



Comparison of U.S. Decennial Census, U.S. Census Bureau's American Community Survey, and California Department of Finance Estimates

INTRODUCTION

There is an emerging issue for many government agencies, policy makers, grant writers, and other public and private groups: which of the various data sources should be used to represent any given jurisdiction? Should a dataset from seven years ago still be used or should a more recent dataset be used? This issue of *Profiles* will briefly describe three of the most commonly used datasets: the decennial U.S. Census, the American Community Survey and the California State Department of Finance estimates; compare the datasets on the basis of timeliness and accuracy; and examine the geographic differences between the datasets. Though this issue focuses on the single variable of population, differences occur in other variables as well.

DATASETS

U.S. Census Bureau- Decennial Census

A *census* is an official enumeration of a population. A constitutional mandate dating back to 1790 resulted in the United States census, counting each person once every ten years. The decennial census has two formats: a short survey and a long survey. The short form survey asks seven questions and results in a full census count of every person living in the United States, U.S. territories, and military personnel abroad. One in six households receives the long form survey which contains the short form's seven questions plus additional questions on 34 social and economic subjects.

Providing data down to the block level, the decennial census is the most versatile and comprehensive dataset available for the entire United States (Table 1). No other survey has the sample size, scope or breadth of material that the decennial census possesses and it is often used by other sources as a benchmark. The most common criticism is that it is released after one to three years after the survey, resulting in data that is not current.

U.S. Census Bureau American Community Survey (ACS)

Due to the lack of timeliness of the decennial census, efforts were made to create data for the U.S. that would be released on a more frequent schedule than once every ten years. The solution was the American Community Survey (ACS). The U.S. Census Bureau is slowly shifting to a rolling survey which has a more timely distribution with annual data published for various jurisdictions. It will replace the decennial census' long form survey in 2010. The Census Bureau piloted the ACS with 1,200 counties in 2000 and it became fully operational in 2005. The ACS currently has a monthly sample of 250,000 addresses and covers every county in the U.S. Data from the 12 monthly samples is averaged to derive annual estimates (the reference period is the average for the year), compared to the single, point-in-time snapshot in the decennial census.

Table 1
Dataset Method Types and Geographic Availability

Data Source	Type of Data	Lowest Geographic Level
Decennial Census	-Census	-Census Block
American Community Survey (ACS)	-Estimate	-Jurisdictions 65,000+ (currently) -Block Group (beginning 2010)
California Department of Finance (DOF)	-Estimate	-Jurisdiction

The first annual ACS data for all geographic areas with populations larger than 65,000 was released in 2007 for year 2006. Three-year averages for geographic areas with populations between 20,000 and 65,000 will begin in 2008 and five-year averages for geographic areas with populations smaller than 20,000, including census tracts and block groups, will begin in 2010. Five-year averages for 2008–12 will replace the 2010 Decennial Census long form social and economic data for small geographic areas; these will be published in 2013 and will incorporate population and housing data from the 2010 Decennial Census short form.

Issues with the ACS survey data have arisen primarily due to sampling size. The sample consists of one in 480 households versus the decennial census' one in six. The resulting data for some jurisdictions conflicts with the 2000 Census counts and State estimates, with some cities having lower counts in recent years than in 2000. In addition, the larger sample size does not accurately reflect areas with diverse populations and housing types.

California State Department of Finance (DOF)

The California State Department of Finance (DOF) provides annual estimates of population and housing units throughout California at the city and county levels. Each estimate uses models that are benchmarked to the decennial census. DOF uses different estimation models for each of the three levels of data it provides: state, county, and city.

First, the state population is estimated by using the California Department of Motor Vehicles' Driver License Address Change (DLAC) method. Second, it uses three population proportions to determine county level population, the DLAC method, Ratio-correlation Method, and the Tax Return Method. The final distribution of the county populations is then compared and controlled to the estimated state totals. Lastly, the city estimates are produced using the Housing Unit method. This method uses total and occupied housing units, household size, household population, and group quarters population. Housing units are then estimated by adding new construction and annexations, and subtracting demolitions and conversions from the prior year's estimate.

The main criticism of the DOF data is the lack of sub-city level data. And, unlike the U.S. Census Bureau, DOF creates estimates of population and housing units;

they are not derived from a population or housing unit count as is in the case of the decennial census or ACS.

