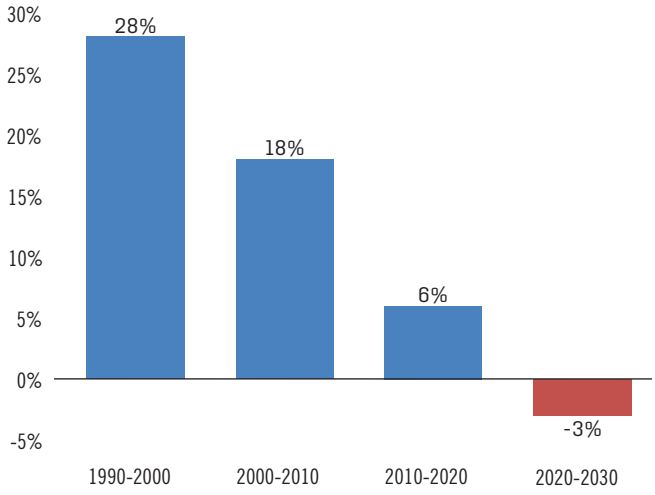
Figure 2: Growth in the Number of Massachusetts Residents with Bachelor's Degrees (with 2030 projection)



Source: MassINC and UMass Donohue Institute

Higher education is the leakiest segment of the state's talent development pipeline. Massachusetts has made real strides preparing low-income students for the future. Between 2006 and 2017, five-year high school graduation rates for low-income students climbed from 68 percent to 82 percent. Recognizing that they will need higher education in order to make it in the Massachusetts knowledge economy, the majority of these low-income students now go on to college. However, post-secondary yield is the exact inverse of high school degree attainment; 82 percent of low-income students fail to make it through college and earn either a two- or four-year degree **(Fig. 3)**.

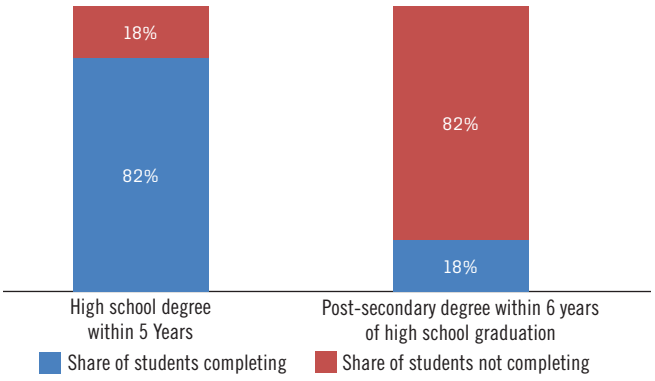
While some progress has been made increasing college completion rates over the last few years, it is notable that the greatest gains have been among non-low-income students. This increasing disparity is evident when comparing the final outcome for the class of 2007 to the class of 2010 at the far right of **Figure 4**, a "waterfall graph" depicting the share of students who continue on at each juncture. Low-income students in the class of 2010 were three times less likely than their non-low-income peers to complete a post-secondary degree (18 percent vs. 52 percent).

Community colleges are one source of leakage in the pipeline. In Massachusetts, more than one-third of low-income students and nearly half of Latino students who go on to college immediately after high school attend community colleges. The latest figures show that only about one-quarter of students enrolling in a Massachusetts community college earn an Associate's degree or credential (another one-quarter transfer to other institutions, where they may or may not earn a degree). At our state universities, which also serve a disproportionate number of low-income students, completion is also a challenge, with some only graduating about half of their students within six years.[8]

Reflexively blaming public colleges for low-graduation rates is not a solution. These post-secondary institutions open their gates to all and go to great lengths to provide underserved students with higher education. Researchers have carefully documented the many structural challenges low-income students face. These challenges range from gaps in academic preparation and lack of awareness and access to information to make complex and highly consequential decisions around college, to employment, housing, transportation, and other obstacles related to financial instability. Equally pernicious, many of these youth simply feel that college is not for them.[9]

As previous MassINC research has demonstrated, when students leave high school underprepared for the post-secondary training needed to obtain the good jobs in our economy, they stack up by the tens of thousands in our adult workforce development system, where the training task becomes far more complex and the available resources are woefully inadequate relative to the need.[10]

Figure 3: Degree completion for low-income Massachusetts high school students in the class of 2010



Source: Massachusetts Department of Elementary & Secondary Education

"Investing in Early College: Our Most Promising Pathway". June 2019, MassINC.

The skills gap means one thing to employers and something else to educators.

across multiple regions, the Network teams confirm that the skills gap means one thing to employers and something else to educators. Employers claim that high school and community college graduates arrive ill-prepared for the workplace and with weak skills, while educators claim that, without more willingness to partner in education and training designs and to open doors so young people can gain work experience, employers won't get what they need.

Until these two constituencies can meet in the middle, they will continue to miscommunicate about what needs to happen next and, unfortunately, there are few examples of sustained and scaled success in this realm.

The Pathways Network participants have committed to the idea that sustained and scaled employer engagement cannot be accomplished without the use of workforce intermediaries, sector organizations, and a neutral organizing and guiding body representing key stakeholders in building a regional system. Such an organization's critical activity is brokering work-based learning opportunities for young people. Very few such mechanisms exist now in the Network states. A second critical factor is the Network's focus on the specific sectors of the economy described below. Employers are much more likely to engage when sector organizations can play a go-between role and when data provided from labor market analyses show the actual supply/demand picture for certain specializations within the chosen sectors.

The Network states are testing diverse strategies to link educational institutions to the labor market and address the needs of emerging industries. They are creating opportunities for adolescents to learn more actively in school and beyond by pursuing internships, building relationships with adult mentors, learning about possible futures, developing marketable skills and knowledge, and making progress toward postsecondary credentials and degrees. The states also are designing programs and services that support young people in making informed choices about academic coursework, technical training, and career options that will help them realize their long-term goals.

