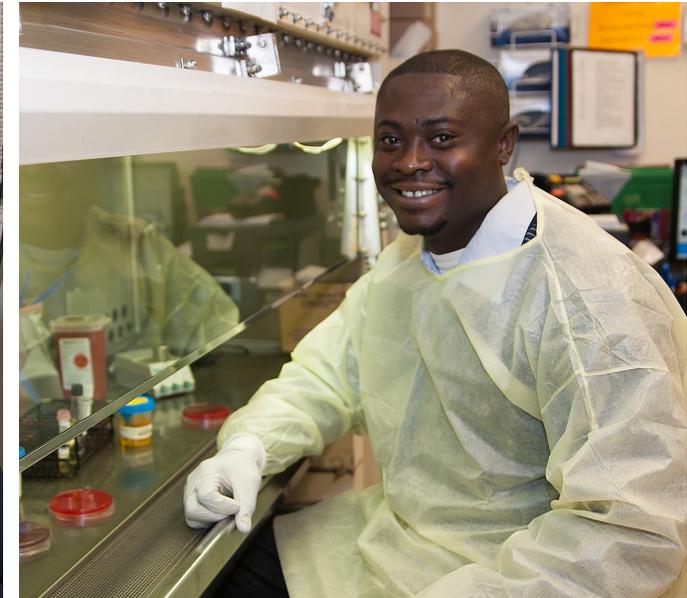

CLOSING THE SKILLS GAP

MEETING THE DEMAND FOR SKILLS IN A GROWING ECONOMY



Building skills for a strong economy.

As I travel around the Commonwealth, I hear a recurring message from businesses that they are struggling to find the skilled talent they need to fill critical vacancies. We have seen strong job creation and a declining unemployment rate in the state, but as of August 2016 there are still nearly 142,000 unemployed workers who can fill this demand for talent with the right training and education. Our young workers just entering the job market are another important source of talent. The data in this chart book inform our thinking about where to target resources to connect job seekers to career opportunities and the kind of preparation businesses value as they make hiring decisions.

Our state's top resource is the talent of our people. Massachusetts has the most highly educated workforce of any state in the nation, with 43 percent of residents holding a bachelor's degree or higher. The Commonwealth's educated workforce is also aging, with baby boomers heading into retirement or reducing their working hours. This presents an opportunity to ensure that individuals who are unemployed or underemployed, and those who are joining the labor force for the first time, have the skills they need to compete for jobs and meet the talent needs of the Commonwealth's employers.

Massachusetts has a rich variety of resources that we can leverage to accelerate learning and align education and training with jobs that are in demand: the career and technical education system, regional sector partnerships, educational technology and initiatives that strengthen the connections between community colleges and universities. I look forward to working with my colleagues in the [Workforce Skills Cabinet](#) and all of the workforce professionals working across the state, to ensure that Massachusetts has the most effective workforce development system in the country, investing in skills and credentials that lead to successful careers and a strong and growing economy.

Secretary of Labor & Workforce Development Ronald L. Walker, II

“*The Commonwealth needs to continue to invest in what is working while also moving forward with new strategies. While our state's economy is strong, we know businesses cannot continue to thrive if that talent pool is not there to support them. We are thinking well into the future about how to give our residents knowledge and skills.*”

-Governor Charlie Baker

Overview

The purpose of this analysis is to provide data that informs policy and practice in the education and workforce development fields. This report documents statewide trends, placing the Massachusetts experience in the national context. We use data from a number of federal and state sources to inform our analysis (see Key Data Sources). These data are the latest available as of August 2016.

Employment & Labor Force Trends

Our economy exceeds the national average for industries that require a bachelor's degree or higher and those industries are experiencing growth. Much of the job growth since 2001 has been in health care and social assistance, education, and professional and technical services. We have also seen

growth in accommodation and food services; a majority of workers in that industry have a high school diploma or less.

With forty-three percent of the Commonwealth's workforce holding a bachelor's degree or higher, Massachusetts has the most highly educated workforce of any state in the country. We also have an aging workforce; forty-five percent of the labor force is age 45 or older. Highly educated baby boomers are beginning to retire or reduce their working hours; employers refer to this as the "silver tsunami." While the demand for skills and credentials continues to rise, our emerging and incumbent workers require ongoing skill development, credentials, and work experience so that they can compete for jobs and fulfill the talent needs of the Commonwealth's employers.

Educational Trends

The largest growth in educational attainment in the Massachusetts labor force is in master's degrees or higher, with a 36 percent rate of growth since 2000, followed by the bachelor's degree at 25 percent. The share of the labor force with a master's degree or higher has grown from 14.8 percent in 2000 to 18.1 percent in 2012-2014, and the share of bachelor's degree holders in the labor force has grown from 22.3 percent in 2000 to 25.1 percent in 2012-2014. Although the share of associate's degree holders in the labor force grew in the U.S. between 2000 and 2012-2014, this share stayed flat in Massachusetts.

We mirror the nation in the rate of growth for bachelor's and associate's degree completions since 2010. Full-time enrollment in associate's degree programs in the state and the nation has declined since fall 2009. There have been small increases in full-time enrollment in bachelor's degree programs. Part-time enrollment in associate's degree programs increased by 8% in Massachusetts, but declined by nearly 4% in the U.S. since fall 2009. Over the same period, part-time enrollment in bachelor's degree programs increased in Massachusetts, but at a lower rate than across the U.S.

Demographics of the Commonwealth's Labor Force: Challenges and Opportunities

Massachusetts' overall population is growing, albeit slowly, and becoming more diverse. Our labor force growth continues to depend on immigration, although for the first time in many years Massachusetts is also experiencing growth in the native born population. In an economy that places a high value on credentials, there is a significant difference in educational attainment among demographic groups, with Black and Hispanic workers having the lowest shares of bachelor's degrees or higher. Labor force participation declined during the Great Recession and has flattened over the past few years. Although the Massachusetts unemployment rate has been dropping since December 2015, the Q2 2016 annual average estimates show there are still an estimated 181,000 workers who are marginally attached or working part-time involuntarily.

Massachusetts continues to see disproportionate unemployment among workers with a high school diploma or less and among younger workers 16-24 years of age. Workers with a high school diploma or less make up 31% of the labor force and 50% of the unemployed. Young workers 16-24 years of age make up 34% of the labor force and 47% of the unemployed. Teen employment has fallen dramatically since 1999 from 54% to 29%. The labor force participation rate has declined among men since 2002 and flattened among women. As the economy continues to generate jobs and baby boomers reach retirement age, there is an opportunity to develop and strengthen strategies that improve the hiring and earning prospects of individuals who are unemployed or underemployed, those who are re-entering the labor force and those who are joining the labor force for the first time.

Recommendations: Building a Talent Pipeline that Responds to Industry Demand

The fast pace of change in the skills and credentials sought by industry, driven by technology and globalization, requires the Commonwealth to continue to identify ways to accelerate learning and skill acquisition, build robust communication loops with industry, and create more effective on-ramps for younger workers. Economic data indicate that employers use a college degree as a proxy for a set of desired skills, including critical thinking, problem solving and work readiness. The Commonwealth can build career pathways that lead to degrees and experiment with other demand driven strategies like apprenticeships and competency-based education to test if those strategies – when developed in close partnership with industry – can be effective in moving people without college degrees into higher skilled careers.

The data further show that opportunity in the Commonwealth is skewing toward industries that are predominantly staffed with workers with bachelor's degrees and also toward careers that require a bachelor's degree or higher. Given that educational attainment is spread unevenly across racial/ethnic lines in the Commonwealth, it will be important to target employment, education and training programs to serve populations that face chronic unemployment or underemployment in order to build a pipeline of skilled workers to fill jobs in demand.

Massachusetts created a cross-secretariat body to coordinate strategy among housing and economic development, workforce development and education called the Workforce Skills Cabinet. In addition, leaders across state agencies are using the framework of the federal Workforce Innovation and Opportunity Act to deliberately connect services through a career pathway framework. Regional sector partnerships, such as those funded through the Workforce Competitiveness Trust Fund (WCTF), are providing training for jobs in demand across the Commonwealth, albeit at a small scale. Massachusetts, through its YouthWorks program, is the only state to invest state dollars in subsidized employment and work readiness training for low-income teens. By continuing to invest in what works while also moving forward with new strategies, Massachusetts can continue to invest in its biggest asset – the talent of its people. Strategies that the Commonwealth could test, strengthen or expand include:

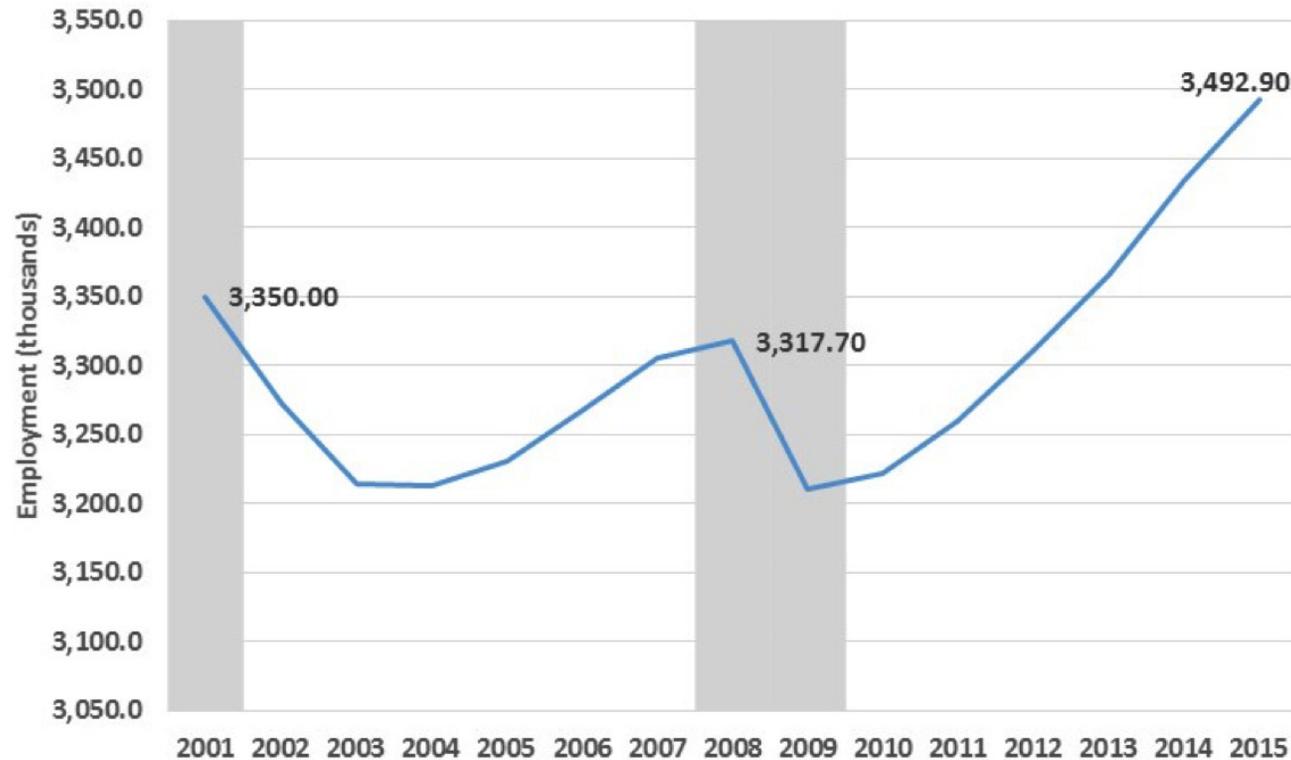
- » **Accelerated learning for adults without post-secondary education:** With increasing skill demands, it is critical that adults with high school degrees or less and non-native English speakers have opportunities to engage in learning that advances their numeracy, literacy and work-readiness skills and prepares them in a timely way for success in the workplace and in post-secondary programs. **“We need to give people leadership skills and give them opportunities. ESOL is a must have,” says Matt Monkiewicz, VP of Marketing at Kayem Foods.** States are experimenting with mobile technology, competency-based education, accelerated learning, personalized learning and digital badges to increase the timeliness, scale and effectiveness of educational pathways for adults. In Massachusetts, job seekers at community colleges, one-stop career centers and adult basic education programs have opportunities to remediate literacy, numeracy and soft skills using Career Ready 101, a product of ACT.
- » **More robust pathways for younger workers struggling to connect to jobs:** Many teens and high school graduates, as well as some new college graduates without work experience, find it challenging to connect to the labor market. Preparing teens for the workplace and connecting them to the entry-level labor market provides critical work experience that studies show lead to better earnings and employment outcomes as adults. The lack of “soft skills” is a mantra repeated by businesses across the Commonwealth in reference to new and emerging workers. **“When it comes to new employees, we can teach them retail skills and customer service. What we need are employees with soft skills: initiative, leadership, dependability, etc.,” says Rick Laferriere, Lead Manager of Workforce Initiatives at CVS Health.** There are opportunities to expand the use of com-

petency-based work readiness training through the Signal Success curriculum or other soft skills curricula for teens and young adults in high schools, non-profit settings and work settings. For young adults in post-secondary programs, work experience in the field of study through internships and co-operative placements provide pathways to employment after graduation and allows them to practice critical work readiness skills.

