ECONOMIC DEVELOPMENT, EDUCATION AND HEALTH IN TENNESSEE

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The relationships between economic development, health and education have long been understood. In this paper, the Center for Economic Research in Tennessee (CERT) evaluates the correlation between these three pillars of a strong economy, population and community in Tennessee.

In Part I, CERT explores the relationships between indicators of economic distress and attainment: job growth, unemployment, income, labor force participation, and poverty. Strengthening economies as measured by these factors are central focal points of the Tennessee Department of Economic and Community Development (TNECD), as reflected in the department's long term objectives and programs.

In Parts II and III, we build upon the primary indicators for economic strength to explore their relationships to educational attainment and health in Tennessee's counties. In Part IV, we identify relationships between health and educational attainment in Tennessee communities.

After identifying the strong ties of health and education to economic growth and unemployment, CERT reports other characteristics of Tennessee's unemployed population in Parts V and VI — including the age demographics, gender, race and ethnicity of the unemployed. As part of this analysis, CERT evaluated the prevalence of separations to persistent nonemployment[1] for each of these demographics. This data can be used to inform policy and programs that aim to reduce unemployment and strengthen economies across Tennessee.

Highlights

- Unemployment rates are correlated with private sector job growth, poverty rates, median household income, and labor force participation in Tennessee counties. Unemployment rates are also correlated with educational attainment of an associate degree or higher, and the number of reported poor or fair health days.
- Rates of labor force participation in Tennessee's counties are correlated with poverty rates, educational attainment, and county health rankings.
- Educational attainment of an associate degree or higher has a strong correlation with job creation in a community, unemployment rates, labor force participation rates, median household incomes and county health rankings in Tennessee counties.
- 5.2 percent of Tennessee workers with no high school degree experienced job separations to persistent nonemployment in 2015 Q1. This share is lower for workers with high school degrees (4.0 percent), some college or associate degrees (3.7 percent), and bachelors or advanced degrees (3.3 percent).
- County health rankings are correlated with rates of poverty and labor force participation in Tennessee counties, as well as educational attainment of an associate degree or higher.
- Tennessee's labor force participation rate was highest among the population age 25 to 34 (78.8 percent), and 35 to 44 (78.5 percent) in 2015. Participation rates are much lower for the population age 55 to 64 (59.4 percent) and 65 and over (16.3 percent).

[1] A separation to persistent nonemployment is characterized by an employee who separates from one firm, and still has not regained employment at any firm by the last day of the subsequent quarter. The old job must be the primary source of income for the worker. This is different from a job-to-job move, where an employee has little-to-no observed nonemployment between jobs.
Source: Job-to-Job Flows Data (Beta) from the Longitudinal Employer-Household Dynamics (LEHD) program of the U.S. Census Bureau

- 5 percent of the state's workers age 25 to 34 experience separations to persistent nonemployment each quarter in Tennessee. Workers age 35 to 44 and 45 to 54 have a lower prevalence of separations to nonemployment each quarter (3.4 percent and 2.9 percent, respectively). The prevalence is much more common for older workers age 65 and above (7.4 percent). (2015 Q1)
- African Americans had the highest unemployment rate (7.5 percent) in 2015. The White (5.1 percent) and Hispanic or Latino (4.0 percent) populations had unemployment rates that were below the state's average.
- Hispanic or Latino men had the highest labor force participation rate in 2015 in Tennessee (83.4 percent), while White women had the lowest labor force participation rate (50.9 percent).
- In 2015 Q1, 4.6 percent of White workers (92,895), 5.5 percent of African American workers (23,689), and 6.1 percent of Hispanic or Latino workers (5,185) experienced separations to persistent nonemployment in Tennessee.

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PART I: ECONOMIC DEVELOPMENT INDICATORS

A primary objective of economic development programs is to drive growth in new incomes and decline in unemployment. TNECD's programs support the department's long term objectives to lead the states of the Southeast in high quality job creation, low unemployment, high capital investment, high personal income per capita, and low economic distress.

TNECD has various initiatives aimed at achieving these results—including business expansion and recruitment, site assistance, downtown revitalization, community development for rural Tennessee, workforce alignment, entrepreneurship initiatives, support for small businesses as well as women- and minority-owned firms, and other programs to help foster a robust and diversified economy.

Employment is a key indicator of economic strength, and a priority of TNECD's programs. "Employment is to economic growth what oxygen is to the human existence. You cannot have one without the other."[2] In this section, CERT demonstrates the relationship between the number of jobs located in a community, and a community's unemployment rate. Next, CERT identifies the relationship of unemployment to several other indicators of economic distress and attainment.

Private Sector Job Growth and Unemployment

Private sector job growth in the last five years (2010-2015) and unemployment rates in Tennessee counties have a strong negative correlation (-0.61 correlation), where an increase in one is accompanied by a decrease in the other.

In 2015, Hancock County had the highest unemployment rate and the third largest percent decline in private sector jobs. Williamson County on the other hand had the lowest unemployment rate and the fifth largest percent increase in private sector jobs in Tennessee.

While these two indicators may appear to correspond fluidly, employment and unemployment data are reported by two different programs of the Bureau of Labor Statistics; the results therefore do not necessarily align. The Quarterly Census of Employment and Wages (QCEW) reports the number of jobs present in a community and is based on a survey of businesses. The Local Area Unemployment Statistics (LAUS) program alternatively reports the number of residents in a community which are employed, unemployed or not participating in the labor force; and is based on a survey of residents in a community.

Tennessee has seen favorable trends in both private sector job growth and unemployment during 2016. In the twelve months from October 2015 to October 2016, Tennessee's private sector employment grew by 66,500 net new jobs, or 2.67 percent.[3] This is the eighth highest rate of growth in the nation, and surpasses national growth of 1.79 percent.

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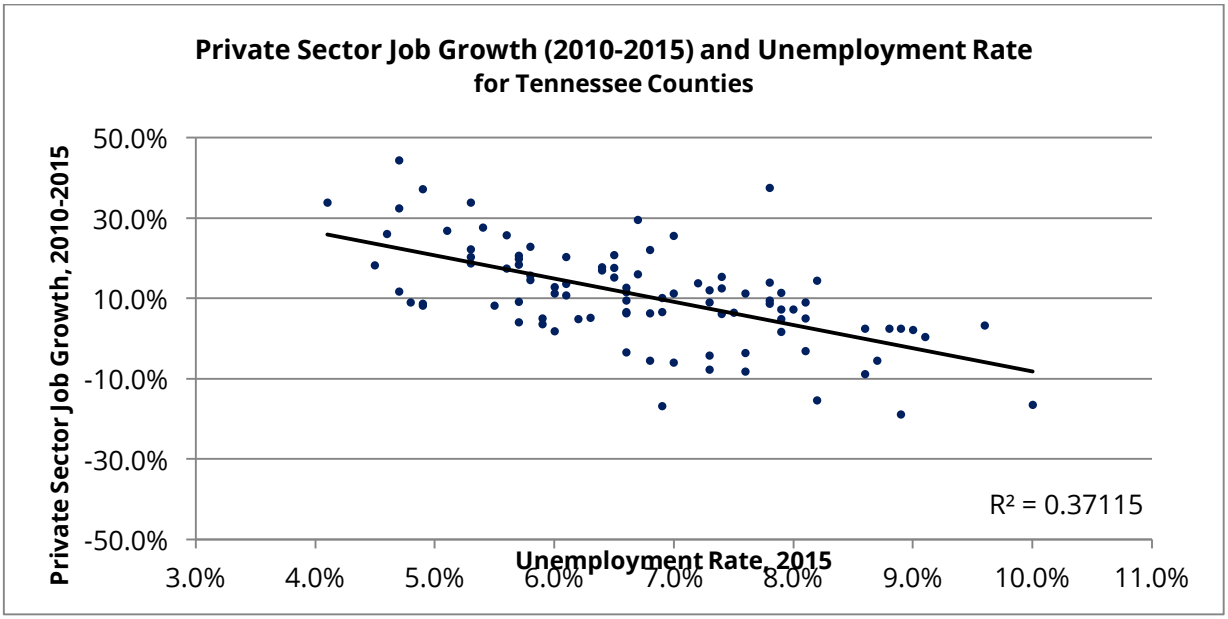
[2] Patton, Mike. "The Key to Economic Growth: Reduce The Unemployment Rate!" Forbes (August 27, 2012). <http://www.forbes.com/sites/mikepatton/2012/08/27/the-key-to-economic-growth-reduce-the-unemployment-rate/#69b8e5007236>

[3] Source: U.S. Bureau of Labor Statistics, Current Employment Survey (CES)

Also over this time period, Tennessee's unemployment rate has declined from 5.6 percent in October 2015 to 4.8 percent in October 2016.[4] The 0.8 percentage point decline in Tennessee's unemployment rate is the No. 4 greatest decline in the nation.[5] The number of Tennessee residents which are unemployed has declined by 19,500 people (11.4 percent) year-over-year.



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (2010-2015 Private Sector Job Growth); U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (2015 Unemployment Rate)

Unemployment and Median Household Income

Median household income and unemployment rates in Tennessee counties also have a strong negative correlation (-0.64 correlation).

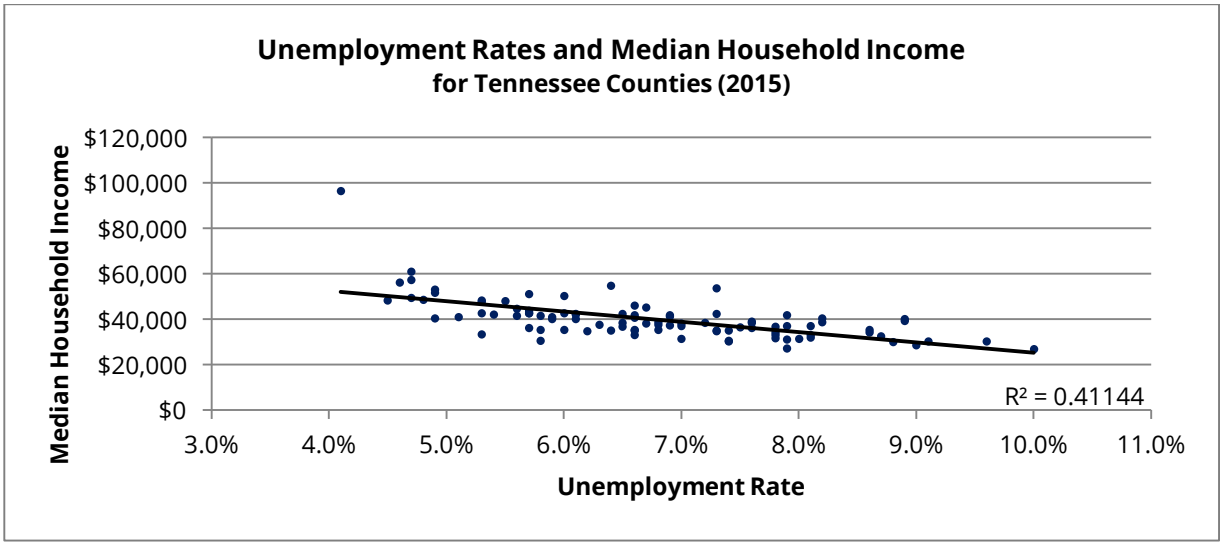
This relationship is reflected in Tennessee counties with high unemployment and low incomes. In 2015, Hancock County had the highest unemployment rate (10.0 percent) and the lowest median household income ($26,898). Scott County had the second highest unemployment rate (9.6 percent) and the fifth lowest median household income ($30,246). Lauderdale County had the third highest unemployment rate (9.1 percent) and the seventh lowest median household income ($30,281).

Many Tennessee counties also had high incomes and low unemployment rates. Williamson County had the lowest unemployment rate (4.1 percent) and the highest median household income ($96,565). Rutherford County had the third lowest unemployment rate (4.6 percent) and the fourth highest median household income ($56,219). Moore County had the fourth lowest unemployment rate (4.7 percent) and the 11th highest median household income ($49,427).

[4] Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (LAUS)

[5] Only the states of Massachusetts, Nevada and Arkansas had a greater decline in unemployment rate than Tennessee. The unemployment rate in South Carolina and Maryland also declined 0.8 percentage points from October 2015 to October 2016, and these states share the No. 4 ranking with Tennessee.

A recent article in *The Economist* comments on the nation's rising wages and declining unemployment—indicative of a strong labor market.[6] Tennessee is leading the nation in both trends, ranking sixth among all states for year-over-year decline in unemployment rate[7] and with recent gains in median household income. Median household income in Tennessee grew 6.4 percent in 2015, which was the second greatest rate of growth in the nation after Montana. In September 2016, The Pew Charitable Trusts highlighted these income advances in Tennessee, and the contribution of expansions by Bridgestone, FedEx and other Tennessee companies.[8]



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Median Household Income); U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (2015 Unemployment Rate)

Unemployment and Labor Force Participation

Labor force participation rates and unemployment rates in Tennessee counties are negatively correlated (-0.69 correlation). The correlation is even stronger for the 25 counties with the lowest unemployment rates (-0.79 correlation).

The five counties with the lowest unemployment rates in Tennessee in 2015 include Williamson, Davidson, Rutherford, Sumner and Wilson. These counties claimed five of the six highest labor force participation rates in Tennessee in 2015.

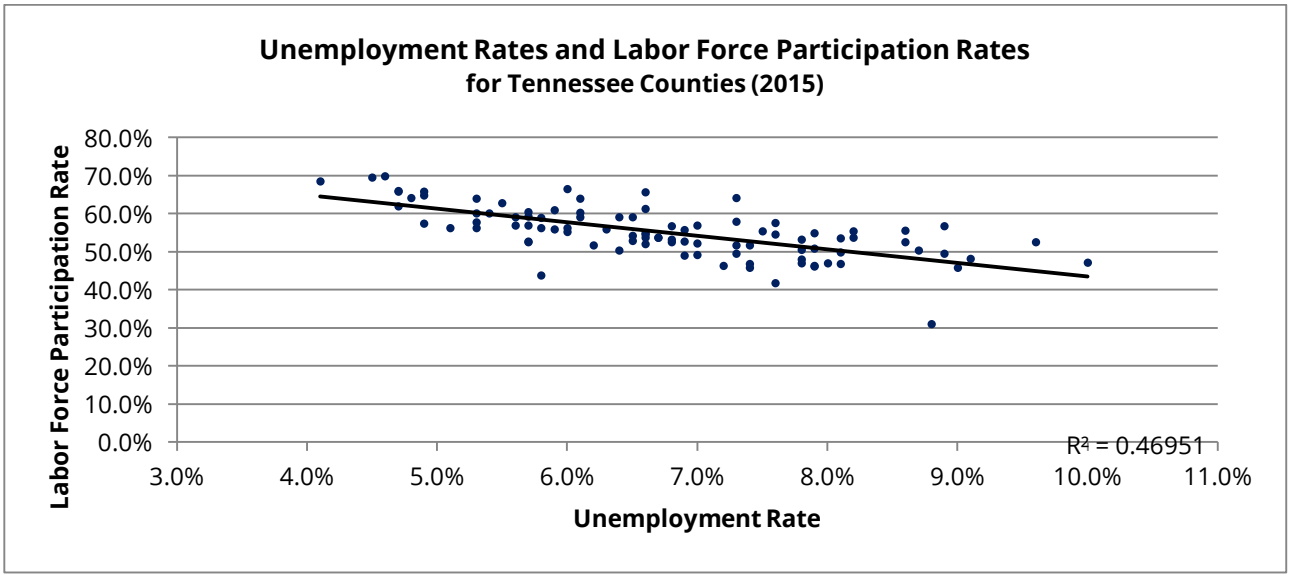
[6] "Wage Growth Surges, Just in Time for the Trump Presidency." *The Economist*. January 6, 2017. <http://www.economist.com/blogs/freeexchange/2017/01/america-s-labour-market>

[7] Tennessee experienced a 0.8 percentage point decline in unemployment rate from November 2015 to November 2016, which is the No. 6 greatest percentage point decline in the nation. Source: CERT analysis of the U.S. Bureau of Labor Statistics data.