EXAMPLES: EMPLOYERS ENGAGING YOUNG PEOPLE IN WORK-BASED LEARNING

- **Paramount Farms:** Five early colleges in California's Central Valley are focused on agricultural business management, plant science, and agricultural mechanics, and are engaged in partnerships with three community colleges and six companies that provide paid internships.
- **Southwire:** The Carroll County, Georgia, company sponsors an engineering academy in a comprehensive high school and 12 For Life, a work-study high school for at-risk young people on the Southwire shop floor.
- **IBM and SAP:** Multiple early colleges featuring work-based learning and paid apprenticeships in computer science, IT, and business in Network states; STEM early colleges in Chicago sponsored by Cisco, IBM, Motorola, Verizon, and Microsoft.
- **Western Massachusetts chapter of the National Tooling and Machining Association (WMNTMA):** A comprehensive high school, a technical community college, and the workforce investment board sponsoring a new manufacturing pathway starting in 9th grade.
- **Wegmans Supermarket:** Leadership of an education and workforce development group in Rochester, New York, under the auspices of the Finger Lakes Regional Economic Development Council, meeting weekly to provide local young people with support and job opportunities.
- **The Boeing Company:** Funded externships for instructors in the St. Louis region to participate with business partners to learn about high-demand pathways and to develop problem-based, real-world projects for students.

FIGURE 3 PROJECTED JOB GROWTH IN SUB-BACHELOR'S DEGREE POSITIONS IN THE HEALTH CARE FIELD

Patient-Centered Postitions	Entry Education	# Jobs 2010	Job Growth 2010-2020	Change
Home Health and Personal Care Aides	Less than high school	1,878,700	70%	1,313,200
Registered Nurses	Associate's degree	2,737,400	36%	711,900
Nursing Aides	Postseconary certificate	1,505,300	20%	302,000
Licensed Practical Nurses	Postseconary certificate	752,300	22%	168,500
Medical Assistants	HS Diploma/equivalent	527,600	31%	162,900
EMTs and Paramedics	Postseconary certificate	226,500	33%	75,400

Source: U.S. Bureau of Labor Statistics. (2012). *Monthly Labor Review.*

ZEROING IN ON INDUSTRY SECTORS OF PROMISE FOR YOUNG PEOPLE

To support the development of career pathways within the Network, JFF carried out asset mapping, including studies of the labor market using "real time" as well as traditional data, in 25 regions where Network initiatives are located. The process consistently identified three growth areas of the economy across the Network's eight states as the best bets for young people seeking appropriate entry-level jobs with a two-year degree. These were health care, information technology (IT) and computer science, and advanced manufacturing.

Health Care. Postsecondary institutions have long prepared people for the health care field. Given the aging population and the new requirements of the Affordable Care Act, the allied health field is one of the most in-demand fields in two- and four-year institutions. High schools also prepare young people in health care. The College & Career Academy Support Network lists 156 health-career-themed high schools or academies in their national directory. There are likely more, and a good number of these schools are highly successful in keeping young people in programs through graduation whether they choose to go on in the field in college or prefer a different career option.

The challenge in health care is that among high school counselors, teachers, and students there is little awareness that nursing is only one option of many in the allied health fields. Other growing technical fields one can enter with a two-year degree include physical therapy assistant, medical laboratory technician, radiological technician, occupational therapy assistant, recreation therapy assistant, and respiratory therapy technician, along with the very new field of health information technology (sometimes called health informatics).

A second challenge concerns access. Because of the recession, many adults who have already completed science courses, and have work experience and often a bachelor's degree, are taking the limited places allocated competitively in postsecondary health career degree programs, effectively crowding out young people with little to no work experience who are entering postsecondary education directly from high school. There are also higher education faculty shortages in the health care field. Finally, few high school programs are aligned with postsecondary programs of study.

On the plus side, because obtaining a license in some areas of health care requires a clinical practicum, hospitals, nursing homes, clinics, and rehabilitation centers are accustomed to taking on interns and are often willing to provide work-based learning opportunities for high school students. In existing health-related early college programs, high school students earn credits that transfer seamlessly into community college credential programs under agreements between the college and the high school, thereby ensuring themselves places in high-demand programs. Furthermore, since certificates and licensure are essential to the health care industry, increasing numbers of career pathways in this sector are integrating industry-recognized credentials into their high school programs of study.

Information Technology (IT) and Computer Science. Almost all workplaces today are IT-enabled. IT skills are required in nearly every occupation, including growing career pathways in such fields as data security, engineering technology, and automotive technology.