- » **Leveraging relationships, instructors and equipment in career vocational and technical education (CVTE):** CVTE is a proven resource for preparing high school students and adults for skilled jobs that are in demand in a wide range of fields including STEM, advanced manufacturing, health care, automotive, welding, building trades and information technology. ***“The partnership with Beth Israel Deaconess Hospital Milton allowed our students to learn and train on-site at the hospital. They gained real-world experience in an acute care setting they would not have received otherwise,” says Dave Tapper from Blue Hills Regional Technical High School.*** CVTE schools are in constant communication with local businesses through business advisory committees and co-operative placement programs. Continued funding for capital equipment grants and sector training grants can support the scaling of CVTE training capacity and the alignment of that training capacity with actual employer demand.
- » **Expanding “Learn & Earn” strategies:** Apprenticeships and on-the-job training provide skill development, certification and upward mobility for workers who may not have – or need – a college diploma. Apprenticeships are well developed in the construction field and starting to gain traction in manufacturing, health care and information technology. On-the-job training (OJT) provides opportunities for workers and businesses to “try out” an employment relationship, while investing in the skill development of the employee. ***“OJT programs are 100% successful because the candidate is hired by the host company before the training begins and therefore, the training funds are always effective. You give them the specific skills necessary to be valuable and successful to your company, and these skills are transferable to other similar companies,” says Mike Munday, CEO of Arwood Machine Corporation.*** The Commonwealth should encourage and promote apprenticeships and OJTs in new sectors and occupations.
- » **Continue and expand regional sector partnerships that provide training for jobs in demand:** Regional industry sector partnerships are bringing together business, education and workforce organizations to train individuals who are unemployed or underemployed for jobs that are in demand. Through regional planning processes, workforce, education and industry are determining priority hiring opportunities. ***“We have been able to design and implement programs that prepare Berkshire residents for critical vacancies in the nursing arena. The important result from these programs is improved health care for our community,” says Elizabeth Kirby from Berkshire Health.*** The WCTF supports training and convening activities that prepare a talent pipeline for industries experiencing skill shortages. The sector partnership model of training has a proven track record of employment outcomes for unemployed workers, but the funding to support the model needs to be more consistent in order to bring the strategy to scale.
- » **Invest in ongoing skill development of employed workers and Massachusetts businesses:** The Commonwealth supports training for incumbent workers to meet businesses’ needs and help strengthen their competitive position in the global market with a unique program called the Workforce Training Fund. With the challenge of baby boomer retirements, the Workforce Training Fund should be considered as a resource to invest in the skills of frontline workers and plan for leadership succession. ***“In today’s business environment, it has never been more crucial to retain a workforce and invest in a partnership for the long term,” says David Flavin, Manager of Learning & Development at Blount Fine Foods.***

We have recovered since the Great Recession and expanded employment beyond the last two peaks.

Annual Average Total Non Farm Employment, Massachusetts
2001 to 2015 (non seasonally adjusted, recessions shaded)

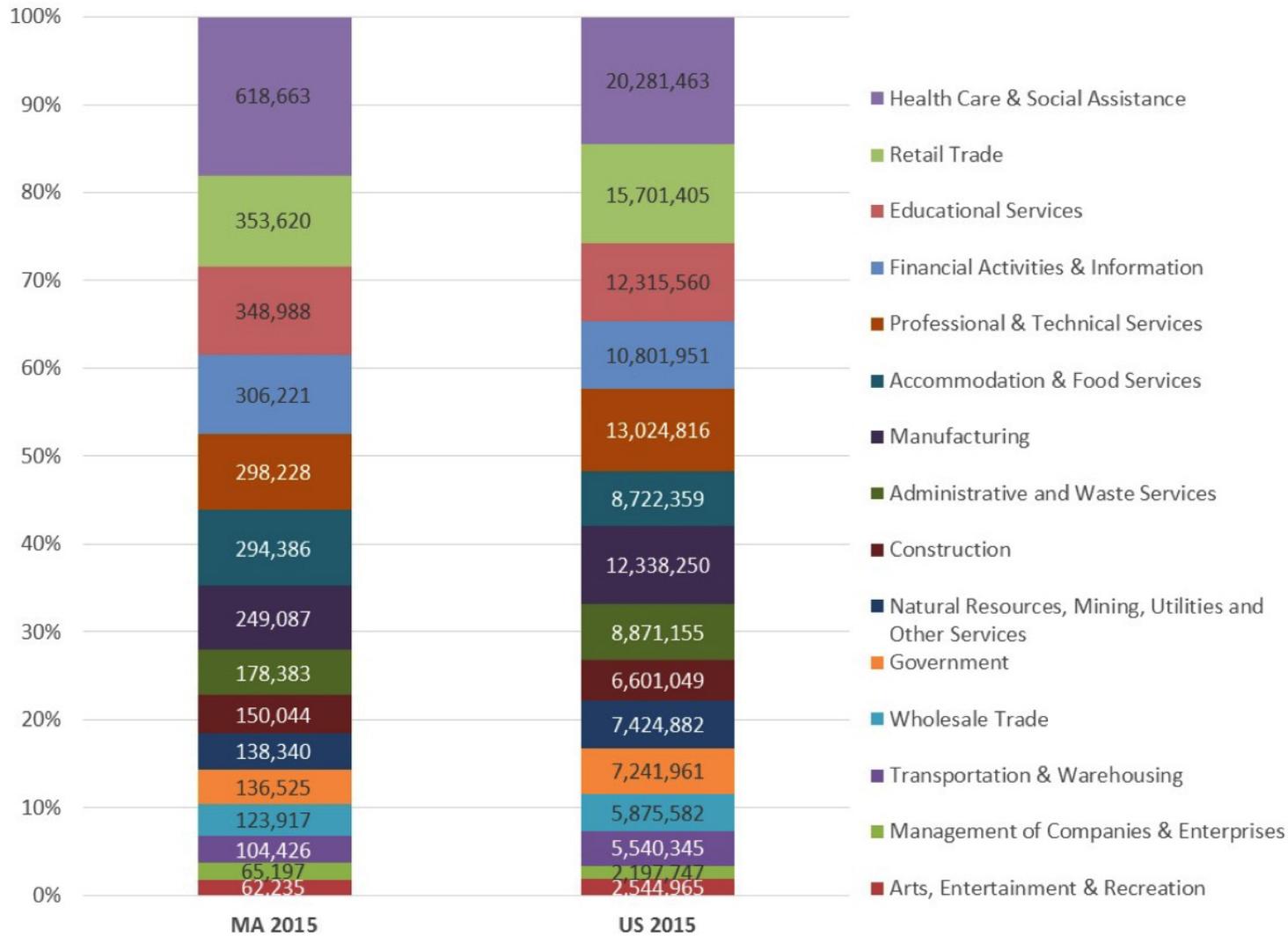


Not seasonally adjusted: Annual average estimates are calculated from the not seasonally adjusted data series. Since seasonal events like changes in weather, harvests, major holidays, and school schedules can influence employment and labor force patterns, and these events are more or less predictable each year, their influence on statistical trends can be eliminated by seasonally adjusting the statistics from month to month. As a general rule, the monthly employment and unemployment numbers reported in the news are seasonally adjusted data. <http://www.bls.gov/cps/seasfaq.htm>

» Trends in Employment and Industry Growth and Demand

Health Care & Social Assistance and Educational Services make up larger shares of employment in MA than in the U.S.

Average Annual Employment by Industry, Massachusetts & U.S., 2015



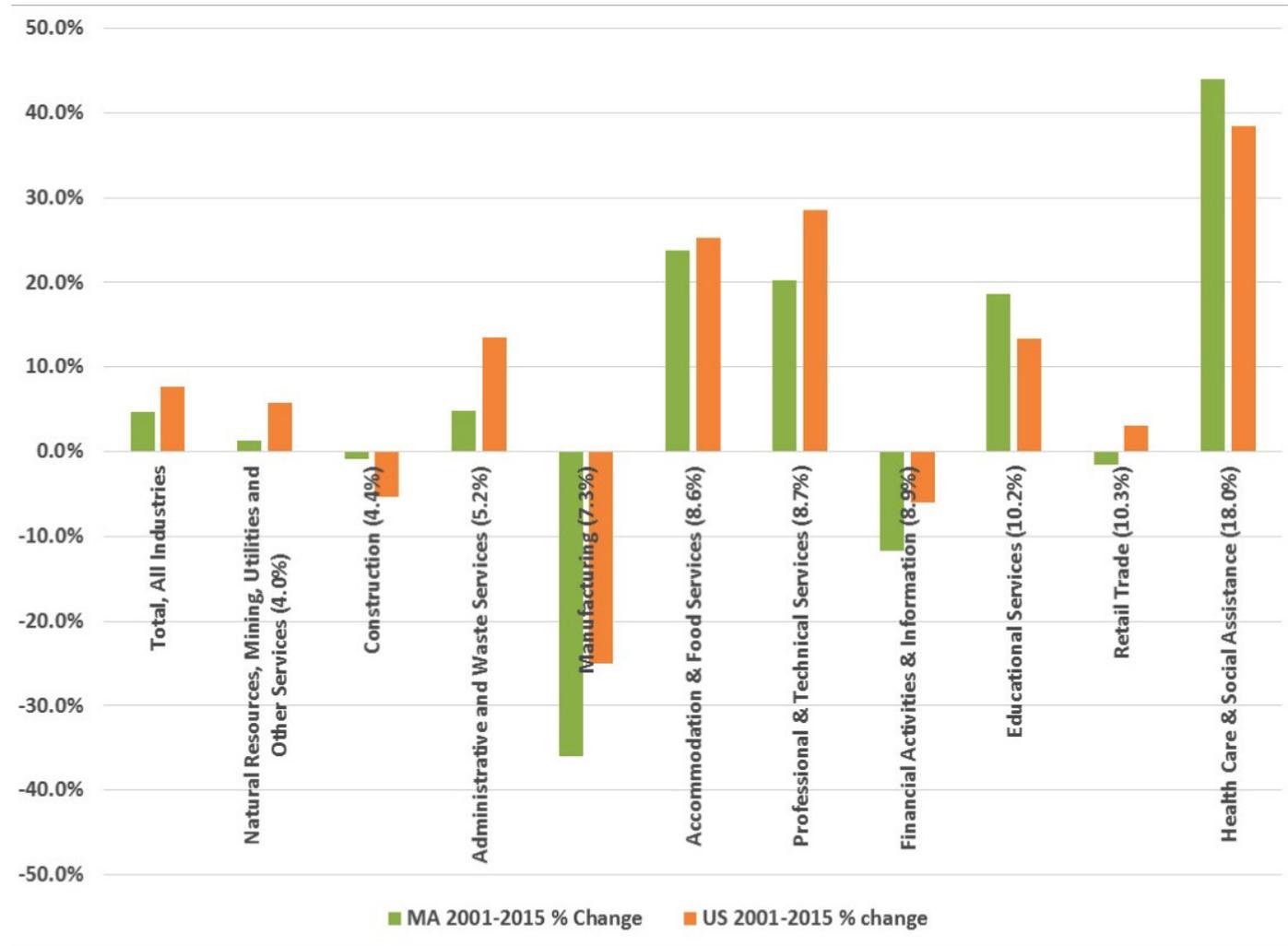
This chart helps show the breakdown of jobs across major industry sectors in Massachusetts.