WHAT'S THE DIFFERENCE?

We used the single indicator of population to demonstrate the numerical differences and similarities among the datasets, though differences amongst the datasets occur in most variables. An example is the key variable of housing units which shows a greater disparity than the population differences discussed below. While it is necessary to examine county differences, it is crucial to also look at city level differences. Each city's share of the Orange County total population was calculated and then examined for notable differences (Table 2). Due to the ACS survey threshold of 65,000 for the 2006 estimate, there are only 14 of 34 cities plus Orange County as a whole represented in the 2006 ACS dataset.

The Census 2000 population count for Orange County was 2,846,289. The ACS 2006 annual estimate reported a population total of 3,002,048 and DOF reported 3,071,924. The population growth between 2000 and 2006 using the ACS was 155,759 (5.5%); using DOF, it was 225,635 (7.9%). There is a numerical difference of 69,876 between the 2006 DOF and ACS estimates, roughly the population of the City of Tustin. Though the numerical difference is dramatic, the percent difference compared to the 2000 county population is small (2.5%).

To further demonstrate the differences, a similar comparison was made for the three most populous Orange County jurisdictions: Santa Ana, Anaheim, and Huntington Beach. DOF and ACS show similar 2006 counts for Santa Ana, differing by only 196 people (0.06%). Both datasets also show similar trends and shares of the county population, down from 11.9% in 2000 to about 11.6% in 2006. Anaheim's population estimates for 2006 differ by 1,424 people but both report similar shares of the county population (ACS: 11.5%, DOF: 11.2%). Huntington Beach has the largest disparity in 2006 populations. DOF estimated 13,939 more people for 2006 than ACS, but again, both show similar shares of Orange County population, (ACS: 6.2%; DOF 6.6%).

Additional noteworthy items for the 14 cities available for the 2006 comparison are found in Table 2. ACS reports a decrease in population from 2000 to 2006 in three of the 14 cities, Tustin (-5,748), Costa Mesa (-3,555) and Huntington Beach (-2,187), while DOF

Table 2
Number and Share of Orange County Population
Census 2000, 2006 American Community Survey, and 2006 California State Department of Finance Estimates

Place	Census 2000 (4/1/2000)		ACS 2006 (Annual)		CA Dept. of Finance 2006 (1/1/2006)		Numerical Change		Numerical Difference ACS 2006 and DOF 2006
	Number	% Share of OC	Number	% Share of OC	Number	% Share of OC	Census 2000 to ACS 2006	Census 2000 to DOF 2006	
Aliso Viejo CDP	40,166	1.4	-	-	44,867	1.5	-	4,701	-
Anaheim	328,014	11.5	344,141	11.5	342,717	11.2	16,127	14,703	1,424
Brea	35,410	1.2	-	-	39,628	1.3	-	4,218	-
Buena Park	78,282	2.8	80,238	2.7	81,488	2.7	1,956	3,206	-1,250
Costa Mesa	108,724	3.8	105,169	3.5	113,323	3.7	-3,555	4,599	-8,154
Cypress	46,229	1.6	-	-	48,938	1.6	-	2,709	-
Dana Point	35,110	1.2	-	-	36,734	1.2	-	1,624	-
Fountain Valley	54,978	1.9	-	-	57,505	1.9	-	2,527	-
Fullerton	126,003	4.4	134,851	4.5	136,659	4.4	8,848	10,656	-1,808
Garden Grove	165,196	5.8	165,450	5.5	172,056	5.6	254	6,860	-6,606
Huntington Beach	189,594	6.7	187,407	6.2	201,346	6.6	-2,187	11,752	-13,939
Irvine	143,072	5.0	182,855	6.1	194,126	6.3	39,783	51,054	-11,271
Laguna Beach	23,727	0.8	-	-	25,006	0.8	-	1,279	-
Laguna Hills	31,178	1.1	-	-	33,281	1.1	-	2,103	-
Laguna Niguel	61,891	2.2	-	-	66,291	2.2	-	4,400	-
Laguna Woods	16,507	0.6	-	-	18,366	0.6	-	1,859	-
La Habra	58,974	2.1	-	-	61,894	2.0	-	2,920	-
Lake Forest	58,707	2.1	-	-	77,991	2.5	-	19,284	-
La Palma	15,408	0.5	-	-	16,109	0.5	-	701	-
Los Alamitos	11,536	0.4	-	-	12,026	0.4	-	490	-
Mission Viejo	93,102	3.3	97,240	3.2	98,165	3.2	4,138	5,063	-925
Newport Beach	70,032	2.5	86,820	2.9	83,503	2.7	16,788	13,471	3,317
Orange	128,821	4.5	133,755	4.5	138,027	4.5	4,934	9,206	-4,272
Placentia	46,488	1.6	-	-	51,324	1.7	-	4,836	-
Rancho Santa Margarita	47,214	1.7	-	-	49,217	1.6	-	2,003	-
San Clemente	49,936	1.8	-	-	66,392	2.2	-	16,456	-
San Juan Capistrano	33,826	1.2	-	-	36,134	1.2	-	2,308	-
Santa Ana	337,977	11.9	351,894	11.7	352,090	11.5	13,917	14,113	-196
Seal Beach	24,157	0.8	-	-	25,513	0.8	-	1,356	-
Stanton	37,403	1.3	-	-	38,828	1.3	-	1,425	-
Tustin	67,504	2.4	61,756	2.1	69,586	2.3	-5,748	2,082	-7,830
Villa Park	5,999	0.2	-	-	6,228	0.2	-	229	-
Westminster	88,207	3.1	95,896	3.2	92,566	3.0	7,689	4,359	3,330
Yorba Linda	58,918	2.1	64,226	2.1	66,911	2.2	5,308	7,993	-2,685
Unincorporated	127,999	4.5	-	-	117,089	3.8	-	-10,910	-
Orange County	2,846,289	100.0	3,002,048		3,071,924	100.0	155,759	225,635	-69,876

