HUD METHODOLOGY FOR ESTIMATING FY 2004 CBSA-BASED MEDIAN FAMILY INCOMES

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For informational purposes, the Department of Housing and Urban Development (HUD) has prepared revised FY 2004 estimates of median family income (MFI) using the new metropolitan statistical area definitions first released by the Office of Management and Budget (OMB) in June 2003. These estimates are not intended for use in HUD programs, but show the basis for estimating FY 2005 HUD median family income and income limit figures unless further metropolitan area definitional changes are made prior to publishing the FY 2005 median family income estimates.

The new metropolitan area definitions are normally referred to as Core-Based Statistical Area (CBSA) definitions. Both the new CBSA-based FY 2004 estimates of median family income and those published on January 28th, 2004, using older OMB Metropolitan Statistical Area (MSA) definitions are based on 2000 Census data. The 2000-to-current updating process used for these two sets of estimates, however, differs. The CBSA estimates are more reliant on Census American Community Survey (ACS) data, as HUD plans to continue doing in the future. Separate median family income estimates (MFIs) are calculated for all metropolitan areas, metropolitan area divisions[1], micropolitan areas, and nonmetropolitan counties that are not part of a micropolitan area[2].

Prior to the CBSA-based income estimates, median family income estimates were based on decennial census median family income estimates updated with a combination of regional Census Current Population Survey (CPS) median family income estimates and area-specific Bureau of Labor Statistics (BLS) earnings and wage data. The income adjustment factors used to update the 2000 Census-based estimates of CBSA Median Family incomes (MFIs) do not use Bureau of Labor Statistics local wage based data to modify regional median family income trend estimates from ACS surveys. This change is being made for two reasons. One is that the ACS data are starting to provide direct, more localized estimates of median family income levels, eliminating the need for surrogate measures. The other is that analysis of income changes during the 1990's shows that use the change in average wage as a surrogate indicator of changes in median family income proved to be less reliable than it had been in the previous decade.

For the FY 2004 estimates, the ACS is used to measure income changes at the state level. The 2004 ACS data, which will be released in late 2005, will permit estimation of local estimates for most metropolitan areas. In subsequent years, estimates for all metropolitan areas and most counties will be available.

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1 Metropolitan divisions are major subparts of large metropolitan areas. They are conceptually equivalent to the OMB Primary Metropolitan Statistical Area (PMSA) definitions previously in use.

2 Micropolitan areas consist of one or more nonmetropolitan counties that have an urban cluster with a population of at least 10,000 but less than 50,000.

The ACS, Census, and CPS surveys have different samples, cover different time periods, use somewhat different sampling methodologies, and produce estimates that are not fully comparable.[3] The year-to-year change for these data sets (e.g., the national CPS MFI from one year to the next) should, however, be statistically reliable over time, as is reflected by comparisons of past decennial census and CPS income changes. The CPS has the smallest samples of these three data sources, and cannot be reliably used to produce MFI estimates below the Census Division (multi-state) level. The decennial Census has the largest samples, but is only available every 10 years and has some non-response bias even with the high survey cooperation rates the Census Bureau normally attains. The ACS falls between the other two surveys in terms of size, but it may produce estimates that are as or more reliable than the Census at the metropolitan area and state levels of aggregation.

Estimates of income need to be associated with a point in time. This poses the need to attribute an "as of" date to survey estimates when such dates are not explicitly defined. The 2000 Census income data, for instance, are based on questions regarding total income for 1999. For most households, income for a year is based on an income stream with at least some changes during the year. For purposes of estimation, HUD therefore assumes that the 2000 Census income estimates have an "as of" date of mid-1999. For the same reason, it assumes that March CPS income estimates, which are based on responses to questions about the previous year's total income, also relate to the middle of the previous calendar year.

ACS estimates present a more complex timing issue, because they are based on samples drawn throughout a year that collect information on income obtained during the previous 12 months. Adjustments are made to incomes collected prior to December to make them approximate a December reporting period. This is done by adding the CPI change between the month of the survey and December of that year to the survey income data. Income figures collected in January are inflated by the CPI change from January to December of that year, the February income figures are inflated from February to December, etc. If median income changes during the year (which are not known when the estimates are done) exactly parallel the CPI changes, an ACS-based median family income estimate will approximate a median family income estimate based on surveying all respondents in December. That, in turn, means that the ACS income data have an approximate "as of" date of the middle of the year if median incomes changed at the same pace during the course of a year.

The importance of the "as of" assumptions becomes less important over time. After the initial income estimates are produced, annual updates are estimated using the same data sources. Any estimation error or bias associated with the "as of" assumptions effects only the first year a data series starts to be used. The impact of this type of bias cannot be measured but, since it is a fixed amount and incomes increase over time, the effect should be modest. The potential for bias is further mitigated by the fact that the CPI and CPS changes for the period in question were very similar at the national level.

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[3] The 2000 Census MFI was $50,046; the March 2000 CPS produced a MFI estimate of $48,952; and the first ACS survey, which collected data during the course of 2000 and effectively represented an estimate one year later than those of the other surveys, had a MFI estimate of $49,628.

The step-by-step normal procedures used to develop FY 2003 estimates are as follows:

1. The 2000 Census was used to estimate what is treated as a mid-1999 median family income point-in-time estimate.

2. The March 2000 and 2001 CPS surveys were used to measure the change in the national median family income level from mid-1999 to mid-2000, which was 3.57 percent. (Divisional CPS estimates were not used, because it is questionable whether they improve estimation accuracy if used only for one year.)

3. The 2000 and 2002 American Community Surveys were used to estimate the change in State MFIs for the mid-2000 to mid-2002 period. The ACS income change factors for each State for the 2000-2002 period were calculated as follows:

   $$\frac{\text{ACS MFI (2002)}}{\text{ACS MFI (2000)}} = \text{2-year increase factor for ACS Median Family Income}$$

4. The product of the 1999-2000 CPS National MFI change and the 2000-2002 ACS State MFI change are converted to a mid-1999 to April 1, 2004 change factor by applying an annual trending figure of 3.5 percent[4] for 21 months (i.e., mid-2002 to the mid-point of Fiscal Year 2004 [April 1, 2004]). This 6.125 percent trending is needed because of lags in ACS and P-60 Series data availability.

   (Step 3 adj. factor) * 1.06125 = mid-1999 to April 1, 2004 adjustment factor

5. Calculate median family incomes for FY 2004 by multiplying the step 1 2000 Census-based estimate of median family income by the income adjustment factor derived in Step 4:

   2000 Census Median Family Income * Step 4 factor = FY 2004 MFI estimate

American Housing Survey (AHS) data are reviewed on an ongoing basis for information about area incomes. There have been no AHS-based changes in median family income estimates this year.

[4] The 3.5 percent trending factor is based on national income change patterns over the 1990-2000 period; it is the 10^{th} root of the change in Census 1990 median family income to 2000 Census median family income.