

Population Projections 2017

Boyd Center for Business and Economic Research

Methodology, Executive Summary, and Notes

The Population Projections for the State of Tennessee, produced for the Tennessee State Data Center, contain projections for each county in Tennessee, by race, age, and sex for each year from 2016 to 2070. Age is defined by five-year bands, starting with an “age 0-4” group and ending with an “age 85+” group. Race is delineated as one of four categories that combine race and ethnic definitions:

- White Non-Hispanic
- Black Non-Hispanic
- All Hispanic
- Other non-Hispanic, including two or more races.

The 2017 projections were produced with a slight but important change in methodology, which will better enable this and future releases to reflect changing trends than previous versions. Among other decisions, forecasting requires a specified base period, launch period, and end period. The span of time between the base and launch period is used to establish recent trends, and the actual forecast is generated for all periods between the launch and end period. In prior releases, the Boyd Center for Business and Economic Research has forecast population for each single year of age. However, forecasting at the single-year age level demanded that 2010 be the launch year, as the decennial census is the last year for which we have estimates for population by county, race, sex, and single-year of age. By switching to five-year age bands, we can use intercensal estimates from the U.S. Census Bureau for all years up to the current year to update our forecast to capture emerging trends in population changes, and use the most current year for our ‘launch year.’

Our forecast still implements a cohort-component methodology. We specify the base year as 2000 and the launch year as 2016. Thus, we inform the forecast with trends from 2000 to 2016. Using vital statistics data from the Tennessee Department of Health, we project the population change resulting from natural components (births minus deaths). Differences between actual population values as reported by the Census and values predicted using births and deaths are used to establish net migration patterns. The forecast used these predicted net migration patterns; life tables from the Social Security Administration; recent average birth rates by county, race, and age of female; and forecast future U.S. populations.

Summary of Results and Discussion of Critical Factors Underlying Expected Future Changes

By 2040, the population of Tennessee is expected to increase to 7.84 million, reflecting expected growth of approximately 50,000 people per year. This figure is consistent with population growth observed from 2010-2016, but lower than the average annual change of 65,500 observed in the 2000s. The decrease in projected growth from prior releases is attributable to several concurrent trends in births, deaths, and net migration, as well as the change in methodology which better enables us to incorporate

these emerging trends. From 2010-2015, there have been changes in all three components of population change (births, deaths, and net migration) all of which led to a slowdown in predicted population growth. In several instances, counties which have heretofore experienced slow-but-steady population growth are now expected to experience negative population growth over the next several decades.

Births

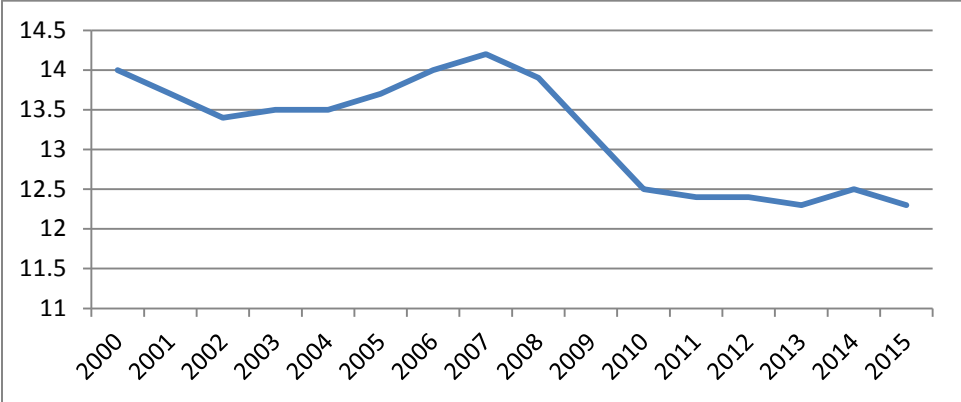
The number of births in Tennessee has still not rebounded to pre-recession levels. In 2007, there were 86,661 live births in Tennessee. In 2015, there were only 81,000 – a decrease of 5,000 births per year. This decrease in births is partially due to changes in the number of women of child-bearing age, but also due to changes in birth rates, particularly among young women:

Table 1: Birth rates per thousand, 2007 and 2015, by age of mother

Age band	2007 Birth Rate Per Thousand	2015 Birth Rate Per Thousand
35-44	19.8	22.5
25-34	99.7	99.0
20-24	128.1	95.1
18-19	93.4	55.7
All Ages	14.2	12.3

As Table 1 shows, there is evidence that in 2015, birth rates are lower overall, sharply lower among women younger than 25 years of age, but slightly higher among women aged 35-44. This is consistent with anecdotal evidence about delayed family formation among the current generation. We believe these lower birth rates represent a new normal, or a structural break, rather than a temporary economic phenomenon. The great recession has been over for at least five years (and technically ended eight years ago) , but birth rates have not returned to pre-recession levels. This emerging trend is not driven by a few counties, but is true across the state. In 77 of 95 counties in Tennessee there were fewer births in 2015 than in 2007, with an average decrease of 55 births.