- More than 618,000 jobs, or 18 percent of total employment, were in the health care and social assistance sector in Massachusetts compared to 16 percent in the U.S.
- The next largest share of employment is in retail trade with about 354,000 jobs, or more than 10 percent of total employment in Massachusetts. Retail trade makes up about 11 percent of total employment in the U.S.

Health Care & Social Assistance, Accommodation & Food Service and Professional & Technical Services have driven job growth since the 2001 peak.

- Strong growth in health care and social assistance has driven our recovery and expansion, growing more than 40 percent since 2001, followed by growth in educational services (nearly 20%) and professional and technical services (20%).
- Accommodation and food service, a source of high turnover occupations, also grew more than 20 percent during this period.
- Manufacturing declined in Massachusetts more sharply than in the U.S., declining more than 35 percent in employment since 2001.

Percent Change in Employment in Top 10 MA Industries, Massachusetts & U.S., 2001 to 2015



Note: Number in parentheses next to industry label indicates the share of total employment for that industry in Massachusetts in 2015.

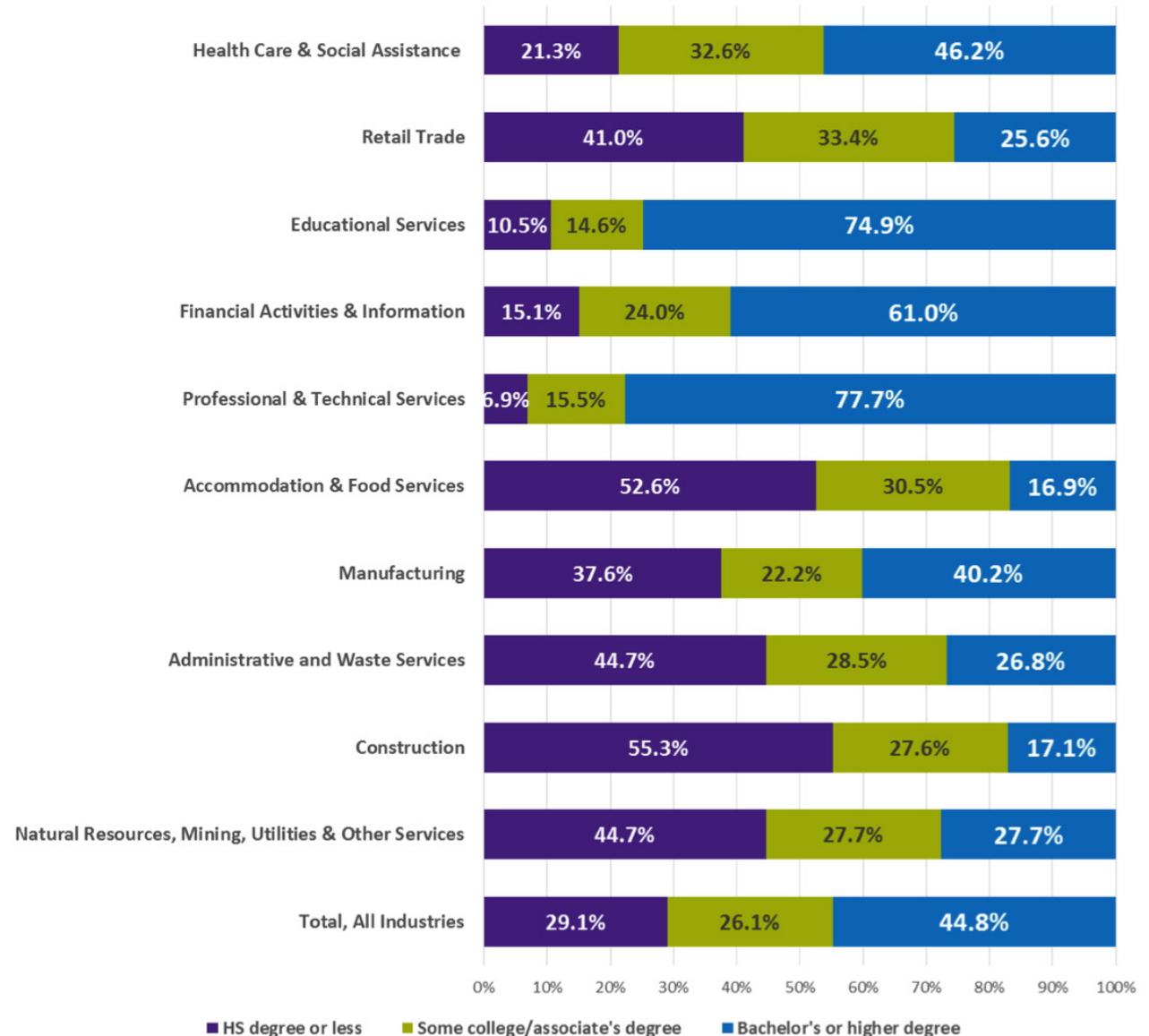
» Trends in the Educational Attainment of the MA Labor Force

This chart shows the educational attainment of workers currently employed in these industries, and reflects the mix of occupations within an industry.

- The industries that have grown the most since 2001 (see chart on page 5) are: (1) health care and social assistance, (2) professional and technical services, (3) educational services, and (4) accommodation and food services. Of those four, the first three have high concentrations of bachelor degree or higher educated workers.
- Accommodation and food service has a high share of HS degree or less.
- Although industries like manufacturing and construction have larger shares of HS degree or less educated workers, jobs in these sectors often require some post-secondary training or apprenticeship.

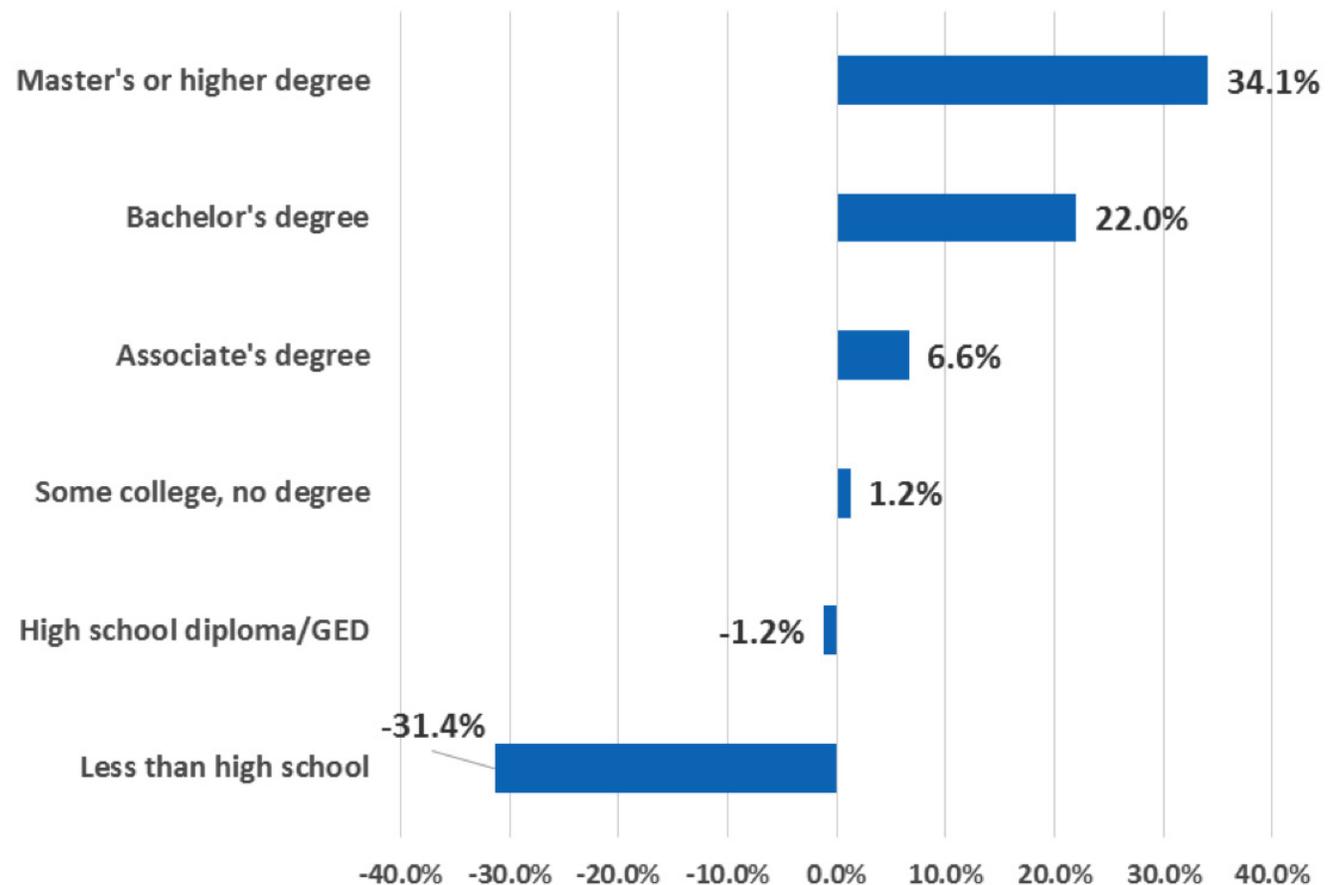
Four of the top five largest industries in Massachusetts have above average shares of workers with bachelor's degrees.

Educational Attainment of Employees by Major Industry in Massachusetts, 2012-2014



Employment opportunities have grown, almost exclusively, for workers with a college degree or higher since 2000.

