and 2007-2009 ACS Estimates of Incorporated Places and Minor Civil Divisions

A significant change was made to the weighting methodology to improve estimates of subcounty areas starting with ACS data products which include the year 2009. The ACS estimates of the total population of incorporated places and minor civil divisions (MCD) are now adjusted so that they are closer to Population Estimate Program (PEP) estimates. These new subcounty controls are in addition to the county-level controls of population by demographic group that have always been a part of ACS methodology. For more information on the subcounty controls methodology see the 2009 Accuracy of the Data at http://www.census.gov/acs/www/data_documentation/documentation_main/.

There are several consequences of implementing subcounty controls that data users need to be aware of. One is that the 2009 1-year ACS estimates of totals and characteristics of population and housing units for subcounty[1] areas are not directly comparable to estimates from the 2008 ACS or from earlier ACS releases. Similarly, the 2007-2009 ACS 3-year estimates of totals and characteristics of population and housing units for subcounty areas are not directly comparable to those from either the 2006-2008 ACS or the 2005-2007ACS. Observed differences between the ACS data products which include the year 2009 and earlier ACS estimates may reflect this change in methodology and may not reflect real changes in the population. In addition to changes seen at the subcounty level, some counties will show modestly different year-to-year distributions of nondemographic characteristics. Further, it must be noted that a small number of incorporated places and MCDs may have large differences in total population between the PEP and ACS despite the subcounty controls.

Certain year-to-year comparisons are of more concern to data users than others. Of greatest concern are comparisons of estimates of totals of persons by characteristic and of housing units by characteristic. Data users should not compare 2009 ACS or 2007-2009 ACS estimates of totals of characteristics for subcounty areas with those of earlier years. In contrast, the 2009 ACS or 2007-2009 ACS distributions of characteristics are generally safe to compare with distributions from previous years, though there are two important exceptions-- estimates of the vacancy rate and of the percent minority. The interaction of the subcounty controls with later steps in the ACS weighting can disproportionately affect the estimates of these two characteristics.

It is helpful to examine the mechanisms that lead to the changes seen in estimates of the vacancy rate and percent minority introduced by subcounty controls and to illustrate them with examples. The subcounty controls lead to changes in the ACS estimates of the vacancy rate of places and MCDs when the ACS coverage of housing units relative to the PEP differs from the ACS coverage of total population relative to the PEP. These

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[1] Subcounty areas refer to incorporated places, MCDs, census designated places (CDP), tracts, and any geographic entities contained within a county.

changes are an artifact of the last step of the weighting, the householder equalization[2], which sets the number of occupied housing units equal to the number of householders. When the subcounty controls differentially adjust estimates of the total population and the housing unit count, this difference is reflected in the number of occupied housing units only, changing the proportion of vacant housing units.

Consider the City of Flint, in Genesee County, Michigan. The PEP-based estimate of total housing units in Flint for 2005-2007 (an average over the 2005, 2006, and 2007 PEP estimates) was 55,368, while the ACS 3-year estimate was 55,750, a relatively small difference of 0.7 percent. In contrast, the PEP-based 2005-2007 population estimate for Flint was 116,025, compared with 108,304 for the 2005-2007 ACS 3-year estimate, a larger difference of 7.1 percent. Thus the adjustment to the population is larger than the adjustment to the housing unit total. Now consider the householder equalization. The 2005-2007 ACS estimate of the number of occupied units would increase from 43,773 to 47,064 if subcounty controls had been implemented. This increase in the estimate of occupied units leads to the decrease in the vacancy rate. Consequently, while the 2005-2007 ACS 3-year estimate of the vacancy rate was 21.5 percent, with the application of subcounty controls the vacancy rate would decrease to 20.1 percent[3].

The changes seen in the estimates of percent minority with subcounty controls are likewise an artifact of how the subcounty controls interact with later stages of weighting. In this case it is related to controlling by six race/ethnicity groups[4] at the county level. If a place or MCD differs in race/ethnicity composition from the rest of the county, and the total population of that place is adjusted by the subcounty controls, then the race/ethnicity composition of both the place and the rest of the county must change in order to maintain the county race/ethnicity totals. The most notable examples of this phenomenon are in counties where the total population of a central city with a high proportion of blacks or Hispanics is adjusted upwards while the rest of the county with a lower proportion of blacks or Hispanics is adjusted downwards. In these situations the percent black or Hispanic decreases in both the urban place and the rest of the county, though it remains unchanged at the county level.

A good example of this effect is seen in application of subcounty controls to the 2005-2007 ACS 3-year estimates of Cuyahoga County, OH. Cuyahoga has a large central city, Cleveland, which is predominantly not non-Hispanic white alone, which we shall refer to as minority (64.2 percent), while the rest of the county is predominantly non-Hispanic white alone, which we shall refer to as non-minority (76.3 percent)[3].

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[2] For information on householder equalization, see "American Community Survey Design and Methodology", Issued April 2009, at the link
http://www.census.gov/acs/www/methodology/methodology_main/.

[3] This example comes from Dixon, (2010). The research paper is currently unfinished, but a link to it will be provided as soon as it is completed.

[4] These six groups are: non-Hispanic white, non-Hispanic black, non-Hispanic American Indian and Alaska Native, non-Hispanic Asian, non-Hispanic Native Hawaiian or Pacific Islander, and Hispanic.

Table 1 shows the distributions of minority and non-minority in the 2005-2007 ACS estimates and what they would be if we had applied the subcounty controls. Note in Table 1 the following points.

- The subcounty controls would increase the total population of the City of Cleveland from 405,002 to 443,701.
- The estimate of total minority would increase in Cleveland from 259,859 to 273,007; but the percent minority in Cleveland would decrease from 64.2 percent to 61.5 percent.
- The estimate of total minority would decrease in the rest of Cuyahoga County, from 214,731 to 201,640, as would the estimate of total non-minorities, from 691,172 to 665,564. The percent minority would decrease from 23.7 to 23.3 percent.
- The estimate of total minority in Cuyahoga County, 474,590, and the percent non-minorities, 36.2 percent, would be (nearly) unchanged[5] by the subcounty controls.

The subcounty controls adjust the total population of Cleveland upwards, while the total number of minorities for Cuyahoga County remains constant. Thus the effect of the controls is to decrease the relative proportion of minority in Cleveland. Since the ACS also controls by age and sex at the county level, the estimates of percentages of age and sex groups of subcounty areas might also be expected to change because of the implementation of subcounty controls. However, these distributions do not differ between geographies as dramatically as the distribution of race/ethnicity do. Thus in practice one sees little effect on the estimates of proportions of age and sex groups because of subcounty controls (though again, the subcounty controls will noticeably affect estimates of counts of persons by age and sex).

Table 1: With and Without Subcounty Controls

	Total Population	Total Minority	Percent Minority	Non-Minority	Percent Non-Minority
Without Subcounty Controls					
Cuyahoga County	1,310,905	474,586	36.2%	836,319	63.8%
Cleveland	405,014	259,866	64.2%	145,148	35.8%
Rest of County	905,891	214,720	23.7%	691,171	76.3%
With Subcounty Controls					
Cuyahoga County	1,310,905	474,647	36.2%	836,258	63.8%
Cleveland	443,701	273,007	61.5%	170,694	38.5%
Rest of County	867,204	201,640	23.3%	665,564	76.7%

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[5] The estimates of total minority and of non-Hispanic white alone change because of different collapsing in weighting cells with the subcounty controls and because the weighting uses slightly different definitions of racial groups than those published.