Figure 1: Birth rates per thousand, all ages, 2000-2015



Declines in births are more pronounced in smaller, typically rural counties than in larger, more urban counties. We compare the average percentage change in births from 2007-2015 for two groups of counties: The 15 counties with more than 1,000 births in 2007, and the 80 counties with less than 1,000 births in 2007.¹ While the 15 larger counties saw an average decrease in births of 0.5 percent, the 80 smaller counties on average had 8.1 percent fewer births in 2015 compared to 2007.

Deaths

Increases in deaths have also contributed to the decrease in population growth. From 2007-2015, deaths per year in Tennessee increased from 56,800 to 66,329. Unlike births, however, the increase is likely due to an aging population rather than mortality rates. Last year, the first of the “baby boomer” generation turned 70, meaning that large shares of the population are moving into the part of life where mortality rates are higher. Further, this cohort effect in death rates is not just driven by high birth rates during the ‘boomer years’ but by lower-than-normal birth rates during the Great Depression and WWII. In 86 of the 95 counties in Tennessee, there were more deaths in 2015 than in 2007, with an average increase of 110 deaths per county per year.

Natural Change

In demographics, natural change refers to the combined effects of births and deaths on population. If natural change is positive, there are more births than deaths. If natural change is negative, the converse is true. Natural population growth in Tennessee has fallen sharply, due to increased deaths and decreased births. In 2007, the population of Tennessee grew by almost 30,000 due to births and deaths alone. In 2015, the natural change in population was only 15,000. As Table 2, shows, about two-thirds of that decrease was due to changes in deaths rather than changes in births.

Table 2: Births, Deaths, and Natural Change

Year	Births	Deaths	Natural Change
2007	86,661	56,800	29,861
2015	81,374	66,329	15,045
Change (2015-2007)	-5,287	9,529	-14,816

The decrease in natural growth was not distributed uniformly over the state, but rather was concentrated in non-urban counties. In 2007, seven counties (Davidson, Hamilton, Knox, Montgomery, Shelby, Rutherford, Williamson) accounted for nearly 22,000 of the approximate 30,000 natural increase in population. However, population in the other 88 counties still increased by 8,000. In 2015, these seven counties experienced a natural increase in population of 17,627, but the rest of the state combined experienced a natural decrease in population of approximately 2,500.

Overall, 89 of the 95 counties in Tennessee experienced lower natural change (either lower growth or greater contraction) in 2015 compared to 2007. Natural change was positive in 70 of 95 counties in

¹ The 15 counties with over 1,000 births in 2007 are Blount, Bradley, Davidson, Hamilton, Knox, Madison, Maury, Montgomery, Rutherford, Shelby, Sullivan, Sumner, Washington, Williamson, and Wilson counties.

2007, but negative in 61 of 95 counties by 2015. From 2007 to 2015, the sign on natural change flipped from positive to negative in 36 counties, but did not flip from negative to positive in any counties.

This stylized fact is important for interpreting our population projections in the context of recent history. There are several counties, particularly smaller rural counties, which have experienced slow-but-steady population growth over the last several decades. Our forecast predicts that many of these counties will begin to steadily decline in population over the next fifteen years. In some cases, that decline has already begun. In others, decreases in natural change from cohort effects in births and deaths are still being masked by net migration in total population change. However, net migration has also been decreasing in Tennessee.

Net Migration

Net migration decreased considerably from the 2000s to the 2010s. From 2000-2010, an average of 41,500 people migrated to Tennessee each year. From 2010-2016, only 31,800 people per year moved to Tennessee. While the decade is still obviously incomplete, six years of data on reduced net migration indicates that this is not a post-recession blip, but likely the new normal.

Further, net migration is not distributed evenly across the state, but is increasingly concentrated in the Nashville area. During the 2000s, the five most populous counties in the Nashville MSA (Davidson, Rutherford, Williamson, Wilson, and Sumner) accounted for 38% of all net migration in Tennessee. In the current decade, those same five counties have absorbed 62% of all net migration in Tennessee.

Net migration to the other 90 counties in the state has fallen by over 50%. During the 2000s, there was an average of 25,400 net migrants per year to counties in the rest of the state, excluding the big 5 Middle Tennessee counties. During the 2010s, that average fell to 12,150 persons per year.

Main Conclusions

Combining these emerging trends in births, deaths, and net migration, our population projections have very different outlooks for three distinct groups of counties. We project the strongest growth in the main counties in the Nashville area, where natural increases are strong, births are still high, and the population is relatively young. We predict slower, but steady growth in the metropolitan counties in the Knoxville, Chattanooga, Clarksville, and to some extent, Memphis MSAs. Finally, in most rural counties, our projections indicate that because of a history of low and decreasing net migration, increased deaths and decreased births, many of these counties can expect to see decreases in population over the coming decades, even where they have not before.