[8] "In 49 States, Income Boost Outpaces Economic Growth." The Pew Charitable Trusts. September 27, 2016 <http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/09/17/in-49-states-income-boost-outpaces-economic-growth>

Unemployment Rate and Labor Force Participation Rate for Selected Counties (2015, Tennessee)

County	2015 Unemployment Rate	2015 Labor Force Participation Rate	Unemployment Rate Rank *(1 is lowest in TN)*	Labor Force Participation Rate Rank *(1 is highest in TN)*
Williamson	4.1%	68.5%	1	3
Davidson	4.5%	69.6%	2	2
Rutherford	4.6%	69.9%	3	1
Sumner	4.7%	66.0%	4	6
Wilson	4.7%	65.9%	4	5



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Labor Force Participation Rates); U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (2015 Unemployment Rate)

Unemployment and Poverty

While Tennessee's poverty rate has declined from 18.3 percent to 16.7 percent during 2015, the poverty rate in Tennessee ranks tenth highest among all states.[9] Poverty tends to have low prevalence among populations with low unemployment. In 2015, 37.3 percent of Tennessee's unemployed population was below the poverty level, while only 7.7 percent of Tennessee's employed population was below the poverty level.

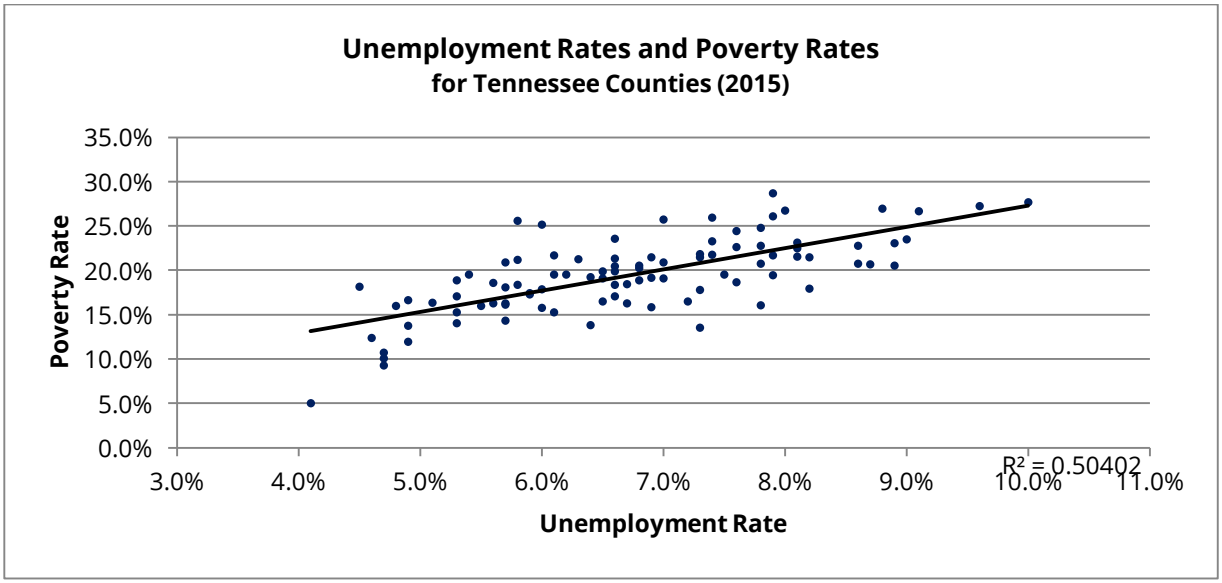
Poverty rates and unemployment rates in Tennessee counties have a strong positive correlation (0.71 correlation), meaning both measures tend to rise and fall together.

In 2015, Scott County had the second highest unemployment rate and the third highest poverty rate. Lauderdale County had the third highest unemployment rate and the sixth highest poverty rate. Lake County had the fourth highest poverty rate and seventh highest unemployment rate.

[9] Source: CERT analysis of data from the U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates

Williamson County had the lowest unemployment rate and the lowest poverty rate. Sumner County had the fifth lowest unemployment rate and the second lowest poverty rate. Moore County had the sixth lowest unemployment rate and the fourth lowest poverty rate.

As such, program and policy goals of reducing joblessness may have advantageous influences on poverty in Tennessee communities.



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Poverty Rates); U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (2015 Unemployment Rate)

Poverty and Labor Force Participation

In addition to unemployment, poverty also has a strong relationship with labor force participation. Statewide, 62.0 percent of Tennessee's population age 16 and older participated in the labor force in 2015. Participation was much weaker among Tennesseans with incomes below the poverty level (40.0 percent) than it was for Tennesseans with incomes above the poverty level (65.8 percent).

Poverty Status in the Past 12 Months by Employment Status (2015, Tennessee)

	Number	Percent
Total	5,122,559	
In labor force	3,176,108	62.0%
Employed	2,980,039	
Unemployed	196,069	
Not in labor force	1,946,451	38.0%
By Poverty Level Status		
Income in the past 12 months below poverty level	755,897	100.0%
In labor force	302,562	40.0%
Employed	229,331	
Unemployed	73,231	
Not in labor force	453,335	60.0%

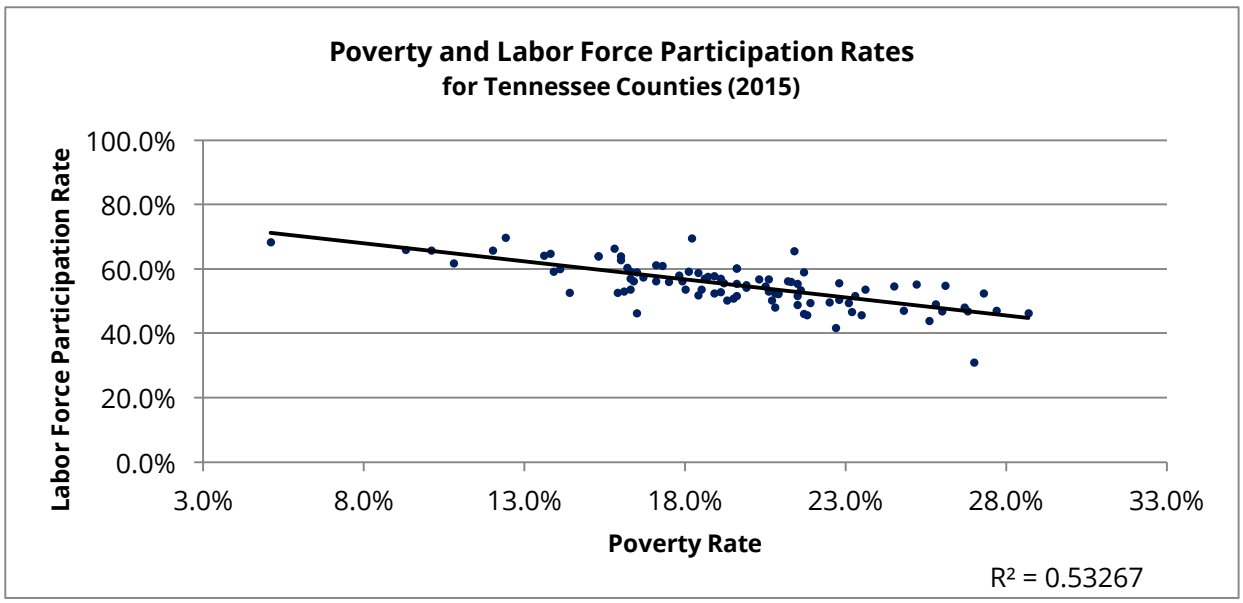
	Number	Percent
Income in the past 12 months at or above poverty level	4,366,662	100.0%
In labor force	2,873,546	65.8%
Employed	2,750,708	
Unemployed	122,838	
Not in labor force	1,493,116	34.2%

Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates

CERT identified a strong correlation between poverty rates and labor force participation rates in Tennessee counties (-0.73 correlation).

In 2015, Grundy County had the highest poverty rate (28.7 percent) and the seventh lowest labor force participation rate (46.3 percent). Lake County had the lowest labor force participation rate and the fourth highest poverty rate. Jackson County had the fifth lowest poverty rate and the 11th lowest labor force participation rate.

Williamson County had the lowest poverty rate (5.1 percent) and the third highest labor force participation rate (68.5 percent). Rutherford County had the highest labor force participation rate (69.9 percent) and the sixth lowest poverty rate (12.4 percent).



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Poverty Rate and Labor Force Participation Rate)

PART II: ECONOMIC DEVELOPMENT & EDUCATION

Education augments the earning potential of Tennesseans, preparing students to pursue high quality jobs. A growing share of Tennessee jobs are projected to require college education—Governor Haslam's Drive to 55 initiative is born out of this premise, with a statewide mission to increase the percentage of Tennesseans equipped with a college degree or certificate from 39.3 percent[10] to 55 percent by 2025. According to Federal Reserve Chairwoman Janet Yellen, "A college degree increasingly will be important in helping workers compete in a world-wide labor market that is constantly inventing ways to replace people with machines."[11] In the *Tennessee Workforce Disruption Index*, CERT reported on the value of education in an economy of automation.[12] A recent study by Princeton University's Alan Krueger echoes the importance of education, reporting that among men ages 25 to 54 who are not working, "many have lower levels of education, and thus may not be working because of employers' increasing focus on jobs that require higher education."[13]

Higher education among a community's residents also supports economic advancements within the business community. Educational attainment levels in a community, as well as proximity to postsecondary institutions, are often key factors in a company's site selection evaluation. As such, education is a key asset in business recruitment and retention—influencing employment and income generation in Tennessee communities.

In this section, CERT identifies relationships of educational attainment to new job creation, unemployment, labor force participation and income. CERT also evaluates the educational attainment characteristics of Tennessee workers experiencing job separations leading to persistent nonemployment.

TNECD Job Commitments and Educational Attainment

Through the department's business recruitment and expansion activities, TNECD received company commitments to create 133,437 jobs between 2011 and 2016. The number of jobs per county is correlated to educational attainment.

The 25 counties with the highest percentages of population age 25 to 64 with an associate degree or higher captured 77.8 percent of the department's job commitments between 2011 and 2016. The fifteen counties with the highest number of job commitments (Davidson, Shelby, Hamilton, Rutherford, Maury, Sullivan, Wilson, Knox, Williamson, Blount, Sumner, Montgomery, Madison, Anderson, and Putnam) all ranked within the top eighteen counties for percent of population age 25 to 64 with an associate degree or higher.

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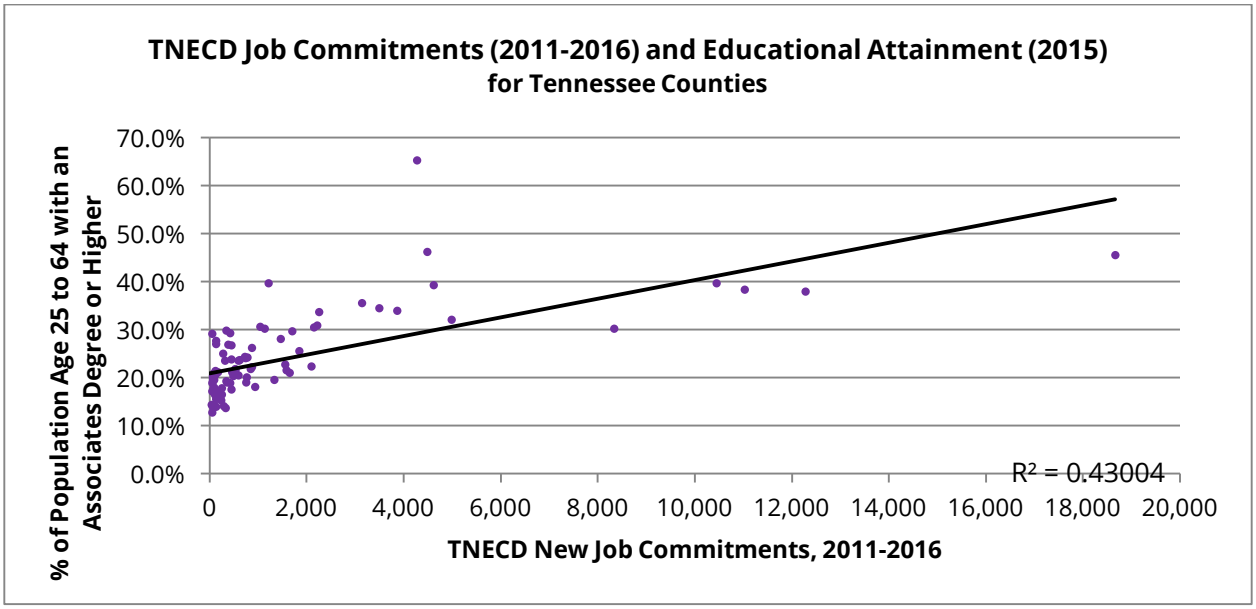
[10] *A Stronger Nation*. Lumina Foundation. (April 2016). <http://strongernation.luminafoundation.org/report/2016/>

[11] "Yellen: Globalization Makes Higher Education Increasingly Important," Wall Street Journal. (December 19, 2016). <http://www.wsj.com/articles/yellen-stresses-importance-of-higher-education-in-time-of-globalization-1482172255>

[12] See "Tennessee Workforce Disruption Index," a report by the Center for Economic Research in Tennessee (CERT), released in March 2016. <http://www.tnecd.com/research-and-data/publications/>

[13] "Economists Who Advised Presidents From Both Parties Find Common Ground," Wall Street Journal. (January 7, 2017). <http://www.wsj.com/articles/economists-who-advised-presidents-from-both-parties-find-common-ground-1483825325>

There were eight counties with no jobs committed through TNECD projects during this time period; all except for one ranked in the bottom 70 percent of counties for educational attainment of an associate degree or higher.



Sources: ECD; U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Percent of Age 25 to 64 with an Associate Degree or Higher)

Educational Attainment and Unemployment

Educational attainment has a strong association with unemployment. High educational attainment tends to correlate with low unemployment rates. Tennessee's unemployment rate for the population age 25 to 64 was 5.3 percent in 2015. The rate was lowest for individuals with a bachelor's degree or higher (2.5 percent), and highest for individuals with less than a high school diploma (11.8 percent). This has been the trend over the last ten years: populations with higher levels of attainment have a lower unemployment rate.

Additionally, the segments of the population with greater educational attainment have experienced the least fluctuation in unemployment over the last 10 years. The population with a bachelor's degree or higher had a 2.1 percentage point spread between the highest and lowest rates from 2005 to 2015. The range was greater for the population with some college or an associate degree (4.4 percentage point range), high school degree (5.6 percentage point range), and those with less than a high school degree (8.7 percentage point range).