Percent Change in the Number of Employed Individuals by Educational Attainment in Massachusetts, 2000 to 2012-2014

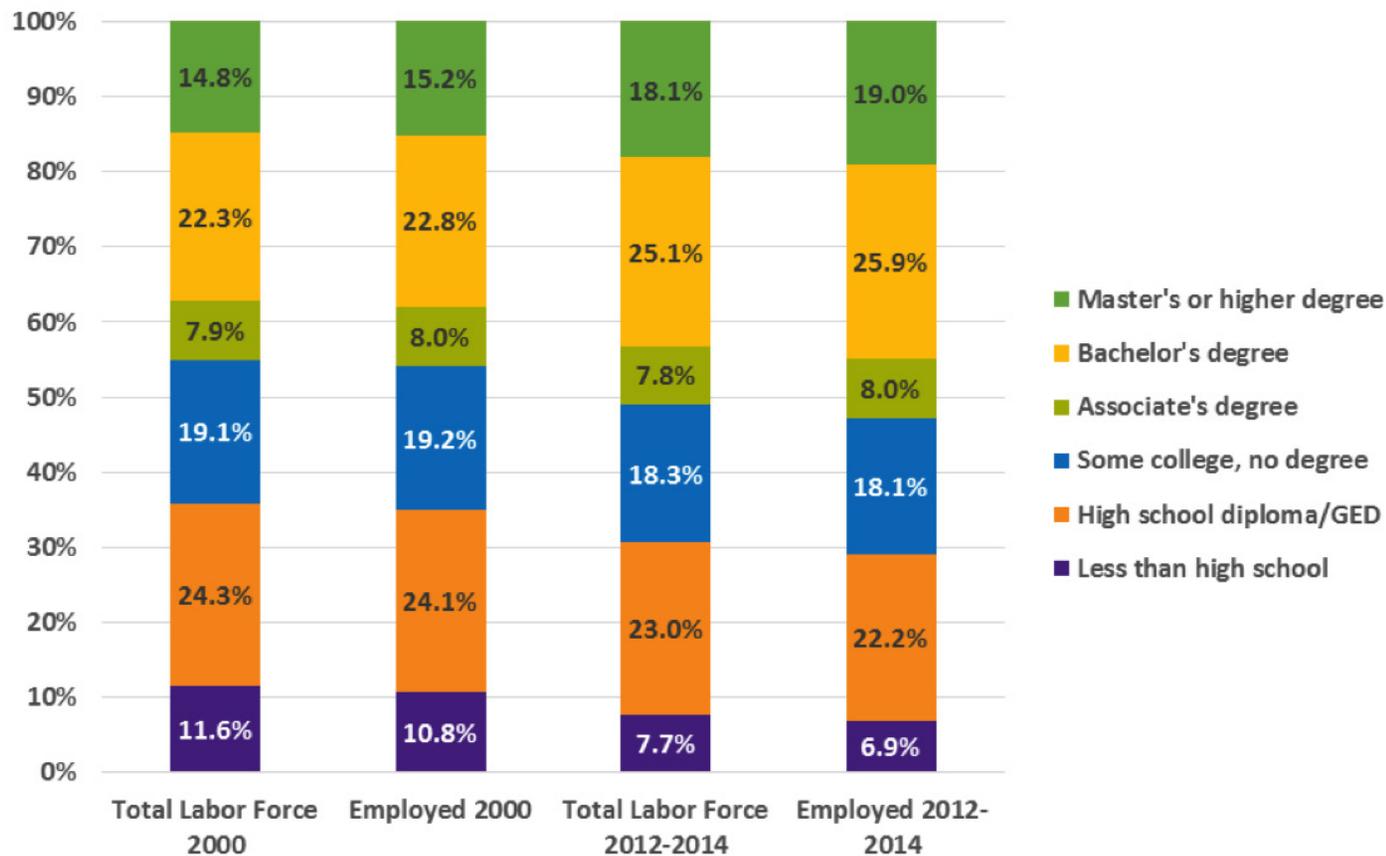


The number of employed workers with a master's degree grew 34 percent, bachelor's grew 22 percent and associate's grew nearly 7 percent.

» Trends in the Educational Attainment of the MA Labor Force

The share of those with bachelor's degrees and higher has grown among employed individuals and in the labor force overall.

Educational Attainment of the Civilian Labor Force & Employed in Massachusetts 2000, 2012-2014

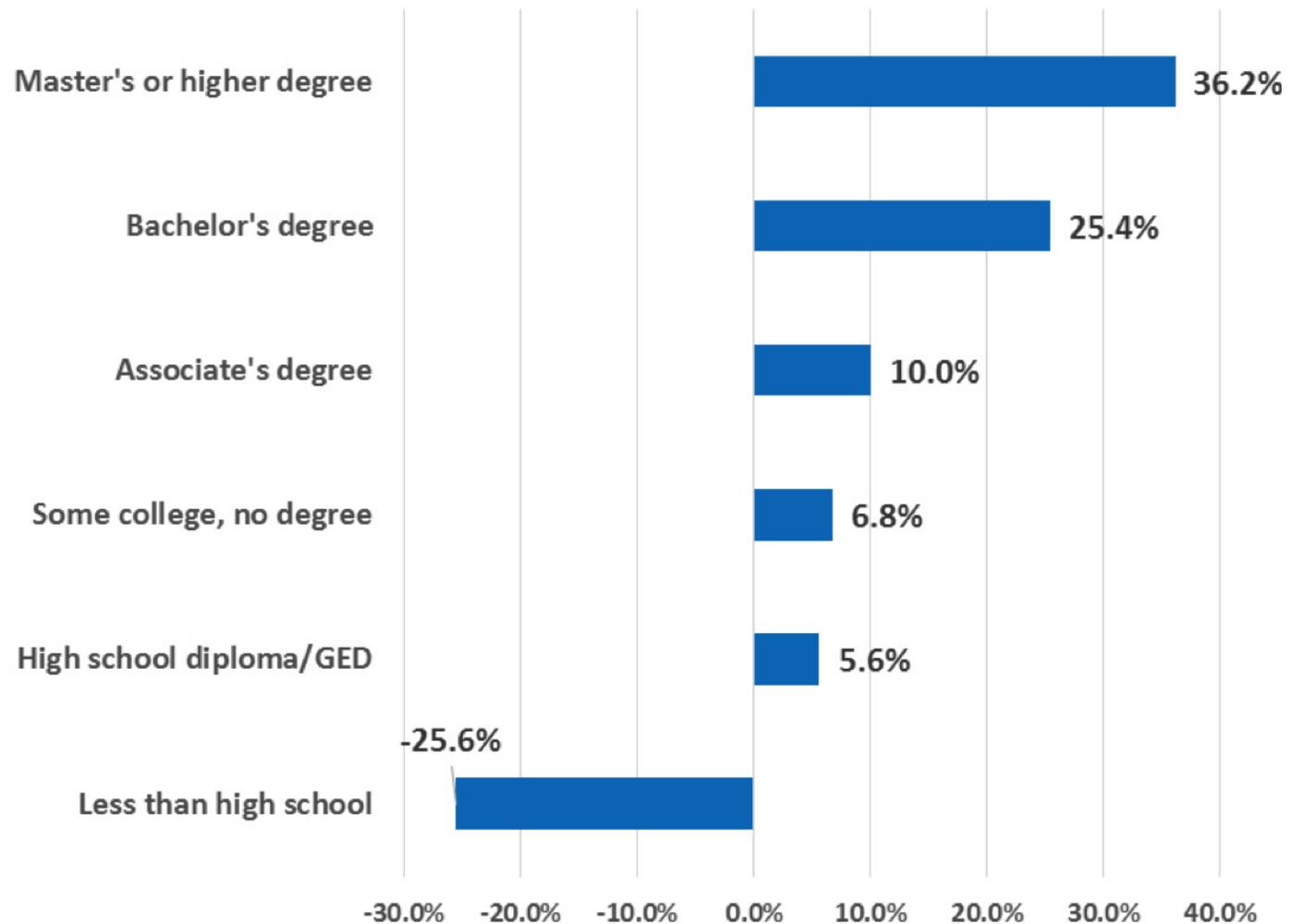


- While shares of workers with a bachelor's degree or higher have grown in the labor force overall since 2000, those with a bachelor's degree or higher have also increased among employed residents.
- In 2012-2014, an estimated 19 percent of employed workers had a master's degree or higher, and nearly 26 percent had a bachelor's degree.
- Shares of workers with some college or less declined since 2000.

Civilian labor force: The civilian labor force is made up of the employed and unemployed, non-military. People with jobs are employed. The unemployed are those who are jobless but are available for work and looking for a job. People who are neither unemployed or employed are not in the labor force; for example people who are in school and not working are not in the labor force. http://www.bls.gov/bls/cps_fact_sheets/lfp_mock.htm

Post-secondary educational attainment continues to grow among the labor force, most notably among individuals with a master's degree or higher.

Percent Change in the Number of Individuals in the Labor Force by Educational Attainment in Massachusetts, 2000 to 2012-2014

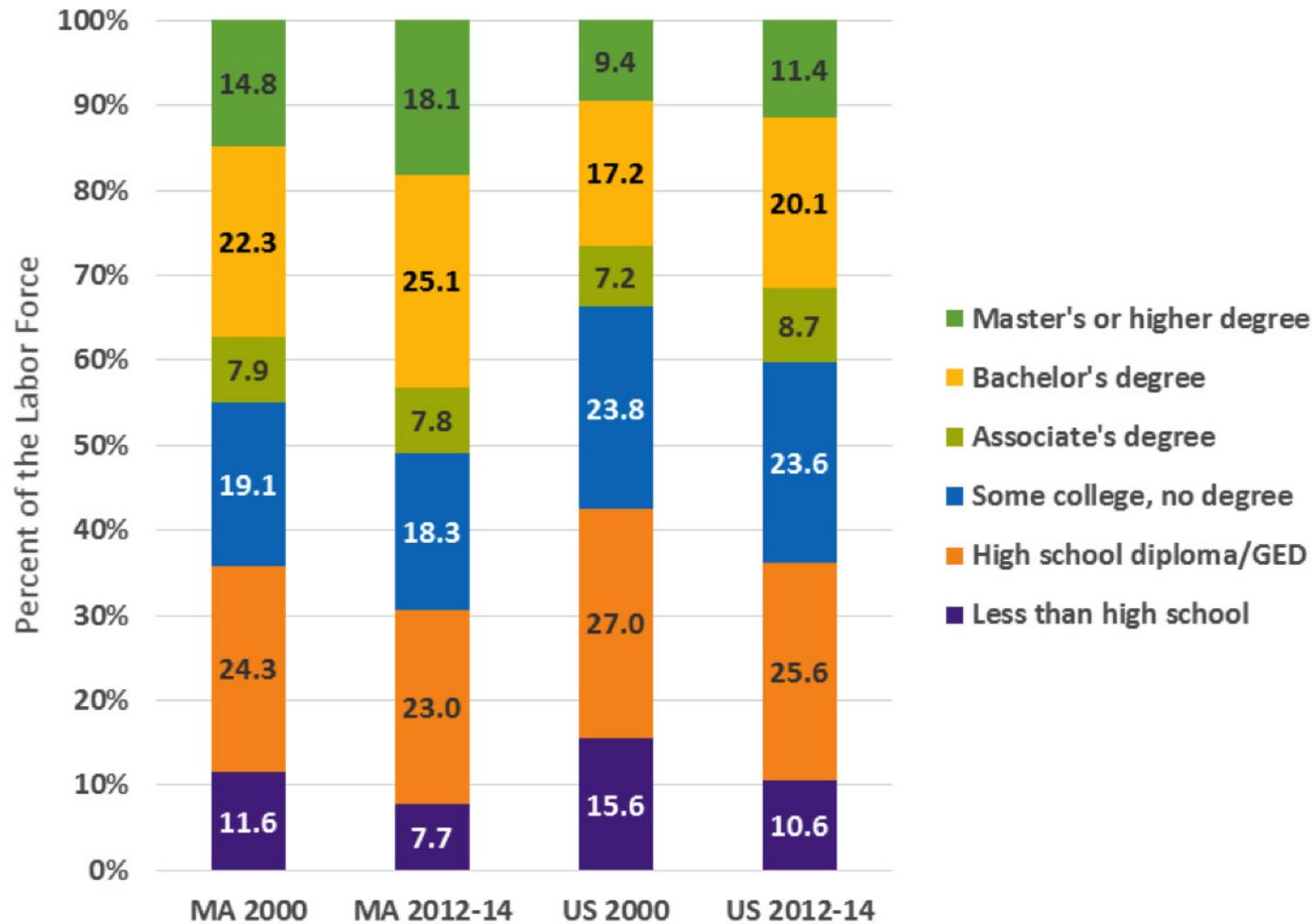


Workers may be responding to employer demand for increased skills by increasing their level of degree attainment.

