

Special Processing Procedures for the Areas Affected by Hurricanes Katrina and Rita: (Vintage 2008): April 1, 2000 to July 1, 2008

The Federal Emergency Management Agency (FEMA) declared 117 counties to be disaster areas in Alabama, Louisiana, Mississippi, and Texas as a result of hurricanes Katrina and Rita in August and September 2005, respectively. In an effort to produce the most accurate and effective estimates possible, the U.S. Census Bureau retained several adjustments developed for the Vintage 2006 and Vintage 2007 estimates in the Vintage 2008 procedures. The adjustments for processing input data accommodate geographic shifts of the population resulting from these events in 2005. These procedures are outlined below.

Internal Migration

Under Age 65 Population

Internal migration of the under age 65 population is measured using address data from Federal income tax returns. However, Federal personal income tax return rates for residents of the disaster areas fell significantly in 2006 as a result of the dislocations and automatic IRS-approved filing extensions. With reductions in filing, we expected the year-to-year match rates of IRS data to erode, thereby reducing the accuracy of estimates of internal migration for the population under age 65. After detailed analysis of the tax filer data, the Census Bureau determined that a supplementation by alternative administrative data was necessary for 62 parishes and counties.¹ Applying supplemental data boosted coverage rates and, therefore, enhanced the accuracy of migration estimates compared to those derived from IRS data alone. The Census Bureau supplemented the IRS data with data from the U.S. Postal Services' National Change of Address (NCOA) file, using records processed through the end of June 2006. This allowed us to measure as much of the movement of the population as possible up to the July 1, 2006 estimate date.

In preparing the migration data to support the July 1, 2007 estimates, we retained the supplemental NCOA addresses that had been combined with IRS addresses as first year addresses, in order to measure migration flows from 2006 to 2007; all addresses in the second year of the matched record sets were IRS addresses. This essentially meant that we were returning the measurement of migration flows for the under age 65 population in the second year to be based upon IRS data alone.

Aged 65 and Older Population

Internal migration of the population aged 65 and older is measured using aggregate Medicare data provided by the Centers for Medicare and Medicaid Services (CMS). The data we receive from CMS every year contain a one-year lag; therefore the data used in the 2006 estimates actually represent Medicare enrollment as of July 1, 2005. We calculate the numeric change between the previous two years of CMS data (July 1, 2004 and July 1, 2005) and add this change to July 1, 2005 CMS data to estimate the enrollment as of July 1, 2006.

However, this standard procedure did not reflect the inordinate impact of the hurricanes. Therefore, we developed a process to estimate out-migration of this age group for the same 62 parishes and counties identified above (see endnote 1). We revised the Medicare enrollment figures to reflect out-migrant data measured from special tabulations of exemptions for the population aged 65 and older from the IRS data enhanced by the NCOA address information. The result was a redistribution of out-migrant enrollees from these parishes and counties to other counties in the nation in accordance with the locations indicated by the IRS/NCOA data. The resulting data were then used as inputs into the estimates process.

We repeated the new process of estimating the latest year's Medicare enrollment for the July 1, 2007 estimates except that we also allowed for the migration of people back into the 62 counties and parishes that had been specially processed for the 2006 estimates. The Medicare enrollment figures were modified to reflect 2006-2007 in-migrant and out-migrant data as measured from special tabulations of exemptions for the population aged 65 and older from the IRS data enhanced by the NCOA address information. The adjusted aged 65 and older migration was then applied to the 2006 estimates to produce a 2007 estimate of the aged 65 and older Medicare enrollment, which were then used as inputs into the final estimates process.

Group Quarters

Our standard method for producing estimates of the group quarters (GQ) population relies heavily on group quarters facility-level population provided to us by state members of the Federal-State Cooperative Program for Population Estimates (FSCPE). The data are often lagged by a year due to the timing of the data collection. To deal with unknown populations for a facility, we assume that the population remained unchanged from the latest available data. For the places affected by the hurricanes, this assumption is no longer acceptable. When the FSCPE members were able to collect and submit current GQ populations for facilities in the damaged area, we utilized their data. For facilities with no updated information in the affected areas, we adjusted the GQ population based on housing unit damage and IRS tax returns.