Labor Force Estimates by Educational Attainment for the Population Age 25 to 64 Years (2015, Tennessee)

	All Education Levels	Less than High School Graduate	High School Graduate or Equivalency	Some College or Associate Degree	Bachelor's Degree or Higher
Civilian Labor Force	2,547,739	205,286	782,249	759,729	800,475
Employed	2,413,123	180,968	726,477	725,338	780,340
Unemployed	134,616	24,318	55,772	34,391	20,135
Unemployment Rate	**5.3%**	**11.8%**	**7.1%**	**4.5%**	**2.5%**

Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates

Unemployment Rate (percent) by Educational Attainment for the Population Age 25 to 64 Years (Tennessee)

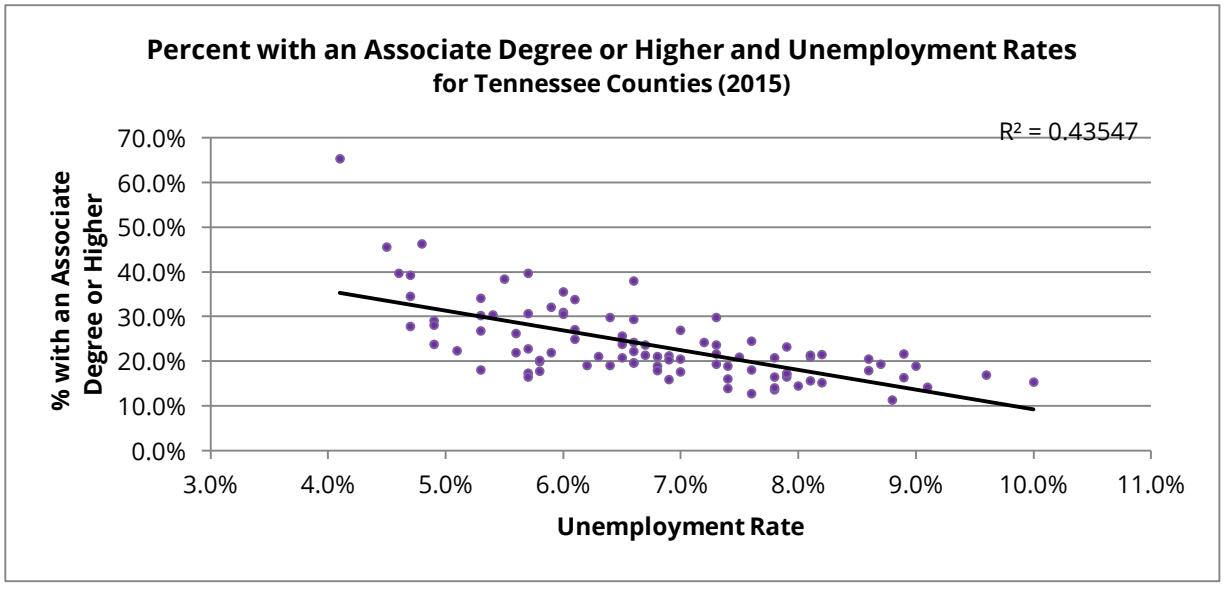
Education Level	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
All Education Levels	5.6	5.7	5.6	5.6	9.3	9.5	8.8	7.8	7.2	6.3	5.3
Less than High School Graduate	10.9	11.6	12.6	12.0	19.6	18.1	17.9	15.1	15.9	14.3	11.8
High School Graduate or Equivalency	6.7	7.1	6.9	6.9	12.2	12.3	11.2	10.3	9.2	8.0	7.1
Some College or Associate Degree	4.9	4.7	4.6	4.7	8.4	8.9	8.6	7.8	6.6	5.5	4.5
Bachelor's Degree or Higher	2.7	2.5	2.2	2.7	3.6	4.3	3.8	3.2	3.3	3.2	2.5

Source: U.S. Census Bureau, American Community Survey 1-Year Estimates

Percent of the population age 25 to 64 with an associate degree or higher and unemployment rates in Tennessee counties are negatively correlated (-0.66 correlation).

In 2015, Lake County had the seventh highest unemployment rate and the lowest percent of population with an associate degree or higher credential. Hancock County had the highest unemployment rate and the ninth lowest percent with an associate degree or higher. Lauderdale County had the third highest unemployment rate and the sixth lowest percent with an associate degree or higher.

Davidson County had the second lowest unemployment rate and the third highest percent of population with an associate degree or higher. Knox County had the seventh lowest unemployment rate and the second highest percent with an associate degree or higher. Wilson County had the fourth lowest unemployment rate and the sixth highest percent with an associate degree or higher.



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Percent Age 25 to 64 with an Associate Degree or Higher); U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (2015 Unemployment Rate)

The relationship between educational attainment and unemployment can also be identified among filings for unemployment benefits. Tennessee workers with postsecondary education credentials, including certificates, comprise a smaller share of total claimants relative to their percentage of the total population. Tennesseans with an associate degree, vocational certificate or higher account make up 22.1 percent of total claimants in the state. Meanwhile this group comprises 35.9 percent of Tennessee's population in the labor force. In addition, 28.4 percent of Tennesseans in the labor force have a bachelor's degree or higher, but this segment of the population makes up less than 15 percent of those filing unemployment claims. Individuals with a high school degree and no postsecondary education experience comprise 41.5 percent of claimants but only 30.9 percent of Tennessee's labor force. These percentages exclude claimants with unknown education levels.

Unemployment Insurance Claimants by Highest Educational Attainment Level (2016, Tennessee)

Education Level	Total Claimants	% of Total Claimants	Population Age 16+ in Labor Force	% of Total Population Age 16 + in Labor Force
Less than 9th Grade	1,541	1.3%	74,453	2.3%
9-12th Grade	13,977	12.1%	221,108	6.9%
High School (includes Certificate of Attendance, GED and Equivalent)	47,835	41.5%	994,326	30.9%
Some College (includes Technical, Vocational and College)	23,533	20.4%	772,886	24.0%
Associate Degree or Vocational Certificate	8,765	7.6%	238,470	7.4%
Bachelor's Degree	12,534	10.9%	577,452	18.0%
Master's Degree	3,646	3.2%	238,838	7.4%
Doctorate and Specialized Degrees	570	0.5%	98,634	3.1%
Education Unknown	2,891	2.5%	--	--
Total Claimants	**115,292**	**100.0%**	**3,216,167**	**100.0%**

Sources: Tennessee Department of Labor and Workforce Development; U.S. Census Bureau, 2015 American Community Survey Public Use Microdata Sample (data retrieved using DataFerrett)

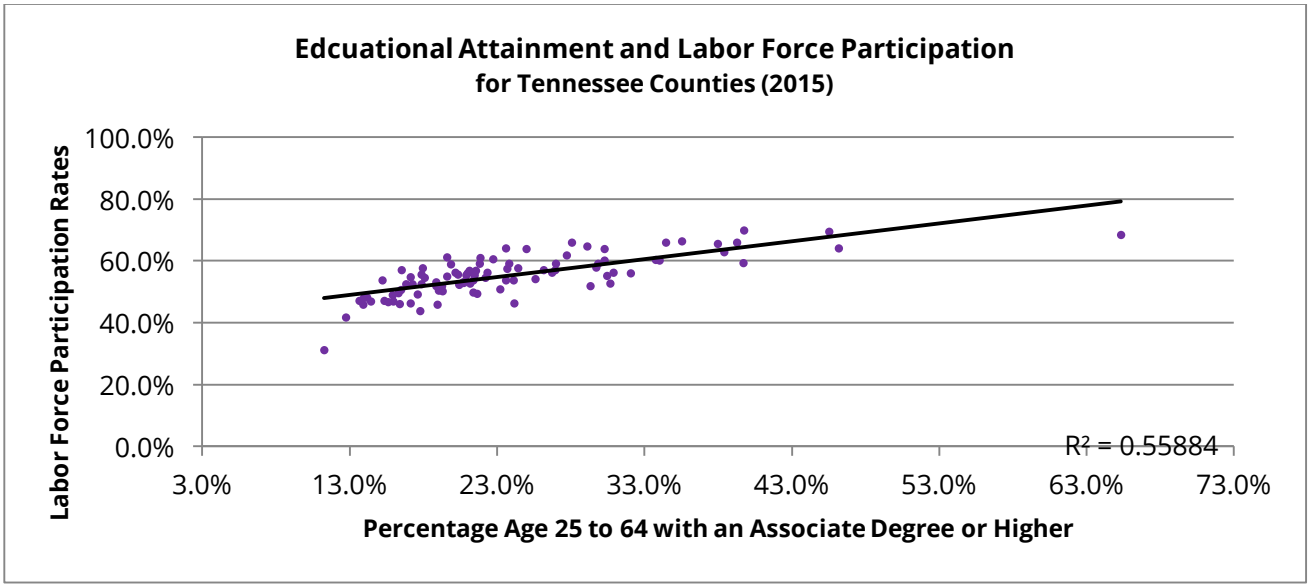
Educational Attainment and Labor Force Participation

Educational attainment of an associate degree or higher credential has a strong positive correlation to labor force participation in Tennessee counties (0.75 correlation).

In 2015, Rutherford County had the highest labor force participation rate and the fourth highest percent of population age 25 to 64 with an associate degree or higher. Montgomery County had the fourth highest labor force participation rate and the ninth highest percent age 25 to 64 with an associate degree or higher.

Lake County had the lowest percentage age 25 to 64 with an associate degree or higher and the lowest labor force participation rate. Morgan County had the second lowest percentage age 25 to 64

with an associate degree or higher and the second lowest labor force participation rate. Wayne County had the fourth lowest percentage age 25 to 64 with an associate degree or higher and the fourth lowest labor force participation rate.



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Educational Attainment and Labor Force Participation Rate)

Census data on the Tennessee population age 25 to 64 also demonstrate the relationship between educational attainment and workforce participation. During 2015, approximately 26 percent of Tennessee's population age 25 to 64 did not participate in the labor force. This rate has ranged from 23.2 percent to 26.2 percent during the last ten years. The percentage of population not in the labor force was twice as high for Tennessee residents with less than a high school degree (49.3 percent), and above average for high school graduates with no postsecondary experience (30.2 percent). The rate of non-participation is lower for the population with some college experience or an associate degree (22.4 percent) and for residents with a bachelor's or more advanced degree (14.4 percent).

Labor Force Participation by Educational Attainment for the Population Age 25 to 64 Years (2015, Tennessee)

	All Education Levels	Less than High School Graduate	High School Graduate or Equivalency	Some College or Associate Degree	Bachelor's Degree or Higher
Population	3,457,707	404,922	1,123,432	986,507	942,846
In labor force	2,562,310	205,286	784,388	765,299	807,337
Civilian	2,547,739	205,286	782,249	759,729	800,475
Armed Forces	14,571	0	2,139	5,570	6,862
Not in Labor Force	895,397	199,636	339,044	221,208	135,509
% Not in Labor Force	**25.9%**	**49.3%**	**30.2%**	**22.4%**	**14.4%**

Source: U.S. Census Bureau 2015 American Community Survey 1-Year Estimate

Percentage of Population Not in Labor Force by Educational Attainment for the Population Age 25 to 64 Years (Tennessee)

Education Level	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
All Education Levels	24.8	25.2	24.6	23.2	24.1	25.6	25.5	25.9	25.6	26.2	25.9
Less than High School Graduate	45	47	44.9	43.9	44.8	48.3	48.1	49.9	47.5	48.5	49.3
High School Graduate or Equivalency	25.8	26.9	26.4	25.5	26.8	29.1	28.8	29.4	29.7	30.8	30.2
Some College or Associate Degree	20.2	19.9	19.9	19.2	20.5	20.5	21.7	21.8	22	22.6	22.4
Bachelor's Degree or Higher	15.9	14.8	14.6	13.7	13.8	14.7	14.1	15	14.5	14.5	14.4

Source: U.S. Census Bureau, American Community Survey 1-Year Estimates

Educational Attainment and Median Household Income

There is a strong relationship between educational attainment and income. Where educational attainment is correlated with job creation, labor force participation, and low unemployment in a community—all factors which underlie employment and income-generation for individuals—it is not surprising that educational attainment is also correlated with median household income.

According to data from the U.S. Census Bureau, Tennessee's population age 25 years and older with less than a high school degree had median earnings of $20,461 in 2015. With each level of educational attainment, median earnings rise: $26,490 for high school graduates, $31,615 for individuals with some college or an associate degree, $45,600 for individuals with a bachelor's degree, and $56,896 for individuals with a graduate or professional degree.

Median Earnings by Educational Attainment for Population Age 25 Years and Over (2015, Tennessee)

Educational Attainment	Median Earnings in the Past 12 Months
Total	$32,406
Less than high school graduate	$20,461
High school graduate (includes equivalency)	$26,490
Some college or associate degree	$31,615
Bachelor's degree	$45,600
Graduate or professional degree	$56,896

Source: U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates

CERT builds on a large body of research identifying the relationship between education and income. The Pew Charitable Trusts found that nearly one-fifth of households have negative net worth. Lack of college education was a defining characteristic for this group.[14] In 2016, CERT and the Boyd Center for Business and Economic Research projected that achievement of 55 percent postsecondary attainment could generate an additional $9.3 billion in additional incomes in

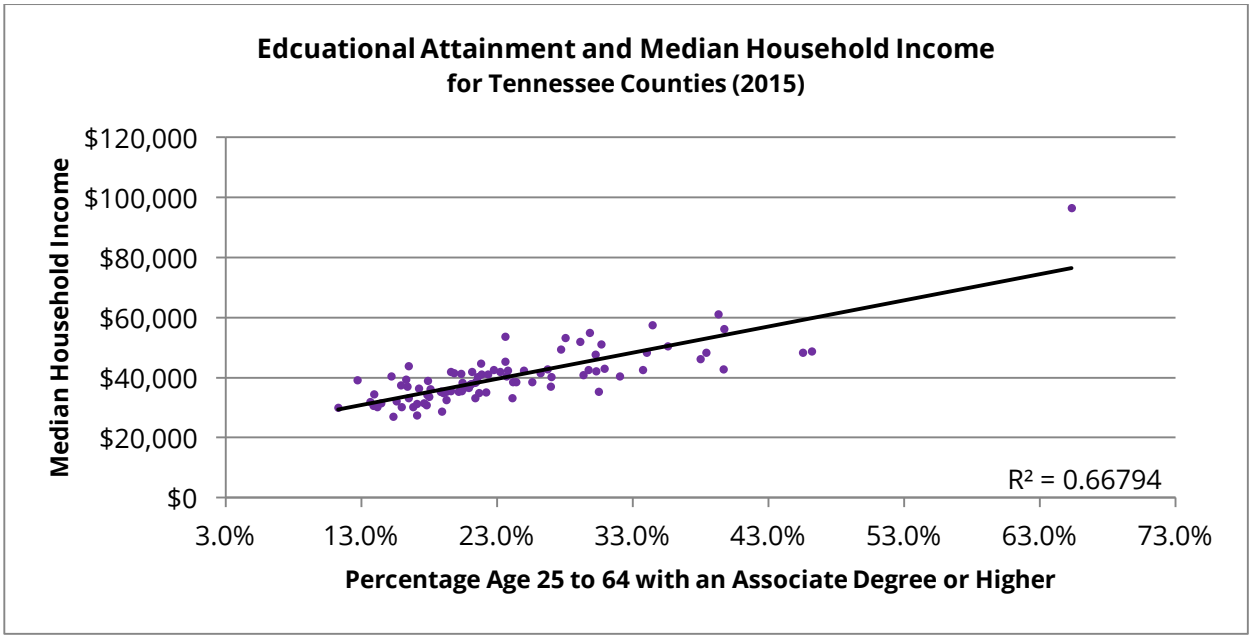
[14] Currier, Erin, and Sheida Elmi. "What Your Household Type Reveals About Your Financial Security." (April 7, 2016). The Pew Charitable Trusts. <http://www.pewtrusts.org/en/research-and-analysis/analysis/2016/04/07/what-your-household-type-reveals-about-your-financial-security>

Tennessee each year.[15] Despite rising costs of tuition and declining average wages of college graduates, the Federal Reserve Bank of New York concluded "the return to a college degree has held steady for more than a decade around 15 percent, easily surpassing the threshold for sound investment.[16] The analysis was conducted using four decades of data on college graduates with either a bachelor's degree or an associate degree.