» Trends in the Educational Attainment of the MA Labor Force

Massachusetts is the most well-educated state in the nation; 43 percent of workers have a bachelor's degree or higher.

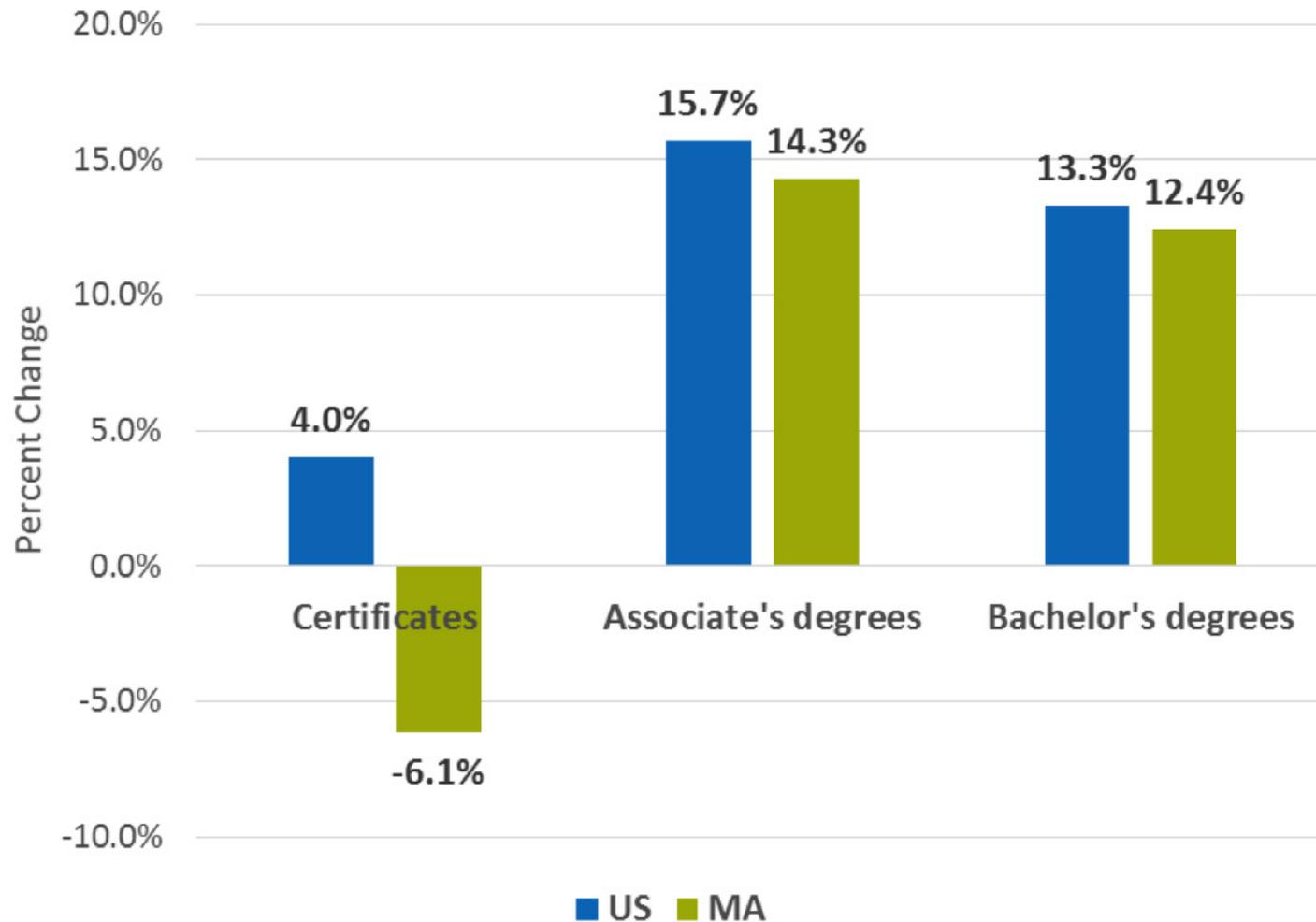
Educational Attainment of Civilian Labor Force, 2000 to 2012-2014



- Shares of the labor force with a bachelor's degree or higher have increased since 2000 in Massachusetts and the U.S., while other levels of attainment have stayed flat or declined.
- Associate's degrees grew in share among workers in the U.S. while staying flat in Massachusetts.

MA mirrors national trends in associate's and bachelor's degree completions, but has showed less growth in certificate completions.

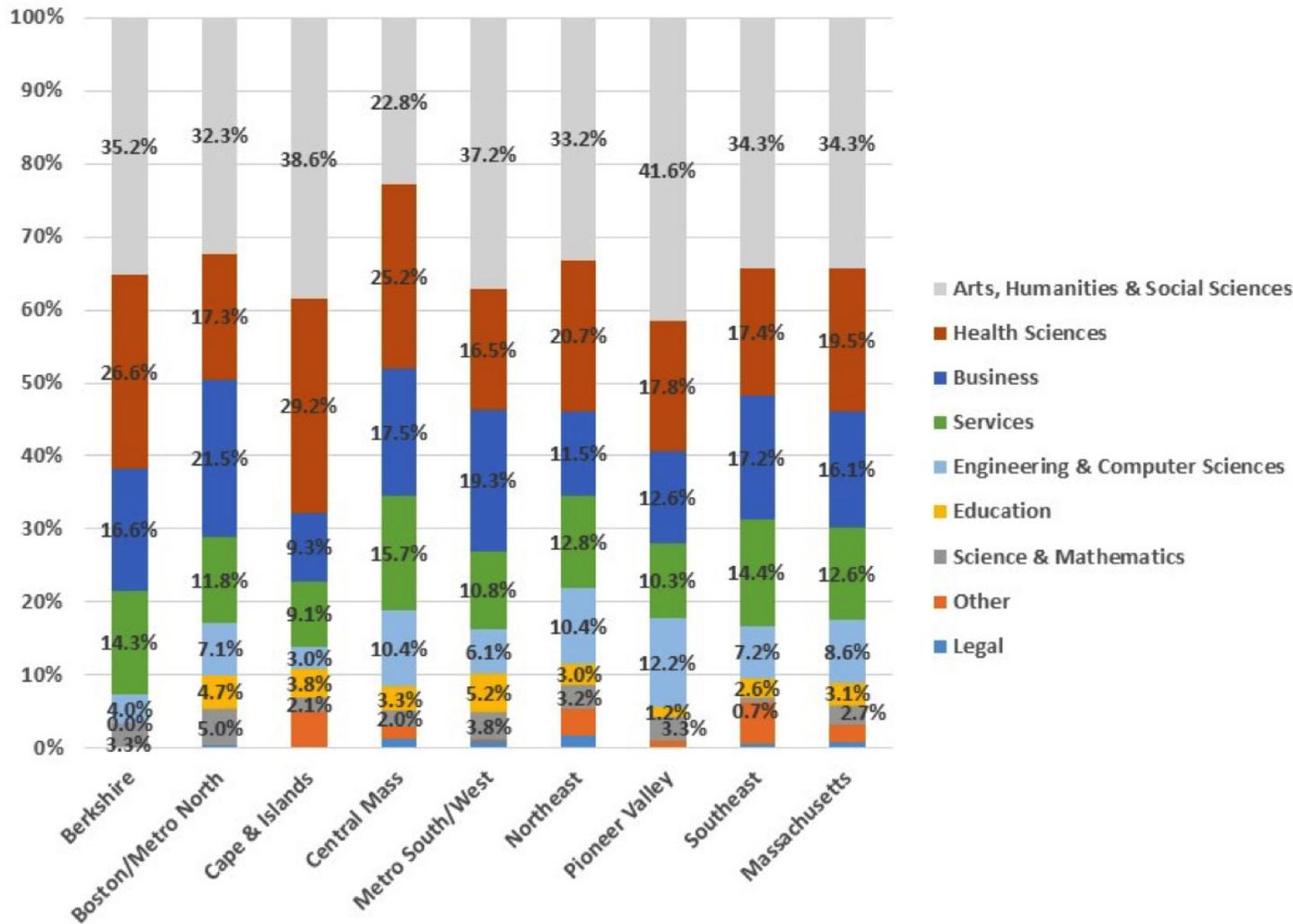
Percentage Change in Total Completions, 2010 to 2014



» Trends in the Educational Attainment of the MA Labor Force

Arts, Humanities and Social Sciences make up the majority of associate's degree completions, in all regions except Central.

Public associate's Degree Completions by Major Fields of Study and Region, 2014

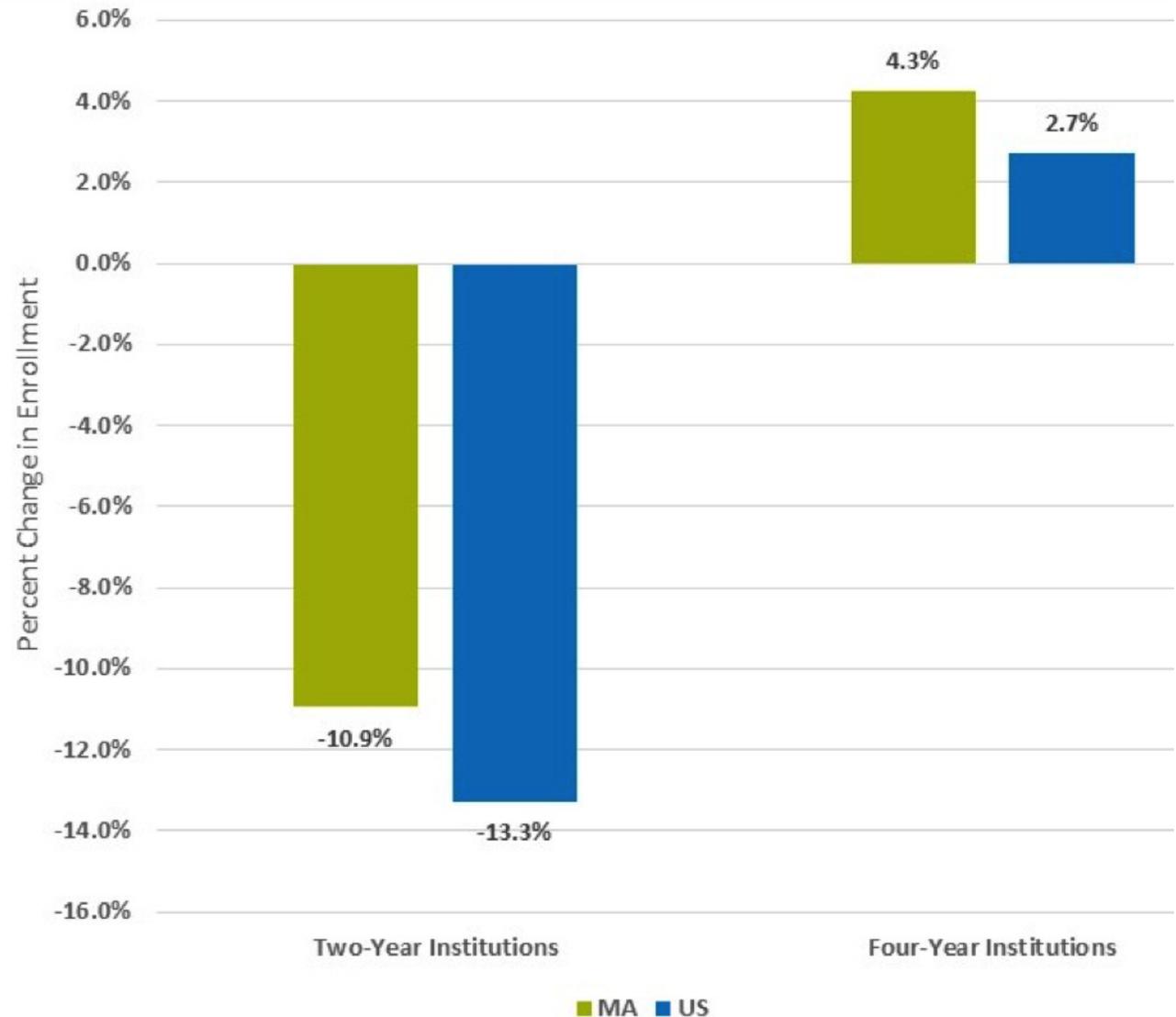


- The largest share of associate's degree completions in 8 of 9 of the regions is in Arts, Humanities and Social Sciences.
- In the Central Mass region, Health Sciences degrees make up the largest share of degrees granted in 2014.

