INDICATOR INSIGHT

DEMOGRAPHICS ◂•▸ AN EXPERT'S INSIGHT ON THE ISSUE IN ARIZONA

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"Demographics" is defined as the statistical data of a human population. Though sometimes interpreted narrowly to focus on "vital" statistics such as births and deaths, demographics usually is construed to include a broad range of indicators. The U.S. Census Bureau, for example, divided its "demographic profiles" from the 2000 census into four parts:

- General characteristics, such as sex, age, and race/ethnicity.
- Social characteristics, including educational enrollment and attainment, marital status, disability status, and migration.
- Economic characteristics, including employment status, occupation, industry, income, and poverty.
- Housing characteristics, such as age of housing, housing value, and physical attributes.

The demographic indicators presented on the Arizona Indicators website fall into one of two categories:

- Statistics that are reported as part of the decennial census or American Community Survey (ACS). Since the standard tables from the ACS number in the hundreds, only a fraction of these are included in Arizona Indicators.
- Estimates of the overall population, including the components of population change — births, deaths, and net migration — and symptomatic indicators of the size or change in the population, such as school enrollment.

Population Estimates

The Census Bureau is one of two primary sources of population estimates for Arizona and its counties. These estimates, which are available back to 1969 by county, are updated annually. When a new decennial census count becomes available, the time series for the last decade is revised. As part of the population estimates, the Census Bureau releases the annual change in population by component — births, deaths, net domestic migration, and international immigration. However, the estimates of domestic migration and immigration are not revised when a new decennial census count becomes available. For incorporated cities and towns, annual estimates are provided by the Census Bureau, but these estimates are not revised to match the decennial census count and the components of population change are not estimated.

The other primary source of population estimates for Arizona, its counties, and its incorporated cities and towns is the Arizona Department of Administration's Office of Employment and Population Statistics (OEPS). Because of changes in the methodology used by the OEPS, Arizona Indicators focuses on the annual estimates by county since 2010; state estimates back to 2000 are presented.

Population growth in Arizona, particularly in its major urban areas, has been highly cyclical, with the rate of growth going up and down with the economic cycle. Apart from the cyclicality, percentage growth has steadily slowed as the population base has enlarged, while numeric growth has been erratic. Numeric gains were highest from the early 1990s through the mid-2000s, but the gains in recent years have been the lowest since the 1960s. The ups and downs of the state's population growth and the inverse relationship between numeric and percentage growth are shown in Figure 1.

ARIZONA INDICATORS

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Arizona Indicators is an online information resource and analysis tool that centralizes data about the state and its communities. Arizona Indicators presents interactive visualizations, clear data descriptions, and public opinion data in a broad range of content areas.

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Arizona's population gains during the last economic expansion (2003 through 2007) as estimated by the OEPS are higher than those of the Census Bureau, as seen in Figure 2. However, since 2008, the OEPS has estimated less population growth than the Census Bureau.

As the economy continues to recover, numeric growth will continue the rebound begun in 2012. However, annual gains are unlikely to reach the levels of the mid-1990s and mid-2000s. It may well be that the numeric gains in Arizona that occurred from the early 1990s through mid-2000s will prove to be the all-time peak (the highest 10-year change was nearly 1.5 million).

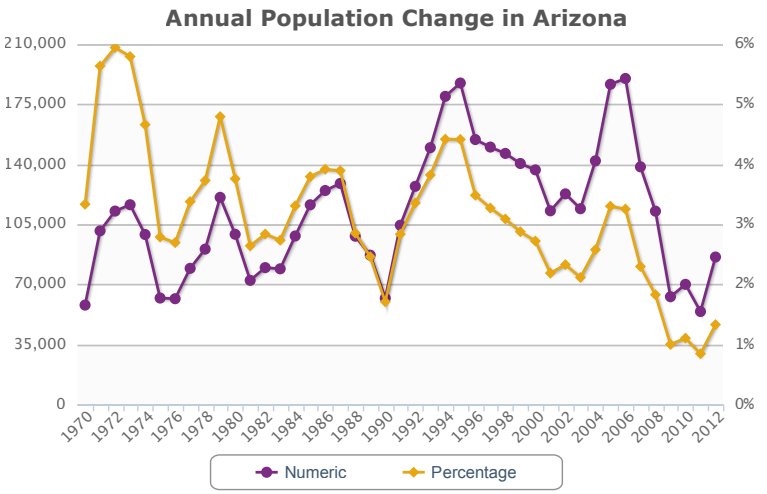

Figure 1 - *Annual Population Change in Arizona.* Source: U.S. Department of Commerce, Census Bureau.