CERT identified a very high positive correlation between educational attainment of an associate degree or higher and median household income in Tennessee counties (0.82 correlation).

In 2015, Wilson County had the second highest median household income and the sixth highest percentage of population age 25 to 64 with an associate degree or higher. Montgomery County had the ninth highest percentage age 25 to 64 with an associate degree or higher and the tenth highest median household income.

Lake County had the lowest percentage of population age 25 to 64 with an associate degree or higher and the fourth lowest median household income. Hancock County had the lowest median household income and the ninth lowest percentage of population age 25 to 64 with an associate degree or higher. Grundy County had the second lowest median household income and the 19th lowest percentage of population age 25 to 64 with an associate degree or higher.



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Median Household Income and Educational Attainment)

[15] "Economic Benefits of Postsecondary Credentials in Tennessee." The Center for Economic Research in Tennessee and the Boyd Center for Business and Economic Research. (February 2016). Accessible at <http://www.tnecd.com/research-and-data/publications/>

[16] Abel, Jason R., and Richard Deitz. "Do the Health Benefits of Cycling Outweigh the Risks?" *Current Issues in Economics and Finance* 20.3 (2014). Federal Reserve Bank of New York. <https://www.newyorkfed.org/medialibrary/media/research/current_issues/ci20-3.pdf>.

Over the last five years (2010 to 2015), eighty counties in Tennessee had an increase in the percentage of those ages 25 to 64 with an associate degree or higher.

In Moore County, the percent of population age 25 to 64 with an associate degree or higher increased from 14.3 percent in 2010 to 27.7 percent in 2015—the largest percentage point increase among Tennessee's 95 counties. Moore County's ranking increased by 57 (ranked 81st in 2010; ranked 24th in 2015). Median household income for renter-occupied housing units increased from $22,179 to $47,045—with an increase in ranking from 44th in 2010 to 2nd in 2015. Median household income for all housing units in Moore County increased from $44,433 in 2010 to $49,427.

In Dyer County, the percent of population age 25 to 64 with an Associate degree or higher increased from 22.1 percent in 2010 to 29.7 percent in 2015—the second largest percentage point increase in Tennessee. Dyer County's ranking increased by 11 (ranked 31st in 2010; ranked 20th in 2015). Median household income for renter-occupied housing units increased from $20,680 to $27,149—with an increase in ranking from 56th in 2010 to 21st in 2015. Median household income for all housing units in Dyer County increased from $36,856 in 2010 to $42,468.

In 2010, Van Buren County's median household income ranked 90th, and its median household income for renter-occupied housing units was 95th. In 2010, Van Buren also ranked 90th in percentage ages 25 to 64 with an Associate degree or higher. Van Buren's percentage ages 25 to 64 with an Associate degree or higher has increased from 12.4 percent in 2010 to 15.2 percent in 2015. Van Buren's median household income has increased from $29,087 in 2010 to $40,439 in 2015, with an increase in ranking from 90th to 39th. For renters, Van Buren's median household income has increased from $9,951 in 2010 to $23,438, with an increase in ranking from 95th to 41st.

Separations to Persistent Nonemployment by Educational Attainment[17]

During 2015 Q1, 4.7 percent (118,566) of Tennessee workers experienced separations to persistent nonemployment.[18] The occurrence of these separations has been declining each quarter since reaching a peak of 6.4 percent in 2009 Q1.

The percent of workers experiencing separations to persistent nonemployment varies by educational attainment level. The percent is highest for workers that do not have high school degrees—impacting 5.2 percent of Tennessee workers with no high school degree in 2015 Q1.[19] (*See Figure 2A*). In each quarter since 2012, between 5 and 6 percent of Tennessee workers with no high school degree have experienced job separations leading to persistent nonemployment. The percent was lower for workers with high school degrees but no college education (4.0 percent), workers with

[17] Source: Job-to-Job Flows Data (Beta) from the Longitudinal Employer-Household Dynamics (LEHD) program of the U.S. Census Bureau

[18] Since 2011, the number of separations to persistent nonemployment has remained around 120,000. Prior to the recession, in years 2003 through 2006, separations to persistent nonemployment were about 8 percent higher, hovering around 130,000. During the recession, this figure reached a high of 153,454 (2008 Q4).

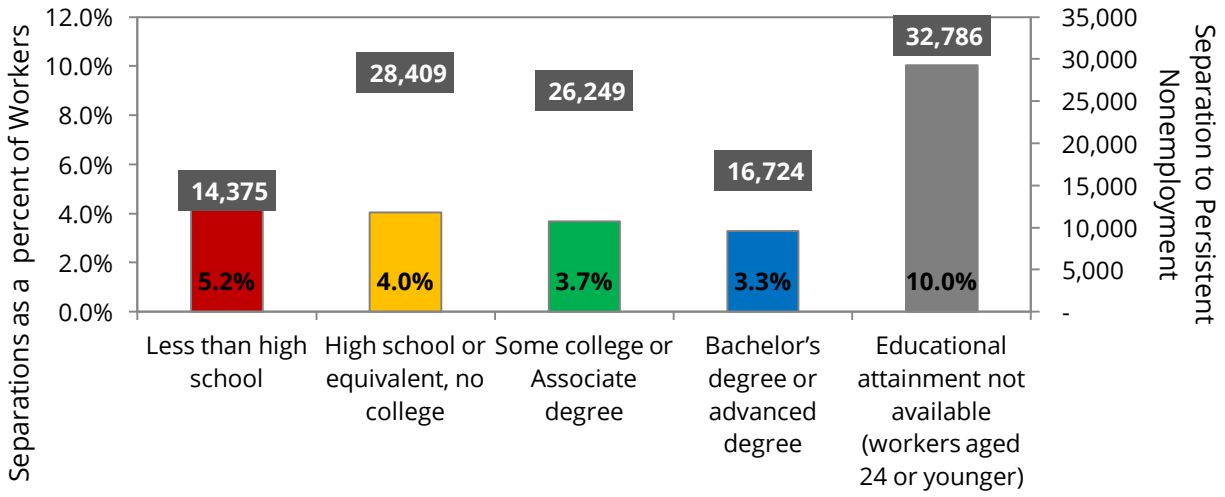
[19] The share of this workforce experiencing separations to persistent nonemployment each quarter has been declining since 2008, when it reached a peak of 5.5 percent.

some college or associate degrees (3.7 percent), and workers with bachelor's or advanced degrees (3.3 percent).[20]

Figure 2B outlines the share of separations leading to persistent nonemployment by educational attainment level in 2015 Q1. While there were slight changes in the years 2008 through 2010,[21] the proportions have remained relatively unchanged over the last decade and a half. (*See Figure 2C*).

During 2015 Q1, workers with no high school degree accounted for 12.1 percent of all separations to persistent nonemployment in Tennessee, and for 10.9 percent of the state's workforce at the beginning of the quarter. Workers with high school diplomas as their highest credential accounted for twice as many separations to persistent nonemployment (24.0 percent), but also nearly three times the workforce size (27.8 percent of Tennessee workers have a high school degree but no college education). Workers with some college or associate degrees accounted for 28.3 percent of the Tennessee workforce but only 22.1 percent of Tennessee's separations to persistent nonemployment. Lastly, workers with bachelor's or advanced degrees accounted for 20.1 percent of the state's workforce but only 14.1 percent of the separations to persistent nonemployment.

Figure 2A: Separations to Persistent Nonemployment as a Share of Workers (2015 Q1, Tennessee)



[20] In each quarter since 2002, 3 to 4 percent of Tennessee workers with bachelor's or advanced degrees experienced separations to persistent nonemployment.

[21] From 2008 through 2010, Tennesseans at every educational attainment level represented a growing share of separations leading to persistent nonemployment, except those with less than a high school degree (who have maintained a share of 12 percent since 2002). During this time period, individuals for which data was not available represented a declining share of separations leading to persistent nonemployment.

Figure 2B: Separations to Persistent Nonemployment by Educational Attainment (2015 Q1, Tennessee)

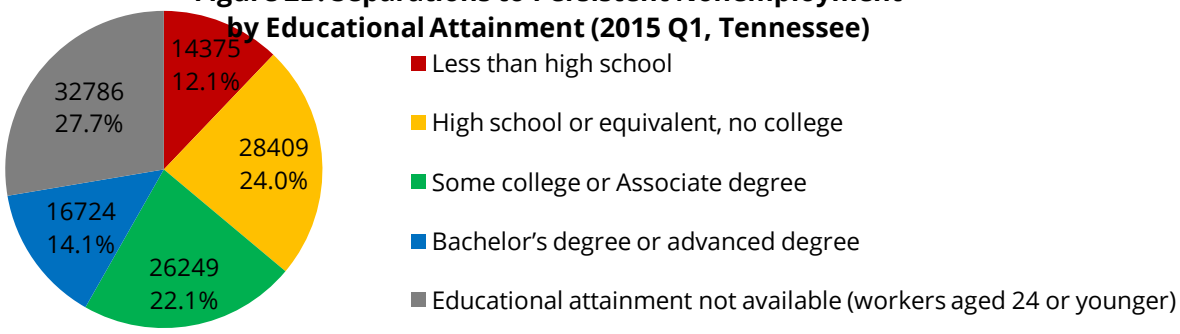
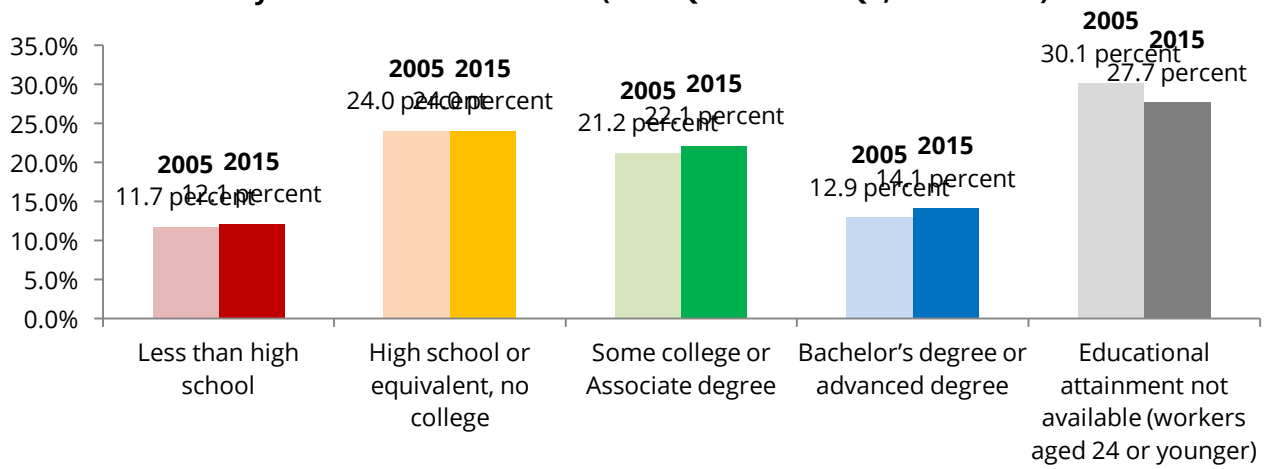


Figure 2C: Share of Separations to Persistent Nonemployment, by Educational Attainment (2005 Q1 and 2015 Q1, Tennessee)



PART III: ECONOMIC DEVELOPMENT & HEALTH

There are high correlations between a community's health and the strength of its economy.

The circuitry between health and economic development, among other topics, is studied in a recent report by the Center on Society and Health at Virginia Commonwealth University, *The Health of the States.* The report finds that health "correlates highly with the population's level of education, employment and income," supporting the idea of interconnectedness between economic circumstances, healthy behaviors and a person's access to a healthy environment. "Employment, education, and concentrated poverty remind policymakers that matters seemingly unrelated to health and medicine—such as job creation, economic development, transportation, the environment, and education—are integral to improving the health of the states."[22]

Many other research studies have identified relationships between economic gains and health improvements, and vice versa. A 2013 study identified both joblessness and smoking among white

[22] *The Health of the States: How U.S. States Compare in Health Status and the Factors that Shape Health*. Center on Society and Health, Virginia Commonwealth University. (October 2016). <http://www.societyhealth.vcu.edu/work/the-projects/the-health-of-the-states.html>

American women without high school degrees to have a strong relationship with declining life expectancy.[23] Author Jennifer Montez reported "there was some evidence that having a job offered intangible benefits that could improve health, including a sense of purpose and control in life, as well as providing networks that help to reduce social isolation."[24] Researchers at the Harvard School of Public found that "workers who lost a job through no fault of their own… were twice as likely to report developing a new ailment like high blood pressure, diabetes or heart disease over the next year and a half, compared to people who were continuously employed."[25]

The relationships of health to economic indicators such as employment and income have been widely studied around the world. An analysis of Chinese populations between 1990 and 2011 revealed that an unemployment rate decline of 1 percent has a short-run impact of 4 percent decline in mortality.[26] In Australia, prolonged financial stress in 2008 and 2009 was a predictor of subsequent obesity.[27] A study in Finland found that family economic distress during times of recession posed risks to child mental health.[28] Brenner and Mooney also reflect on a recession's threat to health, suggesting that recessions tend to generate poverty and an inability to meet basic needs, stress, and rising alcohol and drug use.[29]

Some research has alternatively found economic downturns to have a *favorable* impact on health. Utilizing longitudinal data for the 1972 to 1991 time period, Christopher Ruhm of the University of Virginia concluded temporary economic downturns have a strong relationship with health improvements—"a one percentage point rise in the state unemployment rate, relative to its historical average, is associated with a 0.5 to 0.6 percent decrease in total mortality, or a reduction of around 11,000 fatalities annually."[30] Ruhm also concluded "[a] one point drop in the percentage of the population employed is estimated to reduce the prevalence of smoking, obesity, physical inactivity and multiple health risks by 0.6, 0.4, 0.7 and 1.1 percent."[31] Others have found similar results. A study on the Great Recession's impact in the European Union identified an association

[23] Montez, Jennifer Karas and Zajacova, Anna. "Explaining the Widening Education Gap in Mortality among U.S. White Women." *Journal of Health and Social Behavior*, 54(2):165-181. (2013). <http://www.asanet.org/sites/default/files/savvy/journals/JHSB/Jun13JHSBFeature.pdf>

[24] Tavernise, Sabrina. "Joblessness Shortens Lifespan of Least Educated White Women, Research Says." *The New York Times*. (May 30, 2013). <http://www.nytimes.com/2013/05/30/health/joblessness-shortens-lifespan-of-least-educated-white-women-research-says.html?ref=health>

[25] Rabin, Roni Caryn. "Unemployment May Be Hazardous to Your Health." *The New York Times*. (May 8, 2009). <http://www.nytimes.com/2009/05/09/health/09sick.html>

[26] Wang Q. "The Effects of Unemployment Rate on Health Status of Chinese People." *Iran J Public Health* 44(1):28-35. (2015). <https://www.ncbi.nlm.nih.gov/pubmed/26060773>

[27] Siahpush, Mohammed; Huang, Terry T-K; Sikora, Asia; Tibbits, Melissa; Shaikh, Raees A.; and Singh, Gopal K. "Prolonged financial stress predicts subsequent obesity: Results from a prospective study of an Australian national sample." *Obesity*, 22(2): 616-621. (2014). <http://onlinelibrary.wiley.com/doi/10.1002/oby.20572/full>

[28] Solantaus T, Leinonen J, Punamaki RL. "Children's mental health in times of economic recession: replication and extension of the family economic stress model in Finland." *Dev Psychol* 40(3): 412-29. (2004). < https://www.ncbi.nlm.nih.gov/pubmed/15122967>

[29] Ruhm, Christopher J. "Are Recessions Good for your Health?" *Quarterly Journal of Economics* 115(2): 617-650. (2000). <https://libres.uncg.edu/ir/uncg/f/C_Ruhm_Are_2000.pdf>

[30] Ruhm, Christopher J. "Are Recessions Good for your Health?" *Quarterly Journal of Economics* 115(2): 617-650. (2000). <https://libres.uncg.edu/ir/uncg/f/C_Ruhm_Are_2000.pdf>

[31] Ruhm, Christopher J. "Healthy Living in Hard Times." *Journal of Health Economics* 24(2):341-63. (2005). <http://libres.uncg.edu/ir/uncg/f/C_Ruhm_Healthy_2005.pdf>

between increased unemployment and declines in overall mortality; declines in mortality resulting from cardiovascular diseases, liver diseases, motor vehicle accidents, parasitic infections; and increases in suicide.[32] Dr. Stephen Bezruchka of the University of Washington concluded that in rich countries, "mortality declines faster during recessions than during periods of economic growth." In poor countries, however, declines in unemployment have had positive impacts on health "by providing the means to meet essential needs such as food, clean water and shelter, as well access to basic health care services."[33]

CERT identified a county's health ranking had strong correlation to the prevalence of poverty and labor force participation. *County Health Rankings*, developed by the University of Wisconsin's Population Health Institute and the Robert Wood Johnson Foundation, ranks the health of counties across the nation according to 35 measures of health, each of which is standardized. A county's rank is based on the weighted sum of these measures. Low scores are indicative of good health; and high scores are indicative of poor health.

