Colorado Fertility: Recent Trends and Expectations of Change

Recent Fertility Trends in Colorado and the United States

In 2007, Colorado, as well as the Nation, began experiencing declines in the total number of births as a result of declining general fertility rates. The general fertility rate is the number of live births per 1,000 females of childbearing age (ages 15 to 44 years). Unless otherwise specified, fertility in this document refers to the general fertility rate.

Following a relatively steady period of fertility from 2000-2007, Colorado and the Nation experienced a steep decline in fertility during and following the recession. Colorado’s fertility rates declined faster than those of the Nation, resulting in Colorado having a lower fertility rate than the Nation after 2011. Historically, Colorado fertility has generally followed the year-to-year fertility trends experienced at the National level. Although the fertility rate is still declining, the decline has slowed. The slowing of the decline in fertility in combination with an increasing population of females within childbearing age has resulted in the number of births in Colorado increasing slightly each year since 2014.

According to the National Center for Health Statistics, the Western United States led the declines in fertility across the nation with Arizona, Utah, Nevada, and California having the largest overall declines. Colorado ranked 8th in terms of the decline in the total number of live births per 1,000 women ages 15 to 49 years, declining 14.6% from 70.5 in 2007 to 60.2 in 2015. In 2015 Vermont had the lowest general fertility rate at 51.6, while South Dakota had the highest at 78.2.
This paper presents an analysis of the age composition of the recent changes in fertility, differences by race and ethnicity of women of childbearing age, as well as differences across geographic regions within Colorado. The paper concludes with the State Demography Office’s expectations for future trends of fertility in Colorado in addition to a brief discussion of its importance.

The Decline

Colorado reached a peak in its total number of births in 2007. After remaining relatively stable from the early 1980’s to the mid 1990’s, the number of Colorado births began increasing rapidly through the late 2000’s. The increases were the result of an increasing population of females within childbearing age groups as well as increases in the fertility rate. After 2007, births began to decline, the result of declines in fertility. Recent research has concluded several factors contributed to the recent decline in fertility. Those factors include high unemployment rates during the Great Recession, increases in the use of long acting reversible contraceptives, the slowing pace of international immigration, and increased educational attainment for women.

Colorado was not unique as Nationwide the number of births declined. Of all women of childbearing age, young females have led the decline in fertility across the United States. The number of births to young women declined more significantly than did the number of births to older women. This makes sense given the reasons cited above for the declines in births. Unemployment rates were highest for young adults as compared to older adults during the Great Recession. Recent immigrants, those who have been in the US for five years or less, have a median age of 25. Recent immigrants have a higher fertility rate than the native population; however according to the ACS, the total population of recent immigrants in Colorado has declined from 105,000 prior to the recession to 80,000 in 2015. Across the United States, in 2015, 17 states had their highest fertility rates for women ages 30-34. All
17 states with peak fertility for women in their 30’s rank within the top 25 for the percent of population over age 25 with a Bachelor’s degree or higher. This is consistent with research that has shown some women may delay childbearing in order to complete more education. In the West, California, Colorado, and Washington all have higher fertility rates for women in their 30’s versus women in their 20’s.

Changes in Fertility by Age

According to the CDC National Center for Health Statistics, teen birth rates in particular have demonstrated an unprecedented decline throughout the United States since 2007. Colorado had the largest decline of all states in teen birth rates (ages 15-19 years old) between 2007 and 2013, declining 39% from 41.6 to 25.4 compared to the US decline of 29% to 29.4. Colorado’s teen birth rate has continued to decline and in 2015 measured over 50% lower than it was in 2007. Reasons for the decline in teen birth rates include increased access and use of effective birth control including long acting reversible contraceptives as well as increases in a teen’s likelihood of using birth control during recessions. Research has also credited the MTV reality television show “16 and Pregnant” as it led to more searches regarding birth control.

Across the United States birth rates declined for women under age 30, rose for women aged 30-44, and were unchanged for women aged 45-49 from 2000-2015. Within Colorado, the 15-19 age group experienced the most significant declines, down 53.5%, followed by the 20-24 age group down 31.8%. The 25-29 year olds decreased 18.5% while the 30-39 year olds remained relatively stable, declining during the recession and increasing since 2010, likely the result of delayed fertility during the recession.

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2 Colorado Department of Public Health and Environment, “Taking the Unintended Out of Pregnancy: Colorado’s Success with Long-Acting Reversible Contraception”, January 2017
3 Percheski C, Kimbro R. “How did the Great Recession affect fertility?”, Focus, 2014
Prior to 2013, Colorado’s peak age group for fertility was 25-29 year olds. Since 2013, due to declines in fertility for all women under age 30 in combination with increased fertility for older females, Colorado’s peak age group for fertility is now the 30-34 year old age group.