We assumed that most of the damaged GQ facilities would be located in the counties/parishes with the most severe housing unit damage. Therefore, we first selected those counties/parishes with major or severe damage to 10 percent or more of their housing units due to these hurricanes (as defined by FEMA).² Then we calculated a county GQ population adjustment factor for each selected county/parish by dividing the number of 2006 tax returns filed in each county/parish by the 2005 tax returns. We applied this factor to the July 1, 2005 GQ estimate for each subcounty area and GQ type within the county/parish, produced by the standard method, to calculate an adjusted July 1, 2006 GQ population estimate.

Housing Units

Vintage 2006 estimates.

Counties. We identified 42 counties and parishes that sustained major or severe damage to more than 2 percent of their existing housing units according to FEMA.³ The components of housing change available to us for the estimates process did not reflect the housing situation subsequent

to the hurricanes. Our best alternative was to use the change in the 2005-2006 household populations to estimate the 2006 habitable housing units. We estimated 2006 county and parish housing units in the affected areas by first calculating the ratio of the 2006 household population to the 2005 household population (vintage 2006 county population estimates) for each county and parish. We applied the household population ratio to the 2005 county housing unit estimate to produce the 2006 housing unit estimates.

Subcounty Areas. Reliable information was unavailable on the differential impact of the hurricanes on cities, towns, and unincorporated balances within the 37 counties and parishes with subcounty areas.⁴ Specifically, information on the number and distribution of demolished or uninhabitable units was unavailable, as were alternative sources of information to estimate either the demolished units or the remaining habitable units. Therefore, the 2005-2006 rate of net housing change for each affected county or parish (using the 2006 estimates calculated as described above) was assumed to be constant for their constituent subcounty areas. The housing unit estimates for the cities and towns in the 37 parishes and counties were then produced, as follows:

- We calculated the ratio of the county- and parish-level 2006 housing unit estimates (revised for the hurricane impacts) to the 2005 county and parish housing unit estimates.
- The ratio for each county or parish was applied to their constituent subcounty areas' 2005 housing unit estimates to produce the 2006 subcounty housing unit estimates.

Vintage 2007 estimates.

Counties. We used the 2006 revised population estimates (from the vintage 2007 estimates) to revise the 2006 housing unit estimates. We first calculated the ratio of the revised 2006 county household population to the 2005 county household population. We applied that ratio, by county and parish, to the 2005 county housing unit estimate to produce the revised 2006 housing unit estimates.

The 2007 housing estimates for 40 of the original 42 counties and parishes, were produced by the standard housing methodology, as these data tracked closely with the 2006-2007 household population change. We left the 2007 housing unit estimates unchanged for these counties and parishes.

However, we still identified two parishes (Orleans and St. Bernard) where the household population growth from 2006 to 2007 exceeded the preliminary estimated housing unit growth by more than five percentage points. The wide variance noted by review of the available data suggested that the household population growth in these two parishes was more indicative of housing changes than were the components of housing change. Specifically, the building permit data used to calculate the construction of new residential units were implausible measures for the conversion of units from uninhabitable to habitable status as well as tracing new construction. Therefore, we derived the 2007 housing unit estimates for Orleans and St. Bernard by computing

and applying the ratio of their 2007 to 2005 estimated household populations (from the vintage 2007 estimates) to their 2005 housing estimates.

Subcounty Areas. For the 37 counties and parishes, we produced subcounty housing estimates for their cities and towns, as follows:

- We used the revised county- and parish-level 2005 and 2006 housing unit estimates (from vintage 2007) to recalculate the 2006 subcounty housing unit estimates, using the same procedure described in the subcounty section above.
- We then added the 2006-2007 subcounty components of housing change to these 2006 subcounty estimates to produce the 2007 housing unit estimates.

Vintage 2008 estimates.

In vintage 2008 we returned to standard procedures for estimating these areas with the exception of four incorporated places in Mississippi. In vintage 2008 we obtained information indicative on the current housing situation and made appropriate adjustments for these areas.

