An Alternative to the Census Bureau's Distributive Housing Unit Method for Estimating Population Size for Sub-County Areas.

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The Population Division of the U.S. Census Bureau produces annual population estimates for sub-county areas using the distributive housing unit method. This method distributes independently derived county level household population estimates to sub-county areas based on estimates of housing units (HU), persons per household (PPH) and occupancy rates (OCCR). The number of housing units is estimated based on data from other Census Bureau divisions regarding building permits, demolitions and mobile home shipments. However in the absence of a source of updates regarding PPH and OCCR the Census Bureau is forced to hold these rates constant from Census 2000. The differences then between the sum of the sub-county areas and the county are proportionally adjusted to bring the sub-county areas into agreement with the county estimates. Implicit in this procedure is that change in all of the sub-county areas is the same. This introduces the possibility of serious error because changing PPH and OCCR have the potential to alter the population distribution within a county. In sum when all sub-areas within a county are not changing to the same degree or direction the variability of error for the estimates increase substantially.

In this paper we develop and test an alternative approach that illustrates how sample survey data can be used to update estimates of PPH for the preparation of small area population estimates employing the housing unit method. We use the Census Block Group as the geographic area for which updated estimates of PPH are prepared. Block Groups are clustered not solely on the basis of PPH but rather the distributions of household characteristics that underlie PPH. Changes in PPH are a function of changes in household composition and the hypothesis is that spatially dispersed Block Groups with similar household compositional characteristics will be more likely to change to the same degree and direction than Block Groups in the same county. Block Groups can be classified into approximately 20 to 30 types. That by identifying households in sample surveys—such as the Current Population, American Housing, or American Community Surveys—by Block Group and the type of Block Group to which they belong, the resulting sample size by Block Group Type will yield estimates of PPH with manageable errors of estimate. The changes in household composition and PPH by Block Group Type will then be used to update the estimates of PPH for individual Block Groups. This approach results in a reduction in the variability of error for the estimates as compared with the currently used distributive method.