Over 70% of all births to Hispanic, Black, and American Indian females in 2015 in Colorado were to women under age 30, while the majority of births for White, non-Hispanic and Asian females were to women over age 30.

Changes in Fertility by Race and Ethnicity

Consistent with changes in statewide fertility, total fertility rates have continued to fall for all major race and ethnic groups in Colorado. The Total Fertility Rate (TFR) represents the number of children born to each woman in the course of her lifetime, had her fertility in each year of her childbearing ages been that of the women in each age group in the selected year. A benchmark in fertility analysis is a total fertility rate of just over 2.1 or 2,100 births per 1,000 women which, accounting for mortality, is called the “replacement level” total fertility rate.

Within Colorado in 2000, Hispanics had the highest total fertility rates followed by Black non-Hispanic, White non-Hispanic, Asian non-Hispanic, and American Indian non-Hispanic. Fertility rates declined for all race and ethnic groups in Colorado from just before the Great Recession to today. Hispanic females have had the largest decline in total fertility, continuing to drop from 2.8 in 2007 to 2.1 in 2015. In addition to having a large share of their population within younger age groups, which experienced the most significant declines in recent years, declines in immigration have also impacted the Hispanic fertility rate. Recent immigrants tend to have higher fertility within the first five years following immigration to the United States. The American Community Survey (ACS) estimated close to 540,000 Coloradans in 2015 were

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foreign born, 80,000 of who entered the United States after 2010. According to the ACS, 52.2% of Colorado's foreign born population in 2015 identified as Hispanic. While 57.6% of Colorado's foreign born who entered the US between 2000 and 2009 were Hispanic, only 29.3% of Colorado's foreign born who entered the US after 2010 are Hispanic. In 2015, of the remaining foreign born who entered the US after 2010, 22.3% identified as White not Hispanic and 31.2% identified as Asian, a significant increase from the 17% share identifying as Asian in the two decades prior to 2010.

**Colorado Fertility by Region**

At the sub-state level, fertility varies considerably between regions. The Eastern Plains, San Luis Valley, Adams and Weld County are the only areas within Colorado currently experiencing above replacement fertility. Nearly half of all women of childbearing age in the San Luis Valley are Hispanic resulting in higher fertility rates. The Eastern Plains, Adams, and Weld County also have a large Hispanic share of their childbearing age population contributing to the higher rates. These areas of the state have consistently had higher fertility rates, likely due in part to the types of housing, traditions and attractiveness of the areas to young families.

With the exception of Weld County, all metropolitan counties and Rural Resort Region counties within Colorado are currently at below replacement total fertility rates. From 2010-2015 all metropolitan counties experienced a continued decline in TFR. Boulder (1.4), Rural Resort Region (1.5), Larimer(1.5), Jefferson (1.6) and Denver(1.6), have the lowest TFRs in the state, all well below replacement level. The reasons for which include the fact that Boulder, Denver, and the Resort Region all have the highest female labor force participation rates in the state as well as some of the highest educational attainment levels for females.
The largest declines in the TFR in Colorado were experienced in the City and County of Denver. The most significant declines in fertility within Denver have been by the youngest females. The following chart highlights the significant changes in Denver’s fertility rates by age from 2000 to 2015.

Outside of the Front Range, TFRs increased within the Eastern Plains, Northwestern Colorado, and Southeastern Colorado, while it declined in Southern Colorado and the Southwestern Slope and resort areas of the Western Slope. The largest increase in TFR in the state was in the Northeast region of Colorado including Morgan, Logan, Phillips, Sedgwick, Washington and Yuma counties.

The Northeastern Plains and Southeastern Plains regions along with the San Luis Valley continued the trend of the majority of births from mothers under the age of 30. While in the Rural Resort Region, Larimer, Douglas, Jefferson, Boulder, and Broomfield Counties the majority of new mothers are over age 30.
Up, Down, or Steady?

As mentioned earlier, Colorado reached a peak in the number of births in 2007 with 70,800. The number of births then declined through the recession to 65,100 in 2012 and has climbed since to 66,600 in 2015. The State Demography Office forecasts the number of births in Colorado will continue to climb slowly and will exceed the 2007 level of births just before the year 2023. As younger women complete their transition to much lower fertility rates, total fertility will continue to decline through 2025. After 2025 total fertility is expected to increase slightly due to the increased share of population within older childbearing years and increase in diversity within females of childbearing age.