Massachusetts and the U.S. show a decline in two-year full-time enrollments, but four-year full-time enrollments are growing slightly.

The state's colleges have noted declining enrollments in recent years and some economists cite the improving job market as a cause. This is a challenge for these institutions.

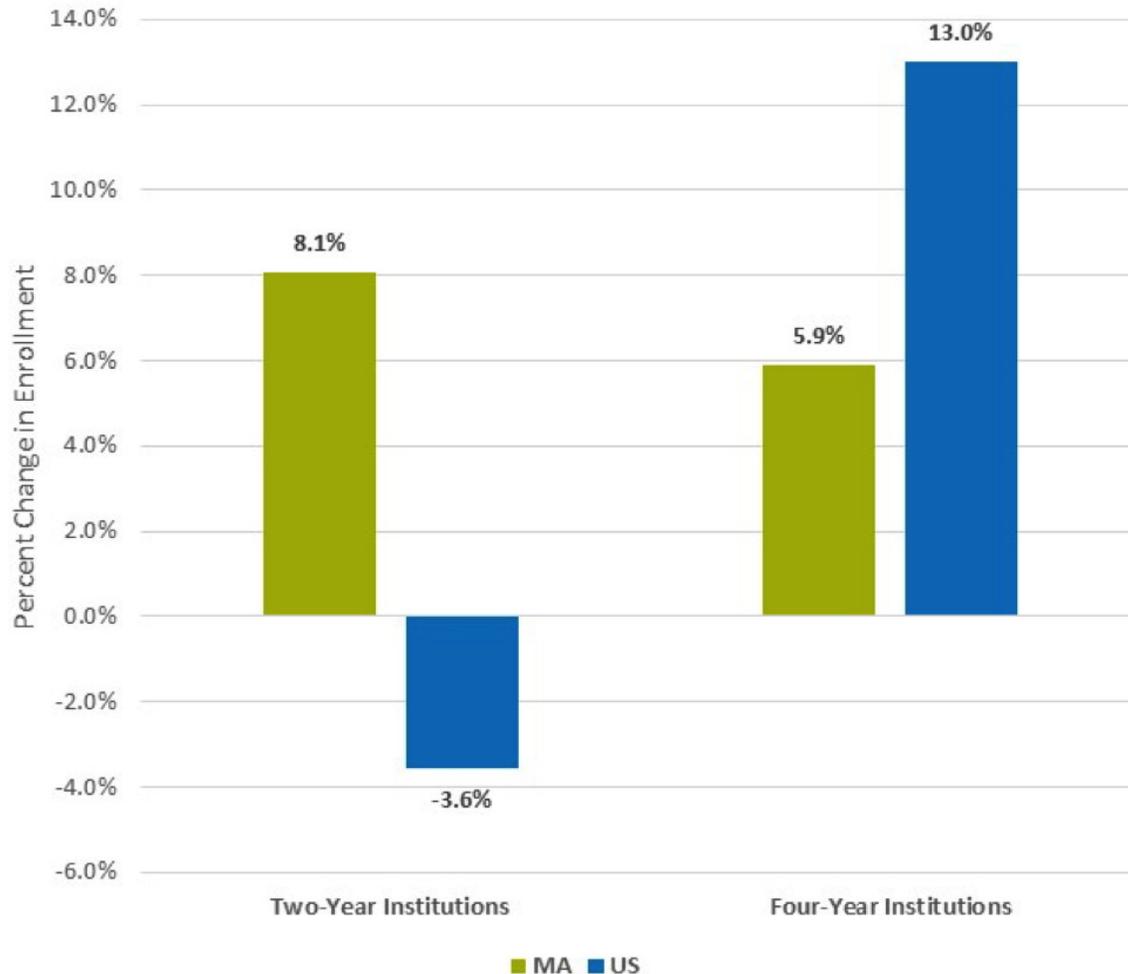
Full-time Enrollment Change in Massachusetts and the U.S., Fall 2009 to Fall 2013



» Trends in the Educational Attainment of the MA Labor Force

Part-time enrollments in MA two-year institutions are growing faster than the national average, while part-time enrollments in four-year institutions are growing at a slower rate.

Part-time Enrollment Change in Massachusetts and the U.S., Fall 2009 to Fall 2013

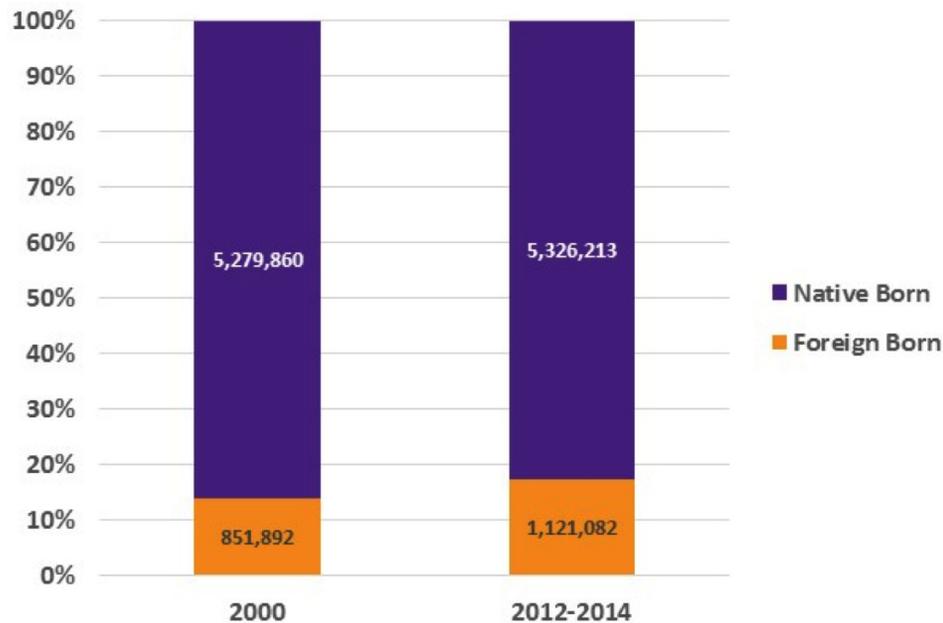


Part-time enrollment can offer non-traditional students with other responsibilities an opportunity toward earning a degree. On the other hand it may lead to a difficult and lengthy journey resulting in no credential and significant student loan debt.

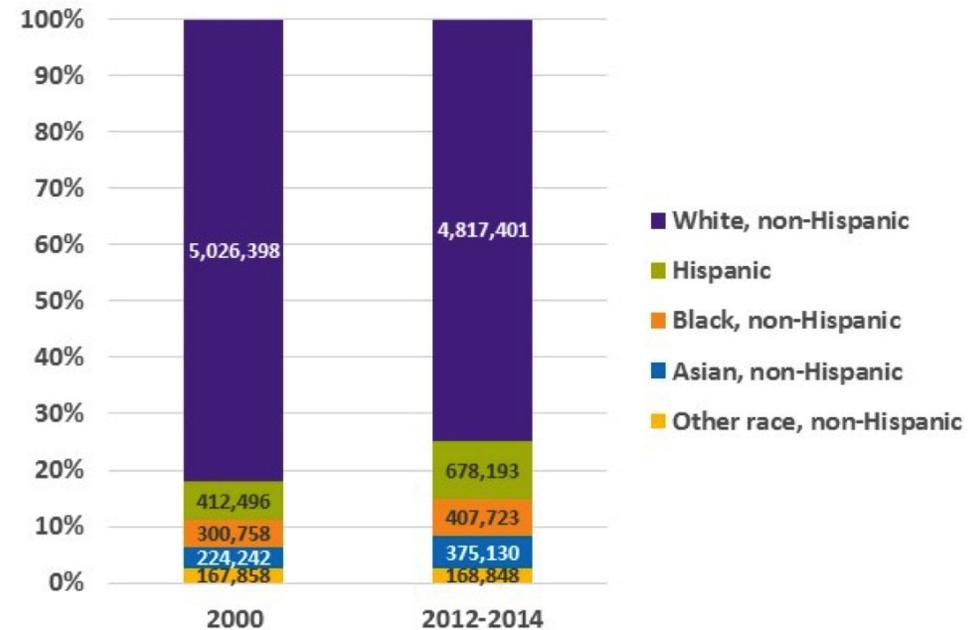
Population growth in Massachusetts is driven by immigration & growth in diversity.

- Massachusetts' population is growing (more slowly than the nation, not shown here), and still relies primarily on immigration for this growth.
- The UMass Donahue Institute Population Estimates Program recently reported that while immigration still drives our population growth, some net natural increase (births vs. deaths) has also occurred.
- The racial/ethnic makeup of our population is also increasingly diverse.

Share of Population in Massachusetts by Foreign Born Status, 2000, 2012-2014

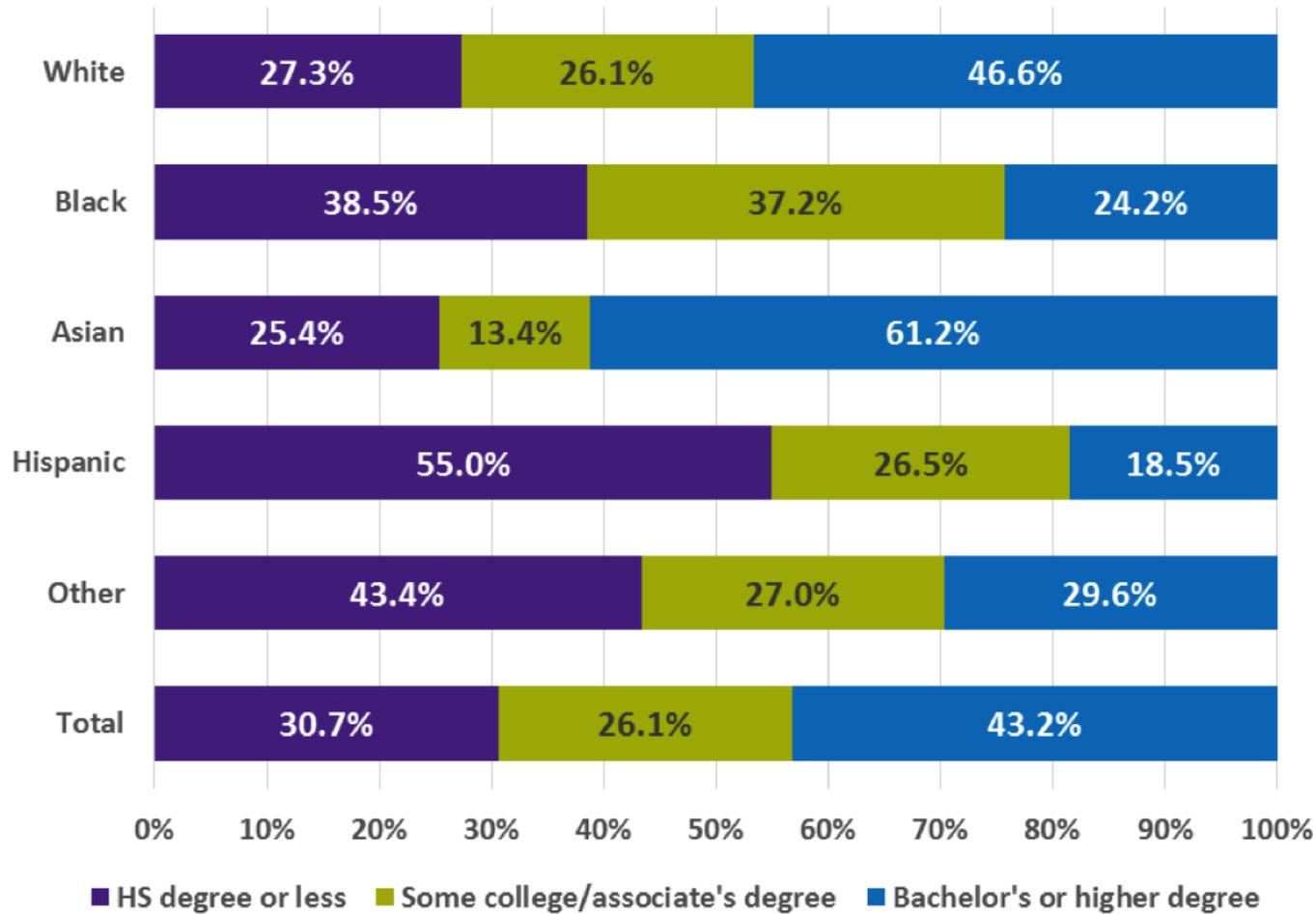


Share of Population in Massachusetts by Race/Ethnicity 2000, 2012-2014



Educational attainment varies by race/ethnicity in Massachusetts.