CERT also identified relationships between poverty and teen pregnancy, and between the number of poor or fair health days and unemployment.

Poverty and County Health Rankings

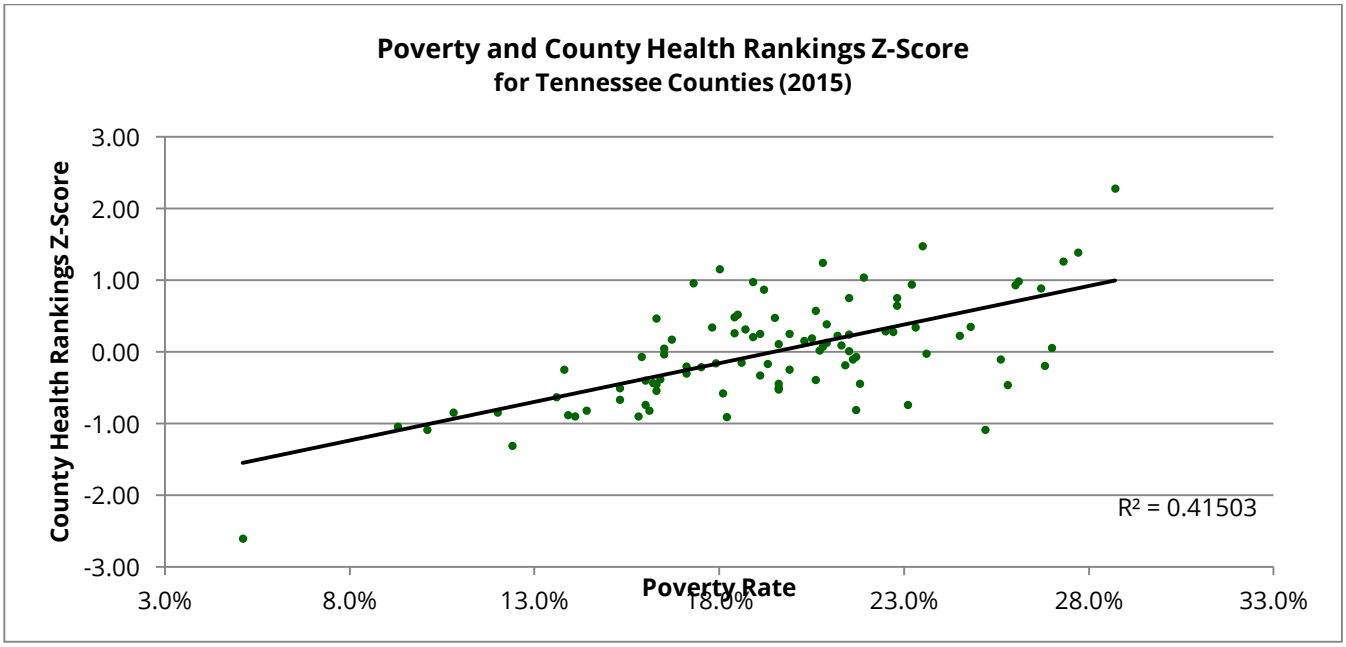
Poverty rates and County Health Ranking scores in Tennessee counties have a strong positive relationship (0.64 correlation).

High scores in the County Health Rankings index (indicative of poor health) are correlated with high poverty rates. In 2015, Grundy County had the highest poverty rate (28.7 percent) and the highest County Health Ranking score, making it the least healthy of Tennessee's 95 counties. Hancock County had the second highest poverty rate (27.7 percent) and the third highest County Health Ranking score. Scott County had the third highest poverty rate (27.3 percent) and the fourth highest County Health Ranking score.

Williamson County had the lowest poverty rate (5.1 percent) and the lowest County Health Ranking score, making it Tennessee's healthiest county. Sumner County had the second lowest poverty rate (9.3 percent) and was the state's fifth most healthy county according to its County Health Ranking score. Moore County had the fourth lowest poverty rate (10.8 percent) and was the state's 11th most healthy county.

[32] Toffolutti, Vernoica; Suhrcke, Marc. "Assessing the short term health impact of the Great Recession in the European Union: A cross-country panel analysis." *Preventive Medicine*, 64:54-62. (2014). <http://www.sciencedirect.com/science/article/pii/S0091743514001224>

[33] Bezruchka, Stephen. "The effects of economic recession on population health." *CMAJ*. 181(5): 281-285. (2009). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2734206/>



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Poverty Rate); County Health Rankings & Roadmaps 2015 Index Z-Score.

Labor Force Participation and County Health Rankings

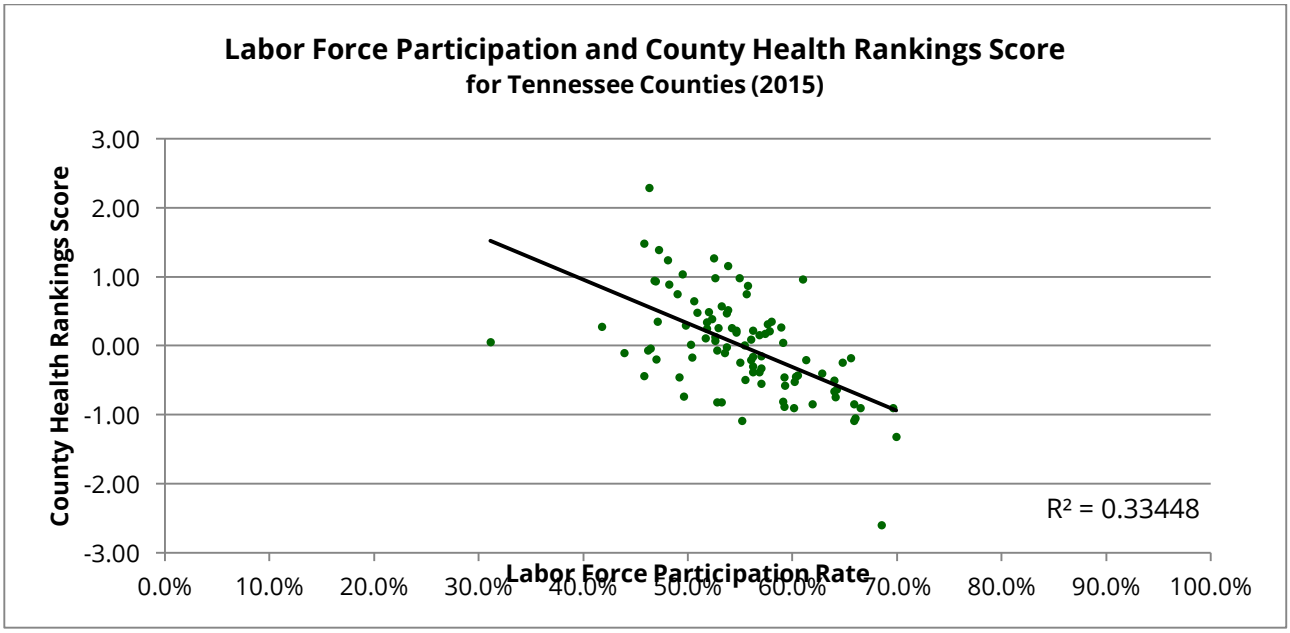
Labor force participation rates and County Health Ranking scores[34] in Tennessee are correlated (0.58 correlation), indicating counties with a healthier ranking are more likely to have a high labor force participation rate and vice versa.

In 2015, Rutherford County had the highest labor force participation rate and the second lowest County Health Ranking score, making it the second healthiest of Tennessee's 95 counties. Davidson County had the second highest labor force participation rate and the sixth healthiest County Health Ranking score in Tennessee. Williamson County had the third highest labor force participation rate and was Tennessee's healthiest county.

Clay County had the fourth lowest labor force participation rate in Tennessee (45.8 percent), and the second worst county health ranking score. Grundy County had the seventh lowest labor force participation rate (46.3 percent) and was Tennessee's most unhealthy county according to the County Health Rankings score.

Recent research by Princeton University's Alan Krueger also identified a relationship between health and labor force participation. In studying men ages 25 to 54 who are not participating in the labor force, Mr. Krueger reported "men outside the labor force frequently report both being unhappy and in physical pain, requiring regular pain medication."[35]

[34] Higher scores indicate a less healthy population.
[35] "Economists Who Advised Presidents From Both Parties Find Common Ground," Wall Street Journal. (January 7, 2017). http://www.wsj.com/articles/economists-who-advised-presidents-from-both-parties-find-common-ground-1483825325



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Labor Force Participation Rate); County Health Rankings & Roadmaps 2015 Index Z-Score.

Poverty and Teen Pregnancy

Children are a significant expense, regardless of parent age. According to data from the U.S. Department of Agriculture, the cost to raise a child born in 2013 from birth to an 18-year-old adult is $245,340 for a middle-income family with two parents and up to five children; the cost is $176,550 for low-income families and $407,820 for high-income families.[36] Another recent study highlights that having a child under age 5 influences a drop in income of $14,850 for households with two adults, and of $16,610 for single women.[37] These "declines in income, combined with an increased family size, are enough to throw many families into poverty." This threat is particularly heightened for teen parents, for whom often lower earnings and joblessness are more common.

Poverty and teen pregnancy in Tennessee's counties have a correlation of 0.59.

In 2014, Lake County had the highest rate of poverty and teen pregnancy of Tennessee's 95 counties. Grundy County had the second highest poverty rate and the eleventh highest teen pregnancy rate. Cocke County had the third highest poverty rate and the fifth highest teen pregnancy rate.

Williamson County had the lowest rate of poverty and the lowest teen pregnancy rate in 2014. Moore County had the third highest teen pregnancy rate and the fifth highest poverty rate. Fayette County had the eighth highest teen pregnancy rate and the tenth highest poverty rate.

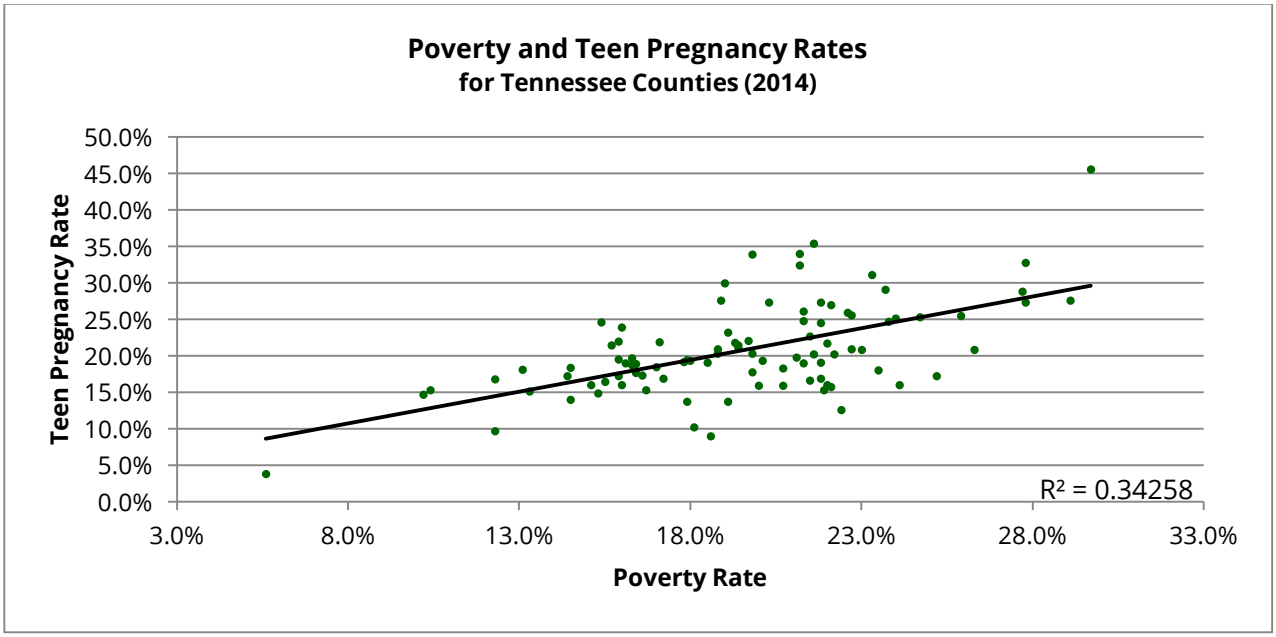
[36] Vo, Lam Thuy. "How Much Does It Cost to Raise a Child?" The Wall Street Journal 22 June 2016. <http://blogs.wsj.com/economics/2016/06/22/how-much-does-it-cost-to-raise-a-child/>

[37] Traub, Amy, Robert Hiltonsmith, and Tamara Draut. "The Parent Trap: The Economic Insecurity of Families with Young Children." *Demos*, 13 Dec. 2016. <http://www.demos.org/publication/parent-trap-economic-insecurity-families-young-children>.

The Centers for Disease Control and Prevention (CDC)[38] lists socioeconomic factors contributing to high teen birth rates, including "low education and low income levels of a teen's family." Additionally, "[t]eens in child welfare systems are at a higher risk of teen pregnancy and birth than other groups."

The CDC also lists a number of social and economic costs of teen pregnancy, including "costs to U.S. taxpayers for increased health care and foster care, increased incarceration rates among children of teen parents, and lost tax revenue because of lower educational attainment and income among teen mothers."

The National Conference of State Legislators (NCSL) also reports on the economic well-being of teen mothers and their children: "Teenage mothers are less likely to finish high school and are more likely to live in poverty, depend on public assistance, and be in poor health than slightly older mothers. Their children are more likely to suffer health and cognitive disadvantages, come in contact with the child welfare and correctional systems, live in poverty, drop out of high school and become teen parents themselves."[39]



Source: U.S. Census Bureau, 2014 American Community Survey 5-Year Estimates (Poverty Rate); Tennessee Department of Health (2014 Teen Pregnancy Rates)

Poor or Fair Health Days and Unemployment

Poor or fair health days and unemployment rates in Tennessee counties are positively correlated (0.69 correlation), indicating counties with high unemployment rates tend to have a high percent of poor or fair health days and vice versa.