NEWS RELEASE
BUREAU OF LABOR STATISTICS
U. S. DEPARTMENT OF LABOR

For release 10:00 a.m. (EDT) Wednesday, September 4, 2019 USDL-19-1571

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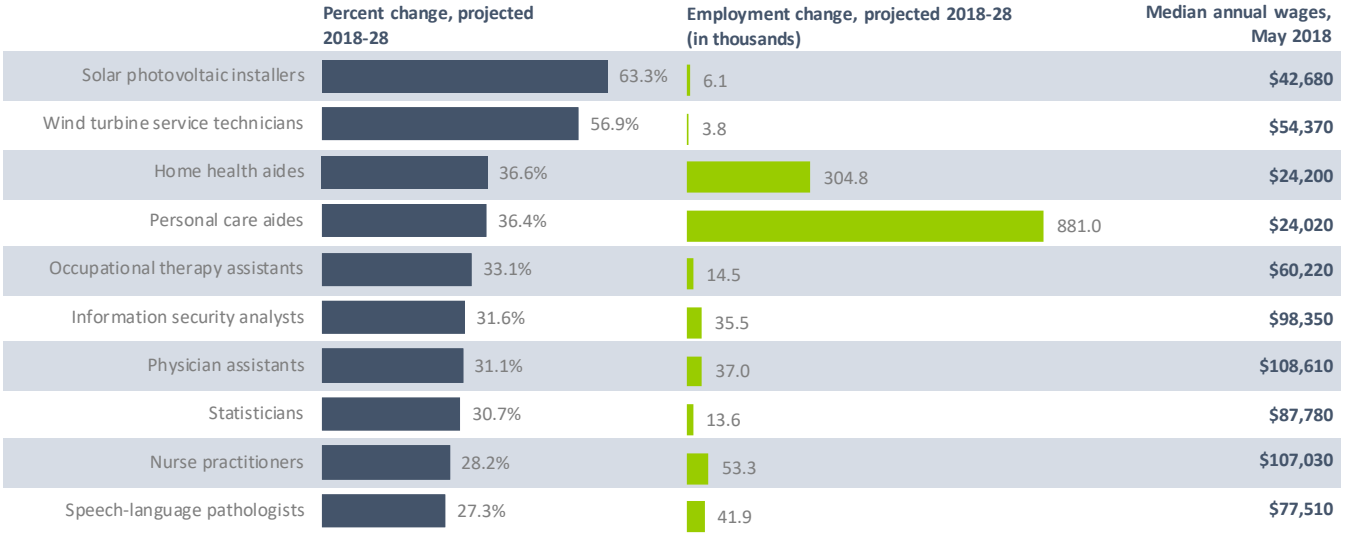
EMPLOYMENT PROJECTIONS — 2018-2028

Employment is projected to grow by 8.4 million jobs to 169.4 million jobs over the 2018–28 decade, the U.S. Bureau of Labor Statistics (BLS) reported today. This expansion reflects an annual growth rate of 0.5 percent, which is slower than the 2008–18 annual growth rate of 0.8 percent. An aging population and labor force will contribute to changes expected over the coming decade including a continued decline in the labor force participation rate and continued growth in employment in healthcare and related industries and occupations. (See Chart 1.) Real Gross Domestic Product (GDP) is projected to grow at much the same rate from 2018 to 2028 as it did in the previous decade; labor productivity is projected to accelerate slightly from the previous decade to an annual rate of 1.6 percent, higher than the previous decade's annual rate of 1.3 percent.

Chart 1. Ten fastest growing occupations, projected 2018-28



Occupational Outlook Handbook

The projections are the foundation of the BLS *Occupational Outlook Handbook (OOH)*, one of the nation's most widely used career information resources. The *OOH* reflects BLS employment projections for the 2018–28 decade. The updated *OOH* is available online at www.bls.gov/ooh.

Health Care Workforce Trends in Massachusetts and Pioneer Valley

MassHire Hampden County Workforce Board

Allied Health Collaborative

October 26, 2018

COMMONWEALTH CORPORATION
Building skills for a strong economy.