- *Subcounty Areas.* We obtained utility connection data for Waveland and Bay St. Louis in Hancock County, Pass Christian and Long Beach in Harrison County. For Bay St. Louis we were able to obtain data for 2006 to 2008, while for the remaining three places we were only able to obtain data for 2008. We then used the utility connection data to estimate the number of housing units for these places from 2006 through 2008.

To estimate the number of housing units in 2008 for these four cities, we divided the number of active utility connections for 2008 by the Census 2000 occupancy rate. To calculate the housing unit estimates for 2006 and 2007 (for those places where we only had one year of utility connection data), we subtracted the number of building permits (multiplied by a completion factor of .98), and mobile homes, and added the estimate of housing unit loss used to calculate the original 2008 estimate. For Bay St. Louis, where we had utility connection data for three years, we applied the same method that we used to calculate the 2008 estimate of housing units.

Bay St. Louis also had a large annexation in 2006, which appeared in our estimates base for the first time in the vintage 2008 estimates. Bay St. Louis was able to give us a count of the units in the annexed area for 2006-2008, which we added to the utility connection data. Bay St. Louis did not have utility connection data for the units in the annexed area.

Subcounty Population

The vintage 2006 and vintage 2007 housing unit estimates resulting from the special calculation procedures were used in calculating the corresponding vintage 2006 and vintage 2007 subcounty population estimates within the 37 counties and parishes with subcounty areas. The procedure used for calculating the population estimates based on intra-county housing unit distributions remained consistent across vintages. No additional data documenting the redistribution of

population due to the hurricanes at the subcounty level for the 2006 and 2007 population estimates were used.

The Census Bureau did not release vintage 2006 or vintage 2007 population estimates for four cities in coastal Mississippi that were in the direct path of hurricane Katrina and had experienced substantial damage (Waveland and Bay St. Louis in Hancock County, Pass Christian and Long Beach in Harrison County). While we determined that these places sustained population loss at a greater rate than the loss for Hancock or Harrison counties as a whole, we were unable to quantify this loss with reliable data.

For the 2008 estimates we used the housing unit estimates based on utility connection data to estimate the population for these places.

¹ These counties and parishes are: in Alabama: Baldwin, Marengo, Mobile; in Louisiana: Acadia, Ascension, Assumption, Beauregard, Calcasieu, Cameron, East Baton Rouge, East Feliciana, Iberia, Iberville, Jefferson, Lafayette, Lafourche, Livingston, Orleans, Plaquemines, Sabine, St. Bernard, St. Charles, St. Helena, St. James, St. John the Baptist, St. Tammany, Tangipahoa, Terrebonne, Vermilion, Washington, West Baton Rouge, West Feliciana; in Mississippi: Adams, Copiah, Covington, Forrest, George, Hancock, Harrison, Jackson, Jefferson Davis, Jones, Lamar, Lauderdale, Leake, Madison, Marion, Newton, Pearl River, Perry, Rankin, Smith, Stone, Wayne; in Texas: Galveston, Hardin, Jasper, Jefferson, Newton, Orange, Polk, San Augustine.

² These counties and parishes are: in Louisiana: Cameron, Jefferson, Orleans, Plaquemines, St. Bernard, St. Tammany, Vermilion; in Mississippi: Hancock, Harrison, Jackson, Stone.

³ These counties and parishes are: in Alabama: Mobile; in Louisiana: Acadia, Allen, Beauregard, Calcasieu, Cameron, Iberia, Jefferson, Jefferson Davis, Orleans, Plaquemines, St. Bernard, St. Charles, St. Helena, St. Tammany, Tangipahoa, Terrebonne, Vermilion, Washington; in Mississippi: Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jasper, Jones, Lamar, Lawrence, Marion, Pearl River, Perry, Stone, Walthall, Wayne; in Texas: Hardin, Jasper, Jefferson, Newton, Orange, Tyler.

⁴ Cameron, Plaquemines, St. Bernard and St. Charles Parishes contain no subcounty areas. Orleans Parish and New Orleans city are coextensive.