Educational Attainment of the Labor Force by Race/Ethnicity in Massachusetts, 2012-2014



- Even as we are the most highly educated state in the nation, our educational attainment is uneven across racial and ethnic groups.
- Black and Hispanic workers have lower than average bachelor's or higher educational attainment.

Massachusetts is the 10th oldest state and 45 percent of the labor force is age 45 or older.

Age Distribution of the Civilian Labor Force, 2001 to 2012-2014

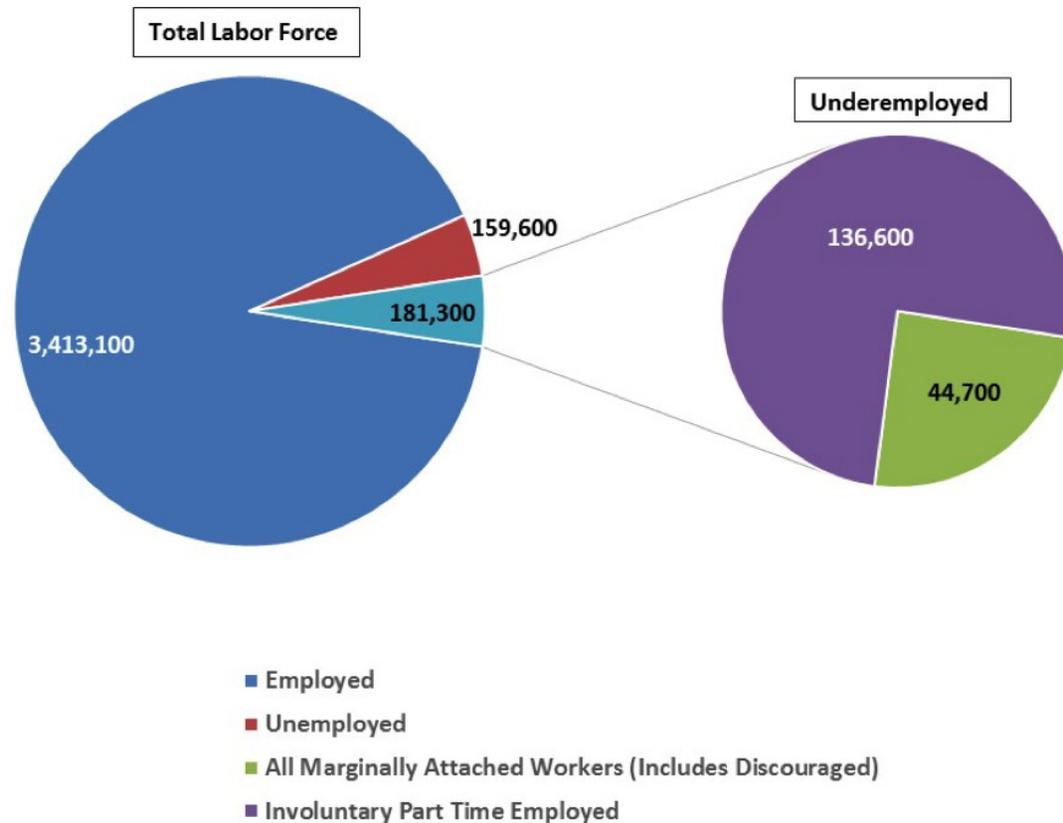


- Another challenge we face is that we are one of the oldest states in the nation. Massachusetts has the 10th oldest population and 45.9 percent of the labor force is age 45 or older.
- The Great Recession saw many older workers delaying retirement and staying in the labor force.
- The aging of our workforce and inevitable “Silver Tsunami” of retirements is a major cause of economic concern because it constrains businesses’ ability to remain competitive due to a lack of experienced workers.

» Demographics of the Commonwealth's Labor Force

There are 181K workers who are marginally attached or involuntary part-time, in addition to nearly 160K still unemployed.

Underemployment in Massachusetts, Annualized Average Q3 2015 - Q2 2016



- While our unemployment rate has declined steadily as the recovery has continued, there are still many workers who have not made it back into the labor force.
- This chart shows a measure of underemployment not typically included in the reported monthly unemployment rate. For the annual average through Q2 2016, there were an estimated 32,000 more underemployed individuals than unemployed individuals in Massachusetts.

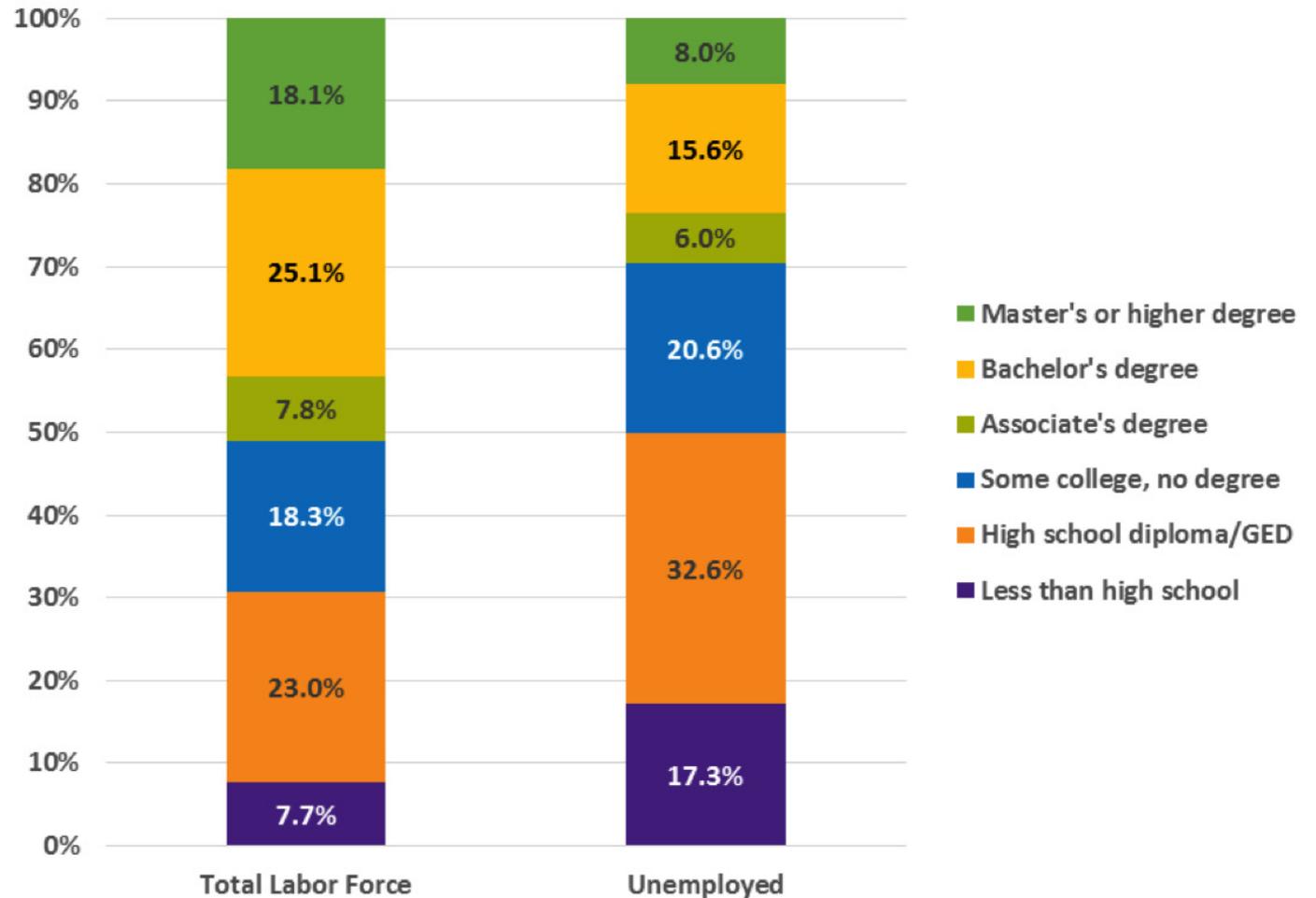
Underemployed: Discouraged workers are those who want and are available for work, and had looked for a job sometime in the prior 12 months. They are not counted as unemployed because they had not searched for work in the prior 4 weeks, for the specific reason that they believed no jobs were available for them. The marginally attached are a group that includes discouraged workers. The criteria for the marginally attached are the same as for discouraged workers, with the exception that any reason could have been cited for the lack of job search in the prior 4 weeks. Persons employed part time for economic reasons are those working less than 35 hours per week who want to work full time, are available to do so, and gave an economic reason (their hours had been cut back or they were unable to find a full-time job) for working part time. These individuals are sometimes referred to as involuntary part-time workers. <http://www.bls.gov/lau/stalt.htm>

These data are different than the traditionally reported, seasonally adjusted unemployment rate. In August 2016, the Massachusetts Department of Labor and Workforce Development reported about 140,000 unemployed people in Massachusetts.

Workers with a high school diploma or less are disproportionately unemployed.