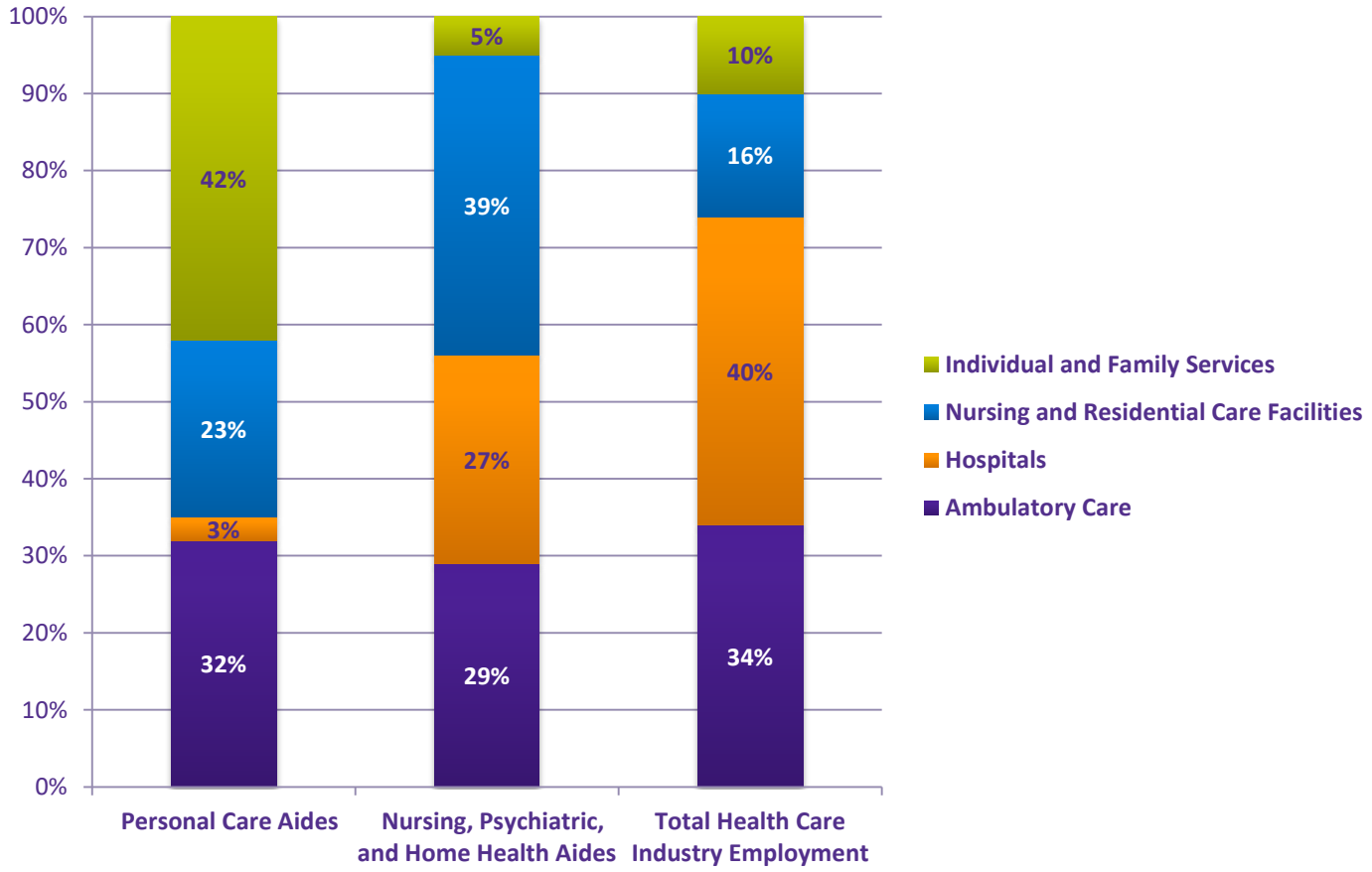
15 High Demand Health Care Occupations

- What do I mean by "high demand"?
  - Strong employment growth
  - Emerging importance of the role in health care delivery
- O*NET Job Zones (1-5)
  - 1 – little to no preparation required (may require a HS diploma)
  - 5 – Extensive preparation needed (most require graduate school)

none of the high demand healthcare occupations fall within job zone 1

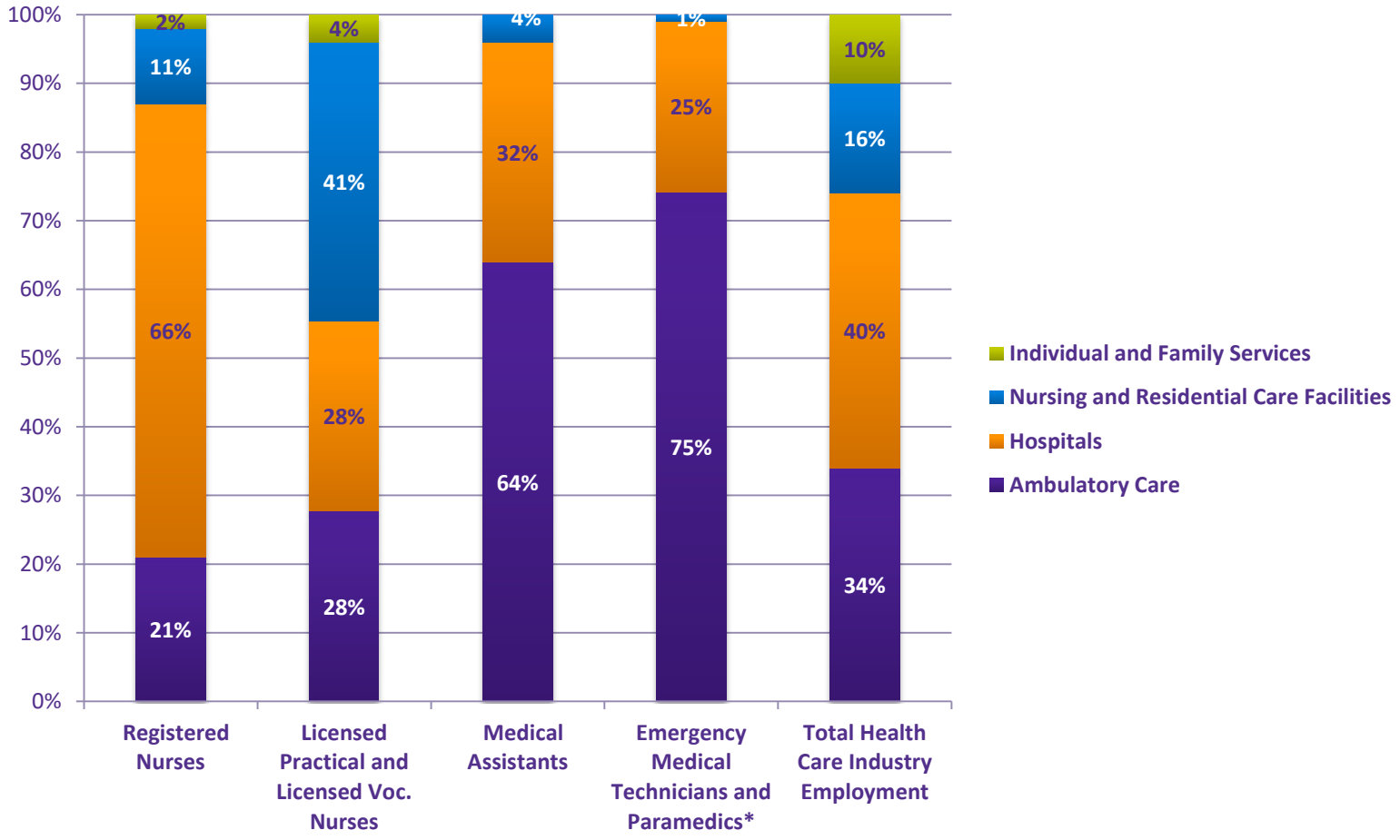
COMMONWEALTH CORPORATION
Building skills for a strong economy.

Job Zone Two High Demand Occupations



COMMONWEALTH CORPORATION
Building skills for a strong economy.

Job Zone 3 High Demand Occupations



Source: 2012-2013-2014 American Community Survey PUMS Data (Public Use Micro Data Samples); Tabulations by Drexel University Center for Labor Markets and Policy.

*The total employment of EMTs is based on Massachusetts data, but due to a smaller sample of EMTs in the 2012-14 ACS data for Massachusetts, the industry distribution of EMTs is based on 2012-14 ACS data for New England.