Unlike most geographic areas, where net natural increase (more births than deaths) is the primary source of population gains, the majority of Arizona's population gains have for decades come from net migration (more people moving to the state than moving from the state). The net migration has come both from domestic sources (other states in the United States, particularly midwestern and western states) and from international sources (immigration from other countries, particularly Mexico).

Net natural increase also has contributed to the state's population gains. Births have increased numerically by substantial amounts over time, though the increases have been briefly interrupted by economic recessions, as in recent years. However, crude birth rates – the number of births divided by the entire population – have fallen a little over time; the number of births has increased simply because of the large increases in the number of Arizona women of child- bearing age. The number of deaths also has steadily increased, though crude death rates have dropped a little.

While the birth and death figures are highly reliable, net migration must be estimated. The Census Bureau's estimated annual population growth is split into net natural increase and implied net migration (net domestic migration and immigration combined) in Figure 3. Only during deep economic recessions has net natural increase been greater than net migration in Arizona.

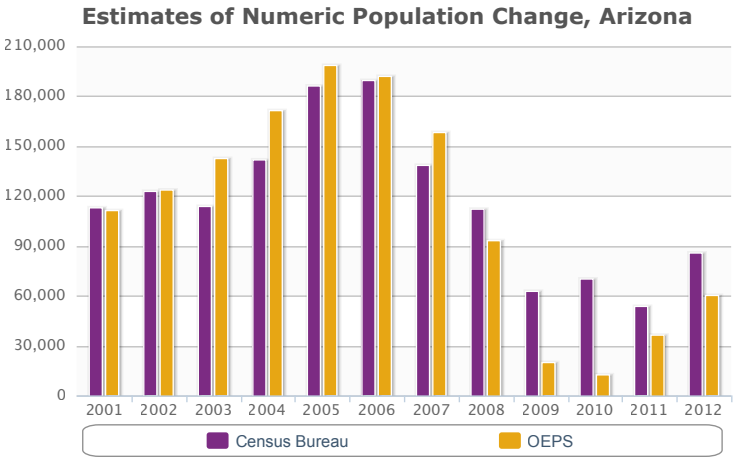

Figure 2 - *Estimates of Numeric Population Change in Arizona.* Source: U.S. Department of Commerce, Census Bureau and the Arizona Department of Administration, Office of Employment and Population Statistics.

Other Indicators

Though figures on legal immigration are available, only crude estimates of undocumented immigration exist. Most immigration to Arizona has been undocumented. Estimates of domestic migration are produced by the Internal Revenue Service (IRS), but these data are released too slowly to be of use in estimating the current population change. The IRS counts domestic in- and out-migration from income tax filings, but these counts are not complete. The IRS data (see Figure 4) demonstrate the cyclicality of domestic in-migration to Arizona and the countercyclicality of domestic out-migration from Arizona (out-migration is higher during economic recessions). Net migration has been highly cyclical. Only a modest upward trend is seen in the numbers. In contrast, migration rates (the number of migrants divided by the number of Arizonans) have trended down.

Several methods are used to estimate population. One technique uses symptomatic indicators to estimate the population in certain age groups. For example, births are the basis for the estimate of the preschool population, public school enrollment is used to estimate the population from 5-to-17 years old, driver licenses are used to estimate the number of working-age adults, and Medicare and Social Security enrollment are used to estimate the retirement-age population.

2010 Decennial Census

Prior to 2010, most households received a short census questionnaire limited to basic characteristics such as age and race/ethnicity. About one-in-six households received the "long form" of the decennial census questionnaire, which included many questions regarding social, economic, and housing characteristics. The decennial census was the primary source of demographic data.

In contrast, the 2010 census was limited to the "short form" – the American Community Survey now provides the broad range of demographic data. Thus, indicators from the 2010 census are limited to age, race/ethnicity, household relationship and type, homeownership, and the vacancy rate.