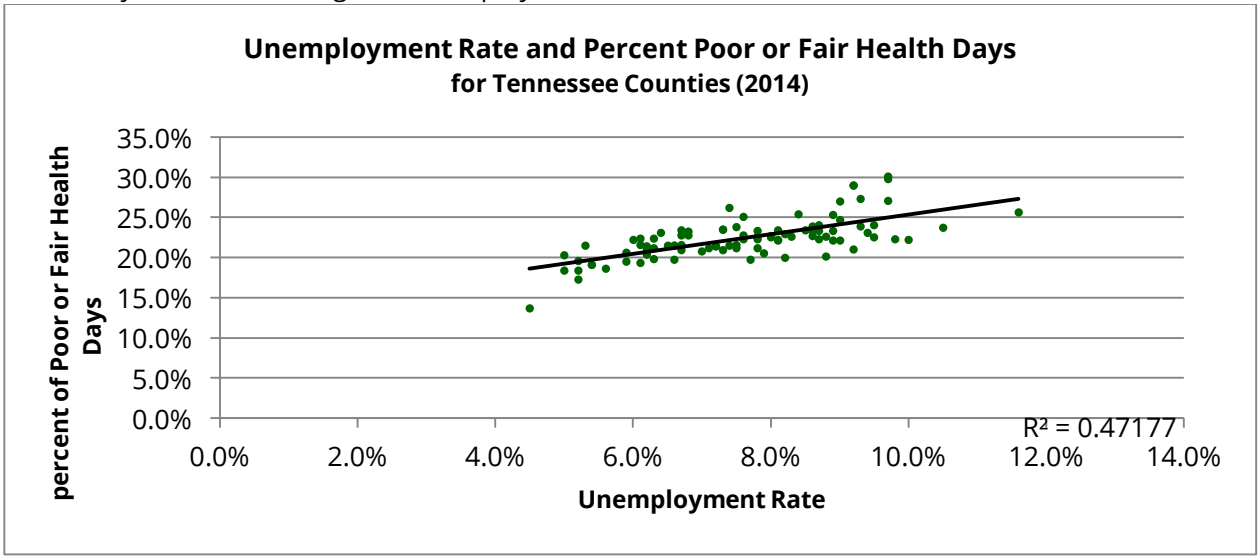
[38] "Teen Pregnancy in the United States," Centers for Disease Control and Prevention. <https://www.cdc.gov/teenpregnancy/about/>

[39] "Teen Pregnancy Prevention," National Conference of State Legislators. (April 29, 2016) <http://www.ncsl.org/research/health/teen-pregnancy-prevention.aspx>

The Behavioral Risk Factor Surveillance System (BRFSS) reports the number of poor or fair health days reported in a county.[40] Poor or fair health days are considered by the County Health Rankings project to be a health outcomes factor related to quality life.

In 2015, Williamson County had the lowest unemployment rate and the lowest percent of poor or fair health days. Wilson County had the second lowest percent of poor or fair health days and the sixth lowest unemployment rate. Robertson County had the fifth lowest percent of poor or fair health days and the tenth lowest unemployment rate.

Lauderdale County had the highest percent of poor or fair health days and the fifth highest unemployment rate. Hardeman County had the third highest percent of poor or fair health days and the 13th highest unemployment rate. Grundy County had the fifth highest percent of poor or fair health days and the 11th highest unemployment rate.



Source: U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics (2015 Unemployment Rate); 2016 County Health Rankings use of 2014 Behavioral Risk Factor Surveillance System data

[40] The BRFSS is a telephone survey of the noninstitutionalized population over 18 years old and living in households with a landline phone.

PART IV: EDUCATION & HEALTH

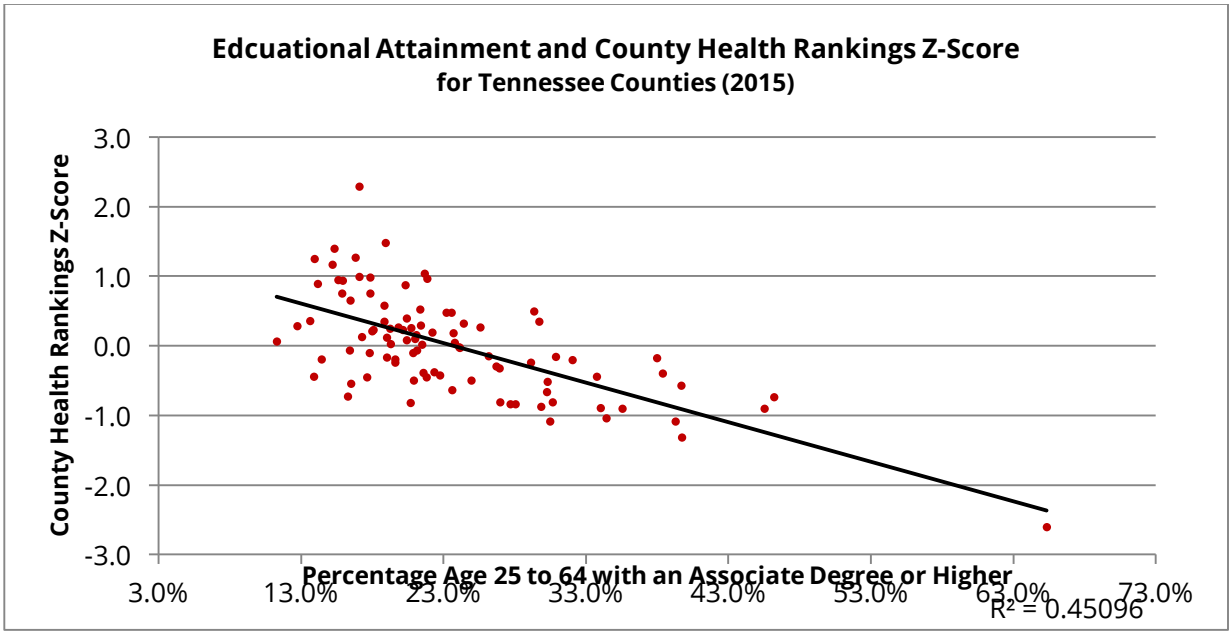
In speaking on the benefits of education, Janet Yellen commented that degrees lead to "a happier, healthier and longer life."[41]

CERT has identified correlations between education and various health indicators in Tennessee's counties.

Educational Attainment and County Health Rankings

Educational attainment of an associate degree and County Health Ranking scores[42] in Tennessee counties are negatively correlated (-0.67 correlation), indicating healthier counties have higher educational attainment and vice versa.

In 2015, Williamson County had the highest percentage of population age 25 to 64 with an associate degree or higher and the lowest County Health Ranking score, making it Tennessee's healthiest county. Knox County had the second highest percentage age 25 to 64 with an associate degree or higher and was the fifteenth healthiest county in Tennessee. Davidson County had the third highest percentage age 25 to 64 with an associate degree or higher and ranked the sixth healthiest county in the state. Rutherford County had the fourth highest percentage age 25 to 64 with an associate degree or higher and was the second healthiest county.



Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (Educational Attainment); County Health Rankings & Roadmaps 2015 Index Z-Score.

[41] "Yellen: Globalization Makes Higher Education Increasingly Important," Wall Street Journal. (December 19, 2016). http://www.wsj.com/articles/yellen-stresses-importance-of-higher-education-in-time-of-globalization-1482172255

[42] Lower z-scores indicate a healthier county than high z-scores.

Teen Pregnancy and Educational Attainment

Tennessee birth rates for adolescents aged 15 to 19 steadily declined from 53.8 per 1,000 teens in 2008 to 33.0 per 1,000 teens in 2014. Teen pregnancy rates also declined from 64.6 to 37.9 per 1,000 teens.

Teen pregnancy can have lasting economic effects on the mother and child. In Tennessee, females age 18 to 22 with children are less likely to have graduated from high school, limiting their educational attainment and in-turn limiting their lifetime earning potential. Over 17 percent of females age 18 to 22 with children in Tennessee had not completed high school in 2015, while approximately 14 percent of females in the same age range with no children had not completed high school.

High School Completion for Females Age 18 to 22 with and without Children (Tennessee, 2015)

	Total	Less than 12th grade - no diploma or equivalent		High school diploma or equivalent or higher	
Females age 18 to 22 with children	30,644	5,279	17.2%	25,365	82.8%
Females age 18 to 22 without children	164,184	22,813	13.9%	141,371	86.1%

Source: U.S. Census Bureau, 2015 American Community Survey 5-Year Estimates (data retrieved using DataFerrett)

Pregnancy during high school or college can alter educational paths. In 2014, only 24 percent of Tennessee females age 17 to 21 that had a child in the last year were attending school at any level. Seventy-one percent of females in the same age range that had not had a child in the last year were attending school at some level.

School Attendance for Females Age 17 to 21 with and without Children (Tennessee, 2014)

	17 years		18 years		19 years		20 years		21 years		17 to 21 years	
Had a child in the last year?	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Female Population	1,030	39,950	1,477	41,586	2,696	38,867	4,170	42,634	3,714	41,304	13,087	204,341
Attending School	84%	96%	39%	81%	18%	69%	21%	59%	10%	52%	24%	71%
Not Attending School	16%	4%	61%	19%	82%	31%	79%	41%	90%	48%	76%	29%

Source: U.S. Census Bureau, 2014 American Community Survey (data retrieved using DataFerrett)

The CDC reports that women giving birth during adolescence are much less likely to graduate from high school. "Only about 50 percent of teen mothers receive a high school diploma by 22 years of age, whereas approximately 90 percent of women who do not give birth during adolescence graduate from high school."[43] Additionally, "[t]he children of teenage mothers are more likely to have lower school achievement and to drop out of high school, have more health problems, be incarcerated at some time during adolescence, give birth as a teenager, and face unemployment as a young adult."

[43] "Teen Pregnancy in the United States." Centers for Disease Control and Prevention. (April 2016). <https://www.cdc.gov/teenpregnancy/about/>

PART V: AGE DEMOGRAPHICS OF TENNESSEE'S UNEMPLOYED POPULATION

Throughout this report, CERT has identified relationships of high unemployment rates to low median household income, poor health and low educational attainment. Specifically, unemployment rates in Tennessee counties have a strong correlation with private sector job growth, median household income, labor force participation, poverty, educational attainment, and poor or fair health days in Tennessee counties. In this section, CERT provides age demographic trends among Tennessee's unemployed population and labor force participation.

Tennessee's unemployment rate in 2015 was 5.7 percent. The rate of unemployment was lowest for the segment of Tennessee's population over 45 years of age—at 3.9 percent for ages 45 to 54, 3.4 percent for ages 55 to 64, and 3.6 percent for ages 65 and older. This has been the trend over the last decade, with the exception of 2011 when Tennessee's population age 35 to 44 had the lowest unemployment rate. Labor force participation varies greatly across these age groups: 74.7 percent for ages 45 to 54, 59.4 percent for ages 55 to 64, and 16.3 percent for ages 65 and older. As the population ages and the baby boomer generation retires, labor force participation rates will continue to decline.

While there have been a growing number of retirements as the baby boomer generation ages, Tennessee has simultaneously experienced an increased number of elderly workers. From 2005 Q1 to 2015 Q1, employment of individuals aged 55 to 64 increased 38.1 percent, and employment of individuals aged 65 and above increased 65.1 percent. In comparison, employment of individuals ages 25 to 34, 35 to 44, and 45 to 54 has changed relatively little, ranging from -5 percent to 5 percent change over the same time period.[44] Nationally, employment as a percentage of population for baby boomers age 55 to 64 in October 2016 (62.2 percent) was not far from a high of 62.8 percent in 2008.[45] A recent *Wall Street Journal* article emphasizes growing labor force participation among the nation's population over age 54, and also reports that the share of entrepreneurs in this age group opening businesses increased from 14.8 percent in 1996 to 24.3 percent in 2015.[46]

The rate of unemployment was just below the state average for Tennesseans age 25 to 34 (5.1 percent) and age 35 to 44 (5.4 percent) in 2015. These two age groups also had the highest labor force participation rates: 78.8 percent of Tennessee's population between the ages of 25 and 34 were participating in the labor force, and 78.5 percent of those age 35 to 44 were participating in the

[44] CERT analysis of Job-to-Job Flows Data (Beta) from the Longitudinal Employer-Household Dynamics (LEHD) program of the U.S. Census Bureau

[45] Russolillo, Steven. "Baby Boomers vs. Millennials: The Uneven Jobs Recovery." The Wall Street Journal. December 1, 2016. <http://www.wsj.com/articles/baby-boomers-vs-millennials-the-uneven-jobs-recovery-1480624537>

[46] Tergesen, Anne. "Five Myths About Landing a Good Job Later in Life." *The Wall Street Journal*. November 29, 2016. <http://www.wsj.com/articles/five-myths-about-landing-a-good-job-later-in-life-1480302842>

labor force. The 2016 Economic Report of the President emphasizes the labor force participation challenge is amplified by retirements as well as by workers age 25 to 54.[47]

The population age 16 to 19 has consistently maintained the highest unemployment rate over the last ten years (19.9 percent in 2015), followed by the population age 20 to 24 (10.0 percent in 2015). The participation rate is low for Tennessee's population age 16 to 19, with only 38.4 percent of this demographic either employed or looking for work during 2015. Students enrolled in school who are not simultaneously working or seeking employment drive down the participation rate for this age group. For ages 20 to 24, the participation rate in 2015 was 75.4 percent.

Nationally, employment as a percentage of population for millennials age 25 to 34 (77.5 percent in October 2016) has been rising over the last five years, however the ratio is far from recovery to its high of 82.3 percent in 2000.[48] The same is true for millennials age 16 to 24, which had a 49.2 percent employment-to-population ratio in October 2016, a high of 62.1 percent in 1989 and a low of 44.6 percent in 2010.

Unemployment Rate by Age (Tennessee)

Age	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total, 16 to 19 years	12.7	17.0	25.9	28.5	26.3	28.8	20.4	31.9	19.3	19.9
Total, 20 to 24 years	8.3	8.9	10.8	18.7	15.6	18.3	10.6	13.6	12.6	10.0
Total, 25 to 34 years	5.7	5.0	6.9	11.9	10.6	10.4	9.8	8.2	7.7	5.1
Total, 35 to 44 years	4.6	3.8	6.2	9.8	8.0	5.8	7.6	6.5	4.8	5.4
Total, 45 to 54 years	3.2	2.7	3.2	6.4	7.5	7.2	6.2	5.3	4.7	3.9
Total, 55 to 64 years	3.7	2.7	4.2	7.3	5.9	6.2	4.3	4.7	4.5	3.4
Total, 65 years and over	3.2	1.9	4.8	9.4	4.0	7.8	2.6	4.7	2.1	3.6

Source: Bureau of Labor Statistics, Current Population Survey

Men had higher labor force participation rates than women in every age group during 2015, except among the ages of 16 to 19.