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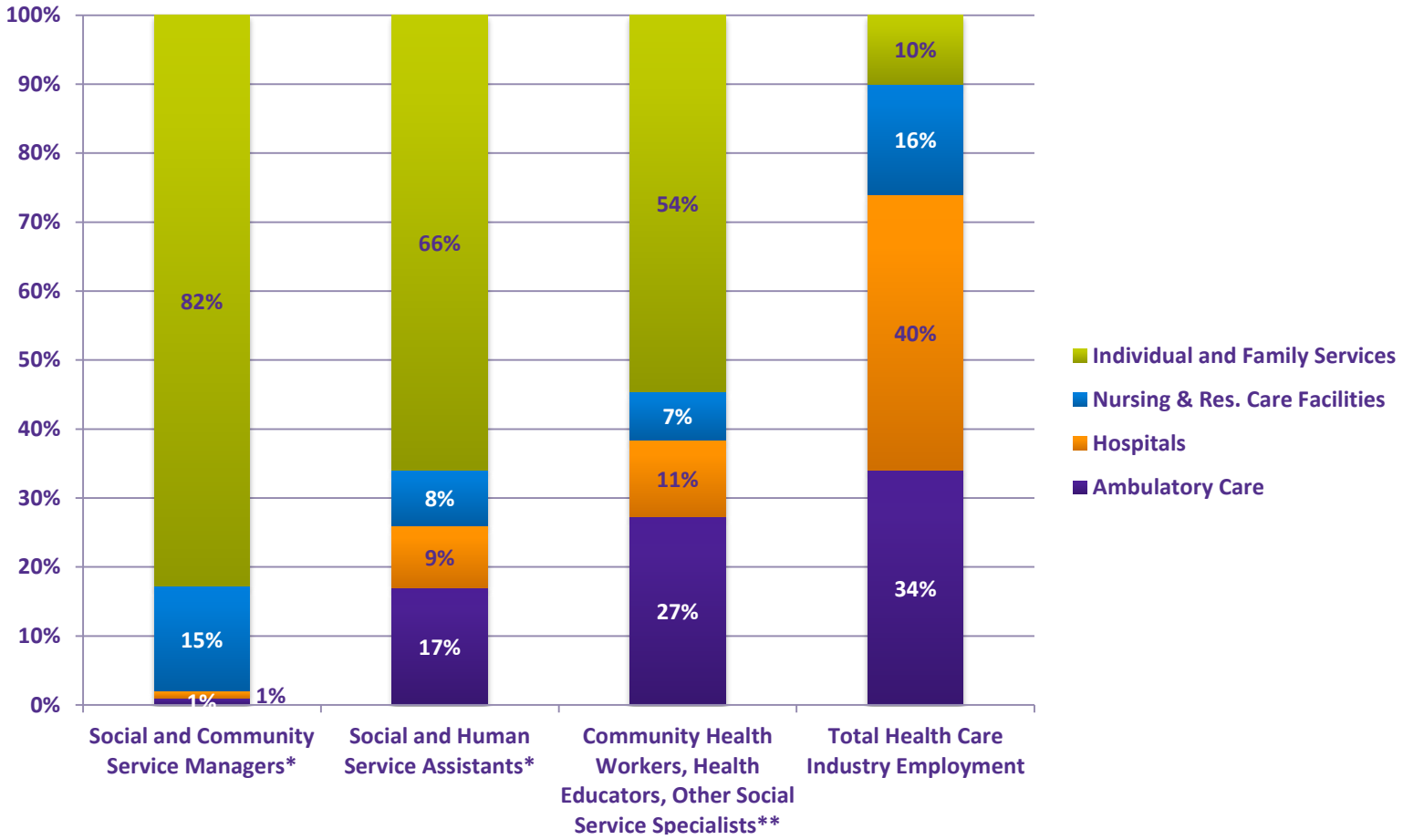
Job Zone 4 High Demand Occupations