Northeastern Colorado currently has, and is expected to continue to have the highest TFR, followed by the Southeastern Plains and the San Luis Valley. Boulder, Denver, and the Rural Resort Region are expected to continue to have the lowest within the state. The most significant change over the forecast period, 2015-2050 is a continued expected decline in the City and County of Denver from a TFR of 1.9 in 2010 to 1.5 by the year 2050. By 2040, only the North and Central Eastern Plains and Northwestern Colorado are expected to have total fertility rates remaining above replacement.

What it means for Colorado

Fertility measures are important in understanding population growth and change in Colorado. In 2015 births represented 65% of current population change in Colorado. With the aging of Colorado’s population, the combination of increasing deaths and declining births due to changing age structure of the population and changing fertility rates relative to total population is expected to eventually result in long term decline in Colorado’s natural increase (births minus deaths). The decline in natural increase is expected to contribute significantly to Colorado’s slowing forecast of population growth.

In particular, the Southeastern Plains and Central Mountain Regions of Colorado are expected to continue to experience natural decline. As a result, growth will be challenging in those regions as without in-migration, population size declines when deaths exceed births. After 2040, Jefferson and Boulder counties are also expected to experience natural decline.
Total fertility rates by race and ethnicity will also determine a large share of the growth in the population by race and ethnicity. Within the United States, over half of all U.S. infants are racial/ethnic minorities. As mentioned before, within Colorado in 2015 38% of births were racial/ethnic minorities and by 2038, over half of births are expected to be racial/ethnic minorities. The United States population is currently forecast by the Census Bureau to be majority minority by the year 2044. Colorado’s total population does not become majority minority prior to the end of this forecast period, currently 2050. The most populous minority group will continue to be Hispanic and Colorado’s total population under age 25 is expected to become majority minority by the year 2040.

The number of historical, current, and future births will impact the overall age structure of Colorado’s population, its dependency ratios, and its future labor force. Colorado’s overall dependency ratio, the share of the population under age 16 and over age 65 relative to the working age population 16 to 64 was highest in 1970. At that time, many of the Post WWII Baby Boomers were children. As the Baby Boomers aged into the typical working age population, the dependency ratio in Colorado declined, reaching its lowest point in 2010. Since 2010, with the aging of the Baby Boomers into typical retirement ages, the dependency ratio in Colorado has begun to increase and is expected to continue increasing through 2050 as a result of the larger share of Colorado’s population within older age groups. The youth dependency ratio, the share of children relative to the working age population is expected to decline slightly, again the result of an aging population with a smaller share of females within childbearing years.

In addition, a smaller share of the population within younger age groups means a smaller share aging into traditional working age groups. This will slow the growth of the labor force relative to the total population. Again, Colorado is not unique and labor force growth is also expected to slow Nationwide leading to more competition for the pool of skilled workers available. The forecasts of fertility, the dependency ratio, and labor force growth rates are
important variables for public finance planning, workforce planning, school and park planning, as well as planning for supports for young families.

Methodology

The State Demography Office prepares forecasts of fertility rates for use in its demographic (cohort-component) model. The rates are developed for each single year of age of females of childbearing age and are based on fertility rates provided by the Colorado Department of Public Health and Environment. Understanding current and historical change in fertility allows us to prepare a thoughtful and informed forecast.

For the Vintage 2016 forecasts, fertility rates by single year of age of females of childbearing age were projected first statewide. Trends by single year of age were forecast for the near term using a linear regression model. The statewide forecast resulted in continued declines in fertility for younger females as they eventually complete their transition to lower fertility rates and continued slight increases for older females. The actual fertility rates by race and ethnicity were then assumed to move toward convergence to a statewide average of fertility rates by single year of age. The rates were not assumed to reach convergence by the end of the forecast period, currently 2050.

Large metropolitan area counties and non-metropolitan region (both referred to hereafter as region) fertility rate forecasts were then derived using a series of steps.

- In the first step, a proxy of the fertility rate by single year of age was derived for each region using the region’s specific share of population by race and ethnicity by age for females of childbearing age by weighting the actual estimates of fertility by race and ethnicity by age by the share of the region’s population by race and ethnicity.

- In the second step, ratios were derived by comparing the proxy rates to the actual estimated fertility by single year of age by region.

- In the third step, the ratios were then applied to the statewide forecast of fertility by race and ethnicity to derive a region forecast.

This methodology was chosen to maintain the unique fertility qualities of specific regions, however, it is also understood long term fertility trends are likely to follow expected statewide long term trends.

The State Demography Office maintains two independent models to forecast births, the statewide race and ethnic model and the county economic-demographic model. The region fertility rate forecasts by single year of age were adjusted to be consistent with the statewide forecast model births.