Labor Force Estimates by Age (2015, Tennessee)

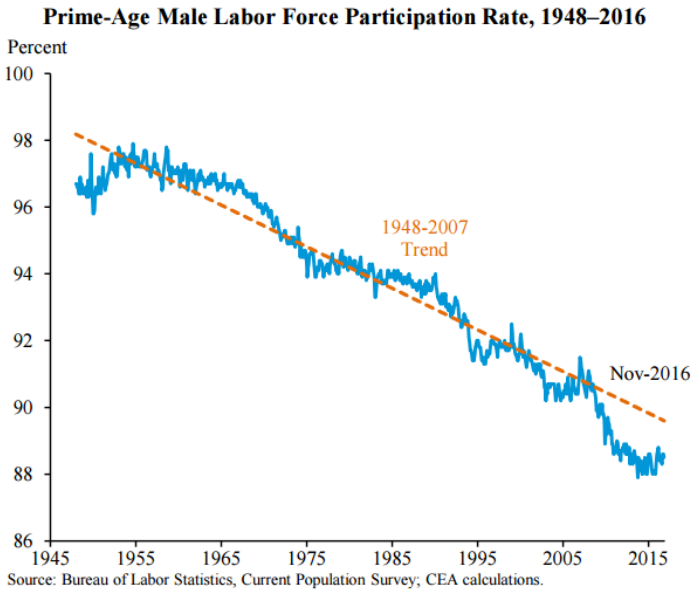
	Labor Force (000s)	Labor Force Participation Rate (%)	Unemployment (000s)	Unemployment Rate (%)
Total	3,088	59.7	175	5.7
By Age				
Total, 16 to 19	121	38.4	24	19.9
Total, 20 to 24	332	75.4	33	10.0

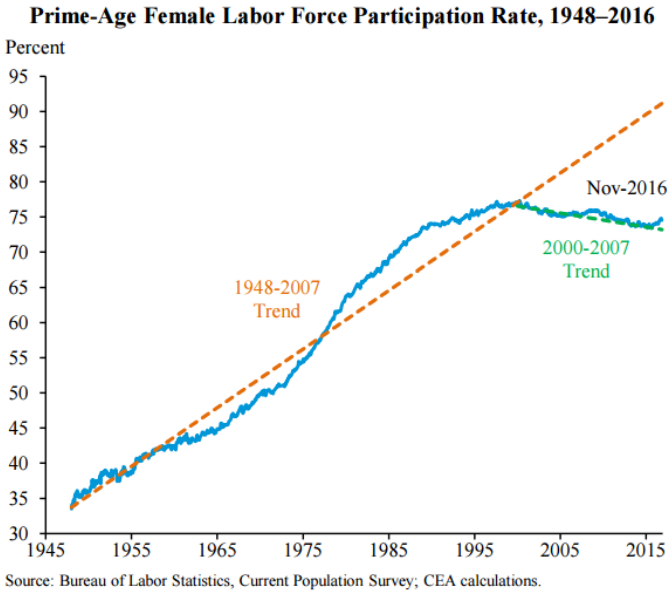
[47] Timiraos, Nick. "White House Economists Spell Out the Four Most Stubborn Economic Challenges." *The Wall Street Journal*. (December 15, 2016). <http://blogs.wsj.com/economics/2016/12/15/white-house-economists-spell-out-the-four-most-stubborn-economic-challenges/>

[48] Russolillo, Steven. "Baby Boomers vs. Millennials: The Uneven Jobs Recovery." The Wall Street Journal. December 1, 2016. <http://www.wsj.com/articles/baby-boomers-vs-millennials-the-uneven-jobs-recovery-1480624537>

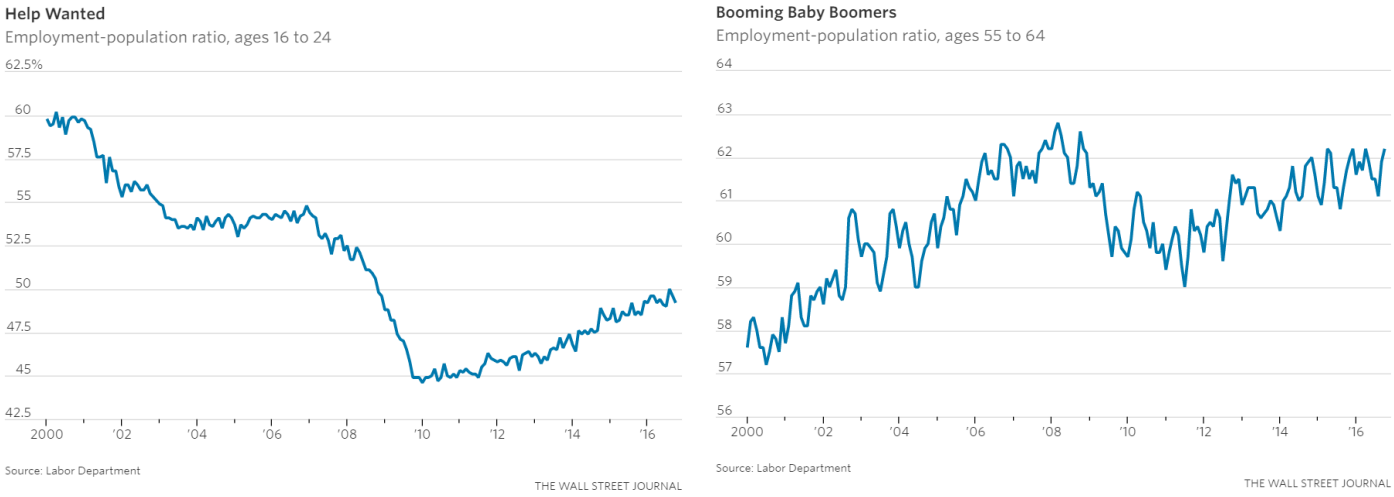
	Labor Force (000s)	Labor Force Participation Rate (%)	Unemployment (000s)	Unemployment Rate (%)
Total, 25 to 34	723	78.8	37	5.1
Total, 35 to 44	611	78.5	33	5.4
Total, 45 to 54	636	74.7	25	3.9
Total, 55 to 64	497	59.4	17	3.4
Total, 65 and over	168	16.3	6	3.6
By Age and Gender				
Men, 16 to 19	66	37.5	15	22.5
Men, 20 to 24	170	80.8	16	9.5
Men, 25 to 34	390	89.4	17	4.4
Men, 35 to 44	335	88.2	18	5.5
Men, 45 to 54	339	82.7	13	3.8
Men, 55 to 64	272	66.0	9	3.5
Men, 65 and over	90	19.9	2	2.7
Women, 16 to 19	56	39.6	9	16.9
Women, 20 to 24	163	70.6	17	10.5
Women, 25 to 34	334	69.1	20	6.0
Women, 35 to 44	276	69.2	15	5.3
Women, 45 to 54	297	67.3	12	4
Women, 55 to 64	225	53	8	3.4
Women, 65 and over	79	13.6	4	4.6

Source: Bureau of Labor Statistics, Current Population Survey





Source: Korn, Melissa. "College Enrollment Drops 1.4% as Adults Head Back to Work." *The Wall Street Journal*. (December 19, 2016). <http://www.wsj.com/articles/college-enrollment-drops-1-4-as-adults-head-back-to-work-1482123660>



Source: Russolillo, Steven. "Baby Boomers vs. Millennials: The Uneven Jobs Recovery." The Wall Street Journal. December 1, 2016. <http://www.wsj.com/articles/baby-boomers-vs-millennials-the-uneven-jobs-recovery-1480624537>

Over 115,000 Tennesseans are currently claiming Unemployment Insurance benefits in the state. Approximately 70 percent of the claimants are between the ages of 26 and 55. The age group that consists of the largest share of claimants are between ages 26 and 35, with the numbers nearly identical for ages 36 to 45 and 46 to 55. Tennesseans aged 25 and under comprise 10.7 percent of all claimants in the state with 12,300 seeking benefits. Those aged 26 to 35 comprise slightly elevated percentage of unemployment claims in Tennessee (24.6 percent) in comparison to their age group as a percentage of the population in the labor force (21.5 percent).

Unemployment Insurance Claimants by Age (2016, Tennessee)

Age Group	Total Claimants	% of Total Claimants	Population in Labor Force	% of Total Population in Labor Force
18 and under	97	0.1%	84,421	2.6%
19-25	12,249	10.6%	468,880	14.6%
26-35	28,349	24.6%	690,230	21.5%
36-45	25,852	22.4%	679,075	21.1%
46-55	25,870	22.4%	679,047	21.1%
56-65	18,063	15.7%	472,840	14.7%
66-75	4,150	3.6%	121,676	3.8%
75 and over	678	0.6%	19,998	0.6%
Age Unknown	19	0.0%		
Total Claimants	**115,327**	**100.0%**	3,216,167	100.0%

Source: Tennessee Department of Labor and Workforce Development; U.S. Census Bureau, 2015 American Community Survey Public Use Microdata Sample (data retrieved using DataFerrett)

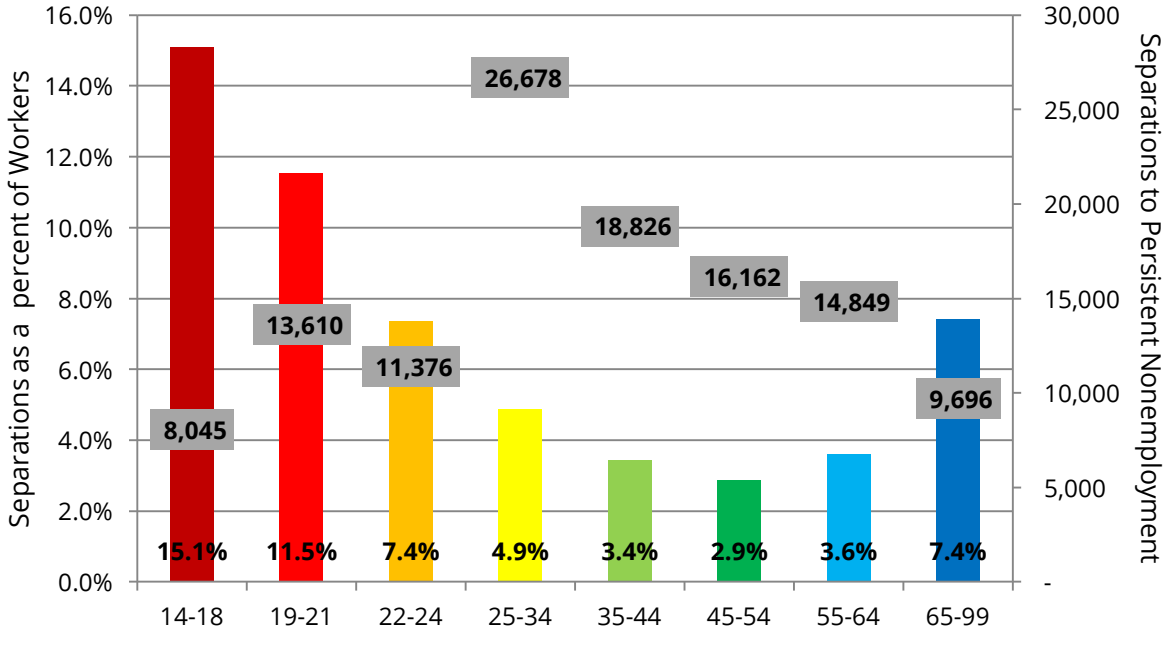
Job Separations Leading to Persistent Nonemployment, by Age[49]

During 2015 Q1, there were 118,566 job separations leading to persistent nonemployment in Tennessee, representing 4.7 percent of workers in the state.[50] The percent varies by age. It is important to understand that job separations can be voluntary (as with exits from the workforce to pursue additional education or retirement) or involuntary (as with fires and layoffs).

The percent of workers experiencing separations to persistent nonemployment was greatest for workers age 14 to 18 (15.1 percent), followed by workers age 19 to 21 (11.5 percent) an age 22 to 24 (7.4 percent). (*See Figure 5A*). Approximately 5 percent of workers age 25 to 34 in Tennessee experience separations to persistent nonemployment each quarter. Workers age 35 to 44 and age 45 to 54 have a lower prevalence of separations to persistent nonemployment each quarter (3.4 percent and 2.9 percent, respectively).

At age 55 there is a turning point in the decline. Separations as a percent of workers rose to 3.6 percent for Tennessee workers between the ages of 55 and 64, and to 7.4 percent for workers age 65 and above.

Figure 5A: Separations to Persistent Nonemployment as a Share of Workers (2015 Q1, Tennessee)



[49] Source: Job-to-Job Flows Data (Beta) from the Longitudinal Employer-Household Dynamics (LEHD) program of the U.S. Census Bureau

[50] A separation leading to persistent nonemployment is characterized by an employee who separates from one firm, and still has not regained employment at any firm by the last day of the subsequent quarter. The old job must be the primary source of income for the worker. Separations to persistent nonemployment differ from job-to-job moves. In the latter case, an employee has little-to-no observed nonemployment between jobs.

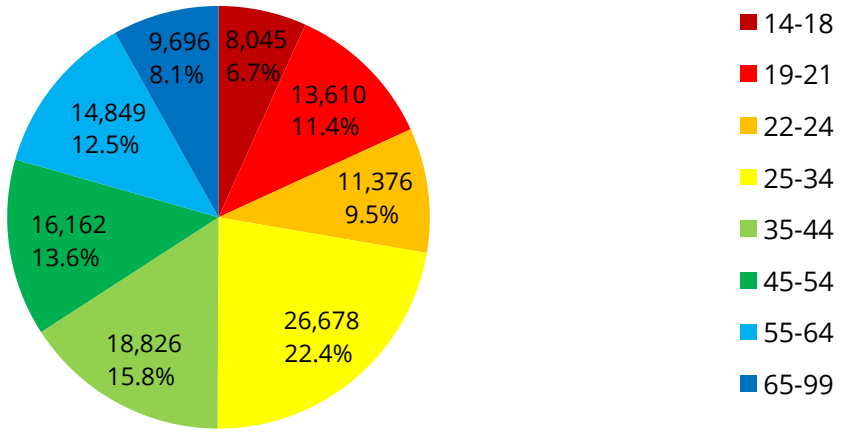
Figure 5B outlines the share of job separations leading to nonemployment in Tennessee by age in 2015 Q1, and change over time is reflected in Figure 5C. Workers age 14 to 24 accounted for 27.9 percent of job separations to nonemployment in the state in 2015 Q1. This is a very high share relative to the age group's share of total employment (12.9 percent).

Tennessee workers age 25 to 34 accounted for 21.6 percent of employment and 22.4 percent of separations to nonemployment.

Workers age 35 to 44 and age 45 to 54 accounted for 15.8 percent and 13.6 percent of separations to nonemployment in Tennessee. The prevalence of separations to nonemployment is low relative to these workers' share of total employment (approximately 22 percent for each age group). Over the last 10 years, workers in these two age groups have accounted for a declining share of the state's total separations to nonemployment, with significant shifts occurring since 2010.

Tennessee workers age 55 to 64 accounted for 16.4 percent of employment but only 12.5 percent of separations. Workers age 65 and above accounted for 5.2 percent of employment but a relatively higher share of the state's separations to nonemployment (8.2 percent). These two age groups have accounted for a growing share of both Tennessee's employment level and of Tennessee's separations to nonemployment in the last 10 years.