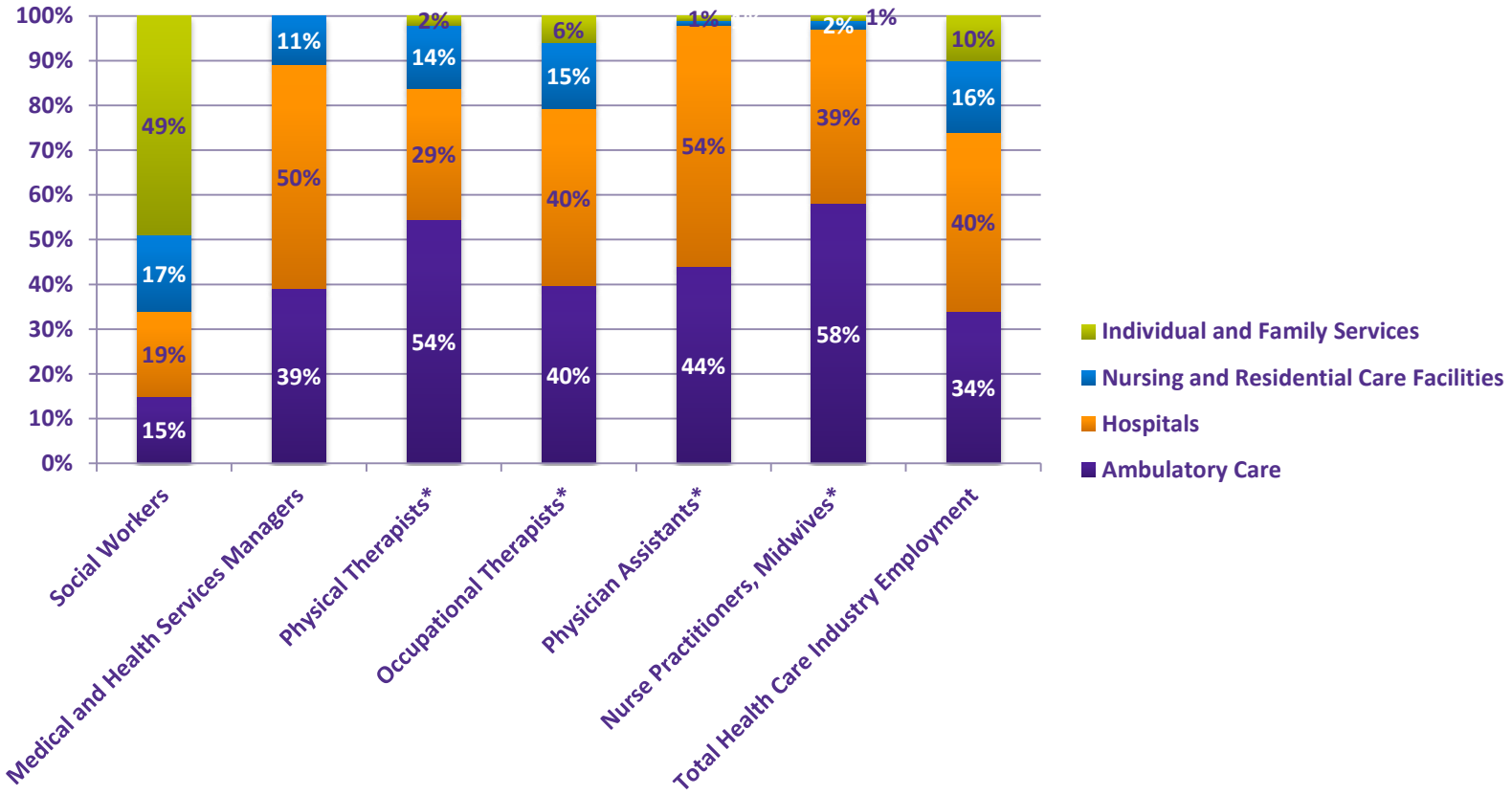


Source: 2012-2013-2014 American Community Survey PUMS Data (Public Use Micro Data Samples); Tabulations by Drexel University Center for Labor Markets and Policy.

* The total employment for these occupations is based on 2012-14 ACS data for Massachusetts. However, due to a smaller sample size in the 2012-14 ACS data for Massachusetts, the industry distribution of workers in these occupations is based on 2012-14 ACS data for New England.

** The total employment for this occupation is based on 2012-14 ACS data for Massachusetts. However, due to a smaller sample size in the 2012-14 ACS data for Massachusetts and New England, the industry distribution of workers in this occupation is based on 2012-14 ACS data for the U.S.

Job Zone 5 High Demand Occupations



Source: 2012-2013-2014 American Community Survey PUMS Data (Public Use Micro Data Samples); Tabulations by Drexel University Center for Labor Markets and Policy.

* The total employment for these occupations is for Massachusetts. However, due to a smaller sample size in the 2012-14 ACS data for Massachusetts, the industry distribution of these occupations is based on 2012-14 ACS data for New England.

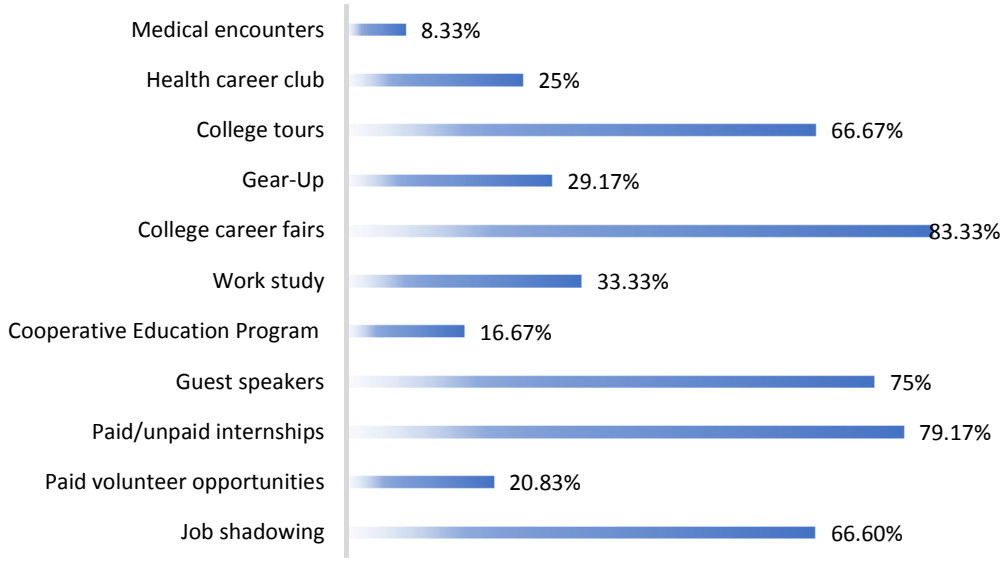
COMMONWEALTH CORPORATION
Building skills for a strong economy.