Sources: U.S. Census Bureau, 2000, Summary File 3; American Community Survey 2006; CA Department of Finance, 2006 E-5a file.
Blue highlight represents data mentioned in text.
- Data not available.

Table 3
Strengths and Weaknesses of Decennial Census, American Community Survey, and California State Department of Finance Estimates

Data Source	Strength	Weakness
Decennial Census	-Counts everyone -Historical comparisons -Many variables -Variety of geographic levels	-Infrequent: every 10 years -Possible under-reporting
American Community Survey (ACS)	-Frequency: annual data -Many variables -Future: variety of geographic levels	-No historical comparisons -Sampling size, error -Currently few low level geographies available
California Department of Finance (DOF)	-Frequency: annual data -Historical comparisons	-Few variables -Estimate, error -No sub-jurisdiction data

estimated increases for all jurisdictions. Costa Mesa (8,154), Huntington Beach (13,939) and Irvine (11,271) all show differences between the two sources of more than 8,000 people for the 2006 estimates. The ACS reported larger increases than DOF in population growth from 2000-2006 for three cities (Anaheim, Newport Beach, and Westminster); DOF reported larger growth in the other eleven cities.

Though population counts differ by varying amounts at the city and county levels, the city shares of the Orange County population are similar in both 2006 datasets. Differences when comparing to the 2000 shares are due to large population increases resulting from annexations, except for the instances of Costa Mesa, Huntington Beach, and Tustin where the ACS reported unexplained and unlikely population losses.

CONCLUSION

The objective of this brief analysis was to examine differences between three commonly used, readily available and respected datasets and sources. Population data compared at the county and local level show distinct differences. Each source and dataset have their merits

and shortcomings with no clear standout (Table 3). One must evaluate needs and intended uses when reporting data and select which dataset is most appropriate for his or her purpose. For example, if reporting for a state program, the State DOF estimates may be the most appropriate source. One may use the census or ACS if a report focuses on federal issues. Another option is to report numbers from all three data sources.

While the Decennial Census and DOF have long histories, the ACS is in its infancy and has yet to provide the full extent of its future value. Further comparison is required when data is available for all Orange County cities. A system of averaging will be used in the future to compute smaller city populations, but ACS does not have multi-year data for comparison available at this time.

Please visit the following websites for more information on these datasets:

*<http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPers/Estimates/E5/E5-06/E-5text2.php>

*http://factfinder.census.gov/servlet/DatasetMainPageServlet?_lang=en

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