Figure 5B: Separations to Persistent Nonemployment by Age (2015 Q1, Tennessee)



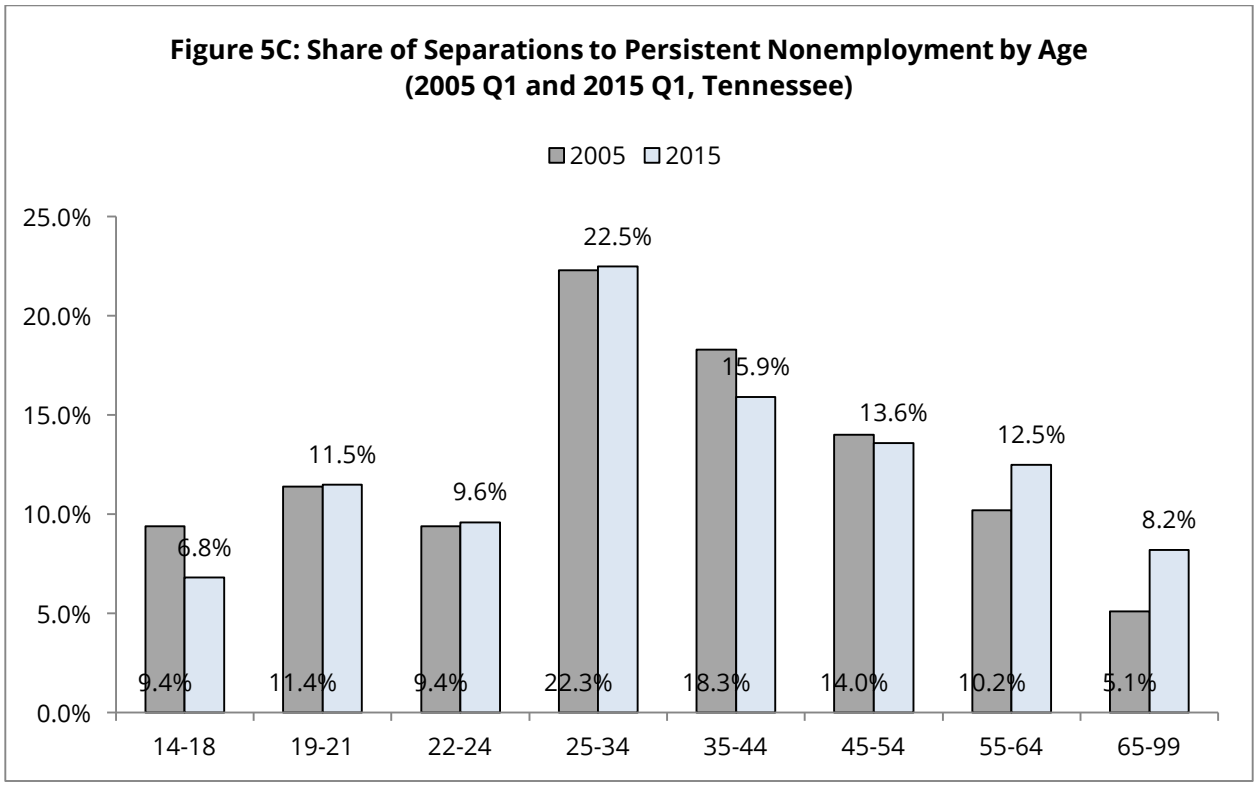


Figure 5C: Share of Separations to Persistent Nonemployment by Age
(2005 Q1 and 2015 Q1, Tennessee)
2005
2015
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
9.4%
6.8%
11.4%
11.5%
9.4%
9.6%
22.3%
22.5%
18.3%
15.9%
14.0%
13.6%
10.2%
12.5%
5.1%
8.2%
14-18
19-21
22-24
25-34
35-44
45-54
55-64
65-99

PART VI: RACE AND ETHNICITY OF TENNESSEE'S UNEMPLOYED POPULATION

Tennessee's unemployment rate was 5.7 percent in 2015, but varies widely by race and ethnicity. African Americans had the highest unemployment rate, at 7.5 percent. The unemployment rate was lower than the state average for the white (5.1 percent) and Hispanic or Latino (4.0 percent) demographics in Tennessee. 124,000 of unemployed Tennesseans were white; 40,000 were African American; and 7,000 were Hispanic or Latino in 2015.

There have been recent favorable labor force trends among Tennessee's Hispanic and Latino population. Among the three race and ethnicity groups for which data is available, Hispanic or Latinos had the highest labor force participation rate, with 69.3 percent of the Hispanic or Latino civilian population engaged in the labor force. The participation rate is particularly high for Hispanic or Latino men (83.4 percent). Hispanics accounted for 5.47 percent of the state's labor force in 2015, however only 2.6 percent of the 115,000 individuals currently claiming Unemployment Insurance benefits in the state. Pew Research Center reported on improvements in income, poverty and jobs during 2015 for Latinos nationwide.[51] Additionally, *The Business Journals* predicts 2017 will be "the year of the Latino entrepreneur," with "the Hispanic-owned business growth rate (40 percent+) [that] is three times the national average" according to a 2015 report.[52]

63.7 percent of Tennessee's African American population was participating in the labor force in 2015, the second highest participation rate. The participation rate was higher for African American men (66.0 percent) than it was for African American women (61.8 percent). African American women did however have higher labor force participation rates than white females (50.9 percent) and Hispanic or Latino females (52.1 percent) in 2015.

Among Tennessee's white population age 16 and older, 59.7 percent participated in the labor force in 2015—a low rate relative to the participation rates of other demographics. The labor force participation rate of white men (67.1 percent) was greater than the participation rate of white women (50.9 percent) in 2015.

Labor Force Estimates by Race or Ethnicity and Gender (2015, Tennessee)

	Labor Force (000s)	Labor Force as a Percent of Population (percent)	Unemployment (000s)	Unemployment Rate (percent)
Total	3,088	59.7	175	5.7
By Race or Ethnicity				
White	2,439	58.8	124	5.1

[51] Krogstad, Jens Manuel and Flores, Antonio. "Latinos Made Economic Strides in 2015 After Years of Few Gains." Pew Research Center. (November 21, 2016). <http://www.pewresearch.org/fact-tank/2016/11/21/latinos-made-economic-strides-in-2015-after-years-of-no-gains/>

[52] "2017 Predictions for Small and Mid-Size Businesses." *The Business Journals*. (January 2017). <http://go.bizjournals.com/smbinsights/2017predictions>

	Labor Force (000s)	Labor Force as a Percent of Population (percent)	Unemployment (000s)	Unemployment Rate (percent)
Black or African American	531	63.7	40	7.5
Hispanic or Latino ethnicity	169	69.3	7	4
By Race or Ethnicity and Gender				
White	2,439	58.8	124	5.1
White, men	1,351	67.1	67	5
White, women	1,088	50.9	57	5.2
Black or African American	531	63.7	40	7.5
Black or African American, men	247	66	18	7.1
Black or African American, women	284	61.8	23	8
Hispanic or Latino ethnicity	169	69.3	7	4
Hispanic or Latino ethnicity, men	112	83.4	4	3.7
Hispanic or Latino ethnicity, women	57	52.1	3	4.5

Source: Bureau of Labor Statistics, Current Population Survey

Unemployment Rate by Race and Ethnicity (Tennessee)

Race	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
White	4.3	3.8	5.8	9.7	8.3	7.9	6.8	6.6	5.5	5.1
Black or African American	10.0	8.4	10.7	15.9	14.6	14.9	13.1	15.0	11.5	7.5
Asian	Not Avl.	Not Avl.	3.4	6.8	6.1	5.9	2.9	1.9	3.1	Not Avl.
Hispanic or Latino Ethnicity	3.5	3.5	8.0	17.4	8.5	10.6	5.5	8.0	4.4	4.0

Source: Bureau of Labor Statistics, Current Population Survey

Unemployment Insurance Claimants, Hispanic/Non-Hispanic (2016, Tennessee)

Gender	Total Claimants	percent of Total Claimants
Hispanic	2,991	2.6 percent
Non-Hispanic	109,711	95.1 percent
Information Not Provided	2,607	2.3 percent
Total Claimants	**115,309**	**100.0 percent**

Source: Tennessee Department of Labor and Workforce Development

Job Separations to Persistent Nonemployment, by Race and Hispanic or Latino Ethnicity[53]

Approximately 78 percent of job separations to persistent nonemployment occur among the state's white population demographic, and 20 percent occur among the African American demographic.

[53] Source: Job-to-Job Flows Data (Beta) from the Longitudinal Employer-Household Dynamics (LEHD) program of the U.S. Census Bureau

The remaining 4 percent of separations to persistent nonemployment occur among American Indians or Alaska Natives (0.6 percent), Asians (1.6 percent), Native Hawaiians or Other Pacific Islanders (0.1 percent), or among workers reporting two or more races (1.4 percent). (*See Figure 6A*). This data mirrors the share of total employment for each demographic: 80 percent of workers employed in Tennessee are white, 17 percent are African American, and 3 percent are either American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, or among workers reporting two or more races. (*See Figure 6B*).

Figure 6A: Separations to Persistent Nonemployment by Race (2015 Q1, Tennessee)

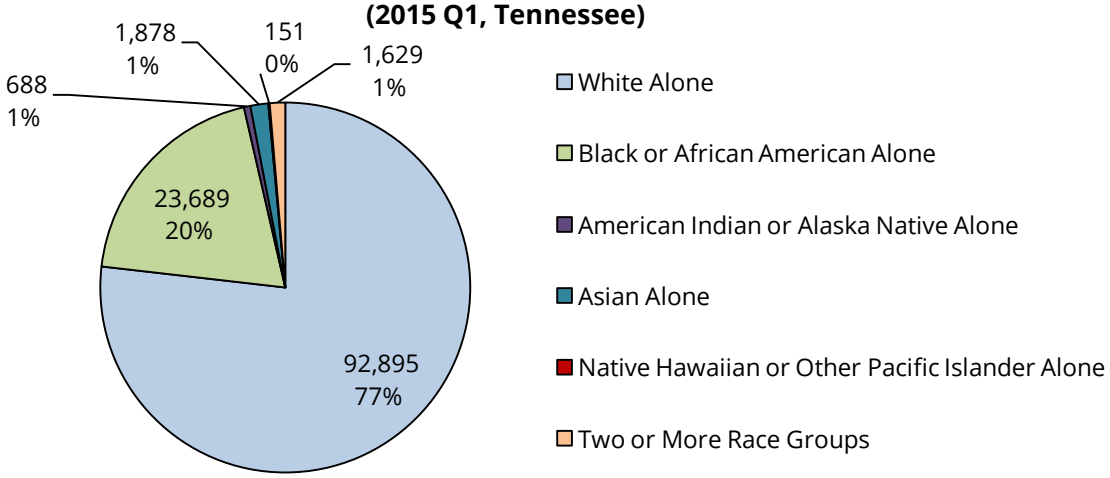
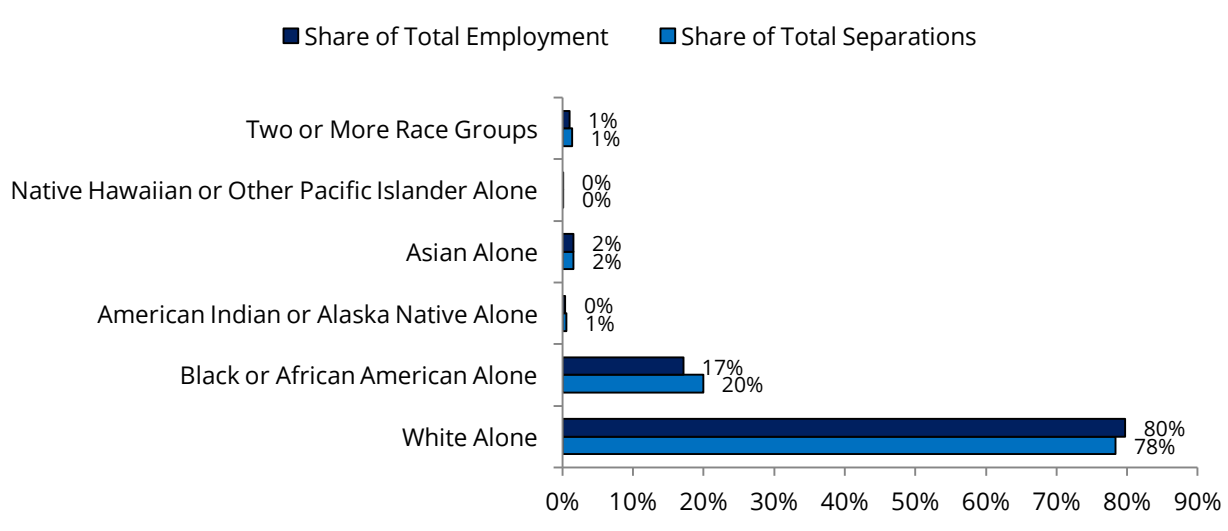


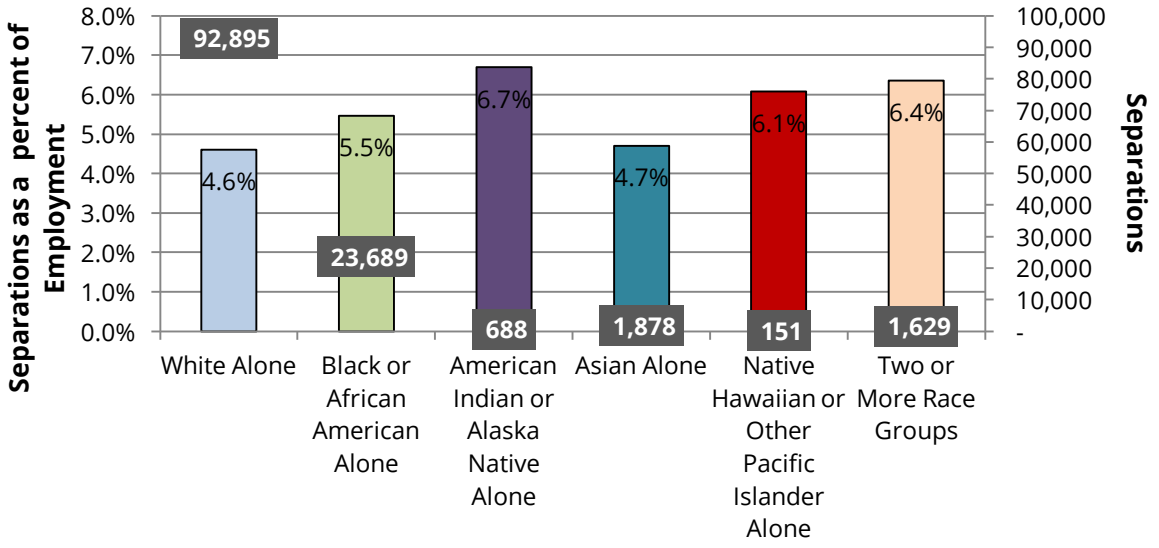
Figure 6B: Share of Employment and Share of Separations by Race (2015 Q1, Tennessee)



The percent of workers experiencing separations to persistent nonemployment varies by race and ethnicity. (*See figure 6C*). American Indian or Alaska Native workers in Tennessee had the greatest

percentage of workers experience separations to nonemployment (688 separations represented 6.7 percent of American Indian or Alaska Native workers in 2015 Q1). The demographic reporting two or more race groups had the second highest percentage of workers experiencing separations to nonemployment (6.4 percent); followed by Native Hawaiian or Other Pacific Islander workers (6.1 percent). The percentage of African American workers experiencing separations to nonemployment was 5.5 percent, a decline from a 7.4 percent peak in 2008. Job separations to nonemployment accounted for 4.7 percent of Asian workers in Tennessee. While white workers in Tennessee experienced more separations to persistent nonemployment than any other race (92,895) in 2015 Q1, this demographic had the lowest share (4.6 percent) of workers experience separations to nonemployment. The share of white workers experiencing separations to persistent nonemployment in Tennessee has been declining from a peak of 6.0 percent in 2008 to an historical low of 4.6 percent at present.

Figure 6C: Separations to Persistent Nonemployment as a Share of Workers (2015 Q1, Tennessee)



The Hispanic or Latino ethnicity group accounted for 3.4 percent of Tennessee's workforce and 4.4 percent of separations to persistent nonemployment during 2015 Q1. The percentage of Hispanic or Latino workers in Tennessee experiencing separations to nonemployment was 6.1 percent. While this rate is high relative to that of white, African American and Asian workers, the rate has declined from a peak of 9.4 percent in 2008 to an historical low of 6.0 percent in 2014.