CAREER ADVISING AND EXPLORATION ACTIVITIES WITHIN HIGH SCHOOLS
2018 Survey Responses

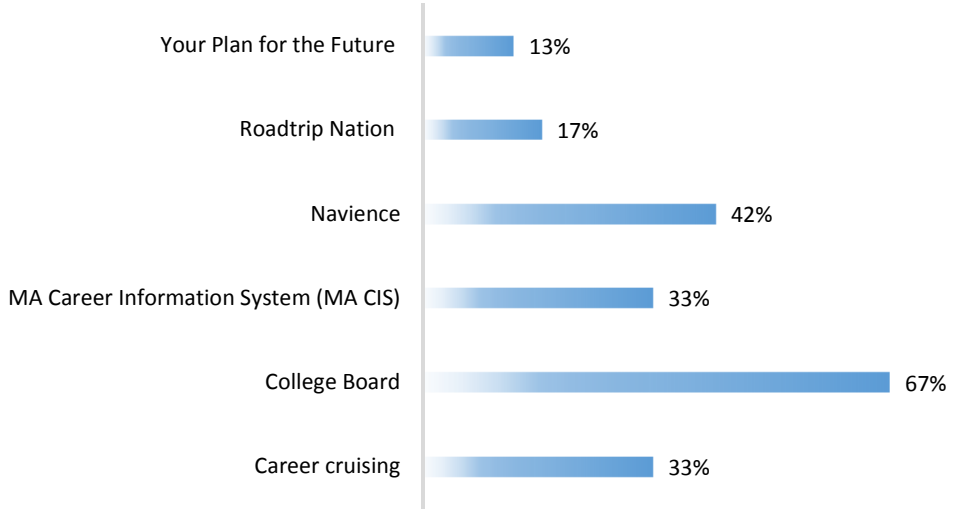
High Schools	Career Exploration Programs											Web-based Tools						Other
	College career fairs	College tours	Cooperative education program	Gear-Up	Guest speakers	Health career club	Job shadowing	Medical encounters	Paid volunteer opportunities	Paid/unpaid internships	Work study	Career Cruising	College Board	MA Career Information System (MA CIS	Navience	Roadtrip Nation	Your Plan for the Future	
Agawam	X	X			X	X		X							X			Springfield Promise Program College rep. visits
Baystate Academy													X					
Chicopee Academy	X	X		X	X					X	X	X						ASVAB
Chicopee Comprehensive	X				X	X	X		X	X		X						
Chicopee												X	X					
Easthampton					X		X		X		X	X						
Granby Junior Senior	X									X								Choices
High School Completion Program	X	X													X	X		
High School of Science & Technology	X				X		X			X			X		X	X		
Holyoke	X	X		X	X		X			X		X	X				X	
Holyoke - Dean Campus	X	X	X		X		X		X	X		X	X	X				
John J Duggan Academy	X			X	X	X	X		X	X	X		X	X			X	Internship, dual-enrollment
Monson	X	X			X		X		X	X			X	X			X	Mefa Pathways
Palmer	X	X			X					X				X				
Pathfinder Regional Vocational Technical		X	X			X						X	X					
Shepherd Hill Regional	X				X		X		X	X			X	X	X		X	
South Hadley	X	X			X		X			X			X	X	X		X	Work-based learning programs
Southwick Regional School	X	X	X	X	X	X	X	X	X	X			X		X			Field trips
Tantasqua Regional	X	X			X		X		X				X		X			
The Springfield Renaissance School	X	X											X		X	X		
Wahconah Regional							X			X	X		X		X			
West Springfield	X	X		X	X		X			X	X		X	X			X	

This table is derived from a survey completed by high schools guidance counselors. The counselors were asked to identify the programs that were available to students within their schools.

Percentage of schools utilizing conventional career exploration programs



Percentage of schools utilizing web-based career exploration programs



Career advising and planning web-based tools descriptions:

Career Cruising - Career Cruising is a self-exploration and planning program that helps people of all ages achieve their potential in school, career and life. It includes an Interactive career guide featuring multimedia interviews with real people in every career, in-depth occupational profiles and information on colleges and universities.

https://public.careercruising.com/en/

College Board – College Board provides college readiness services to students. It helps to prepare them for a successful transition to college through programs and services such as the SAT and the Advanced Placement Program.

https://www.collegeboard.org/

MA Career Information System (MA CIS) - MA Career Information System provides information on career assessment and planning, occupations, the labor market, outlook, and educational options. Target audience includes career and school counselors, job seekers, students and educators. Managed by the MA Department of Career Services.

https://masscis.intocareers.org/materials/portal/home.html

Naviance – Naviance is a personalized college and career readiness program that partners with high schools to assess students' skills and learning styles. It also helps to identify suitable careers, match students with college programs and helps students to identify preparatory courses.

https://www.naviance.com/

Roadtrip Nation Education - Roadtrip Nation Education provides thousands of career stories that illuminate diverse pathways and careers. Students can browse a library of video interviews by the interests and themes that matter most to them.

The Roadmap is an interactive online tool. It allows students to select their unique combination of interests and discover related real-world careers. https://roadtripnation.com/

Your Plan for the Future – Your Plan for the Future helps students to navigate the college enrollment process as well as provide support to students with vocational trainings entering the workforce. https://www.yourplanforthefuture.org/

Examples of integrating the web-based career exploration tools into the school day:

1. Guidance counselors introduce curriculum to students in the classroom and during advisory block
2. Teachers blend the web-based programs with English courses for career research paper and interview writing skills lessons
3. It is implemented in core academic classes by teachers and school counselors
4. During college and career readiness, students create college board accounts, research colleges, and choose colleges they are interested in
5. Senior exit surveys guide the college/career readiness curriculum and programming
6. The data is used to schedule career information sessions, field trips, recruit speakers for our career discovery day, develop career speaker panels and communicate available opportunities, such as internships, programs and/or scholarships
7. The data help guide students on selecting the post-secondary plan that is right for them, based on their interests and goals
8. Results are shared and reviewed with each respective student
9. Attempt to conduct workshops and field trips based on student interests
10. Identify which students are registered and how they are utilizing the site
11. No data is used, however the guidance counselors go over college searches and interests with each students and lead them in further research
12. School counselors use data in guiding course selection and college/career guidance
13. This data is shared with all 9th grade teachers and the classroom teachers integrate it into a final project
14. In the 9th grade Wellness classes. *Beyond 9th grade, it is a struggle to get our classroom teachers to recognize the importance of integration!!*
15. Naviance is new to our school, and we will be introducing it to our students before the end of the school year

Massachusetts Work-Based Learning Plan

Participant's Name:		Worksite Supervisor Name:	
Participant's Email:		Worksite Supervisor Email:	
Participant's ID Number:		School / Program:	
Job Title:		Staff / Teacher Name:	
Worksite:		Start Date:	End Date:

JOB DESCRIPTION – Tasks, responsibilities, projects:

EMPLOYABILITY SKILLS

The employability skills below are essential in every work environment throughout one's career. Please discuss and review these skills at least twice during this work-based learning experience, in a first, baseline review and in a second review near the end of the work-based learning experience. ***(Two reviews to capture growth -- Be objective!)***

KEY

1 = Performance Improvement Needed: Needs to have a strategy to improve this skill
2 = Developing: Developing this skill; learning to address challenges related to this skill; aware of next steps needed to develop this skill
3 = Competent: Demonstrates this skill; aware of the importance of this skill
4 = Proficient: Consistently demonstrates this skill; shows initiative to learn about, enhance or apply this skill
5 = Advanced: Exceeds expectations; works with high level of independence, acts as a role model, or shows initiative to apply and extend this skill

SKILL	PERFORMANCE EXPECTATIONS	REVIEWS Use 1-5 Scale (See Key Above)		COMMENTS Notes, goals, and reflections for Review #1 and Review #2
Attendance and Punctuality	• Arrives on time and prepared for work • Provides sufficient notice if unable to report for work	Rev #1		
		Rev #2		
Motivation and Initiative	• Participates fully in tasks or projects from start to finish • Initiates interaction with supervisor for next task or project upon successful completion of previous one	Rev #1		
		Rev #2		
Communication	• Communicates effectively, orally and in writing, using the language and vocabulary appropriate to a variety of audiences within the workplace including coworkers, supervisors and customers • Demonstrates active listening skills; focuses attentively, makes eye contact or other affirming gestures, confirms understanding and follows directions	Rev #1		
		Rev #2		
Teamwork and Collaboration	• Works productively with co-workers, individually and in teams; support organization's mission and goals • Accepts direction and constructive feedback with positive attitude	Rev #1		
		Rev #2		
Critical Thinking and Problem Solving	• Notices and identifies challenges and problems that arise in the workplace • Brings concerns to attention of supervisors when appropriate • Develops solutions to challenges and problems by analyzing available information and looking at options, guided by expectations for the position and goals of the organization	Rev #1		
		Rev #2		
Workplace Policy, Culture and Safety	• Exhibits understanding of workplace culture and policy • Dresses appropriately for position and duties • Practices personal hygiene appropriate for position and duties • Follows professional standards for use of computers, phones and social media • Respects confidentiality • Complies with health and safety rules for the workplace	Rev #1		
		Rev #2		

WORKPLACE & CAREER SPECIFIC SKILLS

Select three to five skills that will be a focus for this work-based learning experience. Choose from the following lists or identify other skills relevant to the specific workplace or career goals. Skill definitions are available in the resource guide and the online screens. See http://massconnecting.org/wblp

Career / Engagement Skills
Active Learning
Collecting and Organizing Information
Creativity
Customer Service
Leadership
Project Management
Public Speaking / Presentations
Teaching/Instructing
Time Management
Understanding All Aspects of the Industry

Digital Literacy Skills
Computer Technology
Database Use
Graphic Design
Media Literacy
Office Suite Software
Photo Editing
Software Development
Spreadsheet Use
Web Development
[Or industry specific technology]

Applied Academic Skills
Applied Mathematics
Reading
Research and Analysis
Writing

STEM-Related Skills
Engineering Concepts
Environmental Literacy
Health Literacy
Research and Analysis
Science Lab Concepts

Technical / Career-Specific Skills
Applied Arts and Design
Blueprint Reading
Child Development
Cooking / Culinary Arts
Early Childhood Math/Reading Literacy
Equipment Operation
Landscaping
Maintenance / Repair / Painting
Medical Office Skills
[Or other skills applicable to the work experience]

SKILL	SKILL DEFINITION	REVIEWS USE 1-5 SCALE (See Key Above)		COMMENTS Notes, goals, reflections for Review 1 and Review 2
		Rev #1		
		Rev #2		
		Rev #1		
		Rev #2		
		Rev #1		
		Rev #2		
		Rev #1		
		Rev #2		
		Rev #1		
		Rev #2		

COMMENTS & SIGNATURES

REVIEW #1:

Participant Signature: _____

Supervisor Signature: _____

Staff Signature: _____

Date: _____

REVIEW #2:

Participant Signature: _____

Supervisor Signature: _____

Staff Signature: _____

Date: _____

SKILLS EXERCISE

Which skills do you want students to learn about in internships, summer jobs, volunteer projects and other experiences in the healthcare sector? The following list shows skills from the Work-Based Learning Plan. Additional skills are listed in the Work-Based Learning Plan Skills Dictionary at http://massconnecting.org/wblp (click the link for Skills Dictionary). As an exercise, circle 8-10 skills (or more) that you think are particularly important for the health care sector. Write in others as needed. Be ready to explain why you chose those skills.

Career / Engagement Skills

Active Learning

Collecting and Organizing Information

Creativity

Customer Service

Leadership

Project Management

Public Speaking / Presentations

Teaching/Instructing

Time Management

Understanding All Aspects of the Industry

Digital Literacy Skills

Computer Technology

Database Use

Graphic Design

Media Literacy

Office Suite Software

Photo Editing

Software Development

Spreadsheet Use

Web Development

[Or industry specific technology]

Applied Academic Skills

Applied Mathematics

Reading

Research and Analysis

Writing

STEM Related Skills

Engineering Concepts
Environmental Literacy
Health Literacy
Research and Analysis
Science Lab Concepts

Technical / Career-Specific Skills

Applied Arts and Design

Blueprint Reading
Child Development
Cooking / Culinary Arts
Early Childhood Math/Reading Literacy
Equipment Operation
|Landscaping
Maintenance / Repair / Painting
Medical Office Skills
[Or other skills applicable to the work experience]

Employability Skills (included on all WBLPs)

Attendance and Punctuality
Motivation and Initiative
Communication
Teamwork and Collaboration
Critical Thinking and Problem Solving
Workplace Policy Culture and Safety