Educational Attainment of Civilian Labor Force & Unemployed in Massachusetts, 2012-2014

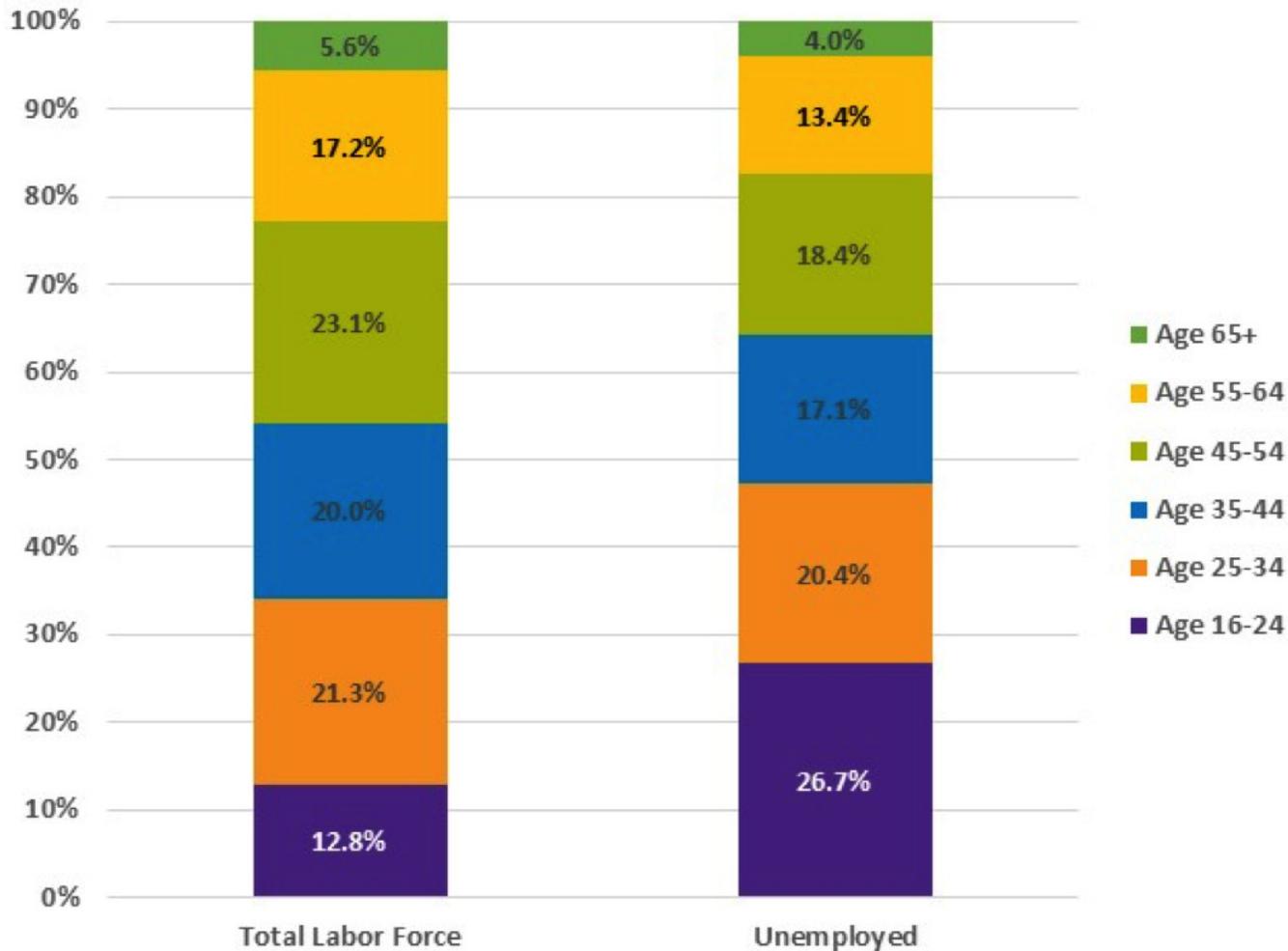
Workers with a high school diploma or less are disproportionately unemployed – making up 30.7% of the labor force, but 50% of the unemployed.



» Demographics of the Commonwealth's Labor Force

Young workers, 16-24 are also disproportionately unemployed.

Age of Civilian Labor Force & Unemployed in Massachusetts, 2012-2014

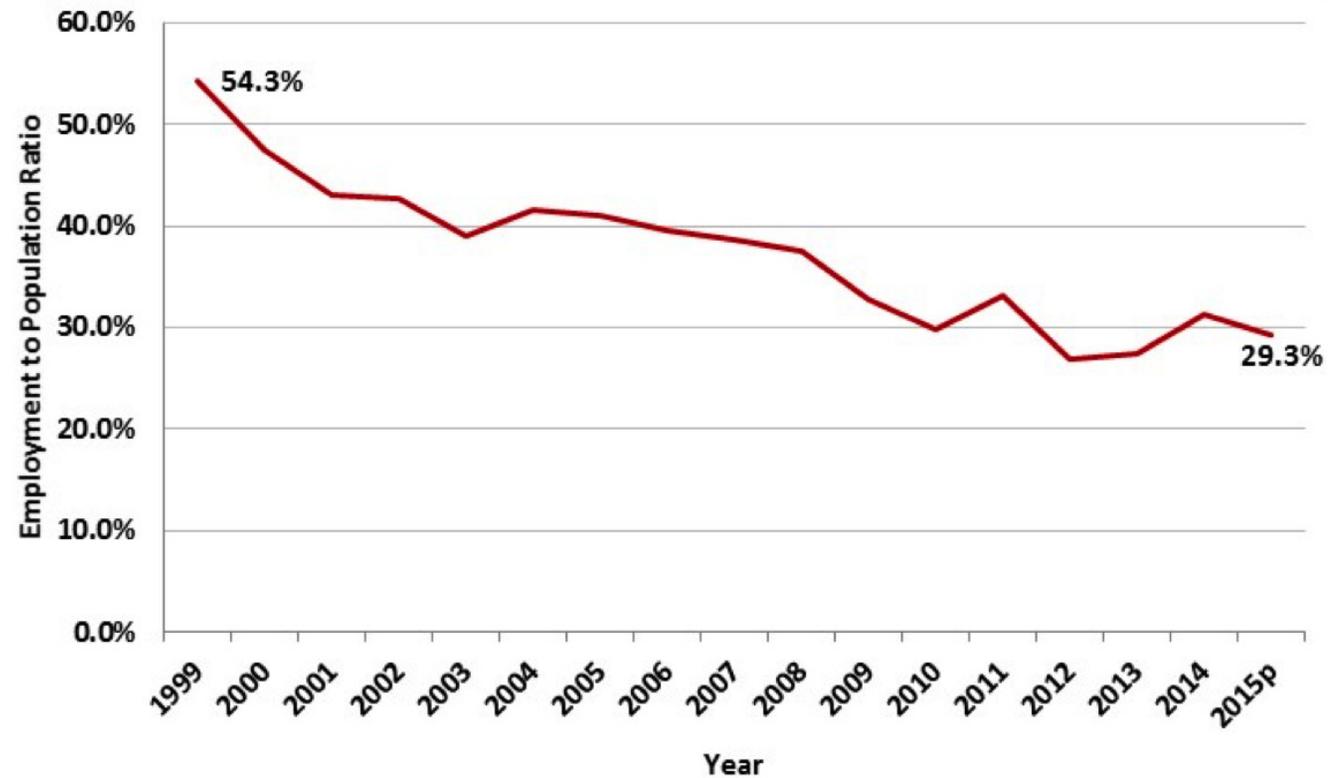


Younger workers are more likely to be unemployed – 16-24 year olds make up nearly 13 percent of the labor force, but nearly 27 percent of the unemployed.

Teen employment has fallen dramatically since 1999, and has been relatively stagnant through the recovery.

Massachusetts Employment Rate, 16-19 Year Olds, 1999 to 2015

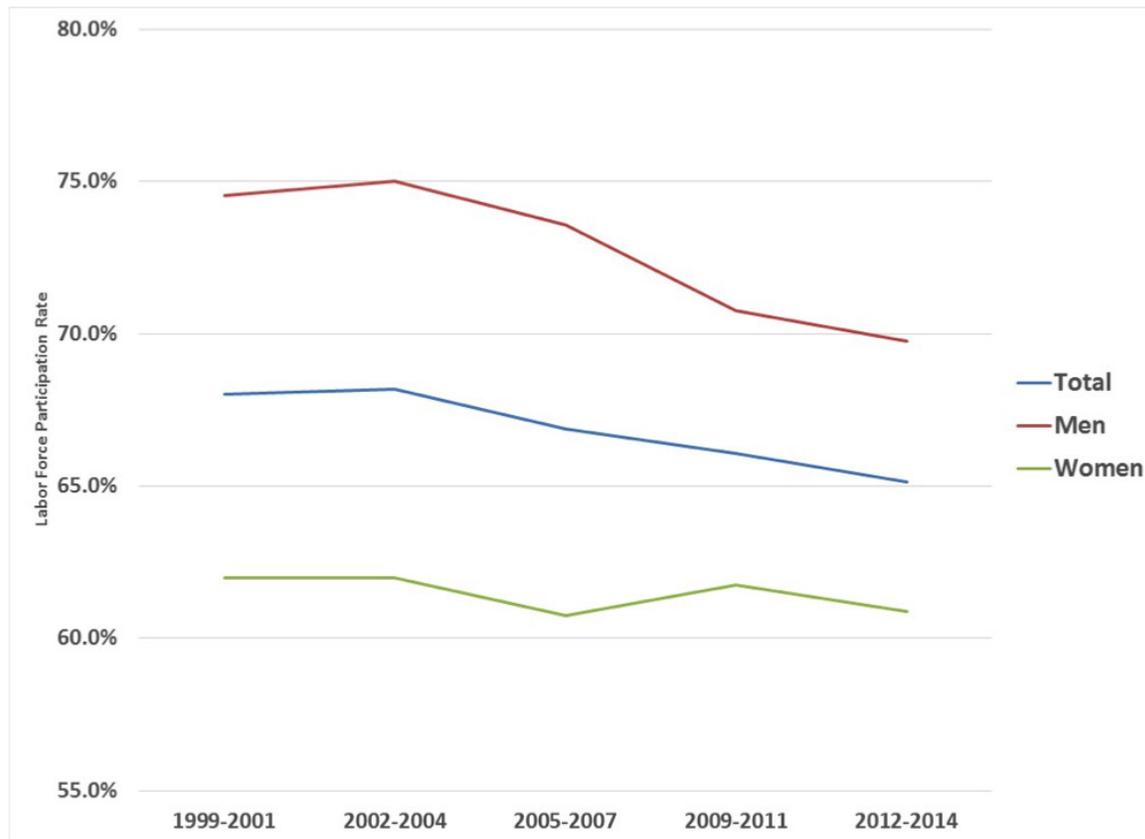
- This chart shows the employment to population ratio for teens 16-19 years old. We've been tracking this rate since our 2013 Signaling Success study detailing the barriers to employment for teens.
- While not declining as rapidly, the teen employment rate has not recovered since 1999.



» Demographics of the Commonwealth's Labor Force

Women's labor force participation has flattened, while men's labor force participation has declined.

Massachusetts Labor Force Participation by Gender, 1999-2001 to 2012-2014



- Our labor force participation rate has declined since 1999-2001.
- After decades of consistent growth, women's labor force participation has stagnated. The male labor force participation rate has declined.

Key Data Sources

Massachusetts Labor Market and Economic Review, 2014 from Massachusetts Executive Office of Labor and Workforce Development:

http://lmi2.detma.org/lmi/pdf/MA_Economic_and_Labor_Review_2014.pdf

Massachusetts Employment (ES-202), Current Employment Statistics (CES-790) from Massachusetts Executive Office of Labor and Workforce Development:

http://lmi2.detma.org/lmi/lmi_es_a.asp

http://lmi2.detma.org/lmi/lmi_ces_a.asp

U.S. Quarterly Census of Employment and Wages (QCEW):

<http://www.bls.gov/cew/datatoc.htm>

Alternative measures of unemployment, Current Population Survey (CPS):

<http://www.bls.gov/lau/stalt.htm>

Massachusetts Population Estimates by County from UMass Donahue Institute Population Estimates Program:

http://pep.donahue-institute.org/countypop2015/MA_CountyPop2015.pdf

U.S. Census Bureau, American Community Survey, Public Use Microdata Sample (PUMS), tabulations by Center for Labor Markets and Policy (CLMP), Drexel University

Integrated Postsecondary Education Data System (IPEDS):

<https://nces.ed.gov/ipeds/datacenter/>

Massachusetts WIOA State Plan

<http://www.mass.gov/massworkforce/state-plan/wioa-2020/ma-wioa-state-plan-final-4-7-16.pdf>