Methodology for the Subcounty Total Resident Population Estimates (Vintage 2014): April 1, 2010 to July 1, 2014

BACKGROUND

The U.S. Census Bureau produces estimates of total resident population for all areas of general-purpose government on an annual basis. The subcounty areas consist of both incorporated places, such as cities, boroughs, and villages; and minor civil divisions such as towns and townships. We use updated housing unit estimates to distribute county household population to subcounty areas based on housing unit change. We produce county-level population estimates with an administrative record based component of change method, which updates the latest census population using data on births, deaths, and domestic and international migration. A more detailed description of the state and county population and housing unit estimates methods can be found at: http://www.census.gov/popest/methodology/index.html.

METHOD

The 2010 Census base counts of housing units and associated population of each governmental unit are geographically updated each year to reflect legal boundary changes reported in the Boundary and Annexation Survey (BAS), from other geographic program revisions, and from 2010 Census corrections.

The Census Bureau develops the subcounty population estimates for the household and group quarters population separately, then combines them to calculate the resident population. We estimate the household population by applying the "Distributive Housing Unit Method" to the county-level household population to distribute it to each subcounty area.

Step 1 - Producing an Uncontrolled Subcounty Household Population Estimate

The uncontrolled subcounty household population estimate begins with the July 1, 2014 housing unit estimate. We multiply this estimate by the 2010 Census occupancy rate and then by the 2010 Census persons per household to produce the uncontrolled population estimate.[1]

Step 2 - Producing a Controlled Subcounty Household Population Estimate

We then control the uncontrolled subcounty estimates so that they sum to the published county totals. To do this, we divide the 2014 county-level household population estimate by the sum of the uncontrolled subcounty household population estimates within the county. We multiply this adjustment or "rake factor" by the uncontrolled subcounty household population estimate calculated in Step 1. This calculation produces the controlled subcounty household population estimate. We round this controlled estimate using a variation of the greatest mantissa methodology.[2]

Step 3 - Group Quarters Population Estimate

The group quarters component of the total estimate is a combination of persons residing in

institutional facilities and non-institutional facilities. The institutional facilities include four   types:

- Juvenile facilities
- Nursing homes
- Correctional facilities
- Other institutional group quarters.

The non-institutional facilities include three types:

- Military barracks
- College dormitories
- Other non-institutional group quarters.

We use group quarters population data from two sources to estimate subcounty populations:

- 2010 Census counts of the group quarters population by facility type for each subcounty area, including any post 2010 additions to the group quarters population, and
- A time series of individual group quarters records from the Group Quarters Report (GQR) that the Population Estimates Program prepares based upon annual updates from State representatives of the Federal-State Cooperative for Population Estimates (FSCPE).

We use these two sets of group quarters population data to derive a time series of group quarters population through the following process:

Part 1 – We aggregate the group quarters population from the 2010 Census to the subcounty level by the seven facility types.

Part 2 – Then, we sum the facility-level group quarters populations from the GQR to the subcounty level by the seven facility types for each estimate date in the time series.

Part 3 – Then, we calculate the year-to-year change indicated by the aggregated GQR time series of population and add this time series of change to the aggregated 2010 Census data. This creates a census-based time series of group quarters population at the subcounty level for each of the seven facility types.

Step 4 - Final Subcounty Population Estimate

To produce the final subcounty population estimate, we add the controlled household population estimate to the total group quarters population estimate.

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[1] Note: We apply national-level persons per household and occupancy rates to new housing estimates in areas with zero values for population or housing as of the 2010 Census.

[2] Greatest mantissa rounding subtracts the integer values from the controlled total, then adds ones, one row at a time (i.e., smallest geographic parts within county) until the rounded total reaches the controlled total.