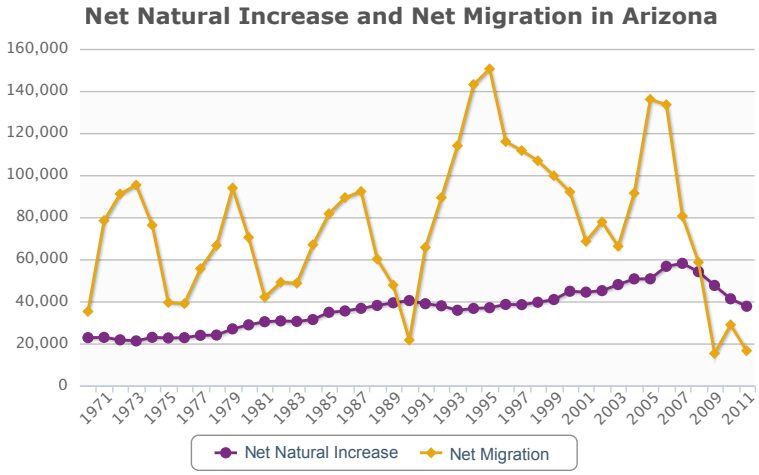

Figure 3 - *Net Natural Increase and Net Migration in Arizona.* Sources: U.S. Department of Commerce, Census Bureau (population change) and Arizona Department of Health Services (births and deaths).

The key value of the decennial census data is that a complete count of the population was made – sampling error is not an issue. However, the census figures are not necessarily completely accurate. Some people always are missed; historically, minorities (particularly young individuals) have been undercounted. Some people are double counted (especially those with more than one residence). Further, respondents are not always accurate in their responses – for example, some do not report their true age (ages ending in '0' and '5' are disproportionately reported).

American Community Survey

The American Community Survey has been conducted on an ongoing basis for the entire country since 2005. Annually, calendar-year ACS results are released for areas with a population of at least 65,000. Due to the small sample size, single-year estimates are not released for less-populous areas. Combined estimates for three years of data are available annually for areas with a population of at least 20,000; five years of data are combined for less populous areas. Annual data are shown in Arizona Indicators for Arizona and the nation. County data are limited to the five-year average.

The Census Bureau publishes the ACS sampling error with every estimate, expressed as the margin of error with 90 percent confidence. The following is an example:

The estimate of the poverty rate in Maricopa County in 2011 was 17.4 percent, with a margin of error of + or – 0.7 percentage points. The interpretation is that there is a 90 percent likelihood that the actual poverty rate was within the confidence interval of 16.7 percent to 18.1 percent. A one-in-ten chance exists that the real rate was outside this range.

Depending on the user's purpose for accessing the data, this sampling error may or may not be acceptable. If the error is deemed to be too large, the user should use the combined data for three years or for five years.

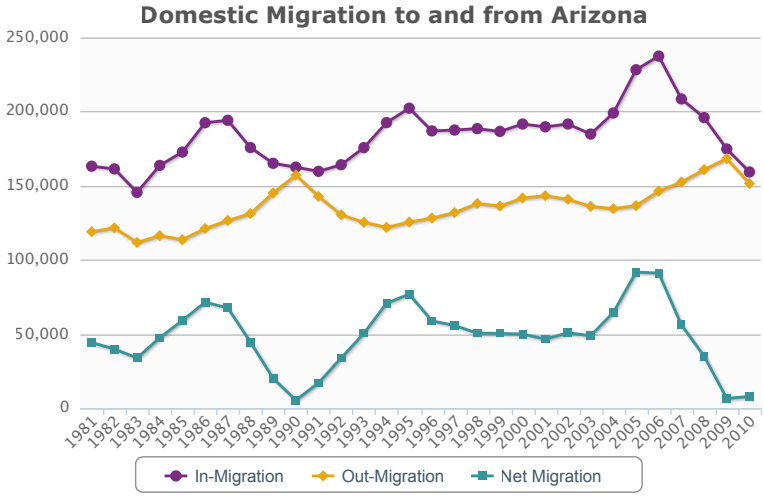

Figure 4 - *Domestic Migration to and from Arizona.* Source: Internal Revenue Service.

In any geographic area, the magnitude of the sampling error varies widely by the size of the population group being analyzed. For example, the sampling error of the poverty rate of children under five years of age is much larger than the error for the entire population. For one population group, sampling error from the one-year sample may be acceptable, while the error for a smaller subgroup may not be acceptable even when using the five-year average.

The published margin of error should be taken into consideration when deciding whether to use a result from the ACS. In general, considerable caution is urged in using the ACS data.